

03.13-01/31/96-01696

FINAL

**REMEDIAL INVESTIGATION REPORT
OPERABLE UNIT NO. 8 (SITE 16)**

**MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA**

APPENDICES

CONTRACT TASK ORDER 0274

JANUARY 31, 1996

Prepared For:

**DEPARTMENT OF THE NAVY
ATLANTIC DIVISION
NAVAL FACILITIES
ENGINEERING COMMAND
*Norfolk, Virginia***

Under:

**LANTDIV CLEAN Program
Contract N62470-89-D-4814**

Prepared by:

**BAKER ENVIRONMENTAL, INC.
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APPENDIX A
FIELD INVESTIGATION DOCUMENTATION

APPENDIX A.1
TEST BORING LOGS

BAKER

TEST BORING LOG

BOREHOLE NUMBER:

16-BD-SB01

SHEET 1 OF 1

PROJECT NUMBER: 62470-274
 PROJECT NAME: SITE 16 - MONTFORD POINT BURN DUMP
 LOCATION: MCB CAMP LEJEUNE, NC
 DRILLING COMPANY: HARDIN-HUBER, INC.
 RIG TYPE & NUMBER: ATV
 DRILLING METHOD: HOLLOW STEM AUGERS
 WEATHER: SUNNY
 GEOLOGIST: R. M. LEWIS
 ENV. SCIENTIST: A. M. BERNHARDT
 DATE BEGUN: 10/19/94 DATE COMPLETED: 10/19/94

GROUND SURFACE ELEVATION: 17.92' msl
 TOTAL DEPTH: 13.0' bgs

ELEVATION	DEPTH	SOIL SAMPLES	SAMPLE NO.	SAMPLE METHOD	BLOWS/6"	RECOVERY	PID (PPM)		LITHOLOGY	DESCRIPTION	DEPTH
							BG	PS			
17.00	1.0		S-1	SS	5	2.0	0.0	0.0		SAND and SILT: Fine grained, trace Fine gravel, black/brown, dry (fill)	1.0
16.00	2.0		S-2	SS	6	2.0	0.0	0.0		CLAY and fine grained SAND: trace silt, orange, moist	2.0
15.00	3.0				6						
14.00	4.0		S-3	SS	4	2.0	0.0	0.0			
13.00	5.0				6					SAND: Fine grained, trace silt, trace clay, light brown, moist	5.0
12.00	6.0		S-4	SS	7	2.0	0.0	0.0			
11.00	7.0				8						
10.00	8.0		S-5	SS	4	2.0	0.0	0.0		SAND: Fine grained, trace silt, light brown to tan, moist, wet at 14'	8.0
9.00	9.0				6						
8.00	10.0		S-6	SS	9	2.0	0.0	0.0			
7.00	11.0				12						
6.00	12.0		S-7	SS	9	1.5	0.0	0.0			
5.00	13.0				15						
4.00	14.0		S-8	SS	9	1.5	-	-			
3.00	15.0				12						
2.00	16.0				12						
1.00	17.0				18						
0.00	18.0										
1.00	19.0										
2.00	20.0										
3.00	21.0										
4.00	22.0										
5.00	23.0										
6.00	24.0										
7.00	25.0										
8.00	26.0										
9.00	27.0										
10.00	28.0										

BOTTOM OF BOREHOLE = 15.0'
 NOTES:
 1) Groundwater encountered at 14' during drilling

BAKER

TEST BORING LOG

BOREHOLE NUMBER:

16-BD-SB03

SHEET 1 OF 1

PROJECT NUMBER: 62470-274
 PROJECT NAME: SITE 16 - MONTFORD POINT BURN DUMP
 LOCATION: MCB CAMP LEJEUNE, NC
 DRILLING COMPANY: HARDIN-HUBER, INC.
 RIG TYPE & NUMBER: ATV
 DRILLING METHOD: HOLLOW STEM AUGERS
 WEATHER: SUNNY
 GEOLOGIST: R.M. LEWIS
 ENV. SCIENTIST: A.M. BERNHARDT
 DATE BEGUN: 10/20/94 DATE COMPLETED: 10/20/94

GROUND SURFACE ELEVATION: 19.61' msl
 TOTAL DEPTH: 13.0' bgs

ELEVATION	DEPTH	SOIL SAMPLES	SAMPLE NO.	SAMPLE METHOD	BLOWS/6"	RECOVERY	PID (PPM)		LITHOLOGY	DESCRIPTION	DEPTH
							BG	PS			
19.00	0.0		S-1	SS	-	-	-	-	SAND: fine grained, trace clay, trace silt, light brown to tan, moist, medium dense	0.0	
18.00	1.0		S-2	SS	6	2.0	0.0	0.0		1.0	
17.00	2.0		S-3	SS	6 5 6	2.0	0.0	0.0		2.0	
16.00	3.0		S-3	SS	6 6 9	2.0	0.0	0.0	3.0		
15.00	4.0		S-4	SS	8 10	2.0	0.0	0.0	4.0		
14.00	5.0		S-4	SS	8 11 12	2.0	0.0	0.0	5.0		
13.00	6.0		S-5	SS	9 15	1.5	0.0	0.0	6.0		
12.00	7.0		S-5	SS	9 15 17	1.5	0.0	0.0	7.0		
11.00	8.0		S-6	SS	8 7 8	2.0	0.0	0.0	8.0		
10.00	9.0	S-6	SS	8 7 8 11	2.0	0.0	0.0	9.0			
9.00	10.0	S-7	SS	7 12 17	2.0	0.0	0.0	10.0			
8.00	11.0	S-7	SS	7 12 17 33	2.0	0.0	0.0	11.0			
7.00	12.0	S-8	SS	17 28	2.0	0.0	0.0	12.0			
6.00	13.0	S-8	SS	17 28 23 24	2.0	0.0	0.0	13.0			
5.00	14.0	S-9	SS	6 6 7 8	1.5	0.0	0.0	14.0			
4.00	15.0	S-9	SS	6 6 7 8	1.5	0.0	0.0	15.0			
3.00	16.0	S-9	SS	6 6 7 8	1.5	0.0	0.0	16.0			
2.00	17.0	S-9	SS	6 6 7 8	1.5	0.0	0.0	17.0			
1.00	18.0	BOTTOM OF BOREHOLE @ 17.0'									
0.00	19.0	NOTES: 1) Groundwater encountered at 16' during drilling.									
0.00	20.0										
1.00	21.0										
2.00	22.0										
3.00	23.0										
4.00	24.0										
5.00	25.0										
6.00	26.0										
7.00	27.0										
8.00	28.0										

BAKER

TEST BORING LOG

BOREHOLE NUMBER:

16-BD-SB04

SHEET: 1 OF 1

PROJECT NUMBER: 62470-274
 PROJECT NAME: SITE 16 - MONTFORD POINT BURN DUMP
 LOCATION: MCB CAMP LEJEUNE, NC
 DRILLING COMPANY: HARDIN-HUBER, INC.
 RIG TYPE & NUMBER: ATV
 DRILLING METHOD: HOLLOW STEM AUGERS
 WEATHER: SUNNY
 GEOLOGIST: R. M. LEWIS
 ENV. SCIENTIST: A. M. BERNHARDT
 DATE BEGUN: 10/19/91 DATE COMPLETED: 10/19/91

GROUND SURFACE ELEVATION: 18.68' msl
 TOTAL DEPTH: 13.0' bgs

ELEVATION	DEPTH	SOIL SAMPLES	SAMPLE NO	SAMPLE METHOD	BLOWS/6"	RECOVERY	PID (PPH)		LITHOLOGY	DESCRIPTION	DEPTH
							B6	PS			
18.00	0.0		S-1	SS	-	-	-	-		SAND and SILT: fine grained, light brown, moist	0.0
17.00	1.0		S-2	SS	3	1.0	0.0	0.0		CLAY: trace silt, light brown, moist	1.0
16.00	2.0				5						2.0
15.00	3.0				5						3.0
14.00	4.0		S-3	SS	10	2.0	0.0	0.0		SAND: fine grained, trace silt, tan, moist	4.0
13.00	5.0				11						5.0
12.00	6.0		S-4	SS	11	2.0	0.0	0.0		SAND and SILT: fine grained, trace clay, light brown, moist	6.0
11.00	7.0				12						7.0
10.00	8.0		S-5	SS	12	1.5	0.0	0.0		SAND: fine grained, trace silt, light brown, moist to damp, wet at 14.5'	8.0
9.00	9.0				13						9.0
8.00	10.0		S-6	SS	13	2.0	0.0	0.0			10.0
7.00	11.0				15						11.0
6.00	12.0		S-7	SS	8	2.0	0.0	0.0			12.0
5.00	13.0				16						13.0
4.00	14.0		S-8	SS	9	2.0	0.0	0.0			14.0
3.00	15.0				11						15.0
2.00	16.0				15						16.0
1.00	17.0				16						17.0
0.00	18.0				3						18.0
1.00	19.0				3						19.0
2.00	20.0										20.0
3.00	21.0										21.0
4.00	22.0										22.0
5.00	23.0										23.0
6.00	24.0										24.0
7.00	25.0										25.0
8.00	26.0										26.0
9.00	27.0										27.0
	28.0										28.0

BOTTOM OF BOREHOLE • 15.0'
 NOTES
 1) Groundwater encountered at 13' during drilling.

BAKER

TEST BORING LOG

BOREHOLE NUMBER:

16-BD-SB05

SHEET: 1 OF: 1

PROJECT NUMBER: 62470-274
 PROJECT NAME: SITE 16 - MONTFORD POINT BURN DUMP
 LOCATION: MCB CAMP LEJEUNE, NC
 DRILLING COMPANY: HARDIN-HUBER, INC.
 RIG TYPE & NUMBER: TRUCK RIG
 DRILLING METHOD: HOLLOW STEM AUGERS
 WEATHER: SUNNY
 GEOLOGIST: R. M. LEWIS
 ENV. SCIENTIST: A. M. BERNHARDT
 DATE BEGUN: 10/18/94 DATE COMPLETED: 10/18/94

GROUND SURFACE ELEVATION: 33.80' msl
 TOTAL DEPTH: 17.0' bgs

ELEVATION	DEPTH	SOIL SAMPLES	SAMPLE NO.	SAMPLE METHOD	BLDS/6"	RECOVERY	PID (PPM)		LITHOLOGY	DESCRIPTION	DEPTH
							B6	PS			
33.00	0.0		S-1	SS	-	-	-	-		GRAVEL: medium, topsoil (roots), glass fragments, black to dark brown, dry (fill material)	0.0
32.00	1.0		S-2	SS	5	0.5	0.5	0.5		Wood Fragments (treated railroad ties)	1.0
31.00	2.0		S-3	SS	3	1.0	0.0	0.0		GRAVEL: medium, trace sand, trace silt, black and dark brown, moist, (fill material)	2.0
30.00	3.0		S-4	SS	3	0.5	3.0	3.0			3.0
29.00	4.0		S-5	SS	3	2.0	0.0	0.0		SAND: fine grained, trace silt, tan, moist, wet at 16'	4.0
28.00	5.0		S-6	SS	6	2.0	0.0	0.0			5.0
27.00	6.0		S-7	SS	7	0.5	2.5	2.5			6.0
26.00	7.0		S-8	SS	9	1.0	2.0	2.0			7.0
25.00	8.0		S-9	SS	8	2.0	0.0	0.0			8.0
24.00	9.0				9						9.0
23.00	10.0				10						10.0
22.00	11.0				12						11.0
21.00	12.0				20						12.0
20.00	13.0				24						13.0
19.00	14.0				28						14.0
18.00	15.0				32						15.0
17.00	16.0				49						16.0
16.00	17.0				50						17.0
15.00	18.0				50						18.0
14.00	19.0				72						19.0
13.00	20.0				8						20.0
12.00	21.0				9						21.0
11.00	22.0				10						22.0
10.00	23.0				9						23.0
9.00	24.0										24.0
8.00	25.0										25.0
7.00	26.0										26.0
6.00	27.0										27.0
	28.0										28.0

BOTTOM OF BOREHOLE = 17.0'

NOTES:

1) Groundwater encountered at 16' during drilling.

BAKER

TEST BORING LOG

BOREHOLE NUMBER:

16-BD-SB08

SHEET: 1 OF 1

PROJECT NUMBER: 62470-274
 PROJECT NAME: SITE 16 - MONTFORD POINT BURN DUMP
 LOCATION: MCB CAMP LEJEUNE, NC
 DRILLING COMPANY: HARDIN-HUBER, INC.
 RIG TYPE & NUMBER: ATV
 DRILLING METHOD: HOLLOW STEM AUGERS
 WEATHER: SUNNY
 GEOLOGIST: R. M. LEHIS
 ENV SCIENTIST: A. M. BERNHARDT
 DATE BEGUN: 10/20/94 DATE COMPLETED: 10/20/94

GROUND SURFACE ELEVATION: 16.04' msl
 TOTAL DEPTH: 13.0' bgs

ELEVATION	DEPTH	SOIL SAMPLES	SAMPLE NO.	SAMPLE METHOD	BLOWS/6"	RECOVERY	PID (PPM)		LITHOLOGY	DESCRIPTION	DEPTH
							BG	PS			
16.00	0.0		S-1	SS	-	-	-	-	SAND and SILT: Fine to medium grained, light brown, moist	0.0	
15.00	1.0		S-2	SS	5	15	0.0	0.0		SAND and SILT: fine grained, trace clay, light brown to tan, moist, medium dense	1.0
14.00	2.0		S-3	SS	6	15	0.0	0.0	SAND: fine grained, trace silt, tan, moist, medium dense	2.0	
13.00	3.0		S-4	SS	8	2.0	0.0	0.0		3.0	
12.00	4.0		S-5	SS	5	2.0	0.0	0.0	SAND and CLAY fine grained, tan to gray, damp, medium dense	4.0	
11.00	5.0		S-6	SS	6	2.0	0.0	0.0		5.0	
10.00	6.0		S-7	SS	7	2.0	0.0	0.0	SAND: fine grained, trace silt, tan/orange/gray, moist, wet at 13', medium dense to dense	6.0	
9.00	7.0		S-8	SS	12	1.5	0.0	0.0		7.0	
8.00	8.0									8.0	
7.00	9.0									9.0	
6.00	10.0									10.0	
5.00	11.0									11.0	
4.00	12.0									12.0	
3.00	13.0									13.0	
2.00	14.0									14.0	
1.00	15.0									15.0	
0.00	16.0									16.0	
17.00	17.0									17.0	
18.00	18.0									18.0	
19.00	19.0									19.0	
20.00	20.0									20.0	
21.00	21.0									21.0	
22.00	22.0									22.0	
23.00	23.0									23.0	
24.00	24.0									24.0	
25.00	25.0									25.0	
26.00	26.0									26.0	
27.00	27.0									27.0	
28.00	28.0									28.0	

BOTTOM OF BOREHOLE = 15.0'
 NOTES:
 1) Groundwater encountered at 13' during drilling.

BAKER

TEST BORING LOG

BOREHOLE NUMBER:

16-BD-SB09

SHEET: 1 OF 1

PROJECT NUMBER: 62470-274
 PROJECT NAME: SITE 16 - MONTFORD POINT BURN DUMP
 LOCATION: HCB CAMP LEJEUNE, NC
 DRILLING COMPANY: HARDIN-HUBER, INC
 RIG TYPE & NUMBER: TRUCK RIG
 DRILLING METHOD: HOLLOW STEM AUGERS
 WEATHER: SUNNY
 GEOLOGIST: R. M. LEWIS
 ENV. SCIENTIST: A. H. BERNHARDT
 DATE BEGUN: 10/18/94 DATE COMPLETED: 10/18/94

GROUND SURFACE ELEVATION: 33.80' msl
 TOTAL DEPTH: 15.0' bgs

ELEVATION	DEPTH	SOIL SAMPLES	SAMPLE NO.	SAMPLE METHOD	BLOWS/6"	RECOVERY	PTD (PPM)		LITHOLOGY	DESCRIPTION	DEPTH
							BG	PS			
33.00	0.0		S-1	SS	-	1.0	-	-		SAND: Fine grained, cool, topsoil first 4", brown, dry, loose; (probable fill)	0.0
32.00	1.0		S-2	SS	1	1.0	0.0	0.0		SAND and CLAY: Fine grained, brown, moist, loose	1.0
31.00	2.0		S-3	SS	2	2.0	0.0	0.0		SAND: Fine grained, trace silt, tan, dry, loose	2.0
30.00	3.0		S-4	SS	2	2.0	0.0	0.0		SAND and CLAY: fine grained, light brown, moist, loose	3.0
29.00	4.0		S-5	SS	1	2.0	0.0	0.0		SAND: Fine grained, trace silt, tan, dry, loose to medium dense, wet at 12.5'	4.0
28.00	5.0		S-6	SS	2	2.0	0.0	0.0			5.0
27.00	6.0		S-7	SS	2	2.0	0.0	0.0			6.0
26.00	7.0		S-8	SS	2	2.0	0.0	0.0			7.0
25.00	8.0		S-9	SS	3	2.0	0.0	0.0			8.0
24.00	9.0		S-10	SS	4	2.0	0.0	0.0			9.0
23.00	10.0		S-11	SS	5	2.0	0.0	0.0			10.0
22.00	11.0		S-12	SS	7	2.0	0.0	0.0			11.0
21.00	12.0		S-13	SS	9	2.0	0.2	0.2			12.0
20.00	13.0		S-14	SS	10	2.0	0.0	0.0			13.0
19.00	14.0		S-15	SS	5	2.0	0.0	0.0			14.0
18.00	15.0		S-16	SS	6	2.0	0.0	0.0			15.0
17.00	16.0		S-17	SS	9	2.0	0.0	0.0			16.0
16.00	17.0		S-18	SS	10	2.0	0.0	0.0			17.0
15.00	18.0		S-19	SS	5	2.0	0.0	0.0			18.0
14.00	19.0		S-20	SS	6	2.0	0.0	0.0			19.0
13.00	20.0		S-21	SS	9	2.0	0.0	0.0			20.0
12.00	21.0		S-22	SS	10	2.0	0.0	0.0			21.0
11.00	22.0		S-23	SS	5	2.0	0.0	0.0			22.0
10.00	23.0		S-24	SS	6	2.0	0.0	0.0			23.0
9.00	24.0		S-25	SS	9	2.0	0.0	0.0			24.0
8.00	25.0		S-26	SS	10	2.0	0.0	0.0			25.0
7.00	26.0		S-27	SS	5	2.0	0.0	0.0			26.0
6.00	27.0		S-28	SS	6	2.0	0.0	0.0			27.0
	28.0		S-29	SS	9	2.0	0.0	0.0			28.0

BOTTOM OF BOREHOLE = 13.0'

NOTES:

1) Groundwater encountered at 12.5' during drilling.

BAKER

TEST BORING LOG

BOREHOLE NUMBER:

16-BD-SB10

SHEET: 1 OF: 1

PROJECT NUMBER: 62-770-274
 PROJECT NAME: SITE 16 - MONTFORD POINT BURN DUMP
 LOCATION: MCB CAMP LEJEUNE, NC
 DRILLING COMPANY: HARDIN-HUBER, INC.
 RIG TYPE & NUMBER: TRUCK RIG
 DRILLING METHOD: HOLLOW STEM AUGERS
 WEATHER: SUNNY
 GEOLOGIST: R. M. LEWIS
 ENV. SCIENTIST: A. M. BERNHARDT
 DATE BEGUN: 10/18/94 DATE COMPLETED: 10/18/94

GROUND SURFACE ELEVATION: 33.80' asl
 TOTAL DEPTH: 17.0' bgs

ELEVATION	DEPTH	SOIL SAMPLES	SAMPLE NO.	SAMPLE METHOD	BLOWS/6"	RECOVERY	PID (PPM)		LITHOLOGY	DESCRIPTION	DEPTH
							BG	PS			
33.00	0.0		S-1	SS	-	-	-	-		SAND and SILT: fine grained, trace coal and glass, dark brown to black, dry, loose, probable fill	0.0
32.00	1.0		S-2	SS	3	15	0.6	0.6			1.0
31.00	2.0				2						2.0
30.00	3.0		S-3	SS	4	-	-	-		Wood Fragments (treated railroad ties), creosote odor, elevated HNU reading	3.0
29.00	4.0				-						4.0
28.00	5.0		S-4	SS	2	1.5	0.6	0.6		SAND: fine grained, trace silt, tan to light brown, dry to moist, wet at 15', medium dense to dense	5.0
27.00	6.0				5						6.0
26.00	7.0		S-5	SS	9	2.0	0.4	0.4			7.0
25.00	8.0				11						8.0
24.00	9.0		S-6	SS	5	2.0	1.0	1.0			9.0
23.00	10.0				10						10.0
22.00	11.0		S-7	SS	9	2.0	0.8	0.8			11.0
21.00	12.0				14						12.0
20.00	13.0		S-8	SS	11	2.0	0.6	0.6			13.0
19.00	14.0				10						14.0
18.00	15.0		S-9	SS	5	2.0	0.0	0.0			15.0
17.00	16.0				5						16.0
16.00	17.0				7						17.0
15.00	18.0				8						18.0
14.00	19.0										19.0
13.00	20.0										20.0
12.00	21.0										21.0
11.00	22.0										22.0
10.00	23.0										23.0
9.00	24.0										24.0
8.00	25.0										25.0
7.00	26.0										26.0
6.00	27.0										27.0
	28.0										28.0

BOTTOM OF BOREHOLE = 17.0'

NOTES:

1) Groundwater encountered at 15' during drilling

BAKER

TEST BORING LOG

BOREHOLE NUMBER:

16-80-SB12

SHEET: 1 OF 1

PROJECT NUMBER: 62470-274
 PROJECT NAME: SITE 16 - MONTFORD POINT BURN DUMP
 LOCATION: MCB CAMP LEJEUNE, NC
 DRILLING COMPANY: HARDIN-HUBER, INC.
 RIG TYPE & NUMBER: ATV
 DRILLING METHOD: HOLLOW STEM AUGERS
 WEATHER: SUNNY
 GEOLOGIST: R. M. LEWIS
 ENV. SCIENTIST: A. M. BERNHARDT
 DATE BEGUN: 10/20/94 DATE COMPLETED: 10/20/94

GROUND SURFACE ELEVATION: 8.65' msl
 TOTAL DEPTH: 13.0' bgs

ELEVATION	DEPTH	SOIL SAMPLES	SAMPLE NO.	SAMPLE METHOD	BLDS/6"	RECOVERY	PID (PPM)		LITHOLOGY	DESCRIPTION	DEPTH
							BG	PS			
8.00	0.0		S-1	SS	-	-	-	-	SAND: fine grained, trace silt, light brown, moist, wet at 6', medium dense	0.0	
7.00	1.0		S-2	SS	6	5	5	2.0		0.0	1.0
6.00	2.0		S-3	SS	4	5	5	2.0		0.0	2.0
5.00	3.0		S-4	SS	4	5	6	2.0		0.0	3.0
4.00	4.0				3	4	4	2.0	0.0	4.0	
3.00	5.0				3	4	4	2.0	0.0	5.0	
2.00	6.0				3	4	4	2.0	0.0	6.0	
1.00	7.0				3	4	4	2.0	0.0	7.0	
0.00	8.0				3	4	4	2.0	0.0	8.0	
0.00	9.0				3	4	4	2.0	0.0	9.0	
1.00	10.0				3	4	4	2.0	0.0	10.0	
2.00	11.0				3	4	4	2.0	0.0	11.0	
3.00	12.0				3	4	4	2.0	0.0	12.0	
4.00	13.0				3	4	4	2.0	0.0	13.0	
5.00	14.0				3	4	4	2.0	0.0	14.0	
6.00	15.0				3	4	4	2.0	0.0	15.0	
7.00	16.0				3	4	4	2.0	0.0	16.0	
8.00	17.0				3	4	4	2.0	0.0	17.0	
9.00	18.0				3	4	4	2.0	0.0	18.0	
10.00	19.0				3	4	4	2.0	0.0	19.0	
11.00	20.0				3	4	4	2.0	0.0	20.0	
12.00	21.0				3	4	4	2.0	0.0	21.0	
13.00	22.0				3	4	4	2.0	0.0	22.0	
14.00	23.0				3	4	4	2.0	0.0	23.0	
15.00	24.0				3	4	4	2.0	0.0	24.0	
16.00	25.0				3	4	4	2.0	0.0	25.0	
17.00	26.0				3	4	4	2.0	0.0	26.0	
18.00	27.0				3	4	4	2.0	0.0	27.0	
19.00	28.0				3	4	4	2.0	0.0	28.0	

BOTTOM OF BOREHOLE = 7.0'
 NOTES:
 1) Groundwater encountered at 6.0' during drilling.

BAKER

TEST BORING LOG

BOREHOLE NUMBER:

16-BD-SB13

SHEET 1 OF 1

PROJECT NUMBER: 62470-274
 PROJECT NAME: SITE 16 - MONTFORD POINT BURN DUMP
 LOCATION: MCB CAMP LEJEUNE, NC
 DRILLING COMPANY: HARDIN-HUBER, INC.
 RIG TYPE & NUMBER: ATV
 DRILLING METHOD: HOLLOW STEM AUGERS
 WEATHER: SUNNY
 GEOLOGIST: R. M. LEWIS
 ENV. SCIENTIST: A. M. BERNHARDT
 DATE BEGUN: 10/20/94 DATE COMPLETED: 10/20/94

GROUND SURFACE ELEVATION: 9.86' msl
 TOTAL DEPTH: 13.0' bgs

ELEVATION	DEPTH	SOIL SAMPLES	SAMPLE NO.	SAMPLE METHOD	BLOWS/6"	RECOVERY	PTD (PPM)		LITHOLOGY	DESCRIPTION	DEPTH
							B6	PS			
9.86	0.0		S-1	SS	-	-	-	-		SAND and SILT: Fine grained, dark brown, moist	0.0
8.86	1.0		S-2	SS	4	2.0	0.0	0.0		SAND: Fine grained, trace silt, light brown, moist, medium dense to loose	1.0
7.86	2.0		S-3	SS	4	2.0	0.0	0.0			2.0
6.86	3.0		S-3	SS	2	2.0	0.0	0.0			3.0
5.86	4.0		S-3	SS	2	2.0	0.0	0.0			4.0
4.86	5.0		S-4	SS	2	2.0	0.0	0.0		CLAY and fine grained SAND: trace silt, light brown, wet at 5', soft	5.0
3.86	6.0		S-4	SS	2	2.0	0.0	0.0			6.0
2.86	7.0				2						7.0
1.86	8.0				3						8.0
0.86	9.0										9.0
0.00	10.0										10.0
1.00	11.0										11.0
2.00	12.0										12.0
3.00	13.0										13.0
4.00	14.0										14.0
5.00	15.0										15.0
6.00	16.0										16.0
7.00	17.0										17.0
8.00	18.0										18.0
9.00	19.0										19.0
10.00	20.0										20.0
11.00	21.0										21.0
12.00	22.0										22.0
13.00	23.0										23.0
14.00	24.0										24.0
15.00	25.0										25.0
16.00	26.0										26.0
17.00	27.0										27.0
18.00	28.0										28.0

BOTTOM OF BOREHOLE = 7.0'
 NOTES:

1) Groundwater encountered at 5.0' during drilling.

BAKER

TEST BORING LOG

BOREHOLE NUMBER:

16-BD-SB14

SHEET: 1 OF: 1

PROJECT NUMBER: 62470-274
 PROJECT NAME: SITE 16 - MONTFORD POINT BURN DUMP
 LOCATION: MCB CAMP LEJEUNE, NC
 DRILLING COMPANY: HARDIN-HUBER, INC.
 RIG TYPE & NUMBER: ATV
 DRILLING METHOD: HOLLOW STEM AUGERS
 WEATHER: SUNNY
 GEOLOGIST: R. M. LEWIS
 ENV. SCIENTIST: A. M. BERNHARDT
 DATE BEGUN: 10/19/94 DATE COMPLETED: 10/19/94

GROUND SURFACE ELEVATION: 16.93' msl
 TOTAL DEPTH: 13.0' bgs

ELEVATION	DEPTH	SOIL SAMPLES	SAMPLE NO.	SAMPLE METHOD	BLOWS/6"	RECOVERY	PID (PPM)		LITHOLOGY	DESCRIPTION	DEPTH
							B6	P6			
16.00	0.0		S-1	SS	-	-	-	-		SAND and SILT: Fine grained, gray/brown/black, rubber tire, dry (fill)	0.0
15.00	1.0		S-2	SS	5	2.0	0.6	0.6		1.0	
14.00	2.0				6					2.0	
13.00	3.0				7					3.0	
12.00	4.0		S-3	SS	3	1.0	0.4	0.4		4.0	
11.00	5.0				4					5.0	
10.00	6.0		S-4	SS	-	-	-	-		6.0	
9.00	7.0			-				7.0			
8.00	8.0	S-5	SS	4	1.0	0.0	0.0		apparent rubber tire	8.0	
7.00	9.0			4					9.0		
6.00	10.0	S-6	SS	5	2.0	0.4	0.4		SAND: Fine grained, trace silt, light brown/tan dry/moist/wet	10.0	
5.00	11.0			5					11.0		
4.00	12.0	S-7	SS	5	2.0	0.0	0.0		12.0		
3.00	13.0			10					13.0		
2.00	14.0			12					14.0		
1.00	15.0								15.0		
0.00	16.0								16.0		
-1.00	17.0								17.0		
-2.00	18.0								18.0		
-3.00	19.0								19.0		
-4.00	20.0								20.0		
-5.00	21.0								21.0		
-6.00	22.0								22.0		
-7.00	23.0								23.0		
-8.00	24.0								24.0		
-9.00	25.0								25.0		
-10.00	26.0								26.0		
-11.00	27.0								27.0		
	28.0								28.0		

BOTTOM OF BOREHOLE = 13.0'
 NOTES:
 1) Groundwater encountered at 12.5' during drilling.

BAKER

TEST BORING LOG

BOREHOLE NUMBER:

16-BD-SB15

SHEET: 1 OF: 1

PROJECT NUMBER: 62470-274
 PROJECT NAME: SITE 16 - MONIFORD POINT BURN DUMP
 LOCATION: MCB CAMP LEJELUNE, NC
 DRILLING COMPANY: HARDIN-HUBER, INC.
 RIG TYPE & NUMBER: ATV
 DRILLING METHOD: HOLLOW STEM AUGERS
 WEATHER: SUNNY
 GEOLOGIST: R. M. LEWIS
 ENV. SCIENTIST: A. M. BERNHARDT
 DATE BEGUN: 10/19/94 DATE COMPLETED: 10/19/94

GROUND SURFACE ELEVATION: 16.77' msl
 TOTAL DEPTH: 13.0' bgs

ELEVATION	DEPTH	SOIL SAMPLES	SAMPLE NO.	SAMPLE METHOD	BLOWS/6"	RECOVERY	PID (PPM)		LITHOLOGY	DESCRIPTION	DEPTH
							BG	PS			
16.00	0.0		S-1	SS	-	-	-	-	SAND and SILT: fine grained, light brown, moist to dry	0.0	
15.00	1.0		S-2	SS	3	2.0	0.0	0.0		1.0	
14.00	2.0		S-3	SS	3 4 5	2.0	0.0	0.0	2.0		
13.00	3.0		S-4	SS	3 4 5	2.0	0.0	0.0	3.0		
12.00	4.0		S-5	SS	5 5 6 9	2.0	0.0	0.0	4.0		
11.00	5.0		S-6	SS	6 6 7 8	2.0	0.0	0.0	5.0		
10.00	6.0		S-7	SS	7 7 10 12	2.0	0.0	0.0	6.0		
9.00	7.0		S-8	SS	6 6 9 7 11	2.0	0.0	0.0	7.0		
8.00	8.0								8.0		
7.00	9.0								9.0		
6.00	10.0								10.0		
5.00	11.0								11.0		
4.00	12.0								12.0		
3.00	13.0								13.0		
2.00	14.0								14.0		
1.00	15.0								15.0		
0.00	16.0								16.0		
1.00	17.0								17.0		
2.00	18.0								18.0		
3.00	19.0								19.0		
4.00	20.0								20.0		
5.00	21.0								21.0		
6.00	22.0								22.0		
7.00	23.0								23.0		
8.00	24.0								24.0		
9.00	25.0								25.0		
10.00	26.0								26.0		
11.00	27.0								27.0		
	28.0								28.0		

BOTTOM OF BOREHOLE = 15.0'

NOTES

1) Groundwater encountered at 13' during drilling

BAKER

TEST BORING LOG















BOREHOLE NUMBER:

16-BD-SB18

SHEET: 1 OF 1

PROJECT NUMBER: 62-70-274
 PROJECT NAME: SITE 16 - MONTFORD POINT BURN DUMP
 LOCATION: MCB CAMP LEJEUNE, NC
 DRILLING COMPANY: HARDIN-HUBER, INC.
 RIG TYPE & NUMBER: ATV
 DRILLING METHOD: HOLLOW STEM AUGERS
 WEATHER: SUNNY
 GEOLOGIST: R. M. LEWIS
 ENV. SCIENTIST: A. M. BERNHARDT
 DATE BEGUN: 10/20/94 DATE COMPLETED: 10/20/94

GROUND SURFACE ELEVATION: 16.77' asl
 TOTAL DEPTH: 13.0' bgs

ELEVATION	DEPTH	SOIL SAMPLES	SAMPLE NO	SAMPLE METHOD	BLOWS/6"	RECOVERY	PID (PPM)		LITHOLOGY	DESCRIPTION	DEPTH
							BG	PS			
16:00	0.0		S-1	SS	-	-	-	-		SAND and SILT: fine grained, light brown, moist, medium dense	0.0
15:00	1.0		S-2	SS	3	2.0	0.0	0.0			1.0
14:00	2.0		S-3	SS	6	2.0	0.0	0.0		SAND: fine grained, trace silt, tan, moist, medium dense	2.0
13:00	3.0		S-4	SS	10	2.0	0.0	0.0			3.0
12:00	4.0		S-5	SS	5	2.0	0.0	0.0			4.0
11:00	5.0		S-6	SS	9	2.0	0.0	0.0			5.0
10:00	6.0		S-7	SS	12	2.0	0.0	0.0			6.0
9:00	7.0		S-8	SS	8	2.0	0.0	0.0		SAND and CLAY: fine grained, trace silt, tan/gray, dry, medium dense	7.0
8:00	8.0		S-9	SS	13	2.0	0.0	0.0			8.0
7:00	9.0		S-10	SS	7	2.0	-	-			9.0
6:00	10.0		S-11	SS	6	2.0	-	-			10.0
5:00	11.0		S-12	SS	10	2.0	-	-			11.0
4:00	12.0		S-13	SS	8	2.0	-	-			12.0
3:00	13.0		S-14	SS	4	2.0	-	-		SAND: fine to medium grained, trace silt, gray, wet at 14', medium dense	13.0
2:00	14.0				12	2.0	-	-			14.0
1:00	15.0				13						15.0
0:00	16.0				16						16.0
1:00	17.0				14						17.0
2:00	18.0										18.0
3:00	19.0										19.0
4:00	20.0										20.0
5:00	21.0										21.0
6:00	22.0										22.0
7:00	23.0										23.0
8:00	24.0										24.0
9:00	25.0										25.0
10:00	26.0										26.0
11:00	27.0										27.0
	28.0										28.0

BOTTOM OF BOREHOLE = 15.0'

NOTES:

1) Groundwater encountered at 14' during drilling

BAKER

TEST BORING LOG

BOREHOLE NUMBER:

16-BD-SB20

SHEET: 1 OF 1

PROJECT NUMBER: 62470-274
 PROJECT NAME: SITE 16 - MONTFORD POINT BURN DUMP
 LOCATION: MCB CAMP LEJEUNE, NC
 DRILLING COMPANY: HARDIN-HUBER, INC
 RIG TYPE & NUMBER: ATV
 DRILLING METHOD: HOLLOW STEM AUGERS
 WEATHER: SUNNY
 GEOLOGIST: R. M. LEWIS
 ENV. SCIENTIST: A. M. BERNHARDT
 DATE BEGUN: 10/20/94 DATE COMPLETED: 10/20/94

GROUND SURFACE ELEVATION: 17.12' msl
 TOTAL DEPTH: 13.0' bgs

ELEVATION	DEPTH	SOIL SAMPLES	SAMPLE NO.	SAMPLE METHOD	BLONS/6"	RECOVERY	PID (PPM)		LITHOLOGY	DESCRIPTION	DEPTH
							BG	PS			
17.00	0.0		S-1	SS	-	-	-	-		SAND and SILT: fine grained, light brown, moist	0.0
16.00	1.0		S-2	SS	3	2.0	0.0	0.0		SAND and CLAY: fine grained, trace silt, light brown, moist, loose	1.0
15.00	2.0				3						2.0
14.00	3.0				3						3.0
13.00	4.0		S-3	SS	3	2.0	0.0	0.0			4.0
12.00	5.0				4						5.0
11.00	6.0		S-4	SS	3	2.0	0.0	0.0			6.0
10.00	7.0				5						7.0
9.00	8.0		S-5	SS	8	2.0	0.4	0.4		SAND: fine grained, trace silt, tan, moist, medium dense	8.0
8.00	9.0				12						9.0
7.00	10.0		S-6	SS	14	2.0	-	-		SAND: fine grained, little clay, trace silt, light brown, moist, medium dense	10.0
6.00	11.0				14						11.0
5.00	12.0		S-7	SS	5	2.0	-	-			12.0
4.00	13.0				6						13.0
3.00	14.0		S-8	SS	4	2.0	-	-		SAND: fine to medium grained, trace silt, orange, wet at 15', medium dense	14.0
2.00	15.0				7						15.0
1.00	16.0				18						16.0
0.00	17.0										17.0
	18.0										18.0
	19.0										19.0
	20.0										20.0
	21.0										21.0
	22.0										22.0
	23.0										23.0
	24.0										24.0
	25.0										25.0
	26.0										26.0
	27.0										27.0
	28.0										28.0

BOTTOM OF BOREHOLE = 15.0'

NOTES:

1) Groundwater encountered at 15' during drilling.

APPENDIX A.2
WELL CONSTRUCTION LOGS

BAKER

WELL CONSTRUCTION LOG

BOREHOLE NUMBER

16-M101

SHEET 1 OF 1

PROJECT NUMBER: 62470-274
 PROJECT NAME: SITE 16 - MONTFORD POINT BURN DUMP
 LOCATION: MCB CAMP LEJEUNE, NC
 DRILLING COMPANY: HARDIN-HUBER, INC.
 RIG TYPE & NUMBER: TRUCK RIG
 DRILLING METHOD: HOLLOW STEM AUGERS
 WEATHER: SUNNY, HOT, HUMID
 GEOLOGIST: R. M. LEWIS
 ENV. SCIENTIST: A. H. BERNHARDT
 DATE BEGUN: 10/18/94 DATE COMPLETED: 10/18/94

GROUND SURFACE ELEVATION: 17.80' msl
 TOP OF PVC CASING ELEVATION: 19.88' msl

WELL DETAILS (FT)
 STICKUP: 2.5
 LENGTH OF RISER (2" I.O.): 13.0
 LENGTH OF SCREEN (2" I.O.): 10.0
 THICKNESS OF GROUT: 9.0
 THICKNESS OF SEAL: 2.0
 THICKNESS OF SAND PACK: 12.0

ELEVATION	DEPTH	SOIL SAMPLES	SAMPLE NO.	SAMPLE METHOD	BLOWS/0.5'	RECOVERY (FT)	PID (PPM)		LITHOLOGY	DESCRIPTION	DEPTH	WELL INSTALLATION
							B6	P5				
4.0	0.0											
17.00	1.0		S-1	SS	1 2 4 3	1.5	0.0	86		SAND: Fine grained, little to trace silt, occasional trace clay, brown/tan/light brown/buff, damp to wet, loose to medium dense		
15.00	3.0		S-2	SS	2 2 3 4	1.3	0.0	86				
13.00	5.0		S-3	SS	3 7 7 7	1.0	0.0	1.0				
11.00	7.0		S-4	SS	4 8 10 13	2.0	0.0	1.0				
9.00	9.0		S-5	SS	5 11 11 17	1.6	0.0	1.0				
7.00	11.0		S-6	SS	5 8 12 6	1.4	0.0	0.9				
5.00	13.0		S-7	SS	3 3 3 3	1.7	0.0	86				
3.00	15.0		S-8	SS	2 3 7 8	1.6	0.0	86				
1.00	17.0		S-9	SS	4 4 7 12	1.4	0.0	86				
0.00	19.0		S-10	SS	6 9 10 12	1.8	0.0	86				
0.00	21.0		S-11	SS	4 6 6 4	2.0	0.0	86				
	23.0											
	24.0											

CLAY: little silt, light brown, damp

BOTTOM OF BOREHOLE • 23.5
 NOTE
 1) Groundwater encountered • 15' during drilling

BAKER

WELL CONSTRUCTION LOG

BORHOLE NUMBER:

16-MW02

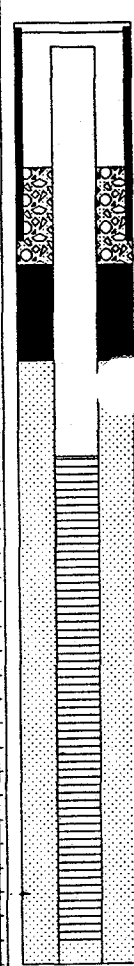
SHEET 1 OF 1

PROJECT NUMBER: 62470-274
 PROJECT NAME: SITE 16 - MONTFORD POINT BURN DUMP
 LOCATION: MCB CAMP LEJEUNE, NC
 DRILLING COMPANY: HARDIN-HUBER, INC.
 RIG TYPE & NUMBER: TRUCK RIG
 DRILLING METHOD: HOLLOW STEM AUGERS
 WEATHER: SUNNY, HOT, HUMID
 GEOLOGIST: R. M. LEWIS
 ENV. SCIENTIST: A. M. BERNHARDT
 DATE BEGUN: 10/19/94 DATE COMPLETED: 10/19/94

GROUND SURFACE ELEVATION: 4.70' msl
 TOP OF PVC CASING ELEVATION: 6.76' msl

WELL DETAILS (FT)

STICKUP: 2.5
 LENGTH OF RISER (2" I.D.): 6.0
 LENGTH OF SCREEN (2" I.D.): 10.0
 THICKNESS OF GROUT: 2.0
 THICKNESS OF SEAL: 2.0
 THICKNESS OF SAND PACK: 12.0

ELEVATION	DEPTH	SOIL SAMPLES	SAMPLE NO.	SAMPLE METHOD	BLOWS/O.S.	RECOVERY (FT)	PID (PPH)		LITHOLOGY	DESCRIPTION	DEPTH	WELL INSTALLATION
							B6	P3				
4.00	0.0		S-1	SS	2	12	0.0	B6	SAND: fine grained, little to trace silt, black/dark brown/brown/light brown/buff, damp to wet, loose to medium dense.	4.0		
3.00	1.0		S-2	SS	2	2.0	0.0	B6				
2.00	2.0		S-3	SS	2	1.2	0.0	B6				
1.00	3.0		S-4	SS	8	1.2	0.0	B6				
0.00	4.0		S-5	SS	1	1.3	0.0	B6				
1.00	5.0		S-6	SS	3	1.6	0.0	B6				
2.00	6.0		S-7	SS	7	2.0	0.0	B6				
3.00	7.0		S-8	SS	7	2.0	0.0	B6				
4.00	8.0		S-9	SS	7	2.0	0.0	B6				
5.00	9.0											
6.00	10.0											
7.00	11.0											
8.00	12.0											
9.00	13.0											
10.00	14.0											
11.00	15.0											
12.00	16.0											
13.00	17.0											
14.00	18.0											
15.00	19.0											
16.00	20.0											
17.00	21.0											
18.00	22.0											
19.00	23.0											
	24.0											

BOTTOM OF BOREHOLE • 16.5
 NOTES:
 1) Groundwater encountered • 8' during drilling

BAKER

WELL CONSTRUCTION LOG

BOREHOLE NUMBER:

16-MW03

SHEET: 1 OF 1

PROJECT NUMBER: 62470-274
 PROJECT NAME: SITE 16 - MONTFORD POINT BURN DUMP
 LOCATION: MCB CAMP LEJEUNE, NC
 DRILLING COMPANY: HARDIN-HUBER, INC.
 RIG TYPE & NUMBER: TRUCK RIG
 DRILLING METHOD: HOLLOW STEM AUGERS
 WEATHER: SUNNY, HOT, HUMID
 GEOLOGIST: R. M. LEWIS
 ENV. SCIENTIST: A. M. BERNHARDT
 DATE BEGUN: 10/18/94 DATE COMPLETED: 10/18/94

GROUND SURFACE ELEVATION: 9.50' msl
 TOP OF PVC CASING ELEVATION: 11.63' msl

WELL DETAILS (FT)
 STICKUP: 2.5
 LENGTH OF RISER (2" I.D.): 7.0
 LENGTH OF SCREEN (2" I.D.): 10.0
 THICKNESS OF GROUT: 7.0
 THICKNESS OF SEAL: 2.0
 THICKNESS OF SAND PACK: 12.0

ELEVATION	DEPTH	SOIL SAMPLES	SAMPLE NO.	SAMPLE METHOD	BLOWS/0.5'	RECOVERY (FT)	PID (PPM)		LITHOLOGY	DESCRIPTION	DEPTH	WELL INSTALLATION
							B6	PS				
13:00	4.0											
12:00	3.0											
11:00	2.0											
10:00	1.0											
9:00	0.0											
8:00	1.0		S-1	SS	1 2	1.1	0.0	B6	SAND: Fine grained, little to trace silt, occasional trace clay, brown/light brown/buff/light gray, damp to wet, loose			
7:00	2.0				2 1							
6:00	3.0		S-2	SS	2 3	1.4	0.0	B6				
5:00	4.0				5 8							
4:00	5.0		S-3	SS	6 4	1.2	0.0	B6				
3:00	6.0				2 3							
2:00	7.0		S-4	SS	2 3	1.3	0.0	B6				
1:00	8.0				1 2							
0:00	9.0		S-5	SS	1 2 4	1.6	0.0	B6				
1:00	10.0				5 5							
2:00	11.0		S-6	SS	5 4	1.6	0.0	B6				
3:00	12.0				3 3							
4:00	13.0		S-7	SS	4 2	1.8	0.0	B6				
5:00	14.0				5 6							
6:00	15.0		S-8	SS	2 3	1.8	0.0	B6				
7:00	16.0				2 2							
8:00	17.0											
9:00	18.0											
10:00	19.0											
11:00	20.0											
12:00	21.0											
13:00	22.0											
14:00	23.0											
	24.0											

BOTTOM OF BOREHOLE • 17.5'

NOTES:

1) Groundwater encountered • 9' during drilling

BAKER

WELL CONSTRUCTION LOG

BOREHOLE NUMBER:

16-MWO-9

SHEET: 1 OF 1

PROJECT NUMBER: 62470-274
 PROJECT NAME: SITE 16 - MONTFORD POINT BURN DUMP
 LOCATION: MCB CAMP LEJEUNE, NC
 DRILLING COMPANY: HARDIN-HUBER, INC.
 RIG TYPE & NUMBER: TRUCK RIG
 DRILLING METHOD: HOLLOW STEM AUGERS
 WEATHER: SUNNY, HOT, HUMID
 GEOLOGIST: R. M. LEWIS
 ENV. SCIENTIST: A. M. BERNHARDT
 DATE BEGUN: 10/19/94 DATE COMPLETED: 10/19/94

GROUND SURFACE ELEVATION: 11.00' msl
 TOP OF PVC CASING ELEVATION: 12.55' msl

WELL DETAILS (FT)

STICKUP: 2.5
 LENGTH OF RISER (2" I.D.): 8.0
 LENGTH OF SCREEN (2" I.D.): 10.0
 THICKNESS OF GROUT: 4.0
 THICKNESS OF SEAL: 2.0
 THICKNESS OF SAND PACK: 12.0

ELEVATION	DEPTH	SOIL SAMPLES	SAMPLE NO.	SAMPLE METHOD	BLOWS/O.5'	RECOVERY (FT)	PID (PPM)		LITHOLOGY	DESCRIPTION	DEPTH	WELL INSTALLATION
							BG	PS				
15:00	4.0											
14:00	3.0											
13:00	2.0											
12:00	1.0											
11:00	0.0		S-1	SS	3	0.9	0.0	B6	SAND: fine grained, little to trace silt, occasional trace clay/silty clay, brown/tan/light brown/buff, damp to wet, loose to medium dense			
10:00	1.0				3							
9:00	2.0		S-2	SS	3	1.4	0.0	B6				
8:00	3.0				3							
7:00	4.0		S-3	SS	4	1.7	0.0	B6				
6:00	5.0				5							
5:00	6.0		S-4	SS	6	1.4	0.0	B6				
4:00	7.0				5							
3:00	8.0		S-5	SS	4	1.8	0.0	B6				
2:00	9.0				4							
1:00	10.0		S-6	SS	4	1.8	0.0	B6				
0:00	11.0				5							
1:00	12.0		S-7	SS	5	1.7	0.0	B6				
2:00	13.0				8							
3:00	14.0		S-8	SS	3	2.0	0.0	B6				
4:00	15.0				2							
5:00	16.0		S-9	SS	3	1.6	0.0	B6				
6:00	17.0				4							
7:00	18.0		S-10	SS	5	2.0	0.0	B6				
8:00	19.0				6							
9:00	20.0				11							
10:00	21.0				13							
11:00	22.0											
12:00	23.0											
13:00	24.0											

BOTTOM OF BOREHOLE = 18.5'

NOTES:

1) Groundwater encountered = 10' during drilling

BAKER

WELL CONSTRUCTION LOG

BOREHOLE NUMBER:

16-MW05

SHEET: 1 OF 2

PROJECT NUMBER: 62470-274
 PROJECT NAME: SITE 16 - MONTFORD POINT BURN DUMP
 LOCATION: MCB CAMP LEJEUNE, NC
 DRILLING COMPANY: HARDIN-HUBER, INC.
 RIG TYPE & NUMBER: TRUCK RIG
 DRILLING METHOD: HOLLOW STEM AUGERS
 WEATHER: SUNNY, HOT, HUMID
 GEOLOGIST: J. E. ZIMMERMAN
 ENV. SCIENTIST: L. H. JOHNSON
 DATE BEGUN: 10/21/94 DATE COMPLETED: 10/21/94

GROUND SURFACE ELEVATION: 19.40' ms l
 TOP OF PVC CASING ELEVATION: 21.28' ms l

WELL DETAILS (FT)

STICKUP: 2.5
 LENGTH OF RISER (2" I.D.): 18.0
 LENGTH OF SCREEN (2" I.D.): 15.0
 THICKNESS OF GROUT: 14.0
 THICKNESS OF SEAL: 2.0
 THICKNESS OF SAND PACK: 17.0

ELEVATION	DEPTH	SOIL SAMPLES	SAMPLE NO	SAMPLE METHOD	BLOBS/O 5'	RECOVERY (FT)	PID (PPM)		LITHOLOGY	DESCRIPTION	DEPTH	WELL INSTALLATION
							B6	B3				
23:00	4.0											
22:00	3.0											
21:00	2.0											
20:00	1.0											
19:00	0.0		S-1	SS	-	0.7	0.0	B6	SAND: fine grained, little to trace silt, occasional trace to little clay, dark brown/brown/black/tan/light brown/buff, damp to wet, loose to medium dense/dense	0.0		
18:00	1.0		S-2	SS	2	1.3	0.0	B6		1.0		
17:00	2.0				3					2.0		
16:00	3.0				2					3.0		
15:00	4.0		S-3	SS	5	1.6	0.0	B6		4.0		
14:00	5.0				6					5.0		
13:00	6.0		S-4	SS	6	1.8	0.0	B6		6.0		
12:00	7.0				12					7.0		
11:00	8.0		S-5	SS	12	1.3	0.0	B6		8.0		
10:00	9.0				17					9.0		
9:00	10.0		S-6	SS	12	2.0	0.0	B6		10.0		
8:00	11.0				17					11.0		
7:00	12.0		S-7	SS	10	2.0	0.0	B6	12.0			
6:00	13.0				18				13.0			
5:00	14.0		S-8	SS	10	1.5	0.0	B6	14.0			
4:00	15.0				15				15.0			
3:00	16.0		S-9	SS	9	1.7	0.0	B6	16.0			
2:00	17.0				7				17.0			
1:00	18.0		S-10	SS	4	2.0	0.0	B6	18.0			
0:00	19.0				4				19.0			
24:00	20.0		S-11	SS	5	2.0	0.0	B6	20.0			
23:00	21.0				6				21.0			
22:00	22.0		S-12	SS	2	1.8	0.0	B6	22.0			
21:00	23.0				3				23.0			
20:00	24.0				4				24.0			

CLAY: little silt, light brown, damp

BAKER

WELL CONSTRUCTION LOG

BOREHOLE NUMBER:

16-MW05

SHEET: 2 OF 2

ELEVATION	DEPTH	SOIL SAMPLES	SAMPLE NO.	SAMPLE METHOD	BLOWS/0.5'	RECOVERY (FT)	PID (PPH)		LITHOLOGY	DESCRIPTION	DEPTH	WELL INSTALLATION
							86	85				
1-00	20.0									<p>SAND: Fine grained, little to trace silt, occasional trace to little clay, dark brown/brown/black/tan/light brown/buff, damp to wet, loose to medium dense/dense</p>	20.0	
2-00	21.0										21.0	
3-00	22.0		S-12	SS	2	1.8	0.0	86			22.0	
4-00	23.0				3						23.0	
5-00	24.0		S-13	SS	1	0.8	0.0	86			24.0	
6-00	25.0				4						25.0	
7-00	26.0		S-14	SS	1	1.0	0.0	86			26.0	
8-00	27.0				4						27.0	
9-00	28.0		S-15	SS	1	1.5	0.0	86			28.0	
10-00	29.0				3						29.0	
11-00	30.0		S-16	SS	2	1.5	0.0	86			30.0	
12-00	31.0				4						31.0	
13-00	32.0		S-17	SS	10	1.3	0.0	86			32.0	
14-00	33.0				15						33.0	
15-00	34.0				4						34.0	
16-00	35.0										35.0	
17-00	36.0										36.0	
18-00	37.0									37.0		
19-00	38.0									38.0		
20-00	39.0									39.0		
21-00	40.0									40.0		
22-00	41.0									41.0		
23-00	42.0									42.0		
24-00	43.0									43.0		
25-00	44.0									44.0		
26-00	45.0									45.0		
27-00	46.0									46.0		
28-00	47.0									47.0		
29-00	48.0									48.0		
30-00	49.0									49.0		
31-00	50.0									50.0		
32-00	51.0									51.0		
33-00	52.0									52.0		

BOTTOM OF BOREHOLE @ 33.5'

NOTES:

- 1) Groundwater encountered @ 33.5' during drilling

BAKER

WELL CONSTRUCTION LOG

BOREHOLE NUMBER:

16-MW06

SHEET: 1 OF 2

PROJECT NUMBER: 62470-274
 PROJECT NAME: SITE 16 - MONTFORD POINT BURN DUMP
 LOCATION: MCB CAMP LEJEUNE, NC
 DRILLING COMPANY: HARDIN-HUBER, INC
 RIG TYPE & NUMBER: TRUCK RIG
 DRILLING METHOD: HOLLOW STEM AUGERS
 WEATHER: SUNNY, HOT, HUMID
 GEOLOGIST: J.E. ZIMMERMAN
 ENV. SCIENTIST: L.H. JOHNSON
 DATE BEGUN: 10/21/94 DATE COMPLETED: 10/21/94

GROUND SURFACE ELEVATION: 16.70' msl
 TOP OF PVC CASING ELEVATION: 18.43' msl

WELL DETAILS (FT)

STICKUP: 2.5
 LENGTH OF RISER (2" I.D.): 16.0
 LENGTH OF SCREEN (2" I.D.): 15.0
 THICKNESS OF GROUT: 12.0
 THICKNESS OF SEAL: 2.0
 THICKNESS OF SAND PACK: 15.0

ELEVATION	DEPTH	SOIL SAMPLES	SAMPLE NO.	SAMPLE METHOD	BLOWS/0.5'	RECOVERY (FT)	PID (PPH)		LITHOLOGY	DESCRIPTION	DEPTH	WELL INSTALLATION
							BG	PS				
20:00	4.0											
19:00	3.0											
18:00	2.0											
17:00	1.0											
16:00	0.0		S-1	SS	5	0.8	0.0	BG	SAND: fine grained, little to trace silt, occasional trace to little clay, dark brown/brown/black/tan/light brown/buff, damp to wet, loose to medium dense/dense	0.0		
15:00	1.0		S-2	SS	3	1.3	0.0	BG		1.0		
14:00	2.0				4					2.0		
13:00	3.0		S-3	SS	2	1.7	0.0	BG		3.0		
12:00	4.0				4					4.0		
11:00	5.0		S-4	SS	3	1.8	0.0	BG		5.0		
10:00	6.0				4					6.0		
9:00	7.0		S-5	SS	4	1.8	0.0	BG		7.0		
8:00	8.0				5					8.0		
7:00	9.0		S-6	SS	7	1.5	0.0	BG		9.0		
6:00	10.0				10					10.0		
5:00	11.0		S-7	SS	3	1.5	0.0	BG		11.0		
4:00	12.0				3				12.0			
3:00	13.0		S-8	SS	4	2.0	0.0	BG	13.0			
2:00	14.0				7				14.0			
1:00	15.0		S-9	SS	7	1.7	0.0	BG	15.0			
0:00	16.0				13				16.0			
1:00	17.0		S-10	SS	4	1.8	0.0	BG	17.0			
2:00	18.0				4				18.0			
3:00	19.0		S-11	SS	7	0.7	0.0	BG	19.0			
4:00	20.0				9				20.0			
5:00	21.0		S-12	SS	7	0.5	0.0	BG	21.0			
6:00	22.0				9				22.0			
7:00	23.0				11				23.0			
	24.0				12				24.0			

APPENDIX A.3
BACKGROUND TEST BORING LOGS

BAKER

TEST BORING LOG

BOREHOLE NUMBER:

16-BB-SB01

SHEET: 1 OF: 1

PROJECT NUMBER: 62470-274
 PROJECT NAME: SITE 16 - MONTFORD POINT BURN DUMP
 LOCATION: MCB CAMP LEJELINE, NC
 DRILLING COMPANY: HARDIN-HUBER, INC.
 RIG TYPE & NUMBER: TRUCK RIG
 DRILLING METHOD: HOLLOW STEM AUGERS
 WEATHER: SUNNY
 GEOLOGIST: J. E. ZIMMERMAN
 ENV. SCIENTIST: L. H. JOHNSON
 DATE BEGUN: 10/20/94 DATE COMPLETED: 10/20/94

GROUND SURFACE ELEVATION: 19.58' wsl
 TOTAL DEPTH: 17.0' bgs

ELEVATION	DEPTH	SOIL SAMPLES	SAMPLE NO.	SAMPLE METHOD	BLOGS/6"	RECOVERY	PID (PPH)		LITHOLOGY	DESCRIPTION	DEPTH
							BG	PS			
19:00	0.0		S-1	HA	-	-	0.0	BG	SAND: Fine grained, little to trace silt, occasional trace clay, dark brown/brown/light brown/buff, damp to wet, very loose to medium dense.	0.0	
18:00	1.0		S-2	SS	4	4	1.6	0.0		BG	1.0
17:00	2.0					6	6				2.0
16:00	3.0					6	6				3.0
15:00	4.0		S-3	SS	6	6	1.8	0.0		BG	4.0
14:00	5.0					8	9				5.0
13:00	6.0		S-4	SS	8	10	1.8	0.0		0.6	6.0
12:00	7.0					10	11				7.0
11:00	8.0		S-5	SS	9	10	1.2	0.0		BG	8.0
10:00	9.0				10	12			9.0		
9:00	10.0	S-6	SS	9	11	2.0	0.0	BG	10.0		
8:00	11.0				7	6			11.0		
7:00	12.0	S-7	SS	9	7	1.9	0.0	BG	12.0		
6:00	13.0				7	8			13.0		
5:00	14.0	S-8	SS	4	3	2.0	0.0	BG	14.0		
4:00	15.0				3	4			15.0		
3:00	16.0	S-9	SS	3	3	2.0	0.0	BG	16.0		
2:00	17.0				5	6			17.0		
1:00	18.0				8				18.0		
0:00	19.0								19.0		
	20.0								20.0		
	21.0								21.0		
	22.0								22.0		
	23.0								23.0		
	24.0								24.0		
	25.0								25.0		
	26.0								26.0		
	27.0								27.0		
	28.0								28.0		

BOTTOM OF BOREHOLE • 17.0'
 NOTES:
 1) Groundwater encountered at 16' during drilling.

BAKER

TEST BORING LOG

BOREHOLE NUMBER:

16-BB-SB02

SHEET: 1 OF 1

PROJECT NUMBER: 62-170-274
 PROJECT NAME: SITE 16 - MONTFORD POINT BURN DUMP
 LOCATION: HCB CAMP LEJEUNE, NC
 DRILLING COMPANY: HARDIN-HUBER, INC.
 RIG TYPE & NUMBER: TRUCK RIG
 DRILLING METHOD: HOLLOW STEM AUGERS
 WEATHER: SUNNY
 GEOLOGIST: J. E. ZIMMERMAN
 ENV. SCIENTIST: L. H. JOHNSON
 DATE BEGUN: 10/20/94 DATE COMPLETED: 10/20/94

GROUND SURFACE ELEVATION: 19.94' asl
 TOTAL DEPTH: 17.0' bgs

ELEVATION	DEPTH	SOIL SAMPLES	SAMPLE NO.	SAMPLE METHOD	BLOWS/6"	RECOVERY	PID (PPM)		LITHOLOGY	DESCRIPTION	DEPTH
							BG	PS			
19.94	0.0		S-1	HA	-	-	0.0	BG			0.0
19.00	1.0		S-2	SS	4	1.7	0.0	BG	SAND: Fine grained, little to trace silt, occasional trace clay, dark brown/brown/light brown/buff, damp to wet, very loose to medium dense		1.0
18.00	2.0				3					2.0	
17.00	3.0				3					3.0	
16.00	4.0		S-3	SS	3	1.6	0.0	BG		4.0	
15.00	5.0				6					5.0	
14.00	6.0		S-4	SS	8	1.8	0.0	BG		6.0	
13.00	7.0				9					7.0	
12.00	8.0		S-5	SS	8	1.1	0.0	BG		8.0	
11.00	9.0				12					9.0	
10.00	10.0		S-6	SS	9	1.6	0.0	BG	10.0		
9.00	11.0				11				11.0		
8.00	12.0		S-7	SS	12	1.8	0.0	BG	12.0		
7.00	13.0				14				13.0		
6.00	14.0		S-8	SS	3	1.8	0.0	BG	14.0		
5.00	15.0				5				15.0		
4.00	16.0		S-9	SS	3	1.5	0.0	BG	16.0		
3.00	17.0				6				17.0		
2.00	18.0				8				18.0		
1.00	19.0								19.0		
0.00	20.0								20.0		
1.00	21.0								21.0		
2.00	22.0								22.0		
3.00	23.0								23.0		
4.00	24.0								24.0		
5.00	25.0								25.0		
6.00	26.0								26.0		
7.00	27.0								27.0		
8.00	28.0								28.0		

BOTTOM OF BOREHOLE • 17.0'

NOTES:

- 1) Groundwater encountered at 16' during drilling

BAKER

TEST BORING LOG

BOREHOLE NUMBER:

16-BB-SB03

SHEET: 1 OF 1

PROJECT NUMBER: 62470-274
 PROJECT NAME: SITE 16 - MONTFORD POINT BURN DUMP
 LOCATION: MCB CAMP LEJEUNE, NC
 DRILLING COMPANY: HARDIN-HUBER, INC.
 RIG TYPE & NUMBER: TRUCK RIG
 DRILLING METHOD: HOLLOW STEM AUGERS
 WEATHER: SUNNY
 GEOLOGIST: J. C. ZIMMERMAN
 ENV. SCIENTIST: L. H. JOHNSON
 DATE BEGUN: 10/20/94 DATE COMPLETED: 10/20/94

GROUND SURFACE ELEVATION: 16.47' msl
 TOTAL DEPTH: 15.0' bgs

ELEVATION	DEPTH	SOIL SAMPLES	SAMPLE NO.	SAMPLE METHOD	BLOWS/6"	RECOVERY	PID (PPM)		LITHOLOGY	DESCRIPTION	DEPTH
							BG	PS			
16.00	0.0		S-1	HA	-	-	0.0	BG	SAND: Fine grained, little to trace silt, dark brown/brown /light brown/buff, damp to wet, very loose to medium dense	0.0	
15.00	1.0		S-2	SS	3	14	0.0	BG		1.0	
14.00	2.0				4					2.0	
13.00	3.0				6					3.0	
12.00	4.0		S-3	SS	3	17	0.0	BG		4.0	
11.00	5.0				4					5.0	
10.00	6.0		S-4	SS	6	17	0.0	BG		6.0	
9.00	7.0				9					7.0	
8.00	8.0	S-5	SS	10	2.0	0.0	BG	8.0			
7.00	9.0			15				9.0			
6.00	10.0	S-6	SS	8	1.7	0.0	BG	10.0			
5.00	11.0			5				11.0			
4.00	12.0	S-7	SS	4	1.4	0.0	BG	12.0			
3.00	13.0			4				13.0			
2.00	14.0	S-8	SS	2	1.6	0.0	BG	14.0			
1.00	15.0			4				15.0			
0.00	16.0			6				16.0			
17.00	17.0			7				17.0			
18.00	18.0							18.0			
19.00	19.0							19.0			
20.00	20.0							20.0			
21.00	21.0							21.0			
22.00	22.0							22.0			
23.00	23.0							23.0			
24.00	24.0							24.0			
25.00	25.0							25.0			
26.00	26.0							26.0			
27.00	27.0							27.0			
28.00	28.0							28.0			

BOTTOM OF BOREHOLE = 15.0'

NOTES:

- 1) Groundwater encountered at 14' during drilling.

APPENDIX A.4
TEST PIT RECORDS

TEST PIT RECORD

PROJECT: CTO-0274

S.O. NO.: 62470-274

COORDINATES: EAST _____

SURFACE ELEVATION: _____

WEATHER: _____

TEST PIT NO.: 16-TP-01

NORTH: _____

WATER LEVEL: NA

DATE: 11/15/94

REMARKS: TEST PIT DIMENSIONS: LENGTH 25', WIDTH 3.5', DEPTH 10.5"

DEFINITIONS

HNU = Photo Ionization Detector Reading
OVA = Organic Vapor Analyzer Reading

Lab Class. = USCS (ASTM D-2487) or AASHTO (ASTM D-3282)
Lab Moist. = Moisture Content (ASTM D-2216) Dry Weight Basis

Depth (Ft.)	Sample Type and No.	HNU or (OVA) ppm		Lab. Class.	Lab. Moist %	Visual Description (Principal Constituents, Gradation, Color, Moisture Content, Organic Content, Plasticity, and Other Observations)	Elevation
		Field	Head Space				
1	NO SAMPLE COLLECTED	BACKGROUND HNU = 0.3				LT. TO MED. GRAY SAND / TRACE SILT - PACKED DOWN	
2		POINT SOURCE HNU = 0.4				LT. TAN SAND / TRACE SILT SOME METAL DEBRIS	
3						LT. GRAY / TRACE SILT INTERMIXED WITH TAN TO LT. BR. SAND / TRACE SILT.	
4						LT. GRAY AND LT. TAN SAND / TRACE SILT. LARGE TREATED POLES ENCOUNTERED AT 3 AND 4 FEET DEPS.	
5						INTERMIXING OF LT. TAN TO BR. SAND / TRACE SILT WITH LT. GRAY SAND / TRACE SILT	
6						LT. TAN AND LT. GRAY SAND	
7						POLE BISECTING TEST PIT	
8						NOTE: COULD NOT ADVANCE TEST PIT ON WESTERN EDGE DUE TO POLE OBSTRUCTION	
9						MOSTLY LT. GRAY SAND / TRACE SILT, SLIGHT PRESENCE OF LT. TAN SAND / TRACE SILT	
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

NOTE: DEPTH 10.5", GROUND WATER NOT ENCOUNTERED.

PROBABLE NATIVE SOIL

PROBABLE FILL WATER

CONTRACTOR: HHI

EQUIPMENT: JOHN DEERE 310D

BAKER REP.: PETE MONDAY / AG ROW BERNARD

TEST PIT NO.: 16-TP-01

SHEET OF _____



TEST PIT RECORD

PROJECT: CTO-0274
 S.O. NO.: 62470-274 TEST PIT NO.: 16-TP-02
 COORDINATES: EAST _____ NORTH: _____
 SURFACE ELEVATION: _____ WATER LEVEL: _____
 WEATHER: _____ DATE: 11/15/94

REMARKS: Test Pit Dimensions: Length 24', Width 3.5', Depth 10' to 12'

		DEFINITIONS					
HNU = Photo Ionization Detector Reading		Lab Class. = USCS (ASTM D-2487) or AASHTO (ASTM D-3282)					
OVA = Organic Vapor Analyzer Reading		Lab Moist. = Moisture Content (ASTM D-2216) Dry Weight Basis					
Depth (Ft.)	Sample Type and No.	HNU or (OVA) ppm		Lab. Class.	Lab. Moist %	Visual Description (Principal Constituents, Gradation, Color, Moisture Content, Organic Content, Plasticity, and Other Observations)	Elevation
		Field	Head Space				
1	NO SAMPLE COLLECTED	B6 = 0.3			NE	MED.-TO-DARK GRAY SAND / TRACE SILT PACKED.	SW. PROBABLY FILL MATERIAL
2		P5 = 0.4				BL. CINDERS AND COAL	
3						LT. TAN SAND / TRACE SILT.	
4						BROWNISH ORANGE SAND / TRACE SILT	
5							
6						LT. GRAY SAND / TRACE SILT INTERMIXED WITH LT. TAN SAND / TRACE SILT	PROBABLY NAT. SOIL
7							
8							
9						LT. TAN SAND / TRACE SILT.	
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

CONTRACTOR: MHI BAKER REP.: PETE MONDAY / R. GRAY BERNHARDT
 EQUIPMENT: JOHN DEERE 310D TEST PIT NO.: 16-TP-02 SHEET OF



TEST PIT RECORD

PROJECT: CTO-0274
 S.O. NO.: 62470-274 TEST PIT NO.: 16-TP-03
 COORDINATES: EAST _____ NORTH: _____
 SURFACE ELEVATION: _____ WATER LEVEL: _____
 WEATHER: _____ DATE: 11/15/94

REMARKS: TEST PIT DIMENSIONS: LENGTH 23', WIDTH 3'5", DEPTH 10'-12'

					DEFINITIONS			
HNU = Photo Ionization Detector Reading OVA = Organic Vapor Analyzer Reading					Lab Class. = USCS (ASTM D-2487) or AASHTO (ASTM D-3282) Lab Moist. = Moisture Content (ASTM D-2216) Dry Weight Basis			
Depth (Ft.)	Sample Type and No.	HNU or (OVA) ppm		Lab. Class.	Lab. Moist % <i>MW</i>	Visual Description		Elevation <i>SE</i>
		Field	Head Space			(Principal Constituents, Gradation, Color, Moisture Content, Organic Content, Plasticity, and Other Observations)		
1	<i>No sample collected</i>	<i>B6 = 01</i>	<i>PS = 01</i>			<i>med. - to - DARK GRAY SAND / TRACE SILT - PACKED</i> <i>LT. TAN SAND / TRACE SILT</i> <i>INTERMIXED WITH LT BR. SAND / TRACE SILT.</i>		<i>BL. CILINDERS</i> <i>ROOFING MAT.</i> <i>PROBABLE FILL MATERIAL</i>
2						<i>med. BR. SAND / TRACE SILT</i> <i>BL. CILINDERS</i> <i>METAL DEBRIS: 5 SHINGLES, PLASTIC.</i> <i>ROOFING SHINGLES.</i> <i>DECOMPOSING PIPE NEEDLES</i>		<i>med. BR. SAND</i> <i>BL. CILINDERS</i> <i>med. BR. SAND</i>
3								
4								
5								
6								
7								<i>PROBABLE NATIVE SOIL</i>
8								
9								
10								
11								
12						<i>UNEXCAVATED</i>		
13						<i>NOTE: GROUNDWATER NOT ENCOUNTERED.</i>		
14								
15								
16								
17								
18								
19								
20								

CONTRACTOR: HHI BAKER REP.: Pete Monday / Ed Klein Kauf
 EQUIPMENT: John Deere 310D TEST PIT NO.: 16-TP-03 SHEET OF

TEST PIT RECORD

PROJECT: CTO-0274
 S.O. NO.: 62470-274 TEST PIT NO.: 16-TP-04
 COORDINATES: EAST _____ NORTH: _____
 SURFACE ELEVATION: _____ WATER LEVEL: _____
 WEATHER: _____ DATE: 11/15/94

REMARKS: TEST PIT Dimensions: LENGTH 25', WIDTH 3.5', DEPTH 12'-14'

DEFINITIONS						Visual Description (Principal Constituents, Gradation, Color, Moisture Content, Organic Content, Plasticity, and Other Observations)	Elevation		
HNU = Photo Ionization Detector Reading OVA = Organic Vapor Analyzer Reading		Lab. Class. = USCS (ASTM D-2487) or AASHTO (ASTM D-3282) Lab Moist. = Moisture Content (ASTM D-2216) Dry Weight Basis		Depth (Ft.)	Sample Type and No.			HNU or (OVA) ppm Field Head Space	Lab. Class.
1	NO SAMPLE COLLECTED	86 ± .1 PS ± .1	LT. BR. SAND / TRACE SILT			med. to DARK GRAY SAND / TRACE SILT, PACKED med. TAN SAND / TRACE SILT			PROBABLE FILL MAT.
2						BROWNISH ORANGE SAND / TRACE SILT.			
3									
4									
5									
6						BROWNISH ORANGE SAND / TRACE SILT INTERMIXED WITH TAN SAND / TRACE SILT			PROBABLE NATIVE SOIL
7						LT. GRAY TO WHITE SAND / TRACE SILT			
8									
9						LT. TAN SAND / TRACE SILT			
10									
11						LT. BR. SAND / TRACE SILT.			
12						NOT EXCAVATED			
13									NOT EXCAVATED
14									
15									
16									
17									
18									
19									
20									

CONTRACTOR: HHI BAKER REP.: PETE MONDAY / ED KLEINKAUF
 EQUIPMENT: JOHN DEERE 310D TEST PIT NO.: 16-TP-04 SHEET OF

APPENDIX B
SAMPLE DOCUMENTATION

APPENDIX B.1
CHAIN-OF-CUSTODY RECORDS



ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD *

COC # 16001

Reference Document No. 457155
Page 1 of 2

Project Name/No. 1 CTO-0274 Samples Shipment Date 7
 Sample Team Members 2 Lab Destination 8
 Profit Center No. 3 Lab Contact 9
 Project Manager 4 MAT BARTMAN Project Contact/Phone 12
 Purchase Order No. 6 Carrier/Waybill No. 13
 Required Report Date 11 28 DAY TURN

Bill to: 5 BAKER ENVIRONMENTAL

Report to: 10 MAT BARTMAN

ONE CONTAINER PER LINE

Sample Number ¹⁴	Sample Description/Type ¹⁵	Date/Time Collected ¹⁶	Container Type ¹⁷	Sample Volume ¹⁸	Pre-servative ¹⁹	Requested Testing Program ²⁰	Condition on Receipt ²¹	Disposal Record No. ²²
16-SDA-SB01-00	SOIL	10/18/94 1005	G			TCL-ORGANICS TAL-INORGANICS	FOR LAB USE ONLY	
16-SDA-SB01-02	SOIL	10/18/94 1043	G			TCL-ORGANICS TAL-INORGANICS		
16-BO-SB16-00	SOIL	10/18/94 1005	G			TCL-ORGANICS TAL-INORGANICS	FOR LAB USE ONLY	
16-BO-SB16-05	SOIL	10/18/94 1027	G			TCL-ORGANICS TAL-INORGANICS		
16-BO-SB16-05D	SOIL	10/18/94 1023	G			TCL-ORGANICS TAL-INORGANICS	FOR LAB USE ONLY	
16-SDA-SB02-00	SOIL	10/18/94 1115	G			TCL-ORGANICS TAL-INORGANICS		
16-SDA-SB02-02	SOIL	10/18/94 1140	G			TCL-ORGANICS TAL-INORGANICS TCL-ORGANICS		
16-BO-SB11-00	SOIL	10/18/94 0936	G			TAL-INORGANICS		

COPY

Special Instructions: 23

Possible Hazard Identification: 24

Non-hazard Flammable Skin Irritant Poison B Unknown

Sample Disposal: 25

Return to Client Disposal by Lab Archive _____ (mos.)

Turnaround Time Required: 26

Normal Rush 28 DAY

QC Level: 27

I. II. III. Project Specific (specify): _____

1. Relinquished by 28 *Return Monday* Date: 10/18/94
(Signature/Affiliation) Time: 17:30

1. Received by 28 Date: _____
(Signature/Affiliation) Time: _____

2. Relinquished by Date: _____
(Signature/Affiliation) Time: _____

2. Received by Date: _____
(Signature/Affiliation) Time: _____

3. Relinquished by Date: _____
(Signature/Affiliation) Time: _____

3. Received by Date: _____
(Signature/Affiliation) Time: _____

Comments: 29

Fed-ex AIRBIL # 1396601345

White: To accompany samples

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* See back of form for special instructions.



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**ANALYSIS REQUEST AND
CHAIN OF CUSTODY RECORD (cont.)***

LOG# 16001

Reference Document No. 30 497155
Page 2 of 2

Project Name _____

Project No. CTO - 0274

Samples Shipment Date 10/18/94

ONE CONTAINER PER LINE

Sample 14 Number	Sample 15 Description/Type	Date/Time 16 Collected	Container 17 Type	Sample 18 Volume	Pre-19 servative	Requested Testing 20 Program	Condition on 21 Receipt	Disposal 22 Record No.
16-BD-5811-06	SOIL	10/18/94 1006	G			TCL-ORGANICS TAL-INORGANICS		
16-BD-5801-00	SOIL	10/18/94 1052	G			TCL-ORGANICS TAL-INORGANICS	FOR LAB USE ONLY	
16-BD-5801-04	SOIL	10/18/94 1109	G			TCL-ORGANICS TAL-INORGANICS		
16-BD-5809-00	SOIL	10/18/94 1330	G			TCL-ORGANICS TAL-INORGANICS	FOR LAB USE ONLY	
16-BD-5809-05	SOIL	10/18/94 1402	G			TCL-ORGANICS TAL-INORGANICS		
274-FB-01	Liquid ^{DRINKED}	10/18/94 1100	G/P			TCL-ORGANICS TAL-INORGANICS	FOR LAB USE ONLY	
274-FB-02	Liquid ^{POTABLE}	10/18/94 1140	G/P			TCL-ORGANICS TAL-INORGANICS		
16-RS-01	Liquid ^{RINSEATE}	10/18/94 153	G/P			TCL-ORGANICS TAL-INORGANICS	FOR LAB USE ONLY	
16-TB-01	Liquid ^{RIP BLANK}	10/18/94 1700	G			TCL-ORGANICS		
							FOR LAB USE ONLY	
							FOR LAB USE ONLY	
							FOR LAB USE ONLY	
							FOR LAB USE ONLY	

COPY

Write: To accompany samples
Yellow: Field copy
* See back of form for special instructions.



ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD*

COCA 16002.

Reference Document No. **497154**

Page 1 of 3

Project Name/No. 1 CTO-0274
 Sample Team Members 2
 Profit Center No. 3
 Project Manager 4 MAT BARTMAN
 Purchase Order No. 6
 Required Report Date 11 28-DAY TURN

Samples Shipment Date 7 10/19/94
 Lab Destination 8
 Lab Contact 9
 Project Contact/Phone 12
 Carrier/Waybill No. 13

Bill to: 5 BAKER ENVIRONMENTAL
 Report to: 10 MAT BARTMAN

ONE CONTAINER PER LINE

Sample Number ¹⁴	Sample Description/Type ¹⁵	Date/Time Collected ¹⁶	Container Type ¹⁷	Sample Volume ¹⁸	Pre-servative ¹⁹	Requested Testing Program ²⁰	Condition on Receipt ²¹	Disposal Record No. ²²
16-SDA-SB03-01	SOIL	10/18/94 1518	6			TCL-ORGANICS TAL-INORGANICS	FOR LAB USE ONLY	
16-SDA-SB03-02	SOIL	10/18/94 1540	6			TCL-ORG. TAL-INORG.		
16-SDA-SB04-01	SOIL	10/18/94 1600	6			TCL-ORG. TAL-INORG. *MS/MSO PROVIDED		
16-SDA-SB04-02	SOIL	10/18/94 1620	6			TCL-ORG. TAL-INORG.		
16-SDA-SB04-03	SOIL	10/18/94 1710	6			TCL-ORG. TAL-INORG.		
16-BD-SB10-01	SOIL	10/18/94 1500	6			TCL-ORG. TAL-INORG.		
16-BD-SB10-03	SOIL	10/18/94 1511	6			TCL-ORG. TAL-INORG.		
16-BD-SB10-07	SOIL	10/18/94 1537	6			TCL-ORG. TAL-INORG.		

COPY

Special Instructions: ²³

Possible Hazard Identification: ²⁴ Non-hazard Flammable Skin Irritant Poison B Unknown

Sample Disposal: ²⁵ Return to Client Disposal by Lab Archive _____ (mos:)

Turnaround Time Required: ²⁶ Normal Rush 28-DAY TURN

QC Level: ²⁷ I. II. III. Project Specific (specify): _____

1. Relinquished by ²⁸ (Signature/Affiliation) <u>Robert A. Mondak/BAKER</u> Date: <u>10/19/94</u> Time: <u>17:36</u>	1. Received by ²⁸ (Signature/Affiliation) _____ Date: _____ Time: _____
2. Relinquished by (Signature/Affiliation) _____ Date: _____ Time: _____	2. Received by (Signature/Affiliation) _____ Date: _____ Time: _____
3. Relinquished by (Signature/Affiliation) _____ Date: _____ Time: _____	3. Received by (Signature/Affiliation) _____ Date: _____ Time: _____

Comments: ²⁹ RED-EX AIRBILL # 139 66 01323.

Write: To accompany samples
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**ANALYSIS REQUEST AND
CHAIN OF CUSTODY RECORD (cont.)***

COC # 16002

Reference Document No. 30 497154

Page 2 of 3

Project Name CTO-274

Project No. CTO-0274

Samples Shipment Date 10/19/94

ONE CONTAINER PER LINE

Sample 14 Number	Sample 15 Description/Type	Date/Time 16 Collected	Container 17 Type	Sample 18 Volume	Pre-19 servative	Requested Testing 20 Program	Condition on 21 Receipt	Disposal 22 Record No.
16-MW03-00	SOIL	10/18/94 1602	G			TCL-ORG. TAL-INORG.		
16-MW03-02	SOIL	10/18/94 1602	G			TCL-ORG. TAL-INORG.	FOR LAB USE ONLY	
16-BD-SB06-00	SOIL	10/18/94 1606	G			TCL-ORG. TAL-INORG.	FOR LAB USE ONLY	
16-BD-SB06-07	SOIL	10/18/94 1640	G			TCL-ORG. TAL-INORG.	FOR LAB USE ONLY	
16-BD-SB05-00	SOIL	10/18/94 1705	G			TCL-ORG. TAL-INORG.	FOR LAB USE ONLY	
16-BD-SB05-07	SOIL	10/18/94 1749	G			TCL-ORG. TAL-INORG.	FOR LAB USE ONLY	
16-BD-SB17-00	SOIL	10/19/94 0855	G			TCL-ORG. TAL-INORG.	FOR LAB USE ONLY	
16-BD-SB17-05	SOIL	10/19/94 0920	G			TCL-ORG. TAL-INORG.	FOR LAB USE ONLY	
16-BD-SB15-00	SOIL	10/19/94 1003	G			TCL-ORG. TAL-INORG.	FOR LAB USE ONLY	
16-BD-SB15-06	SOIL	10/19/94 1005	G			TCL-ORG. TAL-INORG.	FOR LAB USE ONLY	
16-BD-SB04-00	SOIL	10/19/94 1057	G			TCL-ORG. TAL-INORG.	FOR LAB USE ONLY	
16-BD-SB04-06	SOIL	10/19/94 1123	G			TCL-ORG. TAL-INORG.	FOR LAB USE ONLY	
16-MW04-00	SOIL	10/19/94 1111	G			TCL-ORG. TAL-INORG.	FOR LAB USE ONLY	
16-MW04-03	SOIL	10/19/94 1123	G			TCL-ORG. TAL-INORG.	FOR LAB USE ONLY	
16-RS-02	Liquid KINGATE SS. SPOON	10/19/94 1330	G/P			TCL-ORG. *HOLD-DO NOT ANALYZE* TAL-INORG.	FOR LAB USE ONLY	
16-TB-02	Liquid	10/19/94 1515	G			TCL-ORG. VOA ONLY	FOR LAB USE ONLY	
see page 3 of 3 for ADDITIONAL SAMPLES								
				10/19/94	17:50			

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**ANALYSIS REQUEST AND
CHAIN OF CUSTODY RECORD (cont.)***

C.O.C. # 16002

Reference Document No. 30 497154

Page 3 of 3

Project Name _____

Project No. CTO-0274

Samples Shipment Date 10/19/94

ONE CONTAINER PER LINE

Sample 14 Number	Sample 15 Description/Type	Date/Time Collected 16	Container Type 17	Sample 18 Volume	Pre-19 servative	Requested Testing Program 20	Condition on 21 Receipt	Disposal 22 Record No.
16-BD-SB02-00	Soil	10/19/94 1345	G			TCL-ORG. TAL-INORG.		
16-BD-SB02-07	Soil	10/19/94 1420	G			TCL-ORG TAL-INORG	FOR LAB USE ONLY	
16-BD-SB01-00	Soil	10/19/94 1500	G		NOTE - MS/MSD PROVIDED	TCL-ORG. TAL-INORG.	FOR LAB USE ONLY	
16-BD-SB01-00D	Soil	10/19/94 1500	G			TCL-ORG. TAL-INORG.	FOR LAB USE ONLY	
16-BD-SB01-06	Soil	10/19/94 1525	G			TCL-ORG TAL-INORG.	FOR LAB USE ONLY	
16-BD-SB14-00	Soil	10/19/94 1557	G			TCL-ORG. TAL-INORG.	FOR LAB USE ONLY	
							FOR LAB USE ONLY	
							FOR LAB USE ONLY	
							FOR LAB USE ONLY	
							FOR LAB USE ONLY	
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							FOR LAB USE ONLY	

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ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD*

COC # 16003

Reference Document No. 497153

Page 1 of 2

Project Name/No. ¹ CTO - 0274
 Sample Team Members ²
 Profit Center No. ³
 Project Manager ⁴ MATT BARTMAN
 Purchase Order No. ⁶
 Required Report Date ¹¹ 28 DAY TURN

Samples Shipment Date ⁷ 10/20/94
 Lab Destination ⁸
 Lab Contact ⁹ S. SCHNEIDER
 Project Contact/Phone ¹²
 Carrier/Waybill No. ¹³

Bill to: ⁵ BAKER ENVIRONMENTAL
 Report to: ¹⁰ MATT BARTMAN
 BAKER ENVIRONMENTAL

ONE CONTAINER PER LINE

Sample Number ¹⁴	Sample Description/Type ¹⁵	Date/Time Collected ¹⁶	Container Type ¹⁷	Sample Volume ¹⁸	Pre-servative ¹⁹	Requested Testing Program ²⁰	Condition on Receipt ²¹	Disposal Record No. ²²
16-MW02-00	SOIL	10/19/94 1720 ^H	G			TCL - ORGANICS TAL - INORGANICS	FOR LAB USE ONLY	
16-MW02-03	SOIL	10/19/94 1730 ^H	G			TCL - ORGANICS TAL - INORGANICS		
16-BD-SB03-00	SOIL	10/20/94 0835	G			TCL - ORGANICS TAL - INORGANICS		
16-BD-SB03-07	SOIL	10/20/94 0900	G			TCL - ORGANICS TAL - INORGANICS	FOR LAB USE ONLY	
16-BD-SB07-00	SOIL	10/20/94 0907	G			TCL - ORGANICS TAL - INORGANICS		
16-BD-SB07-04	SOIL	10/20/94 1011	G			TCL - ORGANICS TAL - INORGANICS		
16-BD-SB08-00	SOIL	10/20/94 0732	G			TCL - ORGANICS TAL - INORGANICS		
16-BD-SB08-06	SOIL	10/20/94 0806	G			TCL - ORGANICS TAL - INORGANICS		

COPY

Special Instructions: ²³

Possible Hazard Identification: ²⁴

Non-hazard Flammable Skin Irritant Poison B Unknown

Sample Disposal: ²⁵

Return to Client Disposal by Lab Archive _____ (mos.)

Turnaround Time Required: ²⁶

Normal Rush 28 DAY

QC Level: ²⁷

I. II. III. Project Specific (specify): _____

1. Relinquished by ²⁸
(Signature/Affiliation)

E.J. Klein

Date: 10/20/94
Time: 1730

1. Received by ²⁸
(Signature/Affiliation)

Date: _____
Time: _____

2. Relinquished by
(Signature/Affiliation)

Date: _____
Time: _____

2. Received by
(Signature/Affiliation)

Date: _____
Time: _____

3. Relinquished by
(Signature/Affiliation)

Date: _____
Time: _____

3. Received by
(Signature/Affiliation)

Date: _____
Time: _____

Comments: ²⁹

FED Ex AIRBILL # 1396601824

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* See back of form for special instructions.



**ANALYSIS REQUEST AND
CHAIN OF CUSTODY RECORD (cont.)***

Project Name MCA CAMP LESTUVE

Project No. CTO - 0274

Samples Shipment Date 10/20/94

ONE CONTAINER PER LINE

Sample 14 Number	Sample 15 Description/Type	Date/Time Collected 16	Container Type 17	Sample 18 Volume	Pre-19 servative	Requested Testing Program 20	Condition on 21 Receipt	Disposal 22 Record No.
16-BD-SB12-φφ	SOIL	10/20/94 1102	G			TCL-ORGANICS TAL-INORGANICS	FOR LAB USE ONLY	
16-BD-SB12-φZ	SOIL	10/20/94 1120	G			TCL-ORGANICS TAL-INORGANICS		
16-BD-SB13-φφ	SOIL	10/20/94 1145	G			TCL-ORGANICS TAL-INORGANICS	FOR LAB USE ONLY	
16-BD-SB13-φZ	SOIL	10/20/94 1153	G			TCL-ORGANICS TAL-INORGANICS		
16-BD-SB14-φS	SOIL	10/19/94 1601	G			TCL-ORGANICS TAL-INORGANICS	FOR LAB USE ONLY	
16-BD-SB14-φSD	SOIL	10/19/94 1601	G			TCL-ORGANICS TAL-INORGANICS		
16-BB-SB03-φφ	SOIL	10/20/94 1108	G			TCL-ORGANICS TAL-INORGANICS	FOR LAB USE ONLY	
16-BB-SB03-φS	SOIL	10/20/94 1135	G			TCL-ORGANICS TAL-INORGANICS		
16-RS-03	LIQUID - ROSATE SPLIT SPONGE	10/20/94 1235	G/P		HNO ₃ -METALS HCL-VOL	TCL-ORGANICS TAL-INORGANICS	FOR LAB USE ONLY	
16-BD-SB19-φφ	SOIL	10/20/94 1325	G			TCL-ORGANICS TAL-INORGANICS		
16-BD-SB19-φZ	SOIL	10/20/94 1343	G			TCL-ORG TAL-INORG	FOR LAB USE ONLY	
16-BD-SB18-φφ	SOIL	10/20/94 1410	G			TCL-ORG TAL-INORG		
16-BD-SB18-φZ	SOIL	10/20/94 1450	G			TCL-ORG TAL-INORG	FOR LAB USE ONLY	
16-BB-SB02-φφ	SOIL	10/20/94 1347	G			TCL-ORG TAL-INORG		
16-BB-SB02-φZ	SOIL	10/20/94 1414	G			TCL-ORG TAL-INORG	FOR LAB USE ONLY	
16-TB-03	LIQUID TRIP BLANK	10/20/94 1530	G		HCL-VOL	TCL-ORGANICS		
							FOR LAB USE ONLY	

COPY

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ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD*

COC # 16004

Reference Document No. 497152

Page 1 of 2

Project Name/No. 1 CTO - 0274 Samples Shipment Date 7 10/21/94
 Sample Team Members 2 Lab Destination 8
 Profit Center No. 3 Lab Contact 9 S. SCHNEIDER
 Project Manager 4 MATT BARTMAN Project Contact/Phone 12
 Purchase Order No. 6 Carrier/Waybill No. 13
 Required Report Date 11 28 DAY TURN

Bill to: 5 BAKER ENVIRONMENTAL
 Report to: 10 MATT BARTMAN BAKER ENVIR.

ONE CONTAINER PER LINE

Sample Number ¹⁴	Sample Description/Type ¹⁵	Date/Time Collected ¹⁶	Container Type ¹⁷	Sample Volume ¹⁸	Pre-servative ¹⁹	Requested Testing Program ²⁰	Condition on Receipt ²¹	Disposal Record No. ²²
16-BD-SB20-06	SOIL	10/20/94 1545	G			TCL-ORGANICS TAL-INORGANICS	FOR LAB USE ONLY	
16-BD-SB20-06 ^b	SOIL	10/20/94 1614	G			TCL-ORGANICS TAL-INORGANICS		
16-BB-SB01-09	SOIL	10/20/94 1512	G			TCL-ORGANICS TAL-INORGANICS		
16-BB-SB01-07	SOIL	10/20/94 1548	G			TCL-ORGANICS TAL-INORGANICS		
16-TB-04	Liquid R.I.P	10/21/94 0900	G			TCL-ORGANICS	FOR LAB USE ONLY	
16-RS-04	Liquid SS. BOWL	10/21/94 0930	G/P	see comments		TCL-ORGANICS TAL-INORGANICS		
16-MW05-00	SOIL	10/21/94 0745	G			TCL-ORGANICS TAL-INORGANICS		
16-MW05-08	SOIL	10/21/94 0848	G			TCL-ORGANICS TAL-INORGANICS		

Special Instructions: ²³

Possible Hazard Identification: ²⁴

Non-hazard Flammable Skin Irritant Poison B Unknown

Sample Disposal: ²⁵

Return to Client Disposal by Lab Archive _____ (mos.)

Turnaround Time Required: ²⁶

Normal Rush

28 DAY

QC Level: ²⁷

I. II. III.

Project Specific (specify):

1. Relinquished by ²⁸

(Signature/Affiliation)

E.J. Klein

Date: 10/21/94

Time: 1730

1. Received by ²⁸

(Signature/Affiliation)

Date: _____

Time: _____

2. Relinquished by

(Signature/Affiliation)

Date: _____

Time: _____

2. Received by

(Signature/Affiliation)

Date: _____

Time: _____

3. Relinquished by

(Signature/Affiliation)

Date: _____

Time: _____

3. Received by

(Signature/Affiliation)

Date: _____

Time: _____

Comments: ²⁹

HOLD - 16-RS-04 DO NOT ANALYZE.

Fed-ex AIRBILL # 1396601813

White: To accompany samples

Yellow: Field copy

*See back of form for special instructions.



INTERNATIONAL
TECHNOLOGY
CORPORATION

**ANALYSIS REQUEST AND
CHAIN OF CUSTODY RECORD (cont.)***

COC # 16004

Reference Document No. 30 497152

Page 2 of 2

Project Name CTO - φ274
MCA CAMP LGJEUNE

Project No. CTO - φ274

Samples Shipment Date 10/21/94

ONE CONTAINER PER LINE

Sample 14 Number	Sample 15 Description/Type	Date/Time 16 Collected	Container 17 Type	Sample 18 Volume	Pre-19 servative	Requested Testing 20 Program	Condition on 21 Receipt	Disposal 22 Record No.
16-MWφ6-φφ	SOIL	10/21/94 1345	G			TCL-ORGANICS TAL-INORGANICS		
16-MWφ6-φ6	SOIL	10/21/94 1413	G			TCL-ORGANICS TAL-INORGANICS	FOR LAB USE ONLY	
16-MWφ6-φ6D	SOIL	10/21/94 1413	G			TCL-ORGANICS TAL-INORGANICS	FOR LAB USE ONLY	
16-MWφ6-φ6MSD	SOIL	10/21/94 1413	G			TCL-ORGANICS TAL-INORGANICS	FOR LAB USE ONLY	
							FOR LAB USE ONLY	
							FOR LAB USE ONLY	
							FOR LAB USE ONLY	
							FOR LAB USE ONLY	
							FOR LAB USE ONLY	
							FOR LAB USE ONLY	
							FOR LAB USE ONLY	
							FOR LAB USE ONLY	
							FOR LAB USE ONLY	
							FOR LAB USE ONLY	
							FOR LAB USE ONLY	

COPY

Write: To accompany samples

Yellow: Field copy

*See back of form for special instructions.



INTERNATIONAL
TECHNOLOGY
CORPORATION

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD*

C.O.C. # 1605
Reference Document No. 325320
Page 1 of 1

Project Name/No. 1 CTO-274
 Sample Team Members 2
 Profit Center No. 3
 Project Manager 4 MATT BARTMAN
 Purchase Order No. 6
 Required Report Date 11 28-DAY TURN

Samples Shipment Date 7
 Lab Destination 8
 Lab Contact 9
 Project Contact/Phone 12
 Carrier/Waybill No. 13 1396601636

Bill to: 5 BAKER ENVIRONMENTAL INC
 Report to: 10 MATT BARTMAN

ONE CONTAINER PER LINE

Sample Number ¹⁴	Sample Description/Type ¹⁵	Date/Time Collected ¹⁶	Container Type ¹⁷	Sample Volume ¹⁸	Pre-servative ¹⁹	Requested Testing Program ²⁰	Condition on Receipt ²¹	Disposal Record No. ²²
16-MW05-01	Liquid	11/29/04 1146	G/P		HCL/HNO3	TOL-VOA, SVOA, REST/PCB'S TAL-TOTAL-METALS	FOR LAB USE ONLY	
16-MW05D-01	Liquid	11/29/04 1146	P		HNO3	Dissolved METALS		
16-TB-05	TRIPBANK Liquid	11/29/04 1146	G		HCL	TOL-VOA		
							FOR LAB USE ONLY	

COPY

Special Instructions: ²³

Possible Hazard Identification: ²⁴
 Non-hazard Flammable Skin Irritant Poison B Unknown

Sample Disposal: ²⁵
 Return to Client Disposal by Lab Archive _____ (mos.)

Turnaround Time Required: ²⁶
 Normal Rush 28-DAY TURN

QC Level: ²⁷
 I. II. III. Project Specific (specify): _____

1. Relinquished by ²⁸ (Signature/Affiliation) <u>Steph A. Mander</u>	Date: <u>11/29/04</u> Time: <u>1700</u>	1. Received by ²⁸ (Signature/Affiliation)	Date: _____ Time: _____
2. Relinquished by (Signature/Affiliation)	Date: _____ Time: _____	2. Received by (Signature/Affiliation)	Date: _____ Time: _____
3. Relinquished by (Signature/Affiliation)	Date: _____ Time: _____	3. Received by (Signature/Affiliation)	Date: _____ Time: _____

Comments: ²⁹

White: To accompany samples
Yellow: Field copy
* See back of form for special instructions.



**INTERNATIONAL
TECHNOLOGY
CORPORATION**

**ANALYSIS REQUEST AND
CHAIN OF CUSTODY RECORD***

C.O.C. # 16006
Reference Document 325321
Page 1 of 1

Project Name/No. 1 CTO-274
Sample Team Members 2
Profit Center No. 3
Project Manager 4 MATT BARTMAN
Purchase Order No. 6
Required Report Date 11-28-DAY TURN

Samples Shipment Date 7
Lab Destination 8
Lab Contact 9
Project Contact/Phone 12
Carrier/Waybill No. 13 B96601835

Bill to: 5 BAKER ENVIRONMENTAL INC
Report to: 10 MATT BARTMAN

ONE CONTAINER PER LINE

Sample Number ¹⁴	Sample Description/Type ¹⁵	Date/Time Collected ¹⁶	Container Type ¹⁷	Sample Volume ¹⁸	Pre-servative ¹⁹	Requested Testing Program ²⁰	Condition on Receipt ²¹	Disposal Record No. ²²
16-MW03-01	Liquid	11/29/94 1800	G/P		HCL	TCL-ORGANICS TAL-TOTAL-METALS	FOR LAB USE ONLY	
16-MW03D-01	Liquid	11/29/94 1800	P		HNO3	TAL-Dissolved METALS		
16-MW02-01	Liquid	11/29/94 1800	G/P		HCL	TCL-ORGANICS TAL-TOTAL-METALS		
16-MW02D-01	Liquid	11/30/94 1745	P		HNO3	TAL-Dissolved METALS		
16-MW06-01	Liquid	11/30/94 1005	G		HCL	TCL-VOA	FOR LAB USE ONLY	
16-MW06-01D	Liquid	11/30/94 1005	G		HCL	TCL-VOA		
16-TB-06	Liquid	11/30/94 1600	G		HCL	TCL-VOA-TRIETHANOL		

Special Instructions: ²³

Possible Hazard Identification: ²⁴

Non-hazard Flammable Skin Irritant Poison B Unknown

Sample Disposal: ²⁵

Return to Client Disposal by Lab Archive _____ (mos.)

Turnaround Time Required: ²⁶

Normal Rush 28-DAY TURN

QC Level: ²⁷

I. II. III. Project Specific (specify):

1. Relinquished by ²⁸
(Signature/Affiliation) [Signature]

Date: 11/30/94
Time: 1700

1. Received by ²⁸
(Signature/Affiliation)

Date: _____
Time: _____

2. Relinquished by
(Signature/Affiliation)

Date: _____
Time: _____

2. Received by
(Signature/Affiliation)

Date: _____
Time: _____

3. Relinquished by
(Signature/Affiliation)

Date: _____
Time: _____

3. Received by
(Signature/Affiliation)

Date: _____
Time: _____

Comments: ²⁹

White: To accompany samples

Yellow: Field copy

* See back of form for special instructions.



ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD*

C.O.C#16007
Reference Document No. 325322
Page 1 of 1

Project Name/No. ¹ CTO-274 Samples Shipment Date ⁷ 11/30/94
 Sample Team Members ² _____ Lab Destination ⁸ _____
 Profit Center No. ³ _____ Lab Contact ⁹ _____
 Project Manager ⁴ MAT EARTMAN Project Contact/Phone ¹² _____
 Purchase Order No. ⁶ _____ Carrier/Waybill No. ¹³ 1396601835
 Required Report Date ¹¹ 28-DAY TURN

Bill to: ⁵ BAKER ENVIRONMENTAL
 Report to: ¹⁰ MAT EARTMAN

ONE CONTAINER PER LINE

Sample Number ¹⁴	Sample Description/Type ¹⁵	Date/Time Collected ¹⁶	Container Type ¹⁷	Sample Volume ¹⁸	Pre-servative ¹⁹	Requested Testing Program ²⁰	Condition on Receipt ²¹	Disposal Record No. ²²
16-MW06-01	LIQUID	11/30/94 1005	G/P		H202	TCL-SUA, Pest/PCB's TAL-TOTAL-METALS	* METALS PROVIDED	
16-MW06D-01	LIQUID	11/30/94 1005	P		H202	DISSOLVED METALS	* METALS PROVIDED	
16-MW06-01D	LIQUID	11/30/94 1005	G/P		H202	TCL-SUA, Pest/PCB's TAL-TOTAL-METALS		
16-MW06D-01D	LIQUID	11/30/94 1005	P		H202	DISSOLVED METALS		
COPY								
FOR LAB USE ONLY								

Special Instructions: ²³ _____

Possible Hazard Identification: ²⁴ Non-hazard Flammable Skin Irritant Poison B Unknown

Sample Disposal: ²⁵ Return to Client Disposal by Lab Archive _____ (mos.)

Turnaround Time Required: ²⁶ Normal Rush 28-DAY TURN

QC Level: ²⁷ I. II. III. Project Specific (specify): _____

1. Relinquished by ²⁸ <u>[Signature]</u> (Signature/Affiliation)	Date: <u>11/29/94</u> Time: <u>1700</u>	1. Received by ²⁸ _____ (Signature/Affiliation)	Date: _____ Time: _____
2. Relinquished by _____ (Signature/Affiliation)	Date: _____ Time: _____	2. Received by _____ (Signature/Affiliation)	Date: _____ Time: _____
3. Relinquished by _____ (Signature/Affiliation)	Date: _____ Time: _____	3. Received by _____ (Signature/Affiliation)	Date: _____ Time: _____

Comments: ²⁹ _____

White: To accompany samples
Yellow: Field copy
Blue: Back of unit in special issue books



INTERNATIONAL
TECHNOLOGY
CORPORATION

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD *

C.O.C. # 16008 Cooler #1
Reference Document # 325324
Page 1 of ____

Project Name/No. ¹ CO-274 Samples Shipment Date ⁷ 12/1/04
 Sample Team Members ² _____ Lab Destination ⁸ _____
 Profit Center No. ³ _____ Lab Contact ⁹ _____
 Project Manager ⁴ MATT BARTMAN Project Contact/Phone ¹² _____
 Purchase Order No. ⁶ _____ Carrier/Waybill No. ¹³ 1396601846
 Required Report Date ¹¹ 28 DAY TURN

Bill to: ⁵ BAKER ENVIRONMENTAL INC.
 Report to: ¹⁰ MATT BARTMAN

ONE CONTAINER PER LINE

Sample Number ¹⁴	Sample Description/Type ¹⁵	Date/Time Collected ¹⁶	Container Type ¹⁷	Sample Volume ¹⁸	Pre-servative ¹⁹	Requested Testing Program ²⁰	Condition on Receipt ²¹	Disposal Record No. ²²
16-MW04-01	Liquid	11/30/04 1549	G		HCL	TCL-VOA	FOR LAB USE ONLY	
16-MW01-01	Liquid	11/30/04 1725	G		HCL	TCL-VOA		
16-RS-04	RINSATE 2" PUMP	11/30/04 115	G		HCL	TCL-VOA		
16-RS-05	RINSATE PUMP DISCHARGE LINE	12/1/04 0730	G		HCL	TCL-VOA		
							FOR LAB USE ONLY	

COPY

Special Instructions: ²³ Note TRIP BLANK 7TB-08 is the TRIP BLANK FOR COOLER # 1

Possible Hazard Identification: ²⁴ Non-hazard Flammable Skin Irritant Poison B Unknown Sample Disposal: ²⁵ Return to Client Disposal by Lab Archive _____ (mos.)

Turnaround Time Required: ²⁶ Normal Rush 28 DAY TURN QC Level: ²⁷ I. II. III. Project Specific (specify): _____

1. Relinquished by ²⁸ (Signature/Affiliation) <u>[Signature]</u>	Date: <u>12/1/04</u> Time: <u>1700</u>	1. Received by ²⁸ (Signature/Affiliation) _____	Date: _____ Time: _____
2. Relinquished by (Signature/Affiliation) _____	Date: _____ Time: _____	2. Received by (Signature/Affiliation) _____	Date: _____ Time: _____
3. Relinquished by (Signature/Affiliation) _____	Date: _____ Time: _____	3. Received by (Signature/Affiliation) _____	Date: _____ Time: _____

Comments: ²⁹ _____

Write: To accompany samples
Yellow: Field copy
* See back of form for special instructions.



INTERNATIONAL
TECHNOLOGY
CORPORATION

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD*

C.O.C. # 16009 Order # 2
Reference Document No. 325326
Page 1 of 1

Project Name/No. ¹ CTO-274
Sample Team Members ²
Profit Center No. ³
Project Manager ⁴ MATT BARTMAN
Purchase Order No. ⁶
Required Report Date ¹¹ 28 DAY TURN
Samples Shipment Date ⁷ 12/1/94
Lab Destination ⁸
Lab Contact ⁹
Project Contact/Phone ¹²
Carrier/Waybill No. ¹³ 1396601846

Bill to: ⁵ BAKER ENVIRONMENTAL INC
Report to: ¹⁰ MATT BARTMAN

ONE CONTAINER PER LINE

Sample Number ¹⁴	Sample Description/Type ¹⁵	Date/Time Collected ¹⁶	Container Type ¹⁷	Sample Volume ¹⁸	Pre-servative ¹⁹	Requested Testing Program ²⁰	Condition on Receipt ²¹	Disposal Record No. ²²
16-MWΦ4-01	Liquid	11/30/94/1545	6/P		H ₂ O ₂	TCL-ORGANICS TAL-TOTAL METALS	FOR LAB USE ONLY	
16-MWΦ4D-01		11/30/94/1545	P			Dissolved METALS		
16-MWΦ1-01		11/30/94/1725	6/P			TCL-ORGANICS TAL-TOTAL METALS		
16-MWΦ1D-01		11/30/94/1725	P			Dissolved METALS		
16-RS-04	RinSate Pump	11/30/94/1615	6/P			TCL-ORGANICS TAL-TOTAL METALS	FOR LAB USE ONLY	
16-RSD-04	"	11/30/94/1615	P			Dissolved METALS		
16-RS-05	RinSate Pump Discharge Tube	12/1/94/0730	6/P			TCL-ORGANICS TAL-TOTAL METALS	" HOLD DO NOT ANALYZE "	
16-RSD-05	"	12/1/94/0730	P			Dissolved METALS		

COPY

Special Instructions: ²³

Possible Hazard Identification: ²⁴

Non-hazard Flammable Skin Irritant Poison B Unknown

Sample Disposal: ²⁵

Return to Client Disposal by Lab Archive _____ (mos.)

Turnaround Time Required: ²⁶

Normal Rush

QC Level: ²⁷

I. II. III. Project Specific (specify): _____

1. Relinquished by ²⁸
(Signature/Affiliation)

Matt Monday

Date: 12/1/94
Time: 1700

1. Received by ²⁸
(Signature/Affiliation)

Date: _____
Time: _____

2. Relinquished by
(Signature/Affiliation)

Date: _____
Time: _____

2. Received by
(Signature/Affiliation)

Date: _____
Time: _____

3. Relinquished by
(Signature/Affiliation)

Date: _____
Time: _____

3. Received by
(Signature/Affiliation)

Date: _____
Time: _____

Comments: ²⁹

White: To accompany samples

Yellow: Field copy

* See back of form for special instructions.

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD*

cooler 1

C.O.C. # 160
Reference Document No. 1242
Page 1 of 1

Project Name/No. 1 CTO-274
Sample Team Members 2
Profit Center No. 3
Project Manager 4 MATT BARTMAN
Purchase Order No. 6
Required Report Date 11

Samples Shipment Date 7 2/16/95
Lab Destination 8
Lab Contact 9
Project Contact/Phone 12
Carrier/Waybill No. 13 139 66 01 894

Bill to: 5 BAKER ENVIRONMENTAL INC
420 ROYSEY RD
CARROLLS, PA 15108
412-269-6000
Report to: 10 MATT BARTMAN

ONE CONTAINER PER LINE

Sample Number ¹⁴	Sample Description/Type ¹⁵	Date/Time Collected ¹⁶	Container Type ¹⁷	Sample Volume ¹⁸	Pre-ervative ¹⁹	Requested Testing Program ²⁰	Condition on Receipt ²¹	Disposal Record No. ²²
16-MW01-02	Liquid	2/3/95/1615	6/P		HCL/HNO3	TCL-ORGANICS TAL-INORGANICS	FOR LAB USE ONLY	
16-MW02-02		2/3/95/1325	6/P					
16-MW03-02		2/3/95/1520						
16-MW04-02		2/3/95/1705					FOR LAB USE ONLY	
16-MW05-02		2/4/95/0915						
16-MW06-02		2/4/95/0910						
16-RS-15	RESIDUE FROM COMP	2/4/95/0920						
16-TB-15		2/4/95/1000			HCL	TCL-ORGANICS		

Special Instructions: ²³

Possible Hazard Identification: ²⁴

Non-hazard Flammable Skin Irritant Poison B Unknown

Sample Disposal: ²⁵

Return to Client Disposal by Lab Archive (mos.)

Turnaround Time Required: ²⁶

Normal Rush

QC Level: ²⁷

I. II. III. Project Specific (specify):

1. Relinquished by: ²⁸
(Signature/Affiliation)

Date: _____
Time: _____

1. Received by ²⁸
(Signature/Affiliation)

Date: _____
Time: _____

2. Relinquished by
(Signature/Affiliation)

Date: _____
Time: _____

2. Received by
(Signature/Affiliation)

Date: _____
Time: _____

3. Relinquished by
(Signature/Affiliation)

Date: _____
Time: _____

3. Received by
(Signature/Affiliation)

Date: _____
Time: _____

Comments: ²⁹

NO - out coolers TOTAL, COOLER HAS ALL VOA SAMPLES, PLUS TRIP BLANK

White: To accompany samples

Yellow: Field copy

* See back of form for special instructions.



**INTERNATIONAL
TECHNOLOGY
CORPORATION**

**ANALYSIS REQUEST AND
CHAIN OF CUSTODY RECORD ***

COE # 70015
Reference Document No. 388474
Page 1 of 1

Project Name/No. ¹ CTO-0274
Sample Team Members ² _____
Profit Center No. ³ _____
Project Manager ⁴ M. Bartman
Purchase Order No. ⁶ _____
Required Report Date ¹¹ 28 day turn

Samples Shipment Date ⁷ 6-27-94
Lab Destination ⁸ Knoxville
Lab Contact ⁹ Sheree Schneider
Project Contact/Phone ¹² 615-588-6401
Carrier/Waybill No. ¹³ Fed Ex #1396784782

Bill to: ⁵ Baker Environmental
Report to: ¹⁰ _____

ONE CONTAINER PER LINE

Sample Number ¹⁴	Sample Description/Type ¹⁵	Date/Time Collected ¹⁶	Container Type ¹⁷	Sample Volume ¹⁸	Preservative ¹⁹	Requested Testing Program ²⁰	Condition on Receipt ²¹	Disposal Record No. ²²
16-NC-SW01	Aqueous	6-27-94/0842	P		HNO ₃	TAL-metals	FOR LAB USE ONLY	
16-NC-SW03	Aqueous	6-26-94/1555	P, G		HNO ₃	TAL-SW01, TAL-metals TSP Post/PCB		
16-NC-SW05	Aqueous	6-26-94/1415	P, G		HNO ₃	TAL-SW01, TAL-metals TAL-Post/PCB		
17-NC-SW04-06	Solid	6-26-94/1040	P		—	Grain Size		
							FOR LAB USE ONLY	

COPY

Special Instructions: ²³

Possible Hazard Identification: ²⁴

Non-hazard Flammable Skin Irritant Poison B Unknown

Sample Disposal: ²⁵

Return to Client Disposal by Lab Archive 6 (mos.)

Turnaround Time Required: ²⁶

Normal Rush

QC Level: ²⁷

I. II. III. Project Specific (specify): _____

1. Relinquished by ²⁸
(Signature/Affiliation)

[Signature]

Date: 6-27-94
Time: 1700

1. Received by ²⁸
(Signature/Affiliation)

Date: _____
Time: _____

2. Relinquished by
(Signature/Affiliation)

Date: _____
Time: _____

2. Received by
(Signature/Affiliation)

Date: _____
Time: _____

3. Relinquished by
(Signature/Affiliation)

Date: _____
Time: _____

3. Received by
(Signature/Affiliation)

Date: _____
Time: _____

Comments: ²⁹

Write: To accompany samples

Yellow: Field copy

*See back of form for special instructions.



ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD*

COC# 70016

Reference Document No. 388461
Page 1 of 1

Project Name/No. 1 CTO-0274
Sample Team Members 2
Profit Center No. 3
Project Manager 4 M. Bartman
Purchase Order No. 6
Required Report Date 11 120 day turn

Samples Shipment Date 7 6-27-94
Lab Destination 8 Knoxville
Lab Contact 9 Sherree Schneider
Project Contact/Phone 12 615-588-6401
Carrier/Waybill No. 13 Fed Ex # 1396784782

Bill to: 5 Baker Environmental

Report to: 10

ONE CONTAINER PER LINE

Sample Number ¹⁴	Sample Description/Type ¹⁵	Date/Time Collected ¹⁶	Container Type ¹⁷	Sample Volume ¹⁸	Pre-servative ¹⁹	Requested Testing Program ²⁰	Condition on Receipt ²¹	Disposal Record No. ²²
7-NC-SW03	Aqueous	6-26-94/1130	P, G		H ₂ O ₂	TCL-SU04, TAL metals TCL-Post/PCB	FOR LAB USE ONLY	
7-NC-SW02	Aqueous	6-26-94/1210	P, G		H ₂ O ₂	TCL-SU04, TAL metals TCL-Post/PCB		
16-NC-S003-06	Solid	6-26-94/1600	P		-	Grain Size	FOR LAB USE ONLY	
16-NC-S005-08	Solid	6-26-94/1430	P		-	Grain Size		

COPY

Special Instructions: ²³

Possible Hazard Identification: ²⁴

Non-hazard Flammable Skin Irritant Poison B Unknown

Sample Disposal: ²⁵

Return to Client Disposal by Lab Archive 6 (mos.)

Turnaround Time Required: ²⁶

Normal Rush

QC Level: ²⁷

I. II. III. Project Specific (specify): _____

1. Relinquished by ²⁸

(Signature/Affiliation)

[Signature]

Date: 6-27-94

Time: 1700

1. Received by ²⁸

(Signature/Affiliation)

Date: _____

Time: _____

2. Relinquished by

(Signature/Affiliation)

Date: _____

Time: _____

2. Received by

(Signature/Affiliation)

Date: _____

Time: _____

3. Relinquished by

(Signature/Affiliation)

Date: _____

Time: _____

3. Received by

(Signature/Affiliation)

Date: _____

Time: _____

Comments: ²⁹

White: To accompany samples

Yellow: Field copy

* See back of form for special instructions.



INTERNATIONAL
TECHNOLOGY
CORPORATION

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD*

LOC # 70018

Reference Document No. 388463

Page 1 of 1

Project Name/No. 1 270-0274
 Sample Team Members 2
 Profit Center No. 3
 Project Manager 4 M. Bartman
 Purchase Order No. 6
 Required Report Date 11 20 day turn

Samples Shipment Date 7 6-27-94
 Lab Destination 8 Knoxville
 Lab Contact 9 Sherree Schneider
 Project Contact/Phone 12 615-588-6401
 Carrier/Waybill No. 13 Fed ex # 1396784702

Bill to: 5 Baker Environmental
 Report to: 10

ONE CONTAINER PER LINE

Sample Number ¹⁴	Sample Description/Type ¹⁵	Date/Time Collected ¹⁶	Container Type ¹⁷	Sample Volume ¹⁸	Pre-servative ¹⁹	Requested Testing Program ²⁰	Condition on Receipt ²¹	Disposal Record No. ²²
16-NC-SW04D	Aqueous	6-26-94/1502	P.G		HNO ₃	TCL-SUOM, TAL-metals TCL-Post/PCB	FOR LAB USE ONLY	
17-NC-SW04D	Aqueous	6-26-94/1005	P.G		HNO ₃	TCL-SUOM, TAL-metals TCL-Post/PCB		
16-NC-SD01-06	Solid	6-27-94/0852	P		-	Grain Size	FOR LAB USE ONLY	
16-NC-SD02-06	Solid	6-27-94/0807	P		-	Grain Size		

COPY

Special Instructions: ²³

Possible Hazard Identification: ²⁴

Non-hazard Flammable Skin Irritant Poison B Unknown

Sample Disposal: ²⁵

Return to Client Disposal by Lab Archive 6 (mos.)

Turnaround Time Required: ²⁶

Normal Rush

QC Level: ²⁷

I. II. III.

Project Specific (specify):

1. Relinquished by ²⁸

(Signature/Affiliation)

[Signature]

Date: 6-27-94

Time: 1700

1. Received by ²⁸

(Signature/Affiliation)

Date: _____

Time: _____

2. Relinquished by

(Signature/Affiliation)

Date: _____

Time: _____

2. Received by

(Signature/Affiliation)

Date: _____

Time: _____

3. Relinquished by

(Signature/Affiliation)

Date: _____

Time: _____

3. Received by

(Signature/Affiliation)

Date: _____

Time: _____

Comments: ²⁹

White: To accompany samples

Yellow: Field copy

*See back of form for special instructions.



**INTERNATIONAL
TECHNOLOGY
CORPORATION**

**ANALYSIS REQUEST AND
CHAIN OF CUSTODY RECORD***

COE# 700189
Reference Document No. 388464
Page 1 of 1

Project Name/No. ¹ CTO-0274
Sample Team Members ² _____
Profit Center No. ³ _____
Project Manager ⁴ M. Bartman
Purchase Order No. ⁶ _____
Required Report Date ¹¹ 28 days turn

Samples Shipment Date ⁷ 6-27-94
Lab Destination ⁸ Knoxville
Lab Contact ⁹ Shere Schneider
Project Contact/Phone ¹² 615-588-6401
Carrier/Waybill No. ¹³ Fed ex # 1396784782

Bill to: ⁵ Baker Environmental
Report to: ¹⁰ _____

ONE CONTAINER PER LINE

Sample ¹⁴ Number	Sample ¹⁵ Description/Type	Date/Time ¹⁶ Collected	Container ¹⁷ Type	Sample ¹⁸ Volume	Pre- ¹⁹ servative	Requested Testing ²⁰ Program	Condition on ²¹ Receipt	Disposal ²² Record No.
7-UC-SW04	Aqueous	6-26-94/1005	P.G.		H2O3	TCL-SWA, TCL-Post/PCB TAL-Metals	FOR LAB USE ONLY	
16-FA02	Aqueous	6-27-94/1515	P.G.		H2O3	TCL-SWA, TAL-Metals TCL-Post/PCB		
COPY								
FOR LAB USE ONLY								

Special Instructions: ²³ MIS/MSD on 7-UC-SW04 (TCL-SWA, TCL-Post/PCB, TAL-Metals)
Possible Hazard Identification: ²⁴
Non-hazard Flammable Skin Irritant Poison B Unknown
Sample Disposal: ²⁵
Return to Client Disposal by Lab Archive 6 (mos.)
Turnaround Time Required: ²⁶
Normal Rush
QC Level: ²⁷
I. II. III. Project Specific (specify): _____

1. Relinquished by ²⁸ (Signature/Affiliation) <u>for wheel</u>	Date: <u>6-27-94</u> Time: <u>1700</u>	1. Received by ²⁸ (Signature/Affiliation)	Date: _____ Time: _____
2. Relinquished by (Signature/Affiliation)	Date: _____ Time: _____	2. Received by (Signature/Affiliation)	Date: _____ Time: _____
3. Relinquished by (Signature/Affiliation)	Date: _____ Time: _____	3. Received by (Signature/Affiliation)	Date: _____ Time: _____

Comments: ²⁹ _____

Write: To accompany samples
Yellow: Field copy
* See back of form for special instructions.



ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD *

Reference Document No. 100 70020
Page 1 of 2

P. 3

Project Name/No. 1 CTO-6274
Sample Team Members 2
Profit Center No. 3
Project Manager 4 M. Bartman
Purchase Order No. 6
Required Report Date 11 20 day from

Samples Shipment Date 7 6-27-94
Lab Destination 8 Knoxville
Lab Contact 9 Sherie Schneider
Project Contact/Phone 12 615-588-6401
Carrier/Waybill No. 13 FedEx # 1396784782

Bill to: 5 Baker Environmental
Report to: 10

ONE CONTAINER PER LINE

Sample ¹⁴ Number	Sample ¹⁵ Description/Type	Date/Time ¹⁶ Collected	Container ¹⁷ Type	Sample ¹⁸ Volume	Pre- ¹⁹ servative	Requested Testing ²⁰ Program	Condition on ²¹ Receipt	Disposal ²² Record No.
16-EA01-	Aqueous	6-26-94/1730	G		HCL	TLL-V01A	FOR LAB USE ONLY	
16-NC-SW03	Aqueous	6-26-94/1555	G		HCL	TLL-V01A		
16-NC-SW02	Aqueous	6-27-94/1800	G		HCL	TLL-V01A		
7-NC-SW03	Aqueous	6-26-94/1130	G		HCL	TLL-V01A		
16-EA02	Aqueous	6-27-94/1515	G		HCL	TLL-V01A	FOR LAB USE ONLY	
16-NC-SW05	Aqueous	6-26-94/1415	G		HCL	TLL-V01A		
16-NC-SW01	Aqueous	6-27-94/0842	G		HCL	TLL-V01A		
7-NC-SW02	Aqueous	6-26-94/1210	G		HCL	TLL-V01A		

Special Instructions: 23

Possible Hazard Identification: 24
 Non-hazard Flammable Skin Irritant Poison B Unknown

Sample Disposal: 25
 Return to Client Disposal by Lab Archive 6 (mos.)

Turnaround Time Required: 26
 Normal Rush

QC Level: 27
 I. II. III. Project Specific (specify): _____

1. Relinquished by ²⁸ (Signature/Affiliation) <u>[Signature]</u> Date: <u>6-27-94</u> Time: <u>1700</u>	1. Received by ²⁸ (Signature/Affiliation) _____ Date: _____ Time: _____
2. Relinquished by (Signature/Affiliation) _____ Date: _____ Time: _____	2. Received by (Signature/Affiliation) _____ Date: _____ Time: _____
3. Relinquished by (Signature/Affiliation) _____ Date: _____ Time: _____	3. Received by (Signature/Affiliation) _____ Date: _____ Time: _____

Comments: 29
Sampler aware of air bubbles in some vials

C7111CHNIC 047 001

White: To accompany samples
Yellow: Field copy

* See back of C7111 for specimen details



ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD (cont.)*

Reference Document No. ³⁰ 20170020
Page 2 of 2

Project Name

Project No. CTO-6274

Samples Shipment Date 6-27-94

ONE CONTAINER PER LINE

Sample 14 Number	Sample 15 Description/Type	Date/Time 16 Collected	Container 17 Type	Sample 18 Volume	Pre-19 servative	Requested Testing 20 Program	Condition on 21 Receipt	Disposal 22 Record No.
7-NC-5W04	Aqueous	6-26-94/1005	G		HCL	TLL-U011 ✓		
7-NC-5W04D	Aqueous	6-26-94/1005	G		HCL	TLL-U011 ✓	FOR LAB USE ONLY	
7-TB05	Aqueous	6-27-94	G		HCL	TLL-U011 ✓	FOR LAB USE ONLY	
16-NC-5W04	Aqueous	6-26-94/1502	G		HCL	TLL-U011 ✓	FOR LAB USE ONLY	
16-NC-5W04	Aqueous	6-26-94/1502	G		HCL	TLL-U011 ✓	FOR LAB USE ONLY	
7-NC-SD02-06	Aqueous	6-26-94/1227	P		-	Grain Size		
7-NC-SD03-06	Aqueous	6-26-94/1145	P		-	Grain Size		
COPY								
							FOR LAB USE ONLY	
							FOR LAB USE ONLY	
							FOR LAB USE ONLY	
							FOR LAB USE ONLY	
							FOR LAB USE ONLY	
							FOR LAB USE ONLY	
							FOR LAB USE ONLY	
							FOR LAB USE ONLY	

White: To accompany samples
Yellow: Field copy
*See back of form for special instructions



INTERNATIONAL
TECHNOLOGY
CORPORATION

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD (cont.)*

Reference Document No. 30
Page 2 of 2

Project Name _____

Project No. CTO-6774

Samples Shipment Date 6-27-94

600 + 70021

600 + 70021

ONE CONTAINER PER LINE

Sample 14 Number	Sample 15 Description/Type	Date/Time 16 Collected	Container 17 Type	Sample 18 Volume	Pre-19 servative	Requested Testing 20 Program	Condition on 21 Receipt	Disposal 22 Record No.
7-NC-SD04-612	Solid	6-26-94/1030	G	-	+	TLL-Organics TAL-metals		
16-NC-SD04-06	Solid	6-26-94/1527	G		-	TLL-VCM	FOR LAB USE ONLY	
16-NC-SD04-06D	Solid	6-26-94/1527	G		-	TLL-VCM		
16-NC-SD04-612	Solid	6-26-94/1525	G		-	TLL-VCM	FOR LAB USE ONLY	
16-NC-SD02-06	Solid	6-27-94/0807	G		-	TLL-Organics, PCB TAL-metals		
16-NC-SD02-612	Solid	6-27-94/0805	G		-	TLL-Organics TAL-metals	FOR LAB USE ONLY	
16-NC-SD01-06	Solid	6-27-94/0852	G		-	TLL-Organics, PCB TAL-metals		
16-NC-SD01-612	Solid	6-27-94/0850	G		-	TLL-Organics TAL-metals	FOR LAB USE ONLY	
7-NC-SD02-06	Solid	6-26-94/1027	G		-	TLL-Organics, PCB TAL-metals		
7-NC-SD02-612	Solid	6-26-94/1227	G		-	TLL-Organics TAL-metals	FOR LAB USE ONLY	
4-TB-06	Aqueous	6-27-94	G		-	TLL-VCM		
							FOR LAB USE ONLY	
							FOR LAB USE ONLY	
							FOR LAB USE ONLY	
							FOR LAB USE ONLY	

COPY

MS/MSD on 16-NC-SD04-06 (TLL-VCM)

White: To accompany samples
Yellow: Field copy
* See back of form for special instructions.



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TECHNOLOGY
CORPORATION

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD*

C.O.C. 7013 C) R #2.
Reference Document No. 32533
Page 1 of 1

Project Name/No. 1 CTO-274 Samples Shipment Date 7 12/3/04
 Sample Team Members 2 _____ Lab Destination 8 _____
 Profit Center No. 3 _____ Lab Contact 9 _____
 Project Manager 4 _____ Project Contact/Phone 12 _____
 Purchase Order No. 6 _____ Carrier/Waybill No. 13 139660625
 Required Report Date 11 7 DAY TURN.

Bill to: 5 BAKER ENVIRONMENTAL
 Report to: 10 MAT BARTMAN

ONE CONTAINER PER LINE

Sample Number 14	Sample Description/Type 15	Date/Time Collected 16	Container Type 17	Sample Volume 18	Pre-servative 19	Requested Testing Program 20	Condition on Receipt 21	Disposal Record No. 22
16-TK-01	Liquid	12/3/04/0916	6/P		HCL/HAZ	TCL-ORGANICS TAL-INORGANICS	FOR LAB USE ONLY	
7-TK-01	Liquid	12/3/04/0950	6/P		HCL/HAZ	TCL-ORGANICS TAL-INORGANICS		
3-RB-01	Liquid	12/3/04/1230	6			TCL-PCBS TCLP-ORGANICS/INORGANICS RCRA-HAZ CHARACTERISTICS		
							FOR LAB USE ONLY	

COPY

Special Instructions: 23 NOTE! 7-DAY TURN AROUND TIME

Possible Hazard Identification: 24
 Non-hazard Flammable Skin Irritant Poison B Unknown
 Sample Disposal: 25
 Return to Client Disposal by Lab Archive _____ (mos.)

Turnaround Time Required: 26
 Normal Rush 7-DAY TURN.
 QC Level: 27
 I. II. III. Project Specific (specify): _____

1. Relinquished by 28 (Signature/Affiliation) <u>[Signature]</u>	Date: <u>12/19/04</u> Time: <u>1300</u>	1. Received by 28 (Signature/Affiliation)	Date: _____ Time: _____
2. Relinquished by (Signature/Affiliation)	Date: _____ Time: _____	2. Received by (Signature/Affiliation)	Date: _____ Time: _____
3. Relinquished by (Signature/Affiliation)	Date: _____ Time: _____	3. Received by (Signature/Affiliation)	Date: _____ Time: _____

Comments: 29 _____

APPENDIX B.2
INTERNAL TRACKING FORMS

CTO-0274
SITE 16, SOIL BORINGS

DATE SHIPPED	SAMPLE ID	Analysis Requested								Analysis Received								DATE EXPECTED	DATE RECD	TURNAROUND TIME	SDG NO.	COMMENTS
		organics					Eng. P			organics					Eng. P.							
		TCL VOA	TCL SVOA	TCL PEST/PCB	TAL METALS	TAL METALS (D)	ATTERBURG LIMITS	GRAIN SIZE	TOC	TCL VOA	TCL SVOA	TCL PEST/PCB	TAL METALS	TAL METALS (D)	ATTERBURG LIMITS	GRAIN SIZE	TOC					
10/18/94	16-SDA-SB01-00	x	x	x	x					x	x	x	x				11/23/94	11/21/94	33	1705		
10/18/94	16-SDA-SB01-02	x	x	x	x					x	x	x	x				11/23/94	11/21/94	33	1705		
10/18/94	16-BD-SB16-00	x	x	x	x					x	x	x	x				11/23/94	11/21/94	33	1705		
10/18/94	16-BD-SB16-05	x	x	x	x					x	x	x	x				11/23/94	11/21/94	33	1705		
10/18/94	16-BD-SB16-05D	x	x	x	x					x	x	x	x				11/23/94	11/21/94	33	1705		
10/18/94	16-SDA-SB02-00	x	x	x	x					x	x	x	x				11/23/94	11/21/94	33	1705		
10/18/94	16-SDA-SB02-02	x	x	x	x					x	x	x	x				11/23/94	11/21/94	33	1705		
10/18/94	16-BD-SB11-00	x	x	x	x					x	x	x	x				11/23/94	11/21/94	33	1705		
10/18/94	16-BD-SB11-06	x	x	x	x					x	x	x	x				11/23/94	11/21/94	33	1705		
10/18/94	16-MW01-01	x	x	x	x					x	x	x	x				11/23/94	11/21/94	33	1705		
10/18/94	16-MW01-04	x	x	x	x					x	x	x	x				11/23/94	11/21/94	33	1705		
10/18/94	16-BD-SB09-00	x	x	x	x					x	x	x	x				11/23/94	11/21/94	33	1705		
10/18/94	16-BD-SB09-05	x	x	x	x					x	x	x	x				11/23/94	11/21/94	33	1705		
10/18/94	274-FB-01	x	x	x	x					x	x	x	x				11/23/94	11/21/94	33	1705		
10/18/94	274-FB-02	x	x	x	x					x	x	x	x				11/23/94	11/21/94	33	1705		
10/18/94	16-RS-01	x	x	x	x					x	x	x	x				11/23/94	11/21/94	33	1705		
10/18/94	16-TB-01	x								x							11/23/94	11/21/94	33	1705		
10/19/94	16-SDA-SB03-00	x	x	x	x					x	x	x	x				11/24/94	11/22/94	33	1706		
10/19/94	16-SDA-SB03-02	x	x	x	x					x	x	x	x				11/24/94	11/22/94	33	1706		
10/19/94	16-SDA-SB04-00	x	x	x	x					x	x	x	x				11/24/94	11/22/94	33	1706	MS/MSD	
10/19/94	16-SDA-SB04-00D	x	x	x	x					x	x	x	x				11/24/94	11/22/94	33	1706		
10/19/94	16-SDA-SB04-02	x	x	x	x					x	x	x	x				11/24/94	11/22/94	33	1706		
10/19/94	16-BD-SB10-00	x	x	x	x					x	x	x	x				11/24/94	11/22/94	33	1706		
10/19/94	16-BD-SB10-03	x	x	x	x					x	x	x	x				11/24/94	11/22/94	33	1706		
10/19/94	16-BD-SB10-07	x	x	x	x					x	x	x	x				11/24/94	11/22/94	33	1706		
10/19/94	16-MW03-00	x	x	x	x					x	x	x	x				11/24/94	11/22/94	33	1706		
10/19/94	16-MW03-02	x	x	x	x					x	x	x	x				11/24/94	11/22/94	33	1706		
10/19/94	16-BD-SB06-00	x	x	x	x					x	x	x	x				11/24/94	11/22/94	33	1706		

CTO-0274
SITE 16, SOIL BORINGS

DATE SHIPPED	SAMPLE ID	Analysis Requested								Analysis Received								DATE EXPECTED	DATE RECD	TURNAROUND TIME	SDG NO.	COMMENTS
		organics				Eng. P				organics				Eng. P.								
		TCL VOA	TCL SVOA	TCL PEST/PCB	TAL METALS	TAL METALS (D)	ATTERBURG LIMITS	GRAIN SIZE	TOC	TCL VOA	TCL SVOA	TCL PEST/PCB	TAL METALS	TAL METALS (D)	ATTERBURG LIMITS	GRAIN SIZE	TOC					
10/19/94	16-BD-SB06-07	x	x	x	x					x	x	x	x				11/24/94	11/22/94	33	1706		
10/19/94	16-BD-SB05-00	x	x	x	x					x	x	x	x				11/24/94	11/22/94	33	1706		
10/19/94	16-BD-SB05-07	x	x	x	x					x	x	x	x				11/24/94	11/22/94	33	1706		
10/19/94	16-BD-SB17-00	x	x	x	x					x	x	x	x				11/24/94	11/22/94	33	1706		
10/19/94	16-BD-SB17-05	x	x	x	x					x	x	x	x				11/24/94	11/22/94	33	1706		
10/19/94	16-BD-SB15-00	x	x	x	x					x	x	x	x				11/24/94	11/22/94	33	1706		
10/19/94	16-BD-SB15-06	x	x	x	x					x	x	x	x				11/24/94	11/22/94	33	1706		
10/19/94	16-BD-SB04-00	x	x	x	x					x	x	x	x				11/24/94	11/22/94	33	1706		
10/19/94	16-BD-SB04-06	x	x	x	x					x	x	x	x				11/24/94	11/22/94	33	1706		
10/19/94	16-MW04-00	x	x	x	x					x	x	x	x				11/24/94	11/22/94	33	1706		
10/19/94	16-MW04-03	x	x	x	x					x	x	x	x				11/24/94	11/22/94	33	1706		
10/19/94	16-RS-02	x	x	x	x												11/24/94		###	1706	HOLD do not analyze	
10/19/94	16-TB-02	x								x							11/24/94	11/22/94	33	1706		
10/19/94	16-BD-SB02-00	x	x	x	x					x	x	x	x				11/24/94	11/22/94	33	1706		
10/19/94	16-BD-SB02-07	x	x	x	x					x	x	x	x				11/24/94	11/22/94	33	1706		
10/19/94	16-BD-SB11-00	x	x	x	x					x	x	x	x				11/24/94	11/22/94	33	1706	MS/MSD	
10/19/94	16-BD-SB01-00D	x	x	x	x					x	x	x	x				11/24/94	11/22/94	33	1706		
10/19/94	16-BD-SB01-06	x	x	x	x					x	x	x	x				11/24/94	11/22/94	33	1706		
10/19/94	16-BD-SB14-00	x	x	x	x					x	x	x	x				11/24/94	11/22/94	33	1706		
10/20/94	16-MW02-00	x	x	x	x					x	x	x	x				11/25/94	12/13/94	53	1706		
10/20/94	16-MW02-03	x	x	x	x					x	x	x	x				11/25/94	12/13/94	53	1726		
10/20/94	16-BD-SB03-00	x	x	x	x					x	x	x	x				11/25/94	12/13/94	53	1726		
10/20/94	16-BD-SB03-07	x	x	x	x					x	x	x	x				11/25/94	12/13/94	53	1726		
10/20/94	16-BD-SB07-00	x	x	x	x					x	x	x	x				11/25/94	12/13/94	53	1726		
10/20/94	16-BD-SB07-04	x	x	x	x					x	x	x	x				11/25/94	12/13/94	53	1726		
10/20/94	16-BD-SB08-00	x	x	x	x					x	x	x	x				11/25/94	12/13/94	53	1726		
10/20/94	16-BD-SB08-06	x	x	x	x					x	x	x	x				11/25/94	12/13/94	53	1726		
10/20/94	16-BD-SB12-00	x	x	x	x					x	x	x	x				11/25/94	12/13/94	53	1726		

CTO-0274
SITE 16, SOIL BORINGS

DATE SHIPPED	SAMPLE ID	Analysis Requested								Analysis Received								DATE EXPECTED	DATE RECD	TURNAROUND TIME	SDG NO.	COMMENTS
		organics				Eng. P.				organics				Eng. P.								
		TCL VOA	TCL S.VOA	TCL PEST/PCB	TAL METALS	TAL METALS (D)	ATTERBURG LIMITS	GRAIN SIZE	TOC	TCL VOA	TCL S.VOA	TCL PEST/PCB	TAL METALS	TAL METALS (D)	ATTERBURG LIMITS	GRAIN SIZE	TOC					
10/20/94	16-BD-SB12-02	x	x	x	x					x	x	x	x				11/25/94	12/13/94	53	1726		
10/20/94	16-BD-SB13-00	x	x	x	x					x	x	x	x				11/25/94	12/13/94	53	1726		
10/20/94	16-BD-SB13-02	x	x	x	x					x	x	x	x				11/25/94	12/13/94	53	1726		
10/20/94	16-BD-SB14-05	x	x	x	x					x	x	x	x				11/25/94	12/13/94	53	1726		
10/20/94	16-BD-SB14-05D	x	x	x	x												11/25/94		###			
10/20/94	16-BB-SB03-00	x	x	x	x					x	x	x	x				11/25/94	12/13/94	53	1726		
10/20/94	16-BB-SB03-05	x	x	x	x					x	x	x	x				11/25/94	12/13/94	53	1726		
10/20/94	16-RS-03	x	x	x	x					x	x	x	x				11/25/94	12/13/94	53	1726		
10/20/94	16-BD-SB19-00	x	x	x	x					x	x	x	x				11/25/94	12/13/94	53	1726		
10/20/94	16-BD-SB19-03	x	x	x	x					x	x	x	x				11/25/94	12/13/94	53	1726		
10/20/94	16-BD-SB18-00	x	x	x	x					x	x	x	x				11/25/94	12/13/94	53	1726		
10/20/94	16-BD-SB18-06	x	x	x	x					x	x	x	x				11/25/94	12/13/94	53	1726		
10/20/94	16-BB-SB02-00	x	x	x	x					x	x	x	x				11/25/94	12/13/94	53	1726		
10/20/94	16-BB-SB02-07	x	x	x	x					x	x	x	x				11/25/94	12/13/94	53	1726		
10/20/94	16-TB-03	x															11/25/94		###			
10/21/94	16-BD-SB20-00	x	x	x	x					x	x	x	x				11/26/94	12/21/94	60	1742		
10/21/94	16-BD-SB20-06	x	x	x	x					x	x	x	x				11/26/94	12/21/94	60	1742		
10/21/94	16-BB-SB01-00	x	x	x	x					x	x	x	x				11/26/94	12/21/94	60	1742		
10/21/94	16-BB-SB01-07	x	x	x	x					x	x	x	x				11/26/94	12/21/94	60	1742		
10/21/94	16-TB-04	x								x							11/26/94	12/21/94	60	1742		
10/21/94	16-RS-04	x	x	x	x					x	x	x	x				11/26/94	12/21/94	60	1742	Hold do not analyze	
10/21/94	16-MW05-00	x	x	x	x					x	x	x	x				11/26/94	12/21/94	60	1742		
10/21/94	16-MW05-08	x	x	x	x					x	x	x	x				11/26/94	12/21/94	60	1742		
10/21/94	16-MW06-00	x	x	x	x					x	x	x	x				11/26/94	12/21/94	60	1742		
10/21/94	16-MW06-06	x	x	x	x					x	x	x	x				11/26/94	12/21/94	60	1742	MS/MSD	
10/21/94	16-MW06-06D	x	x	x	x					x	x	x	x				11/26/94	12/21/94	60	1742		
11/30/94	16-MW06-01	x	x	x	x					x	x	x	x				1/5/95	1/9/95	39	2178	MS/MSD	
11/30/94	16-MW06D-01					x							x				1/5/95	1/9/95	39	2178	MS/MSD	

**CTO-0274
SITE 16, SOIL BORINGS**

DATE SHIPPED	SAMPLE ID	Analysis Requested									Analysis Received									DATE EXPECTED	DATE RECD	TURNAROUND TIME	SDG NO.	COMMENTS
		organics				Eng. P					organics				Eng. P.									
		TCL VOA	TCL SVOA	TCL PEST/PCB	TAL METALS	TAL METALS (D)	ATTERBURG LIMITS	GRAIN SIZE	TOC	TCL VOA	TCL SVOA	TCL PEST/PCB	TAL METALS	TAL METALS (D)	ATTERBURG LIMITS	GRAIN SIZE	TOC							
11/30/94	16-MW06-01D	x	x	x	x						x	x	x	x						1/5/95	1/9/95	39	2178	
11/30/94	16-MW06D-01D					x									x					1/5/95	1/9/95	39	2178	
11/30/94	16-MW03-01	x	x	x	x						x	x	x	x						1/5/95	1/9/95	39	2178	
11/30/94	16-MW03D-01					x									x					1/5/95	1/9/95	39	2178	
11/30/94	16-MW02-01	x	x	x	x						x	x	x	x						1/5/95	1/9/95	39	2178	
11/30/94	16-MW02D-01					x									x					1/5/95	1/9/95	39	2178	
11/30/94	16-TB-06	x									x									1/5/95	1/9/95	39	2178	
																				2/5/00		0		
																				2/5/00		0		
COUNT		87	82	82	82	4	0	0	0	0	84	80	80	80	4	0	0	0	0					

C10-0274
SITE 16, MONITORING WELLS

DATE SHIPPED	SAMPLE ID	Analysis Requested					Analysis Received					DATE EXPECTED	DATE RECD	TURNAROUND TIME	SDG NO.	COMMENTS
		organics					organics									
		TCL VOA	TCL SVOA	TCL PEST/PCB	TAL METALS	TAL METALS (D)	TCL VOA	TCL SVOA	TCL PEST/PCB	TAL METALS	TAL METALS (D)					
11/29/94	16-MW05-01	x	x	x	x		x	x	x	x		1/4/95	1/9/95	40	2162	
11/29/94	16-MW05D-01					x				x		1/4/95	1/9/95	40	2162	
11/29/94	16-TB-05	x					x					1/4/95	1/9/95	40	2162	
12/1/94	16-MW04-01	x	x	x	x		x	x	x	x		1/6/95	1/11/95	40	2192	
12/1/94	16-MW04D-01					x				x		1/6/95	1/11/95	40	2192	
12/1/94	16-MW01-01	x	x	x	x		x	x	x	x		1/6/95	1/11/95	40	2192	
12/1/94	16-MW01D-01					x				x		1/6/95	1/11/95	40	2192	
12/1/94	16-RS-04	x	x	x	x		x	x	x	x		1/6/95	1/11/95	40	2192	
12/1/94	16-RSD-04					x				x		1/6/95	1/11/95	40	2192	
12/1/94	16-RS-05	x	x	x	x							1/6/95	1/11/95	40	2192	HOLD Do not analyze
12/1/94	16-RSD-05					x						1/6/95	1/11/95	40	2192	HOLD Do not analyze
														0		
														0		
COUNT		6	5	5	5	5	0	5	4	4	4	4	4	0		

CTO-0274
Site 16 - Surface Water

DATE SHIPPED	SAMPLE ID	Analysis Requested					Analysis Received					DATE EXPECTED	DATE RECD	TURNAROUND TIME	SDG NO.	COMMENTS
		organics		TCL PEST/PCB	TAL METALS	TAL METALS (D)	organics		TCL PEST/PCB	TAL METALS	TAL METALS (D)					
		TCL VOA	TCL SVOA										TCL VOA	TCL SVOA		
6/27/94	16-ER01	x	x	x	x		x	x	x	x		8/2/94	8/3/94	36	7NCSD	
6/27/94	16-NC-SW01	x	x	x	x		x	x	x	x		8/2/94	8/3/94	36	7NCSD	
6/27/94	16-NC-SW02	x	x	x	x		x	x	x	x		8/2/94	8/3/94	36	7NCSD	
6/27/94	16-NC-SW03	x	x	x	x		x	x	x	x		8/2/94	8/3/94	36	7NCSD	
6/27/94	16-NC-SW05	x	x	x	x		x	x	x	x		8/2/94	8/3/94	36	7NCSD	
6/27/94	16-NC-SW04	x	x	x	x		x	x	x	x		8/2/94	8/3/94	36	7NCSD	
6/27/94	16-NC-SW04D		x	x	x			x	x	x		8/2/94	8/3/94	36	7NCSD	
6/27/94	16-ER02	x	x	x	x		x	x	x	x		8/2/94	8/3/94	36	7NCSD	
COUNT		7	8	8	8	0	0	7	8	8	8	0	0			

CTO-0274
Site 16 - Sediment

DATE SHIPPED	SAMPLE ID	Analysis Requested									Analysis Received									DATE EXPECTED	DATE RECD	TURNAROUND TIME	SDG NO.	COMMENTS
		organics					Eng. P.				organics					Eng. P.								
		TCL VOA	TCL SVOA	TCL PEST/PCB	TAL METALS	TAL METALS (D)	ATTERBURG LIMITS	GRAIN SIZE	TOC	TCL VOA	TCL SVOA	TCL PEST/PCB	TAL METALS	TAL METALS (D)	ATTERBURG LIMITS	GRAIN SIZE	TOC							
6/27/94	16-NC-SD04-06	x	x	x	x			x	x		x	x	x	x			x	x	8/2/94	8/3/94	36	7NCSD	MS/MSD	
6/27/94	16-NC-SD04-06D	x	x	x	x						x	x	x	x					8/2/94	8/3/94	36	7NCSD		
6/27/94	16-NC-SD04-612	x	x	x	x						x	x	x	x					8/2/94	8/3/94	36	7NCSD		
6/27/94	16-NC-SD02-06	x	x	x	x			x	x		x	x	x	x			x	x	8/2/94	8/3/94	36	7NCSD		
6/27/94	16-NC-SD02-612	x	x	x	x						x	x	x	x					8/2/94	8/3/94	36	7NCSD		
6/27/94	16-NC-SD01-06	x	x	x	x			x	x		x	x	x	x			x	x	8/2/94	8/3/94	36	7NCSD		
6/27/94	16-NC-SD01-612	x	x	x	x						x	x	x	x					8/2/94	8/3/94	36	7NCSD		
6/27/94	16-NC-SD05-06	x	x	x	x			x	x		x	x	x	x			x	x	8/2/94	8/3/94	36	7NCSD		
6/27/94	16-NC-SD05-612	x	x	x	x						x	x	x	x					8/2/94	8/3/94	36	7NCSD		
6/27/94	16-NC-SD03-06	x	x	x	x			x	x		x	x	x	x			x	x	8/2/94	8/3/94	36	7NCSD		
6/27/94	16-NC-SD03-612	x	x	x	x						x	x	x	x					8/2/94	8/3/94	36	7NCSD		
COUNT		11	11	11	11	0	0	5	5	0	11	11	11	11	0	0	5	5	0					

DATE SHIPPED	SAMPLE ID	Analysis Requested								Analysis Received								DATE EXPECTED	DATE RECD	TURNAROUND TIME	SDG NO.	COMMENTS	
		organics								organics													
		TCL VOA	TCL SVOA	TCL PEST/PCB	TAL METALS	TAL METALS (D)	TCLP ORG/INORG	RCRA-HAZ CHARC.		TCL VOA	TCL SVOA	TCL PEST/PCB	TAL METALS	TAL METALS (D)	TCLP ORG/INORG	RCRA-HAZ CHARC.							
12/3/94	16-TK-01	x	x	x	x					x	x	x	x					1/8/95	1/16/95	43	2220		
12/3/94	7-TK-01	x	x	x	x					x	x	x	x					1/8/95	1/16/95	43	2220		
12/3/94	3-RB-01			x				x	x						x	x		1/8/95	1/16/95	43	2220		
12/5/94	80-TK-01	x	x	x	x					x	x	x	x					1/10/95	1/11/95	36	2227		
12/5/94	3-TK-01	x	x	x	x					x	x	x	x					1/10/95	1/11/95	36	2227		
12/5/94	274-DRM-01	x	x	x	x					x	x	x	x					1/10/95	1/11/95	36	2227		
COUNT		5	5	6	5	0	1	1	0	5	5	5	5	0	1	1	0					0	

APPENDIX C
WELL DEVELOPMENT RECORDS

Baker

Baker Environmental, Inc

FIELD WELL DEVELOPMENT RECORD

PROJECT: SITE 16 MCB CAMP LEJEUNE, NC

CTO NO.: 274 WELL NO.: 16-MW01

DATE: 25 OCTOBER 1994

GEOLOGIST/ENGINEER: JE ZIMMERMAN / MK DEJOHN

TIME START	DEVELOPMENT DATA						
	TIME	CUMULATIVE VOLUME (gallons)	pH	TEMP (°C)	SPEC. COND. (µmhos/cm)	TEMP (°C)	COLOR AND TURBIDITY
1000							
TIME FINISH 1057							
INITIAL WATER LEVEL (FT) 14.98	1001	22	5.98	22.8	115	22.8	GRAY MODERATELY TURBID
TOTAL WELL DEPTH (TD) 23.50	1013	33	5.99	23.0	115	23.0	BROWN, TURBID
WELL DIAMETER (INCHES) 2" OD	1019	44	5.82	23.4	89	23.4	GRAY, SLIGHTLY TURBID
CALCULATED WELL VOLUME -	1029	55	6.05	23.4	100	23.4	BROWN MODERATELY TURBID
	1036	66	5.74	23.5	80	23.5	BROWN MODERATELY TURBID
BOREHOLE DIAMETER (INCHES) 8"	1042	77	5.65	23.8	70	23.8	BROWN SLIGHTLY TURBID
	1049	88	5.72	23.4	75	23.4	GRAY SLIGHTLY TURBID
BOREHOLE VOLUME 22.2 GAL	1051	90	5.76	23.4	75	23.4	GRAY SLIGHTLY TURBID
	1057	100	5.73	23.8	70	23.8	GRAY SLIGHTLY TURBID
AMOUNT OF WATER ADDED DURING DRILLING -							
DEVELOPMENT METHOD PUMPING							
PUMP TYPE CENTRIFUGAL							
TOTAL TIME (A) 57 MIN							
AVERAGE FLOW (GPM)(B) 1.8							
TOTAL ESTIMATED WITHDRAWAL AxB = 100 GAL	OBSERVATIONS/NOTES						
ANU/OVA READING 0.8/0.8							

Baker

Baker Environmental, Inc

FIELD WELL DEVELOPMENT RECORD

PROJECT: SITE 16 MCB CAMP LEJEUNE, NC

CTO NO.: 274 WELL NO.: 16-MW02

DATE: 25 OCTOBER 1994

GEOLOGIST/ENGINEER: JEZIMMERMAN / MK DEJOHN

TIME START	DEVELOPMENT DATA						
	TIME	CUMULATIVE VOLUME (gallons)	pH	TEMP (°C)	SPEC. COND. (µmhos/cm)	TEMP (°C)	COLOR AND TURBIDITY
1436							
TIME FINISH 1502							
INITIAL WATER LEVEL (FT) 4.19	1441	37	5.69	20.4	120	20.4	BROWN, TURBID
TOTAL WELL DEPTH (TD) 18.25	1446	74	5.48	20.3	110	20.3	GRAY, MODERATELY TURBID
WELL DIAMETER (INCHES) 2" OD	1451	111	5.43	20.1	110	20.1	GRAY, SLIGHTLY TURBID
CALCULATED WELL VOLUME —	1455	138	5.36	20.3	103	20.3	GRAY, SLIGHTLY TURBID
	1458	156	5.29	20.1	100	20.1	GRAY, SLIGHTLY TURBID
BOREHOLE DIAMETER (INCHES) 8"	1500	185	5.30	20.1	100	20.1	NEARLY CLEAR
BOREHOLE VOLUME 36.7 GAL							
AMOUNT OF WATER ADDED DURING DRILLING —							
DEVELOPMENT METHOD PUMPING							
PUMP TYPE CENTRIFUGAL							
TOTAL TIME (A) 26 MIN							
AVERAGE FLOW (GPM)(B) 6.0							
TOTAL ESTIMATED WITHDRAWAL AxB= 156 GAL	OBSERVATIONS/NOTES						
(IN)/OVA READING 0.3/0.3							

Baker

Baker Environmental, Inc

FIELD WELL DEVELOPMENT RECORD

PROJECT: SITE 16 MCB CAMP LEJEUNE, NC

CTO NO.: 274 WELL NO.: 16-MW03

DATE: 25 OCTOBER 1994

GEOLOGIST/ENGINEER: JEZIMMERMAN / MKDESJOHN

TIME START 1546	DEVELOPMENT DATA						
	TIME	CUMULATIVE VOLUME (gallons)	pH	TEMP (°C)	SPEC. COND. (µmhos/cm)	TEMP (°C)	COLOR AND TURBIDITY
TIME FINISH 1626							
INITIAL WATER LEVEL (FT) 10.84	1552	25	5.49	21.7	231	21.7	BROWN, VERY TURBID
TOTAL WELL DEPTH (TD) 19.99	1604	50	5.48	22.5	237	22.5	BROWN, TURBID
WELL DIAMETER (INCHES) 2" OD	1612	75	5.40	22.3	231	22.3	GRAY, SLIGHTLY TURBID
CALCULATED WELL VOLUME -	1620	90	5.24	20.8	225	20.8	GRAY, SLIGHTLY TURBID
BOREHOLE DIAMETER (INCHES) 8"	1623	100	5.24	21.4	228	21.4	GRAY-BROWN MODERATELY TURBID
BOREHOLE VOLUME 23.9 GAL							
AMOUNT OF WATER ADDED DURING DRILLING -							
DEVELOPMENT METHOD PUMPING							
PUMP TYPE CENTRIFUGAL							
TOTAL TIME (A) 40 MIN							
AVERAGE FLOW (GPM)(B) 2.5							
TOTAL ESTIMATED WITHDRAWAL AxB= 100 GAL	OBSERVATIONS/NOTES						
ANUOVA READING 0.6/0.8							

Baker

Baker Environmental, Inc

FIELD WELL DEVELOPMENT RECORD

PROJECT: SITE 16 MCB CAMP LEJEUNE, NC

CTO NO.: 274 WELL NO.: 16-MW04

DATE: 25 OCTOBER 1994

GEOLOGIST/ENGINEER: JE ZIMMERMAN / MK DEJOHN

TIME START	DEVELOPMENT DATA						
	TIME	CUMULATIVE VOLUME (gallons)	pH	TEMP (°C)	SPEC. COND. (µmhos/cm)	TEMP (°C)	COLOR AND TURBIDITY
1357							
TIME FINISH							
1409							
INITIAL WATER LEVEL (FT)	1400	25	5.41	20.1	115	20.1	BROWN, MODERATELY TURBID
TOTAL WELL DEPTH (TD)	1404	50	5.41	19.7	95	19.7	GRAY-BROWN, SLIGHTLY TURBID
	1407	75	6.45	19.8	92	19.8	GRAY, SLIGHTLY TURBID
WELL DIAMETER (INCHES)	1408	100	5.47	19.5	90	19.5	GRAY, SLIGHTLY TURBID
CALCULATED WELL VOLUME							
-							
BOREHOLE DIAMETER (INCHES)							
8"							
BOREHOLE VOLUME							
24.2 GAL							
AMOUNT OF WATER ADDED DURING DRILLING							
-							
DEVELOPMENT METHOD							
PUMPING							
PUMP TYPE							
CENTRIFUGAL							
TOTAL TIME (A)							
12 MIN							
AVERAGE FLOW (GPM)(B)							
8.33							
TOTAL ESTIMATED WITHDRAWAL Ax B =	OBSERVATIONS/NOTES						
100 GAL							
ANU/OVA READING							
0.6/0.6							

Baker

Baker Environmental, Inc

FIELD WELL DEVELOPMENT RECORD

PROJECT: SITE 16 MCB CAMP LEJEUNE, NC.

CTO NO.: 274 WELL NO.: 16-MW05

DATE: 25 OCTOBER 1994

GEOLOGIST/ENGINEER: JEZIMMERMAN / MKDEJOHN

TIME START	DEVELOPMENT DATA						
	TIME	CUMULATIVE VOLUME (gallons)	pH	TEMP (°C)	SPEC. COND. (µmhos/cm)	TEMP (°C)	COLOR AND TURBIDITY
1651							
TIME FINISH							
1848							
INITIAL WATER LEVEL (FT)	1719	40	5.78	24.0	215	24.0	BROWN-GRAY, TURBID
18.05							
TOTAL WELL DEPTH (TD)	1733	60	5.55	23.9	192	23.9	NEARLY CLEAR
33.49	1743	80	5.53	23.2	181	23.2	BROWN, TURBID
WELL DIAMETER (INCHES)	1757	100	5.52	22.9	175	22.9	BROWN-GRAY MODERATELY TURBID
2"00	1809	120	5.41	23.1	155	23.1	GRAY, SLIGHTLY TURBID
CALCULATED WELL VOLUME	1819	140	5.32	22.6	151	22.6	BROWN-GRAY MODERATELY TURBID
-	1828	160	5.21	22.4	145	22.4	GRAY MODERATELY TURBID
BOREHOLE DIAMETER (INCHES)	1835	180	5.20	22.4	145	22.4	GRAY MODERATELY, TURBID
8"	1845	200	5.25	22.3	130	22.3	GRAY, SLIGHTLY TURBID
BOREHOLE VOLUME							
40.3 GAL							
AMOUNT OF WATER ADDED DURING DRILLING							
-							
DEVELOPMENT METHOD							
PUMPING							
PUMP TYPE							
CENTRIFUGAL							
TOTAL TIME (A)							
117 MIN							
AVERAGE FLOW (GPM)(B)							
1.7							
TOTAL ESTIMATED WITHDRAWAL AxB =	OBSERVATIONS/NOTES						
200 GAL							
(IN)/OVA READING							
0.3/0.3							

Baker

Baker Environmental, Inc

FIELD WELL DEVELOPMENT RECORD

PROJECT: SITE 16 MCB CAMP LEJEUNE

CTO NO.: 274

WELL NO.: 16-MW06

DATE: 26 OCTOBER 1994

GEOLOGIST/ENGINEER: JEZIMMERMAN / MK DEJOHN

TIME START 0740	DEVELOPMENT DATA						
	TIME	CUMULATIVE VOLUME (gallons)	pH	TEMP (°C)	SPEC. COND. (µmhos/cm)	TEMP (°C)	COLOR AND TURBIDITY
TIME FINISH 0814							
INITIAL WATER LEVEL (FT) 15.27	0748	50	5.36	19.0	41	19.0	GRAY MODERATELY TURBID
TOTAL WELL DEPTH (TD) 33.65	0753	75	5.33	19.2	48	19.2	GRAY, SLIGHTLY TURBID
WELL DIAMETER (INCHES) 2"OD	0757	100	5.28	19.2	49	19.2	NEARLY CLEAR
CALCULATED WELL VOLUME -	0801	125	5.27	19.1	51	19.1	GRAY, SLIGHTLY TURBID
BOREHOLE DIAMETER (INCHES) 8"	0805	150	5.29	19.1	51	19.1	NEARLY CLEAR
BOREHOLE VOLUME 48.0 GAL	0810	175	5.22	19.2	51	19.2	NEARLY CLEAR
AMOUNT OF WATER ADDED DURING DRILLING -	0814	200	5.19	19.1	51	19.1	NEARLY CLEAR
DEVELOPMENT METHOD PUMPING							
PUMP TYPE CENTRIFIGAL							
TOTAL TIME (A) 34 MIN							
AVERAGE FLOW (GPM)(B) 5.9							
TOTAL ESTIMATED WITHDRAWAL AxB = 200 GAL	OBSERVATIONS/NOTES						
MUDLOGGING READING 1.2/1.2							

APPENDIX D
IDW SUMMARY

APPENDIX D.1
IDW LETTER REPORT

Baker

Baker Environmental, Inc.
Airport Office Park, Building 3
420 Rouser Road
Coraopolis, Pennsylvania 15108

January 19, 1995

Commander
Atlantic Division
Naval Facilities Engineering Command
1510 Gilbert Street (Building N-26)
Norfolk, Virginia 23511-6299

(412) 269-6000
FAX (412) 269-2002

Attn: Ms. Katherine Landman
Navy Technical Representative
Code 1823

Re: Contract N62470-89-D-4814
Navy CLEAN, District III
Contract Task Order (CTO) 0274
IDW Sampling and Analysis
Operable Units No. 8, 11, and 12
MCB Camp Lejeune, North Carolina

Dear Ms. Landman:

This letter report describes the sample collection activities, analysis, results, and recommendations for the disposition of investigation-derived waste (IDW) present at Sites 16, 7, 80, and 3, Marine Corps Base, Camp Lejeune, North Carolina. The IDW contained in 1,000 gallon tankers, 55 gallon drums, and lab packs, were generated during the period from September 15 to December 4, 1994, during the Baker Environmental, Inc. (Baker) remedial field investigation. An inventory of the IDW along with individual site quantities are provided in Table 1. Analytical results are provided in Attachment A.

Sample Collection and Analysis

Site 16

Two liquid samples were collected from Site 16. The first sample was collected from the well development and purge water holding tank and was given the sample identification 16-TK-01. Sample 16-TK-01 was analyzed for full Target Compound List (TCL)-Organics and Target Analytic List (TAL)-Inorganics.

The second sample was collected from a (55 - gallon) drum containing decontamination fluids. This sample was given the identification 16-DRM-01. Sample 16-DRM-01 was placed on ice and then was composited with decontamination fluids from other sites and given the sample identification 274-DRM-01. Sample 274-DRM-01 was analyzed for full TCL-Organics and TAL-Inorganics. The types and quantities of IDW for Site 16 are provided on Table 1. Analytical results for Site 16 are provided in Attachment A. Note, additional drums of decontamination fluids were also generated at lot 203 (field trailer). These drums were sampled along with all the site decontamination fluids and composited for sample 274-DRM-01. The decontamination fluids generated at Lot 203 are presented on Table 1.

Site 7

Two liquid samples were collected from Site 7. The first sample was collected from the well development and purge water holding tank and was given the sample identification 7-TK-01. Sample 7-TK-01 was analyzed for full TCL-Organics and TAL-Inorganics.

The second sample was collected by compositing two (55 - gallon) drums containing decontamination fluids. This sample was given the identification 7-DRM-01. Sample 7-DRM-01 was placed on ice and then was composited with decontamination fluids from other sites and given the sample identification 274-DRM-01.



A Total Quality Corporation

Baker

Ms. Katherine Landman

January 19, 1995

Page 2

Sample 274-DRM-01 was analyzed for full TCL-Organics and TAL-Inorganics. The types and quantities of IDW for Site 7 are provided on Table 1. Analytical results for Site 7 are provided in Attachment A.

Site 80

Two liquid samples were collected from Site 80. The first sample was collected from the well development and purge water holding tanks and was given the sample identification 80-TK-01. Sample 80-TK-01 was collected by compositing the water from both holding tanks, and was analyzed for full TCL-Organics and TAL-Inorganics.

The second sample was collected from a (55 - gallon) drum containing decontamination fluids. This sample was given the identification 80-DRM-01. Sample 80-DRM-01 was placed on ice and then was composited with decontamination fluids from other sites and given the sample identification 274-DRM-01. Sample 274-DRM-01 was analyzed for full TCL-Organics and TAL-Inorganics. The types and quantities of IDW for Site 80 are provided on Table 1. Analytical results for Site 80 are provided in Attachment A.

Site 3

One solid composite sample (3-RB-01) was collected from Site 3. This composite sample was comprised of drilling mud cuttings. One representative sample was collected from each of the six (55 - gallon) drums. These samples were in turn placed into a stainless steel bowl and homogenized prior to sample packaging. Sample 3-RB-01 was analyzed for RCRA hazardous waste characteristics including TCLP, ignitability, corrosivity, reactivity, and TCL PCBs.

Two liquid samples were collected from Site 3. The first sample was collected from the well development and purge water holding tank and was given the sample identification 3-TK-01. Sample 3-TK-01 was analyzed for full TCL-Organics and TAL-Inorganics.

The second sample was a composite sample from two (55 - gallon) drums of decontamination fluids. This sample was given the identification 3-DRM-01. Sample 3-DRM-01 was placed on ice and then was composited with decontamination fluids from other sites and given the sample identification 74-DRM-01. Sample 274-DRM-01 was analyzed for full TCL-Organics and TAL-Inorganics. The types and quantities of IDW for Site 3 are provided on Table 1. Analytical results for Site 3 are provided in Attachment A.

In addition to the solid and liquid IDW generated from Site 3, the ENSYS field screening investigation conducted at Site 3 generated approximately ten (10) liters of waste methanol. The waste methanol is stored in 10 - one liter glass bottles. These glass containers have been lab packed into two 5 - gallon plastic buckets with 5 containers in each bucket. A sample of the waste methanol was not collected due to waste methanol being a F - listed waste (F003), and proper disposal to a licensed Treatment Storage Disposal Facility (TSDF) is necessary.

Results

Site 16

Sample 16-TK-01 had only two positive volatile detections, one positive detection for semivolatiles, and no positive detections for pesticides/PCBs. Inorganic analysis did not indicate concentrations above what previous background groundwater analysis has indicated for inorganics. Concentrations of all contaminants did not exceed regulatory standards for classification as hazardous by characteristic (40CFR 261.24).

Sample 274-DRM-01 which is a composite sample of the decontamination fluids from all sites including Site 16, indicated positive detections for three volatile contaminants, five positive detections for semivolatiles, and one positive detection for pesticides. Inorganic analysis did not indicate concentrations above background for inorganics. Concentrations of all contaminants did not exceed regulatory standards for classification as hazardous by characteristic (40CFR 261.24).

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Site 7

Sample 7-TK-01 had three positive volatile detections, and no positive detections for either semivolatile, or pesticide/PCB analysis. Inorganic analysis did not indicate concentrations above what previous background groundwater analysis has indicated for inorganics. Concentrations of all contaminants did not exceed 40CFR 261.24 standards.

Results of sample 274-DRM-01 which is a composite sample of the decontamination fluids from all sites, including Site 7, are provided in the results for Site 16.

Site 80

Sample 80-TK-01 had four positive volatile detections, and no positive detections for either semivolatile, or pesticide/PCB analysis. Inorganic analysis did not indicate concentrations above what previous background groundwater analysis has indicated for inorganics. Concentrations of all contaminants did not exceed 40CFR 261.24 standards.

Results of sample 274-DRM-01 which is a composite sample of the decontamination fluids from all sites, including Site 80, are provided in the results for Site 16.

Site 3

Sample 3-TK-01 had seven positive volatile detections, eleven positive semivolatile detections, and one positive detection for pesticides. Inorganic analysis did not indicate concentrations above previous background groundwater analysis has indicated for inorganics. Concentrations of all contaminants did not exceed 40CFR 261.24 standards.

Results of sample 274-DRM-01 which is a composite sample of the decontamination fluids from all sites, including Site 3, are provided in the results for Site 16.

Sample 3-RB-01 which was analyzed for RCRA hazardous waste characteristics, TCLP, and TCL-PCBs, had three positive volatile detections, and no positive detections for either semivolatiles and pesticides/herbicides. Also, PCB analysis indicated no positive detections, and inorganic analysis had one positive detection. Concentrations of all contaminants did not exceed 40CFR 261.24. Sample 3-RB-01 was not found to be reactive to sulfide and cyanide, be ignitable at less than 140 ° F, or be corrosive at less than 2 or greater than 12.

The waste methanol generated during the ENSYS soil investigation at Site 3 was not sampled. The methanol is a F - listed waste (F003), and proper disposal to a licensed TSDF is necessary.

Conclusions and Recommendations

Site 16

Analytical results indicate that samples 16-TK-01, and 274-DRM-01 have low level organic contaminant concentrations. These concentrations do not exceed regulatory values which would classify these samples as hazardous by characteristic. Therefore, the well development/purge water and the decontamination fluid will be disposed of onsite.

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Site 7

Analytical results indicate that samples 7-TK-01, and 274-DRM-01 have low level organic contaminant concentrations. These concentrations do not exceed regulatory values which would classify these samples as hazardous by characteristics. Therefore, the well development/purge water and the decontamination fluid will be disposed of onsite.

Site 80

Analytical results indicate that samples 80-TK-01, and 274-DRM-01 have low level organic contaminant concentrations. These concentrations do not exceed regulatory values which would classify these samples as hazardous by characteristics. Therefore, the well development/purge water and the decontamination fluid will be disposed of onsite.

Site 3

Analytical results indicate that samples 3-TK-01, and 274-DRM-01 have low level organic contaminant concentrations. These concentrations do not exceed regulatory values which would classify these samples as hazardous by characteristics. Therefore, the well development/purge water and the decontamination fluid will be disposed of onsite.

Analytical results for sample (3-RB-01, drilling mud cuttings) indicate low level volatile contaminant concentrations. The RCRA hazardous waste characteristics show this sample to be non-hazardous. The TCLP and RCRA results do not exceed regulatory values which would classify this sample as hazardous by characteristics. Therefore, these drilling mud cuttings will be disposed of onsite.

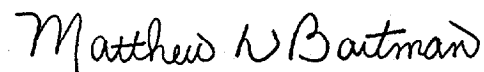
The 10 liters of waste methanol will be packaged and removed from the base by a licensed waste hauler, and shipped to a licensed treatment, storage disposal facility (TSDF) for disposal in a certified fuels or incineration program.

Upon LANTDIV's approval of these disposal recommendations, the IDW will be managed as identified within this letter.

If you have any questions, please do not hesitate to contact me at (412) 269-2053.

Sincerely,

Baker Environmental, Inc.



Matthew D. Bartman
Project Manager

Attachment

MCD/lq

cc: Mr. Neal Paul
Mr. John Riggs

**TABLE 1
SUMMARY OF INVESTIGATIVE DERIVED WASTE
REMEDIAL INVESTIGATION, CTO-0274
MCB CAMP LEJUENE, NORTH CAROLINA**

SITE	MATERIAL	CONTAINERS		VOLUME OF WASTE	UNIT	LABORATORY ANALYSIS
		NUMBER	TYPE			
Site 16	Development/ Purge Water	1	1000 Gallon Tank	750	Gallons	TCL - Organics TAL - Inorganics
Site 16	Decon Water	1	55 Gallon Drum	55	Gallons	TCL - Organics TAL - Inorganics
Site 7	Development/ Purge Water	1	1000 Gallon Tanks	900	Gallons	TCL - Organics TAL - Inorganics
Site 7	Decon Water	2	55 Gallon Drums	70	Gallons	TCL - Organics TAL - Inorganics
Site 80	Development/ Purge Water	2	1000 Gallon Tanks	1,400	Gallons	TCL - Organics TAL - Inorganics
Site 80	Decon Water	1	55 Gallon Drums	55	Gallons	TCL - Organics TAL - Inorganics
Site 3	Development/ Purge Water	1	1000 Gallon Tanks	800	Gallons	TCL - Organics TAL - Inorganics
Site 3	Decon Water	2	55 Gallon Drums	110	Gallons	TCL - Organics TAL - Inorganics
Site 3	Drilling Mud Cuttings	6	55 Gallon Drums	40	Cubic Feet	TCLP - Organics TCLP - Inorganics RCRA - Haz. Characteristics TCL - PCBs
Site 3	Waste Methanol	10	1 Liter Bottles	10	Liters	No Analysis Performed
Lot 203	Decon Water	2	55 Gallon Drums	110	Gallons	TCL - Organics TAL - Inorganics

ATTACHMENT A (Laboratory Analysis)

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

00011
EPA SAMPLE NO.

16TK01

Lab Name: ITAS-KNOXVILLE Contract: BAKER

Lab Code: ITSTU Case No.: 2220 SAS No.: _____ SDG No.: 3RB01

Matrix: (soil/water) WATER Lab Sample ID: AD2051

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: AD2051

Level: (low/med) LOW Date Received: 12/05/94

% Moisture: not dec. _____ Date Analyzed: 12/10/94

GC Column: RTX624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L Q

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/L</u>	Q
74-87-3	-----Chloromethane	10	U
74-83-9	-----Bromomethane	10	U
75-01-4	-----Vinyl Chloride	10	U
75-00-3	-----Chloroethane	10	U
75-09-2	-----Methylene Chloride	1	BJ
67-64-1	-----Acetone	150	
75-15-0	-----Carbon Disulfide	10	U
75-35-4	-----1,1-Dichloroethene	10	U
75-34-3	-----1,1-Dichloroethane	10	U
540-59-0	-----1,2-Dichloroethene (total)	10	U
67-66-3	-----Chloroform	10	U
107-06-2	-----1,2-Dichloroethane	10	U
78-93-3	-----2-Butanone	10	
71-55-6	-----1,1,1-Trichloroethane	10	U
56-23-5	-----Carbon Tetrachloride	10	U
75-27-4	-----Bromodichloromethane	10	U
78-87-5	-----1,2-Dichloropropane	10	U
10061-01-5	-----cis-1,3-Dichloropropene	10	U
79-01-6	-----Trichloroethene	10	U
124-48-1	-----Dibromochloromethane	10	U
79-00-5	-----1,1,2-Trichloroethane	10	U
71-43-2	-----Benzene	10	U
10061-02-6	-----trans-1,3-Dichloropropene	10	U
75-25-2	-----Bromoform	10	U
108-10-1	-----4-Methyl-2-Pentanone	10	U
591-78-6	-----2-Hexanone	10	U
127-18-4	-----Tetrachloroethene	10	U
79-34-5	-----1,1,2,2-Tetrachloroethane	10	U
108-88-3	-----Toluene	10	U
108-90-7	-----Chlorobenzene	10	U
100-41-4	-----Ethylbenzene	10	U
100-42-5	-----Styrene	10	U
1330-20-7	-----Xylene (total)	10	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

* 00012
EPA SAMPLE NO.

