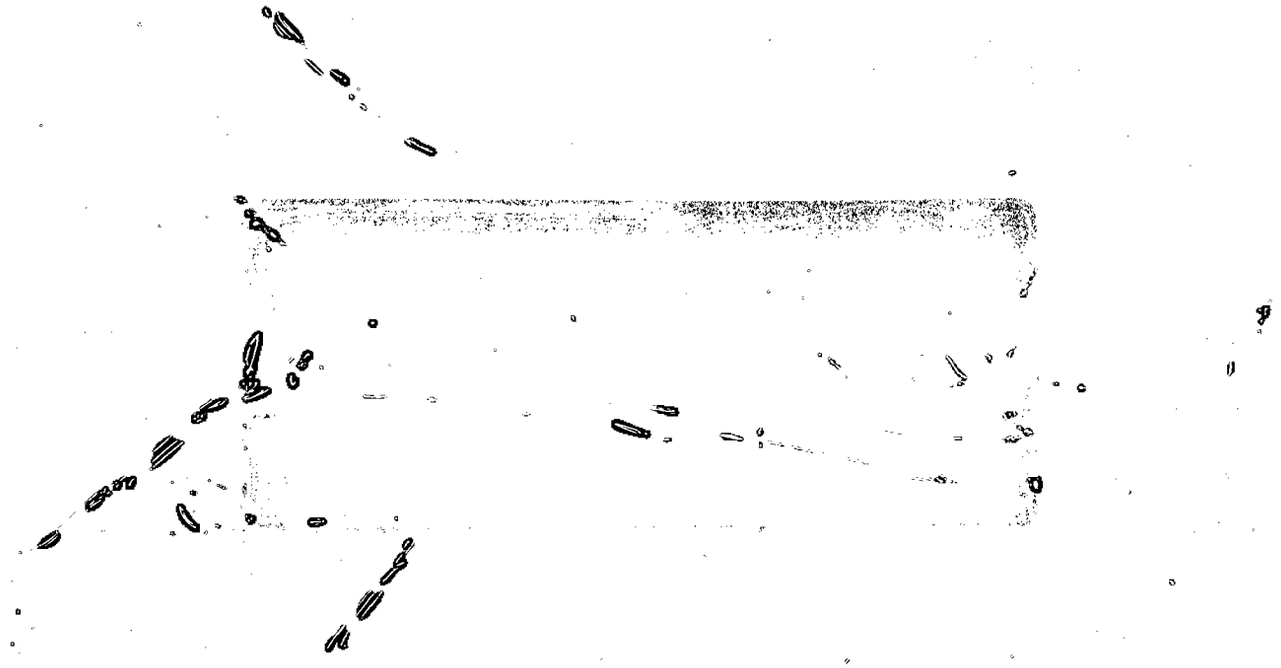
915029



[illegible] KLEAN, INC.

Chemical Waste Analysis, Prevention and Control

2/8282

RECRA ENVIRONMENTAL, INC.

Chemical Waste Analysis, Prevention and Control

SITE CHARACTERIZATION AND ENVIRONMENTAL ASSESSMENT HANNA FURNACE, BUFFALO, NEW YORK VOLUME II

PIN 5034.43.221
City of Buffalo - Arterial Route
Fuhrmann Blvd. - Hamburg Turnpike
Fed. Proj. BRF-1(120), Erie County
Map 326, Parcels 353, 354, 355
A.S. #87-44
Compt. No. D002483
Federal Employee I.D. 16-1263663

Prepared For

Regional Real Estate Office
State of New York
Department of Transportation
125 Main Street
Buffalo, New York 14203

Prepared By

Recra Environmental, Inc.
Audubon Business Centre
10 Hazelwood Drive, Suite No. 106
Amherst, New York 14150

August 1988

APPENDIX A

BORING LOGS

APPENDIX A

HYDROGEOLOGIC INVESTIGATION
DOT/HANNA FURNACE SITE

NOTES ON SUBSURFACE LOGS

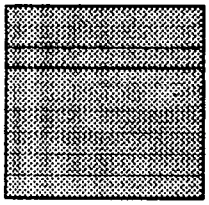
1) Penetration test and split-barrel sampling of soils performed in accordance with ASTM designation D-1586.

2) Description and identification of soils performed in accordance with the Burmister Soil Classification System, as modified in Goldberg-Zion and Associates, Inc. Tech. Procedure No. 1.22, 8/01/83.

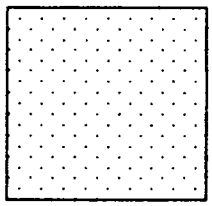
3) Abbreviated terms are as follows:

HSA - hollow stem auger	WOH - weight of hammer
I.D. - inside diameter	in - inch(es)
SB - split barrel sample	ft - foot (feet)
WOR - weight of rods	diam - diameter

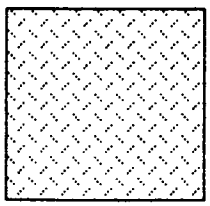
4) Subsurface log patterns:



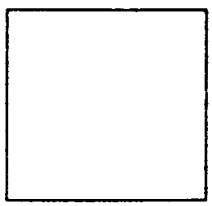
BENTONITE



SAND



GROUT



DATE
STARTED 2-4-88
FINISHED 2-4-88
SHEET 1 OF 1

RECRA ENVIRONMENTAL, INC.

SUBSURFACE LOG

HOLE NO. MW-1 (HF-1)
SURFACE ELEV.
G.W. DEPTH

PROJECT HANNA FURNACE SITE INVESTIGATION; RECRA PROJECT #7C745

LOCATION HANNA FURNACE SITE BUFFALO, NEW YORK

DEPTH-FT	LOG	SAMPLE TYPE	SAMPLE NO	BLOWS ON SAMPLER 0/6	BLOWS ON SAMPLER 6/12	BLOWS ON SAMPLER 12/18	BLOWS ON SAMPLER 18/24	DESCRIPTION	NOTES
5	2"	SB	1	13	44	50	57	Very dense, brown, fine to coarse SAND, some Gravel, little Silt, little Cinders, damp. [Misc. Fill]	Boring advanced with 3-3/4 in. I.D. HSA, truck mounted Diedrich-50 drill rig.
		SB	2	9	12	18	15	Grades to ..... Medium dense, brown to gray-white, trace blue to gray rock fragments, moist.	HNu photoionization analyzer: SB-2 = 25 ppm SB-3 = 30 ppm
		SB	3	8	11	7	3	Grades to ..... dark brown to gray blue, trace Clay.	No other readings.
10		SB	4	WOH	WOH	2	13	Grades to ..... loose, wet. Grades to ..... little Gravel.	Sampler is saturated with water.
		SB	5	2	1	WOR	1	12.0'	
		SB	6	1	WOR	WOR	1	Medium stiff, brown to gray CLAY, some fine Sand, wet, low plasticity. [Silty Clay]	Auger refusal at 15.5 feet.
15	9"	SB	7	4	4	3	4	Grades to ..... Hard, trace Gravel, moderate plasticity. 15.5'	2 in. diameter I.D. sch 40 PVC flush joint casing with 5 foot long screen installed 10.5 feet on 2-4-88.
		SB	8	5	5	100	-		Boring completed at 15.5 feet.
20									Boring collapsed upon auger removal to 13.0 feet.
									No. 4 sand pack placed around screen from 10.5 feet to 3.5 feet.
25									
30									
35									

CLASSIFICATION Visual

METHOD OF INVESTIGATION See Preface Notes

DATE
STARTED 1-28-88
FINISHED 1-29-88
SHEET 1 OF 2

RECRA ENVIRONMENTAL, INC.

SUBSURFACE LOG

HOLE NO. MW-2 (HF-2)
SURFACE ELEV. _____
G.W. DEPTH _____

PROJECT HANNA FURNACE SITE INVESTIGATION, RECRA PROJECT #7C745

LOCATION HANNA FURNACE SITE, BUFFALO, NEW YORK

DEPTH-FT	LOG	SAMPLE TYPE	SAMPLE NO	BLOWS ON SAMPLER 0/6	BLOWS ON SAMPLER 6/12	BLOWS ON SAMPLER 12/18	BLOWS ON SAMPLER 18/24	DESCRIPTION	NOTES
	2"	SB	1	-	-	-	-	Dark brown, fine to coarse SAND, little Gravel, trace Silt, moist. [Misc. Fill]	Boring advanced with 3-3/4 in. I.D. HSA truck mounted Diedrich-50 drill rig.
		SB	2	2	2	2	2		
5		SB	3	2	2	6	100/2	Grades to ..... loose, brown to white, little Silt, wet. Grades to ..... brown to dark gray.	Drilling problems and blow counts at SB-1
		SB	4	21	3	3	3	Grades to ..... little brown Silty Clay. 8.0'	Sample becomes wet. TIP photoionization analyzer no readings.
		SB	5	WOH	3	4	4	Medium, brown Silty CLAY, trace Gravel, wet, slight plasticity. [Silty CLAY] 10.0'	
10	9"	SB	6	2	1	4	6	Loose, dark brown, Clayey SILT and fine to medium SAND, little Gravel, wet, slight plasticity. [Clayey SILT and fine to medium SAND] 12.6'	
		SB	7	1	2	1	3		
15		SB	8	1	1	6	9		
		SB	9	4	5	8	12	Soft, gray, Silty CLAY, wet, medium plasticity. [Silty Clay]	
		SB	10	5	10	15	20	Grades to ..... CLAY, moist, high plasticity.	
20		SB	11	5	8	9	8	Grades to ..... Stiff to very stiff, brown to gray.	Sampler broke, no sample SB-11.
		SB	12	12	14	9	9		No sample SB-12, % recovery.
25		SB	13	2	3	3	4	Grades to ..... Medium to stiff, brown, Silty CLAY, trace fine Gravel, slight plasticity.	
		SB	14	1	4	6	4		
		SB	15	1	3	2	3	Grades to ..... Soft to stiff, brown to gray, medium plasticity.	
30		SB	16	1	3	6	4	32.0'	
		SB	17	55	50	74	37	Very dense GRAVEL, some brown Silty Clay, wet. [GRAVEL] 34.0'	
35									

CLASSIFICATION VISUAL

METHOD OF INVESTIGATION SEE PREFACE NOTES

DATE
STARTED 1-28-88
FINISHED 1-29-88
SHEET 2 OF 2

RECRA ENVIRONMENTAL, INC.

SUBSURFACE LOG

HOLE NO. MW-2 (HF-2)
SURFACE ELEV.
G.W. DEPTH

PROJECT HANNA FURNACE SITE INVESTIGATION; RECRA PROJECT #7C745

LOCATION HANNA FURNACE SITE BUFFALO, NEW YORK

DEPTH-FT	LOG	SAMPLE TYPE	SAMPLE NO	BLOWS ON SAMPLER 0/6	BLOWS ON SAMPLER 6/12	BLOWS ON SAMPLER 12/18	BLOWS ON SAMPLER 18/24	DESCRIPTION	NOTES
35		SB	18	9	29	48	100	Hard, black, SHALE fragments and brown, Silty CLAY, wet.	Top of rock 36.5 feet. Auger refusal at 36.5 ft.
		SB	19	100	-	-	-	[SHALE and Silty CLAY] 36.5'	2 in. diam. I.D. sch 40 PVC flush joint casing with 5 ft. long screen installed to 8.0 ft and grouted on 1-29-88.
40									Initial boring completed at 36.5 feet.
									Initial boring grouted with cement/bentonite mixture to ground surface.
10									Monitoring well installed approximately 7 feet from initial boring.
									No. 4 sand pack placed around screen from bottom of hole to 2.5 ft.
15									
20									
25									
30									
35									

CLASSIFICATION VISUAL

METHOD OF INVESTIGATION SEE PREFACE NOTES

DATE
STARTED 2-3-88
FINISHED 2-3-88
SHEET 1 OF 1

RECRA ENVIRONMENTAL, INC.

SUBSURFACE LOG

HOLE NO. MW-3 (HF-3)
SURFACE ELEV.
G.W. DEPTH

PROJECT HANNA FURNACE SITE INVESTIGATION; RECRA PROJECT #7C745

LOCATION HANNA FURNACE SITE BUFFALO, NEW YORK

DEPTH-FT	LOG	SAMPLE TYPE	SAMPLE NO	BLOWS ON SAMPLER 0/6	BLOWS ON SAMPLER 6/12	BLOWS ON SAMPLER 12/18	BLOWS ON SAMPLER 18/24	DESCRIPTION	NOTES
0	2"	SB	1	8	12	50	-	Very dense, brown, fine to coarse SAND, some Gravel, little Silt, little Cinders, moist. [Misc. Fill]	Boring advanced with 3-3/4 in. I.D. HSA truck mounted Diedrich-50 drill rig.
		SB	2	6	12	4	8		
5		SB	3	12	6	5	10	Grades to ..... Medium dense, dark brown. 3.5'	Sampler only driven to 1.5 ft. SB-1 auger refusal at 2 ft. Relocated drill rig.
		SB	4	2	2	3	5	Stiff, gray, Silty CLAY, medium plasticity, wet. [Silty CLAY]	
		SB	5	3	3	3	4	Grades to ..... Medium, little organic Clayey Silt, trace Gravel. 10.0	HNu photoionization analyzer. No readings. 2 in. diam. I.D. sch 40 PVC flush joint casing with 5 ft. long screen installed to 10 ft. and grouted on 2-3-88.
10		SB	6	3	4	6	5	Stiff, black to brown, organic, Clayey SILT and fine to medium SAND. [Clayey organic SILT and fine to medium SAND] 11.0'	
		SB	7	3	6	13	7		Boring completed at 12.0 ft.
15	9"							Stiff, gray, Silty CLAY, moist, medium plasticity. [Silty CLAY] 14.0	Lacustrine clay unit at 12.0 ft.
									No. 4 sand pack placed around screen from 10.5 ft. to 3.0 ft.
20									
25									
30									
35									

CLASSIFICATION VISUAL

METHOD OF INVESTIGATION SEE PREFACE NOTES

DATE
STARTED 2-2-88
FINISHED 2-2-88
SHEET 1 OF 1

RECRA ENVIRONMENTAL, INC.

SUBSURFACE LOG

HOLE NO. MW-4 (HF-4)
SURFACE ELEV. _____
G.W. DEPTH _____

PROJECT HANNA FURNACE SITE INVESTIGATION; RECRA PROJECT #7C745

LOCATION HANNA FURNACE SITE BUFFALO, NEW YORK

DEPTH-FT	LOG	SAMPLE TYPE	SAMPLE NO	BLOWS ON SAMPLER (0/6 6/12 12/18 18/24)		DESCRIPTION	NOTES
	2"	SB	1	19	17	Very dense, black to brown GRAVEL and fine to coarse SAND, little Silt, occasional roots, moist.	Boring advanced with 3-3/4 in. I.D. HSA truck mounted Diedrich-50 drill rig. Auger advanced to 2.0 ft. Water encountered at 3.0 ft.
				100 4"	-	[Misc. Fill]	
		SB	2	9	12		
				6	14		
5		SB	3	5	30	Grades to .... Medium dense, some Silt, wet.	Sampler is saturated with water.
				20	10		
		SB	4	WOH	3	Grades to .... Very dense, brown to gray blue, little Silt.	
				4	4	6.0'	
		SB	5	3	2		
10				3	2	Medium, brown, Silty CLAY, trace fine to coarse Sand, wet, medium plasticity.	HNu photoionization analyzer: No readings.
	9"	SB	6	2	4	[Silty CLAY]	
				6	5		
		SB	7	1	2	Grades to .... Trace organic Clayey Silt, trace Gravel.	No. 4 sand pack placed from 8.0 ft. to 2.0 ft.
				3	6		
15		SB	8	3	2	Grades to .... Stiff, some organic Clayey Silt, trace fine Gravel. 13.0'	
				4	8		
						Medium to stiff, gray brown, SILT and CLAY, little fine Sand.	Sampled every 5 ft. to boring completed. 2 in. diam. I.D. sch 40 PVC flush joint casing with 5 ft. long screen.
						[SILT and CLAY]	
20		SB	9	6	13	Same as previous sample.	Installed to 8.0 ft. and grouted on 2-2-88.
				6	22		
							Initial boring grouted with cement/bentonite mixture to ground surface.
25		SB	10	4	1	Same as previous sample.	
				8	18		Monitoring well installed approximately 10 feet from initial boring.
30		SB	11	40	25	Same as previous sample, becoming hard.	Top of rock at 39.0 ft.
				54	48	34.0'	
						Very dense, fine to coarse SAND and GRAVEL, little gray Silty Clay, wet.	Initial boring completed at 39.0 ft. Auger refusal at 39.0 ft.
35		SB	12	10	30	[Fine to coarse SAND and GRAVEL] 36.0'	
				25	100		

CLASSIFICATION VISUAL

METHOD OF INVESTIGATION SEE PREFACE NOTES

DATE
STARTED 2-1-88
FINISHED 2-1-88
SHEET 1 OF 1

RECRA ENVIRONMENTAL, INC.

SUBSURFACE LOG

HOLE NO. MW-5 (HF-5)
SURFACE ELEV.
G.W. DEPTH

PROJECT HANNA FURNACE SITE INVESTIGATION; RECRA PROJECT #7C745

LOCATION HANNA FURNACE SITE BUFFALO, NEW YORK

DEPTH-FT	LOG	SAMPLE TYPE	SAMPLE NO	BLOWS ON SAMPLER 0/6	BLOWS ON SAMPLER 6/12	BLOWS ON SAMPLER 12/18	BLOWS ON SAMPLER 18/24	DESCRIPTION	NOTES
		SB	1	6	9	9	10	Medium dense, brown, fine to coarse GRAVEL, some fine to medium Sand, trace Silt, trace Cinders, moist. [Misc. Fill]	Boring augers advanced with 3-3/4 in. I.D. HSA truck mounted Diedrich drill rig. 2 in. diam. I.D. sch 40 PVC flush joint casing with 5 ft. screen installed to 10 ft. and grouted on 2-1-88.
		SB	2	3	8	12	12		
5		SB	3	5	9	20	33	Grades to ... wet. 4.0'	
		SB	4	6	9	12	16	Stiff, brown, Silty CLAY, moist, medium plasticity. [Silty CLAY] 7.0'	Initial boring grouted with cement/bentonite mixture to ground surface.
		SB	5	3	12	20	17		
10		SB	6	5	5	8	13	Dark brown, organic, Clayey SILT and fine to medium SAND, moist, low plasticity. [Organic Clayey SILT and fine to medium SAND] 9.0'	
	◄9"►	SB	7	5	8	11	17		
15		SB	8	6	12	14	20	Brown, fine to medium SAND, moist. [Fine to Medium SAND] 10.5'	Sampled at 5.0 ft intervals. Sample SB-9 lost in bore hole.
								Stiff, gray, Silty CLAY, low to medium plasticity, moist. [Silty CLAY]	Initial boring completed at 34.0 ft.
20		SB	9	3	3	4	6	No sample.	Monitoring well installed approximately 10 feet from initial boring.
25		SB	10	WOH	WOH	3	3	Grades to .... Soft, gray, wet, high plasticity.	Top of rock at 34.0 ft. Auger refusal at 34.0 ft.
30		SB	11	100 5"	-	-	-	Grades to .... Very hard, Silty CLAY and SHALE fragments, wet. [Silty CLAY and SHALE fragments] 34.0'	No. 4 sand pack placed around screen from bottom of hole to 3.0 ft.
35		SB	12	100 2"	-				

CLASSIFICATION VISUAL

METHOD OF INVESTIGATION SEE PREFACE NOTES

DATE
STARTED 2-3-88
FINISHED 2-3-88
SHEET 1 OF 1

RECRA ENVIRONMENTAL, INC.

SUBSURFACE LOG

HOLE NO. MW-6 (HF-6)
SURFACE ELEV.
G.W. DEPTH

PROJECT HANNA FURNACE SITE INVESTIGATION; RECRA PROJECT #7C745

LOCATION HANNA FURNACE SITE BUFFALO, NEW YORK

DEPTH-FT	LOG	SAMPLE TYPE	SAMPLE NO	BLOWS ON SAMPLER 0/6	BLOWS ON SAMPLER 6/12	BLOWS ON SAMPLER 12/18	BLOWS ON SAMPLER 18/24	DESCRIPTION	NOTES
5	2"	SB	1	14	30	34	53	Very dense, brown GRAVEL and fine to coarse SAND, some Silt, damp. [Misc. Fill]	Boring advanced with 3-3/4 in. I.D. HSA truck mounted Diedrich-50 drill rig.
		SB	2	8	5	3	3	Grades to .... Some Gravel.	Sampler spoon broke, no sample recovered at SB-3.
		SB	3	17	43	59	50	Grades to .... Very dense, orange coloring. 6.0'	Sampler is saturated with water.
10		SB	4	WOH	WOH	1	1	Soft, black to brown, organic, Clayey SILT and fine to medium SAND, little Gravel, trace Cinders, wet.	Drill rig relocated approx. 50 ft. northwest of original boring.
		SB	5	1	WOH	1	WOH	[Clayey SILT and fine to medium SAND]	Auger refusal at 7.0 ft. Drill rig relocated to second location. Samples collected from 6 ft. to boring completion.
		SB	6	2	1	2	2	12.0'	
15	9"	SB	7	1	3	4	11	Medium, gray, Silty CLAY, wet, medium plasticity. [Silty CLAY] 14.0'	Boring completed at 12.0 ft.
20									Lacustrine clay unit at 12 ft. 2 in. diam. I.D. sch 40 PVC flush joint casing with 5 ft. screen, installed to 8.0 ft. and grouted on 2-3-88.
25									HNu photoionization analyzer. No readings.
30									No. 4 sand pack placed around screen from 10.5 ft. to 3.0 ft.
35									

CLASSIFICATION VISUAL

METHOD OF INVESTIGATION SEE PREFACE NOTES

DATE
STARTED 1-25-88
FINISHED 1-28-88
SHEET 1 OF 2

RECRA ENVIRONMENTAL, INC.

SUBSURFACE LOG

HOLE NO. MW-7 (HF-7)
SURFACE ELEV. ____
G.W. DEPTH ____

PROJECT HANNA FURNACE SITE INVESTIGATION; RECRA PROJECT #7C745

LOCATION HANNA FURNACE SITE BUFFALO, NEW YORK

DEPTH-FT	LOG	SAMPLE TYPE	SAMPLE NO	BLOWS ON SAMPLER (0-6 / 6-12 / 12-18 / 18-24)	DESCRIPTION	NOTES
	2"	SB	1	6 / 12 / 20 / 42	Dense, dark brown, fine to coarse SAND and GRAVEL, some Silt, moist. [Misc. Fill]	Boring augers advanced with 3-3/4 in. I.D. HSA truck mounted Diedrich-50 drill rig.
		SB	2	6 / 7 / 3 / 4	Grades to .... Loose.	
5		SB	3	2 / 2 / 2 / 2	Grades to .... and Silty Clay, some Gravel, wet.	
		SB	4	2 / - / 1 / 3	Grades to .... Soft, brown to gray, and GRAVEL, some fine to coarse Sand. 8.0'	HNu photoionization analyzer. No reading.
		SB	5	4 / 4 / 4 / 4		
10		SB	6	1 / 1 / 1 / 1	Loose, dark brown, organic Clayey SILT and fine to medium Sand.	2 in. diam. I.D. sch 40 PVC flush joint casing with 5 ft long screen installed to 9.0 ft. and grouted on 1-28-88.
	9"	SB	7	2 / 4 / 8 / 14	Grades to .... organic Silty CLAY, medium plasticity. 12.0'	
15		SB	8	2 / 5 / 5 / 10	Medium to stiff, gray to light brown, Clayey SILT and fine to medium SAND, little Gravel, moist, low to moderate plasticity. [Clayey SILT and fine to medium SAND]	No. 4 sand pack placed around screen from 9.5 ft. to 3.0 ft.
		SB	9	4 / 8 / 8 / 18		
20		SB	10	8 / 9 / 5 / 7		
		SB	11	70 / 12 / 10 / 35	22.0'	
		SB	12	100 3" / - / - / -	Very dense, black, SHALE fragments, some brown Silty CLAY, wet. [SHALE]	
25		SB	13	100 2" / - / - / -		
		SB	14	100 3" / - / - / -		
30		SB	15	100 3" / - / - / -		
		SB	16	100 3" / - / - / -		
		SB	17	100 2" / - / - / -		
35						

CLASSIFICATION VISUAL

METHOD OF INVESTIGATION SEE PREFACE NOTES

DATE
STARTED 1-25-88
FINISHED 1-29-88
SHEET 2 OF 2

RECRA ENVIRONMENTAL, INC.

SUBSURFACE LOG

HOLE NO. MW-7 (HF-7)
SURFACE ELEV. ____
G.W. DEPTH ____

PROJECT HANNA FURNACE SITE INVESTIGATION; RECRA PROJECT #7C745

LOCATION HANNA FURNACE SITE BUFFALO, NEW YORK

DEPTH-FT	LOG	SAMPLE TYPE	SAMPLE NO	BLOWS ON SAMPLER 0/6	BLOWS ON SAMPLER 6/12	BLOWS ON SAMPLER 12/18	BLOWS ON SAMPLER 18/24	DESCRIPTION	NOTES
35		SB	18	100	3"	-	-	Grades to .... Black SHALE fragments, trace brown Silty Clay.	
		SB	19	100	4"	-	-		
40		SB	20	100	4"	-	-		
		SB	21	100	3"	-	-		
		SB	22	100	2"	-	-		
45		SB	23	100	3"	-	-		
		SB	24	100	4"	-	-	48.0'	Initial boring completed at 48.0 ft. and grouted with cement/bentonite mixture to ground surface. Monitoring well installed approximately 5 feet from initial boring.

CLASSIFICATION VISUAL

METHOD OF INVESTIGATION SEE PREFACE NOTES

B
Grain size

APPENDIX B

GRAIN-SIZE ANALYSIS

GOLDBERG-ZOINO & ASSOCIATES, INC.
GEOTECHNICAL-GEOHYDROLOGICAL CONSULTANTS

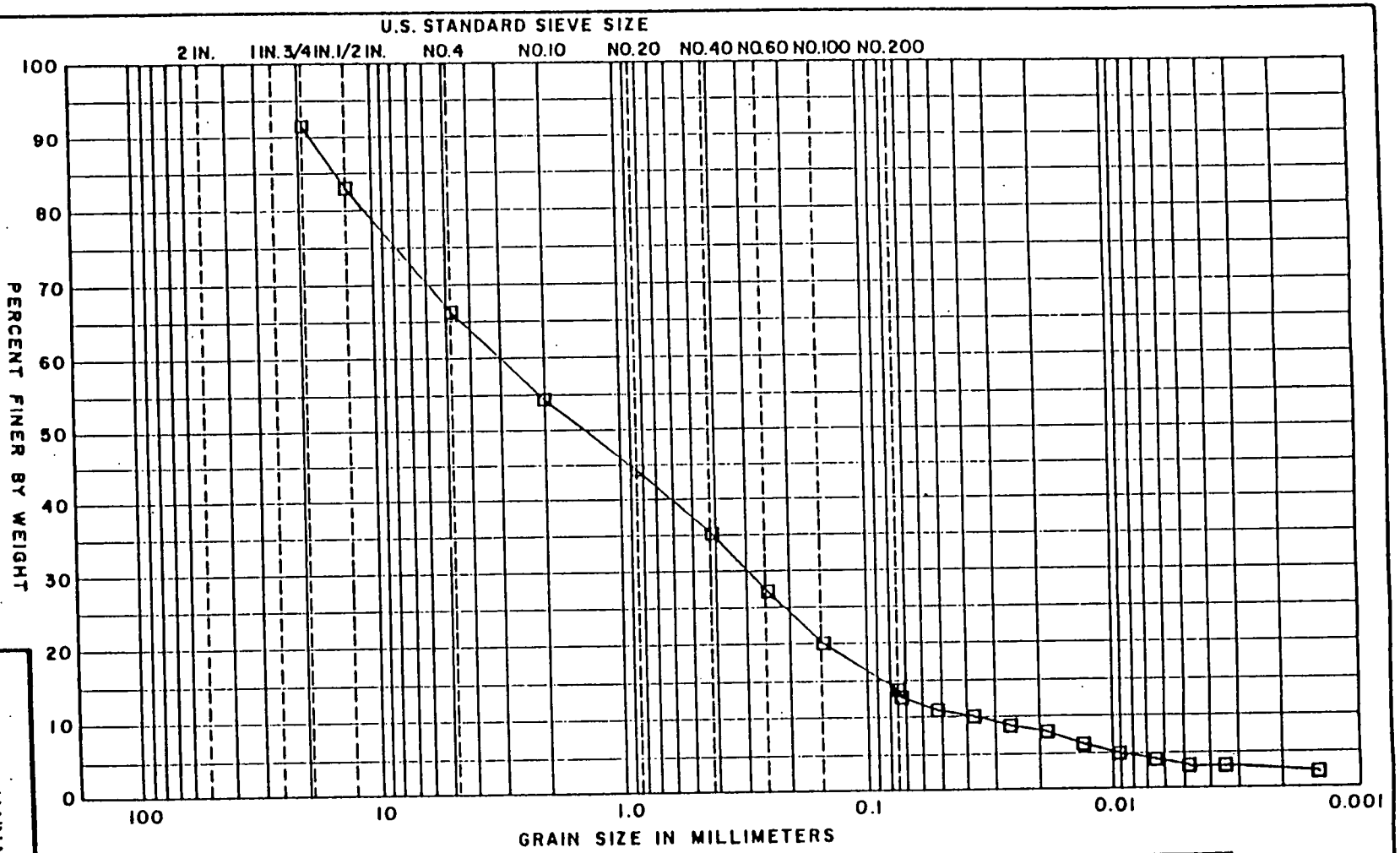
GRADATION TESTS

HANNA FURNACE SITE
W.O. #359

BORING NO. HF-1
SAMPLE SB-1
DEPTH 0-2'
TECH. KST/PEC
REVIEWER

TEST SERIES NO. 1
DATE March 88
RS7831.10

FILE



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

UNIFIED SOIL CLASSIFICATION SYSTEM

TEST NO.	SYM.	MATERIAL SOURCE	REMARKS
S1.1	□	Boring No. HF-1 Sam #1 Depth 0-2'	Brown f-c SAND, some (+) Gravel, little (-) Silt, little Cinders

S.3

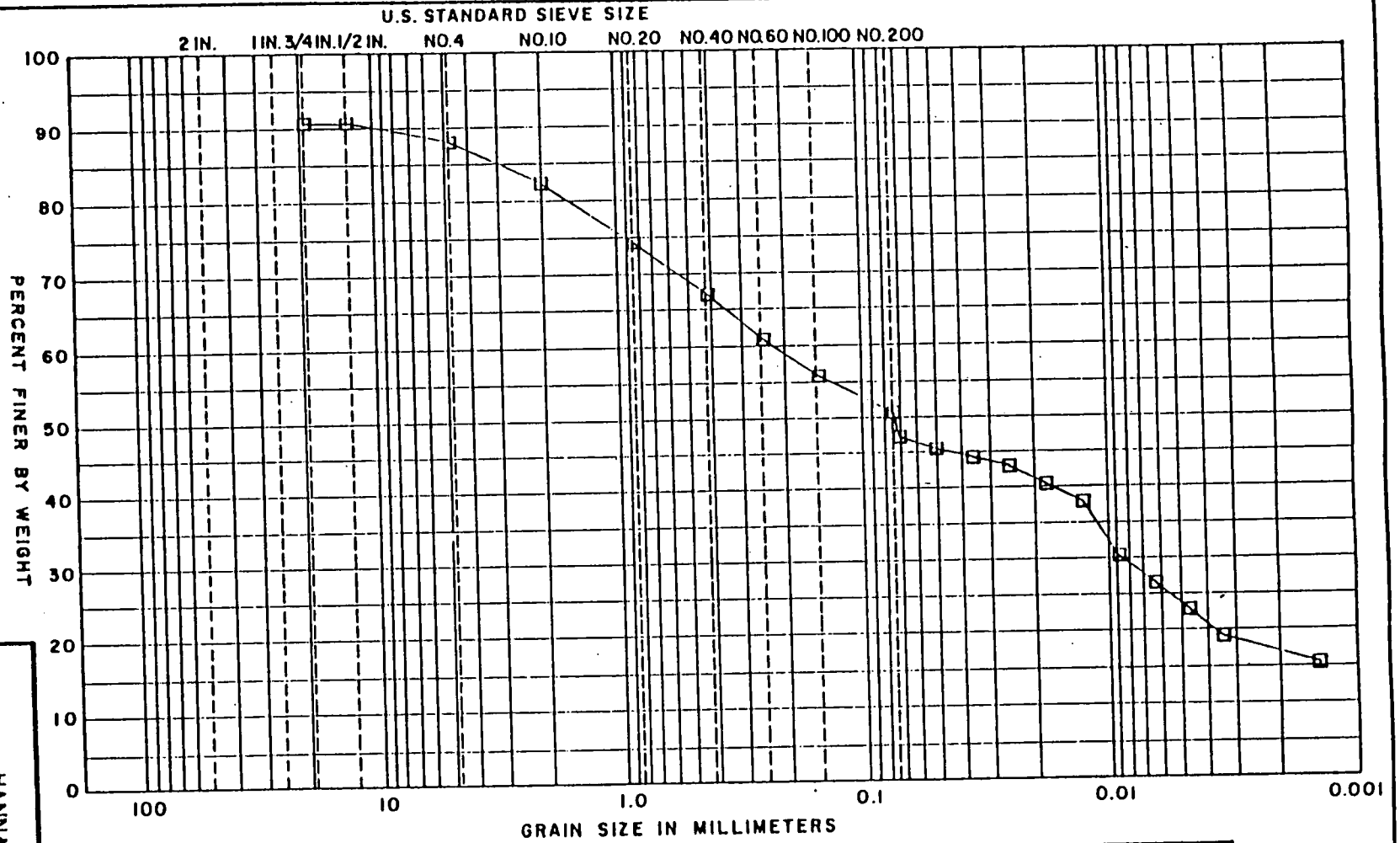
GOLDBERG-ZOINO & ASSOCIATES, INC.
GEOTECHNICAL-GEOHYDROLOGICAL CONSULTANTS

GRADATION TESTS

HANNA FURNACE SITE
W.O. #359

BORING NO. HF-2
SAMPLE Sm-6
DEPTH 10-12'
TECH. MST/PEC
REVIEWER

TEST SERIES NO. 2
DATE March 88
RS7852.10



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

UNIFIED SOIL CLASSIFICATION SYSTEM

TEST NO.	SYM.	MATERIAL SOURCE	REMARKS
S2.1	□	Boring No. HF-2 Sam #6 Depth 10-12'	Dark Brown Clayey SILT and f-m SAND, little (-) Gravel

FILE

S.3

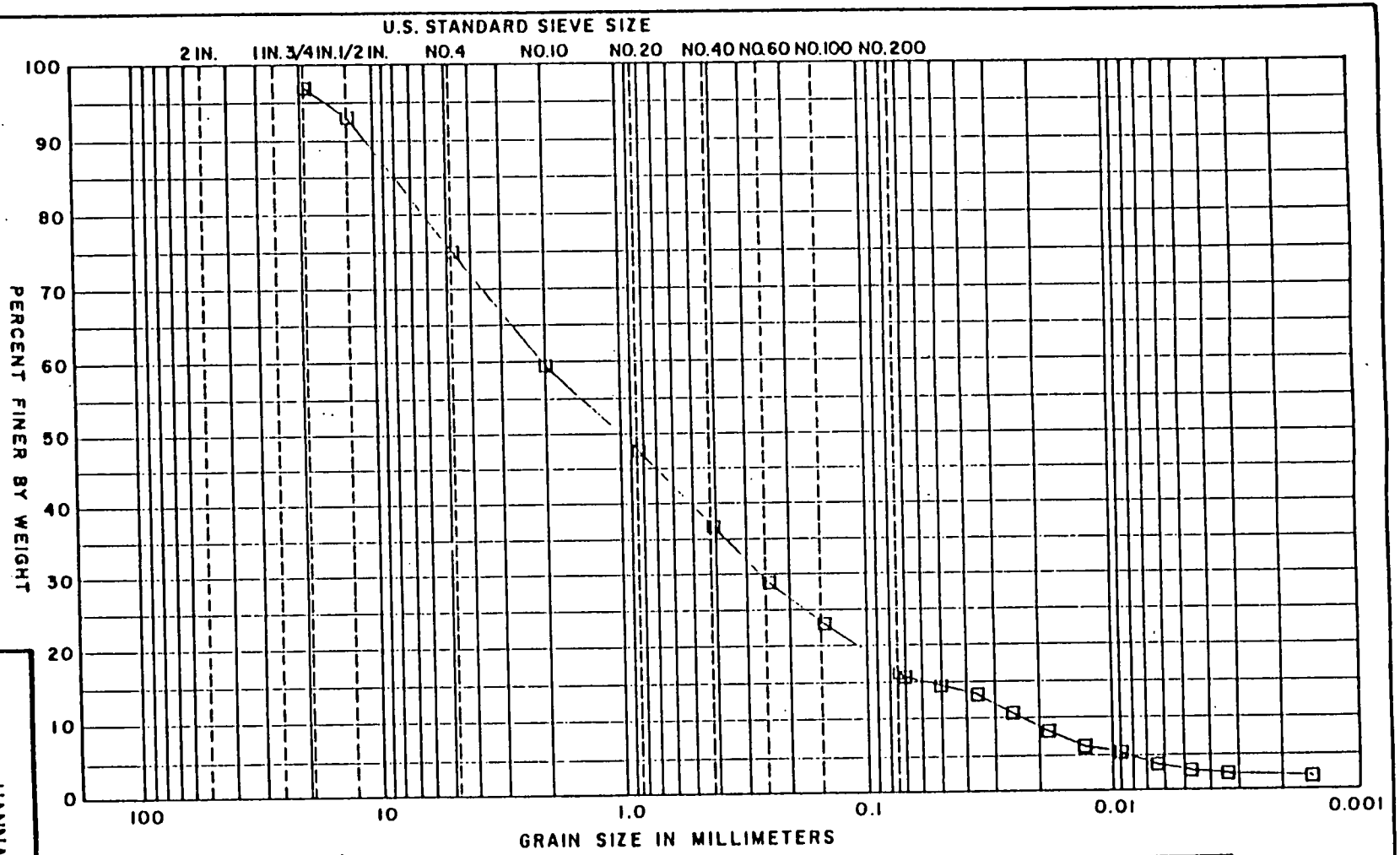
GOLDBERG-ZOINO & ASSOCIATES, INC.
GEOTECHNICAL-GEOHYDROLOGICAL CONSULTANTS

GRADATION TESTS

HANNA FURNACE SITE
W.O. #359

BORING NO. HF-3
SAMPLE SB-1
DEPTH 0-2'
TECH. MST/PEC
REVIEWER

TEST SERIES NO. 3
DATE March 88
RS783.10



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

UNIFIED SOIL CLASSIFICATION SYSTEM

TEST NO.	SYM.	MATERIAL SOURCE	REMARKS
S3.1	□	Boring No. HF-3 Sam #1 Depth 0-2'	Brown f-c SAND, some Gravel, little Silt, little Cinders

FILE

S.3

GOLDBERG-ZOINO & ASSOCIATES, INC.

