03.13-08/22/96-01716

FINAL

REMEDIAL INVESTIGATION REPORT
OPERABLE UNIT NO. 6
(SITE 44)
VOLUME VII
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

CONTRACT TASK ORDER 0303
APPENDICES A-X

AUGUST 22, 1996

Prepared For:

DEPARTMENT OF THE NAVY
ATLANTIC DIVISION
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Norfolk, Virginia

Under:

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APPENDIX A
TEST BORING RECORDS

TEST BORING RECORD

PROJECT: RI/FS at OU No. 6 - Site 44 - MCAS, New River
CTO NO.: 62470-303
BORING NO.: 44-BB-SB01
COORDINATES: EAST: 2466302.2872 NORTH: 360121.1865
ELEVATION: SURFACE: 14.70

RIG: Geoprobe 5400	LARGE BORE SAMPLER	SMALL BORE SAMPLER	LINER	DATE	PROGRESS (FT)	WEATHER	WATER DEPTH (FT)	TIME
SIZE (DIAM.)	1-3/8" ID	--	1-1/8" ID	3/8/95	0.0 - 9.0	Rainy & mild	8.0	1213
LENGTH	4.0'	--	4.0'					
TYPE	Piston	--	Plastic					

REMARKS: Notes: (1) HNu not used due to rainy conditions.

SAMPLE TYPE
S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Direct Push
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

DEFINITIONS
PID = Photoionization Detection Meter
ppm = parts per million
PS = Point Source
BG = Background
BOH = Bottom of Hole

Depth (ft)	Sample Type and No.	Sample Recovery (ft & %)	Lab ID Number	PID (ppm) PS/BG	Visual Description	Elev.
1 — 1.0	S-0		00	(1)	SAND (fine), some silt, little clay; dark brown; moist; 1.2	13.50
2 — 3.0	S-1	1.8 90%		(1)	CLAY, little silt; grayish-brown, & orange; mottled; damp	
4 — 5.0	S-2	1.7 85%		(1)	CLAY, some silt & sand; 4.1 grayish-brn & orange; mottled; 4.8 damp	10.60 9.90
6 — 7.0	S-3	1.6 80%	03	(1)	SAND (fine), some silt & clay; brown w/ iron staining; moist 7.0	7.70
8 — 9.0	S-4	1.5 75%		(1)	SAND (fine), some silt, little clay; brown; moist to wet GROUNDWATER @ 9.0 FT. 9.0	5.70
10					BOH @ 9.0 FT.	

CONTRACTOR: Microseeps
OPERATOR: Art Carion
BAKER REP.: Mark DeJohn
BORING NO.: 44-BB-SB01

TEST BORING RECORD

PROJECT: RI/FS at OU No. 6 - Site 44 - MCAS, New River
CTO NO.: 62470-303 BORING NO.: 44-BB-SB02
COORDINATES: EAST: NORTH:
ELEVATION: SURFACE:

RIG: Geoprobe 5400								
	LARGE BORE SAMPLER	SMALL BORE SAMPLER	LINER	DATE	PROGRESS (FT)	WEATHER	WATER DEPTH (FT)	TIME
SIZE (DIAM.)	1-3/8" ID	--	1-1/8" ID	3/14/95	0.0 - 5.0	Sunny & warm	3.0	1351
LENGTH	4.0'	--	4.0'					
TYPE	Piston	--	Plastic					

REMARKS:

SAMPLE TYPE

S = Split Spoon A = Auger
T = Shelby Tube W = Wash
R = Air Rotary C = Core
D = Direct Push P = Piston
N = No Sample

DEFINITIONS

PID = Photoionization Detection Meter
ppm = parts per million
PS = Point Source
BG = Background
BOH = Bottom of Hole

Depth (ft)	Sample Type and No.	Sample Recovery (ft & %)	Lab ID Number	PID (ppm) PS/BG	Visual Description	Elev.
1	S-0		00	1.1/1.1	SAND (fine), some silt & clay; dark brown; moist; 1.0	
2	S-1	1.9 95%	01	1.2/1.1	CLAY, some silt & fine sand; brown & gray; mottled; damp	
3					3.0	
4	S-2	2.0 100%		1.4/1.4	SAND (fine), some silt, trace to little clay w/ damp sitly layers; brown & gray;	
5					wet GROUNDWATER @ 3.0 ft 5.0	
6					BOH @ 5.0 FT.	
7						
8						
9						
10						

CONTRACTOR: Microseeps BAKER REP.: Mark DeJohn
OPERATOR: Art Carion BORING NO.: 44-BB-SB02 SHEET 1 OF 1

TEST BORING RECORD

PROJECT: RI/FS at OU No. 6 - Site 44 - MCAS, New River
CTO NO.: 62470-303
COORDINATES: EAST: 2466746.0700
ELEVATION: SURFACE: 15.54
BORING NO.: 44-OA-SB01
NORTH: 360076.3167

RIG: Geoprobe 5400	LARGE BORE SAMPLER	SMALL BORE SAMPLER	LINER	DATE	PROGRESS (FT)	WEATHER	WATER DEPTH (FT)	TIME
SIZE (DIAM.)	1-3/8" ID	--	1-1/8" ID	3/8/95	0.0 - 11.0	Cloudy & mild	9.0	1435
LENGTH	4.0'	--	4.0'					
TYPE	Piston	--	Plastic					

REMARKS: Notes: (1) HNu was not used due to rainy conditions.