16TK01

Lab Name: ITAS-KNOXVILLE Contract: BAKER

Lab Code: ITSTU Case No.: 2220 SAS No.: _____ SDG No.: 3RB01

Matrix: (soil/water) WATER Lab Sample ID: AD2051

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: AD2051

Level: (low/med) LOW Date Received: 12/05/94

* Moisture: not dec. _____ Date Analyzed: 12/10/94

GC Column: RTX624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	4.77	70	J

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO. 00047

16TK01

Lab Name: ITAS-KNOXVILLE Contract: BAKER

Lab Code: ITSTU Case No.: 2220 SAS No.: _____ SDG No.: 3RB01

Matrix: (soil/water) WATER Lab Sample ID: AD2052

Sample wt/vol: 1000 (g/mL) ML Lab File ID: AD2052

Level: (low/med) LOW Date Received: 12/05/94

% Moisture: _____ decanted: (Y/N) _____ Date Extracted: 12/07/94

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 12/09/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: _____

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/L</u>	Q
108-95-2	Phenol	10	U
111-44-4	bis(2-Chloroethyl) Ether	10	U
95-57-8	2-Chlorophenol	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
95-50-1	1,2-Dichlorobenzene	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	2,2'-Oxybis(1-Chloropropane)	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-Di-n-Propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
111-91-1	bis(2-Chloroethoxy)Methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
59-50-7	4-Chloro-3-Methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	25	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	25	U
131-11-3	Dimethylphthalate	10	U
208-96-8	Acenaphthylene	10	U
606-20-2	2,6-Dinitrotoluene	10	U
99-09-2	3-Nitroaniline	25	U
83-32-9	Acenaphthene	10	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

16TK01

Lab Name: ITAS-KNOXVILLE Contract: BAKER
 Lab Code: ITSTU Case No.: 2220 SAS No.: _____ SDG No.: 3RB01
 Matrix: (soil/water) WATER Lab Sample ID: AD2052
 Sample wt/vol: 1000 (g/mL) ML Lab File ID: AD2052
 Level: (low/med) LOW Date Received: 12/05/94
 % Moisture: _____ decanted: (Y/N) _____ Date Extracted: 12/07/94
 Concentrated Extract Volume: 1000 (uL) Date Analyzed: 12/09/94
 Injection Volume: 2.0(uL) Dilution Factor: 1.0
 GPC Cleanup: (Y/N) N pH: _____

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L Q

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/L</u>	Q
51-28-5-----	2,4-Dinitrophenol	25	U
100-02-7-----	4-Nitrophenol	25	U
132-64-9-----	Dibenzofuran	10	U
121-14-2-----	2,4-Dinitrotoluene	10	U
84-66-2-----	Diethylphthalate	10	U
7005-72-3-----	4-Chlorophenyl-phenylether	10	U
86-73-7-----	Fluorene	10	U
100-01-6-----	4-Nitroaniline	25	U
534-52-1-----	4,6-Dinitro-2-methylphenol	25	U
86-30-6-----	N-Nitrosodiphenylamine (1)	10	U
101-55-3-----	4-Bromophenyl-phenylether	10	U
118-74-1-----	Hexachlorobenzene	10	U
87-86-5-----	Pentachlorophenol	25	U
85-01-8-----	Phenanthrene	10	U
120-12-7-----	Anthracene	10	U
86-74-8-----	Carbazole	10	U
84-74-2-----	Di-n-Butylphthalate	10	U
206-44-0-----	Fluoranthene	10	U
129-00-0-----	Pyrene	10	U
85-68-7-----	Butylbenzylphthalate	10	U
91-94-1-----	3,3'-Dichlorobenzidine	10	U
56-55-3-----	Benzo(a)Anthracene	10	U
218-01-9-----	Chrysene	10	U
117-81-7-----	bis(2-Ethylhexyl)Phthalate	11	U
117-84-0-----	Di-n-Octyl Phthalate	10	U
205-99-2-----	Benzo(b)Fluoranthene	10	U
207-08-9-----	Benzo(k)Fluoranthene	10	U
50-32-8-----	Benzo(a)Pyrene	10	U
193-39-5-----	Indeno(1,2,3-cd)Pyrene	10	U
53-70-3-----	Dibenz(a,h)Anthracene	10	U
191-24-2-----	Benzo(g,h,i)Perylene	10	U

(1) - Cannot be separated from Diphenylamine

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

• 00049
EPA SAMPLE NO.

16TK01

Lab Name: ITAS-KNOXVILLE Contract: BAKER

Lab Code: ITSTU Case No.: 2220 SAS No.: _____ SDG No.: 3RB01

Matrix: (soil/water) WATER Lab Sample ID: AD2052

Sample wt/vol: 1000 (g/mL) ML Lab File ID: AD2052

Level: (low/med) LOW Date Received: 12/05/94

% Moisture: _____ decanted: (Y/N) _____ Date Extracted: 12/07/94

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 12/09/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: _____

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	17.27	14	J
2.	UNKNOWN	18.58	3	J

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

00092
EPA SAMPLE NO.

16TK01

Lab Name: ITAS-KNOXVILLE Contract: _____

Lab Code: _____ Case No.: W02220 SAS No.: _____ SDG No.: 7TK01

Matrix: (soil/water) WATER Lab Sample ID: AD2052

Sample wt/vol: 1000 (g/mL) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N) _____ Date Received: 12/05/94

Extraction: (SepF/Cont/Sonc) CONT Date Extracted: 12/07/94

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 12/19/94

Injection Volume: 1.00 (uL) Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH: 7.0 Sulfur Cleanup: (Y/N) N

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	UG/L	Q
319-84-6	alpha-BHC	0.050	U
319-85-7	beta-BHC	0.050	U
319-86-8	delta-BHC	0.050	U
58-89-9	gamma-BHC (Lindane)	0.050	U
76-44-8	Heptachlor	0.050	U
309-00-2	Aldrin	0.050	U
1024-57-3	Heptachlor epoxide	0.050	U
959-98-8	Endosulfan I	0.050	U
60-57-1	Dieldrin	0.10	U
72-55-9	4,4'-DDE	0.10	U
72-20-8	Endrin	0.10	U
33213-65-9	Endosulfan II	0.10	U
72-54-8	4,4'-DDD	0.10	U
1031-07-8	Endosulfan sulfate	0.10	U
50-29-3	4,4'-DDT	0.10	U
72-43-5	Methoxychlor	0.50	U
53494-70-5	Endrin ketone	0.10	U
7421-93-4	Endrin aldehyde	0.10	U
5103-71-9	alpha-Chlordane	0.050	U
5103-74-2	gamma-Chlordane	0.050	U
8001-35-2	Toxaphene	5.0	U
12674-11-2	Aroclor-1016	1.0	U
11104-28-2	Aroclor-1221	2.0	U
11141-16-5	Aroclor-1232	1.0	U
53469-21-9	Aroclor-1242	1.0	U
12672-29-6	Aroclor-1248	1.0	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U

1
INORGANIC ANALYSES DATA SHEET

16TK01

Lab Name: ITAS KNOXVILLE
Lab Code: ITSTU
Matrix (soil/water): WATER
Level (low/med): LOW
% Solids: 0.0

Contract: BAKER/LEJE
Case No.: 2220 SAS No.:

SDG No.: N/A

Lab Sample ID: AD2053

Date Received: 12/05/94

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	2160	-		P
7440-36-0	Antimony	50.0	U		P
7440-38-2	Arsenic	10.0	U		P
7440-39-3	Barium	25.7	B		P
7440-41-7	Beryllium	1.0	U		P
7440-43-9	Cadmium	5.0	U		P
7440-70-2	Calcium	8350			P
7440-47-3	Chromium	10.0	U		P
7440-48-4	Cobalt	10.0	U		P
7440-50-8	Copper	10.0	U		P
7439-89-6	Iron	1620			P
7439-92-1	Lead	3.0	U		P
7439-95-4	Magnesium	1560	B		P
7439-96-5	Manganese	19.0			P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	20.0	U		P
7440-09-7	Potassium	1750	B		P
7782-49-2	Selenium	5.0	U		P
7440-22-4	Silver	5.0	U		P
7440-23-5	Sodium	8630			P
7440-28-0	Thallium	10.0	U		P
7440-62-2	Vanadium	10.0	U		P
7440-66-6	Zinc	52.2			P

Color Before: COLORLESS
Color After: COLORLESS

Clarity Before: CLEAR
Clarity After: CLEAR

Texture: N/A
Artifacts: _____

Comments:

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

00009
EPA SAMPLE NO.

7TK01

Lab Name: ITAS-KNOXVILLE Contract: BAKER
 Lab Code: ITSTU Case No.: 2220 SAS No.: _____ SDG No.: 3RB01
 Matrix: (soil/water) WATER Lab Sample ID: AD2056
 Sample wt/vol: 5.0 (g/mL) ML Lab File ID: AD2056
 Level: (low/med) LOW Date Received: 12/05/94
 % Moisture: not dec. _____ Date Analyzed: 12/10/94
 GC Column: RTX624 ID: 0.530 (mm) Dilution Factor: 1.0
 Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/L</u>	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	1	BJ
67-64-1	Acetone	140	
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	9	J
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	10	U
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

00010
EPA SAMPLE NO.

7TK01

Lab Name: ITAS-KNOXVILLE Contract: BAKER
Lab Code: ITSTU Case No.: 2220 SAS No.: _____ SDG No.: 3RB01
Matrix: (soil/water) WATER Lab Sample ID: AD2056
Sample wt/vol: 5.0 (g/mL) ML Lab File ID: AD2056
Level: (low/med) LOW Date Received: 12/05/94
% Moisture: not dec. _____ Date Analyzed: 12/10/94
GC Column: RTX624 ID: 0.530 (mm) Dilution Factor: 1.0
Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	4.77	15	J

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

7TK01

Lab Name: ITAS-KNOXVILLE Contract: BAKER
 Lab Code: ITSTU Case No.: 2220 SAS No.: _____ SDG No.: 3RB01
 Matrix: (soil/water) WATER Lab Sample ID: AD2057
 Sample wt/vol: 1000 (g/mL) ML Lab File ID: AD2057
 Level: (low/med) LOW Date Received: 12/05/94
 % Moisture: _____ decanted: (Y/N) _____ Date Extracted: 12/07/94
 Concentrated Extract Volume: 1000 (uL) Date Analyzed: 12/09/94
 Injection Volume: 2.0(uL) Dilution Factor: 1.0
 GPC Cleanup: (Y/N) N pH: _____

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/L</u>	Q
108-95-2	Phenol	10	U
111-44-4	bis(2-Chloroethyl) Ether	10	U
95-57-8	2-Chlorophenol	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
95-50-1	1,2-Dichlorobenzene	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	2,2'-Oxybis(1-Chloropropane)	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-Di-n-Propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
111-91-1	bis(2-Chloroethoxy)Methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
59-50-7	4-Chloro-3-Methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	25	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	25	U
131-11-3	Dimethylphthalate	10	U
208-96-8	Acenaphthylene	10	U
606-20-2	2,6-Dinitrotoluene	10	U
99-09-2	3-Nitroaniline	25	U
83-32-9	Acenaphthene	10	U

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

7TK01

Lab Name: ITAS-KNOXVILLE Contract: BAKER
 Lab Code: ITSTU Case No.: 2220 SAS No.: _____ SDG No.: 3RB01
 Matrix: (soil/water) WATER Lab Sample ID: AD2057
 Sample wt/vol: 1000 (g/mL) ML Lab File ID: AD2057
 Level: (low/med) LOW Date Received: 12/05/94
 % Moisture: _____ decanted: (Y/N) _____ Date Extracted: 12/07/94
 Concentrated Extract Volume: 1000 (uL) Date Analyzed: 12/09/94
 Injection Volume: 2.0 (uL) Dilution Factor: 1.0
 GPC Cleanup: (Y/N) N pH: _____

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/L</u>	Q
51-28-5	2,4-Dinitrophenol	25	U
100-02-7	4-Nitrophenol	25	U
132-64-9	Dibenzofuran	10	U
121-14-2	2,4-Dinitrotoluene	10	U
84-66-2	Diethylphthalate	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
86-73-7	Fluorene	10	U
100-01-6	4-Nitroaniline	25	U
534-52-1	4,6-Dinitro-2-methylphenol	25	U
86-30-6	N-Nitrosodiphenylamine (1)	10	U
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
87-86-5	Pentachlorophenol	25	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
86-74-8	Carbazole	10	U
84-74-2	Di-n-Butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	10	U
56-55-3	Benzo(a)Anthracene	10	U
218-01-9	Chrysene	10	U
117-81-7	bis(2-Ethylhexyl)Phthalate	10	U
117-84-0	Di-n-Octyl Phthalate	10	U
205-99-2	Benzo(b)Fluoranthene	10	U
207-08-9	Benzo(k)Fluoranthene	10	U
50-32-8	Benzo(a)Pyrene	10	U
193-39-5	Indeno(1,2,3-cd)Pyrene	10	U
53-70-3	Dibenz(a,h)Anthracene	10	U
191-24-2	Benzo(g,h,i)Perylene	10	U

(1) - Cannot be separated from Diphenylamine

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

* 00046
EPA SAMPLE NO.

7TK01

Lab Name: ITAS-KNOXVILLE Contract: BAKER

Lab Code: ITSTU Case No.: 2220 SAS No.: _____ SDG No.: 3RB01

Matrix: (soil/water) WATER Lab Sample ID: AD2057

Sample wt/vol: 1000 (g/mL) ML Lab File ID: AD2057

Level: (low/med) LOW Date Received: 12/05/94

% Moisture: _____ decanted: (Y/N) _____ Date Extracted: 12/07/94

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 12/09/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: _____

Number TICs found: 2 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	18.58	3	J
2.	UNKNOWN	21.28	2	J

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

00091
EPA SAMPLE NO.

7TK01

Lab Name: ITAS-KNOXVILLE Contract: _____

Lab Code: _____ Case No.: W02220 SAS No.: _____ SDG No.: 7TK01

Matrix: (soil/water) WATER Lab Sample ID: AD2057

Sample wt/vol: 1000 (g/mL) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N) _____ Date Received: 12/05/94

Extraction: (SepF/Cont/Sonc) CONT Date Extracted: 12/07/94

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 12/19/94

Injection Volume: 1.00 (uL) Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH: 7.0 Sulfur Cleanup: (Y/N) N

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NO.

COMPOUND

Q

319-84-6-----alpha-BHC	0.050	U
319-85-7-----beta-BHC	0.050	U
319-86-8-----delta-BHC	0.050	U
58-89-9-----gamma-BHC (Lindane)	0.050	U
76-44-8-----Heptachlor	0.050	U
309-00-2-----Aldrin	0.050	U
1024-57-3-----Heptachlor epoxide	0.050	U
959-98-8-----Endosulfan I	0.050	U
60-57-1-----Dieldrin	0.10	U
72-55-9-----4,4'-DDE	0.10	U
72-20-8-----Endrin	0.10	U
33213-65-9-----Endosulfan II	0.10	U
72-54-8-----4,4'-DDD	0.10	U
1031-07-8-----Endosulfan sulfate	0.10	U
50-29-3-----4,4'-DDT	0.10	U
72-43-5-----Methoxychlor	0.50	U
53494-70-5-----Endrin ketone	0.10	U
7421-93-4-----Endrin aldehyde	0.10	U
5103-71-9-----alpha-Chlordane	0.050	U
5103-74-2-----gamma-Chlordane	0.050	U
8001-35-2-----Toxaphene	5.0	U
12674-11-2-----Aroclor-1016	1.0	U
11104-28-2-----Aroclor-1221	2.0	U
11141-16-5-----Aroclor-1232	1.0	U
53469-21-9-----Aroclor-1242	1.0	U
12672-29-6-----Aroclor-1248	1.0	U
11097-69-1-----Aroclor-1254	1.0	U
11096-82-5-----Aroclor-1260	1.0	U

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

7TK01

Lab Name: ITAS KNOXVILLE

Contract: BAKER/LEJE

SDG No.: N/A

Lab Code: ITSTU

Case No.: 2220

SAS No.:

Lab Sample ID: AD2058

Matrix (soil/water): WATER

Level (low/med): LOW

Date Received: 12/05/94

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	1130	-		P
7440-36-0	Antimony	50.0	U		P
7440-38-2	Arsenic	10.0	U		P
7440-39-3	Barium	23.5	B		P
7440-41-7	Beryllium	1.0	U		P
7440-43-9	Cadmium	5.0	U		P
7440-70-2	Calcium	14400			P
7440-47-3	Chromium	10.0	U		P
7440-48-4	Cobalt	10.0	U		P
7440-50-8	Copper	10.0	U		P
7439-89-6	Iron	392			P
7439-92-1	Lead	3.0	U		P
7439-95-4	Magnesium	2380	B		P
7439-96-5	Manganese	7.6	B		P
7439-97-6	Mercury	0.20	U		P
7440-02-0	Nickel	20.0	U		P
7440-09-7	Potassium	2070	B		P
7782-49-2	Selenium	5.0	U		P
7440-22-4	Silver	5.0	U		P
7440-23-5	Sodium	19300			P
7440-28-0	Thallium	10.0	U		P
7440-62-2	Vanadium	10.0	U		P
7440-66-6	Zinc	61.1	-		P

Color Before: COLORLESS
Color After: COLORLESS

Clarity Before: CLEAR
Clarity After: CLEAR

Texture: N/A
Artifacts: _____

Comments:

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

80TK01

Lab Name: ITAS-KNOXVILLE Contract: BAKER

Lab Code: ITSTU Case No.: 2227 SAS No.: _____ SDG No.: 274DRM

Matrix: (soil/water) WATER Lab Sample ID: AD2151

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: AD2151R

Level: (low/med) LOW Date Received: 12/06/94

% Moisture: not dec. _____ Date Analyzed: 12/12/94

GC Column: RTX624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/L</u>	Q
74-87-3	-----Chloromethane	10	U
74-83-9	-----Bromomethane	10	U
75-01-4	-----Vinyl Chloride	10	U
75-00-3	-----Chloroethane	10	U
75-09-2	-----Methylene Chloride	3	BJ
67-64-1	-----Acetone	590	BE
75-15-0	-----Carbon Disulfide	10	U
75-35-4	-----1,1-Dichloroethene	10	U
75-34-3	-----1,1-Dichloroethane	10	U
540-59-0	-----1,2-Dichloroethene (total)	10	U
67-66-3	-----Chloroform	10	U
107-06-2	-----1,2-Dichloroethane	10	U
78-93-3	-----2-Butanone	7	BJ
71-55-6	-----1,1,1-Trichloroethane	10	U
56-23-5	-----Carbon Tetrachloride	10	U
75-27-4	-----Bromodichloromethane	10	U
78-87-5	-----1,2-Dichloropropane	10	U
10061-01-5	-----cis-1,3-Dichloropropene	10	U
79-01-6	-----Trichloroethene	10	U
124-48-1	-----Dibromochloromethane	10	U
79-00-5	-----1,1,2-Trichloroethane	10	U
71-43-2	-----Benzene	10	U
10061-02-6	-----trans-1,3-Dichloropropene	10	U
75-25-2	-----Bromoform	10	U
108-10-1	-----4-Methyl-2-Pentanone	10	U
591-78-6	-----2-Hexanone	2	J
127-18-4	-----Tetrachloroethene	10	U
79-34-5	-----1,1,2,2-Tetrachloroethane	10	U
108-88-3	-----Toluene	10	U
108-90-7	-----Chlorobenzene	10	U
100-41-4	-----Ethylbenzene	10	U
100-42-5	-----Styrene	10	U
1330-20-7	-----Xylene (total)	10	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

80TK01

Lab Name: ITAS-KNOXVILLE Contract: BAKER

Lab Code: ITSTU Case No.: 2227 SAS No.: _____ SDG No.: 274DRM

Matrix: (soil/water) WATER Lab Sample ID: AD2151

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: AD2151R

Level: (low/med) LOW Date Received: 12/06/94

% Moisture: not dec. _____ Date Analyzed: 12/12/94

GC Column: RTX624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Number TICs found: 3

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	4.70	46	J
2.	UNKNOWN ALKENE	14.27	10	J
3.	UNKNOWN	15.73	9	J

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

80TK01DL

Lab Name: ITAS-KNOXVILLE Contract: BAKER

Lab Code: ITSTU Case No.: 2227 SAS No.: _____ SDG No.: 274DRM

Matrix: (soil/water) WATER Lab Sample ID: AD2151

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: AD2151D2

Level: (low/med) LOW Date Received: 12/06/94

% Moisture: not dec. _____ Date Analyzed: 12/12/94

GC Column: RTX624 ID: 0.530 (mm) Dilution Factor: 5.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L Q

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/L</u>	Q
74-87-3	-----Chloromethane	50	U
74-83-9	-----Bromomethane	50	U
75-01-4	-----Vinyl Chloride	50	U
75-00-3	-----Chloroethane	50	U
75-09-2	-----Methylene Chloride	14	BDJ
67-64-1	-----Acetone	780	BD
75-15-0	-----Carbon Disulfide	50	U
75-35-4	-----1,1-Dichloroethene	50	U
75-34-3	-----1,1-Dichloroethane	50	U
540-59-0	-----1,2-Dichloroethene (total)	50	U
67-66-3	-----Chloroform	50	U
107-06-2	-----1,2-Dichloroethane	50	U
78-93-3	-----2-Butanone	39	BDJ
71-55-6	-----1,1,1-Trichloroethane	50	U
56-23-5	-----Carbon Tetrachloride	50	U
75-27-4	-----Bromodichloromethane	50	U
78-87-5	-----1,2-Dichloropropane	50	U
10061-01-5	-----cis-1,3-Dichloropropene	50	U
79-01-6	-----Trichloroethene	50	U
124-48-1	-----Dibromochloromethane	50	U
79-00-5	-----1,1,2-Trichloroethane	50	U
71-43-2	-----Benzene	50	U
10061-02-6	-----trans-1,3-Dichloropropene	50	U
75-25-2	-----Bromoform	50	U
108-10-1	-----4-Methyl-2-Pentanone	50	U
591-78-6	-----2-Hexanone	5	DJ
127-18-4	-----Tetrachloroethene	5	DJ
79-34-5	-----1,1,2,2-Tetrachloroethane	50	U
108-88-3	-----Toluene	50	U
108-90-7	-----Chlorobenzene	50	U
100-41-4	-----Ethylbenzene	50	U
100-42-5	-----Styrene	50	U
1330-20-7	-----Xylene (total)	50	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

80TK01DL

Lab Name: ITAS-KNOXVILLE Contract: BAKER

Lab Code: ITSTU Case No.: 2227 SAS No.: _____ SDG No.: 274DRM

Matrix: (soil/water) WATER Lab Sample ID: AD2151

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: AD2151D2

Level: (low/med) LOW Date Received: 12/06/94

% Moisture: not dec. _____ Date Analyzed: 12/12/94

GC Column: RTX624 ID: 0.530 (mm) Dilution Factor: 5.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	4.70	49	J

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

80TK01

Lab Name: ITAS-KNOXVILLE Contract: BAKER

Lab Code: ITSTU Case No.: 2227 SAS No.: _____ SDG No.: 274DRM

Matrix: (soil/water) WATER Lab Sample ID: AD2152

Sample wt/vol: 1000 (g/mL) ML Lab File ID: AD2152

Level: (low/med) LOW Date Received: 12/06/94

% Moisture: _____ decanted: (Y/N) _____ Date Extracted: 12/07/94

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 12/09/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: _____

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L Q

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/L</u>	Q
108-95-2	Phenol	10	U
111-44-4	bis(2-Chloroethyl) Ether	10	U
95-57-8	2-Chlorophenol	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
95-50-1	1,2-Dichlorobenzene	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	2,2'-Oxybis(1-Chloropropane)	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-Di-n-Propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
111-91-1	bis(2-Chloroethoxy)Methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
59-50-7	4-Chloro-3-Methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	25	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	25	U
131-11-3	Dimethylphthalate	10	U
208-96-8	Acenaphthylene	10	U
606-20-2	2,6-Dinitrotoluene	10	U
99-09-2	3-Nitroaniline	25	U
83-32-9	Acenaphthene	10	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

80TK01

Lab Name: ITAS-KNOXVILLE Contract: BAKER

Lab Code: ITSTU Case No.: 2227 SAS No.: _____ SDG No.: 274DRM

Matrix: (soil/water) WATER Lab Sample ID: AD2152

Sample wt/vol: 1000 (g/mL) ML Lab File ID: AD2152

Level: (low/med) LOW Date Received: 12/06/94

* Moisture: _____ decanted: (Y/N) _____ Date Extracted: 12/07/94

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 12/09/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: _____

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NO. COMPOUND (ug/L or ug/Kg) UG/L Q

51-28-5-----	2,4-Dinitrophenol	25	U
100-02-7-----	4-Nitrophenol	25	U
132-64-9-----	Dibenzofuran	10	U
121-14-2-----	2,4-Dinitrotoluene	10	U
84-66-2-----	Diethylphthalate	10	U
7005-72-3-----	4-Chlorophenyl-phenylether	10	U
86-73-7-----	Fluorene	10	U
100-01-6-----	4-Nitroaniline	25	U
534-52-1-----	4,6-Dinitro-2-methylphenol	25	U
86-30-6-----	N-Nitrosodiphenylamine (1)	10	U
101-55-3-----	4-Bromophenyl-phenylether	10	U
118-74-1-----	Hexachlorobenzene	10	U
87-86-5-----	Pentachlorophenol	25	U
85-01-8-----	Phenanthrene	10	U
120-12-7-----	Anthracene	10	U
86-74-8-----	Carbazole	10	U
84-74-2-----	Di-n-Butylphthalate	10	U
206-44-0-----	Fluoranthene	10	U
129-00-0-----	Pyrene	10	U
85-68-7-----	Butylbenzylphthalate	10	U
91-94-1-----	3,3'-Dichlorobenzidine	10	U
56-55-3-----	Benzo(a)Anthracene	10	U
218-01-9-----	Chrysene	10	U
117-81-7-----	bis(2-Ethylhexyl)Phthalate	10	U
117-84-0-----	Di-n-Octyl Phthalate	10	U
205-99-2-----	Benzo(b)Fluoranthene	10	U
207-08-9-----	Benzo(k)Fluoranthene	10	U
50-32-8-----	Benzo(a)Pyrene	10	U
193-39-5-----	Indeno(1,2,3-cd)Pyrene	10	U
53-70-3-----	Dibenz(a,h)Anthracene	10	U
191-24-2-----	Benzo(g,h,i)Perylene	10	U

(1) - Cannot be separated from Diphenylamine

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

80TK01

Lab Name: ITAS-KNOXVILLE Contract: BAKER

Lab Code: ITSTU Case No.: 2227 SAS No.: _____ SDG No.: 274DRM

Matrix: (soil/water) WATER Lab Sample ID: AD2152

Sample wt/vol: 1000 (g/mL) ML Lab File ID: AD2152

Level: (low/med) LOW Date Received: 12/06/94

% Moisture: _____ decanted: (Y/N) _____ Date Extracted: 12/07/94

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 12/09/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: _____

Number TICs found: 6

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 872-50-4	2-PYRROLIDINONE, 1-METHYL-	6.10	19	JN
2.	UNKNOWN	13.25	3	J
3.	UNKNOWN	13.43	3	J
4.	UNKNOWN	17.68	8	J
5.	UNKNOWN	19.20	2	J
6.	UNKNOWN	19.50	2	J

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

80TK01

Lab Name: ITAS-KNOXVILLE Contract: _____

Lab Code: _____ Case No.: WO2227 SAS No.: _____ SDG No.: 3TK01

Matrix: (soil/water) WATER Lab Sample ID: AD2152

Sample wt/vol: 1000 (g/mL) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N) _____ Date Received: 12/05/94

Extraction: (SepF/Cont/Sonc) CONT Date Extracted: 12/07/94

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 12/19/94

Injection Volume: 1.00 (uL) Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH: 7.0 Sulfur Cleanup: (Y/N) N

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L Q

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/L</u>	Q
319-84-6	alpha-BHC	0.050	U
319-85-7	beta-BHC	0.050	U
319-86-8	delta-BHC	0.050	U
58-89-9	gamma-BHC (Lindane)	0.050	U
76-44-8	Heptachlor	0.050	U
309-00-2	Aldrin	0.050	U
1024-57-3	Heptachlor epoxide	0.050	U
959-98-8	Endosulfan I	0.050	U
60-57-1	Dieldrin	0.10	U
72-55-9	4,4'-DDE	0.10	U
72-20-8	Endrin	0.10	U
33213-65-9	Endosulfan II	0.10	U
72-54-8	4,4'-DDD	0.10	U
1031-07-8	Endosulfan sulfate	0.10	U
50-29-3	4,4'-DDT	0.10	U
72-43-5	Methoxychlor	0.50	U
53494-70-5	Endrin ketone	0.10	U
7421-93-4	Endrin aldehyde	0.10	U
5103-71-9	alpha-Chlordane	0.050	U
5103-74-2	gamma-Chlordane	0.050	U
8001-35-2	Toxaphene	5.0	U
12674-11-2	Aroclor-1016	1.0	U
11104-28-2	Aroclor-1221	2.0	U
11141-16-5	Aroclor-1232	1.0	U
53469-21-9	Aroclor-1242	1.0	U
12672-29-6	Aroclor-1248	1.0	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

80TK014E

Lab Name: ITAS-KNOXVILLE Contract: _____

Lab Code: _____ Case No.: W02227 SAS No.: _____ SDG No.: 3TK01

Matrix: (soil/water) WATER Lab Sample ID: AD2152RE

Sample wt/vol: 1000 (g/mL) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N) _____ Date Received: 12/05/94

Extraction: (SepF/Cont/Sonc) CONT Date Extracted: 12/20/94

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 12/21/94

Injection Volume: 1.00 (uL) Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH: 7.0 Sulfur Cleanup: (Y/N) N

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L Q

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/L</u>	Q
319-84-6	alpha-BHC	0.050	U
319-85-7	beta-BHC	0.050	U
319-86-8	delta-BHC	0.050	U
58-89-9	gamma-BHC (Lindane)	0.050	U
76-44-8	Heptachlor	0.050	U
309-00-2	Aldrin	0.050	U
1024-57-3	Heptachlor epoxide	0.050	U
959-98-8	Endosulfan I	0.10	U
60-57-1	Dieldrin	0.10	U
72-55-9	4,4'-DDE	0.10	U
72-20-8	Endrin	0.10	U
33213-65-9	Endosulfan II	0.10	U
72-54-8	4,4'-DDD	0.10	U
1031-07-8	Endosulfan sulfate	0.10	U
50-29-3	4,4'-DDT	0.10	U
72-43-5	Methoxychlor	0.50	U
53494-70-5	Endrin ketone	0.10	U
7421-93-4	Endrin aldehyde	0.10	U
5103-71-9	alpha-Chlordane	0.050	U
5103-74-2	gamma-Chlordane	0.050	U
8001-35-2	Toxaphene	5.0	U
12674-11-2	Aroclor-1016	1.0	U
11104-28-2	Aroclor-1221	2.0	U
11141-16-5	Aroclor-1232	1.0	U
53469-21-9	Aroclor-1242	1.0	U
12672-29-6	Aroclor-1248	1.0	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

80TK01

Lab Name: ITAS KNOXVILLE Contract: BAKER/LEJE
Lab Code: ITSTU Case No.: 2227 SAS No.: SDG No.: N/A
Matrix (soil/water): WATER Lab Sample ID: AD2153
Level (low/med): LOW Date Received: 09/12/93
& Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	422			P
7440-36-0	Antimony	50.0	U		P
7440-38-2	Arsenic	10.0	U		P
7440-39-3	Barium	27.7	B		P
7440-41-7	Beryllium	1.0	U		P
7440-43-9	Cadmium	5.0	U		P
7440-70-2	Calcium	44100			P
7440-47-3	Chromium	10.0	U		P
7440-48-4	Cobalt	10.0	U		P
7440-50-8	Copper	10.0	U		P
7439-89-6	Iron	344			P
7439-92-1	Lead	3.0	U		P
7439-95-4	Magnesium	3160	B		P
7439-96-5	Manganese	39.0			P
7439-97-6	Mercury	0.20	U		P
7440-02-0	Nickel	20.0	U		P
7440-09-7	Potassium	1640	B		P
7782-49-2	Selenium	5.0	U		P
7440-22-4	Silver	5.0	U		P
7440-23-5	Sodium	22200			P
7440-28-0	Thallium	10.0	U		P
7440-62-2	Vanadium	10.0	U		P
7440-66-6	Zinc	31.9			P

Color Before: ORANGE Clarity Before: CLOUDY Texture: N/A
Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

3TK01

Lab Name: ITAS-KNOXVILLE Contract: BAKER

Lab Code: ITSTU Case No.: 2227 SAS No.: _____ SDG No.: 274DRM

Matrix: (soil/water) WATER Lab Sample ID: AD2145

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: AD2145R

Level: (low/med) LOW Date Received: 12/06/94

% Moisture: not dec. _____ Date Analyzed: 12/12/94

GC Column: RTX624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L Q

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/L</u>	Q
74-87-3	-----Chloromethane	3	J
74-83-9	-----Bromomethane	10	U
75-01-4	-----Vinyl Chloride	10	U
75-00-3	-----Chloroethane	10	U
75-09-2	-----Methylene Chloride	2	BJ
67-64-1	-----Acetone	270	BE
75-15-0	-----Carbon Disulfide	10	U
75-35-4	-----1,1-Dichloroethene	10	U
75-34-3	-----1,1-Dichloroethane	10	U
540-59-0	-----1,2-Dichloroethene (total)	10	U
67-66-3	-----Chloroform	10	U
107-06-2	-----1,2-Dichloroethane	10	U
78-93-3	-----2-Butanone	10	B
71-55-6	-----1,1,1-Trichloroethane	10	U
56-23-5	-----Carbon Tetrachloride	10	U
75-27-4	-----Bromodichloromethane	10	U
78-87-5	-----1,2-Dichloropropane	10	U
10061-01-5	-----cis-1,3-Dichloropropene	10	U
79-01-6	-----Trichloroethene	10	U
124-48-1	-----Dibromochloromethane	10	U
79-00-5	-----1,1,2-Trichloroethane	10	U
71-43-2	-----Benzene	2	J
10061-02-6	-----trans-1,3-Dichloropropene	10	U
75-25-2	-----Bromoform	10	U
108-10-1	-----4-Methyl-2-Pentanone	10	U
591-78-6	-----2-Hexanone	10	U
127-18-4	-----Tetrachloroethene	10	U
79-34-5	-----1,1,2,2-Tetrachloroethane	10	U
108-88-3	-----Toluene	1	J
108-90-7	-----Chlorobenzene	10	U
100-41-4	-----Ethylbenzene	10	U
100-42-5	-----Styrene	10	U
1330-20-7	-----Xylene (total)	10	U J

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

3TK01

Lab Name: ITAS-KNOXVILLE Contract: BAKER

Lab Code: ITSTU Case No.: 2227 SAS No.: _____ SDG No.: 274DRM

Matrix: (soil/water) WATER Lab Sample ID: AD2145

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: AD2145R

Level: (low/med) LOW Date Received: 12/06/94

% Moisture: not dec. _____ Date Analyzed: 12/12/94

GC Column: RTX624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	4.70	17	J

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

3TK01DL

Lab Name: ITAS-KNOXVILLE Contract: BAKER

Lab Code: ITSTU Case No.: 2227 SAS No.: _____ SDG No.: 274DRM

Matrix: (soil/water) WATER Lab Sample ID: AD2145

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: AD2145D

Level: (low/med) LOW Date Received: 12/06/94

% Moisture: not dec. _____ Date Analyzed: 12/12/94

GC Column: RTX624 ID: 0.530 (mm) Dilution Factor: 2.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L Q

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/L</u>	Q
74-87-3	Chloromethane	9	DJ
74-83-9	Bromomethane	20	U
75-01-4	Vinyl Chloride	20	U
75-00-3	Chloroethane	20	U
75-09-2	Methylene Chloride	4	BDJ
67-64-1	Acetone	400	BD
75-15-0	Carbon Disulfide	20	U
75-35-4	1,1-Dichloroethene	20	U
75-34-3	1,1-Dichloroethane	20	U
540-59-0	1,2-Dichloroethene (total)	20	U
67-66-3	Chloroform	20	U
107-06-2	1,2-Dichloroethane	20	U
78-93-3	2-Butanone	11	BDJ
71-55-6	1,1,1-Trichloroethane	20	U
56-23-5	Carbon Tetrachloride	20	U
75-27-4	Bromodichloromethane	20	U
78-87-5	1,2-Dichloropropane	20	U
10061-01-5	cis-1,3-Dichloropropene	20	U
79-01-6	Trichloroethene	20	U
124-48-1	Dibromochloromethane	20	U
79-00-5	1,1,2-Trichloroethane	20	U
71-43-2	Benzene	20	U
10061-02-6	trans-1,3-Dichloropropene	20	U
75-25-2	Bromoform	20	U
108-10-1	4-Methyl-2-Pentanone	20	U
591-78-6	2-Hexanone	20	U
127-18-4	Tetrachloroethene	20	U
79-34-5	1,1,2,2-Tetrachloroethane	20	U
108-88-3	Toluene	20	U
108-90-7	Chlorobenzene	20	U
100-41-4	Ethylbenzene	20	U
100-42-5	Styrene	20	U
1330-20-7	Xylene (total)	20	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

3TK01DL

Lab Name: ITAS-KNOXVILLEContract: BAKERLab Code: ITSTU Case No.: 2227SAS No.: _____ SDG No.: 274DRMMatrix: (soil/water) WATERLab Sample ID: AD2145Sample wt/vol: 5.0 (g/mL) MLLab File ID: AD2145DLevel: (low/med) LOWDate Received: 12/06/94

% Moisture: not dec. _____

Date Analyzed: 12/12/94GC Column: RTX624 ID: 0.530 (mm)Dilution Factor: 2.0

Soil Extract Volume: _____ (uL)

Soil Aliquot Volume: _____ (uL)

Number TICs found: 2CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	2.33	12	J
2.	UNKNOWN	4.73	41	J

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

3TK01

Lab Name: ITAS-KNOXVILLE Contract: BAKER

Lab Code: ITSTU Case No.: 2227 SAS No.: _____ SDG No.: 274DRM

Matrix: (soil/water) WATER Lab Sample ID: AD2146

Sample wt/vol: 1000 (g/mL) ML Lab File ID: AD2146

Level: (low/med) LOW Date Received: 12/06/94

% Moisture: _____ decanted: (Y/N) _____ Date Extracted: 12/07/94

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 12/09/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: _____

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/L</u>	Q
108-95-2	Phenol	10	U
111-44-4	bis(2-Chloroethyl) Ether	10	U
95-57-8	2-Chlorophenol	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
95-50-1	1,2-Dichlorobenzene	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	2,2'-Oxybis(1-Chloropropane)	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-Di-n-Propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
111-91-1	bis(2-Chloroethoxy)Methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
59-50-7	4-Chloro-3-Methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	25	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	25	U
131-11-3	Dimethylphthalate	10	U
208-96-8	Acenaphthylene	10	U
606-20-2	2,6-Dinitrotoluene	10	U
99-09-2	3-Nitroaniline	25	U
83-32-9	Acenaphthene	100	E

P. 2/14/94

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

3TK01

Lab Name: ITAS-KNOXVILLE Contract: BAKER

Lab Code: ITSTU Case No.: 2227 SAS No.: _____ SDG No.: 274DRM

Matrix: (soil/water) WATER Lab Sample ID: AD2146

Sample wt/vol: 1000 (g/mL) ML Lab File ID: AD2146

Level: (low/med) LOW Date Received: 12/06/94

% Moisture: _____ decanted: (Y/N) _____ Date Extracted: 12/07/94

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 12/09/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: _____

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/L	Q
51-28-5	2,4-Dinitrophenol	25	U
100-02-7	4-Nitrophenol	25	U
132-64-9	Dibenzofuran	45	
121-14-2	2,4-Dinitrotoluene	10	U
84-66-2	Diethylphthalate	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
86-73-7	Fluorene	62	
100-01-6	4-Nitroaniline	25	U
534-52-1	4,6-Dinitro-2-methylphenol	25	U
86-30-6	N-Nitrosodiphenylamine (1)	10	U
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
87-86-5	Pentachlorophenol	25	U
85-01-8	Phenanthrene	150	F
120-12-7	Anthracene	10	
86-74-8	Carbazole	6	J
84-74-2	Di-n-Butylphthalate	10	U
206-44-0	Fluoranthene	35	
129-00-0	Pyrene	26	
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	10	U
56-55-3	Benzo(a)Anthracene	2	J
218-01-9	Chrysene	2	J
117-81-7	bis(2-Ethylhexyl)Phthalate	1	J
117-84-0	Di-n-Octyl Phthalate	10	U
205-99-2	Benzo(b)Fluoranthene	10	U
207-08-9	Benzo(k)Fluoranthene	10	U
50-32-8	Benzo(a)Pyrene	10	U
193-39-5	Indeno(1,2,3-cd)Pyrene	10	U
53-70-3	Dibenz(a,h)Anthracene	10	U
191-24-2	Benzo(g,h,i)Perylene	10	U

(1) - Cannot be separated from Diphenylamine

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

3TK01

Lab Name: ITAS-KNOXVILLE Contract: BAKER

Lab Code: ITSTU Case No.: 2227 SAS No.: _____ SDG No.: 274DRM

Matrix: (soil/water) WATER Lab Sample ID: AD2146

Sample wt/vol: 1000 (g/mL) ML Lab File ID: AD2146

Level: (low/med) LOW Date Received: 12/06/94

% Moisture: _____ decanted: (Y/N) _____ Date Extracted: 12/07/94

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 12/09/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: _____

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

Number TICs found: 23

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	7.57	2	J
2.	UNKNOWN	8.73	12	J
3.	UNKNOWN	9.33	4	J
4.	NAPHTHALENE, -DIMETHYL-	9.68	6	JY
5.	NAPHTHALENE, -DIMETHYL-	9.85	8	JY
6.	NAPHTHALENE, -DIMETHYL-	10.08	2	JY
7.	UNKNOWN	10.22	2	J
8.	UNKNOWN	10.73	6	J
9.	UNKNOWN PAH	11.93	6	J
10.	UNKNOWN	12.02	3	J
11.	UNKNOWN	12.12	5	J
12.	UNKNOWN	12.20	18	J
13.	UNKNOWN	12.62	2	J
14.	UNKNOWN PAH	12.75	2	J
15.	9H-FLUORENE, -METHYL-	13.00	3	JY
16.	UNKNOWN	13.58	2	J
17.	132-65-0 DIBENZOTHIOPHENE	13.67	5	JN
18.	UNKNOWN	14.08	6	J
19.	UNKNOWN PAH	14.52	3	J
20.	UNKNOWN PAH	15.17	3	J
21.	UNKNOWN PAH	15.23	3	J
22.	UNKNOWN PAH	15.47	12	J
23.	UNKNOWN PAH	17.27	12	J

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

3TK01DL

Lab Name: ITAS-KNOXVILLE Contract: BAKER

Lab Code: ITSTU Case No.: 2227 SAS No.: _____ SDG No.: 274DRM

Matrix: (soil/water) WATER Lab Sample ID: AD2146

Sample wt/vol: 1000 (g/mL) ML Lab File ID: AD2146D

Level: (low/med) LOW Date Received: 12/06/94

% Moisture: _____ decanted: (Y/N) _____ Date Extracted: 12/07/94

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 12/13/94

Injection Volume: 2.0 (uL) Dilution Factor: 3.0

GPC Cleanup: (Y/N) N pH: _____

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/L</u>	Q
108-95-2	Phenol	30	U
111-44-4	bis(2-Chloroethyl) Ether	30	U
95-57-8	2-Chlorophenol	30	U
541-73-1	1,3-Dichlorobenzene	30	U
106-46-7	1,4-Dichlorobenzene	30	U
95-50-1	1,2-Dichlorobenzene	30	U
95-48-7	2-Methylphenol	30	U
108-60-1	2,2'-Oxybis(1-Chloropropane)	30	U
106-44-5	4-Methylphenol	30	U
621-64-7	N-Nitroso-Di-n-Propylamine	30	U
67-72-1	Hexachloroethane	30	U
98-95-3	Nitrobenzene	30	U
78-59-1	Isophorone	30	U
88-75-5	2-Nitrophenol	30	U
105-67-9	2,4-Dimethylphenol	30	U
111-91-1	bis(2-Chloroethoxy)Methane	30	U
120-83-2	2,4-Dichlorophenol	30	U
120-82-1	1,2,4-Trichlorobenzene	30	U
91-20-3	Naphthalene	30	U
106-47-8	4-Chloroaniline	30	U
87-68-3	Hexachlorobutadiene	30	U
59-50-7	4-Chloro-3-Methylphenol	30	U
91-57-6	2-Methylnaphthalene	30	U
77-47-4	Hexachlorocyclopentadiene	30	U
88-06-2	2,4,6-Trichlorophenol	30	U
95-95-4	2,4,5-Trichlorophenol	75	U
91-58-7	2-Chloronaphthalene	30	U
88-74-4	2-Nitroaniline	75	U
131-11-3	Dimethylphthalate	30	U
208-96-8	Acenaphthylene	30	U
606-20-2	2,6-Dinitrotoluene	30	U
99-09-2	3-Nitroaniline	75	U
83-32-9	Acenaphthene	77	D

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

3TK01DL

Lab Name: ITAS-KNOXVILLE Contract: BAKER

Lab Code: ITSTU Case No.: 2227 SAS No.: _____ SDG No.: 274DRM

Matrix: (soil/water) WATER Lab Sample ID: AD2146

Sample wt/vol: 1000 (g/mL) ML Lab File ID: AD2146D

Level: (low/med) LOW Date Received: 12/06/94

% Moisture: _____ decanted: (Y/N) _____ Date Extracted: 12/07/94

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 12/13/94

Injection Volume: 2.0 (uL) Dilution Factor: 3.0

GPC Cleanup: (Y/N) N pH: _____

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NO. COMPOUND (ug/L or ug/Kg) UG/L Q

51-28-5-----	2,4-Dinitrophenol	75	U
100-02-7-----	4-Nitrophenol	75	U
132-64-9-----	Dibenzofuran	37	D
121-14-2-----	2,4-Dinitrotoluene	30	U
84-66-2-----	Diethylphthalate	30	U
7005-72-3-----	4-Chlorophenyl-phenylether	30	U
86-73-7-----	Fluorene	54	D
100-01-6-----	4-Nitroaniline	75	U
534-52-1-----	4,6-Dinitro-2-methylphenol	75	U
86-30-6-----	N-Nitrosodiphenylamine (1)	30	U
101-55-3-----	4-Bromophenyl-phenylether	30	U
118-74-1-----	Hexachlorobenzene	30	U
87-86-5-----	Pentachlorophenol	75	U
85-01-8-----	Phenanthrene	120	D
120-12-7-----	Anthracene	8	DJ
86-74-8-----	Carbazole	5	DJ
84-74-2-----	Di-n-Butylphthalate	30	U
206-44-0-----	Fluoranthene	31	D
129-00-0-----	Pyrene	22	DJ
85-68-7-----	Butylbenzylphthalate	30	U
91-94-1-----	3,3'-Dichlorobenzidine	30	U
56-55-3-----	Benzo(a)Anthracene	30	U
218-01-9-----	Chrysene	30	U
117-81-7-----	bis(2-Ethylhexyl)Phthalate	30	U
117-84-0-----	Di-n-Octyl Phthalate	30	U
205-99-2-----	Benzo(b)Fluoranthene	30	U
207-08-9-----	Benzo(k)Fluoranthene	30	U
50-32-8-----	Benzo(a)Pyrene	30	U
193-39-5-----	Indeno(1,2,3-cd)Pyrene	30	U
53-70-3-----	Dibenz(a,h)Anthracene	30	U
191-24-2-----	Benzo(g,h,i)Perylene	30	U

(1) - Cannot be separated from Diphenylamine

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

3TK01DL

Lab Name: ITAS-KNOXVILLE Contract: BAKER

Lab Code: ITSTU Case No.: 2227 SAS No.: _____ SDG No.: 274DRM

Matrix: (soil/water) WATER Lab Sample ID: AD2146

Sample wt/vol: 1000 (g/mL) ML Lab File ID: AD2146D

Level: (low/med) LOW Date Received: 12/06/94

% Moisture: _____ decanted: (Y/N) _____ Date Extracted: 12/07/94

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 12/13/94

Injection Volume: 2.0(uL) Dilution Factor: 3.0

GPC Cleanup: (Y/N) N pH: _____

Number TICs found: 10

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	ETHANOL, UNKNOWN ETHER SUBST	8.13	6	J
2.	UNKNOWN PAH	9.75	9	J
3. 569-41-5	NAPHTHALENE, -DIMETHYL-	10.97	8	JY
4.	UNKNOWN	11.90	8	J
5.	UNKNOWN	13.43	17	J
6.	UNKNOWN	13.88	8	J
7. 132-65-0	DIBENZOTHIOPHENE	15.00	8	JN
8.	UNKNOWN	15.42	10	J
9. 203-64-5	UNKNOWN PAH	16.85	11	J
10.	UNKNOWN	18.37	13	J

*Pass
12/13/94*

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

3TK01

Lab Name: ITAS-KNOXVILLE Contract: _____

Lab Code: _____ Case No.: WO2227 SAS No.: _____ SDG No.: 3TK01

Matrix: (soil/water) WATER Lab Sample ID: AD2146

Sample wt/vol: 1000 (g/mL) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N) _____ Date Received: 12/05/94

Extraction: (SepF/Cont/Sonc) CONT Date Extracted: 12/07/94

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 12/19/94

Injection Volume: 1.00 (uL) Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH: 7.0 Sulfur Cleanup: (Y/N) N

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L Q

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/L</u>	Q
319-84-6	alpha-BHC	0.050	U
319-85-7	beta-BHC	0.050	U
319-86-8	delta-BHC	0.050	U
58-89-9	gamma-BHC (Lindane)	0.050	U
76-44-8	Heptachlor	0.050	U
309-00-2	Aldrin	0.050	U
1024-57-3	Heptachlor epoxide	0.050	U
959-98-8	Endosulfan I	0.050	U
60-57-1	Dieldrin	0.10	U
72-55-9	4,4'-DDE	0.10	U
72-20-8	Endrin	0.10	U
33213-65-9	Endosulfan II	0.10	U
72-54-8	4,4'-DDD	0.10	U
1031-07-8	Endosulfan sulfate	0.10	U
50-29-3	4,4'-DDT	0.10	U
72-43-5	Methoxychlor	0.50	U
53494-70-5	Endrin ketone	0.10	U
7421-93-4	Endrin aldehyde	0.11	P
5103-71-9	alpha-Chlordane	0.050	U
5103-74-2	gamma-Chlordane	0.050	U
8001-35-2	Toxaphene	5.0	U
12674-11-2	Aroclor-1016	1.0	U
11104-28-2	Aroclor-1221	2.0	U
11141-16-5	Aroclor-1232	1.0	U
53469-21-9	Aroclor-1242	1.0	U
12672-29-6	Aroclor-1248	1.0	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

3TK01 RE

Lab Name: ITAS-KNOXVILLE Contract: _____

Lab Code: _____ Case No.: W02227 SAS No.: _____ SDG No.: 3TK01

Matrix: (soil/water) WATER Lab Sample ID: AD2146RE

Sample wt/vol: 1000 (g/mL) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N) _____ Date Received: 12/05/94

Extraction: (SepF/Cont/Sonc) CONT Date Extracted: 12/20/94

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 12/21/94

Injection Volume: 1.00 (uL) Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH: 7.0 Sulfur Cleanup: (Y/N) N

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L Q

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/L</u>	Q
319-84-6	alpha-BHC	0.050	U
319-85-7	beta-BHC	0.050	U
319-86-8	delta-BHC	0.050	U
58-89-9	gamma-BHC (Lindane)	0.050	U
76-44-8	Heptachlor	0.050	U
309-00-2	Aldrin	0.050	U
1024-57-3	Heptachlor epoxide	0.050	U
959-98-8	Endosulfan I	0.050	U
60-57-1	Dieldrin	0.10	U
72-55-9	4,4'-DDE	0.10	U
72-20-8	Endrin	0.10	U
33213-65-9	Endosulfan II	0.10	U
72-54-8	4,4'-DDD	0.13	P
1031-07-8	Endosulfan sulfate	0.10	U
50-29-3	4,4'-DDT	0.10	U
72-43-5	Methoxychlor	0.50	U
53494-70-5	Endrin ketone	0.10	U
7421-93-4	Endrin aldehyde	0.22	
5103-71-9	alpha-Chlordane	0.050	U
5103-74-2	gamma-Chlordane	0.050	U
8001-35-2	Toxaphene	5.0	U
12674-11-2	Aroclor-1016	1.0	U
11104-28-2	Aroclor-1221	2.0	U
11141-16-5	Aroclor-1232	1.0	U
53469-21-9	Aroclor-1242	1.0	U
12672-29-6	Aroclor-1248	1.0	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

3TK01

Lab Name: ITAS KNOXVILLE Contract: BAKER/LEJE
Lab Code: ITSTU Case No.: 2227 SAS No.: SDG No.: N/A
Matrix (soil/water): WATER Lab Sample ID: AD2147
Level (low/med): LOW Date Received: 09/12/93
% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	98100			P
7440-36-0	Antimony	50.0	U		P
7440-38-2	Arsenic	36.3			P
7440-39-3	Barium	534			P
7440-41-7	Beryllium	7.5			P
7440-43-9	Cadmium	10.8			P
7440-70-2	Calcium	362000			P
7440-47-3	Chromium	220			P
7440-48-4	Cobalt	23.7	B		P
7440-50-8	Copper	286			P
7439-89-6	Iron	72700			P
7439-92-1	Lead	72.0			P
7439-95-4	Magnesium	12800			P
7439-96-5	Manganese	650			P
7439-97-6	Mercury	0.46			CV
7440-02-0	Nickel	67.6			P
7440-09-7	Potassium	7540			P
7782-49-2	Selenium	9.7			P
7440-22-4	Silver	5.0	U		P
7440-23-5	Sodium	17500			P
7440-28-0	Thallium	10.0	U		P
7440-62-2	Vanadium	165			P
7440-66-6	Zinc	587			P

Color Before: ORANGE Clarity Before: CLOUDY Texture: N/A
Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:

TCLP VOLATILES ANALYSIS

Laboratory Name:	Quanterra-Knoxville	Job Number:	2220
Contract Name:	Quanterra-Export	TCLP Date:	N/A
Client Sample ID:	3-RB-01	Analysis Date:	12/10/94
Lab Sample ID:	AD2064	Sample Matrix:	Soil
Concentration Units:	mg/liter (ppm) in the leachate		

Compound	Concentration	Qualifier	Detection Limit
benzene	0.025	U	0.025
carbon tetrachloride	0.025	U	0.025
chlorobenzene	0.005	J	0.025
chloroform	0.025	U	0.025
1,2-dichloroethane	0.025	U	0.025
1,1-dichloroethene	0.025	U	0.025
methyl ethyl ketone	0.075	+	0.050
tetrachloroethene	0.006	J	0.025
trichloroethene	0.025	U	0.025
vinyl chloride	0.050	U	0.050

+ - Positive result.
 J - Indicates an estimated value less than the detection limit.
 U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

TCLP SEMIVOLATILES ANALYSIS

Laboratory Name:	Quanterra-Knoxville	Job Number:	2220
Contract Name:	Quanterra-Export	TCLP Date:	N/A
Client Sample ID:	3-RB-01	Extraction Date:	12/07/94
Lab Sample ID:	AD2065	Analysis Date:	12/14/94
Concentration Units:	mg/liter (ppm) in the leachate	Sample Matrix:	Soil

Compound	Concentration	Qualifier	Detection Limit
total cresols	0.04	U	0.04
1,4-dichlorobenzene	0.04	U	0.04
2,4-dinitrotoluene	0.04	U	0.04
hexachlorobenzene	0.04	U	0.04
hexachloro-1,3-butadiene	0.04	U	0.04
hexachloroethane	0.04	U	0.04
nitrobenzene	0.04	U	0.04
pentachlorophenol	0.20	U	0.20
pyridine	0.40	U	0.40
2,4,5-trichlorophenol	0.20	U	0.20
2,4,6-trichlorophenol	0.04	U	0.04

TCLP PESTICIDES ANALYSIS

Laboratory Name:	Quanterra-Knoxville	Job Number:	2220
Contract Name:	Quanterra-Export	TCLP Date:	N/A
Client Sample ID:	3-RB-01	Extraction Date:	12/07/94
Lab Sample ID:	AD2065	Analysis Date:	12/08/94
Concentration Units:	mg/liter (ppm) in the leachate	Sample Matrix:	Leachate

Compound	Concentration	Qualifier	Detection Limit
lindane	0.008	U	0.008
heptachlor	0.001	U	0.001
heptachlor epoxide	0.001	U	0.001
endrin	0.004	U	0.004
methoxychlor	0.08	U	0.08
chlordan	0.006	U	0.006
toxaphene	0.1	U	0.1

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

TCLP HERBICIDES ANALYSIS

00145

Laboratory Name:	Quanterra-Knoxville	Job Number:	2220
Contract Name:	Quanterra-Export	TCLP Date:	N/A
Client Sample ID:	3-RB-01	Extraction Date:	12/07/94
Lab Sample ID:	AD2065	Analysis Date:	12/08/94
Concentration Units:	mg/liter (ppm) in the leachate	Sample Matrix:	Soil

Compound	Concentration	Qualifier	Detection Limit
2,4-D	0.1	U	0.1
2,4,5-TP (silvex)	0.02	U	0.02

Surrogate Recovery	2,4-DCPA
Lab Sample ID: AD2065	89

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

3RB01T

Lab Name: ITAS_KNOXVILLE Contract: BAKER/LEJE

Lab Code: ITSTU Case No.: 2220T SAS No.: SDG No.: N/A

Matrix (soil/water): WATER Lab Sample ID: AD2065

Level (low/med): LOW Date Received: 12/05/94

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	200	U		P
7440-39-3	Barium	538			P
7440-43-9	Cadmium	50.0	U		P
7440-47-3	Chromium	100	U		P
7439-92-1	Lead	200	U		P
7439-97-6	Mercury	2.0	U		CV
7782-49-2	Selenium	200	U		P
7440-22-4	Silver	50.0	U		P

Color Before: COLORLESS Clarity Before: CLEAR Texture: N/A
Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:
T_IN_THE_SAMPLE_NO._DESIGNATES_TCLP_EXTRACT.

PCBs ANALYSIS

Laboratory Name:	Quanterra-Knoxville	Job Number:	2220
Contract Name:	Quanterra-Export	Extraction Date:	12/06/94
Client Sample ID:	3-RB-01	Analysis Date:	12/08/94
Lab Sample ID:	AD2061	Confirmation Date:	N/A
Sample Matrix:	Soil	Concentration Units:	µg/kg

Compound	Concentration	Qualifier
Aroclor-1016	20	U
Aroclor-1232	20	U
Aroclor-1242 †	20	U
Aroclor 1248	20	U
Aroclor 1254	40	U
Aroclor 1260	40	U

† - Sample Aroclor pattern identified and/or calculated as Aroclor 1242.
U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

General Chemistry Analysis

000 A

Client Sample ID: AD2063
Sample Date: 12/03/94
Lab Sample ID: Q41211001

Analysis Date	Parameter	Concentration mg/Kg
12/14/94	Sulfide, Reactive*	ND500
12/15/94	Cyanide, Reactive*	ND250

Lab Sample ID: Method Blank

Analysis Date	Parameter	Concentration mg/Kg
12/14/94	Sulfide, Reactive*	ND500
12/15/94	Cyanide, Reactive*	ND250

- * Results were determined by methodologies specified in SW-846, 3rd edition, 1986. These methods are prone to failure in both accuracy and reproducibility, therefore, we cannot assume any liability for these results. The reported detection limits are the EPA action levels for this analysis.

**ANALYSIS SUMMARY
FOR OPEN CUP IGNITABILITY**
Page 1 of 1

Method: ITS001
Reviewed by: AW
Date: 12/13/94

Project Name: IT MIDDLEBRACK Project Number: PC4620

Work Order No.: 04-12-110 04-12-141 Case/SDG Number:

Date Analyzed	Laboratory Sample ID	Client Sample ID	Results
12-13-94	Q41211001	N/A	>140°F
↓	Q41211001 Dup	↓	>140°F
	Q41214101		>140°F
↓	Q41214101 Dup	↓	>140°F

C:057A

115001 Method-Placing Sample in Tare with a Thermometer and Heating to 140°F to see if Ignition occurs.

pH ANALYSIS

00223

Laboratory Name:	Quanterra-Knoxville	Job Number:	2220
Contract Name:	Quanterra-Export	Extraction Date:	N/A
Sample Matrix:	Soil	Analysis Date:	12/14/94
Concentration Units:	standard units (s.u.)		

Client Sample ID	Lab Sample ID	Result
3-RB-01	AD2061	11.21

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

274DRM01

Lab Name: ITAS-KNOXVILLE Contract: BAKER

Lab Code: ITSTU Case No.: 2227 SAS No.: _____ SDG No.: 274DRM

Matrix: (soil/water) WATER Lab Sample ID: AD2148

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: AD2148R

Level: (low/med) LOW Date Received: 12/06/94

% Moisture: not dec. _____ Date Analyzed: 12/12/94

GC Column: RFX624 ID: 0.530 (mm) Dilution Factor: 20.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/L</u>	<u>Q</u>
74-87-3	Chloromethane	200	U
74-83-9	Bromomethane	200	U
75-01-4	Vinyl Chloride	200	U
75-00-3	Chloroethane	200	U
75-09-2	Methylene Chloride	38	BJ
67-64-1	Acetone	34000	BE
75-15-0	Carbon Disulfide	200	U
75-35-4	1,1-Dichloroethene	200	U
75-34-3	1,1-Dichloroethane	200	U
540-59-0	1,2-Dichloroethene (total)	200	U
67-66-3	Chloroform	200	U
107-06-2	1,2-Dichloroethane	200	U
78-93-3	2-Butanone	100	BJ
71-55-6	1,1,1-Trichloroethane	200	U
56-23-5	Carbon Tetrachloride	200	U
75-27-4	Bromodichloromethane	200	U
78-87-5	1,2-Dichloropropane	200	U
10061-01-5	cis-1,3-Dichloropropene	200	U
79-01-6	Trichloroethene	200	U
124-48-1	Dibromochloromethane	200	U
79-00-5	1,1,2-Trichloroethane	200	U
71-43-2	Benzene	200	U
10061-02-6	trans-1,3-Dichloropropene	200	U
75-25-2	Bromoform	200	U
108-10-1	4-Methyl-2-Pentanone	200	U
591-78-6	2-Hexanone	200	U
127-18-4	Tetrachloroethene	200	U
79-34-5	1,1,2,2-Tetrachloroethane	200	U
108-88-3	Toluene	200	U
108-90-7	Chlorobenzene	200	U
100-41-4	Ethylbenzene	200	U
100-42-5	Styrene	200	U
1330-20-7	Xylene (total)	200	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

274DRM01

Lab Name: ITAS-KNOXVILLE Contract: BAKER

Lab Code: ITSTU Case No.: 2227 SAS No.: _____ SDG No.: 274DRM

Matrix: (soil/water) WATER Lab Sample ID: AD2148

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: AD2148R

Level: (low/med) LOW Date Received: 12/06/94

% Moisture: not dec. _____ Date Analyzed: 12/12/94

GC Column: RTX624 ID: 0.530 (mm) Dilution Factor: 20.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	4.70	6900	J

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

274DRM01DL

Lab Name: ITAS-KNOXVILLE Contract: BAKER

Lab Code: ITSTU Case No.: 2227 SAS No.: _____ SDG No.: 274DRM

Matrix: (soil/water) WATER Lab Sample ID: AD2148

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: AD2148D

Level: (low/med) LOW Date Received: 12/06/94

% Moisture: not dec. _____ Date Analyzed: 12/15/94

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 250.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/L</u>	Q
74-87-3	Chloromethane	2500	U
74-83-9	Bromomethane	2500	U
75-01-4	Vinyl Chloride	2500	U
75-00-3	Chloroethane	2500	U
75-09-2	Methylene Chloride	730	BDJ
67-64-1	Acetone	16000	D
75-15-0	Carbon Disulfide	2500	U
75-35-4	1,1-Dichloroethene	2500	U
75-34-3	1,1-Dichloroethane	2500	U
540-59-0	1,2-Dichloroethene (total)	2500	U
67-66-3	Chloroform	2500	U
107-06-2	1,2-Dichloroethane	2500	U
78-93-3	2-Butanone	2500	U
71-55-6	1,1,1-Trichloroethane	2500	U
56-23-5	Carbon Tetrachloride	2500	U
75-27-4	Bromodichloromethane	2500	U
78-87-5	1,2-Dichloropropane	2500	U
10061-01-5	cis-1,3-Dichloropropene	2500	U
79-01-6	Trichloroethene	2500	U
124-48-1	Dibromochloromethane	2500	U
79-00-5	1,1,2-Trichloroethane	480	DJ
71-43-2	Benzene	2500	U
10061-02-6	trans-1,3-Dichloropropene	2500	U
75-25-2	Bromoform	2500	U
108-10-1	4-Methyl-2-Pentanone	2500	U
591-78-6	2-Hexanone	2500	U
127-18-4	Tetrachloroethene	2500	U
79-34-5	1,1,2,2-Tetrachloroethane	2500	U
108-88-3	Toluene	2500	U
108-90-7	Chlorobenzene	2500	U
100-41-4	Ethylbenzene	2500	U
100-42-5	Styrene	2500	U
1330-20-7	Xylene (total)	2500	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

274DRM01DL

Lab Name: ITAS-KNOXVILLE Contract: BAKER

Lab Code: ITSTU Case No.: 2227 SAS No.: _____ SDG No.: 274DRM

Matrix: (soil/water) WATER Lab Sample ID: AD2148

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: AD2148D

Level: (low/med) LOW Date Received: 12/06/94

% Moisture: not dec. _____ Date Analyzed: 12/15/94

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 250.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

Number TICs found: 1

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	4.70	8400	J

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

274DRM01

Lab Name: ITAS-KNOXVILLE Contract: BAKER

Lab Code: ITSTU Case No.: 2227 SAS No.: _____ SDG No.: 274DRM

Matrix: (soil/water) WATER Lab Sample ID: AD2149

Sample wt/vol: 1000 (g/mL) ML Lab File ID: AD2149

Level: (low/med) LOW Date Received: 12/06/94

‡ Moisture: _____ decanted: (Y/N) _____ Date Extracted: 12/07/94

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 12/09/94

Injection Volume: 2.0 (uL) Dilution Factor: 2.0

GPC Cleanup: (Y/N) N pH: _____

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NO.

COMPOUND

Q

108-95-2-----	Phenol	20	U
111-44-4-----	bis(2-Chloroethyl) Ether	20	U
95-57-8-----	2-Chlorophenol	20	U
541-73-1-----	1,3-Dichlorobenzene	20	U
106-46-7-----	1,4-Dichlorobenzene	20	U
95-50-1-----	1,2-Dichlorobenzene	20	U
95-48-7-----	2-Methylphenol	20	U
108-60-1-----	2,2'-Oxybis(1-Chloropropane)	20	U
106-44-5-----	4-Methylphenol	20	U
621-64-7-----	N-Nitroso-Di-n-Propylamine	20	U
67-72-1-----	Hexachloroethane	20	U
98-95-3-----	Nitrobenzene	20	U
78-59-1-----	Isophorone	20	U
88-75-5-----	2-Nitrophenol	20	U
105-67-9-----	2,4-Dimethylphenol	22	
111-91-1-----	bis(2-Chloroethoxy)Methane	20	U
120-83-2-----	2,4-Dichlorophenol	20	U
120-82-1-----	1,2,4-Trichlorobenzene	20	U
91-20-3-----	Naphthalene	20	U
106-47-8-----	4-Chloroaniline	20	U
87-68-3-----	Hexachlorobutadiene	20	U
59-50-7-----	4-Chloro-3-Methylphenol	20	U
91-57-6-----	2-Methylnaphthalene	20	U
77-47-4-----	Hexachlorocyclopentadiene	20	U
88-06-2-----	2,4,6-Trichlorophenol	20	U
95-95-4-----	2,4,5-Trichlorophenol	50	U
91-58-7-----	2-Chloronaphthalene	20	U
88-74-4-----	2-Nitroaniline	50	U
131-11-3-----	Dimethylphthalate	20	U
208-96-8-----	Acenaphthylene	20	U
606-20-2-----	2,6-Dinitrotoluene	20	U
99-09-2-----	3-Nitroaniline	50	U
83-32-9-----	Acenaphthene	2	J

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

274DRM01

Lab Name: ITAS-KNOXVILLE Contract: BAKER

Lab Code: ITSTU Case No.: 2227 SAS No.: _____ SDG No.: 274DRM

Matrix: (soil/water) WATER Lab Sample ID: AD2149

Sample wt/vol: 1000 (g/mL) ML Lab File ID: AD2149

Level: (low/med) LOW Date Received: 12/06/94

% Moisture: _____ decanted: (Y/N) _____ Date Extracted: 12/07/94

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 12/09/94

Injection Volume: 2.0 (uL) Dilution Factor: 2.0

GPC Cleanup: (Y/N) N pH: _____

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/L</u>	Q
51-28-5-----	2,4-Dinitrophenol	50	U
100-02-7-----	4-Nitrophenol	50	U
132-64-9-----	Dibenzofuran	20	U
121-14-2-----	2,4-Dinitrotoluene	20	U
84-66-2-----	Diethylphthalate	4	J
7005-72-3-----	4-Chlorophenyl-phenylether	20	U
86-73-7-----	Fluorene	20	U
100-01-6-----	4-Nitroaniline	50	U
534-52-1-----	4,6-Dinitro-2-methylphenol	50	U
86-30-6-----	N-Nitrosodiphenylamine (1)	20	U
101-55-3-----	4-Bromophenyl-phenylether	20	U
118-74-1-----	Hexachlorobenzene	20	U
87-86-5-----	Pentachlorophenol	50	U
85-01-8-----	Phenanthrene	6	J
120-12-7-----	Anthracene	20	U
86-74-8-----	Carbazole	20	U
84-74-2-----	Di-n-Butylphthalate	20	U
206-44-0-----	Fluoranthene	20	U
129-00-0-----	Pyrene	20	U
85-68-7-----	Butylbenzylphthalate	20	U
91-94-1-----	3,3'-Dichlorobenzidine	20	U
56-55-3-----	Benzo(a)Anthracene	20	U
218-01-9-----	Chrysene	20	U
117-81-7-----	bis(2-Ethylhexyl)Phthalate	7	J
117-84-0-----	Di-n-Octyl Phthalate	20	U
205-99-2-----	Benzo(b)Fluoranthene	20	U
207-08-9-----	Benzo(k)Fluoranthene	20	U
50-32-8-----	Benzo(a)Pyrene	20	U
193-39-5-----	Indeno(1,2,3-cd)Pyrene	20	U
53-70-3-----	Dibenz(a,h)Anthracene	20	U
191-24-2-----	Benzo(g,h,i)Perylene	20	U

(1) - Cannot be separated from Diphenylamine

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

274DRM01

Lab Name: ITAS-KNOXVILLE Contract: BAKER
 Lab Code: ITSTU Case No.: 2227 SAS No.: _____ SDG No.: 274DRM
 Matrix: (soil/water) WATER Lab Sample ID: AD2149
 Sample wt/vol: 1000 (g/mL) ML Lab File ID: AD2149
 Level: (low/med) LOW Date Received: 12/06/94
 % Moisture: _____ decanted: (Y/N) _____ Date Extracted: 12/07/94
 Concentrated Extract Volume: 1000 (uL) Date Analyzed: 12/09/94
 Injection Volume: 2.0 (uL) Dilution Factor: 2.0
 GPC Cleanup: (Y/N) N pH: _____

Number TICs found: 24

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	7.27	42	J
2.	UNKNOWN	9.05	47	J
3.	UNKNOWN	11.23	150	J
4.	134-62-3 BENZAMIDE, N,N-DIETHYL-3-MET	11.48	37	JN
5.	UNKNOWN	11.73	94	J
6.	4536-87-2 BENZENE, (1-ETHYLNONYL)-	12.30	22	JN
7.	4536-88-3 BENZENE, (1-METHYLDECYL)-	12.70	22	JN
8.	UNKNOWN	13.30	43	J
9.	UNKNOWN	13.43	72	J
10.	UNKNOWN	13.88	36	J
11.	UNKNOWN	15.40	24	J
12.	UNKNOWN	15.63	82	J
13.	UNKNOWN	15.93	33	J
14.	UNKNOWN	17.43	67	J
15.	UNKNOWN	17.68	300	J
16.	UNKNOWN	18.35	22	J
17.	UNKNOWN	19.02	57	J
18.	UNKNOWN	19.18	63	J
19.	UNKNOWN	19.62	76	J
20.	UNKNOWN	20.18	92	J
21.	UNKNOWN	20.40	21	J
22.	UNKNOWN	20.72	79	J
23.	UNKNOWN	21.27	59	J
24.	UNKNOWN	21.83	41	J

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

274DRM01

Lab Name: ITAS-KNOXVILLE Contract: _____

Lab Code: _____ Case No.: W02227 SAS No.: _____ SDG No.: 3TK01

Matrix: (soil/water) WATER Lab Sample ID: AD2149

Sample wt/vol: 1000 (g/mL) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N) _____ Date Received: 12/05/94

Extraction: (SepF/Cont/Sonc) CONT Date Extracted: 12/07/94

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 12/19/94

Injection Volume: 1.00 (uL) Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH: 7.0 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/L</u>	Q
319-84-6	alpha-BHC	0.050	U
319-85-7	beta-BHC	0.050	U
319-86-8	delta-BHC	0.050	U
58-89-9	gamma-BHC (Lindane)	0.050	U
76-44-8	Heptachlor	0.050	U
309-00-2	Aldrin	0.050	U
1024-57-3	Heptachlor epoxide	0.050	U
959-98-8	Endosulfan I	0.050	U
60-57-1	Dieldrin	0.10	U
72-55-9	4,4'-DDE	0.10	U
72-20-8	Endrin	0.10	U
33213-65-9	Endosulfan II	0.10	U
72-54-8	4,4'-DDD	0.11	U
1031-07-8	Endosulfan sulfate	0.10	U
50-29-3	4,4'-DDT	0.10	U
72-43-5	Methoxychlor	0.50	U
53494-70-5	Endrin ketone	0.10	U
7421-93-4	Endrin aldehyde	0.10	U
5103-71-9	alpha-Chlordane	0.050	U
5103-74-2	gamma-Chlordane	0.050	U
8001-35-2	Toxaphene	5.0	U
12674-11-2	Aroclor-1016	1.0	U
11104-28-2	Aroclor-1221	2.0	U
11141-16-5	Aroclor-1232	1.0	U
53469-21-9	Aroclor-1242	1.0	U
12672-29-6	Aroclor-1248	1.0	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

274DRM01RE

Lab Name: ITAS-KNOXVILLE Contract: _____

Lab Code: _____ Case No.: WO2227 SAS No.: _____ SDG No.: 3TK01

Matrix: (soil/water) WATER Lab Sample ID: AD2149RE

Sample wt/vol: 1000 (g/mL) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N) _____ Date Received: 12/05/94

Extraction: (SepF/Cont/Sonc) CONT Date Extracted: 12/20/94

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 12/21/94

Injection Volume: 1.00 (uL) Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH: 7.0 Sulfur Cleanup: (Y/N) N

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L Q

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/L</u>	Q
319-84-6	alpha-BHC	0.050	U
319-85-7	beta-BHC	0.050	U
319-86-8	delta-BHC	0.050	U
58-89-9	gamma-BHC (Lindane)	0.050	U
76-44-8	Heptachlor	0.050	U
309-00-2	Aldrin	0.050	U
1024-57-3	Heptachlor epoxide	0.050	U
959-98-8	Endosulfan I	0.050	U
60-57-1	Dieldrin	0.10	U
72-55-9	4,4'-DDE	0.10	U
72-20-8	Endrin	0.10	U
33213-65-9	Endosulfan II	0.10	U
72-54-8	4,4'-DDD	0.10	U
1031-07-8	Endosulfan sulfate	0.10	U
50-29-3	4,4'-DDT	0.10	U
72-43-5	Methoxychlor	0.50	U
53494-70-5	Endrin ketone	0.10	U
7421-93-4	Endrin aldehyde	0.10	U
5103-71-9	alpha-Chlordane	0.050	U
5103-74-2	gamma-Chlordane	0.050	U
8001-35-2	Toxaphene	5.0	U
12674-11-2	Aroclor-1016	1.0	U
11104-28-2	Aroclor-1221	2.0	U
11141-16-5	Aroclor-1232	1.0	U
53469-21-9	Aroclor-1242	1.0	U
12672-29-6	Aroclor-1248	1.0	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

74DRM01

Lab Name: ITAS KNOXVILLE Contract: BAKER/LEJE
 Lab Code: ITSTU Case No.: 2227 SAS No.: SDG No.: N/A
 Matrix (soil/water): WATER Lab Sample ID: AD2150
 Level (low/med): LOW Date Received: 09/12/93
 % Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	24500	-		P
7440-36-0	Antimony	50.0	U		P
7440-38-2	Arsenic	10.0	U		P
7440-39-3	Barium	57.4	B		P
7440-41-7	Beryllium	1.0	U		P
7440-43-9	Cadmium	5.0	U		P
7440-70-2	Calcium	12600	-		P
7440-47-3	Chromium	51.4	-		P
7440-48-4	Cobalt	10.0	U		P
7440-50-8	Copper	18.7	B		P
7439-89-6	Iron	49600	-		P
7439-92-1	Lead	29.9	-		P
7439-95-4	Magnesium	1540	B		P
7439-96-5	Manganese	292	-		P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	29.5	B		P
7440-09-7	Potassium	16500	-		P
7782-49-2	Selenium	9.2	-		P
7440-22-4	Silver	5.0	U		P
7440-23-5	Sodium	39400	-		P
7440-28-0	Thallium	10.0	U		P
7440-62-2	Vanadium	34.2	B		P
7440-66-6	Zinc	1390	-		P

Color Before: ORANGE Clarity Before: CLOUDY Texture: N/A
 Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

APPENDIX D.2
SUMMARY OF IDW DISPOSITION REPORT



Baker Environmental, Inc.
Airport Office Park, Building 3
420 Rouser Road
Coraopolis, Pennsylvania 15108

February 20, 1995

(412) 269-6000
FAX (412) 269-2002

Commander
Atlantic Division
Naval Facilities Engineering Command
1510 Gilbert Street (Building N-26)
Norfolk, Virginia 23511-6299

Attn: Ms. Katherine Landman
Code 1823

Re: Contract N62470-89-D-4814
Navy CLEAN, District III
Contract Task Order (CTO) 0274
Operable Units No. 8, 11, and 12
Sites 3, 7, 16, and 80 IDW Removal
MCB Camp Lejeune, North Carolina

Dear Ms. Landman:

This letter report presents a summary of investigation-derived waste (IDW) disposal activities at Sites 3, 7, 16, and 80, Marine Corps Base, Camp Lejeune, North Carolina. The IDW generated during the remedial investigation conducted from October 10, 1994 through December 4, 1994, was contained in roll-off boxes, 1000 gallon tanks, and 55-gallon drums.

In a letter dated January 19, 1995, Baker Environmental provided the sample collection, analytical findings, conclusions and recommendations with respect to the IDW handling and disposal. The recommendations were subsequently approved by the Navy/Marine Corps. The remainder of this letter report provides a summary of the disposal activities conducted under this CTO.

DISPOSAL

Based on LANTDIV/MCB Camp Lejeune approval, Baker arranged for the disposal of the following:

- 3,850 gallons of nonhazardous well development and purge water
- 400 gallons of nonhazardous decontamination fluids
- 40 cubic feet of drilling mud

Based on the nonhazardous determination, all IDW was deposited back onto the site in which it was generated.

In addition, Baker arranged for Four Seasons Inc., (IDW subcontractor) to remove nine (9) liters of waste methanol from Lot 203. This waste was generated during the EnSys investigation performed at Site 3. The subcontractor was also required to transport the waste methanol to Ecoflo Inc., a licensed Treatment Storage Disposal Facility (TSDF) located in Greensboro, North Carolina. The signed hazardous waste manifest, along with the material characterization form, land disposal restrictions notification and certification form, lab pack certification, and drum inventories are provided in Attachment A.



A Total Quality Corporation

Baker

Ms. Katherine Landman
February 20, 1995
Page 2

If you have any questions, please do not hesitate to call me at (412) 269-2053 or Raymond P. Watras (Activity Coordinator) at (412) 269-2016.

Sincerely,

BAKER ENVIRONMENTAL, INC.

Matthew D. Bartman

Matthew D. Bartman
Project Manager

MDB/lq

cc: Mr. Neal Paul
Mr. John Riggs
Ms. Lee Ann Rapp, Code 183 (w/o attachments)
Ms. Beth Collier, Code 02115(w/o attachments)

**ATTACHMENT A
HAZARDOUS WASTE MANIFEST AND
CORRESPONDING DOCUMENTATION**

NORTH CAROLINA HAZARDOUS WASTE MANIFEST

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST		1. Generator's US EPA ID No. NC16171010212151810111008		Manifest Document No. 111008		2. Page 1 of 1		Information in the shaded areas is not required by Federal law.			
Generator's Name and Mailing Address Commanding General AC/EMD/IR Marine Corp Base - Camp Lejeune PSC 2004 Camp Lejeune, NC 28542-004 4. Generator's Phone 1 910 1 451-5068						A. State Manifest Document Number					
						B. State Generator's ID					
5. Transporter 1 Company Name Four Seasons Environmental, Inc.			6. US EPA ID Number NC1D1911217171312			C. State Transporter's ID					
7. Transporter 2 Company Name			8. US EPA ID Number			D. Transporter's Phone (910)273-2718					
9. Designated Facility Name and Site Address Ecoflo, Inc. 2750 Patterson St. Greensboro, NC 27407			10. US EPA ID Number NC1D19181018141211312			E. State Transporter's ID					
						F. Transporter's Phone					
						G. State Facility's ID					
						H. Facility's Phone (910)855-7925					
						11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)		12. Containers No. Type		13. Total Quantity	
a. Waste, Flammable Liquids, n.o.s. (methanol), 3, UN 1993, PG II		0, 0, 2 D, F		000, 44 P				1003, Doc1			
b.											
c.											
d.											
Additional Descriptions for Materials Listed Above						K. Handling Codes for Wastes Listed Above					
a) Lab Pack - See attached container inventories for container numbers MCB-01 and MCB-02											
15. Special Handling Instructions and Additional Information											
Bill to : FSE PO Box 16590 Greensboro, NC 27416 Attn: K. Webb					24 Hour Emergency Phone: (910)273-2718 HAZ MAT Guide Number: 27						
16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.											
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.											
Printed/Typed Name Eugene H. Jones				Signature <i>Eugene H. Jones</i>				Month Day Year 10 21 03 95			
17. Transporter 1 Acknowledgement of Receipt of Materials				Printed/Typed Name Kenneth Webb				Signature <i>Kenneth Webb</i>		Month Day Year 10 21 03 95	
18. Transporter 2 Acknowledgement of Receipt of Materials				Printed/Typed Name				Signature		Month Day Year	
19. Discrepancy Indication Space											
20. Facility Owner or Operator. Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.											
Printed/Typed Name				Signature				Month Day Year			



Greensboro, NC (910) 855-7925
Savage, MD (301) 498-4550

Four Seasons Industrial
Services, Inc.
P. O. Box 16590
Greensboro, NC 27416-0590

Attn: Kenn Webb

TO BE COMPLETED BY ECOFLO

E-Code No. _____
Sales Rep. _____
Sample Yes No

MATERIAL CHARACTERIZATION FORM

Specialists in chemical and environmental management

SECTION A: GENERATOR INFORMATION

1) Name: Commanding General AC/EMD/IR 4) Technical Contact: Kenn Webb
2) Mailing Address: Marine Corp Base - Camp Lejeune 5) Title: Four Seasons Project Mgr
TSC 2004 Camp Lejeune, NC 28542-0004 6) Phone: (704) 332-7636 Ext. _____
3) Facility Address: Lot 203 - MCB Camp Lejeune 7) FAX Num.: (704) 332-2436
Camp Lejeune, NC 28542 8) EPA ID.#: NC 617 00 22 SBO

SECTION B: WASTE IDENTIFICATION

1) Waste Name: Lab Pack - Methanol and Water
2) Process Generating Waste: Decontamination Activities
3) Waste Code(s): EPA F003, D001 STATE _____
4) Source Code (See Reverse Page): A19 5) Form Code (See Reverse Page): B003 6) SIC Code: 9711

SECTION C: WASTE CHARACTERISTICS

1) PHYSICAL STATE at 70°F: Solid Liquid Gas Describe: _____
2) LAYERS: Multilayered Bilayered None 3) VISCOSITY at 70°F: Low Medium High
4) % TOTAL SOLIDS: varies % Describe: _____
5) BTU/lb. varies 6) pH varies 7) COLOR varies
8) FLASH POINT (°C): < 73°F 73° - 100°F 101° - 140°F 141° - 200°F > 200°F Exact: _____ °F
9) BOILING POINT: ≤ 95°F > 95°F 10) REACTIVE: Yes No Describe: _____
11) % TOTAL ORGANIC HALOGENS Cl F Br 12) CYANIDES: ppm 13) PCB: ppm
14) METALS (TCLP TOTAL Below Regulatory Levels):
As _____ ppm Ba _____ ppm Cd _____ ppm Cr _____ ppm Pb _____ ppm Hg _____ ppm
Se _____ ppm Ag _____ ppm Sb _____ ppm Tl _____ ppm Ni _____ ppm Be _____ ppm

SECTION D: CHEMICAL CONSTITUENTS (must equal 100% and represent all constituents)

<u>Lab Pack</u>	<u>100</u>	%
<u>See Drum Inventory Attached</u>		%
		%
		%
		%
		%
		%
		%

IF UNUSED/VIRGIN MATERIAL PLEASE SUBMIT MSDS

SECTION E: SAFETY DATA

1) HAZARD ALERT SYMBOL: HEALTH FLAMMABILITY REACTIVITY
2) RATED TOXICITY: Ingestion Inhalation Skin Absorption
3) INCOMPATIBILITIES: Oxidizers
heat flame

SECTION F: RECERTIFICATION

I certify that this waste stream has not changed.
Signature NA
Date _____ Title _____

SECTION G: WASTE VOLUME

1) ANTICIPATED VOLUME/CONTAINER COUNT: 2 Gal / Lbs Drums Cu.Yds. (Circle One)
per One Time Week Month Quarter Year Other
2) SIZE OF CONTAINER: 5 10 / 20 / 30 / 40 / 55 / 85 gal. (Circle One), Other _____
3) CONTAINER SPEC.: Open Head Drum Closed Head Drum Lever Lock Roll-Off
 Pallet Tanker Tote Tank Super Sac
4) TYPE OF CONTAINER: Metal Drum Polyfined Metal Drum Fiber Drum Polyfined Fiber Drum
 Poly Drum Wooden Box Fiber Box Cylinder

SECTION H: SHIPPING INFORMATION SECTION (To Be Completed by W.A. Dept.)

PSN: _____
CLASS/DIV.: _____ UN/NA#: _____ PG: _____ Unspecified Labels: _____
RQ: _____ PIH (Yes/No) HAZARD ZONE: _____

SECTION I: CERTIFICATION

I HEREBY CERTIFY THAT THE ABOVE DESCRIBED MATERIAL IS NONRADIOACTIVE AND NONETOLOGICAL/NONINFECTIOUS. I FURTHER CERTIFY THAT ALL INFORMATION SUBMITTED IN THIS AND ALL ATTACHED DOCUMENTS IS COMPLETE AND ACCURATE AND THAT ALL KNOWN OR SUSPECTED HAZARDS HAVE BEEN DISCLOSED.
IN ADDITION, I AUTHORIZE ECOFLO, INC., TO MAKE CORRECTIONS TO THIS MATERIAL CHARACTERIZATION FORM, SUCH CORRECTIONS CONSISTENT WITH THE RESULTS OF SAMPLE CHARACTERIZATION, AND/OR REGULATORY REQUIREMENTS. I UNDERSTAND THAT A CORF COPY WILL BE SENT TO ME.

Guy H. Jones AUTHORIZED SIGNATURE Biological Science Tech TITLE 2/3/95 DATE

ECOFLO

LAND DISPOSAL RESTRICTIONS NOTIFICATION AND CERTIFICATION FORM

Generator Name: MCB - Camp Lejeune

Manifest Doc. No.: NA I1008

Generator USEPA ID No. NC6170022580

State Manifest No.: _____

INSTRUCTIONS: In Column 1, identify all USEPA hazardous waste codes that apply to this waste shipment. In Column 2, indicate the appropriate Treatability Group Non-WasteWater (NWW) or WasteWater (WW) for each waste code. Place a check in Column 3 if the waste is California Listed. Also, check the appropriate California List constituent in Table - 2. In Column 4, enter the appropriate Subcategory Key # from Table - 4, if applicable, and also enter "Debris" in Column 4 if the waste is debris that will be treated using one of the alternative treatment technologies provided by 268.45. In Column 5, reference the appropriate Waste Management paragraph(s) from Table - 3 of this form. In Column 6, enter the Reference Number or Numbers from Table - 1 for all regulated constituents associated with F001-F005, F039, D001, D002 and D012-D043. Also, if the waste is a debris, enter in Column 6 the Reference Number or Numbers from Table - 1 of the contaminants subject to treatment.

Check this box if using a continuation sheet.

REF #	1. WASTE CODE	2. TREAT GROUP	3. CALIF LISTED	4. SUBCATEGORY	5. WASTE MANAGEMENT	6. REGULATED CONSTITUENTS
1	F003	NWW	NA	19	A	131
2	D001	NWW	NA	High W 1	A	131
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						

I hereby certify that all information submitted in this and all associated documents is complete and accurate to the best of my knowledge and information

Signature: Eugene A. Jones

Title: Biological Scientist

Print Name: Eugene A. Jones

Date: 2/3/95

ECOFLO LAB PACK CERTIFICATION

Generator Name: Marine Corp Base - Camp Lejeune

Manifest Doc. No.: F 1008

EPA ID Number: NC617 002 2580

State Manifest Doc. No.: _____

If your waste is packaged in lab packs and does NOT include waste codes listed on Appendix IV (see below), the following certification must be completed and the respective container numbers listed. Use additional sheets if necessary. If any lab pack containers INCLUDE waste codes listed in Appendix IV, the LDR Notification and Certification Form must be completed for those containers and the corresponding waste codes.

Check this box if using a continuation sheet.

Container number(s):

MCB-01	MCB-02						

APPENDIX IV

D009	K004	K062	K106	P012	U134
F019	K005	K071	P010	P076	U151
K003	K006	K100	P011	P078	

I certify under penalty of law that I personally have examined and am familiar with the waste and that the lab pack does not contain any wastes identified at 268.42(c)(2). I am aware that there are significant penalties for submitting a false certification including the possibility of fine or imprisonment.

Signature: *Eugene A. Jones*

Print Name: Eugene A Jones

Date: 2/3/95

Table 1 - Regulated Constituents

CONSTITUENT	CONSTITUENT	CONSTITUENT	CONSTITUENT
115 Heptachlor	150 2-Nitropropane	185 Toluene	
116 Heptachlor epoxide	151 N-Nitrosodiethylamine	186 Toxaphene	
117 Hexachlorobenzene	152 N-Nitrosodimethylamine	187 Tribromomethane (Bromoforn)	
118 Hexachlorobutadiene	153 N-Nitroso-di-n-butylamine	188 1,2,4-Trichlorobenzene	
119 Hexachlorodibenzo-furans	154 N-Nitrosomethylthylamine	189 1,1,1-Trichloroethane	
120 Hexachlorodibenzo-p-dioxins	155 N-Nitrosomorpholine	190 1,1,2-Trichloroethane	
121 Hexachlorocyclopentadiene	156 N-Nitrozopiperidine	191 Trichloroethylene	
122 Hexachloroethane	157 N-Nitrosopyrrolidine	192 Trichloromono fluoromethane	
123 Hexachloropropylene	158 Parathion	193 2,4,5-Trichlorophenol	
124 Indeno (1,2,3-c)pyrene	159 Pentachlorobenzene	194 2,4,6-Trichlorophenol	
125 Iodomethane	160 Pentachlorodibenzo-furans	195 1,2,3-Trichloropropene	
126 Isobutyl alcohol	161 Pentachlorodibenzo-p-dioxins	196 1,1,2-Trichloro-1,2,2-trifluoroethane	
127 Isodrin	162 Pentachloroethane	197 Vinyl chloride	
128 Isosafrole	163 Pentachloronitrobenzene	198 Xylenes (Total)	
129 Kepone	164 Pentachlorophenol	199 Total PCB's	
130 Methacrylonitrile	165 Phenacetin	200 Antimony	
131 Methanol	166 Phenanthrene	201 Arsenic	
132 Methapyrene	167 Phenol	202 Barium	
133 Methoxychlor	168 Phorate	203 Beryllium	
134 3-Methylchloranthrene	169 Phthalic acid	204 Cadmium	
135 4,4-Methylene-bis-(2-chloroaniline)	170 Phthalic anhydride	205 Chromium (Total)	
136 Methylene chloride	171 Pronexide	206 Cyanide (Total)	
137 Methyl ethyl ketone	172 Propanenitrile (Ethyl cyanide)	207 Cyanide (Amenable)	
138 Methyl isobutyl ketone	173 Pyrene	208 Fluoride	
139 Methyl methacrylate	174 Pyridine	209 Lead	
140 Methyl methanesulfonate	175 Safrole	210 Mercury - NWW from Retort	
141 Methyl parathion	176 Silvex (2,4,5-TP)	211 Mercury - All Others	
142 Naphthalene	177 2,4,5-T	212 Nickel	
143 2-Naphthylamine	178 1,2,4,5-Tetrachlorobenzene	213 Selenium	
144 p-Nitroaniline	179 Tetrachlorodibenzo-furans	214 Silver	
145 o-Nitroaniline	180 Tetrachlorodibenzo-p-dioxins	215 Sulfide	
146 Nitrobenzene	181 1,1,1,2-Tetrachloroethane	216 Thallium	
147 5-Nitro-o-toluidine	182 1,1,2,2-Tetrachloroethane	217 Vanadium	
148 o-Nitrophenol	183 Tetrachloroethylene	218 Zinc	
149 p-Nitrophenol	184 2,3,4,6-Tetrachlorophenol		

Table 2 - California Listed Waste

1) Liquid PCB's \geq 50 ppm	2) Halogenated organic carbon (HOC's) \geq 1000 mg/l	3) Free Cyanides (Liquids) \geq 1000 mg/l
4) Nickel (Ni) \geq 134 mg/l	5) Thallium (Tl) \geq 130 mg/l	

Table 1 - Regulated Constituents

#	CONSTITUENT	#	CONSTITUENT	#	CONSTITUENT
1	Acenaphthylene	39	p-Chloroaniline	77	trans-1,2-Dichloroethylene
2	Acenaphthene	40	Chlorobenzene	78	2,4-Dichlorophenol
3	Acetone	41	Chlorobenzilate	79	2,6-Dichlorophenol
4	Acetonitrile	42	2-Chloro-1,3-butadiene	80	1,2-Dichloropropane
5	Acetophenone	43	Chlorodibromomethane	81	cis-1,3-Dichloropropylene
6	2-Acetylaminofluorene	44	Chloroethane	82	trans-1,3-Dichloropropylene
7	Acrolein	45	Chloroform	83	Dieldrin
8	Acrylamide	46	p-Chloro-m-cresol	84	Diethyl phthalate
9	Acrylonitrile	47	2-Chloroethyl vinyl ether	85	2,4-Dimethyl phenol
10	Aldrin	48	Chloromethane (methyl chloride)	86	Dimethyl phthalate
11	4-Aminobiphenyl	49	2-Chloronaphthalene	87	Di-n-butyl phthalate
12	Aniline	50	2-Chlorophenol	88	1,4-Dinitrobenzene
13	Anthracene	51	3-Chloropropylene	89	4,6-Dinitro-o-cresol
14	Aramid	52	Chrysene	90	2,4-Dinitrophenol
15	alpha-BHC	53	p-Cresol	91	2,4-Dinitrotoluene
16	beta-BHC	54	m-Cresol	92	2,6-Dinitrotoluene
17	delta-BHC	55	o-Cresol	93	Di-n-octyl phthalate
18	gamma-BHC	56	Cyclohexanone	94	Di-n-propylnitrosamine
19	Benz(a)anthracene	57	2,4-Dichlorophenoxyacetic acid (2,4-D)	95	Diphenylamine
20	Benzal chloride	58	o,p'-DDD	96	1,2-Diphenylhydrazine
21	Benzene	59	p,p'-DDD	97	Diphenylnitrosamine
22	Benzo(a)pyrene	60	o,p'-DDE	98	1,4-Dioxane
23	Benzo(b)fluoranthene	61	p,p'-DDE	99	p-Dimethylanilinoazobenzene
24	Benzo(g,h,i)perylene	62	o,p'-DDT	100	Disulfoton
25	Benzo(k)fluoranthene	63	p,p'-DDT	101	Endosulfan I
26	bis-(2-Chloroethoxy)methane	64	Dibenzo(a,e)pyrene	102	Endosulfan II
27	bis-(2-Chloroethyl) ether	65	Dibenzo(a,h)anthracene	103	Endosulfan sulfate
28	bis-(2-Chloroisopropyl)ether	66	tris-(2,3-Dibromopropyl) phosphate	104	Endrin
29	bis-(2-Ethylhexyl) phthalate	67	1,2-Dibromo-3-chloropropane	105	Endrin aldehyde
30	Bromodichloromethane	68	1,2-Dibromoethane (ethylene dibromide)	106	2-Ethoxyethanol
31	Bromomethane (methyl bromide)	69	Dibromomethane	107	Ethyl acetate
32	4-Bromophenyl phenyl ether	70	m-Dichlorobenzene	108	Ethyl benzene
33	n-Butyl alcohol	71	o-Dichlorobenzene	109	Ethyl ether
34	Butyl benzyl phthalate	72	p-Dichlorobenzene	110	Ethyl methacrylate
35	2-sec-Butyl-4,6-dinitrophenol(Dinosob)	73	Dichlorodifluoromethane	111	Ethylene oxide
36	Carbon disulfide	74	1,1-Dichloroethane	112	Famphur
37	Carbon tetrachloride	75	1,2-Dichloroethane	113	Fluoranthene
38	Chlordane (alpha & gamma isomers)	76	1,1-Dichloroethylene	114	Fluorene

Table 3 - Waste Management**A THIS RESTRICTED WASTE REQUIRES TREATMENT TO THE APPLICABLE STANDARD**

This waste must be treated to the applicable treatment standard set forth in 40 CFR Part 268 Subpart D, 268.32, or RCRA Section 3004(d) prior to land disposal.

B THIS RESTRICTED WASTE HAS BEEN TREATED TO THE PERFORMANCE STANDARDS

I certify under penalty of law that I have personally examined and am familiar with the treatment technology and operation of the treatment process used to support this certification and that, based on my inquiry of those individuals immediately responsible for obtaining this information, I believe that the treatment process has been operated and maintained properly so as to comply with the performance levels specified in 40 CFR Part 268 Subpart D, and all applicable prohibitions set forth in 40 CFR 268.32 or RCRA Section 3004(d) without impermissible dilution of the prohibited waste. I am aware that there are significant penalties for submitting a false certification, including the possibility of a fine and imprisonment.

C THIS RESTRICTED WASTE, FOR WHICH THE TREATMENT STANDARD IS EXPRESSED AS A SPECIFIED TECHNOLOGY, HAS BEEN TREATED BY THE SPECIFIED TECHNOLOGY

I certify under penalty of law that the waste has been treated in accordance with the requirements of 40 CFR 268.42. I am aware that there are significant penalties for submitting a false certification, including the possibility of fine and imprisonment.

D. THIS RESTRICTED WASTE CAN BE LAND DISPOSED WITHOUT FURTHER TREATMENT

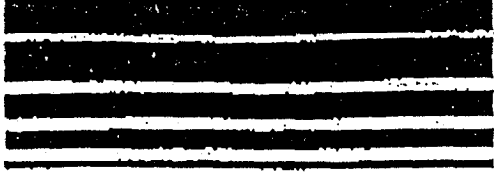
I certify under penalty of law that I personally have examined and am familiar with the waste through analysis and testing or through knowledge of the waste to support this certification that the waste complies with the treatment standards specified in 40 CFR Part 268 Subpart D and all applicable prohibitions set forth in 40 CFR 268.32 or RCRA Section 3004(d). I believe that the information I submitted is true, accurate and complete. I am aware that there are significant penalties for submitting a false certification including the possibility of a fine and imprisonment.

E. THIS RESTRICTED DEBRIS HAS BEEN TREATED IN ACCORDANCE WITH 40 CFR 268.45

I certify under penalty of law that the debris has been treated in accordance with the requirements of 40 CFR 268.45. I am aware that there are significant penalties for making a false certification, including the possibility of fine and imprisonment.

Table 4 - Subcategories

WASTE CODES	KEY #	SUBCATEGORY
D001	1	High TOC ignitable liquids (High TOC NWW).
	2	Low TOC ignitable liquids managed in CWA, CWA-equivalent, or Class 1 SDWA systems.
	3	Low TOC ignitable liquids not managed in CWA, CWA-equivalent, or Class 1 SDWA systems.
D002	4	Corrosive waste managed in CWA, CWA-equivalent, or Class 1 SDWA systems.
	5	Corrosive waste not managed in CWA, CWA-equivalent, or Class 1 SDWA systems.
D003	6	Reactive sulfides
	7	Explosives.
	8	Other reactives.
	9	Waster reactives
D006	10	Reactive cyanides.
	11	Cadmium.
D008	12	Cadmium containing batteries.
	13	Lead.
D009	14	Lead acid batteries.
	15	High mercury NWW's \geq 260 ppm with organics (and are not incinerator residues).
	16	High mercury NWW's \geq 260 ppm with inorganics (including incinerator residues and residues from RMERC).
	17	Low mercury NWW's \leq 260 ppm.
F003	18	All D009 WW's
	19	Wastes that contain any combination of one or more of the following solvents as the only listed F001-5 solvents: carbon disulfide, cyclohexanone, and/or methanol.
F005	20	Containing 2-Nitropropane as the only F001-5 solvent.
	21	Containing 2-Ethoxyethanol as the only F001-5 solvent.
F025	22	Light Ends.
	23	Spent filter/aids and desiccants.
K006	24	Anhydrous.
	25	Hydrated.
K069	26	--- Calcium Sulfate (Low Lead).
	27	Non-Calcium Sulfate (High Lead).
K071	28	Residues from RMERC.
	29	Other nonwastewaters.
	30	All K071 wastewaters.
K106	31	NWW's containing \geq 260 ppm total mercury.
	32	Residues from RMERC $<$ 260 ppm total mercury.
	33	Other nonwastewaters $<$ 260 ppm total mercury.
	34	All K106 wastewaters.
P047	35	4,6-Dinitro-o-cresol
	36	4,6-Dinitro-o-cresol salts
P065	37	Nonwastewaters, not incinerator or RMERC residues.
	38	Nonwastewaters from incinerator or RMERC residues containing \geq 260 ppm mercury.
	39	Nonwastewaters from RMERC residues containing $<$ 260 ppm mercury.
	40	Nonwastewaters from incinerator residues containing $<$ 260 ppm mercury.
	41	All P065 wastewaters.
P092	42	Nonwastewaters, not incinerator or RMERC residues.
	43	Nonwastewaters from incineration or RMERC containing \geq 260 ppm total mercury.
	44	Nonwastewaters from RMERC residues containing \leq 260 ppm total mercury.
	45	Nonwastewaters from incinerator residues containing \leq 260 ppm total mercury.
	46	All P092 wastewaters.
U151	47	Nonwastewaters containing \geq 260 ppm total mercury.
	48	Nonwastewaters from RMERC residues only, containing $<$ 260 ppm total mercury.
	49	Nonwastewaters not from RMERC residues containing $<$ 260 ppm total mercury.
	50	All U151 wastewaters.
U240	51	2,4-D (2,4-Dichlorophenoxyacetic acid).
	52	2,4-D salts and esters.



DRUM INVENTORY

JOB# 95- _____ ACCEPT. CODE _____

DRUM# MCB - 02 HANDLING CODE _____

E-CODE _____

GENERATOR Marine Corp Base - Camp Lejeune DATE 1/24/95 MANIFEST# I1008

PROPER SHIPPING NAME Waste, Flammable Liquids, nos. (Methanol) UN/NA# UN1993

HAZARD CLASS Class 3, PG II DRUM TYPE ^{5 gal} D1/D4 SHIPPING WT./CU. FT. _____

QUANTITY	SUBSTANCE	EPA CODE	PHYS. STATE	CONT. TYPE	COMMENTS
5 x 1 Liter	Methyl alcohol with water	F003	Liquid	glass	
4 x 1 Liter		D001			

PACKER Webb REVIEWER _____

DRUM INVENTORY

JOB# 95- ACCEPT. CODE _____



DRUM# MCB-01 HANDLING CODE _____

E-CODE _____

GENERATOR Marine Corp Base - Camp Lejeune DATE 1/24/95 MANIFEST# F1008

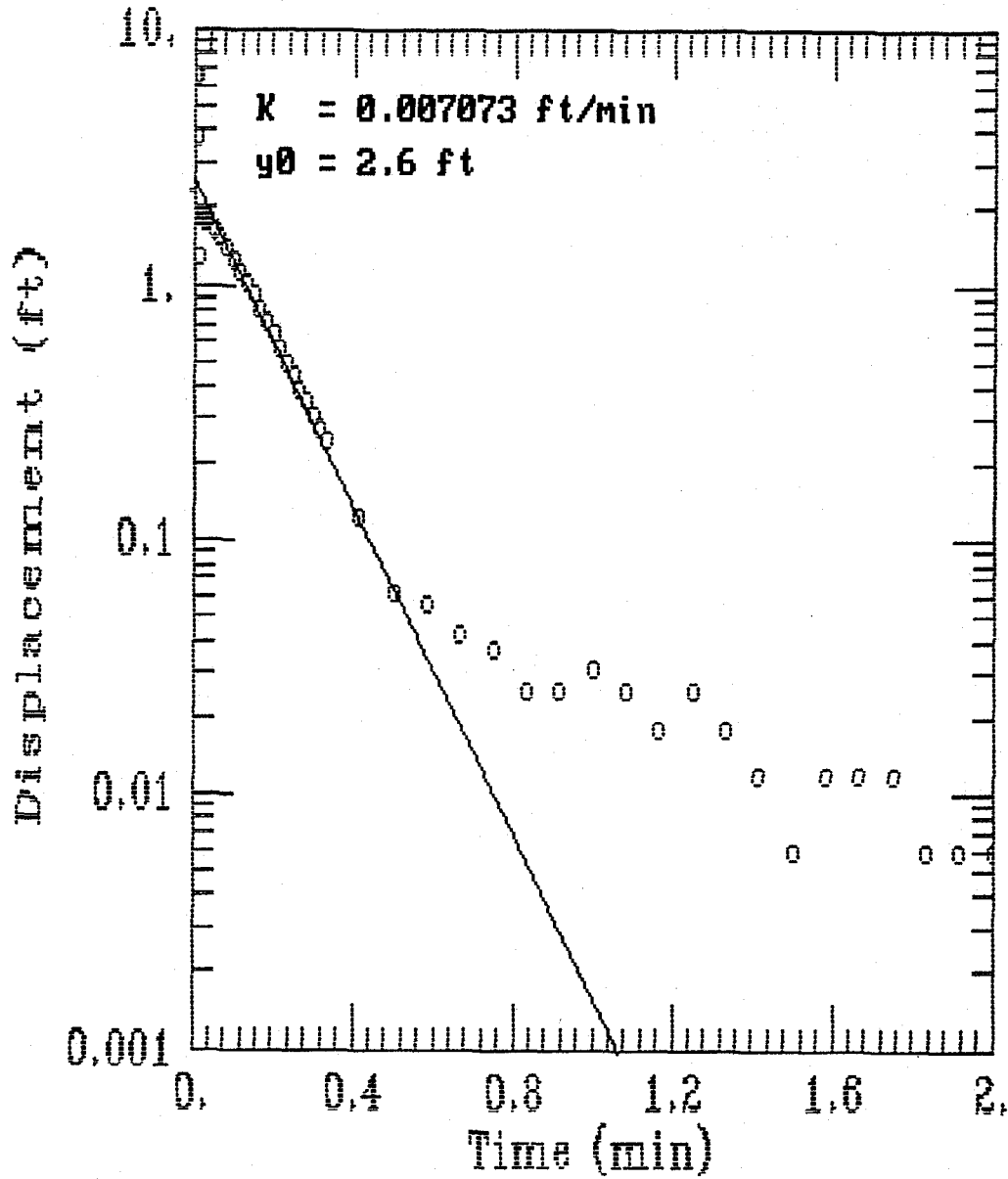
PROPER SHIPPING NAME Waste, Flammable Liquids, nos. (Methanol) UN/NA# UN 1993

HAZARD CLASS Class 3, PG II DRUM TYPE ^{5 gal} D101 SHIPPING WT./CU. FT. _____

QUANTITY	SUBSTANCE	EPA CODE	PHYS. STATE	CONT. TYPE	COMMENTS
✓ 5 x 1 Liter	Methyl Alcohol with water	F003	Liquid	glass	
4 x 1 Liter		D001			
1 x 1/2 Liter					

APPENDIX E
AQUIFER CHARACTERIZATION DATA

16MW01 RISING HEAD TEST



AQTESOLV

 GERAGHTY
& MILLER, INC.

 Modeling Group

A Q T E S O L V R E S U L T S
Version 1.10

03/06/95

16:42:58

=====

TEST DESCRIPTION

Data set..... B:16MW01R.DAT
Data set title..... 16MW01 RISING HEAD TEST

Knowns and Constants:

No. of data points..... 47
 Radius of well casing..... 0.083
 Radius of well..... 0.25
 Aquifer saturated thickness..... 9.67
 Well screen length..... 10
 Static height of water in well..... 9.67
 Log(Re/Rw)..... 2.791
 A, B, C..... 0.000, 0.000, 2.297

=====

ANALYTICAL METHOD

Bouwer-Rice (Unconfined Aquifer Slug Test)

=====

RESULTS FROM STATISTICAL CURVE MATCHING

STATISTICAL MATCH PARAMETER ESTIMATES

	Estimate		Std. Error
K =	9.8555E-003 +/-		2.1819E-003
y0 =	3.1855E+000 +/-		3.2879E-001

ANALYSIS OF MODEL RESIDUALS

residual = calculated - observed
 weighted residual = residual * weight

Weighted Residual Statistics:

Number of residuals..... 47
 Number of estimated parameters..... 2
 Degrees of freedom..... 45
 Residual mean..... 0.04397
 Residual standard deviation..... 0.6589
 Residual variance..... 0.4342

Model Residuals:

Time	Observed	Calculated	Residual	Weight
0.0066	6.621	2.9771	3.6439	1
0.01	3.722	2.8751	0.84689	1
0.0133	1.293	2.7795	-1.4865	1
0.0166	1.846	2.687	-0.84098	1
0.02	1.833	2.5949	-0.76193	1

SE1000C
Environmental Logger
12/07 07:12

it# 01607 Test 0

Setups: INPUT 1

Type Level (F)
Mode TOC
I.D. 16001

Reference 0.000
Linearity 0.110
Scale factor 19.880
Offset -0.060
Delay mSEC 50.000

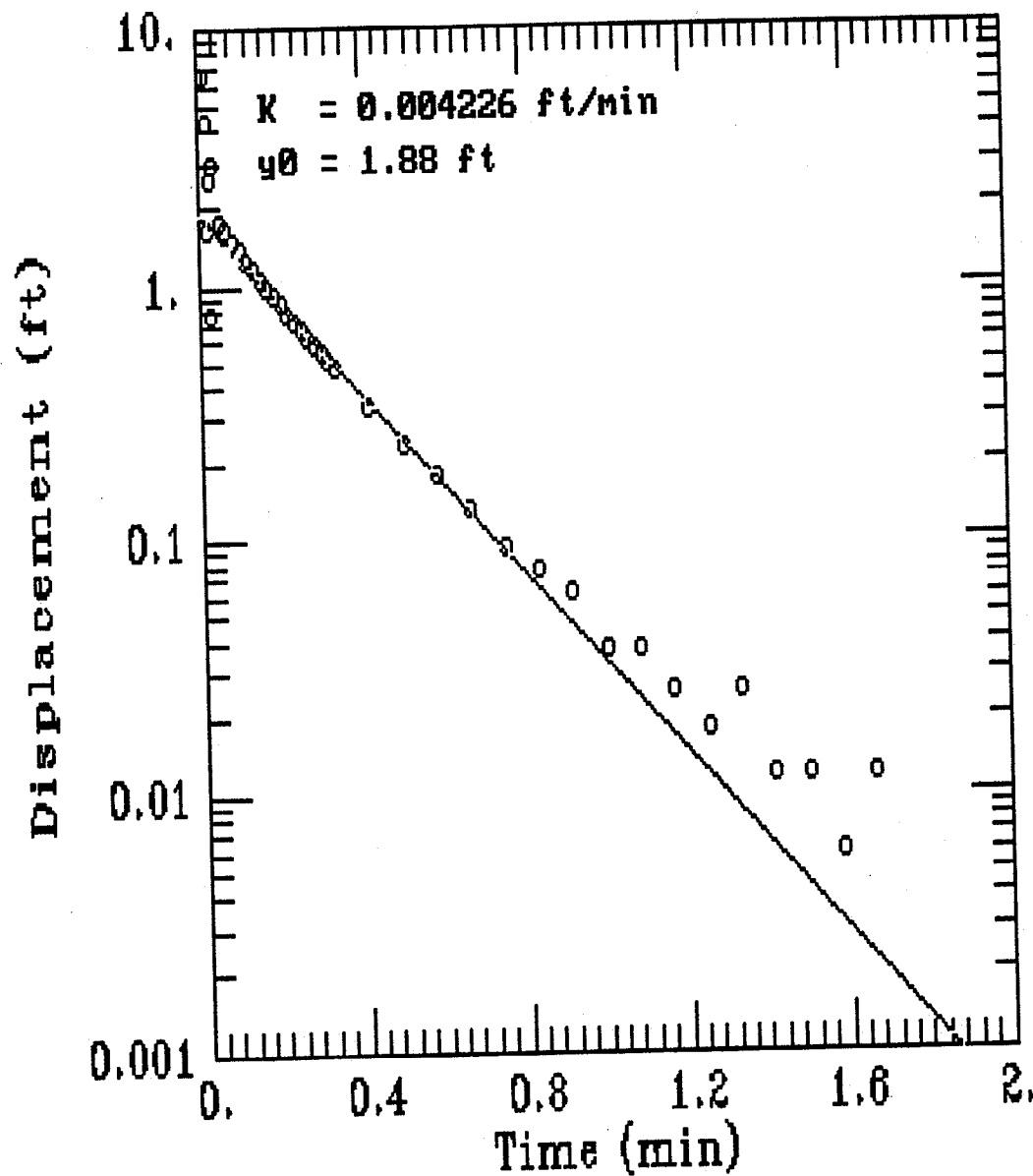
Step 1 12/06 10:02:03

Elapsed Time INPUT 1

0.0000	-0.018
0.0033	0.401
0.0066	6.621
0.0100	3.722
0.0133	1.293
0.0166	1.846
0.0200	1.833
0.0233	1.814
0.0266	1.802
0.0300	1.789
0.0333	1.770
0.0500	1.670
0.0666	1.538
0.0833	1.406
0.1000	1.262
0.1166	1.130
0.1333	1.011
0.1500	0.904
0.1666	0.803
0.1833	0.709
0.2000	0.640
0.2166	0.565
0.2333	0.496
0.2500	0.439
0.2666	0.389
0.2833	0.345
0.3000	0.307
0.3166	0.276
0.3333	0.244
0.4166	0.125
0.5000	0.062
0.5833	0.056
0.6666	0.043
0.7500	0.037
0.8333	0.025
0.9166	0.025
1.0000	0.031
1.0833	0.025
1.1666	0.018
1.2500	0.025
1.3333	0.018
1.4166	0.012
1.5000	0.006

1.5833	0.012
1.6666	0.012
1.7500	0.012
1.8333	0.006
1.9166	0.006
2.0000	0.006
2.5000	0.000
3.0000	0.000
3.5000	-0.006
4.0000	-0.006
4.5000	-0.012
5.0000	-0.006
5.5000	0.000
6.0000	-0.006
6.5000	-0.012
7.0000	-0.012
7.5000	-0.012
8.0000	-0.012
8.5000	-0.006
9.0000	-0.012
9.5000	-0.012
10.0000	-0.012
12.0000	-0.012
14.0000	-0.018

16MW02 RISING HEAD TEST



AQTESOLV

 GERAGHTY
& MILLER, INC.

 Modeling Group

A Q T E S O L V R E S U L T S
Version 1.10

03/06/95

14:35:40

=====

TEST DESCRIPTION

Data set..... 16MW02R.DAT
Data set title..... 16MW02 RISING HEAD TEST

Knowns and Constants:

No. of data points..... 40
Radius of well casing..... 0.083
Radius of well..... 0.25
Aquifer saturated thickness..... 14.38
Well screen length..... 10
Static height of water in well..... 14.38
Log(Re/Rw)..... 3.041
A, B, C..... 0.000, 0.000, 2.297

=====

ANALYTICAL METHOD

Bouwer-Rice (Unconfined Aquifer Slug Test)

=====

RESULTS FROM STATISTICAL CURVE MATCHING

STATISTICAL MATCH PARAMETER ESTIMATES

	Estimate	Std. Error
K =	9.5177E-003 +/-	2.0560E-003
y0 =	3.8678E+000 +/-	4.6778E-001

ANALYSIS OF MODEL RESIDUALS

residual = calculated - observed
weighted residual = residual * weight

Weighted Residual Statistics:

Number of residuals..... 40
Number of estimated parameters..... 2
Degrees of freedom..... 38
Residual mean..... 0.06691
Residual standard deviation..... 0.7461
Residual variance..... 0.5567

Model Residuals:

Time	Observed	Calculated	Residual	Weight
0.0166	6.616	3.3262	3.2898	1
0.02	4.33	3.225	1.105	1
0.0233	1.653	3.1297	-1.4767	1
0.0266	0.779	3.0372	-2.2582	1
0.03	2.552	2.9448	-0.39283	1

SE1000C
Environmental Logger
12/07 07:31

Unit# 01607 Test 1

Setups: INPUT 1

Type Level (F)
Mode TOC
I.D. 16002

Reference 0.000
Linearity 0.110
Scale factor 19.880
Offset -0.060
Delay mSEC 50.000

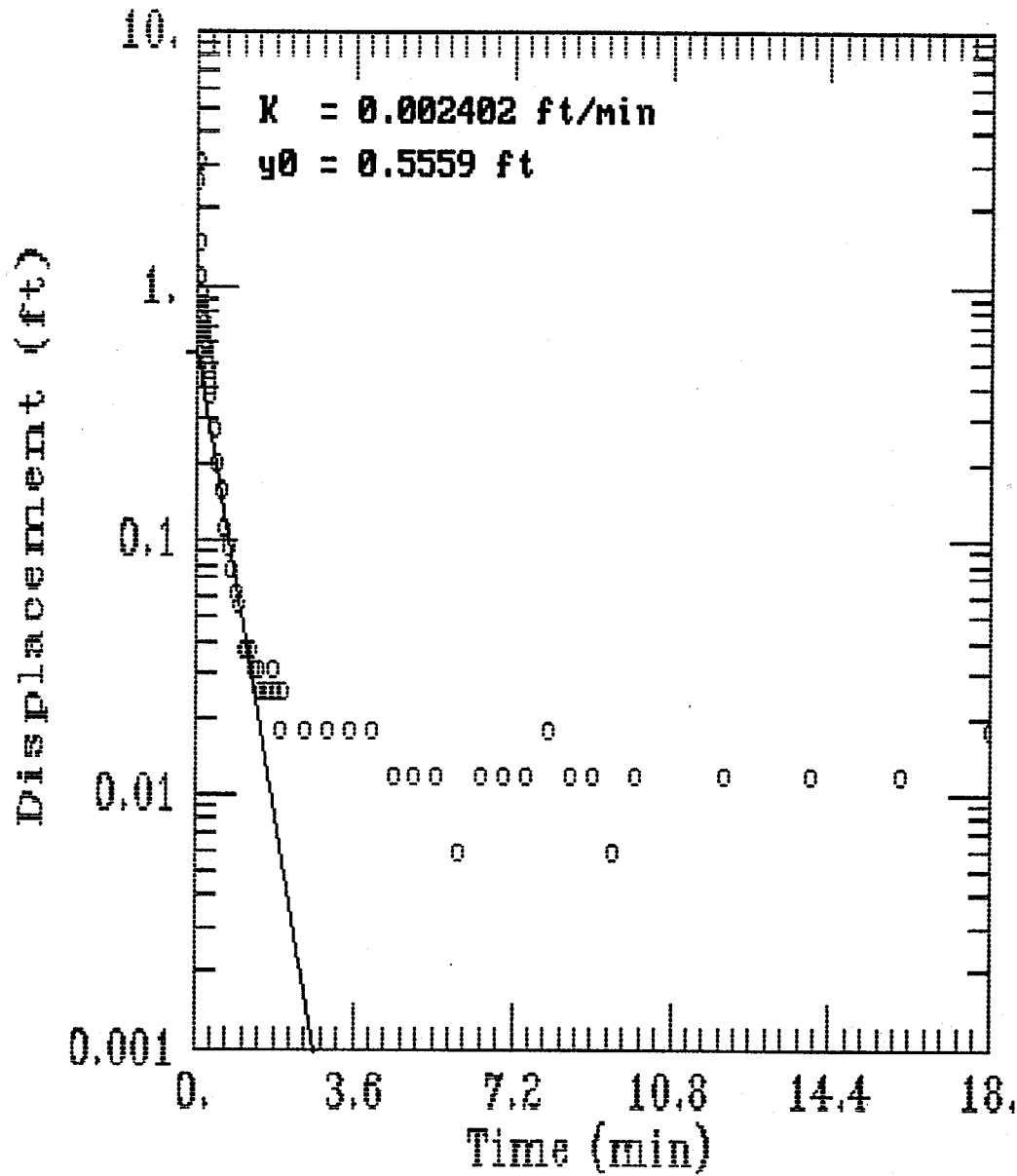
Step 1 12/06 11:07:12

Elapsed Time INPUT 1

0.0000 -0.018
0.0033 -0.018
0.0066 1.257
0.0100 3.815
0.0133 6.541
0.0166 6.616
0.0200 4.330
0.0233 1.653
0.0266 0.779
0.0300 2.552
0.0333 3.017
0.0500 1.798
0.0666 1.653
0.0833 1.502
0.1000 1.377
0.1166 1.263
0.1333 1.157
0.1500 1.062
0.1666 0.987
0.1833 0.905
0.2000 0.842
0.2166 0.779
0.2333 0.729
0.2500 0.666
0.2666 0.628
0.2833 0.584
0.3000 0.540
0.3166 0.503
0.3333 0.471
0.4166 0.333
0.5000 0.239
0.5833 0.182
0.6666 0.132
0.7500 0.094
0.8333 0.075
0.9166 0.062
1.0000 0.037
1.0833 0.037
1.1666 0.025
1.2500 0.018
1.3333 0.025
1.4166 0.012
1.5000 0.012

1.5833	0.006
1.6666	0.012
1.7500	0.000
1.8333	0.000
1.9166	0.000
2.0000	0.000
2.5000	-0.006
3.0000	-0.006
3.5000	-0.006
4.0000	-0.006
4.5000	-0.012
5.0000	-0.012
5.5000	-0.012
6.0000	-0.006
6.5000	-0.012
7.0000	-0.012
7.5000	-0.012
8.0000	-0.012
8.5000	-0.018
9.0000	-0.006
9.5000	-0.018
10.0000	-0.018
12.0000	-0.012
14.0000	-0.018

16MW02 FALLING HEAD TEST



AQTESOLV

 GERAGHTY
& MILLER, INC.

 Modeling Group

A Q T E S O L V R E S U L T S
Version 1.10

03/07/95

05:39:26

=====

TEST DESCRIPTION

Data set..... B:16MW02F.DAT
Data set title..... 16MW02 FALLING HEAD TEST

Knowns and Constants:

No. of data points..... 57
 Radius of well casing..... 0.083
 Radius of well..... 0.25
 Aquifer saturated thickness..... 14.38
 Well screen length..... 10
 Static height of water in well..... 14.38
 Log(Re/Rw)..... 3.041
 A, B, C..... 0.000, 0.000, 2.297

=====

ANALYTICAL METHOD

Bouwer-Rice (Unconfined Aquifer Slug Test)

=====

RESULTS FROM STATISTICAL CURVE MATCHING

STATISTICAL MATCH PARAMETER ESTIMATES

	Estimate		Std. Error
K =	1.0016E-002 +/-		9.4536E-004
y0 =	4.0913E+000 +/-		4.4092E-001

ANALYSIS OF MODEL RESIDUALS

residual = calculated - observed
 weighted residual = residual * weight

Weighted Residual Statistics:

Number of residuals..... 57
 Number of estimated parameters.... 2
 Degrees of freedom..... 55
 Residual mean..... 0.03816
 Residual standard deviation..... 0.1801
 Residual variance..... 0.03242

Model Residuals:

Time	Observed	Calculated	Residual	Weight
0.0666	3.057	2.1641	0.89294	1
0.0833	1.49	1.8447	-0.35465	1
0.1	1.094	1.5724	-0.47838	1
0.1166	0.911	1.3416	-0.43058	1
0.1333	0.924	1.1436	-0.21957	1

SE1000C
Environmental Logger
12/07 07:23

it# 01607 Test 1

Setups: INPUT 1

Type Level (F)
Mode TOC
I.D. 16002

Reference 0.000
Linearity 0.110
Scale factor 19.880
Offset -0.060
Delay mSEC 50.000

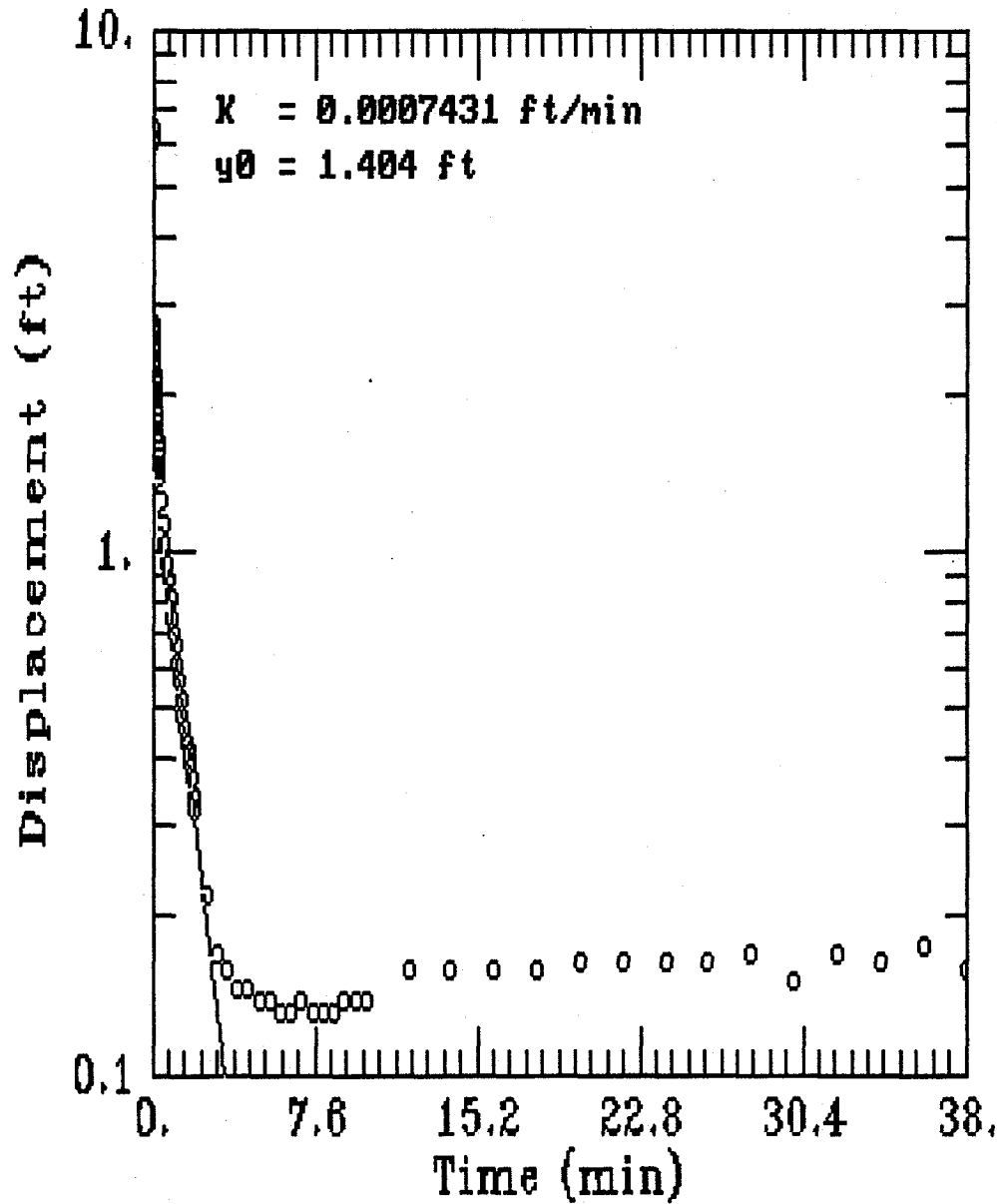
Step 0 12/06 10:48:35

Elapsed Time INPUT 1



0.0000	0.195
0.0033	0.195
0.0066	0.195
0.0100	0.188
0.0133	0.176
0.0166	0.138
0.0200	-0.849
0.0233	-1.736
0.0266	-2.591
0.0300	-2.585
0.0333	-2.321
0.0500	-2.730
0.0666	-3.057
0.0833	-1.490
0.1000	-1.094
0.1166	-0.911
0.1333	-0.924
0.1500	-0.849
0.1666	-0.779
0.1833	-0.723
0.2000	-0.666
0.2166	-0.616
0.2333	-0.578
0.2500	-0.528
0.2666	-0.496
0.2833	-0.459
0.3000	-0.427
0.3166	-0.402
0.3333	-0.377
0.4166	-0.276
0.5000	-0.201
0.5833	-0.157
0.6666	-0.113
0.7500	-0.094
0.8333	-0.075
0.9166	-0.062
1.0000	-0.056
1.0833	-0.037
1.1666	-0.037
1.2500	-0.037
1.3333	-0.031
1.4166	-0.031
1.5000	-0.025

1.5833	-0.025
1.6666	-0.025
1.7500	-0.031
1.8333	-0.025
1.9166	-0.018
2.0000	-0.025
2.5000	-0.018
3.0000	-0.018
3.5000	-0.018
4.0000	-0.018
4.5000	-0.012
5.0000	-0.012
5.5000	-0.012
6.0000	-0.006
6.5000	-0.012
7.0000	-0.012
7.5000	-0.012
8.0000	-0.018
8.5000	-0.012
9.0000	-0.012
9.5000	-0.006
10.0000	-0.012
12.0000	-0.012
14.0000	-0.012
16.0000	-0.012
18.0000	-0.018

16MW03 RISING HEAD TEST



AQTESOLV

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 Modeling Group

A Q T E S O L V R E S U L T S
Version 1.10

03/06/95

14:43:13

=====

TEST DESCRIPTION

Data set..... 16MW03R.DAT
Data set title..... 16MW03 RISING HEAD TEST

Knowns and Constants:

No. of data points..... 75
Radius of well casing..... 0.083
Radius of well..... 0.25
Aquifer saturated thickness..... 9.99
Well screen length..... 10
Static height of water in well..... 9.99
Log(Re/Rw)..... 2.811
A, B, C..... 0.000, 0.000, 2.297

=====

ANALYTICAL METHOD

Bouwer-Rice (Unconfined Aquifer Slug Test)

=====

RESULTS FROM STATISTICAL CURVE MATCHING

STATISTICAL MATCH PARAMETER ESTIMATES

	Estimate		Std. Error
K =	2.6010E-003 +/-		3.7305E-004
y0 =	3.5584E+000 +/-		2.0975E-001

ANALYSIS OF MODEL RESIDUALS

residual = calculated - observed
weighted residual = residual * weight

Weighted Residual Statistics:

Number of residuals..... 75
Number of estimated parameters.... 2
Degrees of freedom..... 73
Residual mean..... 0.1341
Residual standard deviation..... 0.5738
Residual variance..... 0.3293

Model Residuals:

Time	Observed	Calculated	Residual	Weight
0.0133	6.484	3.4335	3.0505	1
0.0166	6.126	3.4032	2.7228	1
0.02	2.254	3.3723	-1.1183	1
0.0233	2.712	3.3425	-0.63053	1
0.0266	2.725	3.313	-0.58803	1

0.03	2.731	3.2829	-0.55192	1
0.0333	2.725	3.2539	-0.52895	1
0.05	2.694	3.1112	-0.41722	1
0.0666	2.625	2.9755	-0.35055	1
0.0833	2.524	2.845	-0.32103	1
0.1	2.417	2.7202	-0.30324	1
0.1166	2.311	2.6016	-0.29062	1
0.1333	2.198	2.4875	-0.2895	1
0.15	2.097	2.3784	-0.28139	1
0.1666	1.997	2.2747	-0.27768	1
0.1833	1.909	2.1749	-0.2659	1
0.2	1.827	2.0795	-0.2525	1
0.2166	1.758	1.9888	-0.23082	1
0.2333	1.689	1.9016	-0.21259	1
0.25	1.632	1.8182	-0.18618	1
0.2666	1.576	1.7389	-0.16289	1
0.2833	1.526	1.6626	-0.13662	1
0.3	1.475	1.5897	-0.11469	1
0.3166	1.432	1.5204	-0.088371	1
0.3333	1.394	1.4537	-0.059682	1
0.4166	1.249	1.1623	0.086742	1
0.5	1.136	0.92901	0.20699	1
0.5833	1.042	0.74277	0.29923	1
0.6666	0.954	0.59386	0.36014	1
0.75	0.885	0.47468	0.41032	1
0.8333	0.816	0.37952	0.43648	1
0.9166	0.753	0.30344	0.44956	1
1	0.697	0.24254	0.45446	1
1.0833	0.659	0.19392	0.46508	1
1.1666	0.609	0.15504	0.45396	1
1.25	0.565	0.12393	0.44107	1
1.3333	0.521	0.099083	0.42192	1
1.4166	0.483	0.07922	0.40378	1
1.5	0.458	0.063321	0.39468	1
1.5833	0.433	0.050627	0.38237	1
1.6666	0.414	0.040478	0.37352	1
1.75	0.395	0.032354	0.36265	1
1.8333	0.37	0.025868	0.34413	1
1.9166	0.339	0.020682	0.31832	1
2	0.32	0.016532	0.30347	1
2.5	0.219	0.004316	0.21468	1
3	0.169	0.0011268	0.16787	1
3.5	0.157	0.00029418	0.15671	1
4	0.144	7.6802E-005	0.14392	1
4.5	0.144	2.0051E-005	0.14398	1
5	0.138	5.2349E-006	0.13799	1
5.5	0.138	1.3667E-006	0.138	1
6	0.131	3.5681E-007	0.131	1
6.5	0.131	9.3154E-008	0.131	1
7	0.138	2.432E-008	0.138	1
7.5	0.131	6.3494E-009	0.131	1
8	0.131	1.6577E-009	0.131	1
8.5	0.131	4.3277E-010	0.131	1
9	0.138	1.1299E-010	0.138	1
9.5	0.138	2.9498E-011	0.138	1
10	0.138	7.7011E-012	0.138	1
12	0.157	3.5778E-014	0.157	1
14	0.157	1.6622E-016	0.157	1
16	0.157	7.7221E-019	0.157	1
18	0.157	3.5875E-021	0.157	1
20	0.163	1.6667E-023	0.163	1
22	0.163	7.7431E-026	0.163	1
24	0.163	3.5973E-028	0.163	1
26	0.163	1.6712E-030	0.163	1
28	0.169	7.7642E-033	0.169	1
30	0.15	3.6071E-035	0.15	1

SE1000C
Environmental Logger
12/07 07:38

Unit# 01607 Test 2

Setups: INPUT 1

Type Level (F)
Mode Surface
I.D. 16003

Reference 0.000
Linearity 0.110
Scale factor 19.880
Offset -0.060
Delay mSEC 50.000

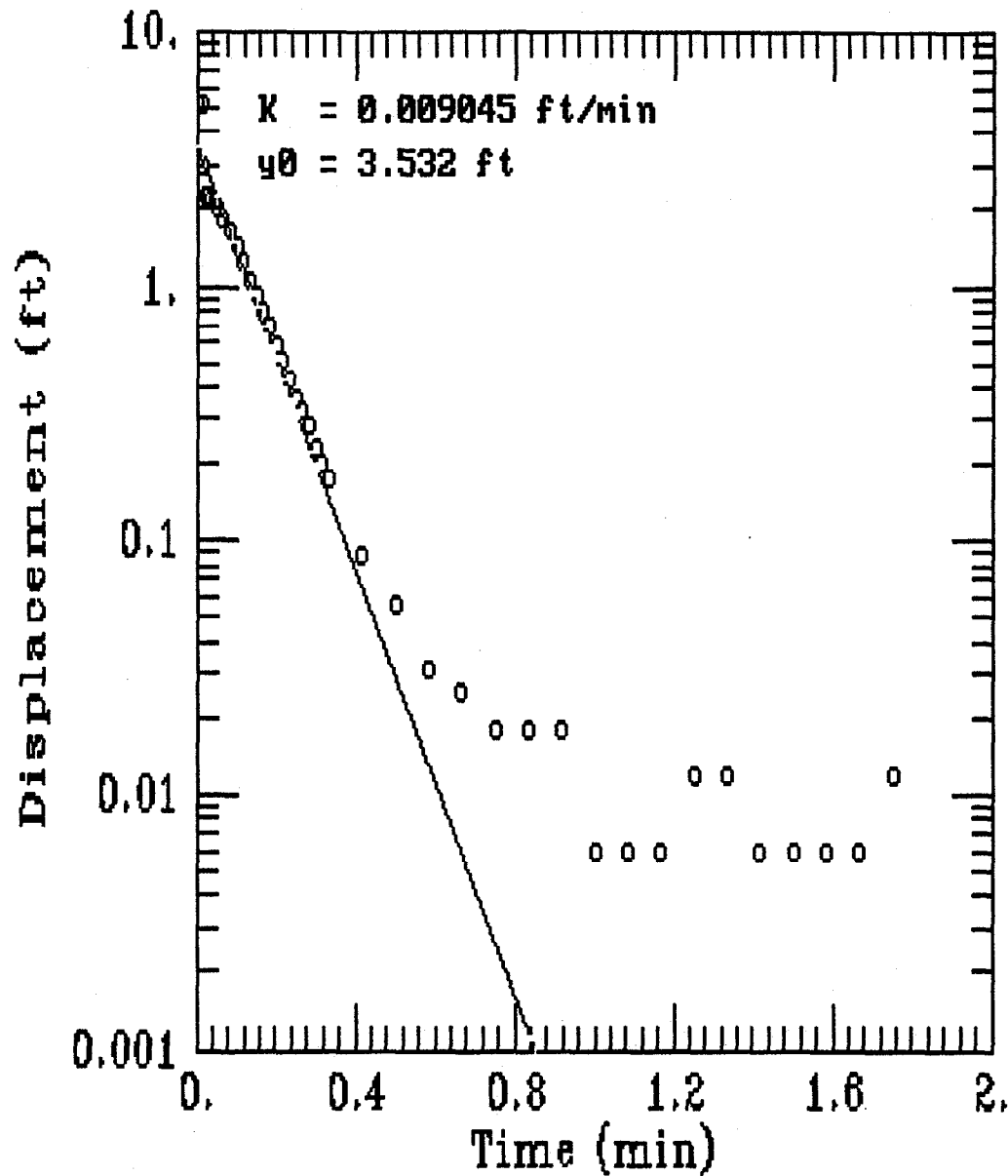
Step 1 12/06 16:07:19

Elapsed Time INPUT 1

0.0000 0.753
0.0033 0.760
0.0066 0.552
0.0100 -3.359
0.0133 -6.484
0.0166 -6.126
0.0200 -2.254
0.0233 -2.712
0.0266 -2.725
0.0300 -2.731
0.0333 -2.725
0.0500 -2.694
0.0666 -2.625
0.0833 -2.524
0.1000 -2.417
0.1166 -2.311
0.1333 -2.198
0.1500 -2.097
0.1666 -1.997
0.1833 -1.909
0.2000 -1.827
0.2166 -1.758
0.2333 -1.689
0.2500 -1.632
0.2666 -1.576
0.2833 -1.526
0.3000 -1.475
0.3166 -1.432
0.3333 -1.394
0.4166 -1.249
0.5000 -1.136
0.5833 -1.042
0.6666 -0.954
0.7500 -0.885
0.8333 -0.816
0.9166 -0.753
1.0000 -0.697
1.0833 -0.659
1.1666 -0.609
1.2500 -0.565
1.3333 -0.521
1.4166 -0.483
1.5000 -0.458

1.5833	-0.433
1.6666	-0.414
1.7500	-0.395
1.8333	-0.370
.9166	-0.339
.0000	-0.320
2.5000	-0.219
3.0000	-0.169
3.5000	-0.157
4.0000	-0.144
4.5000	-0.144
5.0000	-0.138
5.5000	-0.138
6.0000	-0.131
6.5000	-0.131
7.0000	-0.138
7.5000	-0.131
8.0000	-0.131
8.5000	-0.131
9.0000	-0.138
9.5000	-0.138
10.0000	-0.138
12.0000	-0.157
14.0000	-0.157
16.0000	-0.157
18.0000	-0.157
20.0000	-0.163
22.0000	-0.163
24.0000	-0.163
26.0000	-0.163
28.0000	-0.169
30.0000	-0.150
.0000	-0.169
.0000	-0.163
36.0000	-0.175
38.0000	-0.157

16MW04 RISING HEAD TEST



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A Q T E S O L V R E S U L T S
Version 1.10

03/06/95

12:14:23

=====

TEST DESCRIPTION

Data set..... B:16MW04R.DAT
Data set title..... 16MW04 RISING HEAD TEST

Knowns and Constants:

No. of data points..... 42
 Radius of well casing..... 0.083
 Radius of well..... 0.25
 Aquifer saturated thickness..... 8.88
 Well screen length..... 10
 Static height of water in well..... 8.88
 Log(Re/Rw)..... 2.736
 A, B, C..... 0.000, 0.000, 2.297

=====

ANALYTICAL METHOD

Bouwer-Rice (Unconfined Aquifer Slug Test)

=====

RESULTS FROM STATISTICAL CURVE MATCHING

STATISTICAL MATCH PARAMETER ESTIMATES

	Estimate	Std. Error
K =	9.0450E-003 +/-	1.0833E-003
y0 =	3.5319E+000 +/-	2.2287E-001

ANALYSIS OF MODEL RESIDUALS

residual = calculated - observed
 weighted residual = residual * weight

Weighted Residual Statistics:

Number of residuals..... 42
 Number of estimated parameters.... 2
 Degrees of freedom..... 40
 Residual mean..... 0.0151
 Residual standard deviation..... 0.3808
 Residual variance..... 0.145

Model Residuals:

Time	Observed	Calculated	Residual	Weight
0.0133	5.21	3.1086	2.1014	1
0.0166	2.989	3.0117	-0.022694	1
0.02	2.235	2.915	-0.67999	1
0.0233	2.279	2.8241	-0.54511	1
0.0266	2.248	2.7361	-0.48805	1

SE1000C
Environmental Logger
12/07 16:50

Unit# 01607 Test 0

Setups: INPUT 1

Type Level (F)
Mode Surface
I.D. 16004

Reference 0.000
Linearity 0.110
Scale factor 19.880
Offset -0.060
Delay mSEC 50.000

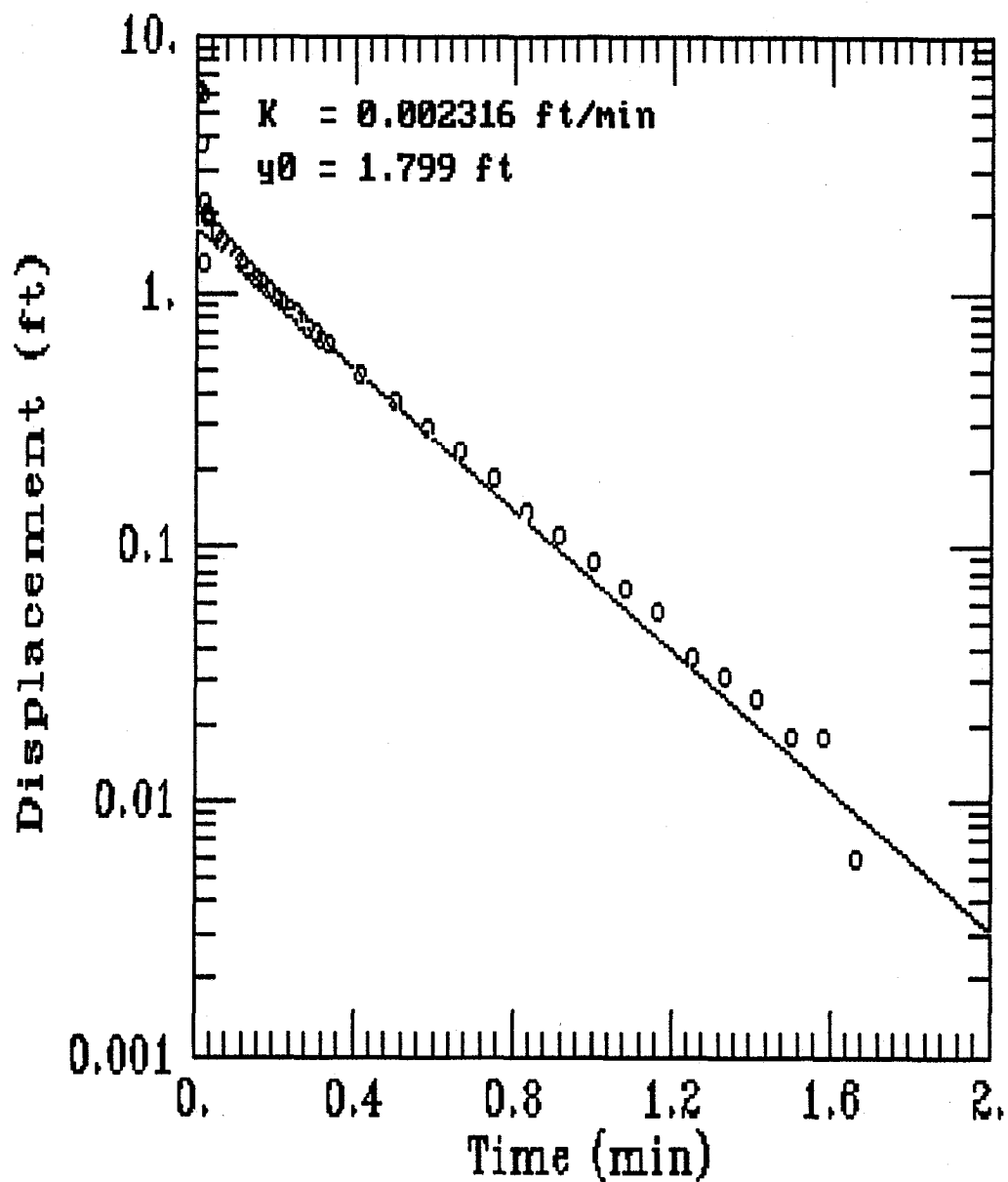
Step 1 12/07 08:58:53

Elapsed Time INPUT 1


0.0000 0.000
0.0033 -0.006
0.0066 -0.942
0.0100 -3.962
0.0133 -5.210
0.0166 -2.989
0.0200 -2.235
0.0233 -2.279
0.0266 -2.248
0.0300 -2.229
0.0333 -2.210
0.0500 -2.060
0.0666 -1.859
0.0833 -1.651
0.1000 -1.438
0.1166 -1.237
0.1333 -1.067
0.1500 -0.917
0.1666 -0.791
0.1833 -0.684
0.2000 -0.577
0.2166 -0.502
0.2333 -0.433
0.2500 -0.364
0.2666 -0.320
0.2833 -0.276
0.3000 -0.232
0.3166 -0.201
0.3333 -0.175
0.4166 -0.087
0.5000 -0.056
0.5833 -0.031
0.6666 -0.025
0.7500 -0.018
0.8333 -0.018
0.9166 -0.018
1.0000 -0.006
1.0833 -0.006
1.1666 -0.006
1.2500 -0.012
1.3333 -0.012
1.4166 -0.006
1.5000 -0.006

1.5833	-0.006
1.6666	-0.006
1.7500	-0.012
1.8333	0.000
1.9166	0.000
2.0000	-0.012
2.5000	-0.006
3.0000	-0.006
3.5000	0.000
4.0000	0.000
4.5000	-0.006
5.0000	-0.006
5.5000	-0.006
6.0000	0.000
6.5000	-0.006
7.0000	-0.006
7.5000	-0.006
8.0000	0.000
8.5000	-0.006
9.0000	-0.006
9.5000	-0.006
10.0000	-0.006
12.0000	0.000

16MW05 RISING HEAD TEST



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A Q T E S O L V R E S U L T S
Version 1.10

03/06/95

12:32:53

=====

TEST DESCRIPTION

Data set..... B:16MW05R.DAT
Data set title..... 16MW05 RISING HEAD TEST

Knowns and Constants:

No. of data points..... 42
 Radius of well casing..... 0.083
 Radius of well..... 0.25
 Aquifer saturated thickness..... 15.55
 Well screen length..... 15
 Static height of water in well..... 15.55
 Log(Re/Rw)..... 3.163
 A, B, C..... 0.000, 0.000, 2.989

=====

ANALYTICAL METHOD

Bouwer-Rice (Unconfined Aquifer Slug Test)

=====

RESULTS FROM STATISTICAL CURVE MATCHING

STATISTICAL MATCH PARAMETER ESTIMATES

	Estimate	Std. Error
K =	6.5345E-003 +/-	1.3603E-003
y0 =	3.8455E+000 +/-	3.9481E-001

ANALYSIS OF MODEL RESIDUALS

residual = calculated - observed
 weighted residual = residual * weight

Weighted Residual Statistics:

Number of residuals..... 42
 Number of estimated parameters.... 2
 Degrees of freedom..... 40
 Residual mean..... 0.1048
 Residual standard deviation..... 0.7672
 Residual variance..... 0.5885

Model Residuals:

Time	Observed	Calculated	Residual	Weight
0.01	6.089	3.5147	2.5743	1
0.0133	5.945	3.4119	2.5331	1
0.0166	3.79	3.3121	0.47791	1
0.02	1.289	3.2123	-1.9233	1
0.0233	2.257	3.1184	-0.86135	1

SE1000C
Environmental Logger
12/07 16:54

Unit# 01607 Test 1

Setups: INPUT 1

Type Level (F)
Mode Surface
I.D. 16005

Reference 0.000
Linearity 0.110
Scale factor 19.880
Offset -0.060
Delay mSEC 50.000

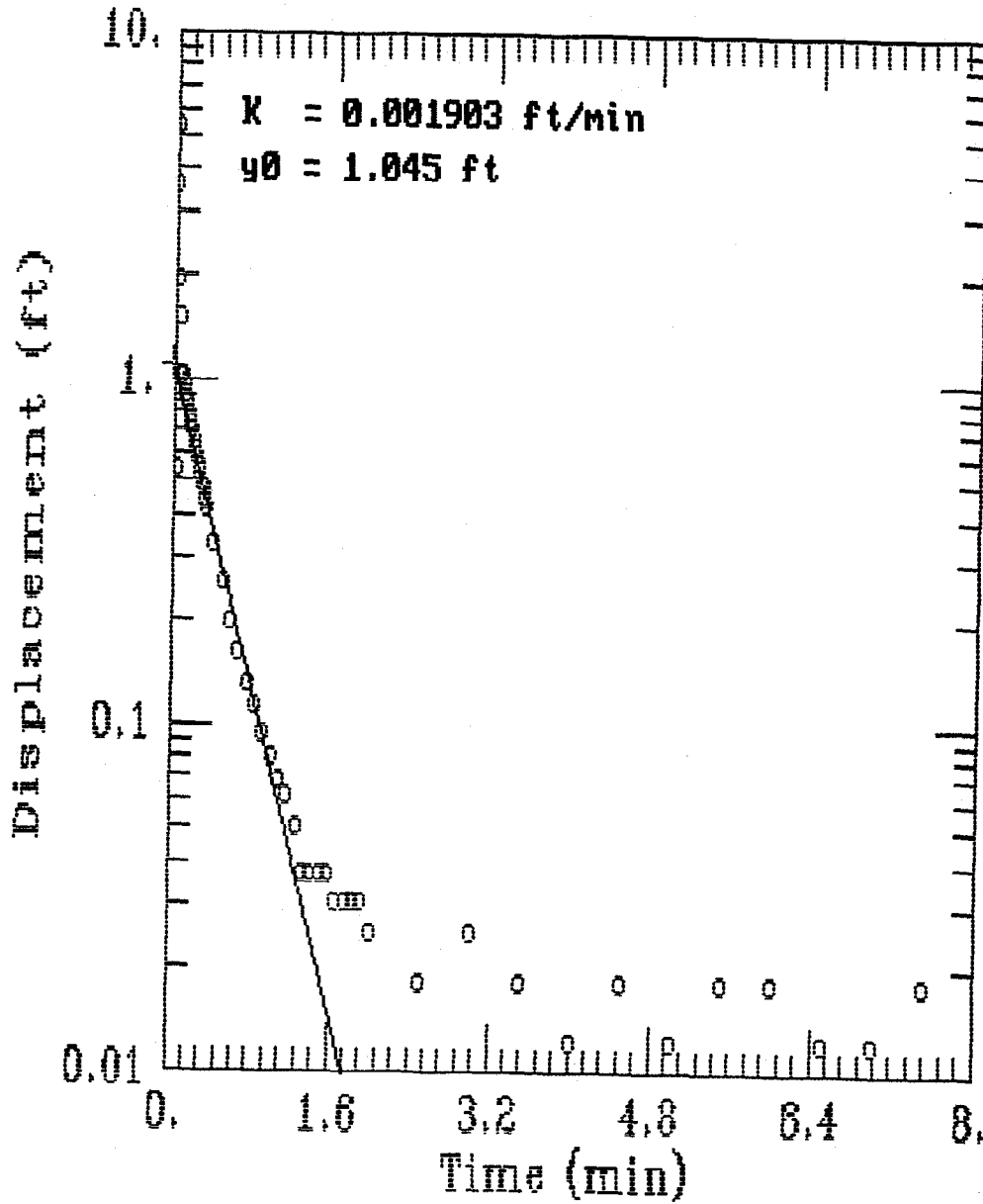
Step 1 12/07 09:58:19

Elapsed Time INPUT 1

0.0000 0.012
0.0033 -0.188
0.0066 -2.031
0.0100 -6.089
0.0133 -5.945
0.0166 -3.790
0.0200 -1.289
0.0233 -2.257
0.0266 -2.012
0.0300 -1.961
0.0333 -1.955
0.0500 -1.729
0.0666 -1.584
0.0833 -1.484
0.1000 -1.377
0.1166 -1.289
0.1333 -1.213
0.1500 -1.138
0.1666 -1.075
0.1833 -1.012
0.2000 -0.955
0.2166 -0.905
0.2333 -0.855
0.2500 -0.817
0.2666 -0.767
0.2833 -0.729
0.3000 -0.691
0.3166 -0.660
0.3333 -0.628
0.4166 -0.484
0.5000 -0.377
0.5833 -0.295
0.6666 -0.239
0.7500 -0.188
0.8333 -0.138
0.9166 -0.113
1.0000 -0.088
1.0833 -0.069
1.1666 -0.056
1.2500 -0.037
1.3333 -0.031
1.4166 -0.025
1.5000 -0.018

1.5833	-0.018
1.6666	-0.006
1.7500	0.000
1.8333	0.006
1.9166	0.006
2.0000	0.012
2.5000	0.012
3.0000	0.025
3.5000	0.018
4.0000	0.018
4.5000	0.012
5.0000	0.018
5.5000	0.018
6.0000	0.012
6.5000	0.018
7.0000	0.012
7.5000	0.025
8.0000	0.025
8.5000	0.025
9.0000	0.018
9.5000	0.018
10.0000	0.025
12.0000	0.025
14.0000	-0.006

16MW05 FALLING HEAD TEST



AQTESOLV

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A Q T E S O L V R E S U L T S
Version 1.10

03/07/95

05:43:21

=====

TEST DESCRIPTION

Data set..... B:16MW05F.DAT
Data set title..... 16MW05 FALLING HEAD TEST

Knowns and Constants:

No. of data points..... 54
Radius of well casing..... 0.083
Radius of well..... 0.25
Aquifer saturated thickness..... 15.55
Well screen length..... 15
Static height of water in well..... 15.55
Log (Re/Rw)..... 3.163
A, B, C..... 0.000, 0.000, 2.989

=====

ANALYTICAL METHOD

Bower-Rice (Unconfined Aquifer Slug Test)

=====

RESULTS FROM STATISTICAL CURVE MATCHING

STATISTICAL MATCH PARAMETER ESTIMATES

	Estimate	Std. Error
K =	7.6287E-003 +/-	1.6387E-003
y0 =	3.2111E+000 +/-	4.2189E-001

ANALYSIS OF MODEL RESIDUALS

residual = calculated - observed
weighted residual = residual * weight

Weighted Residual Statistics:

Number of residuals..... 54
Number of estimated parameters.... 2
Degrees of freedom..... 52
Residual mean..... 0.07579
Residual standard deviation..... 0.5497
Residual variance..... 0.3022

Model Residuals:

Time	Observed	Calculated	Residual	Weight
0.02	5.28	2.6028	2.6772	1
0.0233	3.662	2.5141	1.1479	1
0.0266	1.95	2.4285	-0.47845	1
0.03	0.886	2.3433	-1.4573	1
0.0333	0.547	2.2634	-1.7164	1

SE1000C
Environmental Logger
12/07 16:52

Unit# 01607 Test 1

Setups: INPUT 1

Type Level (F)
Mode Surface
I.D. 16005

Reference 0.000
Linearity 0.110
Scale factor 19.880
Offset -0.060
Delay mSEC 50.000

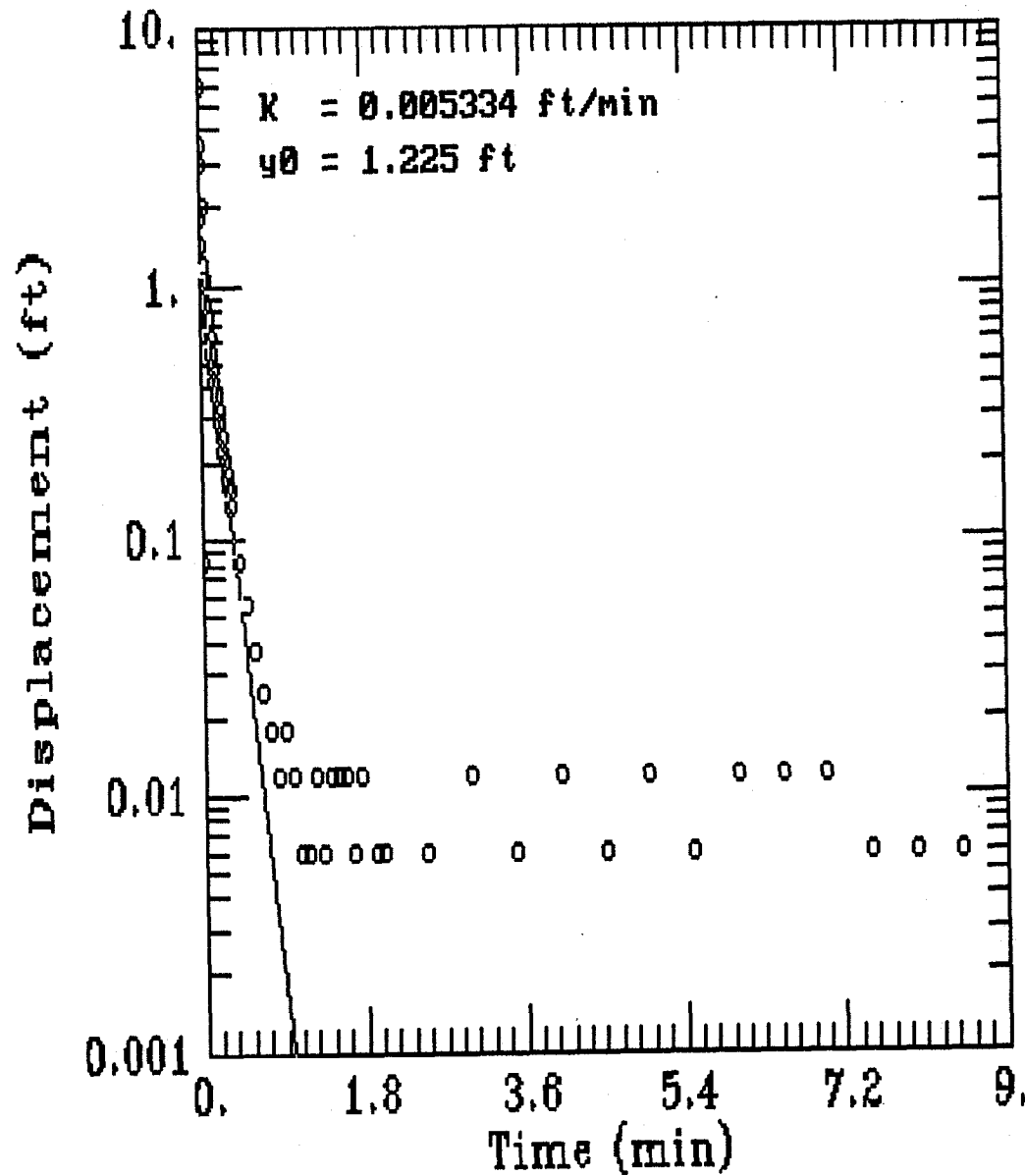
Step 0 12/07 09:43:45

Elapsed Time INPUT 1

0.0000 0.283
0.0033 0.761
0.0066 1.597
0.0100 2.573
0.0133 3.844
0.0166 5.097
0.0200 5.280
0.0233 3.662
0.0266 1.950
0.0300 0.886
0.0333 0.547
0.0500 1.490
0.0666 1.012
0.0833 1.025
0.1000 0.968
0.1166 0.905
0.1333 0.842
0.1500 0.792
0.1666 0.742
0.1833 0.704
0.2000 0.660
0.2166 0.622
0.2333 0.591
0.2500 0.559
0.2666 0.528
0.2833 0.496
0.3000 0.478
0.3166 0.446
0.3333 0.421
0.4166 0.333
0.5000 0.257
0.5833 0.201
0.6666 0.163
0.7500 0.132
0.8333 0.113
0.9166 0.094
1.0000 0.081
1.0833 0.069
1.1666 0.062
1.2500 0.050
1.3333 0.037
1.4166 0.037
1.5000 0.037

1.5833	0.037
1.6666	0.031
1.7500	0.031
1.8333	0.031
1.9166	0.031
2.0000	0.025
2.5000	0.018
3.0000	0.025
3.5000	0.018
4.0000	0.012
4.5000	0.018
5.0000	0.012
5.5000	0.018
6.0000	0.018
6.5000	0.012
7.0000	0.012
7.5000	0.018
8.0000	0.000
8.5000	0.012
9.0000	0.018
9.5000	0.012
10.0000	0.018
12.0000	0.006
14.0000	0.012

16MW06 RISING HEAD TEST



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& MILLER, INC.
Modeling Group

A Q T E S O L V R E S U L T S
Version 1.10

03/06/95

12:35:14

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TEST DESCRIPTION

Data set..... B:16MW06R.DAT
Data set title..... 16MW06 RISING HEAD TEST

Knowns and Constants:

No. of data points..... 58
Radius of well casing..... 0.083
Radius of well..... 0.25
Aquifer saturated thickness..... 16.85
Well screen length..... 15
Static height of water in well..... 16.85
Log(Re/Rw)..... 3.215
A, B, C..... 0.000, 0.000, 2.989

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ANALYTICAL METHOD

Bouwer-Rice (Unconfined Aquifer Slug Test)

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RESULTS FROM STATISTICAL CURVE MATCHING

STATISTICAL MATCH PARAMETER ESTIMATES

	Estimate		Std. Error
K =	5.0425E-002 +/-		8.4244E-003
y0 =	9.1372E+000 +/-		1.6815E+000

ANALYSIS OF MODEL RESIDUALS

residual = calculated - observed
weighted residual = residual * weight

Weighted Residual Statistics:

Number of residuals..... 58
Number of estimated parameters..... 2
Degrees of freedom..... 56
Residual mean..... 0.1371
Residual standard deviation..... 0.5051
Residual variance..... 0.2551

Model Residuals:

Time	Observed	Calculated	Residual	Weight
0.01	5.828	4.6149	1.2131	1
0.0133	1.824	3.6836	-1.8596	1
0.0166	2.962	2.9402	0.021809	1
0.02	3.534	2.3309	1.2031	1
0.0233	1.44	1.8605	-0.42046	1

0.0266	0.081	1.485	-1.404	1
0.03	1.056	1.1772	-0.12124	1
0.0333	2	0.93966	1.0603	1
0.05	1.207	0.30031	0.90669	1
0.0666	1.037	0.096634	0.94037	1
0.0833	0.855	0.030884	0.82412	1
0.1	0.736	0.0098702	0.72613	1
0.1166	0.635	0.0031761	0.63182	1
0.1333	0.547	0.001015	0.54598	1
0.15	0.478	0.0003244	0.47768	1
0.1666	0.421	0.00010439	0.4209	1
0.1833	0.371	3.3361E-005	0.37097	1
0.2	0.327	1.0662E-005	0.32699	1
0.2166	0.289	3.4308E-006	0.289	1
0.2333	0.257	1.0965E-006	0.257	1
0.25	0.226	3.5042E-007	0.226	1
0.2666	0.207	1.1276E-007	0.207	1
0.2833	0.182	3.6038E-008	0.182	1
0.3	0.163	1.1517E-008	0.163	1
0.3166	0.157	3.7061E-009	0.157	1
0.3333	0.138	1.1844E-009	0.138	1
0.4166	0.081	4.0034E-012	0.081	1
0.5	0.056	1.3439E-014	0.056	1
0.5833	0.037	4.5425E-017	0.037	1
0.6666	0.025	1.5354E-019	0.025	1
0.75	0.018	5.1542E-022	0.018	1
0.8333	0.012	1.7421E-024	0.012	1
0.9166	0.018	5.8883E-027	0.018	1
1	0.012	1.9767E-029	0.012	1
1.0833	0.006	6.6813E-032	0.006	1
1.1666	0.006	2.2583E-034	0.006	1
1.25	0.012	7.581E-037	0.012	1
1.3333	0.006	2.5624E-039	0.006	1
1.4166	0.012	8.6608E-042	0.012	1
1.5	0.012	2.9074E-044	0.012	1
1.5833	0.012	9.8271E-047	0.012	1
1.6666	0.006	3.3216E-049	0.006	1
1.75	0.012	1.115E-051	0.012	1
1.9166	0.006	1.2739E-056	0.006	1
2	0.006	4.2764E-059	0.006	1
2.5	0.006	6.2898E-074	0.006	1
3	0.012	9.2513E-089	0.012	1
3.5	0.006	1.3607E-103	0.006	1
4	0.012	2.0014E-118	0.012	1
4.5	0.006	2.9437E-133	0.006	1
5	0.012	4.3298E-148	0.012	1
5.5	0.006	6.3684E-163	0.006	1
6	0.012	9.3669E-178	0.012	1
6.5	0.012	1.3777E-192	0.012	1
7	0.012	2.0264E-207	0.012	1
7.5	0.006	2.9805E-222	0.006	1
8	0.006	4.3839E-237	0.006	1
8.5	0.006	6.448E-252	0.006	1

=====

RESULTS FROM VISUAL CURVE MATCHING

VISUAL MATCH PARAMETER ESTIMATES

Estimate
K = 3.7255E-003
y0 = 6.8391E-001

SE1000C
Environmental Logger
12/07 16:56

lit# 01607 Test 2

Setups: INPUT 1

Type Level (F)
Mode Surface
I.D. 16006

Reference 0.000
Linearity 0.110
Scale factor 19.880
Offset -0.060
Delay mSEC 50.000

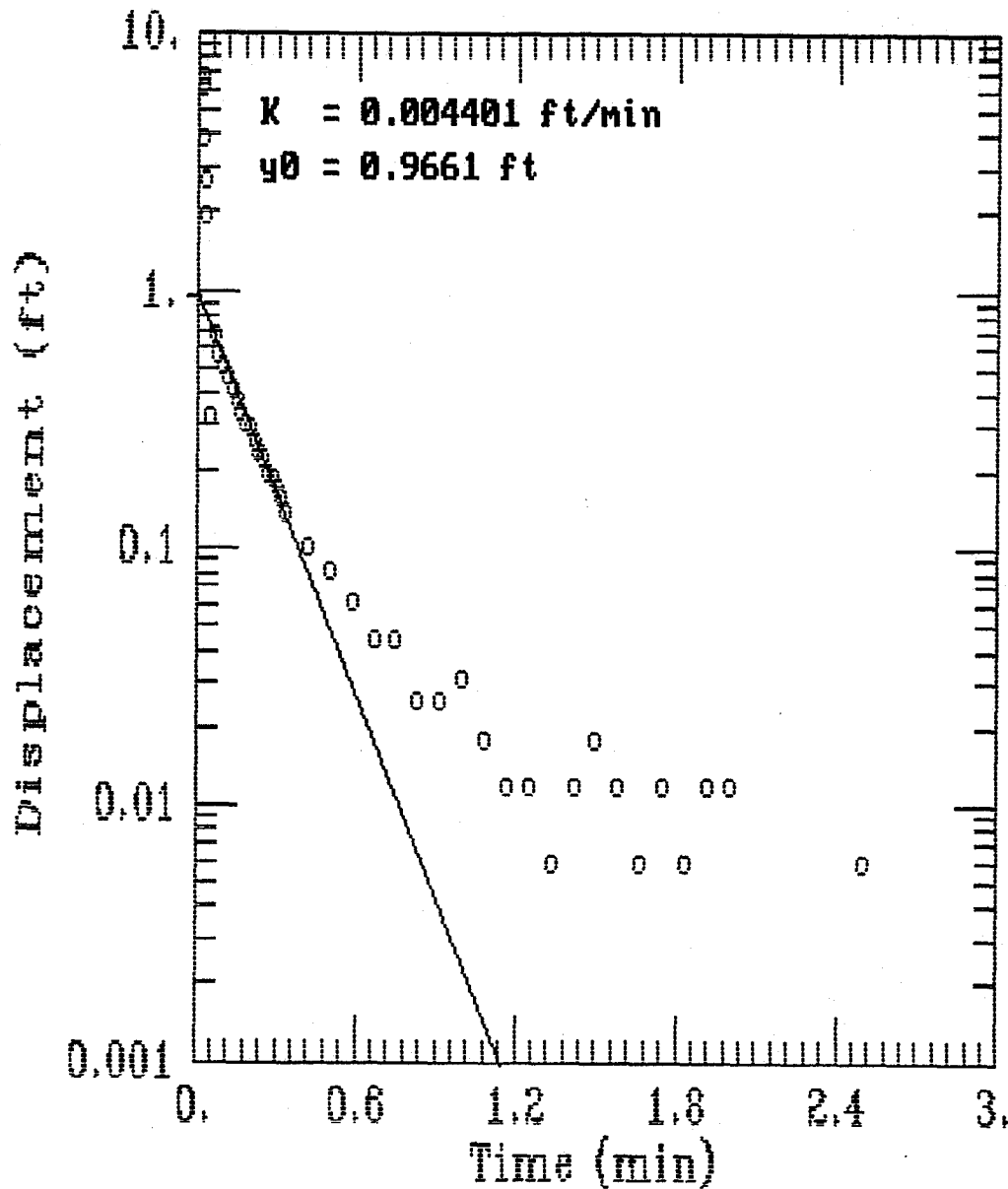
Step 1 12/07 10:54:41

Elapsed Time INPUT 1

0.0000 -0.849
0.0033 -4.081
0.0066 -5.714
0.0100 -5.828
0.0133 -1.824
0.0166 -2.962
0.0200 -3.534
0.0233 -1.440
0.0266 0.081
0.0300 -1.056
0.0333 -2.000
0.0500 -1.207
0.0666 -1.037
0.0833 -0.855
0.1000 -0.736
0.1166 -0.635
0.1333 -0.547
0.1500 -0.478
0.1666 -0.421
0.1833 -0.371
0.2000 -0.327
0.2166 -0.289
0.2333 -0.257
0.2500 -0.226
0.2666 -0.207
0.2833 -0.182
0.3000 -0.163
0.3166 -0.157
0.3333 -0.138
0.4166 -0.081
0.5000 -0.056
0.5833 -0.037
0.6666 -0.025
0.7500 -0.018
0.8333 -0.012
0.9166 -0.018
1.0000 -0.012
1.0833 -0.006
1.1666 -0.006
1.2500 -0.012
1.3333 -0.006
1.4166 -0.012
1.5000 -0.012

1.5833	-0.012
1.6666	-0.006
1.7500	-0.012
1.8333	0.000
1.9166	-0.006
2.0000	-0.006
2.5000	-0.006
3.0000	-0.012
3.5000	-0.006
4.0000	-0.012
4.5000	-0.006
5.0000	-0.012
5.5000	-0.006
6.0000	-0.012
6.5000	-0.012
7.0000	-0.012
7.5000	-0.006
8.0000	-0.006
8.5000	-0.006
9.0000	0.000
9.5000	0.000
10.0000	-0.006
12.0000	-0.012
14.0000	-0.012
16.0000	-0.012
18.0000	-0.006
20.0000	-0.012
22.0000	-0.012
24.0000	-0.006
26.0000	-0.006

16MW06 FALLING HEAD TEST



AQTESOLV

 GERAGHTY
& MILLER, INC.

 Modeling Group

A Q T E S O L V R E S U L T S
Version 1.10

03/07/95

05:46:50

=====

TEST DESCRIPTION

Data set..... B:16MW06F.DAT
Data set title..... 16MW06 FALLING HEAD TEST

Knowns and Constants:

No. of data points..... 44
 Radius of well casing..... 0.083
 Radius of well..... 0.25
 Aquifer saturated thickness..... 16.85
 Well screen length..... 15
 Static height of water in well..... 16.85
 Log(Re/Rw)..... 3.215
 A, B, C..... 0.000, 0.000, 2.989

=====

ANALYTICAL METHOD

Bouwer-Rice (Unconfined Aquifer Slug Test)

=====

RESULTS FROM STATISTICAL CURVE MATCHING

STATISTICAL MATCH PARAMETER ESTIMATES

	Estimate	Std. Error
K =	6.6589E-002 +/-	4.7410E-003
y0 =	4.3755E+001 +/-	6.5505E+000

ANALYSIS OF MODEL RESIDUALS

residual = calculated - observed
 weighted residual = residual * weight

Weighted Residual Statistics:

Number of residuals..... 44
 Number of estimated parameters.... 2
 Degrees of freedom..... 42
 Residual mean..... 0.1279
 Residual standard deviation..... 0.2645
 Residual variance..... 0.06998

Model Residuals:

Time	Observed	Calculated	Residual	Weight
0.02	6.825	7.2036	-0.37858	1
0.0233	6.138	5.349	0.78899	1
0.0266	3.902	3.9719	-0.069906	1
0.03	2.674	2.9229	-0.24885	1
0.0333	1.944	2.1704	-0.22636	1

SE1000C
Environmental Logger
12/07 16:55

it# 01607 Test 2

Setups: INPUT 1

Type Level (F)
Mode Surface
I.D. 16006

Reference 0.000
Linearity 0.110
Scale factor 19.880
Offset -0.060
Delay mSEC 50.000

Step 0 12/07 10:40:57

Elapsed Time INPUT 1

0.0000	0.050
0.0033	0.169
0.0066	0.774
0.0100	1.837
0.0133	3.316
0.0166	5.118
0.0200	6.825
0.0233	6.138
0.0266	3.902
0.0300	2.674
0.0333	1.944
0.0500	0.327
0.0666	0.673
0.0833	0.572
0.1000	0.509
0.1166	0.453
0.1333	0.415
0.1500	0.377
0.1666	0.339
0.1833	0.308
0.2000	0.289
0.2166	0.258
0.2333	0.239
0.2500	0.220
0.2666	0.195
0.2833	0.188
0.3000	0.169
0.3166	0.157
0.3333	0.138
0.4166	0.100
0.5000	0.081
0.5833	0.063
0.6666	0.044
0.7500	0.044
0.8333	0.025
0.9166	0.025
1.0000	0.031
1.0833	0.018
1.1666	0.012
1.2500	0.012
1.3333	0.006
1.4166	0.012
1.5000	0.018

1.5833	0.012
1.6666	0.006
1.7500	0.012
1.8333	0.006
1.9166	0.012
2.0000	0.012
2.5000	0.006
3.0000	0.000
3.5000	0.006
4.0000	0.006
4.5000	0.006
5.0000	0.012
5.5000	0.006
6.0000	0.012
6.5000	0.012
7.0000	0.006
7.5000	0.006
8.0000	0.012
8.5000	0.006
9.0000	0.006
9.5000	0.006
10.0000	0.006
12.0000	0.006

APPENDIX F
BASE BACKGROUND SOIL REPORT

Appendices F.1 and F.2 provide background concentration values for inorganic elements in surface and subsurface soil respectively at MCB, Camp Lejeune. These background borings were collected in areas known to be unimpacted by site operations, and have also been collected during Baker Remedial Investigations since 1993. Both appendices have all background borings identified with a unique sample identification, and the inorganic analytical results pertaining to the sample identification. Provided in the back of each appendix, are the following statistics for the base background samples:

- minimum concentration per inorganic analyte
- maximum concentration per inorganic analyte
- average concentration per inorganic analyte
- twice the average concentration per inorganic analyte.