HANNA FURNACE SITE

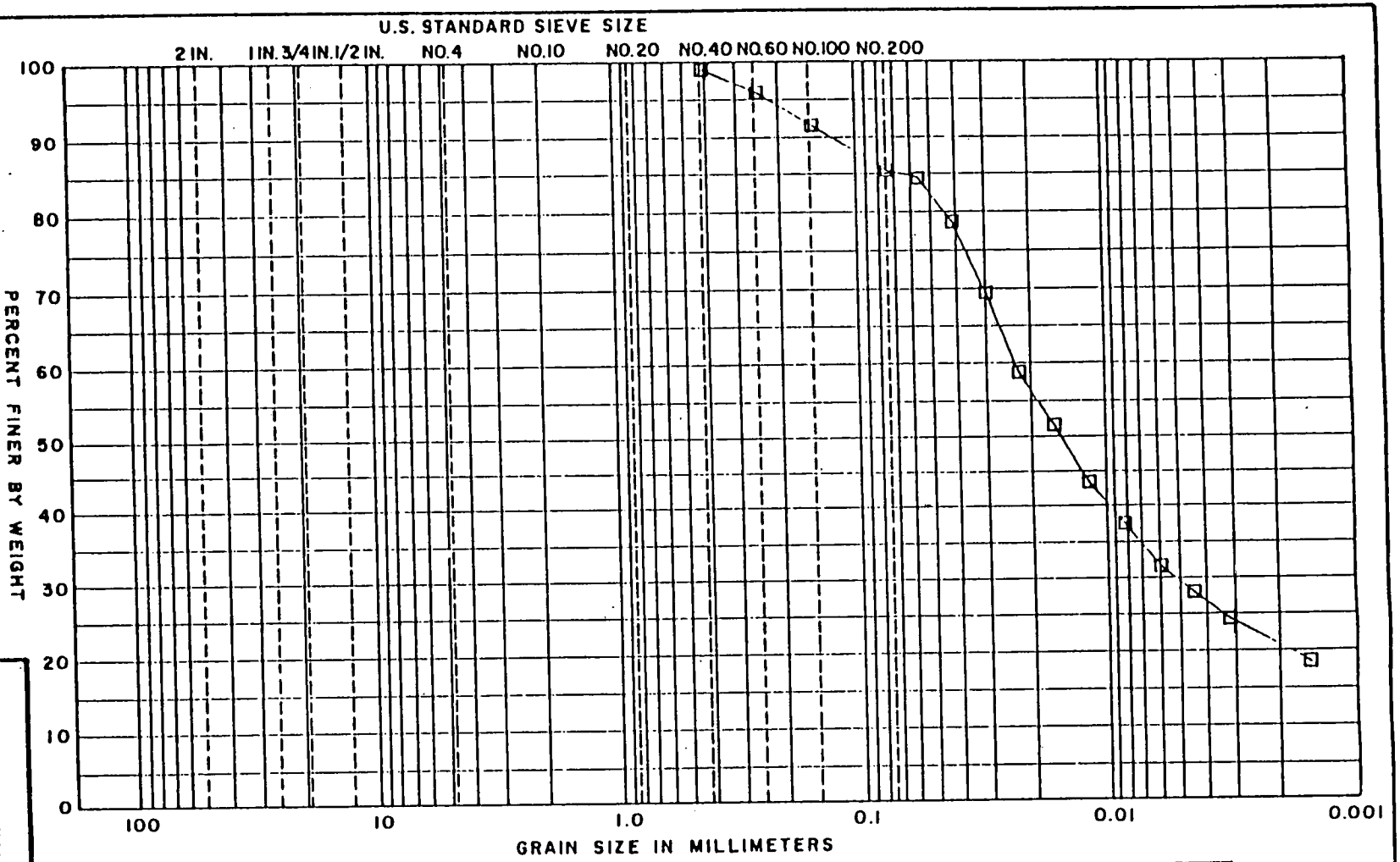
W. O. #359

GRADATION TESTS

BORING NO. HF-4
SAMPLE SS-8
DEPTH 14-18'
TECH. KST/PEC
REVIEWER

TEST SERIES NO. 4
DATE March 88
KST88-10

FILE



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

UNIFIED SOIL CLASSIFICATION SYSTEM

TEST NO.	SYM.	MATERIAL SOURCE	REMARKS
S4.1	□	Boring No. HF-4 Sam #8 Depth 14-18'	Gray SILT & CLAY, little fine Sand

COLDBERG-ZOINO & ASSOCIATES, INC.

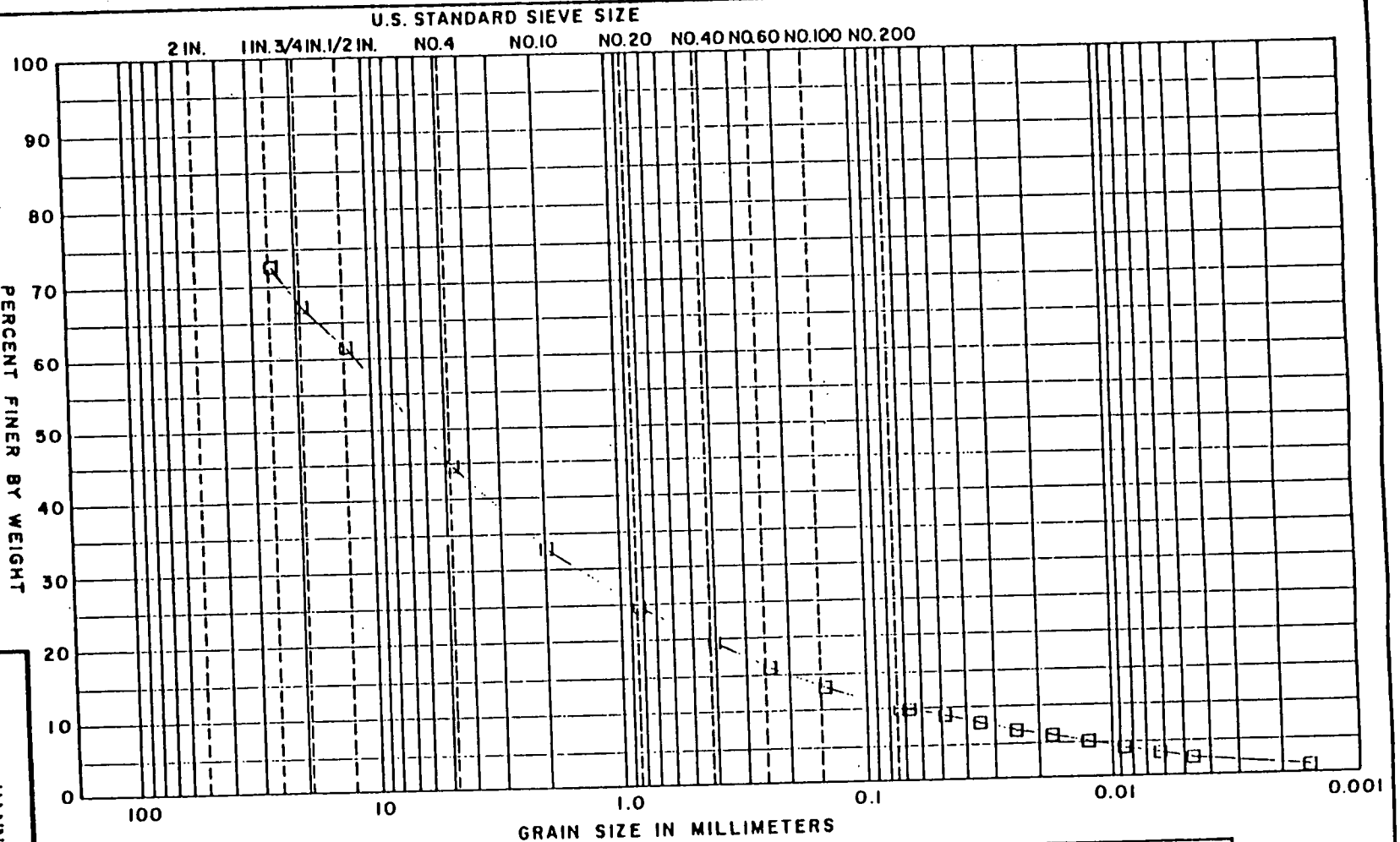
GRADATION TESTS

HANNA FURNACE SITE
W. O. #359

BORING NO. HF-5
SAMPLE SB-1
DEPTH 0-2'
TECH. MST/PEC
REVIEWER

TEST SERIES 5
NO.
DATE March 88
RS782.10

FILE



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

UNIFIED SOIL CLASSIFICATION SYSTEM

TEST NO.	SYM.	MATERIAL SOURCE	REMARKS
S5.1	□	Boring No. HF-5 Sam #1 Depth 0-2'	Brown f-c GRAVEL, some (+) f-m Sand, trace (+) Silt, trace Cinder

S.3

GOLDBERG-ZOINO & ASSOCIATES, INC.

GRADATION TESTS

HANNA FURNACE SITE

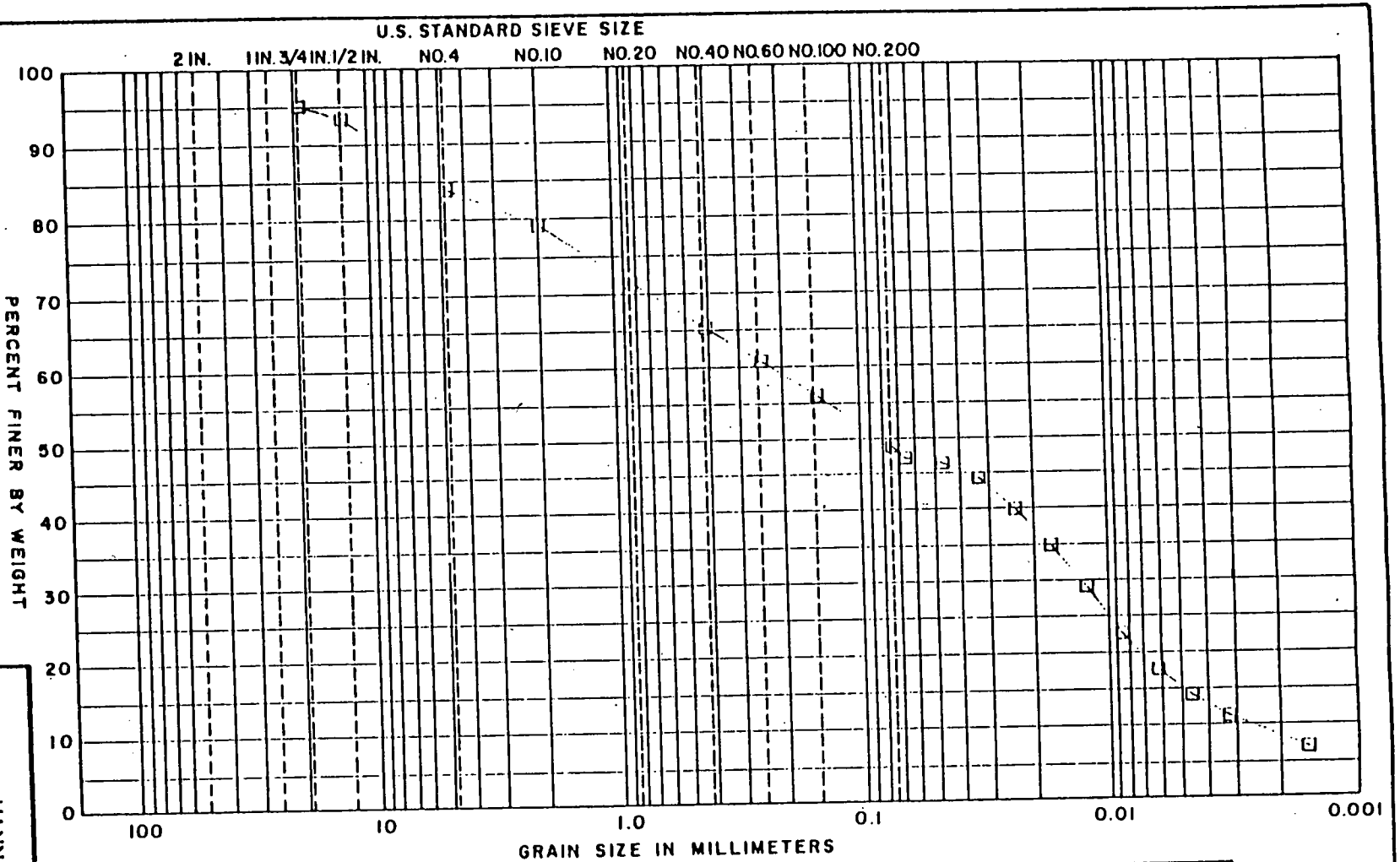
W. O. #359

BORING NO. HF-6
SAMPLE SB-5
DEPTH 8-10'
TECH. MST/PEC
REVIEWER

TEST SERIES NO. 8
DATE March 88

R5782.10

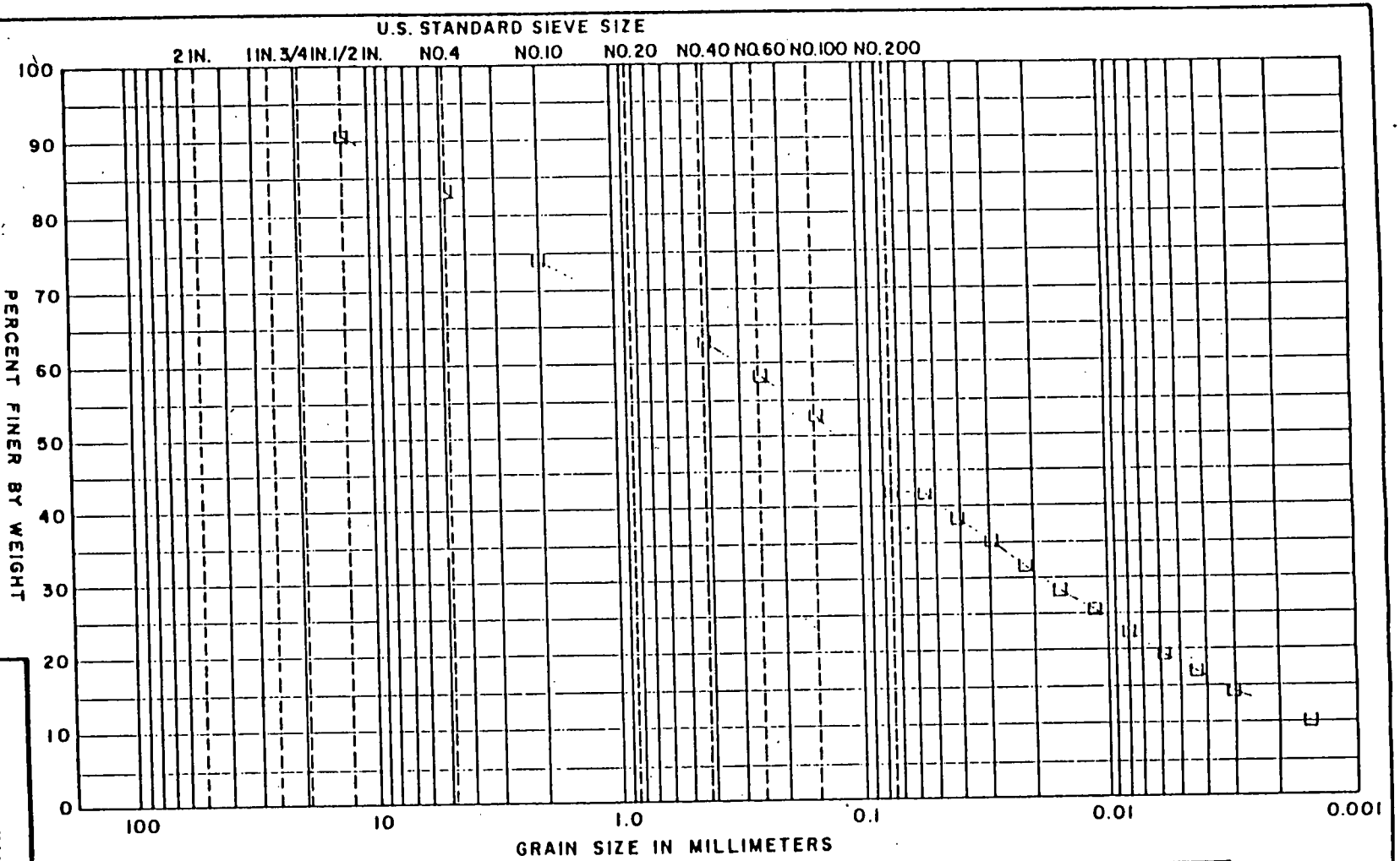
FILE



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

UNIFIED SOIL CLASSIFICATION SYSTEM

TEST NO.	SYM.	MATERIAL SOURCE	REMARKS
S6.1	□	Boring No. HF-6 Sam #5 Depth 8-10'	Brown Clayey SILT and f-m SAND, little Gravel trace Cinders



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

UNIFIED SOIL CLASSIFICATION SYSTEM

TEST NO.	SYM.	MATERIAL SOURCE	REMARKS
S7.1	□	Boring No. HF-7 Sam #8 Depth 14-18'	Gray Clayey SILT and f-m SAND, little (+) Gravel

HANNA FURNACE SITE

W. O. #359

GRADATION TESTS

BORING NO. HF-7 TEST SERIES NO. 7

SAMPLE SB-8 DATE March 88

DEPTH 14-18' RS783.10

TECH. MST/PEC

REVIEWER

FILE

GOLDBERG-ZOINO & ASSOCIATES, INC.

C
Field
obs.

APPENDIX C

FIELD OBSERVATIONS

APPENDIX C

TABLE 1

STATIC WATER LEVELS FOLLOWING WELL DEVELOPMENT AND PRIOR TO SAMPLING

Well	Time	Date	Water Level (ft)(T.O.C.)
MW-1	1200	02-16-88	10.30
	1345	04-05-88	9.32
MW-2	1130	02-16-88	6.00
	1352	04-05-88	5.21
MW-3	1115	02-16-88	8.40
	1356	04-05-88	6.32
MW-4	1100	02-15-88	6.83
	1401	04-05-88	5.97
MW-5	1045	02-16-88	8.48
	1407	04-05-88	7.55
MW-6	1030	02-16-88	11.50
	1412	04-05-88	8.67
MW-7	1000	02-16-88	8.20
	1416	04-05-88	7.83

APPENDIX C

TABLE 2

HANNUA FURNACE
BUFFALO, NEW YORK

WELL DEVELOPMENT FIELD OBSERVATIONS

WELL I.D.	DATE	TIME	pH (STANDARD UNITS)	SPECIFIC CONDUCTANCE (umhos/cm)	TEMP (°C)	TOTAL VOLUME EVACUATED IN GALLONS	TURBIDITY (F.T.U.)	COMMENTS
MW-1	02-12-88	1203	8.23	2160	6.2	Initial	500+	Turbid with dark brown fines
	02-12-88	1207	8.84	2090	5.9	0.62	500+	Turbid with dark brown fines
	02-15-88	1159	8.90	2270	4.5	1.5	500+	Turbid with dark brown fines
	02-16-88	1053	8.75	2050	2.6	2.5	500+	Turbid with dark brown fines
	02-16-88	1120	8.71	2000	0	5	500+	Turbid with dark brown fines
	02-16-88	1157	9.34	2110	3.4	7.5	500+	Turbid with dark brown fines

+ Reading off scale

APPENDIX C

TABLE 2
(Continued)

HANNUA FURNACE
BUFFALO, NEW YORK

WELL DEVELOPMENT FIELD OBSERVATIONS

WELL I.D.	DATE	TIME	pH (STANDARD UNITS)	SPECIFIC CONDUCTANCE (umhos/cm)	TEMP (°C)	TOTAL VOLUME EVACUATED IN GALLONS	TURBIDITY (F.T.U.)	COMMENTS
MW-2	02-11-88	1515	7.77	971	2	Initial	500+	Turbid with black fines
	02-11-88	1519	11.08	1093	3.2	0.85	500+	Turbid with black fines
	02-12-88	1120	11.58	1181	4.4	1.5	450	Turbid dark gray with fines
	02-15-88	1131	11.40	1210	4.5	2.5	450	Turbid dark gray with fines
	02-15-88	1515	11.40	1135	3.3	5	450	Turbid dark gray with fines
	02-15-88	1547	10.40	1030	3.1	8.5	500+	Turbid gray with fines

+ Reading off scale

APPENDIX C

TABLE 2
(Continued)

HANNUA FURNACE
BUFFALO, NEW YORK

WELL DEVELOPMENT FIELD OBSERVATIONS

WELL I.D.	DATE	TIME	pH (STANDARD UNITS)	SPECIFIC CONDUCTANCE (umhos/cm)	TEMP (°C)	TOTAL VOLUME EVACUATED IN GALLONS	TURBIDITY (F.T.U.)	COMMENTS
MW-3	02-11-88	1430	7.28	546	5	Initial	500+	Turbid with dark brown fines
	02-11-88	1436	6.59	655	5.4	0.86	500+	Turbid with dark brown fines
	02-11-88	1442	6.59	662	5.4	2	500+	Turbid with dark brown fines
	02-12-88	1103	5.50	792	3.6	2.5	500+	Turbid with brown fines
	02-15-88	1046	5.92	813	7.3	5	380	Turbid with brown fines
	02-15-88	1412	6.25	760	4.3	6	500+	Turbid with brown fines
	02-15-88	1530	6.21	675	3.4	8	500+	Turbid with brown fines

+ Reading off scale

APPENDIX C

TABLE 2
(Continued)

HANNUA FURNACE
BUFFALO, NEW YORK

WELL DEVELOPMENT FIELD OBSERVATIONS

WELL I.D.	DATE	TIME	pH (STANDARD UNITS)	SPECIFIC CONDUCTANCE (umhos/cm)	TEMP (°C)	TOTAL VOLUME EVACUATED IN GALLONS	TURBIDITY (ftu)	COMMENTS
MW-4	02-11-88	1400	8.33	599	4	Initial	500+	Turbid with dark gray fines
	02-11-88	1415	8.07	637	1.6	0.56	500+	Turbid with dark gray fines
	02-12-88	1045	8.42	826	3.6	3	500+	Turbid with dark gray fines
	02-12-88	1359	8.80	746	2.3	4	500+	Turbid with dark gray fines
	02-15-88	1106	8.54	708	4.7	5	500+	Turbid with dark gray fines
	02-15-88	1346	7.47	782	3.4	11	500+	Turbid with dark gray fines

+ Reading off scale

APPENDIX C

TABLE 2
(Continued)

HANNUA FURNACE
BUFFALO, NEW YORK

WELL DEVELOPMENT FIELD OBSERVATIONS

WELL I.D.	DATE	TIME	pH (STANDARD UNITS)	SPECIFIC CONDUCTANCE (umhos/cm)	TEMP (°C)	TOTAL VOLUME EVACUATED IN GALLONS	TURBIDITY (F.T.U.)	COMMENTS
MW-5	02-11-88	1024	9.65	1008	2.8	Initial	500+	Turbid with brown fines
	02-11-88	1026	6.20	1014	5.1	0.77	500+	Turbid with brown fines
	02-11-88	1039	6.23	1007	3.5	3	500+	Turbid with brown fines
	02-11-88	1045	6.23	1111	5.9	5.5	500+	Turbid with brown fines
	02-11-88	1455	6.25	1193	5.1	8	500+	Turbid with brown fines
	02-12-88	1220	6.36	1450	4.3	10	500+	Turbid with brown fines
	02-12-88	1345	6.33	1559	5.2	12	500+	Turbid with brown fines
	02-12-88	1450	5.68	1545	4.4	14	500+	Turbid with brown fines

+ Reading off scale

APPENDIX C

TABLE 2
(Continued)

HANNUA FURNACE
BUFFALO, NEW YORK

WELL DEVELOPMENT FIELD OBSERVATIONS

WELL I.D.	DATE	TIME	pH (STANDARD UNITS)	SPECIFIC CONDUCTANCE (umhos/cm)	TEMP (°C)	TOTAL VOLUME EVACUATED IN GALLONS	TURBIDITY (F.T.U.)	COMMENTS
MW-6	02-11-88	1157	7.73	1425	4.3	Initial	500+	Turbid with dark brown fines
	02-11-88	1200	7.46	1424	5.0	0.69	500+	Turbid with dark brown fines
	02-11-88	1209	7.64	1426	5.5	3	500	Turbid with dark brown fines
	02-11-88	1228	7.99	1425	3.3	5	500	Turbid with dark brown fines
	02-11-88	1240	8.20	1469	5.3	9	400	Turbid with dark brown fines
	02-11-88	1254	8.23	1354	4.4	9	400	Turbid with dark brown fines
	02-11-88	1307	8.16	1363	3.2	11	300	Turbid with brown fines
	02-11-88	1325	8.14	1353	4.6	14	300	Turbid with brown fines

+ Reading off scale

APPENDIX C

TABLE 2
(Continued)

HANNUA FURNACE
BUFFALO, NEW YORK

WELL DEVELOPMENT FIELD OBSERVATIONS

WELL I.D.	DATE	TIME	pH (STANDARD UNITS)	SPECIFIC CONDUCTANCE (umhos/cm)	TEMP (°C)	TOTAL VOLUME EVACUATED IN GALLONS	TURBIDITY (F.T.U.)	COMMENTS
MW-7	02-10-88	1240	7.93	3040	3.6	Initial	500+	Turbid with dark brown fines
	02-10-88	1245	7.97	2820	3.6	0.6	500+	Turbid with dark brown fines
	02-10-88	1331	7.91	2850	3.9	2	500+	Turbid with dark brown fines
	02-10-88	1335	8.25	2670	4.3	3.5	500	Turbid with dark brown fines
	02-10-88	1346	8.47	2800	4.5	6	500	Turbid with dark brown fines
	02-10-88	1349	8.55	2940	4.8	9	500	Turbid with dark brown fines
	02-10-88	1359	8.31	2860	4.3	12	500	Turbid with dark brown fines
	02-10-88	1440	8.48	2750	4.3	15	500	Turbid with dark brown fines
	02-10-88	1407	8.61	2930	4.2	18	500	Turbid with dark brown fines

APPENDIX C

TABLE 2
(Continued)

HANNUA FURNACE
BUFFALO, NEW YORK

WELL DEVELOPMENT FIELD OBSERVATIONS

WELL I.D.	DATE	TIME	pH (STANDARD UNITS)	SPECIFIC CONDUCTANCE (umhos/cm)	TEMP (°C)	TOTAL VOLUME EVACUATED IN GALLONS	TURBIDITY (F.T.U.)	COMMENTS
MW-7 Cont'd.	02-10-88	1445	8.73	2160	0	29.5	500	Turbid with dark brown fines
	02-10-88	1500	8.54	2630	0	41	500	Turbid with dark brown fines
	02-10-88	1522	8.50	2730	0.2	53	500	Turbid with dark brown fines
	02-10-88	1531	8.45	2750	0.8	60	500	Turbid with dark brown fines

+ Reading off scale

APPENDIX C

TABLE 3

HANNA FURNACE
BUFFALO, NEW YORK

March 14 and 15, 1988

WELL PURGING INFORMATION

WELL I.D.	EVACUATION DATE	TIME	SIZE/TYPE OF CASING	WATER LEVEL (FT.)*	BOTTOM OF WELL (FT.)*	VOLUME OF STANDING WATER (GAL.)	METHOD OF EVACUATION	VOLUME EVACUATED (GAL.)	RECHARGE RATE +	METHOD OF SAMPLING
MW-1	03-14-88	1025	2" PVC	10.03	14.15	0.67	Peristaltic Pump	2.25	Rapid	PVC Bailer
MW-2	03-14-88	1120	2" PVC	5.82	11.28	0.89	Peristaltic Pump	2.75	Rapid	PVC Bailer
MW-3	03-14-88	1227	2" PVC	6.37	13.77	1.21	Peristaltic Pump	3.75	Rapid	PVC Bailer
MW-4	03-14-88	1256	2" PVC	6.57	10.30	0.61	Peristaltic Pump	2.00	Rapid	PVC Bailer
MW-5	03-15-88	1018	2" PVC	7.84	13.22	0.88	Peristaltic Pump	2.75	Rapid	PVC Bailer
MW-6	03-15-88	1036	2" PVC	9.00	13.47	0.73	Peristaltic Pump	2.50	Rapid	PVC Bailer
MW-7	03-15-88	1051	2" PVC	8.11	11.92	0.62	Peristaltic Pump	2.00	Rapid	PVC Bailer

* From top of casing.
\+ Recharge rate determined by the following criteria:
Continuous - no drop in water level during evacuation.
Rapid - recharges within one (1) hour.
Slow - recharges after eight (8) hours.
Very Slow - must return another day.
Negligible - does not recharge within 48 hours

APPENDIX C

TABLE 4

HANNA FURNACE
BUFFALO, NEW YORK

March 14, 15, and 30, 1988

FIELD MEASUREMENTS DURING WELL PURGING

SAMPLE I.D.	DATE	TIME	pH (STANDARD UNITS)	SPECIFIC CONDUCTANCE (umhos/cm)	TEMP. (°C)	COMMENTS
MW-1	03-14-88	1407	9.56	2400	8	Turbid gray sample
MW-2	03-14-88	1417	8.95	1000	6	Turbid gray-brown sample
MW-3	03-15-88	1326	7.36	700	7	Clear sample
MW-4	03-14-88	1420	8.93	820	6	Turbid gray-brown sample
MW-5	03-15-88	1332	6.63	1525	7	Turbid brown sample
MW-6	03-15-88	1328	7.96	2500	7	*Additional volume collected for QC- Slightly turbid brown sample
		1329	7.99	2500	7	
MW-7	03-15-88	1335	7.58	4500	6	Slightly turbid sample
P-3	03-30-88	1045	7.22	1350	12	Clear sample

*QA/QC
QC - Quality Control

APPENDIX C

TABLE 5

HANNA FURNACE
BUFFALO, NEW YORK

MONITORING WELL PERMEABILITIES

WELL NUMBER	TYPE OF TEST	COEFFICIENT OF PERMEABILITY (cm/sec)
MW-1	Falling Head	8.9×10^{-4}
MW-1	Rising Head	6.05×10^{-4}
MW-2	Falling Head	1.05×10^{-4}
MW-2	Rising Head	4.6×10^{-4}
MW-3	Falling Head	1.55×10^{-5}
MW-3	Rising Head	2×10^{-5}
MW-4	Falling Head	2.55×10^{-4}
MW-4	Rising Head	1.25×10^{-3}
MW-5	Falling Head	6.5×10^{-5}
MW-5	Rising Head	6.6×10^{-5}
MW-6	Falling Head	1.08×10^{-4}
MW-6	Rising Head	1.9×10^{-4}
MW-7	Falling Head	1.07×10^{-3}
MW-7	Rising Head	2.5×10^{-3}

APPENDIX C

TABLE 6

CALCULATIONS OF ONE WELL VOLUME
(radius = 2 inches)

Equation for Calculation of One Well Volume is $v - 3.14r^2h/231$

v = volume (gallons) r = radius of borehole

h = height of standing water in well casing in inches

231 = converstion of in^3 to gallons

Height (in)	Volume (gal)	Height (in)	Volume (gal)	Height (in)	Volume (gal)
12	0.7	168	9.1	372	20.2
24	1.3	180	9.8	384	20.9
36	2.0	192	10.4	396	21.5
48	2.6	204	11.1	408	22.2
60	3.3	216	11.7	420	22.7
72	3.9	228	12.4	432	23.4
84	4.6	240	13.0	444	24.1
96	5.2	252	13.7	456	24.8
108	5.9	264	14.4	468	25.4
120	6.5	276	15.0	480	26.1
132	7.2	288	15.7	492	26.7
144	7.8	300	16.3	504	27.4
156	8.5	312	17.0	516	28.0
		324	17.6	528	28.7
		336	18.3	540	29.4
		348	18.9	552	30.0
		360	19.6		

APPENDIX C

TABLE 7

REQUIRED CONTAINERS, PRESERVATION TECHNIQUES AND HOLDING TIMES*

PARAMETER NO./NAME	CONTAINER[1]	PRESERVATION[2,3]	MAXIMUM HOLDING TIME[4]
Table 1B Inorganic Tests:			
1. Acidity	P,G	Cool, 4°C	14 days.
2. Alkalinity	P,G	Cool, 4°C	14 days.
3. Ammonia	P,G	Cool, 4°C, H_2SO_4 to pH<2	28 days.
9. Biochemical oxygen demand	P,G	Cool, 4°C	48 hours.
11. Bromide	P,G	None required	28 days.
14. Biochemical oxygen demand, carbonaceous	P,G	Cool, 4°C	48 hours.
15. Chemical oxygen demand	P,G	Cool, 4°C, H_2SO_4 to pH<2	28 days
16. Chloride	P,G	None required	28 days.
17. Chlorine, total residual	P,G	None required	Analyze immediately.
21. Color	P,G	Cool, 4°C	48 hours.
23-24. Cyanide, total and amenable to chlorination	P,G	Cool, 4°C, NaOH to pH>12, 0.6g ascorbic acid[5]	14 days.[6]
25. Fluoride	P	None required	28 days.
27. Hardness	P,G	HNO_3 to pH<2, H_2SO_4 to pH<2	6 months.
28. Hydrogen ion (pH)	P,G	None required	Analyze immediately.
31,43. Kjeldahl and organic nitrogen	P,G	Cool, 4°C, H_2SO_4 to pH<2	28 days.
Metals:[7]			
18. Chromium VI	P,G	Cool, 4°C	24 hours.
35. Mercury	P,G	HNO_3 to pH<2	28 days.
3,5-8,10,12,13,19,20,22,26,29,30, 32-34,36-37,45,47,51-52,58-60, 62-63,70-72,74-75. Metals except chromium VI and mercury.	P,G	HNO_3 to pH<2	6 months.
38. Nitrate	P,G	Cool, 4°C	48 hours.
39. Nitrate-nitrite	P,G	Cool, 4°C, H_2SO_4 to pH<2	28 days.

APPENDIX C

TABLE 7
(continued)

REQUIRED CONTAINERS, PRESERVATION TECHNIQUES AND HOLDING TIMES*

PARAMETER NO./NAME	[1] CONTAINER	[2,3] PRESERVATION	[4] MAXIMUM HOLDING TIME
40. Nitrite	P,G	Cool, 4°C	48 hours.
41. Oil and grease	G	Cool, 4°C, H_2SO_4 to pH<2	28 days.
42. Organic carbon	P,G	Cool, 4°C, HCl or H_2SO_4 to pH<2	28 days.
44. Orthophosphate	P,G	Filter immediately, cool, 4°C	48 hours.
46. Oxygen, dissolved probe	G Bottle and top	None required	Analyze immediately.
47. Winkler	G Bottle and top	Fix on site and store in dark	8 hours.
48. Phenols	G only	Cool, 4°C, H_2SO_4 to pH<2	28 days.
49. Phosphorus (elemental)	G	Cool, 4°C	48 hours.
50. Phosphorus (total)	P,G	Cool, 4°C, H_2SO_4 to pH<2	28 days.
53. Residue, total	P,G	Cool, 4°C	7 days.
54. Residue, filterable	P,G	Cool, 4°C	48 hours.
55. Residue, non-filterable (TSS)	P,G	Cool, 4°C	7 days.
56. Residue, settleable	P,G	Cool, 4°C	48 hours.
57. Residue, volatile	P,G	Cool, 4°C	7 days.
61. Silica	P	Cool, 4°C	28 days.
64. Specific conductance	P,G	Cool, 4°C	28 days.
65. Sulfate	P,G	Cool, 4°C	28 days.
66. Sulfide	P,G	Cool, 4°C, add zinc acetate plus sodium hydroxide to pH>9	7 days.
67. Sulfite	P,G	None required	Analyze immediately.
68. Surfactants	P,G	Cool, 4°C	48 hours.
69. Temperature	P,G	None required	Analyze.
73. Turbidity	P,G	Cool, 4°C	48 hours.

APPENDIX C

TABLE 7
(continued)

REQUIRED CONTAINERS, PRESERVATION TECHNIQUES AND HOLDING TIMES*

PARAMETER NO./NAME	CONTAINER[1]	PRESERVATION[2,3]	MAXIMUM HOLDING TIME[4]
Table 1C - Organic Tests:[8]			
13,16-20,22,24-28,34-38,39-43, 45-47,56,66,88-89,92-95,97. Purgeable halocarbons.	G, Teflon-lined septum	Cool, 4°C, 0.008% $Na_2S_2O_3$[5]	14 days.
6,57,90. Purgeable aromatic hydrocarbons	G, Teflon-lined septum	Cool, 4°C, 0.008% $Na_2S_2O_3$[5]	14 days.
3,4. Acrolein and acrylonitrile	G, Teflon-lined septum	Cool, 4°C, 0.008% $Na_2S_2O_3$[5]	14 days.
23,30,44,49,53,67,70-71,83,85, 96. Phenols[11]	G, Teflon-lined cap	Cool, 4°C, 0.008% $Na_2S_2O_3$[5]	7 days until extraction. 40 days after extraction
7,38. Benzidines[11]	G, Teflon-lined cap	Cool, 4°C, 0.008% $Na_2S_2O_3$[5]	7 days until extraction. 40 days after extraction
14,17,48,50-52. Phthalate esters	G, Teflon-lined cap	Cool, 4°C	7 days until extraction. 40 days after extraction
72-74. Nitrosamines[11,14]	G, Teflon-lined cap	Cool, 4°C, 0.008% $Na_2S_2O_3$[5] store in dark	7 days until extraction. 40 days after extraction
76-82. PCBs[11] acrylonitrile	G, Teflon-lined cap	Cool, 4°C	7 days until extraction. 40 days after extraction
54,55,65,69. Nitroaromatics and isophorone[11]	G, Teflon-lined cap	Cool, 4°C, 0.008% $Na_2S_2O_3$[5] store in dark	7 days until extraction. 40 days after extraction
1,2,5,8-12,32,33,58,39,64,68,84, 86. Polynuclear aromatic hydrocarbons[11]	G, Teflon-lined cap	Cool, 4°C, 0.008% $Na_2S_2O_3$[5] store in dark	7 days until extraction. 40 days after extraction

APPENDIX C

TABLE 7
(continued)

REQUIRED CONTAINERS, PRESERVATION TECHNIQUES AND HOLDING TIMES*

PARAMETER NO./NAME	CONTAINER[1]	PRESERVATION[2,3]	MAXIMUM HOLDING TIME[4]
15,16,21,31,75. Haloethers[11]	G, Teflon-lined cap	Cool, 4°C, 0.008% $Na_2S_2O_3$[5]	7 days until extraction. 40 days after extraction
29,35-37,60-63,91[11] Chlorinated hydrocarbons[11]	G, Teflon-lined cap	Cool, 4°C, 0.008% $Na_2S_2O_3$[5]	7 days until extraction. 40 days after extraction
87. TCDD[11]	G, Teflon-lined cap	Cool, 4°C, 0.008% $Na_2S_2O_3$[5]	7 days until extraction. 40 days after extraction
Table 1D - Pesticide Tests:			
1-70. Pesticides[11]	G, Teflon-lined cap	Cool, 4°C, pH 5-9[15]	7 days until extraction. 40 days after extraction
Table 1E - Radiological Tests:			
1-5. Alpha, beta and radium	P,G	HNO_3 to pH<2	6 months.

Notes:
1. Polyethylene (P) or Glass (G)
2. Sample preservation should be performed immediately upon sample collection. For composite chemical samples, each aliquot should be preserved at the time of collection. When use of an automated sampler makes it impossible to preserve each aliquote, then chemical samples may be preserved by maintaining at 4°C until compositing and sample splitting is completed.
3. When any sample is to be shipped by common carrier or sent through the United States mails, it must comply with the Department of Transportation Hazardous Material Regulations (49 CFR Part 172). The person offering such material for transportation is responsible for ensuring such compliance. For the preservation requirements of Table 2, the Office of Hazardous Materials, Materials Transportation Bureau, Department of Transportation has determined that the Hazardous Materials Regulations do not apply to the following materials: hydrochloric acid (HCl) in water solutions at concentrations of 0.04% by weight6 or less (pH about 1.96 or greater); sulfuric acid (H_2SO_4) in water solutions at concentrations of 0.35% by weight or less (pH about 1.15 or greater); and sodium hydroxide (NaOH) in water solutions at concentrations of 0.080% by weight or less (pH about 12.30 or less).

APPENDIX C

TABLE 7
(continued)

REQUIRED CONTAINERS, PRESERVATION TECHNIQUES AND HOLDING TIMES*

Notes (continued):

4. Samples should be analyzed as soon as possible after collection. The times listed are the maximum times that samples may be held before analysis and still be considered valid. Samples may be held for longer periods only if the permittee or monitoring laboratory has data on file to show that the specific types of samples under study are stable for the longer time, and has received a variance from the Regional Administrator under §136.3(e). Some samples may not be stable for the maximum time period given in the table. A permittee or monitoring laboratory is obligated to hold the sample for a shorter time if knowledge exists to show that this is necessary to maintain sample stability. See §136.3(3) for details.
5. Should only be used in the presence of residual chlorine.
6. Maximum holding time is 24 hours when sulfide is present. Optionally all samples may be tested with lead acetate paper before pH adjustments in order to determine if sulfide is present. If sulfide is present, it can be removed by the addition of cadmium nitrate powder until a negative spot test is obtained. The sample is filtered and then NaOH is added to pH 12.5.
7. Samples should be filtered immediately on-site before adding preservative for dissolved metals.
8. Guidance applies to samples to be analyzed by GC, LC, or GC/MS for specific compounds.
9. Sample receiving no pH adjustment must be analyzed within seven days of sampling.
10. The pH adjustment is not required if acrolein will not be measured. Samples for acrolein receiving no pH adjustment must be analyzed within 3 days of sampling.
11. When the extractable analyses of concern fall within a single chemical category, the specified preservative and maximum holding times should be observed for optimum safeguard of sample integrity. When the analytes of concern fall within two or more chemical categories, the sample may be preserved by cooling to 4°C, reducing residual chlorine with 0.008% sodium thiosulfate, storing in the dark, and adjusting the pH to 6-9; samples preserved in this manner may be held for seven days before extraction and for forty days after extraction. Exceptions to this optional preservation and holding procedure are noted in footnote 5 (re: the requirement for thiosulfate reduction of residual chlorine), and footnotes 12, 13 (re: the analysis of benzidine).
12. If 1,2-diphenylhydrazine is likely to be present, adjust the pH of the sample to 4.0 ± 0.2 to prevent rearrangement to benzidine.
13. Extracts may be stored up to 7 days before analysis if storage is conducted under an inert (oxidant-free)atmosphere.
14. For the analysis of diphenylnitrosamine, add 0.008% $Na_2S_2O_3$ and adjust pH to 7-10 with NaOH within 24 hours of sampling.
15. The pH adjustment may be performed upon receipt at the laboratory and may be omitted if the samples are extracted within 72 hours of collection. For the analysis of aldrin, add 0.008% $Na_2S_2O_3$.