SAMPLE TYPE
S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Direct Push
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

DEFINITIONS
PID = Photoionization Detection Meter
ppm = parts per million
PS = Point Source
BG = Background
BOH = Bottom of Hole

Depth (ft)	Sample Type and No.	Sample Recovery (ft & %)	Lab ID Number	PID (ppm) PS/BG	Visual Description	Elev.
1 — 1.0	D-N		00	0.5/0.1	CLAY, some silt, little fine sand, trace roots; dark brown; wet — 1.0	14.45
2 — 3.0	S-1	1.8 90%		(1)	SILT, little clay, trace fine & coarse sand & roots; dark brown damp — 3.0	12.54
4 — 5.0	S-2	1.8 90%		(1)	SAND (fine), some clay, little silt & broken gravel; greenish-gray damp w/ wet zone @ 4.5-4.8 ft — 5.0	10.54
6 — 7.0	S-3	1.9 95%		(1)	SILTY CLAY, little fine sand, trace wood, layer of rocks @ 6 ft greenish-gray; damp	
8 — 9.0	S-4	1.2 60%	04	0.1/0.1	CLAY, some fine sand, little silt; — 8.5 gray; moist — 9.0	7.04 6.54
10	S-5	1.0 50%		(1)	SAND (fine), little clay & silt; gray wet GROUNDWATER @ 9.0 FT Match to Sheet 2	

CONTRACTOR: Microseeps
OPERATOR: Art Carion
BAKER REP.: Mark DeJohn
BORING NO.: 44-OA-SB01

TEST BORING RECORD

PROJECT: RI/FS at OU No. 6 - Site 44 - MCAS, New River
CTO NO.: 62470-303 BORING NO.: 44-OA-SB01

SAMPLE TYPE		DEFINITIONS
S = Split Spoon	A = Auger	PID = Photoionization Detection Meter
T = Shelby Tube	W = Wash	ppm = Parts per million
R = Air Rotary	C = Core	PS = Point Source
D = Direct Push	P = Piston	BG = Bachground
N = No Sample		BOH = Bottom of Hole

Depth (ft)		Sample Type and No.	Sample Recovery (ft & %)	Lab ID Number	PID (ppm) PS/BG	Visual Description	Elev.
11	11.0					Continued from Sheet 1	4.54
						11.0	
12						BOH @ 11.0 FT.	
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							

CONTRACTOR: Microseeps BAKER REP.: Mark DeJohn
OPERATOR: Art Carion BORING NO.: 44-OA-SB01 SHEET 2 OF 2

TEST BORING RECORD

PROJECT: RI/FS at OU No. 6 - Site 44 - MCAS, New River
CTO NO.: 62470-303
BORING NO.: 44-OA-SB02
COORDINATES: EAST: 2466788.8020
NORTH: 360175.1059
ELEVATION: SURFACE: 12.33

RIG: Geoprobe 5400	LARGE BORE SAMPLER	SMALL BORE SAMPLER	LINER	DATE	PROGRESS (FT)	WEATHER	WATER DEPTH (FT)	TIME
SIZE (DIAM.)	1-3/8" ID	--	1-1/8" ID	3/8/95	0.0 - 9.0	Cloudy & mild	7.0	1549
LENGTH	4.0'	--	4.0'					
TYPE	Piston	--	Plastic					

REMARKS: Notes: (1) HNu was not used due to rainy conditions.

SAMPLE TYPE
S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Direct Push
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

DEFINITIONS
PID = Photoionization Detection Meter
ppm = parts per million
PS = Point Source
BG = Background
BOH = Bottom of Hole

Depth (ft)	Sample Type and No.	Sample Recovery (ft & %)	Lab ID Number	PID (ppm) PS/BG	Visual Description	Elev.
1	D-N		00	3.2/0.1	SAND (fine), some silt, trace clay; brown; moist	
1.0						
2	S-1	2.0 100%		(1)		
3					CLAY, some silt, trace fine sand; brown; mottled; damp	
3.0						
4	S-2	1.6 80%		(1)		
5						
5.0						
1.7						10.63
6	S-3	1.4 70%	03	1.8/0.1	SAND (fine to med), little silt & clay; brown; moist	
7						
7.0						
8	S-4	1.5 75%		(1)		
8.0						4.33
9					SAND (med to coarse), little silt, trace clay; tan w/ iron staining; wet GROUNDWATER @ 7.0 ft	
9.0						3.33
10					BOH @ 9.0 FT.	

CONTRACTOR: Microseeps
OPERATOR: Art Carion
BAKER REP.: Mark DeJohn
BORING NO.: 44-OA-SB02

TEST BORING RECORD

PROJECT: RI/FS at OU No. 6 - Site 44 - MCAS, New River
CTO NO.: 62470-303
BORING NO.: 44-OA-SB03
COORDINATES: EAST: 2467024.5845 NORTH: 360292.4174
ELEVATION: SURFACE: 7.72

RIG: None used - Hand Sampled	LARGE BORE SAMPLER	SMALL BORE SAMPLER	LINER	DATE	PROGRESS (FT)	WEATHER	WATER DEPTH (FT)	TIME
SIZE (DIAM.)	--	1-3/8" OD	1-1/8" ID	3/14/95	0.0 - 5.0	Clear & cool	4.0	0754
LENGTH	--	2.0'	2.0'					
TYPE	--	Hand	Plastic					

REMARKS:

SAMPLE TYPE

S = Split Spoon
A = Auger
T = Shelby Tube
W = Wash
R = Air Rotary
C = Core
D = Direct Push
P = Piston
N = No Sample

DEFINITIONS

PID = Photoionization Detection Meter
ppm = parts per million
PS = Point Source
BG = Background
BOH = Bottom of Hole

Depth (ft)	Sample Type and No.	Sample Recovery (ft & %)	Lab ID Number	PID (ppm) PS/BG	Visual Description	Elev.
1 – 1.0	D-N		00	0.8/0.8	SILT, little clay, trace fine sand; black; moist – 1.0	6.72
2 – 3.0	S-1	1.3 65%	01	0.8/0.8	SAND (fine to coarse), little silt, trace clay; brown; moist	
4 – 5.0	S-2	1.9 95%		0.8/0.8	sand coarsens w/ depth; wet GROUNDWATER @ 4.0 FT – 5.0	2.72
6					BOH @ 5.0 FT.	
7						
8						
9						
10						

CONTRACTOR: Microseeps
OPERATOR: Art Carion
BAKER REP.: Mark DeJohn
BORING NO.: 44-OA-SB03