The minimum and maximum concentrations are used for a comparison bases only. Whereas twice the average concentration is used in comparing the inorganic analytical results from the on-site soil samples to what is considered by USEPA Region IV to be naturally occurring.

APPENDIX F.1
BASE BACKGROUND SURFACE SOIL REPORT

**BASE BACKGROUND
SURFACE SOILS
TAL INORGANICS
MCB CAMP LEJEUNE, NORTH CAROLINA**

	6-201N-SB11-00	6-201N-SB12-00	6-201C-SB38-00	6-201C-SB39-00	78-BB-SB-00	41-BB-SB01-00	41-BB-SB02-00
Aluminum	1120	45.25	748	245	1490	528	1430
Antimony	4.7	4.8	1.4	1.3	0.33	2.07	0.865
Arsenic	0.28	0.29	0.91	0.28	0.22	0.356	0.317
Barium	2	2.05	16.5	3.5	8.6	1.525	4.06
Beryllium	0.095	0.1	0.03	0.03	0.11	0.1	0.09
Cadmium	0.285	0.295	0.58	0.175	0.55	0.392	0.349
Calcium	178	108	10700	402	941	18.3	54.6
Chromium	0.475	0.49	1.6	0.33	2.2	1.02	0.91
Cobalt	0.85	0.9	0.195	0.185	1.8	1.965	1.75
Copper	0.55	0.6	3.1	0.75	2	2	87.2
Iron	525	160	684	238	1020	83	970
Lead	2	3	62.9	25.1	20.4	2.59	10.9
Magnesium	11.65	10.1	200	26	118	8.85	39.1
Manganese	3.1	1	16	4.5	11.1	0.87	10.2
Mercury	0.01	0.01	0.05	0.06	0.05	0.0305	0.078
Nickel	1.6	1.65	0.8	0.75	2.2	3.55	3.15
Potassium	36.55	37.5	54.5	30.6	102	91.5	81.5
Selenium	0.47	0.485	0.5	0.465	0.31	0.311	0.277
Silver	0.95	1	0.195	0.185	0.33	0.1965	0.175
Sodium	19.65	15.85	14	4.7	67.5	44.1	39.3
Thallium	0.19	0.195	0.205	0.185	0.11	0.565	0.505
Vanadium	1.05	0.8	2.8	1.6	5.3	2.505	2.23
Zinc	0.55	0.8	23.1	4.6	28.3	2.66	6.11
Cyanide					0.265	1.23	1.09

Concentrations are in milligrams per kilogram (mg/kg).

Qualifiers have been removed per Baker's standards.

Qualifiers R, U, and UJ have been given one-half the detection value.

Qualifiers J, NJ, and B have been removed with no detection value change.

**BASE BACKGROUND
SURFACE SOILS
TAL INORGANICS
MCB CAMP LEJEUNE, NORTH CAROLINA**

	41-BB-SB03-00	41-BB-SB04-00	69-BB-SB01-00	69-BB-SB02-00	69-BB-SB03-00	69-BB-SB04-00	74-BB-SB01-00
Aluminum	2100	5370	1310	4150	9570	5360	3110
Antimony	0.87	0.94	0.85	0.95	0.95	0.95	0.905
Arsenic	0.3205	0.345	0.31	0.345	0.79	0.35	0.3325
Barium	4.53	13.4	5.6	15.4	19.6	20.8	11.1
Beryllium	0.09	0.095	0.14	0.155	0.155	0.155	0.148
Cadmium	0.3525	0.38	0.26	0.285	0.29	0.29	0.2695
Calcium	79.2	46.3	28.2	43.6	282	53	181
Chromium	2.64	3.24	0.75	4	12.5	5.8	0.84
Cobalt	1.77	1.905	2.1	2.3	2.35	2.35	2.225
Copper	1.8	1.94	1.75	1.9	1.95	1.95	4.56
Iron	1120	2160	425	1430	9640	3890	1740
Lead	9.98	6.61	2.8	6	5.3	5.6	5.19
Magnesium	74	144	37.3	91.8	610	247	70
Manganese	11.6	11.8	15.1	12.7	12.3	8.3	9.44
Mercury	0.057	0.08	0.015	0.06	0.045	0.025	0.04
Nickel	3.2	3.45	2.9	1.6	1.65	1.65	1.56
Potassium	190	177	32.25	35.5	361	106	87.5
Selenium	0.2795	0.301	0.27	0.295	0.3	0.3	0.29
Silver	0.177	0.1905	0.045	0.045	4.3	0.39	0.046
Sodium	39.65	42.75	20	22	22.4	22.3	70.4
Thallium	0.51	0.55	0.495	0.55	0.55	0.55	0.53
Vanadium	2.255	2.43	1.8	1.95	13.5	5.6	5.21
Zinc	5.97	7.15	3.1	5.2	10.8	7.9	1.27
Cyanide	1.1	1.19	2.2	2.4	2.4	2.4	1.15

Concentrations are in milligrams per kilogram (mg/kg).

Qualifiers have been removed per Baker's standards.

Qualifiers R, U, and UJ have been given one-half the detection value.

Qualifiers J, NJ, and B have been removed with no detection value change.

**BASE BACKGROUND
SURFACE SOILS
TAL INORGANICS
MCB CAMP LEJEUNE, NORTH CAROLINA**

	74-BB-SB02-00	74-BB-SB03-00	74-BB-SB04-00	1-BB-SB38-00	1-BB-SB39-00	1-GW13-00	28-BB-SB37-00	28-BB-SB38-00
Aluminum	1730	1000	2100	3920	4930	1600	2840	379
Antimony	0.925	0.855	0.96	3.6	3.15	8.0	3.55	2.9
Arsenic	0.339	0.314	0.352	0.315	0.28	0.29	0.31	0.255
Barium	1.6	3.12	16	9.6	9.3	2.8	5.1	1.8
Beryllium	0.151	0.14	0.1565	0.105	0.10	0.095	0.105	0.085
Cadmium	0.275	0.2545	0.285	0.315	0.28	0.285	0.31	0.255
Calcium	46.9	43.9	377	538	353	248	114	13.10
Chromium	2.7	0.795	1.98	3.5	4.7	4.1	2.0	0.60
Cobalt	2.27	2.1	2.355	0.42	0.375	0.38	0.415	0.34
Copper	3.92	1.755	1.965	1.6	0.6	1.9	0.6	0.50
Iron	401	787	1640	2270	1470	1000	1210	444
Lead	3.79	1.14	142	5.9	4.5	4.2	2.8	1.7
Magnesium	37.5	16.1	52.5	152	183	47.2	68.8	12.9
Manganese	3.13	7.37	4.61	10.6	4.2	5.9	2.7	3.3
Mercury	0.048	0.0305	0.05	0.03	0.025	0.03	0.025	0.025
Nickel	1.59	1.475	1.65	0.8	0.65	0.65	0.750	0.6
Potassium	89	82.5	92.5	149	153	20.650	29.75	8.35
Selenium	0.296	0.274	0.307	0.42	0.375	0.38	0.415	0.34
Silver	0.047	0.0435	0.0485	0.5	0.465	0.475	0.5	0.425
Sodium	71.8	87.6	122	11.0	17.2	7.25	28.5	18.2
Thallium	0.54	0.4985	0.56	0.42	0.38	0.38	0.415	0.34
Vanadium	1.94	1.8	4.69	7.9	6.1	3.5	3.6	2.1
Zinc	1.15	1.97	2.87	7.2	4.0	1.4	0.9	0.71
Cyanide	1.17	1.08	1.21					

Concentrations are in milligrams per kilogram (mg/kg).

Qualifiers have been removed per Baker's standards.

Qualifiers R, U, and UJ have been given one-half the detection value.

Qualifiers J, NJ, and B have been removed with no detection value change.

BASE BACKGROUND
SURFACE SOILS
TAL INORGANICS
MCB CAMP LEJEUNE, NORTH CAROLINA

	28-GW09DW-00	30-BB-SB12-00	30-BB-SB13-00	30-BB-SB14-00	30-BB-SB15-00	30-BB-SB16-00	30-GW03-00	35-SS01-00
Aluminum	5460	54.6	24.9	49.2	37.5	196	17.7	2220.0
Antimony	3.35	3.2	3.2	3.3	3.5	3.650	3.9	2.45
Arsenic	1.8	0.28	0.29	0.29	0.31	0.325	0.34	0.065
Barium	11.6	1.8	0.7	0.7	0.7	3.100	0.8	15.6
Beryllium	0.10	0.095	0.10	0.10	0.10	0.110	0.12	0.11
Cadmium	0.295	0.28	0.29	0.29	0.31	0.325	0.34	0.04
Calcium	368	11.45	4.3	9.9	9.0	172	5.2	605.0
Chromium	6.0	1.6	0.7	1.9	0.7	0.75	0.8	1.9
Cobalt	0.91	0.375	0.38	0.38	0.41	0.43	0.45	0.60
Copper	2.9	0.55	0.6	0.6	0.6	0.65	0.7	3.9
Iron	2250	276	102	218	69.7	167	80.4	1250.0
Lead	11.6	3.3	0.47	2.4	0.73	4.4	0.86	3.60
Magnesium	157	6.5	2.6	2.6	2.8	37.1	3.1	71.6
Manganese	4.1	11.9	4.4	9.5	1.3	2.5	2.3	5.5
Mercury	0.025	0.06	0.02	0.03	0.05	0.03	0.03	0.065
Nickel	1.9	0.65	0.7	0.7	1.7	0.9	0.8	1.3
Potassium	158	8.25	11.1	3.8	1.0	29.6	1.2	129.5
Selenium	0.94	0.375	0.38	0.38	0.41	0.43	0.45	0.075
Silver	0.49	0.47	0.47	0.48	0.5	0.6	0.6	0.16
Sodium	15.0	14.8	26.0	4.9	5.2	18.2	5.8	126.00
Thallium	0.395	0.375	0.38	0.38	0.41	0.43	0.45	0.06
Vanadium	8.3	1.7	0.75	1.7	0.31	0.76	0.34	3.60
Zinc	6.6	0.35	0.30	0.48	1.7	2.0	1.2	7.4
Cyanide								

Concentrations are in milligrams per kilogram (mg/kg).

Qualifiers have been removed per Baker's standards.

Qualifiers R, U, and UJ have been given one-half the detection value.

Qualifiers J, NJ, and B have been removed with no detection value change.

**BASE BACKGROUND
SURFACE SOILS
TAL INORGANICS
MCB CAMP LEJEUNE, NORTH CAROLINA**

	BB-SB02-00	BB-SB03-00	16-BB-SB01-00	16-BB-SB02-00	16-BB-SB03-00	80-BB-SB01-00	80-BB-SB02-00	80-BB-SB03-00
Aluminum	3630.0	1950.0	1710.0	3630	1950	2240.0	7770.0	2850.0
Antimony	5.00	5.55	5.05	5	5.55	1.35	1.40	1.40
Arsenic	1.000	1.100	1.000	1	1.1	0.250	3.200	0.265
Barium	7.4	7.0	4.1	7.4	7	9.9	13.0	11.6
Beryllium	0.10	0.11	0.23	0.1	0.11	0.020	0.10	0.06
Cadmium	0.50	0.55	1.00	0.5	0.55	0.165	0.175	0.175
Calcium	113.0	227.0	96.8	113	227	505	997.0	239.0
Chromium	3.3	2.5	1.0	3.3	2.5	1.200	10.0	2.0
Cobalt	1.00	1.10	1.00	1	1.1	0.205	1.30	0.45
Copper	1.0	1.1	1.0	1	1.1	1.3	2.2	0.92
Iron	2150.0	1610.0	1260.0	2150	1610	604.0	5550.0	1450.0
Lead	5.20	10.20	7.40	5.2	10.2	7.5	8.90	8.30
Magnesium	99.1	69.4	42.9	99.1	69.4	94.8	289.0	94.2
Manganese	7.4	5.5	6.9	7.4	5.5	66.0	30.7	12.8
Mercury	0.055	0.055	0.055	0.055	0.055	0.050	0.050	0.060
Nickel	2.0	2.25	2.00	2	2.25	1.4	2.70	1.40
Potassium	1.0	111.5	101.0	100	111.5	163.0	416.0	90.9
Selenium	0.500	0.550	0.500	0.5	0.55	0.285	0.300	0.300
Silver	0.50	0.55	0.50	0.5	0.55	0.220	0.23	0.23
Sodium	25.20	26.20	35.90	25.2	26.2	24.1	77.10	72.70
Thallium	1.00	1.10	1.00	1	1.1	0.435	0.46	0.465
Vanadium	5.40	3.10	4.50	5.4	3.1	2.3	14.70	4.30
Zinc	8.7	22.1	9.2	4.35	22.1	6.1	12.9	3.5
Cyanide								

Concentrations are in milligrams per kilogram (mg/kg).

Qualifiers have been removed per Baker's standards.

Qualifiers R, U, and UJ have been given one-half the detection value.

Qualifiers J, NJ, and B have been removed with no detection value change.

**BASE BACKGROUND
SURFACE SOILS
TAL INORGANICS
MCB CAMP LEJEUNE, NORTH CAROLINA**

	7-BB-SB01-00	7-BB-SB02-00	7-BB-SB03-00	MIN	MAX	AVG	2Xaverage
Aluminum	7180.0	3770.0	5800.0	17.7	9570	2575.979	5151.959
Antimony	6.05	5.50	5.60	0.33	8	2.918	5.835
Arsenic	1.200	1.100	3.900	0.065	3.9	0.651	1.302
Barium	12.0	10.2	9.7	0.65	20.8	7.614	15.229
Beryllium	0.26	0.11	0.11	0.02	0.26	0.111	0.222
Cadmium	0.600	0.550	0.550	0.04	1	0.353	0.706
Calcium	397.0	69.5	615.0	4.25	10700	478.856	957.712
Chromium	8.4	3.8	10.6	0.33	12.5	2.929	5.857
Cobalt	1.20	1.10	1.10	0.185	2.355	1.117	2.233
Copper	1.20	1.10	2.30	0.5	87.2	3.645	7.291
Iron	3050.0	2170.0	7510.0	69.7	9640	1630.100	3260.200
Lead	7.10	6.40	8.70	0.47	142	10.899	21.798
Magnesium	104.0	50.5	79.5	2.55	610	88.606	177.212
Manganese	3.25	3.1	1.8	0.87	66	8.821	17.642
Mercury	0.060	0.060	0.060	0.01	0.08	0.043	0.087
Nickel	2.40	2.20	2.25	0.6	3.55	1.688	3.377
Potassium	121.0	110.0	111.5	1	416	93.362	186.724
Selenium	0.600	0.550	1.300	0.075	1.3	0.415	0.831
Silver	0.60	0.55	0.55	0.0435	4.3	0.473	0.945
Sodium	15.80	15.25	17.30	4.7	126	33.778	67.556
Thallium	1.200	1.100	1.100	0.06	1.2	0.538	1.076
Vanadium	9.70	5.40	18.20	0.305	18.2	4.249	8.498
Zinc	5.3	2.9	3.8	0.3	28.3	6.062	12.124
Cyanide				0.265	2.4	1.453	2.905

Concentrations are in milligrams per kilogram (mg/kg).

Qualifiers have been removed per Baker's standards.

Qualifiers R, U, and UJ have been given one-half the detection value.

Qualifiers J, NJ, and B have been removed with no detection value change.

APPENDIX F.2
BASE BACKGROUND SUBSURFACE SOIL REPORT

**BASE BACKGROUND
SUBSURFACE SOIL
TAL INORGANICS
MCB CAMP LEJEUNE, NORTH CAROLINA**

	6-201N-SB11-07	6-201N-SB12-02	6-201C-SB38-01	6-201C-SB39-04	78-BB-SB-01	2-GW09-01	1-BB-SB38-05	1-BB-SB39-04	1-BB-SB39-06	1-GW13-04
Aluminum	672	857	3620	2970	10200	8520	4580.000	6180.000	5980.000	4160.000
Antimony	4.7	4.85	1.4	1.25	0.355	1.6	4.200	3.250	2.950	6.900
Arsenic	0.31	0.315	0.033	0.305	0.24	0.47	1.100	0.290	0.260	0.285
Barium	2	2.05	7.6	6.5	10.9	6.6	7.500	11.800	8.600	7.500
Beryllium	0.095	0.1	0.03	0.025	0.12	0.23	0.125	0.095	0.085	0.095
Cadmium	0.285	0.295	0.57	0.17	0.6	1.2	0.370	0.290	0.260	0.285
Calcium	5.35	5.4	4410	12.1	81.3	10.6	35.600	12.250	19.700	52.400
Chromium	1.6	1.85	6	2.2	5.7	8.7	10.500	5.500	5.300	7.100
Cobalt	0.65	0.9	0.235	0.175	0.95	1.9	0.495	0.385	0.350	0.380
Copper	0.475	0.6	1.7	0.65	0.95	0.47	6.600	0.600	0.500	2.100
Iron	257	126	456	833	822	2840	4940.000	1510.000	1210.000	567.000
Lead	1.2	1.6	11.5	2.7	6.1	4.3	5.100	3.800	3.100	3.300
Magnesium	13.1	12.7	133	86.8	188	260	222.000	189.000	217.000	131.000
Manganese	0.475	0.395	7.5	2.6	2.4	5.2	4.100	4.900	5.400	2.000
Mercury	0.01	0.01	0.04	0.015	0.045	0.11	0.025	0.025	0.020	0.050
Nickel	1.6	1.7	0.8	0.7	2.4	4.7	0.850	2.300	0.600	0.650
Potassium	48.9	40.8	84.7	187	123	184	409.000	191.000	268.000	98.100
Selenium	0.5	0.5	0.55	0.5	0.29	0.115	0.495	0.385	0.350	0.380
Silver	0.95	1	0.195	0.175	0.355	0.7	0.600	0.480	0.435	0.475
Sodium	12.7	12.15	13.25	7.25	44.9	31.5	12.850	21.600	9.200	9.600
Thallium	0.205	0.21	0.22	0.2	0.12	0.23	0.495	0.385	0.350	0.380
Vanadium	0.75	1	3	4.7	7.4	13.4	12.200	6.500	6.100	3.500
Zinc	0.475	0.395	11.6	0.9	2.1	1.4	4.700	2.900	2.400	1.000

Concentrations are in milligrams per kilograms (mg/kg).

Qualifiers have been removed per Baker's standards.

Qualifiers R, U, and UJ have been given one-half the detection value.

Qualifiers J, NJ, and B have been removed with no detection value change.

**BASE BACKGROUND
SUBSURFACE SOIL
TAL INORGANICS
MCB CAMP LEJEUNE, NORTH CAROLINA**

	1-GW13-08	28-BB-SB37-03	28-BB-SB38-04	28-GW09DW-01	30-BB-SB12-03	30-BB-SB13-01	30-BB-SB14-01	30-BB-SB15-01	30-BB-SB16-02	30-GW03-01
Aluminum	6600.000	5170.000	2830.000	5730.000	2970	17.1	25.7	42.6	777	16.9
Antimony	3.200	3.550	3.550	3.750	3.9	3.1	3.6	3.6	3.4	3.9
Arsenic	0.280	0.315	0.315	1.500	0.34	0.28	0.32	0.32	0.30	0.34
Barium	8.400	9.700	5.000	11.700	0.8	0.7	0.8	0.8	3.5	0.8
Beryllium	0.095	0.105	0.105	0.110	0.12	0.09	0.11	0.11	0.10	0.12
Cadmium	0.280	0.315	0.315	0.330	0.34	0.28	0.32	0.32	0.30	0.34
Calcium	92.600	23.450	6.850	441.000	7.0	6.9	4.8	6.3	116	6.6
Chromium	8.300	7.300	3.400	4.700	3.9	0.7	0.8	0.8	0.7	0.8
Cobalt	0.375	0.420	0.420	0.930	0.45	0.37	0.42	0.43	0.40	0.46
Copper	1.600	0.650	0.650	0.650	0.7	0.6	0.7	0.7	0.6	0.7
Iron	959.000	2090.000	749.000	2780.000	908	95.9	155	63.3	514	74.5
Lead	4.000	4.100	2.300	7.400	0.7	0.47	1.9	0.91	3.2	0.59
Magnesium	262.000	153.000	66.000	157.000	24.7	7.5	2.9	2.9	30.2	3.1
Manganese	4.500	3.200	1.500	5.300	1.7	4.3	6.7	1.1	3.7	1.7
Mercury	0.025	0.025	0.025	0.025	0.03	0.03	0.08	0.25	0.03	0.68
Nickel	0.650	0.750	0.750	1.000	0.8	0.7	0.8	2.2	1.7	0.8
Potassium	308.000	122.000	91.300	136.000	13.2	6.3	1.1	21.3	21.9	1.2
Selenium	0.375	0.420	0.420	0.440	0.45	0.37	0.42	0.43	0.40	0.46
Silver	0.470	0.500	0.550	0.550	0.6	0.46	0.6	0.6	0.50	0.6
Sodium	10.900	33.800	28.600	20.300	12.5	11.1	19.3	5.4	14.4	5.8
Thallium	0.375	0.420	0.420	0.440	0.45	0.37	0.42	0.43	0.40	0.46
Vanadium	10.100	6.400	2.800	8.500	6.2	0.73	1.0	0.84	1.6	0.34
Zinc	2.700	1.900	0.970	4.200	0.35	0.32	0.39	1.2	1.7	1.3

Concentrations are in milligrams per kilograms (mg/kg).
Qualifiers have been removed per Baker's standards.
Qualifiers R, U, and UJ have been given one-half the detection value.
Qualifiers J, NJ, and B have been removed with no detection value change.

**BASE BACKGROUND
SUBSURFACE SOIL
TAL INORGANICS
MCB CAMP LEJEUNE, NORTH CAROLINA**

	7-BB-SB02-05	7-BB-SB03-09	16-BB-SB01-07	16-BB-SB02-07	16-BB-SB03-05	MIN	MAX	AVG	2Xaverage
Aluminum	1700.0	581.0	1940	888	2330	16.900	11000.000	3614.723	7229.446
Antimony	5.150	5.750	5.8	5	5.6	0.355	6.900	3.657	7.315
Arsenic	1.05	1.15	1.15	1	1.1	0.033	15.400	1.160	2.320
Barium	22.6	10.8	3.7	0.8	3.8	0.650	22.600	7.063	14.126
Beryllium	0.105	0.115	0.115	0.1	0.11	0.010	0.310	0.104	0.207
Cadmium	0.50	0.550	0.6	0.5	0.55	0.155	1.200	0.373	0.745
Calcium	41.55	32.15	135	74.2	290	4.750	4410.000	224.550	449.100
Chromium	6.2	3.9	4.7	2.4	4.2	0.650	66.400	6.751	13.503
Cobalt	1.05	1.15	1.15	1	1.1	0.175	7.000	0.880	1.761
Copper	1.05	1.15	1.15	1	1.1	0.470	9.500	1.434	2.868
Iron	709.0	1620.0	1150	1220	1870	63.300	90500.000	4101.249	8202.497
Lead	1.80	1.10	2.9	2.4	3.8	0.465	21.400	4.336	8.672
Magnesium	44.1	12.25	104	35.7	115	2.850	852.000	136.866	273.731
Manganese	2.65	2.1	5	2.7	2.4	0.395	19.900	4.336	8.673
Mercury	0.050	0.060	0.06	0.055	0.06	0.010	0.680	0.067	0.135
Nickel	2.050	2.300	2.3	2	2.25	0.450	4.700	1.437	2.875
Potassium	102.5	114.5	116	100.5	228	1.050	1250.000	197.447	394.894
Selenium	0.50	0.55	0.6	0.5	0.55	0.085	2.400	0.470	0.939
Silver	0.50	0.55	0.6	0.5	0.55	0.175	1.000	0.475	0.950
Sodium	13.6	15.65	29.8	10.3	28.2	5.400	141.000	28.366	56.731
Thallium	1.05	1.15	1.15	1	1.1	0.060	2.700	0.588	1.176
Vanadium	3.10	2.50	4	3.9	4.9	0.340	69.400	7.039	14.078
Zinc	2.1	3.15	15	4.35	2.45	0.320	26.600	3.881	7.763

Concentrations are in milligrams per kilograms (mg/kg).
 Qualifiers have been removed per Baker's standards.
 Qualifiers R, U, and UJ have been given one-half the detection value.
 Qualifiers J, NJ, and B have been removed with no detection value change.

**BASE BACKGROUND
SUBSURFACE SOIL
TAL INORGANICS
MCB CAMP LEJEUNE, NORTH CAROLINA**

	35-GWDS01-03	BB-SB02-07	BB-SB03-05	80-BB-SB01-06	80-SS-SB01-03	80-BB-SB2-03	80-BB-SB02-06	80-BB-SB03-03	80-BB-SB03-06	7-BB-SB01-05
Aluminum	2910.0	888.0	2330.0	11000.0	2520.0	5950.0	9600.0	9500.0	1060.0	1400.0
Antimony	2.750	5.000	5.600	6.200	1.300	1.350	1.650	3.500	1.300	5.150
Arsenic	0.12	1.00	1.10	15.40	0.245	1.60	4.70	1.80	0.24	1.05
Barium	5.5	1.6	3.8	22.3	4.5	9.9	13.5	10.9	4.3	16.1
Beryllium	0.06	0.10	0.11	0.31	0.01	0.04	0.20	0.09	0.01	0.105
Cadmium	0.30	0.50	0.55	0.205	0.16	0.165	0.205	0.16	0.155	0.50
Calcium	456.0	74.2	290.0	257.0	105.0	323.0	210.0	142.0	34.2	38.95
Chromium	2.2	2.4	4.2	66.4	2.1	10.0	22.0	12.0	2.9	5.0
Cobalt	0.65	1.00	1.10	7.00	0.42	0.71	1.40	0.75	0.20	1.05
Copper	0.550	1.000	1.100	9.500	0.670	1.600	4.400	2.200	0.630	1.05
Iron	442.0	1220.0	1870.0	90500.0	795.0	2920.0	12800.0	3350.0	557.0	571.0
Lead	8.10	2.40	3.80	21.40	2.90	5.00	11.70	7.80	5.40	3.00
Magnesium	63.5	35.7	115.0	852.0	76.0	282.0	455.0	357.0	50.7	30.6
Manganese	5.6	2.7	2.4	14.9	1.8	19.9	7.4	6.2	5.4	1.95
Mercury	0.03	0.055	0.06	0.07	0.045	0.055	0.07	0.045	0.045	0.055
Nickel	1.050	2.000	2.250	0.600	0.455	1.400	0.600	2.200	0.450	2.050
Potassium	145.0	100.5	228.0	1250.0	161.0	297.0	1020.0	458.0	130.0	103.0
Selenium	0.085	0.500	0.550	2.400	0.275	0.285	0.355	0.275	0.275	0.50
Silver	0.39	0.50	0.55	0.275	0.21	0.22	0.275	0.21	0.21	0.50
Sodium	141.0	20.6	28.2	124.0	63.4	25.5	47.1	73.2	18.3	16.85
Thallium	0.06	1.00	1.10	2.70	0.425	0.44	0.55	0.42	0.42	1.05
Vanadium	3.00	3.90	4.90	69.40	2.30	10.80	18.40	13.50	2.40	2.30
Zinc	2.6	8.7	4.9	26.6	2.0	3.5	8.1	4.8	1.7	3.1

Concentrations are in milligrams per kilograms (mg/kg).
Qualifiers have been removed per Baker's standards.
Qualifiers R, U, and UJ have been given one-half the detection value.
Qualifiers J, NJ, and B have been removed with no detection value change.

APPENDIX G
BAKER'S EVALUATION OF METALS IN GROUNDWATER

DRAFT

**EVALUATION OF METALS IN
GROUNDWATER**

**MARINE CORPS BASE,
CAMP LEJEUNE, NORTH CAROLINA**

CONTRACT TASK ORDER 0177

JUNE 3, 1994

Prepared for:

**DEPARTMENT OF THE NAVY
ATLANTIC DIVISION
NAVAL FACILITIES
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*Norfolk, Virginia***

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TABLES

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2	Comparison of Repeat Sampling in Shallow Wells
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5	Comparison of Inorganic Subsurface Soil Concentrations in "Clean" and "Contaminated" Wells
6	Total Metals in Deep Monitoring Wells
7	Summary of Field Parameters in Shallow, Deep, and Supply Wells

1.0 INTRODUCTION

Numerous groundwater investigations have been conducted at Marine Corps Base (MCB), Camp Lejeune under the Department of the Navy (DON) Installation Restoration Program (IRP). These studies have identified elevated levels of total metals in shallow groundwater at almost every site. The degree of contamination, based on dissolved metals analysis of groundwater samples, is limited. It is believed that the presence of elevated metals are not always related to past disposal activities for several reasons, which is the basis of this study.

Currently, Records of Decision (ROD) are being prepared for Operable Units No. 1 (Sites 21, 24, and 78) and No. 5 (Site 2). Both RODs are proposing to not remediate shallow groundwater which contains elevated levels of total metals above State groundwater standards (i.e., North Carolina Water Quality Standards) and/or Federal drinking water standards (i.e., Maximum Contaminant Levels). Specifically, remediation of shallow groundwater due to elevated total metals is not cost effective, or practical, due to the following: (1) the shallow aquifer is not used for potable supply; (2) the source of metals in groundwater cannot be correlated with soil data or previous disposal practices; (3) the extent of shallow groundwater contamination (based on total metals analysis) is widespread and in many cases undefinable, since there are no apparent contaminant plumes or patterns associated with the metals; and (4) deep groundwater, which is the source of potable water, is not significantly contaminated with metals above the standards.

2.0 STUDY OBJECTIVES

The DON/Marine Corps initiated a study on inorganics in groundwater throughout MCB Camp Lejeune to assess whether total metals in groundwater are related to disposal practices or to other factors. The overall goal of this study is to provide information that would be used in consideration of not remediating shallow groundwater at Operable Units No. 1 and No. 5, and possibly other operable units where total metals are elevated without cause. The following study objectives were identified:

- (1) Determine whether the elevated total metals detected in the shallow aquifer are related to past disposal practices, well construction factors, sampling techniques, or suspended particulates in the samples;
- (2) Determine whether total metals in shallow groundwater are elevated throughout the region or MCB Camp Lejeune;
- (3) Determine whether there is a correlation between elevated total metals in groundwater and metals in soil; and

- (4) Determine whether the concentrations of total metals (i.e., low versus high) is related to shallow and deep aquifer characteristics.

3.0 SCOPE OF WORK

Groundwater and soil data from a total of 21 sites were compiled as part of the overall study. Three of the 21 sites are located outside the boundary of the base. These sites include the ABC Cleaners Superfund Site, located along Route 24 in Jacksonville, and two sites located along Highway 17 (Off-site Properties No. 1 and No. 2). The two sites along Route 17 were investigated by the DON/Marine Corps as part of a real estate survey. The other 18 sites are located throughout various portions of MCB Camp Lejeune (see Figure 1).

Information from studies conducted by Baker and other consultants were obtained to evaluate metal concentrations in groundwater. The study focused on 14 metals of potential concern to human health and the environment. Some of the information was collected under the IR Program whereas other information was obtained during other investigations (e.g., ABC Cleaners RI/FS). The following data tables were then prepared to determine why total metals are generally elevated in shallow groundwater.

Table 1 - Total Metal Concentrations in Shallow Groundwater by Site

Table 2 - Summary of Repeat Sampling of Shallow Wells (Sites 2 and 78)

Table 3 - Dissolved Metal Concentrations in Shallow Groundwater by Site

Table 4 - Summary of Total Metal Concentrations in Upgradient Wells

Table 5 - Comparison of Subsurface Metal Concentrations in Uncontaminated and Contaminated Wells

Table 6 - Total Metal Concentrations in Deep Groundwater by Site

Table 7 - Summary of Field Parameters in Shallow Monitoring Wells, Deep Monitoring Wells, and Supply Wells

The tables are presented at the end of this report.

4.0 DATA ANALYSIS

The following discussion represents an analysis of the information contained in each of the previously mentioned tables.

Table 1 (Total Metal Concentrations in Shallow Groundwater)

All of the sites had at least one (and in most cases several) metal which exceeded either State water quality standards or Federal drinking water standards. The most frequently detected metals included chromium, lead, and manganese, which were detected at almost every site above drinking water standards. Other frequently detected metals which exceeded drinking water standards included arsenic, beryllium, cadmium, and nickel.

An analysis of the data from Table 1 indicates that elevated total metals are present in shallow groundwater at every site, including the three sites which are located off base. The two sites which did not exhibit significant contamination include the ABC Cleaners site (only chromium exceeded the standards) and Site 48 (only manganese exceeded the standards).

Total metals detected in shallow groundwater at Site 2 exceeded State and/or Federal standards in seven of the 11 shallow monitoring wells. Manganese was the most frequently detected metal (7/11). Lead (3/11), chromium (2/11), and cadmium (1/11) were also detected above the standards,, but less frequently (see Figure 2).

With the exception of Wells 78GW03 and 78GW19, total metals were detected at Site 78 (Hadnot Point Industrial Area) above Federal MCLs or NCWQS in every shallow well (see Figure 3). The extent of elevated total metals in groundwater is widespread, encompassing approximately one square mile (or approximately 660 acres) in total area. The distribution and concentration of total metals in shallow groundwater makes it virtually impossible to identify or illustrate contaminant plumes (see Figure 3).

An analysis of the total metals results indicates the following pattern. Samples exhibiting elevated levels of lead, chromium, or other contaminants of concern, also exhibited elevated levels of other metals such as aluminum, antimony, iron, and zinc. Samples which did not exhibit elevated levels of lead, chromium, or manganese also did not exhibit elevated levels of other metals. This pattern indicates that the elevated total metals are not limited to one or

two contaminants, which would be the case if a lead or chromium plume in the groundwater truly existed. In other words, if a site is impacted by a particular metal due to disposal activities (say chromium for example), then other metals such as aluminum, lead, or zinc should not be consistently elevated as in the case of samples collected from the shallow aquifer at MCB Camp Lejeune. This point is depicted in the data summary tables provided in Appendix A for Sites 2 and 78. These tables were taken from the Remedial Investigation Reports for Operable Units No. 1 and No. 5. As an example, note that sample numbers 78-MW08, 78-MW10, 78-MW11, and 78-MW12 all had elevated levels of total metals when compared to samples 78-MW09-2 and 78-MW09-3. It is clear that most of the metal concentrations in a particular sample follow a consistent pattern throughout.

Table 2 (Comparison of Repeat Sampling of Shallow Wells)

Five wells from Sites 2 and 78 were randomly chosen to evaluate total metals concentrations between sampling rounds. The comparison was limited to only chromium, lead, and manganese since these contaminants were frequently detected throughout MCB Camp Lejeune. In several cases, metal concentrations were significantly different between the sampling rounds. If the shallow aquifer was impacted due to former disposal activities, a contaminant plume would be present and concentrations would not significantly deviate. The deviation in metal concentrations may indicate that sampling results are biased due to suspended particulates in the samples.

Table 3 (Dissolved Metal Concentration in Shallow Groundwater by Site)

The data base for Table 3 was limited to 12 sites since many of the previous investigations (i.e., prior to Navy CLEAN) did not analyze for dissolved metals. Nevertheless, an analysis of the 12 sites revealed that elevated levels of dissolved metals in groundwater is limited. Manganese was the most frequently detected metal above drinking water standards (10 of 12 sites exhibited elevated levels). Lead was detected at only one site (Site 21) above drinking water standards. Chromium was also detected at only one site (Site 78) above drinking water standards. No other metal was detected above the standards.

Literature searches have indicated that manganese is a naturally occurring metal in North Carolina. Therefore, the presence of manganese may not be attributable to site-related activities (Greenhorne & O'Mara, 1992).

An analysis of the data from Table 3 clearly shows a significant reduction in metal concentrations when compared to Table 1 (total metals in shallow groundwater). One possible reason for this reduction is that suspended solids or particles are not being introduced into the analysis of the sample due to filtering. A second possibility is that the metals are not significantly present in a dissolved state in shallow groundwater due to the species of metals under site conditions. It should be noted that calcium and sodium did not exhibit such a pattern since the salts of these metals are more soluble in water. For example, the concentrations of total calcium and total sodium versus dissolved calcium and dissolved sodium are similar and are not affected by the removal of the particulates during filtering. The fact that these salts do not exhibit the pattern that the other metals show supports the possibility that total metal concentrations are influenced by particulates in the sample.

Table 4 (Total Metals in Upgradient Shallow Wells)

The data base for Table 4 consists of groundwater results from 14 upgradient shallow monitoring wells (i.e., one well per site). These wells were installed to determine baseline groundwater quality to which on-site groundwater conditions could be compared. In some cases, the upgradient wells were located in areas where other base activities may have influenced groundwater quality.

The analysis of this data shows that manganese was the most frequently detected metal above Federal or State standards in upgradient shallow wells. Manganese was detected in 7 of the 14 upgradient wells above drinking water standards. Chromium and lead were also frequently detected above drinking water standards in upgradient (background) wells. These contaminants were detected in 6 of the 14 upgradient wells. At Site 2, samples collected from an upgradient well (2GW9) exhibited elevated levels of chromium (83 μ /l), lead (27.2 μ /l) and manganese (747 μ /l). At Site 78, samples collected from upgradient wells 96W4 and 78GW26 did not exhibit elevated levels of total metals. The concentration range for metals detected above NC WQS and/of Federal MCLs in upgradient wells is provided below:

- beryllium (ND-46.5 μ /l)
- cadmium (ND-10 μ /l)
- chromium (ND-198 μ /l)
- lead (ND-78.8 μ /l)
- manganese (ND-747 μ /l)
- mercury (ND-1.6J μ /l)

Based on the above range representing upgradient wells, none of the on-site wells at Site 2 exhibited total metals above the maximum background concentrations. However, at Site 78, lead and chromium were detected above the maximum background in several on-site wells.

An analysis of the data from Table 4 indicates that shallow groundwater upgradient of some sites contains total metals above drinking water standards. A comparison of Table 4 data against Table 1 data indicates that shallow groundwater samples from upgradient wells are less contaminated than samples collected from on-site monitoring wells. However, it should be noted that the data base for Table 4 consists of only 14 wells whereas the data base for Table 1 consists of over 130 wells. Therefore, to assume that upgradient groundwater quality is better than on-site groundwater quality may not be justified due to the different data bases.

Table 5 (Comparison of Subsurface Metal Concentrations in Uncontaminated and Contaminated Wells)

The purpose of this table is to determine whether metal concentrations in soils correlate with the elevated levels of metals in shallow groundwater.

To evaluate this, metals in subsurface soils, representing an area of groundwater contamination, were compared to metals in subsurface soil in areas which did not exhibit groundwater contamination. If the elevated total metals in shallow groundwater are present due to former disposal activities, subsurface metals in soil representing an area of groundwater contamination would be expected to be elevated or higher than metals in subsurface soil representing a non-contaminated area. This evaluation assumes that the well exhibiting elevated total metals is within a source area and that the soil sample is representative of soil impacted by metal contamination.

As shown on Table 5, there is no clear pattern or correlation which indicates that elevated total metals are due to soil contamination. Note that in many cases, the concentration of metals which represent "non-contaminated" areas are greater than the metals which represent "contaminated" areas. Also note that the metals in subsurface soil are within or close to background subsurface metal concentrations. Therefore, this supports the possibility that in many cases at MCB Camp Lejeune, the elevated total metals in shallow groundwater cannot be attributable to a source or to past disposal practices.

Table 6 (Total Metals in Deep Monitoring Wells)

Table 6 presents total metal concentrations in deep groundwater for each site. The data base is limited to only 8 sites. Metal concentrations in supply wells were also included for comparison purposes.

As shown on Table 6, total metals in deep groundwater are below drinking water standards with a few exceptions. Arsenic and cadmium were detected above the standards in one deep monitoring well at Site 78 (see Figure 4). Manganese was detected in deep groundwater at three sites and a few of the supply wells. Lead was detected in one supply well at 16 μ /l, which is slightly above the drinking water standard of 15 μ /l.

Elevated total metals are not widespread in deep groundwater for two possible reasons. First, most metals are not very mobile in the environment. Second, deep groundwater samples may not have significant amounts of suspended particulates due to different geologic conditions. Soils in the deeper aquifer are more compacted and consist primarily of calcareous sands, clays, and limestone fragments. Soils in the shallow aquifer are loosely compacted and consist primarily of fine-grained sands, silts, and clays. This classification may support the possibility that suspended solids are collected during sampling, thereby influencing the analysis for total metals.

Table 7 (Summary of Field Parameters in Shallow, Deep, and Supply Wells)

Table 7 provides a range of pH and specific conductivity values representative of shallow and deep groundwater. In general, lower pH values were noted more often in shallow wells than in deep wells (including the supply wells). This condition may influence the leachability and speciation of metals in groundwater.

Deep groundwater usually exhibited higher specific conductivity values. High specific conductivity values are representative of high dissolved conditions. The fact that deep groundwater generally exhibited higher specific conductivity values indicates that most of the metals, if present, are in a dissolved state. The high specific conductivity values could also indicate less suspended particulates due to the geologic conditions of the deep aquifer. The lower specific conductivity values observed in shallow wells indicates that the metals in the shallow aquifer are not in a dissolved state. This also supports the possibility that suspended particulates in the shallow aquifer are influencing the analysis of total metals.

5.0 ANALYSIS OF THE STUDY OBJECTIVES

Each of the objectives identified for this study are analyzed below based on the information collected.

Objective No. 1 (Determine whether the elevated total metals in the shallow aquifer are related to past disposal practices, well construction factors, sampling techniques, or suspended particulates in the samples)

Based on the analysis of information provided in Tables 1 through 7 and Appendix A, it appears that suspended particulates in groundwater samples could influence the concentration of total metals in groundwater. Well construction factors and sampling techniques are probably not a significant factor since the data base is representative of data obtained by Baker, ESE (Site 28 and 30), Roy F. Weston (ABC Cleaners), and Halliburton NUS (Site 7). No particular pattern was noted between sites which Baker obtained the samples versus sites in which other consultants obtained the data. Sampling methods were also considered. For Sites 63 and 65 for example, samples were collected with a bailer. At Sites 2 and 78, samples were collected with a low flow pump. All four sites exhibited elevated levels of total metals in groundwater samples. In addition, due to the fact that deep groundwater quality is not significantly impacted with metals indicates that well construction or sampling techniques are probably not factors related to elevated total metals in groundwater.

With respect to past disposal practices, Table 5 clearly shows that soil concentrations do not correlate with elevated total metals in groundwater. Based on this analysis, and on many of the sites previously investigated, the source of total metals in groundwater cannot be attributable to soil contamination or disposal practices in many cases. This is based on both the history of the site as well as the analytical soil results. In some cases, total metals were detected at elevated levels even when the site history did not correlate with the contaminants found. For example, Sites 2 and 21 have a history of pesticide storage and handling, and there are no known disposal areas (i.e., buried debris) within the site boundary. Nevertheless, both of these sites exhibited several metals above drinking water standards that would not be expected to be present at high concentrations based on the historical use of the site. These metals included lead, chromium, beryllium, cadmium, and manganese.

Objective No. 2 (Determine whether total metals in shallow groundwater are elevated throughout the region or MCB Camp Lejeune)

Based on groundwater data obtained from both upgradient wells and off base wells, total metals were detected above drinking water standards in shallow groundwater in areas that would not be influenced by former disposal activities at the sites. Given that some of the upgradient wells are contaminated, it is apparent that total metals in shallow groundwater are elevated in certain areas of the base outside of the influence of site-related disposal activities. However, it is unknown whether the shallow aquifer upgradient of the sites is contaminated due to other base-related activities or whether the levels in groundwater samples are also elevated due to the influence of suspended fines in the samples.

Objective No. 3 (Determine whether there is a correlation between elevated total metals in groundwater and metals in soil)

An evaluation of the data presented in Table 5 shows that metals in soil samples collected in areas of groundwater contamination are not elevated when compared to metals in soil samples collected in areas that did not exhibit groundwater contamination. This supports the possibility that in many cases, elevated levels of total metals in shallow groundwater are not related to the disposal history at the site. As previously mentioned, sites which did not exhibit soil contamination (when compared to background soil levels) or did not have a history of disposal indicative of metals contamination still exhibited elevated levels of total metals in groundwater. Since there is no apparent correlation between metals in soil and total metals in groundwater, then the possibility exists that the elevated total metals in groundwater are biased high due to suspended particulates.

Objective No. 4 (Determine whether the concentrations of total metals in groundwater is related to shallow and deep aquifer characteristics)

There is some evidence that the geologic conditions of the shallow and deep aquifers influence the amount of total metals detected in groundwater samples. The fact that the deep aquifer generally exhibited higher specific conductivity values indicates that there is more dissolved constituents in the deep aquifer when compared to the shallow aquifer. This was evident when comparing Table 1 (total metals in shallow groundwater) to Table 6 (total metals in deep groundwater). Table 6 did not indicate significant levels of total metals in deep groundwater throughout MCB Camp Lejeune.

The geologic conditions of the shallow aquifer would tend to result in samples that may contain suspended particulates. The suspended particulates could influence the total metals concentrations in the samples.

6.0 CONCLUSIONS

- 1. Elevated levels of total metals in the shallow aquifer are probably influenced to some degree by the geologic conditions of the site.**
- 2. There is no correlation between metal levels in soil and total metals in groundwater. Therefore, elevated total metals in groundwater cannot be attributable to soil contamination of past disposal practices.**
- 3. Elevated levels of total metals in the shallow aquifer may be biased high due to suspended particulates in the samples.**
- 4. Dissolved metals in groundwater were generally below Federal MCLs and NC WQS and therefore, do not present a significant problem at MCB Camp Lejeune.**
- 5. Total and dissolved metal concentrations in the Castle Hayne aquifer were generally below drinking water standards and therefore, do not present a significant problem at MCB Camp Lejeune.**
- 6. The presence of manganese in shallow and deep groundwater may be due to naturally occurring geologic conditions.**

7.0 RECOMMENDATIONS

- 1. Remediation of total metals in the shallow aquifer at Operable Units 1 and 5 is not recommended based on the following:**
 - **Elevated metals in groundwater at both operable units does not appear to be related to soil contamination or past disposal practices;**
 - **The distribution of total metals in groundwater is not characteristic of a plume that would be present due to a source of contamination;**
 - **Remediation of total metals would not be practical from an engineering or cost standpoint; and**
 - **Currently, there is no human or environmental exposure to shallow groundwater.**

- 2. Additional background wells should be installed at all sites in order to provide a baseline for comparing on-site groundwater quality.**

Tables

**TABLE 1
TOTAL METALS BY SITE
SHALLOW MONITORING WELLS
MCB, CAMP LEJEUNE, NORTH CAROLINA**

Site Number Units	NCWQS ug/L	FEDERAL MCL ug/L	Site 1 ug/L	Site 2 ug/L	Site 6 ug/L	Site 7 ug/L	Site 9 ug/L	Site 21 ug/L	Site 24 ug/L	Site 28 ug/L	Site 30 ug/L	Site 41 ug/L	Site 43 ug/L	Site 44 ug/L
Arsenic	50	50	7.2 - 57.4	2.2 - 23.6	ND - 23.3	ND - 43.4J	ND	ND - 101	ND - 116J	5.4 - 13J	6.4 - 12J	2.4 - 36.3	ND - 23.4	ND - 570
Barium	2000	2000	335 - 833	46 - 1420	ND - 1020	427 - 641	ND - 1060	ND - 647	ND - 1120	78.8 - 576	60.1 - 396	53.2 - 999	220 - 745	315 - 3180
Beryllium	NE	4	2.7J - 43.4	1 - 3	ND - 7.5	ND - 10.3J	ND	ND - 8	ND - 19	ND - 1.2J	ND - 2.4	0.80 - 42.8	1.5 - 4.2	1.4 - 36.6
Cadmium	5	5	ND - 12.9	7	ND	ND	ND	ND	ND - 12	3.3J - 17.3J	ND - 10.7J	3.2 - 110	ND - 6.9	ND - 32
Calcium	NA	NA	8850 - 726000	5710 - 450000	5430 - 64900	5050 - 51300	16100 - 90700	6130J - 63000J	ND - 151000	20200 - 160000	1730 - 11900	8750 - 828000	10300 - 91900	2430 - 191000
Chromium	50	100	172 - 627	11 - 117	ND - 201	47.8 - 220	ND - 214	ND - 348J	19 - 316	9.0J - 140	42.8 - 106J	10.5 - 244	161 - 249	126 - 895
Copper	1000	1300	44.6 - 117	3 - 23	ND - 175	17.7 - 36.4	ND - 39.7	ND - 84	ND - 52	18.8J - 75.4	15.8 - 42.5	16.3 - 1030	64.2 - 104	28.6 - 313
Lead	15	15	40.8J - 176J	2.7 - 44.8	ND - 200	23 - 37.3	ND - 127	ND - 2000J	5.1 - 89	20.3J - 234J	7.7J - 115J	4.8 - 9340	16.5 - 28.8	15.8 - 508
Manganese	50	50 (1)	125 - 1720	21 - 190	ND - 362	56.9 - 220	ND - 91.3	39 - 276J	29 - 518	82.2 - 304	78.5 - 578	56.6 - 2110	72.6 - 297	88 - 1730
Mercury	1.1	2	ND - 1.2J	ND	ND - 46	0.2 - 0.36	ND - 1.4	ND - 2.4J	ND - 3.2	ND - 1.4J	0.88J - 0.9J	0.13 - 0.92	ND - 0.24	ND - 1.1
Nickel	100	100	28.5 - 426	ND	ND - 41.9	ND	ND	ND - 123	ND - 140	ND - 59.8	17.1J - 52.6J	28.8 - 137	20.5 - 143	21.9 - 486
Sodium	NA	NA	9090 - 19000	ND - 103000	1110 - 68700	7040 - 156000	1390 - 4170	7950 - 15700	5230 - 19200	9480 - 74700	5320 - 8100	2080 - 40200	9160 - 22100	4060 - 12600
Vanadium	NE	NE	214 - 640	9 - 184	ND - 330	37.8 - 423	ND - 175	ND - 419	ND - 408	6.1 - 164	57 - 101	20.4 - 244	122 - 233	184 - 739
Zinc	2100	5000 (1)	ND - 1110	6 - 146	ND - 1620	83.6 - 133	ND - 118	27J - 487J	20 - 650	ND	79.2 - 104	25.7 - 5180	19 J - 661J	87.3 - 2800J

Site Number Units	Site 48 ug/L	Site 63 ug/L	Site 65 ug/L	Site 69 ug/L	Site 78 ug/L	Site 82 ug/L	ABC Cleaners ug/L	Offsite Property #1 ug/L	Offsite Property #2 ug/L
Arsenic	ND	ND - 23.4	ND - 308	2.9 - 29.0	ND - 405J	ND - 67.8	ND - 12	10.3 - 160	ND
Barium	18 - 51.3	56.1 - 5410	105 - 638	46.5 - 850	ND - 1250	ND - 540	35 - 220	ND - 468	ND
Beryllium	ND	ND - 3.1	ND	1.3 - 10.6	ND - 19	ND	NA	ND - 8.5	ND
Cadmium	2.2 - 3.3	ND	ND	2.4 - 11.4	ND - 21	ND	NA	ND	ND
Calcium	30600 - 113000	2830 - 24300	33300 - 181000	2010 - 38700	ND - 642000	6580 - 60800	790 - 16000	ND - 22800	ND - 5200
Chromium	5.8 - 17.5	4.4 - 134	50.1 - 364	15.1 - 159	ND - 858J	ND - 174	ND - 57	52.8 - 636	ND - 94
Copper	3.1 - 13.5	10.7 - 126	28.2 - 127	16.2 - 70.8	ND - 699	ND - 29.3	ND - 89	ND - 140	ND
Lead	ND	4.3 J - 369	19.1 - 132	7.8 - 188	ND - 360J	ND - 89	ND - 10	12.3 - 345	6.3 - 62.3
Manganese	38.1 - 585	50.3 - 1020	56.2 - 474	13.0 - 912	26 - 714	26.9 - 283	4 - 44	56 - 973	ND - 60.1
Mercury	0.04 - 0.09	ND - 0.20	ND - 0.29	0.10 - 0.94	ND - 1.5	ND - 0.66	NA	ND	ND
Nickel	ND	19.8 - 54.2	19.4 - 84.3	13.6 - 99.8	ND - 234	ND - 34.6	ND - 77	40.2 - 380	ND
Sodium	5750 - 8760	3150 - 7100	3850 - 11700	4790 - 41300	ND - 42500	3670 - 36500	5800 - 33000	ND - 9390	ND - 7630
Vanadium	3.4 - 12.8	7.9 - 163	59.8 - 433	17.3 - 210	ND - 1700	ND - 236	ND - 45	70 - 739	ND - 64.7
Zinc	ND - 30.3	58.5J - 1110J	148J - 406J	36.2 - 12100	6J - 967J	ND - 204	14 - 220	ND - 736	ND - 40.8

NOTES:
 J - Value is estimated.
 JB - Value is estimated below the CRDL, but greater than the IDL.
 NE - Not established.
 NA - Not analyzed.
 ND - Not detected.
 NCWQS - North Carolina Water Quality Standard
 MCL - Maximum Contaminant Level
 (1) - Secondary MCL

TABLE 2
COMPARISON OF REPEAT SAMPLING OF SHALLOW WELLS
MCB, CAMP LEJEUNE, NORTH CAROLINA

Well Date	2GW01		2GW03		2GW06		2GW08		2GW09	
	5/1993	3/1994	5/1993	3/1994	5/1993	3/1994	5/1993	3/1994	5/1993	3/1994
Chromium	18	ND	11	ND	15	ND	ND	ND	25	83
Lead	15.5 J	ND	3.5 J	ND	6.7 J	ND	ND	3.4	27.2 J	23.6
Manganese	55	47	21	ND	79	140	53	415	290	747

Well Date	78GW05		78GW08		78GW15		78GW16		78GW19	
	1/1991	4/1994	1/1991	4/1994	1/1991	4/1994	1/1991	4/1994	1/1991	4/1994
Chromium	ND	17 J	91.8	491 J	21.4	215 J	209	353 J	13.8	ND
Lead	13.6	13.1 J	54.1	131 J	16.6	53	100	224	31.7	8.3
Manganese	162	161 J	46.5	213 J	18.3	115	98.3	150	79	26

NOTES:

J - Value is estimated.

ND - Not detected.

**TABLE 3
DISSOLVED METALS BY SITE
SHALLOW MONITORING WELLS
MCB, CAMP LEJEUNE, NORTH CAROLINA**

Site Number Units	NCWQS ug/L	FEDERAL MCL ug/L	Site 1 ug/L	Site 2 ug/L	Site 6 ug/L	Site 7 ug/L	Site 9 ug/L	Site 21 ug/L	Site 24 ug/L	Site 28 ug/L	Site 30 ug/L	Site 41 ug/L	Site 43 ug/L	Site 44 ug/L
Arsenic	50	50	NA	2.2 - 7.1	ND	NA	ND	ND - 10.6	ND - 16.3	NA	NA	2.2 - 4.7	NA	NA
Barium	2000	2000	NA	25 - 149	ND	NA	ND	ND	ND	NA	NA	12.4 - 451	NA	NA
Beryllium	NE	4	NA	1	ND	NA	ND	ND	ND	NA	NA	0.80 - 3.2	NA	NA
Cadmium	5	5	NA	ND	ND	NA	ND	ND - 5	ND	NA	NA	3.2 - 4.2	NA	NA
Calcium	NA	NA	NA	5800 - 441000	6230 - 57400	NA	15800 - 82400	35900	ND - 113000	NA	NA	4710 - 138000	NA	NA
Chromium	50	100	NA	10	ND	NA	ND	ND	ND	NA	NA	8.3 - 9.6	NA	NA
Copper	1000	1300	NA	2 - 9	ND	NA	ND	ND	ND	NA	NA	16.3 - 23.9	NA	NA
Lead	15	15	NA	2.1	ND	NA	ND	ND - 94	ND	NA	NA	1.0	NA	NA
Manganese	50	50 (1)	NA	17 - 129	ND - 92.7	NA	ND	40 - 134	ND - 320	NA	NA	7.1 - 521	NA	NA
Mercury	1.1	2	NA	ND	ND	NA	ND	ND	ND - 0.5	NA	NA	0.13 - 0.20	NA	NA
Nickel	100	100	NA	ND	ND	NA	ND	ND	ND - 57	NA	NA	28.8 - 31.2	NA	NA
Sodium	NA	NA	NA	ND - 103000	1420 - 70500	NA	1280 - 3860	16200	ND - 183000	NA	NA	2500 - 34200	NA	NA
Vanadium	NE	NE	NA	43	ND	NA	ND	ND	ND	NA	NA	20.4	NA	NA
Zinc	2100	5000 (1)	NA	8 - 35	ND - 350	NA	ND	6B - 50	ND - 437	NA	NA	10.6 - 125	NA	NA

Site Number Units	Site 48 ug/L	Site 63 ug/L	Site 65 ug/L	Site 69 ug/L	Site 78 ug/L	Site 82 ug/L	ABC Cleaners ug/L	Offsite Property #1 ug/L	Offsite Property #2 ug/L
Arsenic	ND	NA	NA	2.9	ND - 21.6	ND	NA	ND - 18.8	ND
Barium	16.8 - 27.6	NA	NA	13.7 - 35.8	ND	ND	NA	ND	ND
Beryllium	ND	NA	NA	1.3	ND	ND	NA	ND	ND
Cadmium	ND - 3.1	NA	NA	2.4	ND	ND	NA	ND	ND
Calcium	72600 - 80700	NA	NA	764 - 10600	ND - 296000	15200 - 58500	NA	ND - 7710	ND
Chromium	ND	NA	NA	7.2	ND - 39	ND	NA	ND - 30.0	ND
Copper	2.6 - 7.6	NA	NA	16.2	ND - 121	ND	NA	ND - 10.7	ND
Lead	ND	NA	NA	1	ND - 17.2	ND	NA	ND - 15.8	ND
Manganese	39.7 - 539	NA	NA	8.5 - 139	ND - 152	21 - 127	NA	ND - 63.8	ND - 21.3
Mercury	0.05 - 0.09	NA	NA	0.1	ND - 0.6	ND	NA	ND	ND
Nickel	ND	NA	NA	13.6	ND	ND	NA	ND	ND
Sodium	6430 - 8920	NA	NA	5170 - 41100	ND - 42200	5980 - 36000	NA	ND - 9540	ND - 6750
Vanadium	ND	NA	NA	16.6	ND	ND	NA	ND	ND
Zinc	ND	NA	NA	7.0 - 7670	ND - 58	ND - 119	NA	ND - 468	ND - 222

NOTES:
 J - Value is estimated.
 JB - Value is estimated below the CRDL, but greater than the IDL.
 NE - Not established.
 NA - Not analyzed.
 ND - Not detected.
 NCWQS - North Carolina Water Quality Standard
 MCL - Maximum Contaminant Level
 (1) - Secondary MCL

**TABLE 4
SUMMARY OF TOTAL METALS IN UPGRAIDENT WELLS
SHALLOW MONITORING WELLS
MCB, CAMP LEJEUNE, NORTH CAROLINA**

Well Number	NCWQS	FEDERAL MCL	Upgradient	Upgradient	Upgradient	Upgradient	Upgradient	Upgradient	Upgradient	Upgradient	Upgradient	Upgradient	Upgradient	Upgradient
			of Site 1	of Site 2	of Site 6	of Site 7	of Site 9	of Sites 21 and 78	of Site 24	of Site 28	of Site 30	of Site 41	of Site 43	of Site 44
Units	ug/L	ug/L	1GW06	2GW09	6BP6S	7GW03	9GW4S	78GW26	24GW07	28GW04	41GW05			
Arsenic	50	50	17.8 J	12.9	ND	ND	ND	ND	3.7 J	7.4 J	13.1			
Barium	2000	2000	548	328	257	428	71.3	ND	ND	576	55.7			
Beryllium	NE	4	3.2 J	3	ND	ND	ND	ND	ND	9.3 J	1.6			
Cadmium	5	5	ND	ND	ND	ND	ND	not reported	ND	3.3 J	10			
Chromium	50	100	193	75	198	124	ND	13	37	122	54.4			
Copper	1000	1300	64.8	25	35.6	36.4	ND	ND	ND	20.7 J	27			
Lead	15	15	78.8 J	27.2	64.4	30.3 J	ND	9	11.4	22.4 J	23.7			
Manganese	50	50 (1)	202	747	84.5	56.9 J	ND	ND	39	206	203			
Mercury	1.1	2	1.6 J	ND	ND	0.36	ND	ND	ND	ND	0.16			
Nickel	100	100	51.6	ND	ND	ND	ND	ND	ND	59.8	38			
Vanadium	NE	NE	214	86	209	152	ND	149	64	83.3	38.1			
Zinc	2100	5000 (1)	ND	103	56.6	86.4 J	ND	68.1	41	ND	173			

No Upgradient Well Sites

No Upgradient Well Sites

No Upgradient Well Sites

Well Number	Upgradient	Upgradient	Upgradient	Upgradient	Upgradient	Upgradient	Upgradient	Upgradient	Upgradient
	of Site 48	of Site 63	of Site 65	of Site 69	of Site 78	of Site 82	of ABC Cleaners	of Offsite Property #1	of Offsite Property #2
Units	48GW1			69GW07	9GW04	6MW3S	MW-S01		
	ug/L			ug/L	ug/L	ug/L	ug/L		
Arsenic	ND			2.9	ND	ND	ND		
Barium	29.4 J			46.3	ND	ND	35		
Beryllium	ND			1.3	ND	ND	NA		
Cadmium	2.5 J			2.4	ND	ND	NA		
Chromium	ND			15.8	ND	ND	ND		
Copper	ND			16.2	ND	ND	ND		
Lead	ND			7.8	ND	ND	3		
Manganese	70.6			13	ND	ND	10		
Mercury	ND			0.1	ND	ND	NA		
Nickel	ND			13.6	ND	ND	ND		
Vanadium	3.4 J			17.3	ND	ND	9		
Zinc	ND			36.2	ND	ND	23		

No Upgradient Well Sites

No Upgradient Well Sites

No Upgradient Well Sites

No Upgradient Well Sites

NOTES:
 J - Value is estimated.
 JB - Value is estimated below the CRDL, but greater than the IDL.
 NE - Not established.
 NA - Not analyzed.
 ND - Not detected.
 NCWQS - North Carolina Water Quality Standard
 MCL - Maximum Contaminant Level
 (1) - Secondary MCL

**TABLE 5
COMPARISON OF INORGANIC SUBSURFACE SOIL CONCENTRATIONS IN "CLEAN" AND "CONTAMINATED" WELLS
MCB, CAMP LEJEUNE, NORTH CAROLINA**

Units Well Number Soil Sample Number	Camp Lejeune Background Subsurface Soil Data mg/kg	Site 1		Site 2		Site 6		Site 7		Site 9		Site 21	
		"Clean" mg/kg	"Contaminated" mg/kg	"Clean" mg/kg	"Contaminated" mg/kg	"Clean" mg/kg	"Contaminated" mg/kg	"Clean" mg/kg	"Contaminated" mg/kg	"Clean" mg/kg	"Contaminated" mg/kg	"Clean" mg/kg	"Contaminated" mg/kg
		--	--	2GW07	2GW09	6GW18	6GW15	7GW03	7GW02	9GW5	9GW1	21GW03	21GW02
		--	--	2-GW07-01	2-GW09-02	6-GW18-0303	6-GW15-03	GW03-002	GW02-7595	9-GW5-03	9-SB35-03	21-GW03	21-GW02
Arsenic	0.03 - 0.47	NA	NA	1.7 J	ND	ND	ND	1.5	ND	ND	ND	ND	0.55 J
Barium	2 - 11	NA	NA	12.5 J	ND	ND	ND	6.6	71	ND	ND	ND	4.4 J
Beryllium	0.03 - 0.23	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cadmium	0.17 - 1.2	NA	NA	ND	ND	ND	ND	1.3	4.5	ND	ND	ND	ND
Chromium	2 - 9	NA	NA	10.9 J	4.6	ND	1.6	5.2	5	ND	2.6 J	15.2	3.2 J
Copper	0.47 - 2	NA	NA	0.97 J	ND	ND	ND	ND	ND	ND	ND	ND	ND
Lead	1 - 12	NA	NA	8 J	4.3	3.3 J	2.2	2.5	34.4	1.6	1.3	7.1	6.9 J
Manganese	0.40 - 8	NA	NA	4.3 J	4.1	ND	1.8 B	3	11.3	ND	3.7 J	2.4	3.4 J
Mercury	0.01 - 0.11	NA	NA	0.3 J	ND	ND	ND	10.13	0.48	ND	ND	ND	ND
Nickel	0.70 - 3.0	NA	NA	ND	ND	ND	ND	3.4	11.8	ND	ND	ND	ND
Vanadium	0.75 - 13	NA	NA	13.8 J	ND	ND	2.9 B	5.5	4.5	ND	ND	15.5	4.4 J
Zinc	0.40 - 12	NA	NA	ND	ND	ND	ND	1.3	ND	ND	6.1 J	5.7	3 J

NOTES:
 Shaded area indicates inorganic which exceeded a MCL and/or NCWQS in groundwater sample.
 J - Value is estimated.
 JB - Value is estimated below the CRDL, but greater than the IDL.
 NA - No available wells to compare OR compound was not analyzed.
 ND - Not detected.
 NCWQS - North Carolina Water Quality Standard
 MCL - Maximum Contaminant Level
 (1) - Secondary MCL

**TABLE 5
COMPARISON OF INORGANIC SUBSURFACE SOIL CONCENTRATIONS IN "CLEAN" AND "CONTAMINATED" WELLS
MCB, CAMP LEJEUNE, NORTH CAROLINA**

Units Well Number Soil Sample Number	Site 24		Site 28		Site 30		Site 41		Site 43		Site 44	
	"Clean" mg/kg	"Contaminated" mg/kg	"Clean" mg/kg	"Contaminated" mg/kg	"Clean" mg/kg	"Contaminated" mg/kg	"Clean" mg/kg	"Contaminated" mg/kg	"Clean" mg/kg	"Contaminated" mg/kg	"Clean" mg/kg	"Contaminated" mg/kg
	24GW10	24GW02	--	--	--	--	41GW04	41-GW11	43GW01	43GW02	44GW02	44GW01
	24-GW10	24-BDA-SB09	--	--	--	--	41-GW04-DW	41-GW11-01	43-GW01-00	43-GW02-00	44-GW02-035	--
Arsenic	ND	ND	NA	NA	NA	NA	0.51	1.6	ND	ND	ND	1.7
Barium	ND	ND	NA	NA	NA	NA	9.4	22.6	ND	ND	ND	17.9
Beryllium	ND	ND	NA	NA	NA	NA	0.18	0.18	ND	ND	ND	ND
Cadmium	ND	ND	NA	NA	NA	NA	0.73	0.73	8.3	ND	ND	ND
Chromium	11.2	9.3	NA	NA	NA	NA	3.6	11.2	8.3	6.7	16.4	10.1
Copper	ND	ND	NA	NA	NA	NA	3.7	22.5	3.4	ND	6.2 J	25.4 J
Lead	4.6 J	6.2 J	NA	NA	NA	NA	4.8	110	9.8	6.1	5.5	10.7
Manganese	4.7	8.4 J	NA	NA	NA	NA	3.7	75.9	31.2	8.2	3.5	20.4
Mercury	ND	ND	NA	NA	NA	NA	0.06	0.31	ND	ND	ND	ND
Nickel	ND	ND	NA	NA	NA	NA	6.6	6.6	7.6	7.3	3.1	3.4
Vanadium	18.4	10	NA	NA	NA	NA	6.8	9.3	7.2	5.8	5	14.7
Zinc	ND	7.8	NA	NA	NA	NA	7.7	130	20.1	3	3.2	34.9

NOTES:
 Shaded area indicates inorganic which exceeded a MCL and/or NCWQS in groundwater sample.
 J - Value is estimated.
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 NA - No available wells to compare OR compound was not analyzed.
 ND - Not detected.
 NCWQS - North Carolina Water Quality Standard
 MCL - Maximum Contaminant Level
 (1) - Secondary MCL

**TABLE 5
COMPARISON OF INORGANIC SUBSURFACE SOIL CONCENTRATIONS IN "CLEAN" AND "CONTAMINATED" WELLS
MCB, CAMP LEJEUNE, NORTH CAROLINA**

Units Well Number Soil Sample Number	Site 48		Site 63		Site 65		Site 69		Site 78		Site 82	
	"Clean" mg/kg	"Contaminated" mg/kg	"Clean" mg/kg	"Contaminated" mg/kg	"Clean" mg/kg	"Contaminated" mg/kg	"Clean" mg/kg	"Contaminated" mg/kg	"Clean" mg/kg	"Contaminated" mg/kg	"Clean" mg/kg	"Contaminated" mg/kg
	48-GW01	48-GW03	63MW03	63MW02	65MW03	65MW02	69-GW11	69-GW03	78GW34	78GW24-1	6-GW28	82MW3
	48-GW1A-01	48-C3-03	63-MW03-04	63-MW02-06	65-MW03-11	65-MW02-06	69-GW11-04	69-CSA-SB23-00	78-GW34	78-B903-SB03	6-GW28-09	6-GW27D-06
Arsenic	1.3	0.77 J	ND	ND	ND	1.3	0.68	0.63	ND	ND	0.31	15.9
Barium	21.1	15	ND	ND	3.4	6.8	5.6	3	ND	ND	ND	ND
Beryllium	0.2	0.19	ND	ND	ND	ND	0.3	0.28	ND	ND	ND	ND
Cadmium	1.4	1.8 J	ND	ND	NA	NA	0.56	0.52	ND	ND	ND	ND
Chromium	18.2	18.6	7.7	ND	3.9	2.7	6.8	1.7	18.5	7.7	2.6	1
Copper	3.5	3.8	ND	ND	1.5	3.1	3.8	3.5	3.4 B	ND	ND	ND
Lead	32.3	14.3	4.2	2.6	1.7	2.7	4.3	1.1	4.5 J	2.6 J	2.7	4.3
Manganese	41.1	7	4.9	14.8	3.5	6.9	4	1.2	9.2	ND	ND	ND
Mercury	ND	ND	ND	ND	NA	NA	0.06	0.05	ND	ND	ND	ND
Nickel	2.2	1.9 J	ND	ND	ND	ND	3.2	3	ND	ND	ND	ND
Vanadium	28.3	20.8 J	ND	ND	4.4	3	4.4	3.6	18.7	19.2	ND	ND
Zinc	ND	ND	ND	ND	2.7	5	3.2	1.5	7.9	ND	ND	ND

NOTES:
 Shaded area indicates inorganic which exceeded a MCL and/or NCWQS in groundwater sample.
 J - Value is estimated.
 JB - Value is estimated below the CRDL, but greater than the IDL.
 NA - No available wells to compare OR compound was not analyzed.
 ND - Not detected.
 NCWQS - North Carolina Water Quality Standard
 MCL - Maximum Contaminant Level
 (1) - Secondary MCL

TABLE 5
COMPARISON OF INORGANIC SUBSURFACE SOIL CONCENTRATIONS IN "CLEAN" AND "CONTAMINATED" WELLS
MCB, CAMP LEJEUNE, NORTH CAROLINA

	ABC Cleaners		Offsite Property #1		Offsite Property #2	
	"Clean"	"Contaminated"	"Clean"	"Contaminated"	"Clean"	"Contaminated"
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Units	--	--	--	--	--	--
Well Number	--	--	--	--	--	--
Soil Sample Number	--	--	--	--	--	--
Arsenic	NA	NA	NA	NA	NA	NA
Barium	NA	NA	NA	NA	NA	NA
Beryllium	NA	NA	NA	NA	NA	NA
Cadmium	NA	NA	NA	NA	NA	NA
Chromium	NA	NA	NA	NA	NA	NA
Copper	NA	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA	NA
Manganese	NA	NA	NA	NA	NA	NA
Mercury	NA	NA	NA	NA	NA	NA
Nickel	NA	NA	NA	NA	NA	NA
Vanadium	NA	NA	NA	NA	NA	NA
Zinc	NA	NA	NA	NA	NA	NA

NOTES:
 Shaded area indicates inorganic which exceeded a MCL and/or NCWQS in groundwater sample.
 J - Value is estimated.
 JB - Value is estimated below the CRDL, but greater than the IDL.
 NA - No available wells to compare OR compound was not analyzed.
 ND - Not detected.
 NCWQS - North Carolina Water Quality Standard
 MCL - Maximum Contaminant Level
 (1) - Secondary MCL

**TABLE 6
TOTAL METALS BY SITE
DEEP MONITORING WELLS
MCB, CAMP LEJEUNE, NORTH CAROLINA**

	Site 1	Site 2	Site 6	Site 7	Site 9	Site 21	Site 24	Site 26	Site 30	Site 41	Site 43	Site 44	Site 48	Site 63	Site 65	Site 69	Site 78	Site 82	ABC Cleaners	Base Supply Wells (1)
Arsenic		ND	ND		ND					2.2 - 9.6						2.2 - 3.5	2 - 118 J	ND	ND - 14	ND
Barium		1420	ND		ND					22.6 - 186						42.3 - 58.0	ND - 547	ND	4 - 36	ND
Beryllium		ND	ND		ND					3.2						0.80 - 0.89	ND	ND	NA	NA
Cadmium	No Deep Wells	ND	ND	No Deep Wells	ND	No Deep Wells	No Deep Wells	No Deep Wells	No Deep Wells	4.2 - 4.7	No Deep Wells	No Deep Wells	No Deep Wells	No Deep Wells	No Deep Wells	3.2	ND - 21	ND	NA	ND
Chromium		16	ND		ND					9.6 - 40.5						8.3 - 20.7	ND - 10	ND	ND - 32	ND
Copper		ND	ND		ND					23.9						16.3	ND	ND	ND - 41	ND - 130
Lead		ND	ND		ND					1.0 - 11.1						3.1 - 6.8	ND	ND	ND - 10	ND - 16
Manganese		ND	ND - 33.5		ND					16.9 - 101						53.7 - 114	ND - 591	ND - 21.6	ND - 45	10 - 120
Mercury		ND	ND		ND					0.15 - 0.17						0.16 - 0.17	ND - 0.3	ND	NA	ND
Nickel		ND	ND		ND					31.2						28.8	ND	ND	ND - 14	NA
Vanadium		ND	ND		ND					20.4 - 49.8						20.4	ND - 24 J	ND	ND - 15	NA
Zinc		ND	ND		ND					17.8 - 83.8						31.1 - 48.7	ND - 181 J	ND	58 - 390	ND - 120

NOTES:

J - Value is estimated.

NA - Not analyzed.

ND - Not detected.

(1) - Range is based on 67 supply wells located throughout MCB, Camp Lejeune, NC.

**TABLE 7
SUMMARY OF FIELD PARAMETERS IN
SHALLOW, DEEP, AND SUPPLY WELLS
MCB, CAMP LEJEUNE, NORTH CAROLINA**

	Shallow Wells		Deep Wells		Supply Wells	
	Range (1)	Average Maximum	Range (2)	Average Maximum	Range (3)	Average Maximum
pH (standard units)	4.5 - 7.28	6.08	7.52 - 11.34	8.88	6.91 - 7.45	7.32
Specific Conductivity (micromhos/cm)	40 - 580	267	149 - 525	350	212 - 511	353

- (1) - Based on data from 11 sites.
- (2) - Based on data from 6 sites.
- (3) - Based on data from 9 supply wells.

Figures

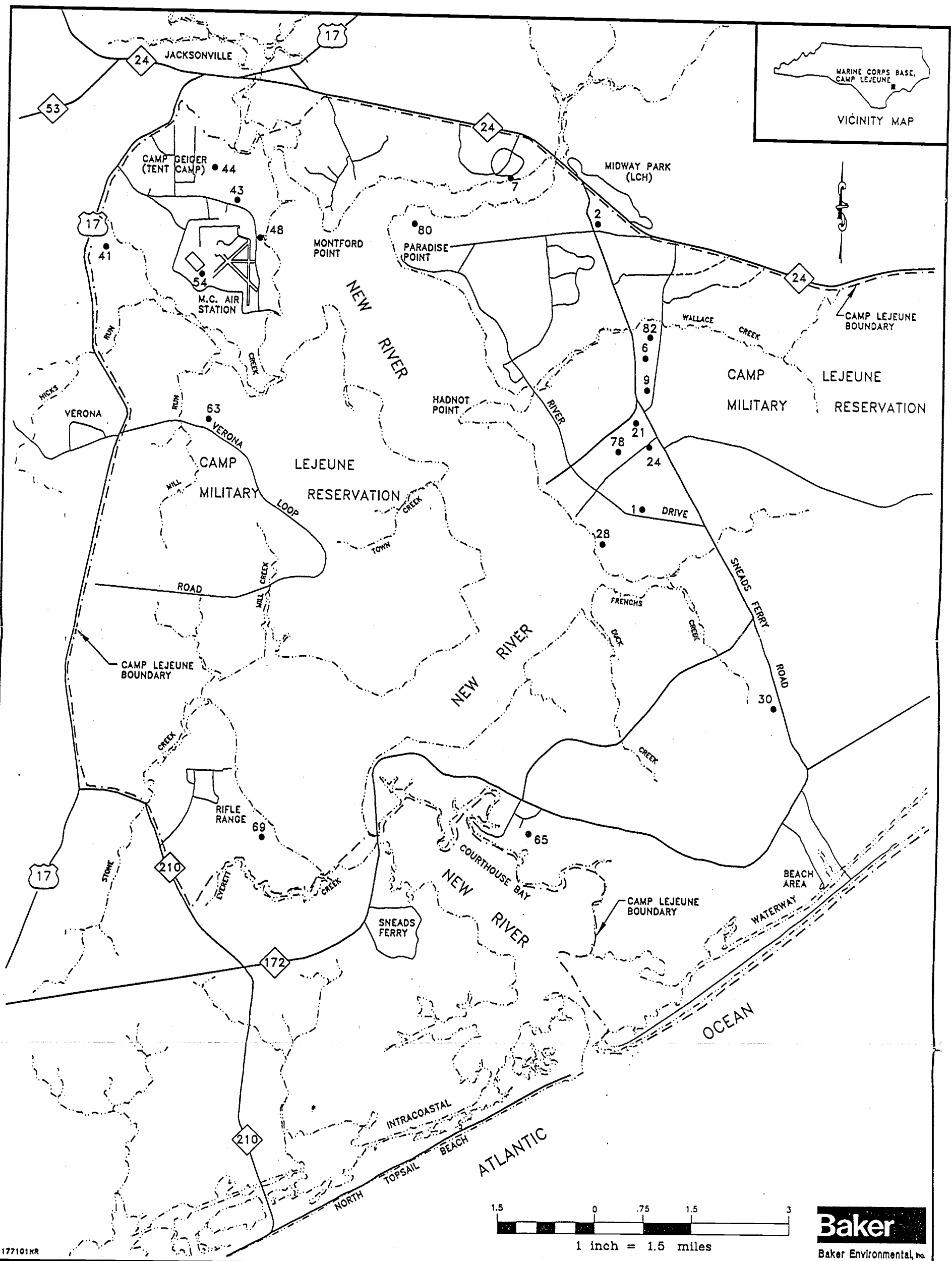
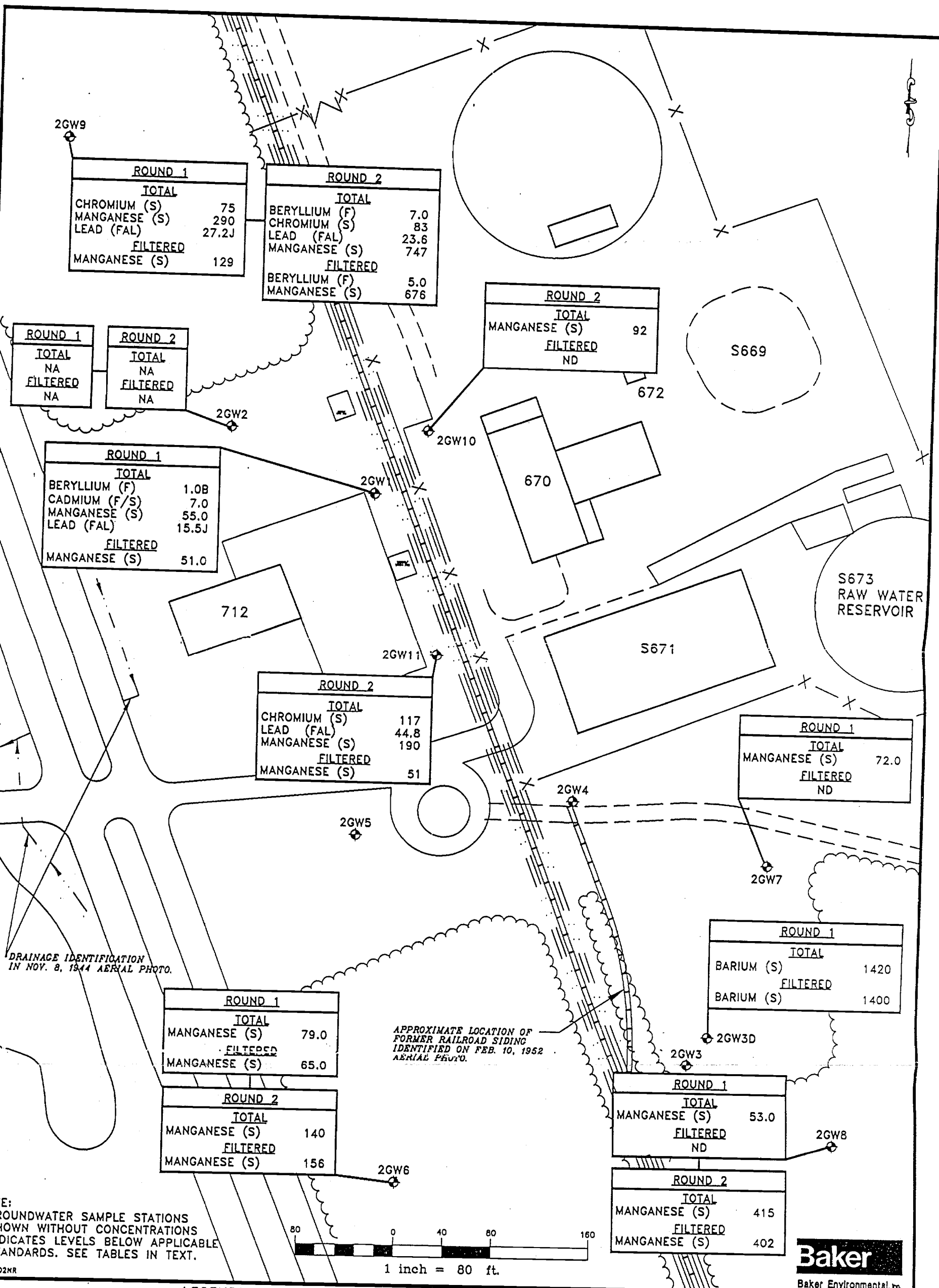


FIGURE 1
 SITE LOCATION MAP
 INORGANIC GROUNDWATER STUDY

MARINE CORPS BASE, CAMP LEJEUNE
 NORTH CAROLINA

016960012



LEGEND

2GW1 GROUNDWATER WELL

(F) EXCEEDS FEDERAL STANDARD

(S) EXCEEDS STATE STANDARD

(FAL) FEDERAL ACTION LEVEL

ND NOT DETECTED ABOVE APPLICABLE STANDARDS

NA NOT ANALYZED

J ESTIMATED CONCENTRATIONS

CONCENTRATIONS EXPRESSED IN ug/l(ppb)

SOURCE: LANTDIV, FEB. 1992

FIGURE 2
POSITIVE DETECTIONS ABOVE APPLICABLE FEDERAL AND STATE STANDARDS FOR TOTAL AND FILTERED INORGANIC ANALYTES IN GROUNDWATER
SITE 2
REMEDIAL INVESTIGATION CTO-0174
MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA

01696002Z

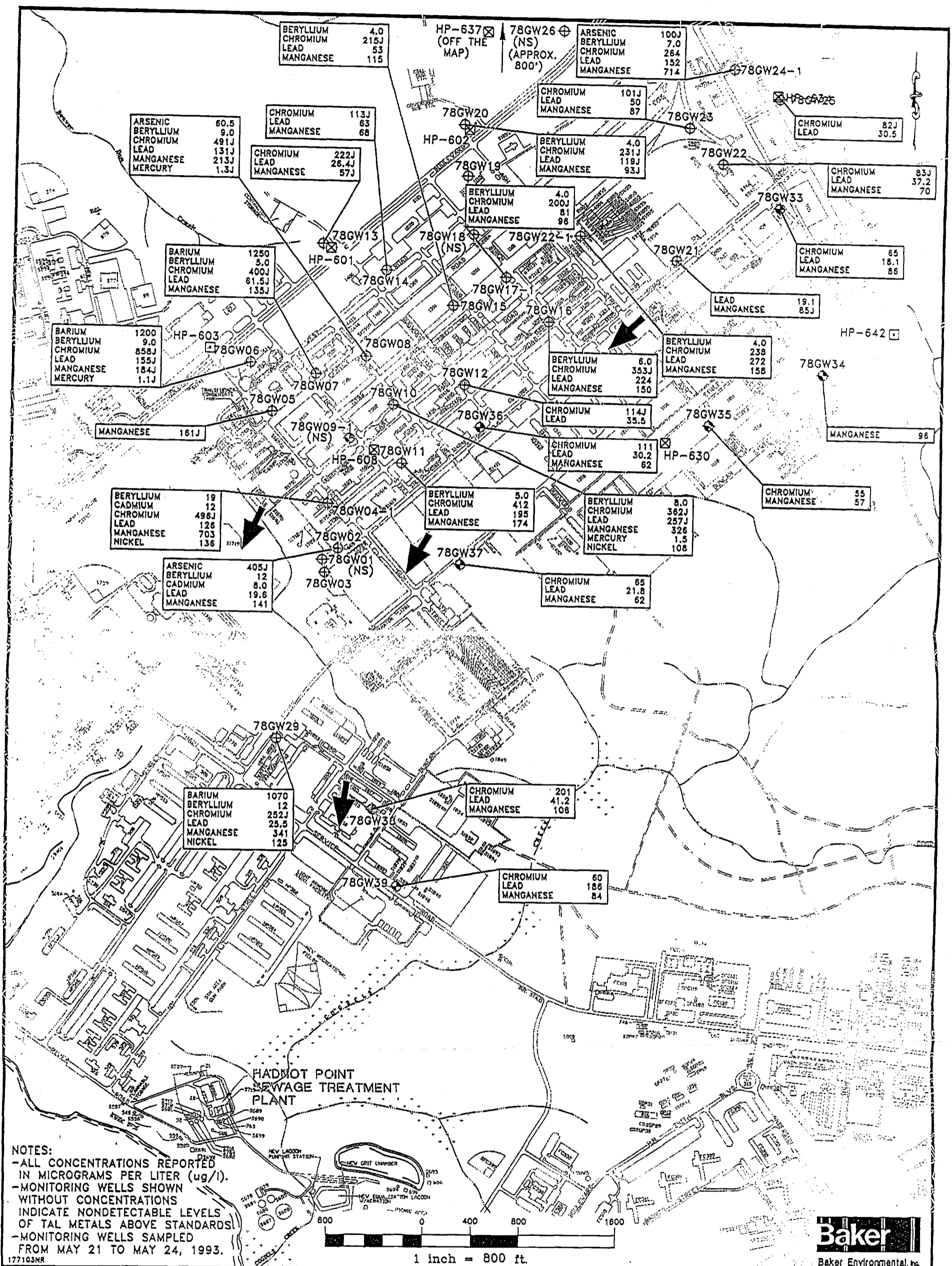
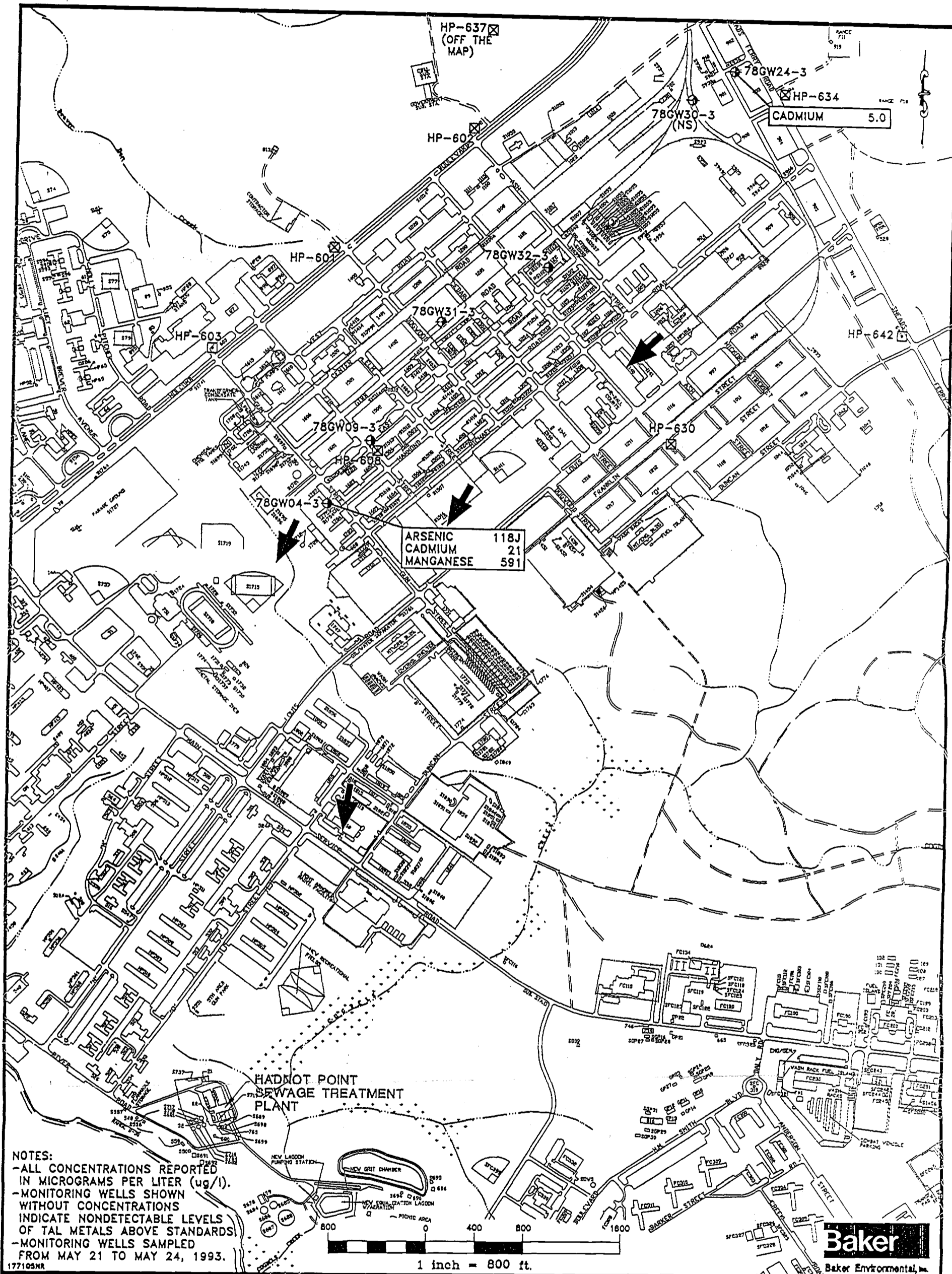


FIGURE 3
 POSITIVE DETECTIONS OF TAL METALS ABOVE FEDERAL MCLs AND/OR NCWQS IN SHALLOW WELLS
 SITE 78
 REMEDIAL INVESTIGATION CTO-0177
 MARINE CORPS BASE, CAMP LEJEUNE
 NORTH CAROLINA

01696003Z



NOTES:
 -ALL CONCENTRATIONS REPORTED IN MICROGRAMS PER LITER (ug/l).
 -MONITORING WELLS SHOWN WITHOUT CONCENTRATIONS INDICATE NONDETECTABLE LEVELS OF TAL METALS ABOVE STANDARDS.
 -MONITORING WELLS SAMPLED FROM MAY 21 TO MAY 24, 1993.
 177105NR

LEGEND

- 78GW04-3 EXISTING DEEP MONITORING WELL INSTALLED BY ESE, 1991
- ➔ APPROXIMATE DIRECTION OF GROUNDWATER FLOW
- (NS) NOT SAMPLED FOR TAL METALS
- HP-603 WATER SUPPLY WELL (ACTIVE)-NOT SAMPLED
- HP-601 WATER SUPPLY WELL (INACTIVE)-NOT SAMPLED

SOURCE: LANTDIV, FEBRUARY 1992

FIGURE 4
 POSITIVE DETECTIONS OF TAL METALS ABOVE FEDERAL MCLs AND/OR NCWQS IN DEEP WELLS
 SITE 78
 REMEDIAL INVESTIGATION CTO-0177
 MARINE CORPS BASE, CAMP LEJEUNE
 NORTH CAROLINA

01696Q04Z

Appendix A
Data Summary Tables
for Sites 2 and 78

OPERABLE UNIT NO. 1 - SITES 21, 24, 78
 SHALLOW, INTERMEDIATE AND DEEP MONITORING WELLS
 GROUNDWATER DATA AND FREQUENCY SUMMARY
 REMEDIAL INVESTIGATION CTO - 19177
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TAL METALS AND CYANIDE

	MINIMUM NONDETECTED UG/L	MAXIMUM NONDETECTED UG/L	MINIMUM DETECTED UG/L	MAXIMUM DETECTED UG/L	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
ALUMINUM	NA	NA	68 J	542000 J	78-GW06-01	59 / 59
ANTIMONY	3 U	20 U	3.3 B	169 J	78-GW02-01	7 / 33
ARSENIC	2 U	10 U	2.3 J	405 J	78-GW02-01	44 / 48
BARIUM	NA	NA	17 B	1250	78-GW07-01	59 / 59
BERYLLIUM	1 U	4 U	1 B	19	24-GW02-01	52 / 59
CADMIUM	5 U	25 U	5	21	78-GW04-3-01	9 / 59
CALCIUM	NA	NA	2420 B	642000	78-GW04-1-01	59 / 59
CHROMIUM	10 U	50 U	10	858 J	78-GW06-01	46 / 59
COBALT	8 U	8 U	8 B	170	78-GW22-2-01	25 / 59
COPPER	2 U	2 U	3 B	699	78-GW39-01	58 / 59
IRON	NA	NA	32 B	523000	78-GW04-3-01	59 / 59
LEAD	1.8 U	4.9 U	2.9 B	2000 J	21-GW0B-01	50 / 59
MAGNESIUM	NA	NA	88 B	37100	24-GW03-01	59 / 59
MANGANESE	2 U	2 U	2 B	714	78-GW24-1-01	57 / 59
MERCURY	0.2 U	0.2 U	0.23 J	3.2	24-GW06-01	24 / 52
NICKEL	20 U	20 U	20 B	234	78-GW22-2-01	31 / 59
POTASSIUM	NA	NA	982 B	67300	78-GW32-3-01	59 / 59
SELENIUM	1 U	5 U	1.1 J	99.5 J	78-GW32-2-01	41 / 54
SILVER	3 U	15 U	5 J	5 J	78-GW09-3-01	1 / 59
SODIUM	NA	NA	2450 B	42500	78-GW32-3-01	59 / 59
THALLIUM	1 U	1 U	1 B	7.3 J	78-GW32-2-01	16 / 59
VANADIUM	4 U	4 U	4 J	1700	78-GW08-01	55 / 59
ZINC	6 U	6 U	6 J	967 J	78-GW22-2-01	57 / 59
CYANIDE	10 U	10 U	ND	ND	ND	0 / 54

OPERABLE UNIT NO. 1 - SITES 21, 24, 78
 SHALLOW, INTERMEDIATE AND DEEP MONITORING WELLS
 GROUNDWATER DATA AND FREQUENCY SUMMARY
 REMEDIAL INVESTIGATION CTO - 19177
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TAL METALS AND CYANIDE

SAMPLE NO.	21-GW01-01	21-GW02-01	21-GW03-01	21-GW04-01	21-GW0A-01	21-GW0B-01
UNITS	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
ALUMINUM	4910 J	319000 J	4820 J	20100 J	16900 J	118000 J
ANTIMONY	7 UJ	7 U	7 U	7 U	7 R	7 U
ARSENIC	15	10	2 U	11.8	45.2 J	30.4
BARIUM	32 B	647	51 B	119 B	100 B	386
BERYLLIUM	1 B	5	1 B	1 B	1 B	6
CADMIUM	5 U	10 U	5 U	5 U	5 U	10 U
CALCIUM	63000 J	24100 J	6130 J	21700 J	23800	6250 J
CHROMIUM	10 UJ	348 J	10 UJ	33 J	21 J	192 J
COBALT	8 U	18 B	8 U	10 B	8 U	36 B
COPPER	4 B	79	7 B	28	24 B	38
IRON	9920 J	122000 J	13400 J	24900 J	38900 J	72900 J
LEAD	1.8 UJ	214 J	4.9 UJ	33 J	29	2000 J
MAGNESIUM	5070	15400	4550 B	5490	4850 B	11600
MANGANESE	64 J	179 J	134 J	193 J	59	276 J
MERCURY	0.2 R	2.4 J	0.2 R	0.2 R	0.2 U	0.2 R
NICKEL	20 U	86	20 U	20 U	20 U	60
POTASSIUM	2390 B	10500	2240 B	3800 B	2360 B	9520
SELENIUM	1 U	11 J	1 U	1 U	1 UJ	3.7 J
SILVER	3 U	3 U	3 U	3 U	3 UJ	3 U
SODIUM	15700	12600	7950	14400	12600	14400
THALLIUM	1 U	1 UJ	1 U	1 UJ	1 UJ	1 U
VANADIUM	30 B	281	11 B	42 B	48 B	243
ZINC	65 J	136 J	27 J	57 J	41 J	175 J
CYANIDE	10 U	10 U	10 U	10 U	10 U	10 U

OPERABLE UNIT NO. 1 - SITES 21, 24, 78
 SHALLOW, INTERMEDIATE AND DEEP MONITORING WELLS
 GROUNDWATER DATA AND FREQUENCY SUMMARY
 REMEDIAL INVESTIGATION CTO - 19177
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TAL METALS AND CYANIDE

SAMPLE NO.	21-GW0C-01	24-GW01-01	24-GW02-01	24-GW03-01	24-GW04-01	24-GW06-01
	UNITS	UG/L	UG/L	UG/L	UG/L	UG/L
ALUMINUM	209000 J	262000	93700	50200	58900	19800
ANTIMONY	7 U	3 U	3 UJ	3 U	4.6 B	3.5 B
ARSENIC	101	10 UJ	2.3 J	4.7 J	116 J	10.1 J
BARIUM	467	380	1120	480	290	159 B
BERYLLIUM	8	3 B	19	5	2 B	9
CADMIUM	10 U	5 U	12	5 U	5 U	5
CALCIUM	35200 J	4120 B	2420 B	124000	65600	151000
CHROMIUM	291 J	296	316	110	153	78
COBALT	60	8 U	41 B	66	8 U	35 B
COPPER	84	49	52	22 B	31	15 B
IRON	106000 J	58600	395000	16300	70500	69500
LEAD	92.5 J	89	17.9	21.6	23.6	7.4
MAGNESIUM	16300	12200	7240	37100	7690	4320 B
MANGANESE	273 J	117	518	393	66	431
MERCURY	0.23 J	0.23	2.6	0.2 U	0.2 U	3.2
NICKEL	123	38 B	140	85	20 U	93
POTASSIUM	11800	12000	7550	15400	6130	3370 B
SELENIUM	4.3 B	1.3 J	1.1 J	16.2 J	4.3 J	1 UJ
SILVER	3 U	3 UJ	15 UJ	3 UJ	3 UJ	3 UJ
SODIUM	15200	6030	11600	19200	5230	7280
THALLIUM	1 U	1 U	1 U	2.4 B	1 U	1 B
VANADIUM	419	304	408	92	202	83
ZINC	487 J	118	461	650	80	489
CYANIDE	10 U					

OPERABLE UNIT NO. 1 - SITES 21, 24, 78
 SHALLOW, INTERMEDIATE AND DEEP MONITORING WELLS
 GROUNDWATER DATA AND FREQUENCY SUMMARY
 REMEDIAL INVESTIGATION CTO - 19177
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TAL METALS AND CYANIDE

SAMPLE NO.	24-GW07-01	24-GW08-01	24-GW09-01	24-GW10-01	78-GW02-01	78-GW03-01
UNITS	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
ALUMINUM	36000	61100	12800	23300	29200 J	23900 J
ANTIMONY	3 U	3 U	3.3 B	5.7 B	169 J	38.5 J
ARSENIC	3.7 J	8 J	4.3 J	2.5 J	405 J	5.7 J
BARIUM	85 B	112 B	164 B	59 B	109 B	36 B
BERYLLIUM	1 B	2 B	1 B	1 U	12	2 B
CADMIUM	5 U	5 U	5 U	5 U	8	5 U
CALCIUM	4960 B	27000	9530	3820 B	37000	32900
CHROMIUM	37	85	19	21	18 J	10 UJ
COBALT	8 U	8 U	11 B	8 U	8 U	8 U
COPPER	19 B	24 B	11 B	13 B	20 B	8 B
IRON	13700	27500	13100	7010	427000 J	5020 J
LEAD	11.4	23.8	5.1	7.3	19.6	3.4
MAGNESIUM	2670 B	5050	7630	1760 B	3650 B	2210 B
MANGANESE	39	47	180	29	141	27
MERCURY	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
NICKEL	20 U	20 U	20 U	20 U	20 U	20 U
POTASSIUM	3870 B	5580	4280 B	2620 B	2770 B	1320 B
SELENIUM	2.1 J	1.9 J	2.6 J	1 UJ	19.8 J	2.4 J
SILVER	3 UJ	3 UJ	3 UJ	3 UJ	15 UJ	3 UJ
SODIUM	6520	6550	6010	6650	5120	4270 B
THALLIUM	1 U	1 U	1 U	1 U	1 UJ	1 UJ
VANADIUM	64	129	26 B	34 B	1660	50
ZINC	41	47	50	20	58 J	12 J
CYANIDE	10 U	10 U	10 U	10 U	10 U	10 U

OPERABLE UNIT NO. 1 - SITES 21, 24, 78
 SHALLOW, INTERMEDIATE AND DEEP MONITORING WELLS
 GROUNDWATER DATA AND FREQUENCY SUMMARY
 REMEDIAL INVESTIGATION CTO - 19177
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TAL METALS AND CYANIDE

SAMPLE NO.	78-GW04-1-01	78-GW04-2-01	78-GW04-3-01	78-GW05-01	78-GW06-01	78-GW07-01
UNITS	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
ALUMINUM	297000 J	286	115 B	23000 J	542000 J	207000 J
ANTIMONY	7 R	7 R	7 R	7 U	7 U	7 U
ARSENIC	18.6 J	2 R	118 J	5.2 J	26 B	16.2
BARIUM	728	519	547	54 B	1200	1250
BERYLLIUM	19	1 B	1 B	2 B	9	5
CADMIUM	12	5 U	21	5 U	5 U	5 U
CALCIUM	642000	170000	105000	90200 J	7180 J	18700 J
CHROMIUM	496 J	10 U	50 U	17 J	858 J	400 J
COBALT	28 B	8 U	8 U	8 U	11 B	20 B
COPPER	87	4 B	7 B	8 B	127	53
IRON	267000 J	32 B	523000	14900 J	142000 J	96700 J
LEAD	126	2 U	2 U	13.1 J	155 J	61.5 J
MAGNESIUM	25500	88 B	3210 B	12700	24000	20000
MANGANESE	703	51	591	161 J	184 J	135 J
MERCURY	0.75	0.2 U	0.3	0.2 R	1.1 J	0.44 J
NICKEL	136	20 B	20 U	20 U	86	54
POTASSIUM	18800	21800	11300	4770 B	25600	13200
SELENIUM	9 J	1 R	1 R	6.4	5.5 B	9.1
SILVER	6 UJ	3 U	15 U	3 U	3 U	3 U
SODIUM	8870	11500	9290	23900	5090	9260
THALLIUM	1.2 J	1 U	1 U	1 UJ	1.1 B	1 UJ
VANADIUM	591	4 UJ	24 J	28 B	811	406
ZINC	373 J	7 J	79 J	32 J	223 J	158 J
CYANIDE	10 U	10 U	10 U	10 U	10 U	10 U

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 REMEDIAL INVESTIGATION CTO - 19177
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TAL METALS AND CYANIDE

SAMPLE NO.	78-GW08-01	78-GW09-2-01	78-GW09-3-01	78-GW10-01	78-GW11-01	78-GW12-01
UNITS	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
ALUMINUM	483000 J	68 J	2710 J	404000 J	332000	108000 J
ANTIMONY	7 U	7 R	7 R	7 R	7 R	7 R
ARSENIC	60.5	2 R	2 R	43 J	10 R	9.6 J
BARIUM	740	27 B	41 B	582	631	155 B
BERYLLIUM	9	1 U	1 B	8	5	2 B
CADMIUM	25 U	5 U	5 U	10 U	25 U	10 U
CALCIUM	28200 J	114000	99100	54400	9130	31200
CHROMIUM	491 J	10 UJ	10 UJ	362 J	412	114 J
COBALT	29 B	8 U	8 U	31 B	8 U	8 U
COPPER	86	4 B	4 B	91	84	30
IRON	138000 J	955 J	99 J	157000 J	120000	26400 J
LEAD	131 J	2 U	2 U	257	195	35.5
MAGNESIUM	18500	2550 B	249 B	17400	15400	7220
MANGANESE	213 J	19	2 U	326	174	47
MERCURY	1.3 J	0.2 U	0.2 U	1.5	0.75	0.2 U
NICKEL	89	20 U	20 U	108	79	20 U
POTASSIUM	14700	1220 B	7820	15800	13000	6090
SELENIUM	25.3	1 UJ	1 UJ	18 J	12 J	3.6 J
SILVER	3 U	3 UJ	5 J	3 UJ	3 U	3 UJ
SODIUM	4710 B	5820	7280	3340 B	3490 B	5420
THALLIUM	1.3 J	1 UJ	1 UJ	1 UJ	1 U	1 UJ
VANADIUM	1700	4 U	9 B	499	526	145
ZINC	200 J	11 J	181 J	217 J	120 J	64 J
CYANIDE	10 U	10 U	10 U	10 U	10 U	10 U

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 SHALLOW, INTERMEDIATE AND DEEP MONITORING WELLS
 GROUNDWATER DATA AND FREQUENCY SUMMARY
 REMEDIAL INVESTIGATION CTO - 19177
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TAL METALS AND CYANIDE

SAMPLE NO.	78-GW13-01	78-GW14-01	78-GW15-01	78-GW16-01	78-GW17-1-01	78-GW17-2-01
UNITS	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
ALUMINUM	61800 J	103000 J	205000 J	341000 J	168000 J	541 J
ANTIMONY	7 U	7 R	7 R	7 R	7 R	7 R
ARSENIC	38.3	18.4 J	4 R	19 J	11.6 J	2 R
BARIUM	236	321	469	511	261	57 B
BERYLLIUM	3 B	1 B	4 B	6	4 B	1 B
CADMIUM	5 U	10 U	5 U	5 U	10 U	5 U
CALCIUM	4040 J	5300	29100	62700	86900	144000
CHROMIUM	222 J	113 J	215 J	353 J	200 J	10 UJ
COBALT	20 B	8 U	9 B	13 B	9 B	8 U
COPPER	18 B	33	49	80	40	5 B
IRON	61800 J	49600 J	43300 J	80900 J	48700 J	2120 J
LEAD	26.4 J	63	53	224	81	5.9
MAGNESIUM	11800	10600	13400	10800	9940	2570 B
MANGANESE	57 J	68	115	150	96	33
MERCURY	0.3 J	0.38	0.2 U	0.38	0.2 U	0.2 U
NICKEL	40	34 B	29 B	61	30 B	20 U
POTASSIUM	8210	6460	12000	14000	11600	1630 B
SELENIUM	4.7 B	12.4 J	2.1 J	14.5 J	5 UJ	1 UJ
SILVER	3 U	3 UJ	3 UJ	3 UJ	3 UJ	3 UJ
SODIUM	15000	15400	6410	4120 B	3180 B	9480
THALLIUM	1 U	1 UJ	1 J	1.4 J	1 J	1 UJ
VANADIUM	158	122	248	371	289	4 U
ZINC	96 J	51 J	116 J	157 J	98 J	6 UJ
CYANIDE	10 U	10 U	10 U	10 U	10 U	10 U

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 REMEDIAL INVESTIGATION CTO - 19177
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TAL METALS AND CYANIDE

SAMPLE NO.	78-GW19-01	78-GW20-01	78-GW21-01	78-GW22-01	78-GW22-1-01	78-GW22-2-01
UNITS	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
ALUMINUM	4110 J	149000 J	23800 J	78900 J	257000	190000 J
ANTIMONY	7 R	7 U	7 U	14 J	7 R	7 UJ
ARSENIC	3.1 J	30.3	6.3 J	10 J	59.5 J	75.6
BARIUM	101 B	430	382	107 B	411	471
BERYLLIUM	1 B	4 B	2 B	1 B	4 B	12
CADMIUM	5 U	5 U	5 U	10 U	25 U	6
CALCIUM	3700 B	5450 J	32900 J	90100	44500	118000 J
CHROMIUM	10 UJ	231 J	22 J	83 J	238	389 J
COBALT	8 U	35 B	10 B	8 U	8 U	170
COPPER	3 B	61	11 B	34	54	92
IRON	8500 J	101000 J	26400 J	27600 J	62300	140000 J
LEAD	8.3	119 J	19.1 J	37.2	272	360 J
MAGNESIUM	5740	13100	9110	5500	12000	13000
MANGANESE	26	93 J	85 J	70	158	348 J
MERCURY	0.2 U	0.37 J	0.2 R	0.3	0.45	0.2 R
NICKEL	20 U	75	20 U	21 B	99	234
POTASSIUM	2130 B	9100	4100 B	6180	12000	10200
SELENIUM	1 UJ	4.2 B	1.1 B	4.2 J	7.5 J	45
SILVER	3 UJ	3 U	3 U	3 UJ	3 U	3 U
SODIUM	24000	11900	9480	12100	9910	8230
THALLIUM	1 UJ	1.8 B	1 U	1.7 J	1 U	3 B
VANADIUM	9 B	236	86	114	269	547
ZINC	6 J	250 J	108 J	50 J	150 J	967 J
CYANIDE	10 U	10 U	10 U	10 U	10 U	10 U

OPERABLE UNIT N. SITES 21, 24, 78
 SHALLOW, INTERMEDIATE AND DEEP MONITORING WELLS
 GROUNDWATER DATA AND FREQUENCY SUMMARY
 REMEDIAL INVESTIGATION CTO - 19177
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TAL METALS AND CYANIDE

SAMPLE NO.	78-GW23-01	78-GW24-1-01	78-GW24-2-01	78-GW24-3-01	78-GW25-01	78-GW29-01
UNITS	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
ALUMINUM	111000 J	160000	1340	304	101000 J	78800 J
ANTIMONY	7 R	7 R	7 R	7 R	7 R	7 R
ARSENIC	7.6 J	100 J	2 R	2 R	11.4 J	19 J
BARIUM	230	396	34 B	17 B	119 B	1070
BERYLLIUM	2 B	7	1 B	1 U	2 B	12
CADMIUM	5 U	5 U	5	5	5 U	5 U
CALCIUM	10800	34400	107000	73400	37800	41600
CHROMIUM	101 J	264	10	10 U	82 J	252 J
COBALT	8 B	39 B	8 U	8 U	8 U	17 B
COPPER	25	71	6 B	5 B	26	34
IRON	30800 J	159000	2320	2370	26300 J	125000 J
LEAD	50	152	3.3	2.9 B	30.5	25.5
MAGNESIUM	7110	11600	1740 B	1500 B	4500 B	21900
MANGANESE	87	714	21	41	33	341
MERCURY	0.3	0.75	0.2 U	0.2 U	0.2 U	0.2 U
NICKEL	42	91	20 U	20 U	20 U	125
POTASSIUM	5450	9090	1050 B	982 B	4950 B	11600
SELENIUM	4.4 J	17.6 J	1 R	1 R	1.6 J	2.5 J
SILVER	3 UJ	3 U	3 U	3 U	3 UJ	3 UJ
SODIUM	7450	10800	8350	7050	16400	21200
THALLIUM	1.7 J	1.5 B	1 U	1 U	1.3 J	1 UJ
VANADIUM	108	436	4 J	4 UJ	144	183
ZINC	67 J	291 J	11 J	16 J	34 J	330 J
CYANIDE	10 U	10 U	10 U	10 U	10 U	10 U

OPERABLE UNIT NO. 1 - SITES 21, 24, 78
SHALLOW, INTERMEDIATE AND DEEP MONITORING WELLS
GROUNDWATER DATA AND FREQUENCY SUMMARY
REMEDIAL INVESTIGATION CTO - 19177
MCB CAMP LEJEUNE, NORTH CAROLINA
TAL METALS AND CYANIDE

SAMPLE NO.	78-GW31-2-01	78-GW31-3-01	78-GW32-2-01	78-GW32-3-01	78-GW33-01	78-GW34-01
UNITS	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
ALUMINUM	110 B	1200	112000 J	539 J	78200	6870
ANTIMONY	7 R	7 R	7 R	7 R	3 U	3 U
ARSENIC	2 R	2 R	21.6 J	2 R	5.6 J	4.4 J
BARIUM	17 B	415	476	42 B	162 B	173 B
BERYLLIUM	1 B	1 B	10	1 B	1 B	1 U
CADMIUM	5 U	5 U	10	5 U	5 U	5 U
CALCIUM	77600	308000	94600	5440	64800	10400
CHROMIUM	10 U	21	215 J	10 UJ	65	10 U
COBALT	8 U	8 U	84	8 U	8 U	8 U
COPPER	3 B	5 B	87	2 U	20 B	11 B
IRON	280	72 B	98500 J	112 J	14900	7250
LEAD	2 U	2 U	146	2 U	18.1	5.5
MAGNESIUM	2200 B	151 B	13700	319 B	7290	2880 B
MANGANESE	8 B	2 B	328	2 U	86	96
MERCURY	0.3	0.2 U	0.3	0.2 U	0.2 U	0.2 U
NICKEL	20 U	20 U	166	20 U	20 B	20 U
POTASSIUM	1640 B	61600	8460	67300	6900	2620 B
SELENIUM	1 R	1.7 J	99.5 J	1 UJ	12.8 J	1 UJ
SILVER	3 U	3 U	3 UJ	3 UJ	3 UJ	3 UJ
SODIUM	10400	26100	7510	42500	7030	4070 B
THALLIUM	1 U	1 UJ	7.3 J	1.3 J	1 U	1 U
VANADIUM	4 J	10 J	462	5 B	74	15 B
ZINC	23 J	10 J	826 J	6 UJ	37	59
CYANIDE	10 U	10 U	10 U	10 U	10 U	10 U

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 SHALLOW, INTERMEDIATE AND DEEP MONITORING WELLS
 GROUNDWATER DATA AND FREQUENCY SUMMARY
 REMEDIAL INVESTIGATION CTO - 19177
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TAL METALS AND CYANIDE

SAMPLE NO.	78-GW35-01	78-GW36-01	78-GW37-01	78-GW38-01	78-GW39-01
UNITS	UG/L	UG/L	UG/L	UG/L	UG/L
ALUMINUM	47100	120000	73500	102000	60000
ANTIMONY	3 U	20 U	3 U	20 U	20 U
ARSENIC	2 UJ	3.1 J	4 J	33.6 J	4 UJ
BARIUM	261	152 B	123 B	420	256
BERYLLIUM	1 B	2 U	2 B	4 U	1 U
CADMIUM	5 U	5 U	5 U	25 U	5 U
CALCIUM	7480	35400	10100	62200	16800
CHROMIUM	55	111	65	201	60
COBALT	8 U	8 U	8 U	8 U	10 B
COPPER	15 B	29	22 B	110	699
IRON	11800	21200	18800	67500	28800
LEAD	13.2	30.2	21.8	41.2	186
MAGNESIUM	5680	5740	4600 B	17500	14300
MANGANESE	57	62	62	106	84
MERCURY	0.2 U	0.3	0.2 U	0.2 U	0.52
NICKEL	20 U	24 B	20 U	32 B	32 B
POTASSIUM	6150	5820	5990	8180	3840 B
SELENIUM	3.5 J	1.7 J	1.1 J	1.3 J	4.3 J
SILVER	3 UJ	3 UJ	3 UJ	3 UJ	3 UJ
SODIUM	10300	2450 B	7270	10300	19500
THALLIUM	1 U	1 U	1 U	1 U	1 U
VANADIUM	59	98	106	235	67
ZINC	30	57	58	134	138
CYANIDE	10 U	10 U	10 U	10 U	10 U

OPERABLE UNIT NO. 5 - SITE 2
 SHALLOW AND DEEP MONITORING WELLS
 GROUNDWATER STATISTICAL SUMMARY
 REMEDIAL INVESTIGATION CTO - 19174
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TAL METALS AND CYANIDE

	SAMPLE NO.	2-GW01-01	2-GW02-01	2-GW03-01	2-GW03DW-01	2-GW04-01	2-GW05-01
	UNITS	UG/L		UG/L	UG/L	UG/L	UG/L
ALUMINUM		36000		5200	269	16800	4050
ANTIMONY		10 U		10 U	3.5 U	10 U	10 U
ARSENIC		21.2		2.5 B	1 UJ	23.6	2.2 B
BARIUM		52 B		46 B	1420	95 B	100 B
BERYLLIUM		1 B		0.5 U	0.5 U	2 B	0.5 U
CADMIUM		7		2.5 U	2.5 U	2.5 U	2.5 U
CALCIUM		23700		8460	450000	11100	21000
CHROMIUM		18		11	16	5 U	5 U
COBALT		10 B		4 U	4 U	4 U	4 U
COPPER		10 B		4 B	8 B	5 B	3 B
IRON		10300		7190	127	28100	12700
LEAD		15.5 L		3.5 J	1.1 UJ	2.7 J	0.5 UJ
MAGNESIUM		5660		1600 B	75 B	1920 B	4800 B
MANGANESE		55		21	2 U	21	46
MERCURY		0.1 U		0.1 U	0.1 U	0.1 U	0.1 U
NICKEL		10 U		10 U	10 U	10 U	10 U
POTASSIUM		2560 B		1030 B	187000	1210 B	2130 B
SELENIUM		4.2 B		0.5 U	0.5 U	0.5 U	0.5 U
SILVER		1.5 U		1.5 U	1.5 U	1.5 U	1.5 U
SODIUM		4040 B		5490	103000	5560	10100
THALLIUM		0.5 U		0.5 U	0.5 UJ	0.5 U	0.5 U
VANADIUM		72		10 B	2 U	89	9 B
ZINC		146		13 B	9 B	16 B	6 B
CYANIDE		5 U		5 U	5 U	5 U	5 U

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OPERABLE UNIT NO. 5 - SITE 2
 SHALLOW AND DEEP MONITORING WELLS
 GROUNDWATER STATISTICAL SUMMARY
 REMEDIAL INVESTIGATION CTO - 19174
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TAL METALS AND CYANIDE

SAMPLE NO.	2-GW06-01	2-GW07-01	2-GW08-01	2-GW09-01
UNITS	UG/L	UG/L	UG/L	UG/L
ALUMINUM	13600	8550	6380	56300
ANTIMONY	10 U	10 U	3.5 UJ	10 U
ARSENIC	5.4 B	5.7 B	9.2 B	12.9
BARIUM	173 B	98 B	98 B	328
BERYLLIUM	0.5 U	0.5 U	0.5 U	3 B
CADMIIUM	2.5 U	2.5 U	2.5 U	2.5 U
CALCIUM	7940	9350	5710	22100
CHROMIUM	15	15	5 U	75
COBALT	12 B	4 U	4 U	10 B
COPPER	5 B	7 B	6 B	25
IRON	11700	12500	9150	42000
LEAD	6.7 J	8.3 J	1.8 UJ	27.2 J
MAGNESIUM	4120 B	3620 B	2020 B	9980
MANGANESE	79	77	53	290
MERCURY	0.1 U	0.1 U	0.1 U	0.1 U
NICKEL	10 U	10 U	10 U	25 B
POTASSIUM	2570 B	1940 B	1550 B	6610
SELENIUM	0.5 U	0.5 U	0.5 U	0.5 U
SILVER	1.5 U	1.5 U	1.5 U	1.5 U
SODIUM	21900	8180	11800	18300
THALLIUM	0.5 U	0.5 U	0.5 U	0.5 U
VANADIUM	15 B	18 B	12 B	86
ZINC	26	22	27	103
CYANIDE	5 U	5 U	5 U	5 U

OPERABLE UNIT NO. 5 - SITE 2
SHALLOW AND DEEP MONITORING WELLS
GROUNDWATER STATISTICAL SUMMARY
REMEDIAL INVESTIGATION CTO - 19174
MCB CAMP LEJEUNE, NORTH CAROLINA
DISSOLVED METALS

SAMPLE NO.	2-GW01D-01	2-GW02D-01	2-GW03D-01	2-GW03DWD-01	2-GW04D-01	2-GW05D-01
UNITS	UG/L		UG/L	UG/L	UG/L	UG/L
ALUMINUM	1930		66 B	89 B	60 B	1990
ANTIMONY	10 U		10 U	3.5 UJ	10 U	10 U
ARSENIC	2.2 B		1 U	1 UJ	6.1 B	1 U
BARIUM	42 B		25 B	1400	64 B	98 B
BERYLLIUM	1 B		0.5 U	0.5 U	0.5 U	1 B
CADMIUM	2.5 U		2.5 U	2.5 U	2.5 U	2.5 U
CALCIUM	24400		7100	441000	11300	21800
CHROMIUM	5 U		5 U	11	5 U	5 U
COBALT	4 U		4 U	4 U	4 U	4 U
COPPER	4 B		2 B	6 B	9 B	4 B
IRON	2560		2170	10 U	2720	7400
LEAD	2.1 J		0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ
MAGNESIUM	5220		1030 B	26 B	1840 B	4900 B
MANGANESE	51		4.5 U	1 U	17	46
MERCURY	0.1 U		0.1 U	0.1 U	0.1 U	0.1 U
NICKEL	10 U		10 U	10 U	10 U	10 U
POTASSIUM	2140 B		589 B	188000	1130 B	2170 B
SELENIUM	0.5 U		0.5 U	0.5 U	0.5 U	0.5 U
SILVER	1.5 U		1.5 U	1.5 U	1.5 U	1.5 U
SODIUM	3590 B		5400	103000	5710	9970
THALLIUM	0.5 U		0.5 U	0.5 U	0.5 U	0.5 U
VANADIUM	2 U		2 U	2 U	2 U	2 U
ZINC	28		3 U	3 U	8 B	9 B
CYANIDE						

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OPERABLE NO. 5 - SITE 2
 SHALLOW AND DEEP MONITORING WELLS
 GROUNDWATER STATISTICAL SUMMARY
 REMEDIAL INVESTIGATION CTO - 19174
 MCB CAMP LEJEUNE, NORTH CAROLINA
 DISSOLVED METALS

SAMPLE NO.	2-GW06D-01	2-GW07D-01	2-GW08D-01	2-GW09D-01
UNITS	UG/L	UG/L	UG/L	UG/L
ALUMINUM	149 B	43 B	95 B	1230
ANTIMONY	10 U	10 U	3.5 U	10 U
ARSENIC	2.9 B	1 U	7.1 B	1 U
BARIUM	126 B	49 B	62 B	149 B
BERYLLIUM	0.5 U	0.5 U	0.5 U	1 B
CADMIUM	2.5 U	2.5 U	2.5 U	2.5 U
CALCIUM	8080	9590	5800	20800
CHROMIUM	5 U	5 U	5 U	10
COBALT	10 B	8 B	4 U	14 B
COPPER	2 B	5 B	4 B	5 B
IRON	7070	4660	6180	7040
LEAD	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ
MAGNESIUM	3610 B	3060 B	1730 B	6890
MANGANESE	65	48	40	129
MERCURY	0.1 U	0.1 U	0.1 U	0.1 U
NICKEL	10 U	10 U	10 U	10 U
POTASSIUM	1970 B	1490 B	1150 B	2790
SELENIUM	0.5 U	0.5 U	0.5 U	0.5 U
SILVER	1.5 U	1.5 U	1.5 U	1.5 U
SODIUM	22600	8720	12100	17200
THALLIUM	0.5 U	0.5 U	0.5 U	0.5 U
VANADIUM	2 U	2 U	2 U	2 U
ZINC	12 B	13 B	19 B	35
CYANIDE				

APPENDIX H
WHITE OAK RIVER BASIN STUDY

WHITE OAK RIVER BASIN REFERENCE STATIONS

Water Body Description

Hadnot Creek, Holland Mill Creek (including Cartwheel Branch) and the section of the White Oak River that encompasses Hadnot Creek, Holland Mill Creek, and Webb Creek are classified as SA from their source to the White Oak River. The SA classifies the water body as a tidal saltwater with shellfishing for market purposes and the following uses: primary recreation, aquatic life propagation and survival, fishing, wildlife, and secondary recreation. Webb Creek is classified as C from its source to the White Oak River. The C classifies the water body as a fresh water with the following uses: aquatic life propagation and survival, fishing, wildlife, and secondary recreation. The section of the White Oak River that encompasses these three creeks is designated by the North Carolina Fisheries Rule as Class C - coastal fishing waters (NCMFC, 1993).

Biological Sampling

Biological samples collected at the background stations consisted of fish and benthic macroinvertebrate. The biological samples were collected to obtain population statistics for fish and benthic macroinvertebrates and to obtain fish tissue samples for chemical analysis (Hadnot Creek only). Prior to initiating the sampling event at each station, the following information describing the site was recorded in the field log book:

Average width, depth and velocity of the water body

Description of substrate

Description of "abiotic" characteristics of the reach such as pools, riffles, runs, channel shape, degree of bank erosion, and shade/sun exposure

Description of "biotic" characteristics of the reach including aquatic and riparian vegetation and wetlands

Water quality measurements were collected during the benthic macroinvertebrate sampling, at a minimum, and during collection of some of the fish samples. On-site water quality measurements at these stations consisted of temperature, pH, specific conductance, salinity and dissolved oxygen. These measurements were conducted prior to sample collection. The station locations and sampling procedures for the collection of the fish and benthic macroinvertebrates is discussed later in this appendix.

Fish and Shellfish

This section discusses collection of the fish and shellfish samples in the reference stations at Webb Creek, Hadnot Creek, and Holland Mill Creek.

A literature review was conducted to determine the fish species that may potentially be exposed to contaminants in the surface water/sediment exposure pathway. This review included compiling information from State and Federal natural resources agencies. In addition, Bakers experience in sampling similar areas formed a basis for a database of expected species for the area.

Sampling variability can prevent the same species of fish from being sampled at each station because either the preferred species was not captured, or adequate numbers of uniform-size individuals were not captured. Therefore, if the preferred species was not successfully collected to satisfy the above requirements, a substitute species was collected that, if possible, exhibiting a similar trophic position in the estuarine ecosystem.

The collected fish species were identified, measured, and counted. The small fish (less than 20 mm) were weighed in groups of 10 or 20 because of their low individual weight; the larger fish were weighed individually. The

proportion of individuals as hybrids and the proportion of individuals with disease, tumors, fin damage, and skeletal anomalies was recorded at each station.

Fish that exhibited signs of being dead for an extended period of time (i.e., brown gills, bloating) were not retained for tissue analysis because of the potential for decomposition and leaching of contaminants from the organs into the edible portions of the fish.

Webb Creek

This section discusses collection of the fish samples in Webb Creek including the station locations and sampling procedures.

Station Location

The fish station WC02 was located on Webb Creek approximately 300 feet upstream from the Camp Lejeune railroad crossing. Station WC03 was located in the White Oak River approximately 25 feet downstream from its confluence with Webb Creek. See fish and benthic macroinvertebrate sampling station figure found later in this appendix for approximate sample locations.

Sampling Procedures

Fish were collected in Webb Creek using gill nets and hoop nets. All fish that were collected were processed for population statistics; no fish at these stations were collected for tissue analysis.

The gill nets were six feet deep by 50 to 100 feet long with a stretch mesh size ranging from two to four inches, and an approximate twine break strength of 29 pounds. The nets were deployed approximately at the locations shown on the figure found later in this appendix. Weights were attached to the nets to secure them on the bottom of the stream and yellow buoys marked with "Baker Environmental" were attached to the tops of the nets. The nets were deployed in the morning or evening, and they were checked for fish within twelve hours after deployment.

The hoop nets were three to four feet in diameter and fourteen to sixteen feet in length. Twenty-five foot wings were attached to the nets to help direct fish into the net. The nets were deployed in the middle of the channel with the wings stretched across the creek in a forty-five degree angle. The end of the net and the wings were secured using 6.5 foot wooden posts. The nets were checked at least once daily, as the fish usually survive when captured in these nets.

Hadnot Creek

This section discusses collection of the fish samples in Hadnot Creek including the station locations and sampling procedures.

Station Location

Fish were collected from four stations in Hadnot Creek (HC01, HC02, HC03 and HC04). HC01 was located approximately 100 feet upstream of Rt. 1104. Station HC02 was located approximately 2,500 feet upstream of Rt. 58. Station HC03 was located in the White Oak River approximately 100 feet upstream from its confluence with Hadnot Creek. Finally, station HC04 was located in Hadnot Creek by the road off of the Rt. 1105 crossing. In October, 1993, fish were collected by Baker in Hadnot Creek as part of another investigation (Baker, 1993). Fillet samples of these fish were chemically analyzed and the results are included in this ERA.

Sampling Procedures

Fish were collected at these stations for population statistics; fish were not collected at these stations for tissue analysis. Fish were collected in Hadnot Creek using hoop nets, gill nets, a haul seine, pole fishing, and the

backpack electroshocker. The same sample collection and sample processing procedures used in Webb Creek were conducted at the Hadnot Creek stations for the gill nets and hoop nets. Pole fishing only was conducted during the October 1993 sampling.

Fish were collected in the furthest upstream stations using electrofishing, conducted with a Smith-Root, Inc., backpack electrofisher powered by a 300-watt portable generator. A DC current was applied utilizing a "rattail" as the cathode and a hand-held electrode as the anode. Blocking seines were placed downstream and upstream of the shocking areas to aid in the collection of the fish. The length of the shocking time per subsection was recorded as seconds of applied current. Stunned fish were collected with one-inch mesh or smaller dip nets handled by members of the field sampling team.

Holland Mill Creek

This section discusses collection of the fish samples in Holland Mill Creek including the station locations and sampling procedures.

Station Location

Fish were collected from three stations in Holland Mill Creek (HM01, HM02, and HM03). HM01 was located on Cartwheel Branch just upstream of Rt. 1444. Station HM02 was located at the confluence of Holland Mill Creek and Cartwheel Branch. Station HM03 was located in the White Oak River approximately 50 feet downstream from Holland Mill Creek.

Sampling Procedures

Fish were collected at these stations for population statistics. Fish were not collected at these stations for tissue analysis. Fish were collected in Holland Mill Creek using hoop nets, gill nets, a haul seine, and the backpack electroshocker. The same sample collection and sample processing procedures used in the Webb Creek and Hadnot Creek stations were conducted at the Holland Mill Creek stations.

Benthic Macroinvertebrates

This section discusses collection of benthic macroinvertebrate samples in the reference stations at Webb Creek, Hadnot Creek, and Holland Mill Creek.

Webb Creek

Benthic macroinvertebrates were collected in Webb Creek using the ponar grab deployed from the boat.

Benthic macroinvertebrates were collected from a boat using a standard ponar grab. The dimensions of the ponar are 23 x 23 cm (9 x 9 in.) for a sampling area of 529 cm² or 0.0523 m² (81 in²).

The ponar was deployed from the boat, which was positioned in slightly different locations for each replicate to prevent re-sampling the same area. After retrieving the ponar with a sediment sample, it was opened into a clean tub and the sediments were removed with a teflon spatula. The sediments were transferred to a 0.5 mm sieve that was agitated (by hand) in water to remove the small particles. The remaining contents in the sieve were transferred into 16-ounce plastic sample jars. The jars were filled up to one-half full with sediments, and buffered formalin solution (10 percent by weight) was added to the remainder of the jar to preserve the benthic macroinvertebrates contained in the sediments. A 100 percent cotton paper label, marked in pencil with the sample number, was placed inside the jar. The outside of the jar was labeled with the sample number using a black permanent marker to identify the sample containers.

After all the benthic macroinvertebrate sampling at the New River was completed, the sample jars were transported to RMC Environmental Services, Inc. for sample sorting and taxonomic identification of the benthic

macroinvertebrates.

Hadnot Creek

Benthic macroinvertebrates were collected in Hadnot Creek using the ponar grab deployed from the boat. The boat was not used at HC01 or HC04 because the water was too shallow. Benthic macroinvertebrates were collected using the same procedures used for collecting benthic macroinvertebrates in Webb Creek.

Holland Mill Creek

Benthic macroinvertebrates were collected in Holland Mill Creek using the ponar grab deployed from the boat. The boat was not used at HM01 because the water was too shallow. The same sample collection and sample processing procedures used in Webb Creek were conducted at the Holland Mill Creek stations.

Biological Tissue Sample Results

The analytical parameters included TCL VOCs, TCL SVOCs, TAL metals, and TCL pesticides/PCBs. Background fish fillet tissue were collected from Hadnot Creek and analyzed these results are discussed below.

Hadnot Creek

Several metals were detected in the Hadnot Creek fillet tissue samples. These metals included aluminum, arsenic, calcium, chromium, copper, magnesium, manganese, mercury, nickel, potassium, sodium and zinc in the fillet samples. The range of detected levels for these chemicals in the fish fillet tissue samples from Hadnot Creek are as follows:

	<u>Minimum (mg/kg)</u>	<u>Maximum (mg/kg)</u>
Aluminum	36.5	36.5
Arsenic	0.34	3.9
Calcium	154	1,170
Chromium	0.21	0.68
Copper	0.18	0.46
Magnesium	254	319
Manganese	0.008	0.38
Mercury	0.05	0.24
Nickel	0.45	0.45
Potassium	3,270	4,040
Sodium	505	1,060
Zinc	3.9	6.5

The maximum detect of manganese was in the southern flounder. The maximum detect of sodium was found in the red drum. Aluminum, calcium, chromium, magnesium, mercury, and potassium were detected at their highest concentrations in the largemouth bass. The maximum detects of arsenic, copper, nickel, and zinc were found in the longnose gar.

Two pesticides were detected in the fillet tissue samples, 4,4'-DDE and alpha-chlordane. 4,4'-DDE was detected twice, both in the longnose gar. Alpha-chlordane was detected once in the largemouth bass. The range of detected concentrations for these constituents were as follows:

	<u>Minimum (ug/kg)</u>	<u>Maximum (ug/kg)</u>
4,4'-DDE	9.7	12.0
alpha-Chlordane	0.17	0.17

Two VOCs and three SVOCs were detected in the fillet tissue samples. Common laboratory contaminants were the primary detections, which included methylene chloride, acetone, di-n-octyl phthalate and bis(2-ethylhexyl)phthalate. Phenol was also detected in the fillet tissue samples. The concentration ranges for these chemicals were the following:

	<u>Minimum (ug/kg)</u>	<u>Maximum (ug/kg)</u>
Methylene chloride	3.0	41.0
Acetone	16	130
di-n-octyl phthalate	61	500
bis(2-ethylhexyl) phthalate	820	17,000
Phenol	460	2,100

Field Chemistry Results

Samples from these surface water bodies were collected from the water surface and bottom.

Webb Creek

At Webb Creek, the salinity at station WC02 ranged from 0 to 7 ppt. Conductivity ranged from 850 to 10,500 micromhos/cm. Dissolved oxygen levels ranged from 4.4 to 9 mg/L. The pH at station WC02 in Webb Creek ranged from 6.85 to 7.48 S.U. in the surface water. The temperature of the water at WC02 ranged from 17.5 to 21 °C.

At WC03, the salinity ranged from 10 to 12.8 ppt. The conductivity ranged from 16,500 to 18,000 micromhos/cm. Dissolved oxygen levels ranged from 8.5 to 10 mg/L. The pH at WC03 in Webb Creek ranged from 7.33 to 7.56 S.U. in the surface water. The temperature of the water at WC03 ranged from 19 to 23 °C.

Hadnot Creek

In Hadnot Creek, the salinity at station HC01 was 0 ppt. The conductivity was 13.5 micromhos/cm. The dissolved oxygen level was 7.7 mg/L. The pH at HC01 was 6.89 S.U. in the surface water, and the temperature of the Hadnot Creek water was 17 °C.

At station HC02, the salinity ranged from 0 to 16.5 ppt. The conductivity ranged from 720 to 22,800 micromhos/cm. The dissolved oxygen levels ranged from 1 to 7.3 mg/L. The pH at HC02 ranged from 6.7 to 7.2 S.U. in the surface water. The temperature of the water at HC02 ranged from 15.5 to 22 °C.

At station HC03, the salinity ranged from 17 to 17.9 ppt. The conductivity ranged from 25,500 to 26,500 micromhos/cm. The dissolved oxygen level was 12 mg/L. The pH at HC03 ranged from 7.69 to 7.79 S.U. in the surface water. The temperature of the water at HC03 ranged from 17.5 to 17.8 °C.

At station HC04, the salinity was 0 ppt. The conductivity was 65 micromhos/cm, and the dissolved oxygen level was 5.3 mg/L. The pH at HC04 was 6.16 S.U. in the surface water, and the temperature of the water was 17.3 °C.

Holland Mill Creek

In Holland Mill Creek, the salinity was 0 ppt at station HM01. The conductivity was 140 micromhos/cm, and the dissolved oxygen level was 8.0 mg/L. The pH at station HM01 was 6.9 S.U. in the surface water, and the temperature of the water was 17.5 °C.

At station HM02, the salinity ranged from 1 to 25 ppt. The conductivity ranged from 2,490 to 38,000 micromhos/cm. The dissolved oxygen levels ranged from 5.0 to 11.8 mg/L. The pH at station HM02 ranged from 6.72 to 7.9 S.U. in the surface water. The temperature of the water at HM02 ranged from 15.2 to 20 °C.

At station HM03, the salinity ranged from 13.5 to 22 ppt. The conductivity ranged from 19,000 to 32,000 micromhos. The dissolved oxygen levels ranged from 3.4 to 10.8 mg/L. The pH at station HM03 ranged from 6.81 to 7.90 S.U. in the surface water. The temperature of the water at HM03 ranged from 17.5 to 17.8 °C.

**Statistical Summary of
Analytical Results
(Surface Water)**

KEY TO STATISTICAL AND ANALYTICAL SUMMARY TABLES

U - Indicated analyte was analyzed for but not detected

J - Indicates an estimated value

UJ - Not detected, quantitation limit may be inaccurate or imprecise

R - Result is rejected and unusable

B - Not detected substantially above the level reported in laboratory or field blanks (organics)

P - There is greater than 25% difference for detected pesticide/PCB concentrations between the two GC columns, the lower of the two values is reported

L - Result is biased low

K - Result is biased high

ND - Analyte not detected

NZ - Analyte not analyzed

mg/L - Milligrams per liter

ug/L - Micrograms per liter

mg/kg - Milligrams per kilogram

ug/kg - Micrograms per kilogram

MARINE CORPS BASE CAMP LEJEUNE
 STATISTICAL SUMMARY OF ANALYTICAL RESULTS
 BACKGROUND - HADNOT CREEK
 SURFACE WATER - METALS

PARAMETER	MINIMUM DETECTED VALUE (ug/L)	MAXIMUM DETECTED VALUE (ug/L)	SAMPLE No. OF MAXIMUM DETECTED VALUE	ARITHMETIC AVERAGE (ug/L)	RME (ug/L)	LOG NORMAL UPPER 95% CONFIDENCE LEVEL (ug/L)	No. OF TIMES DETECTED	No. OF TIMES ANALYZED	FREQUENCY OF DETECTION
Aluminum	692.00	692.00	+ HC-SW04	253.10	488.87	1019.72	1	5	20%
Arsenic	20.00	20.00	+ HC-SW03	5.30	13.35	3190.11	1	5	20%
Barium	9.00	26.00	+ HC-SW03	19.60	25.87	35.22	5	5	100%
Calcium	11800.00	107000.00	+ HC-SW03D	53760.00	92784.90	456379.04	5	5	100%
Chromium	125.00	130.00	+ HC-SW03	54.70	118.12	40374.07	2	5	40%
Iron	291.00	746.00	+ HC-SW01	492.00	666.33	793.41	5	5	100%
Magnesium	954.00	633000.00	+ HC-SW03	258640.80	576299.05	1.50E+16	5	5	100%
Potassium	14500.00	203000.00	+ HC-SW03	84234.00	187308.88	5.24E+12	3	5	60%
Selenium	6.00	6.00	+ HC-SW03	2.00	4.29	38.67	1	5	20%
Sodium	6090.00	2560000.00	+ HC-SW03D	1.01E+06	2.17E+06	4.80E+14	5	5	100%

* = THE RME IS GREATER THAN THE MAXIMUM DETECTED VALUE; THEREFORE, THE MAXIMUM VALUE IS USED TO CALCULATE CHRONIC DAILY INTAKE

+ = THE LOG NORMAL 95% UCL IS GREATER THAN THE MAXIMUM DETECTED VALUE; THEREFORE, THE MAXIMUM VALUE IS USED TO CALCULATE CHRONIC DAILY INTAKE

*+ = BOTH THE RME AND LOG NORMAL 95% UCL ARE GREATER THAN THE MAXIMUM DETECTED VALUE; THEREFORE, THE MAXIMUM VALUE IS USED TO CALCULATE CHRONIC DAILY INTAKE

RME = REASONABLE MAXIMUM EXPOSURE

NA = NOT APPLICABLE

MARINE CORPS BASE CAMP LEJEUNE
 STATISTICAL SUMMARY OF ANALYTICAL RESULTS
 BACKGROUND - HADNOT CREEK
 SURFACE WATER - PESTICIDES/PCBs

PARAMETER	MINIMUM DETECTED VALUE (ug/L)	MAXIMUM DETECTED VALUE (ug/L)	SAMPLE No. OF MAXIMUM DETECTED VALUE	ARITHMETIC AVERAGE (ug/L)	RME (ug/L)	LOG NORMAL UPPER 95% CONFIDENCE LEVEL (ug/L)	No. OF TIMES DETECTED	No. OF TIMES ANALYZED	FREQUENCY OF DETECTION
NO PESTICIDES/PCBs WERE DETECTED									

- * = THE RME IS GREATER THAN THE MAXIMUM DETECTED VALUE; THEREFORE, THE MAXIMUM VALUE IS USED TO CALCULATE CHRONIC DAILY INTAKE
 - + = THE LOG NORMAL 95% UCL IS GREATER THAN THE MAXIMUM DETECTED VALUE; THEREFORE, THE MAXIMUM VALUE IS USED TO CALCULATE CHRONIC DAILY INTAKE
 - *+ = BOTH THE RME AND LOG NORMAL 95% UCL ARE GREATER THAN THE MAXIMUM DETECTED VALUE; THEREFORE, THE MAXIMUM VALUE IS USED TO CALCULATE CHRONIC DAILY INTAKE
- RME = REASONABLE MAXIMUM EXPOSURE
 NA = NOT APPLICABLE

MARINE CORPS BASE CAMP LEJEUNE
 STATISTICAL SUMMARY OF ANALYTICAL RESULTS
 BACKGROUND - HADNOT CREEK
 SURFACE WATER - SEMIVOLATILE ORGANIC COMPOUNDS

PARAMETER	MINIMUM DETECTED VALUE (ug/L)	MAXIMUM DETECTED VALUE (ug/L)	SAMPLE No. OF MAXIMUM DETECTED VALUE	ARITHMETIC AVERAGE (ug/L)	RME (ug/L)	LOG NORMAL UPPER 95% CONFIDENCE LEVEL (ug/L)	No. OF TIMES DETECTED	No. OF TIMES ANALYZED	FREQUENCY OF DETECTION
NO SEMIVOLATILE ORGANIC COMPOUNDS WERE DETECTED									

* = THE RME IS GREATER THAN THE MAXIMUM DETECTED VALUE; THEREFORE, THE MAXIMUM VALUE IS USED TO CALCULATE CHRONIC DAILY INTAKE
 + = THE LOG NORMAL 95% UCL IS GREATER THAN THE MAXIMUM DETECTED VALUE; THEREFORE, THE MAXIMUM VALUE IS USED TO CALCULATE CHRONIC DAILY INTAKE
 *+ = BOTH THE RME AND LOG NORMAL 95% UCL ARE GREATER THAN THE MAXIMUM DETECTED VALUE; THEREFORE, THE MAXIMUM VALUE IS USED TO CALCULATE CHRONIC DAILY INTAKE
 RME = REASONABLE MAXIMUM EXPOSURE
 NA = NOT APPLICABLE

MARINE CORPS BASE CAMP LEJEUNE
 STATISTICAL SUMMARY OF ANALYTICAL RESULTS
 BACKGROUND - HADNOT CREEK
 SURFACE WATER - VOLATILE ORGANIC COMPOUNDS

PARAMETER	MINIMUM DETECTED VALUE (ug/L)	MAXIMUM DETECTED VALUE (ug/L)	SAMPLE No. OF MAXIMUM DETECTED VALUE	ARITHMETIC AVERAGE (ug/L)	RME (ug/L)	LOG NORMAL UPPER 95% CONFIDENCE LEVEL (ug/L)	No. OF TIMES DETECTED	No. OF TIMES ANALYZED	FREQUENCY OF DETECTION
NO VOLATILE ORGANIC COMPOUNDS WERE DETECTED									

- * = THE RME IS GREATER THAN THE MAXIMUM DETECTED VALUE; THEREFORE, THE MAXIMUM VALUE IS USED TO CALCULATE CHRONIC DAILY INTAKE
 - + = THE LOG NORMAL 95% UCL IS GREATER THAN THE MAXIMUM DETECTED VALUE; THEREFORE, THE MAXIMUM VALUE IS USED TO CALCULATE CHRONIC DAILY INTAKE
 - *+ = BOTH THE RME AND LOG NORMAL 95% UCL ARE GREATER THAN THE MAXIMUM DETECTED VALUE; THEREFORE, THE MAXIMUM VALUE IS USED TO CALCULATE CHRONIC DAILY INTAKE
- RME = REASONABLE MAXIMUM EXPOSURE
 NA = NOT APPLICABLE

MARINE CORPS BASE CAMP LEJEUNE
 STATISTICAL SUMMARY OF ANALYTICAL RESULTS
 BACKGROUND - HOLLAND MILL CREEK
 SURFACE WATER - METALS

PARAMETER	MINIMUM DETECTED VALUE (ug/L)	MAXIMUM DETECTED VALUE (ug/L)	SAMPLE No. OF MAXIMUM DETECTED VALUE	ARITHMETIC AVERAGE (ug/L)	RME (ug/L)	LOG NORMAL UPPER 95% CONFIDENCE LEVEL (ug/L)	No. OF TIMES DETECTED	No. OF TIMES ANALYZED	FREQUENCY OF DETECTION
Aluminum	535.00	535.00	*+ HM-SW02	269.50	657.32	48037.76	1	3	33%
Barium	20.00	49.00	*+ HM-SW01	35.67	60.35	204.30	3	3	100%
Calcium	14100.00	302000.00	*+ HM-SW03	118766.67	387190.45	4.42E+14	3	3	100%
Chromium	36.00	158.00	*+ HM-SW03	66.33	202.69	3.67E+12	2	3	67%
Iron	320.00	559.00	*+ HM-SW02	434.67	636.62	843.56	3	3	100%
Lead	58.10	58.10	*+ HM-SW03	19.95	75.65	1.70E+27	1	3	33%
Magnesium	2830.00	754000.00	*+ HM-SW03	288610.00	973947.76	1.02E+35	3	3	100%
Potassium	41100.00	288000.00	*+ HM-SW03	109978.33	372096.67	1.33E+36	2	3	67%
Selenium	1.50	41.00	*+ HM-SW03	15.00	52.97	8.42E+13	2	3	67%
Silver	37.00	37.00	*+ HM-SW03	16.83	46.42	284713.62	1	3	33%
Sodium	16500.00	6750000.00	*+ HM-SW03	2501833.33	8733985.25	1.96E+44	3	3	100%

* = THE RME IS GREATER THAN THE MAXIMUM DETECTED VALUE; THEREFORE, THE MAXIMUM VALUE IS USED TO CALCULATE CHRONIC DAILY INTAKE

+ = THE LOG NORMAL 95% UCL IS GREATER THAN THE MAXIMUM DETECTED VALUE; THEREFORE, THE MAXIMUM VALUE IS USED TO CALCULATE CHRONIC DAILY INTAKE

*+ = BOTH THE RME AND LOG NORMAL 95% UCL ARE GREATER THAN THE MAXIMUM DETECTED VALUE; THEREFORE, THE MAXIMUM VALUE IS USED TO CALCULATE CHRONIC DAILY INTAKE

RME = REASONABLE MAXIMUM EXPOSURE

NA = NOT APPLICABLE

MARINE CORPS BASE CAMP LEJEUNE
 STATISTICAL SUMMARY OF ANALYTICAL RESULTS
 BACKGROUND - HOLLAND MILL CREEK
 SURFACE WATER - PESTICIDES/PCBs

PARAMETER	MINIMUM DETECTED VALUE (ug/L)	MAXIMUM DETECTED VALUE (ug/L)	SAMPLE No. OF MAXIMUM DETECTED VALUE	ARITHMETIC AVERAGE (ug/L)	RME (ug/L)	LOG NORMAL UPPER 95% CONFIDENCE LEVEL (ug/L)	No. OF TIMES DETECTED	No. OF TIMES ANALYZED	FREQUENCY OF DETECTION
NO PESTICIDES/PCBs WERE DETECTED									

* = THE RME IS GREATER THAN THE MAXIMUM DETECTED VALUE; THEREFORE, THE MAXIMUM VALUE IS USED TO CALCULATE CHRONIC DAILY INTAKE

+ = THE LOG NORMAL 95% UCL IS GREATER THAN THE MAXIMUM DETECTED VALUE; THEREFORE, THE MAXIMUM VALUE IS USED TO CALCULATE CHRONIC DAILY INTAKE

*+ = BOTH THE RME AND LOG NORMAL 95% UCL ARE GREATER THAN THE MAXIMUM DETECTED VALUE; THEREFORE, THE MAXIMUM VALUE IS USED TO CALCULATE CHRONIC DAILY INTAKE

RME = REASONABLE MAXIMUM EXPOSURE

NA = NOT APPLICABLE

MARINE CORPS BASE CAMP LEJEUNE
 STATISTICAL SUMMARY OF ANALYTICAL RESULTS
 BACKGROUND - HOLLAND MILL CREEK
 SURFACE WATER - SEMIVOLATILE ORGANIC COMPOUNDS

PARAMETER	MINIMUM DETECTED VALUE (ug/L)	MAXIMUM DETECTED VALUE (ug/L)	SAMPLE No. OF MAXIMUM DETECTED VALUE	ARITHMETIC AVERAGE (ug/L)	RME (ug/L)	LOG NORMAL UPPER 95% CONFIDENCE LEVEL (ug/L)	No. OF TIMES DETECTED	No. OF TIMES ANALYZED	FREQUENCY OF DETECTION
NO SEMIVOLATILE ORGANIC COMPOUNDS WERE DETECTED									

- * = THE RME IS GREATER THAN THE MAXIMUM DETECTED VALUE; THEREFORE, THE MAXIMUM VALUE IS USED TO CALCULATE CHRONIC DAILY INTAKE
 - + = THE LOG NORMAL 95% UCL IS GREATER THAN THE MAXIMUM DETECTED VALUE; THEREFORE, THE MAXIMUM VALUE IS USED TO CALCULATE CHRONIC DAILY INTAKE
 - * + ± BOTH THE RME AND LOG NORMAL 95% UCL ARE GREATER THAN THE MAXIMUM DETECTED VALUE; THEREFORE, THE MAXIMUM VALUE IS USED TO CALCULATE CHRONIC DAILY INTAKE
- RME = REASONABLE MAXIMUM EXPOSURE
 NA = NOT APPLICABLE

MARINE CORPS BASE CAMP LEJEUNE
 STATISTICAL SUMMARY OF ANALYTICAL RESULTS
 BACKGROUND - HOLLAND MILL CREEK
 SURFACE WATER - VOLATILE ORGANIC COMPOUNDS

PARAMETER	MINIMUM DETECTED VALUE (ug/L)	MAXIMUM DETECTED VALUE (ug/L)	SAMPLE No. OF MAXIMUM DETECTED VALUE	ARITHMETIC AVERAGE (ug/L)	RME (ug/L)	LOG NORMAL UPPER 95% CONFIDENCE LEVEL (ug/L)	No. OF TIMES DETECTED	No. OF TIMES ANALYZED	FREQUENCY OF DETECTION
NO VOLATILE ORGANIC COMPOUNDS WERE DETECTED									

- * = THE RME IS GREATER THAN THE MAXIMUM DETECTED VALUE; THEREFORE, THE MAXIMUM VALUE IS USED TO CALCULATE CHRONIC DAILY INTAKE
 - + = THE LOG NORMAL 95% UCL IS GREATER THAN THE MAXIMUM DETECTED VALUE; THEREFORE, THE MAXIMUM VALUE IS USED TO CALCULATE CHRONIC DAILY INTAKE
 - *+ = BOTH THE RME AND LOG NORMAL 95% UCL ARE GREATER THAN THE MAXIMUM DETECTED VALUE; THEREFORE, THE MAXIMUM VALUE IS USED TO CALCULATE CHRONIC DAILY INTAKE
- RME = REASONABLE MAXIMUM EXPOSURE
 NA = NOT APPLICABLE

MARINE CORPS BASE CAMP LEJEUNE
 STATISTICAL SUMMARY OF ANALYTICAL RESULTS
 BACKGROUND - WEBB CREEK
 SURFACE WATER - METALS

PARAMETER	MINIMUM DETECTED VALUE (ug/L)	MAXIMUM DETECTED VALUE (ug/L)	SAMPLE No. OF MAXIMUM DETECTED VALUE	ARITHMETIC AVERAGE (ug/L)	RME (ug/L)	LOG NORMAL UPPER 95% CONFIDENCE LEVEL (ug/L)	No. OF TIMES DETECTED	No. OF TIMES ANALYZED	FREQUENCY OF DETECTION
Barium	27.00	29.00	*+ WC-SW02	28.00	34.31	32.19	2	2	100%
Calcium	40500.00	46900.00	*+ WC-SW02	43700.00	63904.80	58284.51	2	2	100%
Chromium	97.00	97.00	*+ WC-SW03	52.25	334.80	1.32E+20	1	2	50%
Iron	321.00	660.00	*+ WC-SW02	490.50	1560.72	14358.69	2	2	100%
Magnesium	29000.00	44800.00	*+ WC-SW03	36900.00	86780.60	133710.58	2	2	100%
Potassium	10900.00	136000.00	*+ WC-SW03	73450.00	468390.70	1.01E+23	2	2	100%
Sodium	202000.00	895000.00	*+ WC-SW03	548500.00	2736301.00	6.83E+11	2	2	100%

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RME = REASONABLE MAXIMUM EXPOSURE

NA = NOT APPLICABLE

MARINE CORPS BASE CAMP LEJEUNE
 STATISTICAL SUMMARY OF ANALYTICAL RESULTS
 BACKGROUND - WEBB CREEK
 SURFACE WATER - PESTICIDES/PCBs

PARAMETER	MINIMUM DETECTED VALUE (ug/L)	MAXIMUM DETECTED VALUE (ug/L)	SAMPLE No. OF MAXIMUM DETECTED VALUE	ARITHMETIC AVERAGE (ug/L)	RME (ug/L)	LOG NORMAL UPPER 95% CONFIDENCE LEVEL (ug/L)	No. OF TIMES DETECTED	No. OF TIMES ANALYZED	FREQUENCY OF DETECTION
Aldrin	0.04	0.04	*+ WC-SW02	0.03	0.06	0.07	1	2	50%

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RME = REASONABLE MAXIMUM EXPOSURE

NA = NOT APPLICABLE

MARINE CORPS BASE CAMP LEJEUNE
 STATISTICAL SUMMARY OF ANALYTICAL RESULTS
 BACKGROUND - WEBB CREEK
 SURFACE WATER - SEMIVOLATILE ORGANIC COMPOUNDS

PARAMETER	MINIMUM DETECTED VALUE (ug/L)	MAXIMUM DETECTED VALUE (ug/L)	SAMPLE No. OF MAXIMUM DETECTED VALUE	ARITHMETIC AVERAGE (ug/L)	RME (ug/L)	LOG NORMAL UPPER 95% CONFIDENCE LEVEL (ug/L)	No. OF TIMES DETECTED	No. OF TIMES ANALYZED	FREQUENCY OF DETECTION
NO SEMIVOLATILE ORGANIC COMPOUNDS WERE DETECTED									

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- RME = REASONABLE MAXIMUM EXPOSURE
 NA = NOT APPLICABLE

MARINE CORPS BASE CAMP LEJEUNE
 STATISTICAL SUMMARY OF ANALYTICAL RESULTS
 BACKGROUND - WEBB CREEK
 SURFACE WATER - VOLATILE ORGANIC COMPOUNDS

PARAMETER	MINIMUM DETECTED VALUE (ug/L)	MAXIMUM DETECTED VALUE (ug/L)	SAMPLE No. OF MAXIMUM DETECTED VALUE	ARITHMETIC AVERAGE (ug/L)	RME (ug/L)	LOG NORMAL UPPER 95% CONFIDENCE LEVEL (ug/L)	No. OF TIMES DETECTED	No. OF TIMES ANALYZED	FREQUENCY OF DETECTION
NO VOLATILE ORGANIC COMPOUNDS WERE DETECTED									

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**Statistical Summary of
Analytical Results
(Sediment)**

MARINE CORPS BASE CAMP LEJEUNE
 STATISTICAL SUMMARY OF ANALYTICAL RESULTS
 BACKGROUND - HADNOT CREEK
 SEDIMENT - METALS

PARAMETER	MINIMUM DETECTED VALUE (mg/kg)	MAXIMUM DETECTED VALUE (mg/kg)	SAMPLE No. OF MAXIMUM DETECTED VALUE	ARITHMETIC AVERAGE (mg/kg)	RME (mg/kg)	LOG NORMAL UPPER 95% CONFIDENCE LEVEL (mg/kg)	No. OF TIMES DETECTED	No. OF TIMES ANALYZED	FREQUENCY OF DETECTION
Aluminum	780.00	14000.00	+ HC-SD03-612	5467.78	8305.91	20353.32	9	9	100%
Arsenic	0.26	1.90	*+ HC-SD02-612	1.71	2.67	8.56	6	9	67%
Barium	4.10	17.20	+ HC-SD03-612	9.75	13.11	21.84	8	9	89%
Beryllium	0.14	0.32	+ HC-SD02-612	0.16	0.24	4.60	3	6	50%
Cadmium	0.03	0.66	HC-SD03-06	0.11	0.24	0.42	7	9	78%
Calcium	1030.00	3620.00	+ HC-SD01-06	2645.56	3233.82	3840.09	9	9	100%
Chromium	1.30	41.60	+ HC-SD03-612	10.81	18.97	53.55	9	9	100%
Cobalt	4.50	5.00	HC-SD03-612	1.87	2.91	4.01	2	9	22%
Copper	0.66	1.50	*+ HC-SD02-06	1.35	1.75	2.01	6	9	67%
Iron	382.00	11100.00	+ HC-SD03-06D	3396.56	5709.65	28323.00	9	9	100%
Lead	3.70	5.30	*+ HC-SD03-06	4.50	9.55	305.02	2	2	100%
Magnesium	77.10	6540.00	+ HC-SD03-612	1977.79	3486.31	1292043.17	7	9	78%
Manganese	3.50	64.70	HC-SD03-612	16.54	29.38	62.63	9	9	100%
Mercury	0.25	0.42	*+ HC-SD03-612	0.34	0.48	11.17	3	3	100%
Nickel	1.80	12.10	+ HC-SD03-612	3.77	6.49	17.25	4	9	44%
Potassium	623.00	1840.00	+ HC-SD03-612	671.39	1079.26	2769.97	4	9	44%
Selenium	0.21	0.60	HC-SD02-06	0.30	0.39	0.48	5	9	56%
Sodium	1630.00	2750.00	+ HC-SD02-06	845.25	1750.35	183541390882.91	2	6	33%
Thallium	0.14	0.44	+ HC-SD03-612	0.23	0.31	0.46	6	9	67%
Vanadium	1.50	36.90	+ HC-SD03-612	11.11	18.54	58.26	9	9	100%
Zinc	20.80	40.00	+ HC-SD03-612	12.71	22.07	63.76	3	9	33%

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RME = REASONABLE MAXIMUM EXPOSURE

NA = NOT APPLICABLE

MARINE CORPS BASE CAMP LEJEUNE
 STATISTICAL SUMMARY OF ANALYTICAL RESULTS
 BACKGROUND - HADNOT CREEK
 SEDIMENT - PESTICIDES/PCBs

PARAMETER	MINIMUM DETECTED VALUE (ug/kg)	MAXIMUM DETECTED VALUE (ug/kg)	SAMPLE No. OF MAXIMUM DETECTED VALUE	ARITHMETIC AVERAGE (ug/kg)	RME (ug/kg)	LOG NORMAL UPPER 95% CONFIDENCE LEVEL (ug/kg)	No. OF TIMES DETECTED	No. OF TIMES ANALYZED	FREQUENCY OF DETECTION
beta-BHC	1.70	1.70	*+ HC-SD04-612	1.93	2.39	2.58	1	9	11%
delta-BHC	0.64	0.64	*+ HC-SD01-06	1.82	2.35	2.91	1	9	11%
Heptachlor	0.48	2.00	*+ HC-SD04-612	1.89	2.42	3.26	2	9	22%
4,4'-DDD	1.50	4.00	HC-SD03-612	2.16	3.11	3.50	3	9	33%
4,4'-DDT	1.20	1.20	*+ HC-SD03-06D	3.23	4.23	5.08	1	9	11%
Methoxychlor	0.94	0.94	*+ HC-SD04-06	17.66	23.58	92.52	1	9	11%
Endrin aldehyde	0.59	7.10	+ HC-SD02-06	3.56	5.02	10.80	3	9	33%

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MARINE CORPS BASE CAMP LEJEUNE
 STATISTICAL SUMMARY OF ANALYTICAL RESULTS
 BACKGROUND - HADNOT CREEK
 SEDIMENT - SEMIVOLATILE ORGANIC COMPOUNDS

PARAMETER	MINIMUM DETECTED VALUE (ug/kg)	MAXIMUM DETECTED VALUE (ug/kg)	SAMPLE No. OF MAXIMUM DETECTED VALUE	ARITHMETIC AVERAGE (ug/kg)	RME (ug/kg)	LOG NORMAL UPPER 95% CONFIDENCE LEVEL (ug/kg)	No. OF TIMES DETECTED	No. OF TIMES ANALYZED	FREQUENCY OF DETECTION
NO SEMIVOLATILE ORGANIC COMPOUNDS WERE DETECTED									

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MARINE CORPS BASE CAMP LEJEUNE
 STATISTICAL SUMMARY OF ANALYTICAL RESULTS
 BACKGROUND - HADNOT CREEK
 SEDIMENT - VOLATILE ORGANIC COMPOUNDS

PARAMETER	MINIMUM DETECTED VALUE (ug/kg)	MAXIMUM DETECTED VALUE (ug/kg)	SAMPLE No. OF MAXIMUM DETECTED VALUE	ARITHMETIC AVERAGE (ug/kg)	RME (ug/kg)	LOG NORMAL UPPER 95% CONFIDENCE LEVEL (ug/kg)	No. OF TIMES DETECTED	No. OF TIMES ANALYZED	FREQUENCY OF DETECTION
Acetone	70.00	70.00	HC-SD01-06	18.06	30.44	36.73	1	9	11%
Carbon Disulfide	14.00	19.00	HC-SD02-612	12.44	15.67	18.14	2	9	22%
2-Butanone	7.00	7.00	*+ HC-SD01-06	11.06	13.94	15.49	1	9	11%

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NA = NOT APPLICABLE

MARINE CORPS BASE CAMP LEJEUNE
 STATISTICAL SUMMARY OF ANALYTICAL RESULTS
 BACKGROUND - HOLLAND MILL CREEK
 SEDIMENT - METALS

PARAMETER	MINIMUM DETECTED VALUE (mg/kg)	MAXIMUM DETECTED VALUE (mg/kg)	SAMPLE No. OF MAXIMUM DETECTED VALUE	ARITHMETIC AVERAGE (mg/kg)	RME (mg/kg)	LOG NORMAL UPPER 95% CONFIDENCE LEVEL (mg/kg)	No. OF TIMES DETECTED	No. OF TIMES ANALYZED	FREQUENCY OF DETECTION
Aluminum	337.00	13600.00	+ HM-SD02-06	6181.29	10282.21	655067.62	7	7	100%
Barium	11.00	18.70	+ HM-SD02-06	8.71	13.92	68.49	4	7	57%
Cadmium	0.03	0.11	HM-SD01-06D	0.06	0.08	0.10	7	7	100%
Calcium	282.00	7860.00	+ HM-SD02-612	2952.86	4844.12	22431.34	7	7	100%
Chromium	1.10	38.40	+ HM-SD02-06	19.63	32.39	2021.73	7	7	100%
Cobalt	4.00	4.40	+ HM-SD02-06	2.02	3.18	6.18	2	7	29%
Iron	225.00	32400.00	+ HM-SD02-612	12262.43	21399.01	27918943.98	7	7	100%
Lead	0.62	9.20	+ HM-SD03-06	4.35	6.94	32.96	7	7	100%
Magnesium	26.70	5700.00	+ HM-SD03-06	2576.66	4422.69	136198282.35	7	7	100%
Manganese	1.30	67.20	+ HM-SD02-06	34.14	56.82	8851.72	7	7	100%
Mercury	0.09	0.35	+ HM-SD03-06	0.23	0.30	0.38	7	7	100%
Nickel	9.60	14.20	+ HM-SD03-06	6.76	11.07	359.48	4	7	57%
Potassium	1510.00	1760.00	+ HM-SD03-612	1007.00	1596.65	13233.89	4	7	57%
Selenium	0.25	0.40	HM-SD02-06	0.21	0.29	0.39	2	7	29%
Silver	0.49	0.49	*+ HM-SD01-06	0.39	0.49	0.60	1	7	14%
Thallium	0.13	0.37	+ HM-SD02-06	0.20	0.29	0.52	4	7	57%
Vanadium	0.66	30.00	+ HM-SD02-612	16.69	27.76	18094.26	6	7	86%
Zinc	6.70	43.10	+ HM-SD02-06	23.57	34.53	65.13	7	7	100%

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RME = REASONABLE MAXIMUM EXPOSURE

NA = NOT APPLICABLE

MARINE CORPS BASE CAMP LEJEUNE
 STATISTICAL SUMMARY OF ANALYTICAL RESULTS
 BACKGROUND - HOLLAND MILL CREEK
 SEDIMENT - PESTICIDES/PCBs

PARAMETER	MINIMUM DETECTED VALUE (ug/kg)	MAXIMUM DETECTED VALUE (ug/kg)	SAMPLE No. OF MAXIMUM DETECTED VALUE	ARITHMETIC AVERAGE (ug/kg)	RME (ug/kg)	LOG NORMAL UPPER 95% CONFIDENCE LEVEL (ug/kg)	No. OF TIMES DETECTED	No. OF TIMES ANALYZED	FREQUENCY OF DETECTION
beta-BHC	3.80	7.30	HM-SD01-06D	3.24	4.69	5.98	2	7	29%
Aldrin	0.56	0.72	*+ HM-SD01-612	1.84	2.60	4.20	2	7	29%
Dieldrin	0.58	1.50	*+ HM-SD01-612	3.55	5.13	12.37	2	7	29%
4,4'-DDE	1.00	4.30	*+ HM-SD01-612	4.01	5.37	8.82	2	7	29%
4,4'-DDD	0.87	3.10	*+ HM-SD01-612	2.85	4.16	6.44	4	7	57%
4,4'-DDT	1.70	1.70	*+ HM-SD01-612	3.79	5.13	6.75	1	7	14%
alpha-Chlordane	1.30	1.30	*+ HM-SD01-612	1.99	2.61	3.14	1	7	14%
gamma-Chlordane	3.00	3.00	+ HM-SD01-612	2.24	2.86	3.56	1	7	14%

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MARINE CORPS BASE CAMP LEJEUNE
 STATISTICAL SUMMARY OF ANALYTICAL RESULTS
 BACKGROUND - HOLLAND MILL CREEK
 SEDIMENT - SEMIVOLATILE ORGANIC COMPOUNDS

PARAMETER	MINIMUM DETECTED VALUE (ug/kg)	MAXIMUM DETECTED VALUE (ug/kg)	SAMPLE No. OF MAXIMUM DETECTED VALUE	ARITHMETIC AVERAGE (ug/kg)	RME (ug/kg)	LOG NORMAL UPPER 95% CONFIDENCE LEVEL (ug/kg)	No. OF TIMES DETECTED	No. OF TIMES ANALYZED	FREQUENCY OF DETECTION
Di-n-butylphthalate	534.00	619.00	+ HM-SD02-612	423.29	573.31	766.73	3	7	43%
bis(2-Ethylhexyl)phthalate	454.00	454.00	*+ HM-SD03-612	378.64	500.04	607.73	1	7	14%

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MARINE CORPS BASE CAMP LEJEUNE
 STATISTICAL SUMMARY OF ANALYTICAL RESULTS
 BACKGROUND - HOLLAND MILL CREEK
 SEDIMENT - VOLATILE ORGANIC COMPOUNDS

PARAMETER	MINIMUM DETECTED VALUE (ug/kg)	MAXIMUM DETECTED VALUE (ug/kg)	SAMPLE No. OF MAXIMUM DETECTED VALUE	ARITHMETIC AVERAGE (ug/kg)	RME (ug/kg)	LOG NORMAL UPPER 95% CONFIDENCE LEVEL (ug/kg)	No. OF TIMES DETECTED	No. OF TIMES ANALYZED	FREQUENCY OF DETECTION
NO VOLATILE ORGANIC COMPOUNDS WERE DETECTED									

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MARINE CORPS BASE CAMP LEJEUNE
 STATISTICAL SUMMARY OF ANALYTICAL RESULTS
 BACKGROUND - WEBB CREEK
 SEDIMENT - METALS

PARAMETER	MINIMUM DETECTED VALUE (mg/kg)	MAXIMUM DETECTED VALUE (mg/kg)	SAMPLE No. OF MAXIMUM DETECTED VALUE	ARITHMETIC AVERAGE (mg/kg)	RME (mg/kg)	LOG NORMAL UPPER 95% CONFIDENCE LEVEL (mg/kg)	No. OF TIMES DETECTED	No. OF TIMES ANALYZED	FREQUENCY OF DETECTION
Aluminum	8200.00	14800.00	*+ WC-SD02-06	12275.00	15932.10	19239.95	4	4	100%
Barium	13.30	28.20	+ WC-SD02-06	18.83	26.76	35.92	4	4	100%
Cadmium	0.06	0.26	+ WC-SD02-06	0.13	0.24	1.11	4	4	100%
Calcium	2190.00	4060.00	*+ WC-SD02-06	3222.50	4132.21	4914.08	4	4	100%
Chromium	8.70	42.60	+ WC-SD03-612	24.93	42.26	246.57	4	4	100%
Cobalt	3.50	3.90	*+ WC-SD03-612	2.44	4.16	21.71	2	4	50%
Iron	8120.00	20700.00	+ WC-SD03-612	13980.00	20133.62	29586.84	4	4	100%
Lead	5.10	16.90	+ WC-SD02-06	9.85	16.48	51.03	4	4	100%
Magnesium	618.00	6060.00	*+ WC-SD03-612	3197.00	6127.63	817766.37	4	4	100%
Manganese	26.00	47.80	*+ WC-SD03-612	39.35	50.44	60.95	4	4	100%
Mercury	0.23	0.40	*+ WC-SD02-06	0.31	0.41	0.48	4	4	100%
Nickel	3.80	11.40	+ WC-SD03-612	7.25	11.11	21.80	4	4	100%
Potassium	1410.00	1590.00	*+ WC-SD03-612	905.88	1719.51	81148.45	2	4	50%
Thallium	0.24	0.24	+ WC-SD03-06	0.16	0.23	0.31	1	4	25%
Vanadium	11.90	31.00	+ WC-SD03-612	21.33	30.50	45.84	4	4	100%
Zinc	27.20	52.00	+ WC-SD02-06	33.83	48.09	61.59	4	4	100%

* = THE RME IS GREATER THAN THE MAXIMUM DETECTED VALUE; THEREFORE, THE MAXIMUM VALUE IS USED TO CALCULATE CHRONIC DAILY INTAKE

+ = THE LOG NORMAL 95% UCL IS GREATER THAN THE MAXIMUM DETECTED VALUE; THEREFORE, THE MAXIMUM VALUE IS USED TO CALCULATE CHRONIC DAILY INTAKE

*+ = BOTH THE RME AND LOG NORMAL 95% UCL ARE GREATER THAN THE MAXIMUM DETECTED VALUE; THEREFORE, THE MAXIMUM VALUE IS USED TO CALCULATE CHRONIC DAILY INTAKE

RME = REASONABLE MAXIMUM EXPOSURE

NA = NOT APPLICABLE

MARINE CORPS BASE CAMP LEJEUNE
 STATISTICAL SUMMARY OF ANALYTICAL RESULTS
 BACKGROUND - WEBB CREEK
 SEDIMENT - PESTICIDES/PCBs

PARAMETER	MINIMUM DETECTED VALUE (ug/kg)	MAXIMUM DETECTED VALUE (ug/kg)	SAMPLE No. OF MAXIMUM DETECTED VALUE	ARITHMETIC AVERAGE (ug/kg)	RME (ug/kg)	LOG NORMAL UPPER 95% CONFIDENCE LEVEL (ug/kg)	No. OF TIMES DETECTED	No. OF TIMES ANALYZED	FREQUENCY OF DETECTION
delta-BHC	0.79	0.79	*+ WC-SD02-612	1.99	3.02	9.99	1	4	25%
Aldrin	1.20	1.20	*+ WC-SD02-06	1.93	2.65	3.66	1	4	25%
Dieldrin	3.70	3.70	*+ WC-SD02-06	4.00	4.79	4.98	1	4	25%
4,4'-DDE	16.00	16.00	+ WC-SD02-06	7.08	14.12	97.81	1	4	25%
4,4'-DDD	12.00	12.00	+ WC-SD02-06	6.08	10.78	28.91	1	4	25%
4,4'-DDT	0.76	2.60	*+ WC-SD02-06	2.37	4.64	91.00	3	4	75%

* = THE RME IS GREATER THAN THE MAXIMUM DETECTED VALUE; THEREFORE, THE MAXIMUM VALUE IS USED TO CALCULATE CHRONIC DAILY INTAKE

+ = THE LOG NORMAL 95% UCL IS GREATER THAN THE MAXIMUM DETECTED VALUE; THEREFORE, THE MAXIMUM VALUE IS USED TO CALCULATE CHRONIC DAILY INTAKE

*+ = BOTH THE RME AND LOG NORMAL 95% UCL ARE GREATER THAN THE MAXIMUM DETECTED VALUE; THEREFORE, THE MAXIMUM VALUE IS USED TO CALCULATE CHRONIC DAILY INTAKE

RME = REASONABLE MAXIMUM EXPOSURE

NA = NOT APPLICABLE

MARINE CORPS BASE CAMP LEJEUNE
 STATISTICAL SUMMARY OF ANALYTICAL RESULTS
 BACKGROUND - WEBB CREEK
 SEDIMENT - SEMIVOLATILE ORGANIC COMPOUNDS

PARAMETER	MINIMUM DETECTED VALUE (ug/kg)	MAXIMUM DETECTED VALUE (ug/kg)	SAMPLE No. OF MAXIMUM DETECTED VALUE	ARITHMETIC AVERAGE (ug/kg)	RME (ug/kg)	LOG NORMAL UPPER 95% CONFIDENCE LEVEL (ug/kg)	No. OF TIMES DETECTED	No. OF TIMES ANALYZED	FREQUENCY OF DETECTION
Benzo(a)pyrene	544.00	544.00	*+ WC-SD03-612	436.25	554.81	635.17	1	4	25%

* = THE RME IS GREATER THAN THE MAXIMUM DETECTED VALUE; THEREFORE, THE MAXIMUM VALUE IS USED TO CALCULATE CHRONIC DAILY INTAKE

+ = THE LOG NORMAL 95% UCL IS GREATER THAN THE MAXIMUM DETECTED VALUE; THEREFORE, THE MAXIMUM VALUE IS USED TO CALCULATE CHRONIC DAILY INTAKE

*+ = BOTH THE RME AND LOG NORMAL 95% UCL ARE GREATER THAN THE MAXIMUM DETECTED VALUE; THEREFORE, THE MAXIMUM VALUE IS USED TO CALCULATE CHRONIC DAILY INTAKE