APPENDIX C

TABLE 8

DATE: 3/17/88
HOLE NO.: MW-1
TEST: Falling Head
BY: RES

RECRA ENVIRONMENTAL, INC.

VARIABLE HEAD PERMEABILITY TEST

STICK UP: 3.65
HOLE DEPTH: 14.15
STATIC GW LEVEL: 10.10
REF. POINT: Top of Casing.
SHEET 1 OF 1

PROJECT: NYSDOT; Hanna Furnace
Project #7C745

LOCATION: Hanna Furnace Site
Buffalo, New York

INTAKE CONDITIONS		
	OPEN HOLE ☐	HOLE DIAMETER
	SLOTTED HOLE ☐	SLOT SIZE ____ DIAMETER ____
	CASING SEALED AT BOTTOM OF HOLE ☒	CASING DIAMETER 2" DEPTH 14.15

DATE	TIME	ELAPSED TIME (minutes)	DEPTH TO WATER FEET ☒ METERS ☐	HEAD RATIO H_t/H_o	COMMENTS
3/17/88		0	9.62	1	INITIAL READING (Ho) = 0.48
3/17/88		0.25	9.71	0.813	
3/17/88		0.75	9.82	0.583	
3/17/88		1.25	9.90	0.417	
3/17/88		1.75	9.96	0.292	
3/17/88		2.25	10.00	0.208	
3/17/88		2.75	10.03	0.146	
3/17/88		3.25	10.04	0.125	
3/17/88		3.75	10.06	0.083	
3/17/88		4.75	10.08	0.042	
3/17/88		5.75	10.09	0.021	

REMARKS/NOTES:

APPENDIX C

TABLE 8

DATE: 3/17/88
HOLE NO.: MW-1
TEST: Rising Head
BY: RES

RECRA ENVIRONMENTAL, INC.

VARIABLE HEAD PERMEABILITY TEST

STICK UP: 3.65
HOLE DEPTH: 14.15
STATIC GW LEVEL: 10.10
REF. POINT: Top of Casing
SHEET 1 OF 1

PROJECT: NYSDOT; Hanna Furnace
Project #7C745

LOCATION: Hanna Furnace Site
Buffalo, New York

INTAKE CONDITIONS		
	OPEN HOLE ☐	HOLE DIAMETER
	SLOTTED HOLE ☐	SLOT SIZE ____ DIAMETER ____
	CASING SEALED AT BOTTOM OF HOLE ☒	CASING DIAMETER 2" DEPTH 14.15

DATE	TIME	ELAPSED TIME (minutes)	DEPTH TO WATER FEET ☒ METERS ☐	HEAD RATIO H_t/H_o	COMMENTS
3/17/88		0	11.52	1	INITIAL READING (Ho) = 1.42
3/17/88		0.25	11.36	0.887	
3/17/88		0.75	11.20	0.775	
3/17/88		1.25	10.90	0.563	
3/17/88		1.75	10.72	0.437	
3/17/88		2.25	10.59	0.345	
3/17/88		2.75	10.48	0.268	
3/17/88		3.75	10.33	0.162	
3/17/88		4.75	10.26	0.113	
3/17/88		5.75	10.20	0.070	
3/17/88		6.75	10.17	0.049	
3/17/88		8.75	10.13	0.021	

REMARKS/NOTES:

APPENDIX C

TABLE 8

DATE: 3/18/88
HOLE NO.: MW-2
TEST: Falling Head
BY: RES

RECRA ENVIRONMENTAL, INC.

VARIABLE HEAD PERMEABILITY TEST

STICK UP: _____
HOLE DEPTH: 11.28
STATIC GW LEVEL: 6.06
REF. POINT: Top of Casing
SHEET 1 OF 1

PROJECT: NYSDOT; Hanna Furnace
Project #7C745

LOCATION: Hanna Furnace Site
Buffalo, New York

INTAKE CONDITIONS		
	OPEN HOLE ☐	HOLE DIAMETER _____
	SLOTTED HOLE ☐	SLOT SIZE _____ DIAMETER _____
	CASING SEALED AT BOTTOM OF HOLE ☒	CASING DIAMETER 2" DEPTH 11.28

DATE	TIME	ELAPSED TIME (minutes)	DEPTH TO WATER FEET ☒ METERS ☐	HEAD RATIO H_t/H_o	COMMENTS
3/18/88		0	4.64	1	INITIAL READING (Ho) = 1.42
3/18/88		0.25	4.84	0.859	
3/18/88		0.75	5.15	0.641	
3/18/88		1.25	5.32	0.521	
3/18/88		1.75	5.45	0.430	
3/18/88		2.25	5.55	0.359	
3/18/88		2.75	5.62	0.310	
3/18/88		3.75	5.73	0.232	
3/18/88		4.75	5.77	0.204	
3/18/88		6.75	5.82	0.169	
3/18/88		10.75	5.85	0.148	
3/18/88		20.75	5.86	0.141	

REMARKS/NOTES: _____

APPENDIX C

TABLE 8

DATE: 3/18/88
HOLE NO.: MW-2
TEST: Rising Head
BY: RES

RECRA ENVIRONMENTAL, INC.

VARIABLE HEAD PERMEABILITY TEST

STICK UP:
HOLE DEPTH: 11.28
STATIC GW LEVEL: 5.83
REF. POINT: Top of Casing
SHEET 1 OF 1

PROJECT: NYSDOT; Hanna Furnace
Project #7C745

LOCATION: Hanna Furnace Site
Buffalo, New York

INTAKE CONDITIONS		
	OPEN HOLE ☐	HOLE DIAMETER
	SLOTTED HOLE ☐	SLOT SIZE ____ DIAMETER ____
	CASING SEALED AT BOTTOM OF HOLE ☒	CASING DIAMETER 2" DEPTH 11.28

DATE	TIME	ELAPSED TIME (minutes)	DEPTH TO WATER FEET ☒ METERS ☐	HEAD RATIO H_t/H_o	COMMENTS
3/18/88		0	7.09	1	INITIAL READING (Ho) = 1.26
3/18/88		0.25	7.04	0.960	
3/18/88		0.75	6.73	0.714	
3/18/88		1.25	6.57	0.587	
3/18/88		1.75	6.44	0.484	
3/18/88		2.75	6.19	0.286	
3/18/88		3.75	6.00	0.135	
3/18/88		4.75	5.95	0.095	
3/18/88		6.75	5.88	0.040	
3/18/88		10.75	5.85	0.016	
3/18/88		14.75	5.84	0.008	

REMARKS/NOTES:

APPENDIX C

TABLE 8

DATE: 3/18/88
HOLE NO.: MW-3
TEST: Falling Head
BY: RES

RECRA ENVIRONMENTAL, INC.

VARIABLE HEAD PERMEABILITY TEST

STICK UP: _____
HOLE DEPTH: 13.77
STATIC GW LEVEL: 7.05
REF. POINT: Top of Casing
SHEET 1 OF 1

PROJECT: NYSDOT; Hanna Furnace
Project #7C745

LOCATION: Hanna Furnace Site
Buffalo, New York

INTAKE CONDITIONS		
	OPEN HOLE ☐	HOLE DIAMETER _____
	SLOTTED HOLE ☐	SLOT SIZE _____ DIAMETER _____
	CASING SEALED AT BOTTOM OF HOLE ☒	CASING DIAMETER 2" DEPTH 13.77

DATE	TIME	ELAPSED TIME (minutes)	DEPTH TO WATER FEET ☒ METERS ☐	HEAD RATIO H_t/H_o	COMMENTS
3/18/88		0	5.25	1	INITIAL READING (Ho) = 1.8
3/18/88		0.5	5.45	0.889	
3/18/88		1	5.60	0.806	
3/18/88		1.5	5.72	0.739	
3/18/88		2.5	5.92	0.628	
3/18/88		3.5	6.05	0.556	
3/18/88		4.5	6.14	0.506	
3/18/88		5.5	6.21	0.467	
3/18/88		7.5	6.28	0.428	
3/18/88		9.5	6.32	0.406	
3/18/88		13.5	6.36	0.383	
3/18/88		23.5	6.41	0.356	
3/18/88		33.5	6.44	0.339	
3/18/88		53.5	6.47	0.322	
3/18/88		73.5	6.48	0.317	
3/18/88		156.5	6.48	0.317	

REMARKS/NOTES: _____

APPENDIX C

TABLE 8

DATE: 3/18/88
HOLE NO.: MW-3
TEST: Rising Head
BY: RES

RECRA ENVIRONMENTAL, INC.

VARIABLE HEAD PERMEABILITY TEST

STICK UP: _____
HOLE DEPTH: 13.77
STATIC GW LEVEL: 7.05
REF. POINT: Top of Casing
SHEET 1 OF 1

PROJECT: NYSDOT; Hanna Furnace
Project #7C745

LOCATION: Hanna Furnace Site
Buffalo, New York

INTAKE CONDITIONS		
	OPEN HOLE ☐	HOLE DIAMETER _____
	SLOTTED HOLE ☐	SLOT SIZE _____ DIAMETER _____
	CASING SEALED AT BOTTOM OF HOLE ☒	CASING DIAMETER 2" DEPTH 13.77

DATE	TIME	ELAPSED TIME (minutes)	DEPTH TO WATER FEET ☒ METERS ☐	HEAD RATIO H_t/H_o	COMMENTS
3/18/88		0	8.33	1	INITIAL READING (Ho) = 1.28
3/18/88		0.5	8.13	0.844	
3/18/88		1.5	7.71	0.516	
3/18/88		2.5	7.51	0.359	
3/18/88		3.5	7.44	0.305	
3/18/88		5.5	7.38	0.258	
3/18/88		7.5	7.36	0.242	
3/18/88		11.5	7.34	0.227	
3/18/88		21.5	7.30	0.195	
3/18/88		31.5	7.29	0.188	
3/18/88		63.5	7.23	0.141	
3/18/88		83.5	7.22	0.133	

REMARKS/NOTES: _____

APPENDIX C

TABLE 8

DATE: 3/17/88
HOLE NO.: MW-4
TEST: Falling Head
BY: RES

RECRA ENVIRONMENTAL, INC.

VARIABLE HEAD PERMEABILITY TEST

STICK UP: _____
HOLE DEPTH: 10.30
STATIC GW LEVEL: 6.90
REF. POINT: Top of Casing
SHEET 1 OF 1

PROJECT: NYSDOT; Hanna Furnace Project #7C745

LOCATION: Hanna Furnace Site Buffalo, New York

INTAKE CONDITIONS		
	OPEN HOLE ☐	HOLE DIAMETER _____
	SLOTTED HOLE ☐	SLOT SIZE _____ DIAMETER _____
	CASING SEALED AT BOTTOM OF HOLE ☒	CASING DIAMETER 2" DEPTH 10.30

DATE	TIME	ELAPSED TIME (minutes)	DEPTH TO WATER FEET ☒ METERS ☐	HEAD RATIO H_t/H_o	COMMENTS
3/17/88		0	6.25	1	INITIAL READING (Ho) = 0.65
3/17/88		0.5	6.50	0.615	
3/17/88		1	6.57	0.508	
3/17/88		1.5	6.64	0.400	
3/17/88		2.5	6.69	0.323	
3/17/88		3.5	6.74	0.246	
3/17/88		5.5	6.77	0.200	
3/17/88		7.5	6.83	0.108	
3/17/88		11.5	6.85	0.077	

REMARKS/NOTES: _____

APPENDIX C

TABLE 8

DATE: 3/17/88
HOLE NO.: MW-4
TEST: Rising Head
BY: RES

RECRA ENVIRONMENTAL, INC.

VARIABLE HEAD PERMEABILITY TEST

STICK UP: _____
HOLE DEPTH: 10.30
STATIC GW LEVEL: 6.90
REF. POINT: Top of Casing
SHEET 1 OF 1

PROJECT: NYSDOT; Hanna Furnace
Project #7C745

LOCATION: Hanna Furnace Site
Buffalo, New York

INTAKE CONDITIONS		
	OPEN HOLE ☐	HOLE DIAMETER _____
	SLOTTED HOLE ☐	SLOT SIZE _____ DIAMETER _____
	CASING SEALED AT BOTTOM OF HOLE ☒	CASING DIAMETER 2" DEPTH 10.30

DATE	TIME	ELAPSED TIME (minutes)	DEPTH TO WATER FEET ☒ METERS ☐	HEAD RATIO H_t/H_o	COMMENTS
3/17/88		0	7.68	1	INITIAL READING (Ho) = 0.78
3/17/88		0.25	7.48	0.744	
3/17/88		0.75	7.21	0.397	
3/17/88		1.25	7.12	0.282	
3/17/88		1.75	7.02	0.154	
3/17/88		2.75	6.96	0.77	
3/17/88		3.75	6.92	0.026	
3/17/88		5.75	6.90	0	

REMARKS/NOTES: _____

APPENDIX C

TABLE 8

DATE: 3/17/88
HOLE NO.: MW-5
TEST: Falling Head
BY: RES

RECRA ENVIRONMENTAL, INC.

VARIABLE HEAD PERMEABILITY TEST

STICK UP: 3.2
HOLE DEPTH: 13.22
STATIC GW LEVEL: 8.19
REF. POINT: Top of Casing
SHEET 1 OF 1

PROJECT: NYSDOT: Hanna Furnace Project #7C745

LOCATION: Hanna Furance Site Buffalo, New York

INTAKE CONDITIONS		
	OPEN HOLE ☐	HOLE DIAMETER
	SLOTTED HOLE ☐	SLOT SIZE ____ DIAMETER ____
	CASING SEALED AT BOTTOM OF HOLE ☒	CASING DIAMETER 2" DEPTH 13.22

DATE	TIME	ELAPSED TIME (minutes)	DEPTH TO WATER FEET ☒ METERS ☐	HEAD RATIO H_t/H_o	COMMENTS
3/17/88		0	6.09	1	INITIAL READING (Ho) = 2.1
3/17/88		0.5	6.17	0.962	
3/17/88		1.0	6.27	0.914	
3/17/88		1.5	6.34	0.881	
3/17/88		2.5	6.50	0.805	
3/17/88		3.5	6.60	0.757	
3/17/88		4.5	6.71	0.705	
3/17/88		5.5	6.80	0.662	
3/17/88		6.5	6.90	0.614	
3/17/88		7.5	7.00	0.567	
3/17/88		9.5	7.12	0.510	
3/17/88		11.5	7.25	0.448	
3/17/88		13.5	7.35	0.400	
3/17/88		15.5	7.43	0.362	
3/17/88		19.5	7.58	0.290	
3/17/88		23.5	7.67	0.248	
3/17/88		27.5	7.75	0.210	
3/17/88		37.5	7.86	0.157	
3/17/88		47.5	7.98	0.100	

REMARKS/NOTES:

APPENDIX C

TABLE 8

DATE: 3/17/88
HOLE NO.: MW-5
TEST: Rising Head
BY: RES

RECRA ENVIRONMENTAL, INC.

VARIABLE HEAD PERMEABILITY TEST

STICK UP: 3.2
HOLE DEPTH: 13.22
STATIC GW LEVEL: 8.19
REF. POINT: Top of Casing
SHEET 1 OF 1

PROJECT: NYSDOT; Hanna Furnace
Project #7C745

LOCATION: Hanna Furnace Site
Buffalo, New York

INTAKE CONDITIONS		
	OPEN HOLE ☐	HOLE DIAMETER
	SLOTTED HOLE ☐	SLOT SIZE ____ DIAMETER ____
	CASING SEALED AT BOTTOM OF HOLE ☒	CASING DIAMETER 2" DEPTH 13.22

DATE	TIME	ELAPSED TIME (minutes)	DEPTH TO WATER FEET ☒ METERS ☐	HEAD RATIO H_t/H_o	COMMENTS
3/17/88		0	9.60	1	INITIAL READING (Ho) = 1.41
3/17/88		0.5	9.46	0.901	
3/17/88		1	9.36	0.830	
3/17/88		1.5	9.30	0.787	
3/17/88		2.5	9.23	0.738	
3/17/88		3.5	9.13	0.667	
3/17/88		4.5	9.08	0.631	
3/17/88		5.5	9.01	0.582	
3/17/88		7.5	8.90	0.504	
3/17/88		9.5	8.80	0.433	
3/17/88		11.5	8.75	0.397	
3/17/88		15.5	8.64	0.319	
3/17/88		19.5	8.58	0.277	
3/17/88		23.5	8.49	0.213	
3/17/88		33.5	8.44	0.177	
3/17/88		43.5	8.34	0.106	

REMARKS/NOTES:

APPENDIX C

TABLE 8

DATE: 3/17/88
HOLE NO.: MW-6
TEST: Falling Head
BY: RES

RECRA ENVIRONMENTAL, INC.

VARIABLE HEAD PERMEABILITY TEST

STICK UP: 3.4
HOLE DEPTH: 13.47
STATIC GW LEVEL: 9.09
REF. POINT: Top of Casing
SHEET 1 OF 1

PROJECT: NYSDOT; Hanna Furnace
Project #7C745

LOCATION: Hanna Furnace Site
Buffalo, New York

INTAKE CONDITIONS		
	OPEN HOLE ☐	HOLE DIAMETER
	SLOTTED HOLE ☐	SLOT SIZE ____ DIAMETER ____
	CASING SEALED AT BOTTOM OF HOLE ☒	CASING DIAMETER 2" DEPTH 13.47

DATE	TIME	ELAPSED TIME (minutes)	DEPTH TO WATER FEET ☒ METERS ☐	HEAD RATIO H_t/H_o	COMMENTS
3/17/88		0	8.55	1	INITIAL READING (Ho) = 0.54
3/17/88		0.5	8.61	0.889	
3/17/88		1	8.66	0.796	
3/17/88		1.5	8.69	0.741	
3/17/88		2.5	8.74	0.648	
3/17/88		3.5	8.78	0.574	
3/17/88		5.5	8.85	0.444	
3/17/88		7.5	8.88	0.389	
3/17/88		11.5	8.93	0.296	
3/17/88		15.5	8.96	0.241	
3/17/88		25.5	9.03	0.111	

REMARKS/NOTES:

APPENDIX C

TABLE 8

DATE: 3/17/88
HOLE NO.: MW-6
TEST: Rising Head
BY: RES

RECRA ENVIRONMENTAL, INC.

VARIABLE HEAD PERMEABILITY TEST

STICK UP: 3.4
HOLE DEPTH: 13.47
STATIC GW LEVEL: 9.09
REF. POINT: Top of Casing
SHEET 1 OF 1

PROJECT: NYSDOT; Hanna Furnace
Project #7C745

LOCATION: Hanna Furnace Site
Buffalo, New York

INTAKE CONDITIONS		
	OPEN HOLE ☐	HOLE DIAMETER
	SLOTTED HOLE ☐	SLOT SIZE ____ DIAMETER ____
	CASING SEALED AT BOTTOM OF HOLE ☒	CASING DIAMETER 2" DEPTH 13.47

DATE	TIME	ELAPSED TIME (minutes)	DEPTH TO WATER FEET ☒ METERS ☐	HEAD RATIO H_t/H_o	COMMENTS
3/17/88		0	10.02	1	INITIAL READING (Ho) = 0.93
3/17/88		0.25	9.77	0.731	
3/17/88		0.75	9.60	0.548	
3/17/88		1.25	9.58	0.527	
3/17/88		1.75	9.51	0.452	
3/17/88		2.75	9.46	0.398	
3/17/88		3.75	9.40	0.333	
3/17/88		4.75	9.36	0.290	
3/17/88		5.75	9.34	0.269	
3/17/88		7.75	9.29	0.215	
3/17/88		9.75	9.24	0.161	
3/17/88		13.75	9.18	0.097	

REMARKS/NOTES:

APPENDIX C

TABLE 8

DATE: 3/18/88
HOLE NO.: MW-7
TEST: Falling Head
BY: RES

RECRA ENVIRONMENTAL, INC.

VARIABLE HEAD PERMEABILITY TEST

STICK UP: _____
HOLE DEPTH: 11.92
STATIC GW LEVEL: 8.20
REF. POINT: Top of Casing
SHEET 1 OF 1

PROJECT: NYSDOT; Hanna Furnace
Project #7C745

LOCATION: Hanna Furnace Site
Buffalo, New York

INTAKE CONDITIONS		
	OPEN HOLE ☐	HOLE DIAMETER _____
	SLOTTED HOLE ☐	SLOT SIZE _____ DIAMETER _____
	CASING SEALED AT BOTTOM OF HOLE ☒	CASING DIAMETER 2" DEPTH 11.92

DATE	TIME	ELAPSED TIME (minutes)	DEPTH TO WATER FEET ☒ METERS ☐	HEAD RATIO H_t/H_o	COMMENTS
3/18/88		0	7.83	1	INITIAL READING (Ho) = 0.37
3/18/88		0.25	7.89	0.838	
3/18/88		0.75	8.02	0.486	
3/18/88		1.25	8.12	0.216	
3/18/88		1.75	8.14	0.162	
3/18/88		2.25	8.16	0.108	
3/18/88		3.25	8.17	0.081	

REMARKS/NOTES: _____

APPENDIX C

TABLE 8

DATE: 3/18/88 HOLE NO.: MW-7 TEST: Rising Head BY: RES	**RECRA ENVIRONMENTAL, INC.** **VARIABLE HEAD PERMEABILITY TEST**	STICK UP: _____ HOLE DEPTH: 11.92 STATIC GW LEVEL: 8.20 REF. POINT: Top of Casing SHEET 1 OF 1

PROJECT: NYSDOT; Hanna Furnace
Project #7C745

LOCATION: Hanna Furnace Site
Buffalo, New York

INTAKE CONDITIONS		
	OPEN HOLE ☐	HOLE DIAMETER _____
	SLOTTED HOLE ☐	SLOT SIZE _____ DIAMETER _____
	CASING SEALED AT BOTTOM OF HOLE ☒	CASING DIAMETER 2" DEPTH 11.92

DATE	TIME	ELAPSED TIME (minutes)	DEPTH TO WATER FEET ☒ METERS ☐	HEAD RATIO H_t/H_o	COMMENTS
3/18/88		0	8.98	1	INITIAL READING (Ho) = 0.78
3/18/88		0.25	8.59	0.500	
3/18/88		0.75	8.34	0.179	
3/18/88		1.25	8.25	0.064	
3/18/88		1.75	8.22	0.026	
3/18/88		2.25	8.21	0.013	
3/18/88		2.75	8.20	0	

REMARKS/NOTES: _____

D

APPENDIX D

LABORATORY ANALYSIS

1/A8282

ANALYTICAL RESULTS

New York State
Department of Transportation

I.D. #87-1797 and 87-1797A

87-1797 & 87-1797A

1/7650.1

ANALYTICAL RESULTS

Prepared For

New York State
Department of Transportation

Prepared By

Recra Environmental, Inc.
10 Hazelwood Drive, Suite 106
Amherst, New York 14150

METHODOLOGIES

The specific methodologies employed in obtaining the enclosed analytical results are indicated on the specific data table. The method numbers presented refer to one of the following U.S. Environmental Protection Agency references unless noted otherwise in this report.

- 40 CFR Part 136 "Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act" October 26, 1984 (Federal Register) U.S. Environmental Protection Agency.
- U.S. Environmental Protection Agency "Test Methods for Evaluating Solid Waste - Physical/Chemical Methods". Office of Solid Waste and Emergency Response. July 1982, SW-846, Second Edition.

COMMENTS

Comments pertain to data on one or all pages of this report.

The values reported as "less than" (<) indicate the working detection limit for the particular sample and/or parameter.

The values reported as "less than or equal to" (≤) indicate the compound may be present at trace levels relative to the detection limit but not subject to accurate quantification.

Volatile Organic Scan results are used for screening purposes only and are not designed for qualification or quantification of specific organic compounds. Results are calculated based upon the carbon content and response factor of Benzene, but do not imply either the presence or absence of the compound itself.

COMMENTS (continued)

Halogenated Organic Scan results are used for screening purposes only and are not designed for qualification or quantification of any specific organic compound. Results are calculated based upon the chlorine content and response factor of Lindane but do not imply either the presence or absence of Lindane itself. Halogenated Organic Scan results do not include volatile organic constituents.

Results of the analysis of soils are corrected for moisture content and reported on a dry weight basis.

SOIL MATRIX
METHOD 8080 - PCB'S

COMPOUND (Units of Measure = µg/g dry)	SAMPLE IDENTIFICATION (DATE) 1 (12/31/87)	2 (12/31/87)	3 (12/31/87)
Aroclor 1016	<0.05	<0.05	<0.05
Aroclor 1221	<0.1	<0.1	<0.1
Aroclor 1232	<0.1	<0.1	<0.1
Aroclor 1242	<0.05	<0.05	<0.05
Aroclor 1248	<0.05	<0.05	<0.05
Aroclor 1254	<0.05	<0.05	<0.05
Aroclor 1260	<0.05	<0.05	<0.05
Extraction Date	1/6/88	1/6/88	1/6/88
Analysis Date	1/11/88	1/11/88	1/11/88

SOIL MATRIX
METHOD 8080 - PCB'S

COMPOUND (Units of Measure = µg/g dry)	SAMPLE IDENTIFICATION (DATE) 4 (12/31/87)	5 (12/31/87)	6 (12/31/87)
Aroclor 1016	<0.05	<0.05	<0.05
Aroclor 1221	<0.1	<0.1	<0.1
Aroclor 1232	<0.1	<0.1	<0.1
Aroclor 1242	<0.05	<0.05	<0.05
Aroclor 1248	<0.05	<0.05	<0.05
Aroclor 1254	<0.05	<0.05	0.070
Aroclor 1260	0.23	<0.05	<0.05
Extraction Date	1/6/88	1/6/88	1/6/88
Analysis Date	1/11/88	1/11/88	1/11/88

I.D. #87-1797

SOIL MATRIX
METHOD 8080 - PCB'S

COMPOUND (Units of Measure = µg/g dry)	SAMPLE IDENTIFICATION (DATE) 7 (12/31/87)	8 (12/31/87)
Aroclor 1016	<0.05	<0.05
Aroclor 1221	<0.1	<0.1
Aroclor 1232	<0.1	<0.1
Aroclor 1242	<0.05	<0.05
Aroclor 1248	<0.05	<0.05
Aroclor 1254	<0.05	0.53
Aroclor 1260	<0.05	<0.05
Extraction Date	1/6/88	1/6/88
Analysis Date	1/11/88	1/11/88

SOIL MATRIX
METHOD 8080 - PCB'S

COMPOUND (Units of Measure = µg/g dry)	SAMPLE IDENTIFICATION (DATE) 9 (12/13/87)	10 (12/31/87)
Aroclor 1016	<0.05	<0.05
Aroclor 1221	<0.1	<0.1
Aroclor 1232	<0.1	<0.1
Aroclor 1242	<0.05	<0.05
Aroclor 1248	<0.05	<0.05
Aroclor 1254	0.17	<0.05
Aroclor 1260	<0.05	<0.05
Extraction Date	1/6/88	1/6/88
Analysis Date	1/11/88	1/11/88

I.D. #87-1797

SOIL MATRIX
METHOD 8080 - PCB'S

COMPOUND (Units of Measure = µg/g dry)	SAMPLE IDENTIFICATION (DATE) 11 (1/6/88)	12 (1/6/88)	13 (1/6/88)
Aroclor 1016	<0.05	<0.05	<0.05
Aroclor 1221	<0.1	<0.1	<0.1
Aroclor 1232	<0.1	<0.1	<0.1
Aroclor 1242	<0.05	<0.05	<0.05
Aroclor 1248	<0.05	<0.05	<0.05
Aroclor 1254	<0.05	<0.05	<0.05
Aroclor 1260	<0.05	<0.05	<0.05
Extraction Date	1/7/88	1/7/88	1/7/88
Analysis Date	1/13/88	1/13/88	1/13/88

SOIL MATRIX
METHOD 8080 - PCB'S

COMPOUND (Units of Measure = µg/g dry)	SAMPLE IDENTIFICATION (DATE) 14 (1/6/88)	15 (1/6/88)	16 (1/6/88)
Aroclor 1016	<0.05	<0.05	<0.05
Aroclor 1221	<0.1	<0.1	<0.1
Aroclor 1232	<0.1	<0.1	<0.1
Aroclor 1242	<0.05	0.39	1.0
Aroclor 1248	<0.05	<0.05	<0.05
Aroclor 1254	<0.05	<0.05	0.43
Aroclor 1260	<0.05	<0.05	<0.05
Extraction Date	1/7/88	1/7/88	1/7/88
Analysis Date	1/13/88	1/13/88	1/13/88

I.D. #87-1797

SOIL MATRIX
METHOD 8080 - PCB'S

COMPOUND (Units of Measure = µg/g dry)	SAMPLE IDENTIFICATION (DATE) 17 (1/6/88)	18 (1/6/88)	19 (1/6/88)
Aroclor 1016	<0.05	<0.05	<0.2
Aroclor 1221	<0.1	<0.1	<0.4
Aroclor 1232	<0.1	<0.1	<0.4
Aroclor 1242	<0.05	<0.05	<0.2
Aroclor 1248	<0.05	<0.05	<0.2
Aroclor 1254	<0.05	<0.05	<0.2
Aroclor 1260	<0.05	<0.05	<0.2
Extraction Date	1/7/88	1/7/88	1/7/88
Analysis Date	1/14/88	1/13/88	1/13/88

SOIL MATRIX
METHOD 8080 - PCB'S

COMPOUND (Units of Measure = µg/g dry)	SAMPLE IDENTIFICATION (DATE) 20 (1/6/88)	21 (1/6/88)	22 (1/6/88)
Aroclor 1016	<0.2	<0.05	<0.05
Aroclor 1221	<0.4	<0.1	<0.1
Aroclor 1232	<0.4	<0.1	<0.1
Aroclor 1242	<0.2	0.37	<0.05
Aroclor 1248	<0.2	<0.05	<0.05
Aroclor 1254	1.3	<0.05	<0.05
Aroclor 1260	<0.2	<0.05	<0.05
Extraction Date	1/7/88	1/7/88	1/7/88
Analysis Date	1/14/88	1/14/88	1/14/88

I.D. #87-1797

SOIL MATRIX
METHOD 8080 - PCB'S

COMPOUND (Units of Measure = µg/g dry)	SAMPLE IDENTIFICATION (DATE) 23 (1/6/88)	24 (1/6/88)	25 (1/6/88)
Aroclor 1016	<0.05	<0.05	<0.2
Aroclor 1221	<0.1	<0.1	<0.4
Aroclor 1232	<0.1	<0.1	<0.4
Aroclor 1242	0.15	<0.05	<0.2
Aroclor 1248	<0.05	<0.05	<0.2
Aroclor 1254	<0.05	0.35	<0.2
Aroclor 1260	0.074	<0.05	<0.2
Extraction Date	1/7/88	1/7/88	1/7/88
Analysis Date	1/14/88	1/14/88	1/14/88

SOIL MATRIX
METHOD 8080 - PCB'S

COMPOUND (Units of Measure = µg/g dry)	SAMPLE IDENTIFICATION (DATE) 26 (1/6/88)	27 (1/6/88)
Aroclor 1016	<0.2	<0.4
Aroclor 1221	<0.4	<0.8
Aroclor 1232	<0.4	<0.8
Aroclor 1242	<0.2	<0.4
Aroclor 1248	<0.2	<0.4
Aroclor 1254	<0.2	<0.4
Aroclor 1260	<0.2	<0.4
Extraction Date	1/7/88	1/7/88
Analysis Date	1/14/88	1/14/88

I.D. #87-1797

SOIL MATRIX
METHOD 8080 - PCB'S

COMPOUND (Units of Measure = µg/g dry)	SAMPLE IDENTIFICATION (DATE) 28 (1/6/88)	29 (1/6/88)
Aroclor 1016	<0.05	<0.2
Aroclor 1221	<0.1	<0.4
Aroclor 1232	<0.1	<0.4
Aroclor 1242	<0.05	<0.2
Aroclor 1248	<0.05	<0.2
Aroclor 1254	<0.05	<0.2
Aroclor 1260	<0.05	0.56
Extraction Date	1/7/88	1/7/88
Analysis Date	1/14/88	1/16/88

I.D. #87-1797

RECRA ENVIRONMENTAL, INC.

SOIL MATRIX
ORGANIC SCREENING PROCEDURES

PARAMETER	UNITS OF MEASURE	EXTRACTION DATE	ANALYSIS DATE	SAMPLE IDENTIFICATION (DATE)		
				1 (12/31/87)	2 (12/31/87)	3 (12/31/87)
Volatile Organic Scan	µg/g dry as Carbon; Benzene Standard	-	1/8/88	0.39	0.17	0.36
Halogenated Organic Scan	µg/g dry as Chlorine; Lindane Standard	1/6/88	1/11/88	<0.01	0.018	0.027

SOIL MATRIX
ORGANIC SCREENING PROCEDURES

PARAMETER	UNITS OF MEASURE	EXTRACTION DATE	ANALYSIS DATE	SAMPLE IDENTIFICATION (DATE)		
				4 (12/31/87)	5 (12/31/87)	6 (12/31/87)
Volatile Organic Scan	µg/g dry as Carbon; Benzene Standard	-	1/8/88	0.37	0.87	0.47
Halogenated Organic Scan	µg/g dry as Chlorine; Lindane Standard	1/6/88	1/11/88	0.16	0.036	0.053

I.D. #87-1797

RECRA ENVIRONMENTAL, INC.

SOIL MATRIX
ORGANIC SCREENING PROCEDURES

PARAMETER	UNITS OF MEASURE	EXTRACTION DATE	ANALYSIS DATE	SAMPLE IDENTIFICATION (DATE) 7 (12/31/87)	8 (12/31/87)
Volatile Organic Scan	µg/g dry as Carbon; Benzene Standard	-	1/8/88	0.052	3.2
Halogenated Organic Scan	µg/g dry as Chlorine; Lindane Standard	1/6/88	1/11/88	0.078	0.46

SOIL MATRIX
ORGANIC SCREENING PROCEDURES

PARAMETER	UNITS OF MEASURE	EXTRACTION DATE	ANALYSIS DATE	SAMPLE IDENTIFICATION (DATE) 9 (12/31/87)	10 (12/31/87)
Volatile Organic Scan	µg/g dry as Carbon; Benzene Standard	-	1/8/88	1.0	2.4
Halogenated Organic Scan	µg/g dry as Chlorine; Lindane Standard	1/6/88	1/11/88	0.15	0.022

1/7650.10

SOIL MATRIX
ORGANIC SCREENING PROCEDURES

PARAMETER	UNITS OF MEASURE	EXTRACTION DATE	ANALYSIS DATE	SAMPLE IDENTIFICATION (DATE) 11 (1/6/88)	12 (1/6/88)	13 (1/6/88)
Volatile Organic Scan	µg/g dry as Carbon; Benzene Standard	-	1/8/88	0.041	0.48	0.87
Halogenated Organic Scan	µg/g dry as Chlorine; Lindane Standard	1/7/88	1/13/88	<0.01	0.039	0.014

SOIL MATRIX
ORGANIC SCREENING PROCEDURES

PARAMETER	UNITS OF MEASURE	EXTRACTION DATE	ANALYSIS DATE	SAMPLE IDENTIFICATION (DATE) 14 (1/6/88)	15 (1/6/88)	16 (1/6/88)
Volatile Organic Scan	µg/g dry as Carbon; Benzene Standard	-	1/9/88	1.7	0.50	0.75
Halogenated Organic Scan	µg/g dry as Chlorine; Lindane Standard	1/7/88	1/13/88	0.044	0.17	0.85

I.D. #87-1797

1/7650.11

SOIL MATRIX
ORGANIC SCREENING PROCEDURES

PARAMETER	UNITS OF MEASURE	EXTRACTION DATE	ANALYSIS DATE	SAMPLE IDENTIFICATION (DATE) 17 (1/6/88)	18 (1/6/88)	19 (1/6/88)
Volatile Organic Scan	µg/g dry as Carbon; Benzene Standard	-	1/9/88	0.29	0.076	0.64
Halogenated Organic Scan	µg/g dry as Chlorine; Lindane Standard	1/7/88	1/13-14/88	0.037	0.024	0.28

SOIL MATRIX
ORGANIC SCREENING PROCEDURES

PARAMETER	UNITS OF MEASURE	EXTRACTION DATE	ANALYSIS DATE	SAMPLE IDENTIFICATION (DATE) 20 (1/6/88)	21 (1/6/88)	22 (1/6/88)
Volatile Organic Scan	µg/g dry as Carbon; Benzene Standard	-	1/9/88	9.4	3.1	0.16
Halogenated Organic Scan	µg/g dry as Chlorine; Lindane Standard	1/7/88	1/14/88	2.3	0.36	0.11

I.D. #87-1797

ECRA ENVIRONMENTAL, INC.