TEST BORING RECORD

PROJECT: RI/FS at OU No. 6 - Site 44 - MCAS, New River
CTO NO.: 62470-303
BORING NO.: 44-OA-SB04
COORDINATES: EAST: 2467064.8300
NORTH: 360159.6447
ELEVATION: SURFACE: 10.00

RIG: Geoprobe 5400	LARGE BORE SAMPLER	SMALL BORE SAMPLER	LINER	DATE	PROGRESS (FT)	WEATHER	WATER DEPTH (FT)	TIME
SIZE (DIAM.)	1-3/8" ID	--	1-1/8" ID	3/14/95	0.0 - 7.0	Sunny & warm	5.0	1158
LENGTH	4.0'	--	4.0'					
TYPE	Piston	--	Plastic					

REMARKS:

SAMPLE TYPE
S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Direct Push
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

DEFINITIONS
PID = Photoionization Detection Meter
ppm = parts per million
PS = Point Source
BG = Background
BOH = Bottom of Hole

Depth (ft)	Sample Type and No.	Sample Recovery (ft & %)	Lab ID Number	PID (ppm) PS/BG	Visual Description	Elev.
1 – 1.0	S-0		00	0.9/0.9	SILT, some clay, trace fine sand; dark brown; moist — 0.5	9.50
2 – 3.0	S-1	1.8 90%		0.8/0.8	CLAY, little silt; brown & gray; mottled; damp — SAND (fine), some silt & clay; brown & gray; mottled; damp — 2.3 — 3.0	7.70 7.00
4 – 5.0	S-2	1.7 85%	02 02D	0.8/0.8	SILTY SAND, trace clay; brown; moist	
6 – 7.0	S-3	2.0 100%		0.8/0.8	trace iron stained laminae; wet GROUNDWATER @ 5.0 FT — 7.0	3.00
8 – 10					BOH @ 7.0 FT.	

CONTRACTOR: Microseeps
OPERATOR: Art Carion
BAKER REP.: Mark DeJohn
BORING NO.: 44-OA-SB04

TEST BORING RECORD

PROJECT: RI/FS at OU No. 6 - Site 44 - MCAS, New River
CTO NO.: 62470-303
BORING NO.: 44-OA-SB05
COORDINATES: EAST: 246965.4345
NORTH: 360002.9593
ELEVATION: SURFACE: 9.75

RIG: None used - Hand Sampled	LARGE BORE SAMPLER	SMALL BORE SAMPLER	LINER	DATE	PROGRESS (FT)	WEATHER	WATER DEPTH (FT)	TIME
SIZE (DIAM.)	--	1-3/8" OD	1-1/8" ID	3/14/95	0.0 - 5.0	Clear & cool	5.0	0939
LENGTH	--	2.0'	2.0'					
TYPE	--	Hand	Plastic					

REMARKS:

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Direct Push
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

DEFINITIONS

PID = Photoionization Detection Meter
ppm = parts per million
PS = Point Source
BG = Background
BOH = Bottom of Hole

Depth (ft)	Sample Type and No.	Sample Recovery (ft & %)	Lab ID Number	PID (ppm) PS/BG	Visual Description	Elev.
1 – 1.0	D-N		00	0.8/0.8	SILT, little clay, trace fine sand; dark brown; damp	
2 – 3.0	S-1	1.8 90%		0.7/0.7	trace coarse sand; moist to wet — 2.6	7.15
4 – 5.0	S-2	2.0 100%	02	0.7/0.7	SILT, little to some clay, little fine sand; brown & gray; laminae; damp — 4.8	4.95
					SILTY SAND, trace clay; brown — 5.0	4.75
					wet GROUNDWATER @ 5.0 ft	
6					BOH @ 5.0 FT.	
7						
8						
9						
10						

CONTRACTOR: Microseeps
OPERATOR: Art Carion
BAKER REP.: Mark DeJohn
BORING NO.: 44-OA-SB05

TEST BORING RECORD

PROJECT: RI/FS at OU No. 6 - Site 44 - MCAS, New River
CTO NO.: 62470-303
BORING NO.: 44-OA-SB06
COORDINATES: EAST: 2467168.0072 NORTH: 359973.0947
ELEVATION: SURFACE: 9.90

RIG: None used - Hand Sampled	LARGE BORE SAMPLER	SMALL BORE SAMPLER	LINER	DATE	PROGRESS (FT)	WEATHER	WATER DEPTH (FT)	TIME
SIZE (DIAM.)	--	1-3/8" OD	1-1/8" ID	3/14/95	0.0 - 7.0	Clear & cool	5.0	0847
LENGTH	--	2.0'	2.0'					
TYPE	--	Hand	Plastic					

REMARKS:

SAMPLE TYPE
S = Split Spoon A = Auger
T = Shelby Tube W = Wash
R = Air Rotary C = Core
D = Direct Push P = Piston
N = No Sample

DEFINITIONS
PID = Photoionization Detection Meter
ppm = parts per million
PS = Point Source
BG = Background
BOH = Bottom of Hole

Depth (ft)	Sample Type and No.	Sample Recovery (ft & %)	Lab ID Number	PID (ppm) PS/BG	Visual Description	Elev.
1 – 1.0	D-N		00	0.7/0.7	SILT, trace fine & coarse sand, & clay; dark brown; damp – 1.0	8.90
2 – 3.0	S-1	1.9 95%		0.8/0.8	CLAY, little silt; brown & gray; mottled; damp – 2.7	7.20
4 – 5.0	S-2	1.9 95%	02	0.8/0.8	SAND (fine), some silt, little to some clay; gray; moist – 5.0	4.90
6 – 7.0	S-3	2.0 100%		0.7/0.7	SILTY SAND (fine), trace to little clay; gray w/ iron stained laminae; wet GROUNDWATER @ 5.0 ft – 7.0	2.90
8 – 10					BOH @ 7.0 FT.	