RME = REASONABLE MAXIMUM EXPOSURE

NA = NOT APPLICABLE

MARINE CORPS BASE CAMP LEJEUNE
 STATISTICAL SUMMARY OF ANALYTICAL RESULTS
 BACKGROUND - WEBB CREEK
 SEDIMENT - VOLATILE ORGANIC COMPOUNDS

PARAMETER	MINIMUM DETECTED VALUE (ug/kg)	MAXIMUM DETECTED VALUE (ug/kg)	SAMPLE No. OF MAXIMUM DETECTED VALUE	ARITHMETIC AVERAGE (ug/kg)	RME (ug/kg)	LOG NORMAL UPPER 95% CONFIDENCE LEVEL (ug/kg)	No. OF TIMES DETECTED	No. OF TIMES ANALYZED	FREQUENCY OF DETECTION
NO VOLATILE ORGANIC COMPOUNDS WERE DETECTED									

* = THE RME IS GREATER THAN THE MAXIMUM DETECTED VALUE; THEREFORE, THE MAXIMUM VALUE IS USED TO CALCULATE CHRONIC DAILY INTAKE

+ = THE LOG NORMAL 95% UCL IS GREATER THAN THE MAXIMUM DETECTED VALUE; THEREFORE, THE MAXIMUM VALUE IS USED TO CALCULATE CHRONIC DAILY INTAKE

*+ = BOTH THE RME AND LOG NORMAL 95% UCL ARE GREATER THAN THE MAXIMUM DETECTED VALUE; THEREFORE, THE MAXIMUM VALUE IS USED TO CALCULATE CHRONIC DAILY INTAKE

RME = REASONABLE MAXIMUM EXPOSURE

NA = NOT APPLICABLE

**Analytical Summary of Results
(Surface Water)**

MARINE CORPS BASE CAMP LEJEUNE
 ANALYTICAL SUMMARY OF RESULTS
 BACKGROUND - HADNOT CREEK
 SURFACE WATER - METALS

BAKER I.D.	HC-SW01	HC-SW02	HC-SW03	HC-SW03D	HC-SW04
LABORATORY I.D.	5167-16	5162	5166	5163	5152
DATE COLLECTED	08-MAY-1994	06-MAY-1994	06-MAY-1994	06-MAY-1994	08-MAY-1994
UNITS	UG/L	UG/L	UG/L	UG/L	UG/L
Aluminum	356 U	303 U	301 U	187 U	692
Arsenic	1 U	1 UJ	20	10 UJ	1 U
Barium	19 J	20 J	26 J	24 J	9 J
Calcium	27000	36600	86600	107000	11600
Chromium	9 U	19 U	130 J	125 J	9 U
Iron	746	528	339	291	556
Magnesium	1450	44800	633000	613000	954
Potassium	1670 U	14500	203000	202000	1670 U
Selenium	1 U	5 U	6 J	1 UJ	1 UJ
Sodium	6900	383000	2090000	2560000	6090

MARINE CORPS BASE CAMP LEJEUNE
ANALYTICAL SUMMARY OF RESULTS
BACKGROUND - HADNOT CREEK
SURFACE WATER PESTICIDES AND PCBs

BAKER I.D.	HC-SW01	HC-SW02	HC-SW03	HC-SW03D	HC-SW04
LABORATORY I.D.	5167-16	5162	5166	5163	5152
DATE COLLECTED	08-MAY-1994	06-MAY-1994	06-MAY-1994	06-MAY-1994	08-MAY-1994
UNITS	ug/l	ug/l	ug/l	ug/l	ug/l

NO PESTICIDES OR PCBs WERE DETECTED

MARINE CORPS BASE CAMP LEJEUNE
ANALYTICAL SUMMARY OF RESULTS
BACKGROUND - HADNOT CREEK
SURFACE WATER - SEMIVOLATILE ORGANIC COMPOUNDS

BAKER I.D.	HC-SW01	HC-SW02	HC-SW03	HC-SW03D	HC-SW04
LABORATORY I.D.	5167-16	5162	5166	5163	5152
DATE COLLECTED	08-MAY-1994	06-MAY-1994	06-MAY-1994	06-MAY-1994	08-MAY-1994
UNITS	ug/l	ug/l	ug/l	ug/l	ug/l

NO SEMIVOLATILE ORGANIC COMPOUNDS WERE DETECTED

MARINE CORPS BASE CAMP LEJEUNE
ANALYTICAL SUMMARY OF RESULTS
BACKGROUND - HADNOT CREEK
SURFACE WATER - VOLATILE ORGANIC COMPOUNDS

BAKER I.D.	HC-SW01	HC-SW02	HC-SW03	HC-SW03D	HC-SW04
LABORATORY I.D.	5167-16	5162	5166	5163	5152
DATE COLLECTED	08-MAY-1994	06-MAY-1994	06-MAY-1994	06-MAY-1994	08-MAY-1994
UNITS	ug/l	ug/l	ug/l	ug/l	ug/l

NO VOLATILE ORGANIC COMPOUNDS WERE DETECTED

MARINE CORPS BASE CAMP LEJEUNE
 ANALYTICAL SUMMARY OF RESULTS
 BACKGROUND - HOLLAND MILL CREEK
 SURFACE WATER - METALS

BAKER I.D.	HM-SW01	HM-SW02	HM-SW03
LABORATORY I.D.	5167-18	5161	5160
DATE COLLECTED	08-MAY-1994	06-MAY-1994	06-MAY-1994
UNITS	UG/L	UG/L	UG/L
Aluminum	259 U	535 J	288 U
Barium	49 J	38 J	20 J
Calcium	14100	40200	302000
Chromium	10 U	36 J	158 J
Iron	425	559	320
Lead	1 U	2.5 U	58.1
Magnesium	2830	109000	754000
Potassium	1670 U	41100	288000
Selenium	1.5 J	5 U	41 J
Silver	10 U	17 U	37 J
Sodium	16500	739000	6750000

MARINE CORPS BASE CAMP LEJEUNE
ANLAYTICAL SUMMARY OF RESULTS
BACKGROUND - HOLLAND MILL CREEK
SURFACE WATER - PESTICIDES AND PCBs

BAKER I.D.	HM-SW01	HM-SW02	HM-SW03
LABORATORY I.D.	5167-18	5161	5160
DATE COLLECTED	08-MAY-1994	06-MAY-1994	06-MAY-1994
UNITS	ug/l	ug/l	ug/l

NO PESTICIDES OR PCBs WERE DETECTED

MARINE CORPS BASE CAMP LEJEUNE
ANALYTICAL SUMMARY OF RESULTS
BACKGROUND - HOLLAND MILL CREEK
SURFACE WATER - SEMIVOLATILE ORGANIC COMPOUNDS

BAKER I.D.	HM-SW01	HM-SW02	HM-SW03
LABORATORY I.D.	5167-18	5161	5160
DATE COLLECTED	08-MAY-1994	06-MAY-1994	06-MAY-1994
UNITS	ug/l	ug/l	ug/l

NO SEMIVOLATILE ORGANIC COMPOUNDS WERE DETECTED

MARINE CORPS BASE CAMP LEJEUNE
ANALYTICAL SUMMARY OF RESULTS
BACKGROUND - HOLLAND MILL CREEK
SURFACE WATER - VOLATILE ORGANIC COMPOUNDS

BAKER I.D.	HM-SW01	HM-SW02	HM-SW03
LABORATORY I.D.	5167-18	5161	5160
DATE COLLECTED	08-MAY-1994	06-MAY-1994	06-MAY-1994
UNITS	ug/l	ug/l	ug/l

NO VOLATILE ORGANIC COMPOUNDS WERE DETECTED

MARINE CORPS BASE CAMP LEJEUNE
ANALYTICAL SUMMARY OF RESULTS
BACKGROUND - WEBB CREEK
SURFACE WATER - METALS

BAKER I.D.	WC-SW02	WC-SW03
LABORATORY I.D.	5167-8	5158
DATE COLLECTED	06-MAY-1994	06-MAY-1994
UNITS	UG/L	UG/L
Barium	29 J	27 J
Calcium	46900	40500
Chromium	15 U	97 J
Iron	660	321
Magnesium	29000	44800
Potassium	10900	136000
Sodium	202000	895000

MARINE CORPS BASE CAMP LEJEUNE
ANALYTICAL SUMMARY OF RESULTS
BACKGROUND - WEBB CREEK
SURFACE WATER - PESTICIDES AND PCBs

BAKER I.D.	WC-SW02	WC-SW03
LABORATORY I.D.	5167-8	5158
DATE COLLECTED	06-MAY-1994	06-MAY-1994
UNITS	ug/l	ug/l
Aldrin	0.035 J	0.05 U

MARINE CORPS BASE CAMP LEJEUNE
ANALYTICAL SUMMARY OF RESULTS
BACKGROUND - WEBB CREEK
SURFACE WATER - SEMIVOLATILE ORGANIC COMPOUNDS

BAKER I.D.	WC-SW02	WC-SW03
LABORATORY I.D.	5167-8	5158
DATE COLLECTED	06-MAY-1994	06-MAY-1994
UNITS	ug/l	ug/l

NO SEMIVOLATILE ORGANIC COMPOUNDS WERE DETECTED

MARINE CORPS BASE CAMP LEJEUNE
ANALYTICAL SUMMARY OF RESULTS
BACKGROUND - WEBB CREEK
SURFACE WATER - VOLATILE ORGANIC COMPOUNDS

BAKER I.D.	WC-SW02	WC-SW03
LABORATORY I.D.	5167-8	5158
DATE COLLECTED	06-MAY-1994	06-MAY-1994
UNITS	ug/l	ug/l

NO VOLATILE ORGANIC COMPOUNDS WERE DETECTED

**Analytical Summary of Results
(Sediment)**

MARINE CORPS BASE CAMP LEJEUNE¹
 ANALYTICAL SUMMARY OF RESULTS
 BACKGROUND - HADNOT CREEK
 SEDIMENT - METALS

BAKER I.D.	HC-SD01-06	HC-SD01-612	HC-SD02-06	HC-SD02-612	HC-SD03-06	HC-SD03-06D	HC-SD03-612	HC-SD04-06	HC-SD04-612
LABORATORY I.D	5050	5044	5057-2	5054	5238	5237	5236	5052	5051
DATE COLLECTED	8-MAY-1994	8-MAY-1994	6-MAY-1994	6-MAY-1994	07-MAY-1994	07-MAY-1994	07-MAY-1994	8-MAY-1994	8-MAY-1994
UNITS	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG
Aluminum	2940 J	1880 J	7820 J	10100 J	3120 J	7310 J	14000 J	780 J	1260 J
Arsenic	0.46 J	0.28 J	1.1 J	1.9 J	7.5 U	6.5 U	7.9 U	0.45 J	0.26 J
Barium	16.3 J	14.6 J	9.2 J	8.7 J	3.9 U	10.2	17.2	4.1 J	5.5 J
Beryllium	0.14 J	0.16 U	0.25 J	0.32 J	0.95 R	0.92 R	1.3 R	0.13 U	0.15 U
Cadmium	0.03 J	0.03 J	0.1 J	0.04 J	0.66	0.08	0.04 U	0.03 J	0.03 UJ
Calcium	3620 J	3330 J	2030 J	1610 J	3380 J	3350 J	3310 J	1030 J	2150 J
Chromium	2.3	3.2	6	6	16.1	18.8	41.6	2	1.3
Cobalt	1.6 U	1.8 U	2.7 U	1.8 U	3.7 U	4.5	5	1.5 U	1.6 U
Copper	1	1.1	1.5	0.81	4.9 U	4.3 U	3.5 U	0.66	0.73
Iron	648	586	3660	4630	7280 J	11100 J	1700 J	382	583
Lead	0.77 R	0.88 R	1.1 R	7.1 R	5.3	3.7	8.6 R	1 R	1.1 R
Magnesium	87.7	77.1	1450	1040	4420	4130	6540	48.2 U	62.5 U
Manganese	6.9	6.5	6.5	4.9	17.1	35.1	64.7	3.7	3.5
Mercury	0.19 R	0.13 R	0.42 R	0.24 R	0.34	0.25	0.42	0.11 R	0.08 R
Nickel	1.8 U	1.8 U	2.7 U	1.8	9.9	5.5	12.1	1.5 U	1.6 U
Potassium	349 U	396 U	623	395 U	1420	1250	1840	324 U	355 U
Selenium	0.27 J	0.34 J	0.6 J	0.47 J	0.48 UJ	0.41 UJ	0.51 UJ	0.21 J	0.2 UJ
Sodium	339 U	385 U	2750	1630	14100 R	9860 R	6620 R	315 U	344 U
Thallium	0.14	0.16	0.42	0.28	0.34 U	0.29	0.44	0.13 U	0.15 U
Vanadium	2.6	2.8	8.4	7	20.5	18.4	36.9	1.5	1.9
Zinc	4.9 U	4.5 U	9.7 U	6.6 U	20.8	34.3	40	4.5 U	8.3 U

MARINE COPRS BASE CAMP LEJEUNE
 ANALYTICAL SUMMARY OF RESULTS
 BACKGROUND - HADNOT CREEK
 SEDIMENT - PESTICIDES AND PCBs

BAKER I.D.	HC-SD01-06	HC-SD01-612	HC-SD02-06	HC-SD02-612	HC-SD03-06	HC-SD03-06D	HC-SD03-612	HC-SD04-06	HC-SD04-612
LABORATORY I.D.	5057-7	5044	5055	5054	5238	5237	5236	5052	5051
DATE COLLECTED	8-MAY-1994	8-MAY-1994	6-MAY-1994	6-MAY-1994	07-MAY-1994	07-MAY-1994	07-MAY-1994	8-MAY-1994	8-MAY-1994
UNITS	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
beta-BHC	2.4 U	2.8 U	4.2 U	2.8 U	5.8 U	4.9 U	6.2 U	2.3 U	1.7 J
delta-BHC	0.64 J	2.8 U	4.2 U	2.8 U	5.8 U	4.9 U	6.2 U	2.3 U	2.5 U
Heptachlor	0.48 J	2.8 U	4.2 U	2.8 U	5.8 U	4.9 U	6.2 U	2.3 U	2 J
4,4'-DDD	2.4 U	2.8 U	1.5 J	2.8 U	11 U	2 J	4 J	2.3 U	2.5 U
4,4'-DDT	4.7 U	5.4 U	8.2 U	5.3 U	11 U	1.2 J	12 U	4.4 U	4.8 U
Methoxychlor	24 U	28 U	42 U	28 U	58 U	49 U	62 U	0.94 J	25 U
Endrin aldehyde	0.59 J	5.4 U	7.1 J	0.77 J	11 U	9.6 U	12 U	4.4 U	4.8 U

MARINE CORPS BASE CAMP LEJEUNE
ANALYTICAL SUMMARY OF RESULTS
BACKGROUND - HADNOT CREEK
SEDIMENT - SEMIVOLATILE ORGANIC COMPOUNDS

BAKER I.D.	HC-SD01-06	HC-SD01-612	HC-SD02-06	HC-SD02-612	HC-SD03-06	HC-SD03-06D	HC-SD03-612	HC-SD04-06	HC-SD04-612
LABORATORY I.D.	5057-7	5044	5055	5054	5238	5237	5236	5052	5051
DATE COLLECTED	8-MAY-1994	8-MAY-1994	6-MAY-1994	6-MAY-1994	07-MAY-1994	07-MAY-1994	07-MAY-1994	8-MAY-1994	8-MAY-1994
UNITS	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg

NO SEMIVOLATILE ORGANIC COMPOUNDS WERE DETECTED

MARINE CORPS BASE CAMP LEJEUNE
 ANALYTICAL SUMMARY OF RESULTS
 BACKGROUND - HADNOT CREEK
 SEDIMENT - VOLATILE ORGANIC COMPOUNDS

BAKER I.D.	HC-SD01-06	HC-SD01-612	HC-SD02-06	HC-SD02-612	HC-SD03-06	HC-SD03-06D	HC-SD03-612	HC-SD04-06	HC-SD04-612
LABORATORY I.D.	5057-7	5044	5055	5054	5238	5237	5236	5052	5051
DATE COLLECTED	8-MAY-1994	8-MAY-1994	6-MAY-1994	6-MAY-1994	07-MAY-1994	07-MAY-1994	07-MAY-1994	8-MAY-1994	8-MAY-1994
UNITS	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Acetone	70 J	16 UJ	25 UJ	16 UJ	34 UJ	29 UJ	37 UJ	13 UJ	15 UJ
Carbon Disulfide	14 U	16 U	14	19 J	34 U	29 U	37 U	13 U	15 U
2-Butanone	7 J	16 UJ	25 UJ	16 UJ	34 UJ	29 UJ	37 UJ	13 UJ	15 UJ

MARINE CORPS BASE CAMP LEJEUNE
ANALYTICAL SUMMARY OF RESULTS
BACKGROUND - HOLLAND MILL CREEK
SEDIMENT - METALS

BAKER I.D.	HM-SD01-06	HM-SD01-06D	HM-SD01-612	HM-SD02-06	HM-SD02-612	HM-SD03-06	HM-SD03-612
LABORATORY I.D.	5243-18	5220	5219	5242	5241	5240	5239
DATE COLLECTED	08-MAY-1994	08-MAY-1994	08-MAY-1994	07-MAY-1994	07-MAY-1994	07-MAY-1994	07-MAY-1994
UNITS	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG
Aluminum	457 J	337 J	505 J	13600 J	9850 J	8760 J	9760 J
Barium	3.4 U	2.1 U	3.9 U	18.7	13.7	11	12.9
Cadmium	0.03	0.11	0.03	0.08	0.06	0.05	0.03
Calcium	282 J	508 J	2850 J	4250 J	7860 J	2920 J	2000 J
Chromium	1.6	1.1	1.5	38.4	28.1	30.7	36
Cobalt	1.3 U	1.4 U	1.4 U	4.4	3.5 U	3.9 U	4
Iron	262 J	225 J	350 J	15800 J	32400 J	16900 J	19900 J
Lead	0.62 J	0.74 J	1	6	7.2	9.2	5.7
Magnesium	35.5	26.7	34.4	4940	3000	5700	4300
Manganese	1.9	1.3	1.6	67.2	55.5	50.2	61.3
Mercury	0.09	0.16	0.18	0.27	0.32	0.35	0.27
Nickel	1.3 U	1.4 U	1.4 U	11.2	9.6	14.2	10.3
Potassium	297 U	304 U	317 U	1510	1600	1720	1760
Selenium	0.17 U	0.17 U	0.25 J	0.4 J	0.45 UJ	0.5 UJ	0.37 UJ
Silver	0.49	0.37 U	0.39 U	0.85 U	0.95 U	1.1 U	0.79 U
Thallium	0.12 U	0.12 U	0.13	0.37	0.32	0.35 U	0.27
Vanadium	0.84	0.62 U	0.66	27.1	30	28.4	29.5
Zinc	9.7	6.7	8.3	43.1	33.2	34.1	29.9

MARINE CORPS BASE CAMP LEJEUNE
 ANALYTICAL SUMMARY OF RESULTS
 BACKGROUND - HOLLAND MILL CREEK
 SEDIMENT - PESTICIDES AND PCBs

BAKER I.D.	HM-SD01-06	HM-SD01-06D	HM-SD01-612	HM-SD02-06	HM-SD02-612	HM-SD03-06	HM-SD03-612
LABORATORY I.D.	5243-18	5220	5219	5242	5241	5240	5239
DATE COLLECTED	08-MAY-1994	08-MAY-1994	08-MAY-1994	07-MAY-1994	07-MAY-1994	07-MAY-1994	07-MAY-1994
UNITS	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
beta-BHC	2.1 UJ	7.3 J	3.8	5.1 U	5.5 U	6 U	4.5 U
Aldrin	2.1 U	0.56 J	0.72 J	5.1 U	5.5 U	6 U	4.5 U
Dieldrin	4 U	0.58 J	1.5 J	9.8 U	11 U	12 U	8.8 U
4,4'-DDE	4 U	1 J	4.3	9.8 U	11 U	12 U	8.8 U
4,4'-DDD	4 U	0.87 J	3.1	9.8 U	11 U	2.5 J	1.1 J
4,4'-DDT	4 U	4.1 U	1.7 J	9.8 U	11 U	12 U	8.8 U
alpha-Chlordane	2.1 U	2.1 U	1.3 J	5.1 U	5.5 U	6 U	4.5 U
gamma-Chlordane	2.1 U	2.1 U	3	5.1 U	5.5 U	6 U	4.5 U

MARINE CORPS BASE CAMP LEJEUNE
 ANALYTICAL SUMMARY OF RESULTS
 BACKGROUND - HOLLAND MILL CREEK
 SEDIMENT - SEMIVOLATILE ORGANIC COMPOUNDS

BAKER I.D.	HM-SD01-06	HM-SD01-06D	HM-SD01-612	HM-SD02-06	HM-SD02-612	HM-SD03-06	HM-SD03-612
LABORATORY I.D.	5243-18	5220	5219	5242	5241	5240	5239
DATE COLLECTED	08-MAY-1994	08-MAY-1994	08-MAY-1994	07-MAY-1994	07-MAY-1994	07-MAY-1994	07-MAY-1994
UNITS	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Di-n-butylphthalate	401 U	412 U	429 U	614 J	619 J	1150 U	534 J
bis(2-Ethylhexyl)phthalate	401 UJ	412 UJ	429 UJ	943 U	1058 U	1150 U	454 J

MARINE CORPS BASE CAMP LEJEUNE
ANALYTICAL SUMMARY OF RESULTS
BACKGROUND - HOLLAND MILL CREEK
SEDIMENT - VOLATILE ORGANIC COMPOUNDS

BAKER I.D.	HM-SD01-06	HM-SD01-06D	HM-SD01-612	HM-SD02-06	HM-SD02-612	HM-SD03-06	HM-SD03-612
LABORATORY I.D.	5243-18	5220	5219	5242	5241	5240	5239
DATE COLLECTED	08-MAY-1994	08-MAY-1994	08-MAY-1994	07-MAY-1994	07-MAY-1994	07-MAY-1994	07-MAY-1994
UNITS	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg

NO VOLATILE ORGANIC COMPOUNDS WERE DETECTED

MARINE CORPS BASE CAMP LEJEUNE
 ANALYTICAL SUMMARY OF RESULTS
 BACKGROUND - WEBB CREEK
 SEDIMENT - METALS

BAKER I.D.	WC-SD02-06	WC-SD02-612	WC-SD03-06	WC-SD03-612
LABORATORY I.D.	5243-10	5232	5235	5234
DATE COLLECTED	06-MAY-1994	06-MAY-1994	07-MAY-1994	07-MAY-1994
UNITS	MG/KG	MG/KG	MG/KG	MG/KG
Aluminum	14800 J	8200	11500 J	14600 J
Barium	28.2	13.3	14.6	19.2
Cadmium	0.26	0.12	0.06	0.07
Calcium	4060 J	3260 J	2190 J	3380 J
Chromium	18.1	8.7	30.3	42.6
Cobalt	3.5	2.3 U	2.4 U	3.9
Iron	14600 J	8120	12500 J	20700 J
Lead	16.9	11.9	5.1	5.5
Magnesium	1690	618	4420	6060
Manganese	40.2	26	43.4	47.8
Mercury	0.4	0.36	0.23	0.26
Nickel	5.7	3.8	8.1	11.4
Potassium	739 U	508 U	1410	1590
Thallium	0.3 U	0.21 U	0.24	0.32 U
Vanadium	21	11.9	21.4	31
Zinc	52	27.8	28.3	27.2

MARINE CORPS BASE CAMP LEJEUNE
 ANALYTICAL SUMMARY OF RESULTS
 BACKGROUND - WEBB CREEK
 SEDIMENT - PESTICIDES AND PCBs

BAKER I.D.	WC-SD02-06	WC-SD02-612	WC-SD03-06	WC-SD03-612
LABORATORY I.D.	5243-10	5232	5235	5234
DATE COLLECTED	06-MAY-1994	06-MAY-1994	07-MAY-1994	07-MAY-1994
UNITS	ug/kg	ug/kg	ug/kg	ug/kg
delta-BHC	5.2 U	0.79 J	3.7 U	5.4 U
Aldrin	1.2 J	3.9 U	3.7 U	5.4 U
Dieldrin	3.7 J	7.5 U	7.1 U	10 U
4,4'-DDE	16	7.5 U	7.1 U	10 U
4,4'-DDD	12	7.5 U	7.1 U	10 U
4,4'-DDT	2.6 J	1.1 J	0.76 J	10 U

MARINE CORPS BASE CAMP LEJEUNE
ANALYTICAL SUMMARY OF RESULTS
BACKGROUND - WEBB CREEK
SEDIMENT - SEMIVOLATILE ORGANIC COMPOUNDS

BAKER I.D.	WC-SD02-06	WC-SD02-612	WC-SD03-06	WC-SD03-612
LABORATORY I.D.	5243-10	5232	5235	5234
DATE COLLECTED	06-MAY-1994	06-MAY-1994	07-MAY-1994	07-MAY-1994
UNITS	ug/kg	ug/kg	ug/kg	ug/kg
Benzo(a)pyrene	1000 U	688 U	714 U	544 J

MARINE CORPS BASE CAMP LEJEUNE
ANALYTICAL SUMMARY OF RESULTS
BACKGROUND - WEBB CREEK
SEDIMENT - VOLATILE ORGANIC COMPOUNDS

BAKER I.D.	WC-SD02-06	WC-SD02-612	WC-SD03-06	WC-SD03-612
LABORATORY I.D.	5243-10	5232	5235	5234
DATE COLLECTED	06-MAY-1994	06-MAY-1994	07-MAY-1994	07-MAY-1994
UNITS	ug/kg	ug/kg	ug/kg	ug/kg

NO VOLATILE ORGANIC COMPOUNDS WERE DETECTED

Field Chemistry Results

**FIELD CHEMISTRY FROM BIOLOGICAL SAMPLES
HADNOT CREEK, HOLLAND MILL CREEK, AND WEBB CREEK
MCB CAMP LEJEUNE, NORTH CAROLINA**

Sample Identification	Sample Location	Salinity (ppt)	Conductivity (micromhos/cm)	DO (mg/L)	pH (S.U.)	Temperature (deg. C)
HC01-SW/SD-FS/BN	surface	0	13.5	7.7	6.89	17
	bottom	NA	NA	NA	NA	NA
HC02-SW/SD	surface	0.8	1,810	5.9	6.71	16.1
	bottom	15.5	21,900	1.0	6.73	18.2
HC02-FS/BN	surface	0.3	1,200	NA	NA	20.5
	bottom	13.1	20,900	NA	NA	22
	surface	0	720	7.3	7.2	15.5
	bottom	10.5	17,200	1	6.7	20
HC03-SW/SD	surface	0	1,050	NA	NA	20.5
	bottom	16.5	22,800	NA	NA	21
HC03-FS/BN	surface	17	25,500	12	7.79	17.5
	bottom	NA	NA	NA	NA	NA
HC04-SW/SD-FS/BN	surface	17.9	26,500	NA	7.69	17.8
	bottom	NA	NA	NA	NA	NA
HM01-SW/SD-FS/BN	surface	0	65	5.3	6.16	17.3
	bottom	NA	NA	NA	NA	NA
HM02-SW/SD	surface	0	140	8.0	6.9	17.5
	bottom	NA	NA	NA	NA	NA
	surface	24	36,000	11.8	7.9	17.2
	bottom	25	38,000	11.6	7.6	17.6
HM02-FS/BN	surface	21	29,000	7.75	NA	21
	bottom	19	27,000	7.75	NA	20
	surface	2	3,810	NA	NA	19
	bottom	3.75	6,000	NA	NA	19.5
HM03-SW/SD	surface	1	2,490	5.8	6.85	15.5
	bottom	1.1	2,700	5.0	6.72	15.2
HM03-FS/BN	surface	13.5	19,000	3.4	6.81	17.8
	bottom	NA	NA	NA	NA	NA
HM03-FS/BN	surface	22	32,000	10.8	7.90	17.5
	bottom	NA	NA	NA	NA	NA

Sample Identification	Sample Location	Salinity (ppt)	Conductivity (micromhos/cm)	DO (mg/L)	pH (S.U.)	Temperature (deg. C)
WC02-SW/SD	surface	4.5	9,000	9.0	7.48	21
	bottom	5.5	9,000	7.0	7.48	20.5
	surface	0	975	5.1	7.08	17.5
	bottom	0	1,250	4.4	7.15	17.5
WC02-FS/BN	surface	0	850	5.5	6.98	20.5
	bottom	7	10,500	6.1	6.85	21
WC03-SW/SD	surface	10	16,500	10	7.33	23
	bottom	10	16,500	8.5	7.36	22.4
WC03-FS/BN	surface	12	17,200	9.1	7.43	20
	bottom	12.8	18,000	9.6	7.56	19

ppt = parts per thousand

S.U. = Standard Units

NA = Not Analyzed

Sample Location = Water surface or water bottom

DO = Dissolved Oxygen level

FS = Fish sample

BN = Benthic Macroinvertebrate sample

SW/SD = Surface water/sediment sample

**Positive Detection Summary
Fish Fillet Tissue Analysis**

MARINE CORPS BASE CAMP LEJEUNE
 BACKGROUND - HADNOT CREEK
 POSITIVE DETECTIONS SUMMARY
 FISH FILLET TISSUE SAMPLES

Parameter	HC1A-RD (Red Drum) (mg/kg)	HC1A-SF (Southern Flounder) (mg/kg)	HC1A-LBA (Largemouth Bass) (mg/kg)	HC1A-LBB (Largemouth Bass) (mg/kg)	HC1A-LBC (Largemouth Bass) (mg/kg)	HC1A-BCA (Blue Crab) (mg/kg)	HC1A-BCA (Blue Crab) (mg/kg)	HC1A-GA (Longnose Gar) (mg/kg)	HC1A-GB (Longnose Gar) (mg/kg)
Volatiles									
Acetone	0.13 J	0.056 J	0.077 J	0.07 J	0.037 J	0.11 J	0.099 J	0.028 J	0.016 J
Methylene Chloride	0.041	0.013 B	0.017 B	0.016 B	0.003 B	0.011 B	0.022 B	0.004 B	0.015 B
Semivolatiles									
Phenol	ND	0.46	ND	2.1	1.6	ND	ND	ND	ND
Di-n-octyl phthalate	ND	ND	0.061 J	ND	0.085	ND	ND	0.29 J	0.5 J
Bis(2-ethylhexyl)phthalate	1.1 B	0.82 B	3.6 B	3.2 B	4.8 B	ND	ND	11 J	17 J
Pesticides/PCBs									
4,4'-DDD	ND	ND	ND	ND	ND	0.0066	0.0056	ND	ND
4,4'-DDE	ND	ND	ND	ND	ND	0.0087	0.0048	0.012	0.0097
alpha-Chlordane	ND	ND	ND	ND	0.00017 P	0.0018	0.0012	ND	ND
Aroclor-1260	ND	ND	ND	ND	ND	ND	ND	ND	ND
Inorganics									
Aluminum	ND	ND	ND	36.5	ND	ND	ND	ND	ND
Arsenic	0.7 L	0.82	0.34 L	0.37 L	0.36 K	0.68	0.39	2.5	3.9 L
Barium	ND	ND	ND	ND	ND	ND	10.1	ND	ND
Cadmium	ND	ND	ND	ND	ND	0.14	0.11 J	ND	ND
Calcium	154	271	528	684	1170	4480	32200	493	520
Chromium	0.38 L	ND	0.23 L	0.68 L	0.63 L	ND	0.52 L	0.32 L	0.21 L
Copper	0.3 J	0.18 J	0.2 J	0.24 J	0.28 J	7.9	5.8	0.46 J	0.18 J
Iron	ND	ND	ND	ND	ND	ND	ND	ND	ND
Lead	ND	ND	ND	ND	ND	ND	ND	ND	ND
Magnesium	285	254	298	292	319	591	1800	286	300
Manganese	0.13	0.38	0.09 J	0.09 J	0.08 J	1.8	13.6	0.24 J	0.21 J
Mercury	0.07	0.05	0.22	0.24	0.17 K	0.08	0.02 J	0.22	0.14
Nickel	ND	ND	ND	ND	ND	ND	ND	0.45 L	ND
Potassium	3930	3700	3740	3610	4040	2170	1860	3410	3270
Sodium	1060	607	505	580	529	4060	4270	623	523
Zinc	5	5	3.9	4.4	4.6 L	25	17.9	6.5	4.6

Fish Distribution and Characterization

**FISH DISTRIBUTION AND CHARACTERIZATION
BACKGROUND STATIONS - WEBB, HADNOT, AND HOLLAND MILL CREEKS**

MCB CAMP LEJEUNE, NORTH CAROLINA

Common Name	Scientific Name	Length N.C. (cm)	Length Atlas (cm)	Water Type	Habitat	Spawning	Tolerance	Family	Sources
Atlantic Menhaden	<u>Brevoortia tyrannus</u>	20	46	Brackish or marine, enters freshwater	Rivers, streams	NA	Intermediate	Clupeidae	1,2,3,4
Spot	<u>Leiostomas xanthurus</u>	NA	NA	Brackish or marine, enters freshwater	NA	NA	NA	Sciaenidae	1
Stripped Mullet	<u>Mugil cephalus</u>	NA	23-35	Brackish or marine, enters freshwater	Rivers	NA	NA	Mugilidae	1,2
Pinfish	<u>Lagodon rhomboides</u>	NA	38	Marine, seldom enters freshwater	Shallow waters	NA	NA	Sparidae	1,2
Mud Catfish (Yellow Bullhead)	<u>Ictalurus natalis</u>	24	-38	Freshwater	Rivers Streams	April through May	Tolerant	Ictaluridae	1,2,3
Redbreast Sunfish	<u>Lepomis auritus</u>	18	6-15	Freshwater	Streams	April through June	NA	Centrarchidae	1,2,3
Atlantic Croaker	<u>Micropogonias undulatus</u>	NA	61	Estuaries, brackish- water or marine	NA	NA	NA	Sciaenidae	1,2
Pumpkinseed	<u>Lepomis gibbosus</u>	20	8-20	Freshwater	Streams Creeks	April through October	Moderately Tolerant	Centrarchidae	1,2,3,4
Longnose Gar	<u>Lepisosteus osseus</u>	80	-150	Freshwater; May enter brackish water	Rivers	April through May	Intermediate	Lepisosteidae	1,2,3
Summer Flounder	<u>Paralichthys dentatus</u>	NA	37	Brackish or marine, enters freshwater	Rivers	NA	NA	Bothidae	1
Flier	<u>Centrarchus macropterus</u>	12	7-19	Freshwater	Streams	April through May	NA	Centrarchidae	1,2,3
Chain Pickerel	<u>Esox niger</u>	44	38-45	Freshwater	Streams Creeks	February through March	Intermediate	Esocidae	1,2,3

FISH DISTRIBUTION AND CHARACTERIZATION
BACKGROUND STATIONS - WEBB, HADNOT, AND HOLLAND MILL CREEKS
REMEDIAL INVESTIGATION, CTO-0232
MCB CAMP LEJEUNE, NORTH CAROLINA

Common Name	Scientific Name	Length N.C. (cm)	Length Atlas (cm)	Water Type	Habitat	Spawning	Tolerance	Family	Sources
Redear Fish	<u>Lepomis microlophus</u>	18	14-25	Freshwater	Streams	May through August	Intermediate	Centrarchidae	1,2,3
Warmouth	<u>Lepomis gulosus</u>	16	8-26	Freshwater	Rivers Streams	May through August	Intermediate	Centrarchidae	1,2,3
White Perch	<u>Morone americana</u>	NA	to 48	Brackish water; Freshwater	Bays and estuaries; Rivers and lakes	NA	Intermediate	Percichthyidae	3,5
Bluefish	<u>Pomatomus saltatrix</u>	NA	NA	Coastal waters	Surface waters; Near shore and off shore	NA	NA	Pomatomidae	2
Bluegill	<u>Lepomis macrochirus</u>	25	18-20	Freshwater	Rivers Streams Creeks	May through October	Intermediate	Centrarchidae	1,2,3
White Catfish	<u>Ictalurus catus</u>	31	-46	Freshwater	Rivers	May through June	Intermediate	Ictaluridae	1,2,3
Largemouth Bass	<u>Micropterus salmoides</u>	48	12-70	Freshwater	Rivers Streams Creeks	May through June	Intermediate	Centrarchidae	1,2,3
Mummichog	<u>Fundulus heteroclitus</u>	7	8-10	Shallow coastal waters	Rivers Streams	April through August	NA	Cyprinodontid ae	1,2,3
Redfin Pickerel	<u>Esox americanus</u>	23	25-30	Freshwater	Streams Creeks	February through March	NA	Esocidae	1,2,3
Hog Choker	<u>Trinectes maculatus</u>	5	7-12	Shallow coastal waters; Occasionally enters freshwater	Rivers Streams	March through April	NA	Soleidae	1,2,3

**FISH DISTRIBUTION AND CHARACTERIZATION
 BACKGROUND STATIONS - WEBB, HADNOT, AND HOLLAND MILL CREEKS
 REMEDIAL INVESTIGATION, CTO-0232
 MCB CAMP LEJEUNE, NORTH CAROLINA**

Common Name	Scientific Name	Length N.C. (cm)	Length Atlas (cm)	Water Type	Habitat	Spawning	Tolerance	Family	Sources
Pirate Perch	<u>Aphredoderus sayanus</u>	9	7-14	Freshwater	Streams Creeks	January through March	Intermediate	Aphredoderida e	1,2,3
Eastern Mosquito (Mosquitofish) —	<u>Gambusia affinis</u>	NA	NA	Fresh or brackish water	Ponds, lakes, ditches, backwaters, sluggish streams	NA	Intermediate	Poeciliidae	2,5

1 Menhinick, 1992.

2 Boschung, 1983.

3 USEPA, 1989d.

4 Raasch, 1991.

5 Kennish, 1986.

NA = Information not Available

**TOTAL NUMBER AND PERCENT OF AQUATIC SPECIES IDENTIFIED PER AREA
WEBB CREEK AND HADNOT CREEK**

MCB CAMP LEJEUNE, NORTH CAROLINA

SPECIES	WEBB CREEK		Total Detected	HADNOT CREEK				Total Detected
	WC02	WC03		HC01	HCO2	HC03	HC04	
FISH SPECIES								
Spot	4		4			12		12
Stripped Mullet	4		4			3		3
Pumpkinseed			0		3			3
Mudcat	3		3	3				3
Redbreast sunfish	1		1	2				2
Long-Nosed Gar	9	5	14					0
American flier			0	3				3
Chain pickerel			0	1				1
Redear fish			0	1				1
Atlantic croaker			0			5		5
Warmouth			0		1			1
Bluefish			0			3		3
Yellow Bullhead	3		3	2				2
Blue gill	4		4					0
White catfish	1		1					0
Largemouth bass	2		2					0
Summer flounder		1	1					0
Mummichog		3	3					0
Pinfish	25	24	49			5		5
Atlantic menhaden			0			2		2
Redfin pickerel			0				2	2
White perch			0			1		1
Hog choker			0			1		1
Pirate perch			0				8	8

**TOTAL NUMBER AND PERCENT OF AQUATIC SPECIES IDENTIFIED PER AREA
WEBB CREEK AND HADNOT CREEK**

MCB CAMP LEJEUNE, NORTH CAROLINA

SPECIES	WEBB CREEK		Total Detected	HADNOT CREEK				Total Detected
	WC02	WC03		HC01	HC02	HC03	HC04	
NO. OF SPECIES	9	4	12	5	2	8	2	18
NO. OF INDIVIDUALS	53	33	86	10	4	32	10	56
OTHER-AQUATIC SPECIES								
Grass shrimp		3	3					0
Crayfish			0				3	3
NUMBER OF SPECIES	0	1	1	0	0	0	1	1
NO. OF INDIVIDUALS	0	3	3	0	0	0	3	3

**TOTAL NUMBER AND PERCENT OF AQUATIC SPECIES IDENTIFIED PER AREA
HOLLAND MILL CREEK**

MCB CAMP LEJEUNE, NORTH CAROLINA

SPECIES	HOLLAND MILL CREEK (CARTWHEEL BRANCH)			Total Detected
	HM01	HM02	HM03	
Spot			8	8
Stripped Mullet		11	3	14
Pumpkinseed	16	2		18
Chain pickerel	2			2
Swamp darter	6			6
Mud sunfish	1			1
Black drum		1		1
Ligar		3		3
Gizzard Shad		2		2
Spotted sunfish		2		2
Blue gill	2	1		3
Atlantic menhaden			199	199
Largemouth bass		1		1
Hog choker			2	2
Summer flounder		1	17	18
Mummichog		6		6
Pinfish		7	4	11
Goby, freshwater	1	1		2
NUMBER OF SPECIES	6	12	6	18
NO. OF INDIVIDUALS	28	38	233	299

**TOTAL NUMBER AND PERCENT OF AQUATIC SPECIES IDENTIFIED PER AREA
HOLLAND MILL CREEK**

MCB CAMP LEJEUNE, NORTH CAROLINA

SPECIES	HOLLAND MILL CREEK (CARTWHEEL BRANCH)			Total Detected
	HM01	HM02	HM03	
OTHER AQUATIC SPECIES				
Unknown	1			1
Grass shrimp		13		13
Crayfish	3			3
NUMBER OF SPECIES	2	1	0	3
NO. OF INDIVIDUALS	4	13	0	17

HADNOT CREEK - BACKGROUND STATIONS

SPECIES	COC SAMPLE NO.	HC01			HC02			HC03			HC04			
		Fish Length (cm)	Mass Weight	Average Weight (g)	Fish Length (cm)	Mass Weight	Average Weight (g)	Fish Length (cm)	Mass Weight	Average Weight (g)	Fish Length (cm)	Mass Weight	Average Weight (g)	
Stripper Mullet	HC03							15.25	45	45				
								12.5	20	20				
								12.5	20	20				
		COUNT						3		3				
		AVERAGE						13.41666667		28.33333333				
Atlantic Menhaden	HC03													
Blue Fish	HC03							7	7	7				
								11	17	17				
								8	8	8				
		COUNT						3		3				
		AVERAGE						8.66666667		10.66666667				
Spot	HC03							12.5	22	22				
								5.5	<5.0	2.5				
								6.75	<5.0	2.5				
								5	<5.0	2.5				
								3.5	<5.0	2.5				
								5.5	<5.0	2.5				
								14	40	40				
								13.5	35	35				
								12	35	35				
								14	35	35				
								5.5	<5.0	2.5				
								11.5	20	20				
		COUNT							12		12			
AVERAGE							9.020833333		16.83333333					
MAXIMUM							14		40					
MINIMUM							3.5		2.5					

HADNOT CREEK - BACK STATIONS

SPECIES	COC SAMPLE NO.	HC01			HC02			HC03			HC04		
		Fish Length (cm)	Mass Weight	Average Weight (g)	Fish Length (cm)	Mass Weight	Average Weight (g)	Fish Length (cm)	Mass Weight	Average Weight (g)	Fish Length (cm)	Mass Weight	Average Weight (g)
Chain Pickerel	HC01	37	290	290									
	COUNT	1		1									
	AVERAGE	37		290									
	MAXIMUM	37		290									
	MINIMUM	37		290									
Yellow Bullhead	HC01	26.5	270	270									
		26.5	275	275									
	COUNT	2		2									
	AVERAGE	26.5		272.5									
	MAXIMUM	26.5		275									
	MINIMUM	26.5		270									
Pumpkinseed	HC02				13	50	50						
					17.5	125	125						
					16	100	100						
	COUNT				3		3						
	AVERAGE				15.5		91.666667						
	MAXIMUM				17.5		125						
	MINIMUM				13		50						
Warmouth	HC02				22	250	250						
	COUNT				1		1						
	AVERAGE				22		250						
	MAXIMUM				22		250						
	MINIMUM				22		250						
Redfin Pickerel	HC04										+ 1 collected, no length or weight		
											17	30	30
	COUNT										2		2
	AVERAGE										17		30
	MAXIMUM										17		30
	MINIMUM										17		30
Pirate Perch	HC04										5 > 5		2.5
											4.5		2.5
											+ 6 collected, no length or weight		
	COUNT										6		6
	AVERAGE										4.75		2.5
	MAXIMUM									5		2.5	
	MINIMUM									4.5		2.5	
Crayfish	HC04										6	10	3.3
											4.5		3.3
											4		3.3
	COUNT										3		3
	AVERAGE										4.8333333		3.3
	MAXIMUM									6		3.3	
	MINIMUM									4		3.3	
Mudcat	3 collected at HC01, no length or weight												

HOLLAND MILL CREEK - BACKGROUND STATIONS

SPECIES	COC SAMPLE NO.	HM01			HM02			HM03		
		Fish Length (cm)	Mass Weight	Average Weight (g)	Fish Length (cm)	Mass Weight	Average Weight (g)	Fish Length (cm)	Mass Weight	Average Weight (g)
pet Mullet	HM02				38.5	640	640			
					39.5	600	600			
					34.5	400	400			
					34.5	400	400			
					33.5	360	360			
					34	340	340			
					37	460	460			
					35	520	520			
					33.5	410	410			
					32	320	320			
					31	370	370			
	HM03						14.5	40	40	
							6.5	<5	2.5	
							+1 collected, no length or weight			
	COUNT			11	11	3			3	
	AVERAGE			34.818182	436.1818182	10.5			21.25	
	MAXIMUM			39.5	640	14.5			40	
	MINIMUM			31	320	6.5			2.5	
Atlantic Menhaden	HM03						6	24	4	
							6		4	
							5.7		4	
							5.4		4	
							5.5		4	
							5.6		4	
							5.7	22	2.2	
							5.5		2.2	
							5		2.2	
							5.5		2.2	
							5.5		2.2	
							5.2		2.2	
							5.5		2.2	
							5.5		2.2	
							5.6		2.2	
							6.2		2.2	
							6	25	2.5	
							5.5		2.5	
							5		2.5	
							5.5		2.5	
							5.5		2.5	
							5.5		2.5	
							6		2.5	
							5		2.5	
							5.5		2.5	
							5.5	20	2	
							5.7		2	
							5		2	
							5		2	
							6		2	
							5.5		2	
							5.5		2	
							6		2	
							6		2	
							5.5		2	
							5.5	27	1.8	
							5.8		1.8	
							5.5		1.8	
							5.7		1.8	
							6		1.8	
							6		1.8	
					6.5		1.8			
					5.5		1.8			
					6.5		1.8			
					5.5		1.8			
					5.5		1.8			
					6		1.8			
					5.5		1.8			
					5.5	20	2			
					6.5		2			
					5		2			
					5.5		2			
					5.5		2			
					5.5		2			
					6		2			
					5.5		2			
					6		2			
					6		2			
					136 collected no length or weight					
	COUNT						199		61	
	AVERAGE						5.6		2.2540984	
	MAXIMUM						6.5		4	
	MINIMUM						4.5		1.8	

HOLLAND MILL CREEK - BACKGROUND STATIONS

SPECIES	COC SAMPLE NO.	HM01			HM02			HM03			
		Fish Length (cm)	Mass Weight	Average Weight (g)	Fish Length (cm)	Mass Weight	Average Weight (g)	Fish Length (cm)	Mass Weight	Average Weight (g)	
Summer Flounder	HM02				29.5	250	250				
	HM03							33	400	400	
								43	850	850	
								20.5	90	90	
								24	120	120	
					+13 collected, no length or weight						
					COUNT	1		1	17		4
					AVERAGE	29.5		250	30.125		365
					MAXIMUM	29.5		250	43		850
					MINIMUM	29.5		250	20.5		90
Black Drum	HM02				28	350	350				
					COUNT	1		1			
					AVERAGE	28		350			
					MAXIMUM	28		350			
Spotted Sunfish	HM02				15.5	65	65				
					17	110	110				
					COUNT	2		2			
					AVERAGE	16.25		67.5			
					MAXIMUM	17		110			
Largemouth Bass	HM02				34	540	540				
					COUNT	1		1			
					AVERAGE	34		540			
					MAXIMUM	34		540			
Hogchoker	HM03										
					+1 collected, no length or weight						
					COUNT			6	10	10	
					AVERAGE			6		10	
Spot	HM03							5	<5	2.5	
								12	25	25	
								5.8	20	4	
								6		4	
								6.2		4	
								6.4		4	
								6.4		4	
					+1 collected, no length or weight						
					COUNT			8		7	
					AVERAGE			6.82657143		6.78571429	
				MAXIMUM			12		25		
				MINIMUM			5		2.5		
Blue Gill	HM02						17		105		
	HM01	10.5	10	10							
					+1 collected, no length or weight						
					COUNT	2	1	1	1		
					AVERAGE	10.5	10	17	105		

HOLLAND MILL CREEK - BACKGROUND STATIONS

SPECIES	COC SAMPLE NO.	HM01 Fish Length (cm)	Mass Weight	Average Weight (g)	HM02 Fish Length (cm)	Mass Weight	Average Weight (g)	HM03 Fish Length (cm)	Mass Weight	Average Weight (g)
Pumpkinseed	HM02				15	50	50			
					11.5	30	30			
	HM01	7.5	45	4.5						
		6.5		4.5						
		7.5		4.5						
		7.5		4.5						
		6		4.5						
		6		4.5						
		4.5		4.5						
		8.5		4.5						
		8		4.5						
		5.5		4.5						
		8	50	8.3						
		8.5		8.3						
		6.5		8.3						
		8.5		8.3						
	11		8.3							
	7.5		8.3							
	COUNT	16		16	2		2			
	AVERAGE	7.34375		5.925	13.25		40			
	MAXIMUM	11		8.3	15		50			
	MINIMUM	4.5		4.5	11.5		30			
Long-nose Gar	HM02				73	1250	1250			
					83	2000	2000			
					72.5	1640	1640			
		COUNT			3		3			
		AVERAGE			76.1666667		1630			
	MAXIMUM			83		2000				
	MINIMUM			72.5		1250				
Pinfish	HM02				17.5	80	80			
	HM03							5	<5	2.5
					+8 collected, no length or weight			+3 collected, no length or weight		
		COUNT			7		1	4		1
		AVERAGE			17.5		80	5		2.5
		MAXIMUM			17.5		80	5		2.5
	MINIMUM			17.5		80	5		2.5	
Gizzard Shad	HM02				33	460	460			
					34	460	460			
		COUNT			2		2			
		AVERAGE			33.5		470			
	MAXIMUM			34		460				
	MINIMUM			33		460				
Chain Pickerel	HM01	13	10	5						
		13.5		5						
		COUNT			2		2			
		AVERAGE			13.25		5			
	MAXIMUM			13.5		5				
	MINIMUM			13		5				
Unknown Fish	HM01	7.5	<5	2.5						
		COUNT			1		1			
		AVERAGE			7.5		2.5			
		MAXIMUM			7.5		2.5			
	MINIMUM			7.5		2.5				
Swamp Darter	HM01	6	18	3						
		6		3						
		6		3						
		6		3						
		6		3						
		6		3						
		6		3						
	COUNT			6		6				
	AVERAGE			6		3				
	MAXIMUM			6		3				
	MINIMUM			6		3				

HOLLAND MILL CREEK - BACKGROUND STATIONS

SPECIES	COC SAMPLE NO.	HM01			HM02			HM03			
		Fish Length (cm)	Mass Weight	Average Weight (g)	Fish Length (cm)	Mass Weight	Average Weight (g)	Fish Length (cm)	Mass Weight	Average Weight (g)	
Crayfish	HM01	8.5		15	5						
		4.5			5						
		5.5			5						
		COUNT	3			3					
		AVERAGE	6.1666667			5					
		8.5			5						
		4.5			5						

Mud Sunfish 1 collected at HM01, no length or weight

Mummichog 6 collected at HM02, no length or weight

Goby, freshwater 1 collected at HM01 and 1 collected at HM02, no length or weight

Gras shrimp 13 collected at HM02, no length or weight

WEBB CREEK - BACKGROUND STATIONS

CIES	COC SAMPLE NO.	WC02			WC03			
		Fish Length (cm)	Mass Weight	Average Weight (g)	Fish Length (cm)	Mass Weight	Average Weight (g)	
Stripper Mullet	WC02	39.5	500	500				
		35.5	380	380				
		41.5	700	700				
		37	600	600				
		COUNT	4		4			
		AVERAGE	38.375		545			
Summer Flounder	WC03				21	60	60	
		COUNT			1		1	
		AVERAGE			21		60	
		MAXIMUM			21		60	
		MINIMUM			21		60	
Largemouth Bass	WC02	34	525	525				
		34	600	600				
		COUNT	2		2			
		AVERAGE	34		562.5			
		MAXIMUM	34		600			
		MINIMUM	34		525			
breast Sunfish	WC02	16	60	60				
		COUNT	1		1			
		AVERAGE	16		60			
		MAXIMUM	16		60			
		MINIMUM	16		60			
White Catfish	WC02	37	750	750				
		COUNT	1		1			
		AVERAGE	37		750			
		MAXIMUM	37		750			
		MINIMUM	37		750			
Spot	WC02	14.5	10	10				
		13	10	10				
		13	<10	5				
		+1 collected, no length or weight						
		COUNT	4		4			
		AVERAGE	13.5		8.33333333			
		MAXIMUM	14.5		10			
		MINIMUM	13		5			
Blue Gill	WC02	23	300	300				
		23.5	300	300				
		21.5	250	250				
		16.75	85	85				
		COUNT	4		4			
		AVERAGE	21.1875		233.75			
		MAXIMUM	23.5		300			
		MINIMUM	16.75		85			

WEBB CREEK - BACKGROUND STATIONS

SPECIES	COC SAMPLE NO.	WC02			WC03			
		Fish Length (cm)	Mass Weight	Average Weight (g)	Fish Length (cm)	Mass Weight	Average Weight (g)	
Long-nose Gar	WC02	68	1100	1100				
		71.5	1220	1220				
		73.5	1350	1350				
		72.5	1220	1220				
		66.5	1120	1120				
		72.5	1260	1260				
		71.5	1340	1340				
		69.5	1240	1240				
		75	1420	1420				
		WC03				87	1900	1900
						83	1850	1850
						97	2850	2850
						71.5	1000	1000
						73	1580	1580
			COUNT	9	9	5	5	
		AVERAGE	71.16667	1252.222	82.3	1836		
		MAXIMUM	75	1420	97	2850		
		MINIMUM	66.5	1100	71.5	1000		
Pinfish	WC02	10.5	NA					
				+24 collected, no length or weight		24 collected, no length or weight		
		COUNT	25		24			
		AVERAGE	10.5					
		MAXIMUM	10.5					
		MINIMUM	10.5					
Yellow Bullhead Catfish	WC02	38.5	900	900				
		32.5	620	620				
		36.5	640	640				
		COUNT	3	3				
		AVERAGE	35.83333	720				
		MINIMUM	32.5	620				
Mudcat	3 fish collected at WC02, no length or weight							
Mummichog	3 fish collected at WC03, no length or weight							
Grass shrimp	3 collected at WC03, no length or weight							

**Benthic Macroinvertebrate
Characterization and Statistics**

**SUMMARY STATISTICS OF BENTHIC MACROINVERTEBRATE SPECIES AT
HADNOT CREEK, HOLLAND MILL CREEK, AND WEBB CREEK
MCB CAMP LEJEUNE, NORTH CAROLINA**

Station	Number of Species	Number of Organisms	Species Density (#/m ²)	Species Diversity (Shannon-Weiner)	Species Diversity (Brillouin's)	Macroinvertebrate Biotic Index
WC02	7	79	504	0.570	0.518	9.4
WC03	7	74	472	0.323	0.279	9.6
HC01	20	286	1,823	0.802	0.755	7.8
HC02	4	79	504	0.196	0.072	7.6
HC03	8	244	1,555	0.683	0.675	NA
HC04	13	165	1,052	0.807	0.757	7.6
HM01	13	345	2,199	0.525	0.500	6.9
HM02	4	404	2,575	0.128	0.122	9.6
HM03	7	97	618	0.538	0.497	9.6

WC = Webb Creek Stations

HC = Hadnot Creek Stations

HM = Holland Mill Creek Stations

BN = Benthic Macroinvertebrate Sample

NA = Not Applicable

Species Density (#/m²) is based on a sample area of 0.0523 m².

**SYSTEMATIC LIST OF BENTHIC MACROINVERTEBRATE SPECIES
AT BACKGROUND STATIONS
(WEBB, HADNOT, AND HOLLAND MILL CREEKS)
MCB CAMP LEJEUNE, NORTH CAROLINA**

Species	USEPA ⁽¹⁾ Metals
NERMERTEA	Phylum
Anopla	Class
Heteronemertea	Order
Lineidae	Family
<i>Micrura leidyl</i>	Genus Species
ANNELIDA	Phylum
Oligochaeta	Class
Lumbriculida	Order
Lumbriculidae	Family
<i>Eclipidrilus sp.</i>	Genus Species
Tubificida	Order
Tubificidae	Family
<i>Isochaetides freyi</i>	Genus Species
<i>Limnodrilus hoffmeisteri</i>	Genus Species
<i>Spirosperma carolinensis</i>	Genus Species
Polychaeta	Class
Ariciida	Order
Orbiniidae	Family
<i>Scoloplos fragilis</i>	Genus Species
Capitellida	Order
Capitellidae	Family
<i>Heteromestus filiformis</i>	Genus Species
Phyllodocida	Order
Nereidae	Family
<i>Nereis succinea</i>	Genus Species
Phyllodocidae	Family
<i>Eteone heteropoda</i>	Genus Species
Spionida	Order
Spionidae	Family
<i>Scolecoclepidis virdis</i>	Genus Species
<i>Streblospio benedicti</i>	Genus Species
Terebellida	Order

**SYSTEMATIC LIST OF BENTHIC MACROINVERTEBRATE SPECIES
AT BACKGROUND STATIONS
(WEBB, HADNOT, AND HOLLAND MILL CREEKS)
MCB CAMP LEJEUNE, NORTH CAROLINA**

Species	USEPA ⁽¹⁾ Metals
Ampharetidae	Family
<i>Hypaniola grayi</i>	Genus Species
ARTHROPODA	Phylum
Crustacea	Class
Amphipoda	Order
Corophiidae	Family
<i>Corophium lacustris</i>	Genus Species
Gammaridae	Family
<i>Crangonyx pseudogracillus</i>	Genus Species
<i>Gammarus tigrinus</i>	Genus Species
Tanaidacea	Order
Tanaidae	Family
<i>Leptochelia rapax</i>	Genus Species
Decapoda	Order
Palaemonidae	Family
<i>Palaemonetes pugio</i>	Genus Species
Insecta	Class
Coleoptera	Order
Dytiscidae	Family
<i>Hydroporus sp.</i>	Genus Species
Elmidae	Family
<i>Dubiraphia sp.</i>	Genus Species
Diptera	Order
Ceratopogonidae	Family
<i>Palpomyia/sphaeromyia sp.</i>	Genus Species
Chaoboridae	Family
<i>Chaoborus sp.</i>	Genus Species
Chironomidae	Family
<i>Ablabesmyia annulata</i>	Genus Species
<i>Ablabesmyia mallochii</i>	Genus Species
<i>Ablabesmyia ramphe gr.</i>	Genus Species
<i>Clinotanytus pinguis</i>	Genus Species
<i>Chironomus decorus gr.</i>	Genus Species

**SYSTEMATIC LIST OF BENTHIC MACROINVERTEBRATE SPECIES
AT BACKGROUND STATIONS
(WEBB, HADNOT, AND HOLLAND MILL CREEKS)
MCB CAMP LEJEUNE, NORTH CAROLINA**

Species	USEPA ⁽¹⁾ Metals
<i>Cryptochironomus fulvus gr</i>	Genus Species
<i>Dicrotendipes nervosus</i>	Genus Species
<i>Epoicladus sp.</i>	Genus Species
<i>Glyptotendipes sp.</i>	Genus Species
<i>Larsia sp.</i>	Genus Species
<i>Nilothauma sp.</i>	Genus Species
<i>Paraiauteroborniella nigrohaite</i>	Genus Species
<i>Polypedilum illinoense</i>	Genus Species
<i>Polypedilum scalaenum</i>	Genus Species
<i>Procladius sp.</i>	Genus Species
<i>Tanytarsus sp.</i>	Genus Species
<i>Tribelos jucundum</i>	Genus Species
<i>Tribelos lucundum</i>	Genus Species
Tipulidae	Family
<i>Psuedolimnophila sp.</i>	Genus Species
Ephemeroptera	Order
Ephemeridae	Family
<i>Hexagenia billineata</i>	Genus Species
Megaloptera	Order
Sialidae	Family
<i>Sialis sp.</i>	Genus Species
Odonata	Order
Coenagrionidae	Family
<i>Argia sp.</i>	Genus Species
Libellulidae	Family
<i>Pechydiplax longipennis</i>	Genus Species
Trichoptera	Order
Polycentropodidae	Family
<i>Phylacentropus sp.</i>	Genus Species
MOLLUSCA	Phylum
Bivalvia	Class
Mytiloidea	Order
Mytilidae	Family

SYSTEMATIC LIST OF BENTHIC MACROINVERTEBRATE SPECIES
 (AT BACKGROUND STATIONS
 (WEBB, HADNOT, AND HOLLAND MILL CREEKS)
 MCB CAMP LEJEUNE, NORTH CAROLINA

Species	USEPA ⁽¹⁾ Metals
<i>Geukensia demissa</i>	Genus Species
Veneroida	Order
Corbiculidae	Family
<i>Polymesoda caroliniana</i>	Genus Species
Mactridae	Family
<i>Mullinia lateralis</i>	Genus Species
Sphaeriidae	Family
<i>Pisidium casertanum</i>	Genus Species
Tellinidae	Family
<i>Macoma tenta</i>	Genus Species

**USEPA SENSITIVITY TO METALS AND TOLERANCE TO ORGANIC WASTE AND BIOTIC INDEX
FOR BENTHIC MACROINVERTEBRATE SPECIES AT BACKGROUND STATIONS
(WEBB, HADNOT, AND HOLLAND MILL CREEKS)
MCB CAMP LEJEUNE, NORTH CAROLINA**

Species	USEPA ⁽¹⁾ Metals	Organics	NCDEHNR ⁽²⁾ Biotic Index
NERMERTEA			
Anopla			
Heteronemertea			
Lineidae			
<i>Micrura leidyl</i>	NA	NA	NA
ANNELIDA			
Oligochaeta			
Lumbriculida			
Lumbriculidae			
<i>Eclipidrilus sp.</i>	NA	NA	NA
Tubificida			
Tubificidae			
<i>Isochaetides freyi</i>	NA	NA	8.6
<i>Limnodrilus hoffmeisteri</i>	NA	5	9.4
<i>Spirosperma carolinensis</i>	NA	3	NA
Polychaeta			
Ariciida			
Orbiniidae			
<i>Scoloplos fragilis</i>	NA	NA	NA
Capitellida			
Capitellidae			
<i>Heteromestus filiformis</i>	NA	NA	NA
Phyllodocida			
Nereidae			
<i>Nereis succinea</i>	NA	NA	NA
Phyllodocidae			
<i>Eteone heteropoda</i>	NA	NA	NA
Spionida			
Spionidae			
<i>Scolecopides viridis</i>	NA	NA	NA
<i>Sireblospio benedicti</i>	NA	NA	NA
Terebellida			

**USEPA SENSITIVITY TO METALS AND TOLERANCE TO ORGANIC WASTE AND BIOTIC INDES
FOR BENTHIC MACROINVERTEBRATE SPECIES AT BACKGROUND STATIONS
(WEBB, HADNOT, AND HOLLAND MILL CREEKS)
MCB CAMP LEJEUNE, NORTH CAROLINA**

Species	USEPA ⁽¹⁾ Metals	Organics	NCDEHNR ⁽²⁾ Biotic Index
Ampharetidae			
<i>Hypaniola grayi</i>	NA	NA	NA
ARTHROPODA			
Crustacea			
Amphipoda			
Corophiidae			
<i>Corophium lacuatre</i>	NA	NA	NA
Gammaridae			
<i>Crangonyx pseudogracillus</i>	NA	NA	7.9
<i>Gammarus tigrinus</i>	NA	2	NA
Tanaidacea			
Tanaidae			
<i>Leptochelia rapox</i>	NA	NA	NA
Decapoda			
Palaemonidae			
<i>Palaemonetes pugio</i>	NA	NA	NA
Insecta			
Coleoptera			
Dytiscidae			
<i>Hydroporus sp.</i>	NA	NA	8.6
Elmidae			
<i>Dubiraphia sp.</i>	NA	NA	5.9
Diptera			
Ceratopogonidae			
<i>Palpomyia/sphaeromias sp.</i>	NA	NA	7.0
Chaoboridae			
<i>Chaoborus sp.</i>	NA	NA	8.5
Chironomidae			
<i>Ablabesmyia annulata</i>	NA	1	3.5
<i>Ablabesmyia mallochi</i>	S	2	7.2
<i>Ablabesmyia ramphe gr.</i>	NA	2	NA
<i>Clinotanypus pinguis</i>	S	3	8.7

**USEPA SENSITIVITY TO METALS AND TOLERANCE TO ORGANIC WASTE AND BIOTIC INDES
FOR BENTHIC MACROINVERTEBRATE SPECIES AT BACKGROUND STATIONS
(WEBB, HADNOT, AND HOLLAND MILL CREEKS)
MCB CAMP LEJEUNE, NORTH CAROLINA**

Species	USEPA ⁽¹⁾ Metals	Organics	NCDEHNR ⁽²⁾ Biotic Index
<i>Chironomus decorus gr.</i>	NA	NA	9.6
<i>Cryptochironomus fulvus gr</i>	NA	3	6.4
<i>Dicrotendipes nervosus</i>	S	2	9.7
<i>Epoicladius sp.</i>	NA	NA	0.0
<i>Glyptotendipes sp.</i>	NA	NA	9.4
<i>Larsia sp.</i>	NA	2	9.3
<i>Nilothauma sp.</i>	NA	NA	5.0
<i>Paraiauterborniella nigrohaite</i>	NA	NA	NA
<i>Polypedilum illinoense</i>	NA	3	9.0
<i>Polypedilum scalaenum</i>	NA	2	8.4
<i>Procladius sp.</i>	NA	NA	9.1
<i>Tanytarsus sp.</i>	NA	NA	6.7
<i>Tribelos jucundum</i>	S	1	6.3
<i>Tribelos lucundum</i>	NA	NA	6.3
Tipulidae			
<i>Psuedolimnophila sp.</i>	NA	NA	7.2
Ephemeroptera			
Ephemeridae			
<i>Hexagenia billineata</i>	NA	2	NA
Megaloptera			
Sialidae			
<i>Sialis sp.</i>	T	4	7.2
Odonata			
Coenagrionidae			
<i>Argia sp.</i>	NA	NA	8.2
Libellulidae			
<i>Pechydiplax longipennis</i>	NA	NA	NA
Trichoptera			
Polycentropodidae			
<i>Phylacentropus sp.</i>	NA	NA	6.2
MOLLUSCA			
Bivalvia			

**USEPA SENSITIVITY TO METALS AND TOLERANCE TO ORGANIC WASTE AND BIOTIC INDES
FOR BENTHIC MACROINVERTEBRATE SPECIES AT BACKGROUND STATIONS
(WEBB, HADNOT, AND HOLLAND MILL CREEKS)
MCB CAMP LEJEUNE, NORTH CAROLINA**

Species	USEPA ⁽¹⁾ Metals	Organics	NCDEHNR ⁽²⁾ Biotic Index
Mytiloidea			
Mytilidae			
<i>Geukensia demissa</i>	NA	NA	NA
Veneroidea			
Corbiculidae			
<i>Polymesoda caroliniana</i>	NA	NA	NA
Mactridae			
<i>Mullinia lateralis</i>	NA	NA	NA
Sphaeriidae			
<i>Pisidium casertanum</i>	NA	4	6.5
Tellinidae			
<i>Macoma tenta</i>	NA	NA	NA

⁽¹⁾ Macroinvertebrate Field and Laboratory Methods for Evaluating the Biological Integrity of Surface Waters

⁽²⁾ Lenat, 1993

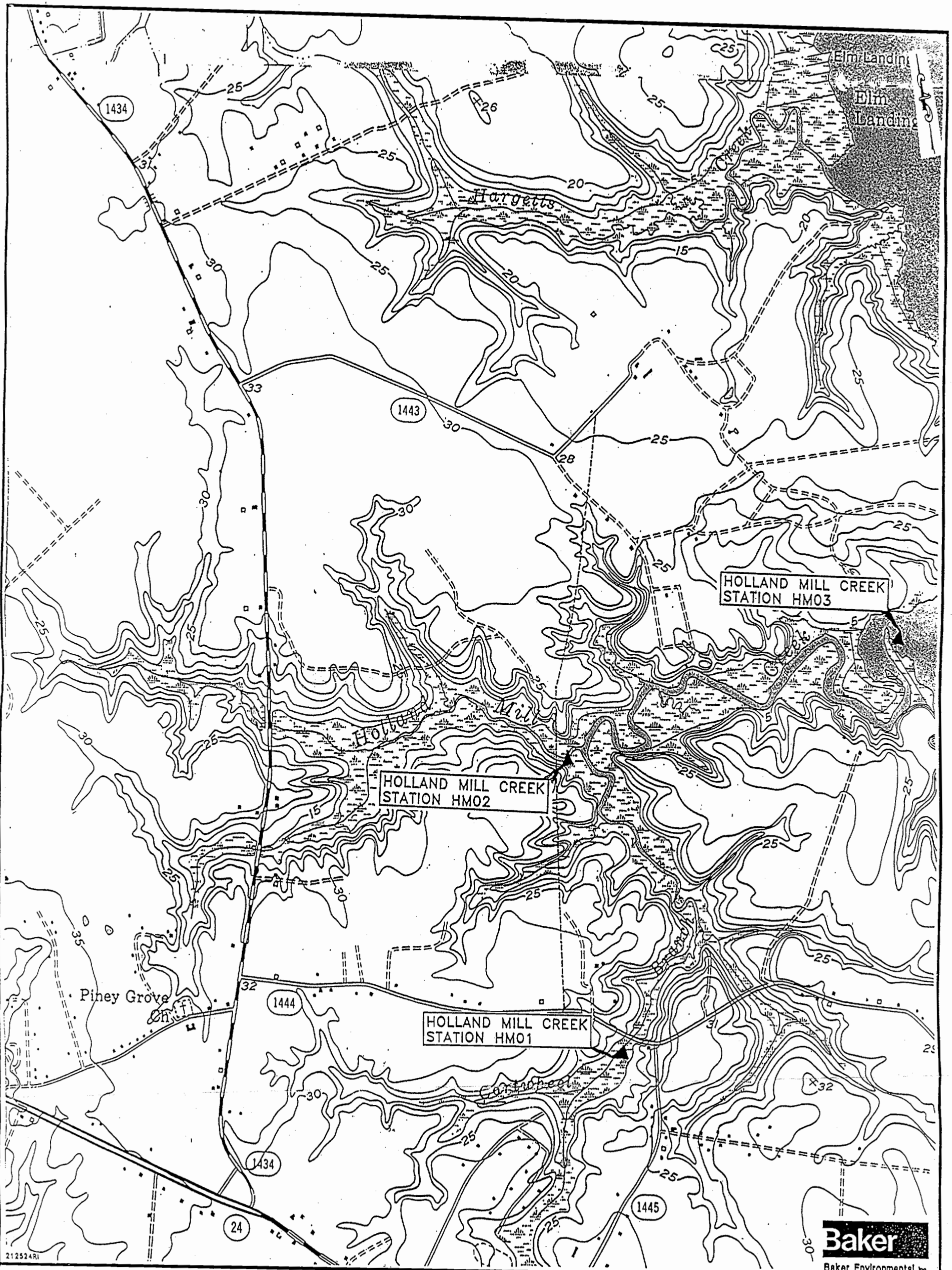
NA = Not Available

S = Sensitive to heavy metals

T = Tolerant to heavy metals

Organics Ranking = 0 to 5 with 0 being the least tolerant

**Sampling Station
Location Maps**

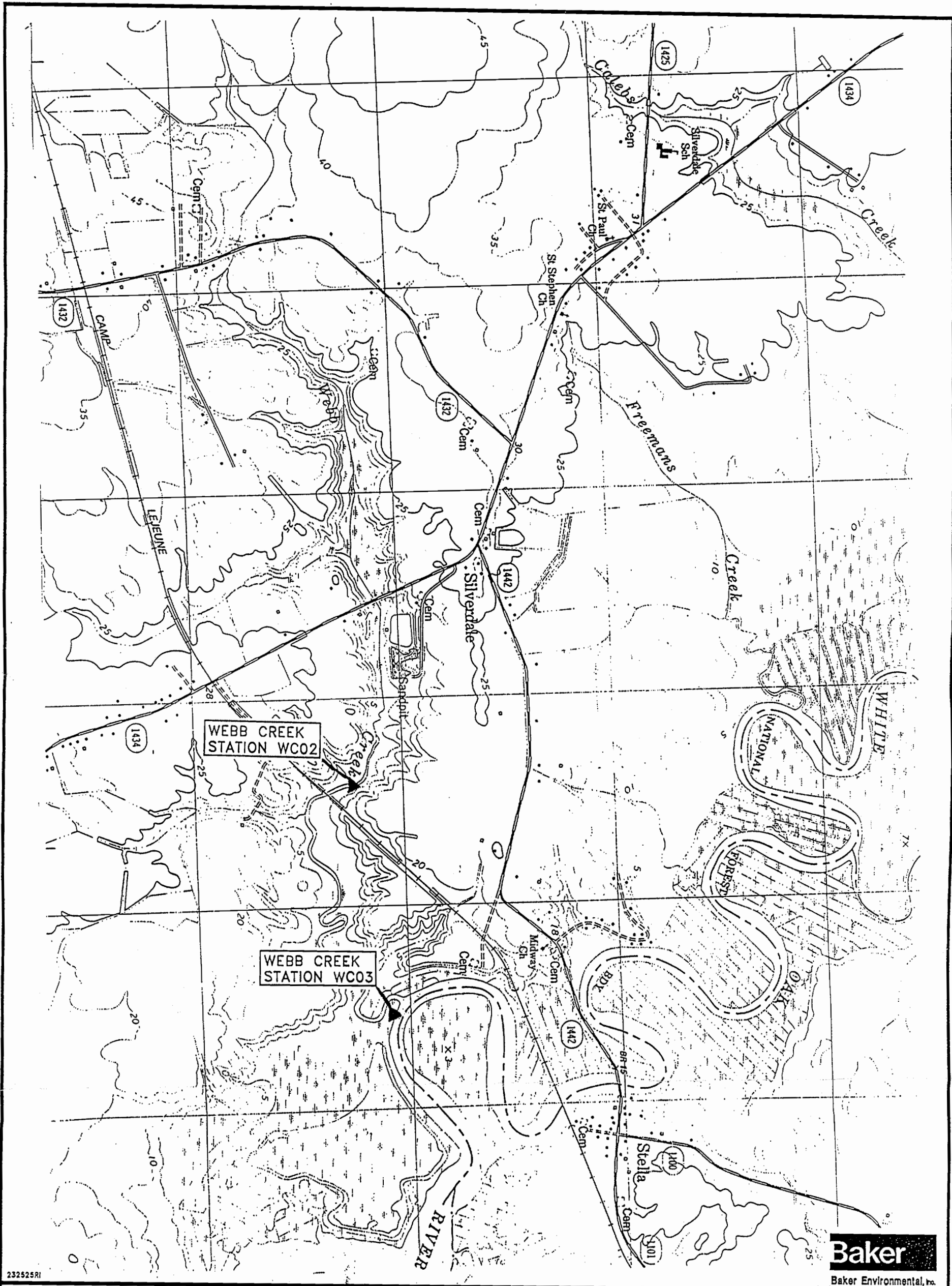


FISH AND BENTHIC MACROINVERTEBRATE
 SAMPLING LOCATION IN HOLLAND MILL CREEK

MARINE CORPS BASE, CAMP LEJEUNE
 NORTH CAROLINA

SOURCE: N.C. DIVISION OF MARINE
 FISHERIES, REPORT AFC-9, NOV. 1975.

01696 Q 052

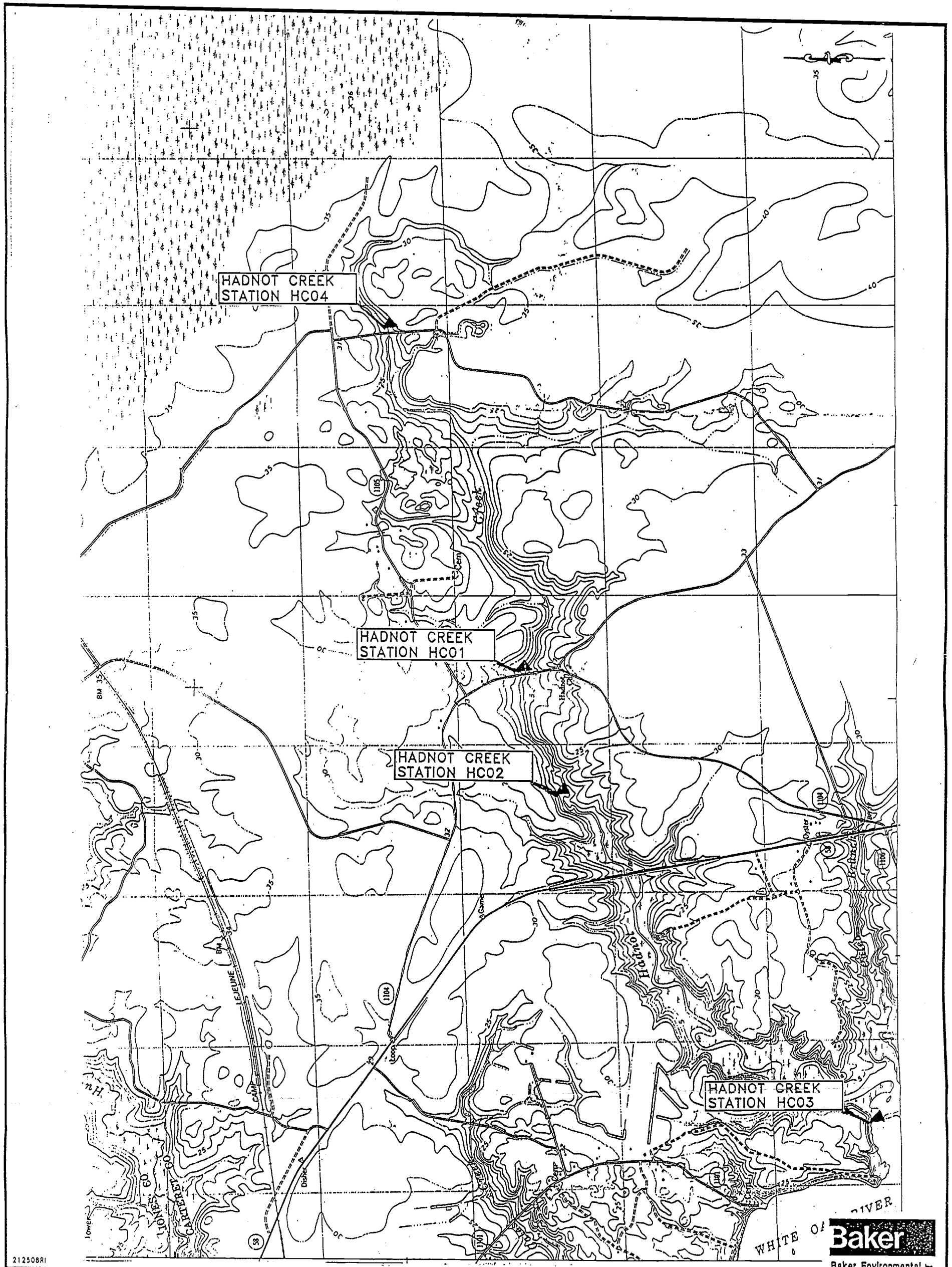


FISH AND BENTHIC MACROINVERTEBRATE
SAMPLING LOCATION IN WEBB CREEK

MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA

SOURCE: N.C. DIVISION OF MARINE
FISHERIES, REPORT AFC-9, NOV. 1975.

01696 Q 062



FISH AND BENTHIC MACROINVERTEBRATE
SAMPLING LOCATION IN HADNOT CREEK

MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA

SOURCE: N.C. DIVISION OF MARINE
FIDHERIES, REPORT AFC-9, NOV. 1975.

01696Q07Z

REFERENCE

Baker, 1994. Baker Environmental Inc., 1994. "Supplemental Aquatic Survey for Wallace Creek and Bearhead Creek". Prepared for the Department of the Navy, Naval Facilities Engineering Command, Atlantic Division, Norfolk, Virginia.

MARINE CORPS BASE CAMP LEJEUNE
 BACKGROUND - HADNOT CREEK
 BENTHIC MACROINVERTEBRATES

	HM01-BN			HM02-BN			HM03-BN		
	01	02	03	01	02	03	01	02	03
NEMERTEA									
Anopla									
Heteronemertea									
Lineidae									
• <i>Micrura teidy</i>							3	4	2
ANNELIDA									
Oligochaeta									
Tubificida									
Tubificidae									
<i>Limnodrilus hoffmeisteri</i>	3	1	3						
Polychaeta									
Aricida									
Orbinidae									
• <i>Scoloplos fragilis</i>							3	20	8
Capitellida									
Capitellidae									
<i>Heteromastus filiformis</i>							1	1	1
Phyllodocida									
Nereidae									
<i>Nereis succinea</i>				7	9	6			
Spionida									
Spionidae									
• <i>Streblospio benedicti</i>							1		
Terebellida									
Ampharetidae									
<i>Hypaniola grayi</i> (ampharetid worm)				3		2			
ARTHROPODA									
Crustacea									
Decapoda									
Palaemonidae									
<i>Palaemonetes pugio</i>									1
Coleoptera									
Dytiscidae									
<i>Hydroporus</i> sp.	1								
Elmidae									
<i>Dubiraphis</i> sp.			8						
Diptera									
Chaoboridae									
<i>Chaoborus</i> sp.			1						
Chironomidae									
<i>Ablabesmyia mallochi</i>	1								
<i>Chironomus decorus</i> gr.	2	2	2	120	180	76	1		
<i>Dicrotendipes nervosus</i>	5		3						
<i>Larsia</i> sp.			1						
<i>Polypedium illinoense</i>	12		7						
<i>Polypedium scalaenum</i>	18		11						
<i>Tanytarsus</i> sp.	11		12						
<i>Tribelos lucundum</i>	50	159	31						
Megaloptera									
Sialidae									
<i>Sialis</i> sp.	1								
MOLLUSCA									
Bivalvia									
Veneroida									
Mactridae									
• <i>Mulinia lateralis</i>							3		
Tellinidae									
<i>Macoma tenta</i>							17	23	9
Total Taxa	10	3	10	3	2	4	7	4	4
Total Specimens	104	162	79	130	189	85	29	48	20
Rate Specimens Average		115			134.667			32.3333	
Standard Deviation	15.0864	90.934	9.06091	66.4254	120.915	36.5639	5.75698	11.1056	4.08248
Bruggin's Diversity		0.5			0.122			0.497	
SPECIES DENSITY (#/M²)	663	1033	504	829	1205	542	185	306	127
SPECIES DIVERSITY (Shannon-Wiener)	0.695	0.045	0.793	0.138	0.083	0.186	0.593	0.436	0.460

MARINE CORP'S BASE CAMP LEASING
BACKGROUND - MADNOT CREEK
BENTHIC MACROINVERTEBRATES

	NC01-BN			NC02-BN			NC03-BN			NC04-BN		
	01	02	03	01	02	03	01	02	03	01	02	03
NEMERTEA												
<i>Ampelisca</i>												
<i>Nelusetta</i>												
<i>Lineolaria</i>												
<i>Mionina lobifera</i>						6	5	3				
NEMELIDA												
<i>Onychocaris</i>												
<i>Lambriculus</i>												
<i>Lambriculus</i>												
<i>Epilimnion</i> sp.			1									
<i>Tubificoides</i>												
<i>Tubificoides</i>												
<i>Ischaemura</i> sp.	77	42	36							21	21	8
<i>Urechis</i> sp.											1	
<i>Epilimnion</i> sp.											1	3
<i>Polydora</i>												
<i>Caprellidae</i>												
<i>Caprellidae</i>												
<i>Metacoelus</i> sp.							14	8				
<i>Physiculus</i>												
<i>Neomysis</i>												
<i>Neomysis</i> sp.							6		18			
<i>Physiculus</i>												
<i>Elanus</i> sp.										1		
<i>Tanaisiidae</i>												
<i>Amphipoda</i>												
<i>Hypania</i> sp.				10	6	46						
ARTHROPODA												
<i>Amphipoda</i>												
<i>Corophidae</i>												
<i>Corophium</i> sp.										82		
<i>Gammaridae</i>												
<i>Corophium</i> sp.				1	1						25	30
<i>Gammarus</i> sp.												
<i>Tanaididae</i>												
<i>Tanaididae</i>												
<i>Leptochela</i> sp.									80			
INSECTA												
<i>Coleoptera</i>												
<i>Dytiscidae</i>												
<i>Hydroporus</i> sp.			1							5	2	6
<i>Elmidae</i>												
<i>Dabirapha</i> sp.		1										
Diptera												
<i>Coropogonidae</i>												
<i>Palpomyia</i> sp.	5	7	4			1						
Chironomidae												
<i>Alibonella</i> sp.	2	7	1									
<i>Alibonella</i> sp.	4	7	8									
<i>Cricotopus</i> sp.											1	
<i>Cricotopus</i> sp.												
<i>Epitriptus</i> sp.		2	3									
<i>Glyptotendipes</i> sp.			1									
<i>Glyptotendipes</i> sp.		2	1									1
<i>Methochaeta</i> sp.		1	2									
<i>Palaemonetes</i> sp.	1	5	2									
<i>Palaemonetes</i> sp.	3	1										
<i>Procladius</i> sp.		1										
<i>Tanytarsus</i> sp.	2	9	2									
<i>Tribolium</i> sp.	4	8	8									
Tipulidae												
<i>Psephenops</i> sp.											1	2
Ephemeroptera												
<i>Ephemeroptera</i>												
<i>Heurysia</i> sp.	3	3	1									
Megoptera												
<i>Salix</i> sp.											1	
Odonata												
<i>Coenagrionidae</i>												
<i>Argia</i> sp.		1										
<i>Libellulidae</i>												
<i>Pachydiplax</i> sp.											1	
Trichoptera												
<i>Polycentropus</i> sp.												
<i>Polycentropus</i> sp.	1	5	7								17	13
MOLLUSCA												
<i>Bivalvia</i>												
<i>Mytilidae</i>												
<i>Mytilus</i> sp.												
<i>Conchospira</i> sp.											1	
Nonata												
<i>Sphaeriidae</i>												
<i>Phidium</i> sp.		2	1								4	
<i>Trochidae</i>												
<i>Macoma</i> sp.												
TOTAL	10	17	15	1	2	4	4	3	6	4	11	8
Total Specimens	102	106	78	18	7	34	30	31	182	44	89	32
Specificity	35.33333			26.33333			61.33333			55		
Standard Deviation	23.50732	8.614633	6.861824	NA	3.535534	21.79448	4.256898	6.882804	28.67211	8.321905	7.129887	6.047432
Shannon's Diversity	0.735				0.072			0.675			0.727	
SPECIES DENSITY (#/M²)	430	474	497	115	45	344	191	188	1186	280	445	331
SPECIES DIVERSITY (Shannon-Wiener)	0.463	0.936	0.831	0.000	0.178	0.230	0.594	0.304	0.449	0.438	0.823	0.763

MARINE CORPS BASE CAMP LEJEUNE
 BACKGROUND - WEBB CREEK
 HIC MACROINVERTEBRATES

	WC02-BN			WC03-BN		
	01	02	03	01	02	03
NEMERTEA						
Anopla						
Heteronemertea						
Lineidae						
• <i>Micrura leidyi</i>				1	2	2
ANNELIDA						
Polychaeta						
Capitellida						
Capitellidae						
<i>Heteromestus filiformis</i>	2					
Phyllodocida						
Nereidae						
<i>Nereis succinea</i>			1			
Spionida						
Spionidae						
• <i>Scolecopides viridis</i>						1
Terebellida						
Ampharetidae						
<i>Hypaniola grayi</i>		4	10			
ROPODA						
Crustacea						
Amphipoda						
Gammaridae						
• <i>Gammarus tigrinus</i>	10			1	1	
Insecta						
Diptera						
Chironomidae						
<i>Chironomus decorus</i> gr.	8	24	13	38	17	6
• <i>Procladius</i> sp.	1	3		2		1
<i>Tanytarsus</i> sp.		2	1			
MOLLUSCA						
Bivalvia						
Veneroida						
Corbiculidae						
• <i>Polymesoda caroliniana</i>					1	
Tellinidae						
<i>Macoma tenta</i>					1	
Total Taxa	4	4	4	4	5	4
Total Specimens	21	33	25	42	22	10
Replicate Specimens Average		26.33			24.67	
Standard Deviation	4.42531	10.5317	6.18466	18.3394	7.05691	2.38048
Brillouin's Diversity		0.518			0.279	
SPECIES DENSITY (#/M²)	134	210	159	268	140	64
SPECIES DIVERSITY (Shannon-Wiener)	0.473	0.380	0.419	0.180	0.304	0.473

APPENDIX I
DATA AND FREQUENCY SUMMARIES

APPENDIX I.1
SURFACE SOIL ORGANICS

FREQUENCY OF DETECTION SUMMARY
 OPERABLE UNIT No. 8
 SITE 16 - SURFACE SOIL
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID:	16-BD-SB01-00	16-BD-SB02-00	16-BD-SB03-00	16-BD-SB04-00	16-BD-SB05-00	16-BD-SB06-00
Laboratory Sample ID:	AC4115	AC4111	AC4571	AC4198	AC4186	AC4182
Date Sampled:	10/19/94	10/19/94	10/20/94	10/19/94	10/18/94	10/18/94

	UNITS						
VOLATILES							
Chloromethane	UG/KG	11 UJ	12 U	11 U	11 UJ	12 U	11 U
Bromomethane	UG/KG	11 UJ	12 U	11 U	11 UJ	12 U	11 U
Vinyl chloride	UG/KG	11 UJ	12 U	11 U	11 UJ	12 U	11 U
Chloroethane	UG/KG	11 UJ	12 U	11 U	11 UJ	12 U	11 U
Methylene chloride	UG/KG	11 UJ	12 U	11 U	11 UJ	12 U	11 U
Acetone	UG/KG	11 UJ	12 U	11 U	14 UJ	12 U	11 U
Carbon Disulfide	UG/KG	11 UJ	12 U	11 U	11 UJ	12 U	11 U
1,1-Dichloroethene	UG/KG	11 UJ	12 U	11 U	11 UJ	12 U	11 U
1,1-Dichloroethane	UG/KG	11 UJ	12 U	11 U	11 UJ	12 U	11 U
1,2-Dichloroethene(total)	UG/KG	11 UJ	12 U	11 U	11 UJ	12 U	11 U
Chloroform	UG/KG	11 UJ	12 U	11 U	11 UJ	12 U	11 U
1,2-Dichloroethane	UG/KG	11 UJ	12 U	11 U	11 UJ	12 U	11 U
2-Butanone	UG/KG	11 UJ	12 U	11 U	11 UJ	12 U	11 U
1,1,1-Trichloroethane	UG/KG	11 UJ	12 U	11 U	11 UJ	12 UJ	11 U
Carbon tetrachloride	UG/KG	11 UJ	12 U	11 U	11 UJ	12 UJ	11 U
Bromodichloromethane	UG/KG	11 UJ	12 U	11 U	11 UJ	12 UJ	11 U
1,2-Dichloropropane	UG/KG	11 UJ	12 U	11 U	11 UJ	12 UJ	11 U
cis-1,3-Dichloropropene	UG/KG	11 UJ	12 U	11 U	11 UJ	12 UJ	11 U
Trichloroethene	UG/KG	11 UJ	12 U	11 U	11 UJ	12 UJ	11 U
Dibromochloromethane	UG/KG	11 UJ	12 U	11 U	11 UJ	12 UJ	11 U
1,1,2-Trichloroethane	UG/KG	11 UJ	12 U	11 U	11 UJ	12 UJ	11 U
Benzene	UG/KG	11 UJ	12 U	11 U	11 UJ	12 UJ	11 U
trans-1,3-Dichloropropene	UG/KG	11 UJ	12 U	11 U	11 UJ	12 UJ	11 U
Bromoform	UG/KG	11 UJ	12 U	11 U	11 UJ	12 UJ	11 U
4-Methyl-2-pentanone	UG/KG	11 UJ	12 U	11 U	11 UJ	12 UJ	11 U
2-Hexanone	UG/KG	11 UJ	12 U	11 U	11 UJ	12 UJ	11 U
Tetrachloroethene	UG/KG	11 UJ	12 U	11 U	11 UJ	12 UJ	11 U
1,1,2,2-Tetrachloroethane	UG/KG	11 UJ	12 U	11 U	11 UJ	12 UJ	11 U
Toluene	UG/KG	11 UJ	12 U	11 U	11 UJ	12 UJ	11 U
Chlorobenzene	UG/KG	11 UJ	12 U	11 U	11 UJ	12 UJ	11 U
Ethylbenzene	UG/KG	11 UJ	12 U	11 U	11 UJ	12 UJ	11 U
Styrene	UG/KG	11 UJ	12 U	11 U	11 UJ	12 UJ	11 U
Xylenes (total)	UG/KG	11 UJ	12 U	11 U	11 UJ	12 UJ	11 U

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 TCL ORGANICS

Client Sample ID:	16-BD-SB01-00	16-BD-SB02-00	16-BD-SB03-00	16-BD-SB04-00	16-BD-SB05-00	16-BD-SB06-00
Laboratory Sample ID:	AC4115	AC4111	AC4571	AC4198	AC4186	AC4182
Date Sampled:	10/19/94	10/19/94	10/20/94	10/19/94	10/18/94	10/18/94

	UNITS						
SEMIVOLATILES	UG/KG	1700 U	390 U	350 U	1800 U	2000 U	360 U
Phenol	UG/KG	1700 U	390 U	350 U	1800 U	2000 U	360 U
bis(2-Chloroethyl) ether	UG/KG	1700 U	390 U	350 U	1800 U	2000 U	360 U
2-Chlorophenol	UG/KG	1700 U	390 U	350 U	1800 U	2000 U	360 U
1,3-Dichlorobenzene	UG/KG	1700 U	390 U	350 U	1800 U	2000 U	360 U
1,4-Dichlorobenzene	UG/KG	1700 UJ	390 UJ	350 U	1800 UJ	2000 UJ	360 UJ
1,2-Dichlorobenzene	UG/KG	1700 U	390 U	350 U	1800 U	2000 U	360 U
2-Methylphenol	UG/KG	1700 U	390 U	350 U	1800 U	2000 U	360 U
2,2'-oxybis-(1-chloropropane)	UG/KG	1700 U	390 U	350 U	1800 U	2000 U	360 U
4-Methylphenol	UG/KG	1700 U	390 U	350 U	1800 U	2000 U	360 U
N-Nitroso-di-n-propylamine	UG/KG	1700 U	390 U	350 U	1800 U	2000 U	360 U
Hexachloroethane	UG/KG	1700 U	390 U	350 U	1800 U	2000 U	360 U
Nitrobenzene	UG/KG	1700 U	390 U	350 U	1800 U	2000 U	360 U
Isophorone	UG/KG	1700 U	390 U	350 U	1800 U	2000 U	360 U
2-Nitrophenol	UG/KG	1700 U	390 U	350 U	1800 U	2000 U	360 U
2,4-Dimethylphenol	UG/KG	1700 U	390 U	350 U	1800 U	2000 U	360 U
bis(2-Chloroethoxy) methane	UG/KG	1700 U	390 U	350 U	1800 U	2000 U	360 U
2,4-Dichlorophenol	UG/KG	1700 U	390 U	350 U	1800 U	2000 U	360 U
1,2,4-Trichlorobenzene	UG/KG	1700 UJ	390 UJ	350 U	1800 UJ	2000 UJ	360 UJ
Naphthalene	UG/KG	1700 U	390 U	350 U	1800 U	2000 U	360 U
4-Chloroaniline	UG/KG	1700 U	390 U	350 U	1800 U	2000 U	360 U
Hexachlorobutadiene	UG/KG	1700 U	390 U	350 U	1800 U	2000 U	360 U
4-Chloro-3-methylphenol	UG/KG	1700 U	390 U	350 U	1800 U	2000 U	360 U
2-Methylnaphthalene	UG/KG	1700 U	390 U	350 U	1800 U	2000 U	360 U
Hexachlorocyclopentadiene	UG/KG	1700 U	390 U	350 U	1800 U	2000 U	360 U
2,4,6-Trichlorophenol	UG/KG	1700 U	390 U	350 U	1800 U	2000 U	360 U
2,4,5-Trichlorophenol	UG/KG	4200 U	950 U	850 U	4500 U	4900 U	870 U
2-Chloronaphthalene	UG/KG	1700 U	390 U	350 U	1800 U	2000 U	360 U
2-Nitroaniline	UG/KG	4200 U	950 U	850 U	4500 U	4900 U	870 U
Dimethyl phthalate	UG/KG	1700 U	390 U	350 U	1800 U	2000 U	360 U
Acenaphthylene	UG/KG	1700 U	390 U	350 U	1800 U	2000 U	360 U
2,6-Dinitrotoluene	UG/KG	1700 U	390 U	350 U	1800 U	2000 U	360 U
3-Nitroaniline	UG/KG	4200 U	950 U	850 U	4500 U	4900 U	870 U
Acenaphthene	UG/KG	1700 UJ	390 UJ	350 U	1800 UJ	2000 UJ	360 UJ

FREQUENCY OF DETECTION SUMMARY
 OPERABLE UNIT No. 8
 SITE 16 - SURFACE SOIL
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID:	16-BD-SB01-00	16-BD-SB02-00	16-BD-SB03-00	16-BD-SB04-00	16-BD-SB05-00	16-BD-SB06-00
Laboratory Sample ID:	AC4115	AC4111	AC4571	AC4198	AC4186	AC4182
Date Sampled:	10/19/94	10/19/94	10/20/94	10/19/94	10/18/94	10/18/94

	UNITS						
<u>SEMIVOLATILES Cont.</u>	UG/KG	4200 U	950 U	850 U	4500 U	4900 U	870 U
2,4-Dinitrophenol	UG/KG	4200 U	950 U	850 U	4500 U	4900 U	870 U
4-Nitrophenol	UG/KG	1700 U	390 U	350 U	1800 U	2000 U	360 U
Dibenzofuran	UG/KG	1700 U	390 U	350 U	1800 U	2000 U	360 U
2,4-Dinitrotoluene	UG/KG	1700 U	390 U	350 U	1800 U	2000 U	360 U
Diethylphthalate	UG/KG	1700 U	390 U	350 U	1800 U	2000 U	360 U
4-Chlorophenyl phenyl ether	UG/KG	1700 U	390 U	350 U	1800 U	2000 U	360 U
Fluorene	UG/KG	1700 U	390 U	350 U	1800 U	2000 U	360 U
4-Nitroaniline	UG/KG	4200 U	950 U	850 U	4500 U	4900 U	870 U
4,6-Dinitro-2-methylphenol	UG/KG	4200 U	950 U	850 U	4500 U	4900 U	870 U
N-nitrosodiphenylamine	UG/KG	1700 U	390 U	350 U	1800 U	2000 U	360 U
4-Bromophenyl-phenylether	UG/KG	1700 U	390 U	350 U	1800 U	2000 U	360 U
Hexachlorobenzene	UG/KG	1700 U	390 U	350 U	1800 U	2000 U	360 U
Pentachlorophenol	UG/KG	4200 U	950 U	850 U	4500 U	4900 U	870 U
Phenanthrene	UG/KG	1700 U	390 U	350 U	1800 U	2000 U	360 U
Anthracene	UG/KG	1700 U	390 U	350 U	1800 U	2000 U	360 U
Carbazole	UG/KG	1700 U	390 U	350 U	1800 U	2000 U	360 U
di-n-Butylphthalate	UG/KG	1700 U	390 U	350 U	1800 U	2000 U	360 U
Fluoranthene	UG/KG	1700 U	390 U	350 U	1800 U	2000 U	360 U
Pyrene	UG/KG	1700 UJ	390 UJ	39 J	1800 UJ	2000 UJ	360 UJ
Butyl benzyl phthalate	UG/KG	1700 U	390 U	350 U	1800 U	2000 U	360 U
3,3'-Dichlorobenzidine	UG/KG	1700 U	390 U	350 U	1800 U	2000 U	360 U
Benzo[a]anthracene	UG/KG	1700 U	390 U	350 U	1800 U	2000 U	360 U
Chrysene	UG/KG	1700 U	390 U	350 U	1800 U	2000 U	360 U
bis(2-Ethylhexyl)phthalate	UG/KG	1700 U	390 U	350 U	1800 U	2000 U	360 U
di-n-Octylphthalate	UG/KG	1700 U	390 U	350 U	1800 U	2000 U	360 U
Benzo[b]fluoranthene	UG/KG	1700 U	390 U	350 U	1800 U	2000 U	360 U
Benzo[k]fluoranthene	UG/KG	1700 U	390 U	350 U	1800 U	2000 U	360 U
Benzo[a]pyrene	UG/KG	1700 U	390 U	42 J	1800 U	2000 U	360 U
Indeno[1,2,3-cd]pyrene	UG/KG	1700 U	390 U	350 U	1800 U	2000 U	360 U
Dibenz[a,h]anthracene	UG/KG	1700 U	390 U	350 U	1800 U	2000 U	360 U
Benzo[g,h,i]perylene	UG/KG	1700 U	390 U	350 U	1800 U	2000 U	360 U

FREQUENCY OF DETECTION SUMMARY
OPERABLE UNIT No. 8
SITE 16 - SURFACE SOIL
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

Client Sample ID:	16-BD-SB01-00	16-BD-SB02-00	16-BD-SB03-00	16-BD-SB04-00	16-BD-SB05-00	16-BD-SB06-00
Laboratory Sample ID:	AC4115	AC4111	AC4571	AC4198	AC4186	AC4182
Date Sampled:	10/19/94	10/19/94	10/20/94	10/19/94	10/18/94	10/18/94

	<u>UNITS</u>						
<u>PESTICIDES/PCBs</u>							
alpha-BHC	UG/KG	1.8 U	2 UJ	1.8 U	1.9 U	2.1 U	1.8 U
beta-BHC	UG/KG	1.8 U	2 UJ	1.8 U	1.9 U	2.1 U	1.8 U
delta-BHC	UG/KG	1.8 U	2 UJ	1.8 U	1.9 U	2.1 U	1.8 U
Lindane (gamma-BHC)	UG/KG	1.8 U	2 UJ	1.8 U	1.9 U	2.1 U	1.8 U
Heptachlor	UG/KG	1.8 U	2 UJ	1.8 U	1.9 U	2.1 U	1.8 U
Aldrin	UG/KG	1.8 U	2 UJ	1.8 U	1.9 U	2.1 U	1.8 U
Heptachlor epoxide	UG/KG	1.8 U	2 UJ	1.8 U	1.9 U	2.1 U	1.8 U
Endosulfan I	UG/KG	1.8 U	2 UJ	1.8 U	1.9 U	2.1 U	1.8 U
Dieldrin	UG/KG	3.4 U	3.8 UJ	3.5 U	7.3	4 U	3.6 U
4,4'-DDE	UG/KG	59	69 J	5	21	440	35 J
Endrin	UG/KG	3.4 U	3.8 UJ	3.5 U	3.6 U	4 U	3.6 U
Endosulfan II	UG/KG	6.4	3.8 UJ	3.5 U	3.6 U	4 U	9.3 J
4,4'-DDD	UG/KG	55 J	5.6 J	3.5 U	5.3	120	3.6 U
Endosulfan sulfate	UG/KG	3.4 U	3.8 UJ	3.5 U	3.6 U	4 U	3.6 U
4,4'-DDT	UG/KG	140 J	66 J	3.8	38	540 J	3.6 U
Methoxychlor	UG/KG	18 U	20 UJ	18 U	19 U	21 U	18 U
Endrin ketone	UG/KG	3.4 U	3.8 UJ	3.5 U	4.2	4 U	3.6 U
Endrin aldehyde	UG/KG	9.2 J	3.8 UJ	3.5 U	3.6 U	4 U	13
alpha-Chlordane	UG/KG	8.7	2 UJ	1.8 U	1.9 U	2.1 U	25 J
gamma-Chlordane	UG/KG	1.8 U	2 UJ	1.8 U	1.9 U	6.1	3.7 J
Toxaphene	UG/KG	180 U	200 UJ	180 U	190 U	210 U	180 U
Aroclor 1016	UG/KG	34 U	38 UJ	35 U	36 U	40 U	36 U
Aroclor 1221	UG/KG	69 U	78 UJ	71 U	74 U	81 U	72 U
Aroclor 1232	UG/KG	34 U	38 UJ	35 U	36 U	40 U	36 U
Aroclor 1242	UG/KG	34 U	38 UJ	35 U	36 U	40 U	36 U
Aroclor 1248	UG/KG	34 U	38 UJ	35 U	36 U	40 U	36 U
Aroclor 1254	UG/KG	460 J	38 UJ	35 U	36 U	40 U	1200
Aroclor 1260	UG/KG	34 U	38 UJ	35 U	36 U	210 J	36 U

FREQUENCY OF DETECTION SUMMARY
 OPERABLE UNIT No. 8
 SITE 16 - SURFACE SOIL
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID:	16-BD-SB07-00	16-BD-SB08-00	16-BD-SB09-00	16-BD-SB10-00	16-BD-SB11-00	16-BD-SB12-00
Laboratory Sample ID:	AC4576	AC4581	AC4144	AC4172	AC4136	AC4586
Date Sampled:	10/20/94	10/20/94	10/18/94	10/18/94	10/18/94	10/20/94

	UNITS	16-BD-SB07-00	16-BD-SB08-00	16-BD-SB09-00	16-BD-SB10-00	16-BD-SB11-00	16-BD-SB12-00
<u>VOLATILES</u>							
Chloromethane	UG/KG	11 U	11 U	11 U	11 U	11 U	11 U
Bromomethane	UG/KG	11 U	11 U	11 U	11 U	11 U	11 U
Vinyl chloride	UG/KG	11 U	11 U	11 U	11 U	11 U	11 U
Chloroethane	UG/KG	11 U	11 U	11 U	11 U	11 U	11 U
Methylene chloride	UG/KG	11 U	11 U	11 U	11 U	11 U	11 U
Acetone	UG/KG	11 U	11 U	15 U	11 U	11 U	11 U
Carbon Disulfide	UG/KG	11 UJ	11 UJ	11 U	11 U	11 U	11 UJ
1,1-Dichloroethene	UG/KG	11 UJ	11 UJ	11 U	11 U	11 U	11 UJ
1,1-Dichloroethane	UG/KG	11 UJ	11 UJ	11 U	11 U	11 U	11 UJ
1,2-Dichloroethene(total)	UG/KG	11 U	11 U	11 U	11 U	11 U	11 U
Chloroform	UG/KG	11 U	11 U	11 U	11 U	11 U	11 U
1,2-Dichloroethane	UG/KG	11 U	11 U	11 U	11 U	11 U	11 U
2-Butanone	UG/KG	11 U	11 U	11 U	11 U	11 U	11 U
1,1,1-Trichloroethane	UG/KG	11 U	11 U	11 U	11 U	11 U	11 U
Carbon tetrachloride	UG/KG	11 U	11 U	11 U	11 U	11 U	11 U
Bromodichloromethane	UG/KG	11 U	11 U	11 U	11 U	11 U	11 U
1,2-Dichloropropane	UG/KG	11 U	11 U	11 U	11 U	11 U	11 U
cis-1,3-Dichloropropene	UG/KG	11 U	11 U	11 U	11 U	11 U	11 U
Trichloroethene	UG/KG	11 U	11 U	11 U	11 U	11 U	11 U
Dibromochloromethane	UG/KG	11 U	11 U	11 U	11 U	11 U	11 U
1,1,2-Trichloroethane	UG/KG	11 U	11 U	11 U	11 U	11 U	11 U
Benzene	UG/KG	11 U	11 U	11 U	11 U	11 U	11 U
trans-1,3-Dichloropropene	UG/KG	11 U	11 U	11 U	11 U	11 U	11 U
Bromoform	UG/KG	11 U	11 U	11 U	11 U	11 U	11 U
4-Methyl-2-pentanone	UG/KG	11 U	11 U	11 U	11 UJ	11 U	11 U
2-Hexanone	UG/KG	11 U	11 U	11 U	11 UJ	11 U	11 U
Tetrachloroethene	UG/KG	11 U	11 U	11 U	11 UJ	11 U	11 U
1,1,2,2-Tetrachloroethane	UG/KG	11 U	11 U	11 U	11 UJ	11 U	11 U
Toluene	UG/KG	11 U	1 J	2 J	11 UJ	11 U	11 U
Chlorobenzene	UG/KG	11 U	11 U	11 U	11 UJ	11 U	11 U
Ethylbenzene	UG/KG	11 U	11 U	11 U	11 UJ	11 U	11 U
Styrene	UG/KG	11 U	11 U	11 U	11 UJ	11 U	11 U
Xylenes (total)	UG/KG	11 U	11 U	11 U	11 UJ	11 U	11 U

FREQUENCY OF DETECTION SUMMARY
 OPERABLE UNIT No. 8
 SITE 16 - SURFACE SOIL
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID:	16-BD-SB07-00	16-BD-SB08-00	16-BD-SB09-00	16-BD-SB10-00	16-BD-SB11-00	16-BD-SB12-00
Laboratory Sample ID:	AC4576	AC4581	AC4144	AC4172	AC4136	AC4586
Date Sampled:	10/20/94	10/20/94	10/18/94	10/18/94	10/18/94	10/20/94

	UNITS					
SEMIVOLATILES	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Phenol	360 U	1800 U	70 J	1800 U	360 U	350 U
bis(2-Chloroethyl) ether	360 U	1800 U	370 U	1800 U	360 U	350 U
2-Chlorophenol	360 U	1800 U	370 U	1800 U	360 U	350 U
1,3-Dichlorobenzene	360 U	1800 U	370 U	1800 U	360 U	350 U
1,4-Dichlorobenzene	360 U	1800 U	370 U	1800 UJ	360 U	350 U
1,2-Dichlorobenzene	360 U	1800 U	370 U	1800 U	360 U	350 U
2-Methylphenol	360 U	1800 U	370 U	1800 U	360 U	350 U
2,2'-oxybis-(1-chloropropane)	360 U	1800 U	370 U	1800 U	360 U	350 U
4-Methylphenol	360 U	1800 U	370 U	1800 U	360 U	350 U
N-Nitroso-di-n-propylamine	360 U	1800 U	370 U	1800 U	360 U	350 U
Hexachloroethane	360 U	1800 U	370 U	1800 U	360 U	350 U
Nitrobenzene	360 U	1800 U	370 U	1800 U	360 U	350 U
Isophorone	360 U	1800 U	370 U	1800 U	360 U	350 U
2-Nitrophenol	360 U	1800 U	370 U	1800 U	360 U	350 U
2,4-Dimethylphenol	360 U	1800 U	370 U	1800 U	360 U	350 U
bis(2-Chloroethoxy) methane	360 U	1800 U	370 U	1800 U	360 U	350 U
2,4-Dichlorophenol	360 U	1800 U	370 U	1800 U	360 U	350 U
1,2,4-Trichlorobenzene	360 U	1800 U	370 U	1800 UJ	360 U	350 U
Naphthalene	360 U	1800 U	370 U	1800 U	360 U	350 U
4-Chloroaniline	360 U	1800 U	370 U	1800 U	360 U	350 U
Hexachlorobutadiene	360 U	1800 U	370 U	1800 U	360 U	350 U
4-Chloro-3-methylphenol	360 U	1800 U	370 U	1800 U	360 U	350 U
2-Methylnaphthalene	360 U	1800 U	370 U	1800 U	360 U	350 U
Hexachlorocyclopentadiene	360 U	1800 U	370 U	1800 U	360 U	350 U
2,4,6-Trichlorophenol	360 U	1800 U	370 U	1800 U	360 U	350 U
2,4,5-Trichlorophenol	880 U	4400 U	890 U	4300 U	870 U	850 U
2-Chloronaphthalene	360 U	1800 U	370 U	1800 U	360 U	350 U
2-Nitroaniline	880 U	4400 U	890 U	4300 U	870 U	850 U
Dimethyl phthalate	360 U	1800 U	370 U	1800 U	360 U	350 U
Acenaphthylene	360 U	1800 U	370 U	1800 U	360 U	350 U
2,6-Dinitrotoluene	360 U	1800 U	370 U	1800 U	360 U	350 U
3-Nitroaniline	880 U	4400 U	890 U	4300 U	870 U	850 U
Acenaphthene	360 U	1800 U	370 U	1800 UJ	360 U	350 U

FREQUENCY OF DETECTION SUMMARY
 OPERABLE UNIT No. 8
 SITE 16 - SURFACE SOIL
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID:	16-BD-SB07-00	16-BD-SB08-00	16-BD-SB09-00	16-BD-SB10-00	16-BD-SB11-00	16-BD-SB12-00
Laboratory Sample ID:	AC4576	AC4581	AC4144	AC4172	AC4136	AC4586
Date Sampled:	10/20/94	10/20/94	10/18/94	10/18/94	10/18/94	10/20/94

	UNITS					
SEMIVOLATILES Cont.						
2,4-Dinitrophenol	UG/KG	880 U	4400 U	890 U	4300 U	870 U 850 U
4-Nitrophenol	UG/KG	880 U	4400 U	890 U	4300 U	870 U 850 U
Dibenzofuran	UG/KG	360 U	1800 U	370 U	1800 U	360 U 350 U
2,4-Dinitrotoluene	UG/KG	360 U	1800 U	370 U	1800 U	360 U 350 U
Diethylphthalate	UG/KG	360 U	1800 U	370 U	1800 U	360 U 350 U
4-Chlorophenyl phenyl ether	UG/KG	360 U	1800 U	370 U	1800 U	360 U 350 U
Fluorene	UG/KG	360 U	1800 U	370 U	1800 U	360 U 350 U
4-Nitroaniline	UG/KG	880 U	4400 U	890 U	4300 U	870 U 850 U
4,6-Dinitro-2-methylphenol	UG/KG	880 U	4400 U	890 U	4300 U	870 U 850 U
N-nitrosodiphenylamine	UG/KG	360 U	1800 U	370 U	1800 U	360 U 350 U
4-Bromophenyl-phenylether	UG/KG	360 U	1800 U	370 U	1800 U	360 U 350 U
Hexachlorobenzene	UG/KG	360 U	1800 U	370 U	1800 U	360 U 350 U
Pentachlorophenol	UG/KG	880 U	4400 U	890 U	4300 U	870 U 850 U
Phenanthrene	UG/KG	360 U	1800 U	56 J	1800 U	360 U 350 U
Anthracene	UG/KG	360 U	1800 U	370 U	1800 U	360 U 350 U
Carbazole	UG/KG	360 U	1800 U	370 U	1800 U	360 U 350 U
di-n-Butylphthalate	UG/KG	360 U	1800 U	370 U	1800 U	360 U 350 U
Fluoranthene	UG/KG	360 U	1800 U	370 U	1800 U	360 U 350 U
Pyrene	UG/KG	360 U	1800 U	370 U	1800 U	360 U 350 U
Butyl benzyl phthalate	UG/KG	360 U	1800 U	370 U	1800 U	360 U 350 U
3,3'-Dichlorobenzidine	UG/KG	360 U	1800 U	370 U	1800 U	360 U 350 U
Benzo[a]anthracene	UG/KG	360 U	1800 U	43 J	1800 U	360 U 350 U
Chrysene	UG/KG	360 U	1800 U	47 J	1800 U	360 U 350 U
bis(2-Ethylhexyl)phthalate	UG/KG	360 U	1800 U	43 J	1800 U	360 U 350 U
di-n-Octylphthalate	UG/KG	360 U	1800 U	370 U	1800 U	360 U 350 U
Benzo[b]fluoranthene	UG/KG	360 U	1800 U	370 U	1800 U	360 U 350 U
Benzo[k]fluoranthene	UG/KG	360 U	1800 U	370 U	1800 U	360 U 350 U
Benzo[a]pyrene	UG/KG	360 U	1800 U	370 U	1800 U	360 U 350 U
Indeno[1,2,3-cd]pyrene	UG/KG	360 U	1800 U	370 U	1800 U	360 U 350 U
Dibenz[a,h]anthracene	UG/KG	360 U	1800 U	370 U	1800 U	360 U 350 U
Benzo[g,h,i]perylene	UG/KG	360 U	1800 U	370 U	1800 U	360 U 350 U

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 OPERABLE UNIT No. 8
 SITE 16 - SURFACE SOIL
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID:	16-BD-SB07-00	16-BD-SB08-00	16-BD-SB09-00	16-BD-SB10-00	16-BD-SB11-00	16-BD-SB12-00
Laboratory Sample ID:	AC4576	AC4581	AC4144	AC4172	AC4136	AC4586
Date Sampled:	10/20/94	10/20/94	10/18/94	10/18/94	10/18/94	10/20/94

	UNITS					
PESTICIDES/PCBs						
alpha-BHC	UG/KG	1.9 U	1.8 U	1.9 U	1.8 U	1.8 U
beta-BHC	UG/KG	1.9 U	1.8 U	1.9 U	1.8 U	1.8 U
delta-BHC	UG/KG	1.9 U	1.8 U	1.9 U	1.8 U	1.8 U
Lindane (gamma-BHC)	UG/KG	1.9 U	1.8 U	1.9 U	1.8 U	1.8 U
Heptachlor	UG/KG	1.9 U	1.8 U	1.9 U	1.8 U	1.8 U
Aldrin	UG/KG	1.9 U	1.8 U	3.4 J	1.8 U	1.8 U
Heptachlor epoxide	UG/KG	1.9 U	1.8 U	1.9 U	1.8 U	1.8 U
Endosulfan I	UG/KG	1.9 U	1.8 U	1.9 U	1.8 U	1.8 U
Dieldrin	UG/KG	3.6 U	3.6 U	77 J	3.6 U	3.5 U
4,4'-DDE	UG/KG	120	56	81	150 J	75
Endrin	UG/KG	3.6 U	3.6 U	6.5	3.6 U	3.5 U
Endosulfan II	UG/KG	3.6 U	3.6 U	3.6 U	3.6 U	3.5 U
4,4'-DDD	UG/KG	21 J	11 J	31	46 J	8.3
Endosulfan sulfate	UG/KG	3.6 U	3.6 U	3.6 U	3.6 U	3.5 U
4,4'-DDT	UG/KG	160 J	49 J	130	150 J	46
Methoxychlor	UG/KG	19 U	18 U	19 U	18 U	18 U
Endrin ketone	UG/KG	3.6 U	3.6 U	9.9	3.6 U	3.5 U
Endrin aldehyde	UG/KG	3.6 U	3.6 U	3.6 U	8.5 J	3.5 U
alpha-Chlordane	UG/KG	1.9 U	3.5	1.9 U	9.4 J	1.8 U
gamma-Chlordane	UG/KG	1.9 U	1.6 J	1.9 U	3.8 J	1.8 U
Toxaphene	UG/KG	190 U	180 U	190 U	180 U	180 U
Aroclor 1016	UG/KG	36 U	36 U	36 U	36 U	35 U
Aroclor 1221	UG/KG	74 U	73 U	74 U	72 U	71 U
Aroclor 1232	UG/KG	36 U	36 U	36 U	36 U	35 U
Aroclor 1242	UG/KG	36 U	36 U	36 U	36 U	35 U
Aroclor 1248	UG/KG	36 U	36 U	36 U	36 U	35 U
Aroclor 1254	UG/KG	36 U	130	190 J	380 J	35 U
Aroclor 1260	UG/KG	36 U	36 U	36 U	36 U	35 U

FREQUENCY OF DETECTION SUMMARY
 OPERABLE UNIT No. 8
 SITE 16 - SURFACE SOIL
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID:	16-BD-SB13-00	16-BD-SB14-00	16-BD-SB15-00	16-BD-SB16-00	16-BD-SB17-00	16-BD-SB18-00
Laboratory Sample ID:	AC4592	AC4121	AC4194	AC4126	AC4190	AC4608
Date Sampled:	10/20/94	10/19/94	10/19/94	10/18/94	10/19/94	10/20/94

	UNITS						
VOLATILES							
Chloromethane	UG/KG	11 UJ	12 UJ	11 U	11 U	11 U	11 UJ
Bromomethane	UG/KG	11 U	12 UJ	11 U	11 U	11 U	11 U
Vinyl chloride	UG/KG	11 U	12 UJ	11 U	11 U	11 U	11 U
Chloroethane	UG/KG	11 U	12 UJ	11 U	11 U	11 U	11 U
Methylene chloride	UG/KG	11 U	12 UJ	11 U	11 U	11 U	11 U
Acetone	UG/KG	11 U	12 UJ	11 J	14 U	11 U	11 U
Carbon Disulfide	UG/KG	11 UJ	12 UJ	11 U	11 U	11 U	11 U
1,1-Dichloroethene	UG/KG	11 U	12 UJ	11 U	11 U	11 U	11 U
1,1-Dichloroethane	UG/KG	11 UJ	12 UJ	11 U	11 U	11 U	11 UJ
1,2-Dichloroethene(total)	UG/KG	11 U	12 UJ	11 U	11 U	11 U	11 U
Chloroform	UG/KG	11 U	12 UJ	11 U	11 U	11 U	11 U
1,2-Dichloroethane	UG/KG	11 U	12 UJ	11 U	11 U	11 U	11 U
2-Butanone	UG/KG	11 U	12 UJ	11 U	11 U	11 U	11 U
1,1,1-Trichloroethane	UG/KG	11 U	12 UJ	11 U	11 U	11 U	11 U
Carbon tetrachloride	UG/KG	11 U	12 UJ	11 U	11 U	11 U	11 U
Bromodichloromethane	UG/KG	11 U	12 UJ	11 U	11 U	11 U	11 U
1,2-Dichloropropane	UG/KG	11 U	12 UJ	11 U	11 U	11 U	11 U
cis-1,3-Dichloropropene	UG/KG	11 U	12 UJ	11 U	11 U	11 U	11 U
Trichloroethene	UG/KG	11 U	12 UJ	11 U	11 U	11 U	11 U
Dibromochloromethane	UG/KG	11 U	12 UJ	11 U	11 U	11 U	11 U
1,1,2-Trichloroethane	UG/KG	11 U	12 UJ	11 U	11 U	11 U	11 U
Benzene	UG/KG	11 U	12 UJ	11 U	11 U	11 U	11 U
trans-1,3-Dichloropropene	UG/KG	11 U	12 UJ	11 U	11 U	11 U	11 U
Bromoform	UG/KG	11 U	12 UJ	11 U	11 U	11 U	11 U
4-Methyl-2-pentanone	UG/KG	11 U	12 UJ	11 UJ	11 U	11 U	11 U
2-Hexanone	UG/KG	11 U	12 UJ	11 UJ	11 U	11 U	11 U
Tetrachloroethene	UG/KG	11 U	12 UJ	11 UJ	11 U	11 U	11 U
1,1,2,2-Tetrachloroethane	UG/KG	11 U	12 UJ	11 UJ	11 U	11 U	11 U
Toluene	UG/KG	11 U	4 J	11 UJ	11 U	11 U	11 U
Chlorobenzene	UG/KG	11 U	12 UJ	11 UJ	11 U	11 U	11 U
Ethylbenzene	UG/KG	11 U	12 UJ	11 UJ	11 U	11 U	11 U
Styrene	UG/KG	11 U	12 UJ	11 UJ	11 U	11 U	11 U
Xylenes (total)	UG/KG	11 U	12 UJ	11 UJ	11 U	11 U	11 U

FREQUENCY OF DETECTION SUMMARY
 OPERABLE UNIT No. 8
 SITE 16 - SURFACE SOIL
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID:	16-BD-SB13-00	16-BD-SB14-00	16-BD-SB15-00	16-BD-SB16-00	16-BD-SB17-00	16-BD-SB18-00
Laboratory Sample ID:	AC4592	AC4121	AC4194	AC4126	AC4190	AC4608
Date Sampled:	10/20/94	10/19/94	10/19/94	10/18/94	10/19/94	10/20/94

	UNITS						
SEMIVOLATILES							
Phenol	UG/KG	380 U	1900 U	1800 U	370 U	1800 U	370 U
bis(2-Chloroethyl) ether	UG/KG	380 U	1900 U	1800 U	370 U	1800 U	370 U
2-Chlorophenol	UG/KG	380 U	1900 U	1800 U	370 U	1800 U	370 U
1,3-Dichlorobenzene	UG/KG	380 U	1900 U	1800 U	370 U	1800 U	370 U
1,4-Dichlorobenzene	UG/KG	43 J	1900 UJ	1800 UJ	370 U	1800 UJ	370 U
1,2-Dichlorobenzene	UG/KG	380 U	1900 U	1800 U	370 U	1800 U	370 U
2-Methylphenol	UG/KG	380 U	1900 U	1800 U	370 U	1800 U	370 U
2,2'-oxybis-(1-chloropropane)	UG/KG	380 U	1900 U	1800 U	370 U	1800 U	370 U
4-Methylphenol	UG/KG	380 U	1900 U	1800 U	370 U	1800 U	370 U
N-Nitroso-di-n-propylamine	UG/KG	380 U	1900 U	1800 U	370 U	1800 U	370 U
Hexachloroethane	UG/KG	380 U	1900 U	1800 U	370 U	1800 U	370 U
Nitrobenzene	UG/KG	380 U	1900 U	1800 U	370 U	1800 U	370 U
Isophorone	UG/KG	380 U	1900 U	1800 U	370 U	1800 U	370 U
2-Nitrophenol	UG/KG	380 U	1900 U	1800 U	370 U	1800 U	370 U
2,4-Dimethylphenol	UG/KG	380 U	1900 U	1800 U	370 U	1800 U	370 U
bis(2-Chloroethoxy) methane	UG/KG	380 U	1900 U	1800 U	370 U	1800 U	370 U
2,4-Dichlorophenol	UG/KG	380 U	1900 U	1800 U	370 U	1800 U	370 U
1,2,4-Trichlorobenzene	UG/KG	380 U	1900 UJ	1800 UJ	370 U	1800 UJ	370 U
Naphthalene	UG/KG	380 U	1900 U	1800 U	370 U	1800 U	370 U
4-Chloroaniline	UG/KG	380 U	1900 U	1800 U	370 U	1800 U	370 U
Hexachlorobutadiene	UG/KG	380 U	1900 U	1800 U	370 U	1800 U	370 U
4-Chloro-3-methylphenol	UG/KG	380 U	1900 U	1800 U	370 U	1800 U	370 U
2-Methylnaphthalene	UG/KG	380 U	1900 U	1800 U	370 U	1800 U	370 U
Hexachlorocyclopentadiene	UG/KG	380 U	1900 U	1800 U	370 U	1800 U	370 U
2,4,6-Trichlorophenol	UG/KG	380 U	1900 U	1800 U	370 U	1800 U	370 U
2,4,5-Trichlorophenol	UG/KG	910 U	4700 U	4400 U	900 U	4300 U	890 U
2-Chloronaphthalene	UG/KG	380 U	1900 U	1800 U	370 U	1800 U	370 U
2-Nitroaniline	UG/KG	910 U	4700 U	4400 U	900 U	4300 U	890 U
Dimethyl phthalate	UG/KG	380 U	1900 U	1800 U	370 U	1800 U	370 U
Acenaphthylene	UG/KG	380 U	1900 U	1800 U	370 U	1800 U	370 U
2,6-Dinitrotoluene	UG/KG	380 U	1900 U	1800 U	370 U	1800 U	370 U
3-Nitroaniline	UG/KG	910 U	4700 U	4400 U	900 U	4300 U	890 U
Acenaphthene	UG/KG	380 U	1900 UJ	1800 UJ	370 U	1800 UJ	370 U

FREQUENCY OF DETECTION SUMMARY
 OPERABLE UNIT No. 8
 SITE 16 - SURFACE SOIL
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID:	16-BD-SB13-00	16-BD-SB14-00	16-BD-SB15-00	16-BD-SB16-00	16-BD-SB17-00	16-BD-SB18-00
Laboratory Sample ID:	AC4592	AC4121	AC4194	AC4126	AC4190	AC4608
Date Sampled:	10/20/94	10/19/94	10/19/94	10/18/94	10/19/94	10/20/94

	UNITS						
SEMIVOLATILES Cont.							
2,4-Dinitrophenol	UG/KG	910 U	4700 U	4400 U	900 U	4300 U	890 UJ
4-Nitrophenol	UG/KG	910 U	4700 U	4400 U	900 U	4300 U	890 U
Dibenzofuran	UG/KG	380 U	1900 U	1800 U	370 U	1800 U	370 U
2,4-Dinitrotoluene	UG/KG	380 U	1900 U	1800 U	370 U	1800 U	370 U
Diethylphthalate	UG/KG	380 U	1900 U	1800 U	370 U	1800 U	370 U
4-Chlorophenyl phenyl ether	UG/KG	380 U	1900 U	1800 U	370 U	1800 U	370 U
Fluorene	UG/KG	380 U	1900 U	1800 U	370 U	1800 U	370 U
4-Nitroaniline	UG/KG	910 U	4700 U	4400 U	900 U	4300 U	890 U
4,6-Dinitro-2-methylphenol	UG/KG	910 U	4700 U	4400 U	900 U	4300 U	890 U
N-nitrosodiphenylamine	UG/KG	380 U	1900 U	1800 U	370 U	1800 U	370 U
4-Bromophenyl-phenylether	UG/KG	380 U	1900 U	1800 U	370 U	1800 U	370 U
Hexachlorobenzene	UG/KG	380 U	1900 U	1800 U	370 U	1800 U	370 U
Pentachlorophenol	UG/KG	910 U	4700 U	4400 U	900 U	4300 U	890 U
Phenanthrene	UG/KG	380 U	1900 U	1800 U	52 J	1800 U	370 U
Anthracene	UG/KG	380 U	1900 U	1800 U	370 U	1800 U	370 U
Carbazole	UG/KG	380 U	1900 U	1800 U	370 U	1800 U	370 U
di-n-Butylphthalate	UG/KG	380 U	1900 U	1800 U	370 U	1800 U	370 U
Fluoranthene	UG/KG	46 J	1900 U	1800 U	370 U	1800 U	370 U
Pyrene	UG/KG	110 J	1900 UJ	1800 UJ	63 J	1800 UJ	370 U
Butyl benzyl phthalate	UG/KG	380 U	1900 U	1800 U	64 J	1800 U	370 U
3,3'-Dichlorobenzidine	UG/KG	380 U	1900 U	1800 U	370 U	1800 U	370 U
Benzo[a]anthracene	UG/KG	380 U	1900 U	1800 U	370 U	1800 U	370 U
Chrysene	UG/KG	68 J	1900 U	1800 U	43 J	1800 U	370 U
bis(2-Ethylhexyl)phthalate	UG/KG	380 U	1900 U	1800 U	490	1800 U	370 U
di-n-Octylphthalate	UG/KG	380 U	1900 U	1800 U	370 U	1800 U	370 U
Benzo[b]fluoranthene	UG/KG	88 J	1900 U	1800 U	54 J	1800 U	370 U
Benzo[k]fluoranthene	UG/KG	84 J	1900 U	1800 U	370 U	1800 U	370 U
Benzo[a]pyrene	UG/KG	380 U	1900 U	1800 U	130 J	1800 U	370 U
Indeno[1,2,3-cd]pyrene	UG/KG	380 U	1900 U	1800 U	52 J	1800 U	370 U
Dibenz[a,h]anthracene	UG/KG	380 U	1900 U	1800 U	370 U	1800 U	370 U
Benzo[g,h,i]perylene	UG/KG	380 U	1900 U	1800 U	92 J	1800 U	370 U

FREQUENCY OF DETECTION SUMMARY
 OPERABLE UNIT No. 8
 SITE 16 - SURFACE SOIL
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID:	16-BD-SB13-00	16-BD-SB14-00	16-BD-SB15-00	16-BD-SB16-00	16-BD-SB17-00	16-BD-SB18-00
Laboratory Sample ID:	AC4592	AC4121	AC4194	AC4126	AC4190	AC4608
Date Sampled:	10/20/94	10/19/94	10/19/94	10/18/94	10/19/94	10/20/94

	UNITS						
PESTICIDES/PCBs							
alpha-BHC	UG/KG	1.9 U	2 U	1.9 U	1.9 U	1.8 U	1.9 U
beta-BHC	UG/KG	1.9 U	2 U	1.9 U	1.9 U	1.8 U	1.9 U
delta-BHC	UG/KG	4.7	2 U	1.9 U	1.9 U	1.8 U	1.9 U
Lindane (gamma-BHC)	UG/KG	1.9 U	2 U	1.9 U	1.9 U	1.8 U	1.9 U
Heptachlor	UG/KG	1.9 U	2 U	1.9 U	1.9 U	1.8 U	1.9 U
Aldrin	UG/KG	1.9 U	2 U	1.9 U	1.9 U	1.8 U	1.9 U
Heptachlor epoxide	UG/KG	1.9 U	2 U	1.9 U	1.9 U	1.8 U	1.9 U
Endosulfan I	UG/KG	1.9 U	2 U	1.9 U	1.9 U	1.8 U	1.9 U
Dieldrin	UG/KG	11 J	3.8 U	28	22 J	3.5 U	5.6
4,4'-DDE	UG/KG	94 J	71 J	21	70	38	230
Endrin	UG/KG	3.7 U	7 J	3.6 U	14 J	3.5 U	3.6 U
Endosulfan II	UG/KG	26 J	10 J	3.6 U	15	3.5 U	3.6 U
4,4'-DDD	UG/KG	17 J	22 J	2.6 J	19 J	35	13
Endosulfan sulfate	UG/KG	3.7 U	3.8 U	3.6 U	3.7 U	3.5 U	3.6 U
4,4'-DDT	UG/KG	40 J	46 J	16	140 J	120	130 J
Methoxychlor	UG/KG	19 U	20 U	19 U	19 U	18 U	19 U
Endrin ketone	UG/KG	3.7 U	3.8 U	3.6 U	3.7 U	3.5 U	3.6 U
Endrin aldehyde	UG/KG	21	19 J	3.6 U	29	3.5 U	3.6 U
alpha-Chlordane	UG/KG	120	19	1.9 U	36	1.8 U	1.9 U
gamma-Chlordane	UG/KG	72 J	6.1 J	1.9 U	18 J	1.8 U	1.9 U
Toxaphene	UG/KG	190 U	200 U	190 U	190 U	180 U	190 U
Aroclor 1016	UG/KG	37 U	38 U	36 U	37 U	35 U	36 U
Aroclor 1221	UG/KG	76 U	77 U	74 U	75 U	71 U	74 U
Aroclor 1232	UG/KG	37 U	38 U	36 U	37 U	35 U	36 U
Aroclor 1242	UG/KG	37 U	38 U	36 U	37 U	35 U	36 U
Aroclor 1248	UG/KG	37 U	38 U	36 U	37 U	35 U	36 U
Aroclor 1254	UG/KG	2100	870	36 U	1100	35 U	65 J
Aroclor 1260	UG/KG	37 U	38 U	36 U	37 U	35 U	36 U

FREQUENCY OF DETECTION SUMMARY
 OPERABLE UNIT No. 8
 SITE 16 - SURFACE SOIL
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID:	16-BD-SB19-00	16-BD-SB20-00	16-MW02-00	16-MW03-00	16-MW04-00	16-MW05-00
Laboratory Sample ID:	AC4604	AC4848	AC4567	AC4178	AC4102	AC4857
Date Sampled:	10/20/94	10/20/94	10/19/94	10/18/94	10/19/94	10/21/94

UNITS

VOLATILES

	16-BD-SB19-00	16-BD-SB20-00	16-MW02-00	16-MW03-00	16-MW04-00	16-MW05-00
Chloromethane	UG/KG	11 UJ	11 U	14 U	11 U	60 U
Bromomethane	UG/KG	11 U	11 U	14 U	11 U	60 U
Vinyl chloride	UG/KG	11 U	11 U	14 U	11 U	60 U
Chloroethane	UG/KG	11 U	11 U	14 U	11 U	60 U
Methylene chloride	UG/KG	11 U	6 J	14 U	11 U	60 U
Acetone	UG/KG	11 U	11 U	21 U	11 U	1200
Carbon Disulfide	UG/KG	11 UJ	11 U	14 UJ	11 U	60 U
1,1-Dichloroethene	UG/KG	11 U	11 U	14 UJ	11 U	60 U
1,1-Dichloroethane	UG/KG	11 UJ	11 U	14 UJ	11 U	60 U
1,2-Dichloroethene(total)	UG/KG	11 U	11 U	14 U	11 U	60 U
Chloroform	UG/KG	11 U	11 U	14 U	11 U	60 U
1,2-Dichloroethane	UG/KG	11 U	11 U	14 U	11 U	60 U
2-Butanone	UG/KG	11 U	11 U	14 U	11 U	60 U
1,1,1-Trichloroethane	UG/KG	11 U	11 U	14 U	11 U	60 U
Carbon tetrachloride	UG/KG	11 U	11 U	14 U	11 U	60 U
Bromodichloromethane	UG/KG	11 U	11 U	14 U	11 U	60 U
1,2-Dichloropropane	UG/KG	11 U	11 U	14 U	11 U	60 U
cis-1,3-Dichloropropene	UG/KG	11 U	11 U	14 U	11 U	60 U
Trichloroethene	UG/KG	11 U	11 U	14 U	11 U	60 U
Dibromochloromethane	UG/KG	11 U	11 U	14 U	11 U	60 U
1,1,2-Trichloroethane	UG/KG	11 U	11 U	14 U	11 U	60 U
Benzene	UG/KG	11 U	11 U	14 U	11 U	60 U
trans-1,3-Dichloropropene	UG/KG	11 U	11 U	14 U	11 U	60 U
Bromoform	UG/KG	11 U	11 U	14 U	11 U	60 U
4-Methyl-2-pentanone	UG/KG	11 U	11 U	14 U	11 U	60 U
2-Hexanone	UG/KG	11 U	11 U	14 U	11 U	60 U
Tetrachloroethene	UG/KG	11 U	11 U	14 U	11 U	60 U
1,1,2,2-Tetrachloroethane	UG/KG	11 U	11 U	14 U	11 U	60 U
Toluene	UG/KG	11 U	11 U	14 U	11 U	60 U
Chlorobenzene	UG/KG	11 U	11 U	14 U	11 U	60 U
Ethylbenzene	UG/KG	11 U	11 U	14 U	11 U	60 U
Styrene	UG/KG	11 U	11 U	14 U	11 U	60 U
Xylenes (total)	UG/KG	11 U	11 U	14 U	11 U	60 U

FREQUENCY OF DETECTION SUMMARY
 OPERABLE UNIT No. 8
 SITE 16 - SURFACE SOIL
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID:	16-BD-SB19-00	16-BD-SB20-00	16-MW02-00	16-MW03-00	16-MW04-00	16-MW05-00
Laboratory Sample ID:	AC4604	AC4848	AC4567	AC4178	AC4102	AC4857
Date Sampled:	10/20/94	10/20/94	10/19/94	10/18/94	10/19/94	10/21/94

	UNITS						
SEMIVOLATILES							
Phenol	UG/KG	360 U	370 UJ	2300 U	360 U	390 U	350 U
bis(2-Chloroethyl) ether	UG/KG	360 U	370 UJ	2300 U	360 U	390 U	350 U
2-Chlorophenol	UG/KG	360 U	370 UJ	2300 U	360 U	390 U	350 U
1,3-Dichlorobenzene	UG/KG	360 U	370 UJ	2300 U	360 U	390 U	350 U
1,4-Dichlorobenzene	UG/KG	360 U	370 UJ	2300 U	360 UJ	390 UJ	350 U
1,2-Dichlorobenzene	UG/KG	360 U	370 UJ	2300 U	360 U	390 U	350 U
2-Methylphenol	UG/KG	360 U	370 UJ	2300 U	360 U	390 U	350 U
2,2'-oxybis-(1-chloropropane)	UG/KG	360 U	370 UJ	2300 U	360 U	390 U	350 U
4-Methylphenol	UG/KG	360 U	370 UJ	2300 U	360 U	390 U	350 U
N-Nitroso-di-n-propylamine	UG/KG	360 U	370 UJ	2300 U	360 U	390 U	350 U
Hexachloroethane	UG/KG	360 U	370 UJ	2300 U	360 U	390 U	350 U
Nitrobenzene	UG/KG	360 U	370 UJ	2300 U	360 U	390 U	350 U
Isophorone	UG/KG	360 U	370 UJ	2300 U	360 U	390 U	350 U
2-Nitrophenol	UG/KG	360 U	370 UJ	2300 U	360 U	390 U	350 U
2,4-Dimethylphenol	UG/KG	360 U	370 UJ	2300 U	360 U	390 U	350 U
bis(2-Chloroethoxy) methane	UG/KG	360 U	370 UJ	2300 U	360 U	390 U	350 U
2,4-Dichlorophenol	UG/KG	360 U	370 UJ	2300 U	360 U	390 U	350 U
1,2,4-Trichlorobenzene	UG/KG	360 U	370 UJ	2300 U	360 UJ	390 UJ	350 U
Naphthalene	UG/KG	360 U	370 UJ	2300 U	360 U	390 U	350 U
4-Chloroaniline	UG/KG	360 U	370 UJ	2300 U	360 U	390 U	350 U
Hexachlorobutadiene	UG/KG	360 U	370 UJ	2300 U	360 U	390 U	350 U
4-Chloro-3-methylphenol	UG/KG	360 U	370 UJ	2300 U	360 U	390 U	350 U
2-Methylnaphthalene	UG/KG	360 U	370 UJ	2300 U	360 U	390 U	350 U
Hexachlorocyclopentadiene	UG/KG	360 U	370 UJ	2300 U	360 U	390 U	350 U
2,4,6-Trichlorophenol	UG/KG	360 U	370 UJ	2300 U	360 U	390 U	350 U
2,4,5-Trichlorophenol	UG/KG	880 U	890 UJ	5500 U	870 U	940 U	840 U
2-Chloronaphthalene	UG/KG	360 U	370 UJ	2300 U	360 U	390 U	350 U
2-Nitroaniline	UG/KG	880 U	890 UJ	5500 U	870 U	940 U	840 U
Dimethyl phthalate	UG/KG	360 U	370 UJ	2300 U	360 U	390 U	350 U
Acenaphthylene	UG/KG	360 U	370 UJ	2300 U	360 U	390 U	350 U
2,6-Dinitrotoluene	UG/KG	360 U	370 UJ	2300 U	360 U	390 U	350 U
3-Nitroaniline	UG/KG	880 U	890 UJ	5500 U	870 U	940 U	840 U
Acenaphthene	UG/KG	360 U	370 UJ	2300 U	360 UJ	390 UJ	350 U

FREQUENCY OF DETECTION SUMMARY
 OPERABLE UNIT No. 8
 SITE 16 - SURFACE SOIL
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID:	16-BD-SB19-00	16-BD-SB20-00	16-MW02-00	16-MW03-00	16-MW04-00	16-MW05-00
Laboratory Sample ID:	AC4604	AC4848	AC4567	AC4178	AC4102	AC4857
Date Sampled:	10/20/94	10/20/94	10/19/94	10/18/94	10/19/94	10/21/94

	UNITS						
SEMIVOLATILES Cont.							
2,4-Dinitrophenol	UG/KG	880 UJ	890 UJ	5500 U	870 U	940 U	840 U
4-Nitrophenol	UG/KG	880 U	890 UJ	5500 U	870 U	940 U	840 U
Dibenzofuran	UG/KG	360 U	370 UJ	2300 U	360 U	390 U	350 U
2,4-Dinitrotoluene	UG/KG	360 U	370 UJ	2300 U	360 U	390 U	350 U
Diethylphthalate	UG/KG	360 U	370 UJ	2300 U	360 U	390 U	350 U
4-Chlorophenyl phenyl ether	UG/KG	360 U	370 UJ	2300 U	360 U	390 U	350 U
Fluorene	UG/KG	360 U	370 UJ	2300 U	360 U	390 U	350 U
4-Nitroaniline	UG/KG	880 U	890 UJ	5500 U	870 U	940 U	840 U
4,6-Dinitro-2-methylphenol	UG/KG	880 U	890 UJ	5500 U	870 U	940 U	840 U
N-nitrosodiphenylamine	UG/KG	360 U	370 UJ	2300 U	360 U	390 U	350 U
4-Bromophenyl-phenylether	UG/KG	360 U	370 UJ	2300 U	360 U	390 U	350 U
Hexachlorobenzene	UG/KG	360 U	370 UJ	2300 U	360 U	390 U	350 U
Pentachlorophenol	UG/KG	880 U	890 UJ	5500 U	870 U	940 U	840 U
Phenanthrene	UG/KG	360 U	370 UJ	2300 U	360 U	390 U	350 U
Anthracene	UG/KG	360 U	370 UJ	2300 U	360 U	390 U	350 U
Carbazole	UG/KG	360 U	370 UJ	2300 U	360 U	390 U	350 U
di-n-Butylphthalate	UG/KG	360 U	370 UJ	2300 U	360 U	390 U	350 U
Fluoranthene	UG/KG	360 U	370 UJ	2300 U	360 U	390 U	350 U
Pyrene	UG/KG	360 U	370 UJ	2300 U	360 UJ	390 UJ	350 U
Butyl benzyl phthalate	UG/KG	360 U	370 UJ	2300 U	360 U	390 U	350 U
3,3'-Dichlorobenzidine	UG/KG	360 U	370 UJ	2300 U	360 U	390 U	350 U
Benzo[a]anthracene	UG/KG	360 U	370 UJ	2300 U	360 U	390 U	350 U
Chrysene	UG/KG	360 U	370 UJ	2300 U	360 U	390 U	350 U
bis(2-Ethylhexyl)phthalate	UG/KG	360 U	44 J	2300 U	360 U	390 U	80 J
di-n-Octylphthalate	UG/KG	360 U	370 UJ	2300 U	360 U	390 U	350 U
Benzo[b]fluoranthene	UG/KG	360 U	370 UJ	2300 U	360 U	390 U	350 U
Benzo[k]fluoranthene	UG/KG	360 U	370 UJ	2300 U	360 U	390 U	350 U
Benzo[a]pyrene	UG/KG	360 U	370 UJ	2300 U	360 U	390 U	350 U
Indeno[1,2,3-cd]pyrene	UG/KG	360 U	370 UJ	2300 U	360 U	390 U	350 U
Dibenz[a,h]anthracene	UG/KG	360 U	370 UJ	2300 U	360 U	390 U	350 U
Benzo[g,h,i]perylene	UG/KG	360 U	370 UJ	2300 U	360 U	390 U	350 U

FREQUENCY OF DETECTION SUMMARY
OPERABLE UNIT No. 8
SITE 16 - SURFACE SOIL
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

Client Sample ID:	16-BD-SB19-00	16-BD-SB20-00	16-MW02-00	16-MW03-00	16-MW04-00	16-MW05-00
Laboratory Sample ID:	AC4604	AC4848	AC4567	AC4178	AC4102	AC4857
Date Sampled:	10/20/94	10/20/94	10/19/94	10/18/94	10/19/94	10/21/94

	<u>UNITS</u>						
<u>PESTICIDES/PCBs</u>							
alpha-BHC	UG/KG	1.9 U	1.9 U	2.3 U	1.9 U	2 U	1.8 U
beta-BHC	UG/KG	1.9 U	1.9 U	2.3 U	1.9 U	2 U	1.8 U
delta-BHC	UG/KG	1.9 U	1.9 U	2.3 U	1.9 U	2 U	1.8 U
Lindane (gamma-BHC)	UG/KG	1.9 U	1.9 U	2.3 U	1.9 U	2 U	1.8 U
Heptachlor	UG/KG	1.9 U	1.9 U	2.3 U	1.9 U	2 U	1.8 U
Aldrin	UG/KG	1.9 U	1.9 U	2.3 U	1.9 U	2 U	1.8 U
Heptachlor epoxide	UG/KG	1.9 U	1.9 U	2.3 U	1.9 U	2 U	1.8 U
Endosulfan I	UG/KG	1.9 U	1.9 U	2.3 U	1.9 U	2 U	1.8 U
Dieldrin	UG/KG	3.6 U	18	4.5 U	3.6 U	4 U	3.5 U
4,4'-DDE	UG/KG	3.6 U	35	9.2	3.6 U	4 U	23
Endrin	UG/KG	3.6 U	3.6 U	4.5 U	3.6 U	4 U	3.5 U
Endosulfan II	UG/KG	3.6 U	3.6 U	4.5 U	3.6 U	4 U	3.5 U
4,4'-DDD	UG/KG	3.6 U	3.6 U	4.5 U	3.6 U	4 U	3.8
Endosulfan sulfate	UG/KG	3.6 U	3.6 U	4.5 U	3.6 U	4 U	3.5 U
4,4'-DDT	UG/KG	3.8 J	20 U	8.1 J	3.6 U	4 U	24 U
Methoxychlor	UG/KG	19 U	19 U	23 U	19 U	20 U	18 U
Endrin ketone	UG/KG	3.6 U	3.6 U	4.5 U	3.6 U	4 U	3.5 U
Endrin aldehyde	UG/KG	3.6 U	4.6	4.5 U	3.6 U	4 U	3.5 U
alpha-Chlordane	UG/KG	9.5	1.9 U	2.3 U	1.9 U	2 U	1.8 U
gamma-Chlordane	UG/KG	1.9 U	1.9 U	2.3 U	1.9 U	2 U	1.8 U
Toxaphene	UG/KG	190 U	190 U	230 U	190 U	200 U	180 U
Aroclor 1016	UG/KG	36 U	36 U	45 U	36 U	40 U	35 U
Aroclor 1221	UG/KG	73 U	74 U	92 U	73 U	80 U	72 U
Aroclor 1232	UG/KG	36 U	36 U	45 U	36 U	40 U	35 U
Aroclor 1242	UG/KG	36 U	36 U	45 U	36 U	40 U	35 U
Aroclor 1248	UG/KG	36 U	36 U	45 U	36 U	40 U	35 U
Aroclor 1254	UG/KG	36 U	41	45 U	36 U	40 U	35 U
Aroclor 1260	UG/KG	36 U	36 U	45 U	36 U	40 U	35 U

FREQUENCY OF DETECTION SUMMARY
 OPERABLE UNIT No. 8
 SITE 16 - SURFACE SOIL
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID:	16-MW06-00	16-SDA-SB01-00	16-SDA-SB02-00	16-SDA-SB03-00	16-SDA-SB04-00
Laboratory Sample ID:	AC4862	AC4116	AC4132	AC4158	AC4162
Date Sampled:	10/21/94	10/18/94	10/18/94	10/18/94	10/18/94

	UNITS					
VOLATILES						
Chloromethane	UG/KG	11 U	11 U	11 U	12 U	11 U
Bromomethane	UG/KG	11 U	11 U	11 U	12 U	11 U
Vinyl chloride	UG/KG	11 U	11 U	11 U	12 U	11 U
Chloroethane	UG/KG	11 U	11 U	11 U	12 U	11 U
Methylene chloride	UG/KG	8 J	11 U	11 U	12 U	11 U
Acetone	UG/KG	200	11 U	18 U	12 U	11 U
Carbon Disulfide	UG/KG	11 U	11 U	11 U	12 U	11 U
1,1-Dichloroethene	UG/KG	11 U	11 U	11 U	12 U	11 U
1,1-Dichloroethane	UG/KG	11 U	11 U	11 U	12 U	11 U
1,2-Dichloroethene(total)	UG/KG	11 U	11 U	11 U	12 U	11 U
Chloroform	UG/KG	11 U	11 U	11 U	12 U	11 U
1,2-Dichloroethane	UG/KG	11 U	11 U	11 U	12 U	11 U
2-Butanone	UG/KG	11 U	11 U	11 U	12 U	11 U
1,1,1-Trichloroethane	UG/KG	11 U	11 U	11 U	12 U	11 U
Carbon tetrachloride	UG/KG	11 U	11 U	11 U	12 U	11 U
Bromodichloromethane	UG/KG	11 U	11 U	11 U	12 U	11 U
1,2-Dichloropropane	UG/KG	11 U	11 U	11 U	12 U	11 U
cis-1,3-Dichloropropene	UG/KG	11 U	11 U	11 U	12 U	11 U
Trichloroethene	UG/KG	11 U	11 U	11 U	12 U	11 U
Dibromochloromethane	UG/KG	11 U	11 U	11 U	12 U	11 U
1,1,2-Trichloroethane	UG/KG	11 U	11 U	11 U	12 U	11 U
Benzene	UG/KG	11 U	11 U	11 U	12 U	11 U
trans-1,3-Dichloropropene	UG/KG	11 U	11 U	11 U	12 U	11 U
Bromoform	UG/KG	11 U	11 U	11 U	12 U	11 U
4-Methyl-2-pentanone	UG/KG	11 U	11 U	11 U	12 U	11 U
2-Hexanone	UG/KG	11 U	11 U	11 U	12 U	11 U
Tetrachloroethene	UG/KG	11 U	11 U	11 U	12 U	11 U
1,1,2,2-Tetrachloroethane	UG/KG	11 U	11 U	11 U	12 U	11 U
Toluene	UG/KG	11 U	11 U	11 U	12 U	11 U
Chlorobenzene	UG/KG	11 U	11 U	11 U	12 U	11 U
Ethylbenzene	UG/KG	11 U	11 U	11 U	12 U	11 U
Styrene	UG/KG	11 U	11 U	11 U	12 U	11 U
Xylenes (total)	UG/KG	11 U	11 U	11 U	12 U	11 U

FREQUENCY OF DETECTION SUMMARY
 OPERABLE UNIT No. 8
 SITE 16 - SURFACE SOIL
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID:	16-MW06-00	16-SDA-SB01-00	16-SDA-SB02-00	16-SDA-SB03-00	16-SDA-SB04-00
Laboratory Sample ID:	AC4862	AC4116	AC4132	AC4158	AC4162
Date Sampled:	10/21/94	10/18/94	10/18/94	10/18/94	10/18/94

	<u>UNITS</u>					
<u>SEMIVOLATILES</u>						
Phenol	UG/KG	350 U	360 U	350 U	380 U	350 U
bis(2-Chloroethyl) ether	UG/KG	350 U	360 U	350 U	380 U	350 U
2-Chlorophenol	UG/KG	350 U	360 U	350 U	380 U	350 U
1,3-Dichlorobenzene	UG/KG	350 U	360 U	350 U	380 U	350 U
1,4-Dichlorobenzene	UG/KG	350 U	360 U	350 U	380 UJ	350 UJ
1,2-Dichlorobenzene	UG/KG	350 U	360 U	350 U	380 U	350 U
2-Methylphenol	UG/KG	350 U	360 U	350 U	380 U	350 U
2,2'-oxybis-(1-chloropropane)	UG/KG	350 U	360 U	350 U	380 U	350 U
4-Methylphenol	UG/KG	350 U	360 U	350 U	380 U	350 U
N-Nitroso-di-n-propylamine	UG/KG	350 U	360 U	350 U	380 U	350 U
Hexachloroethane	UG/KG	350 U	360 U	350 U	380 U	350 U
Nitrobenzene	UG/KG	350 U	360 U	350 U	380 U	350 U
Isophorone	UG/KG	350 U	360 U	350 U	380 U	350 U
2-Nitrophenol	UG/KG	350 U	360 U	350 U	380 U	350 U
2,4-Dimethylphenol	UG/KG	350 U	360 U	350 U	380 U	350 U
bis(2-Chloroethoxy) methane	UG/KG	350 U	360 U	350 U	380 U	350 U
2,4-Dichlorophenol	UG/KG	350 U	360 U	350 U	380 U	350 U
1,2,4-Trichlorobenzene	UG/KG	350 U	360 U	350 U	380 UJ	350 UJ
Naphthalene	UG/KG	36 J	360 U	350 U	380 U	350 U
4-Chloroaniline	UG/KG	350 U	360 U	350 U	380 U	350 U
Hexachlorobutadiene	UG/KG	350 U	360 U	350 U	380 U	350 U
4-Chloro-3-methylphenol	UG/KG	350 U	360 U	350 U	380 U	350 U
2-Methylnaphthalene	UG/KG	67 J	360 U	350 U	380 U	350 U
Hexachlorocyclopentadiene	UG/KG	350 U	360 U	350 U	380 U	350 U
2,4,6-Trichlorophenol	UG/KG	350 U	360 U	350 U	380 U	350 U
2,4,5-Trichlorophenol	UG/KG	850 U	880 U	840 U	930 U	850 U
2-Chloronaphthalene	UG/KG	350 U	360 U	350 U	380 U	350 U
2-Nitroaniline	UG/KG	850 U	880 U	840 U	930 U	850 U
Dimethyl phthalate	UG/KG	350 U	360 U	350 U	380 U	350 U
Acenaphthylene	UG/KG	350 U	360 U	350 U	380 U	350 U
2,6-Dinitrotoluene	UG/KG	350 U	360 U	350 U	380 U	350 U
3-Nitroaniline	UG/KG	850 U	880 U	840 U	930 U	850 U
Acenaphthene	UG/KG	350 U	360 U	350 U	380 UJ	350 UJ

FREQUENCY OF DETECTION SUMMARY
 OPERABLE UNIT No. 8
 SITE 16 - SURFACE SOIL
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Client Sample ID:	16-MW06-00	16-SDA-SB01-00	16-SDA-SB02-00	16-SDA-SB03-00	16-SDA-SB04-00
Laboratory Sample ID:	AC4862	AC4116	AC4132	AC4158	AC4162
Date Sampled:	10/21/94	10/18/94	10/18/94	10/18/94	10/18/94

UNITS

SEMIVOLATILES Cont.