SOIL MATRIX
ORGANIC SCREENING PROCEDURES

PARAMETER	UNITS OF MEASURE	EXTRACTION DATE	ANALYSIS DATE	SAMPLE IDENTIFICATION (DATE)		
				23 (1/6/88)	24 (1/6/88)	25 (1/6/88)
Volatile Organic Scan	µg/g dry as Carbon; Benzene Standard	-	1/9/88	0.62	1.0	19,900
Halogenated Organic Scan	µg/g dry as Chlorine; Lindane Standard	1/7/88	1/14/88	0.085	0.22	2.8

SOIL MATRIX
ORGANIC SCREENING PROCEDURES

PARAMETER	UNITS OF MEASURE	EXTRACTION DATE	ANALYSIS DATE	SAMPLE IDENTIFICATION (DATE)	
				26 (1/6/88)	27 (1/6/88)
Volatile Organic Scan	µg/g dry as Carbon; Benzene Standard	-	1/9/88	75	1.7
Halogenated Organic Scan	µg/g dry as Chlorine; Lindane Standard	1/7/88	1/14/88	1.7	0.73

I.D. #87-1797

1/7650.13

SOIL MATRIX
ORGANIC SCREENING PROCEDURES

PARAMETER	UNITS OF MEASURE	EXTRACTION DATE	ANALYSIS DATE	SAMPLE IDENTIFICATION (DATE)	
				28 (1/6/88)	29 (1/6/88)
Volatile Organic Scan	µg/g dry as Carbon; Benzene Standard	-	1/9/88	1.6	7.9
Halogenated Organic Scan	µg/g dry as Chlorine; Lindane Standard	1/7/88	1/14& 16/88	0.53	0.63

I.D. #87-1797

SOIL MATRIX
TOTAL METALS

PARAMETER (Units of Measure = µg/g dry)	METHOD NUMBER	ANALYSIS DATE	SAMPLE IDENTIFICATION (DATE)		
			1 (12/31/87)	2 (12/31/87)	3 (12/31/87)
Total Arsenic	7060	1/11/88	7.5	5.9	12
Total Chromium	7190	1/13/88	14	18	25
Total Copper	7210	1/13/88	27	25	80
Total Lead	7420	1/14/88	52	39	230

SOIL MATRIX
TOTAL METALS

PARAMETER (Units of Measure = µg/g dry)	METHOD NUMBER	ANALYSIS DATE	SAMPLE IDENTIFICATION (DATE)		
			4 (12/31/87)	5 (12/31/87)	6 (12/31/87)
Total Arsenic	7060	1/11/88	9.1	11	7.3
Total Chromium	7190	1/13/88	58	47	60
Total Copper	7210	1/13/88	190	120	220
Total Lead	7420	1/14/88	490	260	400

SOIL MATRIX
TOTAL METALS

PARAMETER (Units of Measure = µg/g dry)	METHOD NUMBER	ANALYSIS DATE	SAMPLE IDENTIFICATION (DATE)		
			7 (12/31/87)	8 (12/31/87)	9 (12/31/87)
Total Arsenic	7060	1/11/88	5.6	13	9.8
Total Chromium	7190	1/13/88	19	70	75
Total Copper	7210	1/13/88	27	260	250
Total Lead	7420	1/14/88	950	2,600	6,020

SOIL MATRIX
TOTAL METALS

PARAMETER (Units of Measure = µg/g dry)	METHOD NUMBER	ANALYSIS DATE	SAMPLE IDENTIFICATION (DATE)		
			10 (12/31/87)	11 (1/6/88)	12 (1/6/88)
Total Arsenic	7060	1/12/88	10	11	6.0
Total Chromium	7190	1/13/88	16	8.7	11
Total Copper	7210	1/13/88	36	79	79
Total Lead	7420	1/14/88	180	110	96

SOIL MATRIX
TOTAL METALS

PARAMETER (Units of Measure = µg/g dry)	METHOD NUMBER	ANALYSIS DATE	SAMPLE IDENTIFICATION (DATE)		
			13 (1/6/88)	14 (1/6/88)	15 (1/6/88)
Total Arsenic	7060	1/12/88	22	9.1	12
Total Chromium	7190	1/13/88	64	40	390
Total Copper	7210	1/13/88	180	420	190
Total Lead	7420	1/14/88	500	1,100	370

SOIL MATRIX
TOTAL METALS

PARAMETER (Units of Measure = µg/g dry)	METHOD NUMBER	ANALYSIS DATE	SAMPLE IDENTIFICATION (DATE)		
			16 (1/6/88)	17 (1/6/88)	18 (1/6/88)
Total Arsenic	7060	1/12/88	9.0	14	2.1
Total Chromium	7190	1/13/88	170	94	7.1
Total Copper	7210	1/13/88	410	360	15
Total Lead	7420	1/14/88	2,300	650	44

SOIL MATRIX
TOTAL METALS

PARAMETER (Units of Measure = µg/g dry)	METHOD NUMBER	ANALYSIS DATE	SAMPLE IDENTIFICATION (DATE)		
			19 (1/6/88)	20 (1/6/88)	21 (1/6/88)
Total Arsenic	7060	1/12/88	9.4	14	32
Total Chromium	7190	1/13/88	29	110	4,700
Total Copper	7210	1/13/88	89	170	640
Total Lead	7420	1/14/88	370	3,300	260

SOIL MATRIX
TOTAL METALS

PARAMETER (Units of Measure = µg/g dry)	METHOD NUMBER	ANALYSIS DATE	SAMPLE IDENTIFICATION (DATE)		
			22 (1/6/88)	23 (1/6/88)	24 (1/6/88)
Total Arsenic	7060	1/12/88	23	20	31
Total Chromium	7190	1/13/88	310	32	22
Total Copper	7210	1/13/88	23	310	440
Total Lead	7420	1/14/88	21	300	590

SOIL MATRIX
TOTAL METALS

PARAMETER (Units of Measure = µg/g dry)	METHOD NUMBER	ANALYSIS DATE	SAMPLE IDENTIFICATION (DATE)		
			25 (1/6/88)	26 (1/6/88)	27 (1/6/88)
Total Arsenic	7060	1/12/88	31	27	34
Total Chromium	7190	1/13/88	22	46	100
Total Copper	7210	1/13/88	2,200	2,600	1,100
Total Lead	7420	1/14/88	890	1,800	6,500

SOIL MATRIX
TOTAL METALS

PARAMETER (Units of Measure = µg/g dry)	METHOD NUMBER	ANALYSIS DATE	SAMPLE IDENTIFICATION (DATE)	
			28 (1/6/88)	29 (1/6/88)
Total Arsenic	7060	1/12/88	38	23
Total Chromium	7190	1/13/88	58	120
Total Copper	7210	1/13/88	740	640
Total Lead	7420	1/14/88	410	830

SOIL MATRIX

SAMPLE IDENTIFICATION	SAMPLE DATE	PARAMETER (UNITS OF MEASURE)	
		AMMONIA METHOD 350.3 (µg/g DRY)	TOTAL RECOVERABLE OIL & GREASE-METHOD 9070 (µg/g DRY)
1	12/31/87	52	340
2	12/31/87	68	400
3	12/21/87	62	900
4	12/31/87	42	670
5	12/31/87	48	640
6	12/31/87	47	590
7	12/31/87	<16	540
8	12/31/87	21	21,000
9	12/31/87	19	2,000
10	12/31/87	53	380
11	1/6/88	27	520
12	1/6/88	43	320
13	1/6/88	61	610
14	1/6/88	64	2,100
15	1/6/88	60	440
16	1/6/88	<16	3,900
17	1/6/88	<16	860
18	1/6/88	<16	520
19	1/6/88	53	81,000
20	1/6/88	90	3,400
21	1/6/88	<16	6,000
22	1/6/88	<16	4,200
23	1/6/88	110	1,700
24	1/6/88	43	1,400
25	1/6/88	59	156,000
26	1/6/88	78	271,000
27	1/6/88	94	22,500
28	1/6/88	93	3,900
29	1/6/88	25	33,000

SOIL MATRIX

SAMPLE IDENTIFICATION	SAMPLE DATE	PARAMETER (UNITS OF MEASURE)	
		PHENOLICS METHOD 9065 (µg/g DRY)	TOTAL CYANIDE METHOD 9010 (µg/g DRY)
1	12/31/87	<0.6	6.3
2	12/31/87	<0.6	5.6
3	12/21/87	<0.6	15
4	12/31/87	<0.6	17
5	12/31/87	<0.6	11
6	12/31/87	<0.6	20
7	12/31/87	<0.6	<0.6
8	12/31/87	2.8	13
9	12/31/87	<0.6	63
10	12/31/87	<0.6	2.7
11	1/6/88	<0.6	290
12	1/6/88	<0.6	12
13	1/6/88	<0.6	22
14	1/6/88	<0.6	29
15	1/6/88	<0.6	370
16	1/6/88	<0.6	22
17	1/6/88	<0.6	66
18	1/6/88	<0.6	2.8
19	1/6/88	<0.6	11
20	1/6/88	1.5	70
21	1/6/88	<0.6	9.0
22	1/6/88	<0.6	<0.6
23	1/6/88	<0.6	3.2
24	1/6/88	<0.6	8.8
25	1/6/88	5.6	12
26	1/6/88	2.8	18
27	1/6/88	<0.6	23
28	1/6/88	<0.6	55
29	1/6/88	<0.6	180

SOIL MATRIX

SAMPLE IDENTIFICATION	SAMPLE DATE	PARAMETER (UNITS OF MEASURE) DRY WEIGHT (103°C) (%)
1	12/31/87	79.07
2	12/31/87	88.26
3	12/31/87	72.82
4	12/31/87	85.91
5	12/31/87	88.11
6	12/21/87	83.35
7	12/31/87	80.83
8	12/31/87	72.58
9	12/31/87	76.36
10	12/31/87	85.01
11	1/6/88	89.63
12	1/6/88	90.95
13	1/6/88	72.04
14	1/6/88	69.59
15	1/6/88	74.70
16	1/6/88	83.15
17	1/6/88	72.24
18	1/6/88	86.87
19	1/6/88	94.58
20	1/6/88	89.10
21	1/6/88	90.47
22	1/6/88	97.02
23	1/6/88	83.95
24	1/6/88	81.09
25	1/6/88	80.57
26	1/6/88	76.66
27	1/6/88	70.55
28	1/6/88	73.97
29	1/6/88	73.41

QUALITY CONTROL INFORMATION - PRECISION
SOIL MATRIX
METHOD 8080 - PCB'S

SAMPLE IDENTIFICATION 2

COMPOUND (Units of Measure = µg/g dry)	VALUE 1	VALUE 2	MEAN	STANDARD DEVIATION
Aroclor 1016	<0.05	<0.05	<0.05	-
Aroclor 1221	<0.1	<0.1	<0.1	-
Aroclor 1232	<0.1	<0.1	<0.1	-
Aroclor 1242	<0.05	<0.05	<0.05	-
Aroclor 1248	<0.05	<0.05	<0.05	-
Aroclor 1254	<0.05	<0.05	<0.05	-
Aroclor 1260	<0.05	<0.05	<0.05	-
Extraction Date	1/6/88	1/6/88	-	-
Analysis Date	1/11/88	1/11/88	-	-

QUALITY CONTROL INFORMATION - PRECISION
SOIL MATRIX
METHOD 8080 - PCB'S

SAMPLE IDENTIFICATION 29

COMPOUND (Units of Measure = µg/g dry)	VALUE 1	VALUE 2	MEAN	STANDARD DEVIATION
Aroclor 1016	<0.2	<0.2	<0.2	-
Aroclor 1221	<0.4	<0.4	<0.4	-
Aroclor 1232	<0.4	<0.4	<0.4	-
Aroclor 1242	<0.2	<0.2	<0.2	-
Aroclor 1248	<0.2	<0.2	<0.2	-
Aroclor 1254	<0.2	<0.2	<0.2	-
Aroclor 1260	0.56	0.56	0.56	0
Extraction Date	1/7/88	1/7/88	-	-
Analysis Date	1/16/88	1/16/88	-	-

1/7650.23

QUALITY CONTROL INFORMATION - ACCURACY
SOIL MATRIX
METHOD 8080 - PCB'S

SAMPLE IDENTIFICATION Method Blank Spike

COMPOUND	NANOGRAMS OF SPIKE	PERCENT RECOVERY
Aroclor 1016 Aroclor 1260	1.0 1.0	103 66
Extraction Date Analysis Date	1/7/88 1/15/88	

I.D. #87-1797

QUALITY CONTROL INFORMATION - PRECISION
SOIL MATRIX
ORGANIC SCREENING PROCEDURES

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION	VALUE 1	VALUE 2	MEAN	STANDARD DEVIATION
Volatile Organic Scan	µg/g dry as Carbon; Benzene Standard	12	0.42	0.53	0.48	0.078
		26	82	68	75	9.9
		27	1.4	2.0	1.7	0.42

QUALITY CONTROL INFORMATION - ACCURACY
SOIL MATRIX
ORGANIC SCREENING PROCEDURES

PARAMETER	SAMPLE IDENTIFICATION	NANOGRAMS OF SPIKE	PERCENT RECOVERY
Volatile Organic Scan	11	600	92
	26	600	140
	27	600	76
	28	600	72
	Method Blank Spike	600	97

I.D. #87-1797

QUALITY CONTROL INFORMATION - PRECISION
SOIL MATRIX
ORGANIC SCREENING PROCEDURES

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION	VALUE 1	VALUE 2	MEAN	STANDARD DEVIATION
Halogenated Organic Scan	µg/g dry as Chlorine; Lindane Standard	29	0.53	0.72	0.63	0.13

QUALITY CONTROL INFORMATION - ACCURACY
SOIL MATRIX
ORGANIC SCREENING PROCEDURES

PARAMETER	SAMPLE IDENTIFICATION	NANOGRAMS OF SPIKE	PERCENT RECOVERY
Halogenated Organic Scan	2	0.20	115
	29	0.20	81

CRA ENVIRONMENTAL, INC.

QUALITY CONTROL INFORMATION - PRECISION
SOIL MATRIX
TOTAL METALS

PARAMETER (Units of Measure = µg/g dry)	METHOD NUMBER	SAMPLE IDENTIFICATION	VALUE 1	VALUE 2	MEAN	STANDARD DEVIATION
Total Arsenic	7060	6	7.2	7.3	7.3	0.071
Total Chromium	7190		61	58	60	2.1
Total Copper	7210		230	200	220	21
Total Lead	7420		380	420	400	28

QUALITY CONTROL INFORMATION - ACCURACY
SOIL MATRIX
TOTAL METALS

PARAMETER	METHOD NUMBER	SAMPLE IDENTIFICATION	MICROGRAMS OF SPIKE	PERCENT RECOVERY
Total Arsenic	7060	6	50	80
Total Chromium	7190		500	80
Total Copper	7210		500	97
Total Lead	7420		500	104

I.D. #87-1797

RECRA ENVIRONMENTAL, INC.

QUALITY CONTROL INFORMATION - PRECISION
SOIL MATRIX
TOTAL METALS

PARAMETER (Units of Measure = µg/g dry)	METHOD NUMBER	SAMPLE IDENTIFICATION	VALUE 1	VALUE 2	MEAN	STANDARD DEVIATION
Total Arsenic	7060	11	11	11	11	0
Total Chromium	7190		7.8	9.5	8.7	1.2
Total Copper	7210		76	81	79	3.5
Total Lead	7420		110	100	110	7.1

QUALITY CONTROL INFORMATION - ACCURACY
SOIL MATRIX
TOTAL METALS

PARAMETER	METHOD NUMBER	SAMPLE IDENTIFICATION	MICROGRAMS OF SPIKE	PERCENT RECOVERY
Total Arsenic	7060	11	50	92
Total Chromium	7190		500	80
Total Copper	7210		500	97
Total Lead	7420		500	103

I.D. #87-1797

RECRA ENVIRONMENTAL, INC.

QUALITY CONTROL INFORMATION - PRECISION
SOIL MATRIX
TOTAL METALS

PARAMETER (Units of Measure = µg/g dry)	METHOD NUMBER	SAMPLE IDENTIFICATION	VALUE 1	VALUE 2	MEAN	STANDARD DEVIATION
Total Arsenic	7060	29	23	22	23	0.71
Total Chromium	7190		120	120	120	0
Total Copper	7210		710	570	640	99
Total Lead	7420		790	860	830	49

QUALITY CONTROL INFORMATION - ACCURACY
SOIL MATRIX
TOTAL METALS

PARAMETER	METHOD NUMBER	SAMPLE IDENTIFICATION	MICROGRAMS OF SPIKE	PERCENT RECOVERY
Total Arsenic	7060	29	50	95
Total Chromium	7190		500	89
Total Copper	7210		500	101
Total Lead	7420		500	103

I.D. #87-1797

QUALITY CONTROL INFORMATION - PRECISION
SOIL MATRIX

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION	VALUE 1	VALUE 2	MEAN	STANDARD DEVIATION
Total Cyanide	µg/g dry	3	15	15	15	0
		11	280	300	290	14
		29	180	180	180	0
Phenolics	µg/g dry	26	2.7	2.9	2.8	0.14
Total Recoverable Oil and Grease	µg/g dry	4	560	770	670	150
		20	2,800	3,900	3,400	780
		29	33,000	32,000	33,000	710
Ammonia	µg/g dry	9	17	20	19	2.1
		20	94	85	90	6.4
		29	26	23	25	2.1

QUALITY CONTROL INFORMATION - ACCURACY
SOIL MATRIX

PARAMETER	SAMPLE IDENTIFICATION	µg OF SPIKE	% RECOVERY
Total Cyanide	29	50	74
	3	30	100
Phenolics	26	30	98
Total Recoverable Oil and Grease	4	21	92
	29	21	125
Ammonia	9	1,000	86
	20	1,000	92
	29	1,000	102

RECRA ENVIRONMENTAL, INC.

CHAIN OF CUSTODY RECORD

PROJECT NO.: 7c745

SITE NAME: NYS DOT

SAMPLERS (SIGNATURE): Dennis McLaughlin

STATION NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	16oz. GLASS	REMARKS
1	12/31/87	1331		X	SURFACE SOIL #1	1	1	0-6"
2		1340		X	#2	1	1	0-6"
3		1350		X	#3	1	1	0-5"
4		1355		X	#4	1	1	0-12"
5		1400		X	#5	1	1	0-6"
6		1410		X	#6	1	1	0-7"
7		1420		X	#7	1	1	0-6"
8		1426		X	#8	1	1	0-12"
9		1429		X	#9	1	1	0-12"
10		1440		X	#10	1	1	0-9"
					TOTAL	10	10	

RELINQUISHED BY (SIGNATURE)	DATE / TIME	RECEIVED BY (SIGNATURE)	RELINQUISHED BY (SIGNATURE)	DATE / TIME	RECEIVED BY (SIGNATURE)
Dennis McLaughlin	12-31-87 1522	J. Calvert			
RELINQUISHED BY (SIGNATURE)	DATE / TIME	RECEIVED BY (SIGNATURE)	RELINQUISHED BY (SIGNATURE)	DATE / TIME	RECEIVED BY (SIGNATURE)
RELINQUISHED BY (SIGNATURE)	DATE / TIME	RECEIVED FOR LABORATORY BY (SIGNATURE)	DATE / TIME	REMARKS	

Distribution: Original accompanies shipment; copy to coordinator field files.

RECRA ENVIRONMENTAL, INC.

CHAIN OF CUSTODY RECORD

PROJECT NO.	SITE NAME
7C745	NYS. DOT.

SAMPLERS (SIGNATURE): Dennis Malueg

STATION NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	16 OZ GLASS	REMARKS 1 of 2
1	1/6/89	0930		X	# 19	1	1	SOIL SAMPLE
2		0944		X	#20	1	1	
3		0945		X	#21	1	1	
4		0954		X	#22	1	1	
5		1000		X	# 23	1	1	
6		1010		X	# 24	1	1	
7		1254		X	#25	1	1	
8		1308		X	# 26	1	1	
9		1319		X	# 27	1	1	
10		1310		X	# 28	1	1	
11		1314		X	# 29	1	1	
12	V	1020		X	# 11	1	1	
13		1030		X	# 12	1	1	
14		1040		X	# 13	1	1	
					TOTAL	14	14	

RELINQUISHED BY (SIGNATURE)	DATE / TIME	RECEIVED BY (SIGNATURE)	RELINQUISHED BY (SIGNATURE)	DATE / TIME	RECEIVED BY (SIGNATURE)
Dennis Malueg	1-6-89 1400	J. Calpin			
RELINQUISHED BY (SIGNATURE)	DATE / TIME	RECEIVED BY (SIGNATURE)	RELINQUISHED BY (SIGNATURE)	DATE / TIME	RECEIVED BY (SIGNATURE)
RELINQUISHED BY (SIGNATURE)	DATE / TIME	RECEIVED FOR LABORATORY BY (SIGNATURE)	DATE / TIME	REMARKS	

Distribution: Original accompanies shipment; copy to coordinator field files

RECRA ENVIRONMENTAL, INC.

CHAIN OF CUSTODY RECORD

PROJECT NO.: 7c 745

SITE NAME: NYS DOT.

SAMPLERS (SIGNATURE): Dennis Malmus

STATION NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	16oz GLASS	REMARKS
1	1/6/88			*	#14	1	1	2 of 2
2	"			*	#15	1	1	SOIL SAMPLE
3	"			*	#16	1	1	
4	"			*	#17	1	1	
5	"			*	#18	1	1	
					TOTAL	5	5	

RELINQUISHED BY (SIGNATURE)	DATE/TIME	RECEIVED BY (SIGNATURE)	RELINQUISHED BY (SIGNATURE)	DATE/TIME	RECEIVED BY (SIGNATURE)
Dennis Malmus	1-6-88 1100	J. Cahow			
RELINQUISHED BY (SIGNATURE)	DATE/TIME	RECEIVED BY (SIGNATURE)	RELINQUISHED BY (SIGNATURE)	DATE/TIME	RECEIVED BY (SIGNATURE)
RELINQUISHED BY (SIGNATURE)	DATE/TIME	RECEIVED FOR LABORATORY BY (SIGNATURE)	DATE/TIME	REMARKS	

Distribution: Original accompanies shipment; copy to coordinator field files

1/A8282

ANALYTICAL RESULTS

New York State
Department of Transportation

I.D. #88-051

88-051

1/7591.1

ANALYTICAL RESULTS

Prepared For

New York State
Department of Transportation

Prepared By

Recra Environmental, Inc.
10 Hazelwood Drive, Suite 106
Amherst, New York 14150

COMMENTS

Comments pertain to data on one or all pages of this report.

The values reported as "less than" (<) indicate the working detection limit for the particular sample and/or parameter.

Methods used for the EP Toxicity Test procedure as well as the analysis of the resulting extract are presented in U.S. Environmental Protection Agency publication, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods". July 1982, SW-846, Second Edition.

EP TOXICITY TEST EXTRACT - METALS

PARAMETER (Units of Measure = mg/l)	ANALYSIS DATE	EPA MAX. CONC.	SAMPLE IDENTIFICATION	
			COMP.-1	COMP.-2
Total Arsenic	1/19/88	5.0	<0.005	<0.005
Total Barium	1/19/88	100.0	0.12	0.61
Total Cadmium	1/22/88	1.0	0.023	0.085
Total Chromium	1/25/88	5.0	<0.005	0.005
Total Lead	1/22/88	5.0	0.31	3.3
Total Mercury	1/28/88	0.2	<0.0005	<0.0005
Total Selenium	1/19/88	1.0	<0.005	<0.005
Total Silver	1/25/88	5.0	<0.005	<0.005

_X_ Standard Addition
___ Non-Standard Addition

EP TOXICITY TEST EXTRACT - METALS

PARAMETER (Units of Measure = mg/l)	ANALYSIS DATE	EPA MAX. CONC.	SAMPLE IDENTIFICATION
			COMP.-3
Total Arsenic	1/19/88	5.0	<0.005
Total Barium	1/19/88	100.0	0.19
Total Cadmium	1/22/88	1.0	0.015
Total Chromium	1/25/88	5.0	<0.005
Total Lead	1/22/88	5.0	0.14
Total Mercury	1/28/88	0.2	<0.0005
Total Selenium	1/19/88	1.0	<0.006
Total Silver	1/25/88	5.0	<0.005

_X_ Standard Addition
___ Non-Standard Addition

I.D. #88-051

1/7591.3

QUALITY CONTROL INFORMATION - PRECISION
EP TOXICITY TEST EXTRACT - METALS

SAMPLE IDENTIFICATION COMP.-3

PARAMETER (Units of Measure = mg/l)	VALUE 1	VALUE 2	MEAN	STANDARD DEVIATION
Total Arsenic	<0.005	<0.005	<0.005	-
Total Barium	0.18	0.19	0.19	0.0071
Total Cadmium	0.014	0.015	0.015	0.00071
Total Chromium	<0.005	<0.005	<0.005	-
Total Lead	0.14	0.14	0.14	0
Total Mercury	<0.0005	<0.0005	<0.0005	-
Total Selenium	<0.006	<0.006	<0.006	-
Total Silver	<0.005	<0.005	<0.005	-

X Standard Addition
___ Non-Standard Addition

I.D. #88-051

1/7591.4

QUALITY CONTROL INFORMATION - ACCURACY
EP TOXICITY TEST EXTRACT - METALS

SAMPLE IDENTIFICATION COMP.-1

PARAMETER	µg OF SPIKE	% RECOVERY
Total Arsenic	25	100
	50	88
Total Barium	2,500	88
	5,000	108
Total Cadmium	250	98
	500	99
Total Chromium	250	92
	500	98
Total Lead	2,500	100
	5,000	104
Total Mercury	0.2	108
	0.4	110
Total Selenium	25	104
	50	98
Total Silver	250	100
	500	97

I.D. #88-051

QUALITY CONTROL INFORMATION - ACCURACY
EP TOXICITY TEST EXTRACT - METALS

SAMPLE IDENTIFICATION COMP.-2

PARAMETER	µg OF SPIKE	% RECOVERY
Total Arsenic	25	92
	50	104
Total Barium	2,500	110
	5,000	106
Total Cadmium	250	98
	500	96
Total Chromium	250	84
	500	89
Total Lead	2,500	100
	5,000	101
Total Mercury	0.2	111
	0.4	106
Total Selenium	25	116
	50	102
Total Silver	250	93
	500	101

I.D. #88-051

QUALITY CONTROL INFORMATION - ACCURACY
EP TOXICITY TEST EXTRACT - METALS

SAMPLE IDENTIFICATION COMP.-3

PARAMETER	µg OF SPIKE	% RECOVERY
Total Arsenic	25	88
	50	94
Total Barium	2,500	102
	5,000	104
Total Cadmium	250	97
	500	94
Total Chromium	250	84
	500	87
Total Lead	2,500	98
	5,000	105
Total Mercury	0.2	106
	0.4	108
Total Selenium	25	112
	50	105
Total Silver	250	94
	500	96

1/A8282

ANALYTICAL RESULTS

New York State
Department of Transportation

I.D. #88-123 and 88-123A-D

88-123 & 88-123A-D

1/7888.1

ANALYTICAL RESULTS

Prepared For

New York State
Department of Transportation

Prepared By

Recra Environmental, Inc.
10 Hazelwood Drive, Suite 106
Amherst, New York 14150

METHODOLOGIES

The specific methodologies employed in obtaining the enclosed analytical results are indicated on the specific data table. The method numbers presented refer to one of the following U.S. Environmental Protection Agency references unless noted otherwise in this report.

- 40 CFR Part 136 "Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act" October 26, 1984 (Federal Register) U.S. Environmental Protection Agency.
- U.S. Environmental Protection Agency "Test Methods for Evaluating Solid Waste - Physical/Chemical Methods". Office of Solid Waste and Emergency Response. July 1982, SW-846, Second Edition.

COMMENTS

Comments pertain to data on one or all pages of this report.

The values reported as "less than" (<) indicate the working detection limit for the particular sample and/or parameter.

The values reported as "less than or equal to" ($\leq$) indicate the compound may be present at trace levels relative to the detection limit but not subject to accurate quantification.

Volatile Organic Scan results are used for screening purposes only and are not designed for qualification or quantification of specific organic compounds. Results are calculated based upon the carbon content and response factor of Benzene, but do not imply either the presence or absence of the compound itself.

COMMENTS (continued)

Halogenated Organic Scan results are used for screening purposes only and are not designed for qualification or quantification of any specific organic compound. Results are calculated based upon the chlorine content and response factor of Lindane but do not imply either the presence or absence of Lindane itself. Halogenated Organic Scan results do not include volatile organic constituents.

Methods used for the EP Toxicity Test procedure as well as the analysis of the resulting extract are presented in U.S. Environmental Protection Agency publication, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods". July 1982, SW-846, Second Edition.

Results of the analysis of soils are corrected for moisture content and reported on a dry weight basis.

Sample Sat. Comp. contains the following soil samples:

HF-1/SB-3
HF-2/SB-4
HF-3/SB-6
HF-4/SB-5
HF-5/SB-5
HF-6/SB-4
HF-7/SB-9

Sample Unsat. Comp. contains the following soil samples:

HF-1/SB-2
HF-2/SB-2
HF-3/SB-2
HF-4/SB-2
HF-5/SB-3
HF-6/SB-3
HF-7/SB-2

SOIL MATRIX
METHOD 8240 - HAZARDOUS SUBSTANCE LIST VOLATILE ORGANICS

COMPOUND (Units of Measure = µg/g dry)	SAMPLE IDENTIFICATION	
	SAT. COMP.	UNSAT. COMP.
Acetone	59	46
Benzene	<0.5	<0.5
Bromodichloromethane	<0.3	<0.3
Bromoform	<0.5	<0.5
Bromomethane	<1	<1
2-Butanone	<1	<1
Carbon disulfide	<0.6	<0.6
Carbon tetrachloride	<0.3	<0.3
Chlorobenzene	<0.7	<0.7
Chloroethane	<1	<1
2-Chloroethylvinyl ether	<1	<1
Chloroform	<0.2	<0.2
Chloromethane	<1	<1
Dibromochloromethane	<0.4	<0.4
1,1-Dichloroethane	<0.5	<0.5
1,2-Dichloroethane	<0.3	<0.3
1,1-Dichloroethylene	<0.3	<0.3
trans-1,2-Dichloroethylene	<0.2	<0.2
1,2-Dichloropropane	<0.7	<0.7
cis-1,3-Dichloropropene	<0.6	<0.6
trans-1,3-Dichloropropene	<0.6	<0.6
Ethylbenzene	<0.8	<0.8
2-Hexanone	<1	<1
Methylene chloride	<0.3	2.5
4-Methyl-2-pentanone	<1	<1
Styrene	<0.6	<0.6
1,1,2,2-Tetrachloroethane	<0.7	<0.7
Tetrachloroethylene	<0.5	<0.5
Toluene	<0.7	<0.7
1,1,1-Trichloroethane	<0.4	<0.4
1,1,2-Trichloroethane	<0.6	<0.6
Trichloroethylene	<0.2	<0.2
Vinyl acetate	<1	<1
Vinyl chloride	<1	<1
Total Xylenes	<0.6	<0.6

(continued)

SOIL MATRIX
METHOD 8240 - HAZARDOUS SUBSTANCE LIST VOLATILE ORGANICS

ADDITIONAL SAMPLE INFORMATION	SAMPLE IDENTIFICATION	
	SAT. COMP.	UNSAT. COMP.
Analysis Date	2/13/88	2/13/88
Internal Standards		
Level Added = 0.05 µg/g		
(% Recovery)		
Bromochloromethane	102	100
1,4-Difluorobenzene	101	98
Chlorobenzene-D_5	93	107
Surrogates		
Level Added = 0.05 µg/g		
(% Recovery)		
4-Bromofluorobenzene	87	75
1,2-Dichloroethane-D_4	76	74
Toluene-D_8	70	71

I.D. #88-123

SOIL MATRIX

METHOD 8270 - HAZARDOUS SUBSTANCE LIST BASE/NEUTRAL/ACID EXTRACTABLES

COMPOUND (Units of Measure = µg/g dry)	SAMPLE IDENTIFICATION	
	SAT. COMP.	UNSAT. COMP.
Acenaphthene	<0.33	<0.33
Acenaphthylene	<0.33	<0.33
Anthracene	<0.33	<0.33
Benzo(a)anthracene	<0.33	<0.33
Benzo(a)pyrene	<0.33	<0.33
Benzo(b)fluoranthene	<0.33	<0.33
Benzo(g,h,i)perylene	<0.33	<0.33
Benzo(k)fluoranthene	<0.33	<0.33
Benzoic acid	<0.33	<0.33
Benzyl alcohol	<0.33	<0.33
Bis(2-chloroethoxy)methane	<0.33	<0.33
Bis(2-chloroethyl)ether	<0.33	<0.33
Bis(2-chloroisopropyl)ether	<0.33	<0.33
Bis(2-ethylhexyl)phthalate	<0.33	<0.33
4-Bromophenylphenylether	<0.33	<0.33
Butylbenzylphthalate	<0.33	<0.33
4-Chloroaniline	<0.33	<0.33
2-Chloronaphthalene	<0.33	<0.33
4-Chlorophenylphenylether	<0.33	<0.33
Chrysene	<0.33	<0.33
Dibenzo(a,h)anthracene	<0.33	<0.33
Dibenzofuran	<0.33	<0.33
1,2-Dichlorobenzene	<0.33	<0.33
1,3-Dichlorobenzene	<0.33	<0.33
1,4-Dichlorobenzene	<0.33	<0.33
3,3'-Dichlorobenzidine	<0.66	<0.66
Diethylphthalate	<0.33	<0.33
Dimethylphthalate	<0.33	<0.33
Di-n-butylphthalate	<0.33	<0.33
2,6-Dinitrotoluene	<0.33	<0.33
2,4-Dinitrotoluene	<0.33	<0.33
Di-n-octylphthalate	<0.33	<0.33
Fluoranthene	<0.33	<0.33
Fluorene	<0.33	<0.33
Hexachlorobenzene	<0.33	<0.33
Hexachlorobutadiene	<0.33	<0.33
Hexachlorocylopentadiene	<0.33	<0.33
Hexachloroethane	<0.33	<0.33
Indeno(1,2,3-cd)pyrene	<0.33	<0.33
Isophorone	<0.33	<0.33

(Continued)

SOIL MATRIX
METHOD 8270 - HAZARDOUS SUBSTANCE LIST BASE/NEUTRAL/ACID EXTRACTABLES

COMPOUND (Units of Measure = µg/g dry)	SAMPLE IDENTIFICATION	
	SAT. COMP.	UNSAT. COMP.
2-Methylnaphthalene	<0.33	<0.33
Naphthalene	<0.33	<0.33
2-Nitroaniline	<1.6	<1.6
3-Nitroaniline	<1.6	<1.6
4-Nitroaniline	<1.6	<1.6
Nitrobenzene	<0.33	<0.33
N-nitrosodi-n-propylamine	<0.33	<0.33
N-nitrosodiphenylamine	<0.33	<0.33
Phenanthrene	<0.33	<0.33
Pyrene	<0.33	<0.33
1,2,4-Trichlorobenzene	<0.33	<0.33
2-Chlorophenol	<0.33	<0.33
2,4-Dichlorophenol	<0.33	<0.33
2,4-Dimethylphenol	<0.33	<0.33
4,6-Dinitro-o-cresol	<1.6	<1.6
2,4-Dinitrophenol	<1.6	<1.6
2-Methylphenol	<0.33	<0.33
4-Methylphenol	<0.33	<0.33
2-Nitrophenol	<0.33	<0.33
4-Nitrophenol	<1.6	<1.6
p-Chloro-m-cresol	<0.33	<0.33
Pentachlorophenol	<1.6	<1.6
Phenol	<0.33	<0.33
2,4,5-Trichlorophenol	<1.6	<1.6
2,4,6-Trichlorophenol	<0.33	<0.33
Extraction Date	2/10/88	2/10/88
Analysis Date	2/22/88	2/22/88
Internal Standards		
Level Added = 2.0 µg/g		
(% Recovery)		
Phenanthrene-D_{10}	103	102
Surrogates		
Level Added = 5.0 µg/g		
(% Recovery)		
Decafluorobiphenyl	108	143
2-Fluorobiphenyl	160	162
2-Fluorophenol	114	104
Phenol-D_5	108	115

I.D. #88-123

1/7888.7

SOIL MATRIX
METHOD 8080 - HAZARDOUS SUBSTANCE LIST ORGANOCHLORINE PESTICIDES/PCB'S

COMPOUND (Units of Measure = µg/g dry)	SAMPLE IDENTIFICATION	
	SAT. COMP.	UNSAT. COMP.
Aldrin	<0.005	<0.005
Alpha-BHC	<0.005	<0.005
Beta-BHC	<0.005	<0.005
Delta-BHC	<0.005	<0.005
Gamma-BHC	<0.005	<0.005
Chlordane	<0.1	<0.1
4,4'-DDD	<0.01	<0.01
4,4'-DDE	<0.01	<0.01
4,4'-DDT	<0.03	<0.03
Dieldrin	<0.01	<0.01
Endosulfan I	<0.01	<0.01
Endosulfan II	<0.01	<0.01
Endosulfan sulfate	<0.03	<0.03
Endrin	<0.01	<0.01
Heptachlor	0.036	0.032
Heptachlor epoxide	<0.005	<0.005
Toxaphene	<0.3	<0.3
Aroclor 1016	<0.05	<0.05
Aroclor 1221	<0.1	<0.1
Aroclor 1232	<0.1	<0.1
Aroclor 1242	<0.05	<0.05
Aroclor 1248	<0.05	<0.05
Aroclor 1254	<0.05	<0.05
Aroclor 1260	<0.05	<0.05
Endrin ketone	<0.005	<0.005
Methoxychlor	<0.01	<0.05
Extraction Date	2/5/88	2/5/88
Analysis Date	2/15/88	2/15/88

I.D. #88-123

SOIL MATRIX
METHOD 8080 - PCB'S

COMPOUND (Units of Measure = µg/g dry)	SAMPLE IDENTIFICATION (DATE)	
	HF-1/SB-2 (2/4/88)	HF-1/SB-3 (2/4/88)
Aroclor 1016	<0.05	<0.05
Aroclor 1221	<0.1	<0.1
Aroclor 1232	<0.1	<0.1
Aroclor 1242	<0.05	<0.05
Aroclor 1248	<0.05	<0.05
Aroclor 1254	<0.05	<0.05
Aroclor 1260	<0.05	<0.05
Extraction Date	2/5/88	2/5/88
Analysis Date	2/9/88	2/9/88

SOIL MATRIX
METHOD 8080 - PCB'S

COMPOUND (Units of Measure = µg/g dry)	SAMPLE IDENTIFICATION (DATE)	
	HF-2/SB-2 (1/29/88)	HF-2/SB-4 (1/29/88)
Aroclor 1016	<0.1	<0.05
Aroclor 1221	<0.2	<0.1
Aroclor 1232	<0.2	<0.1
Aroclor 1242	<0.1	<0.05
Aroclor 1248	<0.1	<0.05
Aroclor 1254	<0.1	<0.05
Aroclor 1260	<0.1	<0.05
Extraction Date	2/5/88	2/5/88
Analysis Date	2/9/88	2/10/88

SOIL MATRIX
METHOD 8080 - PCB'S

COMPOUND (Units of Measure = µg/g dry)	SAMPLE IDENTIFICATION (DATE)	
	HF-3/SB-2 (2/4/88)	HF-3/SB-6 (2/4/88)
Aroclor 1016	<0.05	<0.05
Aroclor 1221	<0.1	<0.1
Aroclor 1232	<0.1	<0.1
Aroclor 1242	<0.05	<0.05
Aroclor 1248	<0.05	<0.05
Aroclor 1254	<0.05	<0.05
Aroclor 1260	<0.05	<0.05
Extraction Date	2/5/88	2/5/88
Analysis Date	2/9/88	2/9-10/88

SOIL MATRIX
METHOD 8080 - PCB'S

COMPOUND (Units of Measure = µg/g dry)	SAMPLE IDENTIFICATION (DATE)	
	HF-4/SB-2 (2/2/88)	HF-4/SB-5 (2/2/88)
Aroclor 1016	<0.05	<0.05
Aroclor 1221	<0.1	<0.1
Aroclor 1232	<0.1	<0.1
Aroclor 1242	<0.05	<0.05
Aroclor 1248	<0.05	<0.05
Aroclor 1254	<0.05	<0.05
Aroclor 1260	<0.05	<0.05
Extraction Date	2/5/88	2/5/88
Analysis Date	2/9/88	2/9/88

SOIL MATRIX
METHOD 8080 - PCB'S

COMPOUND (Units of Measure = µg/g dry)	SAMPLE IDENTIFICATION (DATE) HF-5/SB-3 (2/1/88)	HF-5/SB-5 (2/1/88)
Aroclor 1016	<0.05	<0.05
Aroclor 1221	<0.1	<0.1
Aroclor 1232	<0.1	<0.1
Aroclor 1242	<0.05	<0.05
Aroclor 1248	<0.05	<0.05
Aroclor 1254	<0.05	<0.05
Aroclor 1260	<0.05	<0.05
Extraction Date	2/5/88	2/5/88
Analysis Date	2/9/88	2/9/88

SOIL MATRIX
METHOD 8080 - PCB'S

COMPOUND (Units of Measure = µg/g dry)	SAMPLE IDENTIFICATION (DATE) HF-6/SB-3 (2/4/88)	HF-6/SB-4 (2/4/88)
Aroclor 1016	<0.05	<0.05
Aroclor 1221	<0.1	<0.1
Aroclor 1232	<0.1	<0.1
Aroclor 1242	<0.05	<0.05
Aroclor 1248	<0.05	<0.05
Aroclor 1254	<0.05	<0.05
Aroclor 1260	<0.05	<0.05
Extraction Date	2/5/88	2/5/88
Analysis Date	2/9/88	2/9/88

SOIL MATRIX
METHOD 8080 - PCB'S

COMPOUND (Units of Measure = µg/g dry)	SAMPLE IDENTIFICATION (DATE)	
	HF-7/SB-2 (1/27/88)	HF-7/SB-9 (1/27/88)
Aroclor 1016	<0.05	<0.05
Aroclor 1221	<0.1	<0.1
Aroclor 1232	<0.1	<0.1
Aroclor 1242	<0.05	<0.05
Aroclor 1248	<0.05	<0.05
Aroclor 1254	<0.05	<0.05
Aroclor 1260	<0.05	<0.05
Extraction Date	2/9/88	2/9/88
Analysis Date	2/13/88	2/13/88

I.D. #88-123

SOIL MATRIX
ORGANIC SCREENING PROCEDURES

PARAMETER	UNITS OF MEASURE	EXTRACTION DATE	ANALYSIS DATE	SAMPLE IDENTIFICATION (DATE)	
				HF-1/SB-2 (2/4/88)	HF-1/SB-3 (2/4/88)
Volatile Organic Scan	µg/g dry as Carbon; Benzene Standard	-	2/5/88	0.021	0.037
Halogenated Organic Scan	µg/g dry as Chlorine; Lindane Standard	2/5/88	2/9/88	<0.01	<0.01

SOIL MATRIX
ORGANIC SCREENING PROCEDURES

PARAMETER	UNITS OF MEASURE	EXTRACTION DATE	ANALYSIS DATE	SAMPLE IDENTIFICATION (DATE)	
				HF-2/SB-2 (1/29/88)	HF-2/SB-4 (1/29/88)
Volatile Organic Scan	µg/g dry as Carbon; Benzene Standard	-	2/4/88	<0.02	0.25
Halogenated Organic Scan	µg/g dry as Chlorine; Lindane Standard	2/5/88	2/9/88	<0.01	<0.01