CONTRACTOR: Microseeps BAKER REP.: Mark DeJohn
OPERATOR: Art Carion BORING NO.: 44-OA-SB06 SHEET 1 OF 1

TEST BORING RECORD

PROJECT: RI/FS at OU No. 6 - Site 44 - MCAS, New River
CTO NO.: 62470-303 BORING NO.: 44-WA-SB01
COORDINATES: EAST: 2466733.5986 NORTH: 360017.2015
ELEVATION: SURFACE: 14.38

RIG: Geoprobe 5400								
	LARGE BORE SAMPLER	SMALL BORE SAMPLER	LINER	DATE	PROGRESS (FT)	WEATHER	WATER DEPTH (FT)	TIME
SIZE (DIAM.)	1-3/8" ID	--	1-1/8" ID	3/13/95	0.0 - 9.0	Sunny & warm	7.0	1210
LENGTH	4.0'	--	4.0'					
TYPE	Piston	--	Plastic					

REMARKS:

SAMPLE TYPE

S = Split Spoon A = Auger
T = Shelby Tube W = Wash
R = Air Rotary C = Core
D = Direct Push P = Piston
N = No Sample

DEFINITIONS

PID = Photoionization Detection Meter
ppm = parts per million
PS = Point Source
BG = Background
BOH = Bottom of Hole

Depth (ft)	Sample Type and No.	Sample Recovery (ft & %)	Lab ID Number	PID (ppm) PS/BG	Visual Description	Elev.
1 – 1.0	S-0		00 00D	1.8/1.7	SAND (fine), some silt & clay, trace roots; dark brown; damp to moist	
2 – 3.0	S-1	1.8 90%		1.6/1.6	Trace coarse sand	
3					3.0	11.38
4 – 5.0	S-2	1.8 90%		1.6/1.6	SAND (fine), some silt, little to some clay; dark gray; moist	
5					5.0	9.38
6 – 7.0	S-3	1.4 70%	03	1.6/1.6	SILTY SAND, trace clay; gray moist	
8 – 9.0	S-4	2.0 100%		1.6/1.6	wet GROUNDWATER @ 7.0 FT	
9					9.0	5.38
10					BOH @ 9.0 FT.	

CONTRACTOR: Microseeps BAKER REP.: Mark DeJohn
OPERATOR: Art Carion BORING NO.: 44-WA-SB01 SHEET 1 OF 1

TEST BORING RECORD

PROJECT: RI/FS at OU No. 6 - Site 44 - MCAS, New River
CTO NO.: 62470-303
BORING NO.: 44-WA-SB02
COORDINATES: EAST: 3466744.3611
NORTH: 360008.8066
ELEVATION: SURFACE: 14.50

RIG: Geoprobe 5400								
	LARGE BORE SAMPLER	SMALL BORE SAMPLER	LINER	DATE	PROGRESS (FT)	WEATHER	WATER DEPTH (FT)	TIME
SIZE (DIAM.)	1-3/8" ID	--	1-1/8" ID	3/14/95	0.0 - 7.0	Sunny & warm	5.0	1158
LENGTH	4.0'	--	4.0'					
TYPE	Piston	--	Plastic					

REMARKS:

SAMPLE TYPE
S = Split Spoon
A = Auger
T = Shelby Tube
W = Wash
R = Air Rotary
C = Core
D = Direct Push
P = Piston
N = No Sample

DEFINITIONS
PID = Photoionization Detection Meter
ppm = parts per million
PS = Point Source
BG = Background
BOH = Bottom of Hole

Depth (ft)	Sample Type and No.	Sample Recovery (ft & %)	Lab ID Number	PID (ppm) PS/BG	Visual Description		Elev.
1	S-0		00	2.1/2.1	CLAY, some silt, little fine sand, trace gravel; dark brown; moist		
1.0							
2	S-1	2.0 100%		1.9/1.9	trace fine sand; mottled; damp	2.1	12.40
3					CLAY, some silt, trace fine sand & gravel w/ layers of silt and debris;		
3.0							
4	S-2	1.8 90%		1.9/1.9	dark gray; moist		
5						5.0	9.50
5.0							
6	S-3	1.8 90%	03	1.9/1.9	SILT, little clay, trace fine sand; gray; damp		
7					SAND (fine to med), some silt, trace to little clay; gray; moist to wet - G.WATER @ 7.0 FT.	6.6 7.0	7.90 7.50
7.0							
8					BOH @ 7.0 FT.		
9							
10							

CONTRACTOR: Microseeps
BAKER REP.: Mark DeJohn
OPERATOR: Art Carion
BORING NO.: 44-WA-SB02
SHEET 1 OF 1

TEST BORING RECORD

PROJECT: RI/FS at OU No. 6 - Site 44 - MCAS, New River
CTO NO.: 62470-303 BORING NO.: 44-WA-SB03
COORDINATES: EAST: 2466735.8992 NORTH: 359996.5188
ELEVATION: SURFACE: 14.60

RIG: Geoprobe 5400								
	LARGE BORE SAMPLER	SMALL BORE SAMPLER	LINER	DATE	PROGRESS (FT)	WEATHER	WATER DEPTH (FT)	TIME
SIZE (DIAM.)	1-3/8" ID	--	1-1/8" ID	3/13/95	0.0 - 9.0	Sunny & warm	7.0	1533
LENGTH	4.0'	--	4.0'					
TYPE	Piston	--	Plastic					

REMARKS:

SAMPLE TYPE
S = Split Spoon A = Auger
T = Shelby Tube W = Wash
R = Air Rotary C = Core
D = Direct Push P = Piston
N = No Sample

DEFINITIONS
PID = Photoionization Detection Meter
ppm = parts per million
PS = Point Source
BG = Background
BOH = Bottom of Hole

Depth (ft)	Sample Type and No.	Sample Recovery (ft & %)	Lab ID Number	PID (ppm) PS/BG	Visual Description	Elev.
1	S-0		00	1.6/1.6	SAND (fine), some silt & clay, trace gravel; dark brown; moist	13.60
1.0					1.0	
2	S-1	1.8 90%		1.5/1.4	CLAY, some silt, trace to little fine sand, wood & gravel, dark brown; damp	
3						
3.0					3.4	11.20
4	S-2	2.0 100%		1.3/1.3	SAND (fine), some silt, little to some clay; gray; damp	
5						
5.0						
6	S-3	1.4 70%	03	1.2/1.2	0.5" clayey layer @ 6ft w/ perched water on top	
7						
7.0					7.0	7.60
8	S-4	1.9 95%		1.1/1.1	SILTY SAND (fine), trace to lillte clay; gray; moist to wet	
9					GROUNDWATER @ 7.0 FT	
9.0					9.0	5.60
10					BOH @ 9.0 FT.	