	16-MW06-00	16-SDA-SB01-00	16-SDA-SB02-00	16-SDA-SB03-00	16-SDA-SB04-00
2,4-Dinitrophenol	UG/KG	850 U	880 U	840 U	930 U
4-Nitrophenol	UG/KG	850 U	880 U	840 U	930 U
Dibenzofuran	UG/KG	350 U	360 U	350 U	380 U
2,4-Dinitrotoluene	UG/KG	350 U	360 U	350 U	380 U
Diethylphthalate	UG/KG	350 U	360 U	350 U	380 U
4-Chlorophenyl phenyl ether	UG/KG	350 U	360 U	350 U	380 U
Fluorene	UG/KG	350 U	360 U	350 U	380 U
4-Nitroaniline	UG/KG	850 U	880 U	840 U	930 U
4,6-Dinitro-2-methylphenol	UG/KG	850 U	880 U	840 U	930 U
N-nitrosodiphenylamine	UG/KG	350 U	360 U	350 U	380 U
4-Bromophenyl-phenylether	UG/KG	350 U	360 U	350 U	380 U
Hexachlorobenzene	UG/KG	350 U	360 U	350 U	380 U
Pentachlorophenol	UG/KG	850 U	880 U	840 U	930 U
Phenanthrene	UG/KG	99 J	360 U	350 U	380 U
Anthracene	UG/KG	100 NJ	360 U	350 U	380 U
Carbazole	UG/KG	350 U	360 U	350 U	380 U
di-n-Butylphthalate	UG/KG	350 U	360 U	350 U	380 U
Fluoranthene	UG/KG	350 U	360 U	350 U	380 U
Pyrene	UG/KG	350 U	360 U	350 U	380 UJ
Butyl benzyl phthalate	UG/KG	350 U	360 U	350 U	380 U
3,3'-Dichlorobenzidine	UG/KG	350 U	360 U	350 U	380 U
Benzo[a]anthracene	UG/KG	350 U	360 U	350 U	380 U
Chrysene	UG/KG	70 J	360 U	350 U	380 U
bis(2-Ethylhexyl)phthalate	UG/KG	120 J	360 U	37 J	380 U
di-n-Octylphthalate	UG/KG	350 U	360 U	350 U	380 U
Benzo[b]fluoranthene	UG/KG	350 U	360 U	350 U	380 U
Benzo[k]fluoranthene	UG/KG	350 U	360 U	350 U	380 U
Benzo[a]pyrene	UG/KG	350 U	360 U	350 U	380 U
Indeno[1,2,3-cd]pyrene	UG/KG	350 U	360 U	350 U	380 U
Dibenz[a,h]anthracene	UG/KG	350 U	360 U	350 U	380 U
Benzo[g,h,i]perylene	UG/KG	350 U	360 U	350 U	380 U

FREQUENCY OF DETECTION SUMMARY
 OPERABLE UNIT No. 8
 SITE 16 - SURFACE SOIL
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID:	16-MW06-00	16-SDA-SB01-00	16-SDA-SB02-00	16-SDA-SB03-00	16-SDA-SB04-00
Laboratory Sample ID:	AC4862	AC4116	AC4132	AC4158	AC4162
Date Sampled:	10/21/94	10/18/94	10/18/94	10/18/94	10/18/94

	<u>UNITS</u>					
<u>PESTICIDES/PCBs</u>						
alpha-BHC	UG/KG	1.8 U	1.9 U	1.8 U	2 U	1.8 U
beta-BHC	UG/KG	1.8 U	1.9 U	1.8 U	2 U	1.8 U
delta-BHC	UG/KG	1.8 U	1.9 U	1.8 U	2 U	1.8 U
Lindane (gamma-BHC)	UG/KG	1.8 U	1.9 U	1.8 U	2 U	1.8 U
Heptachlor	UG/KG	1.8 U	1.9 U	1.8 U	2 U	1.8 U
Aldrin	UG/KG	1.8 U	1.9 U	1.8 U	2 U	1.8 U
Heptachlor epoxide	UG/KG	1.8 U	1.9 U	1.8 U	2 U	1.8 U
Endosulfan I	UG/KG	1.8 U	1.9 U	1.8 U	2 U	1.8 U
Dieldrin	UG/KG	7.4 J	3.6 U	3.5 U	25	9.2
4,4'-DDE	UG/KG	46	66	21	91	10
Endrin	UG/KG	3.5 U	3.6 U	3.5 U	3.8 U	3.4 U
Endosulfan II	UG/KG	3.6 J	3.6 U	3.5 U	16 J	1.9 J
4,4'-DDD	UG/KG	18 J	18 J	3.9 J	11 J	3.4 U
Endosulfan sulfate	UG/KG	3.5 U	3.6 U	3.5 U	4.8 J	3.4 U
4,4'-DDT	UG/KG	37 J	79	21 J	90 J	6.8
Methoxychlor	UG/KG	18 U	19 U	18 U	20 U	4.6 J
Endrin ketone	UG/KG	3.5 U	3.6 U	3.5 U	3.8 U	3.4 U
Endrin aldehyde	UG/KG	6.4 J	8.7	3.5 U	3.8 U	3.4 U
alpha-Chlordane	UG/KG	5.3	6.4	3.1 J	2 U	1.8 U
gamma-Chlordane	UG/KG	2.8 J	3.4 J	1.8 U	2 U	1.8 U
Toxaphene	UG/KG	180 U	190 U	180 U	200 U	180 U
Aroclor 1016	UG/KG	35 U	36 U	35 U	38 U	34 U
Aroclor 1221	UG/KG	71 U	74 U	71 U	77 U	69 U
Aroclor 1232	UG/KG	35 U	36 U	35 U	38 U	34 U
Aroclor 1242	UG/KG	35 U	36 U	35 U	38 U	34 U
Aroclor 1248	UG/KG	35 U	36 U	35 U	38 U	34 U
Aroclor 1254	UG/KG	140	260 J	110	38 U	34 U
Aroclor 1260	UG/KG	50 J	36 U	35 U	38 U	34 U

FREQUENCY OF DETECTION SUMMARY
 OPERABLE UNIT No. 8
 SITE 16 - SURFACE SOIL
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID: Laboratory Sample ID: Date Sampled:	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
	<u>UNITS</u>					
	<u>VOLATILES</u>					
Chloromethane	UG/KG	11 UJ	60 U	ND	ND	0/29
Bromomethane	UG/KG	11 UJ	60 U	ND	ND	0/29
Vinyl chloride	UG/KG	11 UJ	60 U	ND	ND	0/29
Chloroethane	UG/KG	11 UJ	60 U	ND	ND	0/29
Methylene chloride	UG/KG	11 UJ	60 U	6 J	15 J	3/29
Acetone	UG/KG	11 UJ	21 U	11 J	1200	3/29
Carbon Disulfide	UG/KG	11 UJ	60 U	ND	ND	0/29
1,1-Dichloroethene	UG/KG	11 UJ	60 U	ND	ND	0/29
1,1-Dichloroethane	UG/KG	11 UJ	60 U	ND	ND	0/29
1,2-Dichloroethene(total)	UG/KG	11 UJ	60 U	ND	ND	0/29
Chloroform	UG/KG	11 UJ	60 U	ND	ND	0/29
1,2-Dichloroethane	UG/KG	11 UJ	60 U	ND	ND	0/29
2-Butanone	UG/KG	11 UJ	60 U	ND	ND	0/29
1,1,1-Trichloroethane	UG/KG	11 UJ	60 U	ND	ND	0/29
Carbon tetrachloride	UG/KG	11 UJ	60 U	ND	ND	0/29
Bromodichloromethane	UG/KG	11 UJ	60 U	ND	ND	0/29
1,2-Dichloropropane	UG/KG	11 UJ	60 U	ND	ND	0/29
cis-1,3-Dichloropropene	UG/KG	11 UJ	60 U	ND	ND	0/29
Trichloroethene	UG/KG	11 UJ	60 U	ND	ND	0/29
Dibromochloromethane	UG/KG	11 UJ	60 U	ND	ND	0/29
1,1,2-Trichloroethane	UG/KG	11 UJ	60 U	ND	ND	0/29
Benzene	UG/KG	11 UJ	60 U	ND	ND	0/29
trans-1,3-Dichloropropene	UG/KG	11 UJ	60 U	ND	ND	0/29
Bromoform	UG/KG	11 UJ	60 U	ND	ND	0/29
4-Methyl-2-pentanone	UG/KG	11 UJ	60 U	ND	ND	0/29
2-Hexanone	UG/KG	11 UJ	60 U	ND	ND	0/29
Tetrachloroethene	UG/KG	11 UJ	60 U	ND	ND	0/29
1,1,2,2-Tetrachloroethane	UG/KG	11 UJ	60 U	ND	ND	0/29
Toluene	UG/KG	11 UJ	60 U	1 J	4 J	3/29
Chlorobenzene	UG/KG	11 UJ	60 U	ND	ND	0/29
Ethylbenzene	UG/KG	11 UJ	60 U	ND	ND	0/29
Styrene	UG/KG	11 UJ	60 U	ND	ND	0/29
Xylenes (total)	UG/KG	11 UJ	60 U	ND	ND	0/29

FREQUENCY OF DETECTION SUMMARY
 OPERABLE UNIT No. 8
 SITE 16 - SURFACE SOIL
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 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID: Laboratory Sample ID: Date Sampled:	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
	UNITS					
	SEMIVOLATILES					
Phenol	UG/KG	350 U	2300 U	70 J	70 J	16-BD-SB09-00 1/29
bis(2-Chloroethyl) ether	UG/KG	350 U	2300 U	ND	ND	0/29
2-Chlorophenol	UG/KG	350 U	2300 U	ND	ND	0/29
1,3-Dichlorobenzene	UG/KG	350 U	2300 U	ND	ND	0/29
1,4-Dichlorobenzene	UG/KG	350 U	2300 U	43 J	43 J	16-BD-SB13-00 1/29
1,2-Dichlorobenzene	UG/KG	350 U	2300 U	ND	ND	0/29
2-Methylphenol	UG/KG	350 U	2300 U	ND	ND	0/29
2,2'-oxybis-(1-chloropropane)	UG/KG	350 U	2300 U	ND	ND	0/29
4-Methylphenol	UG/KG	350 U	2300 U	ND	ND	0/29
N-Nitroso-di-n-propylamine	UG/KG	350 U	2300 U	ND	ND	0/29
Hexachloroethane	UG/KG	350 U	2300 U	ND	ND	0/29
Nitrobenzene	UG/KG	350 U	2300 U	ND	ND	0/29
Isophorone	UG/KG	350 U	2300 U	ND	ND	0/29
2-Nitrophenol	UG/KG	350 U	2300 U	ND	ND	0/29
2,4-Dimethylphenol	UG/KG	350 U	2300 U	ND	ND	0/29
bis(2-Chloroethoxy) methane	UG/KG	350 U	2300 U	ND	ND	0/29
2,4-Dichlorophenol	UG/KG	350 U	2300 U	ND	ND	0/29
1,2,4-Trichlorobenzene	UG/KG	350 U	2300 U	ND	ND	0/29
Naphthalene	UG/KG	350 U	2300 U	36 J	36 J	16-MW06-00 1/29
4-Chloroaniline	UG/KG	350 U	2300 U	ND	ND	0/29
Hexachlorobutadiene	UG/KG	350 U	2300 U	ND	ND	0/29
4-Chloro-3-methylphenol	UG/KG	350 U	2300 U	ND	ND	0/29
2-Methylnaphthalene	UG/KG	350 U	2300 U	67 J	67 J	16-MW06-00 1/29
Hexachlorocyclopentadiene	UG/KG	350 U	2300 U	ND	ND	0/29
2,4,6-Trichlorophenol	UG/KG	350 U	2300 U	ND	ND	0/29
2,4,5-Trichlorophenol	UG/KG	840 U	5500 U	ND	ND	0/29
2-Chloronaphthalene	UG/KG	350 U	2300 U	ND	ND	0/29
2-Nitroaniline	UG/KG	840 U	5500 U	ND	ND	0/29
Dimethyl phthalate	UG/KG	350 U	2300 U	ND	ND	0/29
Acenaphthylene	UG/KG	350 U	2300 U	ND	ND	0/29
2,6-Dinitrotoluene	UG/KG	350 U	2300 U	ND	ND	0/29
3-Nitroaniline	UG/KG	840 U	5500 U	ND	ND	0/29
Acenaphthene	UG/KG	350 U	2300 U	ND	ND	0/29

FREQUENCY OF DETECTION SUMMARY
 OPERABLE UNIT No. 8
 SITE 16 - SURFACE SOIL
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID: Laboratory Sample ID: Date Sampled:	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
UNITS						
SEMIVOLATILES Cont.						
2,4-Dinitrophenol	UG/KG	840 U	5500 U	ND	ND	0/29
4-Nitrophenol	UG/KG	840 U	5500 U	ND	ND	0/29
Dibenzofuran	UG/KG	350 U	2300 U	ND	ND	0/29
2,4-Dinitrotoluene	UG/KG	350 U	2300 U	ND	ND	0/29
Diethylphthalate	UG/KG	350 U	2300 U	ND	ND	0/29
4-Chlorophenyl phenyl ether	UG/KG	350 U	2300 U	ND	ND	0/29
Fluorene	UG/KG	350 U	2300 U	ND	ND	0/29
4-Nitroaniline	UG/KG	840 U	5500 U	ND	ND	0/29
4,6-Dinitro-2-methylphenol	UG/KG	840 U	5500 U	ND	ND	0/29
N-nitrosodiphenylamine	UG/KG	350 U	2300 U	ND	ND	0/29
4-Bromophenyl-phenylether	UG/KG	350 U	2300 U	ND	ND	0/29
Hexachlorobenzene	UG/KG	350 U	2300 U	ND	ND	0/29
Pentachlorophenol	UG/KG	840 U	5500 U	ND	ND	0/29
Phenanthrene	UG/KG	350 U	2300 U	52 J	99 J	16-MW06-00 3/29
Anthracene	UG/KG	350 U	2300 U	100 NJ	100 NJ	16-MW06-00 1/29
Carbazole	UG/KG	350 U	2300 U	ND	ND	0/29
di-n-Butylphthalate	UG/KG	350 U	2300 U	ND	ND	0/29
Fluoranthene	UG/KG	350 U	2300 U	46 J	46 J	16-BD-SB13-00 1/29
Pyrene	UG/KG	350 U	2300 U	39 J	110 J	16-BD-SB13-00 3/29
Butyl benzyl phthalate	UG/KG	350 U	2300 U	64 J	64 J	16-BD-SB16-00 1/29
3,3'-Dichlorobenzidine	UG/KG	350 U	2300 U	ND	ND	0/29
Benzo[a]anthracene	UG/KG	350 U	2300 U	43 J	43 J	16-BD-SB09-00 1/29
Chrysene	UG/KG	350 U	2300 U	43 J	70 J	16-MW06-00 4/29
bis(2-Ethylhexyl)phthalate	UG/KG	350 U	2300 U	37 J	490	16-BD-SB16-00 6/29
di-n-Octylphthalate	UG/KG	350 U	2300 U	ND	ND	0/29
Benzo[b]fluoranthene	UG/KG	350 U	2300 U	54 J	88 J	16-BD-SB13-00 2/29
Benzo[k]fluoranthene	UG/KG	350 U	2300 U	84 J	84 J	16-BD-SB13-00 1/29
Benzo[a]pyrene	UG/KG	350 U	2300 U	42 J	130 J	16-BD-SB16-00 2/29
Indeno[1,2,3-cd]pyrene	UG/KG	350 U	2300 U	52 J	52 J	16-BD-SB16-00 1/29
Dibenz[a,h]anthracene	UG/KG	350 U	2300 U	ND	ND	0/29
Benzo[g,h,i]perylene	UG/KG	350 U	2300 U	92 J	92 J	16-BD-SB16-00 1/29

FREQUENCY OF DETECTION SUMMARY
OPERABLE UNIT No. 8
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MCB CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

Client Sample ID: Laboratory Sample ID: Date Sampled:	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
	UNITS					
	PESTICIDES/PCBs					
alpha-BHC	UG/KG	1.8 U	2.3 U	ND	ND	0/29
beta-BHC	UG/KG	1.8 U	2.3 U	ND	ND	0/29
delta-BHC	UG/KG	1.8 U	2.3 U	4.7	4.7	16-BD-SB13-00 1/29
Lindane (gamma-BHC)	UG/KG	1.8 U	2.3 U	ND	ND	0/29
Heptachlor	UG/KG	1.8 U	2.3 U	ND	ND	0/29
Aldrin	UG/KG	1.8 U	2.3 U	3.4 J	3.4 J	16-BD-SB09-00 1/29
Heptachlor epoxide	UG/KG	1.8 U	2.3 U	ND	ND	0/29
Endosulfan I	UG/KG	1.8 U	2.3 U	ND	ND	0/29
Dieldrin	UG/KG	3.4 U	4.5 U	5.6	77 J	16-BD-SB09-00 10/29
4,4'-DDE	UG/KG	3.6 U	4 U	5	440	16-BD-SB05-00 26/29
Endrin	UG/KG	3.4 U	4.5 U	6.5	14 J	16-BD-SB16-00 3/29
Endosulfan II	UG/KG	3.5 U	4.5 U	1.9 J	26 J	16-BD-SB13-00 8/29
4,4'-DDD	UG/KG	3.4 U	4.5 U	2.6 J	120	16-BD-SB05-00 20/29
Endosulfan sulfate	UG/KG	3.4 U	4.5 U	4.8 J	4.8 J	16-SDA-SB03-00 1/29
4,4'-DDT	UG/KG	3.6 U	24 U	3.8	540 J	16-BD-SB05-00 24/29
Methoxychlor	UG/KG	18 U	23 U	4.6 J	4.6 J	16-SDA-SB04-00 1/29
Endrin ketone	UG/KG	3.4 U	4.5 U	4.2	9.9	16-BD-SB09-00 2/29
Endrin aldehyde	UG/KG	3.4 U	4.5 U	4.6	29	16-BD-SB16-00 9/29
alpha-Chlordane	UG/KG	1.8 U	2.3 U	3.1 J	120	16-BD-SB13-00 11/29
gamma-Chlordane	UG/KG	1.8 U	2.3 U	1.8 J	72 J	16-BD-SB13-00 9/29
Toxaphene	UG/KG	180 U	230 U	ND	ND	0/29
Aroclor 1016	UG/KG	34 U	45 U	ND	ND	0/29
Aroclor 1221	UG/KG	69 U	92 U	ND	ND	0/29
Aroclor 1232	UG/KG	34 U	45 U	ND	ND	0/29
Aroclor 1242	UG/KG	34 U	45 U	ND	ND	0/29
Aroclor 1248	UG/KG	34 U	45 U	ND	ND	0/29
Aroclor 1254	UG/KG	34 U	45 U	41	2100	16-BD-SB13-00 13/29
Aroclor 1260	UG/KG	34 U	45 U	50 J	210 J	16-BD-SB05-00 2/29

APPENDIX I.2
SURFACE SOIL METALS

FREQUENCY OF DETECTION SUMMARY
OPERABLE UNIT No. 8
SITE 16 - SURFACE SOIL
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TAL INORGANICS

	Client Sample ID:	16-BD-SB01-00	16-BD-SB02-00	16-BD-SB03-00	16-BD-SB04-00	16-BD-SB05-00	16-BD-SB06-00
	Laboratory Sample ID:	AC4115	AC4111	AC4571	AC4198	AC4186	AC4182
	Date Sampled:	10/19/94	10/19/94	10/20/94	10/19/94	10/18/94	10/18/94
	UNITS						
Aluminum	MG/KG	1700 J	1550 J	1170	2030 J	18500 J	5090 J
Antimony	MG/KG	10.4 UJ	11.2 UJ	10.3 U	10.6 UJ	12.1 UJ	10.7 UJ
Arsenic	MG/KG	24.7 J	5.1 J	4.5	10.8 J	9.1 J	3.4 J
Barium	MG/KG	15.3	7.8	19.3	31.5 J	334	14.9
Beryllium	MG/KG	0.21 U	0.22 U	0.21 U	0.21 U	0.24 U	0.21 U
Cadmium	MG/KG	1 U	1.1 U	1 U	1.1 U	9.6	1.1 UJ
Calcium	MG/KG	729 J	310 J	1300	228 J	18300 J	890 J
Chromium	MG/KG	3.5 J	2.2 UJ	2.2	4.3 J	43.2 J	5.8 J
Cobalt	MG/KG	2.1 U	2.2 U	2.1 U	2.1 U	6.3	2.1 UJ
Copper	MG/KG	11.2 J	5.1 J	6	5.7 J	543 J	3.5 J
Iron	MG/KG	4620	7120	4010	4320 J	69700	3720
Lead	MG/KG	15.4 J	6.7 J	28.2	8.1 J	5210 J	12.6 J
Magnesium	MG/KG	94.1	47.5	91.7	71.9 J	2520	149
Manganese	MG/KG	4.8 J	2.8 J	8	3.1 J	1030 J	9.1 J
Mercury	MG/KG	0.12 J	0.12 UJ	0.11 U	0.11 UJ	0.34 J	0.11 UJ
Nickel	MG/KG	4.1 U	4.5 U	4.1 U	4.2 U	24.4	4.3 U
Potassium	MG/KG	207 U	224 U	205	313	351	280
Selenium	MG/KG	1.7	1.1 U	1 U	1.3	6	1.1 U
Silver	MG/KG	1 U	1.1 U	1 U	1.1 U	3.1	1.1 U
Sodium	MG/KG	43.8 U	34.1 U	49.5	55.2 UJ	161 U	48.2 U
Thallium	MG/KG	2.1 U	2.2 U	2.1 U	2.1 U	3.8	2.1 U
Vanadium	MG/KG	9.2	4.8	3.8	8 J	45.4	8.4
Zinc	MG/KG	19.9 J	9.9 UJ	29	7.1 UJ	4350 J	10 UJ
Moisture	%	6.35	17.48	6.39	10.88	19.98	8.95

FREQUENCY OF DETECTION SUMMARY
OPERABLE UNIT No. 8
SITE 16 - SURFACE SOIL
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TAL INORGANICS

	Client Sample ID:	16-BD-SB07-00	16-BD-SB08-00	16-BD-SB09-00	16-BD-SB10-00	16-BD-SB11-00	16-BD-SB12-00
	Laboratory Sample ID:	AC4576	AC4581	AC4144	AC4172	AC4136	AC4586
	Date Sampled:	10/20/94	10/20/94	10/18/94	10/18/94	10/18/94	10/20/94
	UNITS						
Aluminum	MG/KG	3870	6880	1570	4760 J	3840	3640
Antimony	MG/KG	10.4 U	10.7 U	11.2 UJ	10.6 UJ	10.9 UJ	10.6 U
Arsenic	MG/KG	4.9	4.9	8.2	7.2 J	2.2 U	2.1 U
Barium	MG/KG	11.5	12.3	36.3	28.9 J	11	7.1
Beryllium	MG/KG	0.21 U	0.21 U	0.49	0.24	0.22 U	0.21 U
Cadmium	MG/KG	1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U
Calcium	MG/KG	10700	24100	328 UJ	14700 J	945 UJ	4030
Chromium	MG/KG	10.7	13.5	5	9.9 J	4.2	5
Cobalt	MG/KG	2.1 U	2.1 U	2.2 U	2.1 U	2.2 U	2.1 U
Copper	MG/KG	6.5	5	7.7	40.8 J	3.2	2.1 U
Iron	MG/KG	4520	12500	2530 U	7900 J	2420 U	3250
Lead	MG/KG	94.9	10.3	9.4	200 J	8.2	6.4
Magnesium	MG/KG	315 U	401	70.9 U	296 J	115 U	132
Manganese	MG/KG	18.4	22.8	7 U	61.7 J	9.4 U	6.8
Mercury	MG/KG	0.11 U	0.11 U	0.11 U	0.11 J	0.11 U	0.11 U
Nickel	MG/KG	4.2 U	4.3 U	4.5 U	4.2 U	4.4 U	4.2 U
Potassium	MG/KG	208 U	475	225 U	211 U	224	262
Selenium	MG/KG	1 U	1.1 U	2	1.2	1.1 U	1.1 U
Silver	MG/KG	1 U	1.1 U	1.1 UJ	1.1 U	1.1 UJ	1.1 U
Sodium	MG/KG	43.5	49.8	59.4 U	69.2 UJ	23.5 U	34.7
Thallium	MG/KG	2.1 U	2.1 U	2.2 U	2.1 U	2.2 U	2.1 U
Vanadium	MG/KG	8.3	22.4	8.7	12.5	6.1	7.4
Zinc	MG/KG	34.8	14.8 U	6 UJ	201 J	69.5 J	11.3 U
Moisture	%	11.07	9.25	11.06	8.06	8.14	9.27

FREQUENCY OF DETECTION SUMMARY
OPERABLE UNIT No. 8
SITE 16 - SURFACE SOIL
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TAL INORGANICS

Client Sample ID:	16-BD-SB13-00	16-BD-SB14-00	16-BD-SB15-00	16-BD-SB16-00	16-BD-SB17-00	16-BD-SB18-00
Laboratory Sample ID:	AC4592	AC4121	AC4194	AC4126	AC4190	AC4608
Date Sampled:	10/20/94	10/19/94	10/19/94	10/18/94	10/19/94	10/20/94

	UNITS						
Aluminum	MG/KG	1920	3590 J	3420 J	2810	4470 J	2740
Antimony	MG/KG	11.2 U	11.8 UJ	10.8 UJ	11.3 UJ	10.7 UJ	10.4 U
Arsenic	MG/KG	2.2 U	5.2 J	2.2 UJ	2.3	2.6 J	2.1 U
Barium	MG/KG	53.5	32.3	7.6	42.7	9.9	9.4
Beryllium	MG/KG	0.22 U	0.45	0.22 U	0.23 U	0.21 U	0.21 U
Cadmium	MG/KG	1.8	1.2 U	1.1 U	1.1 U	1.1 U	1 U
Calcium	MG/KG	78400	43400 J	275 J	112000 J	2130 J	7330
Chromium	MG/KG	12.6	7.7 J	2.9 J	11.1	6.1 J	2.6
Cobalt	MG/KG	2.2 U	2.4 U	2.2 U	2.3 U	2.2 U	2.1 U
Copper	MG/KG	73.5	32.7 J	2.2 J	88.8	3.3 J	4
Iron	MG/KG	2890	6430	2140 U	4390 U	5220	2050
Lead	MG/KG	69.6	77.7 J	8.8 J	33	7.5 J	10.4
Magnesium	MG/KG	317	341	98.3	462 U	112	112
Manganese	MG/KG	22.7	65 J	10.1 J	37.6	6.7 J	11.3
Mercury	MG/KG	2.6	0.36 J	0.11 UJ	1.5	0.11 UJ	0.11 U
Nickel	MG/KG	4.5 U	4.7 U	4.3 U	4.5 U	4.3 U	4.2 U
Potassium	MG/KG	223 U	237 U	216 U	226 U	214	208 U
Selenium	MG/KG	1.1 U	1.2 U	1.1 U	1.1 U	1.1 U	1 U
Silver	MG/KG	1.2	1.2 U	1.1 U	1.1 UJ	1.1 U	1 U
Sodium	MG/KG	62.3	62.4 U	31.3 U	64.9 U	36.8 U	26.8
Thallium	MG/KG	2.2 U	2.4 U	2.2 U	2.3 U	2.1 U	2.1 U
Vanadium	MG/KG	4	8.8	4.6	4.2	10.8	5.8
Zinc	MG/KG	335	130 J	11.2 UJ	193 J	29.2 J	17.9
Moisture	%	13.05	15.52	11.14	11.44	7.64	10.84

FREQUENCY OF DETECTION SUMMARY
 OPERABLE UNIT No. 8
 SITE 16 - SURFACE SOIL
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TAL INORGANICS

	16-BD-SB19-00	16-BD-SB20-00	16-MW02-00	16-MW03-00	16-MW04-00	16-MW05-00	
Client Sample ID:	16-BD-SB19-00	16-BD-SB20-00	16-MW02-00	16-MW03-00	16-MW04-00	16-MW05-00	
Laboratory Sample ID:	AC4604	AC4848	AC4567	AC4178	AC4102	AC4857	
Date Sampled:	10/20/94	10/20/94	10/19/94	10/18/94	10/19/94	10/21/94	
	UNITS						
Aluminum	MG/KG	2660	2370 J	3040	4590 J	866 J	6680 J
Antimony	MG/KG	10.8 U	10.1 UJ	12.8 U	10.8 UJ	11.8 UJ	10.3 UJ
Arsenic	MG/KG	2.2 U	2 U	3.1	2.2 UJ	2.4 UJ	9.5
Barium	MG/KG	8.2	11.2	36.7	20.6	3	18.1
Beryllium	MG/KG	0.22 U	0.25	0.26 U	0.22 U	0.24 U	0.21 U
Cadmium	MG/KG	1.1 U	1 U	1.3 U	1.1 U	1.2 U	1 U
Calcium	MG/KG	244	7660 J	2590	126 J	68.4 J	755 J
Chromium	MG/KG	2.7	3.3 J	6.4	3.6 J	2.4 UJ	9.2 J
Cobalt	MG/KG	2.2 U	2 U	2.6 U	2.2 U	2.4 U	2.1 U
Copper	MG/KG	2.2 U	7.1	13.3	2.2 UJ	2.4 UJ	19.5
Iron	MG/KG	3110	2280 J	2710	1970	470	12200 J
Lead	MG/KG	8.7	13.8 J	45.3	3.8 J	2.1 UJ	60.1 J
Magnesium	MG/KG	80.8	116	180	133	32.5	281
Manganese	MG/KG	8.5	15.8 J	26.5	21.4 J	6.6 J	20.6 J
Mercury	MG/KG	0.11 U	0.11 U	0.25	0.11 UJ	0.12 UJ	0.43
Nickel	MG/KG	4.3 U	4 U	5.1 U	4.3 U	4.7 U	4.1 U
Potassium	MG/KG	215 U	202 U	296	216 U	235 U	247 J
Selenium	MG/KG	1.1 U	1.1	1.3 U	1.1 U	1.2 U	1.4
Silver	MG/KG	1.1 U	1 U	1.3 U	1.1 U	1.2 U	1 U
Sodium	MG/KG	45.8	40.7	63.4	26.6 U	32.4 U	39.5
Thallium	MG/KG	2.1 U	2 U	2.6 U	2.2 U	2.4 U	2.1 U
Vanadium	MG/KG	5.2	4.7	8.5	2.9	2.4 U	17.6
Zinc	MG/KG	12.7 U	82.7 J	73.8	7.1 UJ	10.5 UJ	51.1 J
Moisture	%	9.68	10.77	28.21	9.25	17.41	7.75

FREQUENCY OF DETECTION SUMMARY
OPERABLE UNIT No. 8
SITE 16 - SURFACE SOIL
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TAL INORGANICS

Client Sample ID:	16-MW06-00	16-SDA-SB01-00	16-SDA-SB02-00	16-SDA-SB03-00	16-SDA-SB04-00
Laboratory Sample ID:	AC4862	AC4116	AC4132	AC4158	AC4162
Date Sampled:	10/21/94	10/18/94	10/18/94	10/18/94	10/18/94

	UNITS					
Aluminum	MG/KG	2200 J	5030	1380	5170 J	2640 J
Antimony	MG/KG	10 UJ	11.2 UJ	10.9 UJ	11.6 UJ	10.5 UJ
Arsenic	MG/KG	2 U	3.4	2.2 U	3.2 J	2.1 UJ
Barium	MG/KG	13.4	18	6.9	23.7	11.5 J
Beryllium	MG/KG	0.25	0.22 U	0.22 U	0.25	0.21 U
Cadmium	MG/KG	1 U	1.1 U	1.1 U	1.2 U	1.1 U
Calcium	MG/KG	7120 J	26500 UJ	17500 UJ	324 J	150 J
Chromium	MG/KG	4.6 J	9.4	4.5	7.1 J	2.5 J
Cobalt	MG/KG	2 U	2.2 U	2.2 U	2.3 U	2.1 U
Copper	MG/KG	8.7	13.4	5.5	3.9 J	2.1 UJ
Iron	MG/KG	2350 J	6650	2220 U	4950	1450 J
Lead	MG/KG	14 J	18	11	96.9 J	7.8 J
Magnesium	MG/KG	88.4	254 U	99.5 U	149	64.4 J
Manganese	MG/KG	13.9 J	16.1 U	9.9 U	16.8 J	22.5 J
Mercury	MG/KG	0.11 U	14	0.11 U	0.12 UJ	0.11 UJ
Nickel	MG/KG	4 U	4.5 U	4.4 U	4.6 U	4.2 U
Potassium	MG/KG	201 U	224 U	218 U	231 U	210 U
Selenium	MG/KG	1 U	1.8	1.1 U	1.2 U	1.1 U
Silver	MG/KG	1 U	1.1 UJ	1.1 UJ	1.2 U	1.1 U
Sodium	MG/KG	31.2	37.3 U	41.3 U	49.8 U	32.7 UJ
Thallium	MG/KG	2 U	2.2 U	2.2 U	2.3 U	2.1
Vanadium	MG/KG	4.1	11.2	3.7	11.5	2.3 J
Zinc	MG/KG	27.8 J	38.3 UJ	25.1 UJ	36.7 J	14.2 J
Moisture	%	8.62	10.86	8.27	14.42	5.82

FREQUENCY OF DETECTION SUMMARY
OPERABLE UNIT No. 8
SITE 16 - SURFACE SOIL
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TAL INORGANICS

Client Sample ID: Laboratory Sample ID: Date Sampled:	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
	UNITS					
Aluminum	MG/KG	NA	NA	868 J	18500 J	16-BD-SB05-00 29/29
Antimony	MG/KG	10 UJ	12.8 U	ND	ND	0/29
Arsenic	MG/KG	2 U	2.4 UJ	2.3	24.7 J	16-BD-SB01-00 17/29
Barium	MG/KG	NA	NA	3	334	16-BD-SB05-00 29/29
Beryllium	MG/KG	0.21 U	0.26 U	0.24	0.49	16-BD-SB09-00 6/29
Cadmium	MG/KG	1 U	1.3 U	1.8	9.6	16-BD-SB05-00 2/29
Calcium	MG/KG	328 UJ	26500 UJ	66.4 J	112000 J	16-BD-SB16-00 25/29
Chromium	MG/KG	2.2 UJ	2.4 UJ	2.2	43.2 J	16-BD-SB05-00 27/29
Cobalt	MG/KG	2 U	2.6 U	6.3	6.3	16-BD-SB05-00 1/29
Copper	MG/KG	2.1 U	2.4 UJ	2.2 J	543 J	16-BD-SB05-00 24/29
Iron	MG/KG	2140 U	4390 U	470	69700	16-BD-SB05-00 24/29
Lead	MG/KG	2.1 UJ	2.1 UJ	3.8 J	5210 J	16-BD-SB05-00 28/29
Magnesium	MG/KG	70.9 U	462 U	32.5	2520	16-BD-SB05-00 23/29
Manganese	MG/KG	7 U	16.1 U	2.8 J	1030 J	16-BD-SB05-00 25/29
Mercury	MG/KG	0.11 U	0.12 UJ	0.11 J	14	16-SDA-SB01-00 9/29
Nickel	MG/KG	4 U	5.1 U	24.4	24.4	16-BD-SB05-00 1/29
Potassium	MG/KG	201 U	237 U	205	475	16-BD-SB08-00 10/29
Selenium	MG/KG	1 U	1.3 U	1.1	6	16-BD-SB05-00 8/29
Silver	MG/KG	1 U	1.3 U	1.2	3.1	16-BD-SB05-00 2/29
Sodium	MG/KG	23.5 U	181 U	26.8	63.4	16-MW02-00 11/29
Thallium	MG/KG	2 U	2.6 U	2.1	3.6	16-BD-SB05-00 2/29
Vanadium	MG/KG	2.4 U	2.4 U	2.3 J	45.4	16-BD-SB05-00 28/29
Zinc	MG/KG	6 UJ	38.3 UJ	14.2 J	4350 J	16-BD-SB05-00 17/29
Moisture	%					

APPENDIX I.3
SUBSURFACE SOIL ORGANICS

FREQUENCY OF DETECTION SUMMARY
OPERABLE UNIT No. 8
SITE 16 - SUBSURFACE SOIL
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

Client Sample ID:	16-BD-SB01-06	16-BD-SB02-07	16-BD-SB03-07	16-BD-SB04-06	16-BD-SB05-07	16-BD-SB06-07
Laboratory Sample ID:	AC4119	AC4113	AC4574	AC4100	AC4188	AC4184
Date Sampled:	10/19/94	10/19/94	10/20/94	10/19/94	10/18/94	10/18/94

	<u>UNITS</u>						
<u>VOLATILES</u>							
Chloromethane	UG/KG	11 U	12 U	10 U	10 U	11 U	10 U
Bromomethane	UG/KG	11 U	12 U	10 U	10 U	11 U	1 J
Vinyl chloride	UG/KG	11 U	12 U	10 U	10 U	11 U	10 U
Chloroethane	UG/KG	11 U	12 U	10 U	10 U	11 U	10 U
Methylene chloride	UG/KG	11 U	12 U	10 U	10 U	11 U	10 U
Acetone	UG/KG	25 U	72 U	22 U	32 U	300	130 U
Carbon Disulfide	UG/KG	11 U	12 U	10 UJ	10 U	11 U	10 U
1,1-Dichloroethene	UG/KG	11 U	12 U	10 UJ	10 U	11 U	10 U
1,1-Dichloroethane	UG/KG	11 U	12 U	10 UJ	10 U	11 U	10 U
1,2-Dichloroethene(total)	UG/KG	11 U	12 U	10 U	10 U	11 U	10 U
Chloroform	UG/KG	11 U	12 U	10 U	10 U	11 U	10 U
1,2-Dichloroethane	UG/KG	11 U	12 U	10 U	10 U	11 U	10 U
2-Butanone	UG/KG	11 U	12 U	10 U	10 U	11 U	10 U
1,1,1-Trichloroethane	UG/KG	11 U	12 U	10 U	10 U	11 U	10 U
Carbon tetrachloride	UG/KG	11 U	12 U	10 U	10 U	11 U	10 U
Bromodichloromethane	UG/KG	11 U	12 U	10 U	10 U	11 U	10 U
1,2-Dichloropropane	UG/KG	11 U	12 U	10 U	10 U	11 U	10 U
cis-1,3-Dichloropropene	UG/KG	11 U	12 U	10 U	10 U	11 U	10 U
Trichloroethene	UG/KG	11 U	12 U	10 U	10 U	11 U	10 U
Dibromochloromethane	UG/KG	11 U	12 U	10 U	10 U	11 U	10 U
1,1,2-Trichloroethane	UG/KG	11 U	12 U	10 U	10 U	11 U	10 U
Benzene	UG/KG	11 U	12 U	10 U	10 U	11 U	10 U
trans-1,3-Dichloropropene	UG/KG	11 U	12 U	10 U	10 U	11 U	10 U
Bromoform	UG/KG	11 U	12 U	10 U	10 U	11 U	10 U
4-Methyl-2-pentanone	UG/KG	11 U	12 U	10 U	10 U	11 U	10 U
2-Hexanone	UG/KG	11 U	12 U	10 U	10 U	11 U	10 U
Tetrachloroethene	UG/KG	11 U	12 U	10 U	10 U	11 U	10 U
1,1,2,2-Tetrachloroethane	UG/KG	11 U	12 U	10 U	10 U	11 U	10 U
Toluene	UG/KG	11 U	12 U	10 U	10 U	11 U	10 U
Chlorobenzene	UG/KG	11 U	12 U	10 U	10 U	11 U	10 U
Ethylbenzene	UG/KG	11 U	12 U	10 U	10 U	11 U	10 U
Styrene	UG/KG	11 U	12 U	10 U	10 U	11 U	10 U
Xylenes (total)	UG/KG	11 U	12 U	10 U	10 U	11 U	10 U

FREQUENCY OF DETECTION SUMMARY
 OPERABLE UNIT No. 8
 SITE 16 - SUBSURFACE SOIL
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID:	16-BD-SB01-06	16-BD-SB02-07	16-BD-SB03-07	16-BD-SB04-06	16-BD-SB05-07	16-BD-SB06-07
Laboratory Sample ID:	AC4119	AC4113	AC4574	AC4100	AC4188	AC4184
Date Sampled:	10/19/94	10/19/94	10/20/94	10/19/94	10/18/94	10/18/94

	<u>UNITS</u>					
<u>SEMIVOLATILES</u>						
Phenol	UG/KG	350 U	380 U	330 U	340 U	340 U
bis(2-Chloroethyl) ether	UG/KG	350 U	380 U	330 U	340 U	340 U
2-Chlorophenol	UG/KG	350 U	380 U	330 U	340 U	340 U
1,3-Dichlorobenzene	UG/KG	350 U	380 U	330 U	340 U	340 U
1,4-Dichlorobenzene	UG/KG	350 UJ	50 UJ	330 U	340 UJ	340 UJ
1,2-Dichlorobenzene	UG/KG	350 U	380 U	330 U	340 U	340 U
2-Methylphenol	UG/KG	350 U	380 U	330 U	340 U	340 U
2,2'-oxybis-(1-chloropropane)	UG/KG	350 U	380 U	330 U	340 U	340 U
4-Methylphenol	UG/KG	350 U	380 U	330 U	340 U	340 U
N-Nitroso-di-n-propylamine	UG/KG	350 U	380 U	330 U	340 U	340 U
Hexachloroethane	UG/KG	350 U	380 U	330 U	340 U	340 U
Nitrobenzene	UG/KG	350 U	380 U	330 U	340 U	340 U
Isophorone	UG/KG	350 U	380 U	330 U	340 U	340 U
2-Nitrophenol	UG/KG	350 U	380 U	330 U	340 U	340 U
2,4-Dimethylphenol	UG/KG	350 U	380 U	330 U	340 U	340 U
bis(2-Chloroethoxy) methane	UG/KG	350 U	380 U	330 U	340 U	340 U
2,4-Dichlorophenol	UG/KG	350 U	380 U	330 U	340 U	340 U
1,2,4-Trichlorobenzene	UG/KG	350 UJ	45 UJ	330 U	340 UJ	340 UJ
Naphthalene	UG/KG	350 U	380 U	330 U	340 U	340 U
4-Chloroaniline	UG/KG	350 U	380 U	330 U	340 U	340 U
Hexachlorobutadiene	UG/KG	350 U	380 U	330 U	340 U	340 U
4-Chloro-3-methylphenol	UG/KG	350 U	380 U	330 U	340 U	340 U
2-Methylnaphthalene	UG/KG	350 U	380 U	330 U	340 U	340 U
Hexachlorocyclopentadiene	UG/KG	350 U	380 U	330 U	340 U	340 U
2,4,6-Trichlorophenol	UG/KG	350 U	380 U	330 U	340 U	340 U
2,4,5-Trichlorophenol	UG/KG	850 U	920 U	800 U	820 U	840 U
2-Chloronaphthalene	UG/KG	350 U	380 U	330 U	340 U	340 U
2-Nitroaniline	UG/KG	850 U	920 U	800 U	820 U	840 U
Dimethyl phthalate	UG/KG	350 U	380 U	330 U	340 U	340 U
Acenaphthylene	UG/KG	350 U	380 U	330 U	340 U	340 U
2,6-Dinitrotoluene	UG/KG	350 U	380 U	330 U	340 U	340 U
3-Nitroaniline	UG/KG	850 U	920 U	800 U	820 U	830 U
Acenaphthene	UG/KG	350 UJ	76 UJ	330 U	340 UJ	340 UJ

FREQUENCY OF DETECTION SUMMARY
 OPERABLE UNIT No. 8
 SITE 16 - SUBSURFACE SOIL
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID:	16-BD-SB01-06	16-BD-SB02-07	16-BD-SB03-07	16-BD-SB04-06	16-BD-SB05-07	16-BD-SB06-07
Laboratory Sample ID:	AC4119	AC4113	AC4574	AC4100	AC4188	AC4184
Date Sampled:	10/19/94	10/19/94	10/20/94	10/19/94	10/18/94	10/18/94

	UNITS						
<u>SEMIVOLATILES Cont.</u>							
2,4-Dinitrophenol	UG/KG	850 U	920 U	800 U	820 U	340 U	830 U
4-Nitrophenol	UG/KG	850 U	920 U	800 U	820 U	840 U	830 U
Dibenzofuran	UG/KG	350 U	380 U	330 U	340 U	340 U	340 U
2,4-Dinitrotoluene	UG/KG	350 U	380 U	330 U	340 U	340 U	340 U
Diethylphthalate	UG/KG	350 U	380 U	330 U	340 U	340 U	340 U
4-Chlorophenyl phenyl ether	UG/KG	350 U	380 U	330 U	340 U	340 U	340 U
Fluorene	UG/KG	350 U	380 U	330 U	340 U	340 U	340 U
4-Nitroaniline	UG/KG	850 U	920 U	800 U	820 U	840 U	830 U
4,6-Dinitro-2-methylphenol	UG/KG	850 U	920 U	800 U	820 U	840 U	830 U
N-nitrosodiphenylamine	UG/KG	350 U	380 U	330 U	340 U	340 U	340 U
4-Bromophenyl-phenylether	UG/KG	350 U	380 U	330 U	340 U	340 U	340 U
Hexachlorobenzene	UG/KG	350 U	380 U	330 U	340 U	340 U	340 U
Pentachlorophenol	UG/KG	850 U	94 J	800 U	820 U	840 U	830 U
Phenanthrene	UG/KG	350 U	380 U	330 U	340 U	340 U	340 U
Anthracene	UG/KG	350 U	380 U	330 U	340 U	340 U	340 U
Carbazole	UG/KG	350 U	380 U	330 U	340 U	340 U	340 U
di-n-Butylphthalate	UG/KG	350 U	380 U	330 U	340 U	340 U	340 U
Fluoranthene	UG/KG	350 U	380 U	330 U	340 U	340 U	340 U
Pyrene	UG/KG	350 UJ	380 UJ	330 U	340 UJ	340 UJ	340 UJ
Butyl benzyl phthalate	UG/KG	350 U	380 U	330 U	340 U	340 U	340 U
3,3'-Dichlorobenzidine	UG/KG	350 U	380 U	330 U	340 U	340 U	340 U
Benzo[a]anthracene	UG/KG	350 U	380 U	330 U	340 U	340 U	340 U
Chrysene	UG/KG	350 U	380 U	330 U	340 U	340 U	340 U
bis(2-Ethylhexyl)phthalate	UG/KG	350 U	380 U	330 U	340 U	340 U	340 U
di-n-Octylphthalate	UG/KG	350 U	380 U	330 U	340 U	340 U	340 U
Benzo[b]fluoranthene	UG/KG	350 U	380 U	330 U	340 U	340 U	340 U
Benzo[k]fluoranthene	UG/KG	350 U	380 U	330 U	340 U	340 U	340 U
Benzo[a]pyrene	UG/KG	350 U	380 U	330 U	340 U	340 U	340 U
Indeno[1,2,3-cd]pyrene	UG/KG	350 U	380 U	330 U	340 U	340 U	340 U
Dibenz[a,h]anthracene	UG/KG	350 U	380 U	330 U	340 U	340 U	340 U
Benzo[g,h,i]perylene	UG/KG	350 U	380 U	330 U	340 U	340 U	340 U

FREQUENCY OF DETECTION SUMMARY
OPERABLE UNIT No. 8
SITE 16 - SUBSURFACE SOIL
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

Client Sample ID:	16-BD-SB01-06	16-BD-SB02-07	16-BD-SB03-07	16-BD-SB04-06	16-BD-SB05-07	16-BD-SB06-07
Laboratory Sample ID:	AC4119	AC4113	AC4574	AC4100	AC4188	AC4184
Date Sampled:	10/19/94	10/19/94	10/20/94	10/19/94	10/18/94	10/18/94

	UNITS						
PESTICIDES/PCBs							
alpha-BHC	UG/KG	1.8 U	1.9 U	1.7 U	1.8 U	3.6 U	1.8 U
beta-BHC	UG/KG	1.8 U	1.9 U	1.7 U	1.8 U	3.6 U	1.8 U
delta-BHC	UG/KG	1.8 U	1.9 U	1.7 U	1.8 U	3.6 U	1.8 U
Lindane (gamma-BHC)	UG/KG	1.8 U	1.9 U	1.7 U	1.8 U	3.6 U	1.8 U
Heptachlor	UG/KG	1.8 U	1.9 U	1.7 U	1.8 U	3.6 U	1.8 U
Aldrin	UG/KG	1.8 U	1.9 U	1.7 U	1.8 U	3.6 U	1.8 U
Heptachlor epoxide	UG/KG	1.8 U	1.9 U	1.7 U	1.8 U	3.6 U	1.8 U
Endosulfan I	UG/KG	1.8 U	1.9 U	1.7 U	1.8 U	3.6 U	1.8 U
Dieldrin	UG/KG	3.5 U	3.8 U	3.3 U	3.4 U	6.9 U	3.4 U
4,4'-DDE	UG/KG	3.5 U	3.8 U	3.3 U	3.4 U	36	3.4 U
Endrin	UG/KG	3.5 U	3.8 U	3.3 U	3.4 U	6.9 U	3.4 U
Endosulfan II	UG/KG	3.5 U	3.8 U	3.3 U	3.4 U	6.9 U	3.4 U
4,4'-DDD	UG/KG	3.5 U	3.8 U	3.3 U	3.4 U	52 J	3.4 U
Endosulfan sulfate	UG/KG	3.5 U	3.8 U	3.3 U	3.4 U	6.9 U	3.4 U
4,4'-DDT	UG/KG	3.5 U	3.8 U	3.3 U	3.4 U	630	3.4 U
Methoxychlor	UG/KG	18 U	19 U	17 U	18 U	36 U	18 U
Endrin ketone	UG/KG	3.5 U	3.8 U	3.3 U	3.4 U	6.9 U	3.4 U
Endrin aldehyde	UG/KG	3.5 U	3.8 U	3.3 U	3.4 U	6.9 U	3.4 U
alpha-Chlordane	UG/KG	1.8 U	1.9 U	1.7 U	1.8 U	3.6 U	1.8 U
gamma-Chlordane	UG/KG	1.8 U	1.9 U	1.7 U	1.8 U	2.4 J	1.8 U
Toxaphene	UG/KG	180 U	190 U	170 U	180 U	360 U	180 U
Aroclor 1016	UG/KG	35 U	38 U	33 U	34 U	69 U	34 U
Aroclor 1221	UG/KG	72 U	77 U	67 U	70 U	140 U	70 U
Aroclor 1232	UG/KG	35 U	38 U	33 U	34 U	69 U	34 U
Aroclor 1242	UG/KG	35 U	38 U	33 U	34 U	69 U	34 U
Aroclor 1248	UG/KG	35 U	38 U	33 U	34 U	69 U	34 U
Aroclor 1254	UG/KG	35 U	38 U	33 U	34 U	69 U	34 U
Aroclor 1260	UG/KG	35 U	38 U	33 U	34 U	69 U	34 U

FREQUENCY OF DETECTION SUMMARY
OPERABLE UNIT No. 8
SITE 16 - SUBSURFACE SOIL
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

Client Sample ID:	16-BD-SB07-04	16-BD-SB08-06	16-BD-SB09-05	16-BD-SB10-03	16-BD-SB10-07	16-BD-SB11-06
Laboratory Sample ID:	AC4578	AC4583	AC4146	AC4174	AC4176	AC4138
Date Sampled:	10/20/94	10/20/94	10/18/94	10/18/94	10/18/94	10/18/94

	UNITS					
VOLATILES						
Chloromethane	UG/KG	11 U	10 U	11 U	11 U	10 U
Bromomethane	UG/KG	11 U	10 U	11 U	11 U	10 U
Vinyl chloride	UG/KG	11 U	10 U	11 U	11 U	10 U
Chloroethane	UG/KG	11 U	10 U	11 U	11 U	10 U
Methylene chloride	UG/KG	11 U	10 U	11 U	11 U	10 U
Acetone	UG/KG	100 J	14 U	78 U	310	120 U
Carbon Disulfide	UG/KG	11 UJ	10 UJ	11 U	11 U	10 U
1,1-Dichloroethene	UG/KG	11 UJ	10 UJ	11 U	11 U	10 U
1,1-Dichloroethane	UG/KG	11 UJ	10 UJ	11 U	11 U	10 U
1,2-Dichloroethene(total)	UG/KG	11 U	10 U	11 U	11 U	10 U
Chloroform	UG/KG	11 U	10 U	11 U	11 U	10 U
1,2-Dichloroethane	UG/KG	11 U	10 U	11 U	11 U	10 U
2-Butanone	UG/KG	11 U	10 U	11 U	11 U	10 U
1,1,1-Trichloroethane	UG/KG	11 U	10 U	11 U	11 U	10 U
Carbon tetrachloride	UG/KG	11 U	10 U	11 U	11 U	10 U
Bromodichloromethane	UG/KG	11 U	10 U	11 U	11 U	10 U
1,2-Dichloropropane	UG/KG	11 U	10 U	11 U	11 U	10 U
cis-1,3-Dichloropropene	UG/KG	11 U	10 U	11 U	11 U	10 U
Trichloroethene	UG/KG	11 U	10 U	11 U	11 U	10 U
Dibromochloromethane	UG/KG	11 U	10 U	11 U	11 U	10 U
1,1,2-Trichloroethane	UG/KG	11 U	10 U	11 U	11 U	10 U
Benzene	UG/KG	11 U	10 U	11 U	11 U	10 U
trans-1,3-Dichloropropene	UG/KG	11 U	10 U	11 U	11 U	10 U
Bromoform	UG/KG	11 U	10 U	11 U	11 U	10 U
4-Methyl-2-pentanone	UG/KG	11 U	10 U	11 U	11 U	10 U
2-Hexanone	UG/KG	11 U	10 U	11 U	11 U	10 U
Tetrachloroethene	UG/KG	11 U	10 U	11 U	11 U	10 U
1,1,2,2-Tetrachloroethane	UG/KG	11 U	10 U	11 U	11 U	10 U
Toluene	UG/KG	11 U	10 U	11 U	11 U	10 U
Chlorobenzene	UG/KG	11 U	10 U	11 U	11 U	10 U
Ethylbenzene	UG/KG	11 U	10 U	11 U	11 U	10 U
Styrene	UG/KG	11 U	10 U	11 U	11 U	10 U
Xylenes (total)	UG/KG	11 U	10 U	11 U	11 U	10 U

FREQUENCY OF DETECTION SUMMARY
 OPERABLE UNIT No. 8
 SITE 16 - SUBSURFACE SOIL
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID:	16-BD-SB07-04	16-BD-SB08-06	16-BD-SB09-05	16-BD-SB10-03	16-BD-SB10-07	16-BD-SB11-06
Laboratory Sample ID:	AC4578	AC4583	AC4146	AC4174	AC4176	AC4138
Date Sampled:	10/20/94	10/20/94	10/18/94	10/18/94	10/18/94	10/18/94

	UNITS					
SEMIVOLATILES	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Phenol	350 U	340 U	340 U	350 U	340 U	330 U
bis(2-Chloroethyl) ether	350 U	340 U	340 U	350 U	340 U	330 U
2-Chlorophenol	350 U	340 U	340 U	350 U	340 U	330 U
1,3-Dichlorobenzene	350 U	340 U	340 U	350 U	340 U	330 U
1,4-Dichlorobenzene	350 U	340 U	340 U	350 UJ	340 UJ	330 U
1,2-Dichlorobenzene	350 U	340 U	340 U	350 U	340 U	330 U
2-Methylphenol	350 U	340 U	340 U	350 U	340 U	330 U
2,2'-oxybis-(1-chloropropane)	350 U	340 U	340 U	350 U	340 U	330 U
4-Methylphenol	350 U	340 U	340 U	350 U	340 U	330 U
N-Nitroso-di-n-propylamine	350 U	340 U	340 U	350 U	340 U	330 U
Hexachloroethane	350 U	340 U	340 U	350 U	340 U	330 U
Nitrobenzene	350 U	340 U	340 U	350 U	340 U	330 U
Isophorone	350 U	340 U	340 U	350 U	340 U	330 U
2-Nitrophenol	350 U	340 U	340 U	350 U	340 U	330 U
2,4-Dimethylphenol	350 U	340 U	340 U	350 U	340 U	330 U
bis(2-Chloroethoxy) methane	350 U	340 U	340 U	350 U	340 U	330 U
2,4-Dichlorophenol	350 U	340 U	340 U	350 U	340 U	330 U
1,2,4-Trichlorobenzene	350 U	340 U	340 U	350 UJ	340 UJ	330 U
Naphthalene	350 U	340 U	340 U	88 J	340 U	330 U
4-Chloroaniline	350 U	340 U	340 U	350 U	340 U	330 U
Hexachlorobutadiene	350 U	340 U	340 U	350 U	340 U	330 U
4-Chloro-3-methylphenol	350 U	340 U	340 U	350 U	340 U	330 U
2-Methylnaphthalene	350 U	340 U	340 U	77 J	340 U	330 U
Hexachlorocyclopentadiene	350 U	340 U	340 U	350 U	340 U	330 U
2,4,6-Trichlorophenol	350 U	340 U	340 U	350 U	340 U	330 U
2,4,5-Trichlorophenol	840 U	830 U	820 U	860 U	810 U	810 U
2-Chloronaphthalene	350 U	340 U	340 U	350 U	340 U	330 U
2-Nitroaniline	840 U	830 U	820 U	860 U	810 U	810 U
Dimethyl phthalate	350 U	340 U	340 U	350 U	340 U	330 U
Acenaphthylene	350 U	340 U	340 U	350 U	340 U	330 U
2,6-Dinitrotoluene	350 U	340 U	340 U	350 U	340 U	330 U
3-Nitroaniline	840 U	830 U	820 U	860 U	810 U	810 U
Acenaphthene	350 U	340 U	340 U	290 J	340 UJ	330 U

FREQUENCY OF DETECTION SUMMARY
 OPERABLE UNIT No. 8
 SITE 16 - SUBSURFACE SOIL
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID:	16-BD-SB07-04	16-BD-SB08-06	16-BD-SB09-05	16-BD-SB10-03	16-BD-SB10-07	16-BD-SB11-06
Laboratory Sample ID:	AC4578	AC4583	AC4146	AC4174	AC4176	AC4138
Date Sampled:	10/20/94	10/20/94	10/18/94	10/18/94	10/18/94	10/18/94

	<u>UNITS</u>					
SEMIVOLATILES Cont.						
2,4-Dinitrophenol	UG/KG	840 U	830 U	820 U	860 U	810 U
4-Nitrophenol	UG/KG	840 U	830 U	820 U	860 U	810 U
Dibenzofuran	UG/KG	350 U	340 U	340 U	310 J	340 U
2,4-Dinitrotoluene	UG/KG	350 U	340 U	340 U	350 U	340 U
Diethylphthalate	UG/KG	350 U	340 U	340 U	350 U	340 U
4-Chlorophenyl phenyl ether	UG/KG	350 U	340 U	340 U	350 U	340 U
Fluorene	UG/KG	350 U	340 U	340 U	680	340 U
4-Nitroaniline	UG/KG	840 U	830 U	820 U	860 U	810 U
4,6-Dinitro-2-methylphenol	UG/KG	840 U	830 U	820 U	860 U	810 U
N-nitrosodiphenylamine	UG/KG	350 U	340 U	340 U	350 U	340 U
4-Bromophenyl-phenylether	UG/KG	350 U	340 U	340 U	350 U	340 U
Hexachlorobenzene	UG/KG	350 U	340 U	340 U	350 U	340 U
Pentachlorophenol	UG/KG	840 U	830 U	820 U	860 U	810 U
Phenanthrene	UG/KG	350 U	340 U	340 U	2200	340 U
Anthracene	UG/KG	350 U	340 U	340 U	380	340 U
Carbazole	UG/KG	350 U	340 U	340 U	180 J	340 U
di-n-Butylphthalate	UG/KG	350 U	340 U	340 U	270 J	340 U
Fluoranthene	UG/KG	350 U	340 U	340 U	1200	340 U
Pyrene	UG/KG	350 U	340 U	340 U	670 J	340 UJ
Butyl benzyl phthalate	UG/KG	350 U	340 U	340 U	350 U	340 U
3,3'-Dichlorobenzidine	UG/KG	350 U	340 U	340 U	350 U	340 U
Benzo[a]anthracene	UG/KG	350 U	340 U	340 U	160 J	340 U
Chrysene	UG/KG	350 U	340 U	340 U	160 J	340 U
bis(2-Ethylhexyl)phthalate	UG/KG	350 U	340 U	340 U	350 U	340 U
di-n-Octylphthalate	UG/KG	350 U	340 U	340 U	350 U	340 U
Benzo[b]fluoranthene	UG/KG	350 U	340 U	340 U	57 J	340 U
Benzo[k]fluoranthene	UG/KG	350 U	340 U	340 U	58 J	340 U
Benzo[a]pyrene	UG/KG	350 U	340 U	340 U	38 J	340 U
Indeno[1,2,3-cd]pyrene	UG/KG	350 U	340 U	340 U	350 U	340 U
Dibenz[a,h]anthracene	UG/KG	350 U	340 U	340 U	350 U	340 U
Benzo[g,h,i]perylene	UG/KG	350 U	340 U	340 U	350 U	340 U

FREQUENCY OF DETECTION SUMMARY
OPERABLE UNIT No. 8
SITE 16 - SUBSURFACE SOIL
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

Client Sample ID:	16-BD-SB07-04	16-BD-SB08-06	16-BD-SB09-05	16-BD-SB10-03	16-BD-SB10-07	16-BD-SB11-08
Laboratory Sample ID:	AC4578	AC4583	AC4146	AC4174	AC4176	AC4138
Date Sampled:	10/20/94	10/20/94	10/18/94	10/18/94	10/18/94	10/18/94

	UNITS					
PESTICIDES/PCBs						
alpha-BHC	UG/KG	1.8 UJ	1.8 UJ	1.7 U	1.8 U	1.7 U
beta-BHC	UG/KG	1.8 UJ	1.8 UJ	1.7 U	1.8 U	1.7 U
delta-BHC	UG/KG	1.8 UJ	1.8 UJ	1.7 U	1.8 U	1.7 U
Lindane (gamma-BHC)	UG/KG	1.8 UJ	1.8 UJ	1.7 U	1.8 U	1.7 U
Heptachlor	UG/KG	1.8 UJ	1.8 UJ	1.7 U	1.8 U	1.7 U
Aldrin	UG/KG	1.8 UJ	1.8 UJ	1.7 U	1.8 U	1.7 U
Heptachlor epoxide	UG/KG	1.8 UJ	1.8 UJ	1.7 U	1.8 U	1.7 U
Endosulfan I	UG/KG	1.8 UJ	1.8 UJ	1.7 U	1.8 U	1.7 U
Dieldrin	UG/KG	3.4 UJ	3.4 UJ	3.4 U	3.6 U	3.3 U
4,4'-DDE	UG/KG	3.4 UJ	3.4 UJ	3.4 U	3.6 U	3.3 U
Endrin	UG/KG	3.4 UJ	3.4 UJ	3.4 U	3.6 U	3.3 U
Endosulfan II	UG/KG	3.4 UJ	3.4 UJ	3.4 U	3.6 U	3.3 U
4,4'-DDD	UG/KG	3.4 UJ	3.4 UJ	3.4 U	3.6 U	3.3 U
Endosulfan sulfate	UG/KG	3.4 UJ	3.4 UJ	3.4 U	3.6 U	3.3 U
4,4'-DDT	UG/KG	3.4 UJ	3.4 UJ	3.4 U	3.6 U	3.3 U
Methoxychlor	UG/KG	18 UJ	18 UJ	17 U	18 U	17 U
Endrin ketone	UG/KG	3.4 UJ	3.4 UJ	3.4 U	3.6 U	3.3 U
Endrin aldehyde	UG/KG	3.4 UJ	3.4 UJ	3.4 U	3.6 U	3.3 U
alpha-Chlordane	UG/KG	1.8 UJ	1.8 UJ	1.7 U	1.8 U	1.7 U
gamma-Chlordane	UG/KG	1.8 UJ	1.8 UJ	1.7 U	1.8 U	1.7 U
Toxaphene	UG/KG	180 UJ	180 UJ	170 U	180 U	170 U
Aroclor 1016	UG/KG	34 UJ	34 UJ	34 U	36 U	33 U
Aroclor 1221	UG/KG	70 UJ	69 UJ	69 U	73 U	68 U
Aroclor 1232	UG/KG	34 UJ	34 UJ	34 U	36 U	33 U
Aroclor 1242	UG/KG	34 UJ	34 UJ	34 U	36 U	33 U
Aroclor 1248	UG/KG	34 UJ	34 UJ	34 U	36 U	33 U
Aroclor 1254	UG/KG	34 UJ	34 UJ	34 U	36 U	33 U
Aroclor 1260	UG/KG	34 UJ	34 UJ	34 U	36 U	33 U

FREQUENCY OF DETECTION SUMMARY
 OPERABLE UNIT No. 8
 SITE 16 - SUBSURFACE SOIL
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID:	16-BD-SB12-02	16-BD-SB13-02	16-BD-SB14-05	16-BD-SB15-06	16-BD-SB16-05	16-BD-SB17-05
Laboratory Sample ID:	AC4589	AC4594	AC4596	AC4196	AC4128	AC4192
Date Sampled:	10/20/94	10/20/94	10/19/94	10/19/94	10/18/94	10/19/94

	UNITS					
VOLATILES						
Chloromethane	UG/KG	26 U	11 U	52 U	11 U	10 U
Bromomethane	UG/KG	26 U	11 U	52 U	11 U	10 U
Vinyl chloride	UG/KG	26 U	11 U	52 U	11 U	10 U
Chloroethane	UG/KG	26 U	11 U	52 U	11 U	10 U
Methylene chloride	UG/KG	26 U	11 U	52 U	11 U	10 U
Acetone	UG/KG	290 J	11 U	900 J	75 U	210
Carbon Disulfide	UG/KG	26 U	11 UJ	52 U	11 U	10 U
1,1-Dichloroethene	UG/KG	26 UJ	11 UJ	52 UJ	11 U	10 U
1,1-Dichloroethane	UG/KG	26 U	11 UJ	52 U	11 U	10 U
1,2-Dichloroethene(total)	UG/KG	26 U	11 U	52 U	11 U	10 U
Chloroform	UG/KG	26 U	11 U	52 U	11 U	10 U
1,2-Dichloroethane	UG/KG	26 U	11 U	52 U	11 U	10 U
2-Butanone	UG/KG	26 U	11 U	52 U	11 U	10 U
1,1,1-Trichloroethane	UG/KG	26 U	11 U	52 U	11 U	10 U
Carbon tetrachloride	UG/KG	26 U	11 U	52 U	11 U	10 U
Bromodichloromethane	UG/KG	26 U	11 U	52 U	11 U	10 U
1,2-Dichloropropane	UG/KG	26 U	11 U	52 U	11 U	10 U
cis-1,3-Dichloropropene	UG/KG	26 U	11 U	52 U	11 U	10 U
Trichloroethene	UG/KG	26 U	11 U	52 U	11 U	10 U
Dibromochloromethane	UG/KG	26 U	11 U	52 U	11 U	10 U
1,1,2-Trichloroethane	UG/KG	26 U	11 U	52 U	11 U	10 U
Benzene	UG/KG	26 U	11 U	52 U	11 U	10 U
trans-1,3-Dichloropropene	UG/KG	26 U	11 U	52 U	11 U	10 U
Bromoform	UG/KG	26 U	11 U	52 U	11 U	10 U
4-Methyl-2-pentanone	UG/KG	26 U	11 U	52 U	11 U	10 U
2-Hexanone	UG/KG	26 U	11 U	52 U	11 U	10 U
Tetrachloroethene	UG/KG	26 U	11 U	52 U	11 U	10 U
1,1,2,2-Tetrachloroethane	UG/KG	26 U	11 U	52 U	11 U	10 U
Toluene	UG/KG	26 U	11 U	52 U	11 U	10 U
Chlorobenzene	UG/KG	26 U	11 U	52 U	11 U	10 U
Ethylbenzene	UG/KG	26 U	11 U	52 U	11 U	10 U
Styrene	UG/KG	26 U	11 U	52 U	11 U	10 U
Xylenes (total)	UG/KG	26 U	11 U	52 U	11 U	10 U

FREQUENCY OF DETECTION SUMMARY
 OPERABLE UNIT No. 8
 SITE 16 - SUBSURFACE SOIL
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID:	16-BD-SB12-02	16-BD-SB13-02	16-BD-SB14-05	16-BD-SB15-06	16-BD-SB16-05	16-BD-SB17-05
Laboratory Sample ID:	AC4589	AC4594	AC4596	AC4196	AC4128	AC4192
Date Sampled:	10/20/94	10/20/94	10/19/94	10/19/94	10/18/94	10/19/94

	<u>UNITS</u>					
<u>SEMIVOLATILES</u>						
Phenol	UG/KG	340 U	350 U	340 UJ	340 U	340 U
bis(2-Chloroethyl) ether	UG/KG	340 U	350 U	340 UJ	340 U	340 U
2-Chlorophenol	UG/KG	340 U	350 U	340 UJ	340 U	340 U
1,3-Dichlorobenzene	UG/KG	340 U	350 U	340 UJ	340 U	340 U
1,4-Dichlorobenzene	UG/KG	67 J	350 U	340 UJ	340 UJ	340 UJ
1,2-Dichlorobenzene	UG/KG	340 U	350 U	340 UJ	340 U	340 U
2-Methylphenol	UG/KG	340 U	350 U	340 UJ	340 U	340 U
2,2'-oxybis-(1-chloropropane)	UG/KG	340 U	350 U	340 UJ	340 U	340 U
4-Methylphenol	UG/KG	340 U	350 U	340 UJ	340 U	340 U
N-Nitroso-di-n-propylamine	UG/KG	340 U	350 U	340 UJ	340 U	340 U
Hexachloroethane	UG/KG	340 U	350 U	340 UJ	340 U	340 U
Nitrobenzene	UG/KG	340 U	350 U	340 UJ	340 U	340 U
Isophorone	UG/KG	340 U	350 U	340 UJ	340 U	340 U
2-Nitrophenol	UG/KG	340 U	350 U	340 UJ	340 U	340 U
2,4-Dimethylphenol	UG/KG	340 U	350 U	340 UJ	340 U	340 U
bis(2-Chloroethoxy) methane	UG/KG	340 U	350 U	340 UJ	340 U	340 U
2,4-Dichlorophenol	UG/KG	340 U	350 U	340 UJ	340 U	340 U
1,2,4-Trichlorobenzene	UG/KG	66 J	350 U	340 UJ	340 UJ	340 UJ
Naphthalene	UG/KG	340 U	350 U	340 UJ	340 U	340 U
4-Chloroaniline	UG/KG	340 U	350 U	340 UJ	340 U	340 U
Hexachlorobutadiene	UG/KG	340 U	350 U	340 UJ	340 U	340 U
4-Chloro-3-methylphenol	UG/KG	340 U	350 U	340 UJ	340 U	340 U
2-Methylnaphthalene	UG/KG	340 U	350 U	340 UJ	340 U	340 U
Hexachlorocyclopentadiene	UG/KG	340 U	350 U	340 UJ	340 U	340 U
2,4,6-Trichlorophenol	UG/KG	340 U	350 U	340 UJ	340 U	340 U
2,4,5-Trichlorophenol	UG/KG	820 U	850 U	820 UJ	830 U	820 U
2-Chloronaphthalene	UG/KG	340 U	350 U	340 UJ	340 U	340 U
2-Nitroaniline	UG/KG	820 U	850 U	820 UJ	830 U	820 U
Dimethyl phthalate	UG/KG	340 U	350 U	340 UJ	340 U	340 U
Acenaphthylene	UG/KG	340 U	350 U	340 UJ	340 U	340 U
2,6-Dinitrotoluene	UG/KG	340 U	350 U	340 UJ	340 U	340 U
3-Nitroaniline	UG/KG	820 U	850 U	820 UJ	830 U	820 U
Acenaphthene	UG/KG	51 J	350 U	340 UJ	340 UJ	340 UJ

FREQUENCY OF DETECTION SUMMARY
 OPERABLE UNIT No. 8
 SITE 16 - SUBSURFACE SOIL
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID:	16-BD-SB12-02	16-BD-SB13-02	16-BD-SB14-05	16-BD-SB15-06	16-BD-SB16-05	16-BD-SB17-05
Laboratory Sample ID:	AC4589	AC4594	AC4596	AC4196	AC4128	AC4192
Date Sampled:	10/20/94	10/20/94	10/19/94	10/19/94	10/18/94	10/19/94

	UNITS						
SEMIVOLATILES Cont.							
2,4-Dinitrophenol	UG/KG	820 U	850 U	820 UJ	830 U	820 U	820 U
4-Nitrophenol	UG/KG	820 U	850 U	820 UJ	830 U	820 U	820 U
Dibenzofuran	UG/KG	340 U	350 U	340 UJ	340 U	340 U	340 U
2,4-Dinitrotoluene	UG/KG	340 U	350 U	340 UJ	340 U	340 U	340 U
Diethylphthalate	UG/KG	340 U	350 U	340 UJ	340 U	340 U	340 U
4-Chlorophenyl phenyl ether	UG/KG	340 U	350 U	340 UJ	340 U	340 U	340 U
Fluorene	UG/KG	340 U	350 U	340 UJ	340 U	340 U	340 U
4-Nitroaniline	UG/KG	820 U	850 U	820 UJ	830 U	820 U	820 U
4,6-Dinitro-2-methylphenol	UG/KG	820 U	850 U	820 UJ	830 U	820 U	820 U
N-nitrosodiphenylamine	UG/KG	340 U	350 U	340 UJ	340 U	340 U	340 U
4-Bromophenyl-phenylether	UG/KG	340 U	350 U	340 UJ	340 U	340 U	340 U
Hexachlorobenzene	UG/KG	340 U	350 U	340 UJ	340 U	340 U	340 U
Pentachlorophenol	UG/KG	38 NJ	850 U	820 UJ	830 U	820 U	820 U
Phenanthrene	UG/KG	340 U	350 U	340 UJ	340 U	340 U	340 U
Anthracene	UG/KG	340 U	350 U	340 UJ	340 U	340 U	340 U
Carbazole	UG/KG	340 U	350 U	340 UJ	340 U	340 U	340 U
di-n-Butylphthalate	UG/KG	340 U	350 U	320 UJ	340 U	340 U	340 U
Fluoranthene	UG/KG	340 U	350 U	340 UJ	340 U	340 U	340 U
Pyrene	UG/KG	340 U	350 U	340 UJ	340 UJ	340 U	340 UJ
Butyl benzyl phthalate	UG/KG	340 U	350 U	340 UJ	340 U	340 U	340 U
3,3'-Dichlorobenzidine	UG/KG	340 U	350 U	340 UJ	340 U	340 U	340 U
Benzo[a]anthracene	UG/KG	340 U	350 U	340 UJ	340 U	340 U	340 U
Chrysene	UG/KG	340 U	350 U	340 UJ	340 U	340 U	340 U
bis(2-Ethylhexyl)phthalate	UG/KG	340 U	350 U	340 UJ	340 U	340 U	340 U
di-n-Octylphthalate	UG/KG	340 U	350 U	340 UJ	340 U	340 U	340 U
Benzo[b]fluoranthene	UG/KG	340 U	350 U	340 UJ	340 U	340 U	340 U
Benzo[k]fluoranthene	UG/KG	340 U	350 U	340 UJ	340 U	340 U	340 U
Benzo[a]pyrene	UG/KG	340 U	350 U	340 UJ	340 U	340 U	340 U
Indeno[1,2,3-cd]pyrene	UG/KG	340 U	350 U	340 UJ	340 U	340 U	340 U
Dibenz[a,h]anthracene	UG/KG	340 U	350 U	340 UJ	340 U	340 U	340 U
Benzo[g,h,i]perylene	UG/KG	340 U	350 U	340 UJ	340 U	340 U	340 U

FREQUENCY OF DETECTION SUMMARY
OPERABLE UNIT No. 8
SITE 16 - SUBSURFACE SOIL
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

Client Sample ID:	16-BD-SB12-02	16-BD-SB13-02	16-BD-SB14-05	16-BD-SB15-06	16-BD-SB16-05	16-BD-SB17-05
Laboratory Sample ID:	AC4589	AC4594	AC4596	AC4196	AC4128	AC4192
Date Sampled:	10/20/94	10/20/94	10/19/94	10/19/94	10/18/94	10/19/94

	UNITS					
PESTICIDES/PCBs						
alpha-BHC	UG/KG	1.7 U	1.8 U	1.7 U	1.8 UJ	1.7 U
beta-BHC	UG/KG	1.7 U	1.8 U	1.7 U	1.8 UJ	1.7 U
delta-BHC	UG/KG	1.7 U	1.8 U	1.7 U	1.8 UJ	1.7 U
Lindane (gamma-BHC)	UG/KG	1.7 U	1.8 U	1.7 U	1.8 UJ	1.7 U
Heptachlor	UG/KG	1.7 U	1.8 U	1.7 U	1.8 UJ	1.7 U
Aldrin	UG/KG	1.7 U	1.8 U	1.7 U	1.8 UJ	1.7 U
Heptachlor epoxide	UG/KG	1.7 U	1.8 U	1.7 U	1.8 UJ	1.7 U
Endosulfan I	UG/KG	1.7 U	1.8 U	1.7 U	1.8 UJ	1.7 U
Dieldrin	UG/KG	3.4 U	3.5 U	3.4 U	3.4 UJ	3.4 U
4,4'-DDE	UG/KG	3.4 U	3.5 U	3.4 U	3.4 UJ	3.4 U
Endrin	UG/KG	3.4 U	3.5 U	3.4 U	3.4 UJ	3.4 U
Endosulfan II	UG/KG	3.4 U	3.5 U	3.4 U	3.4 UJ	3.4 U
4,4'-DDD	UG/KG	3.4 U	3.5 U	3.4 U	3.4 UJ	3.4 U
Endosulfan sulfate	UG/KG	3.4 U	3.5 U	3.4 U	3.4 UJ	3.4 U
4,4'-DDT	UG/KG	3.4 U	3.5 U	3.4 U	3.4 UJ	3.4 U
Methoxychlor	UG/KG	17 U	18 U	17 U	18 UJ	17 U
Endrin ketone	UG/KG	3.4 U	3.5 U	3.4 U	3.4 UJ	3.4 U
Endrin aldehyde	UG/KG	3.4 U	3.5 U	3.4 U	3.4 UJ	3.4 U
alpha-Chlordane	UG/KG	1.7 U	3.8	1.7 U	1.8 UJ	1.7 U
gamma-Chlordane	UG/KG	1.7 U	2.5 J	1.7 U	1.8 UJ	1.7 U
Toxaphene	UG/KG	170 U	180 U	170 U	180 UJ	170 U
Aroclor 1016	UG/KG	34 U	35 U	34 U	34 UJ	34 U
Aroclor 1221	UG/KG	68 U	72 U	69 U	70 UJ	69 U
Aroclor 1232	UG/KG	34 U	35 U	34 U	34 UJ	34 U
Aroclor 1242	UG/KG	34 U	35 U	34 U	34 UJ	34 U
Aroclor 1248	UG/KG	34 U	35 U	34 U	34 UJ	34 U
Aroclor 1254	UG/KG	34 U	45	34 U	34 UJ	34 U
Aroclor 1260	UG/KG	34 U	35 U	34 U	34 UJ	34 U

FREQUENCY OF DETECTION SUMMARY
OPERABLE UNIT No. 8
SITE 16 - SUBSURFACE SOIL
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

Client Sample ID:	16-BD-SB18-06	16-BD-SB19-03	16-BD-SB20-06	16-MW01-01	16-MW01-04	16-MW02-03
Laboratory Sample ID:	AC4610	AC4606	AC4850	AC4140	AC4142	AC4569
Date Sampled:	10/20/94	10/20/94	10/20/94	10/18/94	10/18/94	10/19/94

	UNITS						
VOLATILES							
Chloromethane	UG/KG	11 U	11 UJ	11 U	11 U	11 U	12 U
Bromomethane	UG/KG	11 U	11 U	11 U	11 U	11 U	12 U
Vinyl chloride	UG/KG	11 U	11 U	11 U	11 U	11 U	12 U
Chloroethane	UG/KG	11 U	11 U	11 U	11 U	11 U	12 U
Methylene chloride	UG/KG	11 U	11 U	11 U	11 U	11 U	12 U
Acetone	UG/KG	42 J	85 J	630	11 U	61 U	86
Carbon Disulfide	UG/KG	11 U	11 UJ	11 U	11 U	11 U	12 U
1,1-Dichloroethene	UG/KG	11 UJ	11 U	11 U	11 U	11 U	12 U
1,1-Dichloroethane	UG/KG	11 U	11 UJ	11 U	11 U	11 U	12 U
1,2-Dichloroethene(total)	UG/KG	11 U	11 U	11 U	11 U	11 U	12 U
Chloroform	UG/KG	11 U	11 U	11 U	11 U	11 U	12 U
1,2-Dichloroethane	UG/KG	11 U	11 U	11 U	11 U	11 U	12 U
2-Butanone	UG/KG	11 U	11 U	11 U	11 U	11 U	12 U
1,1,1-Trichloroethane	UG/KG	11 U	11 U	11 U	11 U	11 U	12 U
Carbon tetrachloride	UG/KG	11 U	11 U	11 U	11 U	11 U	12 U
Bromodichloromethane	UG/KG	11 U	11 U	11 U	11 U	11 U	12 U
1,2-Dichloropropane	UG/KG	11 U	11 U	11 U	11 U	11 U	12 U
cis-1,3-Dichloropropene	UG/KG	11 U	11 U	11 U	11 U	11 U	12 U
Trichloroethene	UG/KG	11 U	11 U	11 U	11 U	11 U	12 U
Dibromochloromethane	UG/KG	11 U	11 U	11 U	11 U	11 U	12 U
1,1,2-Trichloroethane	UG/KG	11 U	11 U	11 U	11 U	11 U	12 U
Benzene	UG/KG	11 U	11 U	11 U	11 U	11 U	12 U
trans-1,3-Dichloropropene	UG/KG	11 U	11 U	11 U	11 U	11 U	12 U
Bromoform	UG/KG	11 U	11 U	11 U	11 U	11 U	12 U
4-Methyl-2-pentanone	UG/KG	11 U	11 U	11 U	11 U	11 U	12 U
2-Hexanone	UG/KG	11 U	11 U	11 U	11 U	11 U	12 U
Tetrachloroethene	UG/KG	11 U	11 U	11 U	11 U	11 U	12 U
1,1,2,2-Tetrachloroethane	UG/KG	11 U	11 U	11 U	11 U	11 U	12 U
Toluene	UG/KG	11 U	11 U	11 U	11 U	11 U	12 U
Chlorobenzene	UG/KG	11 U	11 U	11 U	11 U	11 U	12 U
Ethylbenzene	UG/KG	11 U	11 U	11 U	11 U	11 U	12 U
Styrene	UG/KG	11 U	11 U	11 U	11 U	11 U	12 U
Xylenes (total)	UG/KG	11 U	11 U	11 U	11 U	11 U	12 U

FREQUENCY OF DETECTION SUMMARY
 OPERABLE UNIT No. 8
 SITE 16 - SUBSURFACE SOIL
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID:	16-BD-SB18-06	16-BD-SB19-03	16-BD-SB20-06	16-MW01-01	16-MW01-04	16-MW02-03
Laboratory Sample ID:	AC4610	AC4606	AC4850	AC4140	AC4142	AC4569
Date Sampled:	10/20/94	10/20/94	10/20/94	10/18/94	10/18/94	10/19/94

	UNITS						
SEMIVOLATILES							
Phenol	UG/KG	340 U	370 U	360 U	370 U	360 U	390 U
bis(2-Chloroethyl) ether	UG/KG	340 U	370 U	360 U	370 U	360 U	390 U
2-Chlorophenol	UG/KG	340 U	370 U	360 U	370 U	360 U	390 U
1,3-Dichlorobenzene	UG/KG	340 U	370 U	360 U	370 U	360 U	390 U
1,4-Dichlorobenzene	UG/KG	340 U	370 U	360 U	370 U	360 U	50 J
1,2-Dichlorobenzene	UG/KG	340 U	370 U	360 U	370 U	360 U	390 U
2-Methylphenol	UG/KG	340 U	370 U	360 U	370 U	360 U	390 U
2,2'-oxybis-(1-chloropropane)	UG/KG	340 U	370 U	360 U	370 U	360 U	390 U
4-Methylphenol	UG/KG	340 U	370 U	360 U	370 U	360 U	390 U
N-Nitroso-di-n-propylamine	UG/KG	340 U	370 U	360 U	370 U	360 U	390 U
Hexachloroethane	UG/KG	340 U	370 U	360 U	370 U	360 U	390 U
Nitrobenzene	UG/KG	340 U	370 U	360 U	370 U	360 U	390 U
Isophorone	UG/KG	340 U	370 U	360 U	370 U	360 U	390 U
2-Nitrophenol	UG/KG	340 U	370 U	360 U	370 U	360 U	390 U
2,4-Dimethylphenol	UG/KG	340 U	370 U	360 U	370 U	360 U	390 U
bis(2-Chloroethoxy) methane	UG/KG	340 U	370 U	360 U	370 U	360 U	390 U
2,4-Dichlorophenol	UG/KG	340 U	370 U	360 U	370 U	360 U	390 U
1,2,4-Trichlorobenzene	UG/KG	340 U	370 U	360 U	370 U	360 U	45 J
Naphthalene	UG/KG	340 U	370 U	360 U	370 U	360 U	390 U
4-Chloroaniline	UG/KG	340 U	370 U	360 U	370 U	360 U	390 U
Hexachlorobutadiene	UG/KG	340 U	370 U	360 U	370 U	360 U	390 U
4-Chloro-3-methylphenol	UG/KG	340 U	370 U	360 U	370 U	360 U	390 U
2-Methylnaphthalene	UG/KG	340 U	370 U	360 U	370 U	360 U	390 U
Hexachlorocyclopentadiene	UG/KG	340 U	370 U	360 U	370 U	360 U	390 U
2,4,6-Trichlorophenol	UG/KG	340 U	370 U	360 U	370 U	360 U	390 U
2,4,5-Trichlorophenol	UG/KG	830 U	890 U	880 U	900 U	880 U	940 U
2-Chloronaphthalene	UG/KG	340 U	370 U	360 U	370 U	360 U	390 U
2-Nitroaniline	UG/KG	830 U	890 U	880 U	900 U	880 U	940 U
Dimethyl phthalate	UG/KG	340 U	370 U	360 U	370 U	360 U	390 U
Acenaphthylene	UG/KG	340 U	370 U	360 U	370 U	360 U	390 U
2,6-Dinitrotoluene	UG/KG	340 U	370 U	360 U	370 U	360 U	390 U
3-Nitroaniline	UG/KG	830 U	890 U	880 U	900 U	880 U	940 U
Acenaphthene	UG/KG	340 U	370 U	360 U	370 U	360 U	70 J

FREQUENCY OF DETECTION SUMMARY
 OPERABLE UNIT No. 8
 SITE 16 - SUBSURFACE SOIL
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID:	16-BD-SB18-06	16-BD-SB19-03	16-BD-SB20-06	16-MW01-01	16-MW01-04	16-MW02-03
Laboratory Sample ID:	AC4610	AC4606	AC4850	AC4140	AC4142	AC4569
Date Sampled:	10/20/94	10/20/94	10/20/94	10/18/94	10/18/94	10/19/94

UNITS

SEMIVOLATILES Cont.

	16-BD-SB18-06	16-BD-SB19-03	16-BD-SB20-06	16-MW01-01	16-MW01-04	16-MW02-03	
2,4-Dinitrophenol	UG/KG	830 UJ	890 UJ	880 U	900 U	880 U	940 U
4-Nitrophenol	UG/KG	830 U	890 U	880 U	900 U	880 U	940 U
Dibenzofuran	UG/KG	340 U	370 U	360 U	370 U	360 U	390 U
2,4-Dinitrotoluene	UG/KG	340 U	370 U	360 U	370 U	360 U	390 U
Diethylphthalate	UG/KG	340 U	370 U	360 U	370 U	360 U	390 U
4-Chlorophenyl phenyl ether	UG/KG	340 U	370 U	360 U	370 U	360 U	390 U
Fluorene	UG/KG	340 U	370 U	360 U	370 U	360 U	390 U
4-Nitroaniline	UG/KG	830 U	890 U	880 U	900 U	880 U	940 U
4,6-Dinitro-2-methylphenol	UG/KG	830 U	890 U	880 U	900 U	880 U	940 U
N-nitrosodiphenylamine	UG/KG	340 U	370 U	360 U	370 U	360 U	390 U
4-Bromophenyl-phenylether	UG/KG	340 U	370 U	360 U	370 U	360 U	390 U
Hexachlorobenzene	UG/KG	340 U	370 U	360 U	370 U	360 U	390 U
Pentachlorophenol	UG/KG	830 U	890 U	880 U	900 U	880 U	52 NJ
Phenanthrene	UG/KG	340 U	370 U	360 U	370 U	360 U	390 U
Anthracene	UG/KG	340 U	370 U	360 U	370 U	360 U	390 U
Carbazole	UG/KG	340 U	370 U	360 U	370 U	360 U	390 U
di-n-Butylphthalate	UG/KG	340 U	370 U	360 U	370 U	360 U	390 U
Fluoranthene	UG/KG	340 U	370 U	360 U	370 U	360 U	390 U
Pyrene	UG/KG	340 U	370 U	360 U	370 U	360 U	390 U
Butyl benzyl phthalate	UG/KG	340 U	370 U	360 U	370 U	360 U	390 U
3,3'-Dichlorobenzidine	UG/KG	340 U	370 U	360 U	370 U	360 U	390 U
Benzo[a]anthracene	UG/KG	340 U	370 U	360 U	370 U	360 U	390 U
Chrysene	UG/KG	340 U	370 U	360 U	370 U	360 U	390 U
bis(2-Ethylhexyl)phthalate	UG/KG	340 U	370 U	58 J	370 U	360 U	390 U
di-n-Octylphthalate	UG/KG	340 U	370 U	360 U	370 U	360 U	390 U
Benzo[b]fluoranthene	UG/KG	340 U	370 U	360 U	370 U	360 U	390 U
Benzo[k]fluoranthene	UG/KG	340 U	370 U	360 U	370 U	360 U	390 U
Benzo[a]pyrene	UG/KG	340 U	370 U	360 U	370 U	360 U	390 U
Indeno[1,2,3-cd]pyrene	UG/KG	340 U	370 U	360 U	370 U	360 U	390 U
Dibenz[a,h]anthracene	UG/KG	340 U	370 U	360 U	370 U	360 U	390 U
Benzo[g,h,i]perylene	UG/KG	340 U	370 U	360 U	370 U	360 U	390 U

FREQUENCY OF DETECTION SUMMARY
OPERABLE UNIT No. 8
SITE 16 - SUBSURFACE SOIL
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

Client Sample ID:	16-BD-SB18-06	16-BD-SB19-03	16-BD-SB20-06	16-MW01-01	16-MW01-04	16-MW02-03
Laboratory Sample ID:	AC4610	AC4606	AC4850	AC4140	AC4142	AC4569
Date Sampled:	10/20/94	10/20/94	10/20/94	10/18/94	10/18/94	10/19/94

	UNITS					
PESTICIDES/PCBs						
alpha-BHC	UG/KG	1.8 U	1.9 U	1.9 U	1.9 U	2 U
beta-BHC	UG/KG	1.8 U	1.9 U	1.9 U	1.9 U	2 U
delta-BHC	UG/KG	1.8 U	1.9 U	1.9 U	1.9 U	2 U
Lindane (gamma-BHC)	UG/KG	1.8 U	1.9 U	1.9 U	1.9 U	2 U
Heptachlor	UG/KG	1.8 U	1.9 U	1.9 U	1.9 U	2 U
Aldrin	UG/KG	1.8 U	1.9 U	1.9 U	1.9 U	2 U
Heptachlor epoxide	UG/KG	1.8 U	1.9 U	1.9 U	1.9 U	2 U
Endosulfan I	UG/KG	1.8 U	1.9 U	1.9 U	1.9 U	2 U
Dieldrin	UG/KG	3.4 U	3.6 U	3.6 U	3.7 U	3.8 U
4,4'-DDE	UG/KG	3.4 U	3.6 U	3.6 U	7.6	3.8 U
Endrin	UG/KG	3.4 U	3.6 U	3.6 U	3.7 U	3.8 U
Endosulfan II	UG/KG	3.4 U	3.6 U	3.6 U	3.7 U	3.8 U
4,4'-DDD	UG/KG	3.4 U	3.6 U	3.6 U	3.7 U	3.8 U
Endosulfan sulfate	UG/KG	3.4 U	3.6 U	3.6 U	3.7 U	3.8 U
4,4'-DDT	UG/KG	3.4 U	3.6 U	3.6 U	3.7 U	3.8 U
Methoxychlor	UG/KG	18 U	19 U	19 U	19 U	20 U
Endrin ketone	UG/KG	3.4 U	3.6 U	3.6 U	3.7 U	3.8 U
Endrin aldehyde	UG/KG	3.4 U	3.6 U	3.6 U	3.7 U	3.8 U
alpha-Chlordane	UG/KG	1.8 U	1.9 U	1.9 U	1.9 U	2 U
gamma-Chlordane	UG/KG	1.8 U	1.9 U	1.9 U	1.9 U	2 U
Toxaphene	UG/KG	180 U	190 U	190 U	190 U	200 U
Aroclor 1016	UG/KG	34 U	36 U	36 U	37 U	38 U
Aroclor 1221	UG/KG	70 U	74 U	74 U	75 U	78 U
Aroclor 1232	UG/KG	34 U	36 U	36 U	37 U	38 U
Aroclor 1242	UG/KG	34 U	36 U	36 U	37 U	38 U
Aroclor 1248	UG/KG	34 U	36 U	36 U	37 U	38 U
Aroclor 1254	UG/KG	34 U	36 U	36 U	37 U	38 U
Aroclor 1260	UG/KG	34 U	36 U	36 U	37 U	38 U

FREQUENCY OF DETECTION SUMMARY
OPERABLE UNIT No. 8
SITE 16 - SUBSURFACE SOIL
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

Client Sample ID:	16-MW03-02	16-MW04-03	16-MW05-08	16-MW06-06	16-SDA-SB01-02	16-SDA-SB02-02
Laboratory Sample ID:	AC4180	AC4104	AC4860	AC4864	AC4124	AC4134
Date Sampled:	10/18/94	10/19/94	10/21/94	10/21/94	10/18/94	10/18/94

	UNITS						
VOLATILES							
Chloromethane	UG/KG	10 U	11 U	12 U	11 U	11 U	11 U
Bromomethane	UG/KG	10 U	11 U	12 U	11 U	11 U	11 U
Vinyl chloride	UG/KG	10 U	11 U	12 U	11 U	11 U	11 U
Chloroethane	UG/KG	10 U	11 U	12 U	11 U	11 U	11 U
Methylene chloride	UG/KG	10 U	11 U	12 U	11 U	11 U	11 U
Acetone	UG/KG	56 U	47 U	190	11 U	30 U	21 U
Carbon Disulfide	UG/KG	10 U	11 U	12 U	11 U	11 U	11 U
1,1-Dichloroethene	UG/KG	10 U	11 U	12 U	11 U	11 U	11 U
1,1-Dichloroethane	UG/KG	10 U	11 U	12 U	11 U	11 U	11 U
1,2-Dichloroethene(total)	UG/KG	10 U	11 U	12 U	11 U	11 U	11 U
Chloroform	UG/KG	10 U	11 U	12 U	11 U	11 U	11 U
1,2-Dichloroethane	UG/KG	10 U	11 U	12 U	11 U	11 U	11 U
2-Butanone	UG/KG	10 U	11 U	12 U	11 U	11 U	11 U
1,1,1-Trichloroethane	UG/KG	10 U	11 U	12 U	11 U	11 U	11 U
Carbon tetrachloride	UG/KG	10 U	11 U	12 U	11 U	11 U	11 U
Bromodichloromethane	UG/KG	10 U	11 U	12 U	11 U	11 U	11 U
1,2-Dichloropropane	UG/KG	10 U	11 U	12 U	11 U	11 U	11 U
cis-1,3-Dichloropropene	UG/KG	10 U	11 U	12 U	11 U	11 U	11 U
Trichloroethene	UG/KG	10 U	11 U	12 U	11 U	11 U	11 U
Dibromochloromethane	UG/KG	10 U	11 U	12 U	11 U	11 U	11 U
1,1,2-Trichloroethane	UG/KG	10 U	11 U	12 U	11 U	11 U	11 U
Benzene	UG/KG	10 U	11 U	12 U	11 U	11 U	11 U
trans-1,3-Dichloropropene	UG/KG	10 U	11 U	12 U	11 U	11 U	11 U
Bromoform	UG/KG	10 U	11 U	12 U	11 U	11 U	11 U
4-Methyl-2-pentanone	UG/KG	10 U	11 U	12 U	11 U	11 U	11 U
2-Hexanone	UG/KG	10 U	11 U	12 U	11 U	11 U	11 U
Tetrachloroethene	UG/KG	10 U	11 U	12 U	11 U	11 U	11 U
1,1,2,2-Tetrachloroethane	UG/KG	10 U	11 U	12 U	11 U	11 U	11 U
Toluene	UG/KG	10 U	11 U	12 U	11 U	11 U	11 U
Chlorobenzene	UG/KG	10 U	11 U	12 U	11 U	11 U	11 U
Ethylbenzene	UG/KG	10 U	11 U	12 U	11 U	11 U	11 U
Styrene	UG/KG	10 U	11 U	12 U	11 U	11 U	11 U
Xylenes (total)	UG/KG	10 U	11 U	12 U	11 U	11 U	11 U

FREQUENCY OF DETECTION SUMMARY
 OPERABLE UNIT No. 8
 SITE 16 - SUBSURFACE SOIL
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID:	16-MW03-02	16-MW04-03	16-MW05-08	16-MW06-06	16-SDA-SB01-02	16-SDA-SB02-02
Laboratory Sample ID:	AC4180	AC4104	AC4860	AC4864	AC4124	AC4134
Date Sampled:	10/18/94	10/19/94	10/21/94	10/21/94	10/18/94	10/18/94

	UNITS						
SEMIVOLATILES							
Phenol	UG/KG	330 U	360 U	390 U	380 U	370 U	360 U
bis(2-Chloroethyl) ether	UG/KG	330 U	360 U	390 U	380 U	370 U	360 U
2-Chlorophenol	UG/KG	330 U	360 U	390 U	380 U	370 U	360 U
1,3-Dichlorobenzene	UG/KG	330 U	360 U	390 U	380 U	370 U	360 U
1,4-Dichlorobenzene	UG/KG	330 UJ	360 UJ	390 U	380 U	370 U	360 U
1,2-Dichlorobenzene	UG/KG	330 U	360 U	390 U	380 U	370 U	360 U
2-Methylphenol	UG/KG	330 U	360 U	390 U	380 U	370 U	360 U
2,2'-oxybis-(1-chloropropane)	UG/KG	330 U	360 U	390 U	380 U	370 U	360 U
4-Methylphenol	UG/KG	330 U	360 U	390 U	380 U	370 U	360 U
N-Nitroso-di-n-propylamine	UG/KG	330 U	360 U	390 U	380 U	370 U	360 U
Hexachloroethane	UG/KG	330 U	360 U	390 U	380 U	370 U	360 U
Nitrobenzene	UG/KG	330 U	360 U	390 U	380 U	370 U	360 U
Isophorone	UG/KG	330 U	360 U	390 U	380 U	370 U	360 U
2-Nitrophenol	UG/KG	330 U	360 U	390 U	380 U	370 U	360 U
2,4-Dimethylphenol	UG/KG	330 U	360 U	390 U	380 U	370 U	360 U
bis(2-Chloroethoxy) methane	UG/KG	330 U	360 U	390 U	380 U	370 U	360 U
2,4-Dichlorophenol	UG/KG	330 U	360 U	390 U	380 U	370 U	360 U
1,2,4-Trichlorobenzene	UG/KG	330 UJ	360 UJ	390 U	380 U	370 U	360 U
Naphthalene	UG/KG	330 U	360 U	390 U	380 U	370 U	360 U
4-Chloroaniline	UG/KG	330 U	360 U	390 U	380 U	370 U	360 U
Hexachlorobutadiene	UG/KG	330 U	360 U	390 U	380 U	370 U	360 U
4-Chloro-3-methylphenol	UG/KG	330 U	360 U	390 U	380 U	370 U	360 U
2-Methylnaphthalene	UG/KG	330 U	360 U	390 U	380 U	370 U	360 U
Hexachlorocyclopentadiene	UG/KG	330 U	360 U	390 U	380 U	370 U	360 U
2,4,6-Trichlorophenol	UG/KG	330 U	360 U	390 U	380 U	370 U	360 U
2,4,5-Trichlorophenol	UG/KG	810 U	880 U	940 U	910 U	900 U	880 U
2-Chloronaphthalene	UG/KG	330 U	360 U	390 U	380 U	370 U	360 U
2-Nitroaniline	UG/KG	810 U	880 U	940 U	910 U	900 U	880 U
Dimethyl phthalate	UG/KG	330 U	360 U	390 U	380 U	370 U	360 U
Acenaphthylene	UG/KG	330 U	360 U	390 U	380 U	370 U	360 U
2,6-Dinitrotoluene	UG/KG	330 U	360 U	390 U	380 U	370 U	360 U
3-Nitroaniline	UG/KG	810 U	880 U	940 U	910 U	900 U	880 U
Acenaphthene	UG/KG	330 UJ	360 UJ	390 U	380 U	370 U	360 U

FREQUENCY OF DETECTION SUMMARY
 OPERABLE UNIT No. 8
 SITE 16 - SUBSURFACE SOIL
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID:	16-MW03-02	16-MW04-03	16-MW05-08	16-MW06-06	16-SDA-SB01-02	16-SDA-SB02-02
Laboratory Sample ID:	AC4180	AC4104	AC4860	AC4864	AC4124	AC4134
Date Sampled:	10/18/94	10/19/94	10/21/94	10/21/94	10/18/94	10/18/94

	UNITS						
SEMIVOLATILES Cont.	16-MW03-02	16-MW04-03	16-MW05-08	16-MW06-06	16-SDA-SB01-02	16-SDA-SB02-02	
2,4-Dinitrophenol	UG/KG	810 U	880 U	940 U	910 UJ	900 U	880 U
4-Nitrophenol	UG/KG	810 U	880 U	940 U	910 U	900 U	880 U
Dibenzofuran	UG/KG	330 U	360 U	390 U	380 U	370 U	360 U
2,4-Dinitrotoluene	UG/KG	330 U	360 U	390 U	380 U	370 U	360 U
Diethylphthalate	UG/KG	330 U	360 U	390 U	380 U	370 U	360 U
4-Chlorophenyl phenyl ether	UG/KG	330 U	360 U	390 U	380 U	370 U	360 U
Fluorene	UG/KG	330 U	360 U	390 U	380 U	370 U	360 U
4-Nitroaniline	UG/KG	810 U	880 U	940 U	910 U	900 U	880 U
4,6-Dinitro-2-methylphenol	UG/KG	810 U	880 U	940 U	910 U	900 U	880 U
N-nitrosodiphenylamine	UG/KG	330 U	360 U	390 U	380 U	370 U	360 U
4-Bromophenyl-phenylether	UG/KG	330 U	360 U	390 U	380 U	370 U	360 U
Hexachlorobenzene	UG/KG	330 U	360 U	390 U	380 U	370 U	360 U
Pentachlorophenol	UG/KG	810 U	880 U	940 U	910 U	900 U	880 U
Phenanthrene	UG/KG	330 U	360 U	390 U	380 U	370 U	360 U
Anthracene	UG/KG	330 U	360 U	390 U	380 U	370 U	360 U
Carbazole	UG/KG	330 U	360 U	390 U	380 U	370 U	360 U
di-n-Butylphthalate	UG/KG	330 U	360 U	390 U	380 U	370 U	360 U
Fluoranthene	UG/KG	330 U	360 U	390 U	380 U	370 U	360 U
Pyrene	UG/KG	330 UJ	360 UJ	390 U	380 U	370 U	360 U
Butyl benzyl phthalate	UG/KG	330 U	360 U	390 U	380 U	370 U	360 U
3,3'-Dichlorobenzidine	UG/KG	330 U	360 U	390 U	380 U	370 U	360 U
Benzo[a]anthracene	UG/KG	330 U	360 U	390 U	380 U	370 U	360 U
Chrysene	UG/KG	330 U	360 U	390 U	380 U	370 U	360 U
bis(2-Ethylhexyl)phthalate	UG/KG	330 U	360 U	71 J	380 U	370 U	360 U
di-n-Octylphthalate	UG/KG	330 U	360 U	390 U	46 J	370 U	360 U
Benzo[b]fluoranthene	UG/KG	330 U	360 U	390 U	380 U	370 U	360 U
Benzo[k]fluoranthene	UG/KG	330 U	360 U	390 U	380 U	370 U	360 U
Benzo[a]pyrene	UG/KG	330 U	360 U	390 U	380 U	370 U	360 U
Indeno[1,2,3-cd]pyrene	UG/KG	330 U	360 U	390 U	380 U	370 U	360 U
Dibenz[a,h]anthracene	UG/KG	330 U	360 U	390 U	380 U	370 U	360 U
Benzo[g,h,i]perylene	UG/KG	330 U	360 U	390 U	380 U	370 U	360 U

FREQUENCY OF DETECTION SUMMARY
OPERABLE UNIT No. 8
SITE 16 - SUBSURFACE SOIL
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

Client Sample ID:	16-MW03-02	16-MW04-03	16-MW05-08	16-MW06-06	16-SDA-SB01-02	16-SDA-SB02-02
Laboratory Sample ID:	AC4180	AC4104	AC4860	AC4864	AC4124	AC4134
Date Sampled:	10/18/94	10/19/94	10/21/94	10/21/94	10/18/94	10/18/94

	UNITS						
PESTICIDES/PCBs							
alpha-BHC	UG/KG	1.7 U	1.8 U	2 U	2 UJ	1.9 U	1.8 U
beta-BHC	UG/KG	1.7 U	1.8 U	2 U	2 UJ	1.9 U	1.8 U
delta-BHC	UG/KG	1.7 U	1.8 U	2 U	2 UJ	1.9 U	1.8 U
Lindane (gamma-BHC)	UG/KG	1.7 U	1.8 U	2 U	2 UJ	1.9 U	1.8 U
Heptachlor	UG/KG	1.7 U	1.8 U	2 U	2 UJ	1.9 U	1.8 U
Aldrin	UG/KG	1.7 U	1.8 U	2 U	2 UJ	1.9 U	1.8 U
Heptachlor epoxide	UG/KG	1.7 U	1.8 U	2 U	2 UJ	1.9 U	1.8 U
Endosulfan I	UG/KG	1.7 U	1.8 U	2 U	2 UJ	1.9 U	1.8 U
Dieldrin	UG/KG	3.3 U	3.6 U	3.9 U	3.8 UJ	3.7 U	3.6 U
4,4'-DDE	UG/KG	3.3 U	3.6 U	3.9 U	3.8 UJ	3.7 U	3.6 U
Endrin	UG/KG	3.3 U	3.6 U	3.9 U	3.8 UJ	3.7 U	3.6 U
Endosulfan II	UG/KG	3.3 U	3.6 U	3.9 U	3.8 UJ	3.7 U	3.6 U
4,4'-DDD	UG/KG	3.3 U	3.6 U	3.9 U	3.8 UJ	3.7 U	3.6 U
Endosulfan sulfate	UG/KG	3.3 U	3.6 U	3.9 U	3.8 UJ	3.7 U	3.6 U
4,4'-DDT	UG/KG	3.3 U	3.6 U	3.9 U	3.8 UJ	3.7 U	3.6 U
Methoxychlor	UG/KG	17 U	18 U	20 U	20 UJ	19 U	18 U
Endrin ketone	UG/KG	3.3 U	3.6 U	3.9 U	3.8 UJ	3.7 U	3.6 U
Endrin aldehyde	UG/KG	3.3 U	3.6 U	3.9 U	3.8 UJ	3.7 U	3.6 U
alpha-Chlordane	UG/KG	1.7 U	1.8 U	2 U	2 UJ	1.9 U	1.8 U
gamma-Chlordane	UG/KG	1.7 U	1.8 U	2 U	2 UJ	1.9 U	1.8 U
Toxaphene	UG/KG	170 U	180 U	200 U	200 UJ	190 U	180 U
Aroclor 1016	UG/KG	33 U	36 U	39 U	38 UJ	37 U	36 U
Aroclor 1221	UG/KG	68 U	72 U	79 U	77 UJ	75 U	72 U
Aroclor 1232	UG/KG	33 U	36 U	39 U	38 UJ	37 U	36 U
Aroclor 1242	UG/KG	33 U	36 U	39 U	38 UJ	37 U	36 U
Aroclor 1248	UG/KG	33 U	36 U	39 U	38 UJ	37 U	36 U
Aroclor 1254	UG/KG	33 U	36 U	39 U	38 UJ	40	36 U
Aroclor 1260	UG/KG	33 U	36 U	39 U	38 UJ	37 U	36 U

FREQUENCY OF DETECTION SUMMARY
 OPERABLE UNIT No. 8
 SITE 16 - SUBSURFACE SOIL
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID:	16-SDA-SB03-02	16-SDA-SB04-02
Laboratory Sample ID:	AC4160	AC4168
Date Sampled:	10/18/94	10/18/94

	<u>UNITS</u>		
<u>VOLATILES</u>			
Chloromethane	UG/KG	11 U	10 U
Bromomethane	UG/KG	11 U	10 U
Vinyl chloride	UG/KG	11 U	10 U
Chloroethane	UG/KG	11 U	10 U
Methylene chloride	UG/KG	11 U	10 U
Acetone	UG/KG	11 U	10 U
Carbon Disulfide	UG/KG	11 U	10 U
1,1-Dichloroethene	UG/KG	11 U	10 U
1,1-Dichloroethane	UG/KG	11 U	10 U
1,2-Dichloroethene(total)	UG/KG	11 U	10 U
Chloroform	UG/KG	11 U	10 U
1,2-Dichloroethane	UG/KG	11 U	10 U
2-Butanone	UG/KG	11 U	10 U
1,1,1-Trichloroethane	UG/KG	11 U	10 U
Carbon tetrachloride	UG/KG	11 U	10 U
Bromodichloromethane	UG/KG	11 U	10 U
1,2-Dichloropropane	UG/KG	11 U	10 U
cis-1,3-Dichloropropene	UG/KG	11 U	10 U
Trichloroethene	UG/KG	11 U	10 U
Dibromochloromethane	UG/KG	11 U	10 U
1,1,2-Trichloroethane	UG/KG	11 U	10 U
Benzene	UG/KG	11 U	10 U
trans-1,3-Dichloropropene	UG/KG	11 U	10 U
Bromoform	UG/KG	11 U	10 U
4-Methyl-2-pentanone	UG/KG	11 U	10 U
2-Hexanone	UG/KG	11 U	10 U
Tetrachloroethene	UG/KG	11 U	10 U
1,1,2,2-Tetrachloroethane	UG/KG	11 U	10 U
Toluene	UG/KG	11 U	10 U
Chlorobenzene	UG/KG	11 U	10 U
Ethylbenzene	UG/KG	11 U	10 U
Styrene	UG/KG	11 U	10 U
Xylenes (total)	UG/KG	11 U	10 U

FREQUENCY OF DETECTION SUMMARY
OPERABLE UNIT No. 8
SITE 16 - SUBSURFACE SOIL
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

Client Sample ID:	16-SDA-SB03-02	16-SDA-SB04-02
Laboratory Sample ID:	AC4160	AC4168
Date Sampled:	10/18/94	10/18/94

	<u>UNITS</u>		
SEMIVOLATILES			
Phenol	UG/KG	360 U	340 U
bis(2-Chloroethyl) ether	UG/KG	360 U	340 U
2-Chlorophenol	UG/KG	360 U	340 U
1,3-Dichlorobenzene	UG/KG	360 U	340 U
1,4-Dichlorobenzene	UG/KG	360 UJ	340 UJ
1,2-Dichlorobenzene	UG/KG	360 U	340 U
2-Methylphenol	UG/KG	360 U	340 U
2,2-oxybis-(1-chloropropane)	UG/KG	360 U	340 U
4-Methylphenol	UG/KG	360 U	340 U
N-Nitroso-di-n-propylamine	UG/KG	360 U	340 U
Hexachloroethane	UG/KG	360 U	340 U
Nitrobenzene	UG/KG	360 U	340 U
Isophorone	UG/KG	360 U	340 U
2-Nitrophenol	UG/KG	360 U	340 U
2,4-Dimethylphenol	UG/KG	360 U	340 U
bis(2-Chloroethoxy) methane	UG/KG	360 U	340 U
2,4-Dichlorophenol	UG/KG	360 U	340 U
1,2,4-Trichlorobenzene	UG/KG	360 UJ	340 UJ
Naphthalene	UG/KG	360 U	340 U
4-Chloroaniline	UG/KG	360 U	340 U
Hexachlorobutadiene	UG/KG	360 U	340 U
4-Chloro-3-methylphenol	UG/KG	360 U	340 U
2-Methylnaphthalene	UG/KG	360 U	340 U
Hexachlorocyclopentadiene	UG/KG	360 U	340 U
2,4,6-Trichlorophenol	UG/KG	360 U	340 U
2,4,5-Trichlorophenol	UG/KG	880 U	820 U
2-Chloronaphthalene	UG/KG	360 U	340 U
2-Nitroaniline	UG/KG	880 U	820 U
Dimethyl phthalate	UG/KG	360 U	340 U
Acenaphthylene	UG/KG	360 U	340 U
2,6-Dinitrotoluene	UG/KG	360 U	340 U
3-Nitroaniline	UG/KG	880 U	820 U
Acenaphthene	UG/KG	360 UJ	340 UJ

FREQUENCY OF DETECTION SUMMARY
 OPERABLE UNIT No. 8
 SITE 16 - SUBSURFACE SOIL
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID:	16-SDA-SB03-02	16-SDA-SB04-02
Laboratory Sample ID:	AC4160	AC4168
Date Sampled:	10/18/94	10/18/94

UNITS

SEMIVOLATILES Cont.

2,4-Dinitrophenol	UG/KG	880 U	820 U
4-Nitrophenol	UG/KG	880 U	820 U
Dibenzofuran	UG/KG	360 U	340 U
2,4-Dinitrotoluene	UG/KG	360 U	340 U
Diethylphthalate	UG/KG	360 U	340 U
4-Chlorophenyl phenyl ether	UG/KG	360 U	340 U
Fluorene	UG/KG	360 U	340 U
4-Nitroaniline	UG/KG	880 U	820 U
4,6-Dinitro-2-methylphenol	UG/KG	880 U	820 U
N-nitrosodiphenylamine	UG/KG	360 U	340 U
4-Bromophenyl-phenylether	UG/KG	360 U	340 U
Hexachlorobenzene	UG/KG	360 U	340 U
Pentachlorophenol	UG/KG	880 U	820 U
Phenanthrene	UG/KG	360 U	340 U
Anthracene	UG/KG	360 U	340 U
Carbazole	UG/KG	360 U	340 U
di-n-Butylphthalate	UG/KG	360 U	340 U
Fluoranthene	UG/KG	360 U	340 U
Pyrene	UG/KG	360 UJ	340 UJ
Butyl benzyl phthalate	UG/KG	360 U	340 U
3,3'-Dichlorobenzidine	UG/KG	360 U	340 U
Benzo[a]anthracene	UG/KG	360 U	340 U
Chrysene	UG/KG	360 U	340 U
bis(2-Ethylhexyl)phthalate	UG/KG	360 U	340 U
di-n-Octylphthalate	UG/KG	360 U	340 U
Benzo[b]fluoranthene	UG/KG	360 U	340 U
Benzo[k]fluoranthene	UG/KG	360 U	340 U
Benzo[a]pyrene	UG/KG	360 U	340 U
Indeno[1,2,3-cd]pyrene	UG/KG	360 U	340 U
Dibenz[a,h]anthracene	UG/KG	360 U	340 U
Benzo[g,h,i]perylene	UG/KG	360 U	340 U

FREQUENCY OF DETECTION SUMMARY
OPERABLE UNIT No. 8
SITE 16 - SUBSURFACE SOIL
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

Client Sample ID:	16-SDA-SB03-02	16-SDA-SB04-02
Laboratory Sample ID:	AC4160	AC4168
Date Sampled:	10/18/94	10/18/94

	<u>UNITS</u>		
PESTICIDES/PCBs			
alpha-BHC	UG/KG	1.8 U	1.7 U
beta-BHC	UG/KG	1.8 U	1.7 U
delta-BHC	UG/KG	1.8 U	1.7 U
Lindane (gamma-BHC)	UG/KG	1.8 U	1.7 U
Heptachlor	UG/KG	1.8 U	1.7 U
Aldrin	UG/KG	1.8 U	1.7 U
Heptachlor epoxide	UG/KG	1.8 U	1.7 U
Endosulfan I	UG/KG	1.8 U	1.7 U
Dieldrin	UG/KG	3.6 U	3.3 U
4,4'-DDE	UG/KG	10	3.3 U
Endrin	UG/KG	3.6 U	3.3 U
Endosulfan II	UG/KG	7.1 J	3.3 U
4,4'-DDD	UG/KG	3.6 U	3.4 U
Endosulfan sulfate	UG/KG	3.6 U	3.3 U
4,4'-DDT	UG/KG	37 J	3.3 U
Methoxychlor	UG/KG	18 U	17 U
Endrin ketone	UG/KG	3.6 U	3.3 U
Endrin aldehyde	UG/KG	3.6 U	3.3 U
alpha-Chlordane	UG/KG	1.8 U	1.7 U
gamma-Chlordane	UG/KG	1.8 U	1.7 U
Toxaphene	UG/KG	180 U	170 U
Aroclor 1016	UG/KG	36 U	33 U
Aroclor 1221	UG/KG	73 U	68 U
Aroclor 1232	UG/KG	36 U	33 U
Aroclor 1242	UG/KG	36 U	33 U
Aroclor 1248	UG/KG	36 U	33 U
Aroclor 1254	UG/KG	36 U	33 U
Aroclor 1260	UG/KG	36 U	33 U

FREQUENCY OF DETECTION SUMMARY
OPERABLE UNIT No. 8
SITE 16 - SUBSURFACE SOIL
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

Client Sample ID: Laboratory Sample ID: Date Sampled:	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
	UNITS					
	VOLATILES					
Chloromethane	UG/KG	10 U	52 U	ND	ND	0/32
Bromomethane	UG/KG	10 U	52 U	1 J	1 J	16-BD-SB06-07 1/32
Vinyl chloride	UG/KG	10 U	52 U	ND	ND	0/32
Chloroethane	UG/KG	10 U	52 U	ND	ND	0/32
Methylene chloride	UG/KG	10 U	52 U	ND	ND	0/32
Acetone	UG/KG	10 U	130 U	42 J	900 J	16-BD-SB14-05 12/32
Carbon Disulfide	UG/KG	10 UJ	52 U	ND	ND	0/32
1,1-Dichloroethene	UG/KG	10 UJ	52 UJ	ND	ND	0/32
1,1-Dichloroethane	UG/KG	10 UJ	52 U	ND	ND	0/32
1,2-Dichloroethene(total)	UG/KG	10 U	52 U	ND	ND	0/32
Chloroform	UG/KG	10 U	52 U	ND	ND	0/32
1,2-Dichloroethane	UG/KG	10 U	52 U	ND	ND	0/32
2-Butanone	UG/KG	10 U	52 U	ND	ND	0/32
1,1,1-Trichloroethane	UG/KG	10 U	52 U	ND	ND	0/32
Carbon tetrachloride	UG/KG	10 U	52 U	ND	ND	0/32
Bromodichloromethane	UG/KG	10 U	52 U	ND	ND	0/32
1,2-Dichloropropane	UG/KG	10 U	52 U	ND	ND	0/32
cis-1,3-Dichloropropene	UG/KG	10 U	52 U	ND	ND	0/32
Trichloroethene	UG/KG	10 U	52 U	ND	ND	0/32
Dibromochloromethane	UG/KG	10 U	52 U	ND	ND	0/32
1,1,2-Trichloroethane	UG/KG	10 U	52 U	ND	ND	0/32
Benzene	UG/KG	10 U	52 U	ND	ND	0/32
trans-1,3-Dichloropropene	UG/KG	10 U	52 U	ND	ND	0/32
Bromoform	UG/KG	10 U	52 U	ND	ND	0/32
4-Methyl-2-pentanone	UG/KG	10 U	52 U	ND	ND	0/32
2-Hexanone	UG/KG	10 U	52 U	ND	ND	0/32
Tetrachloroethene	UG/KG	10 U	52 U	ND	ND	0/32
1,1,2,2-Tetrachloroethane	UG/KG	10 U	52 U	ND	ND	0/32
Toluene	UG/KG	10 U	52 U	ND	ND	0/32
Chlorobenzene	UG/KG	10 U	52 U	ND	ND	0/32
Ethylbenzene	UG/KG	10 U	52 U	ND	ND	0/32
Styrene	UG/KG	10 U	52 U	ND	ND	0/32
Xylenes (total)	UG/KG	10 U	52 U	ND	ND	0/32

FREQUENCY OF DETECTION SUMMARY
 OPERABLE UNIT No. 8
 SITE 16 - SUBSURFACE SOIL
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID: Laboratory Sample ID: Date Sampled:	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
SEMIVOLATILES						
	UNITS					
Phenol	UG/KG	330 U	390 U	ND	ND	0/32
bis(2-Chloroethyl) ether	UG/KG	330 U	390 U	ND	ND	0/32
2-Chlorophenol	UG/KG	330 U	390 U	ND	ND	0/32
1,3-Dichlorobenzene	UG/KG	330 U	390 U	ND	ND	0/32
1,4-Dichlorobenzene	UG/KG	50 UJ	390 U	50 J	67 J	16-BD-SB12-02 2/32
1,2-Dichlorobenzene	UG/KG	330 U	390 U	ND	ND	0/32
2-Methylphenol	UG/KG	330 U	390 U	ND	ND	0/32
2,2'-oxybis-(1-chloropropane)	UG/KG	330 U	390 U	ND	ND	0/32
4-Methylphenol	UG/KG	330 U	390 U	ND	ND	0/32
N-Nitroso-di-n-propylamine	UG/KG	330 U	390 U	ND	ND	0/32
Hexachloroethane	UG/KG	330 U	390 U	ND	ND	0/32
Nitrobenzene	UG/KG	330 U	390 U	ND	ND	0/32
Isophorone	UG/KG	330 U	390 U	ND	ND	0/32
2-Nitrophenol	UG/KG	330 U	390 U	ND	ND	0/32
2,4-Dimethylphenol	UG/KG	330 U	390 U	ND	ND	0/32
bis(2-Chloroethoxy) methane	UG/KG	330 U	390 U	ND	ND	0/32
2,4-Dichlorophenol	UG/KG	330 U	390 U	ND	ND	0/32
1,2,4-Trichlorobenzene	UG/KG	45 UJ	390 U	45 J	66 J	16-BD-SB12-02 2/32
Naphthalene	UG/KG	330 U	390 U	88 J	88 J	16-BD-SB10-03 1/32
4-Chloroaniline	UG/KG	330 U	390 U	ND	ND	0/32
Hexachlorobutadiene	UG/KG	330 U	390 U	ND	ND	0/32
4-Chloro-3-methylphenol	UG/KG	330 U	390 U	ND	ND	0/32
2-Methylnaphthalene	UG/KG	330 U	390 U	77 J	77 J	16-BD-SB10-03 1/32
Hexachlorocyclopentadiene	UG/KG	330 U	390 U	ND	ND	0/32
2,4,6-Trichlorophenol	UG/KG	330 U	390 U	ND	ND	0/32
2,4,5-Trichlorophenol	UG/KG	800 U	940 U	ND	ND	0/32
2-Chloronaphthalene	UG/KG	330 U	390 U	ND	ND	0/32
2-Nitroaniline	UG/KG	800 U	940 U	ND	ND	0/32
Dimethyl phthalate	UG/KG	330 U	390 U	ND	ND	0/32
Acenaphthylene	UG/KG	330 U	390 U	ND	ND	0/32
2,6-Dinitrotoluene	UG/KG	330 U	390 U	ND	ND	0/32
3-Nitroaniline	UG/KG	800 U	940 U	ND	ND	0/32
Acenaphthene	UG/KG	76 UJ	390 U	51 J	290 J	16-BD-SB10-03 3/32

FREQUENCY OF DETECTION SUMMARY
 OPERABLE UNIT No. 8
 SITE 16 - SUBSURFACE SOIL
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID: Laboratory Sample ID: Date Sampled:	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
	<u>UNITS</u>					
	<u>SEMIVOLATILES Cont.</u>					
2,4-Dinitrophenol	UG/KG	340 U	940 U	ND	ND	0/32
4-Nitrophenol	UG/KG	800 U	940 U	ND	ND	0/32
Dibenzofuran	UG/KG	330 U	390 U	310 J	310 J	16-BD-SB10-03 1/32
2,4-Dinitrotoluene	UG/KG	330 U	390 U	ND	ND	0/32
Diethylphthalate	UG/KG	330 U	390 U	ND	ND	0/32
4-Chlorophenyl phenyl ether	UG/KG	330 U	390 U	ND	ND	0/32
Fluorene	UG/KG	330 U	390 U	680	680	16-BD-SB10-03 1/32
4-Nitroaniline	UG/KG	800 U	940 U	ND	ND	0/32
4,6-Dinitro-2-methylphenol	UG/KG	800 U	940 U	ND	ND	0/32
N-nitrosodiphenylamine	UG/KG	330 U	390 U	ND	ND	0/32
4-Bromophenyl-phenylether	UG/KG	330 U	390 U	ND	ND	0/32
Hexachlorobenzene	UG/KG	330 U	390 U	ND	ND	0/32
Pentachlorophenol	UG/KG	800 U	940 U	38 NJ	94 J	16-BD-SB02-07 3/32
Phenanthrene	UG/KG	330 U	390 U	2200	2200	16-BD-SB10-03 1/32
Anthracene	UG/KG	330 U	390 U	380	380	16-BD-SB10-03 1/32
Carbazole	UG/KG	330 U	390 U	180 J	180 J	16-BD-SB10-03 1/32
di-n-Butylphthalate	UG/KG	320 UJ	390 U	270 J	270 J	16-BD-SB10-03 1/32
Fluoranthene	UG/KG	330 U	390 U	1200	1200	16-BD-SB10-03 1/32
Pyrene	UG/KG	330 U	390 U	670 J	670 J	16-BD-SB10-03 1/32
Butyl benzyl phthalate	UG/KG	330 U	390 U	ND	ND	0/32
3,3'-Dichlorobenzidine	UG/KG	330 U	390 U	ND	ND	0/32
Benzo[a]anthracene	UG/KG	330 U	390 U	160 J	160 J	16-BD-SB10-03 1/32
Chrysene	UG/KG	330 U	390 U	160 J	160 J	16-BD-SB10-03 1/32
bis(2-Ethylhexyl)phthalate	UG/KG	330 U	390 U	58 J	71 J	16-MW05-08 2/32
di-n-Octylphthalate	UG/KG	330 U	390 U	46 J	46 J	16-MW06-06 1/32
Benzo[b]fluoranthene	UG/KG	330 U	390 U	57 J	57 J	16-BD-SB10-03 1/32
Benzo[k]fluoranthene	UG/KG	330 U	390 U	58 J	58 J	16-BD-SB10-03 1/32
Benzo[a]pyrene	UG/KG	330 U	390 U	38 J	38 J	16-BD-SB10-03 1/32
Indeno[1,2,3-cd]pyrene	UG/KG	330 U	390 U	ND	ND	0/32
Dibenz[a,h]anthracene	UG/KG	330 U	390 U	ND	ND	0/32
Benzo[g,h,i]perylene	UG/KG	330 U	390 U	ND	ND	0/32

FREQUENCY OF DETECTION SUMMARY
OPERABLE UNIT No. 8
SITE 16 - SUBSURFACE SOIL
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

Client Sample ID: Laboratory Sample ID: Date Sampled:	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
	UNITS					
	PESTICIDES/PCBs					
alpha-BHC	UG/KG	1.7 U	3.6 U	ND	ND	0/32
beta-BHC	UG/KG	1.7 U	3.6 U	ND	ND	0/32
delta-BHC	UG/KG	1.7 U	3.6 U	ND	ND	0/32
Lindane (gamma-BHC)	UG/KG	1.7 U	3.6 U	ND	ND	0/32
Heptachlor	UG/KG	1.7 U	3.6 U	ND	ND	0/32
Aldrin	UG/KG	1.7 U	3.6 U	ND	ND	0/32
Heptachlor epoxide	UG/KG	1.7 U	3.6 U	ND	ND	0/32
Endosulfan I	UG/KG	1.7 U	3.6 U	ND	ND	0/32
Dieldrin	UG/KG	3.3 U	6.9 U	ND	ND	0/32
4,4'-DDE	UG/KG	3.3 U	3.9 U	7.6	36	16-BD-SB05-07 3/32
Endrin	UG/KG	3.3 U	6.9 U	ND	ND	0/32
Endosulfan II	UG/KG	3.3 U	6.9 U	7.1 J	7.1 J	16-SDA-SB03-02 1/32
4,4'-DDD	UG/KG	3.3 U	3.9 U	52 J	52 J	16-BD-SB05-07 1/32
Endosulfan sulfate	UG/KG	3.3 U	6.9 U	ND	ND	0/32
4,4'-DDT	UG/KG	3.3 U	3.9 U	37 J	630	16-BD-SB05-07 2/32
Methoxychlor	UG/KG	17 U	36 U	ND	ND	0/32
Endrin ketone	UG/KG	3.3 U	6.9 U	ND	ND	0/32
Endrin aldehyde	UG/KG	3.3 U	6.9 U	ND	ND	0/32
alpha-Chlordane	UG/KG	1.7 U	3.6 U	3.8	3.8	16-BD-SB13-02 1/32
gamma-Chlordane	UG/KG	1.7 U	2 U	2.4 J	2.5 J	16-BD-SB13-02 2/32
Toxaphene	UG/KG	170 U	360 U	ND	ND	0/32
Aroclor 1016	UG/KG	33 U	69 U	ND	ND	0/32
Aroclor 1221	UG/KG	67 U	140 U	ND	ND	0/32
Aroclor 1232	UG/KG	33 U	69 U	ND	ND	0/32
Aroclor 1242	UG/KG	33 U	69 U	ND	ND	0/32
Aroclor 1248	UG/KG	33 U	69 U	ND	ND	0/32
Aroclor 1254	UG/KG	33 U	69 U	40	45	16-BD-SB13-02 2/32
Aroclor 1260	UG/KG	33 U	69 U	ND	ND	0/32

APPENDIX I.4
SUBSURFACE SOIL METALS

FREQUENCY OF DETECTION SUMMARY
OPERABLE UNIT No. 8
SITE 16 - SUBSURFACE SOIL
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TAL INORGANICS

Client Sample ID:	16-BD-SB01-06	16-BD-SB02-07	16-BD-SB03-07	16-BD-SB04-06	16-BD-SB05-07	16-BD-SB06-07
Laboratory Sample ID:	AC4119	AC4113	AC4574	AC4100	AC4188	AC4184
Date Sampled:	10/19/94	10/19/94	10/20/94	10/19/94	10/18/94	10/18/94

	UNITS						
Aluminum	MG/KG	355 J	2180 J	463 U	445 J	731 J	655 J
Antimony	MG/KG	10.4 UJ	10.8 UJ	10 U	9.7 UJ	10 UJ	9.5 UJ
Arsenic	MG/KG	2.1 UJ	2.2 UJ	2 U	1.9 UJ	2 UJ	1.9 UJ
Barium	MG/KG	1.2	3.7	1.5 U	1.6	2.8	2.1
Beryllium	MG/KG	0.21 U	0.22 U	0.2 U	0.19 U	0.2 U	0.19 U
Cadmium	MG/KG	1 U	1.1 U	1 U	0.97 U	1 U	0.95 U
Calcium	MG/KG	40.1 J	57.2 J	31.7	17.7 UJ	273 J	103 J
Chromium	MG/KG	2.1 UJ	3.8 J	2 U	1.9 UJ	2.6 J	1.9 UJ
Cobalt	MG/KG	2.1 U	2.2 U	2 U	1.9 U	2 U	1.9 U
Copper	MG/KG	2.1 UJ	2.2 UJ	2 U	1.9 UJ	2.3 J	1.9 UJ
Iron	MG/KG	587	595	612	354	1060	508
Lead	MG/KG	1.1 J	3.4 J	5.4	1.4 UJ	7.2 J	1.3 UJ
Magnesium	MG/KG	13.7	90.3	33.4	14.8	59.4	26
Manganese	MG/KG	0.63 J	3.3 J	1.6	0.87 J	9.8 J	1.7 J
Mercury	MG/KG	0.11 UJ	0.12 UJ	0.1 U	0.1 J	0.11 UJ	0.1 UJ
Nickel	MG/KG	4.2 U	4.3 U	4 U	3.9 U	4 U	3.8 U
Potassium	MG/KG	208 U	221	201 U	194 U	201 U	189 U
Selenium	MG/KG	1 U	1.1 U	1 U	0.97 U	1 U	0.95 U
Silver	MG/KG	1 U	1.1 U	1 U	0.97 U	1 U	0.95 U
Sodium	MG/KG	22.4 U	30.2 U	20.1 U	19.8 U	27.5 U	24.7 U
Thallium	MG/KG	2.1 U	2.2 U	2 U	1.9 U	2 U	1.9 U
Vanadium	MG/KG	2.1 U	2.2 U	2 U	1.9 U	2.5	1.9 U
Zinc	MG/KG	3.1 UJ	6.1 UJ	2.5 U	3.6 UJ	43.6 J	13.5 J
Moisture	%	6.72	14.68	3.22	3.71	5.2	3.83

FREQUENCY OF DETECTION SUMMARY
OPERABLE UNIT No. 8
SITE 16 - SUBSURFACE SOIL
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TAL INORGANICS

Client Sample ID:	16-BD-SB07-04	16-BD-SB08-06	16-BD-SB09-05	16-BD-SB10-03	16-BD-SB10-07	16-BD-SB11-06	
Laboratory Sample ID:	AC4578	AC4583	AC4146	AC4174	AC4176	AC4138	
Date Sampled:	10/20/94	10/20/94	10/18/94	10/18/94	10/18/94	10/18/94	
	UNITS						
Aluminum	MG/KG	814	561	690	2910 J	315 J	659
Antimony	MG/KG	10 U	10 U	10.5 UJ	10.9 UJ	10.4 UJ	10.4 UJ
Arsenic	MG/KG	2 U	2 U	2.1 U	2.5 J	2.1 UJ	2.1 U
Barium	MG/KG	1.6 U	4.3	1.5 U	5.8	1.5	3.3 U
Beryllium	MG/KG	0.2 U	0.2 U	0.21 U	0.22 U	0.21 U	0.21 U
Cadmium	MG/KG	1 U	1 U	1 U	1.1 U	1 U	1 U
Calcium	MG/KG	149	113	26.5 UJ	500 J	57.6 J	99.7 UJ
Chromium	MG/KG	2.4	2.7	2.1 U	3.8 J	2.6 J	2.4
Cobalt	MG/KG	2 U	2 U	2.1 U	2.2 U	2.1 U	2.1 U
Copper	MG/KG	2 U	2 U	2.1 U	2.3 J	2.1 UJ	2.1 U
Iron	MG/KG	430	558	292 U	2370	756	337 U
Lead	MG/KG	2.1	2.4	1.7	4.1 J	1.9 UJ	1.4
Magnesium	MG/KG	43.7	37.1	26.4 U	59.7	19.9	49.9 U
Manganese	MG/KG	2.7	1.5	1.5 U	2.3 J	1.5 J	1.9 U
Mercury	MG/KG	0.1 U	0.1 U	0.1 U	0.11 UJ	0.1 UJ	0.1 U
Nickel	MG/KG	4 U	4 U	4.2 U	4.4 U	4.2 U	4.2 U
Potassium	MG/KG	209	291	210 U	218 U	208 U	209 U
Selenium	MG/KG	1 U	1 U	1 U	1.1 U	1 U	1 U
Silver	MG/KG	1 U	1 U	1 UJ	1.1 U	1 U	1 UJ
Sodium	MG/KG	27.8 U	30.6	21.3 U	39.6 U	20.8 U	20.9 U
Thallium	MG/KG	2 U	2 U	2.1 U	2.2 U	2.1 U	2.1 U
Vanadium	MG/KG	2 U	2 U	2.1 U	5.6	2.1 U	2.1 U
Zinc	MG/KG	3.7 U	4.7 U	2.9 UJ	10.2 UJ	8.1 UJ	4.6 UJ
Moisture	%	4.62	4.06	4.64	8.42	3.86	4.21

FREQUENCY OF DETECTION SUMMARY
OPERABLE UNIT No. 8
SITE 16 - SUBSURFACE SOIL
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TAL INORGANICS

Client Sample ID:	16-BD-SB12-02	16-BD-SB13-02	16-BD-SB14-05	16-BD-SB15-06	16-BD-SB16-05	16-BD-SB17-05
Laboratory Sample ID:	AC4589	AC4594	AC4596	AC4196	AC4128	AC4192
Date Sampled:	10/20/94	10/20/94	10/19/94	10/19/94	10/18/94	10/19/94

	UNITS	1110	2050	692	1730 J	1130	1680 J
Aluminum	MG/KG	9.8 U	10.7 U	10 U	10.4 UJ	10.5 UJ	9.7 UJ
Antimony	MG/KG	2 U	2.1 U	2 U	2.1 UJ	2.1 U	1.9 UJ
Arsenic	MG/KG	3.4	9.2	1.8 U	5.4	2.2 U	4.1
Barium	MG/KG	0.2 U	0.21 U	0.2 U	0.21 U	0.21 U	0.19 U
Beryllium	MG/KG	0.98 U	1.1 U	1 U	1 U	1.1 U	0.97 U
Cadmium	MG/KG	751	1400	114	66.6 J	334 UJ	261 J
Calcium	MG/KG	2 U	2.1 U	2 U	3.4 J	2.5	4.9 J
Chromium	MG/KG	2 U	2.1 U	2 U	2.1 U	2.1 U	1.9 U
Cobalt	MG/KG	2 U	2.7	2 U	2.1 UJ	2.1 U	2.9 J
Copper	MG/KG	787	1280	268	823	1880 U	971
Iron	MG/KG	2.3	3.1	2.1	2.7 UJ	1.8	2.1 UJ
Lead	MG/KG	52	46.2	23.6	113	33 UJ	112
Magnesium	MG/KG	5.7	2.7	5.4	2.7 J	1.6 U	3.7 J
Manganese	MG/KG	0.1 U	0.13	0.1 U	0.11 UJ	0.11 U	0.1 UJ
Mercury	MG/KG	3.9 U	4.3 U	4 U	4.2 U	4.2 U	3.9 U
Nickel	MG/KG	197 U	214 U	201 U	208 U	210 U	194
Potassium	MG/KG	0.98 U	1.1 U	1 U	1 U	1.1 U	0.97 U
Selenium	MG/KG	0.98 U	1.1 U	1 U	1 U	1.1 UJ	0.97 U
Silver	MG/KG	19.7 U	33.8	22.7	31.6 U	25 U	24.9 U
Sodium	MG/KG	2 U	2.1 U	2 U	2.1 U	2.1 U	1.9 U
Thallium	MG/KG	2 U	2.4	2 U	2.1 U	3.1	3.2
Vanadium	MG/KG	2.8 U	21.8	4.9 U	14.3 J	4.8 UJ	6.3 UJ
Zinc	MG/KG						
Moisture	%	4.16	8.37	4.14	5.7	4.9	3.69

FREQUENCY OF DETECTION SUMMARY
 OPERABLE UNIT No. 8
 SITE 16 - SUBSURFACE SOIL
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TAL INORGANICS

Client Sample ID:	16-BD-SB18-06	16-BD-SB19-03	16-BD-SB20-06	16-MW01-01	16-MW01-04	16-MW02-03
Laboratory Sample ID:	AC4610	AC4606	AC4850	AC4140	AC4142	AC4569
Date Sampled:	10/20/94	10/20/94	10/20/94	10/18/94	10/18/94	10/19/94

	UNITS	16-BD-SB18-06	16-BD-SB19-03	16-BD-SB20-06	16-MW01-01	16-MW01-04	16-MW02-03
Aluminum	MG/KG	1810	4840	3420 J	2720	1220	2350
Antimony	MG/KG	9.8 U	11 U	10.3 UJ	11.2 UJ	11.2 UJ	11.1 U
Arsenic	MG/KG	2 U	2.2 U	2.1 U	2.2 U	2.2 U	2.2 U
Barium	MG/KG	5	8.7	6.8	6.1	2.1 U	4.6
Beryllium	MG/KG	0.2 U	0.22 U	0.21	0.22 U	0.22 U	0.22 U
Cadmium	MG/KG	0.98 U	1.1 U	1 U	1.1 U	1.1 U	1.1 U
Calcium	MG/KG	53.2	205	175 J	62.5 UJ	15.8 UJ	88.9
Chromium	MG/KG	3.5	7.9	6.9 J	3	4.3	4.1
Cobalt	MG/KG	2 U	2.2 U	2.1 U	2.2 U	2.2 U	2.2 U
Copper	MG/KG	2 U	2.2 U	2.1 U	2.2 U	2.2 U	2.2 U
Iron	MG/KG	1610	6760	3280 J	1550 U	1770 U	319
Lead	MG/KG	3.5	4.5	4.7 J	4.5	3.1	4.5
Magnesium	MG/KG	130	193	211	84 U	48.1 U	83.7
Manganese	MG/KG	2.3	3.7	4.6 J	6.8 U	5.6 U	3.2
Mercury	MG/KG	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.12 U
Nickel	MG/KG	3.9 U	4.4 U	4.1 U	4.5 U	4.5 U	4.4 U
Potassium	MG/KG	260	370	308 J	225 U	225 U	222 U
Selenium	MG/KG	0.98 U	1.1 U	1 U	1.2	1.1 U	1.1 U
Silver	MG/KG	0.98 U	1.1 U	1 U	1.1 UJ	1.1 UJ	1.1 U
Sodium	MG/KG	27.6	34.1	34.7	22.5 U	24.3 U	25.4
Thallium	MG/KG	2 U	2.2 U	2.1 U	2.2 U	2.2 U	2.2 U
Vanadium	MG/KG	4.8	14.1	8.1	3.8	5.6	2.2 U
Zinc	MG/KG	7.2 U	9.7 U	8.9 J	4.7 UJ	2.6 UJ	6.3 U
Moisture	%	5.06	10.69	11.11	11.06	10.96	15.14

FREQUENCY OF DETECTION SUMMARY
OPERABLE UNIT No. 8
SITE 16 - SUBSURFACE SOIL
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TAL INORGANICS

Client Sample ID:	16-MW03-02	16-MW04-03	16-MW05-08	16-MW06-06	16-SDA-SB01-02	16-SDA-SB02-02
Laboratory Sample ID:	AC4180	AC4104	AC4860	AC4864	AC4124	AC4134
Date Sampled:	10/18/94	10/19/94	10/21/94	10/21/94	10/18/94	10/18/94

	UNITS	16-MW03-02	16-MW04-03	16-MW05-08	16-MW06-06	16-SDA-SB01-02	16-SDA-SB02-02
Aluminum	MG/KG	1000 J	3350 J	699 J	2930 J	4140	1900
Antimony	MG/KG	9.5 UJ	10.9 UJ	11.2 UJ	10.3 UJ	11.4 UJ	11.1 UJ
Arsenic	MG/KG	1.9 UJ	2.2 UJ	2.2 U	2.1 U	2.3 U	2.2 U
Barium	MG/KG	2.4	5.4	3.1	6.6	6.9	7.1
Beryllium	MG/KG	0.19 U	0.22 U	0.22 U	0.21 U	0.23 U	0.22 U
Cadmium	MG/KG	0.95 U	1.1 U	1.1 U	1 U	1.1 U	1.1 U
Calcium	MG/KG	51.4 J	36.6 J	82.9 J	362 J	1630 UJ	1090 UJ
Chromium	MG/KG	3 J	7 J	2.4 J	6.5 J	5.5	2.6
Cobalt	MG/KG	1.9 U	2.2 U	2.2 U	2.1 U	2.3 U	2.2 U
Copper	MG/KG	1.9 UJ	2.2 UJ	2.2 U	2.1 U	2.3 U	2.2 U
Iron	MG/KG	1720	5710	816 J	1380 J	4070 U	1410 U
Lead	MG/KG	1.5 UJ	5.4 J	3.2 J	3.7 J	4.7	2.5
Magnesium	MG/KG	69.6	236	43.4	237	141 U	69 U
Manganese	MG/KG	1.5 J	3.9 J	1.7 J	5.5 J	7.8 U	9.4 U
Mercury	MG/KG	0.1 UJ	0.11 UJ	0.28	0.11 U	0.11 U	0.11 U
Nickel	MG/KG	3.8 U	4.4 U	4.5 U	4.1 U	4.6 U	4.5 U
Potassium	MG/KG	191 U	290	224 U	229 J	229 U	223 U
Selenium	MG/KG	0.95 U	1.1 U	1.1 U	1 U	1.1 U	1.1 U
Silver	MG/KG	0.95 U	1.1 U	1.1 U	1 U	1.1 UJ	1.1 UJ
Sodium	MG/KG	24.5 U	35.6 U	32.5	29.7	25.3 U	27 U
Thallium	MG/KG	1.9 U	2.2 U	2.2 U	2.1 U	2.3 U	2.2 U
Vanadium	MG/KG	3.1	7.2	2.2 U	6.2	8.4	2.6
Zinc	MG/KG	4.4 UJ	17.2 J	9.6 J	4.9 J	399 J	10.2 UJ
Moisture	%	2.09	10.01	15.14	12.89	12.58	10.21

FREQUENCY OF DETECTION SUMMARY
OPERABLE UNIT No. 8
SITE 16 - SUBSURFACE SOIL
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TAL INORGANICS

Client Sample ID:	16-SDA-SB03-02	16-SDA-SB04-02
Laboratory Sample ID:	AC4160	AC4168
Date Sampled:	10/18/94	10/18/94

	<u>UNITS</u>		
Aluminum	MG/KG	7650 J	737 J
Antimony	MG/KG	10.6 UJ	9.6 UJ
Arsenic	MG/KG	2.1 UJ	1.9 UJ
Barium	MG/KG	36.5	3.8
Beryllium	MG/KG	0.21 U	0.19 U
Cadmium	MG/KG	1.1 U	0.96 U
Calcium	MG/KG	477 J	214 J
Chromium	MG/KG	5.5 J	3.3 J
Cobalt	MG/KG	2.1 U	1.9 U
Copper	MG/KG	3.4 J	1.9 UJ
Iron	MG/KG	7830	729
Lead	MG/KG	68 J	2.2 J
Magnesium	MG/KG	185	38.1
Manganese	MG/KG	38.1 J	4 J
Mercury	MG/KG	0.11 UJ	0.1 UJ
Nickel	MG/KG	4.3 U	3.8 U
Potassium	MG/KG	213 U	192 U
Selenium	MG/KG	1.1 U	0.96 U
Silver	MG/KG	1.1 U	0.96 U
Sodium	MG/KG	57.1 U	56.9 U
Thallium	MG/KG	2.1 U	1.9 U
Vanadium	MG/KG	8.8	1.9 U
Zinc	MG/KG	81 J	13.2 J
Moisture	%	10.47	3.29

FREQUENCY OF DETECTION SUMMARY
OPERABLE UNIT No. 8
SITE 16 - SUBSURFACE SOIL
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TAL INORGANICS

Client Sample ID: Laboratory Sample ID: Date Sampled:	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
	<u>UNITS</u>					
Aluminum	463 U	463 U	315 J	7650 J	16-SDA-SB03-02	31/32
Antimony	9.5 UJ	11.4 UJ	ND	ND		0/32
Arsenic	1.9 UJ	2.3 U	2.5 J	2.5 J	16-BD-SB10-03	1/32
Barium	1.5 U	3.3 U	1.2	36.5	16-SDA-SB03-02	25/32
Beryllium	0.19 U	0.23 U	0.21	0.21	16-BD-SB20-06	1/32
Cadmium	0.95 U	1.1 U	ND	ND		0/32
Calcium	15.8 UJ	1630 UJ	31.7	1400	16-BD-SB13-02	24/32
Chromium	1.9 UJ	2.1 UJ	2.4	7.9	16-BD-SB19-03	24/32
Cobalt	1.9 U	2.3 U	ND	ND		0/32
Copper	1.9 UJ	2.3 U	2.3 J	3.4 J	16-SDA-SB03-02	5/32
Iron	292 U	4070 U	268	7830	16-SDA-SB03-02	25/32
Lead	1.3 UJ	2.7 UJ	1.1 J	68 J	16-SDA-SB03-02	26/32
Magnesium	26.4 U	141 U	13.7	237	16-MW06-06	25/32
Manganese	1.5 U	9.4 U	0.63 J	38.1 J	16-SDA-SB03-02	25/32
Mercury	0.1 U	0.12 UJ	0.1 J	0.28	16-MW05-08	3/32
Nickel	3.8 U	4.6 U	ND	ND		0/32
Potassium	189 U	229 U	194	370	16-BD-SB19-03	9/32
Selenium	0.95 U	1.1 U	1.2	1.2	16-MW01-01	1/32
Silver	0.95 U	1.1 U	ND	ND		0/32
Sodium	19.7 U	57.1 U	22.7	34.7	16-BD-SB20-06	9/32
Thallium	1.9 U	2.3 U	ND	ND		0/32
Vanadium	1.9 U	2.2 U	2.4	14.1	16-BD-SB19-03	16/32
Zinc	2.5 U	10.2 UJ	4.9 J	399 J	16-SDA-SB01-02	11/32
Moisture	%					

APPENDIX I.5
GROUNDWATER ORGANICS

FREQUENCY OF DETECTION SUMMARY
 OPERABLE UNIT No. 8
 SITE 16 - GROUNDWATER
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID:	16-MW01-01	16-MW02-01	16-MW03-01	16-MW04-01	16-MW05-01	16-MW06-01
Laboratory Sample ID:	AD1635	AD1488	AD1485	AD1632	AD1167	AD1491
Date Sampled:	11/30/94	11/30/94	11/29/94	11/30/94	11/29/94	11/30/94

	UNITS						
VOLATILES							
Chloromethane	UG/L	10 UJ	10 U	10 U	10 UJ	10 U	10 U
Bromomethane	UG/L	10 UJ	10 U	10 U	10 UJ	10 UJ	10 U
Vinyl chloride	UG/L	10 UJ	10 U	10 U	10 UJ	10 UJ	10 U
Chloroethane	UG/L	10 UJ	10 U	10 U	10 UJ	10 U	10 U
Methylene chloride	UG/L	10 UJ	10 U	10 U	10 UJ	10 U	10 U
Acetone	UG/L	10 UJ	10 U	10 U	10 UJ	10 U	10 U
Carbon Disulfide	UG/L	10 UJ	10 U	10 U	10 UJ	10 U	10 U
1,1-Dichloroethene	UG/L	10 UJ	10 U	10 U	10 UJ	10 U	10 U
1,1-Dichloroethane	UG/L	10 UJ	10 U	10 U	10 UJ	10 U	10 U
1,2-Dichloroethene(total)	UG/L	10 UJ	10 U	10 U	10 UJ	10 U	10 U
Chloroform	UG/L	10 UJ	10 U	10 U	10 UJ	10 U	10 U
1,2-Dichloroethane	UG/L	10 UJ	10 U	10 U	10 UJ	10 U	10 U
2-Butanone	UG/L	10 UJ	10 U	11 U	10 UJ	10 U	10 U
1,1,1-Trichloroethane	UG/L	10 UJ	10 U	10 U	10 UJ	10 U	10 U
Carbon tetrachloride	UG/L	10 UJ	10 U	10 U	10 UJ	10 U	10 U
Bromodichloromethane	UG/L	10 UJ	10 U	10 U	10 UJ	10 U	10 U
1,2-Dichloropropane	UG/L	10 UJ	10 U	10 U	10 UJ	10 U	10 U
cis-1,3-Dichloropropene	UG/L	10 UJ	10 U	10 U	10 UJ	10 U	10 U
Trichloroethene	UG/L	10 UJ	10 U	10 U	10 UJ	10 U	10 U
Dibromochloromethane	UG/L	10 UJ	10 U	10 U	10 UJ	10 U	10 U
1,1,2-Trichloroethane	UG/L	10 UJ	10 U	10 U	10 UJ	10 U	10 U
Benzene	UG/L	10 UJ	10 U	10 U	10 UJ	37	10 U
trans-1,3-Dichloropropene	UG/L	10 UJ	10 U	10 U	10 UJ	10 U	10 U
Bromoform	UG/L	10 UJ	10 U	10 U	10 UJ	10 U	10 U
4-Methyl-2-pentanone	UG/L	10 UJ	10 U	10 U	10 UJ	10 U	10 U
2-Hexanone	UG/L	10 UJ	10 U	10 U	10 UJ	10 U	10 U
Tetrachloroethene	UG/L	10 UJ	10 U	10 U	10 UJ	10 U	10 U
1,1,2,2-Tetrachloroethane	UG/L	10 UJ	10 U	10 U	10 UJ	10 U	10 U
Toluene	UG/L	10 UJ	10 U	10 U	10 UJ	10 U	10 U
Chlorobenzene	UG/L	10 UJ	10 U	10 U	10 UJ	10 U	10 U
Ethylbenzene	UG/L	10 UJ	10 U	10 U	10 UJ	1 J	10 U
Styrene	UG/L	10 UJ	10 U	10 U	10 UJ	10 U	10 U
Xylenes (total)	UG/L	10 UJ	10 U	10 U	10 UJ	12 U	10 U

FREQUENCY OF DETECTION SUMMARY
 OPERABLE UNIT No. 8
 SITE 16 - GROUNDWATER
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID:	16-MW01-01	16-MW02-01	16-MW03-01	16-MW04-01	16-MW05-01	16-MW06-01
Laboratory Sample ID:	AD1635	AD1488	AD1485	AD1632	AD1167	AD1491
Date Sampled:	11/30/94	11/30/94	11/29/94	11/30/94	11/29/94	11/30/94

	UNITS						
SEMIVOLATILES							
Phenol	UG/L	10 U	10 U	2 J	10 U	4 J	1 J
bis(2-Chloroethyl) ether	UG/L	10 U	10 U	10 U	10 U	10 U	10 U
2-Chlorophenol	UG/L	10 U	10 U	10 U	10 U	10 U	10 U
1,3-Dichlorobenzene	UG/L	10 U	10 U	10 U	10 U	10 U	10 U
1,4-Dichlorobenzene	UG/L	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichlorobenzene	UG/L	10 U	10 U	10 U	10 U	10 U	10 U
2-Methylphenol	UG/L	10 U	10 U	10 U	10 U	10 U	10 U
2,2'-oxybis-(1-chloropropane)	UG/L	10 U	10 U	10 U	10 U	10 U	10 U
4-Methylphenol	UG/L	10 U	10 U	10 U	10 U	10 U	10 U
N-Nitroso-di-n-propylamine	UG/L	10 U	10 U	10 U	10 U	10 U	10 U
Hexachloroethane	UG/L	10 U	10 U	10 U	10 U	10 U	10 U
Nitrobenzene	UG/L	10 U	10 U	10 U	10 U	10 U	10 U
Isophorone	UG/L	10 U	10 U	10 U	10 U	10 U	10 U
2-Nitrophenol	UG/L	10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dimethylphenol	UG/L	10 U	10 U	10 U	10 U	10 U	10 U
bis(2-Chloroethoxy) methane	UG/L	10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dichlorophenol	UG/L	10 U	10 U	10 U	10 U	10 U	10 U
1,2,4-Trichlorobenzene	UG/L	10 U	10 U	10 U	10 U	10 U	10 U
Naphthalene	UG/L	10 U	10 U	10 U	10 U	6 J	10 U
4-Chloroaniline	UG/L	10 U	10 U	10 U	10 U	10 U	10 U
Hexachlorobutadiene	UG/L	10 U	10 U	10 U	10 U	10 U	10 U
4-Chloro-3-methylphenol	UG/L	10 U	10 U	10 U	10 U	10 U	10 U
2-Methylnaphthalene	UG/L	10 U	10 U	10 U	10 U	10 U	10 U
Hexachlorocyclopentadiene	UG/L	10 UJ	10 UJ	10 UJ	10 UJ	10 U	10 UJ
2,4,6-Trichlorophenol	UG/L	10 U	10 U	10 U	10 U	10 U	10 U
2,4,5-Trichlorophenol	UG/L	25 U	25 U	25 U	25 U	25 U	25 U
2-Chloronaphthalene	UG/L	10 U	10 U	10 U	10 U	10 U	10 U
2-Nitroaniline	UG/L	25 U	25 U	25 U	25 U	25 U	25 U
Dimethyl phthalate	UG/L	10 U	10 U	10 U	10 U	10 U	10 U
Acenaphthylene	UG/L	10 U	10 U	10 U	10 U	10 U	10 U
2,6-Dinitrotoluene	UG/L	10 U	10 U	10 U	10 U	10 U	10 U
3-Nitroaniline	UG/L	25 U	25 U	25 U	25 U	25 U	25 U
Acenaphthene	UG/L	10 U	10 U	10 U	10 U	10 U	10 U

FREQUENCY OF DETECTION SUMMARY
 OPERABLE UNIT No. 8
 SITE 16 - GROUNDWATER
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID:	16-MW01-01	16-MW02-01	16-MW03-01	16-MW04-01	16-MW05-01	16-MW06-01
Laboratory Sample ID:	AD1635	AD1488	AD1485	AD1632	AD1167	AD1491
Date Sampled:	11/30/94	11/30/94	11/29/94	11/30/94	11/29/94	11/30/94

UNITS

SEMIVOLATILES Cont.

	16-MW01-01	16-MW02-01	16-MW03-01	16-MW04-01	16-MW05-01	16-MW06-01
2,4-Dinitrophenol	UG/L	25 UJ	25 UJ	25 UJ	25 UJ	25 UJ
4-Nitrophenol	UG/L	25 U	25 U	25 U	25 U	25 U
Dibenzofuran	UG/L	10 U	10 U	10 U	10 U	10 U
2,4-Dinitrotoluene	UG/L	10 U	10 U	10 U	10 U	10 U
Diethylphthalate	UG/L	10 U	10 U	10 U	10 U	10 U
4-Chlorophenyl phenyl ether	UG/L	10 U	10 U	10 U	10 U	10 U
Fluorene	UG/L	10 U	10 U	10 U	10 U	10 U
4-Nitroaniline	UG/L	25 U	25 U	25 U	25 U	25 U
4,6-Dinitro-2-methylphenol	UG/L	25 U	25 U	25 U	25 U	25 U
N-nitrosodiphenylamine	UG/L	10 U	10 U	10 U	10 U	10 U
4-Bromophenyl-phenylether	UG/L	10 U	10 U	10 U	10 U	10 U
Hexachlorobenzene	UG/L	10 U	10 U	10 U	10 U	10 U
Pentachlorophenol	UG/L	25 U	25 U	25 U	25 U	25 U
Phenanthrene	UG/L	10 U	10 U	10 U	10 U	10 U
Anthracene	UG/L	10 U	10 U	10 U	10 U	10 U
Carbazole	UG/L	10 U	10 U	10 U	10 U	10 U
di-n-Butylphthalate	UG/L	10 U	10 U	10 U	10 U	10 U
Fluoranthene	UG/L	10 U	10 U	10 U	10 U	10 U
Pyrene	UG/L	10 U	10 U	10 U	10 U	10 U
Butyl benzyl phthalate	UG/L	10 U	10 U	10 U	10 U	10 U
3,3'-Dichlorobenzidine	UG/L	10 U	10 U	10 U	10 U	10 U
Benzo[a]anthracene	UG/L	10 U	10 U	10 U	10 U	10 U
Chrysene	UG/L	10 U	10 U	10 U	10 U	10 U
bis(2-Ethylhexyl)phthalate	UG/L	10 U	1 J	5 J	10 U	1 J
di-n-Octylphthalate	UG/L	10 U	10 U	10 U	10 U	10 U
Benzo[b]fluoranthene	UG/L	10 U	10 U	10 U	10 U	10 U
Benzo[k]fluoranthene	UG/L	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ
Benzo[a]pyrene	UG/L	10 U	10 U	10 U	10 U	10 U
Indeno[1,2,3-cd]pyrene	UG/L	10 U	10 U	10 U	10 U	10 U
Dibenz[a,h]anthracene	UG/L	10 U	10 U	10 U	10 U	10 U
Benzo[g,h,i]perylene	UG/L	10 U	10 U	10 U	10 U	10 U

FREQUENCY OF DETECTION SUMMARY
OPERABLE UNIT No. 8
SITE 16 - GROUNDWATER
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

Client Sample ID:	16-MW01-01	16-MW02-01	16-MW03-01	16-MW04-01	16-MW05-01	16-MW06-01
Laboratory Sample ID:	AD1635	AD1488	AD1485	AD1632	AD1167	AD1491
Date Sampled:	11/30/94	11/30/94	11/29/94	11/30/94	11/29/94	11/30/94

UNITS

PESTICIDES/PCBs

	16-MW01-01	16-MW02-01	16-MW03-01	16-MW04-01	16-MW05-01	16-MW06-01
alpha-BHC	UG/L	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
beta-BHC	UG/L	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
delta-BHC	UG/L	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Lindane (gamma-BHC)	UG/L	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Heptachlor	UG/L	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Aldrin	UG/L	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Heptachlor epoxide	UG/L	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Endosulfan I	UG/L	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Dieldrin	UG/L	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
4,4'-DDE	UG/L	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Endrin	UG/L	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Endosulfan II	UG/L	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
4,4'-DDD	UG/L	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Endosulfan sulfate	UG/L	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
4,4'-DDT	UG/L	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Methoxychlor	UG/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Endrin ketone	UG/L	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Endrin aldehyde	UG/L	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
alpha-Chlordane	UG/L	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
gamma-Chlordane	UG/L	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Toxaphene	UG/L	5 U	5 U	5 U	5 U	5 U
Aroclor 1016	UG/L	1 U	1 U	1 U	1 U	1 U
Aroclor 1221	UG/L	2 U	2 U	2 U	2 U	2 U
Aroclor 1232	UG/L	1 U	1 U	1 U	1 U	1 U
Aroclor 1242	UG/L	1 U	1 U	1 U	1 U	1 U
Aroclor 1248	UG/L	1 U	1 U	1 U	1 U	1 U
Aroclor 1254	UG/L	1 U	1 U	1 U	1 U	1 U
Aroclor 1260	UG/L	1 U	1 U	1 U	1 U	1 U

FREQUENCY OF DETECTION SUMMARY
OPERABLE UNIT No. 8
SITE 16 - GROUNDWATER
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

Client Sample ID: Laboratory Sample ID: Date Sampled:	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
UNITS						
VOLATILES						
Chloromethane	UG/L	10 UJ	10 UJ	ND	ND	0/6
Bromomethane	UG/L	10 UJ	10 UJ	ND	ND	0/6
Vinyl chloride	UG/L	10 UJ	10 UJ	ND	ND	0/6
Chloroethane	UG/L	10 UJ	10 UJ	ND	ND	0/6
Methylene chloride	UG/L	10 UJ	10 UJ	ND	ND	0/6
Acetone	UG/L	10 UJ	10 UJ	ND	ND	0/6
Carbon Disulfide	UG/L	10 UJ	10 UJ	ND	ND	0/6
1,1-Dichloroethene	UG/L	10 UJ	10 UJ	ND	ND	0/6
1,1-Dichloroethane	UG/L	10 UJ	10 UJ	ND	ND	0/6
1,2-Dichloroethene(total)	UG/L	10 UJ	10 UJ	ND	ND	0/6
Chloroform	UG/L	10 UJ	10 UJ	ND	ND	0/6
1,2-Dichloroethane	UG/L	10 UJ	10 UJ	ND	ND	0/6
2-Butanone	UG/L	10 UJ	11 U	ND	ND	0/6
1,1,1-Trichloroethane	UG/L	10 UJ	10 UJ	ND	ND	0/6
Carbon tetrachloride	UG/L	10 UJ	10 UJ	ND	ND	0/6
Bromodichloromethane	UG/L	10 UJ	10 UJ	ND	ND	0/6
1,2-Dichloropropane	UG/L	10 UJ	10 UJ	ND	ND	0/6
cis-1,3-Dichloropropene	UG/L	10 UJ	10 UJ	ND	ND	0/6
Trichloroethene	UG/L	10 UJ	10 UJ	ND	ND	0/6
Dibromochloromethane	UG/L	10 UJ	10 UJ	ND	ND	0/6
1,1,2-Trichloroethane	UG/L	10 UJ	10 UJ	ND	ND	0/6
Benzene	UG/L	10 UJ	10 UJ	37	37	16-MW05-01 1/6
trans-1,3-Dichloropropene	UG/L	10 UJ	10 UJ	ND	ND	0/6
Bromoform	UG/L	10 UJ	10 UJ	ND	ND	0/6
4-Methyl-2-pentanone	UG/L	10 UJ	10 UJ	ND	ND	0/6
2-Hexanone	UG/L	10 UJ	10 UJ	ND	ND	0/6
Tetrachloroethene	UG/L	10 UJ	10 UJ	ND	ND	0/6
1,1,2,2-Tetrachloroethane	UG/L	10 UJ	10 UJ	ND	ND	0/6
Toluene	UG/L	10 UJ	10 UJ	ND	ND	0/6
Chlorobenzene	UG/L	10 UJ	10 UJ	ND	ND	0/6
Ethylbenzene	UG/L	10 UJ	10 UJ	1 J	1 J	16-MW05-01 1/6
Styrene	UG/L	10 UJ	10 UJ	ND	ND	0/6
Xylenes (total)	UG/L	10 UJ	12 U	ND	ND	0/6

FREQUENCY OF DETECTION SUMMARY
 OPERABLE UNIT No. 8
 SITE 16 - GROUNDWATER
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID: Laboratory Sample ID: Date Sampled:	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
UNITS						
SEMIVOLATILES						
Phenol	UG/L	10 U	10 U	1 J	4 J	16-MW05-01 3/6
bis(2-Chloroethyl) ether	UG/L	10 U	10 U	ND	ND	0/6
2-Chlorophenol	UG/L	10 U	10 U	ND	ND	0/6
1,3-Dichlorobenzene	UG/L	10 U	10 U	ND	ND	0/6
1,4-Dichlorobenzene	UG/L	10 U	10 U	ND	ND	0/6
1,2-Dichlorobenzene	UG/L	10 U	10 U	ND	ND	0/6
2-Methylphenol	UG/L	10 U	10 U	ND	ND	0/6
2,2'-oxybis-(1-chloropropane)	UG/L	10 U	10 U	ND	ND	0/6
4-Methylphenol	UG/L	10 U	10 U	ND	ND	0/6
N-Nitroso-di-n-propylamine	UG/L	10 U	10 U	ND	ND	0/6
Hexachloroethane	UG/L	10 U	10 U	ND	ND	0/6
Nitrobenzene	UG/L	10 U	10 U	ND	ND	0/6
Isophorone	UG/L	10 U	10 U	ND	ND	0/6
2-Nitrophenol	UG/L	10 U	10 U	ND	ND	0/6
2,4-Dimethylphenol	UG/L	10 U	10 U	ND	ND	0/6
bis(2-Chloroethoxy) methane	UG/L	10 U	10 U	ND	ND	0/6
2,4-Dichlorophenol	UG/L	10 U	10 U	ND	ND	0/6
1,2,4-Trichlorobenzene	UG/L	10 U	10 U	ND	ND	0/6
Naphthalene	UG/L	10 U	10 U	6 J	6 J	16-MW05-01 1/6
4-Chloroaniline	UG/L	10 U	10 U	ND	ND	0/6
Hexachlorobutadiene	UG/L	10 U	10 U	ND	ND	0/6
4-Chloro-3-methylphenol	UG/L	10 U	10 U	ND	ND	0/6
2-Methylnaphthalene	UG/L	10 U	10 U	ND	ND	0/6
Hexachlorocyclopentadiene	UG/L	10 UJ	10 UJ	ND	ND	0/6
2,4,6-Trichlorophenol	UG/L	10 U	10 U	ND	ND	0/6
2,4,5-Trichlorophenol	UG/L	25 U	25 U	ND	ND	0/6
2-Chloronaphthalene	UG/L	10 U	10 U	ND	ND	0/6
2-Nitroaniline	UG/L	25 U	25 U	ND	ND	0/6
Dimethyl phthalate	UG/L	10 U	10 U	ND	ND	0/6
Acenaphthylene	UG/L	10 U	10 U	ND	ND	0/6
2,6-Dinitrotoluene	UG/L	10 U	10 U	ND	ND	0/6
3-Nitroaniline	UG/L	25 U	25 U	ND	ND	0/6
Acenaphthene	UG/L	10 U	10 U	ND	ND	0/6

FREQUENCY OF DETECTION SUMMARY
 OPERABLE UNIT No. 8
 SITE 16 - GROUNDWATER
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID: Laboratory Sample ID: Date Sampled:	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
	UNITS					
	SEMIVOLATILES Cont.					
2,4-Dinitrophenol	UG/L	25 UJ	25 UJ	ND		0/6
4-Nitrophenol	UG/L	25 U	25 U	ND		0/6
Dibenzofuran	UG/L	10 U	10 U	ND		0/6
2,4-Dinitrotoluene	UG/L	10 U	10 U	ND		0/6
Diethylphthalate	UG/L	10 U	10 U	ND		0/6
4-Chlorophenyl phenyl ether	UG/L	10 U	10 U	ND		0/6
Fluorene	UG/L	10 U	10 U	ND		0/6
4-Nitroaniline	UG/L	25 U	25 U	ND		0/6
4,6-Dinitro-2-methylphenol	UG/L	25 U	25 U	ND		0/6
N-nitrosodiphenylamine	UG/L	10 U	10 U	ND		0/6
4-Bromophenyl-phenylether	UG/L	10 U	10 U	ND		0/6
Hexachlorobenzene	UG/L	10 U	10 U	ND		0/6
Pentachlorophenol	UG/L	25 U	25 U	ND		0/6
Phenanthrene	UG/L	10 U	10 U	ND		0/6
Anthracene	UG/L	10 U	10 U	ND		0/6
Carbazole	UG/L	10 U	10 U	ND		0/6
di-n-Butylphthalate	UG/L	10 U	10 U	ND		0/6
Fluoranthene	UG/L	10 U	10 U	ND		0/6
Pyrene	UG/L	10 U	10 U	ND		0/6
Butyl benzyl phthalate	UG/L	10 U	10 U	ND		0/6
3,3'-Dichlorobenzidine	UG/L	10 U	10 U	ND		0/6
Benzo[a]anthracene	UG/L	10 U	10 U	ND		0/6
Chrysene	UG/L	10 U	10 U	ND		0/6
bis(2-Ethylhexyl)phthalate	UG/L	10 U	10 U	1 J	5 J	16-MW03-01 4/6
di-n-Octylphthalate	UG/L	10 U	10 U	ND		0/6
Benzo[b]fluoranthene	UG/L	10 U	10 U	ND		0/6
Benzo[k]fluoranthene	UG/L	10 UJ	10 UJ	ND		0/6
Benzo[a]pyrene	UG/L	10 U	10 U	ND		0/6
Indeno[1,2,3-cd]pyrene	UG/L	10 U	10 U	ND		0/6
Dibenz[a,h]anthracene	UG/L	10 U	10 U	ND		0/6
Benzo[g,h,i]perylene	UG/L	10 U	10 U	ND		0/6

FREQUENCY OF DETECTION SUMMARY
OPERABLE UNIT No. 8
SITE 16 - GROUNDWATER
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

Client Sample ID: Laboratory Sample ID: Date Sampled:	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
UNITS						
PESTICIDES/PCBs						
alpha-BHC	UG/L	0.05 U	0.05 U	ND	ND	0/6
beta-BHC	UG/L	0.05 U	0.05 U	ND	ND	0/6
delta-BHC	UG/L	0.05 U	0.05 U	ND	ND	0/6
Lindane (gamma-BHC)	UG/L	0.05 U	0.05 U	ND	ND	0/6
Heptachlor	UG/L	0.05 U	0.05 U	ND	ND	0/6
Aldrin	UG/L	0.05 U	0.05 U	ND	ND	0/6
Heptachlor epoxide	UG/L	0.05 U	0.05 U	ND	ND	0/6
Endosulfan I	UG/L	0.05 U	0.05 U	ND	ND	0/6
Dieldrin	UG/L	0.1 U	0.1 U	ND	ND	0/6
4,4'-DDE	UG/L	0.1 U	0.1 U	ND	ND	0/6
Endrin	UG/L	0.1 U	0.1 U	ND	ND	0/6
Endosulfan II	UG/L	0.1 U	0.1 U	ND	ND	0/6
4,4'-DDD	UG/L	0.1 U	0.1 U	ND	ND	0/6
Endosulfan sulfate	UG/L	0.1 U	0.1 U	ND	ND	0/6
4,4'-DDT	UG/L	0.1 U	0.1 U	ND	ND	0/6
Methoxychlor	UG/L	0.5 U	0.5 U	ND	ND	0/6
Endrin ketone	UG/L	0.1 U	0.1 U	ND	ND	0/6
Endrin aldehyde	UG/L	0.1 U	0.1 U	ND	ND	0/6
alpha-Chlordane	UG/L	0.05 U	0.05 U	ND	ND	0/6
gamma-Chlordane	UG/L	0.05 U	0.05 U	ND	ND	0/6
Toxaphene	UG/L	5 U	5 U	ND	ND	0/6
Aroclor 1016	UG/L	1 U	1 U	ND	ND	0/6
Aroclor 1221	UG/L	2 U	2 U	ND	ND	0/6
Aroclor 1232	UG/L	1 U	1 U	ND	ND	0/6
Aroclor 1242	UG/L	1 U	1 U	ND	ND	0/6
Aroclor 1248	UG/L	1 U	1 U	ND	ND	0/6
Aroclor 1254	UG/L	1 U	1 U	ND	ND	0/6
Aroclor 1260	UG/L	1 U	1 U	ND	ND	0/6

APPENDIX I.6
GROUNDWATER TOTAL METALS

FREQUENCY OF DETECTION SUMMARY
OPERABLE UNIT No. 8
SITE 16 - GROUNDWATER
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TAL INORGANICS

Client Sample ID:	16-MW01-01	16-MW02-01	16-MW03-01	16-MW04-01	16-MW05-01	16-MW06-01
Laboratory Sample ID:	AD1636	AD1489	AD1486	AD1633	AD1168	AD1492
Date Sampled:	11/30/94	11/30/94	11/29/94	11/30/94	11/29/94	11/30/94

	UNITS						
Aluminum	UG/L	109 U	134 U	171 U	118 U	106 U	95.3 U
Antimony	UG/L	50 U	50 U	50 U	50 U	50 U	50 U
Arsenic	UG/L	10 U	10 U	10 U	10 U	10 U	10 U
Barium	UG/L	27.2 J	50.9	77.9	24.7 J	53	24.4 J
Beryllium	UG/L	1 U	1 U	1 U	1 U	1 U	1 U
Cadmium	UG/L	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ
Calcium	UG/L	3160	6200	13400	1460	7770	370
Chromium	UG/L	10 U	10 U	10 U	10 U	10 U	10 U
Cobalt	UG/L	10 U	10 U	10 U	10 U	10 U	10 U
Copper	UG/L	10 U	10 U	10 U	10 U	10 U	10 U
Iron	UG/L	58.2 U	62.9 U	712	40.1 U	61.7 U	71.9 U
Lead	UG/L	3 U	3 U	3 U	3.2 J	3 U	3 U
Magnesium	UG/L	1610	1870	5090	1020	1210	1510
Manganese	UG/L	10.7 UJ	23.1 J	28.9 J	5.8 UJ	31.6 J	9.8 J
Mercury	UG/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Nickel	UG/L	20 U	20 U	20 U	20 U	20 U	20 U
Potassium	UG/L	1000 U	1000 U	1000 U	1000 U	1000 U	1000 U
Selenium	UG/L	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ
Silver	UG/L	5 U	5 U	5 U	5 U	5 U	5 U
Sodium	UG/L	3230	7090	15600	16400	6000	2480
Thallium	UG/L	10 U	10 U	10 U	10 U	10 U	10 U
Vanadium	UG/L	10 U	10 U	10 U	10 U	10 U	10 U
Zinc	UG/L	30.6 UJ	80.5	19.5 UJ	23 UJ	13 UJ	18.5 UJ

FREQUENCY OF DETECTION SUMMARY
OPERABLE UNIT No. 8
SITE 16 - GROUNDWATER
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TAL INORGANICS

Client Sample ID:		MINIMUM	MAXIMUM	MINIMUM	MAXIMUM	LOCATION OF	FREQUENCY
Laboratory Sample ID:		NONDETECTED	NONDETECTED	DETECTED	DETECTED	MAXIMUM	OF
Date Sampled:		NONDETECTED	NONDETECTED	DETECTED	DETECTED	DETECTED	DETECTION
	UNITS						
Aluminum	UG/L	95.3 U	171 U	ND	ND		0/6
Antimony	UG/L	50 U	50 U	ND	ND		0/6
Arsenic	UG/L	10 U	10 U	ND	ND		0/6
Barium	UG/L	NA	NA	24.4 J	77.9	16-MW03-01	6/6
Beryllium	UG/L	1 U	1 U	ND	ND		0/6
Cadmium	UG/L	5 UJ	5 UJ	ND	ND		0/6
Calcium	UG/L	NA	NA	370	13400	16-MW03-01	6/6
Chromium	UG/L	10 U	10 U	ND	ND		0/6
Cobalt	UG/L	10 U	10 U	ND	ND		0/6
Copper	UG/L	10 U	10 U	ND	ND		0/6
Iron	UG/L	40.1 U	71.9 U	712	712	16-MW03-01	1/6
Lead	UG/L	3 U	3 U	3.2 J	3.2 J	16-MW04-01	1/6
Magnesium	UG/L	NA	NA	1020	5090	16-MW03-01	6/6
Manganese	UG/L	5.8 UJ	10.7 UJ	9.8 J	31.6 J	16-MW05-01	4/6
Mercury	UG/L	0.2 U	0.2 U	ND	ND		0/6
Nickel	UG/L	20 U	20 U	ND	ND		0/6
Potassium	UG/L	1000 U	1000 U	ND	ND		0/6
Selenium	UG/L	5 UJ	5 UJ	ND	ND		0/6
Silver	UG/L	5 U	5 U	ND	ND		0/6
Sodium	UG/L	NA	NA	2480	16400	16-MW04-01	6/6
Thallium	UG/L	10 U	10 U	ND	ND		0/6
Vanadium	UG/L	10 U	10 U	ND	ND		0/6
Zinc	UG/L	13 UJ	30.6 UJ	80.5	80.5	16-MW02-01	1/6

APPENDIX I.7
GROUNDWATER DISSOLVED METALS

FREQUENCY OF DETECTION SUMMARY
OPERABLE UNIT No. 8
SITE 16 - GROUNDWATER
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
DISSOLVED TAL INORGANICS

Client Sample ID:	16-MW01D-01	16-MW02D-01	16-MW03D-01	16-MW04D-01	16-MW05D-01	16-MW06D-01
Laboratory Sample ID:	AD1657	AD1503	AD1502	AD1656	AD1169	AD1504
Date Sampled:	11/30/94	11/30/94	11/29/94	11/30/94	11/29/94	11/30/94

	UNITS	16-MW01D-01	16-MW02D-01	16-MW03D-01	16-MW04D-01	16-MW05D-01	16-MW06D-01
Aluminum	UG/L	46 U	196 U	109 U	69.4 U	58.7 U	50.6 U
Antimony	UG/L	50 U	50 U	50 U	50 U	50 U	50 U
Arsenic	UG/L	10 U	10 U	10 U	10 U	10 U	10 U
Barium	UG/L	28.4 J	41.1	75.8	19.3 J	44.3	11.9 J
Beryllium	UG/L	1 U	1 U	1 U	1 U	1 U	1 U
Cadmium	UG/L	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ
Calcium	UG/L	3930	5840 J	13600 J	1640	6990	558 J
Chromium	UG/L	10 U	10 U	10 U	10 U	10 U	10 U
Cobalt	UG/L	10 U	10 U	10 U	10 U	10 U	10 U
Copper	UG/L	10 U	10 U	10 U	10 U	18.6	10 U
Iron	UG/L	24.2 U	42.9 UJ	588 J	28.4 U	48.4 U	45.9 UJ
Lead	UG/L	3 U	3 U	3 U	3 U	3 U	3 U
Magnesium	UG/L	1890	1730	5050	1030	1160	1350 J
Manganese	UG/L	12.4 J	21.3 J	30.2 J	6.7 UJ	28.9 U	8.2 J
Mercury	UG/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Nickel	UG/L	20 U	20 U	20 U	20 U	20 U	20 U
Potassium	UG/L	1000 U	1000 U	1000 U	1000 U	1000 U	1000 U
Selenium	UG/L	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ
Silver	UG/L	5 U	5 U	5 U	5 U	5 U	5 U
Sodium	UG/L	3890	6470 J	15500 J	16600	5610	2430 J
Thallium	UG/L	10 U	10 U	10 U	10 U	10 U	10 U
Vanadium	UG/L	10 U	10 U	10 U	10 U	10 U	10 U
Zinc	UG/L	13.6 UJ	39.3 UJ	38.8 UJ	18.9 UJ	13.8 UJ	24.2 UJ

FREQUENCY OF DETECTION SUMMARY
OPERABLE UNIT No. 8
SITE 16 - GROUNDWATER
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
DISSOLVED TAL INORGANICS

Client Sample ID: Laboratory Sample ID: Date Sampled:	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
	UNITS					
Aluminum	UG/L	46 U	196 U	ND	ND	0/6
Antimony	UG/L	50 U	50 U	ND	ND	0/6
Arsenic	UG/L	10 U	10 U	ND	ND	0/6
Barium	UG/L	NA	NA	11.9 J	75.8	16-MW03D-01 6/6
Beryllium	UG/L	1 U	1 U	ND	ND	0/6
Cadmium	UG/L	5 UJ	5 UJ	ND	ND	0/6
Calcium	UG/L	NA	NA	558 J	13600 J	16-MW03D-01 6/6
Chromium	UG/L	10 U	10 U	ND	ND	0/6
Cobalt	UG/L	10 U	10 U	ND	ND	0/6
Copper	UG/L	10 U	10 U	18.6	18.6	16-MW05D-01 1/6
Iron	UG/L	24.2 U	48.4 U	588 J	588 J	16-MW03D-01 1/6
Lead	UG/L	3 U	3 U	ND	ND	0/6
Magnesium	UG/L	NA	NA	1030	5050	16-MW03D-01 6/6
Manganese	UG/L	6.7 UJ	28.9 U	8.2 J	30.2 J	16-MW03D-01 4/6
Mercury	UG/L	0.2 U	0.2 U	ND	ND	0/6
Nickel	UG/L	20 U	20 U	ND	ND	0/6
Potassium	UG/L	1000 U	1000 U	ND	ND	0/6
Selenium	UG/L	5 UJ	5 UJ	ND	ND	0/6
Silver	UG/L	5 U	5 U	ND	ND	0/6
Sodium	UG/L	NA	NA	2430 J	16600	16-MW04D-01 6/6
Thallium	UG/L	10 U	10 U	ND	ND	0/6
Vanadium	UG/L	10 U	10 U	ND	ND	0/6
Zinc	UG/L	13.6 UJ	39.3 UJ	ND	ND	0/6

APPENDIX I.8
NORTHEAST CREEK SURFACE WATER ORGANICS

FREQUENCY OF DETECTION SUMMARY
OPERABLE UNIT No. 8 (SITE 16)
NORTHEAST CREEK SURFACE WATER
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

Client Sample ID:	16-NC-SW01	16-NC-SW02	16-NC-SW03	16-NC-SW04	16-NC-SW05
Laboratory Sample ID:	AB1967	AB1970	AB1973	AB1985	AB1976
Date Sampled:	6/27/94	6/27/94	6/26/94	6/26/94	6/26/94

	<u>UNITS</u>					
<u>VOLATILES</u>						
Chloromethane	UG/L	10 U	10 U	10 U	10 U	10 U
Bromomethane	UG/L	10 U	10 U	10 U	10 U	10 U
Vinyl chloride	UG/L	10 U	10 U	10 U	10 U	10 U
Chloroethane	UG/L	10 U	10 U	10 U	10 U	10 U
Methylene chloride	UG/L	10 U	10 U	10 U	10 U	10 U
Acetone	UG/L	10 U	10 U	10 U	10 U	20 U
Carbon Disulfide	UG/L	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethene	UG/L	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethane	UG/L	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethene(total)	UG/L	10 U	10 U	10 U	10 U	10 U
Chloroform	UG/L	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethane	UG/L	10 U	10 U	10 U	10 U	10 U
2-Butanone	UG/L	10 U	10 U	10 U	10 U	10 U
1,1,1-Trichloroethane	UG/L	10 U	10 U	10 U	10 U	10 U
Carbon tetrachloride	UG/L	10 U	10 U	10 U	10 U	10 U
Bromodichloromethane	UG/L	10 U	10 U	10 U	10 U	10 U
1,2-Dichloropropane	UG/L	10 U	10 U	10 U	10 U	10 U
cis-1,3-Dichloropropene	UG/L	10 U	10 U	10 U	10 U	10 U
Trichloroethene	UG/L	10 U	10 U	10 U	10 U	10 U
Dibromochloromethane	UG/L	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichloroethane	UG/L	10 U	10 U	10 U	10 U	10 U
Benzene	UG/L	10 U	10 U	10 U	10 U	10 U
trans-1,3-Dichloropropene	UG/L	10 U	10 U	10 U	10 U	10 U
Bromoform	UG/L	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone	UG/L	10 U	10 U	10 U	10 U	7 J
2-Hexanone	UG/L	10 U	10 U	10 U	10 U	10 U
Tetrachloroethene	UG/L	10 U	10 U	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane	UG/L	10 U	10 U	10 U	10 U	2 J
Toluene	UG/L	10 U	10 U	10 U	10 U	10 U
Chlorobenzene	UG/L	10 U	10 U	10 U	10 U	10 U
Ethylbenzene	UG/L	10 U	10 U	10 U	10 U	10 U
Styrene	UG/L	10 U	10 U	10 U	10 U	10 U
Xylenes (total)	UG/L	10 U	10 U	10 U	10 U	10 U

FREQUENCY OF DETECTION SUMMARY
 OPERABLE UNIT No. 8 (SITE 16)
 NORTHEAST CREEK SURFACE WATER
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID:	16-NC-SW01	16-NC-SW02	16-NC-SW03	16-NC-SW04	16-NC-SW05
Laboratory Sample ID:	AB1967	AB1970	AB1973	AB1985	AB1976
Date Sampled:	6/27/94	6/27/94	6/26/94	6/26/94	6/26/94

UNITS

SEMIVOLATILES

	UG/L	10 U	10 U	10 U	10 U	10 U
Phenol	UG/L	10 U	10 U	10 U	10 U	10 U
bis(2-Chloroethyl) ether	UG/L	10 U	10 U	10 U	10 U	10 U
2-Chlorophenol	UG/L	10 U	10 U	10 U	10 U	10 U
1,3-Dichlorobenzene	UG/L	10 U	10 U	10 U	10 U	10 U
1,4-Dichlorobenzene	UG/L	10 U	10 U	10 U	10 U	10 U
1,2-Dichlorobenzene	UG/L	10 U	10 U	10 U	10 U	10 U
2-Methylphenol	UG/L	10 U	10 U	10 U	10 U	10 U
2,2'-oxybis-(1-chloropropane)	UG/L	10 U	10 U	10 U	10 U	10 U
4-Methylphenol	UG/L	10 U	10 U	10 U	10 U	10 U
N-Nitroso-di-n-propylamine	UG/L	10 U	10 U	10 U	10 U	10 U
Hexachloroethane	UG/L	10 U	10 U	10 U	10 U	10 U
Nitrobenzene	UG/L	10 U	10 U	10 U	10 U	10 U
Isophorone	UG/L	10 U	10 U	10 U	10 U	10 U
2-Nitrophenol	UG/L	10 U	10 U	10 U	10 U	10 U
2,4-Dimethylphenol	UG/L	10 U	10 U	10 U	10 U	10 U
bis(2-Chloroethoxy) methane	UG/L	10 U	10 U	10 U	10 U	10 U
2,4-Dichlorophenol	UG/L	10 U	10 U	10 U	10 U	10 U
1,2,4-Trichlorobenzene	UG/L	10 U	10 U	10 U	10 U	10 U
Naphthalene	UG/L	10 U	10 U	10 U	10 U	10 U
4-Chloroaniline	UG/L	10 U	10 U	10 U	10 U	10 U
Hexachlorobutadiene	UG/L	10 U	10 U	10 U	10 U	10 U
4-Chloro-3-methylphenol	UG/L	10 U	10 U	10 U	10 U	10 U
2-Methylnaphthalene	UG/L	10 U	10 U	10 U	10 U	10 U
Hexachlorocyclopentadiene	UG/L	10 U	10 U	10 U	10 U	10 U
2,4,6-Trichlorophenol	UG/L	10 U	10 U	10 U	10 U	10 U
2,4,5-Trichlorophenol	UG/L	25 U	25 U	25 U	25 U	25 U
2-Chloronaphthalene	UG/L	10 U	10 U	10 U	10 U	10 U
2-Nitroaniline	UG/L	25 U	25 U	25 U	25 U	25 U
Dimethyl phthalate	UG/L	10 U	10 U	10 U	10 U	10 U
Acenaphthylene	UG/L	10 U	10 U	10 U	10 U	10 U
2,6-Dinitrotoluene	UG/L	10 U	10 U	10 U	10 U	10 U
3-Nitroaniline	UG/L	25 U	25 U	25 U	25 U	25 U
Acenaphthene	UG/L	10 U	10 U	10 U	10 U	10 U

FREQUENCY OF DETECTION SUMMARY
 OPERABLE UNIT No. 8 (SITE 16)
 NORTHEAST CREEK SURFACE WATER
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID:	16-NC-SW01	16-NC-SW02	16-NC-SW03	16-NC-SW04	16-NC-SW05
Laboratory Sample ID:	AB1967	AB1970	AB1973	AB1985	AB1976
Date Sampled:	6/27/94	6/27/94	6/26/94	6/26/94	6/26/94

	UNITS					
SEMIVOLATILES Cont.						
2,4-Dinitrophenol	UG/L	25 U	25 U	25 U	25 U	25 U
4-Nitrophenol	UG/L	25 U	25 U	25 U	25 U	25 U
Dibenzofuran	UG/L	10 U	10 U	10 U	10 U	10 U
2,4-Dinitrotoluene	UG/L	10 U	10 U	10 U	10 U	10 U
Diethylphthalate	UG/L	10 U	10 U	10 U	10 U	10 U
4-Chlorophenyl phenyl ether	UG/L	10 U	10 U	10 U	10 U	10 U
Fluorene	UG/L	10 U	10 U	10 U	10 U	10 U
4-Nitroaniline	UG/L	25 U	25 U	25 U	25 U	25 U
4,6-Dinitro-2-methylphenol	UG/L	25 U	25 U	25 U	25 U	25 U
N-nitrosodiphenylamine	UG/L	10 U	10 U	10 U	10 U	10 U
4-Bromophenyl-phenylether	UG/L	10 U	10 U	10 U	10 U	10 U
Hexachlorobenzene	UG/L	10 U	10 U	10 U	10 U	10 U
Pentachlorophenol	UG/L	25 U	25 U	25 U	25 U	25 U
Phenanthrene	UG/L	10 U	10 U	10 U	10 U	10 U
Anthracene	UG/L	10 U	10 U	10 U	10 U	10 U
Carbazole	UG/L	10 U	10 U	10 U	10 U	10 U
di-n-Butylphthalate	UG/L	10 U	10 U	10 U	10 U	10 U
Fluoranthene	UG/L	10 U	10 U	10 U	10 U	10 U
Pyrene	UG/L	10 U	10 U	10 U	10 U	10 U
Butyl benzyl phthalate	UG/L	10 U	10 U	10 U	10 U	10 U
3,3'-Dichlorobenzidine	UG/L	10 U	10 U	10 U	10 U	10 U
Benzo[a]anthracene	UG/L	10 U	10 U	10 U	10 U	10 U
Chrysene	UG/L	10 U	10 U	10 U	10 U	10 U
bis(2-Ethylhexyl)phthalate	UG/L	10 U	10 U	10 U	10 U	10 U
di-n-Octylphthalate	UG/L	10 U	10 U	10 U	10 U	10 U
Benzo[b]fluoranthene	UG/L	10 U	10 U	10 U	10 U	10 U
Benzo[k]fluoranthene	UG/L	10 U	10 U	10 U	10 U	10 U
Benzo[a]pyrene	UG/L	10 U	10 U	10 U	10 U	10 U
Indeno[1,2,3-cd]pyrene	UG/L	10 U	10 U	10 U	10 U	10 U
Dibenz[a,h]anthracene	UG/L	10 U	10 U	10 U	10 U	10 U
Benzo[g,h,i]perylene	UG/L	10 U	10 U	10 U	10 U	10 U

FREQUENCY OF DETECTION SUMMARY
OPERABLE UNIT No. 8 (SITE 16)
NORTHEAST CREEK SURFACE WATER
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

Client Sample ID:	16-NC-SW01	16-NC-SW02	16-NC-SW03	16-NC-SW04	16-NC-SW05
Laboratory Sample ID:	AB1967	AB1970	AB1973	AB1985	AB1976
Date Sampled:	6/27/94	6/27/94	6/26/94	6/26/94	6/26/94

	<u>UNITS</u>					
<u>PESTICIDES/PCBs</u>						
alpha-BHC	UG/L	0.051 UJ	0.059 UJ	0.051 UJ	0.06 UJ	0.053 UJ
beta-BHC	UG/L	0.051 UJ	0.059 UJ	0.051 UJ	0.06 UJ	0.053 UJ
delta-BHC	UG/L	0.051 UJ	0.059 UJ	0.051 UJ	0.06 UJ	0.053 UJ
Lindane (gamma-BHC)	UG/L	0.051 UJ	0.059 UJ	0.051 UJ	0.06 UJ	0.053 UJ
Heptachlor	UG/L	0.051 UJ	0.059 UJ	0.051 UJ	0.06 UJ	0.053 UJ
Aldrin	UG/L	0.051 UJ	0.059 UJ	0.051 UJ	0.06 UJ	0.053 UJ
Heptachlor epoxide	UG/L	0.051 UJ	0.059 UJ	0.051 UJ	0.06 UJ	0.053 UJ
Endosulfan I	UG/L	0.051 UJ	0.059 UJ	0.051 UJ	0.06 UJ	0.053 UJ
Dieldrin	UG/L	0.1 UJ	0.12 UJ	0.1 UJ	0.12 UJ	0.11 UJ
4,4'-DDE	UG/L	0.1 UJ	0.12 UJ	0.1 UJ	0.12 UJ	0.11 UJ
Endrin	UG/L	0.1 UJ	0.12 UJ	0.1 UJ	0.12 UJ	0.11 UJ
Endosulfan II	UG/L	0.1 UJ	0.12 UJ	0.1 UJ	0.12 UJ	0.11 UJ
4,4'-DDD	UG/L	0.1 UJ	0.12 UJ	0.1 UJ	0.12 UJ	0.11 UJ
Endosulfan sulfate	UG/L	0.1 UJ	0.12 UJ	0.1 UJ	0.12 UJ	0.11 UJ
4,4'-DDT	UG/L	0.1 UJ	0.12 UJ	0.1 UJ	0.12 UJ	0.11 UJ
Methoxychlor	UG/L	0.51 UJ	0.59 UJ	0.51 UJ	0.6 UJ	0.53 UJ
Endrin ketone	UG/L	0.1 UJ	0.12 UJ	0.1 UJ	0.12 UJ	0.11 UJ
Endrin aldehyde	UG/L	0.1 UJ	0.12 UJ	0.1 UJ	0.12 UJ	0.11 UJ
alpha-Chlordane	UG/L	0.051 UJ	0.059 UJ	0.051 UJ	0.06 UJ	0.053 UJ
gamma-Chlordane	UG/L	0.051 UJ	0.059 UJ	0.051 UJ	0.06 UJ	0.053 UJ
Toxaphene	UG/L	5.1 UJ	5.9 UJ	5.1 UJ	6 UJ	5.3 UJ
Aroclor 1016	UG/L	1 UJ	1.2 UJ	1 UJ	1.2 UJ	1.1 UJ
Aroclor 1221	UG/L	2 UJ	2.4 UJ	2 UJ	2.4 UJ	2.1 UJ
Aroclor 1232	UG/L	1 UJ	1.2 UJ	1 UJ	1.2 UJ	1.1 UJ
Aroclor 1242	UG/L	1 UJ	1.2 UJ	1 UJ	1.2 UJ	1.1 UJ
Aroclor 1248	UG/L	1 UJ	1.2 UJ	1 UJ	1.2 UJ	1.1 UJ
Aroclor 1254	UG/L	1 UJ	1.2 UJ	1 UJ	1.2 UJ	1.1 UJ
Aroclor 1260	UG/L	1 UJ	1.2 UJ	1 UJ	1.2 UJ	1.1 UJ