SOIL MATRIX
ORGANIC SCREENING PROCEDURES

PARAMETER	UNITS OF MEASURE	EXTRACTION DATE	ANALYSIS DATE	SAMPLE IDENTIFICATION (DATE)	
				HF-3/SB-2 (2/4/88)	HF-3/SB-6 (2/4/88)
Volatile Organic Scan	µg/g dry as Carbon; Benzene Standard	-	2/5/88	0.36	0.23
Halogenated Organic Scan	µg/g dry as Chlorine; Lindane Standard	2/5/88	2/9-10/88	<0.01	<0.01

SOIL MATRIX
ORGANIC SCREENING PROCEDURES

PARAMETER	UNITS OF MEASURE	EXTRACTION DATE	ANALYSIS DATE	SAMPLE IDENTIFICATION (DATE)	
				HF-4/SB-2 (2/2/88)	HF-4/SB-5 (2/2/88)
Volatile Organic Scan	µg/g dry as Carbon; Benzene Standard	-	2/4/88	1.2	0.043
Halogenated Organic Scan	µg/g dry as Chlorine; Lindane Standard	2/5/88	2/9/88	<0.01	<0.01

SOIL MATRIX
ORGANIC SCREENING PROCEDURES

PARAMETER	UNITS OF MEASURE	EXTRACTION DATE	ANALYSIS DATE	SAMPLE IDENTIFICATION (DATE)	
				HF-5/SB-3 (2/1/88)	HF-5/SB-5 (2/1/88)
Volatile Organic Scan	µg/g dry as Carbon; Benzene Standard	-	2/4/88	0.023	0.077
Halogenated Organic Scan	µg/g dry as Chlorine; Lindane Standard	2/5/88	2/9/88	<0.01	<0.01

SOIL MATRIX
ORGANIC SCREENING PROCEDURES

PARAMETER	UNITS OF MEASURE	EXTRACTION DATE	ANALYSIS DATE	SAMPLE IDENTIFICATION (DATE)	
				HF-6/SB-3 (2/4/88)	HF-6/SB-4 (2/4/88)
Volatile Organic Scan	µg/g dry as Carbon; Benzene Standard	-	2/5/88	1.0	0.25
Halogenated Organic Scan	µg/g dry as Chlorine; Lindane Standard	2/5/88	2/9/88	0.012	0.034

SOIL MATRIX
ORGANIC SCREENING PROCEDURES

PARAMETER	UNITS OF MEASURE	EXTRACTION DATE	ANALYSIS DATE	SAMPLE IDENTIFICATION (DATE)	
				HF-7/SB-2 (1/27/88)	HF-7/SB-9 (1/27/88)
Volatile Organic Scan	µg/g dry as Carbon; Benzene Standard	-	2/4/88	0.45	0.023
Halogenated Organic Scan	µg/g dry as Chlorine; Lindane Standard	2/9/88	2/13/88	0.055	0.0090

SOIL MATRIX
TOTAL METALS

PARAMETER (Units of Measure = µg/g dry)	METHOD NUMBER	ANALYSIS DATE	SAMPLE IDENTIFICATION (DATE)	
			HF-1/SB-2 (2/4/88)	HF-1/SB-3 (2/4/88)
Total Arsenic	7060	2/11/88	23	22
Total Chromium	7190	2/15/88	8.5	11
Total Copper	7210	2/15/88	9.9	15
Total Lead	7420	2/15/88	24	29

SOIL MATRIX
TOTAL METALS

PARAMETER (Units of Measure = µg/g dry)	METHOD NUMBER	ANALYSIS DATE	SAMPLE IDENTIFICATION (DATE)	
			HF-2/SB-2 (1/29/88)	HF-2/SB-4 (1/29/88)
Total Arsenic	7060	2/2/88	25	13
Total Chromium	7190	2/2/88	8.7	14
Total Copper	7210	2/2/88	66	11
Total Lead	7420	2/2/88	25	260

SOIL MATRIX
TOTAL METALS

PARAMETER (Units of Measure = µg/g dry)	METHOD NUMBER	ANALYSIS DATE	SAMPLE IDENTIFICATION (DATE)	
			HF-3/SB-2 (2/4/88)	HF-3/SB-6 (2/4/88)
Total Arsenic	7060	2/11/88	1.8	6.9
Total Chromium	7190	2/15/88	11	17
Total Copper	7210	2/15/88	11	17
Total Lead	7420	2/15/88	16	14

SOIL MATRIX
TOTAL METALS

PARAMETER (Units of Measure = µg/g dry)	METHOD NUMBER	ANALYSIS DATE	SAMPLE IDENTIFICATION (DATE)	
			HF-4/SB-2 (2/2/88)	HF-4/SB-5 (2/2/88)
Total Arsenic	7060	2/11/88	11	11
Total Chromium	7190	2/15/88	4.2	23
Total Copper	7210	2/15/88	17	28
Total Lead	7420	2/15/88	22	19

SOIL MATRIX
TOTAL METALS

PARAMETER (Units of Measure = µg/g dry)	METHOD NUMBER	ANALYSIS DATE	SAMPLE IDENTIFICATION (DATE)	
			HF-5/SB-3 (2/1/88)	HF-5/SB-5 (2/1/88)
Total Arsenic	7060	2/11/88	7.4	4.3
Total Chromium	7190	2/15/88	26	9.7
Total Copper	7210	2/15/88	32	13
Total Lead	7420	2/15/88	17	<5

SOIL MATRIX
TOTAL METALS

PARAMETER (Units of Measure = µg/g dry)	METHOD NUMBER	ANALYSIS DATE	SAMPLE IDENTIFICATION (DATE)	
			HF-6/SB-3 (2/4/88)	HF-6/SB-4 (2/4/88)
Total Arsenic	7060	2/11/88	9.3	14
Total Chromium	7190	2/15/88	46	10
Total Copper	7210	2/15/88	34	29
Total Lead	7420	2/15/88	100	33

1/7388.19

SOIL MATRIX
TOTAL METALS

PARAMETER (Units of Measure = µg/g dry)	METHOD NUMBER	ANALYSIS DATE	SAMPLE IDENTIFICATION (DATE)	
			HF-7/SB-2 (1/27/88)	HF-7/SB-9 (1/27/88)
Total Arsenic	7060	2/2/88	7.6	1.5
Total Chromium	7190	2/2/88	40	4.9
Total Copper	7210	2/2/88	53	<1
Total Lead	7420	2/2/88	30	3.9

I.D. #88-123

1/7888.20

EP TOXICITY TEST EXTRACT - METALS

PARAMETER (Units of Measure = mg/l)	ANALYSIS DATE	EPA MAX. CONC.	SAMPLE IDENTIFICATION	
			SAT. COMP.	UNSAT. COMP.
Total Arsenic	2/11/88	5.0	0.006	<0.005
Total Barium	2/15/88	100.0	0.55	0.20
Total Cadmium	2/15/88	1.0	<0.005	<0.005
Total Chromium	2/15/88	5.0	0.006	0.005
Total Lead	2/15/88	5.0	0.10	0.10
Total Mercury	2/16/88	0.2	<0.0005	<0.0005
Total Selenium	2/11/88	1.0	<0.005	<0.005
Total Silver	2/15/88	5.0	<0.005	<0.005

X Standard Addition
___ Non-Standard Addition

I.D. #88-123

RECRA ENVIRONMENTAL, INC.

SOIL MATRIX

PARAMETER	METHOD NUMBER	UNITS OF MEASURE	ANALYSIS DATE	SAMPLE IDENTIFICATION (DATE) HF-1/SB-2 (2/4/88)	HF-1/SB-3 (2/4/88)
Ammonia	350.3	µg NH_3-N/g dry	3/3/88	150	230
Total Cyanide	9010	µg/g dry	2/10/88	1.3	<0.7
Total Recoverable Oil and Grease	9070	µg/g dry	3/3/88	440	600
Total Recoverable Phenolics	9065	µg/g dry	2/16/88	<0.9	<0.7

SOIL MATRIX

PARAMETER	METHOD NUMBER	UNITS OF MEASURE	ANALYSIS DATE	SAMPLE IDENTIFICATION (DATE) HF-2/SB-2 (1/29/88)	HF-2/SB-4 (1/29/88)
Ammonia	350.3	µg NH_3-N/g dry	3/3/88	220	380
Total Cyanide	9010	µg/g dry	2/9/88	8.6	3.5
Total Recoverable Oil and Grease	9070	µg/g dry	3/3/88	390	650
Total Recoverable Phenolics	9065	µg/g dry	2/16/88	<2	<0.7

SOIL MATRIX

PARAMETER	METHOD NUMBER	UNITS OF MEASURE	ANALYSIS DATE	SAMPLE IDENTIFICATION (DATE) HF-3/SB-2 (2/4/88)	HF-3/SB-6 (2/4/88)
Ammonia	350.3	µg NH_3-N/g dry	3/3/88	78	90
Total Cyanide	9010	µg/g dry	2/10/88	<0.7	<0.8
Total Recoverable Oil and Grease	9070	µg/g dry	3/3/88	570	800
Total Recoverable Phenolics	9065	µg/g dry	2/16/88	<0.7	<0.8

SOIL MATRIX

PARAMETER	METHOD NUMBER	UNITS OF MEASURE	ANALYSIS DATE	SAMPLE IDENTIFICATION (DATE) HF-4/SB-2 (2/2/88)	HF-4/SB-5 (2/2/88)
Ammonia	350.3	µg NH_3-N/g dry	3/3/88	63	73
Total Cyanide	9010	µg/g dry	2/10/88	2.8	<0.7
Total Recoverable Oil and Grease	9070	µg/g dry	3/3/88	550	470
Total Recoverable Phenolics	9065	µg/g dry	2/16/88	<0.8	<0.7

1/7888.23

SOIL MATRIX

PARAMETER	METHOD NUMBER	UNITS OF MEASURE	ANALYSIS DATE	SAMPLE IDENTIFICATION (DATE) HF-5/SB-3 (2/1/88)	HF-5/SB-5 (2/1/88)
Ammonia	350.3	µg NH_3-N/g dry	3/3/88	35	34
Total Cyanide	9010	µg/g dry	2/10/88	<0.6	<0.8
Total Recoverable Oil and Grease	9070	µg/g dry	3/3/88	300	1,820
Total Recoverable Phenolics	9065	µg/g dry	2/16/88	<0.6	<0.8

SOIL MATRIX

PARAMETER	METHOD NUMBER	UNITS OF MEASURE	ANALYSIS DATE	SAMPLE IDENTIFICATION (DATE) HF-6/SB-3 (2/4/88)	HF-6/SB-4 (2/4/88)
Ammonia	350.3	µg NH_3-N/g dry	3/3/88	94	69
Total Cyanide	9010	µg/g dry	2/10/88	15	220
Total Recoverable Oil and Grease	9070	µg/g dry	3/3/88	840	1,960
Total Recoverable Phenolics	9065	µg/g dry	2/16/88	<0.7	<0.8

SOIL MATRIX

PARAMETER	METHOD NUMBER	UNITS OF MEASURE	ANALYSIS DATE	SAMPLE IDENTIFICATION (DATE) HF-7/SB-2 (1/27/88)	HF-7/SB-9 (1/27/88)
Ammonia	350.3	µg NH_3-N/g dry	3/3/88	38	30
Total Cyanide	9010	µg/g dry	2/9/88	0.83	<0.6
Total Recoverable Oil and Grease	9070	µg/g dry	3/3/88	240	180
Total Recoverable Phenolics	9065	µg/g dry	2/16/88	<0.6	<0.6

SOIL MATRIX

PARAMETER	METHOD NUMBER	UNITS OF MEASURE	ANALYSIS DATE	SAMPLE IDENTIFICATION SAT. COMP.	UNSAT. COMP.
Total Cyanide	9010	µg/g dry	3/8/88	38	9.8

SOIL MATRIX

SAMPLE IDENTIFICATION	ANALYSIS DATE	PARAMETER (UNITS OF MEASURE) DRY WEIGHT (103°C) (%)
HF-1/SB-2	2/5/88	60.80
HF-1/SB-3	2/5/88	72.54
HF-2/SB-2	2/5/88	43.00
HF-2/SB-4	2/5/88	72.35
HF-3/SB-2	2/5/88	79.85
HF-3/SB-6	2/5/88	69.68
HF-4/SB-2	2/5/88	68.51
HF-4/SB-5	2/5/88	76.70
HF-5/SB-3	2/5/88	83.58
HF-5/SB-5	2/5/88	65.16
HF-6/SB-3	2/5/88	83.00
HF-6/SB-4	2/5/88	62.78
HF-7/SB-2	2/9/88	89.06
HF-7/SB-9	2/9/88	90.33
Sat. Comp.	2/5/88	65.16
Unsat. Comp.	2/5/88	80.49

1/7888.26

QUALITY CONTROL INFORMATION - PRECISION
SOIL MATRIX
METHOD 8080 - PCB'S

SAMPLE IDENTIFICATION HF-3/SB-6

COMPOUND (Units of Measure = µg/g dry)	VALUE 1	VALUE 2	MEAN	STANDARD DEVIATION
Aroclor 1016	<0.05	<0.05	<0.05	-
Aroclor 1221	<0.1	<0.1	<0.1	-
Aroclor 1232	<0.1	<0.1	<0.1	-
Aroclor 1242	<0.05	<0.05	<0.05	-
Aroclor 1248	<0.05	<0.05	<0.05	-
Aroclor 1254	<0.05	<0.05	<0.05	-
Aroclor 1260	<0.05	<0.05	<0.05	-
Extraction Date	2/5/88	2/5/88	-	-
Analysis Date	2/9/88	2/10/88	-	-

QUALITY CONTROL INFORMATION - ACCURACY
SOIL MATRIX
METHOD 8080 - PCB'S

SAMPLE IDENTIFICATION Method Blank Spike

COMPOUND	NANOGRAMS OF SPIKE	PERCENT RECOVERY
Aroclor 1016	1.0	95
Aroclor 1260	1.0	89
Extraction Date	2/9/88	
Analysis Date	2/13/88	

QUALITY CONTROL INFORMATION - PRECISION
SOIL MATRIX
ORGANIC SCREENING PROCEDURES

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION	VALUE 1	VALUE 2	MEAN	STANDARD DEVIATION
Volatile Organic Scan	µg/g dry as Carbon; Benzene Standard	HF-7/SB-2	0.42	0.47	0.45	0.035
Halogenated Organic Scan	µg/g dry as Chlorine; Lindane Standard	HF-3/SB-6	<0.01	<0.01	<0.01	-

QUALITY CONTROL INFORMATION - ACCURACY
SOIL MATRIX
ORGANIC SCREENING PROCEDURES

PARAMETER	SAMPLE IDENTIFICATION	NANOGRAMS OF SPIKE	PERCENT RECOVERY
Volatile Organic Scan	HF-1/SB-3	3,000	92

QUALITY CONTROL INFORMATION - PRECISION
SOIL MATRIX
TOTAL METALS

PARAMETER (Units of Measure = µg/g dry)	METHOD NUMBER	SAMPLE IDENTIFICATION	VALUE 1	VALUE 2	MEAN	STANDARD DEVIATION
Total Arsenic	7060	HF-4/SB-5	10	11	11	0.71
Total Chromium	7190		23	23	23	0
Total Copper	7210		26	29	28	2.1
Total Lead	7420		18	19	19	0.71

QUALITY CONTROL INFORMATION - ACCURACY
SOIL MATRIX
TOTAL METALS

PARAMETER	METHOD NUMBER	SAMPLE IDENTIFICATION	MICROGRAMS OF SPIKE	PERCENT RECOVERY
Total Arsenic	7060	HF-4/SB-5	50	100
Total Chromium	7190		500	102
Total Copper	7210		500	97
Total Lead	7420		500	106

QUALITY CONTROL INFORMATION - PRECISION
SOIL MATRIX
TOTAL METALS

PARAMETER (Units of Measure = µg/g dry)	METHOD NUMBER	SAMPLE IDENTIFICATION	VALUE 1	VALUE 2	MEAN	STANDARD DEVIATION
Total Arsenic	7060	HF-7/SB-9	1.3	1.7	1.5	0.28
Total Chromium	7190	—	4.6	5.1	4.9	0.35
Total Copper	7210		<1	<1	<1	-
Total Lead	7420		3.5	4.2	3.9	0.49

QUALITY CONTROL INFORMATION - ACCURACY
SOIL MATRIX
TOTAL METALS

PARAMETER	METHOD NUMBER	SAMPLE IDENTIFICATION	MICROGRAMS OF SPIKE	PERCENT RECOVERY
Total Arsenic	7060	HF-7/SB-9	50	88
Total Chromium	7190		500	83
Total Copper	7210		500	99
Total Lead	7420		500	98

1/7888.30

QUALITY CONTROL INFORMATION - PRECISION
EP TOXICITY TEST EXTRACT - METALS

SAMPLE IDENTIFICATION UNSAT. COMP.

PARAMETER (Units of Measure = mg/l)	VALUE 1	VALUE 2	MEAN	STANDARD DEVIATION
Total Arsenic	<0.005	<0.005	<0.005	-
Total Barium	0.20	0.20	0.20	0
Total Cadmium	<0.005	<0.005	<0.005	-
Total Chromium	0.005	0.005	0.005	0
Total Lead	0.10	0.09	0.10	0.0071
Total Mercury	<0.0005	<0.0005	<0.0005	-
Total Selenium	<0.005	<0.005	<0.005	-
Total Silver	<0.005	<0.005	<0.005	-

X Standard Addition
___ Non-Standard Addition

I.D. #88-123

1/7888.31

QUALITY CONTROL INFORMATION - ACCURACY
EP TOXICITY TEST EXTRACT - METALS

SAMPLE IDENTIFICATION SAT. COMP.

PARAMETER	µg OF SPIKE	% RECOVERY
Total Arsenic	25	92
	50	92
Total Barium	2,500	110
	5,000	110
Total Cadmium	250	100
	500	98
Total Chromium	250	85
	500	86
Total Lead	2,500	97
	5,000	101
Total Mercury	0.2	103
	0.4	114
Total Selenium	25	96
	50	96
Total Silver	250	95
	500	97

I.D. #88-123

1/7888.32

QUALITY CONTROL INFORMATION - ACCURACY
EP TOXICITY TEST EXTRACT - METALS

SAMPLE IDENTIFICATION UNSAT. COMP.

PARAMETER	µg OF SPIKE	% RECOVERY
Total Arsenic	25	104
	50	92
Total Barium	2,500	111
	5,000	115
Total Cadmium	250	97
	500	100
Total Chromium	250	85
	500	90
Total Lead	2,500	96
	5,000	99
Total Mercury	0.2	112
	0.4	109
Total Selenium	25	96
	50	94
Total Silver	250	94
	500	100

I.D. #88-123

QUALITY CONTROL INFORMATION - PRECISION
SOIL MATRIX

PARAMETER	METHOD NUMBER	UNITS OF MEASURE	SAMPLE IDENTIFICATION	VALUE 1	VALUE 2	MEAN	STANDARD DEVIATION
Ammonia	350.3	µg NH_3-N/g dry	HF-1/SB-3	230	220	230	7.1
Total Cyanide	9010	µg/g dry	HF-6/SB-3	13	16	15	2.1
Total Recoverable Oil and Grease	9070	µg/g dry	HF-1/SB-3	460	740	600	200
Total Recoverable Phenolics	9065	µg/g dry	HF-6/SB-4	<0.8	<0.8	<0.8	-

QUALITY CONTROL INFORMATION - ACCURACY
SOIL MATRIX

PARAMETER	METHOD NUMBER	SAMPLE IDENTIFICATION	MICROGRAMS OF SPIKE	PERCENT RECOVERY
Ammonia	350.3	HF-1/SB-3	1,000	112
Total Cyanide	9010	HF-7/SB-2	50	94
Total Recoverable Oil and Grease	9070	HF-1/SB-3	18,000	63
Total Recoverable Phenolics	9065	HF-6/SB-4	30	91

RECRA ENVIRONMENTAL, INC.

CHAIN OF CUSTODY RECORD

PROJECT NO.: 7c745

SITE NAME: HANNA FURNANCE DOT.

SAMPLERS (SIGNATURE): Dana Mahon

STATION NO	DATE	TIME	COMP	GRAB	STATION LOCATION	NO. OF CONTAINERS	16 GRAB	REMARKS
1	2/4/88			X	HF-1 SB-1	1	1	0-2' Soil Borings
					SB-2	1	1	2-4' * TO BE ANALYZED
					SB-3	1	1	4-6' * TO BE ANALYZED
					SB-4	1	1	6-8'
					SB-5	1	1	8-10'
					SB-6	1	1	10-12'
					SB-7	1	1	12-14'
					SB-8	1	1	14-15'
					TOTAL	8	8	

RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED BY (SIGNATURE)	RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED BY (SIGNATURE)
Dana Mahon	2/4/88	1430	J. Calvert				
RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED BY (SIGNATURE)	RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED BY (SIGNATURE)
RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED FOR LABORATORY BY (SIGNATURE)	DATE	TIME	REMARKS	

Distribution: Original accompanies shipment; copy to coordinator field files

RECRA ENVIRONMENTAL, INC.

CHAIN OF CUSTODY RECORD

PROJECT NO.: 7C745

SITE NAME: HAVANA FURNACE (DUT.)

SAMPLERS (SIGNATURE): Dennis Malvern

STATION NO	DATE	TIME	COMP	GRAB	STATION LOCATION	NO. OF CONTAINERS	16-1 GLASS	REMARKS
1	1/29/88			X	HF-2 SB-1 THROUGH SB-10	10	10	SOIL BORING SAMPLES
					SB-13 THROUGH SB-19	6	6	Note:
					TOTAL	16	16	- NO SAMPLES OBTAINED AT SB-11 AND SB-12
								- CONTINUOUSLY SAMPLED FROM SURFACE TO BORING COMPLETION (SB-1) OF 365 FT (SB-19)
								SB-2 AND SB-4 TO BE ANALYZED.

RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED BY (SIGNATURE)	RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED BY (SIGNATURE)
Dennis Malvern	1-29-88	1618	J. Calvert				
RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED BY (SIGNATURE)	RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED BY (SIGNATURE)
RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED FOR LABORATORY BY (SIGNATURE)	DATE	TIME	REMARKS	

Distribution: Original accompanies shipment; copy to coordinator field files

RECRA ENVIRONMENTAL, INC.

CHAIN OF CUSTODY RECORD

PROJECT NO.: 70745

SITE NAME: HANNA FURNACE I.UT.

SAMPLERS (SIGNATURE): Dennis Molson

STATION NO	DATE	TIME	COMP	GRAB	STATION LOCATION	NO. OF CONTAINERS	16 oz GLASS						REMARKS
1	3/2/88			*	HF-4 SB-1	1	1						0-2'
					SB-2	1	1						2-4' * SAMPLE TO BE ANALYZED
					SB-3	1	1						4-6'
					SB-4	1	1						6-8'
					SB-5	2	2						8-9', 9-10' * SAMPLE TO BE ANALYZED
					SB-6	1	1						10-12'
					SB-7	2	2						12-13', 13-14'
					SB-8	1	1						14-16'
					SB-9	2	2						19-20'
					SB-10	1	1						24-26'
					SB-11	1	1						29-31'
					SB-12	1	1						34-36'
					TOTAL	15	15						

RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED BY (SIGNATURE)	RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED BY (SIGNATURE)
Dennis Molson	3-2-88	1615	J. Calvert				
RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED BY (SIGNATURE)	RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED BY (SIGNATURE)
RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED FOR LABORATORY BY (SIGNATURE)	DATE	TIME	REMARKS	

Distribution: Original accompanies shipment; copy to coordinator field files

RECRA ENVIRONMENTAL, INC.

CHAIN OF CUSTODY RECORD

PROJECT NO.: 7c745

SITE NAME: HANNA FURNACE D.O.T.

SAMPLERS (SIGNATURE): Dennis Malum

STATION NO	DATE	TIME	COMP	GRAB	STATION LOCATION	NO. OF CONTAINERS	16oz GLASS							REMARKS
1	2/1/88			*	HF-5 SB-1	2	2							0-2' SOIL BORINGS
					SB-2	2	2							2-4'
					SB-3	1	1							4-6' * TO BE ANALYZED
					SB-4	1	1							6-8'
					SB-5	2	2							8-10' * TO BE ANALYZED
					SB-6	2	2							10-12'
					SB-7	1	1							12-14'
					SB-8	2	2							14-16'
					SB-9	—	—							NO SAMPLE
					SB-10	2	2							25'-26'
					SB-11	1	1							28-28.5'
					SB-12	1	1							34-34.5'
						17	17							

RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED BY (SIGNATURE)	RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED BY (SIGNATURE)
Dennis Malum	2/2/88	1615	J. Calvert				
RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED BY (SIGNATURE)	RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED BY (SIGNATURE)
RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED FOR LABORATORY BY (SIGNATURE)	DATE	TIME	REMARKS	

Distribution: Original accompanies shipment; copy to coordinator field files

RECRA ENVIRONMENTAL, INC.

CHAIN OF CUSTODY RECORD

PROJECT NO.: 7c 045

SITE NAME: HANNA FURNACE DOT.

SAMPLERS (SIGNATURE): Dennis Mahon

STATION NO	DATE	TIME	COMP	GRAB	STATION LOCATION	NO. OF CONTAINERS	16oz GLASS						REMARKS
HF-6	2/4/88			*	HF-6 SB-1	1	1						0-2' SOIL BORINGS
					SB-2	1	1						2-4' ↓
					SB-3	1	1						4-6' * TO BE ANALYZED
					SB-4	1	1						6-8' * TO BE ANALYZED
					SB-5	1	1						8-10'
					SB-6	1	1						10-12'
					SB-7	1	1						12-14'
2	2/4/88				HF-3 SB-1	1	1						0-2'
					SB-2	1	1						2-4' * TO BE ANALYZED
					SB-3	1	1						4-6'
					SB-4	1	1						6-8'
					SB-5	1	1						8-10'
					SB-6	2	2						10-11', (11-13)* TO BE ANALYZED
					SB-7	1	1						12-14'

RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED BY (SIGNATURE)	RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED BY (SIGNATURE)
Dennis Mahon	2-4-88	1430	J. Calvert				
RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED BY (SIGNATURE)	RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED BY (SIGNATURE)
RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED FOR LABORATORY BY (SIGNATURE)	DATE/TIME	REMARKS		

Distribution: Original accompanies shipment; copy to coordinator field files

RECRA ENVIRONMENTAL, INC.

CHAIN OF CUSTODY RECORD

PROJECT NO.: 7c 745

SITE NAME: D.O.T HANNA FURNACE

SAMPLERS (SIGNATURE): Dennis Malcom

STATION NO	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	16oz GLASS						REMARKS
1	1/27/84			*	HF-7 BORING SOILS	1	1						SB-1 0 -2'
						1	1						SB-2 2 - 4'
						1	1						SB-3 4 - 6'
						1	1						SB-4 - 6 - 8' PARTIAL SAMPLE
						1	1						SB-5 8 -10'
						1	1						SB-6 10 - 12'
						1	1						SB-7 12 - 14'
						1	1						SB-8 14 - 16'
						1	1						SB-9 16 - 18'
						1	1						SB-10 18 - 20'
						1	1						SB-11 - PARTIAL SAMPLE 20 - 22'
						1	1						SB-12 - PARTIAL SAMPLE 22 - 24'
						1	1						SB-13 - PARTIAL SAMPLE 24 - 26'
						13	13						

RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED BY (SIGNATURE)	RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED BY (SIGNATURE)
Dennis Malcom	1-27-84	1530	J. Calvert				
RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED BY (SIGNATURE)	RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED BY (SIGNATURE)
RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED FOR LABORATORY BY (SIGNATURE)	DATE	TIME	REMARKS	

Distribution: Original accompanies shipment; copy to coordinator field files.

RECRA ENVIRONMENTAL, INC.

CHAIN OF CUSTODY RECORD

PROJECT NO.: 7c745

SITE NAME: DOT Hanna Furnace

SAMPLERS (SIGNATURE): [signature]

STATION NO	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	16oz Glass						REMARKS
1	1/27/88			X	HF-7 Boring Soils	1	1						SB-14 26-28' Partial Sample
					↓	1	1						SB-15 28-30' ↓
						1	1						SB-16 30-32'
						1	1						SB-17 32-34'
						1	1						SB-18 34-36'
						1	1						SB-19 36-38' Full Sample
						1	1						SB-20 38-40' Partial Sample
						1	1						SB-21 40-42' ↓
						1	1						SB-22 42-44'
						1	1						SB-23 44-46'
						1	1						SB-24 46-48'
					Total	11	11						

RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED BY (SIGNATURE)	RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED BY (SIGNATURE)
[signature]	1-27-88	1530	J. Calvert				
RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED BY (SIGNATURE)	RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED BY (SIGNATURE)
RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED FOR LABORATORY BY (SIGNATURE)	DATE	TIME	REMARKS	

Distribution: Original accompanies shipment, copy to coordinator field files.

1/A8282

ANALYTICAL RESULTS

New York State
Department of Transportation

I.D. #88-384 and 88-384A

88-384 & 88-384A

1/8218.1

ANALYTICAL RESULTS

Prepared For

New York State
Department of Transportation

Prepared By

Recra Environmental, Inc.
10 Hazelwood Drive, Suite 106
Amherst, New York 14150

METHODOLOGIES

The specific methodologies employed in obtaining the enclosed analytical results are indicated on the specific data table. The method numbers presented refer to one of the following U.S. Environmental Protection Agency references unless noted otherwise in this report.

- 40 CFR Part 136 "Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act" October 26, 1984 (Federal Register) U.S. Environmental Protection Agency.
- U.S. Environmental Protection Agency "Test Methods for Evaluating Solid Waste - Physical/Chemical Methods". Office of Solid Waste and Emergency Response. July 1982, SW-846, Second Edition.

COMMENTS

Comments pertain to data on one or all pages of this report.

The values reported as "less than" (<) indicate the working detection limit for the particular sample and/or parameter.

The values reported as "less than or equal to" (≤) indicate the compound may be present at trace levels relative to the detection limit but not subject to accurate quantification.

Results of the analysis of Pesticide/PCB's are based on the matching of retention times between samples and standards on a single gas chromatographic column.

COMMENTS (continued)

Volatile Organic Scan results are used for screening purposes only and are not designed for qualification or quantification of specific organic compounds. Results are calculated based upon the carbon content and response factor of Benzene, but do not imply either the presence or absence of the compound itself.

Halogenated Organic Scan results are used for screening purposes only and are not designed for qualification or quantification of any specific organic compound. Results are calculated based upon the chlorine content and response factor of Lindane but do not imply either the presence or absence of Lindane itself. Halogenated Organic Scan results do not include volatile organic constituents.

AQUEOUS MATRIX
METHOD 8240 - HAZARDOUS SUBSTANCE LIST VOLATILE ORGANICS

COMPOUND (Units of Measure = µg/l)	SAMPLE IDENTIFICATION (DATE) MW-1 (3/14/88)	MW-2 (3/14/88)	MW-4 (3/14/88)
Acetone	<10	<10	<10
Benzene	<4.4	<4.4	<4.4
Bromodichloromethane	<2.2	<2.2	<2.2
Bromoform	<4.7	<4.7	<4.7
Bromomethane	<10	<10	<10
2-Butanone	<10	<10	<10
Carbon disulfide	<5.0	<5.0	<5.0
Carbon tetrachloride	<2.8	<2.8	<2.8
Chlorobenzene	<6.0	<6.0	<6.0
Chloroethane	<10	<10	<10
2-Chloroethylvinyl ether	<10	<10	<10
Chloroform	<1.6	<1.6	<1.6
Chloromethane	<10	<10	<10
Dibromochloromethane	<3.1	<3.1	<3.1
1,1-Dichloroethane	<4.7	<4.7	<4.7
1,2-Dichloroethane	<2.8	<2.8	<2.8
1,1-Dichloroethylene	<2.8	<2.8	<2.8
trans-1,2-Dichloroethylene	<1.6	<1.6	<1.6
1,2-Dichloropropane	<6.0	<6.0	<6.0
cis-1,3-Dichloropropene	<5.0	<5.0	<5.0
trans-1,3-Dichloropropene	<5.0	<5.0	<5.0
Ethylbenzene	<7.2	<7.2	<7.2
2-Hexanone	<10	<10	<10
Methylene chloride	<2.8	<2.8	<2.8
4-Methyl-2-pentanone	<10	<10	<10
Styrene	<5.0	<5.0	<5.0
1,1,2,2-Tetrachloroethane	<6.9	<6.9	<6.9
Tetrachloroethylene	<4.1	<4.1	<4.1
Toluene	<6.0	<6.0	<6.0
1,1,1-Trichloroethane	<3.8	<3.8	<3.8
1,1,2-Trichloroethane	<5.0	<5.0	<5.0
Trichloroethylene	<1.9	<1.9	<1.9
Vinyl acetate	<10	<10	<10
Vinyl chloride	<10	<10	<10
Total Xylenes	<5.0	<5.0	<5.0

(continued)

AQUEOUS MATRIX
METHOD 8240 - HAZARDOUS SUBSTANCE LIST VOLATILE ORGANICS

ADDITIONAL SAMPLE INFORMATION	SAMPLE IDENTIFICATION (DATE) MW-1 (3/14/88)	MW-2 (3/14/88)	MW-4 (3/14/88)
Analysis Date	3/16/88	3/16/88	3/16/88
Internal Standards			
Level Added = 50 µg/l			
(% Recovery)			
Bromochloromethane	89	89	99
1,4-Difluorobenzene	102	102	102
Chlorobenzene-D_5	96	96	107
Surrogates			
Level Added = 50 µg/l			
(% Recovery)			
4-Bromofluorobenzene	110	109	116
1,2-Dichloroethane-D_4	109	96	99
Toluene-D_8	109	109	100

I.D. #88-384

AQUEOUS MATRIX
METHOD 8240 - HAZARDOUS SUBSTANCE LIST VOLATILE ORGANICS

COMPOUND (Units of Measure = µg/l)	SAMPLE IDENTIFICATION (DATE)	
	FIELD BLANK (3/14/88)	TRIP BLANK (3/14/88)
Acetone	<10	<10
Benzene	<4.4	<4.4
Bromodichloromethane	<2.2	<2.2
Bromoform	<4.7	<4.7
Bromomethane	<10	<10
2-Butanone	<10	<10
Carbon disulfide	<5.0	<5.0
Carbon tetrachloride	<2.8	<2.8
Chlorobenzene	<6.0	<6.0
Chloroethane	<10	<10
2-Chloroethylvinyl ether	<10	<10
Chloroform	<1.6	<1.6
Chloromethane	<10	<10
Dibromochloromethane	<3.1	<3.1
1,1-Dichloroethane	<4.7	<4.7
1,2-Dichloroethane	<2.8	<2.8
1,1-Dichloroethylene	<2.8	<2.8
trans-1,2-Dichloroethylene	<1.6	<1.6
1,2-Dichloropropane	<6.0	<6.0
cis-1,3-Dichloropropene	<5.0	<5.0
trans-1,3-Dichloropropene	<5.0	<5.0
Ethylbenzene	<7.2	<7.2
2-Hexanone	<10	<10
Methylene chloride	<2.8	<2.8
4-Methy -2-pentanone	<10	<10
Styrene	<5.0	<5.0
1,1,2,2-Tetrachloroethane	<6.9	<6.9
Tetrachloroethylene	<4.1	<4.1
Toluene	<6.0	<6.0
1,1,1-Trichloroethane	<3.8	<3.8
1,1,2-Trichloroethane	<5.0	<5.0
Trichloroethylene	<1.9	<1.9
Vinyl acetate	<10	<10
Vinyl chloride	<10	<10
Total Xylenes	<5.0	<5.0

(continued)

AQUEOUS MATRIX
METHOD 8240 - HAZARDOUS SUBSTANCE LIST VOLATILE ORGANICS

ADDITIONAL SAMPLE INFORMATION	SAMPLE IDENTIFICATION (DATE)	
	FIELD BLANK (3/14/88)	TRIP BLANK (3/14/88)
Analysis Date	3/16/88	3/16/88
Internal Standards		
Level Added = 50 µg/l		
(% Recovery)		
Bromochloromethane	92	94
1,4-Difluorobenzene	101	111
Chlorobenzene D_5	100	95
Surrogates		
Level Added = 50 µg/l		
(% Recovery)		
4-Bromofluorobenzene	119	123
1,2-Dichloroethane-D_4	94	94
Toluene-D_8	107	116

AQUEOUS MATRIX
METHOD 8270 - HAZARDOUS SUBSTANCE LIST BASE/NEUTRAL/ACID EXTRACTABLES

COMPOUND (Units of Measure = µg/l)	SAMPLE IDENTIFICATION (DATE)		
	MW-1 (3/14/88)	MW-2 (3/14/88)	MW-4 (3/14/88)
Acenaphthene	<1.9	<1.9	<1.9
Acenaphthylene	<3.5	<3.5	<3.5
Anthracene	<1.9	<1.9	<1.9
Benzo(a)anthracene	<7.8	<7.8	<7.8
Benzo(a)pyrene	<2.5	<2.5	<2.5
Benzo(b)fluoranthene	<4.8	<4.8	<4.8
Benzo(g,h,i)perylene	<4.1	<4.1	<4.1
Benzo(k)fluoranthene	<2.5	<2.5	<2.5
Benzoic acid	<50	<50	<50
Benzyl alcohol	<10	<10	<10
Bis(2-chloroethoxy)methane	<5.3	<5.3	<5.3
Bis(2-chloroethyl)ether	<5.7	<5.7	<5.7
Bis(2-chloroisopropyl)ether	<5.7	<5.7	<5.7
Bis(2-ethylhexyl)phthalate	<2.5	<2.5	<2.5
4-Bromophenylphenylether	<1.9	<1.9	<1.9
Butylbenzylphthalate	<2.5	<2.5	<2.5
4-Chloroaniline	<10	<10	<10
2-Chloronaphthalene	<1.9	<1.9	<1.9
4-Chlorophenylphenylether	<4.2	<4.2	<4.2
Chrysene	<2.5	<2.5	<2.5
Dibenzo(a,h)anthracene	<2.5	<2.5	<2.5
Dibenzofuran	<10	<10	<10
1,2-Dichlorobenzene	<1.9	<1.9	<1.9
1,3-Dichlorobenzene	<1.9	<1.9	<1.9
1,4-Dichlorobenzene	<4.4	<4.4	<4.4
3,3'-Dichlorobenzidine	<17	<17	<17
Diethylphthalate	<1.9	<1.9	<1.9
Dimethylphthalate	<1.6	<1.6	<1.6
Di-n-butylphthalate	<2.5	<2.5	<2.5
2,6-Dinitrotoluene	<1.9	<1.9	<1.9
2,4-Dinitrotoluene	<5.7	<5.7	<5.7
Di-n-octylphthalate	<2.5	<2.5	<2.5
Fluoranthene	<2.2	<2.2	<2.2
Fluorene	<1.9	<1.9	<1.9
Hexachlorobenzene	<1.9	<1.9	<1.9
Hexachlorobutadiene	<0.9	<0.9	<0.9
Hexachlorocylopentadiene	<25	<25	<25
Hexachloroethane	<1.6	<1.6	<1.6
Indeno(1,2,3-cd)pyrene	<3.7	<3.7	<3.7
Isophorone	<2.2	<2.2	<2.2

(Continued)

AQUEOUS MATRIX
METHOD 8270 - HAZARDOUS SUBSTANCE LIST BASE/NEUTRAL/ACID EXTRACTABLES

COMPOUND (Units of Measure = µg/l)	SAMPLE IDENTIFICATION (DATE) MW-1 (3/14/88)	MW-2 (3/14/88)	MW-4 (3/14/88)
2-Methylnaphthalene	<10	<10	<10
Naphthalene	<1.6	<1.6	<1.6
2-Nitroaniline	<50	<50	<50
3-Nitroaniline	<50	<50	<50
4-Nitroaniline	<50	<50	<50
Nitrobenzene	<1.9	<1.9	<1.9
N-nitrosodi-n-propylamine	<25	<25	<25
N-nitrosodiphenylamine	<1.9	<1.9	<1.9
Phenanthrene	<5.4	<5.4	<5.4
Pyrene	<1.9	<1.9	<1.9
1,2,4-Trichlorobenzene	<1.9	<1.9	<1.9
2-Chlorophenol	<3.3	<3.3	<3.3
2,4-Dichlorophenol	<2.7	<2.7	<2.7
2,4-Dimethylphenol	<2.7	<2.7	<2.7
4,6-Dinitro-o-cresol	<24	<24	<24
2,4-Dinitrophenol	<42	<42	<42
2-Methylphenol	<10	<10	<10
4-Methylphenol	<10	<10	<10
2-Nitrophenol	<3.6	<3.6	<3.6
4-Nitrophenol	<2.4	<2.4	<2.4
p-Chloro-m-cresol	<3.0	<3.0	<3.0
Pentachlorophenol	<3.6	<3.6	<3.6
Phenol	<1.5	<1.5	<1.5
2,4,5-Trichlorophenol	<50	<50	<50
2,4,6-Trichlorophenol	<2.7	<2.7	<2.7
Extraction Date	3/19/88	3/19/88	3/19/88
Analysis Date	3/22/88	3/23/88	3/23/88
Internal Standards			
Level Added = 40 µg/l (% Recovery)			
Phenanthrene-D_{10}	78	82	77
Surrogates			
Level Added = 100 µg/l (% Recovery)			
Decafluorobiphenyl	56	56	67
2-Fluorobiphenyl	73	62	77
2-Fluorophenol	38	39	53
Phenol-D_5	33	29	35