CONTRACTOR: Microseeps BAKER REP.: Mark DeJohn
OPERATOR: Art Carion BORING NO.: 44-WA-SB03 SHEET 1 OF 1

TEST BORING RECORD

PROJECT: RI/FS at OU No. 6 - Site 44 - MCAS, New River
CTO NO.: 62470-303
BORING NO.: 44-WA-SB04
COORDINATES: EAST: 2466725.2110 NORTH: 360004.6108
ELEVATION: SURFACE: 14.68

RIG: Geoprobe 5400								
	LARGE BORE SAMPLER	SMALL BORE SAMPLER	LINER	DATE	PROGRESS (FT)	WEATHER	WATER DEPTH (FT)	TIME
SIZE (DIAM.)	1-3/8" ID	--	1-1/8" ID	3/13/95	0.0 - 9.0	Sunny & warm	7.0	1645
LENGTH	4.0'	--	4.0'					
TYPE	Piston	--	Plastic					

REMARKS:

SAMPLE TYPE
S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Direct Push
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

DEFINITIONS
PID = Photoionization Detection Meter
ppm = parts per million
PS = Point Source
BG = Background
BOH = Bottom of Hole

Depth (ft)	Sample Type and No.	Sample Recovery (ft & %)	Lab ID Number	PID (ppm) PS/BG	Visual Description	Elev.
1 - 1.0	S-0		00	1.1/1.1	CLAY, little silt & fine sand, trace roots; dark brown; moist	
2 - 3.0	S-1	1.8 90%		1.1/1.0	silty zones, trace gravel; damp	
4 - 5.0	S-2	1.9 95%		1.2/0.9	3.9	10.78
					SILTY SAND, trace to little clay, trace wood & rock frag.; gray blueish color & sewer odor @ 5ft	9.68
6 - 7.0	S-3	1.9 95%	03	1.6/1.2	SAND (fine), some silt, little to some clay; gray; moist, wet @ 5ft	
8 - 9.0	S-4	2.0 100%		1.2/1.2	little clay; moist to wet GROUNDWATER @ 7.0 FT	
					9.0	5.68
10					BOH @ 9.0 FT.	

CONTRACTOR: Microseeps
OPERATOR: Art Carion
BAKER REP.: Mark DeJohn
BORING NO.: 44-WA-SB04

TEST BORING RECORD

PROJECT: RI/FS at OU No. 6 - Site 44 - MCAS, New River
CTO NO.: 62470-303
BORING NO.: 44-GW01DW
COORDINATES: EAST: 2466944.3148 NORTH: 360140.1916
ELEVATION: SURFACE: 11.74

RIG: Geoprobe 5400	LARGE BORE SAMPLER	SMALL BORE SAMPLER	LINER	DATE	PROGRESS (FT)	WEATHER	WATER DEPTH (FT)	TIME
SIZE (DIAM.)	1-3/8" ID	--	1-1/8" ID	3/13/95	0.0 - 9.0	Sunny & cool	6.5	1003
LENGTH	4.0'	--	4.0'					
TYPE	Piston	--	Plastic					

REMARKS:

SAMPLE TYPE
S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Direct Push
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

DEFINITIONS
PID = Photoionization Detection Meter
ppm = parts per million
PS = Point Source
BG = Background
BOH = Bottom of Hole

Depth (ft)	Sample Type and No.	Sample Recovery (ft & %)	Lab ID Number	PID (ppm) PS/BG	Visual Description	Elev.
1 – 1.0	D-N		00	2.2/2.2	CLAY, some silt, little fine sand; brown; moist — 1.0	10.74
2 – 3.0	S-1	1.8 90%		1.3/1.2	SAND (fine), some silt, little clay; brown; moist, wet @ 3ft — 3.0	8.74
4 – 5.0	S-2	1.7 85%		1.2/1.2	CLAY, little silt w/ zones of fine sand & rock frag.; dark gray; plastic; moist	
6 – 7.0	S-3	1.2 60%	03	1.3/1.3	trace wood; moist to wet — 6.5	5.24
8 – 9.0	S-4	2.0 100%		1.2/1.2	SAND (fine), trace to some silt, trace clay; brown; wet GROUNDWATER @ 6.5 FT — 9.0	2.74
10					BOH @ 9.0 FT.	

CONTRACTOR: Microseeps
OPERATOR: Art Carion
BAKER REP.: Mark DeJohn
BORING NO.: 44-GW01DW

TEST BORING RECORD

PROJECT: RI/FS at OU No. 6 - Site 44 - MCAS, New River
CTO NO.: 62470-303
COORDINATES: EAST: 2466705.9356 NORTH: 360159.0646
ELEVATION: SURFACE: 15.78
BORING NO.: 44-GW04

RIG: Geoprobe 5400	LARGE BORE SAMPLER	SMALL BORE SAMPLER	LINER	DATE	PROGRESS (FT)	WEATHER	WATER DEPTH (FT)	TIME
SIZE (DIAM.)	1-3/8" ID	--	1-1/8" ID	3/13/95	0.0 - 11.0	Sunny & cool	9.0	0854
LENGTH	4.0'	--	4.0'					
TYPE	Piston	--	Plastic					

REMARKS:

SAMPLE TYPE
S = Split Spoon A = Auger
T = Shelby Tube W = Wash
R = Air Rotary C = Core
D = Direct Push P = Piston
N = No Sample

DEFINITIONS
PID = Photoionization Detection Meter
ppm = parts per million
PS = Point Source
BG = Background
BOH = Bottom of Hole