FREQUENCY OF DETECTION SUMMARY
 OPERABLE UNIT No. 8 (SITE 16)
 NORTHEAST CREEK SURFACE WATER
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID: Laboratory Sample ID: Date Sampled:	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
UNITS						
VOLATILES						
Chloromethane	UG/L	10 U	10 U	ND	ND	0/5
Bromomethane	UG/L	10 U	10 U	ND	ND	0/5
Vinyl chloride	UG/L	10 U	10 U	ND	ND	0/5
Chloroethane	UG/L	10 U	10 U	ND	ND	0/5
Methylene chloride	UG/L	10 U	10 U	ND	ND	0/5
Acetone	UG/L	10 U	20 U	ND	ND	0/5
Carbon Disulfide	UG/L	10 U	10 U	ND	ND	0/5
1,1-Dichloroethene	UG/L	10 U	10 U	ND	ND	0/5
1,1-Dichloroethane	UG/L	10 U	10 U	ND	ND	0/5
1,2-Dichloroethene(total)	UG/L	10 U	10 U	ND	ND	0/5
Chloroform	UG/L	10 U	10 U	ND	ND	0/5
1,2-Dichloroethane	UG/L	10 U	10 U	ND	ND	0/5
2-Butanone	UG/L	10 U	10 U	ND	ND	0/5
1,1,1-Trichloroethane	UG/L	10 U	10 U	ND	ND	0/5
Carbon tetrachloride	UG/L	10 U	10 U	ND	ND	0/5
Bromodichloromethane	UG/L	10 U	10 U	ND	ND	0/5
1,2-Dichloropropane	UG/L	10 U	10 U	ND	ND	0/5
cis-1,3-Dichloropropene	UG/L	10 U	10 U	ND	ND	0/5
Trichloroethene	UG/L	10 U	10 U	ND	ND	0/5
Dibromochloromethane	UG/L	10 U	10 U	ND	ND	0/5
1,1,2-Trichloroethane	UG/L	10 U	10 U	ND	ND	0/5
Benzene	UG/L	10 U	10 U	ND	ND	0/5
trans-1,3-Dichloropropene	UG/L	10 U	10 U	ND	ND	0/5
Bromoform	UG/L	10 U	10 U	ND	ND	0/5
4-Methyl-2-pentanone	UG/L	10 U	10 U	7 J	7 J	16-NC-SW05 1/5
2-Hexanone	UG/L	10 U	10 U	ND	ND	0/5
Tetrachloroethene	UG/L	10 U	10 U	ND	ND	0/5
1,1,2,2-Tetrachloroethane	UG/L	10 U	10 U	2 J	2 J	16-NC-SW05 1/5
Toluene	UG/L	10 U	10 U	ND	ND	0/5
Chlorobenzene	UG/L	10 U	10 U	ND	ND	0/5
Ethylbenzene	UG/L	10 U	10 U	ND	ND	0/5
Styrene	UG/L	10 U	10 U	ND	ND	0/5
Xylenes (total)	UG/L	10 U	10 U	ND	ND	0/5

FREQUENCY OF DETECTION SUMMARY
OPERABLE UNIT No. 8 (SITE 16)
NORTHEAST CREEK SURFACE WATER
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

Client Sample ID: Laboratory Sample ID: Date Sampled:	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
UNITS						
SEMIVOLATILES						
Phenol	UG/L	10 U	10 U	ND	ND	0/5
bis(2-Chloroethyl) ether	UG/L	10 U	10 U	ND	ND	0/5
2-Chlorophenol	UG/L	10 U	10 U	ND	ND	0/5
1,3-Dichlorobenzene	UG/L	10 U	10 U	ND	ND	0/5
1,4-Dichlorobenzene	UG/L	10 U	10 U	ND	ND	0/5
1,2-Dichlorobenzene	UG/L	10 U	10 U	ND	ND	0/5
2-Methylphenol	UG/L	10 U	10 U	ND	ND	0/5
2,2'-oxybis-(1-chloropropane)	UG/L	10 U	10 U	ND	ND	0/5
4-Methylphenol	UG/L	10 U	10 U	ND	ND	0/5
N-Nitroso-di-n-propylamine	UG/L	10 U	10 U	ND	ND	0/5
Hexachloroethane	UG/L	10 U	10 U	ND	ND	0/5
Nitrobenzene	UG/L	10 U	10 U	ND	ND	0/5
Isophorone	UG/L	10 U	10 U	ND	ND	0/5
2-Nitrophenol	UG/L	10 U	10 U	ND	ND	0/5
2,4-Dimethylphenol	UG/L	10 U	10 U	ND	ND	0/5
bis(2-Chloroethoxy) methane	UG/L	10 U	10 U	ND	ND	0/5
2,4-Dichlorophenol	UG/L	10 U	10 U	ND	ND	0/5
1,2,4-Trichlorobenzene	UG/L	10 U	10 U	ND	ND	0/5
Naphthalene	UG/L	10 U	10 U	ND	ND	0/5
4-Chloroaniline	UG/L	10 U	10 U	ND	ND	0/5
Hexachlorobutadiene	UG/L	10 U	10 U	ND	ND	0/5
4-Chloro-3-methylphenol	UG/L	10 U	10 U	ND	ND	0/5
2-Methylnaphthalene	UG/L	10 U	10 U	ND	ND	0/5
Hexachlorocyclopentadiene	UG/L	10 U	10 U	ND	ND	0/5
2,4,6-Trichlorophenol	UG/L	10 U	10 U	ND	ND	0/5
2,4,5-Trichlorophenol	UG/L	25 U	25 U	ND	ND	0/5
2-Chloronaphthalene	UG/L	10 U	10 U	ND	ND	0/5
2-Nitroaniline	UG/L	25 U	25 U	ND	ND	0/5
Dimethyl phthalate	UG/L	10 U	10 U	ND	ND	0/5
Acenaphthylene	UG/L	10 U	10 U	ND	ND	0/5
2,6-Dinitrotoluene	UG/L	10 U	10 U	ND	ND	0/5
3-Nitroaniline	UG/L	25 U	25 U	ND	ND	0/5
Acenaphthene	UG/L	10 U	10 U	ND	ND	0/5

FREQUENCY OF DETECTION SUMMARY
OPERABLE UNIT No. 8 (SITE 16)
NORTHEAST CREEK SURFACE WATER
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

Client Sample ID: Laboratory Sample ID: Date Sampled:		MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
	UNITS						
	SEMIVOLATILES Cont.						
	2,4-Dinitrophenol	UG/L	25 U	25 U	ND	ND	0/5
	4-Nitrophenol	UG/L	25 U	25 U	ND	ND	0/5
	Dibenzofuran	UG/L	10 U	10 U	ND	ND	0/5
	2,4-Dinitrotoluene	UG/L	10 U	10 U	ND	ND	0/5
	Diethylphthalate	UG/L	10 U	10 U	ND	ND	0/5
	4-Chlorophenyl phenyl ether	UG/L	10 U	10 U	ND	ND	0/5
	Fluorene	UG/L	10 U	10 U	ND	ND	0/5
	4-Nitroaniline	UG/L	25 U	25 U	ND	ND	0/5
	4,6-Dinitro-2-methylphenol	UG/L	25 U	25 U	ND	ND	0/5
	N-nitrosodiphenylamine	UG/L	10 U	10 U	ND	ND	0/5
	4-Bromophenyl-phenylether	UG/L	10 U	10 U	ND	ND	0/5
	Hexachlorobenzene	UG/L	10 U	10 U	ND	ND	0/5
	Pentachlorophenol	UG/L	25 U	25 U	ND	ND	0/5
	Phenanthrene	UG/L	10 U	10 U	ND	ND	0/5
	Anthracene	UG/L	10 U	10 U	ND	ND	0/5
	Carbazole	UG/L	10 U	10 U	ND	ND	0/5
	di-n-Butylphthalate	UG/L	10 U	10 U	ND	ND	0/5
	Fluoranthene	UG/L	10 U	10 U	ND	ND	0/5
	Pyrene	UG/L	10 U	10 U	ND	ND	0/5
	Butyl benzyl phthalate	UG/L	10 U	10 U	ND	ND	0/5
	3,3'-Dichlorobenzidine	UG/L	10 U	10 U	ND	ND	0/5
	Benzo[a]anthracene	UG/L	10 U	10 U	ND	ND	0/5
	Chrysene	UG/L	10 U	10 U	ND	ND	0/5
	bis(2-Ethylhexyl)phthalate	UG/L	10 U	10 U	10 J	10 J	16-NC-SW05 1/5
	di-n-Octylphthalate	UG/L	10 U	10 U	ND	ND	0/5
	Benzo[b]fluoranthene	UG/L	10 U	10 U	ND	ND	0/5
	Benzo[k]fluoranthene	UG/L	10 U	10 U	ND	ND	0/5
	Benzo[a]pyrene	UG/L	10 U	10 U	ND	ND	0/5
	Indeno[1,2,3-cd]pyrene	UG/L	10 U	10 U	ND	ND	0/5
	Dibenz[a,h]anthracene	UG/L	10 U	10 U	ND	ND	0/5
	Benzo[g,h,i]perylene	UG/L	10 U	10 U	ND	ND	0/5

FREQUENCY OF DETECTION SUMMARY
OPERABLE UNIT No. 8 (SITE 16)
NORTHEAST CREEK SURFACE WATER
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

Client Sample ID: Laboratory Sample ID: Date Sampled:		MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
	UNITS						
	PESTICIDES/PCBs						
	alpha-BHC	UG/L	0.051 UJ	0.06 UJ	ND	ND	0/5
	beta-BHC	UG/L	0.051 UJ	0.06 UJ	ND	ND	0/5
	delta-BHC	UG/L	0.051 UJ	0.06 UJ	ND	ND	0/5
	Lindane (gamma-BHC)	UG/L	0.051 UJ	0.06 UJ	ND	ND	0/5
	Heptachlor	UG/L	0.051 UJ	0.06 UJ	ND	ND	0/5
	Aldrin	UG/L	0.051 UJ	0.06 UJ	ND	ND	0/5
	Heptachlor epoxide	UG/L	0.051 UJ	0.06 UJ	ND	ND	0/5
	Endosulfan I	UG/L	0.051 UJ	0.06 UJ	ND	ND	0/5
	Dieldrin	UG/L	0.1 UJ	0.12 UJ	ND	ND	0/5
	4,4'-DDE	UG/L	0.1 UJ	0.12 UJ	ND	ND	0/5
	Endrin	UG/L	0.1 UJ	0.12 UJ	ND	ND	0/5
	Endosulfan II	UG/L	0.1 UJ	0.12 UJ	ND	ND	0/5
	4,4'-DDD	UG/L	0.1 UJ	0.12 UJ	ND	ND	0/5
	Endosulfan sulfate	UG/L	0.1 UJ	0.12 UJ	ND	ND	0/5
	4,4'-DDT	UG/L	0.1 UJ	0.12 UJ	ND	ND	0/5
	Methoxychlor	UG/L	0.51 UJ	0.6 UJ	ND	ND	0/5
	Endrin ketone	UG/L	0.1 UJ	0.12 UJ	ND	ND	0/5
	Endrin aldehyde	UG/L	0.1 UJ	0.12 UJ	ND	ND	0/5
	alpha-Chlordane	UG/L	0.051 UJ	0.06 UJ	ND	ND	0/5
	gamma-Chlordane	UG/L	0.051 UJ	0.06 UJ	ND	ND	0/5
	Toxaphene	UG/L	5.1 UJ	6 UJ	ND	ND	0/5
	Aroclor 1016	UG/L	1 UJ	1.2 UJ	ND	ND	0/5
	Aroclor 1221	UG/L	2 UJ	2.4 UJ	ND	ND	0/5
	Aroclor 1232	UG/L	1 UJ	1.2 UJ	ND	ND	0/5
	Aroclor 1242	UG/L	1 UJ	1.2 UJ	ND	ND	0/5
	Aroclor 1248	UG/L	1 UJ	1.2 UJ	ND	ND	0/5
	Aroclor 1254	UG/L	1 UJ	1.2 UJ	ND	ND	0/5
	Aroclor 1260	UG/L	1 UJ	1.2 UJ	ND	ND	0/5

APPENDIX I.9
NORTHEAST CREEK SURFACE WATER METALS

FREQUENCY OF DETECTION SUMMARY
 OPERABLE UNIT No. 8 (SITE 16)
 NORTHEAST CREEK SURFACE WATER
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TAL INORGANICS

Client Sample ID:	16-NC-SW01	16-NC-SW02	16-NC-SW03	16-NC-SW04	16-NC-SW05
Laboratory Sample ID:	AB1969	AB1972	AB1975	AB1987	AB1978
Date Sampled:	6/27/94	6/27/94	6/26/94	6/26/94	6/26/94

	UNITS	16-NC-SW01	16-NC-SW02	16-NC-SW03	16-NC-SW04	16-NC-SW05
Aluminum	UG/L	4210 J	4560 J	4880 J	5550 J	12300 J
Antimony	UG/L	50 U	50 U	50 U	50 U	50 U
Arsenic	UG/L	2 UJ	2.2 J	3.1 J	2.6 J	2.9 J
Barium	UG/L	22.9	23.2	25.8	26.7	30.4
Beryllium	UG/L	1 U	1 U	1 U	1 U	1 U
Cadmium	UG/L	5 U	5 U	5 U	5 U	5 U
Calcium	UG/L	161000 J	154000 J	165000 J	173000 J	165000 J
Chromium	UG/L	10 UJ	10 U	10 U	10 U	15.6
Cobalt	UG/L	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ
Copper	UG/L	10 U	10 UJ	10 UJ	10 UJ	10 UJ
Iron	UG/L	2780 J	3380 J	3410 J	3590 J	6650 J
Lead	UG/L	6	7 J	5.8 J	5.5 J	13.7
Magnesium	UG/L	542000	542000	570000	615000	552000
Manganese	UG/L	19.3	21.2	19.3	17.2	24.4
Mercury	UG/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Nickel	UG/L	20 UJ	20 UJ	20 UJ	20 UJ	20 UJ
Potassium	UG/L	175000	169000	179000	188000	179000
Selenium	UG/L	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ
Silver	UG/L	8.9	8.4	8.8	8.6	6.4
Sodium	UG/L	4250000 J	4240000 J	4430000 J	4740000 J	4270000 J
Thallium	UG/L	10 UJ	2 UJ	2 UJ	10 UJ	10 UJ
Vanadium	UG/L	10 U	10 U	10 U	10 U	19.6
Zinc	UG/L	5 U	5 U	6.2 U	11.7 U	13.8 U

FREQUENCY OF DETECTION SUMMARY
OPERABLE UNIT No. 8 (SITE 16)
NORTHEAST CREEK SURFACE WATER
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TAL INORGANICS

Client Sample ID: Laboratory Sample ID: Date Sampled:	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION	
	UNITS						
Aluminum	UG/L	NA	NA	4210 J	12300 J	16-NC-SW05	5/5
Antimony	UG/L	50 U	50 U	ND	ND		0/5
Arsenic	UG/L	2 UJ	2 UJ	2.2 J	3.1 J	16-NC-SW03	4/5
Barium	UG/L	NA	NA	22.9	30.4	16-NC-SW05	5/5
Beryllium	UG/L	1 U	1 U	ND	ND		0/5
Cadmium	UG/L	5 U	5 U	ND	ND		0/5
Calcium	UG/L	NA	NA	154000 J	173000 J	16-NC-SW04	5/5
Chromium	UG/L	10 UJ	10 UJ	15.6	15.6	16-NC-SW05	1/5
Cobalt	UG/L	10 UJ	10 UJ	ND	ND		0/5
Copper	UG/L	10 U	10 U	ND	ND		0/5
Iron	UG/L	NA	NA	2780 J	6650 J	16-NC-SW05	5/5
Lead	UG/L	NA	NA	5.5 J	13.7	16-NC-SW05	5/5
Magnesium	UG/L	NA	NA	542000	615000	16-NC-SW04	5/5
Manganese	UG/L	NA	NA	17.2	24.4	16-NC-SW05	5/5
Mercury	UG/L	0.2 U	0.2 U	ND	ND		0/5
Nickel	UG/L	20 UJ	20 UJ	ND	ND		0/5
Potassium	UG/L	NA	NA	169000	188000	16-NC-SW04	5/5
Selenium	UG/L	2 UJ	2 UJ	ND	ND		0/5
Silver	UG/L	NA	NA	6.4	8.9	16-NC-SW01	5/5
Sodium	UG/L	NA	NA	4240000 J	4740000 J	16-NC-SW04	5/5
Thallium	UG/L	2 UJ	10 UJ	ND	ND		0/5
Vanadium	UG/L	10 U	10 U	19.6	19.6	16-NC-SW05	1/5
Zinc	UG/L	5 U	13.8 U	ND	ND		0/5

APPENDIX I.10
NORTHEAST CREEK SEDIMENTS ORGANICS

FREQUENCY OF DETECTION SUMMARY
OPERABLE UNIT No. 8 (SITE 16)
NORTHEAST CREEK SEDIMENT
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

Client Sample ID:	16-NC-SD01-06	16-NC-SD01-612	16-NC-SD02-06	16-NC-SD02-612	16-NC-SD03-06	16-NC-SD03-612
Laboratory Sample ID:	AB2048	AB2026	AB2045	AB2024	AB2036	AB2018
Date Sampled:	6/27/94	6/27/94	6/27/94	6/27/94	6/26/94	6/26/94

	UNITS						
VOLATILES							
Chloromethane	UG/KG	12 UJ	13 U	15 U	17 U	11 U	12 U
Bromomethane	UG/KG	12 U	13 U	15 U	17 U	11 U	12 U
Vinyl chloride	UG/KG	12 U	13 U	15 U	17 U	11 U	12 U
Chloroethane	UG/KG	12 U	13 U	15 U	17 U	11 U	12 U
Methylene chloride	UG/KG	12 U	13 U	70 U	18 U	47 U	41 U
Acetone	UG/KG	12 U	37 U	15 U	52 U	17 U	12 U
Carbon Disulfide	UG/KG	12 U	13 U	15 U	17 U	2 J	12 U
1,1-Dichloroethene	UG/KG	12 U	13 U	15 U	17 U	11 U	12 U
1,1-Dichloroethane	UG/KG	12 U	13 U	15 U	17 U	11 U	12 U
1,2-Dichloroethene(total)	UG/KG	12 U	13 U	15 U	17 U	11 U	12 U
Chloroform	UG/KG	12 U	13 U	15 U	17 U	11 U	12 U
1,2-Dichloroethane	UG/KG	12 U	13 U	15 U	17 U	11 U	12 U
2-Butanone	UG/KG	12 U	13 U	15 U	17 U	11 U	12 U
1,1,1-Trichloroethane	UG/KG	12 U	13 U	15 U	17 U	11 U	12 U
Carbon tetrachloride	UG/KG	12 U	13 U	15 U	17 U	11 U	12 U
Bromodichloromethane	UG/KG	12 U	13 U	15 U	17 U	11 U	12 U
1,2-Dichloropropane	UG/KG	12 U	13 U	15 U	17 U	11 U	12 U
cis-1,3-Dichloropropene	UG/KG	12 U	13 U	15 U	17 U	11 U	12 U
Trichloroethene	UG/KG	12 U	13 U	15 U	17 U	11 U	12 U
Dibromochloromethane	UG/KG	12 U	13 U	15 U	17 U	11 U	12 U
1,1,2-Trichloroethane	UG/KG	12 U	13 U	15 U	17 U	11 U	12 U
Benzene	UG/KG	12 U	13 U	15 U	17 U	11 U	12 U
trans-1,3-Dichloropropene	UG/KG	12 U	13 U	15 U	17 U	11 U	12 U
Bromoform	UG/KG	12 U	13 U	15 U	17 U	11 U	12 U
4-Methyl-2-pentanone	UG/KG	12 U	13 U	15 U	17 U	11 U	12 U
2-Hexanone	UG/KG	12 U	13 U	15 U	17 U	11 U	12 U
Tetrachloroethene	UG/KG	12 U	13 U	15 U	17 U	11 U	12 U
1,1,2,2-Tetrachloroethane	UG/KG	12 U	13 U	15 U	17 U	11 U	12 U
Toluene	UG/KG	12 U	13 U	2 J	17 U	11 U	12 U
Chlorobenzene	UG/KG	12 U	13 U	15 U	17 U	11 U	12 U
Ethylbenzene	UG/KG	12 U	13 U	15 U	17 U	11 U	12 U
Styrene	UG/KG	12 U	13 U	15 U	17 U	11 U	12 U
Xylenes (total)	UG/KG	12 U	13 U	15 U	17 U	11 U	12 U

FREQUENCY OF DETECTION SUMMARY
 OPERABLE UNIT No. 8 (SITE 16)
 NORTHEAST CREEK SEDIMENT
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID:	16-NC-SD01-06	16-NC-SD01-612	16-NC-SD02-06	16-NC-SD02-612	16-NC-SD03-06	16-NC-SD03-612
Laboratory Sample ID:	AB2048	AB2026	AB2045	AB2024	AB2036	AB2018
Date Sampled:	6/27/94	6/27/94	6/27/94	6/27/94	6/26/94	6/26/94

	UNITS	16-NC-SD01-06	16-NC-SD01-612	16-NC-SD02-06	16-NC-SD02-612	16-NC-SD03-06	16-NC-SD03-612
SEMIVOLATILES							
Phenol	UG/KG	1900 U	2400 U	990 U	560 U	380 U	380 U
bis(2-Chloroethyl) ether	UG/KG	1900 U	2100 U	990 U	560 U	380 U	380 U
2-Chlorophenol	UG/KG	1900 U	2100 U	990 U	560 U	380 U	380 U
1,3-Dichlorobenzene	UG/KG	1900 U	2100 U	990 U	560 U	380 U	380 U
1,4-Dichlorobenzene	UG/KG	1900 U	2100 U	990 U	560 U	380 U	380 U
1,2-Dichlorobenzene	UG/KG	1900 U	2100 U	990 U	560 U	380 U	380 U
2-Methylphenol	UG/KG	1900 U	2100 U	990 U	560 U	380 U	380 U
2,2'-oxybis-(1-chloropropane)	UG/KG	1900 U	2100 U	990 U	560 U	380 U	380 U
4-Methylphenol	UG/KG	1900 U	2100 U	990 U	560 U	380 U	380 U
N-Nitroso-di-n-propylamine	UG/KG	1900 U	2100 U	990 U	560 U	380 U	380 U
Hexachloroethane	UG/KG	1900 U	2100 U	990 U	560 U	380 U	380 U
Nitrobenzene	UG/KG	1900 U	2100 U	990 U	560 U	380 U	380 U
Isophorone	UG/KG	1900 U	2100 U	990 U	560 U	380 U	380 U
2-Nitrophenol	UG/KG	1900 U	2100 U	990 U	560 U	380 U	380 U
2,4-Dimethylphenol	UG/KG	1900 U	2100 U	990 U	560 U	380 U	380 U
bis(2-Chloroethoxy) methane	UG/KG	1900 U	2100 U	990 U	560 U	380 U	380 U
2,4-Dichlorophenol	UG/KG	1900 U	2100 U	990 U	560 U	380 U	380 U
1,2,4-Trichlorobenzene	UG/KG	1900 U	2100 U	990 U	560 U	380 U	380 U
Naphthalene	UG/KG	1900 U	2100 U	990 U	560 U	380 U	380 U
4-Chloroaniline	UG/KG	1900 U	2100 U	990 U	560 U	380 U	380 U
Hexachlorobutadiene	UG/KG	1900 U	2100 U	990 U	560 U	380 U	380 U
4-Chloro-3-methylphenol	UG/KG	1900 U	2100 U	990 U	560 U	380 U	380 U
2-Methylnaphthalene	UG/KG	1900 U	2100 U	990 U	560 U	380 U	380 U
Hexachlorocyclopentadiene	UG/KG	1900 U	2100 U	990 U	560 U	380 U	380 U
2,4,6-Trichlorophenol	UG/KG	1900 U	2100 U	990 U	560 U	380 U	380 U
2,4,5-Trichlorophenol	UG/KG	4600 U	5100 U	2400 U	1400 U	920 U	930 U
2-Chloronaphthalene	UG/KG	1900 U	2100 U	990 U	560 U	380 U	380 U
2-Nitroaniline	UG/KG	4600 U	5100 U	2400 U	1400 U	920 U	930 U
Dimethyl phthalate	UG/KG	1900 U	2100 U	990 U	560 U	380 U	380 U
Acenaphthylene	UG/KG	1900 U	2100 U	990 U	560 U	380 U	380 U
2,6-Dinitrotoluene	UG/KG	1900 U	2100 U	990 U	560 U	380 U	380 U
3-Nitroaniline	UG/KG	4600 U	5100 U	2400 U	1400 U	920 U	930 U
Acenaphthene	UG/KG	1900 U	2100 U	990 U	560 U	380 U	380 U

FREQUENCY OF DETECTION SUMMARY
 OPERABLE UNIT No. 8 (SITE 16)
 NORTHEAST CREEK SEDIMENT
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP-LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID:	16-NC-SD01-08	16-NC-SD01-612	16-NC-SD02-06	16-NC-SD02-612	16-NC-SD03-08	16-NC-SD03-612
Laboratory Sample ID:	AB2048	AB2026	AB2045	AB2024	AB2036	AB2018
Date Sampled:	6/27/94	6/27/94	6/27/94	6/27/94	6/26/94	6/26/94

	UNITS						
SEMIVOLATILES Cont.							
2,4-Dinitrophenol	UG/KG	4600 U	5100 U	2400 U	1400 U	920 U	930 U
4-Nitrophenol	UG/KG	4600 UJ	5100 UJ	2400 UJ	1400 UJ	920 UJ	930 UJ
Dibenzofuran	UG/KG	1900 U	2100 U	990 U	560 U	380 U	380 U
2,4-Dinitrotoluene	UG/KG	1900 U	2100 U	990 U	560 U	380 U	380 U
Diethylphthalate	UG/KG	1900 U	2100 U	990 U	560 U	380 U	380 U
4-Chlorophenyl phenyl ether	UG/KG	1900 U	2100 U	990 U	560 U	380 U	380 U
Fluorene	UG/KG	1900 U	2100 U	990 U	560 U	380 U	380 U
4-Nitroaniline	UG/KG	4600 U	5100 U	2400 U	1400 U	920 U	930 U
4,6-Dinitro-2-methylphenol	UG/KG	4600 U	5100 U	2400 U	1400 U	920 U	930 U
N-nitrosodiphenylamine	UG/KG	1900 U	2100 U	990 U	560 U	380 U	380 U
4-Bromophenyl-phenylether	UG/KG	1900 U	2100 U	990 U	560 U	380 U	380 U
Hexachlorobenzene	UG/KG	1900 U	2100 U	990 U	560 U	380 U	380 U
Pentachlorophenol	UG/KG	4600 U	5100 U	2400 U	1400 U	920 U	930 U
Phenanthrene	UG/KG	1900 U	2100 U	990 U	560 U	380 U	380 U
Anthracene	UG/KG	1900 U	2100 U	990 U	560 U	380 U	380 U
Carbazole	UG/KG	1900 U	2100 U	990 U	560 U	380 U	380 U
di-n-Butylphthalate	UG/KG	1900 U	2100 U	990 U	560 U	380 U	380 U
Fluoranthene	UG/KG	1900 U	2100 U	990 U	560 U	380 U	380 U
Pyrene	UG/KG	1900 U	2100 U	990 U	560 U	380 U	380 U
Butyl benzyl phthalate	UG/KG	1900 U	2100 U	990 U	560 U	380 U	380 U
3,3'-Dichlorobenzidine	UG/KG	1900 U	2100 U	990 U	560 U	380 U	380 U
Benzo[a]anthracene	UG/KG	1900 U	2100 U	990 U	560 U	380 U	380 U
Chrysene	UG/KG	1900 U	2100 U	990 U	560 U	380 U	380 U
bis(2-Ethylhexyl)phthalate	UG/KG	1900 U	2100 U	990 U	560 U	380 U	380 U
di-n-Octylphthalate	UG/KG	1900 U	2100 U	990 U	560 U	380 U	380 U
Benzo[b]fluoranthene	UG/KG	1900 U	2100 U	990 U	560 U	380 U	380 U
Benzo[k]fluoranthene	UG/KG	1900 U	2100 U	990 U	560 U	380 U	380 U
Benzo[a]pyrene	UG/KG	1900 U	2100 U	990 U	560 U	380 U	380 U
Indeno[1,2,3-cd]pyrene	UG/KG	1900 U	2100 U	990 U	560 U	380 U	380 U
Dibenz[a,h]anthracene	UG/KG	1900 U	2100 U	990 U	560 U	380 U	380 U
Benzo[g,h,i]perylene	UG/KG	1900 U	2100 U	990 U	560 U	380 U	380 U

FREQUENCY OF DETECTION SUMMARY
OPERABLE UNIT No. 8 (SITE 16)
NORTHEAST CREEK SEDIMENT
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

Client Sample ID:	16-NC-SD01-06	16-NC-SD01-612	16-NC-SD02-06	16-NC-SD02-612	16-NC-SD03-06	16-NC-SD03-612
Laboratory Sample ID:	AB2048	AB2026	AB2045	AB2024	AB2036	AB2018
Date Sampled:	6/27/94	6/27/94	6/27/94	6/27/94	6/26/94	6/26/94

	<u>UNITS</u>						
PESTICIDES/PCBs							
alpha-BHC	UG/KG	1.9 U	2.2 U	2.5 U	2.9 U	1.9 U	2 U
beta-BHC	UG/KG	1.9 U	2.2 U	2.5 U	2.9 U	1.9 U	2 U
delta-BHC	UG/KG	1.9 U	2.2 U	2.5 U	2.9 U	1.9 U	2 U
Lindane (gamma-BHC)	UG/KG	1.9 U	2.2 U	2.5 U	2.9 U	1.9 U	2 U
Heptachlor	UG/KG	1.9 U	2.2 U	2.5 U	2.9 U	1.9 U	2 U
Aldrin	UG/KG	1.9 U	2.2 U	2.5 U	2.9 U	1.9 U	2 U
Heptachlor epoxide	UG/KG	1.9 U	2.2 U	2.5 U	2.9 U	1.9 U	2 U
Endosulfan I	UG/KG	1.9 U	2.2 U	2.5 U	2.9 U	1.9 U	2 U
Dieldrin	UG/KG	3.7 U	4.2 U	4.9 U	5.5 U	3.7 U	3.8 U
4,4'-DDE	UG/KG	3.7 U	4.2 U	4.9 U	5.5 U	3.7 U	3.8 U
Endrin	UG/KG	3.7 U	4.2 U	4.9 U	5.5 U	3.7 U	3.8 U
Endosulfan II	UG/KG	3.7 U	4.2 U	4.9 U	5.5 U	3.7 U	3.8 U
4,4'-DDD	UG/KG	3.7 U	4.2 U	4.9 U	5.5 U	3.7 U	3.8 U
Endosulfan sulfate	UG/KG	3.7 U	4.2 U	4.9 U	5.5 U	3.7 U	3.8 U
4,4'-DDT	UG/KG	3.7 U	4.2 U	4.9 U	5.5 U	3.7 U	3.8 U
Methoxychlor	UG/KG	19 U	22 U	25 U	29 U	19 U	20 U
Endrin ketone	UG/KG	3.7 UJ	4.2 UJ	4.9 UJ	5.5 U	3.7 UJ	3.8 U
Endrin aldehyde	UG/KG	3.7 U	4.2 U	4.9 U	5.5 U	3.7 U	3.8 U
alpha-Chlordane	UG/KG	1.9 U	2.2 U	2.5 U	2.9 U	1.9 U	2 U
gamma-Chlordane	UG/KG	1.9 U	2.2 U	2.5 U	2.9 U	1.9 U	2 U
Toxaphene	UG/KG	190 U	220 U	250 U	290 U	190 U	200 U
Aroclor 1016	UG/KG	37 U	42 U	49 U	55 U	37 U	38 U
Aroclor 1221	UG/KG	76 U	86 U	99 U	110 U	75 U	78 U
Aroclor 1232	UG/KG	37 U	42 U	49 U	55 U	37 U	38 U
Aroclor 1242	UG/KG	37 U	42 U	49 U	55 U	37 U	38 U
Aroclor 1248	UG/KG	37 U	42 U	49 U	55 U	37 U	38 U
Aroclor 1254	UG/KG	37 U	42 U	49 U	55 U	37 U	38 U
Aroclor 1260	UG/KG	37 U	42 U	49 U	55 U	37 U	38 U

FREQUENCY OF DETECTION SUMMARY
 OPERABLE UNIT No. 8 (SITE 16)
 NORTHEAST CREEK SEDIMENT
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID:	16-NC-SD04-06	16-NC-SD04-612	16-NC-SD05-06	16-NC-SD05-612
Laboratory Sample ID:	AB2042	AB2012	AB2030	AB2014
Date Sampled:	6/26/94	6/26/94	6/26/94	6/26/94

UNITS

VOLATILES

	UG/KG	12 U	12 U	14 UJ	13 U
Chloromethane	UG/KG	12 U	12 U	14 UJ	13 U
Bromomethane	UG/KG	12 U	12 U	14 U	13 U
Vinyl chloride	UG/KG	12 U	12 U	14 U	13 U
Chloroethane	UG/KG	12 U	12 U	14 U	13 U
Methylene chloride	UG/KG	58 U	33 U	14 U	13 U
Acetone	UG/KG	12 U	12 U	15 U	13 U
Carbon Disulfide	UG/KG	12 U	12 U	14 U	13 U
1,1-Dichloroethene	UG/KG	12 U	12 U	14 U	13 U
1,1-Dichloroethane	UG/KG	12 U	12 U	14 U	13 U
1,2-Dichloroethene(total)	UG/KG	12 U	12 U	14 U	13 U
Chloroform	UG/KG	12 U	12 U	14 U	13 U
1,2-Dichloroethane	UG/KG	12 U	12 U	14 U	13 U
2-Butanone	UG/KG	12 U	12 U	14 U	13 U
1,1,1-Trichloroethane	UG/KG	12 U	12 U	14 U	13 U
Carbon tetrachloride	UG/KG	12 U	12 U	14 U	13 U
Bromodichloromethane	UG/KG	12 U	12 U	14 U	13 U
1,2-Dichloropropane	UG/KG	12 U	12 U	14 U	13 U
cis-1,3-Dichloropropene	UG/KG	12 U	12 U	14 U	13 U
Trichloroethene	UG/KG	12 U	12 U	14 U	13 U
Dibromochloromethane	UG/KG	12 U	12 U	14 U	13 U
1,1,2-Trichloroethane	UG/KG	12 U	12 U	14 U	13 U
Benzene	UG/KG	12 U	12 U	14 U	13 U
trans-1,3-Dichloropropene	UG/KG	12 U	12 U	14 U	13 U
Bromoform	UG/KG	12 U	12 U	14 U	13 U
4-Methyl-2-pentanone	UG/KG	12 U	12 U	14 U	13 U
2-Hexanone	UG/KG	12 U	12 U	14 U	13 U
Tetrachloroethene	UG/KG	12 U	12 U	14 U	13 U
1,1,2,2-Tetrachloroethane	UG/KG	12 U	12 U	14 U	13 U
Toluene	UG/KG	1 J	12 U	14 U	13 U
Chlorobenzene	UG/KG	12 U	12 U	14 U	13 U
Ethylbenzene	UG/KG	12 U	12 U	14 U	13 U
Styrene	UG/KG	12 U	12 U	14 U	13 U
Xylenes (total)	UG/KG	12 U	12 U	14 U	13 U

FREQUENCY OF DETECTION SUMMARY
OPERABLE UNIT No. 8 (SITE 16)
NORTHEAST CREEK SEDIMENT
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

Client Sample ID:	16-NC-SD04-06	16-NC-SD04-612	16-NC-SD05-06	16-NC-SD05-612
Laboratory Sample ID:	AB2042	AB2012	AB2030	AB2014
Date Sampled:	6/26/94	6/26/94	6/26/94	6/26/94

	UNITS				
SEMIVOLATILES					
Phenol	UG/KG	2100 U	400 U	440 U	430 U
bis(2-Chloroethyl) ether	UG/KG	2100 U	400 U	440 U	430 U
2-Chlorophenol	UG/KG	2100 U	400 U	440 U	430 U
1,3-Dichlorobenzene	UG/KG	2100 U	400 U	440 U	430 U
1,4-Dichlorobenzene	UG/KG	2100 U	400 U	440 U	430 U
1,2-Dichlorobenzene	UG/KG	2100 U	400 U	440 U	430 U
2-Methylphenol	UG/KG	2100 U	400 U	440 U	430 U
2,2'-oxybis-(1-chloropropane)	UG/KG	2100 U	400 U	440 U	430 U
4-Methylphenol	UG/KG	2100 U	400 U	440 U	430 U
N-Nitroso-di-n-propylamine	UG/KG	2100 U	400 U	440 U	430 U
Hexachloroethane	UG/KG	2100 U	400 U	440 U	430 U
Nitrobenzene	UG/KG	2100 U	400 U	440 U	430 U
Isophorone	UG/KG	2100 U	400 U	440 U	430 U
2-Nitrophenol	UG/KG	2100 U	400 U	440 U	430 U
2,4-Dimethylphenol	UG/KG	2100 U	400 U	440 U	430 U
bis(2-Chloroethoxy) methane	UG/KG	2100 U	400 U	440 U	430 U
2,4-Dichlorophenol	UG/KG	2100 U	400 U	440 U	430 U
1,2,4-Trichlorobenzene	UG/KG	2100 U	400 U	440 U	430 U
Naphthalene	UG/KG	2100 U	400 U	440 U	430 U
4-Chloroaniline	UG/KG	2100 U	400 U	440 U	430 U
Hexachlorobutadiene	UG/KG	2100 U	400 U	440 U	430 U
4-Chloro-3-methylphenol	UG/KG	2100 U	400 U	440 U	430 U
2-Methylnaphthalene	UG/KG	2100 U	400 U	440 U	430 U
Hexachlorocyclopentadiene	UG/KG	2100 U	400 U	440 U	430 U
2,4,6-Trichlorophenol	UG/KG	2100 U	400 U	440 U	430 U
2,4,5-Trichlorophenol	UG/KG	5000 U	980 U	1100 U	1000 U
2-Chloronaphthalene	UG/KG	2100 U	400 U	440 U	430 U
2-Nitroaniline	UG/KG	5000 U	980 U	1100 U	1000 U
Dimethyl phthalate	UG/KG	2100 U	400 U	440 U	430 U
Acenaphthylene	UG/KG	2100 U	400 U	440 U	430 U
2,6-Dinitrotoluene	UG/KG	2100 U	400 U	440 U	430 U
3-Nitroaniline	UG/KG	5000 U	980 U	1100 U	1000 U
Acenaphthene	UG/KG	2100 U	400 U	440 U	430 U

FREQUENCY OF DETECTION SUMMARY
 OPERABLE UNIT No. 8 (SITE 16)
 NORTHEAST CREEK SEDIMENT
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID:	16-NC-SD04-06	16-NC-SD04-612	16-NC-SD05-06	16-NC-SD05-612
Laboratory Sample ID:	AB2042	AB2012	AB2030	AB2014
Date Sampled:	6/26/94	6/26/94	6/26/94	6/26/94

	UNITS				
SEMIVOLATILES Cont.					
2,4-Dinitrophenol	UG/KG	5000 U	980 U	1100 U	1000 U
4-Nitrophenol	UG/KG	5000 U	980 UJ	1100 UJ	1000 UJ
Dibenzofuran	UG/KG	2100 U	400 U	440 U	430 U
2,4-Dinitrotoluene	UG/KG	2100 U	400 U	440 U	430 U
Diethylphthalate	UG/KG	2100 U	400 U	440 U	430 U
4-Chlorophenyl phenyl ether	UG/KG	2100 U	400 U	440 U	430 U
Fluorene	UG/KG	2100 U	400 U	440 U	430 U
4-Nitroaniline	UG/KG	5000 U	980 U	1100 U	1000 U
4,6-Dinitro-2-methylphenol	UG/KG	5000 U	980 U	1100 U	1000 U
N-nitrosodiphenylamine	UG/KG	2100 U	400 U	440 U	430 U
4-Bromophenyl-phenylether	UG/KG	2100 U	400 U	440 U	430 U
Hexachlorobenzene	UG/KG	2100 U	400 U	440 U	430 U
Pentachlorophenol	UG/KG	5000 U	980 U	1100 U	1000 U
Phenanthrene	UG/KG	2100 U	400 U	440 U	430 U
Anthracene	UG/KG	2100 U	400 U	440 U	430 U
Carbazole	UG/KG	2100 U	400 U	440 U	430 U
di-n-Butylphthalate	UG/KG	2100 U	400 U	440 U	430 U
Fluoranthene	UG/KG	2100 U	400 U	440 U	430 U
Pyrene	UG/KG	2100 U	400 U	440 U	430 U
Butyl benzyl phthalate	UG/KG	2100 U	400 U	440 U	430 U
3,3'-Dichlorobenzidine	UG/KG	2100 U	400 U	440 U	430 U
Benzo[a]anthracene	UG/KG	2100 U	400 U	440 U	430 U
Chrysene	UG/KG	2100 U	400 U	440 U	430 U
bis(2-Ethylhexyl)phthalate	UG/KG	2100 U	400 U	440 U	430 U
di-n-Octylphthalate	UG/KG	2100 U	400 U	440 U	430 U
Benzo[b]fluoranthene	UG/KG	2100 U	400 U	440 U	430 U
Benzo[k]fluoranthene	UG/KG	2100 U	400 U	440 U	430 U
Benzo[a]pyrene	UG/KG	2100 U	400 U	440 U	430 U
Indeno[1,2,3-cd]pyrene	UG/KG	2100 U	400 U	440 U	430 U
Dibenz[a,h]anthracene	UG/KG	2100 U	400 U	440 U	430 U
Benzo[g,h,i]perylene	UG/KG	2100 U	400 U	440 U	430 U

FREQUENCY OF DETECTION SUMMARY
OPERABLE UNIT No. 8 (SITE 16)
NORTHEAST CREEK SEDIMENT
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

Client Sample ID:	16-NC-SD04-06	16-NC-SD04-612	16-NC-SD05-06	16-NC-SD05-612
Laboratory Sample ID:	AB2042	AB2012	AB2030	AB2014
Date Sampled:	6/26/94	6/26/94	6/26/94	6/26/94

	<u>UNITS</u>				
<u>PESTICIDES/PCBs</u>					
alpha-BHC	UG/KG	2.1 U	2.1 U	2.2 U	2.2 U
beta-BHC	UG/KG	2.1 U	2.1 U	2.2 U	2.2 U
delta-BHC	UG/KG	2.1 U	2.1 U	2.2 U	2.2 U
Lindane (gamma-BHC)	UG/KG	2.1 U	2.1 U	2.2 U	2.2 U
Heptachlor	UG/KG	2.1 U	2.1 U	2.2 U	2.2 U
Aldrin	UG/KG	2.1 U	2.1 U	2.2 U	2.2 U
Heptachlor epoxide	UG/KG	2.1 U	2.1 U	2.2 U	2.2 U
Endosulfan I	UG/KG	2.1 U	2.1 U	2.2 U	2.2 U
Dieldrin	UG/KG	4 U	4 U	4.3 U	4.2 U
4,4'-DDE	UG/KG	4 U	4 U	4.3 U	4.2 U
Endrin	UG/KG	4 U	4 U	4.3 U	4.2 U
Endosulfan II	UG/KG	4 U	4 U	4.3 U	4.2 U
4,4'-DDD	UG/KG	4 U	4 U	4.3 U	4.2 U
Endosulfan sulfate	UG/KG	4 U	4 U	4.3 U	4.2 U
4,4'-DDT	UG/KG	4 U	4 U	4.3 U	4.2 U
Methoxychlor	UG/KG	21 U	21 U	22 U	22 U
Endrin ketone	UG/KG	4 UJ	4 U	4.3 UJ	4.2 U
Endrin aldehyde	UG/KG	4 U	4 U	4.3 U	4.2 U
alpha-Chlordane	UG/KG	2.1 U	2.1 U	2.2 U	2.2 U
gamma-Chlordane	UG/KG	2.1 U	2.1 U	2.2 U	2.2 U
Toxaphene	UG/KG	210 U	210 U	220 U	220 U
Aroclor 1016	UG/KG	40 U	40 U	43 U	42 U
Aroclor 1221	UG/KG	81 U	81 U	88 U	85 U
Aroclor 1232	UG/KG	40 U	40 U	43 U	42 U
Aroclor 1242	UG/KG	40 U	40 U	43 U	42 U
Aroclor 1248	UG/KG	40 U	40 U	43 U	42 U
Aroclor 1254	UG/KG	40 U	40 U	43 U	42 U
Aroclor 1260	UG/KG	40 U	40 U	43 U	42 U

FREQUENCY OF DETECTION SUMMARY
OPERABLE UNIT No. 8 (SITE 16)
NORTHEAST CREEK SEDIMENT
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

Client Sample ID: Laboratory Sample ID: Date Sampled:		MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
	UNITS						
	VOLATILES						
	Chloromethane	UG/KG	11 U	17 U	ND	ND	0/10
	Bromomethane	UG/KG	11 U	17 U	ND	ND	0/10
	Vinyl chloride	UG/KG	11 U	17 U	ND	ND	0/10
	Chloroethane	UG/KG	11 U	17 U	ND	ND	0/10
	Methylene chloride	UG/KG	12 U	70 U	ND	ND	0/10
	Acetone	UG/KG	12 U	52 U	ND	ND	0/10
	Carbon Disulfide	UG/KG	12 U	17 U	2 J	2 J	16-NC-SD03-06 1/10
	1,1-Dichloroethene	UG/KG	11 U	17 U	ND	ND	0/10
	1,1-Dichloroethane	UG/KG	11 U	17 U	ND	ND	0/10
	1,2-Dichloroethene(total)	UG/KG	11 U	17 U	ND	ND	0/10
	Chloroform	UG/KG	11 U	17 U	ND	ND	0/10
	1,2-Dichloroethane	UG/KG	11 U	17 U	ND	ND	0/10
	2-Butanone	UG/KG	11 U	17 U	ND	ND	0/10
	1,1,1-Trichloroethane	UG/KG	11 U	17 U	ND	ND	0/10
	Carbon tetrachloride	UG/KG	11 U	17 U	ND	ND	0/10
	Bromodichloromethane	UG/KG	11 U	17 U	ND	ND	0/10
	1,2-Dichloropropane	UG/KG	11 U	17 U	ND	ND	0/10
	cis-1,3-Dichloropropene	UG/KG	11 U	17 U	ND	ND	0/10
	Trichloroethene	UG/KG	11 U	17 U	ND	ND	0/10
	Dibromochloromethane	UG/KG	11 U	17 U	ND	ND	0/10
	1,1,2-Trichloroethane	UG/KG	11 U	17 U	ND	ND	0/10
	Benzene	UG/KG	11 U	17 U	ND	ND	0/10
	trans-1,3-Dichloropropene	UG/KG	11 U	17 U	ND	ND	0/10
	Bromoform	UG/KG	11 U	17 U	ND	ND	0/10
	4-Methyl-2-pentanone	UG/KG	11 U	17 U	ND	ND	0/10
	2-Hexanone	UG/KG	11 U	17 U	ND	ND	0/10
	Tetrachloroethene	UG/KG	11 U	17 U	ND	ND	0/10
	1,1,2,2-Tetrachloroethane	UG/KG	11 U	17 U	ND	ND	0/10
	Toluene	UG/KG	11 U	17 U	1 J	2 J	16-NC-SD02-06 2/10
	Chlorobenzene	UG/KG	11 U	17 U	ND	ND	0/10
	Ethylbenzene	UG/KG	11 U	17 U	ND	ND	0/10
	Styrene	UG/KG	11 U	17 U	ND	ND	0/10
	Xylenes (total)	UG/KG	11 U	17 U	ND	ND	0/10

FREQUENCY OF DETECTION SUMMARY
OPERABLE UNIT No. 8 (SITE 16)
NORTHEAST CREEK SEDIMENT
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

Client Sample ID: Laboratory Sample ID: Date Sampled:	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
	UNITS					
	SEMIVOLATILES					
Phenol	UG/KG	380 U	2400 U	ND	ND	0/10
bis(2-Chloroethyl) ether	UG/KG	380 U	2100 U	ND	ND	0/10
2-Chlorophenol	UG/KG	380 U	2100 U	ND	ND	0/10
1,3-Dichlorobenzene	UG/KG	380 U	2100 U	ND	ND	0/10
1,4-Dichlorobenzene	UG/KG	380 U	2100 U	ND	ND	0/10
1,2-Dichlorobenzene	UG/KG	380 U	2100 U	ND	ND	0/10
2-Methylphenol	UG/KG	380 U	2100 U	ND	ND	0/10
2,2'-oxybis-(1-chloropropane)	UG/KG	380 U	2100 U	ND	ND	0/10
4-Methylphenol	UG/KG	380 U	2100 U	ND	ND	0/10
N-Nitroso-di-n-propylamine	UG/KG	380 U	2100 U	ND	ND	0/10
Hexachloroethane	UG/KG	380 U	2100 U	ND	ND	0/10
Nitrobenzene	UG/KG	380 U	2100 U	ND	ND	0/10
Isophorone	UG/KG	380 U	2100 U	ND	ND	0/10
2-Nitrophenol	UG/KG	380 U	2100 U	ND	ND	0/10
2,4-Dimethylphenol	UG/KG	380 U	2100 U	ND	ND	0/10
bis(2-Chloroethoxy) methane	UG/KG	380 U	2100 U	ND	ND	0/10
2,4-Dichlorophenol	UG/KG	380 U	2100 U	ND	ND	0/10
1,2,4-Trichlorobenzene	UG/KG	380 U	2100 U	ND	ND	0/10
Naphthalene	UG/KG	380 U	2100 U	ND	ND	0/10
4-Chloroaniline	UG/KG	380 U	2100 U	ND	ND	0/10
Hexachlorobutadiene	UG/KG	380 U	2100 U	ND	ND	0/10
4-Chloro-3-methylphenol	UG/KG	380 U	2100 U	ND	ND	0/10
2-Methylnaphthalene	UG/KG	380 U	2100 U	ND	ND	0/10
Hexachlorocyclopentadiene	UG/KG	380 U	2100 U	ND	ND	0/10
2,4,6-Trichlorophenol	UG/KG	380 U	2100 U	ND	ND	0/10
2,4,5-Trichlorophenol	UG/KG	920 U	5100 U	ND	ND	0/10
2-Chloronaphthalene	UG/KG	380 U	2100 U	ND	ND	0/10
2-Nitroaniline	UG/KG	920 U	5100 U	ND	ND	0/10
Dimethyl phthalate	UG/KG	380 U	2100 U	ND	ND	0/10
Acenaphthylene	UG/KG	380 U	2100 U	ND	ND	0/10
2,6-Dinitrotoluene	UG/KG	380 U	2100 U	ND	ND	0/10
3-Nitroaniline	UG/KG	920 U	5100 U	ND	ND	0/10
Acenaphthene	UG/KG	380 U	2100 U	ND	ND	0/10

FREQUENCY OF DETECTION SUMMARY
OPERABLE UNIT No. 8 (SITE 16)
NORTHEAST CREEK SEDIMENT
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

Client Sample ID: Laboratory Sample ID: Date Sampled:		MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
	UNITS						
	SEMIVOLATILES Cont.						
	2,4-Dinitrophenol	UG/KG 920 U	5100 U	ND	ND		0/10
	4-Nitrophenol	UG/KG 920 UJ	5100 UJ	ND	ND		0/10
	Dibenzofuran	UG/KG 380 U	2100 U	ND	ND		0/10
	2,4-Dinitrotoluene	UG/KG 380 U	2100 U	ND	ND		0/10
	Diethylphthalate	UG/KG 380 U	2100 U	ND	ND		0/10
	4-Chlorophenyl phenyl ether	UG/KG 380 U	2100 U	ND	ND		0/10
	Fluorene	UG/KG 380 U	2100 U	ND	ND		0/10
	4-Nitroaniline	UG/KG 920 U	5100 U	ND	ND		0/10
	4,6-Dinitro-2-methylphenol	UG/KG 920 U	5100 U	ND	ND		0/10
	N-nitrosodiphenylamine	UG/KG 380 U	2100 U	ND	ND		0/10
	4-Bromophenyl-phenylether	UG/KG 380 U	2100 U	ND	ND		0/10
	Hexachlorobenzene	UG/KG 380 U	2100 U	ND	ND		0/10
	Pentachlorophenol	UG/KG 920 U	5100 U	ND	ND		0/10
	Phenanthrene	UG/KG 380 U	2100 U	ND	ND		0/10
	Anthracene	UG/KG 380 U	2100 U	ND	ND		0/10
	Carbazole	UG/KG 380 U	2100 U	ND	ND		0/10
	di-n-Butylphthalate	UG/KG 380 U	2100 U	ND	ND		0/10
	Fluoranthene	UG/KG 380 U	2100 U	ND	ND		0/10
	Pyrene	UG/KG 380 U	2100 U	ND	ND		0/10
	Butyl benzyl phthalate	UG/KG 380 U	2100 U	ND	ND		0/10
	3,3'-Dichlorobenzidine	UG/KG 380 U	2100 U	ND	ND		0/10
	Benzo[a]anthracene	UG/KG 380 U	2100 U	ND	ND		0/10
	Chrysene	UG/KG 380 U	2100 U	ND	ND		0/10
	bis(2-Ethylhexyl)phthalate	UG/KG 380 U	2100 U	ND	ND		0/10
	di-n-Octylphthalate	UG/KG 380 U	2100 U	ND	ND		0/10
	Benzo[b]fluoranthene	UG/KG 380 U	2100 U	ND	ND		0/10
	Benzo[k]fluoranthene	UG/KG 380 U	2100 U	ND	ND		0/10
	Benzo[a]pyrene	UG/KG 380 U	2100 U	ND	ND		0/10
	Indeno[1,2,3-cd]pyrene	UG/KG 380 U	2100 U	ND	ND		0/10
	Dibenz[a,h]anthracene	UG/KG 380 U	2100 U	ND	ND		0/10
	Benzo[g,h,i]perylene	UG/KG 380 U	2100 U	ND	ND		0/10

FREQUENCY OF DETECTION SUMMARY
OPERABLE UNIT No. 8 (SITE 16)
NORTHEAST CREEK SEDIMENT
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

Client Sample ID: Laboratory Sample ID: Date Sampled:	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
UNITS						
PESTICIDES/PCBs						
alpha-BHC	UG/KG	1.9 U	2.9 U	ND	ND	0/10
beta-BHC	UG/KG	1.9 U	2.9 U	ND	ND	0/10
delta-BHC	UG/KG	1.9 U	2.9 U	ND	ND	0/10
Lindane (gamma-BHC)	UG/KG	1.9 U	2.9 U	ND	ND	0/10
Heptachlor	UG/KG	1.9 U	2.9 U	ND	ND	0/10
Aldrin	UG/KG	1.9 U	2.9 U	ND	ND	0/10
Heptachlor epoxide	UG/KG	1.9 U	2.9 U	ND	ND	0/10
Endosulfan I	UG/KG	1.9 U	2.9 U	ND	ND	0/10
Dieldrin	UG/KG	3.7 U	5.5 U	ND	ND	0/10
4,4'-DDE	UG/KG	3.7 U	5.5 U	ND	ND	0/10
Endrin	UG/KG	3.7 U	5.5 U	ND	ND	0/10
Endosulfan II	UG/KG	3.7 U	5.5 U	ND	ND	0/10
4,4'-DDD	UG/KG	3.7 U	5.5 U	ND	ND	0/10
Endosulfan sulfate	UG/KG	3.7 U	5.5 U	ND	ND	0/10
4,4'-DDT	UG/KG	3.7 U	5.5 U	ND	ND	0/10
Methoxychlor	UG/KG	19 U	29 U	ND	ND	0/10
Endrin ketone	UG/KG	3.7 UJ	5.5 U	ND	ND	0/10
Endrin aldehyde	UG/KG	3.7 U	5.5 U	ND	ND	0/10
alpha-Chlordane	UG/KG	1.9 U	2.9 U	ND	ND	0/10
gamma-Chlordane	UG/KG	1.9 U	2.9 U	ND	ND	0/10
Toxaphene	UG/KG	190 U	290 U	ND	ND	0/10
Aroclor 1016	UG/KG	37 U	55 U	ND	ND	0/10
Aroclor 1221	UG/KG	75 U	110 U	ND	ND	0/10
Aroclor 1232	UG/KG	37 U	55 U	ND	ND	0/10
Aroclor 1242	UG/KG	37 U	55 U	ND	ND	0/10
Aroclor 1248	UG/KG	37 U	55 U	ND	ND	0/10
Aroclor 1254	UG/KG	37 U	55 U	ND	ND	0/10
Aroclor 1260	UG/KG	37 U	55 U	ND	ND	0/10

APPENDIX I.11
NORTHEAST CREEK SEDIMENTS METALS

FREQUENCY OF DETECTION SUMMARY
OPERABLE UNIT No. 8 (SITE 16)
NORTHEAST CREEK SEDIMENT
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TAL INORGANICS

Client Sample ID:	16-NC-SD01-06	16-NC-SD01-612	16-NC-SD02-06	16-NC-SD02-612	16-NC-SD03-06	16-NC-SD03-612	
Laboratory Sample ID:	AB2049	AB2027	AB2046	AB2025	AB2037	AB2019	
Date Sampled:	6/27/94	6/27/94	6/27/94	6/27/94	6/26/94	6/26/94	
	UNITS						
Aluminum	MG/KG	2150 J	6700 J	1760 J	3570 J	1620 J	1400 J
Antimony	MG/KG	11.7 U	12.1 U	13.8 U	15.3 U	11.4 U	11 U
Arsenic	MG/KG	1.5 J	1.2 J	0.8 J	0.64 UJ	3.6 J	2.8 J
Barium	MG/KG	3.4	7.5	5.5	10.8	1.9	3.3
Beryllium	MG/KG	0.3	0.27	0.28 U	0.31 U	0.23 U	0.22 U
Cadmium	MG/KG	1.2 U	1.2 U	1.4 U	1.5 U	1.1 U	1.1 U
Calcium	MG/KG	1220	434	341	192	87.4	93.8
Chromium	MG/KG	10	11.2	3.9	3.9	8.9	4.2
Cobalt	MG/KG	2.4	2.4 U	2.8 U	3.1 U	2.3 U	2.2 U
Copper	MG/KG	2.3 UJ	2.4 UJ	2.8 UJ	3.1 UJ	2.3 UJ	2.2 UJ
Iron	MG/KG	9110 J	4520 J	1290 J	336 J	8470 J	2500 J
Lead	MG/KG	4.5 J	6 J	3.2 J	4.8 J	5.3 J	2.3 J
Magnesium	MG/KG	271 U	504	415 U	309 U	168 U	172 U
Manganese	MG/KG	4.1	7.8	3.8	4.8	6.1	1.7
Mercury	MG/KG	0.12 U	0.12 U	0.14 U	0.13 U	0.1 U	0.12 U
Nickel	MG/KG	4.7 U	4.8 U	5.5 U	6.1 U	4.6 U	4.4 U
Potassium	MG/KG	411 U	561 U	460 U	306 U	294 U	243 U
Selenium	MG/KG	0.45 U	0.5 U	0.56 U	0.64 U	0.44 UJ	0.47 U
Silver	MG/KG	1.2	1.2 U	1.4 U	1.5 U	1.1 U	1.1 U
Sodium	MG/KG	710	671	1320	334	622	568
Thallium	MG/KG	0.45 U	0.5 U	0.56 U	0.64 U	0.44 U	0.47 U
Vanadium	MG/KG	29.9	11.8	3.6	4.3	11.6	4.7
Zinc	MG/KG	4.7 J	2.8 J	2 J	2.7 J	5.6 J	1.9 J

FREQUENCY OF DETECTION SUMMARY
OPERABLE UNIT No. 8 (SITE 16)
NORTHEAST CREEK SEDIMENT
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TAL INORGANICS

Client Sample ID:	16-NC-SD04-06	16-NC-SD04-612	16-NC-SD05-06	16-NC-SD05-612
Laboratory Sample ID:	AB2043	AB2013	AB2031	AB2015
Date Sampled:	6/26/94	6/26/94	6/26/94	6/26/94

	UNITS				
Aluminum	MG/KG	1380 J	4160 J	6150 J	7460 J
Antimony	MG/KG	12 U	12.2 U	12.8 U	12.5 U
Arsenic	MG/KG	3.8 J	0.47 UJ	1.3 J	4.7 J
Barium	MG/KG	3.5	10.5	7.8	10.3
Beryllium	MG/KG	0.24 U	0.24 U	0.29	0.33
Cadmium	MG/KG	1.2 U	1.2 U	1.3 U	1.3 U
Calcium	MG/KG	124	114	103	90.5
Chromium	MG/KG	10.1 J	7.1	16.4	21.2
Cobalt	MG/KG	2.4 U	2.4 U	2.6	3.1
Copper	MG/KG	2.4 UJ	2.4 UJ	2.6 UJ	2.5 UJ
Iron	MG/KG	8730 J	1460 J	6630 J	9960 J
Lead	MG/KG	3.2 J	5.5 J	5.2 J	4.6 J
Magnesium	MG/KG	185 UJ	304 U	606	618
Manganese	MG/KG	1.9	10.4	10.4	10.5
Mercury	MG/KG	0.11 U	0.11 U	0.13 U	0.13 U
Nickel	MG/KG	4.8 U	4.9 U	5.1 U	5 U
Potassium	MG/KG	399 U	451 U	793 U	899 U
Selenium	MG/KG	0.48 UJ	0.47 U	0.49 U	0.49 U
Silver	MG/KG	1.2 U	1.2 U	1.3 U	1.3 U
Sodium	MG/KG	646 J	170	429	402
Thallium	MG/KG	0.48 U	0.47 U	0.49 U	0.49 U
Vanadium	MG/KG	19.2 J	5	14.3	16.7
Zinc	MG/KG	46.4 J	2.5 J	3.9 J	3.6 J

FREQUENCY OF DETECTION SUMMARY
OPERABLE UNIT No. 8 (SITE 16)
NORTHEAST CREEK SEDIMENT
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TAL INORGANICS

Client Sample ID: Laboratory Sample ID: Date Sampled:	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
	<u>UNITS</u>					
Aluminum	NA	NA	1380 J	7460 J	16-NC-SD05-612	10/10
Antimony	11 U	15.3 U	ND	ND		0/10
Arsenic	0.47 UJ	0.64 UJ	0.8 J	4.7 J	16-NC-SD05-612	8/10
Barium	NA	NA	1.9	10.8	16-NC-SD02-612	10/10
Beryllium	0.22 U	0.31 U	0.27	0.33	16-NC-SD05-612	4/10
Cadmium	1.1 U	1.5 U	ND	ND		0/10
Calcium	NA	NA	87.4	1220	16-NC-SD01-06	10/10
Chromium	NA	NA	3.9	21.2	16-NC-SD05-612	10/10
Cobalt	2.2 U	3.1 U	2.4	3.1	16-NC-SD05-612	3/10
Copper	2.2 UJ	3.1 UJ	ND	ND		0/10
Iron	NA	NA	336 J	9960 J	16-NC-SD05-612	10/10
Lead	NA	NA	2.3 J	6 J	16-NC-SD01-612	10/10
Magnesium	168 U	415 U	504	618	16-NC-SD05-612	3/10
Manganese	NA	NA	1.7	10.5	16-NC-SD05-612	10/10
Mercury	0.1 U	0.14 U	ND	ND		0/10
Nickel	4.4 U	6.1 U	ND	ND		0/10
Potassium	243 U	899 U	ND	ND		0/10
Selenium	0.44 UJ	0.64 U	ND	ND		0/10
Silver	1.1 U	1.5 U	1.2	1.2	16-NC-SD01-06	1/10
Sodium	NA	NA	170	1320	16-NC-SD02-06	10/10
Thallium	0.44 U	0.64 U	ND	ND		0/10
Vanadium	NA	NA	3.6	29.9	16-NC-SD01-06	10/10
Zinc	NA	NA	1.9 J	46.4 J	16-NC-SD04-06	10/10

APPENDIX J
FIELD DUPLICATE SUMMARIES

APPENDIX J.1
SOIL ORGANICS

FIELD DUPLICATE SUMMARY
 OPERABLE UNIT No. 8
 SITE 16 - DUPLICATES - SOIL
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID:	16-BD-SB01-00	16-BD-SB01-00D	16-BD-SB16-05	16-BD-SB16-05D	16-MW06-06	16-MW06-06D
Laboratory Sample ID:	AC4115	AC4117	AC4128	AC4130	AC4864	AC4866
Date Sampled:	10/19/94	10/19/94	10/18/94	10/18/94	10/21/94	10/21/94

	UNITS						
VOLATILES							
Chloromethane	UG/KG	11 UJ	11 UJ	11 U	10 U	11 U	12 U
Bromomethane	UG/KG	11 UJ	11 UJ	11 U	10 U	11 U	12 U
Vinyl chloride	UG/KG	11 UJ	11 UJ	11 U	10 U	11 U	12 U
Chloroethane	UG/KG	11 UJ	11 UJ	11 U	10 U	11 U	12 U
Methylene chloride	UG/KG	11 UJ	11 UJ	11 U	10 U	11 U	12 U
Acetone	UG/KG	11 UJ	11 UJ	760	980	11 U	12 U
Carbon Disulfide	UG/KG	11 UJ	11 UJ	11 U	10 U	11 U	12 U
1,1-Dichloroethene	UG/KG	11 UJ	11 UJ	11 U	10 U	11 U	12 U
1,1-Dichloroethane	UG/KG	11 UJ	11 UJ	11 U	10 U	11 U	12 U
1,2-Dichloroethene(total)	UG/KG	11 UJ	11 UJ	11 U	10 U	11 U	12 U
Chloroform	UG/KG	11 UJ	11 UJ	11 U	10 U	11 U	12 U
1,2-Dichloroethane	UG/KG	11 UJ	11 UJ	11 U	10 U	11 U	12 U
2-Butanone	UG/KG	11 UJ	11 UJ	11 U	10 U	11 U	12 U
1,1,1-Trichloroethane	UG/KG	11 UJ	11 UJ	11 U	10 U	11 U	12 U
Carbon tetrachloride	UG/KG	11 UJ	11 UJ	11 U	10 U	11 U	12 U
Bromodichloromethane	UG/KG	11 UJ	11 UJ	11 U	10 U	11 U	12 U
1,2-Dichloropropane	UG/KG	11 UJ	11 UJ	11 U	10 U	11 U	12 U
cis-1,3-Dichloropropene	UG/KG	11 UJ	11 UJ	11 U	10 U	11 U	12 U
Trichloroethene	UG/KG	11 UJ	11 UJ	11 U	10 U	11 U	12 U
Dibromochloromethane	UG/KG	11 UJ	11 UJ	11 U	10 U	11 U	12 U
1,1,2-Trichloroethane	UG/KG	11 UJ	11 UJ	11 U	10 U	11 U	12 U
Benzene	UG/KG	11 UJ	11 UJ	11 U	10 U	11 U	12 U
trans-1,3-Dichloropropene	UG/KG	11 UJ	11 UJ	11 U	10 U	11 U	12 U
Bromoform	UG/KG	11 UJ	11 UJ	11 U	10 U	11 U	12 U
4-Methyl-2-pentanone	UG/KG	11 UJ	11 UJ	11 U	10 U	11 U	12 U
2-Hexanone	UG/KG	11 UJ	11 UJ	11 U	10 U	11 U	12 U
Tetrachloroethene	UG/KG	11 UJ	11 UJ	11 U	10 U	11 U	12 U
1,1,2,2-Tetrachloroethane	UG/KG	11 UJ	11 UJ	11 U	10 U	11 U	12 U
Toluene	UG/KG	11 UJ	11 UJ	11 U	10 U	11 U	12 U
Chlorobenzene	UG/KG	11 UJ	11 UJ	11 U	10 U	11 U	12 U
Ethylbenzene	UG/KG	11 UJ	11 UJ	11 U	10 U	11 U	12 U
Styrene	UG/KG	11 UJ	11 UJ	11 U	10 U	11 U	12 U
Xylenes (total)	UG/KG	11 UJ	11 UJ	11 U	10 U	11 U	12 U

FIELD DUPLICATE SUMMARY
 OPERABLE UNIT No. 8
 SITE 16 - DUPLICATES - SOIL
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID:	16-BD-SB01-00	16-BD-SB01-00D	16-BD-SB16-05	16-BD-SB16-05D	16-MW06-06	16-MW06-06D
Laboratory Sample ID:	AC4115	AC4117	AC4128	AC4130	AC4864	AC4866
Date Sampled:	10/19/94	10/19/94	10/18/94	10/18/94	10/21/94	10/21/94

	<u>UNITS</u>					
<u>SEMIVOLATILES</u>						
Phenol	UG/KG	1700 U	1800 U	340 U	340 U	380 U
bis(2-Chloroethyl) ether	UG/KG	1700 U	1800 U	340 U	340 U	380 U
2-Chlorophenol	UG/KG	1700 U	1800 U	340 U	340 U	380 U
1,3-Dichlorobenzene	UG/KG	1700 U	1800 U	340 U	340 U	380 U
1,4-Dichlorobenzene	UG/KG	1700 UJ	1800 UJ	340 U	340 U	380 U
1,2-Dichlorobenzene	UG/KG	1700 U	1800 U	340 U	340 U	380 U
2-Methylphenol	UG/KG	1700 U	1800 U	340 U	340 U	380 U
2,2'-oxybis-(1-chloropropane)	UG/KG	1700 U	1800 U	340 U	340 U	380 U
4-Methylphenol	UG/KG	1700 U	1800 U	340 U	340 U	380 U
N-Nitroso-di-n-propylamine	UG/KG	1700 U	1800 U	340 U	340 U	380 U
Hexachloroethane	UG/KG	1700 U	1800 U	340 U	340 U	380 U
Nitrobenzene	UG/KG	1700 U	1800 U	340 U	340 U	380 U
Isophorone	UG/KG	1700 U	1800 U	340 U	340 U	380 U
2-Nitrophenol	UG/KG	1700 U	1800 U	340 U	340 U	380 U
2,4-Dimethylphenol	UG/KG	1700 U	1800 U	340 U	340 U	380 U
bis(2-Chloroethoxy) methane	UG/KG	1700 U	1800 U	340 U	340 U	380 U
2,4-Dichlorophenol	UG/KG	1700 U	1800 U	340 U	340 U	380 U
1,2,4-Trichlorobenzene	UG/KG	1700 UJ	1800 UJ	340 U	340 U	380 U
Naphthalene	UG/KG	1700 U	1800 U	340 U	340 U	380 U
4-Chloroaniline	UG/KG	1700 U	1800 U	340 U	340 U	380 U
Hexachlorobutadiene	UG/KG	1700 U	1800 U	340 U	340 U	380 U
4-Chloro-3-methylphenol	UG/KG	1700 U	1800 U	340 U	340 U	380 U
2-Methylnaphthalene	UG/KG	1700 U	1800 U	340 U	340 U	380 U
Hexachlorocyclopentadiene	UG/KG	1700 U	1800 U	340 U	340 U	380 U
2,4,6-Trichlorophenol	UG/KG	1700 U	1800 U	340 U	340 U	380 U
2,4,5-Trichlorophenol	UG/KG	4200 U	4300 U	820 U	830 U	910 U
2-Chloronaphthalene	UG/KG	1700 U	1800 U	340 U	340 U	380 U
2-Nitroaniline	UG/KG	4200 U	4300 U	820 U	830 U	910 U
Dimethyl phthalate	UG/KG	1700 U	1800 U	340 U	340 U	380 U
Acenaphthylene	UG/KG	1700 U	1800 U	340 U	340 U	380 U
2,6-Dinitrotoluene	UG/KG	1700 U	1800 U	340 U	340 U	380 U
3-Nitroaniline	UG/KG	4200 U	4300 U	820 U	830 U	910 U
Acenaphthene	UG/KG	1700 UJ	1800 UJ	340 U	340 U	380 U

FIELD DUPLICATE SUMMARY
 OPERABLE UNIT No. 8
 SITE 16 - DUPLICATES - SOIL
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID:	16-BD-SB01-00	16-BD-SB01-00D	16-BD-SB16-05	16-BD-SB16-05D	16-MW06-06	16-MW06-06D
Laboratory Sample ID:	AC4115	AC4117	AC4128	AC4130	AC4864	AC4866
Date Sampled:	10/19/94	10/19/94	10/18/94	10/18/94	10/21/94	10/21/94

UNITS

SEMIVOLATILES Cont.

	16-BD-SB01-00	16-BD-SB01-00D	16-BD-SB16-05	16-BD-SB16-05D	16-MW06-06	16-MW06-06D
2,4-Dinitrophenol	UG/KG 4200 U	4300 U	820 U	830 U	910 UJ	930 UJ
4-Nitrophenol	UG/KG 4200 U	4300 U	820 U	830 U	910 U	930 U
Dibenzofuran	UG/KG 1700 U	1800 U	340 U	340 U	380 U	380 U
2,4-Dinitrotoluene	UG/KG 1700 U	1800 U	340 U	340 U	380 U	380 U
Diethylphthalate	UG/KG 1700 U	1800 U	340 U	340 U	380 U	380 U
4-Chlorophenyl phenyl ether	UG/KG 1700 U	1800 U	340 U	340 U	380 U	380 U
Fluorene	UG/KG 1700 U	1800 U	340 U	340 U	380 U	380 U
4-Nitroaniline	UG/KG 4200 U	4300 U	820 U	830 U	910 U	930 U
4,6-Dinitro-2-methylphenol	UG/KG 4200 U	4300 U	820 U	830 U	910 U	930 U
N-nitrosodiphenylamine	UG/KG 1700 U	1800 U	340 U	340 U	380 U	380 U
4-Bromophenyl-phenylether	UG/KG 1700 U	1800 U	340 U	340 U	380 U	380 U
Hexachlorobenzene	UG/KG 1700 U	1800 U	340 U	340 U	380 U	380 U
Pentachlorophenol	UG/KG 4200 U	4300 U	820 U	830 U	910 U	930 U
Phenanthrene	UG/KG 1700 U	1800 U	340 U	340 U	380 U	380 U
Anthracene	UG/KG 1700 U	1800 U	340 U	340 U	380 U	380 U
Carbazole	UG/KG 1700 U	1800 U	340 U	340 U	380 U	380 U
di-n-Butylphthalate	UG/KG 1700 U	1800 U	340 U	340 U	380 U	380 U
Fluoranthene	UG/KG 1700 U	1800 U	340 U	340 U	380 U	380 U
Pyrene	UG/KG 1700 UJ	1800 UJ	340 U	340 U	380 U	380 U
Butyl benzyl phthalate	UG/KG 1700 U	1800 U	340 U	340 U	380 U	380 U
3,3'-Dichlorobenzidine	UG/KG 1700 U	1800 U	340 U	340 U	380 U	380 U
Benzo[a]anthracene	UG/KG 1700 U	1800 U	340 U	340 U	380 U	380 U
Chrysene	UG/KG 1700 U	1800 U	340 U	340 U	380 U	380 U
bis(2-Ethylhexyl)phthalate	UG/KG 1700 U	1800 U	340 U	340 U	380 U	380 U
di-n-Octylphthalate	UG/KG 1700 U	1800 U	340 U	340 U	46 J	380 U
Benzo[b]fluoranthene	UG/KG 1700 U	1800 U	340 U	340 U	380 U	380 U
Benzo[k]fluoranthene	UG/KG 1700 U	1800 U	340 U	340 U	380 U	380 U
Benzo[a]pyrene	UG/KG 1700 U	1800 U	340 U	340 U	380 U	380 U
Indeno[1,2,3-cd]pyrene	UG/KG 1700 U	1800 U	340 U	340 U	380 U	380 U
Dibenz[a,h]anthracene	UG/KG 1700 U	1800 U	340 U	340 U	380 U	380 U
Benzo[g,h,i]perylene	UG/KG 1700 U	1800 U	340 U	110 J	380 U	380 U

FIELD DUPLICATE SUMMARY
 OPERABLE UNIT No. 8
 SITE 16 - DUPLICATES - SOIL
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID:	16-BD-SB01-00	16-BD-SB01-00D	16-BD-SB16-05	16-BD-SB16-05D	16-MW06-06	16-MW06-06D
Laboratory Sample ID:	AC4115	AC4117	AC4128	AC4130	AC4864	AC4866
Date Sampled:	10/19/94	10/19/94	10/18/94	10/18/94	10/21/94	10/21/94

	<u>UNITS</u>						
<u>PESTICIDES/PCBs</u>							
alpha-BHC	UG/KG	1.8 U	1.8 U	1.8 U	1.8 U	2 UJ	1.9 U
beta-BHC	UG/KG	1.8 U	1.8 U	1.8 U	1.8 U	2 UJ	1.9 U
delta-BHC	UG/KG	1.8 U	1.8 U	1.8 U	1.8 U	2 UJ	1.9 U
Lindane (gamma-BHC)	UG/KG	1.8 U	1.8 U	1.8 U	1.8 U	2 UJ	1.9 U
Heptachlor	UG/KG	1.8 U	1.8 U	1.8 U	1.8 U	2 UJ	1.9 U
Aldrin	UG/KG	1.8 U	1.8 U	1.8 U	1.8 U	2 UJ	1.9 U
Heptachlor epoxide	UG/KG	1.8 U	1.8 U	1.8 U	1.8 U	2 UJ	1.9 U
Endosulfan I	UG/KG	1.8 U	1.8 U	1.8 U	1.8 U	2 UJ	1.9 U
Dieldrin	UG/KG	3.4 U	18 J	3.5 U	3.5 U	3.8 UJ	3.7 U
4,4'-DDE	UG/KG	59	75 J	3.5 U	3.5 U	3.8 UJ	3.7 U
Endrin	UG/KG	3.4 U	19 J	3.5 U	3.4 U	3.8 UJ	3.7 U
Endosulfan II	UG/KG	6.4	19 J	3.5 U	3.4 U	3.8 UJ	3.7 U
4,4'-DDD	UG/KG	55 J	18 J	3.5 U	3.4 U	3.8 UJ	3.7 U
Endosulfan sulfate	UG/KG	3.4 U	3.6 U	3.5 U	3.4 U	3.8 UJ	3.7 U
4,4'-DDT	UG/KG	140 J	79 J	3.5 U	3.4 U	3.8 UJ	3.7 U
Methoxychlor	UG/KG	18 U	18 U	18 U	18 U	20 UJ	19 U
Endrin ketone	UG/KG	3.4 U	3.6 U	3.5 U	3.4 U	3.8 UJ	3.7 U
Endrin aldehyde	UG/KG	9.2 J	25 J	3.5 U	3.4 U	3.8 UJ	3.7 U
alpha-Chlordane	UG/KG	8.7	39 J	1.8 U	1.8 U	2 UJ	1.9 U
gamma-Chlordane	UG/KG	1.8 U	6.1	1.8 U	1.8 U	2 UJ	1.9 U
Toxaphene	UG/KG	180 U	180 U	180 U	180 U	200 UJ	190 U
Aroclor 1016	UG/KG	34 U	36 U	35 U	34 U	38 UJ	37 U
Aroclor 1221	UG/KG	69 U	72 U	71 U	70 U	77 UJ	76 U
Aroclor 1232	UG/KG	34 U	36 U	35 U	34 U	38 UJ	37 U
Aroclor 1242	UG/KG	34 U	36 U	35 U	34 U	38 UJ	37 U
Aroclor 1248	UG/KG	34 U	36 U	35 U	34 U	38 UJ	37 U
Aroclor 1254	UG/KG	460 J	1900 J	35 U	34 U	38 UJ	37 U
Aroclor 1260	UG/KG	34 U	36 U	35 U	34 U	38 UJ	37 U

FIELD DUPLICATE SUMMARY
 OPERABLE UNIT No. 8
 SITE 16 - DUPLICATES - SOIL
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID:	16-SDA-SB04-00	16-SDA-SB04-00D
Laboratory Sample ID:	AC4162	AC4166
Date Sampled:	10/18/94	10/18/94

	<u>UNITS</u>		
<u>VOLATILES</u>			
Chloromethane	UG/KG	11 U	11 U
Bromomethane	UG/KG	11 U	11 U
Vinyl chloride	UG/KG	11 U	11 U
Chloroethane	UG/KG	11 U	11 U
Methylene chloride	UG/KG	11 U	11 U
Acetone	UG/KG	11 U	11 U
Carbon Disulfide	UG/KG	11 U	11 U
1,1-Dichloroethene	UG/KG	11 U	11 U
1,1-Dichloroethane	UG/KG	11 U	11 U
1,2-Dichloroethene(total)	UG/KG	11 U	11 U
Chloroform	UG/KG	11 U	11 U
1,2-Dichloroethane	UG/KG	11 U	11 U
2-Butanone	UG/KG	11 U	11 U
1,1,1-Trichloroethane	UG/KG	11 U	11 U
Carbon tetrachloride	UG/KG	11 U	11 U
Bromodichloromethane	UG/KG	11 U	11 U
1,2-Dichloropropane	UG/KG	11 U	11 U
cis-1,3-Dichloropropene	UG/KG	11 U	11 U
Trichloroethene	UG/KG	11 U	11 U
Dibromochloromethane	UG/KG	11 U	11 U
1,1,2-Trichloroethane	UG/KG	11 U	11 U
Benzene	UG/KG	11 U	11 U
trans-1,3-Dichloropropene	UG/KG	11 U	11 U
Bromoform	UG/KG	11 U	11 U
4-Methyl-2-pentanone	UG/KG	11 U	11 U
2-Hexanone	UG/KG	11 U	11 U
Tetrachloroethene	UG/KG	11 U	11 U
1,1,2,2-Tetrachloroethane	UG/KG	11 U	11 U
Toluene	UG/KG	11 U	11 U
Chlorobenzene	UG/KG	11 U	11 U
Ethylbenzene	UG/KG	11 U	11 U
Styrene	UG/KG	11 U	11 U
Xylenes (total)	UG/KG	11 U	11 U

FIELD DUPLICATE SUMMARY
 OPERABLE UNIT No. 8
 SITE 16 - DUPLICATES - SOIL
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID:	16-SDA-SB04-00	16-SDA-SB04-00D
Laboratory Sample ID:	AC4162	AC4166
Date Sampled:	10/18/94	10/18/94

	<u>UNITS</u>		
SEMIVOLATILES			
Phenol	UG/KG	350 U	360 U
bis(2-Chloroethyl) ether	UG/KG	350 U	360 U
2-Chlorophenol	UG/KG	350 U	360 U
1,3-Dichlorobenzene	UG/KG	350 U	360 U
1,4-Dichlorobenzene	UG/KG	350 UJ	360 UJ
1,2-Dichlorobenzene	UG/KG	350 U	360 U
2-Methylphenol	UG/KG	350 U	360 U
2,2'-oxybis-(1-chloropropane)	UG/KG	350 U	360 U
4-Methylphenol	UG/KG	350 U	360 U
N-Nitroso-di-n-propylamine	UG/KG	350 U	360 U
Hexachloroethane	UG/KG	350 U	360 U
Nitrobenzene	UG/KG	350 U	360 U
Isophorone	UG/KG	350 U	360 U
2-Nitrophenol	UG/KG	350 U	360 U
2,4-Dimethylphenol	UG/KG	350 U	360 U
bis(2-Chloroethoxy) methane	UG/KG	350 U	360 U
2,4-Dichlorophenol	UG/KG	350 U	360 U
1,2,4-Trichlorobenzene	UG/KG	350 UJ	360 UJ
Naphthalene	UG/KG	350 U	360 U
4-Chloroaniline	UG/KG	350 U	360 U
Hexachlorobutadiene	UG/KG	350 U	360 U
4-Chloro-3-methylphenol	UG/KG	350 U	360 U
2-Methylnaphthalene	UG/KG	350 U	360 U
Hexachlorocyclopentadiene	UG/KG	350 U	360 U
2,4,6-Trichlorophenol	UG/KG	350 U	360 U
2,4,5-Trichlorophenol	UG/KG	850 U	870 U
2-Chloronaphthalene	UG/KG	350 U	360 U
2-Nitroaniline	UG/KG	850 U	870 U
Dimethyl phthalate	UG/KG	350 U	360 U
Acenaphthylene	UG/KG	350 U	360 U
2,6-Dinitrotoluene	UG/KG	350 U	360 U
3-Nitroaniline	UG/KG	850 U	870 U
Acenaphthene	UG/KG	350 UJ	360 UJ

FIELD DUPLICATE SUMMARY
 OPERABLE UNIT No. 8
 SITE 16 - DUPLICATES - SOIL
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID:	16-SDA-SB04-00	16-SDA-SB04-00D
Laboratory Sample ID:	AC4162	AC4166
Date Sampled:	10/18/94	10/18/94

	<u>UNITS</u>		
<u>SEMIVOLATILES Cont.</u>			
2,4-Dinitrophenol	UG/KG	850 U	870 U
4-Nitrophenol	UG/KG	850 U	870 U
Dibenzofuran	UG/KG	350 U	360 U
2,4-Dinitrotoluene	UG/KG	350 U	360 U
Diethylphthalate	UG/KG	350 U	360 U
4-Chlorophenyl phenyl ether	UG/KG	350 U	360 U
Fluorene	UG/KG	350 U	360 U
4-Nitroaniline	UG/KG	850 U	870 U
4,6-Dinitro-2-methylphenol	UG/KG	850 U	870 U
N-nitrosodiphenylamine	UG/KG	350 U	360 U
4-Bromophenyl-phenylether	UG/KG	350 U	360 U
Hexachlorobenzene	UG/KG	350 U	360 U
Pentachlorophenol	UG/KG	850 U	870 U
Phenanthrene	UG/KG	350 U	360 U
Anthracene	UG/KG	350 U	360 U
Carbazole	UG/KG	350 U	360 U
di-n-Butylphthalate	UG/KG	350 U	360 U
Fluoranthene	UG/KG	350 U	360 U
Pyrene	UG/KG	350 UJ	360 UJ
Butyl benzyl phthalate	UG/KG	350 U	360 U
3,3'-Dichlorobenzidine	UG/KG	350 U	360 U
Benzo[a]anthracene	UG/KG	350 U	360 U
Chrysene	UG/KG	350 U	360 U
bis(2-Ethylhexyl)phthalate	UG/KG	350 U	360 U
di-n-Octylphthalate	UG/KG	350 U	360 U
Benzo[b]fluoranthene	UG/KG	350 U	360 U
Benzo[k]fluoranthene	UG/KG	350 U	360 U
Benzo[a]pyrene	UG/KG	350 U	360 U
Indeno[1,2,3-cd]pyrene	UG/KG	350 U	360 U
Dibenz[a,h]anthracene	UG/KG	350 U	360 U
Benzo[g,h,i]perylene	UG/KG	350 U	360 U

FIELD DUPLICATE SUMMARY
 OPERABLE UNIT No. 8
 SITE 16 - DUPLICATES - SOIL
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID:	16-SDA-SB04-00	16-SDA-SB04-00D
Laboratory Sample ID:	AC4162	AC4166
Date Sampled:	10/18/94	10/18/94

	<u>UNITS</u>		
PESTICIDES/PCBs			
alpha-BHC	UG/KG	1.8 U	1.9 U
beta-BHC	UG/KG	1.8 U	1.9 U
delta-BHC	UG/KG	1.8 U	1.9 U
Lindane (gamma-BHC)	UG/KG	1.8 U	1.9 U
Heptachlor	UG/KG	1.8 U	1.9 U
Aldrin	UG/KG	1.8 U	1.9 U
Heptachlor epoxide	UG/KG	1.8 U	1.9 U
Endosulfan I	UG/KG	1.8 U	1.9 U
Dieldrin	UG/KG	9.2	6.9
4,4'-DDE	UG/KG	10	8.6
Endrin	UG/KG	3.4 U	3.6 U
Endosulfan II	UG/KG	1.9 J	3.6 U
4,4'-DDD	UG/KG	3.4 U	3.6 U
Endosulfan sulfate	UG/KG	3.4 U	3.6 U
4,4'-DDT	UG/KG	6.8	5.6
Methoxychlor	UG/KG	4.6 J	19 U
Endrin ketone	UG/KG	3.4 U	3.6 U
Endrin aldehyde	UG/KG	3.4 U	3.6 U
alpha-Chlordane	UG/KG	1.8 U	1.9 U
gamma-Chlordane	UG/KG	1.8 U	1.9 U
Toxaphene	UG/KG	180 U	190 U
Aroclor 1016	UG/KG	34 U	36 U
Aroclor 1221	UG/KG	69 U	73 U
Aroclor 1232	UG/KG	34 U	36 U
Aroclor 1242	UG/KG	34 U	36 U
Aroclor 1248	UG/KG	34 U	36 U
Aroclor 1254	UG/KG	34 U	36 U
Aroclor 1260	UG/KG	34 U	36 U

APPENDIX J.2
SOIL METALS

FIELD DUPLICATE SUMMARY
 OPERABLE UNIT No. 8
 SITE 16 - DUPLICATES - SOIL
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TAL INORGANICS

Client Sample ID:	16-BD-SB01-00	16-BD-SB01-00D	16-BD-SB16-05	16-BD-SB16-05D	16-MW06-06	16-MW06-06D
Laboratory Sample ID:	AC4115	AC4117	AC4128	AC4130	AC4864	AC4866
Date Sampled:	10/19/94	10/19/94	10/18/94	10/18/94	10/21/94	10/21/94

	UNITS						
Aluminum	MG/KG	1700 J	2070 J	1130	811	2930 J	3530 J
Antimony	MG/KG	10.4 UJ	10.2 UJ	10.5 UJ	13 UJ	10.3 UJ	11.3 UJ
Arsenic	MG/KG	24.7 J	22.6 J	2.1 U	2.1 U	2.1 U	2.3 U
Barium	MG/KG	15.3	40 J	2.2 U	1.7 U	6.6	8.2
Beryllium	MG/KG	0.21 U	0.25	0.21 U	0.21 U	0.21 U	0.23
Cadmium	MG/KG	1 U	1 U	1.1 U	1 U	1 U	1.1 U
Calcium	MG/KG	729 J	839 J	334 UJ	154 UJ	362 J	599 J
Chromium	MG/KG	3.5 J	4.2 J	2.5	2.1 U	6.5 J	6.4 J
Cobalt	MG/KG	2.1 U	2 U	2.1 U	2.1 U	2.1 U	2.3 U
Copper	MG/KG	11.2 J	16.1 J	2.1 U	2.1 U	2.1 U	2.3 U
Iron	MG/KG	4620	5120 J	1880 U	1420 U	1380 J	1200 J
Lead	MG/KG	15.4 J	17.3 J	1.8	1.8	3.7 J	3.6 J
Magnesium	MG/KG	94.1	137 J	33 UJ	22.4 UJ	237	269
Manganese	MG/KG	4.8 J	8 J	1.6 U	1.8 U	5.5 J	5.4 J
Mercury	MG/KG	0.12 J	0.11 UJ	0.11 U	0.1 U	0.11 U	0.12 U
Nickel	MG/KG	4.1 U	4.1 U	4.2 U	4.2 U	4.1 U	4.5 U
Potassium	MG/KG	207 U	204 U	210 U	209 U	229 J	243 J
Selenium	MG/KG	1.7	1.6	1.1 U	1 U	1 U	1.1 U
Silver	MG/KG	1 U	1 U	1.1 UJ	1 UJ	1 U	1.1 U
Sodium	MG/KG	43.6 U	46.8 UJ	25 U	29.1 U	29.7	37
Thallium	MG/KG	2.1 U	2 U	2.1 U	2.1 U	2.1 U	2.3 U
Vanadium	MG/KG	9.2	12.5	3.1	2.1 U	6.2	5.1
Zinc	MG/KG	19.9 J	29.5 J	4.8 UJ	8.7 UJ	4.9 J	4.9 J
Moisture	%	6.35	7.72	4.9	4.36	12.89	14.05

FIELD DUPLICATE SUMMARY
OPERABLE UNIT No. 8
SITE 16 - DUPLICATES - SOIL
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TAL INORGANICS

Client Sample ID:	16-SDA-SB04-00	16-SDA-SB04-00D
Laboratory Sample ID:	AC4162	AC4166
Date Sampled:	10/18/94	10/18/94

	UNITS		
Aluminum	MG/KG	2640 J	3590 J
Antimony	MG/KG	10.5 UJ	11 UJ
Arsenic	MG/KG	2.1 UJ	2.2 UJ
Barium	MG/KG	11.5 J	15.2 J
Beryllium	MG/KG	0.21 U	0.22 U
Cadmium	MG/KG	1.1 U	1.1 U
Calcium	MG/KG	150 J	204 J
Chromium	MG/KG	2.5 J	2.5 J
Cobalt	MG/KG	2.1 U	2.2 U
Copper	MG/KG	2.1 UJ	2.2 UJ
Iron	MG/KG	1450 J	1660 J
Lead	MG/KG	7.8 J	8.6 J
Magnesium	MG/KG	64.4 J	131 J
Manganese	MG/KG	22.5 J	29 J
Mercury	MG/KG	0.11 UJ	0.11 UJ
Nickel	MG/KG	4.2 U	4.4 U
Potassium	MG/KG	210 U	220 U
Selenium	MG/KG	1.1 U	1.1 U
Silver	MG/KG	1.1 U	1.1 U
Sodium	MG/KG	32.7 UJ	37.8 UJ
Thallium	MG/KG	2.1	2.2 U
Vanadium	MG/KG	2.3 J	2.9 J
Zinc	MG/KG	14.2 J	16 J
Moisture	%	5.82	8.98

APPENDIX J.3
GROUNDWATER ORGANICS

FIELD DUPLICATE SUMMARY
 OPERABLE UNIT No. 8
 SITE 16 - FIELD DUPLICATES - GROUNDWATER
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID:	16-MW06-01	16-MW06-01D
Laboratory Sample ID:	AD1491	AD1494
Date Sampled:	11/30/94	11/30/94

	UNITS		
VOLATILES			
Chloromethane	UG/L	10 U	10 U
Bromomethane	UG/L	10 U	10 U
Vinyl chloride	UG/L	10 U	10 U
Chloroethane	UG/L	10 U	10 U
Methylene chloride	UG/L	10 U	10 U
Acetone	UG/L	10 U	10 U
Carbon Disulfide	UG/L	10 U	10 U
1,1-Dichloroethene	UG/L	10 U	10 U
1,1-Dichloroethane	UG/L	10 U	10 U
1,2-Dichloroethene(total)	UG/L	10 U	10 U
Chloroform	UG/L	10 U	10 U
1,2-Dichloroethane	UG/L	10 U	10 U
2-Butanone	UG/L	10 U	10 U
1,1,1-Trichloroethane	UG/L	10 U	10 U
Carbon tetrachloride	UG/L	10 U	10 U
Bromodichloromethane	UG/L	10 U	10 U
1,2-Dichloropropane	UG/L	10 U	10 U
cis-1,3-Dichloropropene	UG/L	10 U	10 U
Trichloroethene	UG/L	10 U	10 U
Dibromochloromethane	UG/L	10 U	10 U
1,1,2-Trichloroethane	UG/L	10 U	10 U
Benzene	UG/L	10 U	10 U
trans-1,3-Dichloropropene	UG/L	10 U	10 U
Bromoform	UG/L	10 U	10 U
4-Methyl-2-pentanone	UG/L	10 U	10 U
2-Hexanone	UG/L	10 U	10 U
Tetrachloroethene	UG/L	10 U	10 U
1,1,2,2-Tetrachloroethane	UG/L	10 U	10 U
Toluene	UG/L	10 U	10 U
Chlorobenzene	UG/L	10 U	10 U
Ethylbenzene	UG/L	10 U	10 U
Styrene	UG/L	10 U	10 U
Xylenes (total)	UG/L	10 U	10 U

FIELD DUPLICATE SUMMARY
 OPERABLE UNIT No. 8
 SITE 16 - FIELD DUPLICATES - GROUNDWATER
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID:	16-MW06-01	16-MW06-01D
Laboratory Sample ID:	AD1491	AD1494
Date Sampled:	11/30/94	11/30/94

	UNITS		
SEMIVOLATILES			
Phenol	UG/L	1 J	10 U
bis(2-Chloroethyl) ether	UG/L	10 U	10 U
2-Chlorophenol	UG/L	10 U	10 U
1,3-Dichlorobenzene	UG/L	10 U	10 U
1,4-Dichlorobenzene	UG/L	10 U	10 U
1,2-Dichlorobenzene	UG/L	10 U	10 U
2-Methylphenol	UG/L	10 U	10 U
2,2'-oxybis-(1-chloropropane)	UG/L	10 U	10 U
4-Methylphenol	UG/L	10 U	10 U
N-Nitroso-di-n-propylamine	UG/L	10 U	10 U
Hexachloroethane	UG/L	10 U	10 U
Nitrobenzene	UG/L	10 U	10 U
Isophorone	UG/L	10 U	10 U
2-Nitrophenol	UG/L	10 U	10 U
2,4-Dimethylphenol	UG/L	10 U	10 U
bis(2-Chloroethoxy) methane	UG/L	10 U	10 U
2,4-Dichlorophenol	UG/L	10 U	10 U
1,2,4-Trichlorobenzene	UG/L	10 U	10 U
Naphthalene	UG/L	10 U	10 U
4-Chloroaniline	UG/L	10 U	10 U
Hexachlorobutadiene	UG/L	10 U	10 U
4-Chloro-3-methylphenol	UG/L	10 U	10 U
2-Methylnaphthalene	UG/L	10 U	10 U
Hexachlorocyclopentadiene	UG/L	10 UJ	10 U
2,4,6-Trichlorophenol	UG/L	10 U	10 U
2,4,5-Trichlorophenol	UG/L	25 U	25 U
2-Chloronaphthalene	UG/L	10 U	10 U
2-Nitroaniline	UG/L	25 U	25 U
Dimethyl phthalate	UG/L	10 U	10 U
Acenaphthylene	UG/L	10 U	10 U
2,6-Dinitrotoluene	UG/L	10 U	10 U
3-Nitroaniline	UG/L	25 U	25 U
Acenaphthene	UG/L	10 U	10 U

FIELD DUPLICATE SUMMARY
 OPERABLE UNIT No. 8
 SITE 16 - FIELD DUPLICATES - GROUNDWATER
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID:	16-MW06-01	16-MW06-01D
Laboratory Sample ID:	AD1491	AD1494
Date Sampled:	11/30/94	11/30/94

	<u>UNITS</u>		
<u>SEMIVOLATILES Cont.</u>			
2,4-Dinitrophenol	UG/L	25 UJ	25 U
4-Nitrophenol	UG/L	25 U	25 U
Dibenzofuran	UG/L	10 U	10 U
2,4-Dinitrotoluene	UG/L	10 U	10 U
Diethylphthalate	UG/L	10 U	10 U
4-Chlorophenyl phenyl ether	UG/L	10 U	10 U
Fluorene	UG/L	10 U	10 U
4-Nitroaniline	UG/L	25 U	25 U
4,6-Dinitro-2-methylphenol	UG/L	25 U	25 U
N-nitrosodiphenylamine	UG/L	10 U	10 U
4-Bromophenyl-phenylether	UG/L	10 U	10 U
Hexachlorobenzene	UG/L	10 U	10 U
Pentachlorophenol	UG/L	25 U	25 U
Phenanthrene	UG/L	10 U	10 U
Anthracene	UG/L	10 U	10 U
Carbazole	UG/L	10 U	10 U
di-n-Butylphthalate	UG/L	10 U	10 U
Fluoranthene	UG/L	10 U	10 U
Pyrene	UG/L	10 U	10 U
Butyl benzyl phthalate	UG/L	10 U	10 U
3,3'-Dichlorobenzidine	UG/L	10 U	10 U
Benzo[a]anthracene	UG/L	10 U	10 U
Chrysene	UG/L	10 U	10 U
bis(2-Ethylhexyl)phthalate	UG/L	2 J	3 J
di-n-Octylphthalate	UG/L	10 U	10 U
Benzo[b]fluoranthene	UG/L	10 U	10 U
Benzo[k]fluoranthene	UG/L	10 UJ	10 U
Benzo[a]pyrene	UG/L	10 U	10 U
Indeno[1,2,3-cd]pyrene	UG/L	10 U	10 U
Dibenz[a,h]anthracene	UG/L	10 U	10 U
Benzo[g,h,i]perylene	UG/L	10 U	10 U

FIELD DUPLICATE SUMMARY
 OPERABLE UNIT No. 8
 SITE 16 - FIELD DUPLICATES - GROUNDWATER
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID:	16-MW06-01	16-MW06-01D
Laboratory Sample ID:	AD1491	AD1494
Date Sampled:	11/30/94	11/30/94

	<u>UNITS</u>		
PESTICIDES/PCBs			
alpha-BHC	UG/L	0.05 U	0.05 U
beta-BHC	UG/L	0.05 U	0.05 U
delta-BHC	UG/L	0.05 U	0.05 U
Lindane (gamma-BHC)	UG/L	0.05 U	0.05 U
Heptachlor	UG/L	0.05 U	0.05 U
Aldrin	UG/L	0.05 U	0.05 U
Heptachlor epoxide	UG/L	0.05 U	0.05 U
Endosulfan I	UG/L	0.05 U	0.05 U
Dieldrin	UG/L	0.1 U	0.1 U
4,4-DDE	UG/L	0.1 U	0.1 U
Endrin	UG/L	0.1 U	0.1 U
Endosulfan II	UG/L	0.1 U	0.1 U
4,4-DDD	UG/L	0.1 U	0.1 U
Endosulfan sulfate	UG/L	0.1 U	0.1 U
4,4-DDT	UG/L	0.1 U	0.1 U
Methoxychlor	UG/L	0.5 U	0.5 U
Endrin ketone	UG/L	0.1 U	0.1 U
Endrin aldehyde	UG/L	0.1 U	0.1 U
alpha-Chlordane	UG/L	0.05 U	0.05 U
gamma-Chlordane	UG/L	0.05 U	0.05 U
Toxaphene	UG/L	5 U	5 U
Aroclor 1016	UG/L	1 U	1 U
Aroclor 1221	UG/L	2 U	2 U
Aroclor 1232	UG/L	1 U	1 U
Aroclor 1242	UG/L	1 U	1 U
Aroclor 1248	UG/L	1 U	1 U
Aroclor 1254	UG/L	1 U	1 U
Aroclor 1260	UG/L	1 U	1 U

APPENDIX J.4
GROUNDWATER TOTAL AND DISSOLVED METALS

FIELD DUPLICATE SUMMARY
 OPERABLE UNIT No. 8
 SITE 16 - FIELD DUPLICATES - GROUNDWATER
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TAL INORGANICS

Client Sample ID:	16-MW06-01	16-MW06-01D	16-MW06D-01	16-MW06D-01D
Laboratory Sample ID:	AD1492	AD1495	AD1504	AD1505
Date Sampled:	11/30/94	11/30/94	11/30/94	11/30/94

	<u>UNITS</u>				
Aluminum	UG/L	95.3 U	79.8 U	50.6 U	54.5 U
Antimony	UG/L	50 U	50 U	50 U	50 U
Arsenic	UG/L	10 U	10 U	10 U	10 U
Barium	UG/L	24.4 J	27.9 J	11.9 J	11.6 J
Beryllium	UG/L	1 U	1 U	1 U	1 U
Cadmium	UG/L	5 UJ	5 UJ	5 UJ	5 UJ
Calcium	UG/L	370	418	558 J	7980 J
Chromium	UG/L	10 U	10 U	10 U	10 U
Cobalt	UG/L	10 U	10 U	10 U	10 U
Copper	UG/L	10 U	10 U	10 U	10 U
Iron	UG/L	71.9 U	46.4 U	45.9 UJ	199 J
Lead	UG/L	3 U	3 U	3 U	3.6 J
Magnesium	UG/L	1510	1710	1350 J	2300 J
Manganese	UG/L	9.8 J	10.4 J	8.2 J	63.6 J
Mercury	UG/L	0.2 U	0.2 U	0.2 U	0.2 U
Nickel	UG/L	20 U	20 U	20 U	20 U
Potassium	UG/L	1000 U	1000 U	1000 U	1330
Selenium	UG/L	5 UJ	5 UJ	5 UJ	5 UJ
Silver	UG/L	5 U	5 U	5 U	5 U
Sodium	UG/L	2480	2810	2430 J	8500 J
Thallium	UG/L	10 U	10 U	10 U	10 U
Vanadium	UG/L	10 U	10 U	10 U	10 U
Zinc	UG/L	18.5 UJ	21.8 UJ	24.2 UJ	22 UJ

APPENDIX J.5
NORTHEAST CREEK SURFACE WATER ORGANICS

FIELD DUPLICATE SUMMARY
 OPERABLE UNIT No. 8 (SITE 16)
 NORTHEAST CREEK SURFACE WATER
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID:	16-NC-SW04	16-NC-SW04D
Laboratory Sample ID:	AB1985	AB1988
Date Sampled:	6/26/94	6/26/94

	<u>UNITS</u>		
<u>VOLATILES</u>			
Chloromethane	UG/L	10 U	10 U
Bromomethane	UG/L	10 U	10 U
Vinyl chloride	UG/L	10 U	10 U
Chloroethane	UG/L	10 U	10 U
Methylene chloride	UG/L	10 U	12 U
Acetone	UG/L	10 U	10 U
Carbon Disulfide	UG/L	10 U	10 U
1,1-Dichloroethene	UG/L	10 U	10 U
1,1-Dichloroethane	UG/L	10 U	10 U
1,2-Dichloroethene(total)	UG/L	10 U	10 U
Chloroform	UG/L	10 U	10 U
1,2-Dichloroethane	UG/L	10 U	10 U
2-Butanone	UG/L	10 U	10 U
1,1,1-Trichloroethane	UG/L	10 U	10 U
Carbon tetrachloride	UG/L	10 U	10 U
Bromodichloromethane	UG/L	10 U	10 U
1,2-Dichloropropane	UG/L	10 U	10 U
cis-1,3-Dichloropropene	UG/L	10 U	10 U
Trichloroethene	UG/L	10 U	10 U
Dibromochloromethane	UG/L	10 U	10 U
1,1,2-Trichloroethane	UG/L	10 U	10 U
Benzene	UG/L	10 U	10 U
trans-1,3-Dichloropropene	UG/L	10 U	10 U
Bromoform	UG/L	10 U	10 U
4-Methyl-2-pentanone	UG/L	10 U	10 U
2-Hexanone	UG/L	10 U	10 U
Tetrachloroethene	UG/L	10 U	10 U
1,1,2,2-Tetrachloroethane	UG/L	10 U	10 U
Toluene	UG/L	10 U	10 U
Chlorobenzene	UG/L	10 U	10 U
Ethylbenzene	UG/L	10 U	10 U
Styrene	UG/L	10 U	10 U
Xylenes (total)	UG/L	10 U	10 U

FIELD DUPLICATE SUMMARY
 OPERABLE UNIT No. 8 (SITE 16)
 NORTHEAST CREEK SURFACE WATER
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID:	16-NC-SW04	16-NC-SW04D
Laboratory Sample ID:	AB1985	AB1988
Date Sampled:	6/26/94	6/26/94

	<u>UNITS</u>		
SEMIVOLATILES			
Phenol	UG/L	10 U	10 U
bis(2-Chloroethyl) ether	UG/L	10 U	10 U
2-Chlorophenol	UG/L	10 U	10 U
1,3-Dichlorobenzene	UG/L	10 U	10 U
1,4-Dichlorobenzene	UG/L	10 U	10 U
1,2-Dichlorobenzene	UG/L	10 U	10 U
2-Methylphenol	UG/L	10 U	10 U
2,2'-oxybis-(1-chloropropane)	UG/L	10 U	10 U
4-Methylphenol	UG/L	10 U	10 U
N-Nitroso-di-n-propylamine	UG/L	10 U	10 U
Hexachloroethane	UG/L	10 U	10 U
Nitrobenzene	UG/L	10 U	10 U
Isophorone	UG/L	10 U	10 U
2-Nitrophenol	UG/L	10 U	10 U
2,4-Dimethylphenol	UG/L	10 U	10 U
bis(2-Chloroethoxy) methane	UG/L	10 U	10 U
2,4-Dichlorophenol	UG/L	10 U	10 U
1,2,4-Trichlorobenzene	UG/L	10 U	10 U
Naphthalene	UG/L	10 U	10 U
4-Chloroaniline	UG/L	10 U	10 U
Hexachlorobutadiene	UG/L	10 U	10 U
4-Chloro-3-methylphenol	UG/L	10 U	10 U
2-Methylnaphthalene	UG/L	10 U	10 U
Hexachlorocyclopentadiene	UG/L	10 U	10 U
2,4,6-Trichlorophenol	UG/L	10 U	10 U
2,4,5-Trichlorophenol	UG/L	25 U	25 U
2-Chloronaphthalene	UG/L	10 U	10 U
2-Nitroaniline	UG/L	25 U	25 U
Dimethyl phthalate	UG/L	10 U	10 U
Acenaphthylene	UG/L	10 U	10 U
2,6-Dinitrotoluene	UG/L	10 U	10 U
3-Nitroaniline	UG/L	25 U	25 U
Acenaphthene	UG/L	10 U	10 U

FIELD DUPLICATE SUMMARY
 OPERABLE UNIT No. 8 (SITE 16)
 NORTHEAST CREEK SURFACE WATER
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID:	16-NC-SW04	16-NC-SW04D
Laboratory Sample ID:	AB1985	AB1988
Date Sampled:	6/26/94	6/26/94

UNITS

SEMIVOLATILES Cont.

2,4-Dinitrophenol	UG/L	25 U	25 U
4-Nitrophenol	UG/L	25 U	25 U
Dibenzofuran	UG/L	10 U	10 U
2,4-Dinitrotoluene	UG/L	10 U	10 U
Diethylphthalate	UG/L	10 U	10 U
4-Chlorophenyl phenyl ether	UG/L	10 U	10 U
Fluorene	UG/L	10 U	10 U
4-Nitroaniline	UG/L	25 U	25 U
4,6-Dinitro-2-methylphenol	UG/L	25 U	25 U
N-nitrosodiphenylamine	UG/L	10 U	10 U
4-Bromophenyl-phenylether	UG/L	10 U	10 U
Hexachlorobenzene	UG/L	10 U	10 U
Pentachlorophenol	UG/L	25 U	25 U
Phenanthrene	UG/L	10 U	10 U
Anthracene	UG/L	10 U	10 U
Carbazole	UG/L	10 U	10 U
di-n-Butylphthalate	UG/L	10 U	10 U
Fluoranthene	UG/L	10 U	10 U
Pyrene	UG/L	10 U	10 U
Butyl benzyl phthalate	UG/L	10 U	10 U
3,3'-Dichlorobenzidine	UG/L	10 U	10 U
Benzo[a]anthracene	UG/L	10 U	10 U
Chrysene	UG/L	10 U	10 U
bis(2-Ethylhexyl)phthalate	UG/L	10 U	10 U
di-n-Octylphthalate	UG/L	10 U	10 U
Benzo[b]fluoranthene	UG/L	10 U	10 U
Benzo[k]fluoranthene	UG/L	10 U	10 U
Benzo[a]pyrene	UG/L	10 U	10 U
Indeno[1,2,3-cd]pyrene	UG/L	10 U	10 U
Dibenz[a,h]anthracene	UG/L	10 U	10 U
Benzo[g,h,i]perylene	UG/L	10 U	10 U

FIELD DUPLICATE SUMMARY
 OPERABLE UNIT No. 8 (SITE 16)
 NORTHEAST CREEK SURFACE WATER
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID:	16-NC-SW04	16-NC-SW04D
Laboratory Sample ID:	AB1985	AB1988
Date Sampled:	6/26/94	6/26/94

	<u>UNITS</u>		
<u>PESTICIDES/PCBs</u>			
alpha-BHC	UG/L	0.06 UJ	0.066 UJ
beta-BHC	UG/L	0.06 UJ	0.066 UJ
delta-BHC	UG/L	0.06 UJ	0.066 UJ
Lindane (gamma-BHC)	UG/L	0.06 UJ	0.066 UJ
Heptachlor	UG/L	0.06 UJ	0.066 UJ
Aldrin	UG/L	0.06 UJ	0.066 UJ
Heptachlor epoxide	UG/L	0.06 UJ	0.066 UJ
Endosulfan I	UG/L	0.06 UJ	0.066 UJ
Dieldrin	UG/L	0.12 UJ	0.13 UJ
4,4'-DDE	UG/L	0.12 UJ	0.13 UJ
Endrin	UG/L	0.12 UJ	0.13 UJ
Endosulfan II	UG/L	0.12 UJ	0.13 UJ
4,4'-DDD	UG/L	0.12 UJ	0.13 UJ
Endosulfan sulfate	UG/L	0.12 UJ	0.13 UJ
4,4'-DDT	UG/L	0.12 UJ	0.13 UJ
Methoxychlor	UG/L	0.6 UJ	0.66 UJ
Endrin ketone	UG/L	0.12 UJ	0.13 UJ
Endrin aldehyde	UG/L	0.12 UJ	0.13 UJ
alpha-Chlordane	UG/L	0.06 UJ	0.066 UJ
gamma-Chlordane	UG/L	0.06 UJ	0.066 UJ
Toxaphene	UG/L	6 UJ	6.6 UJ
Aroclor 1016	UG/L	1.2 UJ	1.3 UJ
Aroclor 1221	UG/L	2.4 UJ	2.7 UJ
Aroclor 1232	UG/L	1.2 UJ	1.3 UJ
Aroclor 1242	UG/L	1.2 UJ	1.3 UJ
Aroclor 1248	UG/L	1.2 UJ	1.3 UJ
Aroclor 1254	UG/L	1.2 UJ	1.3 UJ
Aroclor 1260	UG/L	1.2 UJ	1.3 UJ

APPENDIX J.6
NORTHEAST CREEK SURFACE WATER METALS

FIELD DUPLICATES SUMMARY
 OPERABLE UNIT No. 8 (SITE 16)
 NORTHEAST CREEK SURFACE WATER
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TAL INORGANICS

Client Sample ID:	16-NC-SW04	16-NC-SW04D
Laboratory Sample ID:	AB1987	AB1990
Date Sampled:	6/26/94	6/26/94

	UNITS		
Aluminum	UG/L	5550 J	4260 J
Antimony	UG/L	50 U	50 U
Arsenic	UG/L	2.6 J	2.5 J
Barium	UG/L	26.7	23.9
Beryllium	UG/L	1 U	1 U
Cadmium	UG/L	5 U	5 U
Calcium	UG/L	173000 J	156000 J
Chromium	UG/L	10 U	10 U
Cobalt	UG/L	10 UJ	10 UJ
Copper	UG/L	10 UJ	10 UJ
Iron	UG/L	3590 J	2860 J
Lead	UG/L	5.5 J	5.6 J
Magnesium	UG/L	615000	534000
Manganese	UG/L	17.2	14.9
Mercury	UG/L	0.2 U	0.2 U
Nickel	UG/L	20 UJ	20 UJ
Potassium	UG/L	188000	171000
Selenium	UG/L	2 UJ	2 UJ
Silver	UG/L	8.6	9.2
Sodium	UG/L	4740000 J	4090000 J
Thallium	UG/L	10 UJ	10 UJ
Vanadium	UG/L	10 U	10 U
Zinc	UG/L	11.7 U	6.1 U

APPENDIX J.7
NORTHEAST CREEK SEDIMENT ORGANICS

FIELD DUPLICATE SUMMARY
 OPERABLE UNIT No. 8 (SITE 16)
 NORTHEAST CREEK SEDIMENT
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID:	16-NC-SD04-06	16-NC-SD04-06D
Laboratory Sample ID:	AB2042	AB2010
Date Sampled:	6/26/94	6/26/94

	<u>UNITS</u>		
<u>VOLATILES</u>			
Chloromethane	UG/KG	12 U	12 U
Bromomethane	UG/KG	12 U	12 U
Vinyl chloride	UG/KG	12 U	12 U
Chloroethane	UG/KG	12 U	12 U
Methylene chloride	UG/KG	58 U	50 U
Acetone	UG/KG	12 U	17 U
Carbon Disulfide	UG/KG	12 U	12 U
1,1-Dichloroethene	UG/KG	12 U	12 U
1,1-Dichloroethane	UG/KG	12 U	12 U
1,2-Dichloroethene(total)	UG/KG	12 U	12 U
Chloroform	UG/KG	12 U	12 U
1,2-Dichloroethane	UG/KG	12 U	12 U
2-Butanone	UG/KG	12 U	12 U
1,1,1-Trichloroethane	UG/KG	12 U	12 U
Carbon tetrachloride	UG/KG	12 U	12 U
Bromodichloromethane	UG/KG	12 U	12 U
1,2-Dichloropropane	UG/KG	12 U	12 U
cis-1,3-Dichloropropene	UG/KG	12 U	12 U
Trichloroethene	UG/KG	12 U	12 U
Dibromochloromethane	UG/KG	12 U	12 U
1,1,2-Trichloroethane	UG/KG	12 U	12 U
Benzene	UG/KG	12 U	12 U
trans-1,3-Dichloropropene	UG/KG	12 U	12 U
Bromoform	UG/KG	12 U	12 U
4-Methyl-2-pentanone	UG/KG	12 U	12 U
2-Hexanone	UG/KG	12 U	12 U
Tetrachloroethene	UG/KG	12 U	12 U
1,1,2,2-Tetrachloroethane	UG/KG	12 U	12 U
Toluene	UG/KG	1 J	12 U
Chlorobenzene	UG/KG	12 U	12 U
Ethylbenzene	UG/KG	12 U	12 U
Styrene	UG/KG	12 U	12 U
Xylenes (total)	UG/KG	12 U	12 U

FIELD DUPLICATE SUMMARY
 OPERABLE UNIT No. 8 (SITE 16)
 NORTHEAST CREEK SEDIMENT
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID:	16-NC-SD04-06	16-NC-SD04-06D
Laboratory Sample ID:	AB2042	AB2010
Date Sampled:	6/26/94	6/26/94

	<u>UNITS</u>		
SEMIVOLATILES			
Phenol	UG/KG	2100 U	2000 U
bis(2-Chloroethyl) ether	UG/KG	2100 U	2000 U
2-Chlorophenol	UG/KG	2100 U	2000 U
1,3-Dichlorobenzene	UG/KG	2100 U	2000 U
1,4-Dichlorobenzene	UG/KG	2100 U	2000 U
1,2-Dichlorobenzene	UG/KG	2100 U	2000 U
2-Methylphenol	UG/KG	2100 U	2000 U
2,2'-oxybis-(1-chloropropane)	UG/KG	2100 U	2000 U
4-Methylphenol	UG/KG	2100 U	2000 U
N-Nitroso-di-n-propylamine	UG/KG	2100 U	2000 U
Hexachloroethane	UG/KG	2100 U	2000 U
Nitrobenzene	UG/KG	2100 U	2000 U
Isophorone	UG/KG	2100 U	2000 U
2-Nitrophenol	UG/KG	2100 U	2000 U
2,4-Dimethylphenol	UG/KG	2100 U	2000 U
bis(2-Chloroethoxy) methane	UG/KG	2100 U	2000 U
2,4-Dichlorophenol	UG/KG	2100 U	2000 U
1,2,4-Trichlorobenzene	UG/KG	2100 U	2000 U
Naphthalene	UG/KG	2100 U	2000 U
4-Chloroaniline	UG/KG	2100 U	2000 U
Hexachlorobutadiene	UG/KG	2100 U	2000 U
4-Chloro-3-methylphenol	UG/KG	2100 U	2000 U
2-Methylnaphthalene	UG/KG	2100 U	2000 U
Hexachlorocyclopentadiene	UG/KG	2100 U	2000 U
2,4,6-Trichlorophenol	UG/KG	2100 U	2000 U
2,4,5-Trichlorophenol	UG/KG	5000 U	4800 U
2-Chloronaphthalene	UG/KG	2100 U	2000 U
2-Nitroaniline	UG/KG	5000 U	4800 U
Dimethyl phthalate	UG/KG	2100 U	2000 U
Acenaphthylene	UG/KG	2100 U	2000 U
2,6-Dinitrotoluene	UG/KG	2100 U	2000 U
3-Nitroaniline	UG/KG	5000 U	4800 U
Acenaphthene	UG/KG	2100 U	2000 U

FIELD DUPLICATE SUMMARY
 OPERABLE UNIT No. 8 (SITE 16)
 NORTHEAST CREEK SEDIMENT
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID:	16-NC-SD04-06	16-NC-SD04-06D
Laboratory Sample ID:	AB2042	AB2010
Date Sampled:	6/26/94	6/26/94

	UNITS		
<u>SEMIVOLATILES Cont.</u>			
2,4-Dinitrophenol	UG/KG	5000 U	4800 U
4-Nitrophenol	UG/KG	5000 U	4800 UJ
Dibenzofuran	UG/KG	2100 U	2000 U
2,4-Dinitrotoluene	UG/KG	2100 U	2000 U
Diethylphthalate	UG/KG	2100 U	2000 U
4-Chlorophenyl phenyl ether	UG/KG	2100 U	2000 U
Fluorene	UG/KG	2100 U	2000 U
4-Nitroaniline	UG/KG	5000 U	4800 U
4,6-Dinitro-2-methylphenol	UG/KG	5000 U	4800 U
N-nitrosodiphenylamine	UG/KG	2100 U	2000 U
4-Bromophenyl-phenylether	UG/KG	2100 U	2000 U
Hexachlorobenzene	UG/KG	2100 U	2000 U
Pentachlorophenol	UG/KG	5000 U	4800 U
Phenanthrene	UG/KG	2100 U	2000 U
Anthracene	UG/KG	2100 U	2000 U
Carbazole	UG/KG	2100 U	2000 U
di-n-Butylphthalate	UG/KG	2100 U	2000 U
Fluoranthene	UG/KG	2100 U	2000 U
Pyrene	UG/KG	2100 U	2000 U
Butyl benzyl phthalate	UG/KG	2100 U	2000 U
3,3'-Dichlorobenzidine	UG/KG	2100 U	2000 U
Benzo[a]anthracene	UG/KG	2100 U	2000 U
Chrysene	UG/KG	2100 U	2000 U
bis(2-Ethylhexyl)phthalate	UG/KG	2100 U	2000 U
di-n-Octylphthalate	UG/KG	2100 U	2000 U
Benzo[b]fluoranthene	UG/KG	2100 U	2000 U
Benzo[k]fluoranthene	UG/KG	2100 U	2000 U
Benzo[a]pyrene	UG/KG	2100 U	2000 U
Indeno[1,2,3-cd]pyrene	UG/KG	2100 U	2000 U
Dibenz[a,h]anthracene	UG/KG	2100 U	2000 U
Benzo[g,h,i]perylene	UG/KG	2100 U	2000 U

FIELD DUPLICATE SUMMARY
 OPERABLE UNIT No. 8 (SITE 16)
 NORTHEAST CREEK SEDIMENT
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID:	16-NC-SD04-06	16-NC-SD04-06D
Laboratory Sample ID:	AB2042	AB2010
Date Sampled:	6/26/94	6/26/94

	<u>UNITS</u>		
<u>PESTICIDES/PCBs</u>			
alpha-BHC	UG/KG	2.1 U	2 U
beta-BHC	UG/KG	2.1 U	2 U
delta-BHC	UG/KG	2.1 U	2 U
Lindane (gamma-BHC)	UG/KG	2.1 U	2 U
Heptachlor	UG/KG	2.1 U	2 U
Aldrin	UG/KG	2.1 U	2 U
Heptachlor epoxide	UG/KG	2.1 U	2 U
Endosulfan I	UG/KG	2.1 U	2 U
Dieldrin	UG/KG	4 U	3.9 U
4,4'-DDE	UG/KG	4 U	3.9 U
Endrin	UG/KG	4 U	3.9 U
Endosulfan II	UG/KG	4 U	3.9 U
4,4'-DDD	UG/KG	4 U	3.9 U
Endosulfan sulfate	UG/KG	4 U	3.9 U
4,4'-DDT	UG/KG	4 U	3.9 U
Methoxychlor	UG/KG	21 U	20 U
Endrin ketone	UG/KG	4 UJ	3.9 U
Endrin aldehyde	UG/KG	4 U	3.9 U
alpha-Chlordane	UG/KG	2.1 U	2 U
gamma-Chlordane	UG/KG	2.1 U	2 U
Toxaphene	UG/KG	210 U	200 U
Aroclor 1016	UG/KG	40 U	39 U
Aroclor 1221	UG/KG	81 U	78 U
Aroclor 1232	UG/KG	40 U	39 U
Aroclor 1242	UG/KG	40 U	39 U
Aroclor 1248	UG/KG	40 U	39 U
Aroclor 1254	UG/KG	40 U	39 U
Aroclor 1260	UG/KG	40 U	39 U

APPENDIX J.8
NORTHEAST CREEK SEDIMENT METALS

FIELD DUPLICATE SUMMARY
 OPERABLE UNIT No. 8 (SITE 16)
 NORTHEAST CREEK SEDIMENT
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TAL INORGANICS

Client Sample ID:	16-NC-SD04-06	16-NC-SD04-06D
Laboratory Sample ID:	AB2043	AB2011
Date Sampled:	6/26/94	6/26/94

	<u>UNITS</u>		
Aluminum	MG/KG	1380 J	947 J
Antimony	MG/KG	12 U	11.1 U
Arsenic	MG/KG	3.8 J	6.6 J
Barium	MG/KG	3.5	1.7
Beryllium	MG/KG	0.24 U	0.22 U
Cadmium	MG/KG	1.2 U	1.1 U
Calcium	MG/KG	124	71.6
Chromium	MG/KG	10.1 J	5.3 J
Cobalt	MG/KG	2.4 U	2.2 U
Copper	MG/KG	2.4 UJ	2.2 UJ
Iron	MG/KG	8730 J	4850 J
Lead	MG/KG	3.2 J	3.2 J
Magnesium	MG/KG	185 UJ	97.6 UJ
Manganese	MG/KG	1.9	1.5
Mercury	MG/KG	0.11 U	0.12 U
Nickel	MG/KG	4.8 U	4.4 U
Potassium	MG/KG	399 U	254 UJ
Selenium	MG/KG	0.48 UJ	0.46 U
Silver	MG/KG	1.2 U	1.1 U
Sodium	MG/KG	646 J	162 J
Thallium	MG/KG	0.48 U	0.46 UJ
Vanadium	MG/KG	19.2 J	9.8 J
Zinc	MG/KG	46.4 J	1.1 UJ

APPENDIX K
QA/QC SUMMARIES

APPENDIX K.1
SOIL ORGANICS

FREQUENCY OF DETECTION SUMMARY
OPERABLE UNIT No. 8
SITE 16 - QA/QC - SOIL
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

Client Sample ID:	16-RS-01	16-RS-03	16-TB-01	16-TB-02	16-TB-03	16-TB-04
Laboratory Sample ID:	AC4154	AC4616	AC4156	AC4110	AC4842	AC4843
Date Sampled:	10/18/94	10/20/94	10/18/94	10/19/94	10/20/94	10/21/94

	UNITS						
VOLATILES							
Chloromethane	UG/L	6 J	10 U	7 J	4 J	10 U	10 U
Bromomethane	UG/L	10 U	10 U	10 U	10 U	10 U	10 U
Vinyl chloride	UG/L	10 U	10 U	10 U	10 U	10 U	10 U
Chloroethane	UG/L	10 U	10 U	10 U	10 U	10 U	10 U
Methylene chloride	UG/L	10	10 U	6 J	3 J	10 U	10 U
Acetone	UG/L	14	10 U	8 J	7 J	10 U	10 U
Carbon Disulfide	UG/L	10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethene	UG/L	10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethane	UG/L	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethene(total)	UG/L	10 U	10 U	10 U	10 U	10 U	10 U
Chloroform	UG/L	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethane	UG/L	2 J	1 J	2 J	3 J	10 U	10 U
2-Butanone	UG/L	3 J	10 U	10 U	10 U	10 U	10 U
1,1,1-Trichloroethane	UG/L	10 U	10 U	10 U	10 U	10 U	10 U
Carbon tetrachloride	UG/L	10 U	10 U	10 U	10 U	10 U	10 U
Bromodichloromethane	UG/L	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloropropane	UG/L	10 U	10 U	10 U	10 U	10 U	10 U
cis-1,3-Dichloropropene	UG/L	10 U	10 U	10 U	10 U	10 U	10 U
Trichloroethene	UG/L	10 U	10 U	10 U	10 U	10 U	10 U
Dibromochloromethane	UG/L	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichloroethane	UG/L	10 U	10 U	10 U	10 U	10 U	10 U
Benzene	UG/L	10 U	10 U	10 U	10 U	10 U	10 U
trans-1,3-Dichloropropene	UG/L	10 U	10 U	10 U	10 U	10 U	10 U
Bromoform	UG/L	10 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone	UG/L	10 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone	UG/L	10 U	10 U	10 U	10 U	10 U	10 U
Tetrachloroethene	UG/L	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane	UG/L	10 U	10 U	10 U	10 U	10 U	10 U
Toluene	UG/L	10 U	10 U	10 U	10 U	10 U	10 U
Chlorobenzene	UG/L	10 U	10 U	10 U	10 U	10 U	10 U
Ethylbenzene	UG/L	10 U	10 U	10 U	10 U	10 U	10 U
Styrene	UG/L	10 U	10 U	10 U	10 U	10 U	10 U
Xylenes (total)	UG/L	10 U	10 U	10 U	10 U	10 U	10 U

FREQUENCY OF DETECTION SUMMARY
 OPERABLE UNIT No. 8
 SITE 16 - QA/QC - SOIL
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID:	16-RS-01	16-RS-03	16-TB-01	16-TB-02	16-TB-03	16-TB-04
Laboratory Sample ID:	AC4154	AC4616	AC4156	AC4110	AC4842	AC4843
Date Sampled:	10/18/94	10/20/94	10/18/94	10/19/94	10/20/94	10/21/94

UNITS

SEMIVOLATILES

	16-RS-01	16-RS-03	16-TB-01	16-TB-02	16-TB-03	16-TB-04
Phenol	UG/L	10 U	10 U	NA	NA	NA
bis(2-Chloroethyl) ether	UG/L	10 U	10 U	NA	NA	NA
2-Chlorophenol	UG/L	10 U	10 U	NA	NA	NA
1,3-Dichlorobenzene	UG/L	10 U	10 U	NA	NA	NA
1,4-Dichlorobenzene	UG/L	10 U	10 U	NA	NA	NA
1,2-Dichlorobenzene	UG/L	10 U	10 U	NA	NA	NA
2-Methylphenol	UG/L	10 U	10 U	NA	NA	NA
2,2'-oxybis-(1-chloropropane)	UG/L	10 U	10 UJ	NA	NA	NA
4-Methylphenol	UG/L	10 U	10 U	NA	NA	NA
N-Nitroso-di-n-propylamine	UG/L	10 U	10 UJ	NA	NA	NA
Hexachloroethane	UG/L	10 U	10 U	NA	NA	NA
Nitrobenzene	UG/L	10 U	10 U	NA	NA	NA
Isophorone	UG/L	10 U	10 U	NA	NA	NA
2-Nitrophenol	UG/L	10 U	10 U	NA	NA	NA
2,4-Dimethylphenol	UG/L	10 U	10 U	NA	NA	NA
bis(2-Chloroethoxy) methane	UG/L	10 U	10 U	NA	NA	NA
2,4-Dichlorophenol	UG/L	10 U	10 U	NA	NA	NA
1,2,4-Trichlorobenzene	UG/L	10 U	10 U	NA	NA	NA
Naphthalene	UG/L	10 U	10 U	NA	NA	NA
4-Chloroaniline	UG/L	10 U	10 U	NA	NA	NA
Hexachlorobutadiene	UG/L	10 U	10 U	NA	NA	NA
4-Chloro-3-methylphenol	UG/L	10 U	10 U	NA	NA	NA
2-Methylnaphthalene	UG/L	10 U	10 U	NA	NA	NA
Hexachlorocyclopentadiene	UG/L	10 U	10 U	NA	NA	NA
2,4,6-Trichlorophenol	UG/L	10 U	10 U	NA	NA	NA
2,4,5-Trichlorophenol	UG/L	25 U	25 U	NA	NA	NA
2-Chloronaphthalene	UG/L	10 U	10 U	NA	NA	NA
2-Nitroaniline	UG/L	25 U	25 U	NA	NA	NA
Dimethyl phthalate	UG/L	10 U	10 U	NA	NA	NA
Acenaphthylene	UG/L	10 U	10 U	NA	NA	NA
2,6-Dinitrotoluene	UG/L	10 U	10 U	NA	NA	NA
3-Nitroaniline	UG/L	25 U	25 U	NA	NA	NA
Acenaphthene	UG/L	10 U	10 U	NA	NA	NA

FREQUENCY OF DETECTION SUMMARY
 OPERABLE UNIT No. 8
 SITE 16 - QA/QC - SOIL
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID:	16-RS-01	16-RS-03	16-TB-01	16-TB-02	16-TB-03	16-TB-04
Laboratory Sample ID:	AC4154	AC4616	AC4156	AC4110	AC4842	AC4843
Date Sampled:	10/18/94	10/20/94	10/18/94	10/19/94	10/20/94	10/21/94

UNITS

SEMIVOLATILES Cont.

	16-RS-01	16-RS-03	16-TB-01	16-TB-02	16-TB-03	16-TB-04
2,4-Dinitrophenol	UG/L	25 U	25 U	NA	NA	NA
4-Nitrophenol	UG/L	25 U	25 U	NA	NA	NA
Dibenzofuran	UG/L	10 U	10 U	NA	NA	NA
2,4-Dinitrotoluene	UG/L	10 U	10 U	NA	NA	NA
Diethylphthalate	UG/L	10 U	10 U	NA	NA	NA
4-Chlorophenyl phenyl ether	UG/L	10 U	10 U	NA	NA	NA
Fluorene	UG/L	10 U	10 U	NA	NA	NA
4-Nitroaniline	UG/L	25 U	25 U	NA	NA	NA
4,6-Dinitro-2-methylphenol	UG/L	25 U	25 U	NA	NA	NA
N-nitrosodiphenylamine	UG/L	10 U	10 U	NA	NA	NA
4-Bromophenyl-phenylether	UG/L	10 U	10 U	NA	NA	NA
Hexachlorobenzene	UG/L	10 U	10 U	NA	NA	NA
Pentachlorophenol	UG/L	25 U	25 U	NA	NA	NA
Phenanthrene	UG/L	10 U	10 U	NA	NA	NA
Anthracene	UG/L	10 U	10 U	NA	NA	NA
Carbazole	UG/L	10 U	10 U	NA	NA	NA
di-n-Butylphthalate	UG/L	10 U	10 U	NA	NA	NA
Fluoranthene	UG/L	10 U	10 U	NA	NA	NA
Pyrene	UG/L	10 U	10 U	NA	NA	NA
Butyl benzyl phthalate	UG/L	10 U	10 U	NA	NA	NA
3,3'-Dichlorobenzidine	UG/L	10 U	10 U	NA	NA	NA
Benzo[a]anthracene	UG/L	10 U	10 U	NA	NA	NA
Chrysene	UG/L	10 U	10 U	NA	NA	NA
bis(2-Ethylhexyl)phthalate	UG/L	10 U	1 J	NA	NA	NA
di-n-Octylphthalate	UG/L	10 U	10 U	NA	NA	NA
Benzo[b]fluoranthene	UG/L	10 U	10 U	NA	NA	NA
Benzo[k]fluoranthene	UG/L	10 U	10 U	NA	NA	NA
Benzo[a]pyrene	UG/L	10 U	10 U	NA	NA	NA
Indeno[1,2,3-cd]pyrene	UG/L	10 U	10 U	NA	NA	NA
Dibenz[a,h]anthracene	UG/L	10 U	10 U	NA	NA	NA
Benzo[g,h,i]perylene	UG/L	10 U	10 U	NA	NA	NA

FREQUENCY OF DETECTION SUMMARY
OPERABLE UNIT No. 8
SITE 16 - QA/QC - SOIL
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

Client Sample ID:	16-RS-01	16-RS-03	16-TB-01	16-TB-02	16-TB-03	16-TB-04
Laboratory Sample ID:	AC4154	AC4616	AC4156	AC4110	AC4842	AC4843
Date Sampled:	10/18/94	10/20/94	10/18/94	10/19/94	10/20/94	10/21/94

	UNITS					
PESTICIDES/PCBs						
alpha-BHC	UG/L	0.05 UJ	0.05 UJ	NA	NA	NA
beta-BHC	UG/L	0.05 UJ	0.05 UJ	NA	NA	NA
delta-BHC	UG/L	0.05 UJ	0.05 UJ	NA	NA	NA
Lindane (gamma-BHC)	UG/L	0.05 UJ	0.05 UJ	NA	NA	NA
Heptachlor	UG/L	0.05 UJ	0.05 UJ	NA	NA	NA
Aldrin	UG/L	0.05 UJ	0.05 UJ	NA	NA	NA
Heptachlor epoxide	UG/L	0.05 UJ	0.05 UJ	NA	NA	NA
Endosulfan I	UG/L	0.05 UJ	0.05 UJ	NA	NA	NA
Dieldrin	UG/L	0.1 UJ	0.1 UJ	NA	NA	NA
4,4'-DDE	UG/L	0.1 UJ	0.1 UJ	NA	NA	NA
Endrin	UG/L	0.1 UJ	0.1 UJ	NA	NA	NA
Endosulfan II	UG/L	0.1 UJ	0.1 UJ	NA	NA	NA
4,4'-DDD	UG/L	0.1 UJ	0.1 UJ	NA	NA	NA
Endosulfan sulfate	UG/L	0.1 UJ	0.1 UJ	NA	NA	NA
4,4'-DDT	UG/L	0.1 UJ	0.1 UJ	NA	NA	NA
Methoxychlor	UG/L	0.5 UJ	0.5 UJ	NA	NA	NA
Endrin ketone	UG/L	0.1 UJ	0.1 UJ	NA	NA	NA
Endrin aldehyde	UG/L	0.1 UJ	0.1 UJ	NA	NA	NA
alpha-Chlordane	UG/L	0.05 UJ	0.05 UJ	NA	NA	NA
gamma-Chlordane	UG/L	0.05 UJ	0.05 UJ	NA	NA	NA
Toxaphene	UG/L	5 UJ	5 UJ	NA	NA	NA
Aroclor 1016	UG/L	1 UJ	1 UJ	NA	NA	NA
Aroclor 1221	UG/L	2 UJ	2 UJ	NA	NA	NA
Aroclor 1232	UG/L	1 UJ	1 UJ	NA	NA	NA
Aroclor 1242	UG/L	1 UJ	1 UJ	NA	NA	NA
Aroclor 1248	UG/L	1 UJ	1 UJ	NA	NA	NA
Aroclor 1254	UG/L	1 UJ	1 UJ	NA	NA	NA
Aroclor 1260	UG/L	1 UJ	1 UJ	NA	NA	NA

FREQUENCY OF DETECTION SUMMARY
OPERABLE UNIT No. 8
SITE 16 - QA/QC - SOIL
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

Client Sample ID:	274-FB-01	274-FB-02
Laboratory Sample ID:	AC4148	AC4151
Date Sampled:	10/18/94	10/18/94

	<u>UNITS</u>		
<u>VOLATILES</u>			
Chloromethane	UG/L	5 J	10 U
Bromomethane	UG/L	10 U	10 U
Vinyl chloride	UG/L	10 U	10 U
Chloroethane	UG/L	10 U	10 U
Methylene chloride	UG/L	8 J	8 J
Acetone	UG/L	12	5 J
Carbon Disulfide	UG/L	10 U	10 U
1,1-Dichloroethene	UG/L	10 U	10 U
1,1-Dichloroethane	UG/L	10 U	10 U
1,2-Dichloroethene(total)	UG/L	10 U	10 U
Chloroform	UG/L	10 U	17
1,2-Dichloroethane	UG/L	2 J	10 U
2-Butanone	UG/L	6 J	10 U
1,1,1-Trichloroethane	UG/L	10 U	10 U
Carbon tetrachloride	UG/L	10 U	10 U
Bromodichloromethane	UG/L	10 U	14
1,2-Dichloropropane	UG/L	10 U	10 U
cis-1,3-Dichloropropene	UG/L	10 U	10 U
Trichloroethene	UG/L	10 U	10 U
Dibromochloromethane	UG/L	10 U	8 J
1,1,2-Trichloroethane	UG/L	10 U	10 U
Benzene	UG/L	10 U	10 U
trans-1,3-Dichloropropene	UG/L	10 U	10 U
Bromoform	UG/L	10 U	10 U
4-Methyl-2-pentanone	UG/L	10 U	10 U
2-Hexanone	UG/L	10 U	10 U
Tetrachloroethene	UG/L	10 U	10 U
1,1,2,2-Tetrachloroethane	UG/L	10 U	10 U
Toluene	UG/L	10 U	10 U
Chlorobenzene	UG/L	10 U	10 U
Ethylbenzene	UG/L	10 U	10 U
Styrene	UG/L	10 U	10 U
Xylenes (total)	UG/L	10 U	10 U

FREQUENCY OF DETECTION SUMMARY
 OPERABLE UNIT No. 8
 SITE 16 - QA/QC - SOIL
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID:	274-FB-01	274-FB-02
Laboratory Sample ID:	AC4148	AC4151
Date Sampled:	10/18/94	10/18/94

	<u>UNITS</u>			
SEMIVOLATILES				
Phenol	UG/L	10 U		10 U
bis(2-Chloroethyl) ether	UG/L	10 U		10 U
2-Chlorophenol	UG/L	10 U		10 U
1,3-Dichlorobenzene	UG/L	10 U		10 U
1,4-Dichlorobenzene	UG/L	10 U		10 U
1,2-Dichlorobenzene	UG/L	10 U		10 U
2-Methylphenol	UG/L	10 U		10 U
2,2-oxybis-(1-chloropropane)	UG/L	10 U		10 U
4-Methylphenol	UG/L	10 U		10 U
N-Nitroso-di-n-propylamine	UG/L	10 U		10 U
Hexachloroethane	UG/L	10 U		10 U
Nitrobenzene	UG/L	10 U		10 U
Isophorone	UG/L	10 U		10 U
2-Nitrophenol	UG/L	10 U		10 U
2,4-Dimethylphenol	UG/L	10 U		10 U
bis(2-Chloroethoxy) methane	UG/L	10 U		10 U
2,4-Dichlorophenol	UG/L	10 U		10 U
1,2,4-Trichlorobenzene	UG/L	10 U		10 U
Naphthalene	UG/L	10 U		10 U
4-Chloroaniline	UG/L	10 U		10 U
Hexachlorobutadiene	UG/L	10 U		10 U
4-Chloro-3-methylphenol	UG/L	10 U		10 U
2-Methylnaphthalene	UG/L	10 U		10 U
Hexachlorocyclopentadiene	UG/L	10 U		10 U
2,4,6-Trichlorophenol	UG/L	10 U		10 U
2,4,5-Trichlorophenol	UG/L	25 U		25 U
2-Chloronaphthalene	UG/L	10 U		10 U
2-Nitroaniline	UG/L	25 U		25 U
Dimethyl phthalate	UG/L	10 U		10 U
Acenaphthylene	UG/L	10 U		10 U
2,6-Dinitrotoluene	UG/L	10 U		10 U
3-Nitroaniline	UG/L	25 U		25 U
Acenaphthene	UG/L	10 U		10 U

FREQUENCY OF DETECTION SUMMARY
OPERABLE UNIT No. 8
SITE 16 - QA/QC - SOIL
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

Client Sample ID:	274-FB-01	274-FB-02
Laboratory Sample ID:	AC4148	AC4151
Date Sampled:	10/18/94	10/18/94

UNITS

SEMIVOLATILES Cont.

2,4-Dinitrophenol	UG/L	25 U	25 U
4-Nitrophenol	UG/L	25 U	25 U
Dibenzofuran	UG/L	10 U	10 U
2,4-Dinitrotoluene	UG/L	10 U	10 U
Diethylphthalate	UG/L	10 U	10 U
4-Chlorophenyl phenyl ether	UG/L	10 U	10 U
Fluorene	UG/L	10 U	10 U
4-Nitroaniline	UG/L	25 U	25 U
4,6-Dinitro-2-methylphenol	UG/L	25 U	25 U
N-nitrosodiphenylamine	UG/L	10 U	10 U
4-Bromophenyl-phenylether	UG/L	10 U	10 U
Hexachlorobenzene	UG/L	10 U	10 U
Pentachlorophenol	UG/L	25 U	25 U
Phenanthrene	UG/L	10 U	10 U
Anthracene	UG/L	10 U	10 U
Carbazole	UG/L	10 U	10 U
di-n-Butylphthalate	UG/L	10 U	10 U
Fluoranthene	UG/L	10 U	10 U
Pyrene	UG/L	10 U	10 U
Butyl benzyl phthalate	UG/L	10 U	10 U
3,3'-Dichlorobenzidine	UG/L	10 U	10 U
Benzo[a]anthracene	UG/L	10 U	10 U
Chrysene	UG/L	10 U	10 U
bis(2-Ethylhexyl)phthalate	UG/L	10 U	10 U
di-n-Octylphthalate	UG/L	10 U	10 U
Benzo[b]fluoranthene	UG/L	10 U	10 U
Benzo[k]fluoranthene	UG/L	10 U	10 U
Benzo[a]pyrene	UG/L	10 U	10 U
Indeno[1,2,3-cd]pyrene	UG/L	10 U	10 U
Dibenz[a,h]anthracene	UG/L	10 U	10 U
Benzo[g,h,i]perylene	UG/L	10 U	10 U

FREQUENCY OF DETECTION SUMMARY
 OPERABLE UNIT No. 8
 SITE 16 - QA/QC - SOIL
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID:	274-FB-01	274-FB-02
Laboratory Sample ID:	AC4148	AC4151
Date Sampled:	10/18/94	10/18/94

	<u>UNITS</u>		
<u>PESTICIDES/PCBs</u>			
alpha-BHC	UG/L	0.05 UJ	0.05 UJ
beta-BHC	UG/L	0.05 UJ	0.05 UJ
delta-BHC	UG/L	0.05 UJ	0.05 UJ
Lindane (gamma-BHC)	UG/L	0.05 UJ	0.05 UJ
Heptachlor	UG/L	0.05 UJ	0.05 UJ
Aldrin	UG/L	0.05 UJ	0.05 UJ
Heptachlor epoxide	UG/L	0.05 UJ	0.05 UJ
Endosulfan I	UG/L	0.05 UJ	0.05 UJ
Dieldrin	UG/L	0.1 UJ	0.1 UJ
4,4'-DDE	UG/L	0.1 UJ	0.1 UJ
Endrin	UG/L	0.1 UJ	0.1 UJ
Endosulfan II	UG/L	0.1 UJ	0.1 UJ
4,4'-DDD	UG/L	0.1 UJ	0.1 UJ
Endosulfan sulfate	UG/L	0.1 UJ	0.1 UJ
4,4'-DDT	UG/L	0.1 UJ	0.1 UJ
Methoxychlor	UG/L	0.5 UJ	0.5 UJ
Endrin ketone	UG/L	0.1 UJ	0.1 UJ
Endrin aldehyde	UG/L	0.1 UJ	0.1 UJ
alpha-Chlordane	UG/L	0.05 UJ	0.05 UJ
gamma-Chlordane	UG/L	0.05 UJ	0.05 UJ
Toxaphene	UG/L	5 UJ	5 UJ
Aroclor 1016	UG/L	1 UJ	1 UJ
Aroclor 1221	UG/L	2 UJ	2 UJ
Aroclor 1232	UG/L	1 UJ	1 UJ
Aroclor 1242	UG/L	1 UJ	1 UJ
Aroclor 1248	UG/L	1 UJ	1 UJ
Aroclor 1254	UG/L	1 UJ	1 UJ
Aroclor 1260	UG/L	1 UJ	1 UJ

FREQUENCY OF DETECTION SUMMARY
OPERABLE UNIT No. 8
SITE 16 - QA/QC - SOIL
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

Client Sample ID: Laboratory Sample ID: Date Sampled:	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
UNITS						
VOLATILES						
Chloromethane	UG/L	10 U	10 U	4 J	7 J	16-TB-01 4/8
Bromomethane	UG/L	10 U	10 U	ND	ND	0/8
Vinyl chloride	UG/L	10 U	10 U	ND	ND	0/8
Chloroethane	UG/L	10 U	10 U	ND	ND	0/8
Methylene chloride	UG/L	10 U	10 U	3 J	10	16-RS-01 5/8
Acetone	UG/L	10 U	10 U	5 J	14	16-RS-01 5/8
Carbon Disulfide	UG/L	10 U	10 U	ND	ND	0/8
1,1-Dichloroethene	UG/L	10 U	10 U	ND	ND	0/8
1,1-Dichloroethane	UG/L	10 U	10 U	ND	ND	0/8
1,2-Dichloroethene(total)	UG/L	10 U	10 U	ND	ND	0/8
Chloroform	UG/L	10 U	10 U	17	17	274-FB-02 1/8
1,2-Dichloroethane	UG/L	10 U	10 U	1 J	3 J	16-TB-02 5/8
2-Butanone	UG/L	10 U	10 U	3 J	6 J	274-FB-01 2/8
1,1,1-Trichloroethane	UG/L	10 U	10 U	ND	ND	0/8
Carbon tetrachloride	UG/L	10 U	10 U	ND	ND	0/8
Bromodichloromethane	UG/L	10 U	10 U	14	14	274-FB-02 1/8
1,2-Dichloropropane	UG/L	10 U	10 U	ND	ND	0/8
cis-1,3-Dichloropropene	UG/L	10 U	10 U	ND	ND	0/8
Trichloroethene	UG/L	10 U	10 U	ND	ND	0/8
Dibromochloromethane	UG/L	10 U	10 U	8 J	8 J	274-FB-02 1/8
1,1,2-Trichloroethane	UG/L	10 U	10 U	ND	ND	0/8
Benzene	UG/L	10 U	10 U	ND	ND	0/8
trans-1,3-Dichloropropene	UG/L	10 U	10 U	ND	ND	0/8
Bromoform	UG/L	10 U	10 U	ND	ND	0/8
4-Methyl-2-pentanone	UG/L	10 U	10 U	ND	ND	0/8
2-Hexanone	UG/L	10 U	10 U	ND	ND	0/8
Tetrachloroethene	UG/L	10 U	10 U	ND	ND	0/8
1,1,2,2-Tetrachloroethane	UG/L	10 U	10 U	ND	ND	0/8
Toluene	UG/L	10 U	10 U	ND	ND	0/8
Chlorobenzene	UG/L	10 U	10 U	ND	ND	0/8
Ethylbenzene	UG/L	10 U	10 U	ND	ND	0/8
Styrene	UG/L	10 U	10 U	ND	ND	0/8
Xylenes (total)	UG/L	10 U	10 U	ND	ND	0/8

FREQUENCY OF DETECTION SUMMARY
OPERABLE UNIT No. 8
SITE 16 - QA/QC - SOIL
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

Client Sample ID: Laboratory Sample ID: Date Sampled:	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
	<u>UNITS</u>					
	<u>SEMIVOLATILES</u>					
Phenol	UG/L	10 U	10 U	ND	ND	0/4
bis(2-Chloroethyl) ether	UG/L	10 U	10 U	ND	ND	0/4
2-Chlorophenol	UG/L	10 U	10 U	ND	ND	0/4
1,3-Dichlorobenzene	UG/L	10 U	10 U	ND	ND	0/4
1,4-Dichlorobenzene	UG/L	10 U	10 U	ND	ND	0/4
1,2-Dichlorobenzene	UG/L	10 U	10 U	ND	ND	0/4
2-Methylphenol	UG/L	10 U	10 U	ND	ND	0/4
2,2'-oxybis-(1-chloropropane)	UG/L	10 U	10 U	ND	ND	0/4
4-Methylphenol	UG/L	10 U	10 U	ND	ND	0/4
N-Nitroso-di-n-propylamine	UG/L	10 U	10 U	ND	ND	0/4
Hexachloroethane	UG/L	10 U	10 U	ND	ND	0/4
Nitrobenzene	UG/L	10 U	10 U	ND	ND	0/4
isophorone	UG/L	10 U	10 U	ND	ND	0/4
2-Nitrophenol	UG/L	10 U	10 U	ND	ND	0/4
2,4-Dimethylphenol	UG/L	10 U	10 U	ND	ND	0/4
bis(2-Chloroethoxy) methane	UG/L	10 U	10 U	ND	ND	0/4
2,4-Dichlorophenol	UG/L	10 U	10 U	ND	ND	0/4
1,2,4-Trichlorobenzene	UG/L	10 U	10 U	ND	ND	0/4
Naphthalene	UG/L	10 U	10 U	ND	ND	0/4
4-Chloroaniline	UG/L	10 U	10 U	ND	ND	0/4
Hexachlorobutadiene	UG/L	10 U	10 U	ND	ND	0/4
4-Chloro-3-methylphenol	UG/L	10 U	10 U	ND	ND	0/4
2-Methylnaphthalene	UG/L	10 U	10 U	ND	ND	0/4
Hexachlorocyclopentadiene	UG/L	10 U	10 U	ND	ND	0/4
2,4,6-Trichlorophenol	UG/L	10 U	10 U	ND	ND	0/4
2,4,5-Trichlorophenol	UG/L	25 U	25 U	ND	ND	0/4
2-Chloronaphthalene	UG/L	10 U	10 U	ND	ND	0/4
2-Nitroaniline	UG/L	25 U	25 U	ND	ND	0/4
Dimethyl phthalate	UG/L	10 U	10 U	ND	ND	0/4
Acenaphthylene	UG/L	10 U	10 U	ND	ND	0/4
2,6-Dinitrotoluene	UG/L	10 U	10 U	ND	ND	0/4
3-Nitroaniline	UG/L	25 U	25 U	ND	ND	0/4
Acenaphthene	UG/L	10 U	10 U	ND	ND	0/4

FREQUENCY OF DETECTION SUMMARY
OPERABLE UNIT No. 8
SITE 16 - QA/QC - SOIL
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

Client Sample ID: Laboratory Sample ID: Date Sampled:	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
	UNITS					
	SEMIVOLATILES Cont.					
2,4-Dinitrophenol	UG/L	25 U	25 U	ND	ND	0/4
4-Nitrophenol	UG/L	25 U	25 U	ND	ND	0/4
Dibenzofuran	UG/L	10 U	10 U	ND	ND	0/4
2,4-Dinitrotoluene	UG/L	10 U	10 U	ND	ND	0/4
Diethylphthalate	UG/L	10 U	10 U	ND	ND	0/4
4-Chlorophenyl phenyl ether	UG/L	10 U	10 U	ND	ND	0/4
Fluorene	UG/L	10 U	10 U	ND	ND	0/4
4-Nitroaniline	UG/L	25 U	25 U	ND	ND	0/4
4,6-Dinitro-2-methylphenol	UG/L	25 U	25 U	ND	ND	0/4
N-nitrosodiphenylamine	UG/L	10 U	10 U	ND	ND	0/4
4-Bromophenyl-phenylether	UG/L	10 U	10 U	ND	ND	0/4
Hexachlorobenzene	UG/L	10 U	10 U	ND	ND	0/4
Pentachlorophenol	UG/L	25 U	25 U	ND	ND	0/4
Phenanthrene	UG/L	10 U	10 U	ND	ND	0/4
Anthracene	UG/L	10 U	10 U	ND	ND	0/4
Carbazole	UG/L	10 U	10 U	ND	ND	0/4
di-n-Butylphthalate	UG/L	10 U	10 U	ND	ND	0/4
Fluoranthene	UG/L	10 U	10 U	ND	ND	0/4
Pyrene	UG/L	10 U	10 U	ND	ND	0/4
Butyl benzyl phthalate	UG/L	10 U	10 U	ND	ND	0/4
3,3'-Dichlorobenzidine	UG/L	10 U	10 U	ND	ND	0/4
Benzo[a]anthracene	UG/L	10 U	10 U	ND	ND	0/4
Chrysene	UG/L	10 U	10 U	ND	ND	0/4
bis(2-Ethylhexyl)phthalate	UG/L	10 U	10 U	1 J	1 J	1/4
di-n-Octylphthalate	UG/L	10 U	10 U	ND	ND	0/4
Benzo[b]fluoranthene	UG/L	10 U	10 U	ND	ND	0/4
Benzo[k]fluoranthene	UG/L	10 U	10 U	ND	ND	0/4
Benzo[a]pyrene	UG/L	10 U	10 U	ND	ND	0/4
Indeno[1,2,3-cd]pyrene	UG/L	10 U	10 U	ND	ND	0/4
Dibenz[a,h]anthracene	UG/L	10 U	10 U	ND	ND	0/4
Benzo[g,h,i]perylene	UG/L	10 U	10 U	ND	ND	0/4

FREQUENCY OF DETECTION SUMMARY
OPERABLE UNIT No. 8
SITE 16 - QA/QC - SOIL
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

Client Sample ID: Laboratory Sample ID: Date Sampled:	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
	UNITS					
	PESTICIDES/PCBs					
alpha-BHC	UG/L	0.05 UJ	0.05 UJ	ND	ND	0/4
beta-BHC	UG/L	0.05 UJ	0.05 UJ	ND	ND	0/4
delta-BHC	UG/L	0.05 UJ	0.05 UJ	ND	ND	0/4
Lindane (gamma-BHC)	UG/L	0.05 UJ	0.05 UJ	ND	ND	0/4
Heptachlor	UG/L	0.05 UJ	0.05 UJ	ND	ND	0/4
Aldrin	UG/L	0.05 UJ	0.05 UJ	ND	ND	0/4
Heptachlor epoxide	UG/L	0.05 UJ	0.05 UJ	ND	ND	0/4
Endosulfan I	UG/L	0.05 UJ	0.05 UJ	ND	ND	0/4
Dieldrin	UG/L	0.1 UJ	0.1 UJ	ND	ND	0/4
4,4'-DDE	UG/L	0.1 UJ	0.1 UJ	ND	ND	0/4
Endrin	UG/L	0.1 UJ	0.1 UJ	ND	ND	0/4
Endosulfan II	UG/L	0.1 UJ	0.1 UJ	ND	ND	0/4
4,4'-DDD	UG/L	0.1 UJ	0.1 UJ	ND	ND	0/4
Endosulfan sulfate	UG/L	0.1 UJ	0.1 UJ	ND	ND	0/4
4,4'-DDT	UG/L	0.1 UJ	0.1 UJ	ND	ND	0/4
Methoxychlor	UG/L	0.5 UJ	0.5 UJ	ND	ND	0/4
Endrin ketone	UG/L	0.1 UJ	0.1 UJ	ND	ND	0/4
Endrin aldehyde	UG/L	0.1 UJ	0.1 UJ	ND	ND	0/4
alpha-Chlordane	UG/L	0.05 UJ	0.05 UJ	ND	ND	0/4
gamma-Chlordane	UG/L	0.05 UJ	0.05 UJ	ND	ND	0/4
Toxaphene	UG/L	5 UJ	5 UJ	ND	ND	0/4
Aroclor 1016	UG/L	1 UJ	1 UJ	ND	ND	0/4
Aroclor 1221	UG/L	2 UJ	2 UJ	ND	ND	0/4
Aroclor 1232	UG/L	1 UJ	1 UJ	ND	ND	0/4
Aroclor 1242	UG/L	1 UJ	1 UJ	ND	ND	0/4
Aroclor 1248	UG/L	1 UJ	1 UJ	ND	ND	0/4
Aroclor 1254	UG/L	1 UJ	1 UJ	ND	ND	0/4
Aroclor 1260	UG/L	1 UJ	1 UJ	ND	ND	0/4

APPENDIX K.2
SOIL METALS

FREQUENCY OF DETECTION SUMMARY
OPERABLE UNIT No. 8
SITE 16 - QA/QC - SOIL
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TAL INORGANICS

Client Sample ID:	16-RS-01	16-RS-03	274-FB-01	274-FB-02
Laboratory Sample ID:	AC4155	AC4617	AC4149	AC4152
Date Sampled:	10/18/94	10/20/94	10/18/94	10/18/94

	UNITS				
Aluminum	UG/L	40 U	40 U	50.1	77.4
Antimony	UG/L	50 U	50 U	50 U	50 U
Arsenic	UG/L	10 U	10 U	10 U	10 U
Barium	UG/L	2 U	2 U	2 U	4.2
Beryllium	UG/L	1 U	1 U	1 U	1 U
Cadmium	UG/L	5 U	5 U	5 U	5 U
Calcium	UG/L	42.6	49 U	50.8	19400
Chromium	UG/L	10 U	10 U	10 U	10 U
Cobalt	UG/L	10 U	10 U	10 U	10 U
Copper	UG/L	10 U	10 U	10 U	10 U
Iron	UG/L	108	69 U	25.5	1400
Lead	UG/L	3 U	3 U	3 U	3 U
Magnesium	UG/L	50 U	50 U	50 U	1280
Manganese	UG/L	2 U	2 U	2 U	23
Mercury	UG/L	0.2 U	0.2 U	0.2 U	0.2 U
Nickel	UG/L	20 U	20 U	20 U	20 U
Potassium	UG/L	1000 U	1000 U	1000 U	1000 U
Selenium	UG/L	5 U	5 U	5 U	5 U
Silver	UG/L	5 U	5 U	5 U	5 U
Sodium	UG/L	100 U	100 U	100 U	7890
Thallium	UG/L	10 U	10 U	10 U	10 U
Vanadium	UG/L	10 U	10 U	10 U	10 U
Zinc	UG/L	63.9	15	25	16.4

FREQUENCY OF DETECTION SUMMARY
OPERABLE UNIT No. 8
SITE 16 - QA/QC - SOIL
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TAL INORGANICS

Client Sample ID: Laboratory Sample ID: Date Sampled:	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION	
	UNITS						
Aluminum	UG/L	40 U	40 U	50.1	77.4	274-FB-02	2/4
Antimony	UG/L	50 U	50 U	ND	ND		0/4
Arsenic	UG/L	10 U	10 U	ND	ND		0/4
Barium	UG/L	2 U	2 U	4.2	4.2	274-FB-02	1/4
Beryllium	UG/L	1 U	1 U	ND	ND		0/4
Cadmium	UG/L	5 U	5 U	ND	ND		0/4
Calcium	UG/L	49 U	49 U	42.6	19400	274-FB-02	3/4
Chromium	UG/L	10 U	10 U	ND	ND		0/4
Cobalt	UG/L	10 U	10 U	ND	ND		0/4
Copper	UG/L	10 U	10 U	ND	ND		0/4
Iron	UG/L	69 U	69 U	25.5	1400	274-FB-02	3/4
Lead	UG/L	3 U	3 U	ND	ND		0/4
Magnesium	UG/L	50 U	50 U	1280	1280	274-FB-02	1/4
Manganese	UG/L	2 U	2 U	23	23	274-FB-02	1/4
Mercury	UG/L	0.2 U	0.2 U	ND	ND		0/4
Nickel	UG/L	20 U	20 U	ND	ND		0/4
Potassium	UG/L	1000 U	1000 U	ND	ND		0/4
Selenium	UG/L	5 U	5 U	ND	ND		0/4
Silver	UG/L	5 U	5 U	ND	ND		0/4
Sodium	UG/L	100 U	100 U	7890	7890	274-FB-02	1/4
Thallium	UG/L	10 U	10 U	ND	ND		0/4
Vanadium	UG/L	10 U	10 U	ND	ND		0/4
Zinc	UG/L	NA	NA	15	63.9	16-RS-01	4/4

APPENDIX K.3
GROUNDWATER ORGANICS

FREQUENCY OF DETECTION SUMMARY
 OPERABLE UNIT No. 8
 SITE 16 - QA/QC - GROUNDWATER
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID:	16-RS-04	16-TB-05	16-TB-06
Laboratory Sample ID:	AD1638	AD1172	AD1483
Date Sampled:	11/30/94	11/29/94	11/30/94

	<u>UNITS</u>			
<u>VOLATILES</u>				
Chloromethane	UG/L	10 UJ	10 U	10 U
Bromomethane	UG/L	10 UJ	10 UJ	2 J
Vinyl chloride	UG/L	10 UJ	10 UJ	10 U
Chloroethane	UG/L	10 UJ	10 U	10 U
Methylene chloride	UG/L	2 J	2 J	2 J
Acetone	UG/L	6 J	10 U	7 J
Carbon Disulfide	UG/L	10 UJ	10 U	10 U
1,1-Dichloroethene	UG/L	10 UJ	10 U	10 U
1,1-Dichloroethane	UG/L	10 UJ	10 U	10 U
1,2-Dichloroethene(total)	UG/L	10 UJ	10 U	10 U
Chloroform	UG/L	10 UJ	10 U	10 U
1,2-Dichloroethane	UG/L	1 J	2 J	2 J
2-Butanone	UG/L	8 J	7 J	9 J
1,1,1-Trichloroethane	UG/L	10 UJ	10 U	10 U
Carbon tetrachloride	UG/L	10 UJ	10 U	10 U
Bromodichloromethane	UG/L	10 UJ	10 U	10 U
1,2-Dichloropropane	UG/L	10 UJ	10 U	10 U
cis-1,3-Dichloropropene	UG/L	10 UJ	10 U	10 U
Trichloroethene	UG/L	10 UJ	10 U	10 U
Dibromochloromethane	UG/L	10 UJ	10 U	10 U
1,1,2-Trichloroethane	UG/L	10 UJ	10 U	10 U
Benzene	UG/L	10 UJ	10 U	10 U
trans-1,3-Dichloropropene	UG/L	10 UJ	10 U	10 U
Bromoform	UG/L	10 UJ	10 U	10 U
4-Methyl-2-pentanone	UG/L	10 UJ	10 U	10 U
2-Hexanone	UG/L	10 UJ	2 J	2 J
Tetrachloroethene	UG/L	10 UJ	10 U	10 U
1,1,2,2-Tetrachloroethane	UG/L	10 UJ	10 U	10 U
Toluene	UG/L	10 UJ	10 U	10 U
Chlorobenzene	UG/L	10 UJ	10 U	10 U
Ethylbenzene	UG/L	10 UJ	10 U	10 U
Styrene	UG/L	10 UJ	10 U	10 U
Xylenes (total)	UG/L	10 UJ	10 U	1 J

FREQUENCY OF DETECTION SUMMARY
 OPERABLE UNIT No. 8
 SITE 16 - QA/QC - GROUNDWATER
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID:	16-RS-04	16-TB-05	16-TB-06
Laboratory Sample ID:	AD1638	AD1172	AD1483
Date Sampled:	11/30/94	11/29/94	11/30/94

	<u>UNITS</u>			
<u>SEMIVOLATILES</u>				
Phenol	UG/L	10 U	NA	NA
bis(2-Chloroethyl) ether	UG/L	10 U	NA	NA
2-Chlorophenol	UG/L	10 U	NA	NA
1,3-Dichlorobenzene	UG/L	10 U	NA	NA
1,4-Dichlorobenzene	UG/L	10 U	NA	NA
1,2-Dichlorobenzene	UG/L	10 U	NA	NA
2-Methylphenol	UG/L	10 U	NA	NA
2,2'-oxybis-(1-chloropropane)	UG/L	10 U	NA	NA
4-Methylphenol	UG/L	10 U	NA	NA
N-Nitroso-di-n-propylamine	UG/L	10 U	NA	NA
Hexachloroethane	UG/L	10 U	NA	NA
Nitrobenzene	UG/L	10 U	NA	NA
Isophorone	UG/L	10 U	NA	NA
2-Nitrophenol	UG/L	10 U	NA	NA
2,4-Dimethylphenol	UG/L	10 U	NA	NA
bis(2-Chloroethoxy) methane	UG/L	10 U	NA	NA
2,4-Dichlorophenol	UG/L	10 U	NA	NA
1,2,4-Trichlorobenzene	UG/L	10 U	NA	NA
Naphthalene	UG/L	10 U	NA	NA
4-Chloroaniline	UG/L	10 U	NA	NA
Hexachlorobutadiene	UG/L	10 U	NA	NA
4-Chloro-3-methylphenol	UG/L	10 U	NA	NA
2-Methylnaphthalene	UG/L	10 U	NA	NA
Hexachlorocyclopentadiene	UG/L	10 U	NA	NA
2,4,6-Trichlorophenol	UG/L	10 U	NA	NA
2,4,5-Trichlorophenol	UG/L	25 U	NA	NA
2-Chloronaphthalene	UG/L	10 U	NA	NA
2-Nitroaniline	UG/L	25 U	NA	NA
Dimethyl phthalate	UG/L	10 U	NA	NA
Acenaphthylene	UG/L	10 U	NA	NA
2,6-Dinitrotoluene	UG/L	10 U	NA	NA
3-Nitroaniline	UG/L	25 U	NA	NA
Acenaphthene	UG/L	10 U	NA	NA

FREQUENCY OF DETECTION SUMMARY
 OPERABLE UNIT No. 8
 SITE 16 - QA/QC - GROUNDWATER
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID:	16-RS-04	16-TB-05	16-TB-06
Laboratory Sample ID:	AD1638	AD1172	AD1483
Date Sampled:	11/30/94	11/29/94	11/30/94

	UNITS			
SEMIVOLATILES Cont.				
2,4-Dinitrophenol	UG/L	25 UJ	NA	NA
4-Nitrophenol	UG/L	25 U	NA	NA
Dibenzofuran	UG/L	10 U	NA	NA
2,4-Dinitrotoluene	UG/L	10 U	NA	NA
Diethylphthalate	UG/L	10 U	NA	NA
4-Chlorophenyl phenyl ether	UG/L	10 U	NA	NA
Fluorene	UG/L	10 U	NA	NA
4-Nitroaniline	UG/L	25 U	NA	NA
4,6-Dinitro-2-methylphenol	UG/L	25 U	NA	NA
N-nitrosodiphenylamine	UG/L	10 U	NA	NA
4-Bromophenyl-phenylether	UG/L	10 U	NA	NA
Hexachlorobenzene	UG/L	10 U	NA	NA
Pentachlorophenol	UG/L	25 U	NA	NA
Phenanthrene	UG/L	10 U	NA	NA
Anthracene	UG/L	10 U	NA	NA
Carbazole	UG/L	10 U	NA	NA
di-n-Butylphthalate	UG/L	10 U	NA	NA
Fluoranthene	UG/L	10 U	NA	NA
Pyrene	UG/L	10 U	NA	NA
Butyl benzyl phthalate	UG/L	10 U	NA	NA
3,3'-Dichlorobenzidine	UG/L	10 U	NA	NA
Benzo[a]anthracene	UG/L	10 U	NA	NA
Chrysene	UG/L	10 U	NA	NA
bis(2-Ethylhexyl)phthalate	UG/L	10 U	NA	NA
di-n-Octylphthalate	UG/L	10 U	NA	NA
Benzo[b]fluoranthene	UG/L	10 U	NA	NA
Benzo[k]fluoranthene	UG/L	10 UJ	NA	NA
Benzo[a]pyrene	UG/L	10 U	NA	NA
Indeno[1,2,3-cd]pyrene	UG/L	10 U	NA	NA
Dibenz[a,h]anthracene	UG/L	10 U	NA	NA
Benzo[g,h,i]perylene	UG/L	10 U	NA	NA

FREQUENCY OF DETECTION SUMMARY
 OPERABLE UNIT No. 8
 SITE 16 - QA/QC - GROUNDWATER
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID:	16-RS-04	16-TB-05	16-TB-06
Laboratory Sample ID:	AD1638	AD1172	AD1483
Date Sampled:	11/30/94	11/29/94	11/30/94

	<u>UNITS</u>			
<u>PESTICIDES/PCBs</u>				
alpha-BHC	UG/L	0.05 U	NA	NA
beta-BHC	UG/L	0.05 U	NA	NA
delta-BHC	UG/L	0.05 U	NA	NA
Lindane (gamma-BHC)	UG/L	0.05 U	NA	NA
Heptachlor	UG/L	0.05 U	NA	NA
Aldrin	UG/L	0.05 U	NA	NA
Heptachlor epoxide	UG/L	0.05 U	NA	NA
Endosulfan I	UG/L	0.05 U	NA	NA
Dieldrin	UG/L	0.1 U	NA	NA
4,4'-DDE	UG/L	0.1 U	NA	NA
Endrin	UG/L	0.1 U	NA	NA
Endosulfan II	UG/L	0.1 U	NA	NA
4,4'-DDD	UG/L	0.1 U	NA	NA
Endosulfan sulfate	UG/L	0.1 U	NA	NA
4,4'-DDT	UG/L	0.1 U	NA	NA
Methoxychlor	UG/L	0.5 U	NA	NA
Endrin ketone	UG/L	0.1 U	NA	NA
Endrin aldehyde	UG/L	0.1 U	NA	NA
alpha-Chlordane	UG/L	0.05 U	NA	NA
gamma-Chlordane	UG/L	0.05 U	NA	NA
Toxaphene	UG/L	5 U	NA	NA
Aroclor 1016	UG/L	1 U	NA	NA
Aroclor 1221	UG/L	2 U	NA	NA
Aroclor 1232	UG/L	1 U	NA	NA
Aroclor 1242	UG/L	1 U	NA	NA
Aroclor 1248	UG/L	1 U	NA	NA
Aroclor 1254	UG/L	1 U	NA	NA
Aroclor 1260	UG/L	1 U	NA	NA

FREQUENCY OF DETECTION SUMMARY
 OPERABLE UNIT No. 8
 SITE 16 - QA/QC - GROUNDWATER
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID: Laboratory Sample ID: Date Sampled:		MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
	<u>UNITS</u>						
	<u>VOLATILES</u>						
	Chloromethane	UG/L	10 UJ	10 UJ	ND		0/3
	Bromomethane	UG/L	10 UJ	10 UJ	2 J	16-TB-06	1/3
	Vinyl chloride	UG/L	10 UJ	10 UJ	ND		0/3
	Chloroethane	UG/L	10 UJ	10 UJ	ND		0/3
	Methylene chloride	UG/L	NA	NA	2 J	16-TB-06	3/3
	Acetone	UG/L	10 U	10 U	6 J	16-TB-06	2/3
	Carbon Disulfide	UG/L	10 UJ	10 UJ	ND		0/3
	1,1-Dichloroethene	UG/L	10 UJ	10 UJ	ND		0/3
	1,1-Dichloroethane	UG/L	10 UJ	10 UJ	ND		0/3
	1,2-Dichloroethene(total)	UG/L	10 UJ	10 UJ	ND		0/3
	Chloroform	UG/L	10 UJ	10 UJ	ND		0/3
	1,2-Dichloroethane	UG/L	NA	NA	1 J	16-TB-06	3/3
	2-Butanone	UG/L	NA	NA	7 J	16-TB-06	3/3
	1,1,1-Trichloroethane	UG/L	10 UJ	10 UJ	ND		0/3
	Carbon tetrachloride	UG/L	10 UJ	10 UJ	ND		0/3
	Bromodichloromethane	UG/L	10 UJ	10 UJ	ND		0/3
	1,2-Dichloropropane	UG/L	10 UJ	10 UJ	ND		0/3
	cis-1,3-Dichloropropene	UG/L	10 UJ	10 UJ	ND		0/3
	Trichloroethene	UG/L	10 UJ	10 UJ	ND		0/3
	Dibromochloromethane	UG/L	10 UJ	10 UJ	ND		0/3
	1,1,2-Trichloroethane	UG/L	10 UJ	10 UJ	ND		0/3
	Benzene	UG/L	10 UJ	10 UJ	ND		0/3
	trans-1,3-Dichloropropene	UG/L	10 UJ	10 UJ	ND		0/3
	Bromoform	UG/L	10 UJ	10 UJ	ND		0/3
	4-Methyl-2-pentanone	UG/L	10 UJ	10 UJ	ND		0/3
	2-Hexanone	UG/L	10 UJ	10 UJ	2 J	16-TB-06	2/3
	Tetrachloroethene	UG/L	10 UJ	10 UJ	ND		0/3
	1,1,2,2-Tetrachloroethane	UG/L	10 UJ	10 UJ	ND		0/3
	Toluene	UG/L	10 UJ	10 UJ	ND		0/3
	Chlorobenzene	UG/L	10 UJ	10 UJ	ND		0/3
	Ethylbenzene	UG/L	10 UJ	10 UJ	ND		0/3
	Styrene	UG/L	10 UJ	10 UJ	ND		0/3
	Xylenes (total)	UG/L	10 UJ	10 UJ	1 J	16-TB-06	1/3

FREQUENCY OF DETECTION SUMMARY
OPERABLE UNIT No. 8
SITE 16 - QA/QC - GROUNDWATER
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