I.D. #88-384

AQUEOUS MATRIX
METHOD 8270 - HAZARDOUS SUBSTANCE LIST BASE/NEUTRAL/ACID EXTRACTABLES

COMPOUND (Units of Measure = µg/l)	SAMPLE IDENTIFICATION (DATE)	
	FIELD BLANK (3/14/88)	TRIP BLANK (3/14/88)
Acenaphthene	<1.9	<1.9
Acenaphthylene	<3.5	<3.5
Anthracene	<1.9	<1.9
Benzo(a)anthracene	<7.8	<7.8
Benzo(a)pyrene	<2.5	<2.5
Benzo(b)fluoranthene	<4.8	<4.8
Benzo(g,h,i)perylene	<4.1	<4.1
Benzo(k)fluoranthene	<2.5	<2.5
Benzoic acid	<50	<50
Benzyl alcohol	<10	<10
Bis(2-chloroethoxy)methane	<5.3	<5.3
Bis(2-chloroethyl)ether	<5.7	<5.7
Bis(2-chloroisopropyl)ether	<5.7	<5.7
Bis(2-ethylhexyl)phthalate	<2.5	<2.5
4-Bromophenylphenylether	<1.9	<1.9
Butylbenzylphthalate	<2.5	<2.5
4-Chloroaniline	<10	<10
2-Chloronaphthalene	<1.9	<1.9
4-Chlorophenylphenylether	<4.2	<4.2
Chrysene	<2.5	<2.5
Dibenzo(a,h)anthracene	<2.5	<2.5
Dibenzofuran	<10	<10
1,2-Dichlorobenzene	<1.9	<1.9
1,3-Dichlorobenzene	<1.9	<1.9
1,4-Dichlorobenzene	<4.4	<4.4
3,3'-Dichlorobenzidine	<17	<17
Diethylphthalate	<1.9	<1.9
Dimethylphthalate	<1.6	<1.6
Di-n-butylphthalate	<2.5	<2.5
2,6-Dinitrotoluene	<1.9	<1.9
2,4-Dinitrotoluene	<5.7	<5.7
Di-n-octylphthalate	<2.5	<2.5
Fluoranthene	<2.2	<2.2
Fluorene	<1.9	<1.9
Hexachlorobenzene	<1.9	<1.9
Hexachlorobutadiene	<0.9	<0.9
Hexachlorocylopentadiene	<25	<25
Hexachloroethane	<1.6	<1.6
Indeno(1,2,3-cd)pyrene	<3.7	<3.7
Isophorone	<2.2	<2.2

(Continued)

AQUEOUS MATRIX
METHOD 8270 - HAZARDOUS SUBSTANCE LIST BASE/NEUTRAL/ACID EXTRACTABLES

COMPOUND (Units of Measure = µg/l)	SAMPLE IDENTIFICATION (DATE) FIELD BLANK (3/14/88)	TRIP BLANK (3/14/88)
2-Methylnaphthalene	<10	<10
Naphthalene	<1.6	<1.6
2-Nitroaniline	<50	<50
3-Nitroaniline	<50	<50
4-Nitroaniline	<50	<50
Nitrobenzene	<1.9	<1.9
N-nitrosodi-n-propylamine	<25	<25
N-nitrosodiphenylamine	<1.9	<1.9
Phenanthrene	<5.4	<5.4
Pyrene	<1.9	<1.9
1,2,4-Trichlorobenzene	<1.9	<1.9
2-Chlorophenol	<3.3	<3.3
2,4-Dichlorophenol	<2.7	<2.7
2,4-Dimethylphenol	<2.7	<2.7
4,6-Dinitro-o-cresol	<24	<24
2,4-Dinitrophenol	<42	<42
2-Methylphenol	<10	<10
4-Methylphenol	<10	<10
2-Nitrophenol	<3.6	<3.6
4-Nitrophenol	<2.4	<2.4
p-Chloro-m-cresol	<3.0	<3.0
Pentachlorophenol	<3.6	<3.6
Phenol	<1.5	<1.5
2,4,5-Trichlorophenol	<50	<50
2,4,6-Trichlorophenol	<2.7	<2.7
Extraction Date	3/19/88	3/19/88
Analysis Date	3/23/88	3/23/88
Internal Standards		
Level Added = 40 µg/l		
(% Recovery)		
Phenanthrene-D_{10}	71	59
Surrogates		
Level Added = 100 µg/l		
(% Recovery)		
Decafluorobiphenyl	69	67
2-Fluorobiphenyl	82	78
2-Fluorophenol	55	48
Phenol-D_5	36	31

I.D. #88-384

1/8218.10

AQUEOUS MATRIX
METHOD 8080 - HAZARDOUS SUBSTANCE LIST ORGANOCHLORINE PESTICIDES/PCB'S

COMPOUND (Units of Measure = µg/l)	SAMPLE IDENTIFICATION (DATE) MW-1 (3/14/88)	MW-2 (3/14/88)	MW-4 (3/14/88)
Aldrin	<0.01	<0.01	<0.01
Alpha-BHC	0.11	<0.01	<0.01
Beta-BHC	<0.01	<0.01	<0.01
Delta-BHC	0.011	<0.01	<0.01
Gamma-BHC	<0.01	<0.01	<0.01
Chlordane	<0.2	<0.2	<0.2
4,4'-DDD	<0.02	<0.02	<0.02
4,4'-DDE	<0.02	<0.02	<0.02
4,4'-DDT	<0.05	<0.05	<0.05
Dieldrin	<0.02	<0.02	<0.02
Endosulfan I	<0.02	<0.02	<0.02
Endosulfan II	<0.02	<0.02	<0.02
Endosulfan sulfate	0.054	<0.05	0.21
Endrin	<0.02	<0.02	<0.02
Heptachlor	<0.01	<0.01	<0.01
Heptachlor epoxide	<0.01	<0.01	<0.01
Toxaphene	<0.5	<0.5	<0.5
Aroclor 1016	<0.1	<0.1	<0.1
Aroclor 1221	<0.2	<0.2	<0.2
Aroclor 1232	<0.2	<0.2	<0.2
Aroclor 1242	<0.1	<0.1	<0.1
Aroclor 1248	<0.1	<0.1	<0.1
Aroclor 1254	<0.1	<0.1	<0.1
Aroclor 1260	<0.1	<0.1	<0.1
Endrin ketone	<0.02	<0.02	<0.02
Methoxychlor	<0.05	<0.05	<0.05
Extraction Date	3/18/88	3/18/88	3/18/88
Analysis Date	3/26/88	3/26/88	3/26/88

I.D. #88-384

AQUEOUS MATRIX
METHOD 8080 - HAZARDOUS SUBSTANCE LIST ORGANOCHLORINE PESTICIDES/PCB'S

COMPOUND (Units of Measure = µg/l)	SAMPLE IDENTIFICATION (DATE)	
	FIELD BLANK (3/14/88)	TRIP BLANK (3/14/88)
Aldrin	<0.01	0.017
Alpha-BHC	<0.01	<0.01
Beta-BHC	<0.01	<0.01
Delta-BHC	<0.01	<0.01
Gamma-BHC	<0.01	<0.01
Chlordane	<0.2	<0.2
4,4'-DDD	<0.02	<0.02
4,4'-DDE	<0.02	<0.02
4,4'-DDT	<0.05	<0.05
Dieldrin	<0.02	<0.02
Endosulfan I	<0.02	<0.02
Endosulfan II	<0.02	<0.02
Endosulfan sulfate	<0.05	<0.05
Endrin	<0.02	<0.02
Heptachlor	<0.01	<0.01
Heptachlor epoxide	<0.01	<0.01
Toxaphene	<0.5	<0.5
Aroclor 1016	<0.1	<0.1
Aroclor 1221	<0.2	<0.2
Aroclor 1232	<0.2	<0.2
Aroclor 1242	<0.1	<0.1
Aroclor 1248	<0.1	<0.1
Aroclor 1254	<0.1	<0.1
Aroclor 1260	<0.1	<0.1
Endrin ketone	<0.02	<0.02
Methoxychlor	<0.05	<0.05
Extraction Date	3/18/88	3/18/88
Analysis Date	3/27/88	3/27/88

I.D. #88-384

AQUEOUS MATRIX
ORGANIC SCREENING PROCEDURES

PARAMETER	UNITS OF MEASURE	EXTRACTION DATE	ANALYSIS DATE	SAMPLE IDENTIFICATION (DATE)		
				MW-1 (3/14/88)	MW-2 (3/14/88)	MW-4 (3/14/88)
Volatile Organic Scan	µg/l as Carbon; Benzene Standard	-	3/18/88	0.53	0.78	<0.4
Halogenated Organic Scan	µg/l as Chlorine; Lindane Standard	3/18/88	3/26/88	0.19	0.35	0.30

1/8218.13

AQUEOUS MATRIX
ORGANIC SCREENING PROCEDURES

PARAMETER	UNITS OF MEASURE	EXTRACTION DATE	ANALYSIS DATE	SAMPLE IDENTIFICATION (DATE)	
				FIELD BLANK (3/14/88)	TRIP BLANK (3/14/88)
Volatile Organic Scan	µg/l as Carbon; Benzene Standard	-	3/18/88	<0.4	<0.4
Halogenated Organic Scan	µg/l as Chlorine; Lindane Standard	3/18/88	3/27/88	0.38	0.30

I.D. #88-384

AQUEOUS MATRIX
TOTAL METALS

PARAMETER (Units of Measure = mg/l)	METHOD NUMBER	ANALYSIS DATE	SAMPLE IDENTIFICATION (DATE)	
			MW-1 (3/14/88)	MW-2 (3/14/88)
Total Arsenic	7060	3/31/88	0.10	0.012
Total Chromium	7190	4/8/88	0.059	0.013
Total Copper	7210	4/7/88	0.053	0.021
Total Lead	7420	4/7/88	0.12	<0.05

AQUEOUS MATRIX
TOTAL METALS

PARAMETER (Units of Measure = mg/l)	METHOD NUMBER	ANALYSIS DATE	SAMPLE IDENTIFICATION (DATE)	
			MW-4 (3/14/88)	FIELD BLANK (3/14/88)
Total Arsenic	7060	3/31/88	0.13	<0.005
Total Chromium	7190	4/8/88	0.14	<0.005
Total Copper	7210	4/7/88	0.45	<0.005
Total Lead	7420	4/7/88	0.35	<0.05

AQUEOUS MATRIX
TOTAL METALS

PARAMETER (Units of Measure = mg/l)	METHOD NUMBER	ANALYSIS DATE	SAMPLE IDENTIFICATION (DATE)
			TRIP BLANK (3/14/88)
Total Arsenic	7060	3/31/88	<0.005
Total Chromium	7190	4/8/88	<0.005
Total Copper	7210	4/7/88	<0.005
Total Lead	7420	4/7/88	<0.05

AQUEOUS MATRIX
WATER QUALITY TESTING

PARAMETER	METHOD NUMBER	UNITS OF MEASURE	ANALYSIS DATE	SAMPLE IDENTIFICATION (DATE) MW-1 (3/14/88)	MW-2 (3/14/88)
Ammonia	350.3	mg NH_3-N/L	4/11/88	2.3	0.18
Total Cyanide	9010	mg/l	3/22/88	0.40	0.064
Total Recoverable Oil and Grease	9070	mg/l	4/6/88	<5	<5
Total Recoverable Phenolics	9065	mg/l	3/17/88	<0.01	<0.01

AQUEOUS MATRIX
WATER QUALITY TESTING

PARAMETER	METHOD NUMBER	UNITS OF MEASURE	ANALYSIS DATE	SAMPLE IDENTIFICATION (DATE) MW-4 (3/14/88)	FIELD BLANK (3/14/88)
Ammonia	350.3	mg NH_3-N/L	4/11/88	0.87	<0.1
Total Cyanide	9010	mg/l	3/22/88	0.036	<0.01
Total Recoverable Oil and Grease	9070	mg/l	4/6/88	<5	<5
Total Recoverable Phenolics	9065	mg/l	3/17/88	<0.01	<0.01

AQUEOUS MATRIX
WATER QUALITY TESTING

PARAMETER	METHOD NUMBER	UNITS OF MEASURE	ANALYSIS DATE	SAMPLE IDENTIFICATION (DATE) TRIP BLANK (3/14/88)
Ammonia	350.3	mg NH_3-N/L	4/11/88	<0.1
Total Cyanide	9010	mg/l	3/22/88	<0.01
Total Recoverable Oil and Grease	9070	mg/l	4/6/88	<5
Total Recoverable Phenolics	9065	mg/l	3/17/88	<0.01

1/8218.16

QUALITY CONTROL INFORMATION - ACCURACY
AQUEOUS MATRIX
METHOD 8240 - HAZARDOUS SUBSTANCE LIST VOLATILE ORGANICS

SAMPLE IDENTIFICATION MW-4

COMPOUND	NANOGRAMS OF SPIKE	PERCENT RECOVERY
Benzene	200	102
Bromodichloromethane	200	90
Bromoform	200	87
1,2-Dichloroethane	200	102
trans-1,2-Dichloroethylene	200	117
cis-1,3-Dichloropropene	200	93
trans-1,3-Dichloropropene	200	74
Ethylbenzene	200	106
1,1,2,2-Tetrachloroethane	200	93
Toluene	200	114
1,1,1-Trichloroethane	200	97
Analysis Date		3/16/88
Internal Standards		
Level Added = 50 µg/l		
(% Recovery)		
Bromochloromethane		87
1,4-Difluorobenzene		94
Chlorobenzene-D_5		82
Surrogates		
Level Added = 50 µg/l		
(% Recovery)		
4-Bromofluorobenzene		130
1,2-Dichloroethane-D_4		101
Toluene-D_8		116

I.D. #88-384

QUALITY CONTROL INFORMATION - PRECISION
AQUEOUS MATRIX
TOTAL METALS

PARAMETER (Units of Measure = mg/l)	METHOD NUMBER	SAMPLE IDENTIFICATION	VALUE 1	VALUE 2	MEAN	STANDARD DEVIATION
Total Arsenic	7060	MW-4	0.13	0.13	0.13	0
Total Chromium	7190		0.075	0.20	0.14	0.088
Total Copper	7210		0.45	0.44	0.45	0.0071
Total Lead	7420		0.21	0.48	0.35	0.19

QUALITY CONTROL INFORMATION - ACCURACY
AQUEOUS MATRIX
TOTAL METALS

PARAMETER	METHOD NUMBER	SAMPLE IDENTIFICATION	MICROGRAMS OF SPIKE	PERCENT RECOVERY
Total Arsenic	7060	MW-4	50	86
Total Chromium	7190		500	93
Total Copper	7210		500	99
Total Lead	7420		500	101

I.D. #88-384

QUALITY CONTROL INFORMATION - PRECISION
AQUEOUS MATRIX
WATER QUALITY TESTING

PARAMETER	METHOD NUMBER	UNITS OF MEASURE	SAMPLE IDENTIFICATION	VALUE 1	VALUE 2	MEAN	STANDARD DEVIATION
Ammonia	350.3	mg NH_3-N/L	*	7.5	7.6	7.6	0.071
Total Cyanide	9010	mg/l	*	0.49	0.48	0.49	0.0071
Total Recoverable Phenolics	9065	mg/l	*	<0.01	<0.01	<0.01	-

QUALITY CONTROL INFORMATION - ACCURACY
AQUEOUS MATRIX
WATER QUALITY TESTING

PARAMETER	METHOD NUMBER	SAMPLE IDENTIFICATION	MICROGRAMS OF SPIKE	PERCENT RECOVERY
Ammonia	350.3	*	200	103
Total Cyanide	9010	*	25	87
Total Recoverable Phenolics	9065	*	20	91

*Quality control results were generated from a sample of similar matrix at the time of analysis.

RECRA ENVIRONMENTAL, INC.

CHAIN OF CUSTODY RECORD

PROJECT NO.: 7C745

SITE NAME: NYSDOT

SAMPLERS (SIGNATURE): L. J. M—k/RES

STATION NO	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	Liter amber	40ml VOA	16oz. GLASS	16oz. PLASTIC	4oz. PLASTIC		REMARKS
①	3/14/88	0845		✓	TRIP BLANK	5	5						COC# 4319 - 4323
↓	↓	↓		↓	↓	4		4					COC# 4324 - 4327
						1			1				COC# 4328
						1				1			COC# 4329
↓	↓	↓		↓	↓	2					2		COC# 4330; 4429
②	3/14/88	1040		✓	FIELD BLANK	5	X						#4331 - 0102 COC# 4331 - 4335
↓	↓	↓		↓	↓	4		X					COC# 4336 - 4339
						1			X				COC# 4340 (0102)
						1				X			COC# 4341 (0105)
↓	↓	↓		↓	↓	2					X		#4342 - 0101 COC# 4342 - 4343 #4343 - 0102
					TOTALS	26	10	8	2	2	4		

RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED BY (SIGNATURE)	RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED BY (SIGNATURE)
Robert E. Steiner	3-14-88	1530	J. Calvert				
RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED BY (SIGNATURE)	RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED BY (SIGNATURE)
RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED FOR LABORATORY BY (SIGNATURE)	DATE	TIME	REMARKS	

Distribution: Original accompanies shipment; copy to coordinator field files

RECRA ENVIRONMENTAL, INC.

CHAIN OF CUSTODY RECORD

PROJECT NO: 7C745

SITE NAME: NYSDOT

SAMPLERS (SIGNATURE): L. J. Mink/RES

STATION NO	DATE	TIME	COMP	GRAB	STATION LOCATION	NO. OF CONTAINERS	1 liter amber	40 ml VOAs	16oz. GLASS	16oz. PLASTIC	4oz. PLASTIC	REMARKS
(5)	3/14/88			✓	MW-3	5	X					COC # 4370 - 4374 (0102)
						4		X				COC # 4375 - 4378
						1			X			COC # 4379 (0102)
						1				X		COC # 4380 (0105)
						2					X	COC # 4381 - 4382 4381-0101 4382-0102
(6)	3/14/88	1320		✓	MW-4	5	X					4383 (0102) COC # 4383 - 4387
						4		X				COC # 4388 - 4391
						1			X			COC # 4392 (0102)
						1				X		COC # 4393 (0105)
						2					X	COC # 4394 - 4395 4394-(0101) 4395-(0102)
						13	5	4	1	1	2	
					TOTALS →	~~26~~	~~10~~	~~8~~	~~2~~	~~2~~	~~4~~	

RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED BY (SIGNATURE)	RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED BY (SIGNATURE)
Robert E. Steinel	3-14-88	1530	J. Calvert				
RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED BY (SIGNATURE)	RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED BY (SIGNATURE)
RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED FOR LABORATORY BY (SIGNATURE)	DATE	TIME	REMARKS	

Distribution: Original accompanies shipment; copy to coordinator field files

RECRA ENVIRONMENTAL, INC.

CHAIN OF CUSTODY RECORD

PROJECT NO.: 7C745

SITE NAME: NYSDOT

SAMPLERS (SIGNATURE): Lisa J. Marsh/RES

STATION NO.	DATE	TIME	COMP	GRAB	STATION LOCATION	NO. OF CONTAINERS	1 liter amber	40 ml VOA	16oz. glass	16oz. plastic	4oz. plastic	REMARKS
(3)	3/14/88	1100		✓	MW-1	5	X					#4344-0102 COC #4344-4348
↓	↓	↓		↓	↓	4		X				COC # 4349-4352
						1			X			COC # 4353 (0102)
						1				X		COC # 4354 (0105)
↓	↓	↓		↓	↓	2					X	4355-0101 COC # 4355-4356 4356-0102
(4)	3/14/88	1210		✓	MW-2	5	X					#4357-0102 COC # 4357-4361
↓	↓	↓		↓	↓	4		X				COC # 4362-4365
						1			X			COC # 4366 (0102)
						1				X		COC # 4367 (0105)
↓	↓	↓		↓	↓	2					X	4368-0101 COC # 4368-4369 4369-0102
					TOTALS	26	10	8	2	2	4	

RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED BY (SIGNATURE)	RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED BY (SIGNATURE)
Robert E. Steiner	3-14-88	1530	J. Corbett				
RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED BY (SIGNATURE)	RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED BY (SIGNATURE)
RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED FOR LABORATORY BY (SIGNATURE)	DATE/TIME	REMARKS		

Distribution: Original accompanies shipment; copy to coordinator field files

1/A8282

ANALYTICAL RESULTS

New York State
Department of Transportation

I.D. #88-398 and 88-398A

88-398 & 88-398A

1/8265.1

ANALYTICAL RESULTS

Prepared For

New York State
Department of Transportation

Prepared By

Recra Environmental, Inc.
10 Hazelwood Drive, Suite 106
Amherst, New York 14150

METHODOLOGIES

The specific methodologies employed in obtaining the enclosed analytical results are indicated on the specific data table. The method numbers presented refer to one of the following U.S. Environmental Protection Agency references unless noted otherwise in this report.

- 40 CFR Part 136 "Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act" October 26, 1984 (Federal Register) U.S. Environmental Protection Agency.
- U.S. Environmental Protection Agency "Test Methods for Evaluating Solid Waste - Physical/Chemical Methods". Office of Solid Waste and Emergency Response. July 1982, SW-846, Second Edition.

COMMENTS

Comments pertain to data on one or all pages of this report.

The values reported as "less than" (<) indicate the working detection limit for the particular sample and/or parameter.

The values reported as "less than or equal to" (≤) indicate the compound may be present at trace levels relative to the detection limit but not subject to accurate quantification.

Results of the analysis of Pesticide/PCB's are based on the matching of retention times between samples and standards on a single gas chromatographic column.

COMMENTS (continued)

Halogenated Organic Scan results are used for screening purposes only and are not designed for qualification or quantification of any specific organic compound. Results are calculated based upon the chlorine content and response factor of Lindane but do not imply either the presence or absence of Lindane itself. Halogenated Organic Scan results do not include volatile organic constituents.

Volatile Organic Scan results are used for screening purposes only and are not designed for qualification or quantification of specific organic compounds. Results are calculated based upon the carbon content and response factor of Benzene, but do not imply either the presence or absence of the compound itself.

Sample MW-6 was analyzed in duplicate by Method 8270. No compounds of interest were detected.

AQUEOUS MATRIX
METHOD 8240 - HAZARDOUS SUBSTANCE LIST VOLATILE ORGANICS

COMPOUND (Units of Measure = µg/l)	SAMPLE IDENTIFICATION (DATE) MW-3 (3/15/88)	MW-5 (3/15/88)
Acetone	<10	<10
Benzene	<4.4	<4.4
Bromodichloromethane	<2.2	<2.2
Bromoform	<4.7	<4.7
Bromomethane	<10	<10
2-Butanone	<10	<10
Carbon disulfide	<5.0	<5.0
Carbon tetrachloride	<2.8	<2.8
Chlorobenzene	<6.0	<6.0
Chloroethane	<10	<10
2-Chloroethylvinyl ether	<10	<10
Chloroform	<1.6	<1.6
Chloromethane	<10	<10
Dibromochloromethane	<3.1	<3.1
1,1-Dichloroethane	<4.7	<4.7
1,2-Dichloroethane	<2.8	<2.8
1,1-Dichloroethylene	<2.8	<2.8
trans-1,2-Dichloroethylene	<1.6	<1.6
1,2-Dichloropropane	<6.0	<6.0
cis-1,3-Dichloropropene	<5.0	<5.0
trans-1,3-Dichloropropene	<5.0	<5.0
Ethylbenzene	<7.2	<7.2
2-Hexanone	<10	<10
Methylene chloride	<2.8	<2.8
4-Methyl-2-pentanone	<10	<10
Styrene	<5.0	<5.0
1,1,2,2-Tetrachloroethane	<6.9	<6.9
Tetrachloroethylene	<4.1	<4.1
Toluene	<6.0	<6.0
1,1,1-Trichloroethane	<3.8	<3.8
1,1,2-Trichloroethane	<5.0	<5.0
Trichloroethylene	<1.9	<1.9
Vinyl acetate	<10	<10
Vinyl chloride	<10	<10
Total Xylenes	<5.0	<5.0

(continued)

AQUEOUS MATRIX
METHOD 8240 - HAZARDOUS SUBSTANCE LIST VOLATILE ORGANICS

ADDITIONAL SAMPLE INFORMATION	SAMPLE IDENTIFICATION (DATE) MW-3 (3/15/88)	MW-5 (3/15/88)
Analysis Date	3/16/88	3/16/88
Internal Standards		
Level Added = 50 µg/l		
(% Recovery)		
Bromochloromethane	85	89
1,4-Difluorobenzene	99	96
Chlorobenzene D_5	95	96
Surrogates		
Level Added = 50 µg/l		
(% Recovery)		
4-Bromofluorobenzene	109	103
1,2-Dichloroethane-D_4	94	90
Toluene-D_8	104	98

AQUEOUS MATRIX
METHOD 8240 - HAZARDOUS SUBSTANCE LIST VOLATILE ORGANICS

COMPOUND (Units of Measure = µg/l)	SAMPLE IDENTIFICATION (DATE) MW-6 (3/15/88)	MW-7 (3/15/88)
Acetone	<10	<10
Benzene	<4.4	<4.4
Bromodichloromethane	<2.2	<2.2
Bromoform	<4.7	<4.7
Bromomethane	<10	<10
2-Butanone	<10	<10
Carbon disulfide	<5.0	<5.0
Carbon tetrachloride	<2.8	<2.8
Chlorobenzene	<6.0	<6.0
Chloroethane	<10	<10
2-Chloroethylvinyl ether	<10	<10
Chloroform	<1.6	<1.6
Chloromethane	<10	<10
Dibromochloromethane	<3.1	<3.1
1,1-Dichloroethane	<4.7	<4.7
1,2-Dichloroethane	<2.8	<2.8
1,1-Dichloroethylene	<2.8	<2.8
trans-1,2-Dichloroethylene	<1.6	<1.6
1,2-Dichloropropane	<6.0	<6.0
cis-1,3-Dichloropropene	<5.0	<5.0
trans-1,3-Dichloropropene	<5.0	<5.0
Ethylbenzene	<7.2	<7.2
2-Hexanone	<10	<10
Methylene chloride	<2.8	<2.8
4-Methyl-2-pentanone	<10	<10
Styrene	<5.0	<5.0
1,1,2,2-Tetrachloroethane	<6.9	<6.9
Tetrachloroethylene	<4.1	<4.1
Toluene	<6.0	<6.0
1,1,1-Trichloroethane	<3.8	<3.8
1,1,2-Trichloroethane	<5.0	<5.0
Trichloroethylene	<1.9	<1.9
Vinyl acetate	<10	<10
Vinyl chloride	<10	<10
Total Xylenes	<5.0	<5.0

(continued)

AQUEOUS MATRIX
METHOD 8240 - HAZARDOUS SUBSTANCE LIST VOLATILE ORGANICS

ADDITIONAL SAMPLE INFORMATION	SAMPLE IDENTIFICATION (DATE) MW-6 (3/15/88)	MW-7 (3/15/88)
Analysis Date	3/16/88	3/16/88
Internal Standards		
Level Added = 50 µg/l		
(% Recovery)		
Bromochloromethane	94	94
1,4-Difluorobenzene	100	107
Chlorobenzene D_5	102	101
Surrogates		
Level Added = 50 µg/l		
(% Recovery)		
4-Bromofluorobenzene	123	108
1,2-Dichloroethane-D_4	102	87
Toluene-D_8	93	96

I.D. #88-398

AQUEOUS MATRIX
METHOD 8270 - HAZARDOUS SUBSTANCE LIST BASE/NEUTRAL/ACID EXTRACTABLES

COMPOUND (Units of Measure = µg/l)	SAMPLE IDENTIFICATION (DATE) MW-3 (3/15/88)	MW-5 (3/15/88)
Acenaphthene	<1.9	<1.9
Acenaphthylene	<3.5	<3.5
Anthracene	<1.9	<1.9
Benzo(a)anthracene	<7.8	<7.8
Benzo(a)pyrene	<2.5	<2.5
Benzo(b)fluoranthene	<4.8	<4.8
Benzo(g,h,i)perylene	<4.1	<4.1
Benzo(k)fluoranthene	<2.5	<2.5
Benzoic acid	<50	<50
Benzyl alcohol	<10	<10
Bis(2-chloroethoxy)methane	<5.3	<5.3
Bis(2-chloroethyl)ether	<5.7	<5.7
Bis(2-chloroisopropyl)ether	<5.7	<5.7
Bis(2-ethylhexyl)phthalate	<2.5	<2.5
4-Bromophenylphenylether	<1.9	<1.9
Butylbenzylphthalate	<2.5	<2.5
4-Chloroaniline	<10	<10
2-Chloronaphthalene	<1.9	<1.9
4-Chlorophenylphenylether	<4.2	<4.2
Chrysene	<2.5	<2.5
Dibenzo(a,h)anthracene	<2.5	<2.5
Dibenzofuran	<10	<10
1,2-Dichlorobenzene	<1.9	<1.9
1,3-Dichlorobenzene	<1.9	<1.9
1,4-Dichlorobenzene	<4.4	<4.4
3,3'-Dichlorobenzidine	<16.5	<16.5
Diethylphthalate	<1.9	<1.9
Dimethylphthalate	<1.6	<1.6
Di-n-butylphthalate	<2.5	<2.5
2,6-Dinitrotoluene	<1.9	<1.9
2,4-Dinitrotoluene	<5.7	<5.7
Di-n-octylphthalate	<2.5	<2.5
Fluoranthene	<2.2	<2.2
Fluorene	<1.9	<1.9
Hexachlorobenzene	<1.9	<1.9
Hexachlorobutadiene	<0.9	<0.9
Hexachlorocylopentadiene	<25	<25
Hexachloroethane	<1.6	<1.6
Indeno(1,2,3-cd)pyrene	<3.7	<3.7
Isophorone	<2.2	<2.2

(Continued)

AQUEOUS MATRIX
METHOD 8270 - HAZARDOUS SUBSTANCE LIST BASE/NEUTRAL/ACID EXTRACTABLES

COMPOUND (Units of Measure = µg/l)	SAMPLE IDENTIFICATION (DATE) MW-3 (3/15/88)	MW-5 (3/15/88)
2-Methylnaphthalene	<10	<10
Naphthalene	<1.6	<1.6
2-Nitroaniline	<50	<50
3-Nitroaniline	<50	<50
4-Nitroaniline	<50	<50
Nitrobenzene	<1.9	<1.9
N-nitrosodi-n-propylamine	<25	<25
N-nitrosodiphenylamine	<1.9	<1.9
Phenanthrene	<5.4	<5.4
Pyrene	<1.9	<1.9
1,2,4-Trichlorobenzene	<1.9	<1.9
2-Chlorophenol	<3.3	<3.3
2,4-Dichlorophenol	<2.7	<2.7
2,4-Dimethylphenol	<2.7	<2.7
4,6-Dinitro-o-cresol	<24	<24
2,4-Dinitrophenol	<42	<42
2-Methylphenol	<10	<10
4-Methylphenol	<10	<10
2-Nitrophenol	<3.6	<3.6
4-Nitrophenol	<2.4	<2.4
p-Chloro-m-cresol	<3.0	<3.0
Pentachlorophenol	<3.6	<3.6
Phenol	<1.5	<1.5
2,4,5-Trichlorophenol	<50	<50
2,4,6-Trichlorophenol	<2.7	<2.7
Extraction Date	3/19/88	3/19/88
Analysis Date	3/23/88	3/23/88
Internal Standards		
Level Added = 40 µg/l		
(% Recovery)		
Phenanthrene-D_{10}	64	93
Surrogates		
Level Added = 100 µg/l		
(% Recovery)		
Decafluorobiphenyl	75	48
2-Fluorobiphenyl	75	60
2-Fluorophenol	38	41
Phenol-D_5	28	33

I.D. #88-398

AQUEOUS MATRIX
METHOD 8270 - HAZARDOUS SUBSTANCE LIST BASE/NEUTRAL/ACID EXTRACTABLES

COMPOUND (Units of Measure = µg/l)	SAMPLE IDENTIFICATION (DATE)	
	MW-6 (3/15/88)	MW-7 (3/15/88)
Acenaphthene	<1.9	<1.9
Acenaphthylene	<3.5	<3.5
Anthracene	<1.9	<1.9
Benzo(a)anthracene	<7.8	<7.8
Benzo(a)pyrene	<2.5	<2.5
Benzo(b)fluoranthene	<4.8	<4.8
Benzo(g,h,i)perylene	<4.1	<4.1
Benzo(k)fluoranthene	<2.5	<2.5
Benzoic acid	<50	<50
Benzyl alcohol	<10	<10
Bis(2-chloroethoxy)methane	<5.3	<5.3
Bis(2-chloroethyl)ether	<5.7	<5.7
Bis(2-chloroisopropyl)ether	<5.7	<5.7
Bis(2-ethylhexyl)phthalate	<2.5	<2.5
4-Bromophenylphenylether	<1.9	<1.9
Butylbenzylphthalate	<2.5	<2.5
4-Chloroaniline	<10	<10
2-Chloronaphthalene	<1.9	<1.9
4-Chlorophenylphenylether	<4.2	<4.2
Chrysene	<2.5	<2.5
Dibenzo(a,h)anthracene	<2.5	<2.5
Dibenzofuran	<10	<10
1,2-Dichlorobenzene	<1.9	<1.9
1,3-Dichlorobenzene	<1.9	<1.9
1,4-Dichlorobenzene	<4.4	<4.4
3,3'-Dichlorobenzidine	<16.5	<16.5
Diethylphthalate	<1.9	<1.9
Dimethylphthalate	<1.6	<1.6
Di-n-butylphthalate	<2.5	<2.5
2,6-Dinitrotoluene	<1.9	<1.9
2,4-Dinitrotoluene	<5.7	<5.7
Di-n-octylphthalate	<2.5	<2.5
Fluoranthene	<2.2	<2.2
Fluorene	<1.9	<1.9
Hexachlorobenzene	<1.9	<1.9
Hexachlorobutadiene	<0.9	<0.9
Hexachlorocylopentadiene	<25	<25
Hexachloroethane	<1.6	<1.6
Indeno(1,2,3-cd)pyrene	<3.7	<3.7
Isophorone	<2.2	<2.2

(Continued)

AQUEOUS MATRIX
METHOD 8270 - HAZARDOUS SUBSTANCE LIST BASE/NEUTRAL/ACID EXTRACTABLES

COMPOUND (Units of Measure = µg/l)	SAMPLE IDENTIFICATION (DATE) MW-6 (3/15/88)	MW-7 (3/15/88)
2-Methylnaphthalene	<10	<10
Naphthalene	<1.6	<1.6
2-Nitroaniline	<50	<50
3-Nitroaniline	<50	<50
4-Nitroaniline	<50	<50
Nitrobenzene	<1.9	<1.9
N-nitrosodi-n-propylamine	<25	<25
N-nitrosodiphenylamine	<1.9	<1.9
Phenanthrene	<5.4	<5.4
Pyrene	<1.9	<1.9
1,2,4-Trichlorobenzene	<1.9	<1.9
2-Chlorophenol	<3.3	<3.3
2,4-Dichlorophenol	<2.7	<2.7
2,4-Dimethylphenol	<2.7	<2.7
4,6-Dinitro-o-cresol	<24	<24
2,4-Dinitrophenol	<42	<42
2-Methylphenol	<10	<10
4-Methylphenol	<10	<10
2-Nitrophenol	<3.6	<3.6
4-Nitrophenol	<2.4	<2.4
p-Chloro-m-cresol	<3.0	<3.0
Pentachlorophenol	<3.6	<3.6
Phenol	<1.5	<1.5
2,4,5-Trichlorophenol	<50	<50
2,4,6-Trichlorophenol	<2.7	<2.7
Extraction Date	3/19/88	3/19/88
Analysis Date	3/23/88	3/23/88
Internal Standards		
Level Added = 40 µg/l		
(% Recovery)		
Phenanthrene-D_{10}	84	67
Surrogates		
Level Added = 100 µg/l		
(% Recovery)		
Decafluorobiphenyl	50	57
2-Fluorobiphenyl	71	73
2-Fluorophenol	33	52
Phenol-D_5	31	40

I.D. #88-398

AQUEOUS MATRIX
METHOD 8080 - HAZARDOUS SUBSTANCE LIST ORGANOCHLORINE PESTICIDES/PCB'S

COMPOUND (Units of Measure = µg/l)	SAMPLE IDENTIFICATION (DATE) MW-3 (3/15/88)	MW-5 (3/15/88)
Aldrin	<0.01	0.012
Alpha-BHC	<0.01	<0.01
Beta-BHC	<0.01	<0.01
Delta-BHC	<0.01	<0.01
Gamma-BHC	<0.01	<0.01
Chlordane	<0.2	<0.2
4,4'-DDD	<0.02	<0.02
4,4'-DDE	<0.02	<0.02
4,4'-DDT	<0.05	<0.05
Dieldrin	<0.02	<0.02
Endosulfan I	<0.02	<0.02
Endosulfan II	<0.02	<0.02
Endosulfan sulfate	<0.05	<0.05
Endrin	<0.02	<0.02
Heptachlor	0.082	0.12
Heptachlor epoxide	<0.01	<0.01
Toxaphene	<0.5	<0.5
Aroclor 1016	<0.1	<0.1
Aroclor 1221	<0.2	<0.2
Aroclor 1232	<0.2	<0.2
Aroclor 1242	<0.1	<0.1
Aroclor 1248	<0.1	<0.1
Aroclor 1254	<0.1	<0.1
Aroclor 1260	<0.1	<0.1
Endrin ketone	<0.02	0.12
Methoxychlor	<0.05	0.16
Extraction Date	3/18/88	3/18/88
Analysis Date	3/27/88	3/27/88

I.D. #88-398

AQUEOUS MATRIX
METHOD 8080 - HAZARDOUS SUBSTANCE LIST ORGANOCHLORINE PESTICIDES/PCB'S

COMPOUND (Units of Measure = µg/l)	SAMPLE IDENTIFICATION (DATE) MW-6 (3/15/88)	MW-7 (3/15/88)
Aldrin	<0.01	<0.01
Alpha-BHC	<0.01	<0.01
Beta-BHC	<0.01	<0.01
Delta-BHC	<0.01	<0.01
Gamma-BHC	<0.01	<0.01
Chlordane	<0.2	<0.2
4,4'-DDD	<0.02	<0.02
4,4'-DDE	<0.02	<0.02
4,4'-DDT	<0.05	<0.05
Dieldrin	<0.02	<0.02
Endosulfan I	<0.02	<0.02
Endosulfan II	<0.02	<0.02
Endosulfan sulfate	0.094	<0.05
Endrin	<0.02	<0.02
Heptachlor	0.081	0.080
Heptachlor epoxide	<0.01	<0.01
Toxaphene	<0.5	<0.5
Aroclor 1016	<0.1	<0.1
Aroclor 1221	<0.2	<0.2
Aroclor 1232	<0.2	<0.2
Aroclor 1242	<0.1	<0.1
Aroclor 1248	<0.1	<0.1
Aroclor 1254	<0.1	<0.1
Aroclor 1260	<0.1	<0.1
Endrin ketone	<0.02	<0.02
Methoxychlor	<0.05	0.085
Extraction Date	3/18/88	3/18/88
Analysis Date	3/27/88	3/27/88

I.D. #88-398

AQUEOUS MATRIX
ORGANIC SCREENING PROCEDURES

PARAMETER	UNITS OF MEASURE	EXTRACTION DATE	ANALYSIS DATE	SAMPLE IDENTIFICATION (DATE)	
				MW-3 (3/15/88)	MW-5 (3/15/88)
Volatile Organic Scan	µg/l as Carbon; Benzene Standard	-	3/22/88	<0.4	0.83
Halogenated Organic Scan	µg/l as Chlorine; Lindane Standard	3/18/88	3/27/88	0.14	0.27

AQUEOUS MATRIX
ORGANIC SCREENING PROCEDURES

PARAMETER	UNITS OF MEASURE	EXTRACTION DATE	ANALYSIS DATE	SAMPLE IDENTIFICATION (DATE)	
				MW-6 (3/15/88)	MW-7 (3/15/88)
Volatile Organic Scan	µg/l as Carbon; Benzene Standard	-	3/22/88	<0.4	<0.4
Halogenated Organic Scan	µg/l as Chlorine; Lindane Standard	3/18/88	3/27/88	0.14	0.18

I.D. #88-398

AQUEOUS MATRIX
TOTAL METALS

PARAMETER (Units of Measure = mg/l)	METHOD NUMBER	ANALYSIS DATE	SAMPLE IDENTIFICATION (DATE)	
			MW-3 (3/15/88)	MW-5 (3/15/88)
Total Arsenic	7060	3/31/88	<0.005	0.007
Total Chromium	7190	4/9/88	0.012	0.018
Total Copper	7210	4/8/88	0.026	0.041
Total Lead	7420	4/9/88	<0.03	<0.03

AQUEOUS MATRIX
TOTAL METALS

PARAMETER (Units of Measure = mg/l)	METHOD NUMBER	ANALYSIS DATE	SAMPLE IDENTIFICATION (DATE)	
			MW-6 (3/15/88)	MW-7 (3/15/88)
Total Arsenic	7060	3/31/88	<0.005	0.009
Total Chromium	7190	4/9/88	0.013	0.010
Total Copper	7210	4/8/88	0.023	0.031
Total Lead	7420	4/9/88	<0.03	0.05

AQUEOUS MATRIX
WATER QUALITY TESTING

PARAMETER	METHOD NUMBER	UNITS OF MEASURE	ANALYSIS DATE	SAMPLE IDENTIFICATION (DATE) MW-3 (3/15/88)	MW-5 (3/15/88)
Ammonia	350.3	mg NH_3-N/L	4/11/88	0.75	5.7
Total Cyanide	335.2	mg/l	3/22/88	0.017	<0.01
Total Recoverable Oil and Grease	413.1	mg/l	4/6/88	<5	<5
Total Recoverable Phenolics	420.1	mg/l	3/18/88	<0.01	0.02

AQUEOUS MATRIX
WATER QUALITY TESTING

PARAMETER	METHOD NUMBER	UNITS OF MEASURE	ANALYSIS DATE	SAMPLE IDENTIFICATION (DATE) MW-6 (3/15/88)	MW-7 (3/15/88)
Ammonia	350.3	mg NH_3-N/L	4/11/88	1.3	4.5
Total Cyanide	335.2	mg/l	3/22/88	0.49	0.081
Total Recoverable Oil and Grease	413.1	mg/l	4/6/88	<5	<5
Total Recoverable Phenolics	420.1	mg/l	3/18/88	<0.01	0.013

1/8265.15

QUALITY CONTROL INFORMATION - ACCURACY
AQUEOUS MATRIX
METHOD 8270 - HAZARDOUS SUBSTANCE LIST BASE/NEUTRAL/ACID EXTRACTABLES

SAMPLE IDENTIFICATION Method Blank Spike

COMPOUND	NANOGRAMS OF SPIKE	PERCENT RECOVERY
2-Chlorophenol	25	64
1,3-Dichlorobenzene	25	60
2,4-Dichlorophenol	25	44
Di-n-octylphthalate	25	108
Fluoranthene	25	100
Fluorene	25	88
Naphthalene	25	88
Nitrobenzene	25	96
2,4,6-Trichlorophenol	25	20
Extraction Date	3/19/88	
Analysis Date	3/22/88	
Internal Standards		
Level Added = 40 µg/l		
(% Recovery)		
Phenanthrene-D_{10}		70
Surrogates		
Level Added = 100 µg/l		
(% Recovery)		
Decafluorobiphenyl		58
2-Fluorobiphenyl		74
2-Fluorophenol		32
Phenol-D_5		36

I.D. #88-398

RECRA ENVIRONMENTAL, INC.