Depth (ft)	Sample Type and No.	Sample Recovery (ft & %)	Lab ID Number	PID (ppm) PS/BG	Visual Description	Elev.
1 – 1.0	D-N		00	1.1/1.1	CLAY, some silt, trace fine sand; brown; damp — 1.0	14.78
2 – 3.0	S-1	1.5 75%		0.9/0.9	SILT, trace coarse sand & clay; dark brown; damp	
4 – 5.0	S-2	1.5 75%		1.1/1.0	lillte to some fine sand	
6 – 7.0	S-3	1.5 75%		1.2/1.1	moist to wet CLAY, some silt, trace fine — 6.5 — 9.28 sand; brown; mottled; damp — 7.0 — 8.78	
8 – 9.0	S-4	1.7 85%	04	1.1/1.1	SAND (fine), some silt & clay; brown & red; mottled; damp to moist	
10	S-5	1.9 95%		1.3/1.3	trace to little clay; wet GROUNDWATER @ 9.0 FT. Match to Sheet 2	

CONTRACTOR: Microseeps BAKER REP.: Mark DeJohn
OPERATOR: Art Carion BORING NO.: 44-GW04

TEST BORING RECORD

PROJECT: RI/FS at OU No. 6 - Site 44 - MCAS, New River
CTO NO.: 62470-303 BORING NO.: 44-GW04

SAMPLE TYPE		DEFINITIONS
S = Split Spoon	A = Auger	PID = Photoionization Detection Meter
T = Shelby Tube	W = Wash	ppm = Parts per million
R = Air Rotary	C = Core	PS = Point Source
D = Direct Push	P = Piston	BG = Bachground
N = No Sample		BOH = Bottom of Hole

Depth (ft)	Sample Type and No.	Sample Recovery (ft & %)	Lab ID Number	PID (ppm) PS/BG	Visual Description	Elev.
11 11.0					Continued from Sheet 1	
					11.0	4.78
12					BOH @ 11.0 FT.	
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						

CONTRACTOR: Microseeps BAKER REP.: Mark DeJohn
OPERATOR: Art Carion BORING NO.: 44-GW04 SHEET 2 OF 2

TEST BORING RECORD

PROJECT: RI/FS at OU No. 6 - Site 44 - MCAS, New River
CTO NO.: 62470-303 BORING NO.: 44-GW05
COORDINATES: EAST: 2467164.5079 NORTH: 360139.8878
ELEVATION: SURFACE: 12.55

RIG: Geoprobe 5400								
	LARGE BORE SAMPLER	SMALL BORE SAMPLER	LINER	DATE	PROGRESS (FT)	WEATHER	WATER DEPTH (FT)	TIME
SIZE (DIAM.)	1-3/8" ID	--	1-1/8" ID	3/14/95	0.0 - 9.0	Clear & cool	8.0	1058
LENGTH	4.0'	--	2.0'					
TYPE	Piston	--	Plastic					

REMARKS:

SAMPLE TYPE
S = Split Spoon A = Auger
T = Shelby Tube W = Wash
R = Air Rotary C = Core
D = Direct Push P = Piston
N = No Sample

DEFINITIONS
PID = Photoionization Detection Meter
ppm = parts per million
PS = Point Source
BG = Background
BOH = Bottom of Hole

Depth (ft)	Sample Type and No.	Sample Recovery (ft & %)	Lab ID Number	PID (ppm) PS/BG	Visual Description	Elev.
1 1.0	D-N		00	0.8/0.8	CLAY, some silt, trace fine sand; brown; damp 1.0	11.55
2 3.0	S-1	1.8 90%		0.8/0.8	CLAY, little silt; gray & burnt orange; mottled; damp	
4 5.0	S-2	1.9 95%		0.8/0.8	4.7	7.85
6 7.0	S-3	1.8 90%	03	0.8/0.8	SAND (fine to med), some silt, little clay; gray & brown; mottled; damp	
8 9.0	S-4	1.9 95%		0.8/0.8	trace coarse sand & gravel, trace silty laminae; wet GROUNDWATER @ 8.0 FT 9.0	3.55
10					BOH @ 9.0 FT.	

CONTRACTOR: Microseeps BAKER REP.: Mark DeJohn
OPERATOR: Art Carion BORING NO.: 44-GW05 SHEET 1 OF 1

APPENDIX B
TEST BORING AND WELL CONSTRUCTION RECORDS

Baker
Baker Environmental, Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: RI/FS at OU NO. 6 - Site 44 - MCAS, New River
CTO NO.: 62470-303
COORDINATES: EAST: 2466944.3148 NORTH: 360140.1916
ELEVATION: SURFACE: 11.74 TOP OF PVC CASING: 13.89
BORING NO.: 44-GW01DW

RIG: B-80 Mobile Rig

	SPLIT SPOON	CASING	AUGERS	CORE BARREL
SIZE (DIAM.)	1-3/8"	6"		
LENGTH	2.0	54.0'		
TYPE	Std.	steel		
HAMMER WT.	140 lbs.			
FALL	30"			
STICK UP				

DATE	PROGRESS (FT.)	WEATHER	WATER DEPTH (FT.)	TIME
3-20-95	0 - 54.0	Sunny, 70s	6.40'	—
3-21-95	54.0 - 54.7	Cloudy, 70s	—	—
3-22-95	54.0 - 86.0	Pt. Cloudy, 70s	—	—

REMARKS:
Shelby Tube sample collected from 54.0' to 54.7'

SAMPLE TYPE
S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

Well Information	Diam.	Type	Top Depth (ft.)	Bottom Depth (ft.)
Riser	2.0"	Schedule 40 PVC	+2.5'	65.0' (bgs)
Screen	2.0"	Schedule 40 0.01 Slot	65.0' (bgs)	70.0' (bgs)