Client Sample ID: Laboratory Sample ID: Date Sampled:	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
	UNITS					
	SEMIVOLATILES					
Phenol	UG/L	10 U	10 U	ND	ND	0/1
bis(2-Chloroethyl) ether	UG/L	10 U	10 U	ND	ND	0/1
2-Chlorophenol	UG/L	10 U	10 U	ND	ND	0/1
1,3-Dichlorobenzene	UG/L	10 U	10 U	ND	ND	0/1
1,4-Dichlorobenzene	UG/L	10 U	10 U	ND	ND	0/1
1,2-Dichlorobenzene	UG/L	10 U	10 U	ND	ND	0/1
2-Methylphenol	UG/L	10 U	10 U	ND	ND	0/1
2,2'-oxybis-(1-chloropropane)	UG/L	10 U	10 U	ND	ND	0/1
4-Methylphenol	UG/L	10 U	10 U	ND	ND	0/1
N-Nitroso-di-n-propylamine	UG/L	10 U	10 U	ND	ND	0/1
Hexachloroethane	UG/L	10 U	10 U	ND	ND	0/1
Nitrobenzene	UG/L	10 U	10 U	ND	ND	0/1
Isophorone	UG/L	10 U	10 U	ND	ND	0/1
2-Nitrophenol	UG/L	10 U	10 U	ND	ND	0/1
2,4-Dimethylphenol	UG/L	10 U	10 U	ND	ND	0/1
bis(2-Chloroethoxy) methane	UG/L	10 U	10 U	ND	ND	0/1
2,4-Dichlorophenol	UG/L	10 U	10 U	ND	ND	0/1
1,2,4-Trichlorobenzene	UG/L	10 U	10 U	ND	ND	0/1
Naphthalene	UG/L	10 U	10 U	ND	ND	0/1
4-Chloroaniline	UG/L	10 U	10 U	ND	ND	0/1
Hexachlorobutadiene	UG/L	10 U	10 U	ND	ND	0/1
4-Chloro-3-methylphenol	UG/L	10 U	10 U	ND	ND	0/1
2-Methylnaphthalene	UG/L	10 U	10 U	ND	ND	0/1
Hexachlorocyclopentadiene	UG/L	10 UJ	10 UJ	ND	ND	0/1
2,4,6-Trichlorophenol	UG/L	10 U	10 U	ND	ND	0/1
2,4,5-Trichlorophenol	UG/L	25 U	25 U	ND	ND	0/1
2-Chloronaphthalene	UG/L	10 U	10 U	ND	ND	0/1
2-Nitroaniline	UG/L	25 U	25 U	ND	ND	0/1
Dimethyl phthalate	UG/L	10 U	10 U	ND	ND	0/1
Acenaphthylene	UG/L	10 U	10 U	ND	ND	0/1
2,6-Dinitrotoluene	UG/L	10 U	10 U	ND	ND	0/1
3-Nitroaniline	UG/L	25 U	25 U	ND	ND	0/1
Acenaphthene	UG/L	10 U	10 U	ND	ND	0/1

FREQUENCY OF DETECTION SUMMARY
OPERABLE UNIT No. 8
SITE 16 - QA/QC - GROUNDWATER
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

Client Sample ID: Laboratory Sample ID: Date Sampled:		MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
	UNITS						
	SEMIVOLATILES Cont.						
	2,4-Dinitrophenol	UG/L	25 UJ	25 UJ	ND	ND	0/1
	4-Nitrophenol	UG/L	25 U	25 U	ND	ND	0/1
	Dibenzofuran	UG/L	10 U	10 U	ND	ND	0/1
	2,4-Dinitrotoluene	UG/L	10 U	10 U	ND	ND	0/1
	Diethylphthalate	UG/L	10 U	10 U	ND	ND	0/1
	4-Chlorophenyl phenyl ether	UG/L	10 U	10 U	ND	ND	0/1
	Fluorene	UG/L	10 U	10 U	ND	ND	0/1
	4-Nitroaniline	UG/L	25 U	25 U	ND	ND	0/1
	4,6-Dinitro-2-methylphenol	UG/L	25 U	25 U	ND	ND	0/1
	N-nitrosodiphenylamine	UG/L	10 U	10 U	ND	ND	0/1
	4-Bromophenyl-phenylether	UG/L	10 U	10 U	ND	ND	0/1
	Hexachlorobenzene	UG/L	10 U	10 U	ND	ND	0/1
	Pentachlorophenol	UG/L	25 U	25 U	ND	ND	0/1
	Phenanthrene	UG/L	10 U	10 U	ND	ND	0/1
	Anthracene	UG/L	10 U	10 U	ND	ND	0/1
	Carbazole	UG/L	10 U	10 U	ND	ND	0/1
	di-n-Butylphthalate	UG/L	10 U	10 U	ND	ND	0/1
	Fluoranthene	UG/L	10 U	10 U	ND	ND	0/1
	Pyrene	UG/L	10 U	10 U	ND	ND	0/1
	Butyl benzyl phthalate	UG/L	10 U	10 U	ND	ND	0/1
	3,3'-Dichlorobenzidine	UG/L	10 U	10 U	ND	ND	0/1
	Benzo[a]anthracene	UG/L	10 U	10 U	ND	ND	0/1
	Chrysene	UG/L	10 U	10 U	ND	ND	0/1
	bis(2-Ethylhexyl)phthalate	UG/L	10 U	10 U	ND	ND	0/1
	di-n-Octylphthalate	UG/L	10 U	10 U	ND	ND	0/1
	Benzo[b]fluoranthene	UG/L	10 U	10 U	ND	ND	0/1
	Benzo[k]fluoranthene	UG/L	10 UJ	10 UJ	ND	ND	0/1
	Benzo[a]pyrene	UG/L	10 U	10 U	ND	ND	0/1
	Indeno[1,2,3-cd]pyrene	UG/L	10 U	10 U	ND	ND	0/1
	Dibenz[a,h]anthracene	UG/L	10 U	10 U	ND	ND	0/1
	Benzo[g,h,i]perylene	UG/L	10 U	10 U	ND	ND	0/1

FREQUENCY OF DETECTION SUMMARY
OPERABLE UNIT No. 8
SITE 16 - QA/QC - GROUNDWATER
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

Client Sample ID: Laboratory Sample ID: Date Sampled:	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
	UNITS					
	PESTICIDES/PCBs					
alpha-BHC	UG/L	0.05 U	0.05 U	ND	ND	0/1
beta-BHC	UG/L	0.05 U	0.05 U	ND	ND	0/1
delta-BHC	UG/L	0.05 U	0.05 U	ND	ND	0/1
Lindane (gamma-BHC)	UG/L	0.05 U	0.05 U	ND	ND	0/1
Heptachlor	UG/L	0.05 U	0.05 U	ND	ND	0/1
Aldrin	UG/L	0.05 U	0.05 U	ND	ND	0/1
Heptachlor epoxide	UG/L	0.05 U	0.05 U	ND	ND	0/1
Endosulfan I	UG/L	0.05 U	0.05 U	ND	ND	0/1
Dieldrin	UG/L	0.1 U	0.1 U	ND	ND	0/1
4,4'-DDE	UG/L	0.1 U	0.1 U	ND	ND	0/1
Endrin	UG/L	0.1 U	0.1 U	ND	ND	0/1
Endosulfan II	UG/L	0.1 U	0.1 U	ND	ND	0/1
4,4'-DDD	UG/L	0.1 U	0.1 U	ND	ND	0/1
Endosulfan sulfate	UG/L	0.1 U	0.1 U	ND	ND	0/1
4,4'-DDT	UG/L	0.1 U	0.1 U	ND	ND	0/1
Methoxychlor	UG/L	0.5 U	0.5 U	ND	ND	0/1
Endrin ketone	UG/L	0.1 U	0.1 U	ND	ND	0/1
Endrin aldehyde	UG/L	0.1 U	0.1 U	ND	ND	0/1
alpha-Chlordane	UG/L	0.05 U	0.05 U	ND	ND	0/1
gamma-Chlordane	UG/L	0.05 U	0.05 U	ND	ND	0/1
Toxaphene	UG/L	5 U	5 U	ND	ND	0/1
Aroclor 1016	UG/L	1 U	1 U	ND	ND	0/1
Aroclor 1221	UG/L	2 U	2 U	ND	ND	0/1
Aroclor 1232	UG/L	1 U	1 U	ND	ND	0/1
Aroclor 1242	UG/L	1 U	1 U	ND	ND	0/1
Aroclor 1248	UG/L	1 U	1 U	ND	ND	0/1
Aroclor 1254	UG/L	1 U	1 U	ND	ND	0/1
Aroclor 1260	UG/L	1 U	1 U	ND	ND	0/1

APPENDIX K.4
GROUNDWATER TOTAL AND DISSOLVED METALS

FREQUENCY OF DETECTION SUMMARY
 OPERABLE UNIT No. 8
 SITE 16 - QA/QC - GROUNDWATER
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TAL TOTAL & DISSOLVED INORGANICS

Client Sample ID:	16-RS-04	16-RSD-04
Laboratory Sample ID:	AD1639	AD1658
Date Sampled:	11/30/94	11/30/94

	UNITS		
Aluminum	UG/L	40 U	74.6
Antimony	UG/L	50 U	50 U
Arsenic	UG/L	10 U	10 U
Barium	UG/L	2 U	2 U
Beryllium	UG/L	1 U	1 U
Cadmium	UG/L	5 UJ	5 UJ
Calcium	UG/L	49.4	90.2
Chromium	UG/L	10 U	10 U
Cobalt	UG/L	10 U	10 U
Copper	UG/L	10 U	10 U
Iron	UG/L	61.2	41.7
Lead	UG/L	3 U	5.2
Magnesium	UG/L	50 U	50 U
Manganese	UG/L	2 U	2 U
Mercury	UG/L	0.2 U	0.2 U
Nickel	UG/L	20 U	20 U
Potassium	UG/L	1000 U	1000 U
Selenium	UG/L	5 UJ	5 UJ
Silver	UG/L	5 U	5 U
Sodium	UG/L	100 U	106
Thallium	UG/L	10 U	10 U
Vanadium	UG/L	10 U	10 U
Zinc	UG/L	18.7 J	20.6 J

FREQUENCY OF DETECTION SUMMARY
OPERABLE UNIT No. 8
SITE 16 - QA/QC - GROUNDWATER
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TAL TOTAL & DISSOLVED INORGANICS

Client Sample ID:						LOCATION OF	FREQUENCY
Laboratory Sample ID:		MINIMUM	MAXIMUM	MINIMUM	MAXIMUM	MAXIMUM	OF
Date Sampled:	UNITS	NONDETECTED	NONDETECTED	DETECTED	DETECTED	DETECTED	DETECTION
Aluminum	UG/L	40 U	40 U	74.6	74.6	16-RSD-04	1/2
Antimony	UG/L	50 U	50 U	ND	ND		0/2
Arsenic	UG/L	10 U	10 U	ND	ND		0/2
Barium	UG/L	2 U	2 U	ND	ND		0/2
Beryllium	UG/L	1 U	1 U	ND	ND		0/2
Cadmium	UG/L	5 UJ	5 UJ	ND	ND		0/2
Calcium	UG/L	NA	NA	49.4	90.2	16-RSD-04	2/2
Chromium	UG/L	10 U	10 U	ND	ND		0/2
Cobalt	UG/L	10 U	10 U	ND	ND		0/2
Copper	UG/L	10 U	10 U	ND	ND		0/2
Iron	UG/L	NA	NA	41.7	61.2	16-RS-04	2/2
Lead	UG/L	3 U	3 U	5.2	5.2	16-RSD-04	1/2
Magnesium	UG/L	50 U	50 U	ND	ND		0/2
Manganese	UG/L	2 U	2 U	ND	ND		0/2
Mercury	UG/L	0.2 U	0.2 U	ND	ND		0/2
Nickel	UG/L	20 U	20 U	ND	ND		0/2
Potassium	UG/L	1000 U	1000 U	ND	ND		0/2
Selenium	UG/L	5 UJ	5 UJ	ND	ND		0/2
Silver	UG/L	5 U	5 U	ND	ND		0/2
Sodium	UG/L	100 U	100 U	106	106	16-RSD-04	1/2
Thallium	UG/L	10 U	10 U	ND	ND		0/2
Vanadium	UG/L	10 U	10 U	ND	ND		0/2
Zinc	UG/L	NA	NA	18.7 J	20.6 J	16-RSD-04	2/2

APPENDIX K.5
NORTHEAST CREEK SURFACE WATER
AND SEDIMENT ORGANICS

FREQUENCY OF DETECTION SUMMARY
 OPERABLE UNIT No. 8 (SITE 16)
 QA/QC SAMPLES
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID:	16-ER01	16-ER02
Laboratory Sample ID:	AB1964	AB1997
Date Sampled:	6/26/94	6/27/94

	<u>UNITS</u>		
<u>VOLATILES</u>			
Chloromethane	UG/L	10 U	10 U
Bromomethane	UG/L	10 U	10 U
Vinyl chloride	UG/L	10 U	10 U
Chloroethane	UG/L	10 U	10 U
Methylene chloride	UG/L	13	12
Acetone	UG/L	9 J	8 J
Carbon Disulfide	UG/L	10 U	10 U
1,1-Dichloroethene	UG/L	10 U	10 U
1,1-Dichloroethane	UG/L	10 U	10 U
1,2-Dichloroethene(total)	UG/L	10 U	10 U
Chloroform	UG/L	10 U	10 U
1,2-Dichloroethane	UG/L	10 U	10 U
2-Butanone	UG/L	2 J	10 U
1,1,1-Trichloroethane	UG/L	10 U	10 U
Carbon tetrachloride	UG/L	10 U	10 U
Bromodichloromethane	UG/L	10 U	10 U
1,2-Dichloropropane	UG/L	10 U	10 U
cis-1,3-Dichloropropene	UG/L	10 U	10 U
Trichloroethene	UG/L	10 U	10 U
Dibromochloromethane	UG/L	10 U	10 U
1,1,2-Trichloroethane	UG/L	10 U	10 U
Benzene	UG/L	10 U	10 U
trans-1,3-Dichloropropene	UG/L	10 U	10 U
Bromoform	UG/L	10 U	10 U
4-Methyl-2-pentanone	UG/L	10 U	10 U
2-Hexanone	UG/L	10 U	10 U
Tetrachloroethene	UG/L	10 U	10 U
1,1,2,2-Tetrachloroethane	UG/L	10 U	10 U
Toluene	UG/L	10 U	10 U
Chlorobenzene	UG/L	10 U	10 U
Ethylbenzene	UG/L	10 U	10 U
Styrene	UG/L	10 U	10 U
Xylenes (total)	UG/L	10 U	10 U

FREQUENCY OF DETECTION SUMMARY
 OPERABLE UNIT No. 8 (SITE 16)
 QA/QC SAMPLES
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID:	16-ER01	16-ER02
Laboratory Sample ID:	AB1964	AB1997
Date Sampled:	6/26/94	6/27/94

	<u>UNITS</u>		
SEMIVOLATILES			
Phenol	UG/L	10 U	10 U
bis(2-Chloroethyl) ether	UG/L	10 U	10 U
2-Chlorophenol	UG/L	10 U	10 U
1,3-Dichlorobenzene	UG/L	10 U	10 U
1,4-Dichlorobenzene	UG/L	10 U	10 U
1,2-Dichlorobenzene	UG/L	10 U	10 U
2-Methylphenol	UG/L	10 U	10 U
2,2'-oxybis-(1-chloropropane)	UG/L	10 U	10 U
4-Methylphenol	UG/L	10 U	10 U
N-Nitroso-di-n-propylamine	UG/L	10 U	10 U
Hexachloroethane	UG/L	10 U	10 U
Nitrobenzene	UG/L	10 U	10 U
Isophorone	UG/L	10 U	10 U
2-Nitrophenol	UG/L	10 U	10 U
2,4-Dimethylphenol	UG/L	10 U	10 U
bis(2-Chloroethoxy) methane	UG/L	10 U	10 U
2,4-Dichlorophenol	UG/L	10 U	10 U
1,2,4-Trichlorobenzene	UG/L	10 U	10 U
Naphthalene	UG/L	10 U	10 U
4-Chloroaniline	UG/L	10 U	10 U
Hexachlorobutadiene	UG/L	10 U	10 U
4-Chloro-3-methylphenol	UG/L	10 U	10 U
2-Methylnaphthalene	UG/L	10 U	10 U
Hexachlorocyclopentadiene	UG/L	10 U	10 U
2,4,6-Trichlorophenol	UG/L	10 U	10 U
2,4,5-Trichlorophenol	UG/L	25 U	25 U
2-Chloronaphthalene	UG/L	10 U	10 U
2-Nitroaniline	UG/L	25 U	25 U
Dimethyl phthalate	UG/L	10 U	10 U
Acenaphthylene	UG/L	10 U	10 U
2,6-Dinitrotoluene	UG/L	10 U	10 U
3-Nitroaniline	UG/L	25 U	25 U
Acenaphthene	UG/L	10 U	10 U

FREQUENCY OF DETECTION SUMMARY
OPERABLE UNIT No. 8 (SITE 16)
QA/QC SAMPLES
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

Client Sample ID:	16-ER01	16-ER02
Laboratory Sample ID:	AB1964	AB1997
Date Sampled:	6/26/94	6/27/94

	<u>UNITS</u>		
<u>SEMIVOLATILES Cont.</u>			
2,4-Dinitrophenol	UG/L	25 U	25 U
4-Nitrophenol	UG/L	25 U	25 U
Dibenzofuran	UG/L	10 U	10 U
2,4-Dinitrotoluene	UG/L	10 U	10 U
Diethylphthalate	UG/L	10 U	10 U
4-Chlorophenyl phenyl ether	UG/L	10 U	10 U
Fluorene	UG/L	10 U	10 U
4-Nitroaniline	UG/L	25 U	25 U
4,6-Dinitro-2-methylphenol	UG/L	25 U	25 U
N-nitrosodiphenylamine	UG/L	10 U	10 U
4-Bromophenyl-phenylether	UG/L	10 U	10 U
Hexachlorobenzene	UG/L	10 U	10 U
Pentachlorophenol	UG/L	25 U	25 U
Phenanthrene	UG/L	10 U	10 U
Anthracene	UG/L	10 U	10 U
Carbazole	UG/L	10 U	10 U
di-n-Butylphthalate	UG/L	10 U	10 U
Fluoranthene	UG/L	10 U	10 U
Pyrene	UG/L	10 U	10 U
Butyl benzyl phthalate	UG/L	10 U	10 U
3,3'-Dichlorobenzidine	UG/L	10 U	10 U
Benzo[a]anthracene	UG/L	10 U	10 U
Chrysene	UG/L	10 U	10 U
bis(2-Ethylhexyl)phthalate	UG/L	6	1 J
di-n-Octylphthalate	UG/L	10 U	10 U
Benzo[b]fluoranthene	UG/L	10 U	10 U
Benzo[k]fluoranthene	UG/L	10 U	10 U
Benzo[a]pyrene	UG/L	10 U	10 U
Indeno[1,2,3-cd]pyrene	UG/L	10 U	10 U
Dibenz[a,h]anthracene	UG/L	10 U	10 U
Benzo[g,h,i]perylene	UG/L	10 U	10 U

FREQUENCY OF DETECTION SUMMARY
OPERABLE UNIT No. 8 (SITE 16)
QA/QC SAMPLES
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

Client Sample ID:	16-ER01	16-ER02
Laboratory Sample ID:	AB1964	AB1997
Date Sampled:	6/26/94	6/27/94

	<u>UNITS</u>		
PESTICIDES/PCBs			
alpha-BHC	UG/L	0.051 U	0.05 U
beta-BHC	UG/L	0.051 U	0.05 U
delta-BHC	UG/L	0.051 U	0.05 U
Lindane (gamma-BHC)	UG/L	0.051 U	0.05 U
Heptachlor	UG/L	0.051 U	0.05 U
Aldrin	UG/L	0.051 U	0.05 U
Heptachlor epoxide	UG/L	0.051 U	0.05 U
Endosulfan I	UG/L	0.051 U	0.05 U
Dieldrin	UG/L	0.1 U	0.1 U
4,4'-DDE	UG/L	0.1 U	0.1 U
Endrin	UG/L	0.1 U	0.1 U
Endosulfan II	UG/L	0.1 U	0.1 U
4,4'-DDD	UG/L	0.1 U	0.1 U
Endosulfan sulfate	UG/L	0.1 U	0.1 U
4,4'-DDT	UG/L	0.1 U	0.1 U
Methoxychlor	UG/L	0.51 U	0.5 U
Endrin ketone	UG/L	0.1 U	0.1 U
Endrin aldehyde	UG/L	0.1 U	0.1 U
alpha-Chlordane	UG/L	0.051 U	0.05 U
gamma-Chlordane	UG/L	0.051 U	0.05 U
Toxaphene	UG/L	5.1 U	5 U
Aroclor 1016	UG/L	1 U	1 U
Aroclor 1221	UG/L	2 U	2 U
Aroclor 1232	UG/L	1 U	1 U
Aroclor 1242	UG/L	1 U	1 U
Aroclor 1248	UG/L	1 U	1 U
Aroclor 1254	UG/L	1 U	1 U
Aroclor 1260	UG/L	1 U	1 U

FREQUENCY OF DETECTION SUMMARY
OPERABLE UNIT No. 8 (SITE 16)
QA/QC SAMPLES
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

Client Sample ID: Laboratory Sample ID: Date Sampled:		MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
	UNITS						
	VOLATILES						
	Chloromethane	UG/L	10 U	10 U	ND	ND	0/2
	Bromomethane	UG/L	10 U	10 U	ND	ND	0/2
	Vinyl chloride	UG/L	10 U	10 U	ND	ND	0/2
	Chloroethane	UG/L	10 U	10 U	ND	ND	0/2
	Methylene chloride	UG/L	NA	NA	12	13	16-ER01 2/2
	Acetone	UG/L	NA	NA	8 J	9 J	16-ER01 2/2
	Carbon Disulfide	UG/L	10 U	10 U	ND	ND	0/2
	1,1-Dichloroethene	UG/L	10 U	10 U	ND	ND	0/2
	1,1-Dichloroethane	UG/L	10 U	10 U	ND	ND	0/2
	1,2-Dichloroethene(total)	UG/L	10 U	10 U	ND	ND	0/2
	Chloroform	UG/L	10 U	10 U	ND	ND	0/2
	1,2-Dichloroethane	UG/L	10 U	10 U	ND	ND	0/2
	2-Butanone	UG/L	10 U	10 U	2 J	2 J	16-ER01 1/2
	1,1,1-Trichloroethane	UG/L	10 U	10 U	ND	ND	0/2
	Carbon tetrachloride	UG/L	10 U	10 U	ND	ND	0/2
	Bromodichloromethane	UG/L	10 U	10 U	ND	ND	0/2
	1,2-Dichloropropane	UG/L	10 U	10 U	ND	ND	0/2
	cis-1,3-Dichloropropene	UG/L	10 U	10 U	ND	ND	0/2
	Trichloroethene	UG/L	10 U	10 U	ND	ND	0/2
	Dibromochloromethane	UG/L	10 U	10 U	ND	ND	0/2
	1,1,2-Trichloroethane	UG/L	10 U	10 U	ND	ND	0/2
	Benzene	UG/L	10 U	10 U	ND	ND	0/2
	trans-1,3-Dichloropropene	UG/L	10 U	10 U	ND	ND	0/2
	Bromoform	UG/L	10 U	10 U	ND	ND	0/2
	4-Methyl-2-pentanone	UG/L	10 U	10 U	ND	ND	0/2
	2-Hexanone	UG/L	10 U	10 U	ND	ND	0/2
	Tetrachloroethene	UG/L	10 U	10 U	ND	ND	0/2
	1,1,2,2-Tetrachloroethane	UG/L	10 U	10 U	ND	ND	0/2
	Toluene	UG/L	10 U	10 U	ND	ND	0/2
	Chlorobenzene	UG/L	10 U	10 U	ND	ND	0/2
	Ethylbenzene	UG/L	10 U	10 U	ND	ND	0/2
	Styrene	UG/L	10 U	10 U	ND	ND	0/2
	Xylenes (total)	UG/L	10 U	10 U	ND	ND	0/2

FREQUENCY OF DETECTION SUMMARY
OPERABLE UNIT No. 8 (SITE 16)
QA/QC SAMPLES
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

Client Sample ID: Laboratory Sample ID: Date Sampled:	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
	UNITS					
	SEMIVOLATILES					
Phenol	UG/L	10 U	10 U	ND	ND	0/2
bis(2-Chloroethyl) ether	UG/L	10 U	10 U	ND	ND	0/2
2-Chlorophenol	UG/L	10 U	10 U	ND	ND	0/2
1,3-Dichlorobenzene	UG/L	10 U	10 U	ND	ND	0/2
1,4-Dichlorobenzene	UG/L	10 U	10 U	ND	ND	0/2
1,2-Dichlorobenzene	UG/L	10 U	10 U	ND	ND	0/2
2-Methylphenol	UG/L	10 U	10 U	ND	ND	0/2
2,2'-oxybis-(1-chloropropane)	UG/L	10 U	10 U	ND	ND	0/2
4-Methylphenol	UG/L	10 U	10 U	ND	ND	0/2
N-Nitroso-di-n-propylamine	UG/L	10 U	10 U	ND	ND	0/2
Hexachloroethane	UG/L	10 U	10 U	ND	ND	0/2
Nitrobenzene	UG/L	10 U	10 U	ND	ND	0/2
Isophorone	UG/L	10 U	10 U	ND	ND	0/2
2-Nitrophenol	UG/L	10 U	10 U	ND	ND	0/2
2,4-Dimethylphenol	UG/L	10 U	10 U	ND	ND	0/2
bis(2-Chloroethoxy) methane	UG/L	10 U	10 U	ND	ND	0/2
2,4-Dichlorophenol	UG/L	10 U	10 U	ND	ND	0/2
1,2,4-Trichlorobenzene	UG/L	10 U	10 U	ND	ND	0/2
Naphthalene	UG/L	10 U	10 U	ND	ND	0/2
4-Chloroaniline	UG/L	10 U	10 U	ND	ND	0/2
Hexachlorobutadiene	UG/L	10 U	10 U	ND	ND	0/2
4-Chloro-3-methylphenol	UG/L	10 U	10 U	ND	ND	0/2
2-Methylnaphthalene	UG/L	10 U	10 U	ND	ND	0/2
Hexachlorocyclopentadiene	UG/L	10 U	10 U	ND	ND	0/2
2,4,6-Trichlorophenol	UG/L	10 U	10 U	ND	ND	0/2
2,4,5-Trichlorophenol	UG/L	25 U	25 U	ND	ND	0/2
2-Chloronaphthalene	UG/L	10 U	10 U	ND	ND	0/2
2-Nitroaniline	UG/L	25 U	25 U	ND	ND	0/2
Dimethyl phthalate	UG/L	10 U	10 U	ND	ND	0/2
Acenaphthylene	UG/L	10 U	10 U	ND	ND	0/2
2,6-Dinitrotoluene	UG/L	10 U	10 U	ND	ND	0/2
3-Nitroaniline	UG/L	25 U	25 U	ND	ND	0/2
Acenaphthene	UG/L	10 U	10 U	ND	ND	0/2

FREQUENCY OF DETECTION SUMMARY
OPERABLE UNIT No. 8 (SITE 16)
QA/QC SAMPLES
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

Client Sample ID: Laboratory Sample ID: Date Sampled:		MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
	UNITS						
	SEMIVOLATILES Cont.						
	2,4-Dinitrophenol	UG/L	25 U	25 U	ND	ND	0/2
	4-Nitrophenol	UG/L	25 U	25 U	ND	ND	0/2
	Dibenzofuran	UG/L	10 U	10 U	ND	ND	0/2
	2,4-Dinitrotoluene	UG/L	10 U	10 U	ND	ND	0/2
	Diethylphthalate	UG/L	10 U	10 U	ND	ND	0/2
	4-Chlorophenyl phenyl ether	UG/L	10 U	10 U	ND	ND	0/2
	Fluorene	UG/L	10 U	10 U	ND	ND	0/2
	4-Nitroaniline	UG/L	25 U	25 U	ND	ND	0/2
	4,6-Dinitro-2-methylphenol	UG/L	25 U	25 U	ND	ND	0/2
	N-nitrosodiphenylamine	UG/L	10 U	10 U	ND	ND	0/2
	4-Bromophenyl-phenylether	UG/L	10 U	10 U	ND	ND	0/2
	Hexachlorobenzene	UG/L	10 U	10 U	ND	ND	0/2
	Pentachlorophenol	UG/L	25 U	25 U	ND	ND	0/2
	Phenanthrene	UG/L	10 U	10 U	ND	ND	0/2
	Anthracene	UG/L	10 U	10 U	ND	ND	0/2
	Carbazole	UG/L	10 U	10 U	ND	ND	0/2
	di-n-Butylphthalate	UG/L	10 U	10 U	ND	ND	0/2
	Fluoranthene	UG/L	10 U	10 U	ND	ND	0/2
	Pyrene	UG/L	10 U	10 U	ND	ND	0/2
	Butyl benzyl phthalate	UG/L	10 U	10 U	ND	ND	0/2
	3,3'-Dichlorobenzidine	UG/L	10 U	10 U	ND	ND	0/2
	Benzo[a]anthracene	UG/L	10 U	10 U	ND	ND	0/2
	Chrysene	UG/L	10 U	10 U	ND	ND	0/2
	bis(2-Ethylhexyl)phthalate	UG/L	NA	NA	1 J	6	16-ER01 2/2
	di-n-Octylphthalate	UG/L	10 U	10 U	ND	ND	0/2
	Benzo[b]fluoranthene	UG/L	10 U	10 U	ND	ND	0/2
	Benzo[k]fluoranthene	UG/L	10 U	10 U	ND	ND	0/2
	Benzo[a]pyrene	UG/L	10 U	10 U	ND	ND	0/2
	Indeno[1,2,3-cd]pyrene	UG/L	10 U	10 U	ND	ND	0/2
	Dibenz[a,h]anthracene	UG/L	10 U	10 U	ND	ND	0/2
	Benzo[g,h,i]perylene	UG/L	10 U	10 U	ND	ND	0/2

FREQUENCY OF DETECTION SUMMARY
OPERABLE UNIT No. 8 (SITE 16)
QA/QC SAMPLES
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

Client Sample ID: Laboratory Sample ID: Date Sampled:	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
UNITS						
PESTICIDES/PCBs						
alpha-BHC	UG/L	0.05 U	0.051 U	ND	ND	0/2
beta-BHC	UG/L	0.05 U	0.051 U	ND	ND	0/2
delta-BHC	UG/L	0.05 U	0.051 U	ND	ND	0/2
Lindane (gamma-BHC)	UG/L	0.05 U	0.051 U	ND	ND	0/2
Heptachlor	UG/L	0.05 U	0.051 U	ND	ND	0/2
Aldrin	UG/L	0.05 U	0.051 U	ND	ND	0/2
Heptachlor epoxide	UG/L	0.05 U	0.051 U	ND	ND	0/2
Endosulfan I	UG/L	0.05 U	0.051 U	ND	ND	0/2
Dieldrin	UG/L	0.1 U	0.1 U	ND	ND	0/2
4,4'-DDE	UG/L	0.1 U	0.1 U	ND	ND	0/2
Endrin	UG/L	0.1 U	0.1 U	ND	ND	0/2
Endosulfan II	UG/L	0.1 U	0.1 U	ND	ND	0/2
4,4'-DDD	UG/L	0.1 U	0.1 U	ND	ND	0/2
Endosulfan sulfate	UG/L	0.1 U	0.1 U	ND	ND	0/2
4,4'-DDT	UG/L	0.1 U	0.1 U	ND	ND	0/2
Methoxychlor	UG/L	0.5 U	0.51 U	ND	ND	0/2
Endrin ketone	UG/L	0.1 U	0.1 U	ND	ND	0/2
Endrin aldehyde	UG/L	0.1 U	0.1 U	ND	ND	0/2
alpha-Chlordane	UG/L	0.05 U	0.051 U	ND	ND	0/2
gamma-Chlordane	UG/L	0.05 U	0.051 U	ND	ND	0/2
Toxaphene	UG/L	5 U	5.1 U	ND	ND	0/2
Aroclor 1016	UG/L	1 U	1 U	ND	ND	0/2
Aroclor 1221	UG/L	2 U	2 U	ND	ND	0/2
Aroclor 1232	UG/L	1 U	1 U	ND	ND	0/2
Aroclor 1242	UG/L	1 U	1 U	ND	ND	0/2
Aroclor 1248	UG/L	1 U	1 U	ND	ND	0/2
Aroclor 1254	UG/L	1 U	1 U	ND	ND	0/2
Aroclor 1260	UG/L	1 U	1 U	ND	ND	0/2

APPENDIX K.6
NORTHEAST CREEK SURFACE WATER
AND SEDIMENT METALS

FREQUENCY OF DETECTION SUMMARY
OPERABLE UNIT No. 8 (SITE 16)
QA/QC SAMPLES
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TAL INORGANICS

Client Sample ID:	16-ER01	16-ER02
Laboratory Sample ID:	AB1966	AB1999
Date Sampled:	6/26/94	6/27/94

	<u>UNITS</u>		
Aluminum	UG/L	40 UJ	40 UJ
Antimony	UG/L	50 U	50 U
Arsenic	UG/L	2 UJ	2 UJ
Barium	UG/L	2 U	2 U
Beryllium	UG/L	1 U	1 U
Cadmium	UG/L	5 U	5 U
Calcium	UG/L	87.9 UJ	78.1 UJ
Chromium	UG/L	10 U	10 U
Cobalt	UG/L	10 UJ	10 UJ
Copper	UG/L	10 UJ	10 UJ
Iron	UG/L	15.1 UJ	15.4 UJ
Lead	UG/L	2 U	2 U
Magnesium	UG/L	51.3 U	102 U
Manganese	UG/L	2 U	2 U
Mercury	UG/L	0.2 U	0.2 U
Nickel	UG/L	20 UJ	20 UJ
Potassium	UG/L	1600 U	1310 U
Selenium	UG/L	2 UJ	2 UJ
Silver	UG/L	5 U	5 U
Sodium	UG/L	264 UJ	847 J
Thallium	UG/L	2 UJ	2 UJ
Vanadium	UG/L	10 U	10 U
Zinc	UG/L	6.6 U	25.2 U

FREQUENCY OF DETECTION SUMMARY
OPERABLE UNIT No. 8 (SITE 16)
QA/QC SAMPLES
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TAL INORGANICS

Client Sample ID:		MINIMUM	MAXIMUM	MINIMUM	MAXIMUM	LOCATION OF	FREQUENCY
Laboratory Sample ID:		NONDETECTED	NONDETECTED	DETECTED	DETECTED	MAXIMUM	OF
Date Sampled:						DETECTED	DETECTION
	<u>UNITS</u>						
Aluminum	UG/L	40 UJ	40 UJ	ND	ND		0/2
Antimony	UG/L	50 U	50 U	ND	ND		0/2
Arsenic	UG/L	2 UJ	2 UJ	ND	ND		0/2
Barium	UG/L	2 U	2 U	ND	ND		0/2
Beryllium	UG/L	1 U	1 U	ND	ND		0/2
Cadmium	UG/L	5 U	5 U	ND	ND		0/2
Calcium	UG/L	78.1 UJ	87.9 UJ	ND	ND		0/2
Chromium	UG/L	10 U	10 U	ND	ND		0/2
Cobalt	UG/L	10 UJ	10 UJ	ND	ND		0/2
Copper	UG/L	10 UJ	10 UJ	ND	ND		0/2
Iron	UG/L	15.1 UJ	15.4 UJ	ND	ND		0/2
Lead	UG/L	2 U	2 U	ND	ND		0/2
Magnesium	UG/L	51.3 U	102 U	ND	ND		0/2
Manganese	UG/L	2 U	2 U	ND	ND		0/2
Mercury	UG/L	0.2 U	0.2 U	ND	ND		0/2
Nickel	UG/L	20 UJ	20 UJ	ND	ND		0/2
Potassium	UG/L	1310 U	1600 U	ND	ND		0/2
Selenium	UG/L	2 UJ	2 UJ	ND	ND		0/2
Silver	UG/L	5 U	5 U	ND	ND		0/2
Sodium	UG/L	284 UJ	264 UJ	847 J	847 J	16-ER02	1/2
Thallium	UG/L	2 UJ	2 UJ	ND	ND		0/2
Vanadium	UG/L	10 U	10 U	ND	ND		0/2
Zinc	UG/L	6.6 U	25.2 U	ND	ND		0/2

APPENDIX L
COPC WORKSHEETS

Checked vs. newest RBC table

Site 16 - Surface Soil

VOC's

SVOC's

CONTAMINANT	RANGE	Log Normal 95% UCL	FREQUENCY	BLANK	2X average BACKGROUND	HISTORY	ANTHROPOGENIC NUTRIENT	TOXICITY	RBC	ARAR	COPC	RFD _o /CSF _o (mg/kg/day) (mg/kg)
Methylenechloride	62-152	7.6	3/29	10	NA				85,000			free in house
Acetone	11-120	31.5	3/29	14	NA			780,000				
Toluene	11-42	7.3	3/29	ND	NA			16,000,000				
Phenol	72	592.8	1/29	ND	NA			87,000,000				
1,4 Dichlorobenzene	43	609.6	1/29	ND	NA			27,000				
Napthalene	36	618.2	1/29	ND	NA			3,100,000				
2-Methylnapthalene	67	594.2	1/29	ND	NA			NA		freq NA		
Phenanthrene	52-99	634.0	3/29	ND	NA			NA		no tox		
Anthracene	100-11	574.5	1/29	ND	NA			3,300,000				
Fluoranthene	46	606.7	1/29	ND	NA			3,100,000				
Pyrene	39-112	610.6	3/29	ND	NA			2,300,000				
Butylbenzyl phthalate	6A	595.3	1/29	ND	NA			16,000,000				
Benzo [a] anthracene	43	609.7	1/29	ND	NA			880				
Chrysene	43-70	661.1	1/29	ND	NA			88,000				
Bis (2-ethylhexyl) phthalate	37-49	762.2	1/29	15	NA			16,000				
Benzo [b] fluoranthene	59-82	605.2	2/29	ND	NA			880				
Benzo [k] fluoranthene	8A	588.3	1/29	ND	NA			880				
Benzo [a] pyrene	x 42-132	610.9	2/29 (1)	ND	NA			88				
Benzo [1,2,3-cd] perylene	52	602.2	1/29	ND	NA			880				
Benzo [g,h,i] perylene	92	575.7	1/29	ND	NA			NA		freq 2		
delta-BHC	4.7	1.2	1/29	ND	NA			NA		freq 2		
Aldrin	3.4	1.1	1/29	ND	NA			38				
Dieldrin	x 56-77	13.2	1/29	ND	NA			40				
1,4 DPE	5-440	262.1	26/29	ND	NR			1900			no RFD	

-/7.30E+

5.00E-05/1.60E+

(cont'd) 16. S₀₅

CONTAMINANT	RANGE	Log Normal 95% UCL	FREQUENCY	BLANK	2x average BACKGROUND	HISTORY	ANTHEROGENIC	NUTRIENT	TOXICITY	RBC	ARAR	COPC	RFD ₀ /CSF ₀ (mg/kg/day) x (mg/kg)
Endrin	16.5-141	2.9	3/29	ND	NA					23,000			
Endosulfan II ⁽¹⁾	1.9-261	5.7	8/29	ND	NA					470,000			
4,4' DDD	2.61-120	38.3	20/29	ND	NA					2700			
Endosulfan sulfate ⁽¹⁾	4.81	2.0	1/29	ND	NA					470,000			
4,4' DDT	3.81-540	304.3	27/29	ND	NA					1900			
Methoxychlor	4.61	9.8	4/29	ND	NA					390,000			
Endrin ketone ⁽²⁾	4.2-9.9	2.4	2/29	ND	NA					23,000			
Endrin Aldehyde ⁽²⁾	4.6-29	7.6	9/29	ND	NA					23,000			
alpha-chlordane ⁽³⁾	3.11-120	15.9	11/29	ND	NA					1490			
gamma-chlordane ⁽³⁾	1.16-721	5.3	9/29	ND	NA					1490			
Aroclor 1254	X 41-2160	716.6	13/29	ND	NA				M	1600	NO RFD		2.00E-05/ -
Aroclor 1260 ⁽⁴⁾	X 505-2161	27.7	2/29	ND	NA				C	83	NO RFD		-/7.70E+
(nutrient) Aluminum	860-18500	4850.3	21/29	77.4	4209.010					18,000			
Arsenic ⁽⁵⁾	X 2.3-21.11	6.7	17/29	ND	1.3*				C	0.37	NO RFD		3.00E-04/1.75E
Barium	3-394	36.8	24/29	4.2	14.192					5500			
Benzilium	X 0.24-0.49	0.2	6/29	ND	0.22*				C	0.15	NO RFD		5.00E-03/1.30E
Cadmium	1.8-9.6	0.9	2/29	ND	0.611					39			
nutrient Calcium	16.410-1220	146842.3	25/29	19,400	1068.920					NA			
Chromium ⁽⁶⁾	2.2-43.21	9.7	27/29	ND	4.765					390			
Cobalt	6.3	1.4	1/29	ND	2.348					1700			
nutrient Copper	2.21-5731	51.6	24/29	ND	9.016					2900			
Iron	470-6430	8664.4	29/29	1400	2514.673					NA			
Lead	X 3.81-5210	203.5	28/29	ND	21.8*				-	1100 ⁽⁷⁾	NO RFD		-/-
nutrient Magnesium	325-2520	283.7	23/29	1280	169.397					NA			

file in line

* new BK value

(cont'd) 16 S.S.

	CONTAMINANT	RANGE	Log Normal 95% UCL	FREQUENCY	BLANK	2x average BACKGROUND	HISTORY	ANTHROPOGENIC	NUTRIENT	TOXICITY	RBC	ARAR	COPC	ADD ₀ / CSF ₀ (mg/kg/day) (mg/kg)
	Manganese	2.00-10.00	52.0	25/29	23	17.6*				n	390		X	5.00E-03/ -
	Mercury	0.11-1.9	0.7	9/29	ND	0.078					23			
	Nickel	24.9	3.1	4/29	ND	3.092					1600			
nutrient	Potassium	205-475	201.6	10/29	ND	159.363					NA			
	Selenium	1.1-16	1.1	8/29	ND	0.739					390			
	Silver	1.2-3.1	0.7	2/29	ND	0.960					390			
nutrient	Sodium	26.8-63.9	39.3	11/29	7890	68.263					NA			
	Thallium ⁽⁸⁾	2.1-3.0	1.3	2/29	ND	0.806					6.3			
	Vanadium	2.31-45.4	11.9	28/29	ND	6.541					550			
	Zinc	14.21-435	324.8	17/29	63.9	9.839					23,000			
Notes:														
(1) USEPA Region III RBC for endosulfan used as a surrogate.														
(2) USEPA Region III RBC for endrin used as a surrogate.														
(3) USEPA Region III RBC for chlordane used as a surrogate.														
(4) USEPA Region III RBC for polychlorinated biphenyls.														
(5) Arsenic was evaluated as a carcinogen.														
(6) Chromium was evaluated as the hexavalent state.														
(7) Lead action level for residential soils.														
(8) USEPA Region III RBC for thallium carbonate, thallium chloride and thallium sulfate.														

fill in line

ND = Nondetect

Checked vs. newest KBC table

Site 16 Subsurface Soil

	CONTAMINANT	RANGE	Log Normal 95% UCL	FREQUENCY	BLANK	2X average BACKGROUND	HISTORY	ANTHROPOGENIC	NUTRIENT	TOXICITY	RBC	ARAR	COPC	RFD _o /CSF _o (mg/L/day) (mg/kg)
✓	Bromodichloromethane	10	7.2	1/32	ND	NA					110,000			
✓	Acetone	921-9100	417.5	12/32	14	NA					1,800,000			
✓	1,4-Dichlorobenzene	520-670	196.7	2/32	ND	NA					27,000			
✓	1,2,4-Trichlorobenzene	450-600	199.1	2/32	ND	NA					780,000			
✓	Naphthalene	880	180.9	1/32	ND	NA					3,100,000			
✓	2-Methylnaphthalene	770	182.0	1/32	ND	NA					NA	freq. NA		-1-
✓	Acenaphthene	50-2400	195.1	3/32	ND	NA					4,700,000			
✓	Dibenzofuran	3100	186.5	1/32	ND	NA					310,000			
✓	Fluorene	680	204.7	1/32	ND	NA					3,100,000			
✓	Pentachlorophenol	380-1940	537.1	3/32	ND	NA					15300			
✓	Phenanthrene	2200	247.0	1/32	ND	NA					NA	freq. NA		-1-
✓	Anthracene	380	190.5	1/32	ND	NA					23,000,000			
✓	Carbazole	1800	178.7	1/32	ND	NA					32,000			
✓	di-n-Butylphthalate	2700	183.7	1/32	ND	NA					1,800,000			
✓	Fluoranthene	1200	222.6	1/32	ND	NA					2,100,000			
✓	Pyrene	10700	204.3	1/32	ND	NA					2,300,000			
✓	Benzo[a]anthracene	1600	178.2	1/32	ND	NA					1880			
✓	Chrysene	11000	178.2	1/32	ND	NA					188,000			
✓	basis-ethylhexylDanthilate	500-700	184.3	2/32	15	NA					46,000			
✓	di-n-octylphthalate	460	187.4	1/32	ND	NA					4600,000			
✓	Benzo[b]fluoranthene	570	185.4	1/32	ND	NA					1880			
✓	Benzo[k]fluoranthene	580	185.2	1/32	ND	NA					18800			
✓	Benzo[a]pyrene	380	190.5	1/32	ND	NA					188			
✓	4,4'DDE	1.00-36	3.4	3/32	ND	NA					1900			
✓	Endosulfan II(s)	7.0	2.1	1/32	ND	NA					470,000			

fill in lines

16 SUB S.S.

CONTAMINANT	RANGE	log Normal 95% UCL	FREQUENCY	BLANK	2X average- BACKGROUND	HISTORY	ANTHROPOGENIC	NUTRIENT	TOXICITY	RBC	ARAR	COPC	RFD ₀ /CSF ₀ (mg/kg/day)/(mg/kg)
4,4' DDD	52)	3.0	1/32	ND	NA					2700			
4,4' DDT	3+ - 630	8.3	2/32	ND	NA					1900			
alpha-chlordane ⁽²⁾	2.9	1.1	1/32	ND	NA					190			
gamma-chlordane ⁽²⁾	2.4 - 2.5	1.1	2/32	ND	NA					190			
Endosulfan	40-45	21.2	2/32	ND	NA					1600			
(nutrient) Aluminum	2151-1650	2684.9	31/32	77.4	7126.505					18,000			
Arsenic ⁽³⁾	2.51	1.1	1/32	ND	0.764				C	0.37	freq. NA		3.00E-04/1.75E+0
Berillium	1.2-36.5	7.1	25/32	4.2	11.295					5500			
Bismuth	0.21	0.1	1/32	ND	0.200				C	0.15	freq. NA		5.00E-03/4.30E+0
Cadmium													
(nutrient) Calcium	31.7-1900	544.6	24/32	19,400	553.524					NA			
Chromium ⁽⁴⁾	2.4-7.9	4.4	24/32	ND	8.371					390			
Copper	2.31-341	1.5	5/32	ND	2.152					2900			
(nutrient) Iron	2147-7480	2222.6	25/32	1400	2132.543					NA			
Lead	1.11-688	5.8	20/32	ND	7.273					400(5)			
(nutrient) Magnesium	13.7-257	110.9	25/32	1280	211.929					NA			
Manganese	0.121-38.1	5.4	25/32	23	7.073					390			
Mercury	0.11-0.28	0.1	3/32	ND	0.150					23			
(nutrient) Potassium	184-370	172.3	9/32	ND	238.252					NA			
Selenium	1.2	0.6	1/32	ND	0.792					390			
(nutrient) Sodium	22.7-317	21.8	9/32	7890	145.533					NA			
Vanadium	2.4-14.1	4.8	10/32	ND	9.530					550			
Zinc	99-3881	27.1	11/32	63.9	4.323					23,000			

full in lines

(1) USEPA Region III. RBC for endosulfan used as a surrogate.
 (2) USEPA Region III. RBC for chlordane used as a surrogate.
 (3) Arsenic was evaluated as a carcinogen.
 (4) Chromium was evaluated as the hexavalent state.
 (5) Lead action level for residential soils.
 ND = Nondetect

APPENDIX M
STATISTICAL SUMMARIES

APPENDIX M.1
SURFACE SOIL ORGANICS

STATISTICAL SUMMARY
 OPERABLE UNIT No. 8
 SITE 16 - SURFACE SOIL
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID: Laboratory Sample ID: Date Sampled:	MAXIMUM DETECTED	ARITHMETIC MEAN	STANDARD DEVIATION	NORMAL UPPER 95% CONFIDENCE INTERVAL	LOG NORMAL UPPER 95% CONFIDENCE INTERVAL
	<u>UNITS</u>				
<u>VOLATILES</u>					
Chloromethane	UG/KG	ND	NA	NA	NA
Bromomethane	UG/KG	ND	NA	NA	NA
Vinyl chloride	UG/KG	ND	NA	NA	NA
Chloroethane	UG/KG	ND	NA	NA	NA
Methylene chloride	UG/KG	15 J	6.9	4.8	8.4
Acetone	UG/KG	1200	54.1	223.3	124.7
Carbon Disulfide	UG/KG	ND	NA	NA	NA
1,1-Dichloroethene	UG/KG	ND	NA	NA	NA
1,1-Dichloroethane	UG/KG	ND	NA	NA	NA
1,2-Dichloroethene(total)	UG/KG	ND	NA	NA	NA
Chloroform	UG/KG	ND	NA	NA	NA
1,2-Dichloroethane	UG/KG	ND	NA	NA	NA
2-Butanone	UG/KG	ND	NA	NA	NA
1,1,1-Trichloroethane	UG/KG	ND	NA	NA	NA
Carbon tetrachloride	UG/KG	ND	NA	NA	NA
Bromodichloromethane	UG/KG	ND	NA	NA	NA
1,2-Dichloropropane	UG/KG	ND	NA	NA	NA
cis-1,3-Dichloropropene	UG/KG	ND	NA	NA	NA
Trichloroethene	UG/KG	ND	NA	NA	NA
Dibromochloromethane	UG/KG	ND	NA	NA	NA
1,1,2-Trichloroethane	UG/KG	ND	NA	NA	NA
Benzene	UG/KG	ND	NA	NA	NA
trans-1,3-Dichloropropene	UG/KG	ND	NA	NA	NA
Bromoform	UG/KG	ND	NA	NA	NA
4-Methyl-2-pentanone	UG/KG	ND	NA	NA	NA
2-Hexanone	UG/KG	ND	NA	NA	NA
Tetrachloroethene	UG/KG	ND	NA	NA	NA
1,1,2,2-Tetrachloroethane	UG/KG	ND	NA	NA	NA
Toluene	UG/KG	4 J	6.1	4.7	7.6
Chlorobenzene	UG/KG	ND	NA	NA	NA
Ethylbenzene	UG/KG	ND	NA	NA	NA
Styrene	UG/KG	ND	NA	NA	NA
Xylenes (total)	UG/KG	ND	NA	NA	NA

STATISTICAL SUMMARY
OPERABLE UNIT No. 8
SITE 16 - SURFACE SOIL
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

Client Sample ID: Laboratory Sample ID: Date Sampled:	MAXIMUM DETECTED	ARITHMETIC MEAN	STANDARD DEVIATION	NORMAL UPPER 95% CONFIDENCE INTERVAL	LOG NORMAL UPPER 95% CONFIDENCE INTERVAL	
<u>UNITS</u>						
SEMIVOLATILES						
Phenol	UG/KG	70 J	412.9	362.9	527.5	592.8
bis(2-Chloroethyl) ether	UG/KG	ND	NA	NA	NA	NA
2-Chlorophenol	UG/KG	ND	NA	NA	NA	NA
1,3-Dichlorobenzene	UG/KG	ND	NA	NA	NA	NA
1,4-Dichlorobenzene	UG/KG	43 J	411.8	363.9	526.8	609.6
1,2-Dichlorobenzene	UG/KG	ND	NA	NA	NA	NA
2-Methylphenol	UG/KG	ND	NA	NA	NA	NA
2,2'-oxybis-(1-chloropropane)	UG/KG	ND	NA	NA	NA	NA
4-Methylphenol	UG/KG	ND	NA	NA	NA	NA
N-Nitroso-di-n-propylamine	UG/KG	ND	NA	NA	NA	NA
Hexachloroethane	UG/KG	ND	NA	NA	NA	NA
Nitrobenzene	UG/KG	ND	NA	NA	NA	NA
Isophorone	UG/KG	ND	NA	NA	NA	NA
2-Nitrophenol	UG/KG	ND	NA	NA	NA	NA
2,4-Dimethylphenol	UG/KG	ND	NA	NA	NA	NA
bis(2-Chloroethoxy) methane	UG/KG	ND	NA	NA	NA	NA
2,4-Dichlorophenol	UG/KG	ND	NA	NA	NA	NA
1,2,4-Trichlorobenzene	UG/KG	ND	NA	NA	NA	NA
Naphthalene	UG/KG	36 J	412.1	363.8	527.0	618.2
4-Chloroaniline	UG/KG	ND	NA	NA	NA	NA
Hexachlorobutadiene	UG/KG	ND	NA	NA	NA	NA
4-Chloro-3-methylphenol	UG/KG	ND	NA	NA	NA	NA
2-Methylnaphthalene	UG/KG	67 J	413.2	362.7	527.7	594.2
Hexachlorocyclopentadiene	UG/KG	ND	NA	NA	NA	NA
2,4,6-Trichlorophenol	UG/KG	ND	NA	NA	NA	NA
2,4,5-Trichlorophenol	UG/KG	ND	NA	NA	NA	NA
2-Chloronaphthalene	UG/KG	ND	NA	NA	NA	NA
2-Nitroaniline	UG/KG	ND	NA	NA	NA	NA
Dimethyl phthalate	UG/KG	ND	NA	NA	NA	NA
Acenaphthylene	UG/KG	ND	NA	NA	NA	NA
2,6-Dinitrotoluene	UG/KG	ND	NA	NA	NA	NA
3-Nitroaniline	UG/KG	ND	NA	NA	NA	NA
Acenaphthene	UG/KG	ND	NA	NA	NA	NA

STATISTICAL SUMMARY
 OPERABLE UNIT No. 8
 SITE 16 - SURFACE SOIL
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID: Laboratory Sample ID: Date Sampled:	MAXIMUM DETECTED	ARITHMETIC MEAN	STANDARD DEVIATION	NORMAL UPPER 95% CONFIDENCE INTERVAL	LOG NORMAL UPPER 95% CONFIDENCE INTERVAL
<u>UNITS</u>					
SEMIVOLATILES Cont.					
2,4-Dinitrophenol	UG/KG	ND	NA	NA	NA
4-Nitrophenol	UG/KG	ND	NA	NA	NA
Dibenzofuran	UG/KG	ND	NA	NA	NA
2,4-Dinitrotoluene	UG/KG	ND	NA	NA	NA
Diethylphthalate	UG/KG	ND	NA	NA	NA
4-Chlorophenyl phenyl ether	UG/KG	ND	NA	NA	NA
Fluorene	UG/KG	ND	NA	NA	NA
4-Nitroaniline	UG/KG	ND	NA	NA	NA
4,6-Dinitro-2-methylphenol	UG/KG	ND	NA	NA	NA
N-nitrosodiphenylamine	UG/KG	ND	NA	NA	NA
4-Bromophenyl-phenylether	UG/KG	ND	NA	NA	NA
Hexachlorobenzene	UG/KG	ND	NA	NA	NA
Pentachlorophenol	UG/KG	ND	NA	NA	NA
Phenanthrene	UG/KG	99 J	405.2	369.1	521.8
Anthracene	UG/KG	100 NJ	414.3	361.7	528.5
Carbazole	UG/KG	ND	NA	NA	NA
di-n-Butylphthalate	UG/KG	ND	NA	NA	NA
Fluoranthene	UG/KG	46 J	411.9	363.8	526.8
Pyrene	UG/KG	110 J	405.2	369.1	521.8
Butyl benzyl phthalate	UG/KG	64 J	412.7	363.1	527.4
3,3'-Dichlorobenzidine	UG/KG	ND	NA	NA	NA
Benzo[a]anthracene	UG/KG	43 J	412.0	363.8	526.9
Chrysene	UG/KG	70 J	399.4	373.8	517.5
bis(2-Ethylhexyl)phthalate	UG/KG	490	407.7	373.8	525.8
di-n-Octylphthalate	UG/KG	ND	NA	NA	NA
Benzo[b]fluoranthene	UG/KG	88 J	408.9	366.1	524.5
Benzo[k]fluoranthene	UG/KG	84 J	413.2	362.5	527.7
Benzo[a]pyrene	UG/KG	130 J	410.4	365.0	525.7
Indeno[1,2,3-cd]pyrene	UG/KG	52 J	412.3	363.5	527.1
Dibenz[a,h]anthracene	UG/KG	ND	NA	NA	NA
Benzo[g,h,i]perylene	UG/KG	92 J	413.7	362.1	528.1

STATISTICAL SUMMARY
OPERABLE UNIT No. 8
SITE 16 - SURFACE SOIL
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

Client Sample ID: Laboratory Sample ID: Date Sampled:		MAXIMUM DETECTED	ARITHMETIC MEAN	STANDARD DEVIATION	NORMAL UPPER 95% CONFIDENCE INTERVAL	LOG NORMAL UPPER 95% CONFIDENCE INTERVAL
	UNITS					
	PESTICIDES/PCBs					
	alpha-BHC	UG/KG	ND	NA	NA	NA
	beta-BHC	UG/KG	ND	NA	NA	NA
	delta-BHC	UG/KG	4.7	1.1	0.7	1.2
	Lindane (gamma-BHC)	UG/KG	ND	NA	NA	NA
	Heptachlor	UG/KG	ND	NA	NA	NA
	Aldrin	UG/KG	3.4 J	1.0	0.5	1.1
	Heptachlor epoxide	UG/KG	ND	NA	NA	NA
	Endosulfan I	UG/KG	ND	NA	NA	NA
	Dieldrin	UG/KG	77 J	8.5	15.2	13.3
	4,4'-DDE	UG/KG	440	67.4	87.6	95.1
	Endrin	UG/KG	14 J	2.6	2.5	3.4
	Endosulfan II	UG/KG	26 J	4.4	5.7	6.2
	4,4'-DDD	UG/KG	120	16.7	24.3	24.3
	Endosulfan sulfate	UG/KG	4.8 J	1.9	0.6	2.1
	4,4'-DDT	UG/KG	540 J	73.0	104.7	106.0
	Methoxychlor	UG/KG	4.6 J	9.3	1.1	9.7
	Endrin ketone	UG/KG	9.9	2.2	1.6	2.7
	Endrin aldehyde	UG/KG	29	5.4	6.9	7.6
	alpha-Chlordane	UG/KG	120	9.1	22.9	16.3
	gamma-Chlordane	UG/KG	72 J	4.7	13.4	8.9
	Toxaphene	UG/KG	ND	NA	NA	NA
	Aroclor 1016	UG/KG	ND	NA	NA	NA
	Aroclor 1221	UG/KG	ND	NA	NA	NA
	Aroclor 1232	UG/KG	ND	NA	NA	NA
	Aroclor 1242	UG/KG	ND	NA	NA	NA
	Aroclor 1248	UG/KG	ND	NA	NA	NA
	Aroclor 1254	UG/KG	2100	253.2	481.0	405.1
	Aroclor 1260	UG/KG	210 J	25.9	35.9	37.3

APPENDIX M.2
SURFACE SOIL METALS

STATISTICAL SUMMARY
OPERABLE UNIT No. 8
SITE 16 - SURFACE SOIL
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TAL INORGANICS

Client Sample ID: Laboratory Sample ID: Date Sampled:		MAXIMUM DETECTED	ARITHMETIC MEAN	STANDARD DEVIATION	NORMAL UPPER 95% CONFIDENCE INTERVAL	LOG NORMAL UPPER 95% CONFIDENCE INTERVAL
	UNITS					
Aluminum	MG/KG	18500 J	3799.2	3238.0	4821.9	4850.3
Antimony	MG/KG	ND	NA	NA	NA	NA
Arsenic	MG/KG	24.7 J	4.3	4.9	5.9	6.7
Barium	MG/KG	334	29.5	59.8	48.4	36.8
Beryllium	MG/KG	0.49	0.2	0.1	0.2	0.2
Cadmium	MG/KG	9.6	0.9	1.7	1.4	0.9
Calcium	MG/KG	112000 J	12430.8	25203.6	20391.8	146842.3
Chromium	MG/KG	43.2 J	7.1	7.7	9.5	9.7
Cobalt	MG/KG	6.3	1.3	1.0	1.6	1.4
Copper	MG/KG	543 J	31.7	100.5	63.5	51.6
Iron	MG/KG	69700	6318.6	12554.8	10284.3	8664.4
Lead	MG/KG	5210 J	210.3	962.5	514.3	200.5
Magnesium	MG/KG	2520	226.4	451.7	369.1	283.7
Manganese	MG/KG	1030 J	51.5	188.8	111.2	52.0
Mercury	MG/KG	14	0.7	2.6	1.5	0.7
Nickel	MG/KG	24.4	2.9	4.1	4.2	3.1
Potassium	MG/KG	475	170.2	97.5	201.0	201.6
Selenium	MG/KG	6	1.0	1.1	1.3	1.1
Silver	MG/KG	3.1	0.7	0.5	0.8	0.7
Sodium	MG/KG	63.4	32.5	16.7	37.8	39.3
Thallium	MG/KG	3.6	1.2	0.5	1.4	1.3
Vanadium	MG/KG	45.4	8.8	8.4	11.5	11.9
Zinc	MG/KG	4350 J	199.2	801.9	452.5	324.8

Moisture %

APPENDIX M.3
SUBSURFACE SOIL ORGANICS

STATISTICAL SUMMARY
 OPERABLE UNIT No. 8
 SITE 16 - SUBSURFACE SOIL
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 TCL ORGANICS

Client Sample ID: Laboratory Sample ID: Date Sampled:	MAXIMUM DETECTED	ARITHMETIC MEAN	STANDARD DEVIATION	NORMAL UPPER 95% CONFIDENCE INTERVAL	LOG NORMAL UPPER 95% CONFIDENCE INTERVAL
	<u>UNITS</u>				
<u>VOLATILES</u>					
Chloromethane	UG/KG	ND	NA	NA	NA
Bromomethane	UG/KG	1 J	6.2	4.0	7.2
Vinyl chloride	UG/KG	ND	NA	NA	NA
Chloroethane	UG/KG	ND	NA	NA	NA
Methylene chloride	UG/KG	ND	NA	NA	NA
Acetone	UG/KG	900 J	136.2	226.1	204.0
Carbon Disulfide	UG/KG	ND	NA	NA	NA
1,1-Dichloroethene	UG/KG	ND	NA	NA	NA
1,1-Dichloroethane	UG/KG	ND	NA	NA	NA
1,2-Dichloroethene(total)	UG/KG	ND	NA	NA	NA
Chloroform	UG/KG	ND	NA	NA	NA
1,2-Dichloroethane	UG/KG	ND	NA	NA	NA
2-Butanone	UG/KG	ND	NA	NA	NA
1,1,1-Trichloroethane	UG/KG	ND	NA	NA	NA
Carbon tetrachloride	UG/KG	ND	NA	NA	NA
Bromodichloromethane	UG/KG	ND	NA	NA	NA
1,2-Dichloropropane	UG/KG	ND	NA	NA	NA
cis-1,3-Dichloropropene	UG/KG	ND	NA	NA	NA
Trichloroethene	UG/KG	ND	NA	NA	NA
Dibromochloromethane	UG/KG	ND	NA	NA	NA
1,1,2-Trichloroethane	UG/KG	ND	NA	NA	NA
Benzene	UG/KG	ND	NA	NA	NA
trans-1,3-Dichloropropene	UG/KG	ND	NA	NA	NA
Bromoform	UG/KG	ND	NA	NA	NA
4-Methyl-2-pentanone	UG/KG	ND	NA	NA	NA
2-Hexanone	UG/KG	ND	NA	NA	NA
Tetrachloroethene	UG/KG	ND	NA	NA	NA
1,1,2,2-Tetrachloroethane	UG/KG	ND	NA	NA	NA
Toluene	UG/KG	ND	NA	NA	NA
Chlorobenzene	UG/KG	ND	NA	NA	NA
Ethylbenzene	UG/KG	ND	NA	NA	NA
Styrene	UG/KG	ND	NA	NA	NA
Xylenes (total)	UG/KG	ND	NA	NA	NA

STATISTICAL SUMMARY
OPERABLE UNIT No. 8
SITE 16 - SUBSURFACE SOIL
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

Client Sample ID: Laboratory Sample ID: Date Sampled:	MAXIMUM DETECTED	ARITHMETIC MEAN	STANDARD DEVIATION	NORMAL UPPER 95% CONFIDENCE INTERVAL	LOG NORMAL UPPER 95% CONFIDENCE INTERVAL
UNITS					
SEMIVOLATILES					
Phenol	UG/KG	ND	NA	NA	NA
bis(2-Chloroethyl) ether	UG/KG	ND	NA	NA	NA
2-Chlorophenol	UG/KG	ND	NA	NA	NA
1,3-Dichlorobenzene	UG/KG	ND	NA	NA	NA
1,4-Dichlorobenzene	UG/KG	67 J	163.0	38.9	174.7
1,2-Dichlorobenzene	UG/KG	ND	NA	NA	NA
2-Methylphenol	UG/KG	ND	NA	NA	NA
2,2'-oxybis-(1-chloropropane)	UG/KG	ND	NA	NA	NA
4-Methylphenol	UG/KG	ND	NA	NA	NA
N-Nitroso-di-n-propylamine	UG/KG	ND	NA	NA	NA
Hexachloroethane	UG/KG	ND	NA	NA	NA
Nitrobenzene	UG/KG	ND	NA	NA	NA
Isophorone	UG/KG	ND	NA	NA	NA
2-Nitrophenol	UG/KG	ND	NA	NA	NA
2,4-Dimethylphenol	UG/KG	ND	NA	NA	NA
bis(2-Chloroethoxy) methane	UG/KG	ND	NA	NA	NA
2,4-Dichlorophenol	UG/KG	ND	NA	NA	NA
1,2,4-Trichlorobenzene	UG/KG	66 J	162.8	39.7	174.7
Naphthalene	UG/KG	88 J	173.2	17.8	178.5
4-Chloroaniline	UG/KG	ND	NA	NA	NA
Hexachlorobutadiene	UG/KG	ND	NA	NA	NA
4-Chloro-3-methylphenol	UG/KG	ND	NA	NA	NA
2-Methylnaphthalene	UG/KG	77 J	172.9	19.5	178.7
Hexachlorocyclopentadiene	UG/KG	ND	NA	NA	NA
2,4,6-Trichlorophenol	UG/KG	ND	NA	NA	NA
2,4,5-Trichlorophenol	UG/KG	ND	NA	NA	NA
2-Chloronaphthalene	UG/KG	ND	NA	NA	NA
2-Nitroaniline	UG/KG	ND	NA	NA	NA
Dimethyl phthalate	UG/KG	ND	NA	NA	NA
Acenaphthylene	UG/KG	ND	NA	NA	NA
2,6-Dinitrotoluene	UG/KG	ND	NA	NA	NA
3-Nitroaniline	UG/KG	ND	NA	NA	NA
Acenaphthene	UG/KG	290 J	167.2	43.3	180.1

STATISTICAL SUMMARY
OPERABLE UNIT No. 8
SITE 16 - SUBSURFACE SOIL
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

Client Sample ID: Laboratory Sample ID: Date Sampled:	MAXIMUM DETECTED	ARITHMETIC MEAN	STANDARD DEVIATION	NORMAL UPPER 95% CONFIDENCE INTERVAL	LOG NORMAL UPPER 95% CONFIDENCE INTERVAL
UNITS					
SEMIVOLATILES Cont.					
2,4-Dinitrophenol	UG/KG	ND	NA	NA	NA
4-Nitrophenol	UG/KG	ND	NA	NA	NA
Dibenzofuran	UG/KG	310 J	180.2	25.2	187.7
2,4-Dinitrotoluene	UG/KG	ND	NA	NA	NA
Diethylphthalate	UG/KG	ND	NA	NA	NA
4-Chlorophenyl phenyl ether	UG/KG	ND	NA	NA	NA
Fluorene	UG/KG	680	191.7	89.5	218.6
4-Nitroaniline	UG/KG	ND	NA	NA	NA
4,6-Dinitro-2-methylphenol	UG/KG	ND	NA	NA	NA
N-nitrosodiphenylamine	UG/KG	ND	NA	NA	NA
4-Bromophenyl-phenylether	UG/KG	ND	NA	NA	NA
Hexachlorobenzene	UG/KG	ND	NA	NA	NA
Pentachlorophenol	UG/KG	94 J	390.9	109.3	423.7
Phenanthrene	UG/KG	2200	239.2	357.9	346.6
Anthracene	UG/KG	380	182.3	37.1	193.5
Carbazole	UG/KG	180 J	176.1	8.6	178.7
di-n-Butylphthalate	UG/KG	270 J	178.6	18.9	184.3
Fluoranthene	UG/KG	1200	208.0	181.2	262.3
Pyrene	UG/KG	670 J	191.4	87.8	217.7
Butyl benzyl phthalate	UG/KG	ND	NA	NA	NA
3,3'-Dichlorobenzidine	UG/KG	ND	NA	NA	NA
Benzo[a]anthracene	UG/KG	160 J	175.5	9.0	178.2
Chrysene	UG/KG	160 J	175.5	9.0	178.2
bis(2-Ethylhexyl)phthalate	UG/KG	71 J	168.3	28.4	176.8
di-n-Octylphthalate	UG/KG	46 J	171.4	24.3	178.7
Benzo[b]fluoranthene	UG/KG	57 J	172.3	22.7	179.1
Benzo[k]fluoranthene	UG/KG	58 J	172.3	22.5	179.0
Benzo[a]pyrene	UG/KG	38 J	171.7	25.8	179.4
Indeno[1,2,3-cd]pyrene	UG/KG	ND	NA	NA	NA
Dibenz[a,h]anthracene	UG/KG	ND	NA	NA	NA
Benzo[g,h,i]perylene	UG/KG	ND	NA	NA	NA

STATISTICAL SUMMARY
OPERABLE UNIT No. 8
SITE 16 - SUBSURFACE SOIL
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

Client Sample ID: Laboratory Sample ID: Date Sampled:	MAXIMUM DETECTED	ARITHMETIC MEAN	STANDARD DEVIATION	NORMAL UPPER 95% CONFIDENCE INTERVAL	LOG NORMAL UPPER 95% CONFIDENCE INTERVAL
PESTICIDES/PCBs	UNITS				
alpha-BHC	UG/KG	ND	NA	NA	NA
beta-BHC	UG/KG	ND	NA	NA	NA
delta-BHC	UG/KG	ND	NA	NA	NA
Lindane (gamma-BHC)	UG/KG	ND	NA	NA	NA
Heptachlor	UG/KG	ND	NA	NA	NA
Aldrin	UG/KG	ND	NA	NA	NA
Heptachlor epoxide	UG/KG	ND	NA	NA	NA
Endosulfan I	UG/KG	ND	NA	NA	NA
Dieldrin	UG/KG	ND	NA	NA	NA
4,4'-DDE	UG/KG	36	3.3	6.2	5.1
Endrin	UG/KG	ND	NA	NA	NA
Endosulfan II	UG/KG	7.1 J	2.0	1.0	2.3
4,4'-DDD	UG/KG	52 J	3.3	8.9	6.0
Endosulfan sulfate	UG/KG	ND	NA	NA	NA
4,4'-DDT	UG/KG	630	22.5	111.0	55.8
Methoxychlor	UG/KG	ND	NA	NA	NA
Endrin ketone	UG/KG	ND	NA	NA	NA
Endrin aldehyde	UG/KG	ND	NA	NA	NA
alpha-Chlordane	UG/KG	3.8	1.0	0.5	1.2
gamma-Chlordane	UG/KG	2.5 J	1.0	0.4	1.1
Toxaphene	UG/KG	ND	NA	NA	NA
Aroclor 1016	UG/KG	ND	NA	NA	NA
Aroclor 1221	UG/KG	ND	NA	NA	NA
Aroclor 1232	UG/KG	ND	NA	NA	NA
Aroclor 1242	UG/KG	ND	NA	NA	NA
Aroclor 1248	UG/KG	ND	NA	NA	NA
Aroclor 1254	UG/KG	45	19.7	6.8	21.7
Aroclor 1260	UG/KG	ND	NA	NA	NA

APPENDIX M.4
SUBSURFACE SOIL METALS

STATISTICAL SUMMARY
OPERABLE UNIT No. 8
SITE 16 - SUBSURFACE SOIL
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TAL INORGANICS

Client Sample ID:					NORMAL	LOG NORMAL
Laboratory Sample ID:		MAXIMUM	ARITHMETIC	STANDARD	UPPER 95%	UPPER 95%
Date Sampled:		DETECTED	MEAN	DEVIATION	CONFIDENCE	CONFIDENCE
					INTERVAL	INTERVAL
	UNITS					
Aluminum	MG/KG	7650 J	1803.3	1600.6	2283.4	2684.9
Antimony	MG/KG	ND	NA	NA	NA	NA
Arsenic	MG/KG	2.5 J	1.1	0.3	1.2	1.1
Barium	MG/KG	36.5	4.8	6.3	6.7	7.1
Beryllium	MG/KG	0.21	0.1	0.0	0.1	0.1
Cadmium	MG/KG	ND	NA	NA	NA	NA
Calcium	MG/KG	1400	228.2	301.3	318.6	544.6
Chromium	MG/KG	7.9	3.3	2.0	3.9	4.4
Cobalt	MG/KG	ND	NA	NA	NA	NA
Copper	MG/KG	3.4 J	1.3	0.6	1.5	1.5
Iron	MG/KG	7830	1492.7	1866.4	2052.6	2222.6
Lead	MG/KG	68 J	4.9	11.6	8.4	5.8
Magnesium	MG/KG	237	74.9	67.6	95.2	110.4
Manganese	MG/KG	38.1 J	4.1	6.5	6.1	5.4
Mercury	MG/KG	0.28	0.1	0.0	0.1	0.1
Nickel	MG/KG	ND	NA	NA	NA	NA
Potassium	MG/KG	370	149.3	78.3	172.8	172.3
Selenium	MG/KG	1.2	0.5	0.1	0.6	0.6
Silver	MG/KG	ND	NA	NA	NA	NA
Sodium	MG/KG	34.7	18.6	8.8	21.3	21.8
Thallium	MG/KG	ND	NA	NA	NA	NA
Vanadium	MG/KG	14.1	3.3	3.2	4.3	4.8
Zinc	MG/KG	399 J	21.4	70.7	42.6	27.1
Moisture	%					

APPENDIX M.5
GROUNDWATER ORGANICS

STATISTICAL SUMMARY
OPERABLE UNIT No. 8
SITE 16 - GROUNDWATER
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

Client Sample ID: Laboratory Sample ID: Date Sampled:	MAXIMUM DETECTED	ARITHMETIC MEAN	STANDARD DEVIATION	NORMAL UPPER 95% CONFIDENCE INTERVAL	LOG NORMAL UPPER 95% CONFIDENCE INTERVAL
UNITS					
VOLATILES					
Chloromethane	UG/L	ND	NA	NA	NA
Bromomethane	UG/L	ND	NA	NA	NA
Vinyl chloride	UG/L	ND	NA	NA	NA
Chloroethane	UG/L	ND	NA	NA	NA
Methylene chloride	UG/L	ND	NA	NA	NA
Acetone	UG/L	ND	NA	NA	NA
Carbon Disulfide	UG/L	ND	NA	NA	NA
1,1-Dichloroethene	UG/L	ND	NA	NA	NA
1,1-Dichloroethane	UG/L	ND	NA	NA	NA
1,2-Dichloroethene(total)	UG/L	ND	NA	NA	NA
Chloroform	UG/L	ND	NA	NA	NA
1,2-Dichloroethane	UG/L	ND	NA	NA	NA
2-Butanone	UG/L	ND	NA	NA	NA
1,1,1-Trichloroethane	UG/L	ND	NA	NA	NA
Carbon tetrachloride	UG/L	ND	NA	NA	NA
Bromodichloromethane	UG/L	ND	NA	NA	NA
1,2-Dichloropropane	UG/L	ND	NA	NA	NA
cis-1,3-Dichloropropene	UG/L	ND	NA	NA	NA
Trichloroethene	UG/L	ND	NA	NA	NA
Dibromochloromethane	UG/L	ND	NA	NA	NA
1,1,2-Trichloroethane	UG/L	ND	NA	NA	NA
Benzene	UG/L	37	10.3	13.1	21.1
trans-1,3-Dichloropropene	UG/L	ND	NA	NA	NA
Bromoform	UG/L	ND	NA	NA	NA
4-Methyl-2-pentanone	UG/L	ND	NA	NA	NA
2-Hexanone	UG/L	ND	NA	NA	NA
Tetrachloroethene	UG/L	ND	NA	NA	NA
1,1,2,2-Tetrachloroethane	UG/L	ND	NA	NA	NA
Toluene	UG/L	ND	NA	NA	NA
Chlorobenzene	UG/L	ND	NA	NA	NA
Ethylbenzene	UG/L	1 J	4.3	1.6	5.7
Styrene	UG/L	ND	NA	NA	NA
Xylenes (total)	UG/L	ND	NA	NA	NA

STATISTICAL SUMMARY
OPERABLE UNIT No. 8
SITE 16 - GROUNDWATER
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

Client Sample ID: Laboratory Sample ID: Date Sampled:		MAXIMUM DETECTED	ARITHMETIC MEAN	STANDARD DEVIATION	NORMAL UPPER 95% CONFIDENCE INTERVAL	LOG NORMAL UPPER 95% CONFIDENCE INTERVAL	
	UNITS						
	SEMIVOLATILES						
	Phenol	UG/L	4 J	3.7	1.8	5.1	10.5
	bis(2-Chloroethyl) ether	UG/L	ND	NA	NA	NA	NA
	2-Chlorophenol	UG/L	ND	NA	NA	NA	NA
	1,3-Dichlorobenzene	UG/L	ND	NA	NA	NA	NA
	1,4-Dichlorobenzene	UG/L	ND	NA	NA	NA	NA
	1,2-Dichlorobenzene	UG/L	ND	NA	NA	NA	NA
	2-Methylphenol	UG/L	ND	NA	NA	NA	NA
	2,2'-oxybis-(1-chloropropane)	UG/L	ND	NA	NA	NA	NA
	4-Methylphenol	UG/L	ND	NA	NA	NA	NA
	N-Nitroso-di-n-propylamine	UG/L	ND	NA	NA	NA	NA
	Hexachloroethane	UG/L	ND	NA	NA	NA	NA
	Nitrobenzene	UG/L	ND	NA	NA	NA	NA
	Isophorone	UG/L	ND	NA	NA	NA	NA
	2-Nitrophenol	UG/L	ND	NA	NA	NA	NA
	2,4-Dimethylphenol	UG/L	ND	NA	NA	NA	NA
	bis(2-Chloroethoxy) methane	UG/L	ND	NA	NA	NA	NA
	2,4-Dichlorophenol	UG/L	ND	NA	NA	NA	NA
	1,2,4-Trichlorobenzene	UG/L	ND	NA	NA	NA	NA
	Naphthalene	UG/L	6 J	5.2	0.4	5.5	5.5
	4-Chloroaniline	UG/L	ND	NA	NA	NA	NA
	Hexachlorobutadiene	UG/L	ND	NA	NA	NA	NA
	4-Chloro-3-methylphenol	UG/L	ND	NA	NA	NA	NA
	2-Methylnaphthalene	UG/L	ND	NA	NA	NA	NA
	Hexachlorocyclopentadiene	UG/L	ND	NA	NA	NA	NA
	2,4,6-Trichlorophenol	UG/L	ND	NA	NA	NA	NA
	2,4,5-Trichlorophenol	UG/L	ND	NA	NA	NA	NA
	2-Chloronaphthalene	UG/L	ND	NA	NA	NA	NA
	2-Nitroaniline	UG/L	ND	NA	NA	NA	NA
	Dimethyl phthalate	UG/L	ND	NA	NA	NA	NA
	Acenaphthylene	UG/L	ND	NA	NA	NA	NA
	2,6-Dinitrotoluene	UG/L	ND	NA	NA	NA	NA
	3-Nitroaniline	UG/L	ND	NA	NA	NA	NA
	Acenaphthene	UG/L	ND	NA	NA	NA	NA

STATISTICAL SUMMARY
OPERABLE UNIT No. 8
SITE 16 - GROUNDWATER
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

Client Sample ID: Laboratory Sample ID: Date Sampled:	MAXIMUM DETECTED	ARITHMETIC MEAN	STANDARD DEVIATION	NORMAL UPPER 95% CONFIDENCE INTERVAL	LOG NORMAL UPPER 95% CONFIDENCE INTERVAL
UNITS					
SEMIVOLATILES Cont.					
2,4-Dinitrophenol	UG/L	ND	NA	NA	NA
4-Nitrophenol	UG/L	ND	NA	NA	NA
Dibenzofuran	UG/L	ND	NA	NA	NA
2,4-Dinitrotoluene	UG/L	ND	NA	NA	NA
Diethylphthalate	UG/L	ND	NA	NA	NA
4-Chlorophenyl phenyl ether	UG/L	ND	NA	NA	NA
Fluorene	UG/L	ND	NA	NA	NA
4-Nitroaniline	UG/L	ND	NA	NA	NA
4,6-Dinitro-2-methylphenol	UG/L	ND	NA	NA	NA
N-nitrosodiphenylamine	UG/L	ND	NA	NA	NA
4-Bromophenyl-phenylether	UG/L	ND	NA	NA	NA
Hexachlorobenzene	UG/L	ND	NA	NA	NA
Pentachlorophenol	UG/L	ND	NA	NA	NA
Phenanthrene	UG/L	ND	NA	NA	NA
Anthracene	UG/L	ND	NA	NA	NA
Carbazole	UG/L	ND	NA	NA	NA
di-n-Butylphthalate	UG/L	ND	NA	NA	NA
Fluoranthene	UG/L	ND	NA	NA	NA
Pyrene	UG/L	ND	NA	NA	NA
Butyl benzyl phthalate	UG/L	ND	NA	NA	NA
3,3'-Dichlorobenzidine	UG/L	ND	NA	NA	NA
Benzo[a]anthracene	UG/L	ND	NA	NA	NA
Chrysene	UG/L	ND	NA	NA	NA
bis(2-Ethylhexyl)phthalate	UG/L	5 J	3.2	2.0	4.8
di-n-Octylphthalate	UG/L	ND	NA	NA	NA
Benzo[b]fluoranthene	UG/L	ND	NA	NA	NA
Benzo[k]fluoranthene	UG/L	ND	NA	NA	NA
Benzo[a]pyrene	UG/L	ND	NA	NA	NA
Indeno[1,2,3-cd]pyrene	UG/L	ND	NA	NA	NA
Dibenz[a,h]anthracene	UG/L	ND	NA	NA	NA
Benzo[g,h,i]perylene	UG/L	ND	NA	NA	NA

STATISTICAL SUMMARY
OPERABLE UNIT No. 8
SITE 16 - GROUNDWATER
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

Client Sample ID: Laboratory Sample ID: Date Sampled:	MAXIMUM DETECTED	ARITHMETIC MEAN	STANDARD DEVIATION	NORMAL UPPER 95% CONFIDENCE INTERVAL	LOG NORMAL UPPER 95% CONFIDENCE INTERVAL
UNITS					
PESTICIDES/PCBs					
alpha-BHC	UG/L	ND	NA	NA	NA
beta-BHC	UG/L	ND	NA	NA	NA
delta-BHC	UG/L	ND	NA	NA	NA
Lindane (gamma-BHC)	UG/L	ND	NA	NA	NA
Heptachlor	UG/L	ND	NA	NA	NA
Aldrin	UG/L	ND	NA	NA	NA
Heptachlor epoxide	UG/L	ND	NA	NA	NA
Endosulfan I	UG/L	ND	NA	NA	NA
Dieldrin	UG/L	ND	NA	NA	NA
4,4'-DDE	UG/L	ND	NA	NA	NA
Endrin	UG/L	ND	NA	NA	NA
Endosulfan II	UG/L	ND	NA	NA	NA
4,4'-DDD	UG/L	ND	NA	NA	NA
Endosulfan sulfate	UG/L	ND	NA	NA	NA
4,4'-DDT	UG/L	ND	NA	NA	NA
Methoxychlor	UG/L	ND	NA	NA	NA
Endrin ketone	UG/L	ND	NA	NA	NA
Endrin aldehyde	UG/L	ND	NA	NA	NA
alpha-Chlordane	UG/L	ND	NA	NA	NA
gamma-Chlordane	UG/L	ND	NA	NA	NA
Toxaphene	UG/L	ND	NA	NA	NA
Aroclor 1016	UG/L	ND	NA	NA	NA
Aroclor 1221	UG/L	ND	NA	NA	NA
Aroclor 1232	UG/L	ND	NA	NA	NA
Aroclor 1242	UG/L	ND	NA	NA	NA
Aroclor 1248	UG/L	ND	NA	NA	NA
Aroclor 1254	UG/L	ND	NA	NA	NA
Aroclor 1260	UG/L	ND	NA	NA	NA

APPENDIX M.6
GROUNDWATER TOTAL METALS

STATISTICAL SUMMARY
OPERABLE UNIT No. 8
SITE 16 - GROUNDWATER
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TAL INORGANICS

Client Sample ID:	16-MW01-01	16-MW02-01	16-MW03-01	16-MW04-01	16-MW05-01	16-MW06-01
Laboratory Sample ID:	AD1636	AD1489	AD1486	AD1633	AD1168	AD1492
Date Sampled:	11/30/94	11/30/94	11/29/94	11/30/94	11/29/94	11/30/94

	<u>UNITS</u>						
Aluminum	UG/L	54.5 U	67 U	85.5 U	59 U	53 U	47.65 U
Antimony	UG/L	25 U	25 U	25 U	25 U	25 U	25 U
Arsenic	UG/L	5 U	5 U	5 U	5 U	5 U	5 U
Barium	UG/L	27.2 J	50.9	77.9	24.7 J	53	24.4 J
Beryllium	UG/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Cadmium	UG/L	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ
Calcium	UG/L	3160	6200	13400	1460	7770	370
Chromium	UG/L	5 U	5 U	5 U	5 U	5 U	5 U
Cobalt	UG/L	5 U	5 U	5 U	5 U	5 U	5 U
Copper	UG/L	5 U	5 U	5 U	5 U	5 U	5 U
Iron	UG/L	29.1 U	31.45 U	712	20.05 U	30.85 U	35.95 U
Lead	UG/L	1.5 U	1.5 U	1.5 U	3.2 J	1.5 U	1.5 U
Magnesium	UG/L	1610	1870	5090	1020	1210	1510
Manganese	UG/L	5.35 UJ	23.1 J	28.9 J	2.9 UJ	31.6 J	9.8 J
Mercury	UG/L	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Nickel	UG/L	10 U	10 U	10 U	10 U	10 U	10 U
Potassium	UG/L	500 U	500 U	500 U	500 U	500 U	500 U
Selenium	UG/L	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ
Silver	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Sodium	UG/L	3230	7090	15600	16400	6000	2480
Thallium	UG/L	5 U	5 U	5 U	5 U	5 U	5 U
Vanadium	UG/L	5 U	5 U	5 U	5 U	5 U	5 U
Zinc	UG/L	15.3 UJ	80.5	9.75 UJ	11.5 UJ	6.5 UJ	9.25 UJ

STATISTICAL SUMMARY
OPERABLE UNIT No. 8
SITE 16 - GROUNDWATER
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TAL INORGANICS

Client Sample ID: Laboratory Sample ID: Date Sampled:	MAXIMUM DETECTED	ARITHMETIC MEAN	STANDARD DEVIATION	NORMAL UPPER 95% CONFIDENCE INTERVAL	LOG NORMAL UPPER 95% CONFIDENCE INTERVAL
	UNITS				
Aluminum	UG/L	ND	NA	NA	NA
Antimony	UG/L	ND	NA	NA	NA
Arsenic	UG/L	ND	NA	NA	NA
Barium	UG/L	77.9	43.0	21.5	60.7
Beryllium	UG/L	ND	NA	NA	NA
Cadmium	UG/L	ND	NA	NA	NA
Calcium	UG/L	13400	5393.3	4818.7	9357.3
Chromium	UG/L	ND	NA	NA	NA
Cobalt	UG/L	ND	NA	NA	NA
Copper	UG/L	ND	NA	NA	NA
Iron	UG/L	712	143.2	278.7	372.5
Lead	UG/L	3.2 J	1.8	0.7	2.4
Magnesium	UG/L	5090	2051.7	1518.3	3300.6
Manganese	UG/L	31.6 J	16.9	12.5	27.2
Mercury	UG/L	ND	NA	NA	NA
Nickel	UG/L	ND	NA	NA	NA
Potassium	UG/L	ND	NA	NA	NA
Selenium	UG/L	ND	NA	NA	NA
Silver	UG/L	ND	NA	NA	NA
Sodium	UG/L	16400	8466.7	6083.8	13471.3
Thallium	UG/L	ND	NA	NA	NA
Vanadium	UG/L	ND	NA	NA	NA
Zinc	UG/L	80.5	22.1	28.7	45.8

APPENDIX M.7
GROUNDWATER DISSOLVED METALS

STATISTICAL SUMMARY
OPERABLE UNIT No. 8
SITE 16 - GROUNDWATER
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
DISSOLVED TAL INORGANICS

Client Sample ID:					NORMAL UPPER 95% CONFIDENCE INTERVAL	LOG NORMAL UPPER 95% CONFIDENCE INTERVAL
Laboratory Sample ID:	MAXIMUM DETECTED	ARITHMETIC MEAN	STANDARD DEVIATION			
Date Sampled:						
	UNITS					
Aluminum	UG/L	ND	NA	NA	NA	NA
Antimony	UG/L	ND	NA	NA	NA	NA
Arsenic	UG/L	ND	NA	NA	NA	NA
Barium	UG/L	75.8	36.8	22.8	55.5	101.1
Beryllium	UG/L	ND	NA	NA	NA	NA
Cadmium	UG/L	ND	NA	NA	NA	NA
Calcium	UG/L	13600 J	5426.3	4684.0	9279.5	98245.9
Chromium	UG/L	ND	NA	NA	NA	NA
Cobalt	UG/L	ND	NA	NA	NA	NA
Copper	UG/L	18.6	7.3	5.6	11.8	14.7
Iron	UG/L	588 J	113.8	232.4	305.0	4916.3
Lead	UG/L	ND	NA	NA	NA	NA
Magnesium	UG/L	5050	2035.0	1513.2	3279.8	4376.0
Manganese	UG/L	30.2 J	15.0	9.6	22.9	56.9
Mercury	UG/L	ND	NA	NA	NA	NA
Nickel	UG/L	ND	NA	NA	NA	NA
Potassium	UG/L	ND	NA	NA	NA	NA
Selenium	UG/L	ND	NA	NA	NA	NA
Silver	UG/L	ND	NA	NA	NA	NA
Sodium	UG/L	16600	8416.7	6085.0	13422.3	30323.4
Thallium	UG/L	ND	NA	NA	NA	NA
Vanadium	UG/L	ND	NA	NA	NA	NA
Zinc	UG/L	ND	NA	NA	NA	NA

APPENDIX M.8
NORTHEAST CREEK SURFACE WATER ORGANICS

STATISTICAL SUMMARY
OPERABLE UNIT No. 8 (SITE 16)
NORTHEAST CREEK SURFACE WATER
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

Client Sample ID: Laboratory Sample ID: Date Sampled:	MAXIMUM DETECTED	ARITHMETIC MEAN	STANDARD DEVIATION	NORMAL UPPER 95% CONFIDENCE INTERVAL	LOG NORMAL UPPER 95% CONFIDENCE INTERVAL
<u>UNITS</u>					
<u>VOLATILES</u>					
Chloromethane	UG/L	ND	NA	NA	NA
Bromomethane	UG/L	ND	NA	NA	NA
Vinyl chloride	UG/L	ND	NA	NA	NA
Chloroethane	UG/L	ND	NA	NA	NA
Methylene chloride	UG/L	ND	NA	NA	NA
Acetone	UG/L	ND	NA	NA	NA
Carbon Disulfide	UG/L	ND	NA	NA	NA
1,1-Dichloroethene	UG/L	ND	NA	NA	NA
1,1-Dichloroethane	UG/L	ND	NA	NA	NA
1,2-Dichloroethene(total)	UG/L	ND	NA	NA	NA
Chloroform	UG/L	ND	NA	NA	NA
1,2-Dichloroethane	UG/L	ND	NA	NA	NA
2-Butanone	UG/L	ND	NA	NA	NA
1,1,1-Trichloroethane	UG/L	ND	NA	NA	NA
Carbon tetrachloride	UG/L	ND	NA	NA	NA
Bromodichloromethane	UG/L	ND	NA	NA	NA
1,2-Dichloropropane	UG/L	ND	NA	NA	NA
cis-1,3-Dichloropropene	UG/L	ND	NA	NA	NA
Trichloroethene	UG/L	ND	NA	NA	NA
Dibromochloromethane	UG/L	ND	NA	NA	NA
1,1,2-Trichloroethane	UG/L	ND	NA	NA	NA
Benzene	UG/L	ND	NA	NA	NA
trans-1,3-Dichloropropene	UG/L	ND	NA	NA	NA
Bromoform	UG/L	ND	NA	NA	NA
4-Methyl-2-pentanone	UG/L	7 J	5.4	0.9	6.3
2-Hexanone	UG/L	ND	NA	NA	NA
Tetrachloroethene	UG/L	ND	NA	NA	NA
1,1,2,2-Tetrachloroethane	UG/L	2 J	4.4	1.3	5.7
Toluene	UG/L	ND	NA	NA	NA
Chlorobenzene	UG/L	ND	NA	NA	NA
Ethylbenzene	UG/L	ND	NA	NA	NA
Styrene	UG/L	ND	NA	NA	NA
Xylenes (total)	UG/L	ND	NA	NA	NA

STATISTICAL SUMMARY
OPERABLE UNIT No. 8 (SITE 16)
NORTHEAST CREEK SURFACE WATER
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

Client Sample ID: Laboratory Sample ID: Date Sampled:	MAXIMUM DETECTED	ARITHMETIC MEAN	STANDARD DEVIATION	NORMAL UPPER 95% CONFIDENCE INTERVAL	LOG NORMAL UPPER 95% CONFIDENCE INTERVAL
UNITS					
SEMIVOLATILES					
Phenol	UG/L	ND	NA	NA	NA
bis(2-Chloroethyl) ether	UG/L	ND	NA	NA	NA
2-Chlorophenol	UG/L	ND	NA	NA	NA
1,3-Dichlorobenzene	UG/L	ND	NA	NA	NA
1,4-Dichlorobenzene	UG/L	ND	NA	NA	NA
1,2-Dichlorobenzene	UG/L	ND	NA	NA	NA
2-Methylphenol	UG/L	ND	NA	NA	NA
2,2'-oxybis-(1-chloropropane)	UG/L	ND	NA	NA	NA
4-Methylphenol	UG/L	ND	NA	NA	NA
N-Nitroso-di-n-propylamine	UG/L	ND	NA	NA	NA
Hexachloroethane	UG/L	ND	NA	NA	NA
Nitrobenzene	UG/L	ND	NA	NA	NA
Isophorone	UG/L	ND	NA	NA	NA
2-Nitrophenol	UG/L	ND	NA	NA	NA
2,4-Dimethylphenol	UG/L	ND	NA	NA	NA
bis(2-Chloroethoxy) methane	UG/L	ND	NA	NA	NA
2,4-Dichlorophenol	UG/L	ND	NA	NA	NA
1,2,4-Trichlorobenzene	UG/L	ND	NA	NA	NA
Naphthalene	UG/L	ND	NA	NA	NA
4-Chloroaniline	UG/L	ND	NA	NA	NA
Hexachlorobutadiene	UG/L	ND	NA	NA	NA
4-Chloro-3-methylphenol	UG/L	ND	NA	NA	NA
2-Methylnaphthalene	UG/L	ND	NA	NA	NA
Hexachlorocyclopentadiene	UG/L	ND	NA	NA	NA
2,4,6-Trichlorophenol	UG/L	ND	NA	NA	NA
2,4,5-Trichlorophenol	UG/L	ND	NA	NA	NA
2-Chloronaphthalene	UG/L	ND	NA	NA	NA
2-Nitroaniline	UG/L	ND	NA	NA	NA
Dimethyl phthalate	UG/L	ND	NA	NA	NA
Acenaphthylene	UG/L	ND	NA	NA	NA
2,6-Dinitrotoluene	UG/L	ND	NA	NA	NA
3-Nitroaniline	UG/L	ND	NA	NA	NA
Acenaphthene	UG/L	ND	NA	NA	NA

STATISTICAL SUMMARY
OPERABLE UNIT No. 8 (SITE 16)
NORTHEAST CREEK SURFACE WATER
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

Client Sample ID: Laboratory Sample ID: Date Sampled:		MAXIMUM DETECTED	ARITHMETIC MEAN	STANDARD DEVIATION	NORMAL UPPER 95% CONFIDENCE INTERVAL	LOG NORMAL UPPER 95% CONFIDENCE INTERVAL
	<u>UNITS</u>					
	<u>SEMIVOLATILES Cont.</u>					
	2,4-Dinitrophenol	ND	NA	NA	NA	NA
	4-Nitrophenol	ND	NA	NA	NA	NA
	Dibenzofuran	ND	NA	NA	NA	NA
	2,4-Dinitrotoluene	ND	NA	NA	NA	NA
	Diethylphthalate	ND	NA	NA	NA	NA
	4-Chlorophenyl phenyl ether	ND	NA	NA	NA	NA
	Fluorene	ND	NA	NA	NA	NA
	4-Nitroaniline	ND	NA	NA	NA	NA
	4,6-Dinitro-2-methylphenol	ND	NA	NA	NA	NA
	N-nitrosodiphenylamine	ND	NA	NA	NA	NA
	4-Bromophenyl-phenylether	ND	NA	NA	NA	NA
	Hexachlorobenzene	ND	NA	NA	NA	NA
	Pentachlorophenol	ND	NA	NA	NA	NA
	Phenanthrene	ND	NA	NA	NA	NA
	Anthracene	ND	NA	NA	NA	NA
	Carbazole	ND	NA	NA	NA	NA
	di-n-Butylphthalate	ND	NA	NA	NA	NA
	Fluoranthene	ND	NA	NA	NA	NA
	Pyrene	ND	NA	NA	NA	NA
	Butyl benzyl phthalate	ND	NA	NA	NA	NA
	3,3'-Dichlorobenzidine	ND	NA	NA	NA	NA
	Benzo[a]anthracene	ND	NA	NA	NA	NA
	Chrysene	ND	NA	NA	NA	NA
	bis(2-Ethylhexyl)phthalate	10 J	6.0	2.2	8.1	9.1
	di-n-Octylphthalate	ND	NA	NA	NA	NA
	Benzo[b]fluoranthene	ND	NA	NA	NA	NA
	Benzo[k]fluoranthene	ND	NA	NA	NA	NA
	Benzo[a]pyrene	ND	NA	NA	NA	NA
	Indeno[1,2,3-cd]pyrene	ND	NA	NA	NA	NA
	Dibenz[a,h]anthracene	ND	NA	NA	NA	NA
	Benzo[g,h,i]perylene	ND	NA	NA	NA	NA

STATISTICAL SUMMARY
OPERABLE UNIT No. 8 (SITE 16)
NORTHEAST CREEK SURFACE WATER
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

Client Sample ID: Laboratory Sample ID: Date Sampled:	MAXIMUM DETECTED	ARITHMETIC MEAN	STANDARD DEVIATION	NORMAL UPPER 95% CONFIDENCE INTERVAL	LOG NORMAL UPPER 95% CONFIDENCE INTERVAL
	UNITS				
	PESTICIDES/PCBs				
alpha-BHC	UG/L	ND	NA	NA	NA
beta-BHC	UG/L	ND	NA	NA	NA
delta-BHC	UG/L	ND	NA	NA	NA
Lindane (gamma-BHC)	UG/L	ND	NA	NA	NA
Heptachlor	UG/L	ND	NA	NA	NA
Aldrin	UG/L	ND	NA	NA	NA
Heptachlor epoxide	UG/L	ND	NA	NA	NA
Endosulfan I	UG/L	ND	NA	NA	NA
Dieldrin	UG/L	ND	NA	NA	NA
4,4'-DDE	UG/L	ND	NA	NA	NA
Endrin	UG/L	ND	NA	NA	NA
Endosulfan II	UG/L	ND	NA	NA	NA
4,4'-DDD	UG/L	ND	NA	NA	NA
Endosulfan sulfate	UG/L	ND	NA	NA	NA
4,4'-DDT	UG/L	ND	NA	NA	NA
Methoxychlor	UG/L	ND	NA	NA	NA
Endrin ketone	UG/L	ND	NA	NA	NA
Endrin aldehyde	UG/L	ND	NA	NA	NA
alpha-Chlordane	UG/L	ND	NA	NA	NA
gamma-Chlordane	UG/L	ND	NA	NA	NA
Toxaphene	UG/L	ND	NA	NA	NA
Aroclor 1016	UG/L	ND	NA	NA	NA
Aroclor 1221	UG/L	ND	NA	NA	NA
Aroclor 1232	UG/L	ND	NA	NA	NA
Aroclor 1242	UG/L	ND	NA	NA	NA
Aroclor 1248	UG/L	ND	NA	NA	NA
Aroclor 1254	UG/L	ND	NA	NA	NA
Aroclor 1260	UG/L	ND	NA	NA	NA

APPENDIX M.9
NORTHEAST CREEK SURFACE WATER METALS

STATISTICAL SUMMARY
OPERABLE UNIT No. 8 (SITE 16)
NORTHEAST CREEK SURFACE WATER
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TAL INORGANICS

Client Sample ID: Laboratory Sample ID: Date Sampled:		MAXIMUM DETECTED	ARITHMETIC MEAN	STANDARD DEVIATION	NORMAL UPPER 95% CONFIDENCE INTERVAL	LOG NORMAL UPPER 95% CONFIDENCE INTERVAL
	UNITS					
Aluminum	UG/L	12300 J	6300.0	3390.2	9532.4	12042.6
Antimony	UG/L	ND	NA	NA	NA	NA
Arsenic	UG/L	3.1 J	2.4	0.8	3.2	4.8
Barium	UG/L	30.4	25.8	3.0	28.7	29.3
Beryllium	UG/L	ND	NA	NA	NA	NA
Cadmium	UG/L	ND	NA	NA	NA	NA
Calcium	UG/L	173000 J	163600.0	6913.8	170192.0	170836.3
Chromium	UG/L	15.6	7.1	4.7	11.6	16.5
Cobalt	UG/L	ND	NA	NA	NA	NA
Copper	UG/L	ND	NA	NA	NA	NA
Iron	UG/L	6650 J	3962.0	1533.3	5424.0	6185.0
Lead	UG/L	13.7	7.6	3.5	10.9	12.6
Magnesium	UG/L	615000	564200.0	30613.7	593388.9	595611.6
Manganese	UG/L	24.4	20.3	2.7	22.9	23.4
Mercury	UG/L	ND	NA	NA	NA	NA
Nickel	UG/L	ND	NA	NA	NA	NA
Potassium	UG/L	188000	178000.0	6928.2	184605.8	185200.2
Selenium	UG/L	ND	NA	NA	NA	NA
Silver	UG/L	8.9	8.2	1.0	9.2	9.6
Sodium	UG/L	4740000 J	4386000.0	212438.2	4588551.2	4603566.1
Thallium	UG/L	ND	NA	NA	NA	NA
Vanadium	UG/L	19.6	7.9	6.5	14.1	24.2
Zinc	UG/L	ND	NA	NA	NA	NA

APPENDIX M.10
NORTHEAST CREEK SEDIMENT ORGANICS

STATISTICAL SUMMARY
OPERABLE UNIT No. 8 (SITE 16)
NORTHEAST CREEK SEDIMENT
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

Client Sample ID: Laboratory Sample ID: Date Sampled:	MAXIMUM DETECTED	ARITHMETIC MEAN	STANDARD DEVIATION	NORMAL UPPER 95% CONFIDENCE INTERVAL	LOG NORMAL UPPER 95% CONFIDENCE INTERVAL
	<u>UNITS</u>				
VOLATILES					
Chloromethane	UG/KG	ND	NA	NA	NA
Bromomethane	UG/KG	ND	NA	NA	NA
Vinyl chloride	UG/KG	ND	NA	NA	NA
Chloroethane	UG/KG	ND	NA	NA	NA
Methylene chloride	UG/KG	ND	NA	NA	NA
Acetone	UG/KG	ND	NA	NA	NA
Carbon Disulfide	UG/KG	2 J	6.2	1.7	7.2
1,1-Dichloroethene	UG/KG	ND	NA	NA	NA
1,1-Dichloroethane	UG/KG	ND	NA	NA	NA
1,2-Dichloroethene(total)	UG/KG	ND	NA	NA	NA
Chloroform	UG/KG	ND	NA	NA	NA
1,2-Dichloroethane	UG/KG	ND	NA	NA	NA
2-Butanone	UG/KG	ND	NA	NA	NA
1,1,1-Trichloroethane	UG/KG	ND	NA	NA	NA
Carbon tetrachloride	UG/KG	ND	NA	NA	NA
Bromodichloromethane	UG/KG	ND	NA	NA	NA
1,2-Dichloropropane	UG/KG	ND	NA	NA	NA
cis-1,3-Dichloropropene	UG/KG	ND	NA	NA	NA
Trichloroethene	UG/KG	ND	NA	NA	NA
Dibromochloromethane	UG/KG	ND	NA	NA	NA
1,1,2-Trichloroethane	UG/KG	ND	NA	NA	NA
Benzene	UG/KG	ND	NA	NA	NA
trans-1,3-Dichloropropene	UG/KG	ND	NA	NA	NA
Bromoform	UG/KG	ND	NA	NA	NA
4-Methyl-2-pentanone	UG/KG	ND	NA	NA	NA
2-Hexanone	UG/KG	ND	NA	NA	NA
Tetrachloroethene	UG/KG	ND	NA	NA	NA
1,1,2,2-Tetrachloroethane	UG/KG	ND	NA	NA	NA
Toluene	UG/KG	2 J	5.5	2.3	6.8
Chlorobenzene	UG/KG	ND	NA	NA	NA
Ethylbenzene	UG/KG	ND	NA	NA	NA
Styrene	UG/KG	ND	NA	NA	NA
Xylenes (total)	UG/KG	ND	NA	NA	NA

STATISTICAL SUMMARY
OPERABLE UNIT No. 8 (SITE 16)
NORTHEAST CREEK SEDIMENT
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

Client Sample ID: Laboratory Sample ID: Date Sampled:	MAXIMUM DETECTED	ARITHMETIC MEAN	STANDARD DEVIATION	NORMAL UPPER 95% CONFIDENCE INTERVAL	LOG NORMAL UPPER 95% CONFIDENCE INTERVAL
UNITS					
SEMIVOLATILES					
Phenol	UG/KG	ND	NA	NA	NA
bis(2-Chloroethyl) ether	UG/KG	ND	NA	NA	NA
2-Chlorophenol	UG/KG	ND	NA	NA	NA
1,3-Dichlorobenzene	UG/KG	ND	NA	NA	NA
1,4-Dichlorobenzene	UG/KG	ND	NA	NA	NA
1,2-Dichlorobenzene	UG/KG	ND	NA	NA	NA
2-Methylphenol	UG/KG	ND	NA	NA	NA
2,2'-oxybis-(1-chloropropane)	UG/KG	ND	NA	NA	NA
4-Methylphenol	UG/KG	ND	NA	NA	NA
N-Nitroso-di-n-propylamine	UG/KG	ND	NA	NA	NA
Hexachloroethane	UG/KG	ND	NA	NA	NA
Nitrobenzene	UG/KG	ND	NA	NA	NA
Isophorone	UG/KG	ND	NA	NA	NA
2-Nitrophenol	UG/KG	ND	NA	NA	NA
2,4-Dimethylphenol	UG/KG	ND	NA	NA	NA
bis(2-Chloroethoxy) methane	UG/KG	ND	NA	NA	NA
2,4-Dichlorophenol	UG/KG	ND	NA	NA	NA
1,2,4-Trichlorobenzene	UG/KG	ND	NA	NA	NA
Naphthalene	UG/KG	ND	NA	NA	NA
4-Chloroaniline	UG/KG	ND	NA	NA	NA
Hexachlorobutadiene	UG/KG	ND	NA	NA	NA
4-Chloro-3-methylphenol	UG/KG	ND	NA	NA	NA
2-Methylnaphthalene	UG/KG	ND	NA	NA	NA
Hexachlorocyclopentadiene	UG/KG	ND	NA	NA	NA
2,4,6-Trichlorophenol	UG/KG	ND	NA	NA	NA
2,4,5-Trichlorophenol	UG/KG	ND	NA	NA	NA
2-Chloronaphthalene	UG/KG	ND	NA	NA	NA
2-Nitroaniline	UG/KG	ND	NA	NA	NA
Dimethyl phthalate	UG/KG	ND	NA	NA	NA
Acenaphthylene	UG/KG	ND	NA	NA	NA
2,6-Dinitrotoluene	UG/KG	ND	NA	NA	NA
3-Nitroaniline	UG/KG	ND	NA	NA	NA
Acenaphthene	UG/KG	ND	NA	NA	NA

STATISTICAL SUMMARY
OPERABLE UNIT No. 8 (SITE 16)
NORTHEAST CREEK SEDIMENT
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

Client Sample ID: Laboratory Sample ID: Date Sampled:		MAXIMUM DETECTED	ARITHMETIC MEAN	STANDARD DEVIATION	NORMAL UPPER 95% CONFIDENCE INTERVAL	LOG NORMAL UPPER 95% CONFIDENCE INTERVAL
	<u>UNITS</u>					
	<u>SEMIVOLATILES Cont.</u>					
	2,4-Dinitrophenol	UG/KG	ND	NA	NA	NA
	4-Nitrophenol	UG/KG	ND	NA	NA	NA
	Dibenzofuran	UG/KG	ND	NA	NA	NA
	2,4-Dinitrotoluene	UG/KG	ND	NA	NA	NA
	Diethylphthalate	UG/KG	ND	NA	NA	NA
	4-Chlorophenyl phenyl ether	UG/KG	ND	NA	NA	NA
	Fluorene	UG/KG	ND	NA	NA	NA
	4-Nitroaniline	UG/KG	ND	NA	NA	NA
	4,6-Dinitro-2-methylphenol	UG/KG	ND	NA	NA	NA
	N-nitrosodiphenylamine	UG/KG	ND	NA	NA	NA
	4-Bromophenyl-phenylether	UG/KG	ND	NA	NA	NA
	Hexachlorobenzene	UG/KG	ND	NA	NA	NA
	Pentachlorophenol	UG/KG	ND	NA	NA	NA
	Phenanthrene	UG/KG	ND	NA	NA	NA
	Anthracene	UG/KG	ND	NA	NA	NA
	Carbazole	UG/KG	ND	NA	NA	NA
	di-n-Butylphthalate	UG/KG	ND	NA	NA	NA
	Fluoranthene	UG/KG	ND	NA	NA	NA
	Pyrene	UG/KG	ND	NA	NA	NA
	Butyl benzyl phthalate	UG/KG	ND	NA	NA	NA
	3,3'-Dichlorobenzidine	UG/KG	ND	NA	NA	NA
	Benzo[a]anthracene	UG/KG	ND	NA	NA	NA
	Chrysene	UG/KG	ND	NA	NA	NA
	bis(2-Ethylhexyl)phthalate	UG/KG	ND	NA	NA	NA
	di-n-Octylphthalate	UG/KG	ND	NA	NA	NA
	Benzo[b]fluoranthene	UG/KG	ND	NA	NA	NA
	Benzo[k]fluoranthene	UG/KG	ND	NA	NA	NA
	Benzo[a]pyrene	UG/KG	ND	NA	NA	NA
	Indeno[1,2,3-cd]pyrene	UG/KG	ND	NA	NA	NA
	Dibenz[a,h]anthracene	UG/KG	ND	NA	NA	NA
	Benzo[g,h,i]perylene	UG/KG	ND	NA	NA	NA

STATISTICAL SUMMARY
OPERABLE UNIT No. 8 (SITE 16)
NORTHEAST CREEK SEDIMENT
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

Client Sample ID: Laboratory Sample ID: Date Sampled:	MAXIMUM DETECTED	ARITHMETIC MEAN	STANDARD DEVIATION	NORMAL UPPER 95% CONFIDENCE INTERVAL	LOG NORMAL UPPER 95% CONFIDENCE INTERVAL
	<u>UNITS</u>				
<u>PESTICIDES/PCBs</u>					
alpha-BHC	UG/KG	ND	NA	NA	NA
beta-BHC	UG/KG	ND	NA	NA	NA
delta-BHC	UG/KG	ND	NA	NA	NA
Lindane (gamma-BHC)	UG/KG	ND	NA	NA	NA
Heptachlor	UG/KG	ND	NA	NA	NA
Aldrin	UG/KG	ND	NA	NA	NA
Heptachlor epoxide	UG/KG	ND	NA	NA	NA
Endosulfan I	UG/KG	ND	NA	NA	NA
Dieldrin	UG/KG	ND	NA	NA	NA
4,4'-DDE	UG/KG	ND	NA	NA	NA
Endrin	UG/KG	ND	NA	NA	NA
Endosulfan II	UG/KG	ND	NA	NA	NA
4,4'-DDD	UG/KG	ND	NA	NA	NA
Endosulfan sulfate	UG/KG	ND	NA	NA	NA
4,4'-DDT	UG/KG	ND	NA	NA	NA
Methoxychlor	UG/KG	ND	NA	NA	NA
Endrin ketone	UG/KG	ND	NA	NA	NA
Endrin aldehyde	UG/KG	ND	NA	NA	NA
alpha-Chlordane	UG/KG	ND	NA	NA	NA
gamma-Chlordane	UG/KG	ND	NA	NA	NA
Toxaphene	UG/KG	ND	NA	NA	NA
Aroclor 1016	UG/KG	ND	NA	NA	NA
Aroclor 1221	UG/KG	ND	NA	NA	NA
Aroclor 1232	UG/KG	ND	NA	NA	NA
Aroclor 1242	UG/KG	ND	NA	NA	NA
Aroclor 1248	UG/KG	ND	NA	NA	NA
Aroclor 1254	UG/KG	ND	NA	NA	NA
Aroclor 1260	UG/KG	ND	NA	NA	NA

APPENDIX M.11
NORTHEAST CREEK SEDIMENT METALS

STATISTICAL SUMMARY
OPERABLE UNIT No. 8 (SITE 16)
NORTHEAST CREEK SEDIMENT
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
TAL INORGANICS

Client Sample ID: Laboratory Sample ID: Date Sampled:		MAXIMUM DETECTED	ARITHMETIC MEAN	STANDARD DEVIATION	NORMAL UPPER 95% CONFIDENCE INTERVAL	LOG NORMAL UPPER 95% CONFIDENCE INTERVAL
	UNITS					
Aluminum	MG/KG	7460 J	3635.0	2368.6	5007.9	6589.5
Antimony	MG/KG	ND	NA	NA	NA	NA
Arsenic	MG/KG	4.7 J	2.0	1.6	2.9	8.2
Barium	MG/KG	10.8	6.5	3.4	8.4	11.1
Beryllium	MG/KG	0.33	0.2	0.1	0.2	0.3
Cadmium	MG/KG	ND	NA	NA	NA	NA
Calcium	MG/KG	1220	280.0	351.1	483.5	621.0
Chromium	MG/KG	21.2	9.7	5.6	12.9	15.8
Cobalt	MG/KG	3.1	1.7	0.7	2.1	2.2
Copper	MG/KG	ND	NA	NA	NA	NA
Iron	MG/KG	9960 J	5300.6	3707.8	7449.8	26382.7
Lead	MG/KG	6 J	4.5	1.2	5.1	5.6
Magnesium	MG/KG	618	264.0	220.5	391.8	552.2
Manganese	MG/KG	10.5	6.2	3.5	8.2	11.4
Mercury	MG/KG	ND	NA	NA	NA	NA
Nickel	MG/KG	ND	NA	NA	NA	NA
Potassium	MG/KG	ND	NA	NA	NA	NA
Selenium	MG/KG	ND	NA	NA	NA	NA
Silver	MG/KG	1.2	0.7	0.2	0.8	0.8
Sodium	MG/KG	1320	587.2	309.4	766.5	924.0
Thallium	MG/KG	ND	NA	NA	NA	NA
Vanadium	MG/KG	29.9	12.1	8.4	17.0	24.5
Zinc	MG/KG	46.4 J	7.6	13.7	15.5	16.2

APPENDIX N
CDI CALCULATIONS AND SPREADSHEETS

**EXAMPLE SOIL INGESTION CALCULATIONS
OPERABLE UNIT NO. 8 (SITE 16)
CONTRACT TASK ORDER 0274**

Purpose: Estimate intake/risk from ingestion of soil

$$\text{Intake (mg/kg}\cdot\text{day)} = \frac{C \times CF \times EF \times ED \times IR}{BW \times AT}$$

Where:

C	=	Contaminant concentration in soil (mg/kg)
CF	=	Conversion factor (kg/mg)
EF	=	Exposure frequency (days/year)
ED	=	Exposure duration (years)
IR	=	Ingestion rate (mg/day)
BW	=	Body weight (kg)
AT _c	=	Averaging time carcinogen (days)
AT _{nc}	=	Averaging time noncarcinogen (days)

Risks:

$$\begin{aligned} \text{Carcinogens} &= \text{Intake (mg/kg}\cdot\text{day)} \times \text{CSF (mg/kg}\cdot\text{day)}^{-1} \\ \text{Noncarcinogens} &= \text{Intake (mg/kg}\cdot\text{day)} / \text{RfD (mg/kg}\cdot\text{day)} \end{aligned}$$

Example Carcinogen: Beryllium

$$\begin{aligned} \text{Intake (mg/kg}\cdot\text{day)} &= \frac{0.2 \text{ mg/kg} \times 100 \text{ mg/day} \times 350 \text{ days/yr} \times 24 \text{ yrs} \times 1.0\text{E-}6 \text{ kg/mg}}{70 \text{ kg} \times 25,550 \text{ days}} \\ &= 9.39\text{E-}08 \end{aligned}$$

$$\text{Risk} = 9.39\text{E-}08 \text{ mg/kg}\cdot\text{day} \times 4.30\text{E+}00 \text{ mg/kg}\cdot\text{day}^{-1} = 4.04\text{E-}07$$

Example Noncarcinogen: Beryllium

$$\begin{aligned} \text{Intake (mg/kg}\cdot\text{day)} &= \frac{0.2 \text{ mg/kg} \times 100 \text{ mg/day} \times 350 \text{ days/yr} \times 24 \text{ yrs} \times 1.0\text{E-}6 \text{ kg/mg}}{70 \text{ kg} \times 8,760 \text{ days}} \\ &= 2.74\text{E-}07 \end{aligned}$$

$$\text{Risk} = \frac{2.74\text{E-}07 \text{ mg/kg}\cdot\text{day}}{5.00\text{E-}03 \text{ mg/kg}\cdot\text{day}} = 5.48\text{E-}05$$

SOIL INGESTION EXPOSURE ASSESSMENT
 OPERABLE UNIT NO. 8 (SITE 16)
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 FUTURE RESIDENTIAL CHILD

Intake from ingestion of soil is calculated as follows:

$$\text{Intake (mg/kg-day)} = C * CF * EF * ED * IR/BW * ATc \text{ or } ATnc * DY$$

$$\text{Risk} = \text{Intake} * CSF \text{ or } /RID$$

Where:

INPUTS

C = contaminant concentration in soil (mg/kg)	
CF = conversion for kg to mg	1E-06
EF = exposure frequency (days/yr)	350
ED = exposure duration (yr)	6
IR = soil ingestion rate (mg/day)	200
BW = body weight (kg)	15
ATc = averaging time for carcinogen (yr)	70
ATnc = averaging time for noncarcinogen (yr)	6
DY = days per year (days/year)	365
CSF = cancer slope factor (mg/kg-day) ⁻¹	specific
RID = reference dose (mg/kg-day)	specific

Note: Inputs are scenario and site specific

Contaminant	Concentration Carcinogen (mg/kg)	Exposure Frequency (days/yr)	Exposure Duration (yr)	Conversion Factor (kg/mg)	Ingestion Rate (mg/day)	Body Weight (kg)	Average Carc Time (years)	Days per year (days/yr)	Carc Dose (mg/kg/day)	Slope Factor (mg/kg/day) ⁻¹	Carcinogenic Risk Child	Percent Carcinogenic Risk
benzo(a)pyrene	0.13	350	6	1E-06	200	15	70	365	1.42E-07	7.30E+00	1.04E-06	7.73
dieldrin	0.0132	350	6	1E-06	200	15	70	365	1.45E-08	1.60E+01	2.31E-07	1.72
aroclor-1260	0.0277	350	6	1E-06	200	15	70	365	3.04E-08	7.70E+00	2.34E-07	1.74
arsenic	6.7	350	6	1E-06	200	15	70	365	7.34E-06	1.50E+00	1.10E-05	81.82
beryllium	0.2	350	6	1E-06	200	15	70	365	2.19E-07	4.30E+00	9.42E-07	7.00
TOTAL											1.35E-05	100.00

Contaminant	Concentration Noncarcinogen (mg/kg)	Exposure Frequency (days/yr)	Exposure Duration (yr)	Conversion Factor (kg/mg)	Ingestion Rate (mg/day)	Body Weight (kg)	Average Noncarc Time (years)	Days per year (days/yr)	Noncarc Dose (mg/kg/day)	Reference Dose (mg/kg/day)	Noncarcinogenic Risk Child	Percent Noncarcinogenic Risk
dieldrin	0.0132	350	6	1E-06	200	15	6	365	1.69E-07	5.00E-05	0.0034	0.37
aroclor-1254	0.7166	350	6	1E-06	200	15	6	365	9.16E-06	2.00E-05	0.4581	49.86
aluminum	4850.3	350	6	1E-06	200	15	6	365	6.20E-02	1.00E+00	0.0620	6.75
arsenic	6.7	350	6	1E-06	200	15	6	365	8.57E-05	3.00E-04	0.2855	31.08
beryllium	0.2	350	6	1E-06	200	15	6	365	2.56E-06	5.00E-03	0.0005	0.06
cadmium	0.9	350	6	1E-06	200	15	6	365	1.15E-05	5.00E-04	0.0230	2.50
chromium	9.7	350	6	1E-06	200	15	6	365	1.24E-04	5.00E-03	0.0248	2.70
copper	51.6	350	6	1E-06	200	15	6	365	6.60E-04	3.71E-02	0.0178	1.94
mercury	0.7	350	6	1E-06	200	15	6	365	8.95E-06	3.00E-04	0.0299	3.25
zinc	324.8	350	6	1E-06	200	15	6	365	4.15E-03	3.00E-01	0.0138	1.51
TOTAL											0.9188	100.00

SOIL INGESTION EXPOSURE ASSESSMENT
 OPERABLE UNIT NO. 8 (SITE 16)
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 FUTURE RESIDENTIAL ADULT

Intake from ingestion of soil is calculated as follows:

$$\text{Intake (mg/kg-day)} = C * CF * EF * ED * IR/BW * ATc \text{ or } ATnc * DY$$

$$\text{Risk} = \text{Intake} * \text{CSF or RfD}$$

Where:

INPUTS

C = contaminant concentration in soil (mg/kg)	
CF = conversion for kg to mg	1E-06
EF = exposure frequency (days/yr)	350
ED = exposure duration (yr)	24
IR = soil ingestion rate (mg/day)	100
BW = body weight (kg)	70
ATc = averaging time for carcinogen (yr)	70
ATnc = averaging time for noncarcinogen (yr)	24
DY = days per year (days/year)	365
CSF = cancer slope factor (mg/kg-day) ⁻¹	specific
RfD = reference dose (mg/kg-day)	specific

Note: Inputs are scenario and site specific

Contaminant	Concentration Carcinogen (mg/kg)	Exposure Frequency (days/yr)	Exposure Duration (yr)	Conversion Factor (kg/mg)	Ingestion Rate (mg/day)	Body Weight (kg)	Average Carc Time (years)	Days per year (days/yr)	Carc Dose (mg/kg/day)	Slope Factor (mg/kg/day) ⁻¹	Carcinogenic Risk Child	Percent Carcinogenic Risk
benzo(a)pyrene	0.13	350	24	1E-06	100	70	70	365	6.11E-08	7.30E+00	4.46E-07	7.73
dieldrin	0.0132	350	24	1E-06	100	70	70	365	6.20E-09	1.60E+01	9.92E-08	1.72
aroclor-1260	0.0277	350	24	1E-06	100	70	70	365	1.30E-08	7.70E+00	1.00E-07	1.74
arsenic	6.7	350	24	1E-06	100	70	70	365	3.15E-06	1.50E+00	4.72E-06	81.82
beryllium	0.2	350	24	1E-06	100	70	70	365	9.39E-08	4.30E+00	4.04E-07	7.00
TOTAL											5.77E-06	100.00

Contaminant	Concentration Noncarcinogen (mg/kg)	Exposure Frequency (days/yr)	Exposure Duration (yr)	Conversion Factor (kg/mg)	Ingestion Rate (mg/day)	Body Weight (kg)	Average Noncarc Time (years)	Days per year (days/yr)	Noncarc Dose (mg/kg/day)	Reference Dose (mg/kg/day)	Noncarcinogenic Risk Child	Percent Noncarcinogenic Risk
dieldrin	0.0132	350	24	1E-06	100	70	24	365	1.81E-08	5.00E-05	0.0004	0.37
aroclor-1254	0.7166	350	24	1E-06	100	70	24	365	9.82E-07	2.00E-05	0.0491	49.86
aluminum	4850.3	350	24	1E-06	100	70	24	365	6.64E-03	1.00E+00	0.0066	6.75
arsenic	6.7	350	24	1E-06	100	70	24	365	9.18E-06	3.00E-04	0.0306	31.08
beryllium	0.2	350	24	1E-06	100	70	24	365	2.74E-07	5.00E-03	0.0001	0.06
cadmium	0.9	350	24	1E-06	100	70	24	365	1.23E-06	5.00E-04	0.0025	2.50
chromium	9.7	350	24	1E-06	100	70	24	365	1.33E-05	5.00E-03	0.0027	2.70
copper	51.6	350	24	1E-06	100	70	24	365	7.07E-05	3.71E-02	0.0019	1.94
mercury	0.7	350	24	1E-06	100	70	24	365	9.59E-07	3.00E-04	0.0032	3.25
zinc	324.8	350	24	1E-06	100	70	24	365	4.45E-04	3.00E-01	0.0015	1.51
TOTAL											0.0984	100.00

SOIL INGESTION EXPOSURE ASSESSMENT
 OPERABLE UNIT NO. 8 (SITE 16)
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 MILITARY PERSONNEL

Intake from ingestion of soil is calculated as follows:

$$\text{Intake (mg/kg-day)} = C * CF * EF * ED * IR / BW * ATc \text{ or } ATnc * DY$$

$$\text{Risk} = \text{Intake} * CSF \text{ or } RfD$$

Where:	INPUTS
C = contaminant concentration in soil (mg/kg)	
CF = conversion for kg to mg	1E-06
EF = exposure frequency (days/yr)	350
ED = exposure duration (yr)	4
IR = soil ingestion rate (mg/day)	100
BW = body weight (kg)	70
ATc = averaging time for carcinogen (yr)	70
ATnc = averaging time for noncarcinogen (yr)	4
DY = days per year (days/year)	365
CSF = cancer slope factor (mg/kg-day) ⁻¹	specific
RfD = reference dose (mg/kg-day)	specific

Note: Inputs are scenario and site specific

Contaminant	Concentration Carcinogen (mg/kg)	Exposure Frequency (days/yr)	Exposure Duration (yr)	Conversion Factor (kg/mg)	Ingestion Rate (mg/day)	Body Weight (kg)	Average Carc Time (years)	Days per year (days/yr)	Carc Dose (mg/kg/day)	Slope Factor (mg/kg/day) ⁻¹	Carcinogenic Risk Child	Percent Carcinogenic Risk
benzo(a)pyrene	0.13	350	4	1E-06	100	70	70	365	1.02E-08	7.30E+00	7.43E-08	7.73
dieldrin	0.0132	350	4	1E-06	100	70	70	365	1.03E-09	1.60E+01	1.65E-08	1.72
aroclor-1260	0.0277	350	4	1E-06	100	70	70	365	2.17E-09	7.70E+00	1.67E-08	1.74
arsenic	6.7	350	4	1E-06	100	70	70	365	5.24E-07	1.50E+00	7.87E-07	81.82
beryllium	0.2	350	4	1E-06	100	70	70	365	1.57E-08	4.30E+00	6.73E-08	7.00
TOTAL											9.62E-07	100.00

Contaminant	Concentration Noncarcinogen (mg/kg)	Exposure Frequency (days/yr)	Exposure Duration (yr)	Conversion Factor (kg/mg)	Ingestion Rate (mg/day)	Body Weight (kg)	Average Noncarc Time (years)	Days per year (days/yr)	Noncarc Dose (mg/kg/day)	Reference Dose (mg/kg/day)	Noncarcinogenic Risk Child	Percent Noncarcinogenic Risk
dieldrin	0.0132	350	4	1E-06	100	70	4	365	1.81E-08	5.00E-05	0.0004	0.37
aroclor-1254	0.7166	350	4	1E-06	100	70	4	365	9.82E-07	2.00E-05	0.0491	49.86
aluminum	4850.3	350	4	1E-06	100	70	4	365	6.64E-03	1.00E+00	0.0066	6.75
arsenic	6.7	350	4	1E-06	100	70	4	365	9.18E-06	3.00E-04	0.0306	31.08
beryllium	0.2	350	4	1E-06	100	70	4	365	2.74E-07	5.00E-03	0.0001	0.06
cadmium	0.9	350	4	1E-06	100	70	4	365	1.23E-06	5.00E-04	0.0025	2.50
chromium	9.7	350	4	1E-06	100	70	4	365	1.33E-05	5.00E-03	0.0027	2.70
copper	51.6	350	4	1E-06	100	70	4	365	7.07E-05	3.71E-02	0.0019	1.94
mercury	0.7	350	4	1E-06	100	70	4	365	9.59E-07	3.00E-04	0.0032	3.25
zinc	324.8	350	4	1E-06	100	70	4	365	4.45E-04	3.00E-01	0.0015	1.51
TOTAL											0.0884	100.00

EXAMPLE DERMAL CONTACT WITH SOIL CALCULATIONS
OPERABLE UNIT NO. 8 (SITE 16)
CONTRACT TASK ORDER 0274

Purpose: Estimate intake/risk from dermal contact with soil

$$\text{Intake (mg/kg}\cdot\text{day)} = \frac{C \times CF \times SA \times AF \times Abs \times EF \times ED}{BW \times AT}$$

Where:	C	=	Contaminant concentration in soil (mg/kg)
	CF	=	Conversion factor (kg/mg)
	SA	=	Surface available for contact (cm ² /event)
	AF	=	Soil to skin adherence factor (mg/cm ²)
	Abs	=	Fraction absorbed (percent)
	EF	=	Exposure frequency (days/year)
	ED	=	Exposure duration (years)
	IR	=	Ingestion rate (mg/day)
	BW	=	Body weight (kg)
	AT _c	=	Averaging time carcinogen (days)
	AT _{nc}	=	Averaging time noncarcinogen (days)

Risks:

$$\begin{aligned} \text{Carcinogens} &= \text{Intake (mg/kg}\cdot\text{day)} \times \text{CSF (mg/kg}\cdot\text{day)}^{-1} \\ \text{Noncarcinogens} &= \text{Intake (mg/kg}\cdot\text{day)} / \text{RfD (mg/kg}\cdot\text{day)} \end{aligned}$$

Example Carcinogen: Dieldrin

$$\begin{aligned} \text{Intake (mg/kg}\cdot\text{day)} &= \frac{0.0132 \text{ mg/kg} \times 1.0\text{E-}06 \text{ kg/mg} \times 5,800 \text{ cm}^2/\text{event} \times 1\% \times 1 \text{ mg/cm}^2 \times 350 \text{ event/yr} \times 24 \text{ yrs}}{70 \text{ kg} \times 25,550 \text{ days}} \\ &= 3.59\text{E-}09 \end{aligned}$$

$$\text{Risk} = 3.59\text{E-}09 \text{ mg/kg}\cdot\text{day} \times 1.60\text{E+}01 \text{ mg/kg}\cdot\text{day}^{-1} = 5.75\text{E-}08$$

Example Noncarcinogen: Dieldrin

$$\begin{aligned} \text{Intake (mg/kg}\cdot\text{day)} &= \frac{0.0132 \text{ mg/kg} \times 1.0\text{E-}06 \text{ kg/mg} \times 5,800 \text{ cm}^2/\text{event} \times 1 \text{ mg/cm}^2 \times 1\% \times 350 \text{ event/yr} \times 24 \text{ yrs}}{70 \text{ kg} \times 8,760 \text{ days}} \\ &= 1.05\text{E-}08 \end{aligned}$$

$$\text{Risk} = \frac{1.05\text{E-}08 \text{ mg/kg}\cdot\text{day}}{5.00\text{E-}05 \text{ mg/kg}\cdot\text{day}} = 2.10\text{E-}04$$

SOIL DERMAL CONTACT EXPOSURE ASSESSMENT
 OPERABLE UNIT NO. 8 (SITE 18)
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 FUTURE RESIDENTIAL CHILD

Dermal contact with soil is calculated as follows:

$$\text{Intake (mg/kg-day)} = C * CF * SA * AF * Abs * EF * ED / BW * ATc \text{ or } ATnc * DY$$

$$\text{Risk} = \text{Intake} * CSF \text{ or } RfD$$

Where:	INPUTS
C = contaminant concentration in soil (mg/kg)	
CF = conversion factor (kg/mg)	1E-08
SA = exposed skin surface area (cm ²)	2300
AF = soil to skin adherence factor (mg/cm ²)	1
Abs = fraction absorbed (unitless)	Specific
EF = exposure frequency (events/yr)	350
ED = exposure duration (years)	6
BW = body weight (kg)	15
ATc = averaging time for carcinogen (yr)	70
ATnc = averaging time for noncarcinogen (yr)	6
DY = day per year (day/yr)	365
CSF = cancer slope factor (mg/kg-day) ⁻¹	specific
RfD = reference dose (mg/kg-day)	specific

Note: Inputs are scenario and site specific

Contaminant	Concentration Carcinogen (mg/kg)	Conversion Factor (kg/mg)	Surface Area (cm ²)	Adherence Factor (mg/cm ²)	Fraction Absorbed	Exposure Frequency (events/yr)	Exposure Duration (yrs)	Body Weight (kg)	Average Carc Time (years)	Days per year (day/year)	Carc Dose (mg/kg/day)	Slope Factor (mg/kg-day) ⁻¹	Carcinogenic Risk Child	Percent Carcinogenic Risk
benzo(a)pyrene	0.13	1E-08	2300	1	0.01	350	6	15	70	365	1.84E-08	7.30E+00	1.20E-07	38.51
dieldrin	0.0132	1E-08	2300	1	0.01	350	6	15	70	365	1.66E-08	1.60E+01	2.68E-08	8.57
aroclor-1260	0.0277	1E-08	2300	1	0.01	350	6	15	70	365	3.49E-08	7.70E+00	2.69E-08	8.65
arsenic	6.7	1E-08	2300	1	0.001	350	6	15	70	365	8.44E-08	1.50E+00	1.27E-07	40.78
beryllium	0.2	1E-08	2300	1	0.001	350	6	15	70	365	2.52E-08	4.30E+00	1.08E-08	3.49
TOTAL													3.11E-07	100.00

Contaminant	Concentration Noncarcinogen (mg/kg)	Conversion Factor (kg/mg)	Surface Area (cm ²)	Adherence Factor (mg/cm ²)	Fraction Absorbed	Exposure Frequency (events/yr)	Exposure Duration (yrs)	Body Weight (kg)	Average Noncarc Time (years)	Days per year (day/year)	Noncarc Dose (mg/kg/day)	Reference Dose (mg/kg-day)	Noncarcinogenic Risk Child	Percent Noncarcinogenic Risk
dieldrin	0.0132	1E-08	2300	1	0.01	350	6	15	6	365	1.84E-08	5.00E-05	0.000368	0.87
aroclor-1254	0.7188	1E-08	2300	1	0.01	350	6	15	6	365	1.05E-08	2.00E-05	0.052682	90.32
aluminum	4850.3	1E-08	2300	1	0.001	350	6	15	6	365	7.13E-04	1.00E+00	0.000713	1.22
arsenic	6.7	1E-08	2300	1	0.001	350	6	15	6	365	9.85E-07	3.00E-04	0.003284	5.63
beryllium	0.2	1E-08	2300	1	0.001	350	6	15	6	365	2.94E-08	5.00E-03	0.000008	0.01
cadmium	0.8	1E-08	2300	1	0.001	350	6	15	6	365	1.32E-07	5.00E-04	0.000265	0.45
chromium	9.7	1E-08	2300	1	0.001	350	6	15	6	365	1.43E-08	5.00E-03	0.000285	0.49
copper	51.8	1E-08	2300	1	0.001	350	6	15	6	365	7.59E-08	3.71E-02	0.000204	0.35
mercury	0.7	1E-08	2300	1	0.001	350	6	15	6	365	1.03E-07	3.00E-04	0.000343	0.59
zinc	324.8	1E-08	2300	1	0.001	350	6	15	6	365	4.76E-05	3.00E-01	0.000159	0.27
TOTAL													0.058328	100.00

SOIL DERMAL CONTACT EXPOSURE ASSESSMENT
 OPERABLE UNIT NO. 8 (SITE 18)
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 FUTURE RESIDENTIAL ADULT

Dermal contact with soil is calculated as follows:

$$\text{Intake (mg/kg-day)} = C * CF * SA * AF * Abs * EF * ED/BW * ATc \text{ or } ATnc * DY$$

$$\text{Risk} = \text{Intake} * CSF \text{ or } RfD$$

Where:

INPUTS

- C = contaminant concentration in soil (mg/kg)
- CF = conversion factor (kg/mg)
- SA = exposed skin surface area (cm²)
- AF = soil to skin adherence factor (mg/cm²)
- Abs = fraction absorbed (unitless)
- EF = exposure frequency (events/yr)
- ED = exposure duration (years)
- BW = body weight (kg)
- ATc = averaging time for carcinogen (yr)
- ATnc = averaging time for noncarcinogen (yr)
- DY = day per year (day/yr)
- CSF = cancer slope factor (mg/kg-day)⁻¹
- RfD = reference dose (mg/kg-day)

- 1E-06
- 5800
- 1
- Specific
- 350
- 24
- 70
- 70
- 24
- 365
- specific
- specific

Note: Inputs are scenario and site specific

Contaminant	Concentration Carcinogen (mg/kg)	Conversion Factor (kg/mg)	Surface Area (cm ²)	Adherence Factor (mg/cm ²)	Fraction Absorbed	Exposure Frequency (events/yr)	Exposure Duration (yrs)	Body Weight (kg)	Average Carc Time (years)	Days per year (day/year)	Carc Dose (mg/kg/day)	Slope Factor (mg/kg-day) ⁻¹	Carcinogenic Risk Child	Percent Carcinogenic Risk
benzo(a)pyrene	0.13	1E-06	5800	1	0.01	350	24	70	70	365	3.54E-08	7.30E+00	2.59E-07	38.51
dieldrin	0.0132	1E-06	5800	1	0.01	350	24	70	70	365	3.80E-09	1.60E+01	5.75E-08	8.57
aroclor-1260	0.0277	1E-06	5800	1	0.01	350	24	70	70	365	7.55E-09	7.70E+00	5.81E-08	8.85
arsenic	6.7	1E-06	5800	1	0.001	350	24	70	70	365	1.83E-07	1.50E+00	2.74E-07	40.78
beryllium	0.2	1E-06	5800	1	0.001	350	24	70	70	365	5.45E-09	4.30E+00	2.34E-08	3.49
TOTAL													8.71E-07	100.00

Contaminant	Concentration Noncarcinogen (mg/kg)	Conversion Factor (kg/mg)	Surface Area (cm ²)	Adherence Factor (mg/cm ²)	Fraction Absorbed	Exposure Frequency (events/yr)	Exposure Duration (yrs)	Body Weight (kg)	Average Noncarc Time (years)	Days per year (day/year)	Noncarc Dose (mg/kg/day)	Reference Dose (mg/kg-day)	Noncarcinogenic Risk Child	Percent Noncarcinogenic Risk
dieldrin	0.0132	1E-06	5800	1	0.01	350	24	70	24	365	1.05E-08	5.00E-05	0.000210	0.87
aroclor-1254	0.7168	1E-06	5800	1	0.01	350	24	70	24	365	5.69E-07	2.00E-05	0.028488	90.32
aluminum	4850.3	1E-06	5800	1	0.001	350	24	70	24	365	3.85E-04	1.00E+00	0.000385	1.22
arsenic	6.7	1E-06	5800	1	0.001	350	24	70	24	365	5.32E-07	3.00E-04	0.001774	5.63
beryllium	0.2	1E-06	5800	1	0.001	350	24	70	24	365	1.59E-08	5.00E-03	0.000003	0.01
cadmium	0.9	1E-06	5800	1	0.001	350	24	70	24	365	7.15E-08	5.00E-04	0.000143	0.45
chromium	9.7	1E-06	5800	1	0.001	350	24	70	24	365	7.71E-07	5.00E-03	0.000154	0.49
copper	51.6	1E-06	5800	1	0.001	350	24	70	24	365	4.10E-08	3.71E-02	0.000111	0.35
mercury	0.7	1E-06	5800	1	0.001	350	24	70	24	365	5.56E-08	3.00E-04	0.000185	0.59
zinc	324.8	1E-06	5800	1	0.001	350	24	70	24	365	2.58E-05	3.00E-01	0.000088	0.27
TOTAL													0.031516	100.00

SOIL DERMAL CONTACT EXPOSURE ASSESSMENT
 OPERABLE UNIT NO. 8 (SITE 18)
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 MILITARY PERSONNEL

Dermal contact with soil is calculated as follows:

$$\text{Intake (mg/kg-day)} = C * CF * SA * AF * Abs * EF * ED / BW * ATc \text{ or } ATnc * DY$$

$$\text{Risk} = \text{Intake} * CSF \text{ or } RfD$$

Where:	INPUTS
C = contaminant concentration in soil (mg/kg)	
CF = conversion factor (kg/mg)	1E-08
SA = exposed skin surface area (cm ²)	5800
AF = soil to skin adherence factor (mg/cm ²)	1
Abs = fraction absorbed (unitless)	Specific
EF = exposure frequency (events/yr)	350
ED = exposure duration (years)	4
BW = body weight (kg)	70
ATc = averaging time for carcinogen (yr)	70
ATnc = averaging time for noncarcinogen (yr)	4
DY = day per year (day/yr)	365
CSF = cancer slope factor (mg/kg-day) ⁻¹	specific
RfD = reference dose (mg/kg-day)	specific

Note: Inputs are scenario and site specific

Contaminant	Concentration Carcinogen (mg/kg)	Conversion Factor (kg/mg)	Surface Area (cm ²)	Adherence Factor (mg/cm ²)	Fraction Absorbed	Exposure Frequency (events/yr)	Exposure Duration (yrs)	Body Weight (kg)	Average Carc Time (years)	Days per year (day/year)	Carc Dose (mg/kg/day)	Slope Factor (mg/kg-day) ⁻¹	Carcinogenic Risk Child	Percent Carcinogenic Risk
benzo(a)pyrene	0.13	1E-08	5800	1	0.01	350	4	70	70	365	5.80E-08	7.30E+00	4.31E-08	38.51
dieldrin	0.0132	1E-08	5800	1	0.01	350	4	70	70	365	5.88E-10	1.80E+01	8.58E-08	8.57
aroclor-1280	0.0277	1E-08	5800	1	0.01	350	4	70	70	365	1.28E-08	7.70E+00	9.68E-08	8.85
arsenic	6.7	1E-08	5800	1	0.001	350	4	70	70	365	3.04E-08	1.50E+00	4.58E-08	40.78
beryllium	0.2	1E-08	5800	1	0.001	350	4	70	70	365	8.08E-10	4.30E+00	3.80E-08	3.48
TOTAL													1.12E-07	100.00

Contaminant	Concentration Noncarcinogen (mg/kg)	Conversion Factor (kg/mg)	Surface Area (cm ²)	Adherence Factor (mg/cm ²)	Fraction Absorbed	Exposure Frequency (events/yr)	Exposure Duration (yrs)	Body Weight (kg)	Average Noncarc Time (years)	Days per year (day/year)	Noncarc Dose (mg/kg/day)	Reference Dose (mg/kg-day)	Noncarcinogenic Risk Child	Percent Noncarcinogenic Risk
dieldrin	0.0132	1E-08	5800	1	0.01	350	4	70	4	365	1.05E-08	5.00E-05	0.000210	0.87
aroclor-1254	0.7188	1E-08	5800	1	0.01	350	4	70	4	365	5.88E-07	2.00E-05	0.028488	80.32
aluminum	4850.3	1E-08	5800	1	0.001	350	4	70	4	365	3.85E-04	1.00E+00	0.000385	1.22
arsenic	6.7	1E-08	5800	1	0.001	350	4	70	4	365	5.32E-07	3.00E-04	0.001774	5.83
beryllium	0.2	1E-08	5800	1	0.001	350	4	70	4	365	1.58E-08	5.00E-03	0.000003	0.01
cadmium	0.8	1E-08	5800	1	0.001	350	4	70	4	365	7.15E-08	5.00E-04	0.000143	0.45
chromium	9.7	1E-08	5800	1	0.001	350	4	70	4	365	7.71E-07	5.00E-03	0.000154	0.48
copper	51.8	1E-08	5800	1	0.001	350	4	70	4	365	4.10E-08	3.71E-02	0.000111	0.35
mercury	0.7	1E-08	5800	1	0.001	350	4	70	4	365	5.58E-08	3.00E-04	0.000185	0.58
zinc	324.8	1E-08	5800	1	0.001	350	4	70	4	365	2.58E-05	3.00E-01	0.000088	0.27
TOTAL													0.031818	100.00

**EXAMPLE INHALATION OF PARTICULATES CALCULATIONS
OPERABLE UNIT NO. 8 (SITE 16)
CONTRACT TASK ORDER 0274**

Purpose: Estimate intake/risk from the inhalation of soil particulates

$$Intake (mg/kg \cdot day) = \frac{C \times IR \times EF \times ED \times 1/PEF}{BW \times AT}$$

Where:

C	=	Contaminant concentration in soil (mg/kg)
IR	=	Inhalation rate (m ³ /day)
EF	=	Exposure frequency (days/year)
ED	=	Exposure duration (years)
PEF	=	Particulate Emission Factor (m ³ /kg)
BW	=	Body weight (kg)
AT _c	=	Averaging time carcinogen (days)
AT _{nc}	=	Averaging time noncarcinogen (days)

Risks:

Carcinogens = Intake (mg/kg·day) x CSF (mg/kg·day)⁻¹
 Noncarcinogens = Intake (mg/kg·day)/RfD (mg/kg·day)

Example Carcinogen: Arsenic

$$Intake (mg/kg \cdot day) = \frac{6.7 \text{ mg/kg} \times 20 \text{ m}^3/day \times 350 \text{ days/yr} \times 24 \text{ yrs} \times 1/4.6E+09 \text{ m}^3/kg}{70 \text{ kg} \times 25,550 \text{ days}}$$

$$= 1.37E-10$$

Risk = 1.37E-10 mg/kg·day x 1.51E+01 mg/kg·day⁻¹ = 2.07E-09

Example Noncarcinogen:

Noncarcinogenic COPCs cannot be evaluated, as there is no inhalation toxicity information published for them.

PARTICULATE INHALATION EXPOSURE ASSESSMENT
 OPERABLE UNIT NO. 8 (SITE 16)
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 FUTURE RESIDENTIAL CHILD

Intake from the inhalation of particulates is calculated as follows:

$$\text{Intake (mg/kg-day)} = (C \cdot EF \cdot ED \cdot IR \cdot 1/PEF) / (BW \cdot ATc \text{ or } ATnc \cdot DY)$$

$$\text{Risk} = \text{Intake} \cdot CSF \text{ or } RfD$$

Where:	INPUTS
C = contaminant concentration in soil (mg/kg)	Calculated
CSF = carcinogenic slope factor	Specific
RfD = reference dose for noncarcinogen	Specific
IR = inhalation rate (m3)	10
EF = exposure frequency (days)	350
ED = exposure duration (years)	6
BW = body weight (kg)	15
ATc = averaging time for carcinogen (yr)	70
ATnc = averaging time for noncarcinogen (yr)	6
DY = day per year (day/yr)	365
PEF = particulate emission factor (m3/kg)	4.83E+09

Note: Inputs are scenario and site specific

Contaminant	Concentration Carcinogen (mg/kg)	Particulate Emission Factor (m3/kg)	Exposure Frequency (events/yr)	Inhalation Rate (m3/day)	Exposure Duration (yrs)	Body Weight (kg)	Average Carc Time (years)	Days per year (day/year)	Carc Dose (mg/kg/day)	Slope Factor (mg/kg-day) ⁻¹	Carcinogenic Risk Child	Percent Contribution to Risk
benzo(a)pyrene	0.13	4.8E+09	350	10	6	15	70	365	1.54E-12	6.10E+00	9.38E-12	0.78
dieldrin	0.0132	4.8E+09	350	10	6	15	70	365	1.58E-13	1.61E+01	2.52E-12	0.20
arsenic	6.7	4.8E+09	350	10	6	15	70	365	7.93E-11	1.51E+01	1.20E-09	97.41
beryllium	0.2	4.8E+09	350	10	6	15	70	365	2.37E-12	8.40E+00	1.99E-11	1.62
TOTAL											1.23E-06	100.00

Contaminant	Concentration Noncarcinogen (mg/kg)	Particulate Emission Factor (m3/kg)	Exposure Frequency (events/yr)	Inhalation Rate (m3/day)	Exposure Duration (yrs)	Body Weight (kg)	Average Noncarc Time (years)	Days per year (day/year)	Noncarc Dose (mg/kg/day)	Reference Dose (mg/kg-day)	Noncarcinogenic Risk Child	Percent Noncarcinogenic Risk
TOTAL											0.0000	0.00

Aroclor-1260 does not have an inhalation slope factor.

File Name: P1.WQ1

PARTICULATE INHALATION EXPOSURE ASSESSMENT
 OPERABLE UNIT NO. 8 (SITE 18)
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 FUTURE RESIDENTIAL ADULT

Intake from the inhalation of particulates is calculated as follows:

$$\text{Intake (mg/kg-day)} = (C * EF * ED * IR * 1/PEF) / (BW * ATc \text{ or } ATnc * DY)$$

$$\text{Risk} = \text{Intake} * \text{CSF or RfD}$$

Where:

C = contaminant concentration in soil (mg/kg)	Calculated	INPUTS
CSF = carcinogenic slope factor	Specific	
RfD = reference dose for noncarcinogen	Specific	
IR = inhalation rate (m3)	20	
EF = exposure frequency (days)	350	
ED = exposure duration (years)	24	
BW = body weight (kg)	70	
ATc = averaging time for carcinogen (yr)	70	
ATnc = averaging time for noncarcinogen (yr)	24	
DY = day per year (day/yr)	365	
PEF = particulate emission factor (m3/kg)	4.63E+08	

Note: Inputs are scenario and site specific

Contaminant	Concentration Carcinogen (mg/kg)	Particulate Emission Factor (m3/kg)	Exposure Frequency (events/yr)	Inhalation Rate (m3/day)	Exposure Duration (yrs)	Body Weight (kg)	Average Carc Time (years)	Days per year (day/year)	Carc Dose (mg/kg/day)	Slope Factor (mg/kg-day) ⁻¹	Carcinogenic Risk Adult	Percent Contribution to Risk
benzo(a)pyrene	0.13	4.6E+08	350	20	24	70	70	365	2.84E-12	8.10E+00	1.81E-11	0.76
dieldrin	0.0132	4.6E+08	350	20	24	70	70	365	2.68E-13	1.81E+01	4.31E-12	0.20
arsenic	8.7	4.6E+08	350	20	24	70	70	365	1.38E-10	1.51E+01	2.05E-09	97.41
beryllium	0.2	4.6E+08	350	20	24	70	70	365	4.08E-12	8.40E+00	3.41E-11	1.82
TOTAL											2.11E-08	100.00

Contaminant	Concentration Noncarcinogen (mg/kg)	Particulate Emission Factor (m3/kg)	Exposure Frequency (events/yr)	Inhalation Rate (m3/day)	Exposure Duration (yrs)	Body Weight (kg)	Average Noncarc Time (years)	Days per year (day/year)	Noncarc Dose (mg/kg/day)	Reference Dose (mg/kg-day)	Noncarcinogenic Risk Adult	Percent Noncarcinogenic Risk
TOTAL											0.0000	0.00

Aroclor-1260 does not have an inhalation slope factor.

File Name: P1.WQ2

PARTICULATE INHALATION EXPOSURE ASSESSMENT
 OPERABLE UNIT NO. 8 (SITE 16)
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 MILITARY PERSONNEL

Intake from the inhalation of particulates is calculated as follows:

$$\text{Intake (mg/kg-day)} = (C * EF * ED * IR * 1/PEF) / (BW * ATc \text{ or } ATnc * DY)$$

$$\text{Risk} = \text{Intake} * CSF \text{ or } RfD$$

Where:	INPUTS
C = contaminant concentration in soil (mg/kg)	Calculated
CSF = carcinogenic slope factor	Specific
RfD = reference dose for noncarcinogen	Specific
IR = Inhalation rate (m3)	20
EF = exposure frequency (days)	350
ED = exposure duration (years)	4
BW = body weight (kg)	70
ATc = averaging time for carcinogen (yr)	70
ATnc = averaging time for noncarcinogen (yr)	4
DY = day per year (day/yr)	365
PEF = particulate emission factor (m3/kg)	4.63E+09

Note: Inputs are scenario and site specific

Contaminant	Concentration Carcinogen (mg/kg)	Particulate Emission Factor (m3/kg)	Exposure Frequency (events/yr)	Inhalation Rate (m3/day)	Exposure Duration (yrs)	Body Weight (kg)	Average Carc Time (years)	Days per year (day/year)	Carc Dose (mg/kg/day)	Slope Factor (mg/kg-day) ⁻¹	Carcinogenic Risk Adult	Percent Contribution to Risk
benzo(a)pyrene	0.13	4.6E+09	350	20	4	70	70	365	4.40E-13	8.10E+00	2.88E-12	0.78
dieldrin	0.0132	4.6E+09	350	20	4	70	70	365	4.46E-14	1.01E+01	7.19E-13	0.20
arsenic	6.7	4.6E+09	350	20	4	70	70	365	2.27E-11	1.51E+01	3.42E-10	97.41
beryllium	0.2	4.6E+09	350	20	4	70	70	365	8.76E-13	8.40E+00	5.68E-12	1.82
TOTAL											3.51E-10	100.00

Contaminant	Concentration Noncarcinogen (mg/kg)	Particulate Emission Factor (m3/kg)	Exposure Frequency (events/yr)	Inhalation Rate (m3/day)	Exposure Duration (yrs)	Body Weight (kg)	Average Noncarc Time (years)	Days per year (day/year)	Noncarc Dose (mg/kg/day)	Reference Dose (mg/kg-day)	Noncarcinogenic Risk Adult	Percent Noncarcinogenic Risk
TOTAL											0.0000	0.00

Aroclor-1260 does not have an inhalation slope factor.

File Name: P1.WQ3

**EXAMPLE GROUNDWATER INGESTION CALCULATIONS
OPERABLE UNIT NO. 8 (SITE 16)
CONTRACT TASK ORDER 0274**

Purpose: Estimate intake/risk from ingestion of groundwater

$$\text{Intake (mg/kg}\cdot\text{day)} = \frac{C \times IR \times EF \times ED}{BW \times AT}$$

Where:

C	=	Contaminant concentration in groundwater (mg/L)
IR	=	Daily intake ingestion rate (L/day)
EF	=	Exposure frequency (days/year)
ED	=	Exposure duration (years)
BW	=	Body weight (kg)
AT _c	=	Averaging time carcinogen (days)
AT _{nc}	=	Averaging time noncarcinogen (days)

Risks:

Carcinogens = Intake (mg/kg·day) x CSF (mg/kg·day)⁻¹

Noncarcinogens = Intake (mg/kg·day)/RfD (mg/kg·day)

Example Carcinogen: Benzene

$$\text{Intake (mg/kg}\cdot\text{day)} = \frac{0.037 \text{ mg/L} \times 2 \text{ L/day} \times 350 \text{ days/yr} \times 30 \text{ yrs}}{70 \text{ kg} \times 25,550 \text{ days}}$$

$$= 4.34\text{E-}04$$

Risk = 4.34E-04 mg/kg·day x 2.9E-02 mg/kg·day⁻¹ = 1.26E-05

Example Noncarcinogen: No noncarcinogenic COPCs.

GROUNDWATER INGESTION EXPOSURE ASSESSMENT
 OPERABLE UNIT NO. 8 (SITE 16)
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 FUTURE RESIDENTIAL CHILD

Intake from drinking water is calculated as follows:

$$\text{Intake (mg/kg-day)} = C * IRw * EF * ED/BW * AT \text{ or } ATnc * DY$$

$$\text{Risk} = \text{Intake} * \text{CSF or /RfD}$$

- Where:
- | | |
|---|---------------|
| | INPUTS |
| C = contaminant concentration in water (mg/l) | |
| IRw = daily water ingestion rate (L/Day) | 1 |
| EF = exposure frequency (days/yr) | 350 |
| ED = exposure duration (yr) | 6 |
| BW = body weight (kg) | 15 |
| ATc = averaging time for carcinogen (yr) | 70 |
| ATnc = averaging time for noncarcinogen (yr) | 6 |
| DY = days per year (day/year) | 365 |
| CSF = cancer slope factor (mg/kg-day) ⁻¹ | specific |
| RfD = reference dose (mg/kg-day) | specific |

Note: Inputs are scenario and site specific

Contaminant	Concentration Carcinogen (mg/l)	Ingestion Rate (L/day)	Exposure Frequency (day/year)	Exposure Duration (year)	Body Weight (kg)	Average Carc Time (years)	Days per year (day/yr)	Carc Dose (mg/kg-day)	Slope Factor (mg/kg-day) ⁻¹	Carcinogenic Risk Child	Percent Carcinogenic Risk
benzene	0.037	1	350	6	15	70	365	2.03E-04	2.90E-02	5.88E-06	100.000
TOTAL										5.88E-06	100.00

Contaminant	Concentration Noncarcinogen (mg/l)	Ingestion Rate (L/day)	Exposure Frequency (day/year)	Exposure Duration (year)	Body Weight (kg)	Average Noncarc Time (years)	Days per year (day/yr)	Noncarc Dose (mg/kg-day)	Reference Dose (mg/kg-day)	Noncarcinogenic Risk Child	Percent Noncarcinogenic Risk
TOTAL										0.00000	0.00

File Name: 2GWI.WQ1

GROUNDWATER INGESTION EXPOSURE ASSESSMENT
 OPERABLE UNIT NO. 8 (SITE 16)
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 FUTURE RESIDENTIAL ADULT

Intake from drinking water is calculated as follows:

$$\text{Intake (mg/kg-day)} = C * IRw * EF * ED/BW * AT \text{ or } ATnc * DY$$

$$\text{Risk} = \text{Intake} * CSF \text{ or } /RID$$

Where:	INPUTS
C = contaminant concentration in water (mg/l)	
IRw = daily water ingestion rate (L/Day)	2
EF = exposure frequency (days/yr)	350
ED = exposure duration (yr)	30
BW = body weight (kg)	70
ATc = averaging time for carcinogen (yr)	70
ATnc = averaging time for noncarcinogen (yr)	30
DY = days per year (day/year)	365
CSF = cancer slope factor (mg/kg-day) ⁻¹	specific
RID = reference dose (mg/kg-day)	specific

Note: Inputs are scenario and site specific

Contaminant	Concentration Carcinogen (mg/l)	Ingestion Rate (L/day)	Exposure Frequency (day/year)	Exposure Duration (year)	Body Weight (kg)	Average Carc Time (years)	Days per year (day/yr)	Carc Dose (mg/kg-day)	Slope Factor (mg/kg-day) ⁻¹	Carcinogenic Risk Child	Percent Carcinogenic Risk
benzene	0.037	2	350	30	70	70	365	4.34E-04	2.90E-02	1.26E-05	100.000
TOTAL										1.26E-05	100.00

Contaminant	Concentration Noncarcinogen (mg/l)	Ingestion Rate (L/day)	Exposure Frequency (day/year)	Exposure Duration (year)	Body Weight (kg)	Average Noncarc Time (years)	Days per year (day/yr)	Noncarc Dose (mg/kg-day)	Reference Dose (mg/kg-day)	Noncarcinogenic Risk Child	Percent Noncarcinogenic Risk
TOTAL										0.000000	0.00

File Name: 2GWI.WQ2

**EXAMPLE DERMAL CONTACT WITH GROUNDWATER CALCULATIONS
OPERABLE UNIT NO. 8 (SITE 16)
CONTRACT TASK ORDER 0274**

Purpose: Estimate intake/risk from dermal contact with groundwater

$$\text{Intake (mg/kg·day)} = \frac{C \times SA \times PC \times ET \times EF \times ED \times CF}{BW \times AT}$$

Where:

C	=	Contaminant concentration in groundwater (mg/L)
SA	=	Exposed skin surface available for contact (cm ²)
PC	=	Permeability constant (cm/hr)
ET	=	Exposure time (hr/day)
EF	=	Exposure frequency (days/year)
ED	=	Exposure duration (years)
CF	=	Conversion factor (1 L/1,000 cm ³)
BW	=	Body weight (kg)
AT _c	=	Averaging time carcinogen (days)
AT _{nc}	=	Averaging time noncarcinogen (days)

Risks:

Carcinogens = Intake (mg/kg·day) x CSF (mg/kg·day)⁻¹
 Noncarcinogens = Intake (mg/kg·day)/RfD (mg/kg·day)

Example Carcinogen: Benzene

$$\text{Intake (mg/kg·day)} = \frac{0.037 \text{ mg/L} \times 23,000 \text{ cm}^2 \times 1.10\text{E-}01 \text{ cm/hr} \times 0.25 \text{ hr/day} \times 350 \text{ days/yr} \times 30 \text{ yrs} \times 1 \text{ L/1,000 cm}^3}{70 \text{ kg} \times 25,550 \text{ days}}$$

$$= 1.37\text{E-}04$$

$$\text{Risk} = 1.37\text{E-}04 \text{ mg/kg·day} \times 2.90\text{E-}02 \text{ mg/kg·day}^{-1} = 3.9\text{E-}06$$

Example Noncarcinogen: No noncarcinogenic COPCs.