1/8265.16

QUALITY CONTROL INFORMATION - PRECISION
AQUEOUS MATRIX
METHOD 8080 - HAZARDOUS SUBSTANCE LIST ORGANOCHLORINE PESTICIDES/PCB'S

SAMPLE IDENTIFICATION MW-6

COMPOUND (Units of Measure = µg/l)	VALUE 1	VALUE 2	MEAN	STANDARD DEVIATION
Delta-BHC	<0.01	<0.01	<0.01	-
Endosulfan sulfate	0.096	0.092	0.094	0.0028
Heptachlor	0.052	0.11	0.081	0.041
Extraction Date	3/18/88	3/18/88	-	-
Analysis Date	3/27/88	3/27/88	-	-

QUALITY CONTROL INFORMATION - ACCURACY
AQUEOUS MATRIX
METHOD 8080 - HAZARDOUS SUBSTANCE LIST ORGANOCHLORINE PESTICIDES/PCB'S

SAMPLE IDENTIFICATION Method Blank Spike

COMPOUND	NANOGRAMS OF SPIKE	PERCENT RECOVERY
Aldrin	0.20	87
Gamma-BHC	0.20	89
4,4'-DDE	0.20	87
Endosulfan II	0.20	89
Endrin	0.20	88
Methoxychlor	0.20	98
Extraction Date	3/18/88	
Analysis Date	3/25/88	

I.D. #88-398

QUALITY CONTROL INFORMATION - PRECISION
AQUEOUS MATRIX
ORGANIC SCREENING PROCEDURES

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION	VALUE 1	VALUE 2	MEAN	STANDARD DEVIATION
Volatile Organic Scan	µg/l as Carbon; Benzene Standard	MW-6	<0.4	<0.4	<0.4	-
Halogenated Organic Scan	µg/l as Chlorine; Lindane Standard	MW-6	0.098	0.19	0.14	0.065

QUALITY CONTROL INFORMATION - ACCURACY
AQUEOUS MATRIX
ORGANIC SCREENING PROCEDURES

PARAMETER	SAMPLE IDENTIFICATION	NANOGRAMS OF SPIKE	PERCENT RECOVERY
Volatile Organic Scan	MW-6	50	93
Halogenated Organic Scan	Method Blank Spike	0.20	89

QUALITY CONTROL INFORMATION - PRECISION
AQUEOUS MATRIX
TOTAL METALS

PARAMETER (Units of Measure = mg/l)	METHOD NUMBER	SAMPLE IDENTIFICATION	VALUE 1	VALUE 2	MEAN	STANDARD DEVIATION
Total Arsenic	7060	MW-6	<0.005	<0.005	<0.005	-
Total Chromium	7190		0.009	0.016	0.013	0.0049
Total Copper	7210		0.022	0.023	0.023	0.00071
Total Lead	7420		<0.03	<0.03	<0.03	-

QUALITY CONTROL INFORMATION - ACCURACY
AQUEOUS MATRIX
TOTAL METALS

PARAMETER	METHOD NUMBER	SAMPLE IDENTIFICATION	MICROGRAMS OF SPIKE	PERCENT RECOVERY
Total Arsenic	7060	MW-6	50	89
Total Chromium	7190		500	95
Total Copper	7210		500	101
Total Lead	7420		500	96

RECRA ENVIRONMENTAL, INC.

QUALITY CONTROL INFORMATION - PRECISION
AQUEOUS MATRIX
WATER QUALITY TESTING

PARAMETER	METHOD NUMBER	UNITS OF MEASURE	SAMPLE IDENTIFICATION	VALUE 1	VALUE 2	MEAN	STANDARD DEVIATION
Ammonia	350.3	mg NH_3-N/L	MW-6	1.3	1.3	1.3	0
Total Cyanide	335.2	mg/l	MW-6	0.48	0.49	0.49	0.0071
Total Recoverable Phenolics	420.1	mg/l	*	<0.01	<0.01	<0.01	-

QUALITY CONTROL INFORMATION - ACCURACY
AQUEOUS MATRIX
WATER QUALITY TESTING

PARAMETER	METHOD NUMBER	SAMPLE IDENTIFICATION	MICROGRAMS OF SPIKE	PERCENT RECOVERY
Ammonia	350.3	MW-6	200	89
Total Cyanide	335.2	MW-6	25	87
Total Recoverable Oil and Grease	413.1	*	20	84
Total Recoverable Phenolics	420.1	*	10	98

*Quality control results were generated from a sample of similar matrix at the time of analysis.

I.D. #88-398

1/8330.1

ANALYTICAL RESULTS

Prepared For

New York State Department of Transportation

Prepared By

Recra Environmental, Inc.
10 Hazelwood Drive, Suite 106
Amherst, New York 14150

METHODOLOGIES

The specific methodologies employed in obtaining the enclosed analytical results are indicated on the specific data table. The method numbers presented refer to one of the following U.S. Environmental Protection Agency references unless noted otherwise in this report.

- 40 CFR Part 136 "Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act" October 26, 1984 (Federal Register) U.S. Environmental Protection Agency.

- U.S. Environmental Protection Agency "Test Methods for Evaluating Solid Waste - Physical/Chemical Methods". Office of Solid Waste and Emergency Response. July 1982, SW-846, Second Edition.

COMMENTS

Comments pertain to data on one or all pages of this report.

The values reported as "less than" (<) indicate the working detection limit for the particular sample and/or parameter.

The values reported as "less than or equal to" (≤) indicate the compound may be present at trace levels relative to the detection limit but not subject to accurate quantification.

Volatile Organic Scan results are used for screening purposes only and are not designed for qualification or quantification of specific organic compounds. Results are calculated based upon the carbon content and respons factor of Benzene, but do not imply either the presence or absence of the pound itself.

Halogenated Organic Scan results are used for screening purposes onl are not designed for qualification or quantification of any specific orga compound. Results are calculated based upon the chlorine content and res factor of Lindane but do not imply either the presence or absence of Lind itself. Halogenated Organic Scan results do not include volatile organic constituents.

Results of the analysis of sediments are corrected for moisture content and reported on a dry weight basis. The dry weights (103°C) are as follows:

A - 34.9%
B - 37.4%
C - 43.9%

AQUEOUS MATRIX
METHOD 8080 - PCB'S

COMPOUND (Units of Measure = µg/l)	SAMPLE IDENTIFICATION (DATE) A(1-3) (3/16/88)	B(1-3) (3/16/88)	C(1-3) (3/16/88)
Aroclor 1016	<0.1	<0.1	<0.1
Aroclor 1221	<0.2	<0.2	<0.2
Aroclor 1232	<0.2	<0.2	<0.2
Aroclor 1242	<0.1	<0.1	<0.1
Aroclor 1248	<0.1	<0.1	<0.1
Aroclor 1254	<0.1	<0.1	<0.1
Aroclor 1260	<0.1	<0.1	<0.1
Extraction Date	3/21/88	3/21/88	3/21/88
Analysis Date	3/26/88	3/26/88	3/26/88

SEDIMENT MATRIX
METHOD 8080 - PCB'S

COMPOUND (Units of Measure = µg/g dry)	SAMPLE IDENTIFICATION (DATE) A (3/16/88)	B (3/16/88)	C (3/16/88)
Aroclor 1016	<0.05	<0.05	<0.05
Aroclor 1221	<0.1	<0.1	<0.1
Aroclor 1232	<0.1	<0.1	<0.1
Aroclor 1242	<0.05	<0.05	<0.05
Aroclor 1248	0.35	0.47	0.23
Aroclor 1254	<0.05	<0.05	<0.05
Aroclor 1260	0.26	0.18	0.15
Extraction Date	3/18/88	3/18/88	3/18/88
Analysis Date	3/25/88	3/25/88	3/25/88

AQUEOUS MATRIX
ORGANIC SCREENING PROCEDURES

PARAMETER	UNITS OF MEASURE	EXTRACTION DATE	ANALYSIS DATE	SAMPLE IDENTIFICATION (DATE) A(1-3) (3/16/88)	B(1-3) (3/16/88)	C(1-3) (3/16/88)
Volatile Organic Scan	µg/l as Carbon; Benzene Standard	-	3/22/88	<0.4	0.56	<0.4
Halogenated Organic Scan	µg/l as Chlorine; Lindane Standard	3/21/88	3/26/88	0.16	0.076	0.21

RECRA ENVIRONMENTAL, INC.

SEDIMENT MATRIX
ORGANIC SCREENING PROCEDURES

PARAMETER	UNITS OF MEASURE	EXTRACTION DATE	ANALYSIS DATE	SAMPLE IDENTIFICATION (DATE)		
				A (3/16/88)	B (3/16/88)	C (3/16/88)
Volatile Organic Scan	µg/g dry as Carbon; Benzene Standard	-	3/23/88	1.2	1.4	1.2
Halogenated Organic Scan	µg/g dry as Chlorine; Lindane Standard	3/18/88	3/25/88	0.56	1.1	0.46

AQUEOUS MATRIX
TOTAL METALS

PARAMETER (Units of Measure = mg/l)	METHOD NUMBER	ANALYSIS DATE	SAMPLE IDENTIFICATION (DATE) A(1-3) (3/16/88)	B(1-3) (3/16/88)	C(1-3) (3/16/88)
Total Arsenic	7060	3/31/88	<0.005	<0.005	<0.005
Total Chromium	7190	4/8/88	0.010	0.009	<0.005
Total Copper	7210	4/8/88	0.006	<0.006	<0.005
Total Lead	7420	4/10/88	<0.02	<0.02	<0.02

SEDIMENT MATRIX
TOTAL METALS

PARAMETER (Units of Measure = µg/g dry)	METHOD NUMBER	ANALYSIS DATE	SAMPLE IDENTIFICATION (DATE) A (3/16/88)	B (3/16/88)	C (3/16/88)
Total Arsenic	7060	3/31/88	22	33	25
Total Chromium	7190	4/8/88	79	77	80
Total Copper	7210	4/8/88	200	170	130
Total Lead	7420	4/10/88	980	1,440	650

AQUEOUS MATRIX
WATER QUALITY TESTING

PARAMETER	METHOD NUMBER	UNITS OF MEASURE	ANALYSIS DATE	SAMPLE IDENTIFICATION (DATE) A(1-3) (3/16/88)	B(1-3) (3/16/88)	C(1-3) (3/16/88)
Ammonia	350.3	mg NH_3-N/L	4/11/88	<0.1	<0.1	<0.1
Total Cyanide	9010	mg/l	3/22/88	<0.01	<0.01	<0.01
Total Recoverable Oil and Grease	9070	mg/l	4/7/88	<5	<5	<5
Total Recoverable Phenolics	9065	mg/l	3/23/88	<0.01	<0.01	<0.01

SEDIMENT MATRIX

PARAMETER	METHOD NUMBER	UNITS OF MEASURE	ANALYSIS DATE	SAMPLE IDENTIFICATION (DATE) A (3/16/88)	B (3/16/88)	C (3/16/88)
Ammonia	350.3	µg NH_3-N/g dry	4/27/88	110	83	<30
Total Cyanide	9010	µg/g dry	4/4/88	120	130	28
Total Recoverable Oil and Grease	9070	µg/g dry	4/7/88	14,300	19,000	14,200
Total Recoverable Phenolics	9065	µg/g dry	3/21/88	1.8	<2	2.1

QUALITY CONTROL INFORMATION - PRECISION
AQUEOUS MATRIX
ORGANIC SCREENING PROCEDURES

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION	VALUE 1	VALUE 2	MEAN	STANDARD DEVIATION
Volatile Organic Scan	µg/l as Carbon; Benzene Standard	C(1-3)	<0.4	<0.4	<0.4	-

QUALITY CONTROL INFORMATION - PRECISION
SEDIMENT MATRIX
ORGANIC SCREENING PROCEDURES

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION	VALUE 1	VALUE 2	MEAN	STANDARD DEVIATION
Volatile Organic Scan	µg/g dry as Carbon; Benzene Standard	B	1.4	1.4	1.4	0

QUALITY CONTROL INFORMATION - ACCURACY
AQUEOUS MATRIX
ORGANIC SCREENING PROCEDURES

PARAMETER	SAMPLE IDENTIFICATION	NANOGRAMS OF SPIKE	PERCENT RECOVERY
Volatile Organic Scan	C(1-3)	50	103

I.D. #88-408

QUALITY CONTROL INFORMATION - PRECISION
AQUEOUS MATRIX
TOTAL METALS

PARAMETER (Units of Measure = mg/l)	METHOD NUMBER	SAMPLE IDENTIFICATION	VALUE 1	VALUE 2	MEAN	STANDARD DEVIATION
Total Arsenic	7060	B(1-3)	<0.005	<0.005	<0.005	-
Total Chromium	7190		0.009	0.008	0.009	0.00071
Total Copper	7210		<0.006	<0.006	<0.006	-
Total Lead	7420		<0.02	<0.02	<0.02	-

QUALITY CONTROL INFORMATION - ACCURACY
AQUEOUS MATRIX
TOTAL METALS

PARAMETER	METHOD NUMBER	SAMPLE IDENTIFICATION	MICROGRAMS OF SPIKE	PERCENT RECOVERY
Total Arsenic	7060	B(1-3)	50	94
Total Chromium	7190		500	93
Total Copper	7210		500	100
Total Lead	7420		500	96

QUALITY CONTROL INFORMATION - PRECISION
SEDIMENT MATRIX
TOTAL METALS

PARAMETER (Units of Measure = µg/g dry)	METHOD NUMBER	SAMPLE IDENTIFICATION	VALUE 1	VALUE 2	MEAN	STANDARD DEVIATION
Total Arsenic	7060	B	32	34	33	1.4
Total Chromium	7190		77	76	77	0.71
Total Copper	7210		170	170	170	0
Total Lead	7420		1,470	1,400	1,440	49

QUALITY CONTROL INFORMATION - ACCURACY
SEDIMENT MATRIX
TOTAL METALS

PARAMETER	METHOD NUMBER	SAMPLE IDENTIFICATION	MICROGRAMS OF SPIKE	PERCENT RECOVERY
Total Arsenic	7060	B	50	82
Total Chromium	7190		500	91
Total Copper	7210		500	100
Total Lead	7420		500	102

I.D. #88-408

1/A8282

ANALYTICAL RESULTS

New York State
Department of Transportation

I.D. #88-438

1/8234.1

ANALYTICAL RESULTS

Prepared For

New York State
Department of Transportation

Prepared By

Recra Environmental, Inc.
10 Hazelwood Drive, Suite 106
Amherst, New York 14150

COMMENTS

Comments pertain to data on one or all pages of this report.

The values reported as "less than" (<) indicate the working detection limit for the particular sample and/or parameter.

Methods used for the EP Toxicity Test procedure as well as the analysis of the resulting extract are presented in U.S. Environmental Protection Agency publication, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods". July 1982, SW-846, Second Edition.

1/8234.2

EP TOXICITY TEST EXTRACT - METALS

PARAMETER (Units of Measure = mg/l)	ANALYSIS DATE	EPA MAX. CONC.	SAMPLE IDENTIFICATION (DATE) CANAL COMP. (3/16/88)
Total Arsenic	4/9/88	5.0	0.007
Total Barium	4/11/88	100.0	0.72
Total Cadmium	4/14/88	1.0	0.032
Total Chromium	4/14/88	5.0	<0.005
Total Lead	4/15/88	5.0	1.3
Total Mercury	3/29/88	0.2	<0.0005
Total Selenium	4/9/88	1.0	<0.005
Total Silver	4/14/88	5.0	<0.005

X Standard Addition
___ Non-Standard Addition

I.D. #88-438

RECRA ENVIRONMENTAL, INC.

1/8234.3

QUALITY CONTROL INFORMATION - PRECISION
EP TOXICITY TEST EXTRACT - METALS

SAMPLE IDENTIFICATION CANAL COMP.

PARAMETER (Units of Measure = mg/l)	VALUE 1	VALUE 2	MEAN	STANDARD DEVIATION
Total Arsenic	0.007	0.007	0.007	0
Total Barium	0.76	0.68	0.72	0.057
Total Cadmium	0.030	0.033	0.032	0.0021
Total Chromium	<0.005	<0.005	<0.005	-
Total Lead	1.3	1.3	1.3	0
Total Mercury	<0.0005	<0.0005	<0.0005	-
Total Selenium	<0.005	<0.005	<0.005	-
Total Silver	<0.005	<0.005	<0.005	-

X Standard Addition
___ Non-Standard Addition

I.D. #88-438

RECRA ENVIRONMENTAL, INC.

1/8234.4

QUALITY CONTROL INFORMATION - ACCURACY
EP TOXICITY TEST EXTRACT - METALS

SAMPLE IDENTIFICATION CANAL COMP.

PARAMETER	µg OF SPIKE	% RECOVERY
Total Arsenic	25	98
	50	97
Total Barium	2,500	102
	5,000	105
Total Cadmium	250	97
	500	96
Total Chromium	250	81
	500	80
Total Lead	2,500	103
	5,000	103
Total Mercury	0.2	119
	0.4	123
Total Selenium	25	100
	50	98
Total Silver	250	102
	500	102

I.D. #88-438

1/A8282

ANALYTICAL RESULTS

New York State
Department of Transportation

I.D. #88-504 and 88-504A

88-504 & 88-504A

1/8407.1

ANALYTICAL RESULTS

Prepared For

New York State
Department of Transportation

Prepared By

Recra Environmental, Inc.
10 Hazelwood Drive, Suite 106
Amherst, New York 14150

METHODOLOGIES

The specific methodologies employed in obtaining the enclosed analytical results are indicated on the specific data table. The method numbers presented refer to one of the following U.S. Environmental Protection Agency references unless noted otherwise in this report.

- 40 CFR Part 136 "Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act" October 26, 1984 (Federal Register) U.S. Environmental Protection Agency.
- U.S. Environmental Protection Agency "Test Methods for Evaluating Solid Waste - Physical/Chemical Methods". Office of Solid Waste and Emergency Response. July 1982, SW-846, Second Edition.

COMMENTS

Comments pertain to data on one or all pages of this report.

The values reported as "less than" (<) indicate the working detection limit for the particular sample and/or parameter.

Volatile Organic Scan results are used for screening purposes only and are not designed for qualification or quantification of specific organic compounds. Results are calculated based upon the carbon content and response factor of Benzene, but do not imply either the presence or absence of the compound itself.

Halogenated Organic Scan results are used for screening purposes only and are not designed for qualification or quantification of any specific organic compound. Results are calculated based upon the chlorine content and response factor of Lindane but do not imply either the presence or absence of Lindane itself. Halogenated Organic Scan results do not include volatile organic constituents.

Results of the analysis of sediments are corrected for moisture content and reported on a dry weight basis.

The dry weight (103°C) is as follows:

SS-1 - 80.2%

AQUEOUS MATRIX
METHOD 8080 - PCB'S

COMPOUND (Units of Measure = µg/l)	SAMPLE IDENTIFICATION (DATE) P-3 (3/30/88)
Aroclor 1016	<0.1
Aroclor 1221	<0.2
Aroclor 1232	<0.2
Aroclor 1242	<0.1
Aroclor 1248	1.3
Aroclor 1254	0.85
Aroclor 1260	<0.1
Extraction Date	4/5/88
Analysis Date	4/12/88

SEDIMENT MATRIX
METHOD 8080 - PCB'S

COMPOUND (Units of Measure = µg/g dry)	SAMPLE IDENTIFICATION (DATE) SS-1 (3/30/88)
Aroclor 1016	<0.05
Aroclor 1221	<0.1
Aroclor 1232	<0.1
Aroclor 1242	<0.05
Aroclor 1248	<0.05
Aroclor 1254	<0.05
Aroclor 1260	0.17
Extraction Date	4/1/88
Analysis Date	4/6/88

I.D. #88-504

SECRA ENVIRONMENTAL, INC.

AQUEOUS MATRIX
ORGANIC SCREENING PROCEDURES

PARAMETER	UNITS OF MEASURE	EXTRACTION DATE	ANALYSIS DATE	SAMPLE IDENTIFICATION (DATE) P-3 (3/30/88)
Volatile Organic Scan	µg/l as Carbon; Benzene Standard	-	4/6/88	11
Halogenated Organic Scan	µg/l as Chlorine; Lindane Standard	4/5/88	4/12/88	1.1

SEDIMENT MATRIX
ORGANIC SCREENING PROCEDURES

PARAMETER	UNITS OF MEASURE	EXTRACTION DATE	ANALYSIS DATE	SAMPLE IDENTIFICATION (DATE) SS-1 (3/30/88)
Volatile Organic Scan	µg/g dry as Carbon; Benzene Standard	-	4/6/88	0.037
Halogenated Organic Scan	µg/g dry as Chlorine; Lindane Standard	4/1/88	4/6/88	0.13

AQUEOUS MATRIX
TOTAL METALS

PARAMETER (Units of Measure = mg/l)	METHOD NUMBER	ANALYSIS DATE	SAMPLE IDENTIFICATION (DATE) P-3 (3/30/88)
Total Arsenic	7060	4/30/88	<0.006
Total Chromium	7190	4/26/88	<0.005
Total Copper	7210	4/25/88	0.020
Total Lead	7420	4/29/88	<0.05

SEDIMENT MATRIX
TOTAL METALS

PARAMETER (Units of Measure = µg/g dry)	METHOD NUMBER	ANALYSIS DATE	SAMPLE IDENTIFICATION (DATE) SS-1 (3/30/88)
Total Arsenic	7060	5/6/88	11
Total Chromium	7190	5/5/88	29
Total Copper	7210	5/5/88	74
Total Lead	7420	5/6/88	130

I.D. #88-504

AQUEOUS MATRIX
WATER QUALITY TESTING

PARAMETER	METHOD NUMBER	UNITS OF MEASURE	ANALYSIS DATE	SAMPLE IDENTIFICATION (DATE) P-3 (3/30/88)
Ammonia	350.3	mg NH_3-N/L	4/16/88	<0.1
Total Cyanide	9010	mg/l	4/13/88	<0.01
Total Recoverable Oil and Grease	9070	mg/l	4/12/88	<5
Total Recoverable Phenolics	9065	mg/l	4/28/88	<0.01

SEDIMENT MATRIX

PARAMETER	METHOD NUMBER	UNITS OF MEASURE	ANALYSIS DATE	SAMPLE IDENTIFICATION (DATE) SS-1 (3/30/88)
Ammonia	350.3	µg NH_3-N/g dry	5/9/88	<15
Total Cyanide	9010	µg/g dry	4/13/88	3.7
Total Recoverable Oil and Grease	9070	µg/g dry	4/7/88	290
Total Recoverable Phenolics	9065	µg/g dry	4/28/88	<0.02

QUALITY CONTROL INFORMATION - ACCURACY
SEDIMENT MATRIX
METHOD 8080 - PCB'S

SAMPLE IDENTIFICATION Method Blank Spike

COMPOUND	NANOGRAMS OF SPIKE	PERCENT RECOVERY
Aroclor 1260	1.0	90
Extraction Date Analysis Date	4/1/88 4/6/88	

I.D. #88-504

ECRA ENVIRONMENTAL, INC.

QUALITY CONTROL INFORMATION - PRECISION
AQUEOUS MATRIX
TOTAL METALS

PARAMETER (Units of Measure = mg/l)	METHOD NUMBER	SAMPLE IDENTIFICATION	VALUE 1	VALUE 2	MEAN	STANDARD DEVIATION
Total Arsenic	7060	P-3	<0.006	<0.006	<0.006	-
Total Chromium	7190		<0.005	<0.005	<0.005	-
Total Copper	7210		0.024	0.016	0.020	0.0057
Total Lead	7420		<0.05	<0.05	<0.05	-

QUALITY CONTROL INFORMATION - ACCURACY
AQUEOUS MATRIX
TOTAL METALS

PARAMETER	METHOD NUMBER	SAMPLE IDENTIFICATION	MICROGRAMS OF SPIKE	PERCENT RECOVERY
Total Arsenic	7060	P-3	50	104
Total Chromium	7190		500	96
Total Copper	7210		500	99
Total Lead	7420		500	99

I.D. #88-504

ECRA ENVIRONMENTAL, INC.

QUALITY CONTROL INFORMATION - PRECISION
SEDIMENT MATRIX
TOTAL METALS

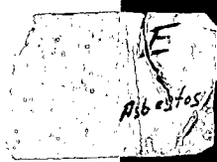
PARAMETER (Units of Measure = µg/g dry)	METHOD NUMBER	SAMPLE IDENTIFICATION	VALUE 1	VALUE 2	MEAN	STANDARD DEVIATION
Total Arsenic	7060	SS-1	12	9.1	11	2.1
Total Chromium	7190		21	37	29	11
Total Copper	7210		61	86	74	18
Total Lead	7420		130	130	130	0

QUALITY CONTROL INFORMATION - ACCURACY
SEDIMENT MATRIX
TOTAL METALS

PARAMETER	METHOD NUMBER	SAMPLE IDENTIFICATION	MICROGRAMS OF SPIKE	PERCENT RECOVERY
Total Arsenic	7060	SS-1	50	100
Total Chromium	7190		500	81
Total Copper	7210		500	107
Total Lead	7420		500	100

APPENDIX E

TRANSMISSION ELECTRON MICROSCOPY FOR ASBESTOS



ROBERT J. EMERSON, Ph.D.
PRESIDENT

Shelburne Laboratories, Inc.
P.O. Box 458, Shelburne, Vermont 05482 (802) 985-3379

RECEIVED
MAY - 1 1988
RECRA ENVIRONMENTAL, INC.

April 18, 1988

Kenneth E. Kasperek
Recra Environmental, Inc.
Audubon Business Centre
10 Hazelwood Drive, Suite 106
Amherst, NY 14150

Re: Asbestos Analysis via TEM
Our Project No. 11459
Your Project No. 88-504B

Dear Mr. Kasperek:

Please find enclosed the data sheets and photomicrographs from the 3 water samples submitted April 11, 1988 (Lab No. SL88-1729-1731). The results are as follows:

Lab No. SL88	Sample I.D./ Description	Water Volume (Milliliters)	Asbestos Results	MDL
1729	4402-7C745	10	1.08×10^6 f/L (2-Chrysotile Fibers)	5.4×10^5 f/L
1730	4421-7C745	10	5.4×10^5 f/L (1-Chrysotile Fiber)	5.4×10^5 f/L
1731	02826-7C745	10	5.7×10^5 f/L (1-Chrysotile Fiber)	5.7×10^5 f/L

The analysis was performed by Transmission Electron Microscopy (TEM) using a JEOL 100SX with a Tracor Northern Energy Dispersive X-Ray Spectrometry at a magnification of 10,000X. A modification of the Jaffe protocol was utilized for the sample preparation. Twenty grid squares were counted for each analysis.

Should you have any questions, please feel free to contact me.

Sincerely,

Lucie Jean

Lucie Jean
Laboratory Manager

LJ/sp
Enclosures

SHELBURNE LABORATORIES
P.O. Box 458
Shelburne, Vermont 95482

ASBESTOS ANALYSIS VIA TEM
WATER SAMPLES

Client Name RECRA ENV. Inc. Lab Proj. # 11459
Client I.D. #4402-7C745 Laboratory I.D. SL88-1729
Filter Diameter 47 mm Filter type MCN
Total Fiber Count 1077600 f/L Fiber type 2 · Chrysotile
1.08 X 10^6
EPA RMCL = 7.1 x 10^6 Fibers/Liter

CALCULATIONS

TOTAL FIBER COUNT:
Date Grids Sized 3/11/88 Ave. Size of Grid Sqs. .0089 mm^2
Area for 20 Grid Sqs. = 0.178 mm^2 Fibers Counted in 20 Sqs. 2
Total Fiber Count = 2/.178 = 11.2 Fibers per mm^2

FIBERS PER LITER:
Volume of Water Filtered 0.01 (L)
Area of Exposed Filter on 47mm Filter = 962.11mm^2 (effective area)
11.2 Fibers/mm^2 x 962.11 (Area of Exposed Filter) = 10776 f/F
10776 f/F x 1/.01 (L) = 1077600 f/L

MINIMUM DETECTION LIMIT:
1/.178 (area of 20 grid squares) x 962.11/1 (effect. area) x 1/.01 (L) (Volume filtered) = 540511 t/L
5.4 X 10^5

CHAIN OF CUSTODY:
Received by BS Date 04-11-88
Prepped by BS Date 04-11-88
Analyzed by HC Date 4-14-88
Reported by Lucie Jean Date 4/15/88

HC/LJ-2 3/88

SAMPLE # 5188-1729 DATE EXAMINED 4-14-88
EXAMINER HC

PHOTO NUMBERS LOW MAG 503
HIGH MAG 501
SAED —
EDS Jeli 151 Disk101

FIBER MEASUREMENT

GRID Square	FIBER/STRUC #	TYPE	SIZE LENGTH	SIZE WIDTH	SAED	EDS
1. I	fiber	Chrysotile	3.0	x .25	—	Mg Si
2. II	Matrix	Chrysotile	5.2	x .05	—	Mg Si
3.						
4.						
5.						
6.						
7.						
8.						
9.						
10.						
11.						
12.						
13.						
14.						
15.						
16.						
17.						
18.						
19.						
20.						
21.						
22.						
23.						
24.						
25.						
26.						
27.						
28.						
29.						
30.						
31.						
32.						

TN FLEXTRAN [13-B]

IDENT-6E/80

QUALITATIVE ELEMENT IDENTIFICATION

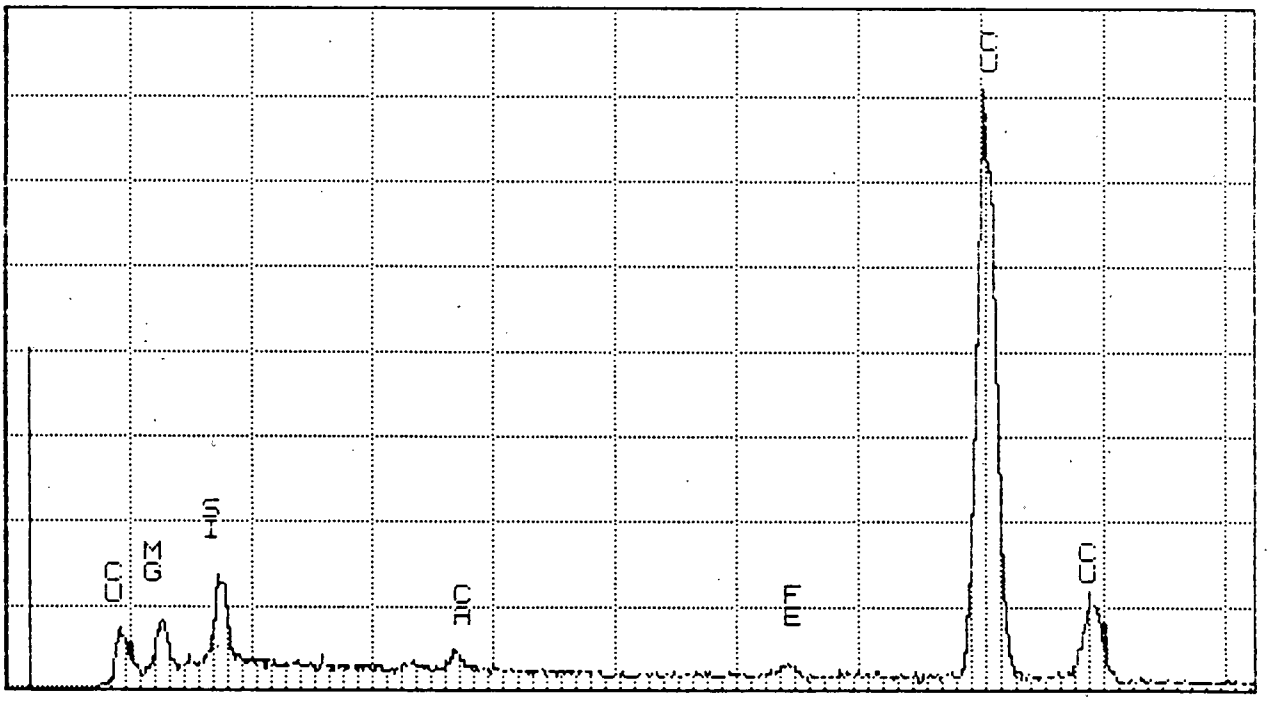
SAMPLE ID:SL88-1729 4-14-88

POSSIBLE IDENTIFICATION
CU KA KB LA
SI KA OR RB LA?
MG KA OR AS LA?
CA KA
FE KA

PEAK LISTING

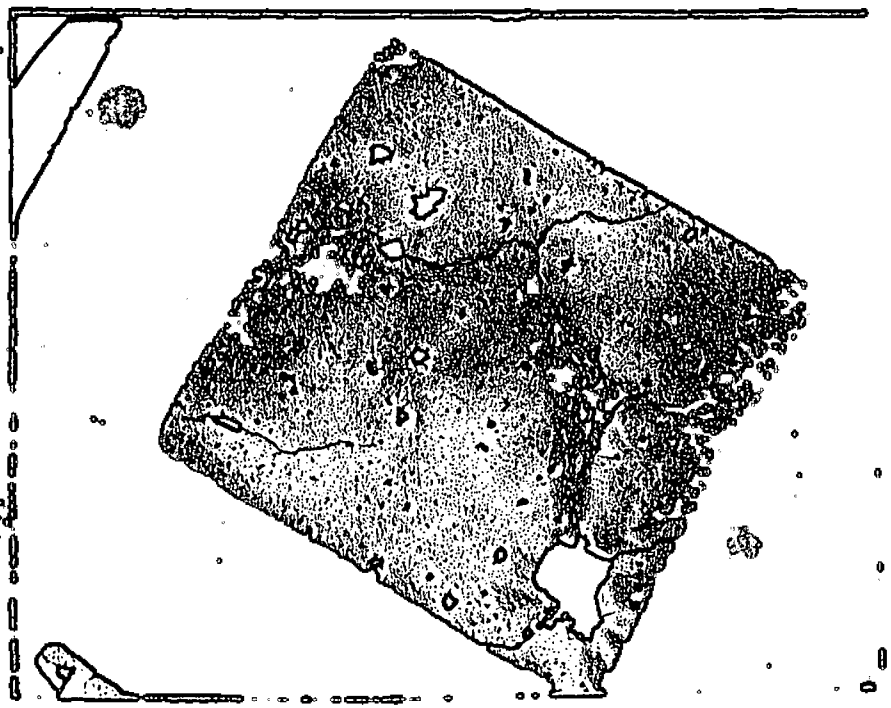
	ENERGY	AREA	EL. AND LINE
1	0.932	1061	CU LA
2	1.255	1049	MG KA OR AS LA?
3	1.740	1941	SI KA OR RB LA?
4	3.684	408	CA KA
5	6.410	290	FE KA
6	8.042	14160	CU KA
7	8.903	1994	CU KB

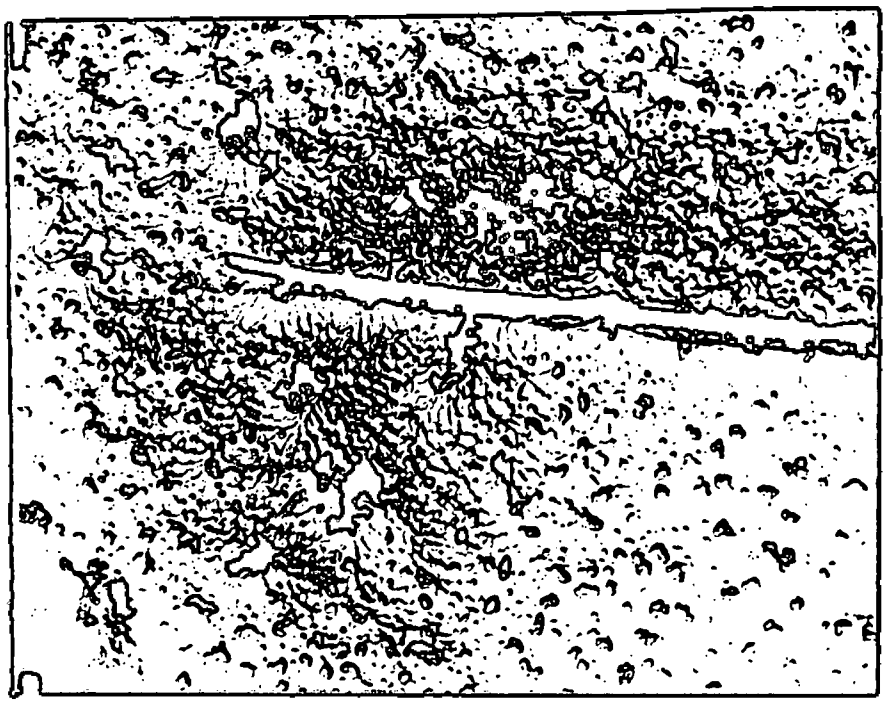
Series II Shelburne Laboratories, Inc. THU 14-APR-88 09:14
Cursor: 0.000keV = 0



0.000 B- 5 VFS = 1024 10.240

SL88-1729 4-14-88 37





SL88-1729

SAMPLE # 5L88-1730 DATE EXAMINED 4-12-88
EXAMINER HC

PHOTO NUMBERS LOW MAG 486
HIGH MAG 488
SAED –
EDS file 147 Disk 101

FIBER MEASUREMENT

GRID	FIBER/STRUC #	TYPE	SIZE LENGTH	SIZE WIDTH	SAED	EDS
Square						
1. 15	Cluster	Chrysotile	5.2	0.5	–	1495
2.						
3.						
4.						
5.						
6.						
7.						
8.						
9.						
10.						
11.						
12.						
13.						
14.						
15.						
16.						
17.						
18.						
19.						
20.						
21.						
22.						
23.						
24.						
25.						
26.						
27.						
28.						
29.						
30.						
31.						
32.						