Depth (ft.)	Samp. Type and No.	Samp. Rec. (ft. & %)	SPT or RQD	Lab ID No.	PID (ppm)	Visual Description	Well Installation Detail	Elevation (ft. MSL)
1	S-1	1.8/2.0 90%	3 4 5 4		.0 .0	SILT, some fine sand, trace to little clay, trace organics and cemented sand fragments; damp; brown - lt. brown 0.7'		
2						SILT and CLAY, little fine sand, trace organics; brown-lt. brown	cement grout	
3								
4	N						6" steel casing	
5	5.0					5.0'		
6	S-2	1.1/2.0 55%	2 2 5 6		.0 .0	SILT and FINE SAND, little wood fragments and roots; moist; dark brown 6.2'		
7	7.0					CLAY, little fine sand, trace to little silt; damp; lt. gray 6.4'		
8						FINE SAND, some silt, little clay; wet; lt. gray 6.7'		
9	N					FINE SAND, some silt; wet; tan	PVC riser	
10	10.0					10.0'		

Match to Sheet 2

DRILLING CO.: Hardin-Huber, Inc.
DRILLER: J. Carron
BAKER REP.: D. M. Gaviglia
BORING NO.: 44-GW01DW

Baker Environmental, Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: RI/FS at OU No. 6 - Site 44 - MCAS, New River
CTO NO.: 62470-303 BORING NO.: 44-GW01DW

SAMPLE TYPE

S = Split Spoon A = Auger
T = Shelby Tube W = Wash
R = Air Rotary C = Core
D = Denison P = Piston
N = No Sample

DEFINITIONS

SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
RQD = Rock Quality Designation (%)
Lab. Class. = USCS (ASTM D-2487) or AASHTO (ASTM D-3282)
Lab. Moist. = Moisture Content (ASTM D-2216) Dry Weight Basis

Depth (ft.)	Samp. Type and No.	Samp. Rec. (ft. & %)	SPT or RQD	Lab ID No.	PID (ppm)	Visual Description	Well Installation Detail	Elevation (ft. MSL)
11	S-3	1.6/2.0 80%	3 3 2 3		.0 .0	Continued from Sheet 1 FINE SAND and SILTY CLAY, some shell fragments; moist to wet; tan		
12						SILTY CLAY, some fine sand lamiment from 10.2' to 10.25' 10.25'		
12.0								
13						FINE SAND and SILT, little to some clay; damp; Olive-Dk. gray, Greenish-gray @ 15'		
14	N							
15								
15.0								
16	S-4	2.0/2.0 100%	2 2 11 12		.0 .0			
16.3'								
17						FINE SAND and SILT, trace clay and shell fragments; damp; greenish-gray; stiff		
17.0								
18								
19	N							
20								
20.0						20.0'		
21	S-5	1.9/2.0 95%	12 22 24 26		.0 .0	CLAYEY SILT w/ little to some fine grained SAND and trace SHELL FRAG. Light greenish gray and white medium dense, damp		
22								
22.0								
23								
24	N							
25								
25.0								
26	S-6	1.7/2.0 85%	9 12 14 15		.0 .0			
26.6'								
27						CLAYEY SILT w/ fine grained SAND and SHELL FRAG. Light gray and white, medium dense, damp.		
27.0								
28								
29	N							
30						30.0'		
30.0								

Cement grout
6" Steel Casing
PVC riser

DRILLING CO.: Hardin-Huber, Inc. BAKER REP.: D.M. Gaviglia
DRILLER: J. Corron BORING NO.: 44-GW01DW SHEET 2 OF 5

Baker
Baker Environmental, Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: RI/FS at OU No. 6 - Site 44 - MCAS, New River
CTO NO.: 62470-303 BORING NO.: 44-GW01DW

SAMPLE TYPE
S = Split Spoon; A = Auger; T = Shelby Tube; W = Wash; R = Air Rotary; C = Core; D = Denison; P = Piston; N = No Sample

DEFINITIONS
SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
RQD = Rock Quality Designation (%)
Lab. Class. = USCS (ASTM D-2487) or AASHTO (ASTM D-3282)
Lab. Moist. = Moisture Content (ASTM D-2216) Dry Weight Basis

Depth (ft.)	Samp. Type and No.	Samp. Rec. (ft. & %)	SPT or RQD	Lab ID No.	PID (ppm)	Visual Description
31	S-7	2.0/2.0 100%	8 12 13 14		0.0	Continued from Sheet 2
32 32.0						
33	S-8	1.6/2.0 80%	6 11 11 13		0.0	SAND, fine to medium grained w/ SHELL FRAG and little to some CLAYEY SILT. Light gray & white, medium dense to dense, wet. Partial cementation is present.
34 34.0						
35	S-9	1.4/2.0 70%	8 32 20 18		0.0	
36 36.0						
37	S-10	1.5/2.0 75%	13 14 13 14		0.0	
38 38.0						
39	S-11	1.3/2.0 65%	13 16 17 18		0.0	
40 40.0						
41	S-12	1.2/2.0 60%	15 18 17 18		0.0	
42 42.0						
43	S-13	1.3/2.0 65%	16 13 12 11		0.0	SAND, medium grained w/ some fine grained SAND little to some SHELL FRAG, trace to little SILT. Light gray, medium dense to dense, wet. Partial cementation is present
44 44.0						
45	S-14	1.3/2.0 65%	14 18 14 18		0.0	
46 46.0						
47	S-15		15 25 25 50/4"			
48 47.9						
49	S-16		8 23 50/4"			
49.4						
50 50.0	AN					

Well Installation Detail: cement grout; 6" Steel Casing; PVC riser; Bentonite Slurry

Elevation (ft. MSL)

DRILLING CO.: Hardin-Huber, Inc. BAKER REP.: D. M. Gavigla
DRILLER: J. Corron BORING NO.: 44-GW01DW SHEET 3 OF 5

Baker Environmental, Inc

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: RI/FS at OU No. 6 - Site 44 - MCAS, New River
CTO NO.: 62470-303 BORING NO.: 44-GW01OW

SAMPLE TYPE
S = Split Spoon; A = Auger; T = Shelby Tube; W = Wash; R = Air Rotary; C = Core; D = Denison; P = Piston; N = No Sample