GROUNDWATER DERMAL EXPOSURE ASSESSMENT
 OPERABLE UNIT NO. 8 (SITE 18)
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 FUTURE RESIDENTIAL CHILD

Dermal Contact from groundwater is calculated as follows:

$$\text{Intake (mg/kg-day)} = \text{CW} \cdot \text{SA} \cdot \text{PC} \cdot \text{ET} \cdot \text{EF} \cdot \text{ED} \cdot \text{CF/BW} \cdot \text{ATc or ATnc} \cdot \text{DY}$$

Risk = Intake * CSF or /RfD

Where:	INPUTS
CW = contaminant concentration in water (mg/l)	
SA = skin surface available for contact (cm ²)	10000
PC = contaminant specific dermal permeability (cm/hr)	Specific
ET = exposure time (hours/day)	0.25
EF = exposure frequency (days/yr)	350
ED = exposure duration (years)	6
CF = volumetric conversion factor for water (1liter/1000 cm ³)	0.001
BW = body weight (kg)	15
ATc = averaging time for carcinogen (yr)	70
ATnc = averaging time for noncarcinogen (yr)	6
DY = days per year (days)	365

Note: Inputs are site and scenario specific

Contaminant	Concentration Carcinogen (mg/l)	Surface Area (cm ²)	Dermal Permeability (cm/hr)	Exposure Time (hours/day)	Exposure Frequency (days/yr)	Exposure Duration (years)	Volumetric Conversion (L/m ³)	Body Weight (kg)	Averaging Carc Time (years)	Days per Year (days)	Carc Dose (mg/kg-day)	Slope Factor (mg/kg-day) ⁻¹	Carcinogenic Risk Child	Percent Carcinogenic Risk
benzene	0.037	10000	1.10E-01	0.25	350	6	0.001	15	70	365	5.66E-05	2.90E-02	1.62E-06	100.00
TOTAL													1.62E-06	100.00

Contaminant	Concentration Noncarcinogen (mg/l)	Surface Area (cm ²)	Dermal Permeability (cm/hr)	Exposure Time (hours/day)	Exposure Frequency (days/yr)	Exposure Duration (years)	Volumetric Conversion (L/m ³)	Body Weight (kg)	Average Noncarc Time (years)	Days per Year (days)	Noncarc Dose (mg/kg-day)	Reference Dose (mg/kg-day)	Noncarc Risk Child	Percent Noncarcinogenic Risk
		10000	1.10E-01	0.25	350	6	0.001	15	6	365	0.00E+00		0.000000	0.00
TOTAL														

File Name: 23WDC.WQ1

GROUNDWATER DERMAL CONTACT EXPOSURE ASSESSMENT
 OPERABLE UNIT NO. 9 (SITE 18)
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 FUTURE RESIDENTIAL ADULT

Dermal Contact from groundwater is calculated as follows:

$$\text{Intake (mg/kg-day)} = \text{CW} * \text{SA} * \text{PC} * \text{ET} * \text{EF} * \text{ED} * \text{CF} / \text{BW} * \text{ATc or ATnc} * \text{DY}$$

Risk = Intake * CSF or /RfD

Where:

	INPUTS
CW = contaminant concentration in water (mg/l)	
SA = skin surface available for contact (cm ²)	10000
PC = contaminant specific dermal permeability (cm/hr)	Specific
ET = exposure time (hours/day)	0.25
EF = exposure frequency (days/yr)	360
ED = exposure duration (years)	30
CF = volumetric conversion factor for water (liter/1000 cm ³)	0.001
BW = body weight (kg)	70
ATc = averaging time for carcinogen (yr)	70
ATnc = averaging time for noncarcinogen (yr)	30
DY = days per year (days)	365

Note: Inputs are site and scenario specific

Contaminant	Concentration Carcinogen (mg/l)	Surface Area (cm ²)	Dermal Permeability (cm/hr)	Exposure Time (hours/day)	Exposure Frequency (days/yr)	Exposure Duration (years)	Volumetric Conversion (L/m ³)	Body Weight (kg)	Averaging Carc Time (years)	Days per Year (days)	Carc Dose (mg/kg-day)	CSF Factor (mg/kg-day) ⁻¹	Carcinogenic Risk Child	Percent Carcinogenic Risk
Benzene	0.037	10000	1.10E-01	0.25	360	30	0.001	70	70	365	5.97E-06	2.80E-02	1.73E-08	100.00
TOTAL													1.73E-08	100.00

Contaminant	Concentration Noncarcinogen (mg/l)	Surface Area (cm ²)	Dermal Permeability (cm/hr)	Exposure Time (hours/day)	Exposure Frequency (days/yr)	Exposure Duration (years)	Volumetric Conversion (L/m ³)	Body Weight (kg)	Average Noncarc Time (years)	Days per Year (days)	Noncarc Dose (mg/kg-day)	RfD Dose (mg/kg-day)	Noncarc Risk Child	Percent Noncarcinogenic Risk
		10000	1.10E-01	0.25	360	30	0.001	70	30	365	0.00E+00		0.000000	0.00
TOTAL														

File Name: 2GWDC.WQ2

**EXAMPLE INHALATION OF VOLATILE ORGANICS CALCULATIONS
OPERABLE UNIT NO. 8 (SITE 16)
CONTRACT TASK ORDER 0274**

Purpose: Estimate intake/risk from the inhalation of volatile organics

$$\text{Intake (mg/kg}\cdot\text{day)} = \frac{Cs \times IR \times ET \times EF \times ED \times 1.0}{BW \times AT}$$

Where:

Cs	=	Shower air concentration (mg/m ³)
IR	=	Inhalation rate (m ³ /hr)
ET	=	Exposure time (hrs/day)
EF	=	Exposure frequency (days/year)
ED	=	Exposure duration (years)
BW	=	Body weight (kg)
AT	=	Averaging time (days)

Risks:

$$\begin{aligned} \text{Carcinogens} &= \text{Intake (mg/kg}\cdot\text{day)} \times \text{CSF (mg/kg}\cdot\text{day)}^{-1} \\ \text{Noncarcinogens} &= \text{Intake (mg/kg}\cdot\text{day)} / \text{RfD (mg/kg}\cdot\text{day)} \end{aligned}$$

Example Carcinogen: Benzene

$$\begin{aligned} \text{Intake (mg/kg}\cdot\text{day)} &= \frac{3.47\text{E-}02 \text{ mg/m}^3 \times 0.6 \text{ m}^3/\text{hr} \times 0.25 \text{ hrs/d} \times 350 \text{ days/yr} \times 30 \text{ yrs}}{70 \text{ kg} \times 25,550 \text{ days}} \\ &= 3.15\text{E-}05 \end{aligned}$$

$$\text{Risk} = 3.1\text{E-}05 \text{ mg/kg}\cdot\text{day} \times 2.9\text{E-}02 \text{ mg/kg}\cdot\text{day}^{-1} = 8.9\text{E-}07$$

Example Noncarcinogen: Benzene

$$\begin{aligned} \text{Intake (mg/kg}\cdot\text{day)} &= \frac{3.47\text{E-}02 \text{ mg/m}^3 \times 0.6 \text{ m}^3/\text{hr} \times 0.25 \text{ hrs/d} \times 350 \text{ days/yr} \times 30 \text{ yrs}}{70 \text{ kg} \times 10,950 \text{ days}} \\ &= 7.1\text{E-}05 \end{aligned}$$

$$\text{Risk} = \frac{7.1\text{E-}05 \text{ mg/kg}\cdot\text{day}}{1.71\text{E-}03 \text{ mg/kg}\cdot\text{day}} = 4.7\text{E-}02$$

SHOWER MODEL: COPC VOLITILIZATION
 OPERABLE UNIT NO. 8 (SITE 16)
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 FUTURE RESIDENTIAL CHILD AND ADULT

Based on work conducted by J.B. Andelman
 as presented in the GRI manual.

$$C_{inf} = [(E)(F_w)(C_w/1000)]/F_a$$

$$E = (ETCE)(H)/(HTCE)$$

$$C_a = C_{inf}[1 + ((1/kt_s)(\exp(-kt_s)-1))]$$

$$k = F_a/V_b$$

ETCE =	0.6
HTCE =	9.1E-03 m ³ -atm/mol
F _a =	2.4 m ³ /min
V _b =	12 m ³
k =	0.2 1/min
F _w =	10 L/min
t _s =	12 min

Where: C_{inf} = Asymptotic Concentration in Air (mg/m³)

E = The Efficiency of Release - Water to Air (unitless)

H = The Henry's Constant for Chemical i (m³-atm/mol)

C_w = Constituent Concentration in Shower Water (ug/L)

C_a = Shower Air Concentration (mg/m³)

ETCE = The Efficiency of Release of TCE (unitless)

HTCE = The Henry's Constant for TCE (m³-atm/mol)

F_a = Flow Rate of Air in the Shower (m³/min)

V_b = The Volume of an Average Bathroom (m³)

k = Rate Constant (1/min)

F_w = The Flow Rate of Water in the Shower (L/min)

t_s = Showering Time (min)

COPCs	C _w (ug/L)	Henry's Law Constant (atm-m ³ /mol)	E	C _{inf} (mg/m ³)	C _a (mg/m ³)
benzene	37	5.50E-03	3.63E-01	5.59E-02	3.47E-02

FILENAME: SHRMDL.WQ1

INHALATION OF VOLATILE ORGANICS EXPOSURE ASSESSMENT
GROUNDWATER
FUTURE SCENARIO RESIDENTIAL CHILD
OPERABLE UNIT NO. 8 (SITE 16)
REMEDIAL INVESTIGATION CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA

Intake from the inhalation of volatile organics is calculated as follows:

$$\text{Intake (mg/kg-day)} = (C \cdot EF \cdot ED \cdot ET \cdot IR) / (BW \cdot ATc \text{ or } ATnc \cdot DY)$$

$$\text{Risk} = \text{Intake} \cdot CSF \text{ or } RfD$$

Where:	INPUTS
C = contaminant concentration in air (mg/m ³)	Calculated
CSF = carcinogenic slope factor	Specific
RfD = reference dose for noncarcinogen	Specific
IR = inhalation rate (m ³ /hr)	0.6
EF = exposure frequency (days)	350
ED = exposure duration (years)	6
ET = exposure time (hr/day)	0.25
BW = body weight (kg)	15
ATc = averaging time for carcinogen (yr)	70
ATnc = averaging time for noncarcinogen (yr)	6
DY = day per year (day/yr)	365

Note: Inputs are scenario and site specific

Carcinogenic Contaminant	Concentration Carcinogen (mg/m ³)	Exposure Frequency (events/yr)	Inhalation Rate (m ³ /hr)	Exposure Duration (yrs)	Exposure Time (hr/day)	Body Weight (kg)	Average Carc Time (years)	Days per year (day/year)	Carc Dose (mg/kg/day)	Slope Factor (mg/kg-day) ⁻¹	Carcinogenic Risk Child	Percent Contribution to Risk
benzene	0.0347	350	0.6	6	0.25	15	70	365	2.85E-05	2.90E-02	8.27E-07	100%
TOTAL											8.3E-07	100%

Systemic Contaminant	Concentration Noncarcinogen (mg/m ³)	Exposure Frequency (events/yr)	Inhalation Rate (m ³ /hr)	Exposure Duration (yrs)	Exposure Time (hr/day)	Body Weight (kg)	Average Noncarc Time (years)	Days per year (day/year)	Noncarc Dose (mg/kg/day)	Reference Dose (mg/kg-day)	Noncarcinogenic Risk Child	Percent Contribution to Risk
benzene	0.0347	350	0.6	6	0.25	15	6	365	3.33E-04	1.71E-03	1.95E-01	100%
TOTAL											0.2	100%

File Name: GW1H.WQ1

INHALATION OF VOLATILE ORGANICS EXPOSURE ASSESSMENT
 GROUNDWATER
 FUTURE SCENARIO RESIDENTIAL ADULT
 OPERABLE UNIT NO. 8 (SITE 16)
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA

Intake from the inhalation of volatile organics is calculated as follows:

$$\text{Intake (mg/kg-day)} = (C \cdot EF \cdot ED \cdot ET \cdot IR) / (BW \cdot ATc \text{ or } ATnc \cdot DY)$$

$$\text{Risk} = \text{Intake} \cdot CSF \text{ or } RfD$$

Where:

C = contaminant concentration in air (mg/m3)
 CSF = carcinogenic slope factor
 RfD = reference dose for noncarcinogen
 IR = inhalation rate (m3/hr)
 EF = exposure frequency (days)
 ED = exposure duration (years)
 ET = exposure time (hr/day)
 BW = body weight (kg)
 ATc = averaging time for carcinogen (yr)
 ATnc = averaging time for noncarcinogen (yr)
 DY = day per year (day/yr)

INPUTS

Calculated
 Specific
 Specific
 0.6
 350
 30
 0.25
 70
 70
 30
 365

Note: Inputs are scenario and site specific

Carcinogenic Contaminant	Concentration Carcinogen (mg/m3)	Exposure Frequency (events/yr)	Inhalation Rate (m3/hr)	Exposure Duration (yrs)	Exposure Time (hr/day)	Body Weight (kg)	Average Carc Time (years)	Days per year (day/year)	Carc Dose (mg/kg/day)	Slope Factor (mg/kg-day) ⁻¹	Carcinogenic Risk Adult	Percent Contribution to Risk
benzene	0.0347	350	0.6	30	0.25	70	70	365	3.06E-05	2.90E-02	8.86E-07	100%
TOTAL											9E-07	100%

Systemic Contaminant	Concentration Noncarcinogen (mg/m3)	Exposure Frequency (events/yr)	Inhalation Rate (m3/hr)	Exposure Duration (yrs)	Exposure Time (hr/day)	Body Weight (kg)	Average Noncarc Time (years)	Days per year (day/year)	Noncarc Dose (mg/kg/day)	Reference Dose (mg/kg-day)	Noncarcinogenic Risk Adult	Percent Contribution to Risk
benzene	0.0347	350	0.6	30	0.25	70	30	365	7.13E-05	1.71E-03	4.17E-02	100%
TOTAL											0.0417	100%

File Name: GWIH.WQ2

**EXAMPLE INGESTION OF SURFACE WATER CALCULATIONS
OPERABLE UNIT NO. 8 (SITE 16)
CONTRACT TASK ORDER 0274**

Purpose: Estimate intake/risk from ingestion of surface water

$$\text{Intake (mg/kg·day)} = \frac{C \times IR \times ET \times EF \times ED}{BW \times AT \times DY}$$

Where:

C	=	Contaminant concentration in surface water (mg/L)
IR	=	Ingestion rate (L/hr)
ET	=	Exposure time (hrs/event)
EF	=	Exposure frequency (events/year)
ED	=	Exposure duration (years)
BW	=	Body weight (kg)
AT	=	Averaging time (years)
DY	=	Days per year (days)

Risks:

$$\begin{aligned} \text{Carcinogens} &= \text{Intake (mg/kg·day)} \times \text{CSF (mg/kg·day)}^{-1} \\ \text{Noncarcinogens} &= \text{Intake (mg/kg·day)} / \text{RfD (mg/kg·day)} \end{aligned}$$

Example Carcinogen: 1,1,2,2-Tetrachloroethane

$$\begin{aligned} \text{Intake (mg/kg·day)} &= \frac{0.002 \text{ mg/L} \times 0.05 \text{ L/hr} \times 2.6 \text{ hrs/event} \times 48 \text{ events/yr} \times 30 \text{ years}}{70 \text{ kg} \times 70 \text{ years} \times 365 \text{ days/yr}} \\ &= 2.09\text{E-}07 \end{aligned}$$

$$\text{Risk} = 2.09\text{E-}07 \text{ mg/kg·day} \times 2.00\text{E-}01 \text{ mg/kg·day}^{-1} = 4.19\text{E-}08$$

Example Noncarcinogen: Manganese

$$\begin{aligned} \text{Intake (mg/kg·day)} &= \frac{0.0234 \text{ mg/L} \times 0.05 \text{ L/hr} \times 2.6 \text{ hrs/event} \times 48 \text{ events/yr} \times 30 \text{ years}}{70 \text{ kg} \times 30 \text{ years} \times 365 \text{ days/yr}} \\ &= 5.7\text{E-}06 \end{aligned}$$

$$\text{Risk} = \frac{5.7\text{E-}06 \text{ mg/kg·day}}{5.0\text{E-}03 \text{ mg/kg·day}} = 1.14\text{E-}03$$

Re: Site 16 Future Residential Adult

SURFACE WATER INGESTION EXPOSURE ASSESSMENT
 OPERABLE UNIT NO. 8 (SITE 16)
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 FUTURE RESIDENTIAL CHILD

The intake from the ingestion of surface water is calculated as follows:

$$\text{Intake (mg/kg-day)} = C_w * C_R * E_T * E_F * E_D / B_W * A_Tc \text{ or } A_Tnc * D_Y$$

$$\text{Risk} = \text{Intake} * C_Sf \text{ or } RfD$$

Where:	INPUT
C _w = contaminant concentration in surface water (mg/l)	
IR = ingestion rate (Liter/hour)	0.05
E _T = exposure time (hours/event)	2.8
E _F = exposure frequency (events/yr)	48
E _D = exposure duration (yrs)	6
B _W = body weight (kg)	15
A _{Tc} = averaging time for carcinogen (yr)	70
A _{Tnc} = averaging time for noncarcinogen (yr)	6
D _Y = days per year (days)	365
C _{Sf} = cancer slope factor (mg/kg-day) ⁻¹	specific
RfD = reference dose (mg/kg-day)	specific

Note: Inputs are scenario and site specific

Contaminant	Concentration Carcinogen (mg/l)	Contact Rate (l/hour)	Exposure Time (hrs/event)	Exposure Frequency (events/yr)	Exposure Duration (years)	Body Weight (kg)	Average Carc Time (years)	Days per Year (days)	Carc Dose (mg/kg-day)	Cancer Slope Factor (mg/kg-day) ⁻¹	Carcinogenic Risk Child	Percent Carcinogenic Risk
1,1,2,2-Tetrachloroethane	0.002	0.05	2.8	48	6	15	70	365	1.95E-07	2.00E-01	3.91E-08	100.00
TOTAL											3.91E-08	100.00

Contaminant	Concentration Noncarcinogen (mg/l)	Contact Rate (l/hour)	Exposure Time (hrs/event)	Exposure Frequency (events/yr)	Exposure Duration (years)	Body Weight (kg)	Average Noncarc (years)	Days per Year (days)	Noncarc Dose (mg/kg-day)	Reference Dose (mg/kg-day)	Noncarcinogenic Risk Child	Percent Noncarcinogenic Risk
barium	0.0293	0.05	2.8	48	6	15	6	365	3.34E-05	7.00E-02	0.0005	5.30
manganese	0.0234	0.05	2.8	48	6	15	6	365	2.87E-05	5.00E-03	0.0053	59.25
vanadium	0.0198	0.05	2.8	48	6	15	6	365	2.23E-05	7.00E-03	0.0032	35.45
TOTAL											0.0090	100.00

FILE NAME: SWLWQ1

SURFACE WATER INGESTION EXPOSURE ASSESSMENT
 OPERABLE UNIT NO. 8 (SITE 18)
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 FUTURE RESIDENTIAL ADULT

The intake from the ingestion of surface water is calculated as follows:

$$\text{Intake (mg/kg-day)} = Cw \cdot CR \cdot ET \cdot EF \cdot ED/BW \cdot ATc \text{ or } ATnc \cdot DY$$

$$\text{Risk} = \text{Intake} \cdot CSF \text{ or } /RID$$

Where:	INPUT
Cw = contaminant concentration in surface water (mg/l)	
IR = ingestion rate (Liter/hour)	0.05
ET = exposure time (hours/event)	2.6
EF = exposure frequency (events/yr)	48
ED = exposure duration (yrs)	30
BW = body weight (kg)	70
ATc = averaging time for carcinogen (yr)	70
ATnc = averaging time for noncarcinogen (yr)	30
DY = days per year (days)	365
CSF = cancer slope factor (mg/kg-day) ⁻¹	specific
RID = reference dose (mg/kg-day)	specific

Note: Inputs are scenario and site specific

Contaminant	Concentration Carcinogen (mg/l)	Contact Rate (l/hour)	Exposure Time (hrs/event)	Exposure Frequency (events/yr)	Exposure Duration (years)	Body Weight (kg)	Average Carc Time (years)	Days per Year (days)	Carc Dose (mg/kg-day)	Cancer Slope Factor (mg/kg-day) ⁻¹	Carcinogenic Risk Adult	Percent Carcinogenic Risk
1,1,2,2-tetrachloroethane	0.002	0.05	2.6	48	30	70	70	365	2.09E-07	2.00E-01	4.19E-08	100.00
TOTAL											4.19E-08	100.00

Contaminant	Concentration Noncarcinogen (mg/l)	Contact Rate (l/hour)	Exposure Time (hrs/event)	Exposure Frequency (events/yr)	Exposure Duration (years)	Body Weight (kg)	Average Noncarc (years)	Days per Year (days)	Noncarc Dose (mg/kg-day)	Reference Dose (mg/kg-day)	Noncarcinogenic Risk Adult	Percent Noncarcinogenic Risk
barium	0.0293	0.05	2.6	48	30	70	30	365	7.18E-08	7.00E-02	0.0001	5.30
manganese	0.0234	0.05	2.6	48	30	70	30	365	5.71E-08	5.00E-03	0.0011	59.25
vanadium	0.0186	0.05	2.6	48	30	70	30	365	4.76E-08	7.00E-03	0.0007	35.45
TOTAL											0.0019	100.00

FILE NAME: SWI.WQ2

**EXAMPLE DERMAL CONTACT WITH SURFACE WATER CALCULATIONS
OPERABLE UNIT NO. 8 (SITE 16)
CONTRACT TASK ORDER 0274**

Purpose: Estimate intake/risk from dermal contact with surface water

$$Intake (mg/kg \cdot day) = \frac{C \times SA \times PC \times ET \times EF \times ED \times CF}{BW \times AT}$$

Where:

C	=	Contaminant concentration in groundwater (mg/L)
SA	=	Exposed skin surface available for contact (cm ²)
PC	=	Permeability constant (cm/hr)
ET	=	Exposure time (hr/day)
EF	=	Exposure frequency (days/year)
ED	=	Exposure duration (years)
CF	=	Conversion factor (1 L/1,000 cm ³)
BW	=	Body weight (kg)
AT _c	=	Averaging time carcinogen (days)
AT _{nc}	=	Averaging time noncarcinogen (days)

Risks:

Carcinogens = Intake (mg/kg·day) x CSF (mg/kg·day)⁻¹
 Noncarcinogens = Intake (mg/kg·day)/RfD (mg/kg·day)

Example Carcinogen: 1,1,2,2-Tetrachloroethane

$$Intake (mg/kg \cdot day) = \frac{0.002 \text{ mg/L} \times 8300 \text{ cm}^2 \times 9.0E-03 \text{ cm/hr} \times 2.6 \text{ hr/day} \times 48 \text{ days/yr} \times 30 \text{ yrs} \times 1 \text{ L/1,000 cm}^3}{70 \text{ kg} \times 70 \text{ yrs} \times 365 \text{ days/yr}}$$

$$= 3.0E-07$$

$$Risk = 3.0E-07 \text{ mg/kg} \cdot \text{day} \times 0.2 \text{ mg/kg} \cdot \text{day}^{-1} = 6.25E-08$$

Example Noncarcinogen: Manganese

$$Intake (mg/kg \cdot day) = \frac{0.0234 \text{ mg/L} \times 8300 \text{ cm}^2 \times 1.0E-03 \text{ cm/hr} \times 2.6 \text{ hr/day} \times 48 \text{ days/yr} \times 30 \text{ yrs} \times 1 \text{ L/1,000 cm}^3}{70 \text{ kg} \times 30 \text{ yrs} \times 365 \text{ days/yr}}$$

$$= 9.49E-07$$

$$Risk = \frac{9.49E-07 \text{ mg/kg} \cdot \text{day}}{5.0E-03 \text{ mg/kg} \cdot \text{day}} = 1.89E-04$$

SURFACE WATER DERMAL EXPOSURE ASSESSMENT
OPERABLE UNIT NO. 8 (SITE 18)
REMEDIAL INVESTIGATION - CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
FUTURE RESIDENTIAL CHILD

The intake from dermal contact with surface water is calculated as follows:

$$\text{Intake (mg/kg-day)} = Cw \cdot SA \cdot PC \cdot ET \cdot EF \cdot ED \cdot CF/BW \cdot ATc \text{ or } ATnc \cdot DY$$

$$\text{Risk} = \text{Intake} \cdot CSF \text{ or } /RD$$

Where:	INPUTS
CW = contaminant concentration in water (mg/l)	2100
SA = skin surface available for contact (cm ²)	Specific
PC = contaminant specific dermal permeability (cm/hr)	2.6
ET = exposure time (hours/day)	48
EF = exposure frequency (days/yr)	6
ED = exposure duration (years)	0.001
CF = volumetric conversion factor for water (liter/1000 cm ³)	15
BW = body weight (kg)	70
ATc = averaging time for carcinogen (yr)	6
ATnc = averaging time for noncarcinogen (yr)	365
DY = days per year (days)	Specific
CSF = cancer slope factor (mg/kg-day) ⁻¹	Specific
RD = reference dose (mg/kg-day)	Specific

Note: inputs are site and scenario specific

CONTAMINANT	Concentration Carcinogen (mg/l)	Surface Area (cm ²)	Dermal Permeability (cm/hr)	Exposure Time (hours/day)	Exposure Frequency (days/yr)	Exposure Duration (years)	Volumetric Conversion (L/m ³)	Body Weight (kg)	Averaging Carc Time (years)	Days per Year (days)	Carc Dose (mg/kg-day)	Slope Factor (mg/kg-day) ⁻¹	Carcinogenic Risk Child	Percent Carcinogenic Risk
1,1,2,2-TETRACHLOROETHANE	0.002	2100	1.0E-03	2.6	48	6	0.001	15	70	365	7.38E-08	2.00E-01	1.48E-08	100.00
TOTAL													1.48E-08	100.00

CONTAMINANT	Concentration Noncarcinogen (mg/l)	Surface Area (cm ²)	Dermal Permeability (cm/hr)	Exposure Time (hours/day)	Exposure Frequency (days/yr)	Exposure Duration (years)	Volumetric Conversion (L/m ³)	Body Weight (kg)	Average Noncarc Time (years)	Days per Year (days)	Noncarc Dose (mg/kg-day)	Reference Dose (mg/kg-day)	Noncarc Risk Child	Percent Noncarcinogenic Risk
barium	0.0280	2100	1.0E-03	2.6	48	6	0.001	15	6	365	1.40E-06	7.00E-02	0.00002	6.30
manganese	0.0234	2100	1.0E-03	2.6	48	6	0.001	15	6	365	1.12E-06	6.00E-03	0.00022	68.25
vanadium	0.0198	2100	1.0E-03	2.6	48	6	0.001	15	6	365	9.38E-07	7.00E-03	0.00013	35.45
TOTAL													0.00038	100.00

File Name: SWDC.WQ1

SURFACE WATER DERMAL EXPOSURE ASSESSMENT
OPERABLE UNIT NO. 8 (SITE 16)
REMEDIAL INVESTIGATION - CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA
FUTURE RESIDENTIAL ADULT

The intake from dermal contact with surface water is calculated as follows:

$$\text{Intake (mg/kg-day)} = Cw \cdot SA \cdot PC \cdot ET \cdot EF \cdot ED \cdot CF/BW \cdot ATc \text{ or } ATnc \cdot DY$$

$$\text{Risk} = \text{Intake} \cdot CSF \text{ or } RfD$$

Where:

INPUTS

- CW = contaminant concentration in water (mg/l)
- SA = skin surface available for contact (cm²)
- PC = contaminant specific dermal permeability (cm/hr)
- ET = exposure time (hours/day)
- EF = exposure frequency (days/yr)
- ED = exposure duration (years)
- CF = volumetric conversion factor for water (liter/1000 cm³)
- BW = body weight (kg)
- ATc = averaging time for carcinogen (yr)
- ATnc = averaging time for noncarcinogen (yr)
- DY = days per year (days)
- CSF = cancer slope factor (mg/kg-day)⁻¹
- RfD = reference dose (mg/kg-day)

- \$300
- Specific
- 2.6
- 48
- 30
- 0.001
- 70
- 70
- 30
- 365
- Specific
- Specific

Note: Inputs are site and scenario specific

Contaminant	Concentration Carcinogen (mg/l)	Surface Area (cm ²)	Dermal Permeability (cm/hr)	Exposure Time (hours/day)	Exposure Frequency (days/yr)	Exposure Duration (years)	Volumetric Conversion (L/m ³)	Body Weight (kg)	Avg/Avrg Carc Time (years)	Days per Year (days)	Carc Dose (mg/kg-day)	Slope Factor (mg/kg-day) ⁻¹	Carcinogenic Risk Adult	Percent Carcinogenic Risk
1,1,2,2-tetrachloroethane	0.002	8300	1.0E-03	2.6	48	30	0.001	70	70	365	3.13E-07	2.00E-01	6.26E-06	100.00
TOTAL													6.26E-06	100.00

Contaminant	Concentration Noncarcinogen (mg/l)	Surface Area (cm ²)	Dermal Permeability (cm/hr)	Exposure Time (hours/day)	Exposure Frequency (days/yr)	Exposure Duration (years)	Volumetric Conversion (L/m ³)	Body Weight (kg)	Average Noncarc Time (years)	Days per Year (days)	Noncarc Dose (mg/kg-day)	Reference Dose (mg/kg-day)	Noncarc Risk Adult	Percent Noncarcinogenic Risk
barium	0.0233	8300	1.0E-03	2.6	48	30	0.001	70	30	365	1.19E-06	7.00E-02	0.00002	3.30
manganese	0.0234	8300	1.0E-03	2.6	48	30	0.001	70	30	365	8.48E-07	6.00E-03	0.00019	59.25
vanadium	0.0196	8300	1.0E-03	2.6	48	30	0.001	70	30	365	7.96E-07	7.00E-03	0.00011	35.45
TOTAL													0.00032	100.00

File Name: SWDC.WQ2

**EXAMPLE INGESTION OF SEDIMENT CALCULATIONS
OPERABLE UNIT NO. 8 (SITE 16)
CONTRACT TASK ORDER 0274**

Purpose: Estimate intake/risk from ingestion of sediment

$$\text{Intake (mg/kg}\cdot\text{day)} = \frac{C \times IR \times CF \times EF \times ED}{BW \times AT}$$

Where:

C	=	Contaminant concentration in sediment (mg/kg)
IR	=	Ingestion rate (mg/day)
CF	=	Conversion factor for kg to mg (mg/day)
EF	=	Exposure frequency (days/year)
ED	=	Exposure duration (years)
BW	=	Body weight (kg)
AT	=	Averaging time (years)

Risks:

Carcinogens = Intake (mg/kg·day) x CSF (mg/kg·day)⁻¹

Noncarcinogens = Intake (mg/kg·day)/RfD (mg/kg·day)

Example Carcinogen: Arsenic

$$\begin{aligned} \text{Intake (mg/kg}\cdot\text{day)} &= \frac{4.7 \text{ mg/kg} \times 100 \text{ mg/day} \times 1.0E-06 \times 48 \text{ days/yr} \times 30 \text{ yrs}}{70 \text{ kg} \times 70 \text{ yrs} \times 365 \text{ days}} \\ &= 3.78E-07 \end{aligned}$$

Risk = 3.78E-07 mg/kg·day x 1.75 mg/kg·day⁻¹ = 6.62E-07

Example Noncarcinogen: Arsenic

$$\begin{aligned} \text{Intake (mg/kg}\cdot\text{day)} &= \frac{4.7 \text{ mg/kg} \times 100 \text{ mg/day} \times 1.0E-06 \times 48 \text{ days/yr} \times 30 \text{ yrs}}{70 \text{ kg} \times 30 \text{ yrs} \times 365 \text{ days}} \\ &= 8.83E-07 \end{aligned}$$

$$\text{Risk} = \frac{8.83E-07 \text{ mg/kg}\cdot\text{day}}{3.0E-04 \text{ mg/kg}\cdot\text{day}} = 2.94E-03$$

SEDIMENT INGESTION L...URE ASSESSMENT
 OPERABLE UNIT NO. 8 (SITE 16)
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 FUTURE RESIDENTIAL CHILD

Intake from ingestion of sediment is calculated as follows:

$$\text{Intake (mg/kg-day)} = C \cdot IR \cdot CF \cdot EF \cdot ED / BW \cdot ATC \text{ or } ATnc \cdot DY$$

$$\text{Risk} = \text{Intake} \cdot CSF \text{ or } RfD$$

Where:

INPUTS

- C = contaminant concentration in sediment (mg/kg)
- CF = conversion for kg to mg
- EF = exposure frequency (days/yr)
- ED = exposure duration (yr)
- IR = soil ingestion rate (mg/day)
- BW = body weight (kg)
- ATc = averaging time for carcinogen (yr)
- ATnc = averaging time for noncarcinogen (yr)
- DY = days per year (days/year)
- CSF = cancer slope factor (mg/kg-day)⁻¹
- RfD = reference dose (mg/kg-day)

- 1E-08
- 48
- 6
- 200
- 15
- 70
- 6
- 365
- Specific
- Specific

Note: inputs are scenario and site specific

Contaminant	Concentration Carcinogen (mg/kg)	Exposure Frequency (days/yr)	Exposure Duration (yr)	Ingestion Rate (mg/day)	Conversion Factor (kg/mg)	Body Weight (kg)	Average Carc Time (years)	Days per year (days/yr)	Carc Dose (mg/kg/day)	Slope Factor (mg/kg/day) ⁻¹	Carcinogenic Risk Child	Percent Carcinogenic Risk
arsenic	4.7	48	6	200	1E-06	15	70	365	7.06E-07	1.75E+00	1.24E-08	86.44
beryllium	0.3	48	6	200	1E-06	15	70	365	4.51E-08	4.30E+00	1.94E-07	13.58
TOTAL											1.43E-06	100.00

Contaminant	Concentration Noncarcinogen (mg/kg)	Exposure Frequency (days/yr)	Exposure Duration (yr)	Ingestion Rate (mg/day)	Conversion Factor (kg/mg)	Body Weight (kg)	Average Noncarc Time (years)	Days per year (days/yr)	Noncarc Dose (mg/kg/day)	Reference Dose (mg/kg/day)	Noncarcinogenic Risk Child	Percent Noncarcinogenic Risk
Carbon disulfide	0.002	48	6	200	1E-06	15	6	365	3.51E-09	1.00E-01	0.00000004	0.00
toluene	0.002	48	6	200	1E-06	15	6	365	3.51E-09	2.00E-01	0.00000002	0.00
arsenic	4.7	48	6	200	1E-06	15	6	365	8.24E-08	3.00E-04	0.02747032	80.59
beryllium	0.3	48	6	200	1E-06	15	6	365	5.28E-07	5.00E-03	0.00010521	0.31
silver	0.8	48	6	200	1E-06	15	6	365	1.40E-06	5.00E-03	0.00028055	0.82
vanadium	24.5	48	6	200	1E-06	15	6	365	4.30E-05	7.00E-03	0.00813699	18.00
zinc	16.2	48	6	200	1E-06	15	6	365	2.84E-05	3.00E-01	0.00009468	0.28
TOTAL											0.03406760	100.00

File Name: SDI.WQ1

SEDIMENT INGESTION RISK ASSESSMENT
 OPERABLE UNIT NO. 8 (SITE 18)
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 FUTURE RESIDENTIAL ADULT

Intake from ingestion of sediment is calculated as follows:

$$\text{Intake (mg/kg-day)} = C * IR * CF * EF * ED / BW * ATC \text{ or } ATnc * DY$$

$$\text{Risk} = \text{Intake} * CSF \text{ or } RfD$$

Where:

INPUTS

C = contaminant concentration in sediment (mg/kg)	1E-06
CF = conversion for kg to mg	48
EF = exposure frequency (days/yr)	30
ED = exposure duration (yr)	100
IR = soil ingestion rate (mg/day)	70
BW = body weight (kg)	70
ATc = averaging time for carcinogen (yr)	30
ATnc = averaging time for noncarcinogen (yr)	365
DY = days per year (days/year)	Specific
CSF = cancer slope factor (mg/kg-day) ⁻¹	Specific
RfD = reference dose (mg/kg-day)	

Note: Inputs are scenario and site specific

Contaminant	Concentration Carcinogen (mg/kg)	Exposure Frequency (days/yr)	Exposure Duration (yr)	Ingestion Rate (mg/day)	Conversion Factor (kg/mg)	Body Weight (kg)	Average Carc Time (years)	Days per year (days/yr)	Carc Dose (mg/kg/day)	Slope Factor (mg/kg/day) ⁻¹	Carcinogenic Risk Adult	Percent Carcinogenic Risk
arsenic	4.7	48	30	100	1E-06	70	70	365	3.78E-07	1.75E+00	6.62E-07	88.44
beryllium	0.3	48	30	100	1E-06	70	70	365	2.42E-08	4.30E+00	1.04E-07	13.56
TOTAL											7.66E-07	100.00

Contaminant	Concentration Noncarcinogen (mg/kg)	Exposure Frequency (days/yr)	Exposure Duration (yr)	Ingestion Rate (mg/day)	Conversion Factor (kg/mg)	Body Weight (kg)	Average Noncarc Time (years)	Days per year (days/yr)	Noncarc Dose (mg/kg/day)	Reference Dose (mg/kg/day)	Noncarcinogenic Risk Adult	Percent Noncarcinogenic Risk
Carbon disulfide	0.002	48	30	100	1E-06	70	30	365	3.78E-10	1.00E-01	0.000000004	0.00
toluene	0.002	48	30	100	1E-06	70	30	365	3.78E-10	2.00E-01	0.000000002	0.00
arsenic	4.7	48	30	100	1E-06	70	30	365	8.83E-07	3.00E-04	0.002943249	80.59
beryllium	0.3	48	30	100	1E-06	70	30	365	5.64E-08	5.00E-03	0.000011272	0.31
silver	0.8	48	30	100	1E-06	70	30	365	1.50E-07	5.00E-03	0.000030059	0.82
vanadium	24.5	48	30	100	1E-06	70	30	365	4.60E-08	7.00E-03	0.000657534	18.00
zinc	16.2	48	30	100	1E-06	70	30	365	3.04E-08	3.00E-01	0.000010145	0.28
TOTAL											0.003882284	100.00

File Name: SDI.WQ2

**EXAMPLE DERMAL CONTACT WITH SEDIMENT CALCULATIONS
OPERABLE UNIT NO. 8 (SITE 16)
CONTRACT TASK ORDER 0274**

Purpose: Estimate intake/risk from dermal contact with sediment

$$\text{Intake (mg/kg·day)} = \frac{C \times CF \times SA \times AF \times Abs \times EF \times ED}{BW \times AT \times DY}$$

Where:

C	=	Concentration of contaminant in sediment (mg/kg)
CF	=	Conversion factor for kg to mg
SA	=	Exposed skin surface area (cm ²)
AF	=	Sediment to skin adherence factor (mg/cm ²)
Abs	=	Fraction absorbed (unitless)
EF	=	Exposure frequency (events/year)
ED	=	Exposure duration (years)
BW	=	Body weight (kg)
AT	=	Averaging time (years)
DY	=	Days per year (days)

Risks:

$$\text{Carcinogens} = \text{Intake (mg/kg·day)} \times \text{CSF (mg/kg·day)}^{-1}$$

$$\text{Noncarcinogens} = \text{Intake (mg/kg·day)} / \text{RfD (mg/kg·day)}$$

Example Carcinogen: Arsenic

$$\text{Intake (mg/kg·day)} = \frac{4.7 \text{ mg/kg} \times 1.0E-06 \times 8300 \text{ cm}^2 \times 1 \times 0.001 \times 48 \text{ events/yr} \times 30 \text{ yrs}}{70 \text{ kg} \times 70 \text{ years} \times 365 \text{ days/yr}}$$

$$= 3.14E-08$$

$$\text{Risk} = 3.14E-08 \text{ mg/kg·day} \times 1.75 \text{ mg/kg·day}^{-1} = 5.49E-08$$

Example Noncarcinogen: Arsenic

$$\text{Intake (mg/kg·day)} = \frac{4.7 \text{ mg/kg} \times 1.0E-06 \times 8300 \text{ cm}^2 \times 1 \times 0.001 \times 48 \text{ events/yr} \times 30 \text{ yrs}}{70 \text{ kg} \times 30 \text{ years} \times 365 \text{ days/yr}}$$

$$= 7.334E-08$$

$$\text{Risk} = \frac{7.33E-08 \text{ mg/kg·day}}{3.0E-04 \text{ mg/kg·day}} = 2.44E-04$$

SEDIMENT DERMAL CONTACT ASSESSMENT
 OPERABLE UNIT NO. 8 (SITE 18)
 REMEDIAL INVESTIGATION CTO-0274
 MCB CAMP LEJEUNE, NORTH CAROLINA
 FUTURE RESIDENTIAL CHILD

The intake from dermal contact to sediment is calculated as follows:

$$\text{Intake (mg/kg-day)} = C \cdot CF \cdot SA \cdot AF \cdot Abs \cdot EF \cdot ED/BW \cdot ATc \text{ or } ATnc \cdot DY$$

$$\text{Risk} = \text{Intake} \cdot CSF \text{ or } /RID$$

Where:	INPUTS
C = contaminant concentration in soil (mg/kg)	
CF = conversion factor for kg to mg	1.00E-06
SA = exposed skin surface area (cm ²)	2100
AF = sediment to skin adherence factor (mg/cm ²)	1
Abs = fraction absorbed (unitless) (contaminant specific)	Specific
EF = exposure frequency (events/yr)	48
ED = exposure duration (years)	6
BW = body weight (kg)	15
ATc = averaging time for carcinogen (yr)	70
ATnc = averaging time for noncarcinogen (yr)	6
DY = day per year (day/yr)	365
CSF = cancer slope factor (mg/kg-day) ⁻¹	Specific
RID = reference dose (mg/kg-day)	Specific

Note: Inputs are scenario and site specific

Contaminant	Concentration Carcinogen (mg/kg)	Conversion Factor (kg/mg)	Surface Area (cm ²)	Adherence Factor (mg/cm ²)	Fraction Absorbed (%)	Exposure Frequency (events/yr)	Exposure Duration (yrs)	Body Weight (kg)	Average Carc Time (years)	Days per year (day/year)	Carc Dose (mg/kg/day)	Slope Factor (mg/kg-day) ⁻¹	Carcinogenic Risk Child	Percent Carcinogenic Risk
arsenic	4.7	1E-06	2100	1	0.001	48	6	15	70	365	7.42E-08	1.70E+00	1.30E-08	81.44
beryllium	0.3	1E-06	2100	1	0.001	48	6	15	70	365	4.73E-10	4.30E+00	2.04E-09	13.66
TOTAL													1.60E-08	100.00

Contaminant	Concentration Noncarcinogen (mg/kg)	Conversion Factor (kg/mg)	Surface Area (cm ²)	Adherence Factor (mg/cm ²)	Fraction Absorbed (%)	Exposure Frequency (events/yr)	Exposure Duration (yrs)	Body Weight (kg)	Average Noncarc Time (years)	Days per year (day/year)	Noncarc Dose (mg/kg/day)	Reference Dose (mg/kg-day)	Noncarcinogenic Risk Child	Percent Noncarcinogenic Risk
carbon disulfide	0.002	1E-06	2100	1	0.001	48	6	15	6	365	3.68E-11	1.00E-01	0.000000004	0.00
toluene	0.002	1E-06	2100	1	0.001	48	6	15	6	365	3.68E-11	2.00E-01	0.000000002	0.00
arsenic	4.7	1E-06	2100	1	0.001	48	6	15	6	365	8.65E-08	3.00E-04	0.0002884384	80.69
beryllium	0.3	1E-06	2100	1	0.001	48	6	15	6	365	8.62E-09	5.00E-03	0.0000011047	0.31
silver	0.8	1E-06	2100	1	0.001	48	6	15	6	365	1.47E-08	5.00E-03	0.0000029468	0.82
vanadium	24.5	1E-06	2100	1	0.001	48	6	15	6	365	4.61E-07	7.00E-03	0.0000844384	18.00
zinc	16.2	1E-06	2100	1	0.001	48	6	15	6	365	2.98E-07	3.00E-01	0.0000009842	0.28
TOTAL													0.0003678219	100.00

File: SDDC.W01

SEDIMENT DERMAL CONTACT RISK ASSESSMENT
 OPERABLE UNIT NO. 8 (SITE 10)
 REMEDIAL INVESTIGATION CTO-0274
 MCS CAMP LEJEUNE, NORTH CAROLINA
 FUTURE RESIDENTIAL ADULT

The intake from dermal contact to sediment is calculated as follows:

$$\text{Intake (mg/kg-day)} = C * CF * SA * AF * Abs * EF * ED / BW * ATc \text{ or } ATnc * DY$$

$$\text{Risk} = \text{Intake} * CSF \text{ or } RID$$

Where:	INPUTS
C = contaminant concentration in soil (mg/kg)	1.00E-06
CF = conversion factor for kg to mg	8300
SA = exposed skin surface area (cm ²)	1
AF = sediment to skin adherence factor (mg/cm ²)	Specific
Abs = fraction absorbed (unitless) (contaminant specific)	48
EF = exposure frequency (events/yr)	30
ED = exposure duration (years)	70
BW = body weight (kg)	70
ATc = averaging time for carcinogen (yr)	30
ATnc = averaging time for noncarcinogen (yr)	365
DY = day per year (day/yr)	Specific
CSF = cancer slope factor (mg/kg-day) ⁻¹	Specific
RID = reference dose (mg/kg-day)	Specific

Note: Inputs are scenario and site specific

Contaminant	Concentration Carcinogen (mg/kg)	Conversion Factor (kg/mg)	Surface Area (cm ²)	Adherence Factor (mg/cm ²)	Fraction Absorbed (%)	Exposure Frequency (events/yr)	Exposure Duration (yrs)	Body Weight (kg)	Average Carc Time (years)	Days per year (day/year)	Carc Dose (mg/kg/day)	Slope Factor (mg/kg-day) ⁻¹	Carcinogenic Risk Adult	Percent Carcinogenic Risk
arsenic	4.7	1E-06	8300	1	0.001	48	30	70	70	365	3.14E-08	1.78E+00	5.50E-08	86.44
beryllium	0.3	1E-06	8300	1	0.001	48	30	70	70	365	2.00E-09	4.30E+00	8.82E-09	13.56
TOTAL													6.38E-08	100.00

Contaminant	Concentration Noncarcinogen (mg/kg)	Conversion Factor (kg/mg)	Surface Area (cm ²)	Adherence Factor (mg/cm ²)	Fraction Absorbed (%)	Exposure Frequency (events/yr)	Exposure Duration (yrs)	Body Weight (kg)	Average Noncarc Time (years)	Days per year (day/year)	Noncarc Dose (mg/kg/day)	Reference Dose (mg/kg-day)	Noncarcinogenic Risk Adult	Percent Noncarcinogenic Risk
Carbon disulfide	0.002	1E-06	8300	1	0.001	48	30	70	30	365	3.12E-11	1.00E-01	0.000000003	0.00
toluene	0.002	1E-06	8300	1	0.001	48	30	70	30	365	3.12E-11	2.00E-01	0.000000002	0.00
arsenic	4.7	1E-06	8300	1	0.001	48	30	70	30	365	7.33E-08	3.00E-04	0.0002442898	80.59
beryllium	0.3	1E-06	8300	1	0.001	48	30	70	30	365	4.08E-09	5.00E-03	0.0000008358	0.31
silver	0.8	1E-06	8300	1	0.001	48	30	70	30	365	1.25E-08	5.00E-03	0.0000024949	0.82
vanadium	24.5	1E-06	8300	1	0.001	48	30	70	30	365	3.82E-07	7.00E-03	0.0000545753	18.00
zinc	18.2	1E-06	8300	1	0.001	48	30	70	30	365	2.63E-07	3.00E-01	0.0000008420	0.28
TOTAL													0.0000031378	100.00

File: SDDC.W02

APPENDIX O
FIELD DATA SHEETS

APPENDIX O.1
TERRESTRIAL

ECOLOGICAL EVALUATION
FIELD DATA SHEET - TERRESTRIAL

Project Name: Habitat Evaluation

Location: MCB Camp Lejeune, Jacksonville NC

Date: 12/6/94

Sampling Location: Mitford Point Burn Dump

Data Collected By: LES, CDC

Habitat Type: Deciduous forest

Vegetation: Deciduous trees with scattered pines

Trees:

Dominant Species:

- | | |
|-------------------------|-----------|
| 1. _____ | 6. _____ |
| 2. <u>none dominant</u> | 7. _____ |
| 3. _____ | 8. _____ |
| 4. _____ | 9. _____ |
| 5. _____ | 10. _____ |

Secondary Species:

- | | |
|--|--|
| 1. <u>Loblolly - Pinus taeda</u> | 6. <u>Magnolia - Magnolia grandifolia</u> |
| 2. <u>Water oak - Quercus nigra</u> | 7. <u>Tulip Poplar - Liriodendron tulipifera</u> |
| 3. <u>Sweetgum - Liquidambar</u> | 8. <u>Red maple - Acer rubrum</u> |
| 4. <u>Sycamore - Platanus occidentalis</u> | 9. _____ |
| 5. <u>Southern red oak - Quercus falcata</u> | 10. _____ |

Saplings/Shrubs:

Dominant Species:

- | | |
|-------------------------|-----------|
| 1. _____ | 6. _____ |
| 2. _____ | 7. _____ |
| 3. <u>none dominant</u> | 8. _____ |
| 4. _____ | 9. _____ |
| 5. _____ | 10. _____ |

Secondary Species:

- | | |
|--|-----------|
| 1. <u>Sweet myrtle - ^{myrica} Ceratola</u> | 6. _____ |
| 2. <u>beauty berry - ^{Callicarpa} americana</u> | 7. _____ |
| 3. <u>juniper - ^{Juniperus} virginiana</u> | 8. _____ |
| 4. <u>blue berry - ^{Vaccinium} sp.</u> | 9. _____ |
| 5. _____ | 10. _____ |

Woody Vines:

Dominant Species:

- | | |
|-------------------------|-----------|
| 1. _____ | 6. _____ |
| 2. <u>none dominant</u> | 7. _____ |
| 3. _____ | 8. _____ |
| 4. _____ | 9. _____ |
| 5. _____ | 10. _____ |

Secondary Species:

- | | |
|---|-----------|
| 1. <u>greenbriar - ^{Smilax} rotundifolia</u> | 6. _____ |
| 2. <u>bullbriar - ^{Smilax} bona-nox</u> | 7. _____ |
| 3. _____ | 8. _____ |
| 4. _____ | 9. _____ |
| 5. _____ | 10. _____ |

Herbs:

Dominant Species:

- | | |
|-------------------------|-----------|
| 1. _____ | 6. _____ |
| 2. _____ | 7. _____ |
| 3. <u>none dominant</u> | 8. _____ |
| 4. _____ | 9. _____ |
| 5. _____ | 10. _____ |

Secondary Species:

- | | |
|-------------------------------------|-----------|
| 1. <u>little on floor of forest</u> | 6. _____ |
| 2. <u>except at edges where</u> | 7. _____ |
| 3. <u>scotone plants invade</u> | 8. _____ |
| 4. _____ | 9. _____ |
| 5. _____ | 10. _____ |

Birds: _____

Time: _____

Weather Conditions:

<u>Species</u>	<u>Sex</u>	<u>Feeding</u>	<u>Nesting</u>	<u>Approx. No.</u>
1. junco	-	Junco hyemalis		
2. kingfisher	-	Megascops asio		
3. mourning dove	-	Zenaidura macroura		
4. great blue heron	-	Ardea herodias		
5. red-bellied woodpecker	-	Melanerpes carolinus		
6. downy woodpecker	-	Picoides pubescens		
7. Carolina chickadee	-	Parus carolinensis		
8. osprey	-	Pandion haliaetus		
9. great horned owl	-	Bubo virginianus		
Flicker	-	Colaptes auratus		

10. _____

Mammals: _____

Time: _____

Weather Conditions:

<u>Species</u>	<u>Observed</u>	<u>Sign</u>	<u>Adult/Juvenile</u>	<u>Sex</u>
1.	<u>white-tailed deer - Odocoileus virginianus</u>			
2.	_____			
3.	_____			
4.	_____			
5.	_____			
6.	_____			
7.	_____			
8.	_____			
9.	_____			
10.	_____			

Reptiles and Amphibians: _____

Time: _____

Weather Conditions:

<u>Species</u>	<u>Observed</u>	<u>Sign</u>	<u>Adult/Juvenile</u>	<u>Sex</u>
1.	<u>Anole - Anole Carolinensis</u>			
2.	<u>Southern toad toad -</u>			
3.	_____			
4.	_____			
5.	_____			
6.	_____			

7.

8.

9.

10.

Miscellaneous Notes:

ECOLOGICAL EVALUATION
FIELD DATA SHEET - TERRESTRIAL

Project Name: Habitat Evaluation

Location: MCB Camp Lejeune, Jacksonville, NC

Date: 12/6/94

Sampling Location: Montford Point Burn Dump

Data Collected By: YSS, CDC

Habitat Type: Pine Forest

Vegetation: Pines, little understory or floor veg.

Trees:

Dominant Species:

- | | |
|---------------------------------|-----------|
| 1. _____ | 6. _____ |
| 2. <u>Loblolly pine - Pinus</u> | 7. _____ |
| 3. <u>taeda</u> | 8. _____ |
| 4. _____ | 9. _____ |
| 5. _____ | 10. _____ |

Secondary Species:

- | | |
|----------------|-----------|
| 1. _____ | 6. _____ |
| 2. <u>none</u> | 7. _____ |
| 3. _____ | 8. _____ |
| 4. _____ | 9. _____ |
| 5. _____ | 10. _____ |

Saplings/Shrubs:

Dominant Species:

- | | |
|----------------------------|-----------|
| 1. _____ | 6. _____ |
| 2. _____ | 7. _____ |
| 3. <i>none - except</i> | 8. _____ |
| 4. <i>young Crotalaria</i> | 9. _____ |
| 5. _____ | 10. _____ |

Secondary Species:

- | | |
|----------------|-----------|
| 1. _____ | 6. _____ |
| 2. <i>none</i> | 7. _____ |
| 3. _____ | 8. _____ |
| 4. _____ | 9. _____ |
| 5. _____ | 10. _____ |

Woody Vines:

Dominant Species:

- | | |
|----------------|-----------|
| 1. _____ | 6. _____ |
| 2. _____ | 7. _____ |
| 3. <i>none</i> | 8. _____ |
| 4. _____ | 9. _____ |
| 5. _____ | 10. _____ |

Secondary Species:

- | | |
|----------------|-----------|
| 1. _____ | 6. _____ |
| 2. _____ | 7. _____ |
| 3. <i>none</i> | 8. _____ |
| 4. _____ | 9. _____ |
| 5. _____ | 10. _____ |

Herbs:

Dominant Species:

- Andropogon*
1. Broom sedge - virginicus 6. _____
 2. Bushy beardgrass - A. 7. _____
 3. _____ *glomeratus* 8. _____
 4. _____ 9. _____
 5. _____ 10. _____

Secondary Species:

1. _____ 6. _____
2. _____ 7. _____
3. _____ *now* 8. _____
4. _____ 9. _____
5. _____ 10. _____

Birds: _____

Time: _____

Weather Conditions:

<u>Species</u>	<u>Sex</u>	<u>Feeding</u>	<u>Nesting</u>	<u>Approx. No.</u>
1.	_____	_____	_____	_____
2.	_____	_____	_____	_____
3.	_____	_____	_____	_____
4.	_____	<i>linked with deciduous forest</i>		_____
5.	_____	_____	_____	_____
6.	_____	_____	_____	_____
7.	_____	_____	_____	_____
8.	_____	_____	_____	_____
9.	_____	_____	_____	_____

10. _____

Mammals: _____

Time: _____

Weather Conditions:

<u>Species</u>	<u>Observed</u>	<u>Sign</u>	<u>Adult/Juvenile</u>	<u>Sex</u>
1.	_____	_____	_____	_____
2.	_____	_____	_____	_____
3.	_____	_____	_____	_____
4.	_____	_____	_____	_____
5.	_____	_____	_____	_____
6.	_____	_____	_____	_____
7.	_____	_____	_____	_____
8.	_____	_____	_____	_____
9.	_____	_____	_____	_____
10.	_____	_____	_____	_____

listed with deciduous forest

Reptiles and Amphibians: _____

Time: _____

Weather Conditions:

<u>Species</u>	<u>Observed</u>	<u>Sign</u>	<u>Adult/Juvenile</u>	<u>Sex</u>
1.	_____	_____	_____	_____
2.	_____	_____	_____	_____
3.	_____	_____	_____	_____
4.	_____	_____	_____	_____
5.	_____	_____	_____	_____
6.	_____	_____	_____	_____

listed with deciduous forest

- 7. _____
- 8. _____
- 9. _____
- 10. _____

Miscellaneous Notes:

ECOLOGICAL EVALUATION
FIELD DATA SHEET - TERRESTRIAL

Project Name: Habitat Evaluation

Location: MCB Camp Lejeune, Jacksonville, NC

Date: 12/6/94

Sampling Location: Montford Point Burn Dump

Data Collected By: ZSS, CDC

Habitat Type: Ecotone - between forest and open area

Vegetation: _____

Trees:

Dominant Species:

- | | |
|----------------|-----------|
| 1. _____ | 6. _____ |
| 2. _____ | 7. _____ |
| 3. <u>none</u> | 8. _____ |
| 4. _____ | 9. _____ |
| 5. _____ | 10. _____ |

Secondary Species:

- | | |
|----------------|-----------|
| 1. _____ | 6. _____ |
| 2. <u>none</u> | 7. _____ |
| 3. _____ | 8. _____ |
| 4. _____ | 9. _____ |
| 5. _____ | 10. _____ |

Saplings/Shrubs:

Dominant Species:

- | | |
|-------------------------|-----------|
| 1. _____ | 6. _____ |
| 2. _____ | 7. _____ |
| 3. <u>none dominant</u> | 8. _____ |
| 4. _____ | 9. _____ |
| 5. _____ | 10. _____ |

Secondary Species:

- | | |
|--|--|
| 1. <u>loblolly - Pinus taeda</u> | 6. <u>Sweet myrtle - Myrica caroliniana</u> |
| 2. <u>Privet - Ligustrum ^{judgare}</u> | 7. <u>Sweet gum - Liquidambar _{styraciflua}</u> |
| 3. <u>Red bay - Persea borbonia</u> | 8. _____ |
| 4. <u>Blackberry - Rubus sp.</u> | 9. _____ |
| 5. <u>Sassafras - ^{Sassafras} albidum</u> | 10. _____ |

Woody Vines:

Dominant Species:

- | | |
|-------------------------|-----------|
| 1. _____ | 6. _____ |
| 2. <u>none dominant</u> | 7. _____ |
| 3. _____ | 8. _____ |
| 4. _____ | 9. _____ |
| 5. _____ | 10. _____ |

Secondary Species:

- | | |
|---|-----------|
| 1. <u>Green briar - Smilax ^{rotundifolia}</u> | 6. _____ |
| 2. <u>Bull briar - Smilax ^{nox} bona-</u> | 7. _____ |
| 3. <u>Mars-leaved Smilax ^{Smilax}</u> | 8. _____ |
| 4. _____ | 9. _____ |
| 5. <u>Smilax smallii</u> | 10. _____ |

Herbs:

Dominant Species:

- | | |
|-------------------------|-----------|
| 1. <u>none dominant</u> | 6. _____ |
| 2. _____ | 7. _____ |
| 3. _____ | 8. _____ |
| 4. _____ | 9. _____ |
| 5. _____ | 10. _____ |

Secondary Species:

- | | |
|--|--|
| 1. <u>Ladies Thumb - ^{Polygonum} persicaria</u> | 6. <u>Brome sedge - ^{Andropogon} virginicus</u> |
| 2. <u>Shepherd's purse - ^{Capsella} bursa-pastoris</u> | 7. <u>Dog fennel - ^{Eupatorium} capillifolium</u> |
| 3. <u>Mock-bishop's weed - ^{Ptilimnium} capillaceum</u> | 8. <u>Indian strawberry - ^{Duchesnea} indica</u> |
| 4. <u>Goosegrass - ^{Eleusine} indica</u> | 9. <u>Slender bush clover - ^{Lespedeza} virginica</u> |
| 5. <u>Bushy beardgrass - ^{Andropogon}</u> | 10. <u>Yucca - ^{Yucca} filamentosa</u> |
| <u>Ebony spleenwort - ^{Adiantum} platyneuron</u> | <u>Great mullein - ^{Verbascum} thapsus</u> |
| <u>Lyre-leaved sage - ^{Salvia} lyrata</u> | <u>Pussy toes - ^{Antennaria} sp.</u> |

Birds: _____

Time: _____

Weather Conditions:

<u>Species</u>	<u>Sex</u>	<u>Feeding</u>	<u>Nesting</u>	<u>Approx. No.</u>
1.	_____	_____	_____	_____
2.	_____	_____	_____	_____
3.	_____	_____	_____	_____
4.	<u>listd with deciduous forest</u>			
5.	_____	_____	_____	_____
6.	_____	_____	_____	_____
7.	_____	_____	_____	_____
8.	_____	_____	_____	_____
9.	_____	_____	_____	_____

10. _____

Mammals: _____

Time: _____

Weather Conditions:

<u>Species</u>	<u>Observed</u>	<u>Sign</u>	<u>Adult/Juvenile</u>	<u>Sex</u>
1.	_____	_____	_____	_____
2.	_____	_____	_____	_____
3.	_____	_____	_____	_____
4.	_____	_____	_____	_____
5.	_____	_____	_____	_____
6.	_____	_____	_____	_____
7.	_____	_____	_____	_____
8.	_____	_____	_____	_____
9.	_____	_____	_____	_____
10.	_____	_____	_____	_____

listed with deciduous forest

Reptiles and Amphibians: _____

Time: _____

Weather Conditions:

<u>Species</u>	<u>Observed</u>	<u>Sign</u>	<u>Adult/Juvenile</u>	<u>Sex</u>
1.	_____	_____	_____	_____
2.	_____	_____	_____	_____
3.	_____	_____	_____	_____
4.	_____	_____	_____	_____
5.	_____	_____	_____	_____
6.	_____	_____	_____	_____

listed with deciduous forest

7.

8.

9.

10.

Miscellaneous Notes:

This ecotone area surrounds a clearing which is very sparsely vegetated to lacking in vegetation. Large areas of bare sand are present with grasses along the edges.

APPENDIX O.2
SURFACE WATER AND SEDIMENT

SAMPLING STATION CHARACTERIZATION DATA SHEET

Station Number: 16-NC-01 SW/SD Date: 6-27-94 Time: 0842 (SD)
 Samplers: AMB, JEZ Date: 6-27-94 Time: 0850 (SD)
 Water Body: Northeast Creek State: NC County: Onslow
 Sample Type: Fish Benthic Macroinvertebrate Sediment Surface Water
 SAMPLING EQUIPMENT: Seine Gill Net Ponar Kemmerer Sediment Corer Spoon Other: Dip

Riparian Zone/Instream Features

Predominant Surrounding Land Use: Forest Urban Industrial Other: _____

Shore Vegetation: _____

Aquatic Vegetation: NONE

Estimated Stream Width: 1/2 mile ft Est. Stream Depth: 1M ft Riffle: — ft Run: 1006 ft Pool: — ft

Stream Type: Cold Water Warm Water Velocity: _____ Channelized: Yes ___ No X

Canopy Cover: Open Partly Open Partly Shaded Shaded

Sediment/Substrate:

Sediment Odors: Normal Sewage Petroleum Chemical Anaerobic Other: _____

Sediment Oils: Absent Slight Moderate Profuse HNu

Ponar Grab: Number of Jars Filled with Sediments Replicate: #1: _____ Replicate #2: _____ Replicate #3: _____

Sediment Description: SAND, fine to medium grained w/ trace silt and some medium grained gravel. SANDY CLAY 6"-12" in core.

Water:

Depth	Temp. °C	pH (s.u.)	Dissolved Oxygen (mg/L)	Conductivity (micromhos/cm)	Salinity (ppt)
Surface	24.9	7.8	5.6	31,800	27

Water Odors: Normal Sewage Petroleum Chemical Other: _____

Water Surface Oils: Slick Sheen None Secchi: NA ft.

Turbidity: Clear Slightly Turbid Turbid Opaque Water Color: Brown

Weather Conditions: cloudy, very windy, humid temp in 70's Tide: In Out

Comments: _____
used stainless steel sampling spoon to collect sample.

SAMPLING STATION CHARACTERIZATION DATA SHEET

Station Number: 16-NC-SW/SD02 Date: 6-27-94 (sw) Time: 0800
 Samplers: AMB, JEZ Date: 6-26-94 (SD) Time: _____
 Water Body: Northwest Creek State: NC County: Onslow
 Sample Type: Fish Benthic Macroinvertebrate Sediment Surface Water
 SAMPLING EQUIPMENT: Seine Gill Net Ponar Kemmerer Sediment Corer Spoon Other: Pin method

Riparian Zone/Instream Features

Predominant Surrounding Land Use: Forest Urban Industrial Other: _____

Shore Vegetation: _____

Aquatic Vegetation: NONE

Estimated Stream Width: 1/2 mile Est. Stream Depth: 4M ft Riffle: — ft Run: 1006 ft Pool: — ft

Stream Type: Cold Water Warm Water Velocity: _____ Channelized: Yes No

Canopy Cover: Open Partly Open Partly Shaded Shaded

Sediment/Substrate:

Sediment Odors: Normal Sewage Petroleum Chemical Anaerobic Other: _____

Sediment Oils: Absent Slight Moderate Profuse HNu

Ponar Grab: Number of Jars Filled with Sediments Replicate: #1: NA Replicate #2: NA Replicate #3: NA

Sediment Description: SAND, fine to medium grained w/ trace silt and fine grained gravel. Rooted material (peat like) is also present

Water:

Depth	Temp. °C	pH (s.u.)	Dissolved Oxygen (mg/L)	Conductivity (micromhos/cm)	Salinity (ppt)
Surface	28.1	7.8	4.7	32,800	23

Water Odors: Normal Sewage Petroleum Chemical Other: _____

Water Surface Oils: Slick Sheen None Secchi: NA ft.

Turbidity: Clear Slightly Turbid Turbid Opaque Water Color: Brown

Weather Conditions: cloudy, very windy, humid (temp in 70's) Tide: In Out

Comments: used sediment corer

SAMPLING STATION CHARACTERIZATION DATA SHEET

Station Number: 16-NC-SW/SD 03 Date: 6-26-94 (sw) Time: 1555 (sw)
 Samplers: A.M.B. J.F.Z Date: 6-26-94 (SD) Time: 1605 (SD)
 Water Body: Northeast Creek State: NC County: DuSlo

Sample Type: Fish Benthic Macroinvertebrate Sediment Surface Water
 SAMPLING EQUIPMENT: Seine Gill Net Ponar Kemmerer Sediment Corer Spoon Other: Dip net/rod

Riparian Zone/Instream Features

Predominant Surrounding Land Use: Forest Urban Industrial Other: _____

Shore Vegetation: _____

Aquatic Vegetation: NONE

Estimated Stream Width: 1/2 mile Est. Stream Depth: _____ ft Riffle: _____ ft Run: 1006 ft Pool: _____ ft

Stream Type: Cold Water Warm Water Velocity: negligible Channelized: Yes ___ No X

Canopy Cover: Open Partly Open Partly Shaded Shaded

Sediment/Substrate:

Sediment Odors: Normal Sewage Petroleum Chemical Anaerobic Other: _____

Sediment Oils: Absent Slight Moderate Profuse HNu

Ponar Grab: Number of Jars Filled with Sediments Replicate: #1: NA Replicate #2: NA Replicate #3: NA

Sediment Description: SAND, fine grained w/ trace silt. Trace of fine gravel

Water:

Depth	Temp. °C	pH (s.u.)	Dissolved Oxygen (mg/L)	Conductivity (micromhos/cm)	Salinity (ppt)
<u>Surface</u>	<u>29.2</u>	<u>8.0</u>	<u>6.8</u>	<u>32,500</u>	<u>29</u>

Water Odors: Normal Sewage Petroleum Chemical Other: _____

Water Surface Oils: Slick Sheen None Secchi: NA ft.

Turbidity: Clear Slightly Turbid Turbid Opaque Water Color: Brown/Yellow

Weather Conditions: Storm is gathering. Breezy rain begins Tide: In Out

Comments: oxidation is evident at bottom of core 6-12"

SAMPLING STATION CHARACTERIZATION DATA SHEET

Station Number: 16-NC-SW/SD05 Date: 6-26-94 Time: 1415 (SW)
 Samplers: AMB, JEZ Date: 6-26-94 Time: 1430 (SD)
 Water Body: Northwest Creek State: NC County: Onslow

Sample Type: Fish Benthic Macroinvertebrate Sediment Surface Water

SAMPLING EQUIPMENT: Seine Gill Net Ponar Kemmerer Sediment Core Spoon Other: Dip Net Method

Riparian Zone/Instream Features

Predominant Surrounding Land Use: Forest Urban Industrial Other: _____

Shore Vegetation: _____

Aquatic Vegetation: _____

Estimated Stream Width: 1/2 mile Est. Stream Depth: NM ft Riffle: — ft Run: 100% Pool: — ft

Stream Type: Cold Water Warm Water Velocity: NM Channelized: Yes — No X

Canopy Cover: Open Partly Open Partly Shaded Shaded

Sediment/Substrate:

Sediment Odors: Normal Sewage Petroleum Chemical Anaerobic Other: _____

Sediment Oils: Absent Slight Moderate Profuse HNu

Ponar Grab: Number of Jars Filled with Sediments Replicate: #1: _____ Replicate #2: _____ Replicate #3: _____

Sediment Description: SILTY CLAY w/ oxidation present

Water:

Depth	Temp. °C	pH (s.u.)	Dissolved Oxygen (mg/L)	Conductivity (micromhos/cm)	Salinity (ppt)
Surface	30.9	7.99	7.3	32,200	30

Water Odors: Normal Sewage Petroleum Chemical Other: _____

Water Surface Oils: Slick Sheen None Secchi: NA ft.

Turbidity: Clear Slightly Turbid Turbid Opaque Water Color: Brown/Yellow

Weather Conditions: partly cloudy, warm, humid, breezy Temp: in 80's Tide: In Out

Comments: Due to resistance of CLAYEY soil could not use sediment corer. used stainless steel spoon instead

SAMPLING STATION CHARACTERIZATION DATA SHEET

Station Number: 16+NC-SW/SD04 Date: 6-26-94(Su) Time: 1502(Su)
 Samplers: AMB, JIEZ Date: 6-26-94(SD) Time: 1525(SD)
 Water Body: Northeast Creek State: NC County: Onslow

Sample Type: Fish Benthic Macroinvertebrate Sediment Surface Water

SAMPLING EQUIPMENT: Seine Gill Net Ponar Kemmerer Sediment Corer Spoon Other: Dip net/bod.

Riparian Zone/Instream Features

Predominant Surrounding Land Use: Forest Urban Industrial Other: _____

Shore Vegetation: _____

Aquatic Vegetation: _____

Estimated Stream Width: 1/4 mile Est. Stream Depth: 11m ft Riffle: — ft Run: 1006 ft Pool: — ft

Stream Type: Cold Water Warm Water Velocity: 11m Channelized: Yes — No X

Canopy Cover: Open Partly Open Partly Shaded Shaded

Sediment/Substrate:

Sediment Odors: Normal Sewage Petroleum Chemical Anaerobic Other: _____

Sediment Oils: Absent Slight Moderate Profuse HNu

Ponar Grab: Number of Jars Filled with Sediments Replicate: #1: NA Replicate #2: NA Replicate #3: NA

Sediment Description: SAND, fine grained w/ trace silt and some fine grain gravel

Water:

Depth	Temp. °C	pH (s.u.)	Dissolved Oxygen (mg/L)	Conductivity (micromhos/cm)	Salinity (ppt)
Surface	30.1	8.0	7.2	33,000	30

Water Odors: Normal Sewage Petroleum Chemical Other: _____

Water Surface Oils: Slick Sheen None Secchi: NA ft.

Turbidity: Clear Slightly Turbid Turbid Opaque Water Color: Brown/Yellow

Weather Conditions: partly cloudy, breezy, warm, humid Tide: In Out
80's

Comments: _____

APPENDIX P
ENDANGERED SPECIES SURVEY

Critical species list - Camp Lejeune endangered species and special-interest communities survey

Principal Investigator: Richard LeBlond, 326-1440.

List current as of 9-30-91.
Replaces list of 6-30-91.

"?" = Species names followed by a "?" are less than confidently identified. They are nonetheless caught in this biological safety net, the mesh size of which errs on the side of diversity. Until identification is confirmed (most of these are represented by a specimen), these site records should be regarded as tentative.

Species sites are listed chronologically under the species name; with the 1990 month and day of discovery listed first, followed by the site's sector site number, community type and UTM grid number. Sites documented prior to the start of the current survey are indicated by the parenthetical date of discovery following the site name (see Rhexia aristosa at FD-1). Prior sites not yet relocated during the current survey are indicated by "---" in the date column (see Rhynchospora tracyi at FD-1).

Status codes. Federal status is listed first, and separated from the state status by a comma; e.g., Rhexia aristosa FC2,T (Federal Candidate level 2, state Threatened). Species with state status only are indicated by a single code without comma; e.g., Rhynchospora tracyi SR (Significantly Rare).

- FE = Federal Endangered
- FT = Federal Threatened
- FC1 = Federal Candidate level 1. At risk. Listing warranted but precluded by higher priorities.
- FC2 = Federal Candidate level 2. Vulnerable. Listing warranted but precluded by higher priorities.
- FC3 = Federal Candidate level 3C. More abundant and/or less threatened than previously known.
- E = State Endangered
- T = State Threatened
- SC = State Special Concern
- C = State Candidate
- SR = State Significantly Rare
- W = State Watch List (W1)
- W3 = " " " , undocumented state occurrence prior to Lejeune site.

proposed = proposed for listing as State Candidate, Significantly Rare or Watch List based on current evidence

List of species and communities by sector - Camp Lejeune
endangered species and special-interest communities survey

List current as of 9-30-91.
 Replaces list of 6-30-91.

		<u>Status</u>	<u>UTM Grid</u>
<u>SECTOR E</u>			
E-1	Upper Beach Amaranthus pumilus (1988)	FC2,T	907266- 949297
E-5	Brackish Marsh Parietaria praetermissa Solanum pseudogracile	W W	860237
<u>SECTOR F</u>			
FA-1	Depression Meadow Aristida palustris Burmannia biflora Panicum tenerum Rhexia aristosa Rhynchospora wrightiana	SR W SR FC2,T W	878409
FA-2	Road Meadow Rhynchospora nitens Rhynchospora pusilla	W W	895385
FA-4	Depression Meadow Aristida palustris Coelorachis rugosa Dichanthelium erectifolium Rhexia aristosa Rhynchospora harperi	SR W SR FC2,T C	883407
FB-1	Wet Pine Flatwoods Amphicarpum purshii Lysimachia loomisii Panicum tenerum Xyris difformis var. curtissii	SR W SR W	927413
FB-2	Road Meadow Rhynchospora pusilla Rhynchospora nitens	W W	926409
FB-3	Wet Pine Flatwoods Lysimachia loomisii Pleea tenuifolia Scleria minor Tofieldia glabra	W W SR FC2,C	937416

(FB-3 cont.)			
	<i>Xyris difformis</i> var. <i>curtissii</i>	W	
	<i>Xyris elliottii</i>	SR	
FB-4	Wet Pine Flatwoods		939426
	<i>Lysimachia loomisii</i>	W	
	<i>Rhynchospora harveyi</i>	W	
	<i>Rhynchospora pusilla</i>	W	
	<i>Scleria minor</i>	SR	
FC-2	Flatwood/Swamp Ecotone		922413
	<i>Anthaenantia rufa</i>	W	
	<i>Helianthus heterophyllus</i>	W	
	<i>Lysimachia loomisii</i>	W	
	<i>Oxypolis ternata</i>	FC2, T	
FC-3	Depression Meadow	‡	918318
	<i>Aristida palustris</i>	SR	
	<i>Bartonia verna</i>	W	
	<i>Burmannia biflora</i>	W	
	<i>Dichanthelium erectifolium</i>	SR	
	<i>Litsea aestivalis</i>	FC2, C	
	<i>Muhlenbergia torreyana</i>	F3C, E	
	<i>Paspalum praecox</i>	W	
	<i>Rhexia aristosa</i>	FC2, T	
	<i>Rhynchospora cephalantha</i> f. <i>antrorsa</i>	unusual/rare	
	<i>Rhynchospora tracyi</i>	SR	
FC-4	Pocosin Ecotone		919376
	<i>Andropogon capillipes</i>	W	
	<i>Gentiana autumnalis</i>	W	
FD-1	Cypress Savanna		904377
	<i>Agalinis linifolia</i>	SR	
	<i>Anthaenantia rufa</i>	W	
	<i>Aristida palustris</i>	SR	
	<i>Bartonia verna</i>	W	
	<i>Burmannia biflora</i>	W	
	<i>Carex verrucosa</i>	SR	
	<i>Coelorachis rugosa</i>	W	
	<i>Dichanthelium</i> sp. 1 = <i>Panicum hirstii</i>	FC2, C	
	<i>Dichanthelium erectifolium</i>	SR	
	<i>Lobelia boykinii</i>	FC2, C	
	<i>Lysimachia loomisii</i>	W	
	<i>Muhlenbergia torreyana</i>	F3C, E	
	<i>Panicum tenerum</i>	SR	
	<i>Paspalum praecox</i>	W	
	<i>Rhexia aristosa</i>	FC2, T	
	<i>Rhynchospora cephalantha</i> f. <i>antrorsa</i>	unusual/rare	
	<i>Rhynchospora harperi</i>	C	
	<i>Rhynchospora tracyi</i> (1984)	SR	
	<i>Rhynchospora wrightiana</i>	W	
	<i>Scleria georgiana</i>	C	
	<i>Sporanthes laciniata</i>	C	

(FD-1 cont.)

Xyris baldwiniana	W	
FD-3 Small Depression Pond		899378
Carex verrucosa	SR	
Eleocharis equisetoides	SR	

SECTOR G

G-10 Pocosin Ecotone		929348
Lysimachia asperulifolia	FE,E	

GA-1 Depression Meadow, Wet Pine Flatwoods		894359
Agalinis linifolia	SR	
Andropogon capillipes	W	
Aristida palustris	SR	
Burmannia biflora	W	
Dichanthelium erectifolium	SR	
Eleocharis equisetoides	SR	
Eleocharis melanocarpa	C	
Gentiana autumnalis	W	
Panicum tenerum	SR	
Rhexia aristosa	FC2,T	
Rhynchospora tracyi	SR	
Scleria georgiana	C	

GA-2 Depression Meadow		896360
Andropogon capillipes	W	
Agalinis linifolia	SR	
Aristida palustris	SR	
Burmannia biflora	W	
Dichanthelium erectifolium	SR	
Panicum tenerum	SR	
Pleea tenuifolia	W	
Rhexia aristosa	FC2,T	
Rhynchospora wrightiana	W	
Scleria georgiana	C	

GA-3 Cypress Savanna		898360
Agalinis linifolia	SR	
Andropogon capillipes	W	
Aristida palustris	SR	
Burmannia biflora	W	
Carex verrucosa	SR	
Coelorachis rugosa	W	
Dichanthelium erectifolium	SR	
Eleocharis equisetoides	SR	
Panicum tenerum	SR	
Paspalum praecox	W	
Rhexia aristosa	FC2,T	
Rhynchospora pusilla	W	
Rhynchospora tracyi	SR	
Scleria georgiana	C	

GA-4	Savanna		899349
	<i>Asclepias pedicellata</i>	C	
	<i>Dichanthelium erectifolium</i>	SR	
	<i>Dionaea muscipula</i>	FC2, C-SC	
	<i>Lysimachia loomisii</i>	W	
	<i>Oxypolis ternata</i>	FC2, C	
	<i>Pleea tenuifolia</i>	W	
	<i>Polygala brevifolia</i>	W	
	<i>Polygala hookeri</i>	C	
	<i>Rhynchospora pallida</i>	SR	
	<i>Sarracenia rubra</i> ssp. <i>rubra</i>	W	
	<i>Solidago pulchra</i>	FC2, C	
	<i>Tofieldia glabra</i>	FC2, C	
	<i>Xyris baldwiniana</i>	W	
GA-5	Depression Meadow		901361
	<i>Agalinis linifolia</i>	SR	
	<i>Anthaenantia rufa</i>	W	
	<i>Aristida palustris</i>	SR	
	<i>Burmannia biflora</i>	W	
	<i>Carex verrucosa</i>	SR	
	<i>Dichanthelium erectifolium</i>	SR	
	<i>Eleocharis equisetoides</i>	SR	
	<i>Panicum tenerum</i>	SR	
	<i>Paspalum praecox</i>	W	
	<i>Rhexia aristosa</i>	FC2, T	
	<i>Rhynchospora inundata</i>	W	
	<i>Rhynchospora tracyi</i>	SR	
	<i>Xyris smalliana</i>	W	
GB-1	Wet Pine Flatwoods/Small Stream Pocosin		908376
	<i>Rhynchospora elliottii</i>	W	
GB-2	Road Meadow		907376
	<i>Agalinis virgata</i>	C	
GB-3	Road Meadow		929368
	<i>Calopogon barbatus</i>	W	
	<i>Dionaea muscipula</i>	FC2, C-SC	
	<i>Solidago pulchra</i>	FC2, C	
GB-4	Road Meadow		931365
	<i>Dionaea muscipula</i>	FC2, C-SC	
	<i>Rhynchospora pallida</i>	SR	
	<i>Solidago pulchra</i>	FC2, C	
GB-5	Wet Pine Flatwoods		932364
	<i>Dionaea muscipula</i>	FC2, C-SC	
	<i>Solidago pulchra</i>	FC2, C	
	<i>Tofieldia glabra</i>	FC2, C	

GB-6	Pocosin Ecotone Amphicarpum purshii Dionaea muscipula Solidago pulchra	SR FC2, C-SC FC2, C	935364
GB-7	Road Meadow Rhexia aristosa Solidago pulchra	FC2, T FC2, C	940364
GB-8	Road Meadow Bartonia verna Solidago pulchra Tofieldia glabra	W FC2, C FC2, C	932368
GB-9	Road Meadow Juncus validus	W	934362
GB-10	Road Depression Meadow Calopogon barbatus	W	918374
GC-1	Small Depression Pond Agalinis linifolia Aristida palustris Coelorachis rugosa Dichanthelium erectifolium Eleocharis tricostata Panicum tenerum Paspalum praecox Rhexia aristosa Rhynchospora tracyi	SR SR W SR W SR W FC2, T SR	946360
GC-2	Small Depression Pond Agalinis linifolia Aristida palustris Burmanna biflora Cladium mariscoides Dichanthelium erectifolium Eleocharis equisetoides Ludwigia linifolia Panicum tenerum Paspalum praecox Rhexia aristosa Rhynchospora harperi Rhynchospora pusilla Rhynchospora tracyi Scleria georgiana	SR SR W SR SR SR SR SR W FC2, T C W SR C	949357
GC-3	Pocosin Ecotone Amphicarpum purshii	SR	945342
GC-5	Depression Meadow Eleocharis tricostata Panicum tenerum	W SR	940345

GC-6.	Depression Meadow		942358
	Agalinis linifolia	SR	
	Aristida palustris	SR	
	Burmannia biflora	W	
	Coelorachis rugosa	W	
	Dichantherium erectifolium	SR	
	Litsea aestivalis	FC2,C	
	Panicum tenerum	SR	
	Paspalum praecox	W	
	Rhexia aristosa	FC2,T	
	Rhynchospora wrightiana	W	
	Scleria georgiana	C	
GC-7	Depression Meadow		942359
	Aristida palustris	SR	
	Litsea aestivalis	FC2,C	
	Panicum tenerum	SR	
	Rhexia aristosa	FC2,T	
	Rhexia cubensis	SR	
	Sarracenia rubra ssp. rubra	W	
GC-8	Small Depression Pond		947356
	Rhexia aristosa	FC2,T	
	Rhexia aristosa X cubensis	undescribed taxon	
	Rhexia cubensis	SR	
GC-9	Depression Meadow		949356
	Aristida palustris	SR	
	Coelorachis rugosa	W	
	Rhexia aristosa	FC2,T	
GC-10	Depression Meadow		948356
	Agalinis linifolia	SR	
	Aristida palustris	SR	
	Coelorachis rugosa	W	
	Eleocharis tricostata	W	
	Panicum tenerum	SR	
	Paspalum praecox	W	
	Rhexia aristosa	FC2,T	
	Rhynchospora tracyi	SR	
	Scleria georgiana	C	
GC-11	Flatwoods Road Meadow		949364
	Andropogon capillipes	W	
GC-12	Streamhead Pocosin		944348
	Amphicarpum purshii	SR	
	Dionaea muscipula	FC2,C-SC	
	Peltandra sagittifolia	SR	
	Rhynchospora pallida	SR	
	Solidago pulchra	FC2,C	
	Tofieldia glabra	FC2,C	

GD-1	Road Meadow		938326
	<i>Amphicarpum purshii</i>	SR	
	<i>Rhexia cubensis</i>	SR	
GD-2	Small Depression Pond		938335
	<i>Eleocharis tricostata</i>	W	
GD-3	Small Depression Pond		937335
	<i>Eleocharis vivipara</i>	W	
	<i>Litsea aestivalis</i>	FC2,C	
	<i>Rhexia aristosa</i>	FC2,T	
	<i>Xyris smalliana</i>	W	
GD-4	Small Depression Pond		936336
	<i>Dichanthelium erectifolium</i>	SR	
	<i>Eleocharis melanocarpa</i>	C	
	<i>Eleocharis tricostata</i>	W	
	<i>Rhexia aristosa</i>	FC2,T	
GD-5	Road Meadow		921333
	<i>Agalinis linifolia</i>	SR	
	<i>Dionaea muscipula</i>	FC2,C-SC	
	<i>Pleea tenuifolia</i>	W	
	<i>Rhynchospora pusilla</i>	W	
	<i>Solidago pulchra</i>	FC2,C	
GD-6	Road Meadow		922332
	<i>Rhexia aristosa</i>	FC2,T	
	<i>Rhexia aristosa</i> X <i>cubensis</i>	undescribed taxon	
	<i>Rhexia cubensis</i>	SR	
	<i>Rhynchospora pusilla</i>	W	
	<i>Xyris baldwiniana</i>	W	
GE-1	Flatwoods/Pocosin Ecotone		910328
	<i>Calamovilfa brevipilis</i>	F3C,E	
	<i>Carex elliotii</i>	W	
	<i>Dionaea muscipula</i> (1988)	FC2,C-SC	
	<i>Ludwigia microcarpa</i> (1988)	W	
	<i>Lysimachia asperulifolia</i> (1988)	FE,E	
	<i>Polygala brevifolia</i>	W	
	<i>Rhynchospora pallida</i>	SR	
	<i>Solidago pulchra</i> (1988)	FC2,C	
	<i>Tofieldia glabra</i>	FC2,C	
GE-2	Pocosin Ecotone		918333
	<i>Amphicarpum purshii</i>	SR	
	<i>Dionaea muscipula</i>	FC2,C-SC	
	<i>Oxypolis ternata</i>	FC2,C	
	<i>Pleea tenuifolia</i>	W	
	<i>Polygala brevifolia</i>	W	
	<i>Rhynchospora pallida</i>	SR	
	<i>Rhynchospora wrightiana</i>	W	
	<i>Solidago pulchra</i>	FC2,C	
	<i>Tofieldia glabra</i>	FC2,C	

GE-3.	Road Depression Meadow Amphicarpum purshii Calamovilfa brevipilis Dionaea muscipula Pleea tenuifolia	SR F3C, E FC2, C-SC W	907330
GE-4	Small Depression Pond Rhexia aristosa Rhynchospora inundata	FC2, T W	907328
GF-1	Wet Pine Flatwoods Agalinis fasciculata Agalinis virgata Calopogon barbatus Gentiana autumnalis Tofieldia glabra	W C W W FC2, C	949331
GF-1	Road Meadow Andropogon capillipes	W	949331
GF-3	Depression Meadow Rhexia aristosa	FC2, T	906327
GF-5	Road Meadow Agalinis linifolia Ludwigia microcarpa Rhexia aristosa Xyris baldwiniana	SR W FC2, T W	944326
GG-1	Depression Meadow Dichanthelium erectifolium Eleocharis equisetoides Panicum tenerum Rhexia aristosa Rhexia cubensis Rhynchospora inundata Rhynchospora tracyi Rhynchospora wrightiana	SR SR SR FC2, T SR W SR W	934317
GG-2	Road Meadow Eleocharis tricostata Ludwigia microcarpa	W W	943325
GH-1	Coastal Fringe Sandhill Cladina evansii	W	?
GI-1	Coastal Fringe Sandhill Cladina evansii	W	?

SECTOR H

HA-3	Depression Meadow		876335
	Aristida palustris	SR	
	Burmannis biflora	W	
	Coelorachis rugosa	W	
	Dichanthelium erectifolium	SR	
	Ludwigia linifolia	SR	
	Rhexia aristosa	FC2, T	
	Rhynchospora harperi	C	
	Rhynchospora nitens	W	
	Rhynchospora wrightiana	W	
	Scleria georgiana	C	
HA-5	Depression Meadow		874336
	Aristida palustris	SR	
	Dichanthelium erectifolium	SR	
	Ludwigia linifolia	SR	
	Rhexia aristosa	FC2, T	
	Scleria georgiana	C	
HA-6	Small Depression Pond		873334
	Aristida palustris	SR	
	Coelorachis rugosa	W	
	Dichanthelium erectifolium	SR	
	Eleocharis tricostata	W	
	Rhexia aristosa	FC2, T	
	Rhynchospora harperi	C	
	Rhynchospora nitens	W	
	Scleria reticularis var. reticularis	C	
HA-7	Small Depression Pond		872334
	Dichanthelium erectifolium	SR	
	Ludwigia linifolia	SR	
	Rhexia aristosa	FC2, T	
	Rhynchospora nitens	W	
	Scleria reticularis var. reticularis	C	
HA-8	Small Depression Pond		872333
	Coelorachis rugosa	W	
	Rhynchospora nitens	W	
	Scleria reticularis var. reticularis	C	
HA-9	Road Meadow (best treated as extension of HA-10)		871336
	Scleria georgiana	C	
HA-10	Small Depression Pond		870337
	Scleria georgiana	C	
HA-11	Small Depression Pond		869338
	Ludwigia linifolia	SR	
	Rhexia aristosa	FC2, T	
	Rhynchospora nitens	W	
	Scleria reticularis var. reticularis	C	

HB-1	Flatwoods/Pocosin Ecotone		876311
	Carex elliottii	W	
	Dionaea muscipula	FC2, C-SC	
	Polygala brevifolia	W	
HB-2	Flatwoods/Pocosin Ecotone		875317
	Amphicarpum purshii	SR	
	Lysimachia asperulifolia (P. Robinson)	FE, E	
	Polygala brevifolia	W	
	Solidago pulchra	FC2, C	
HB-3	Small Depression Pond		878328
	Agalinis linifolia	SR	
	Aristida palustris	SR	
	Burmanna biflora	W	
	Dichanthelium erectifolium	SR	
	Dionaea muscipula	FC2, C-SC	
	Ludwigia linifolia	SR	
	Oxypolis ternata	FC2, C	
	Paspalum praecox	W	
	Rhexia aristosa	FC2, T	
	Rhynchospora harperi	C	
	Solidago pulchra	FC2, C	
HB-5	Wet Pine Flatwoods, Pocosin		870320
	Asclepias pedicellata	C	
	Calopogon barbatus	W	
	Solidago pulchra	FC2, C	
	Sporopolus species 1	FC2, T	
HD-1	Small Depression Pond/Black Gum Swamp		878337
	Dichanthelium erectifolium	SR	
	Rhexia aristosa	FC2, T,	
HD-2	Depression Meadow/Small Depression Pond		876339
	Aristida palustris	SR	
	Burmanna biflora	W	
	Rhexia aristosa	FC2, T	
HD-3	Depression Meadow/Small Depression Pond		871341
	Aristida palustris	SR	
	Burmanna biflora	W	
	Dichanthelium erectifolium	SR	
	Eleocharis equisetoides	SR	
	Eleocharis robbinsii	C	
	Myriophyllum laxum	FC2, T	
	Panicum tenerum	SR	
	Rhexia aristosa	FC2, T	
	Rhynchospora harperi	C	
	Rhynchospora inundata	W	
	Rhynchospora nitens	W	
	Rhynchospora pleiantha	SR	
	Rhynchospora tracyi	SR	
	Scleria georgiana	C	

HE-1	Depression Meadow		893334
	Agalinis linifolia	SR	
	Aristida palustris	SR	
	Burmannia biflora	W	
	Rhexia aristosa	FC2, T	
HE-2	Depression Meadow		892334
	Agalinis linifolia	SR	
	Aristida palustris	SR	
	Bartonia verna	W	
	Burmannia biflora	W	
	Rhexia aristosa	FC2, T	
	Rhynchospora wrightiana	W	
HE-3	Depression Meadow		889332
	Aristida palustris	SR	
	Dichanthelium erectifolium	SR	
	Eleocharis equisetoides	SR	
	Ludwigia linifolia	SR	
	Panicum tenerum	SR	
	Rhexia aristosa	FC2, T	
	Rhynchospora harperi	C	
	Rhynchospora inundata	W	
	Rhynchospora tracyi	SR	
	Scleria reticularis var. reticularis	C	
	Xyris smalliana	W	
HE-4	Small Stream Pocosin		895331
	Rhynchospora inundata	W	
HE-5	Depression Meadow		896332
	Aristida palustris	SR	
	Burmannia biflora	W	
	Eleocharis equisetoides	SR	
	Panicum tenerum	SR	
	Rhexia aristosa	FC2, T	
	Rhynchospora harperi	C	
	Rhynchospora inundata	W	
HE-6	Small Depression Pond		882329
	Burmannia biflora	W	
	Dichanthelium erectifolium	SR	
	Eleocharis equisetoides	SR	
	Panicum tenerum	SR	
	Rhexia aristosa	FC2, T	
	Rhexia aristosa X cubensis	undescribed taxon	
	Rhexia cubensis	SR	
	Rhynchospora scirpoides	C	
	Rhynchospora tracyi	SR	
	Rhynchospora wrightiana	W	

HE-7.	Road Meadow		880330
	Agaliniis fasciculata	W	
	Rhexia aristosa	FC2, T	
	Rhynchospora pusilla	W	
	Rhynchospora nitens	W	
HE-8	Pocosin Ecotone		883329
	Dionaea muscipula	FC2, C-SC	
HE-8	Road Depression Meadow		882328
	Paspalum praecox	W	
HF-1	Small Depression Pond/Depression Meadow		900316
	Agaliniis linifolia	SR	
	Aristida palustris	SR	
	Coelorachis rugosa	W	
	Dichanthelium erectifolium	SR	
	Eleocharis tricostata	W	
	Ludwigia linifolia	SR	
	Panicum tenerum	SR	
	Paspalum praecox	W	
	Rhexia aristosa	FC2, T	
	Rhynchospora tracyi	SR	
	Rhynchospora wrightiana	W	
	Scleria georgiana	C	
	Spiranthes laciniata	C	
	Xyris smalliana	W	
HF-2	Road Meadow		899316
	Aristida palustris	SR	
	Dichanthelium erectifolium	SR	
	Eleocharis equisetoides	SR	
	Rhexia aristosa	FC2, T	
	Rhynchospora inundata	W	
	Rhynchospora nitens	W	
	Rhynchospora pallida	SR	
	Rhynchospora wrightiana	W	
	Sagittaria graminea var. chapmanii	C	
HF-3	Small Depression Pond		898318
	Aristida palustris	SR	
	Dichanthelium erectifolium	SR	
	Eleocharis equisetoides	SR	
	Paspalum praecox	W	
	Rhexia aristosa	FC2, T	
	Sagittaria graminea var. chapmanii	C	
HF-3	Road Meadow		898318
	Amphicarpum purshii	SR	
HF-4	Road Meadow		898319
	Agaliniis linifolia	SR	
	Rhexia aristosa	FC2, T	
	Rhexia cubensis	SR	

(HF-4 cont.)			
	Rhynchospora nitens		W
	Sagittaria graminea var. chapmanii		C
HF-5	Flatwoods/Pocosin Ecotone		896319
	Carex elliottii		W
	Rhexia cubensis		SR
	Rhynchospora pallida		SR
HF-6	Road Meadow		894319
	Rhexia aristosa	FC2, T	
	Rhynchospora pallida		SR
HF-7	Small Depression Pond		892318
	Eleocharis equisetoides		SR
	Rhynchospora inundata		W
	Xyris smalliana		W
HF-8	Road Meadow		896311
	Amphicarpum purshii		SR
HF-8	Small Depression Pond		896312
	Agalinis linifolia		SR
	Aristida palustris		SR
	Burmannia biflora		W
	Dichanthelium erectifolium		SR
	Eleocharis elongata		C
	Eleocharis equisetoides		SR
	Eleocharis tricostata		W
	Panicum tenerum		SR
	Rhexia aristosa	FC2, T	
	Rhexia cubensis		SR
	Rhynchospora inundata		W
	Rhynchospora pleiantha		C
HF-9	Road Meadow		889313
	Amphicarpum purshii		SR
HF-11	Small Depression Pond		897309
	Agalinis linifolia		SR
	Carex verrucosa		SR
	Coelorachis rugosa		W
	Dichanthelium erectifolium		SR
	Eleocharis equisetoides		SR
	Panicum tenerum		SR
	Rhexia aristosa	FC2, T	
	Rhynchospora inundata		W
	Spiranthes laciniata		C
	Sporobolus species 1 (into HF-20)	FC2, T	
HF-12	Small Depression Pond		897308
	Eleocharis elongata		C
	Eleocharis equisetoides		SR

HF-13	Small Depression Pond		895309
	Carex verrucosa	SR	
	Panicum tenerum	SR	
	Rhexia aristosa	FC2,T	
	Rhynchospora inundata	W	
	Rhynchospora tracyi	SR	
HF-14	Pocosin Ecotone		894312
	Amphicarpum purshii	SR	
	Rhexia aristosa	FC2,T	
HF-15	Small Depression Pond		894310
	Eleocharis equisetoides	SR	
	Litsea aestivalis	FC2,C	
	Scirpus etuberculatus	SR	
HF-15	Pond/Flatwoods Ecotone		894310
	Asclepias pedicellata	C	
HF-16	Small Depression Pond		892308
	Eleocharis robbinsii? (too deep to wade)	C	
	Panicum tenerum	SR	
	Rhexia aristosa	FC2,T	
	Rhexia cubensis	SR	
	Rhynchospora inundata	W	
	Rhynchospora scirpoides	C	
HF-17	Small Depression Pond		891306
	Aristida palustris	SR	
	Burmannia biflora	W	
	Dichanthelium erectifolium	SR	
	Eleocharis equisetoides	SR	
	Eleocharis robbinsii	C	
	Panicum tenerum	SR	
	Rhexia aristosa	FC2,T	
	Rhynchospora scirpoides	C	
	Rhynchospora tracyi	SR	
	Rhynchospora wrightiana	W	
	Utricularia olivacea	T	
	Xyris smalliana	W	
HF-18	Depression Meadow		898308
	Agalinis linifolia	SR	
	Coelorachis rugosa	W	
	Paspalum praecox	W	
	Rhexia aristosa	FC2,T	
HF-19	Small Depression Pocosin		897307
	Amphicarpum purshii (into HF-20)	SR	
HF-20	Flatwoods/Pocosin Ecotone		897308
	Amphicarpum purshii	SR	
	Solidago pulchra	FC2,C	
	Sporobolus species 1	FC2,T	

HF-21	Small Depression Pond Coelorachis rugosa	W	899310
HF-22	Road Depression Meadow Juncus validus	W	902306
HF-23	Small Stream Swamp Carex albicans var. emmonsii	W	905302
HF-24	Road/Pocosin Ecotone Dionaea muscipula Rhynchospora pallida	FC2, C-SC SR	900309
HF-25	Road Depression Meadow Andropogon capillipes Burmannia biflora Dichantherium wrightianum Dionaea muscipula Ludwigia microcarpa Paspalum praecox Polygala brevifolia Rhynchospora nitens Rhynchospora pallida Solidago pulchra Xyris baldwiniana	W W W FC2, C-SC W W W W SR FC2, C W	904310

SECTOR I

IA-1	Small Depression Pond Rhynchospora inundata Rhynchospora scirpoides	W C	886297
IA-2	Small Depression Pond Burmannia biflora Eleocharis equisetoides Eleocharis vivipara (?) Panicum tenerum Rhynchospora inundata Rhynchospora scirpoides	W SR W SR W C	890296
IA-3	Wet Pine Flatwoods Asclepias pedicellata	C	887298
IC-2	Small Depression Pond Eleocharis equisetoides Rhynchospora inundata	SR W	875279
IC-3	Small Depression Pond Eleocharis equisetoides	SR	869280

IC-4	Small Depression Pond Eleocharis equisetoides Rhynchospora inundata Sagittaria engelmanniana	SR W W	870280
IC-6	Coastal Fringe Sandhill Cladina evansii	W	859270
IC-7	Small Depression Pond Eleocharis equisetoides	SR	862270
IC-8	Coastal Fringe Sandhill Cladina evansii	W	?
IC-9	Maritime Forest Cynanchum angustifolium Iresine rhizomatosa Sageretia minutiflora	W W C	853258
IC-10	Coastal Fringe Evergreen Forest Asplenium platyneuron var. bacculum-rubrum Cornus asperifolia Rhynchospora miliacea	W C W	856262
IC-11	Seepage Meadow Eleocharis montevidensis	proposed	867259
IE-2	Pocosin Ecotone Dionaea muscipula	FC2,C-SC	873291

SECTOR J

JB-1	Small Stream Swamp Carex chapmanii Carex floridana	FC2,T W	819305
JC-1	Small Depression Pond Eleocharis melanocarpa	C	844290

SECTOR K

KA-1	Small Stream Swamp Carex floridana	W	797390
KC-1	Wet Pine Flatwoods Buchnera floridana Calamovilfa brevipilis Dionaea muscipula Pleea tenuifolia Rhynchospora pallida Solidago pulchra	W F3C,E FC2,C-SC W SR FC2,C	772377

SECTOR L

LA-1	Road Depression Meadow	727352-
	Wet Pine Flatwoods	724337
	Dionaea muscipula	FC2, C-SC
	Pleea tenuifolia	W
	Rhynchospora pusilla	W
	Xyris elliotii	SR
LB-1	Road Meadow (US 17)	725306-724337
	Savanna	
	Agalinis aphylla	C
	Agalinis fasciculata	W
	Agalinis virgata	C
	Amphicarpum purshii	SR
	Andropogon capillipes	W
	Asclepias pedicellata	C*
	Bartonia verna	W
	Calamovilfa brevipilis	F3C, E
	Calopogon barbatus	W
	Dionaea muscipula	FC2, C-SC
	Gentiana autumnalis	W
	Linum floridanum var. chrysocarpum	SR
	Oxypolis ternata	FC2, C
	Pleea tenuifolia	W
	Polygala brevifolia	W
	Rhynchospora nitens	W
	Rhynchospora pallida	SR
	Rhynchospora pusilla	W
	Solidago pulchra	FC2, C
	Sporobolus species 1	FC2, T
	Tofieldia glabra	FC2, C
	Xyris baldwiniana	W
	Xyris elliotii	SR
	Xyris flabelliformis	C
LB-3	Mesic Pine Flatwoods	734330
	Carex chapmanii	FC2, T
	Carex floridana	W
LB-4	Powerline Depression Meadow	743296-747287
	Carex elliotii	W
	Polygala brevifolia	W
LC-1	Road Meadow (NC 210)	752270-745287
	Agalinis fasciculata	W
	Agalinis tenella	W
	Andropogon capillipes	W
	Dionaea muscipula	FC2, C-SC
	Xyris difformis var. curtissii	W
	Xyris elliotii	SR

LC-2	Powerline Depression Meadow	747287-764282
	Andropogon capillipes	W
	Carex elliotii	W
	Dionaea muscipula	FC2,C-SC
	Rhexia aristosa	FC2,T
	Rhynchospora oligantha	C

SECTOR M

MB-1	Mesic Pine Flatwoods	770398
	Carex floridana	W
MD-1	Small Stream Swamp	752393-
	Carex chapmanii	FC2,T 752372
	Carex floridana	W
	Scirpus lineatus	C
	Senecio glabellus	W
ME-1	Road Meadow (US 17)	728353-735387
	Oxypolis ternata	FC2,C
MF-1	Wet Pine Flatwoods, Pocosin Ecotone	776370
	Andropogon capillipes	C
	Calamovilfa brevifolia	F3C,E
	Calopogon barbatus	W
	Carex elliotii	W
	Dionaea muscipula	FC2,C-SC
	Polygala brevifolia	W
	Solidago pulchra	FC2,C

SECTOR Q

QA-1	Small Depression Pocosin	943390
	Litsea aestivalis (1984)	FC2,C
QA-2	Small Depression Pond	941391
QA-3	Depression Meadow	946402
	Anthaenantia rufa	W
	Aristida palustris	SR
	Burmannia biflora	W
	Coelorachis rugosa	W
	Dichanthelium erectifolium	SR
	Dichanthelium sp. 1 =Panicum hirstii	FC2,C
	Eleocharis equisetoides	SR
	Lobelia boykinii	FC2,C
	Muhlenbergia torreyana	F3C,E
	Panicum tenerum	SR
	Paspalum praecox	W
	Rhexia aristosa	FC2,T
	Rhynchospora elliotii	W
	Rhynchospora harperi	C

(QA-3	Depression Meadow cont.)		
	Rhynchospora tracyi	SR	
	Scleria georgiana	C	
	Spiranthes laciniata	C	
	Xyris smalliana	W	
QA-3	Pocosin Ecotone		946401
	Amphicarpum purshii	SR	
	Gentiana autumnalis	W	
	Rhynchospora nitens	W	
QA-4	Wet Pine Flatwoods		940403
	Andropogon capillipes	W	
QA-5	Wet Pine Flatwoods		950414
	Andropogon capillipes	W	
	Gentiana autumnalis	W	
QA-6	Depression Meadow		944392
	Aristida palustris	SR	
	Carex verrucosa	SR	
	Panicum tenerum	SR	
	Rhynchospora inundata	W	
QA-7	Small Stream Swamp		944424
	Carex chapmanii	FC2, T	
	Carex elliotii	W	
	Rhynchospora miliacea	W	
	Scirpus lineatus	C	
QB-1	Nonriverine Swamp Forest (<u>Nyssa biflora</u> variant)		953375
	"Peterson's Quagmire"		
QB-2	Road Meadow (Lyman Road)		943375
	Anthaenanthia rufa	W	
	Coelorachis rugosa	W	
	Dionaea muscipula	FC2, C-SC	
	Gentiana autumnalis	W	
	Paspalum praecox	W	
	Paspalum stramineum var. stramineum	proposed	
	Polygala brevifolia	W	
	Rhynchospora nitens	W	
	Rhynchospora oligantha	SR	
	Rhynchospora pallida	SR	
	Scleria georgiana	C	
	Scleria minor	SR	
	Solidago gracillima	W	
	Solidago pulchra	FC2, C	
	Tofieldia glabra	FC2, C	
	Xyris baldwiniana	W	

QB-3. Small Depression Pond
Eleocharis tricostata
Rhexia cubensis
Rhynchospora wrightiana

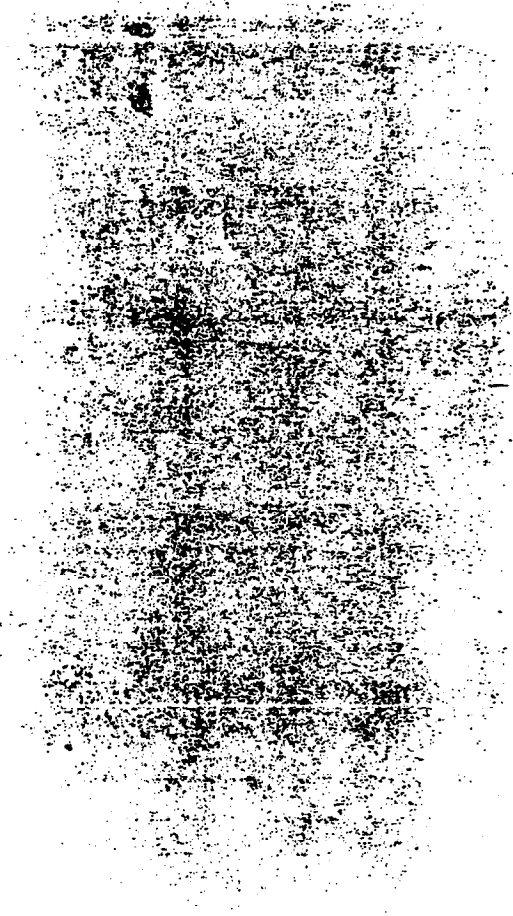
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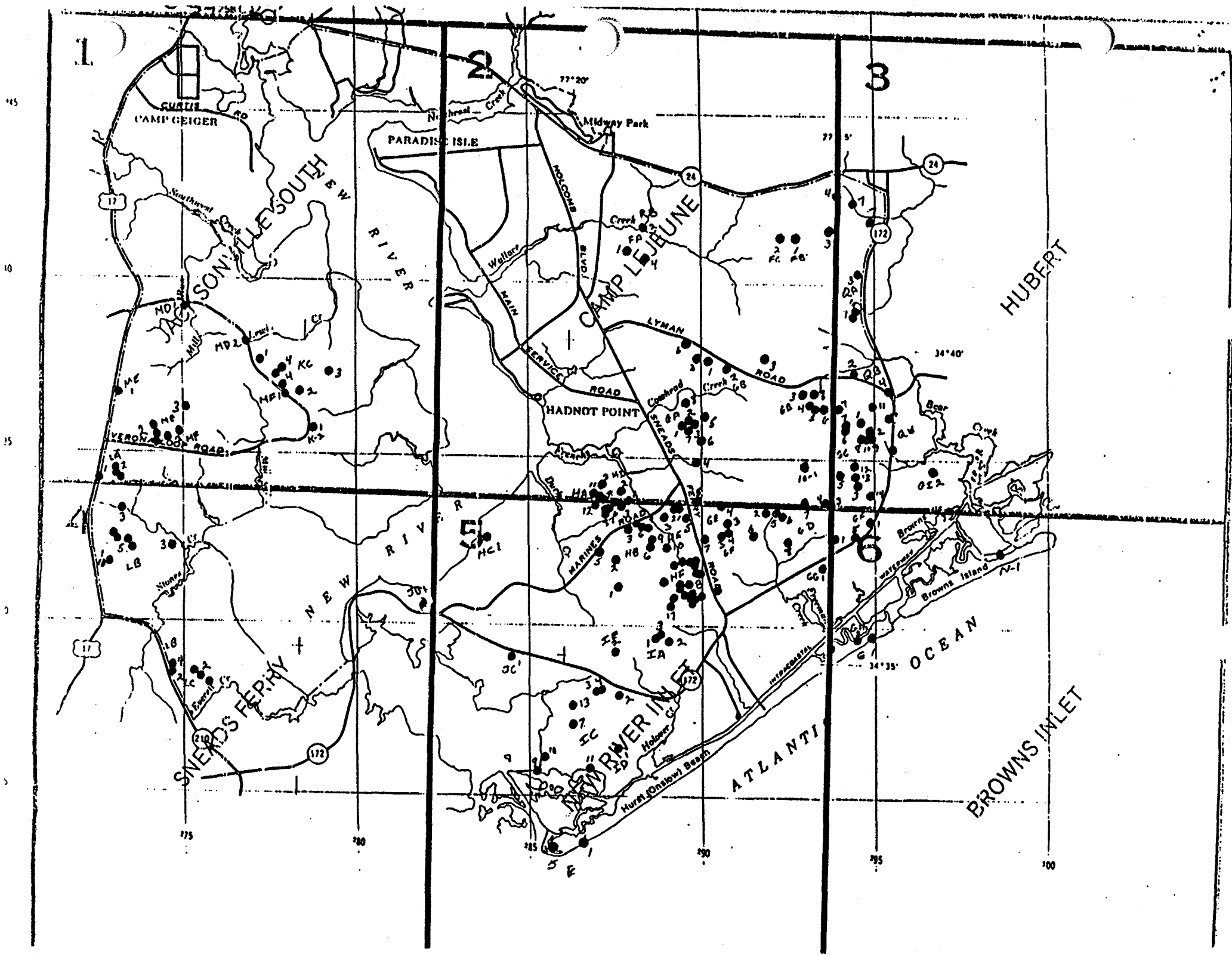
W
SR
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RB-1 Road Meadow
Ludwigia microcarpa

888434

W





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CAMP GEIGER

PARADISE ISLE

Midway Park

SONVILLE SOUTH B W RIVER

CAMP LEJEUNE

HUBERT

MD 17

HADNOT POINT

34°40'

VERON ROAD

ROAD

172

NEW RIVER

HA

34°35'

SNEEDS FERRY

HA

OCEAN

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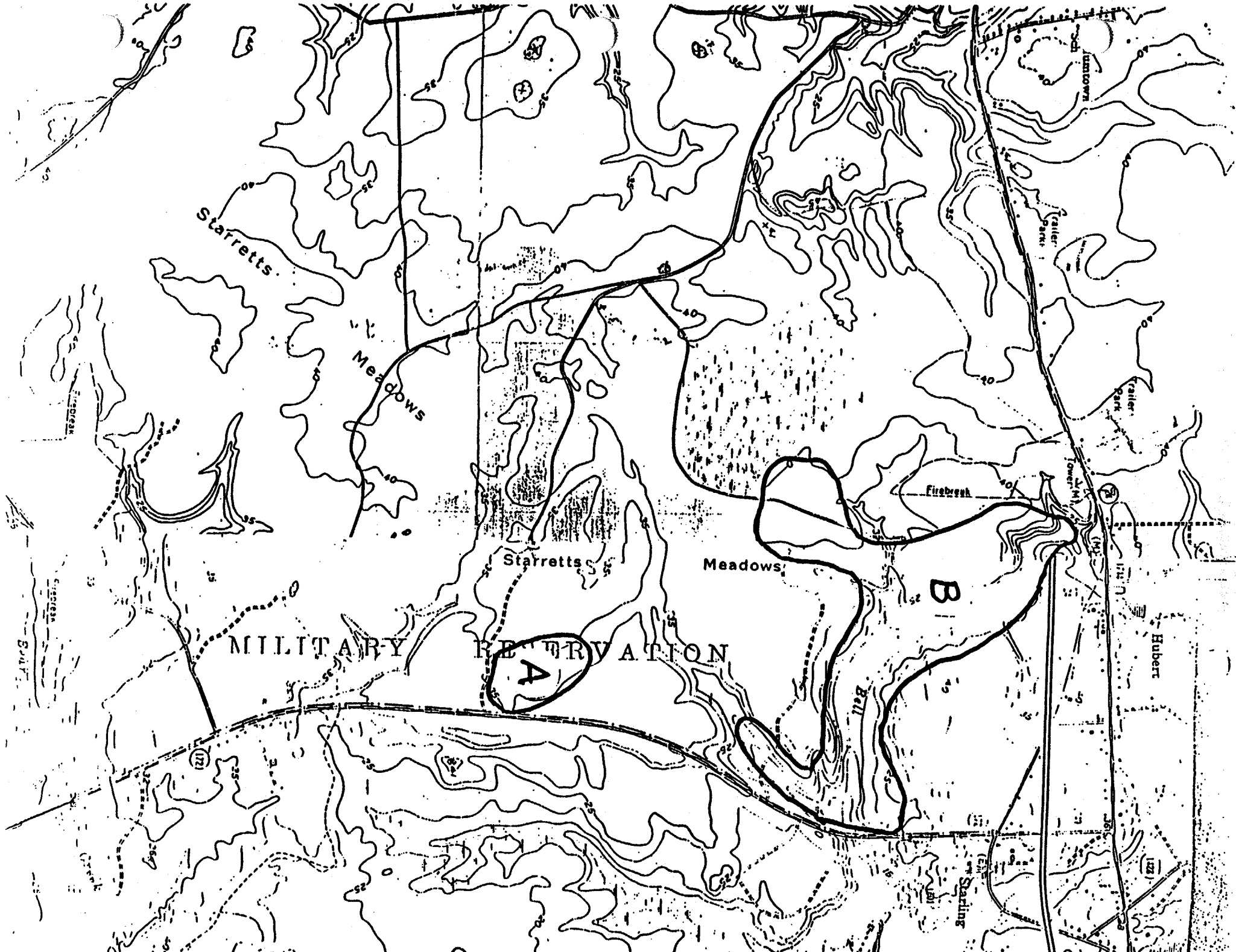
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AREAS OF SIGNIFICANT NATURAL VALUE

<u>Site</u>	<u>Name</u>	<u>UTM Grid</u>
A	Starretts Meadow QA-3 Depression Meadow	946402
B	Pocosin Road Flatwoods and Bell Swamp FB-3 Wet Pine Flatwoods FB-4 Wet Pine Flatwoods QA-7 Small Stream Swamp	937416 939426 944424
C	Lyman Road Cypress Savanna FD-1 Cypress Savanna	904377
D	Cowhead Creek Limesinks GA-1 depression meadow GA-2 depression meadow GA-3 cypress savanna GA-5 depression meadow	894359 896360 897359 901361
E	Jumping Run Savanna GA-4 savanna/flatwoods/pocosin	899349
F	OP-3 Flatwoods and Pocosin GB-3 road depression meadow GB-4 road depression meadow GB-5 wet pine flatwoods	929368 931365 932364
G	Spring Branch Limesinks GC-1 small depression pond GC-2 small depression pond GC-6 depression meadow GC-7 depression meadow GC-8 small depression pond GC-9 depression meadow	946360 949357 942358 942359 947356 949356
H	Weil Point Road Limesinks HA-2 depression meadow HA-3 depression meadow HA-4 depression meadow HA-5 depression meadow HA-6 small depression pond HA-7 small depression pond HA-8 small depression pond HD-3 depression meadow	878335 876335 875334 874336 873334 872334 872333 871341
I	Alligator Meadow Limesinks HE-1 depression meadow HE-2 depression meadow HE-3 depression meadow HE-4 small stream pocosin HE-5 depression meadow	893334 892334 889332 895331 896332

<u>Site</u>	<u>Name</u>	<u>UTM Grid</u>
J	Loosestrife Pocosin	
	GE-1 flatwoods/pocosin	910328
	GE-2 flatwoods/pocosin	918333
	GE-3 flatwoods/pocosin	907330
K	Africa Pond Limesinks	
	HF-8 small depression pond	896312
	HF-10 small depression pond	890312
	HF-11 small depression pond	897309
	HF-12 small depression pond	897308
	HF-13 small depression pond	895309
	HF-14 wet pine flatwoods/pocosin ecotone	894312
	HF-15 small depression pond	894310
	HF-16 small depression pond	892308
	HF-17 small depression pond	891306
	HF-18 depression meadow	898308
	HF-19 small depression pocosin	897307
HF-20 wet pine flatwoods/pocosin ecotone	897308	
L	Mill Run Swamp	
	MD-1 Small Stream Swamp/hardwood forest	752393- 752372
M	Verona Loop Road Flatwoods	
	KC-1 wet pine flatwoods	772377
	MF-1 flatwoods and pocosin	776370
N	Millstone Creek Swamp	
	LB-3 small stream swamp	724337-
O	Dixon Flatwoods	
	LB-1 flatwoods/pocosin/roadside	725315 743325



Starretts

Meadows

Starretts

Meadows

Firebreath

B

A

Ball

Hubert

MILITARY RESERVATION

Scenic Spacing

Trailer Park

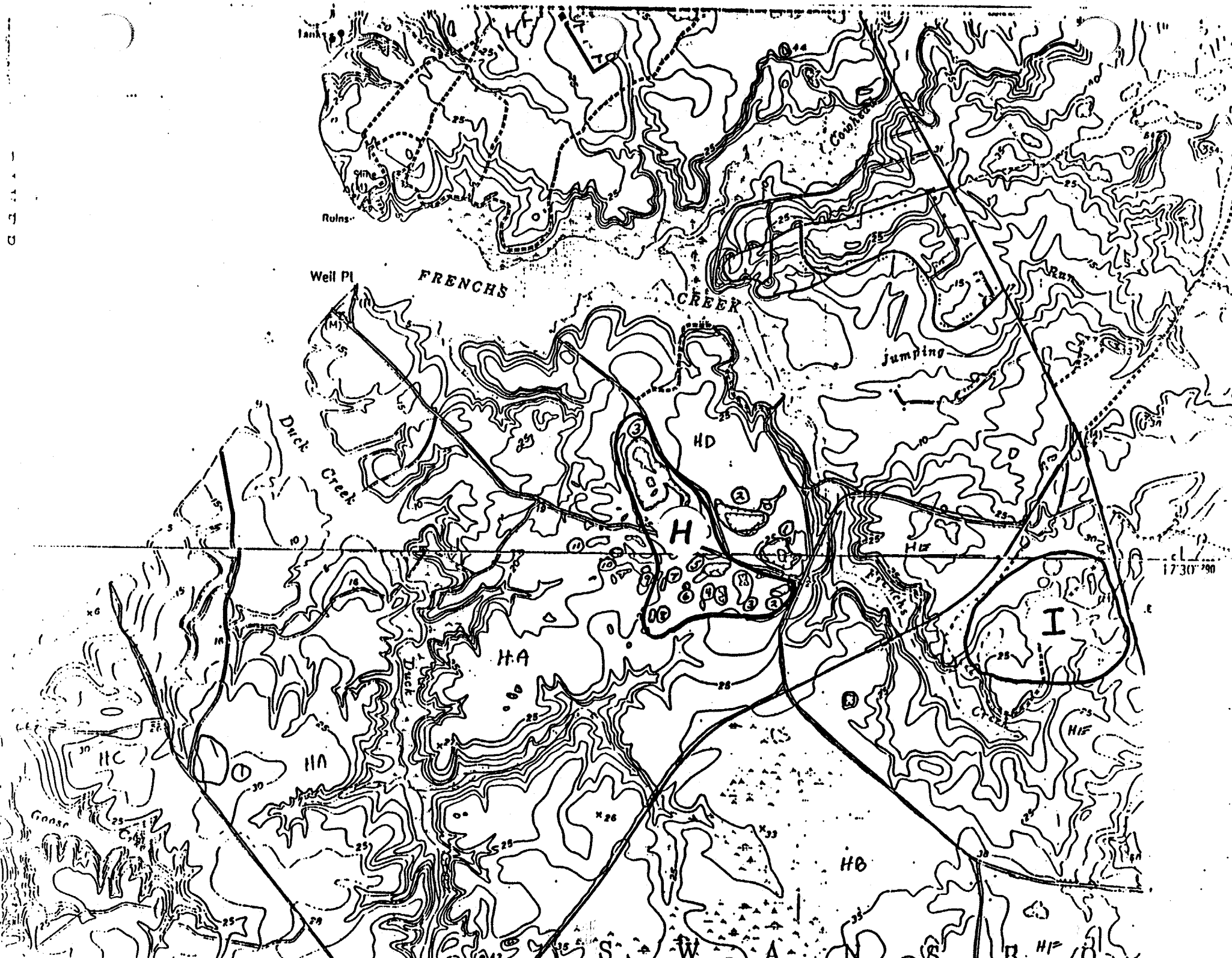
Trailer Park

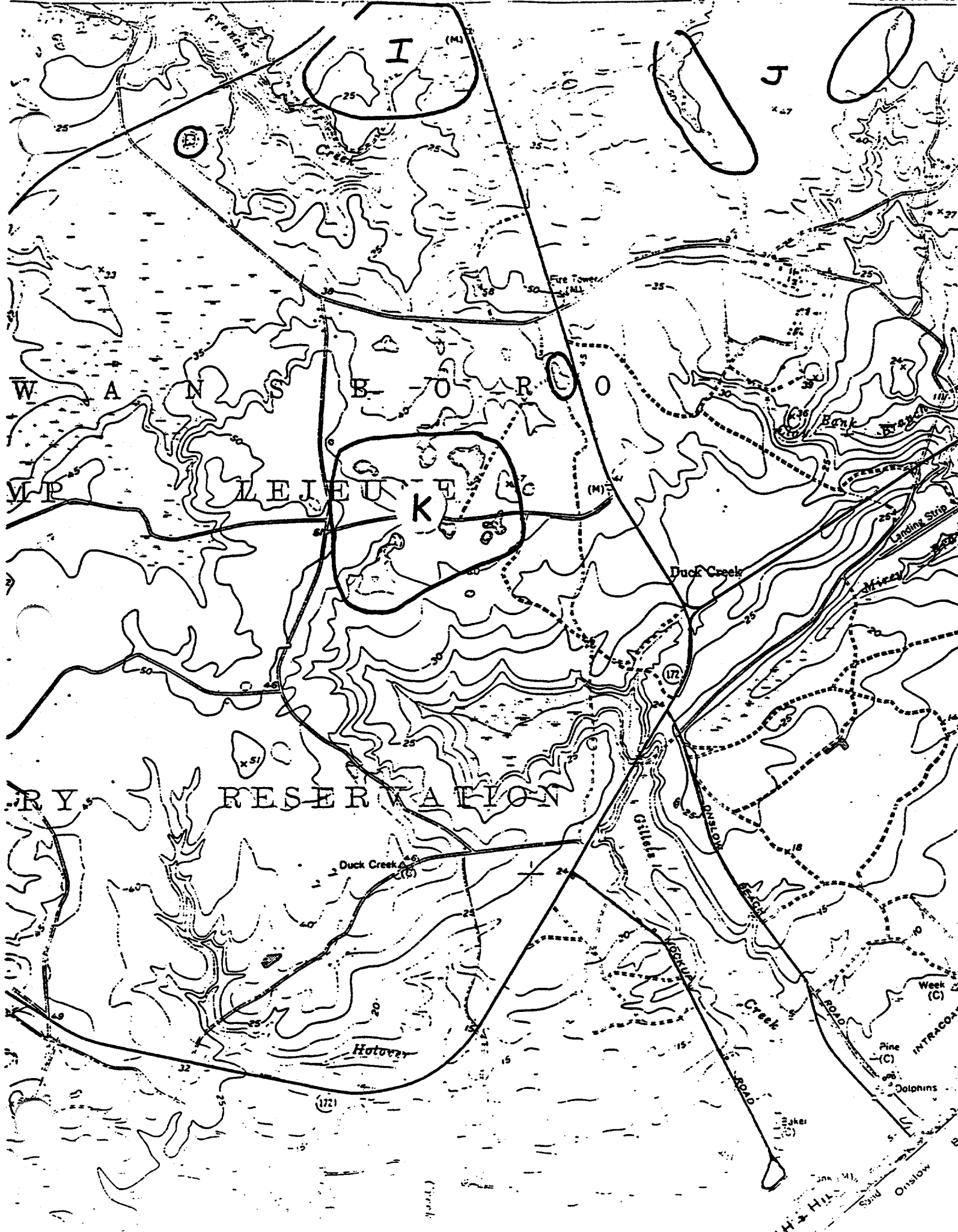
Trailer Park

127

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127





WANSBORO

LEJEUNE

RESERVATION

Duck Creek

Hotover

Duck Creek

ONSTOW ROAD

Creek

ROAD

INTRACOASTAL

Pine (C)

Dolphins

Lake

ONSTOW

(172)

(172)

I (M)

J

K (M)

Bank

Bank

Landing Strip

MAZEY

Week (C)

ONSTOW



CAMP LEJEUNE
MILITARY RESERVATION

Run

Muddy

Creek

Creek

Creek

Stones
Landing

Dixon

Bank (M)

BM
67

BM
66

Creek

1

2

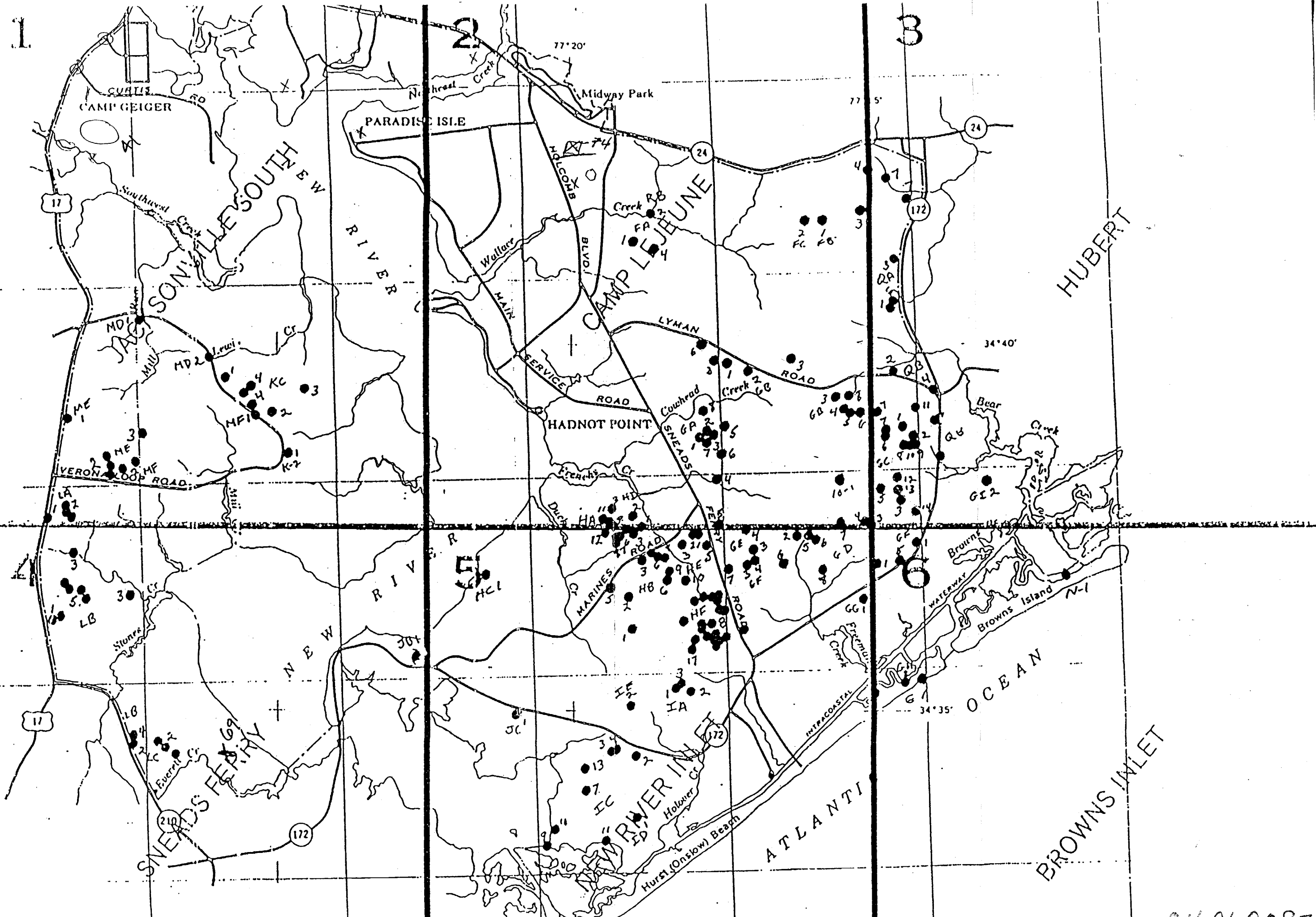
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APPENDIX Q
TERRESTRIAL REFERENCE VALUES AND CDI SPREADSHEETS

APPENDIX Q.1
TRVs

Derivation of Terrestrial Reference Values

The following section discusses the procedures used to develop the terrestrial reference values (TRVs) used in the terrestrial portion of the ERA.

Most of the whitetailed deer, bobwhite quail, and cottontail rabbit TRVs for inorganic chemicals were derived from mineral tolerance values (MTLs) contained in the Mineral Tolerance of Domestic Animals (NAS, 1980). This book defines an MTL as "that dietary level that, when fed for a limited period, will not impair animal performance and should not produce unsafe residues in human food derived from the animal." (NAS, 1980) The values in this book were reported as mg mineral/kg feed. Therefore, these values were first converted to mg mineral/kg body weight-day using the following equation (Opresko, 1993):

$$\text{TRV} = \text{MTL} * \text{CR}$$

where:

TRV = Terrestrial Reference Value (mg mineral/kg body weight-day)

MTL = Mineral Tolerance Value (mg mineral/kg food)

CR = consumption rate (kg food/kg body weight-day)

For the whitetailed deer TRVs derived from the cattle MTLs, a consumption rate of 0.05 kg food/kg body weight-day was used for the cow (O'Dell, 1971). Because the cattle MTL was developed primarily with cow studies that were conducted for less than 6 months, the new TRV was multiplied by 0.1 to account for subchronic to chronic uncertainty. The TRV for a cow then was adjusted to a TRV for a deer to account for differences in the body size using the following equation (Opresko, 1993):

$$\text{TRV (deer)} = [\text{TRV (cow)}] * [\text{bw (cow)/bw (deer)}]^{1/3}$$

Where:

TRV (deer) = Deer Terrestrial Reference Value
(mg mineral/kg body weight-day)

TRV (cow) = Cow Terrestrial Reference Value
(mg mineral/kg body weight-day)

bw (cow) = body weight of a cow (100 kg)

bw (deer) = body weight of a deer (45.4 kg)

For the bobwhite quail TRVs derived from the poultry MTLs, a consumption rate of 0.41 kg food/kg body weight was calculated based on an average poultry weighing 0.5 kg, and the following allometric model (Nagy, 1987):

$$\text{CR (birds)} = 0.648 (\text{bw})^{0.651}$$

Where:

CR (birds) = consumption rate for birds
(kg food/kg body weight-day)

bw = body weight for an average bird (0.5 kg)

The TRV for poultry then was adjusted to a TRV for a bobwhite quail to account for differences in the body size using the same equation that was used to adjust the cow to the deer. The body weight used for the bobwhite quail was 0.174 kg.

For the cottontail rabbit TRVs derived from the rabbit MTLs, a consumption rate of 0.081 was calculated using the following equation:

$$\text{CR (rabbit)} = \text{FR}/\text{bw}$$

Where:

CR (rabbit) = consumption rate for rabbits
(kg food/kg body weight-day)

FR = feeding rate of a cottontail rabbit (0.237 kg/day)

bw = body weight of a cottontail rabbit (1.229 kg)

The TRV (rabbit) was not adjusted for body size since a rabbit was used in the TRV calculation.

The following procedures were used for deriving TRV for the whitetailed deer, bobwhite quail, and cottontail rabbit when MTLs were not available, and for species that did not have MTLs. Their TRVs were determined using No Observed Adverse Effects Levels (NOAELs) or Lowest Observed Effects Levels (LOAELs). When available, the NOAEL or LOAEL from the Integrated Risk Information System (IRIS) was used in the TRV development. However, if a toxicity value was not available from IRIS, then one was obtained from various literature sources including Agency for Toxic Substances Registry Toxicological Profiles, Toxicological Benchmarks for Wildlife (Opresko *et.al.*, 1994) and published articles. Chemicals that only had diet concentration (as opposed to NOAELS) were converted to TRVs using the above equation and the appropriate consumption rates and body weights. The attached table contains the respective body weights used in the TRV adjustments.

As is presented in the attached table, toxicity data from many species were used to develop the TRVs. The attached table presents which animal was used to develop a particular TRV in parentheses. When possible, the chronic reproductive or developmental NOAEL value was used in the development of the TRV. However, in

some instances, only a subchronic NOAEL or a chronic or sub-chronic LOAEL for some chemicals were found in the literature. If a LOAEL was used, the number was divided by 10 as an uncertainty factor. If a subchronic value was used it also was divided by 10 as an uncertainty factor. Finally, toxicity values were not found for all the chemicals. Where possible, the toxicity of a similar chemical was used for these chemicals (i.e., using endrin for endrin aldehyde). The attached table identifies, in parentheses, which chemicals were used as surrogates.

REGION IV VALUES

REFERENCE INTAKE DOSES - REGION IV

Chemical	Cattle (mg/kg/day)	Poultry (mg/kg/day)	Rabbit (mg/kg/day)	Dog (mg/kg/day)	Rat (mg/kg/day)	Mouse (mg/kg/day)	Guinea Pig (mg/kg/day)	Mink (mg/kg/day)
Aluminum	5 (1)	10 (1)	11.61 (1)	15 (1)	NA	1.93 (60)	NA	NA
Antimony	NA	NA	4.06 (1)	NA	0.035 (12)	NA	NA	NA
Arsenic	0.25 (1)	5.135 (61) Mallard	2.90 (1)	NA	NA	0.1261 (13)	NA	NA
Barium	0.1 (1)	1 (1)	1.16 (1)	NA	0.25 (4)	NA	NA	NA
Beryllium	NA	NA	NA	NA	0.54 (4)	NA	NA	NA
Cadmium	0.0025 (1)	1.45 (63) Mallard	0.03 (1)	0.075 (14)	0.004 (15)	NA	NA	NA
Chromium	5 (1)	50 (1)	56.03 (1)	NA	2.41 (5)	NA	NA	NA
Cobalt	0.05 (1)	0.5 (1)	0.56 (1)	NA	NA	NA	NA	NA
Copper	0.5 (1)	15 (1)	11.61 (1)	NA	NA	NA	NA	12.9 (17)
Iron	5 (1)	50 (1)	29.02 (1)	NA	NA	NA	NA	NA
Lead	0.15 (1)	3.85 (65) A. kestrel	1.74 (1)	NA	8 (6)	NA	NA	NA
Manganese	1 (24)	100 (1)	23.21 (1)	NA	6.6 (66)	NA	NA	NA
Mercury	0.01 (1)	0.1 (1)	0.12 (1)	NA	0.32 (16)	NA	NA	NA
Nickel	0.25 (1)	15 (1)	2.90 (1)	25 (2)	5 (2)	NA	NA	NA
Selenium	0.01 (1)	0.5 (67) Mallard	0.12 (1)	NA	0.04 (19)	NA	NA	NA
Silver	NA	5 (1)	NA	NA	NA	0.181 (20)	NA	NA
Thallium	NA	NA	NA	NA	0.023 (54)	NA	NA	NA
Vanadium	0.25 (1)	11.36 (68) Mallard	0.06 (1)	NA	0.65 (56)	NA	NA	NA
Zinc	2.5 (1)	50 (1)	29.02 (1)	1 (3)	160 (69)	NA	NA	NA
Cyanide	NA	4.5 (21)	NA	0.375 (22)	10.6 (23)	NA	NA	NA
Acenaphthene	NA	NA	NA	NA	17.5 (56)	NA	NA	NA
Acenaphthylene	NA	NA	NA	NA	17.5 Acen.	NA	NA	NA
Anthracene	NA	NA	NA	NA	NA	100 (33)	NA	NA
Benzo(a)anthracene (Benzo(a)pyrene)	NA	NA	NA	NA	NA	1	NA	NA
Benzo(b)fluoranthene (Benzo(a)pyrene)	NA	NA	NA	NA	NA	1	NA	NA
Benzo(k)fluoranthene (Benzo(a)pyrene)	NA	NA	NA	NA	NA	1	NA	NA
Benzo(ghi)perylene (Benzo(a)pyrene)	NA	NA	NA	NA	NA	1	NA	NA
Benzo(g,h,i)perylene (Benzo(a)pyrene)	NA	NA	NA	NA	NA	1	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA	1 (7)	NA	NA
beta-BHC	NA	NA	NA	NA	5 (51)	NA	NA	NA
Bis(2-ethylhexyl)phthalate	NA	1.11 (16) Ringed Dove	NA	NA	NA	NA	0.1833 (11)	NA
Butylbenzylphthalate	NA	NA	NA	NA	15.9 (52)	NA	NA	NA
Carbazole (Benzo(a)pyrene)	NA	NA	NA	NA	NA	1	NA	NA
Chrysene (Benzo(a)pyrene)	NA	NA	NA	NA	NA	1	NA	NA
Dibenzofuran (Benzo(a)pyrene)	NA	NA	NA	NA	NA	1	NA	NA
Dibenz(a,h)anthracene (Benzo(a)pyrene)	NA	NA	NA	NA	NA	1	NA	NA
Diethylphthalate	NA	NA	NA	NA	NA	4563 (53)	NA	NA
Di-n-butylphthalate	NA	0.11 (16) Ringed Dove	NA	NA	125 (63)	NA	NA	NA
Fluoranthene	NA	NA	NA	NA	NA	12.5 (6)	NA	NA
Fluorene	NA	NA	NA	NA	12.5 (56)	NA	NA	NA
Indeno(1,2,3-cd)pyrene (Benzo(a)pyrene)	NA	NA	NA	NA	NA	1	NA	NA
2-Methylnaphthalene (Naphthalene)	NA	NA	NA	NA	41	NA	NA	NA
Naphthalene	NA	NA	NA	NA	41 (9)	NA	NA	NA
Phenanthrene (Naphthalene)	NA	NA	NA	NA	41	NA	NA	NA
Phenol	NA	NA	NA	NA	6 (57)	NA	NA	NA
Pyrene	NA	NA	NA	NA	NA	7.5 (10)	NA	NA

REGION IV VALUES

REFERENCE INTAKE DOSES - REGION IV

Chemical		Cattle (mg/kg/day)	Poultry (mg/kg/day)	Rabbit (mg/kg/day)	Dog (mg/kg/day)	Rat (mg/kg/day)	Mouse (mg/kg/day)	Guinea Pig (mg/kg/day)	Mink (mg/kg/day)
Aldrin		0.5 (24)	NA	NA	0.025 (77)	0.025 (77)	NA	NA	NA
Alpha-chlordane	(Chlordane)	1 (24)	2.14 (70) Blackbird	NA	0.075 (48)	0.055 (48)	NA	NA	NA
Gamma-chlordane	(Chlordane)	1 (24)	2.14 (70) Blackbird	NA	0.075 (48)	0.055 (48)	NA	NA	NA
Dieldrin		0.5 (24)	0.03 (71) Mallard	NA	0.005 (25)	0.005 (25)	NA	NA	NA
4,4'-DDD	(DDT)	NA	0.088 (DDT)	NA	NA	0.8	NA	NA	DDT
4,4'-DDE		NA	0.088 (24) Quail	NA	NA	0.8 (47)	NA	NA	NA
4,4'-DDT		NA	0.088 (24) Quail	NA	NA	0.8 (47)	NA	NA	NA
Endosulfan		NA	10 (72) Partridge	NA	0.57 (26)	0.6 (26)	NA	NA	NA
Endosulfan II	(Endosulfan)	NA	10 (72) Partridge	NA	0.57 (26)	0.6 (26)	NA	NA	NA
Endosulfan sulfate	(Endosulfan)	NA	10 (72) Partridge	NA	0.57 (26)	0.6 (26)	NA	NA	NA
Endrin		NA	0.3 (73) Mallard	NA	0.025 (27)	0.25 (28)	NA	NA	NA
Endrin aldehyde	(Endrin)	NA	0.3 (73) Mallard	NA	0.025 (27)	0.25 (28)	NA	NA	NA
Endrin ketone	(Endrin)	NA	0.3 (73) Mallard	NA	0.025 (27)	0.25 (28)	NA	NA	NA
Heptachlor		NA	NA	NA	NA	0.15 (45)	NA	NA	0.057 (28)
Heptachlor Epoxide		NA	NA	NA	0.000125 (24)	NA	NA	NA	NA
Aroclor-1221		NA	NA	NA	NA	3.5 (30)	NA	NA	NA
Aroclor-1232	(Aroclor-1242)	NA	0.41 (78) Owl	NA	NA	0.15 (31)	NA	NA	NA
Aroclor-1260		NA	NA	NA	NA	0.005 (32)	NA	NA	NA
Aroclor-1254		NA	0.18 (76) Pheasant	1 (75)	NA	NA	NA	NA	0.1 (50)
Aroclor-1248		NA	NA	0.28 (77)	NA	NA	0.13 (62)	NA	NA
Methylene chloride		NA	NA	NA	NA	5.85 (34)	NA	NA	NA
Carbon disulfide		NA	NA	1.1 (35)	NA	NA	NA	NA	NA
1,1-Dichloroethene		NA	NA	NA	NA	28 (56)	NA	NA	NA
1,2-Dichloroethene (total)		NA	NA	NA	NA	5 (44)	NA	NA	NA
Chloroform		NA	NA	NA	30 (38)	38 (37)	NA	NA	NA
2-Butanone		NA	NA	NA	NA	NA	NA	NA	NA
1,1,1-Trichloroethane		NA	NA	NA	NA	1000 (38)	NA	NA	NA
Trichloroethene		NA	NA	NA	NA	100 (38)	NA	NA	NA
1,1,2-Trichloroethane		NA	NA	NA	NA	NA	0.39 (40)	NA	NA
Benzene		NA	NA	NA	NA	0.1 (41)	NA	NA	NA
Tetrachloroethene		NA	NA	NA	NA	1.4 (42)	NA	NA	NA
Toluene		NA	NA	NA	NA	22.3 (38)	NA	NA	NA
Ethylbenzene		NA	NA	NA	NA	9.71 (41)	NA	NA	NA
Xylenes		NA	NA	NA	NA	179 (43)	NA	NA	NA
Acetone		NA	NA	NA	NA	10 (46)	NA	NA	NA

- (1) NAS, 1980
- (2) Ambrose, 1978
- (3) Drinker et. al., 1927
- (4) Schroder and Mitchner, 1975a,b
- (5) Mackenzie, 1958
- (6) Azar, 1973
- (7) Mackenzie, 1961
- (8) USEPA, 1988
- (9) Schmall, 1955
- (10) USEPA, 1989a
- (11) Lamb, et.al., 1987
- (12) Schroeder, 1978
- (13) Schroeder and Mitchner, 1971
- (14) Loser, 1977a,b
- (15) Kopp, 1982
- (16) Peakall, 1974
- (17) Aulerich, 1982
- (18) Fitzhugh, 1950

- (19) Halverson, 1988
- (20) Rungby, 1984
- (21) Gomez, 1983, 1988
- (22) USEPA, 1980
- (23) Howard, 1955
- (24) Ford, 1981
- (25) Walker, 1980
- (26) Hoechst, 1989
- (27) Vesicol, 1989
- (28) Treon, 1955
- (29) Aulerich, 1980
- (30) Wasserman, 1973
- (31) Bruckner, 1974
- (32) Byrne, 1986
- (33) USEPA, 1989b
- (34) Nat. Coffee Assoc., 1982
- (35) Hardin, 1981
- (36) Heywood, 1978

- (37) Jorgenson, 1985
- (38) Lane, et.al., 1982
- (39) NTP, 1985a
- (40) White, 1985
- (41) Wolf, 1958
- (42) Buban, 1985
- (43) NTP, 1986
- (44) Quest, 1983
- (45) Vesicol, 1985
- (46) USEPA, 1988
- (47) Fitzhugh, 1948
- (48) WHO, 1984 and NRCC, 1975
- (49) Vesicol, 1983
- (50) Ringer, 1983
- (51) Ito, 1975
- (52) NTP, 1985b
- (53) McClane and Hughs, 1980
- (54) USEPA, 1986a

- (55) USEPA, 1986b
- (56) USEPA, 1989
- (57) NTP, 1983
- (58) Schroeder and Mitchner, 1970
- (59) Nitchke, et.al., 1983
- (60) Ondreicka, et.al., 1988
- (61) USFWS, 1984
- (62) Thomas, 1980
- (63) White and Finely, 1978
- (64) Smith, et.al., 1953
- (65) Pattee, 1984
- (66) Laskey, et.al., 1982
- (67) Heinz, et.al., 1987
- (68) White and Dieter, 1978
- (69) Schlicker and Cox, 1988
- (70) Sticker, et.al., 1983
- (71) Nebeker, 1992
- (72) Abiola, 1992

- (73) Spann, et.al., 1988
- (74) Dow, 1958
- (75) Villeneuve, et.al., 1971
- (76) Dahlgren, et.al., 1971
- (77) FAO/WHO, 1978

REGION IV VALUES

TERRESTRIAL REFERENCE VALUES

Body Weight (kg)		
Cattle	100	
Whitetailed Deer	45.4	(Dee, 1991)
Bobwhite Quail	0.0174	(USEPA, 1993)
Eastern Cottontail	1.2285	(USEPA, 1993)
Lab Rat	0.35	(USEPA, 1988)
Lab Dog	10	(USEPA, 1988)
Poultry	0.5	
Red Fox	4.535	(Storm et.al., 1976)
Raccoon	5.12	
Lab Mouse	0.03	(USEPA, 1988)
Guinea pig	0.86	(USEPA, 1988)
Mink	1	(USEPA, 1993)
Mallard Duck	1	(Heinze et.al., 1989)
Short-tailed Shrew	0.017	(Schlesinger and Pot
Americal Kestral	0.13	(Pattee, 1984)
Blackbird	0.064	(Stickel, 1983)
Pheasant	1	(USEPA, 1993)
Ringed Dove	0.155	(Terres, 1980)
Screech Owl	0.181	(Dunning, 1984)
Partridge	0.4	(Abiola, 1992)

REGION IV VALUES

Chemical	White-tailed Deer (mg/kg/day)	Bobwhite Quail (mg/kg/day)	Eastern Cottontail (mg/kg/day)	Red Fox (mg/kg/day)	Raccoon (mg/kg/day)
Aluminum	6.51E+00 (ct)	3.08E+01 (b)	1.18E+01 (rb)	1.89E+01 (dg)	3.49E+01 (mo)
Antimony	6.91E-03 (rt)	9.32E-02 (rt)	4.08E+00 (rb)	1.49E-02 (rt)	1.43E-02 (rt)
Arsenic	3.22E-01 (ct)	1.98E+01 (b)	2.90E+00 (rb)	2.37E-02 (mo)	2.27E-02 (mo)
Barium	1.30E-01 (ct)	3.08E+00 (b)	1.18E+00 (rb)	1.07E-01 (rt)	1.02E-01 (rt)
Beryllium	1.07E-01 (rt)	1.47E+00 (rt)	3.50E-01 (rt)	2.30E-01 (rt)	2.21E-01 (rt)
Cadmium	3.22E-03 (ct)	3.39E+00 (b)	2.80E-02 (rb)	9.79E-02 (dg)	1.84E-03 (rt)
Chromium	6.51E+00 (ct)	1.32E+02 (b)	3.80E+01 (rb)	1.02E+00 (rt)	9.89E-01 (rt)
Cobalt	6.51E-02 (ct)	1.53E+00 (b)	3.80E-01 (rb)	3.75E-01 (rb)	3.61E-01 (rb)
Copper	6.51E-01 (ct)	4.39E+01 (b)	1.18E+01 (rb)	7.80E+00 (mk)	7.49E+00 (mk)
Iron	6.51E+00 (ct)	1.53E+02 (b)	2.90E+01 (rb)	1.89E+01 (rb)	1.80E+01 (rb)
Lead	1.90E-01 (ct)	7.22E+00 (b)	1.74E+00 (rb)	3.41E+00 (rt)	3.27E+00 (rt)
Manganese	1.30E+00 (ct)	3.08E+02 (b)	2.32E+01 (rb)	3.75E+00 (rt)	3.40E+00 (rt)
Mercury	1.30E-02 (ct)	3.08E-01 (b)	3.08E-01 (rb)	1.39E-01 (rt)	1.31E-01 (rt)
Nickel	3.22E-01 (ct)	4.98E+01 (b)	2.90E+00 (rb)	3.22E+01 (dg)	2.93E+00 (rt)
Selenium	1.30E-02 (ct)	1.93E+00 (b)	1.20E-01 (rb)	1.70E-02 (rt)	1.84E-02 (rt)
Silver	1.98E-02 (mo)	1.53E+01 (b)	6.25E-02 (mo)	3.40E-02 (mo)	3.28E-02 (mo)
Thallium	4.94E-03 (rt)	6.39E-02 (rt)	1.51E-02 (rt)	9.79E-03 (rt)	9.40E-03 (rt)
Vanadium	3.22E-01 (ct)	4.39E+01 (b)	4.39E-02 (rb)	2.77E-01 (rt)	2.89E-01 (rt)
Zinc	3.22E+00 (ct)	1.53E+02 (b)	2.90E+01 (rb)	1.30E+00 (dg)	6.54E+01 (rt)
Cyanide	2.13E+00 (rt)	1.38E+01 (b)	7.11E+00 (rt)	4.89E-01 (dg)	4.42E+00 (rt)
Acenaphthene	3.48E+00 (rt)	4.79E+01 (rt)	1.15E+01 (rt)	7.42E+00 (rt)	7.19E+00 (rt)
Acenaphthylene	3.48E+00 (rt)	4.79E+01 (rt)	1.15E+01 (rt)	7.42E+00 (rt)	7.19E+00 (rt)
Anthracene	9.71E+00 (mo)	1.20E+02 (mo)	2.90E+01 (mo)	1.89E+01 (mo)	1.80E+01 (mo)
Benzo(a)anthracene	8.71E-02 (mo)	1.20E+00 (mo)	2.90E-01 (mo)	1.89E-01 (mo)	1.80E-01 (mo)
Benzo(b)fluoranthene	8.71E-02 (mo)	1.20E+00 (mo)	2.90E-01 (mo)	1.89E-01 (mo)	1.80E-01 (mo)
Benzo(k)fluoranthene	8.71E-02 (mo)	1.20E+00 (mo)	2.90E-01 (mo)	1.89E-01 (mo)	1.80E-01 (mo)
Benzo(ghi)perylene	8.71E-02 (mo)	1.20E+00 (mo)	2.90E-01 (mo)	1.89E-01 (mo)	1.80E-01 (mo)
Benzo(g,h,i)perylene	8.71E-02 (mo)	1.20E+00 (mo)	2.90E-01 (mo)	1.89E-01 (mo)	1.80E-01 (mo)
Benzo(a)pyrene	8.71E-02 (mo)	1.20E+00 (mo)	2.90E-01 (mo)	1.89E-01 (mo)	1.80E-01 (mo)
beta-BHC	8.89E-01 (rt)	1.38E+01 (rt)	3.22E+00 (rt)	2.13E+00 (rt)	2.04E+00 (rt)
Bis(2-ethylhexyl)phthal	4.89E-02 (gp)	2.30E+00 (b)	1.80E-01 (gp)	1.05E-01 (gp)	1.01E-01 (gp)
Butylbenzylphthalate	3.14E+00 (rt)	4.32E+01 (rt)	1.05E+01 (rt)	6.77E+00 (rt)	6.50E+00 (rt)
Carbazole	8.71E-02 (mo)	1.20E+00 (mo)	2.90E-01 (mo)	1.89E-01 (mo)	1.80E-01 (mo)
Chrysene	8.71E-02 (mo)	1.20E+00 (mo)	2.90E-01 (mo)	1.89E-01 (mo)	1.80E-01 (mo)
Dibenzofuran	8.71E-02 (mo)	1.20E+00 (mo)	2.90E-01 (mo)	1.89E-01 (mo)	1.80E-01 (mo)
Dibenz(a,h)anthracene	8.71E-02 (mo)	1.20E+00 (mo)	2.90E-01 (mo)	1.89E-01 (mo)	1.80E-01 (mo)
Diethylphthalate	3.89E+02 (mo)	5.50E+03 (mo)	1.32E+03 (mo)	9.80E+02 (mo)	9.29E+02 (mo)
Di-n-butylphthalate	2.47E+01 (rt)	3.40E+01 (rt)	2.29E+01 (rt)	3.32E+01 (rt)	3.11E+01 (rt)
Fluoranthene	1.08E+00 (mo)	1.20E+01 (mo)	3.63E+00 (mo)	2.30E+00 (mo)	2.25E+00 (mo)
Fluorene	2.47E+00 (rt)	3.40E+01 (rt)	6.23E+00 (rt)	5.32E+00 (rt)	5.11E+00 (rt)
Indeno(1,2,3-cd)pyrene	8.71E-02 (mo)	1.20E+00 (mo)	2.90E-01 (mo)	1.89E-01 (mo)	1.80E-01 (mo)
2-Methylnaphthalene	6.10E+00 (rt)	1.12E+02 (rt)	2.70E+01 (rt)	1.73E+01 (rt)	1.69E+01 (rt)
Naphthalene	6.10E+00 (rt)	1.12E+02 (rt)	2.70E+01 (rt)	1.73E+01 (rt)	1.69E+01 (rt)
Phenanthrene	6.10E+00 (rt)	1.12E+02 (rt)	2.70E+01 (rt)	1.73E+01 (rt)	1.69E+01 (rt)
Phenol	1.18E+00 (rt)	1.83E+01 (rt)	3.89E+00 (rt)	2.59E+00 (rt)	2.45E+00 (rt)
Pyrene	6.53E-01 (mo)	8.89E+00 (mo)	2.18E+00 (mo)	1.41E+00 (mo)	1.35E+00 (mo)
Aldrin	6.51E-01 (ct)	6.80E-02 (rt)	1.80E-02 (rt)	3.22E-02 (dg)	1.02E-02 (rt)
Alpha-chlordane	1.30E+00 (ct)	3.30E+00 (b)	3.82E-02 (rt)	6.79E-02 (dg)	2.25E-02 (rt)
Gamma-chlordane	1.30E+00 (ct)	3.30E+00 (b)	3.82E-02 (rt)	6.79E-02 (dg)	2.25E-02 (rt)
Dieldrin	6.51E-01 (ct)	1.18E-01 (b)	3.29E-03 (rt)	6.51E-03 (dg)	2.04E-03 (rt)
4,4'-DDD	1.59E-01 (rt)	8.80E-02 (b)	3.29E-01 (rt)	3.41E-01 (rt)	3.27E-01 (rt)
4,4'-DDE	1.59E-01 (rt)	8.80E-02 (b)	3.29E-01 (rt)	3.41E-01 (rt)	3.27E-01 (rt)
4,4'-DDT	1.59E-01 (rt)	8.80E-02 (b)	3.29E-01 (rt)	3.41E-01 (rt)	3.27E-01 (rt)
Endosulfan	1.19E-01 (rt)	2.94E+01 (b)	3.90E-01 (rt)	7.42E-01 (dg)	2.45E-01 (rt)
Endosulfan II	1.19E-01 (rt)	2.94E+01 (b)	3.90E-01 (rt)	7.42E-01 (dg)	2.45E-01 (rt)
Endosulfan sulfate	1.19E-01 (rt)	2.94E+01 (b)	3.90E-01 (rt)	7.42E-01 (dg)	2.45E-01 (rt)
Endrin	4.94E-02 (rt)	1.18E+00 (b)	1.80E-01 (rt)	3.22E-02 (dg)	1.02E-01 (rt)
Endrin aldehyde	4.94E-02 (rt)	1.18E+00 (b)	1.80E-01 (rt)	3.22E-02 (dg)	1.02E-01 (rt)
Endrin isomers	4.94E-02 (rt)	1.18E+00 (b)	1.80E-01 (rt)	3.22E-02 (dg)	1.02E-01 (rt)
Heptachlor	2.98E-02 (rt)	4.08E-01 (rt)	9.87E-02 (rt)	8.39E-02 (rt)	6.13E-02 (rt)
Heptachlor epoxide	7.25E-05 (dg)	1.04E-03 (dg)	2.91E-04 (dg)	1.83E-04 (dg)	1.39E-04 (dg)
Aroclor-1221	6.91E-01 (rt)	9.32E+00 (rt)	2.30E+00 (rt)	1.49E+00 (rt)	1.43E+00 (rt)
Aroclor-1232	2.98E-02 (rt)	8.95E-01 (b)	8.87E-02 (rt)	6.39E-02 (rt)	6.13E-02 (rt)
Aroclor-1260	8.89E-04 (rt)	1.39E-02 (rt)	1.39E-03 (rt)	2.13E-03 (rt)	2.04E-03 (rt)
Aroclor-1254	2.98E-02 (mk)	6.90E-01 (b)	1.00E+00 (rb)	6.47E-01 (rb)	6.21E-01 (rb)
Aroclor-1248	1.13E-02 (mo)	1.38E-01 (mo)	2.90E-01 (rb)	1.81E-01 (rb)	2.34E-02 (mo)
Methylene chloride	1.18E+00 (rt)	1.38E+01 (rt)	3.89E+00 (rt)	2.49E+00 (rt)	2.39E+00 (rt)
Carbon disulfide	3.30E-01 (rb)	4.59E+00 (rb)	1.10E+00 (rb)	7.12E-01 (rb)	6.94E-01 (rb)
1,1-Dichloroethene	6.53E+00 (rt)	7.61E+01 (rt)	1.94E+01 (rt)	1.19E+01 (rt)	1.14E+01 (rt)
1,2-Dichloroethene (tot)	9.89E-01 (rt)	1.38E+01 (rt)	3.29E+00 (rt)	2.13E+00 (rt)	2.04E+00 (rt)
Chloroform	7.51E+00 (rt)	1.02E+02 (rt)	2.50E+01 (rt)	3.90E+01 (dg)	1.50E+01 (rt)
2-Butanone	NA	NA	NA	NA	NA
1,1,1-Trichloroethane	1.89E+02 (rt)	2.72E+03 (rt)	6.99E+02 (rt)	4.29E+02 (rt)	4.09E+02 (rt)
Trichloroethene	1.89E+01 (rt)	2.72E+02 (rt)	6.99E+01 (rt)	4.29E+01 (rt)	4.09E+01 (rt)
1,1,2-Trichloroethane	3.40E-02 (mo)	4.89E-01 (mo)	1.13E-01 (mo)	7.32E-02 (mo)	7.03E-02 (mo)
Benzene	1.89E-02 (rt)	2.72E-01 (rt)	6.99E-02 (rt)	4.29E-02 (rt)	4.09E-02 (rt)
Tetrachloroethene	2.77E-01 (rt)	3.81E+00 (rt)	9.21E-01 (rt)	5.99E-01 (rt)	5.72E-01 (rt)
Toluene	4.41E+00 (rt)	6.09E+01 (rt)	1.47E+01 (rt)	9.49E+00 (rt)	9.12E+00 (rt)
Ethylbenzene	1.90E+00 (rt)	2.94E+01 (rt)	6.39E+00 (rt)	4.13E+00 (rt)	3.97E+00 (rt)
Xylene	3.54E+01 (rt)	4.87E+02 (rt)	1.18E+02 (rt)	7.82E+01 (rt)	7.32E+01 (rt)
Acetone	1.89E+00 (rt)	2.72E+01 (rt)	6.99E+00 (rt)	4.29E+00 (rt)	4.09E+00 (rt)
2-Hexanone	NA	NA	NA	NA	NA

Notes: The following abbreviations indicate which species was used to develop the TPV

(ct) = cattle (rb) = rabbit
 (rt) = rat (dg) = dog
 (b) = bird (mo) = mouse
 (gp) = guinea (mk) = mink

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APPENDIX Q.2
CDI SPREADSHEETS

Food Source Ingestion of: lv-vegetation lf-fish lm-mammals lw-worms lw-fruit	Feeding Rate (l in kg/d)	Incidental Soil Ingestion (ls in kg/d)	Rate of Drinking Water Ingestion (lw in l/d)	Rate of Worm Ingestion (two in kg/d)	Rate of Fruit Ingestion (lf in kg/d)	Rate of Mammal Ingestion (lm in kg/d)	Rate of Vegetation Ingestion (lv in kg/d)	Body Weight (BW) (kg)	Home Range Size (acres)	Contaminated Area (acres)	H Rate	Equation Used to Calculate Total Exposure E=total exposure Cw=constituent conc. in water Cs=constituent conc. in soil Cw=constituent conc. in worms Cfr=constituent conc. in fruit H=rate of home range area to site area
Vegetation (lv) 100%	0.013	0.001	0.019	NA	NA	NA	0.013	0.174	26.242	4	0.152	$E = \frac{[Cw](lv) + [Cs](lw) + [Cw](lw) + [Cfr](lf)]}{BW}$

Contaminant of Concern	Soil to Plant Transfer Coefficient (Bv)	Constituent Concentration in Water (mg/l) (Cw)	Constituent Concentration in Soil (mg/kg) (Cs)	Constituent Concentration in Worms (mg/kg) (Cwo)	Constituent Concentration in Fruit (mg/kg) (Cfr)	Constituent Concentration in Mammals (mg/kg) (Cm)	Total Exposure (mg/kg/d)	TRV	RATIO
Aluminum	0.004	12.0428	4800.30	NA	NA	NA	6.288	3.08E+01	2.05E-01
Arsenic	0.040	0.0031	6.70	NA	NA	NA	0.010	1.88E+01	5.07E-04
Berilium	0.150	0.0230	36.80	NA	NA	NA	5.104	3.08E+00	3.41E-02
Beryllium	0.010	ND	0.20	NA	NA	NA	0.000	1.47E+00	1.49E-04
Calcium	0.990	ND	0.80	NA	NA	NA	0.007	5.98E+00	1.21E-03
Chromium	0.008	0.0198	6.70	NA	NA	NA	0.012	1.53E+02	7.65E-05
Copper	0.400	ND	51.80	NA	NA	NA	0.285	4.98E+01	6.42E-03
Iron	0.004	8.1880	8884.48	NA	NA	NA	8.511	1.53E+02	6.32E-02
Lead	0.045	0.0128	200.50	NA	NA	NA	0.303	7.92E+00	4.03E-02
Manganese	0.250	0.0234	32.00	NA	NA	NA	0.207	3.08E+02	6.77E-04
Mercury	0.800	ND	0.70	NA	NA	NA	0.008	3.08E-01	3.66E-02
Selenium	0.025	ND	1.10	NA	NA	NA	0.001	1.93E+00	7.24E-04
Silver	0.400	0.0088	0.70	NA	NA	NA	0.005	1.53E+01	3.23E-04
Thallium	0.004	ND	1.30	NA	NA	NA	0.001	6.28E-02	2.12E-02
Vanadium	0.008	0.0198	11.80	NA	NA	NA	0.014	4.38E+01	3.31E-04
Zinc	1.300	ND	384.80	NA	NA	NA	6.080	1.53E+02	3.88E-02
Alpha-chlordane	0.088	ND	0.02	NA	NA	NA	0.000	3.30E+00	6.14E-08
Beta-chlordane	0.088	ND	0.01	NA	NA	NA	0.000	3.30E+00	3.05E-08
1,4'-DDD	0.013	ND	0.04	NA	NA	NA	0.000	6.80E-02	4.81E-04
1,4'-DDE	0.060	ND	0.21	NA	NA	NA	0.000	8.80E-02	2.84E-03
1,4'-DDT	0.008	ND	0.30	NA	NA	NA	0.000	8.80E-02	3.68E-03
Dieldrin	0.088	ND	0.01	NA	NA	NA	0.000	1.18E-01	2.28E-04
Endrin	0.022	ND	0.00	NA	NA	NA	0.000	1.18E+00	3.10E-08
Endrin aldehyde	0.022	ND	0.01	NA	NA	NA	0.000	1.18E+00	6.14E-08
Endrin ketone	0.022	ND	0.00	NA	NA	NA	0.000	1.18E+00	2.57E-08
Endosulfan II	0.322	ND	0.01	NA	NA	NA	0.000	2.84E+01	5.38E-07
Aroclor-1254	0.022	ND	0.72	NA	NA	NA	0.001	6.80E-01	1.28E-03
Aroclor-1260	0.022	ND	0.03	NA	NA	NA	0.000	1.38E-02	2.52E-03
Benzo(a)pyrene	0.013	ND	0.13	NA	NA	NA	0.000	1.20E+00	1.22E-04
Benzo(b)fluoranthene	0.008	ND	0.08	NA	NA	NA	0.000	1.20E+00	7.65E-05
Bis(2-ethylhexyl)phthalate	0.044	0.0081	0.48	NA	NA	NA	0.002	2.30E+00	7.52E-04
Chrysene	0.020	ND	0.07	NA	NA	NA	0.000	1.20E+00	7.03E-05
Fluorene	0.087	ND	0.18	NA	NA	NA	0.000	1.12E+02	1.88E-06
Pyrene	0.033	ND	0.11	NA	NA	NA	0.000	8.80E+00	1.67E-05
Acetone	53.288	ND	0.03	NA	NA	NA	0.020	2.72E+01	7.35E-04
Toluene	1.065	ND	0.00	NA	NA	NA	0.000	6.08E+01	6.87E-07
								SUM	4.52E-01

ND - Not Detected
 NA - Not Applicable

EQUATIONS USED TO CALCULATE EXPOSURE FOR THE MAGCOON
 OPERABLE UNIT NO. 8 (SITE 18)
 REMEDIAL INVESTIGATION, CTD-874
 MCB CAMP LEVELINE, NORTH CAROLINA

Food Source Ingestion of Vegetation (V _{veg}) Fish (F _{fish}) Invertebrate (I _{invertebrate}) Worms (W _{worms}) B _{insect}	Feeding Rate (I) in kg/d	Invertebrate Soil Ingestion (I _{in} in kg/d)	Rate of Drinking Water Ingestion (W _{in} in kg)	Rate of Worm Ingestion (W _{in} in kg/d)	Rate of Fruit Ingestion (F _{in} in kg/d)	Rate of Fish Ingestion (F _{in} in kg/d)	Rate of Vegetation Ingestion (V _{in} in kg/d)	Body Weight (BW) (kg)	Home Range Size (acres)	Contaminated Area (acres)	H Ratio	Equation Used to Calculate Total Exposure E=total exposure C _w =contaminant conc. in water C _s =contaminant conc. in soil C _{wb} =contaminant conc. in worms C _f =contaminant conc. in fruit H=ratio of home range area to site area
Vegetation V=40% Fish F=60%	0.214	0.080	0.422	NA	0.088	0.129	NA	6.120	258.884	4	0.016	$E = \frac{C_w(W) + C_s(I) + [C_w(W) + C_f(F)] H}{BW}$

Contaminant of Concern	Soil to Plant Transfer Coefficient (F _{tp}) (B)	Constituent Concentration in Water (mg/l) (C _w)	Constituent Concentration in Soil (mg/kg) (C _s)	Constituent Concentration in Worms (mg/kg) (C _{wb})	Fish Bioconcentration Factor (BCF)	Constituent Concentration in Fishes (mg/kg) (C _f) (= BW*BCF)	Total Exposure (mg/kg/d)	TRV	RATIO
Aluminum	0.001	12.04	480.20	NA	231.000	2781.84	7.11E+01	2.49E-01	2.04E+02
Arsenic	0.008	0.00	6.70	NA	44.000	4.10E-03	2.37E-02	1.80E-01	
Barium	0.016	0.09	36.80	NA	8.000	1.07E-02	1.09E-01	1.05E-01	
Beryllium	0.002	ND	0.20	NA	18.000	1.22E-02	2.31E-01	5.89E-02	
Cadmium	0.180	ND	0.20	NA	64.000	6.02E-02	1.64E-02	5.82E-02	
Chromium	0.006	0.08	3.70	NA	16.000	6.16E-03	8.89E-01	8.37E-03	
Copper	0.250	ND	51.80	NA	36.000	6.52E-03	7.49E+00	8.71E-04	
Iron	0.001	6.19	8664.40	NA	ND	1.04E+00	1.80E+01	5.79E-02	
Lead	0.008	0.01	200.80	NA	48.000	3.92E-02	3.27E+00	8.95E-03	
Manganese	0.080	0.02	58.00	NA	36.000	2.64E-02	3.60E+00	7.22E-03	
Mercury	0.300	ND	0.70	NA	6800.000	7.89E-02	1.31E-01	6.09E-04	
Nickel	0.086	ND	1.10	NA	8.000	7.45E-02	1.64E-02	4.85E-03	
Silver	0.100	0.01	0.70	NA	0.500	9.07E-04	3.29E-02	2.79E-02	
Thallium	0.000	ND	1.30	NA	119.000	7.97E-02	9.40E-03	8.49E-03	
Vanadium	0.003	0.02	11.80	NA	ND	2.35E-03	2.88E-01	9.88E-03	
Zinc	0.800	ND	204.80	NA	47.000	9.61E-02	6.54E+01	1.47E-03	
Alpha-chlordane	0.026	ND	0.02	NA	14100.000	1.08E-02	2.25E-02	4.80E-02	
Beta-chlordane	0.026	ND	0.01	NA	14100.000	0.00	3.60E-07	3.29E-02	1.60E-02
1,4'-DDD	0.013	ND	0.04	NA	53800.000	0.00	2.49E-04	3.27E-01	7.57E-02
1,4'-DDE	0.080	ND	0.21	NA	63900.000	0.00	1.37E-02	3.27E-01	4.20E-02
1,4'-DDT	0.026	ND	0.20	NA	53900.000	0.00	1.92E-02	3.27E-01	5.89E-02
Dieldrin	0.085	ND	0.01	NA	4970.000	0.00	1.10E-02	2.04E-03	5.26E-04
Endrin	0.022	ND	0.00	NA	3870.000	0.00	1.85E-07	1.02E-01	1.80E-02
Endrin aldehyde	0.022	ND	0.01	NA	3870.000	0.00	6.10E-07	1.02E-01	4.89E-02
Endrin isomers	0.022	ND	0.00	NA	ND	0.00	1.61E-07	1.02E-01	1.57E-02
Endosulfan II	0.322	ND	0.01	NA	270.000	0.00	9.27E-07	2.45E-01	3.27E-02
Endosulfan 1254	0.022	ND	0.72	NA	31600.000	0.00	4.91E-02	6.21E-01	7.74E-02
Endosulfan 1260	0.022	ND	0.02	NA	31900.000	0.00	1.99E-02	2.04E-03	9.09E-04
Hexachlorocyclopentadiene	0.013	ND	0.12	NA	30.000	0.00	8.41E-02	1.90E-01	4.85E-02
Hexachlorocyclohexane	0.006	ND	0.08	NA	30.000	0.00	5.92E-02	1.80E-01	3.08E-02
Heptachlorocyclopentadiene	0.044	0.01	0.48	NA	130.000	1.18	3.06E-02	1.01E-01	2.01E-01
Chrysene	0.020	ND	0.02	NA	30.000	0.00	4.64E-02	1.80E-01	2.99E-02
Phenanthrene	0.087	ND	0.10	NA	30.000	0.00	8.67E-02	1.88E+01	6.11E-07
Pyrene	0.032	ND	0.11	NA	30.000	0.00	7.89E-02	1.26E+00	5.89E-02
Acetone	53.298	ND	0.02	NA	0.990	0.00	4.39E-04	4.09E+00	1.07E-04
Toluene	1.085	ND	0.00	NA	10.700	0.00	1.36E-02	9.12E+00	1.49E-07
									BLM 2.05E+02

ND - Not Detected
 NA - Not Applicable

Food Source Ingestion of: Iv-vegetation If-fish Im-mammals Iw-worms If-fruit	Feeding Rate (I in kg/d)	Incidental Soil Ingestion (Is in kg/d)	Rate of Drinking Water Ingestion (Iw in l/d)	Rate of Worm Ingestion (Iw in kg/d)	Rate of Fruit Ingestion (If in kg/d)	Rate of Mammal Ingestion (Im in kg/d)	Rate of Vegetation Ingestion (Iv in kg/d)	Body Weight (BW) (kg)	Home Range Size (acres)	Contaminated Area (acres)	H Ratio	Equation Used to Calculate Total Exposure E=total exposure Cw=constituent conc. in water Cs=constituent conc. in soil Cwv=constituent conc. in worms Cfv=constituent conc. in fruit H=ratio of home range area to site area
Vegetation (Iv) 100 percent	0.237	0.008	0.119	NA	NA	NA	0.237	1.229	9.297	4	0.430	$E = \frac{Cw(Iv) + [Cs(Is)I + Cwv(Iw) + Cfv(If)] H}{BW}$

Contaminant of Concern	Soil to Plant Transfer Coefficient (Bt)	Constituent Concentration in Water (mg/l) (Cw)	Constituent Concentration in Soil (mg/kg) (Cs)	Constituent Concentration in Worms (mg/kg) (Cwv)	Constituent Concentration in Fruit (mg/kg) (Cfv)	Constituent Concentration in Mammals (mg/kg) (Cm)	Total Exposure (mg/kg/d)	TRV	RATIO
Aluminum	0.004	12.0428	4830.30	NA	NA	NA	1.24E+01	1.18E+01	1.07E+00
Arsenic	0.040	0.0031	6.70	NA	NA	NA	3.59E-02	2.90E+00	1.34E-02
Barium	0.130	0.0293	38.80	NA	NA	NA	5.34E-01	1.18E+00	4.61E-01
Beryllium	0.010	ND	0.30	NA	NA	NA	5.84E-04	3.99E-01	1.59E-03
Cadmium	0.200	ND	0.90	NA	NA	NA	4.29E-02	2.90E-02	1.48E+00
Chromium	0.008	0.0138	9.70	NA	NA	NA	2.89E-02	5.90E+01	4.63E-04
Copper	0.400	ND	51.60	NA	NA	NA	1.82E+00	1.18E+01	1.58E-01
Iron	0.004	6.1830	8884.40	NA	NA	NA	2.07E+01	2.80E+01	7.19E-01
Lead	0.045	0.0126	200.50	NA	NA	NA	1.19E+00	1.74E+00	6.81E-01
Manganese	0.230	0.0234	32.00	NA	NA	NA	1.18E+00	2.32E+01	5.10E-02
Mercury	0.800	ND	0.70	NA	NA	NA	5.37E-02	1.20E-01	4.47E-01
Selenium	0.025	ND	1.10	NA	NA	NA	4.47E-03	1.20E-01	3.79E-02
Silver	0.400	0.0089	0.70	NA	NA	NA	2.59E-02	5.29E-02	4.88E-01
Thallium	0.004	ND	1.30	NA	NA	NA	3.02E-03	1.51E-02	2.00E-01
Sodium	0.008	0.0198	11.90	NA	NA	NA	3.10E-02	5.80E-02	5.39E-01
Zinc	1.300	ND	324.80	NA	NA	NA	4.11E+01	2.90E+01	1.62E+00
Alpha-chlordane	0.026	ND	0.02	NA	NA	NA	6.59E-05	3.62E-02	1.81E-03
Beta-chlordane	0.026	ND	0.01	NA	NA	NA	2.18E-05	3.62E-02	6.03E-04
1,4'-DDD	0.013	ND	0.04	NA	NA	NA	1.18E-04	5.28E-01	2.25E-04
1,4'-DDE	0.020	ND	0.21	NA	NA	NA	7.50E-04	5.28E-01	1.43E-03
1,4'-DDT	0.028	ND	0.30	NA	NA	NA	8.02E-04	5.28E-01	1.92E-03
Dieldrin	0.085	ND	0.01	NA	NA	NA	1.18E-04	3.29E-03	3.63E-02
Endrin	0.022	ND	0.00	NA	NA	NA	1.12E-05	1.85E-01	6.90E-05
Endrin aldehyde	0.022	ND	0.01	NA	NA	NA	2.83E-05	1.85E-01	1.78E-04
Endrin ketone	0.022	ND	0.00	NA	NA	NA	9.29E-06	1.85E-01	5.62E-05
Endosulfan II	0.322	ND	0.01	NA	NA	NA	1.83E-04	3.99E-01	4.14E-04
Aroclor-1254	0.022	ND	0.78	NA	NA	NA	2.78E-03	1.00E+00	3.78E-03
Aroclor-1260	0.022	ND	0.03	NA	NA	NA	1.07E-04	3.29E-03	3.23E-02
Benzo(a)pyrene	0.013	ND	0.13	NA	NA	NA	4.01E-04	2.90E-01	1.38E-03
Benzo(b)fluoranthene	0.006	ND	0.09	NA	NA	NA	2.18E-04	2.90E-01	7.54E-04
2-(2-ethylhexyl)phthalate	0.044	0.0081	0.48	NA	NA	NA	3.63E-03	1.63E-01	2.23E-02
Chrysene	0.020	ND	0.07	NA	NA	NA	2.54E-04	2.90E-01	8.74E-04
Fluoranthene	0.027	ND	0.10	NA	NA	NA	9.92E-04	2.70E+01	3.68E-03
Pyrene	0.033	ND	0.11	NA	NA	NA	5.23E-04	2.18E+00	2.41E-04
Acetone	53.299	ND	0.03	NA	NA	NA	1.38E-01	6.58E+00	2.12E-02
Toluene	1.025	ND	0.00	NA	NA	NA	3.62E-04	1.47E+01	2.46E-05
								SUM	7.83E+00

ND - Not Detected
NA - Not Applicable

EQUATIONS USED TO CALCULATE EXPOSURE FOR THE RED FOX
 OPERABLE UNIT NO. 8 (SITE 18)
 REMEDIAL INVESTIGATION, CTO-274
 MCB CAMP LEJEUNE, NORTH CAROLINA

Food Source Ingestion of: In=Ingestion of vegetation F=Fish M=Marine Mammals W=Worms B=Beet	Feeding Rate (l in kg/d)	Invertebrate Soil Ingestion (ls in kg/d)	Rate of Drinking Water Ingestion (lv in l/d)	Rate of Worm Ingestion (lw in kg/d)	Rate of Fruit Ingestion (lf in kg/d)	Rate of Mammal Ingestion (lm in kg/d)	Rate of Vegetation Ingestion (lv in kg/d)	Body Weight (BW) (kg)	Horn Range Size (acres)	Contaminated Area (acres)	H Ratio	Equation Used to Calculate Total Exposure E=total exposure Ei=total exposure Cw=constituent conc. in water Cs=constituent conc. in soil Cm=constituent conc. in mammals Cb=constituent conc. in beet H=ratio of home range area to site area
Small Mammals m=80%	0.801	0.017	0.285	NA	NA	0.481	0.18018	4.536	1245.4			$E = \frac{C_w \cdot W + [(C_m)(m) + (C_s)(S) + (C_b)(B)] \cdot H}{BW}$
Vegetation v=20%	0.112 Small Mammal	0.00899 Small Mammal	0.0852 Small Mammal	NA	NA	NA	0.112 Small Mammal	0.3725 Small Mammal		4	0.002	$E = \frac{[(C_w)(W) + (C_s)(S) + (C_m)(M) + (C_b)(B)] \cdot H}{BW}$
								Small Mammal	0.038		All AOCs	

Contaminant of Concern	Soil to Plant Transfer Coefficient (B1)	Constituent Concentration in Water (mg/l) (Cw)	Constituent Concentration in Soil (mg/kg) (Cs)	Constituent Concentration in Worms (mg/kg) (Cw)	Ingestion-to-Rate Biotransfer Factor (B2)	Constituent Concentration in Mammals (mg/kg) (Cm)	Total Exposure (mg/kg/d)	TRW	RATIO
Aluminum	0.004	12.04	4800.20	NA	1.89E-03	6.45E-02	1.09E+00	1.95E+01	5.65E-02
Arsenic	0.040	0.00	8.70	NA	2.00E-03	2.59E-04	2.86E-04	2.57E-03	1.59E-02
Barium	0.150	0.00	26.80	NA	1.80E-04	2.90E-04	2.40E-03	1.07E-01	2.19E-02
Beryllium	0.010	ND	0.80	NA	1.00E-03	2.05E-06	3.55E-06	2.30E-01	1.11E-05
Cadmium	0.850	ND	0.90	NA	5.40E-04	9.39E-05	5.29E-05	9.78E-05	5.42E-04
Chromium	0.008	0.00	9.70	NA	5.60E-03	6.21E-04	1.46E-03	1.09E+00	1.41E-03
Copper	0.400	ND	51.90	NA	1.00E-02	6.59E-02	2.39E-03	7.80E+00	3.07E-04
Iron	0.004	6.19	9884.40	NA	2.00E-02	1.49E+00	6.32E-01	1.88E+01	3.37E-02
Lead	0.045	0.01	300.60	NA	3.00E-04	1.25E-03	4.23E-03	3.41E+00	1.24E-02
Manganese	0.250	0.02	58.00	NA	4.00E-04	1.72E-03	2.72E-03	3.75E+00	9.91E-04
Mercury	0.900	ND	0.70	NA	2.50E-01	4.98E-02	7.85E-05	1.39E-01	5.78E-04
Selenium	0.025	ND	1.10	NA	1.80E-02	2.42E-04	1.95E-05	1.70E-02	9.11E-04
Silver	0.400	0.01	0.70	NA	3.00E-03	2.72E-04	7.89E-04	2.40E-03	2.22E-02
Thallium	0.004	ND	1.30	NA	4.00E-02	4.39E-04	1.81E-05	9.79E-03	1.64E-03
Vanadium	0.008	0.02	11.90	NA	2.60E-03	2.72E-04	1.81E-03	2.77E-01	6.83E-02
Zinc	1.500	ND	264.90	NA	1.00E-01	1.49E+01	5.04E-02	1.30E+00	3.87E-02
Alpha-Chlordane	0.028	ND	0.02	NA	7.94E-03	1.99E-06	2.25E-07	9.78E-02	2.30E-02
Beta-Chlordane	0.028	ND	0.01	NA	7.94E-03	4.29E-07	7.49E-08	9.78E-02	7.99E-07
1,4'-DDD	0.013	ND	0.04	NA	3.51E-02	1.09E-05	5.02E-07	2.41E-01	1.49E-02
1,4'-DDE	0.020	ND	0.21	NA	1.29E-02	2.42E-05	2.82E-06	2.41E-01	6.30E-02
1,4'-DDT	0.008	ND	0.30	NA	6.31E-02	1.89E-04	3.96E-06	2.41E-01	1.14E-05
Dieldrin	0.085	ND	0.01	NA	1.00E-03	4.33E-07	2.53E-07	6.51E-03	2.89E-05
Endrin	0.022	ND	0.00	NA	1.00E-02	4.05E-07	4.02E-08	3.25E-02	1.24E-02
Endrin aldehyde	0.022	ND	0.01	NA	1.00E-02	1.08E-06	1.06E-07	3.25E-02	2.24E-02
Endrin lactone	0.022	ND	0.00	NA	1.00E-02	3.25E-07	3.32E-08	3.25E-02	1.02E-02
Endosulfan II	0.222	ND	0.91	NA	1.00E-04	6.82E-08	3.84E-07	7.42E-01	3.02E-07
Aroclor-1264	0.022	ND	0.72	NA	1.00E-02	1.00E-04	9.94E-04	6.47E-01	1.64E-02
Aroclor-1260	0.022	ND	0.02	NA	1.00E-02	2.87E-06	2.84E-07	2.12E-02	1.81E-04
Benzo(a)pyrene	0.013	ND	0.13	NA	2.51E-02	2.85E-05	1.71E-06	1.88E-01	9.10E-02
Benzo(b)fluoranthene	0.008	ND	0.08	NA	1.00E-01	7.99E-05	1.12E-06	1.99E-01	6.97E-02
Benzo(k)fluoranthene	0.044	0.01	0.48	NA	3.18E-03	3.98E-05	7.81E-04	1.05E-01	7.42E-03
Chrysene	0.020	ND	0.07	NA	1.26E-02	1.18E-05	9.55E-07	1.88E-01	5.09E-02
Fluoranthene	0.027	ND	0.10	NA	7.94E-04	2.99E-06	2.00E-04	1.76E-01	1.14E-07
Pyrene	0.023	ND	0.11	NA	5.01E-03	9.53E-06	1.63E-06	1.41E+00	1.19E-02
Acetone	53.299	ND	0.02	NA	1.45E-09	7.30E-09	1.43E-04	4.29E+00	2.37E-05
Toluene	1.085	ND	0.00	NA	1.26E-05	1.46E-09	4.10E-07	9.40E+00	4.22E-02
								SLM	2.30E-01

ND - Not Detected
 NA - Not Applicable

Food Source Ingestion of: Iv=vegetation If=fish Im=mammals Iw=worms If=fruit	Feeding Rate (I in kg/d)	Incidental Soil Ingestion (Is in kg/d)	Rate of Drinking Water Ingestion (Iw in l/d)	Rate of Worm Ingestion (Iwo in kg/d)	Rate of Fruit Ingestion (If in kg/d)	Rate of Mammal Ingestion (Im in kg/d)	Rate of Vegetation Ingestion (Iv in kg/d)	Body Weight (BW) (kg)	Home Range Size (acres)	Contaminated Area (acres)	H Ratio	Equation Used to Calculate Total Exposure E=total exposure Cw=constituent conc. in water Cs=constituent conc. in soil Cw=constituent conc. in worms Cf=constituent conc. in fruit H=ratio of home range area to site area
Vegetation(Iv) 100 percent	1.800	0.019	1.100	NA	NA	NA	1.800	45.400	434.000	4	0.009	$E = \frac{(Cw)(Iw) + [(Cs)(Iv)] + (Cf)(If) + (Cw)(Iwo)}{BW}$

Contaminant of Concern	Soil to Plant Transfer Coefficient (Bv)	Constituent Concentration in Water (mg/l) (Cw)	Constituent Concentration in Soil (mg/kg) (Cs)	Constituent Concentration in Worms (mg/kg) (Cwo)	Constituent Concentration in Fruit (mg/kg) (Cf)	Constituent Concentration in Mammals (mg/kg) (Cm)	Total Exposure (mg/kg/d)	TW	RATIO
Aluminum	0.004	12.04	4630.30	NA	NA	NA	3.15E-01	6.51E+00	4.85E-02
Arsenic	0.040	0.00	6.70	NA	NA	NA	1.82E-04	3.25E-01	5.81E-04
Barium	0.130	0.03	36.80	NA	NA	NA	2.36E-03	1.30E-01	1.98E-02
Beryllium	0.010	ND	0.20	NA	NA	NA	1.34E-06	1.07E-01	1.28E-05
Cadmium	0.350	ND	0.80	NA	NA	NA	1.57E-04	3.25E-03	4.82E-02
Chromium	0.008	0.02	8.70	NA	NA	NA	4.25E-04	6.51E+00	6.69E-05
Copper	0.400	ND	51.80	NA	NA	NA	6.96E-03	6.51E-01	1.01E-02
Iron	0.004	6.19	8884.40	NA	NA	NA	1.82E-01	6.51E+00	2.95E-02
Lead	0.045	0.01	200.50	NA	NA	NA	3.63E-03	1.99E-01	1.98E-02
Manganese	0.230	0.02	32.00	NA	NA	NA	4.79E-03	1.30E+00	3.68E-03
Mercury	0.800	ND	0.70	NA	NA	NA	1.88E-04	1.30E-02	1.52E-02
Selenium	0.025	ND	1.10	NA	NA	NA	1.25E-05	1.30E-02	9.80E-04
Silver	0.400	0.01	0.70	NA	NA	NA	3.05E-04	1.58E-02	1.94E-02
Thallium	0.004	ND	1.30	NA	NA	NA	6.22E-06	4.54E-03	1.38E-03
Vanadium	0.008	0.02	11.80	NA	NA	NA	5.38E-04	3.25E-01	1.62E-03
Zinc	1.300	ND	384.80	NA	NA	NA	1.82E-01	3.25E+00	4.68E-02
Alpha-chlordane	0.026	ND	0.02	NA	NA	NA	1.84E-07	1.30E+00	1.41E-07
Gamma-chlordane	0.026	ND	0.01	NA	NA	NA	6.12E-08	1.30E+00	4.71E-08
1,4'-DDD	0.013	ND	0.04	NA	NA	NA	2.94E-07	1.58E-01	1.88E-06
1,4'-DDE	0.020	ND	0.21	NA	NA	NA	2.01E-06	1.98E-01	1.27E-05
1,4'-DDT	0.008	ND	0.30	NA	NA	NA	1.82E-06	1.58E-01	1.15E-05
Dieldrin	0.085	ND	0.01	NA	NA	NA	3.98E-07	6.51E-01	6.08E-07
Endrin	0.022	ND	0.00	NA	NA	NA	3.08E-08	4.84E-02	6.20E-07
Endrin aldehyde	0.022	ND	0.01	NA	NA	NA	8.03E-08	4.84E-02	1.63E-06
Endrin isomers	0.022	ND	0.00	NA	NA	NA	2.53E-08	4.84E-02	5.19E-07
Endosulfan II	0.322	ND	0.01	NA	NA	NA	5.90E-07	1.18E-01	4.97E-06
Aroclor-1254	0.022	ND	0.72	NA	NA	NA	7.57E-06	2.80E-02	2.70E-04
Aroclor-1260	0.022	ND	0.03	NA	NA	NA	2.93E-07	9.88E-04	2.98E-04
Benzo(a)pyrene	0.013	ND	0.13	NA	NA	NA	9.89E-07	8.71E-02	1.15E-05
Benzo(b)fluoranthene	0.008	ND	0.09	NA	NA	NA	4.78E-07	8.71E-02	5.48E-06
Benzo(k)fluoranthene	0.004	0.01	0.68	NA	NA	NA	2.29E-04	4.88E-02	4.68E-03
Chrysene	0.080	ND	0.07	NA	NA	NA	6.78E-07	8.71E-02	7.79E-06
Fluoranthene	0.087	ND	0.10	NA	NA	NA	3.34E-06	8.10E+00	4.12E-07
Pyrene	0.033	ND	0.11	NA	NA	NA	1.54E-06	6.53E-01	2.35E-06
Acetone	53.289	ND	0.03	NA	NA	NA	5.21E-04	1.88E+00	2.84E-04
Toluene	1.085	ND	0.00	NA	NA	NA	1.34E-06	4.41E+00	3.04E-07
								SUM	2.71E-01

ND - Not Detected
 NA - Not Applicable