SHELBURNE LABORATORIES
P.O. Box 458
Shelburne, Vermont 95482

ASBESTOS ANALYSIS VIA TEM
WATER SAMPLES

Client Name RECRA Env. Inc. Lab Proj. # 11459
Client I.D. #4421-7C745 Laboratory I.D. SL88- 1730
Filter Diameter 47 mm Filter type MCM
Total Fiber Count 5.4×10^5 f/L Fiber type 1 - Chrysotile

EPA RMCL = 7.1×10^6 Fibers/Liter

CALCULATIONS

TOTAL FIBER COUNT:

Date Grids Sized 3/11/88 Ave. Size of Grid Sqs. .0089 mm^2
Area for 20 Grid Sqs. = 0.178 mm^2 Fibers Counted in 20 Sqs. 1
Total Fiber Count = 1/.178 = 5.62 Fibers per mm^2

FIBERS PER LITER:

Volume of Water Filtered 0.01 (L)
Area of Exposed Filter on 47mm Filter = 962.11mm^2 (effective area)

5.62 Fibers/mm^2 x 962.11 (Area of Exposed Filter) = 5407 f/F

5407 f/F x $\frac{1}{.01}$ (L) = 5.4×10^5 f/L

MINIMUM DETECTION LIMIT:

$\frac{1}{.178}$ (area of 20 grid squares) x $\frac{962.11}{1}$ (effect. area) x $\frac{1}{.01}$ (L) (Volume filtered) = 5.4×10^5 f/L

CHAIN OF CUSTODY:

Received by BS Date 04-11-88
Prepped by BS Date 04-11-88
Analyzed by HC Date 4-12-88
Reported by Lucie Tlam Date 4/15/88

QUALITATIVE ELEMENT IDENTIFICATION

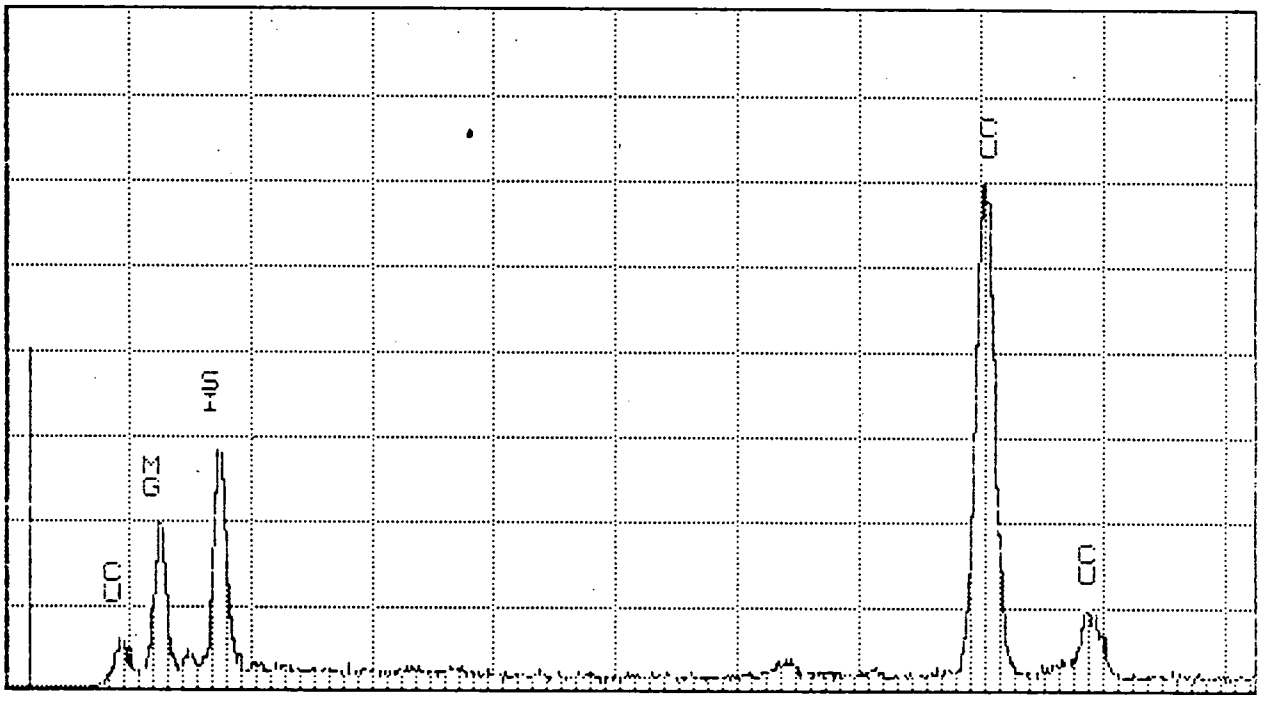
SAMPLE ID:SL88-1730 4-12-88

POSSIBLE IDENTIFICATION
CU KA KB LA
SI KA OR RB LA?
MG KA OR AS LA?

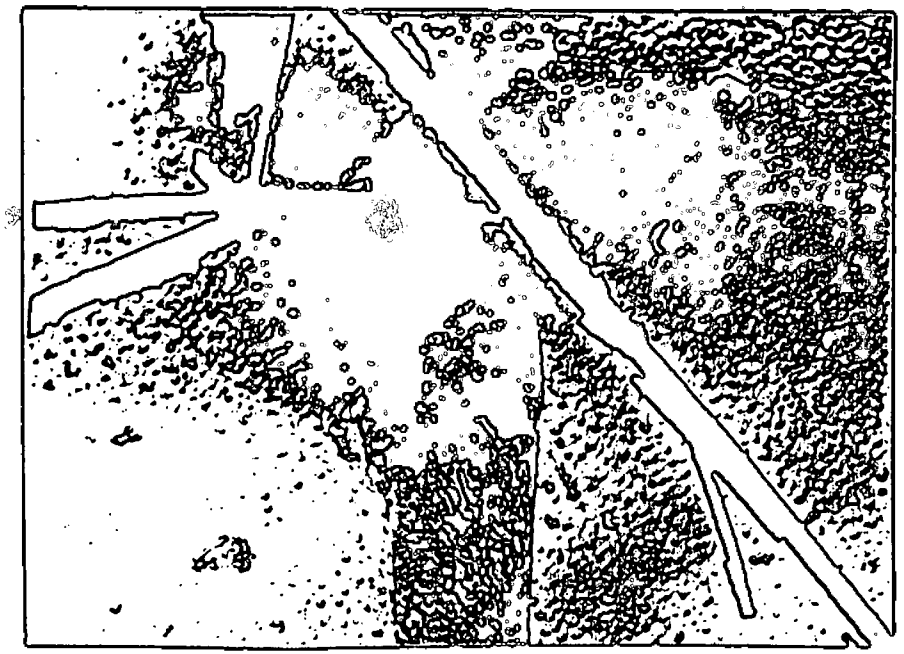
PEAK LISTING

	ENERGY	AREA	EL. AND LINE
1	0.932	378	CU LA
2	1.254	1545	MG KA OR AS LA?
3	1.743	2388	SI KA OR RB LA?
4	8.037	6172	CU KA
5	8.893	730	CU KB

Series II Shelburne Laboratories, Inc. TUE 12-APR-88 15:17
Cursor: 0.000keV = 0



0.000 B- 5 VFS = 512 10.240
1717 SL88-1730 4-12-88



SL88-1730

SHELBURNE LABORATORIES
P.O. Box 458
Shelburne, Vermont 95482

ASBESTOS ANALYSIS VIA TEM
WATER SAMPLES

Client Name RECRA ENV. INC Lab Proj. # 11459
Client I.D. #02826-7C745 Laboratory I.D. SL88- 1731
Filter Diameter 47 mm Filter type MCN
Total Fiber Count 56,7645 f/L Fiber type Chrysotile
5.6X10^5
EPA RMCL = 7.1×10^6 Fibers/Liter

CALCULATIONS

TOTAL FIBER COUNT:
Date Grids Sized 4/11/88 Ave. Size of Grid Sqs. .0085 mm^2
Area for 20 Grid Sqs. = 0.170 mm^2 Fibers Counted in 20 Sqs. 1
Total Fiber Count = 1/.170 = 5.8 Fibers per mm^2

FIBERS PER LITER:
Volume of Water Filtered 0.01 (L)
Area of Exposed Filter on 47mm Filter = 962.11mm^2 (effective area)
5.8 Fibers/mm^2 x 962.11 (Area of Exposed Filter) = 5676.5 f/F
5676.5 f/F x 1/.01 (L) = 56,7645 f/L

MINIMUM DETECTION LIMIT:
1/.170 (area of 20 grid squares) x 962.11/1 (effect. area) x 1/.01 (L) (Volume filtered) = 567645 ~~56,5947~~ f/L

CHAIN OF CUSTODY:
Received by BS Date 04-11-88
Prepped by BS Date 04-11-88
Analyzed by PG Date 4-12-88
Reported by Lucie Jean Date 4/15/88

HC/LJ-2 3/88

SAMPLE # SL88-1731 DATE EXAMINED 4-12-88

EXAMINER PJ

PHOTO NUMBERS LOW MAG 490

HIGH MAG ~~490~~ 489

SAED —

EDS 149

FIBER MEASUREMENT

~~GRID~~ Fiber	FIBER/STRUC #	TYPE	SIZE LENGTH	SIZE WIDTH	SAED	EDS
1.	4	Chrys	2.0	.05	—	Mg (Fe)
2.						
3.						
4.						
5.						
6.						
7.						
8.						
9.						
10.						
11.						
12.						
13.						
14.						
15.						
16.						
17.						
18.						
19.						
20.						
21.						
22.						
23.						
24.						
25.						
26.						
27.						
28.						
29.						
30.						
31.						
32.						

QUALITATIVE ELEMENT IDENTIFICATION

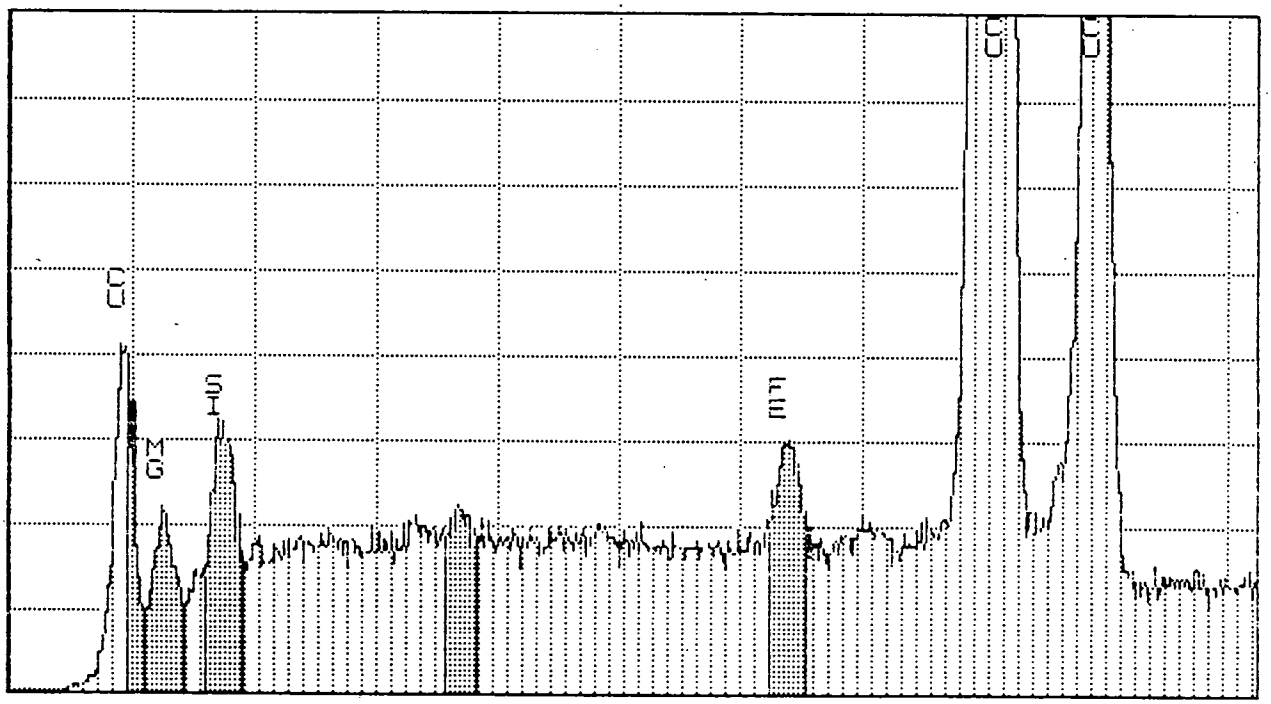
SAMPLE ID:SL88-1731 4-12-88

POSSIBLE IDENTIFICATION
CU KA KB LA
SI KA OR RB LA?
FE KA
MG KA OR AS LA?

PEAK LISTING

	ENERGY	AREA	EL. AND LINE
1	0.925	3307	CU LA
2	1.256	1017	MG KA OR AS LA?
3	1.739	1741	SI KA OR RB LA?
4	6.391	1250	FE KA
5	8.040	104968	CU KA
6	8.902	14156	CU KB

Series II Shelburne Laboratories, Inc. TUE 12-APR-88 23:02
Cursor: 0.000keV = 0 ROI (FE) 6.240: 6.530

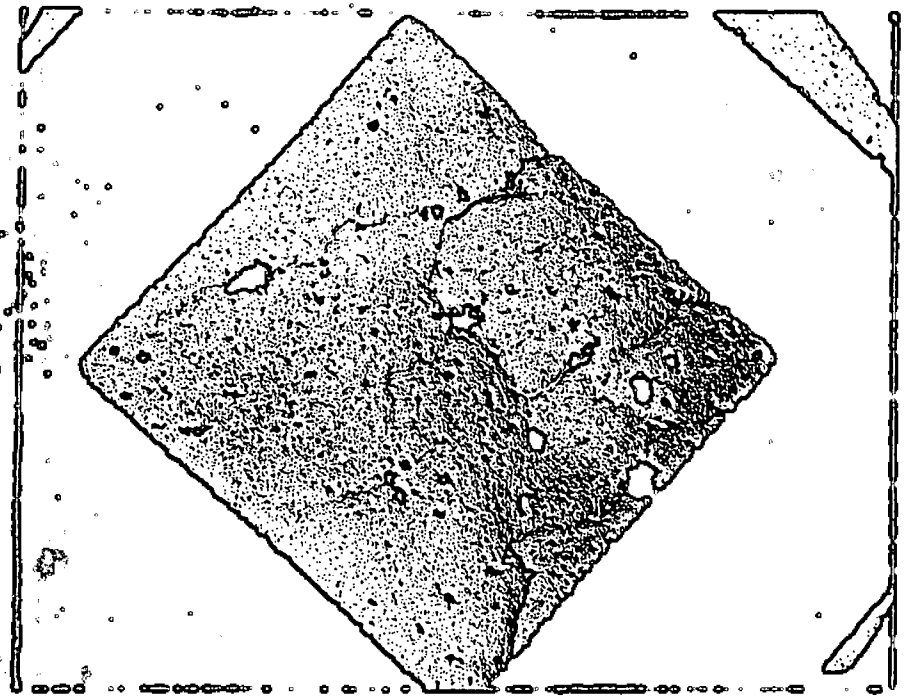


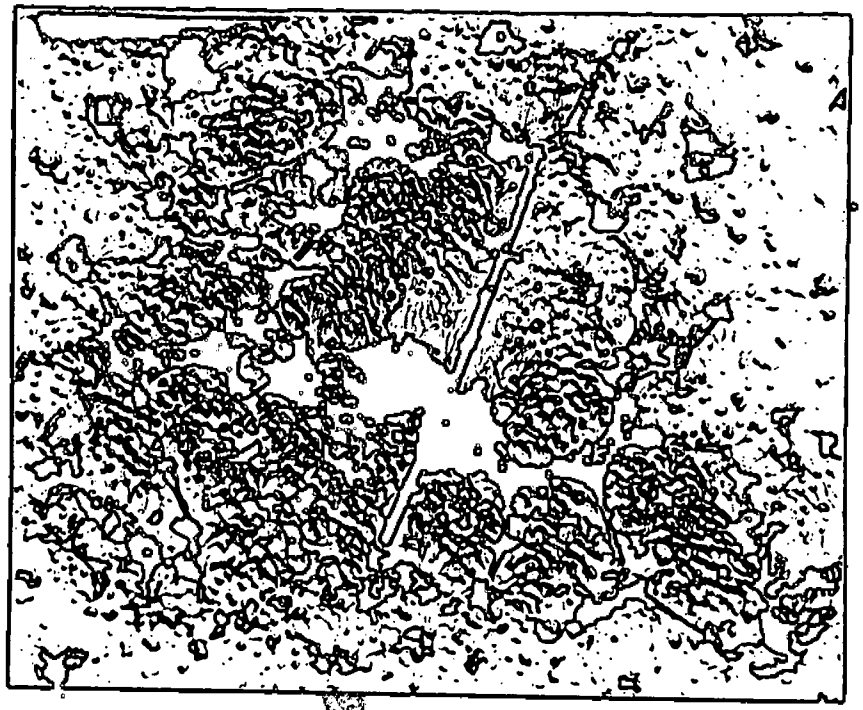
0.000 VFS = 512 10.240
86 SL88-1731 4-12-88

PEAK RATIO PROGRAM
SL88-1731 4-12-88 86 SECS
SI = 2044 COUNTS(NET)

Fe [illegible]

1	937 COUNTS(NET)	MG	/SI	=	0.4584
4	239 COUNTS(NET)	CA	/SI	=	0.1169
5	-156 COUNTS(NET)	NA	/SI	=	-0.0763
6	787 COUNTS(NET)	FE	/SI	=	0.3850





SL88-1731

SHELBURNE LABORATORIES, INC.

TEM WATER - SAMPLE PREPARATION ✓

Date Received: 4-11-88 Client: RECRA Environ.

Date Prepared: 4-11-88 Technician: B. Schultz

Filter Type: ~~(.4) PVC or MCE~~ (.1) ~~PVC or MCE~~ Cellulose nitrate

Lab No. SL87	Sample No. I.D.	Vol - ml (.4)	Vol - ml (.1)
1729	#4402-7C745 PT.A		10 ml
1730	#4421-7C745 PT. C		10 ml
1731	#02826-7C745 P-C paired sample		10 ml
1732	lab-filter blank		—

Shelburne Laboratories

Calibration of TEM grid square openings

Batch No.: Q

No. of grids in batch: ~~25~~

Technician: John Nasrallah

Date sized: 4/11/88

$\bar{X} = .0085\ mm^2$

Opening Size (um)

GRID#	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
	.0087	.0087	.0087	.0088	.0087	.0087	.0087	.0087	.0088	.0086	.0086	.0088	.0087	.0087	.0087	.0088	.0087	.0087	.0087
	.0081	.0081	.0081	.0083	.0083	.0082	.0082	.0083	.0081	.0082	.0082	.0081	.0083	.0082	.0081	.0083	.0082	.0081	.0083

YECRA ENV.

Date Used	4/11
#of Grid	6

4 2

Shelburne Laboratories

Calibration of TEM grid square openings

Batch No.: 10872 P

No. of grids in batch: 7

Technician: John N.

Date sized: 3/11/88

$\bar{X}$ = .0089

Opening Size (um)

GRID#	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
	.0088	.0090	.0090	.0090	.0090	.0085	.0088	.0090	.0088	.0090	.0091	.0085	.0085	.0085	.0086	.0087	.0085	.0090	.0083
	.0094	.0094	.0094	.0094	.0094	.0094	.0094	.0094	.0094	.0094	.0094	.0093	.0094	.0094	.0094	.0094	.0094	.0094	.0094

NECRA EM

Date Used	4/11
#of Grid	6

JN

F
Pg

APPENDIX F

REFERENCES

APPENDIX F
REFERENCES

This appendix includes general and specific references used in preparation of this report.

1. Bear, Jacob, "Hydraulics of Groundwater," McGraw-Hill Book Company, 1979.

2. Bouwer, Herman, "Groundwater Hydrology," McGraw-Hill Book Company, New York, 1978.

3. Buehler, E.J. and Tesmer, I.H., "Geology of Erie County, New York, Buffalo Society of Natural Sciences", Vol. 21, No. 3, 1963.

4. Department of the Navy "Soil Mechanics", NAVFAC DM 7.1, Washington, D.C., 1971.

5. Engineering-Science in Association with Dames and Moore, "Engineering Investigations at Inactive Hazardous Waste Sites - Phase I Investigation at Hanna Furance, Buffalo, New York", January 1986.

6. Erie Coutny, DEP, Inactive Site Profile Report, April 1982.

7. Freeze, Allan R. and Cherry, John A., "Groundwater," Pretice-Hall, Inc., Englewood Cliffs, New Jersey, 1979.

8. Jumikis, Alfreds R., "Rock Mechanics", Trans Tech Publications, Rockport, Maine, 1979.

9. Lambe, William T. and Whitman, Robert V., "Soil Mechanics," John Wiley and Sons, Inc., New York, 1969.

10. Rupley, Bahler, and Blake, Consulting Engineers, "Hanna Furnace Corp., Solid Waste Management Facility Report", October, 1979.

11. United States Environmental Protection Agency (USEPA), "Handbook Remedial Action at Waste Disposal Sites (Revised)", 1985.

12. United State Environmental Protection Agency (USEPA), Preparation of Soil Sampling Protocol: Techniques and Strategies, 1983.

13. United States Geological Survey (USGS), "Draft Report of Preliminary Evaluation of Chemical Migration to the Niagara River from Hazardous Waste Disposal Sites in Erie and Niagara Counties", 1983.

APPENDIX G

LIMITATIONS

APPENDIX G

LIMITATIONS

Explorations

-- The analyses and conclusions submitted in this report are based upon the data obtained from subsurface explorations and field test results made by others as described in the text. The nature and extent of variations between these explorations or results may not become evident until construction or future studies. If variations then appear evident, it will be necessary to reevaluate the conclusions of this report.

-- The geologic profiles described in the text are intended to convey trends in subsurface conditions. The boundaries between strata are approximate and idealized and have been developed by interpretations of widely spaced test borings and samples; actual soil/bedrock transitions are probably more gradual. For specific information, refer to the boring logs.

-- Field activities conducted during this study were monitored by GZA on a part-time basis. Thus, GZA's interpretation and evaluation of the data collected was based upon the REI work plan, REI field reports and GZA observations while on site.

-- Groundwater level readings have been made in the monitoring wells at times and under conditions stated in the text. These data have been reviewed, and interpretations have been made in the text of this report. However, it must be noted that fluctuations in the level of the groundwater will occur due to variations in rainfall, the Union Ship Canal water level and other factors occurring at the time measurements were made, and, as such, interpretations may change accordingly.

Survey

-- Surveying (location and elevation) of monitoring wells installed during the current study was done by I.R. Klettke Land Surveyors using optical survey techniques. Survey data were used in developing the conclusions made in this report. Should variations in these measurements become evident it will be necessary to reevaluate the conclusions in this report.

Analysis

-- Groundwater flow (direction and velocity) conditions presented in this report are based upon field data and permeability test data developed by others as described in the text. The nature and extent of variations between these analyses may not become evident until future studies are done. If variations then appear evident, it will be necessary to reevaluate the conclusions of this report.

Use of Report

-- This report has been prepared for the exclusive use of Recra Environmental, Inc. for specific application to the Hanna Furnace Site at Buffalo, New York in accordance with generally accepted geotechnical and groundwater engineering practices. No other warranty, expressed or implied, is made.

APPENDIX H

REVISED HRS DATA

The Following Image(s) are the Best Copy Available

BIEL'S

Ground Water Route Work Sheet

Rating Factor	Assigned Value (Circle One)	Multiplier	Score	Max. Score	R.F. (Section)
[1] Observed Release	0 (45)	1	45	45	3.1

If observed release is given a score of 45, proceed to line [4].
If observed release is given a score of 0, proceed to line [2].

[2] Route Characteristics					3.2
Depth to Aquifer of Concern	0 1 2 3	2		6	
Net Precipitation	0 1 2 3	1		3	
Permeability of the Unsaturated Zone	0 1 2 3	1		3	
Physical State	0 1 2 3	1		3	
Total Route Characteristics Score				15	
[3] Containment	0 1 2 3	1		3	3.3
[4] Waste Characteristics					3.4
Toxicity/Persistence	0 3 6 9 12 15 (18)	1	18	18	
Hazardous Waste Quantity	0 1 2 3 4 5 6 7 (8)	1	8	8	
Total Waste Characteristics Score			26	28	
[5] Targets					3.5
Ground Water Use	0 (1) 2 3	3	3	9	
Distance to Nearest Well/Population Served	(0) 4 6 8 10 12 16 18 20 24 30 32 35 40	1	0	40	
Total Targets Score			3	49	
[6] If line [1] is 45, multiply [1] x [4] x [5] If line [1] is 0, multiply [2] x [3] x [4] x [5]			3510	57,330	
[7] Divide line [6] by 57,330 and multiply by 100			S_{gw} = 6.12		

FIGURE 2
GROUND WATER ROUTE WORK SHEET

Surface Water Route Work Sheet

Rating Factor	Assigned Value (Circle One)	Multiplier	Score	Max. Score	Ref. (Section)
[1] Observed Release	(0) 45	1	0	45	4.1
If observed release is given a value of 45, proceed to line [4]. If observed release is given a value of 0, proceed to line [2].					
[2] Route Characteristics					4.2
Facility Slope and Intervening Terrain	0 1 2 (3)	1	3	3	
1-yr. 24-hr. Rainfall	0 1 (2) 3	1	2	3	
Distance to Nearest Surface Water	0 1 2 (3)	2	6	6	
Physical State	0 1 (2) 3	1	2	3	
Total Route Characteristics Score			14	15	
[3] Containment	0 1 2 (3)	1	3	3	4.3
[4] Waste Characteristics					4.4
Toxicity/Persistence	0 3 6 9 12 15 (18)	1	18	18	
Hazardous Waste Quantity	0 1 2 3 4 5 6 7 (8)	1	8	8	
Total Waste Characteristics Score			26	26	
[5] Targets					4.5
Surface Water Use	0 1 (2) 3	3	6	9	
Distance to a Sensitive Environment	0 1 2 (3)	2	6	6	
Population Served/Distance to Water Intake Downstream	(0) 4 6 8 10 12 16 18 20 24 30 32 35 40	1	0	40	
Total Targets Score			12	55	
[6] If line [1] is 45, multiply [1] x [4] x [5]. If line [1] is 0, multiply [2] x [3] x [4] x [5]			13,104	64,350	
[7] Divide line [6] by 64,350 and multiply by 100			S_{SW} = 20.36		

FIGURE 7
SURFACE WATER ROUTE WORK SHEET

Air Route Work Sh[illegible]

Rating Factor	Assigned Value (Circle One)	Multiplier	Score	Max. Score	Ref. (Section)
[1] Observed Rel[illegible]	(0) 45	1	(0)	45	5.1

Data and Location:

Sampling Protocol:

If line [1] is 0, the S_a = 0. Enter on line [5].
If line [1] is 45, then proceed to line [2].

[2] Waste Characteristics					5.2
Reactivity and Incompatibility	0 1 2 3	1		3	
Toxicity	0 1 2 3	3		9	
Hazardous Waste Quantity	0 1 2 3 4 5 6 7 8	1		8	
	Total Waste Characteristics Score			20	
[3] Targets					5.3
Population Within 4-Mile Radius	0 9 12 15 18 21 24 27 30	1		30	
Distance to Sensitive Environment	0 1 2 3	2		6	
Land Use	0 1 2 3	1		3	
	Total Targets Score			39	
[4] Multiply [1] x [2] x [3]				35,100	
[5] Divide line [4] by 35,100 and multiply by 100			S_a = (0)		

FIGURE 9
AIR ROUTE WORK SHEET

Facility Name: HANNA FURNACE Date: _____

Fire and Explosion Work Sheet

Rating Factor	Assigned Value (Circle One)	Multiplier	Score	Max. Score	Ref. (Section)
1 Containment	1 (3)	1	3	3	7.1
2 Waste Characteristics					7.2
Direct Evidence	0 3	1		3	
Ignitability	0 1 2 3	1		3	
Reactivity	0 1 2 3	1		3	
Incompatibility	0 1 2 3	1		3	
Hazardous Waste Quantity	0 1 2 3 4 5 6 7 8	1		8	
Total Waste Characteristics Score			0	20	
3 Targets					7.3
Distance to Nearest Population	0 1 2 3 4 5	1		5	
Distance to Nearest Building	0 1 2 3	1		3	
Distance to Sensitive Environment	0 1 2 3	1		3	
Land Use	0 1 2 3	1		3	
Population Within 2-Mile Radius	0 1 2 3 4 5	1		5	
Buildings Within 2-Mile Radius	0 1 2 3 4 5	1		5	
Total Targets Score				24	
4 Multiply 1 x 2 x 3			0	1,440	
5 Divide line 4 by 1,440 and multiply by 100			S_{FE} = 0		

FIRE AND EXPLOSION WORK SHEET

Facility Name: HANNA FURNACE Date: [illegible]

Direct Contact Work Sheet

Rating Factor	Assigned Value (Circle One)	Multiplier	Score	Max. Score	Ref. (Section)
1 Observed Incident	(0) 45	1	0	45	8.1
If line 1 is 45, proceed to line 4 If line 1 is 0, proceed to line 2					
2 Accessibility	0 1 2 (3)	1	3	3	8.2
3 Containment	0 (15)	1	15		8.3
4 Waste Characteristics Toxicity	0 1 2 (3)	5	15	15	8.4
5 Targets					8.5
Population Within 1-Mile Radius	0 1 2 3 (4) 5	4	16	20	
Distance to a Critical Habitat	(0) 1 2 3	4	0	12	
Total Targets Score			16	32	
6 If line 1 is 45, multiply 1 x 4 x 5 If line 1 is 0, multiply 2 x 3 x 4 x 5			10,800	21,600	
7 Divide line 6 by 21,600 and multiply by 100			S_{DC} = 50.0		

DIRECT CONTACT WORK SHEET

Facility Name: HANNA FURNACE Date:

Worksheet for Computing S_M

	S	S^2
Groundwater Route Score (S_{gw})	6.12	37.45
Surface Water Route Score (S_{sw})	20.36	414.52
Air Route Score (S_a)	0	0
$S_{gw}^2 + S_{sw}^2 + S_a^2$		457.97
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2}$		21.25
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2} / 1.73 = S_M =$		12.28

WORK SHEET FOR COMPUTING S_M

1/8282

DOCUMENTATION RECORDS
FOR
HAZARD RANKING SYSTEM

FACILITY NAME: Hanna Furnace

LOCATION: 1818 Fuhrman Boulevard, Buffalo, NY 14024

GROUNDWATER ROUTE

1. OBSERVED RELEASE

Contaminants detected:

Compound	M-4 Background Level	Highest Detected Level	Variance
Ammonia	0.87	5.7 (MW-5)	4.83
Benzene	ND (0)	<4.4 (MW-2)	<4.4
VOS	ND (0)	.83 (MW-5)	.83
Alpha-BHC	ND (0)	.11 (MW-1)	.11
Aroclor 1242 (PCB)	ND (0)	<.1 (MW-5)	.1
Delta-BHC	ND (0)	.011(MW-1)	.011

(Reference: Groundwater Analytical Report)

*****

4. WASTE CHARACTERISTICS

Toxicity and Persistence

Observed Release Compounds: Ammonia
Benzene
VOS
Alpha-BHC
Aroclor 1242 (PCB)
Delta-BHC

(Reference: Groundwater Analytical Report)

Compound with highest score:

Aroclor 1242 (PCB) (toxicity = 3, persistence = 3) - 18

All other factors either unchanged (refer to initial Phase I) or unapplicable.

SURFACE WATER ROUTE

4. WASTE CHARACTERISTICS

Toxicity and Persistence

Observed Release Compounds:
- PCB's
- VOS
- HOS
- Chromium
- Copper

(Reference: Surface Water Analytical Report)

Compound with highest score:

PCB (toxicity = 3, persistence = 3) - 18

All other factors either unchanged (refer to initial Phase I).

AIR ROUTE

1. OBSERVED RELEASE

Contaminants detected:

No volatile organics detected.

Date(s) and location of contaminants:

Drilling operations conducted by Buffalo Drilling, Goldberg-Zoino and Recra Environmental, Inc.

1/29/88
2/1/88
2/2/88
2/3/88

(Reference: Dennis Malucci field notes/GZA report, (1987 drilling logs).

All other rating factors were unapplicable (refer to initial Phase I).

10 45 Jerry Pietraszek arrivals
1100 buffalo drilling rigs is in operation
1130 start boring HF-7 for well installation
1131 Finish boring wl 4.6' from G.S.
Sand - size 39 Q-ROK - 45 silica
1200 Jerry Pietraszek departs.
1215 Place well casing in hole
1216 Lunch
1330 buffalo drilling grouting borehole and monitoring well HF-7 (MW-7)
1420 set up at boring HF-2
1425 steam cleaning equip.
Lock # A819
1506 Finish steam cleaning

1525 off site

HF-2

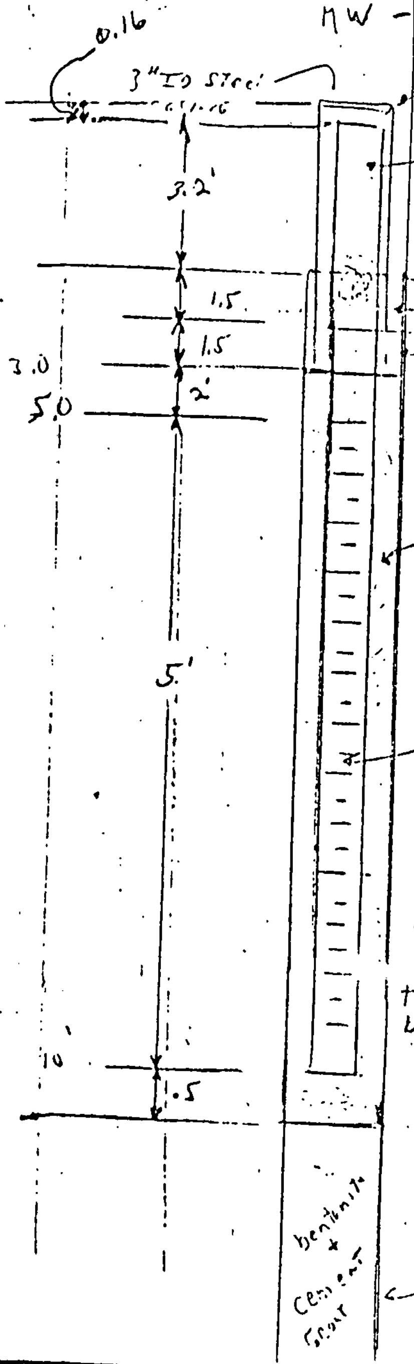
S	N	description	notes
SB-4	21-3-3-3 .8' rec.	Loose dark brown fill and rock fragments little silty brown clay wet - slightly plastic trace (f) sand	Photo Vac Tip readings of SB-1 through SB-12 no appreciable reading above background
SB-5	WH-3 4-4 .7 rec	med. dark brown silty clay trace rock fragments wet	
SB-6	2-1-4-6 .6' rec	Loose dark brown clayey silt little dark grey clay slightly plastic wet trace wood debris	

12.0

7C745 2/1/88 DMM

S	N	Description	HNU
SB-9	3-3-[illegible]	- no sample - lost in hole	19 ← change to every 5' sampling
SB-10	WH-[illegible] 3-3 2.0' rec	Soft gray clay, silty plastic, wet	21 - HNU [illegible] 24 * no organic readings above background for all samples at HF-5 26
SB-11	100/1½" /5 rec 1'	Hard silty clay and shale fragments wet.	29 29.4
SB-12	100/2" rec 0.1'	Very stiff silty clay and shale fragments, wet	34 boring completed at 35.0 ft. 34.16

7C745 HF-5 boring 2-1-88



WL 10.20 TOC
bottom 13.20
stick up 3.0'

bags of sand = 2 bags
bags of concrete 9 bags
amt bentonite ½ bucket
sch #40 PVC = 13 ft
total boring = 35 ft + 10 ft = 45 (1st boring)

Note boring completed at 35 ft. - grouted to surface.

DMM 1/2145 2-2-89

OnSite 0809 Buffalo drilling 0710
Lt. snow 0710 - 810 steam cleaning
0822 start HF-4
1055 Finish HF-4 boring
1056 Jeff Wittinger arrives to review samples and determine MW-4 well construction
1120 Lunch
1155 Jeff W. departs
1247 resume work - start boring for MW-4.
1310 Finish boring.
1435 Finish well MW-4 installation + grouted HF-4 borehole
1436 set up drill rig at HF-6
1450 grouted HF-5 borehole
1505 Finished grouting HF-5
1520 general cleaning equipment
1550 off site

DMM 1/2145

HF-4

S	N	description	notes
SB-1	9-17 100/4"	Dense black, brown, gray f+c GRAVEL and Sand. little cinders (rocks). fill moist	Augers advanced 3 1/4" ID HSA truck mounted derrick - SD drilling
	.8 ne		
			2.0
SB-2	9-12-6-14	mod Dense (f) Gravel and gray/white c+f Sand some dark brown fill wet H2O in spoons	WL - 3.0' encountered in borings
	1.1 ne		HNU photo-ionizer
			1/p all samples exhibit little or no organic vapors above background levels
SB3	5-30-24 10	Very dense brown, dark green; f+c SAND wet some gray green med coarse fill	
	1.4' ne		
			6.0

HF-6

S	N	description		notes
SB-3	17-43 59-50	Hard gray rock, dense brown (fill) orange coloring trace (f) Sand moist.	4.0	sampled at 3 ft new location auger refusal at 3 ft at 2nd location move approx. 50' NW of original stake (HF-6)
	1.4 rec		6.0	
SB-4		No Sample auger refusal at 7.0 ft.		
SB-4-1	WH WH 1-1	Soft black (f) fill trace (f) Gravel little brown (f) Sand wet some dark brown black clayey Silt		3rd LOCATION Sampling approx 50 ft directly West of Stake auger refusal at 2.5 ft.
	1.4' rec		8.0	
SB-5	1/12" 1/12"	Soft black + brown Clayey Silt, trace (f+c) Gravel brown black (fill) wet		4th location approx 50 ft east of STAKE HF-6
	1.6 rec		10.	

2-3-88

HF-6

S	N	description		notes
SB-6	2-1-2-2	Soft black, brown Organic CLAY slightly plastic	11.0	HNU photo ionizer Note: no organic vapor readings above background
		dark brown organic fill wet wood debris		
	2' rec		12.0	
SB-7	1-3-4-11	Medium gray silty clay wet plastic		boring completed at 12 ft
	rec 1.2'		14	

DM 7c7u5 2-3-88

HF-3

S	N	descriptions	note
SB-1	8-12-50/6" .80' nc	HARD black (f-c) GRAVEL and brown (f) Sand dry little brown loose (fill) 2.	3 3/4" ID HSA detrich 50 drill rig auger refusal at 3' - relocated approx 50 - EAST of STAKE.
SB-2	6-12-4 8 1.0' nc.	Stiff dark brown clay and (c) Sand 3.5 Clayey Silt slightly plastic moist	
SB-3	12-6-5-10 0.7' nc	Stiff gray silty CLAY plastic wet 4.0 6.5	

DM 7c7u5 2-3-88

S	N HF-3	description	NOTES
SB-4	22-35 2.0'	Med. gray Silty CLAY little brown loose (fill) wet trace (c) Gravel 2.0	Note: no HNU READINGS ABOVE BACK ROUND
SB-5	3-3-3-4 1.4 nc	Med Stiff gray Silty CLAY and loose dark brown fill moist - debris trace wood 10.0	
SB-6	3-4-6-5 2.0 nc	Stiff black-brown fill Organic 11.0 Stiff Silty Clay gray and (f) sand, moist.	
SB-7	3-6-13-17 nc 1.2	Stiff Silty gray clay. moist 12	boring completed at 12 FT

14 1/2