DEFINITIONS
SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
RQD = Rock Quality Designation (%)
Lab. Class. = USCS (ASTM D-2487) or AASHTO (ASTM D-3282)
Lab. Moist. = Moisture Content (ASTM D-2216) Dry Weight Basis

Depth (ft.)	Samp. Type and No.	Samp. Rec. (ft. & %)	SPT or RQD	Lab ID No.	PID (ppm)	Visual Description
51	S-17	1.2/2.0 60%	13 12 12 10		.0 .0	Continued from Sheet 3 SAND, fine grained w/ CLAYEY SILT and trace SHELL FRAG. Light greenish gray medium dense, damp to moist. Partial cementation
52 52.0						
53	S-18	1.6/2.0 80%	8 10 12 13		.0 .0	
54 54.0						
55	T	35%	—		.0 .0	
56 56.0	N	—	—		—	
57	S-19	.5/2.0 25%	50/5"		.3 .3	SAND, fine to medium grained and SHELL FRAG/ SHELL MATERIAL. Light grayish green + white very dense, wet.
58 58.0						
59	S-20	.9/2.0 45%	17 28 50/4"		.3 .3	SAND, fine to medium grained w/ trace SILT and little SHELL FRAG/ SHELL MATERIAL. Light grayish green, very dense, wet
60 60.0						
61	S-21	.8/2.0 40%	34 50/5"		.3 .3	
62 62.0						
63	S-22	—	50/5"			NO RECOVERY
64 64.0						
65	S-23	—	50/4"			NO RECOVERY
66 66.0						
67	S-24	1.0/2.0 50%	18 19 17 22		.3 .3	SAND, fine grained w/ trace medium grained and trace SILT and trace SHELL MATERIAL Light gray and white, dense, wet.
68 68.0						
69	S-25	.8/2.0 40%	9 17 24 27		.3 .3	
70 70.0						

Well Installation Detail: Bentonite slurry; 6" Steel casing; PVC riser; Bentonite pellets; Sand pack; Well screen

Elevation (ft. MSL)

DRILLING CO.: Hardin-Huber, Inc. BAKER REP.: J.E. Zimmerman
DRILLER: J. Corron BORING NO.: 44-GW01OW SHEET 4 OF 5

Baker
Baker Environmental, Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: RI/FS at OU No. 6 - Site 44 - MCAS, New River
CTO NO.: 62470-303 BORING NO.: 44-GW01OW

SAMPLE TYPE
S = Split Spoon A = Auger
T = Shelby Tube W = Wash
R = Air Rotary C = Core
D = Denison P = Piston
N = No Sample

DEFINITIONS
SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
RQD = Rock Quality Designation (%)
Lab. Class. = USCS (ASTM D-2487) or AASHTO (ASTM D-3282)
Lab. Moist. = Moisture Content (ASTM D-2216) Dry Weight Basis

Depth (ft.)	Samp. Type and No.	Samp. Rec. (ft. & %)	SPT or RQD	Lab ID No.	PID (ppm)	Visual Description	Well Installation Detail	Elevation (ft. MSL)
71	S-26	.7/2.0 35%	11 13 12 15		.3/.3	Continued from Sheet 4 SAND, fine grained w/trace SILT and trace CLAY and trace SHELL MATERIAL Light green + white, wet		
72 72.0								
73	S-27	1.7/2.0 85%	7 7 9 12		.3/.3	SILTY SAND, fine grained w/little CLAY and trace SHELL MATERIAL. Green + white, medium dense, wet		
74 74.0								
75	S-28	—	7 11 12 14		—	NO RECOVERY	Bentonite pellets	
76 76.0								
77	S-29	—	8 8 12 14		—	NO RECOVERY		
78 78.0								
79	S-30	—	7 8 9 8		—	NO RECOVERY		
80 80.0								
81	S-31	1.0/2.0 50%	32 50/5"		.3/.3	SILTY SAND, fine grained w/trace CLAY w/trace SHELL MATERIAL. Light green + white, wet		
82 82.0								
83	S-32	2.0/2.0 100%	10 10 13 16		.3/.3	SANDY SILT, fine grained w/trace to little CLAY. Green, medium dense, damp		
84 84.0								
85	S-33	2.0/2.0 100%	10 10 9 13		.3/.3	SILTY CLAY w/trace SAND, fine grained Green, medium dense damp.		
86 86.0								
7						End of Boring * Borehole sampled to 86.0' (bgs) and back-filled to 71.0' (bgs) * Well set at 70.5' (bgs)		
8								
9								
0								

DRILLING CO.: Hardin-Huber, Inc. BAKER REP.: J. E. Zimmerman
DRILLER: J. Corron BORING NO.: 44-GW01OW SHEET 5 OF 5

Baker
Baker Environmental, Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: RI/FS at OU NO. 6 - Site 44 - MCAS, New River
CTO NO.: 62470-303
COORDINATES: EAST: 2466705.9356 NORTH: 360159.0646
ELEVATION: SURFACE: 15.78 TOP OF PVC CASING: 17.55
BORING NO.: 44-GW04

RIG: R40	SPLIT SPOON	CASING	AUGERS	CORE BARREL	DATE	PROGRESS (FT.)	WEATHER	WATER DEPTH (FT.)	TIME
SIZE (DIAM.)	1-3/8"		4¼" ID		3-22-95	0-23.0	partly cloudy warm (70's)	9.0'	
LENGTH	2.0		5.0'						
TYPE	Std.		HSA						
HAMMER WT.	140 lbs.								
FALL	30"								
STICK UP									

REMARKS: Borehole continuously sampled to 22.0' (bgs). Borehole drilled out to 23.0' (bgs). Type II monitoring well set 3-22-95. HNu background = .3 ppm.

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

Well Information	Diam.	Type	Top Depth (ft.)	Bottom Depth (ft.)
Riser	2.0"	Schedule 40 PVC	+2.5'	7.0' (bgs)
Screen	2.0"	Schedule 40 0.01 Slot	7.0' (bgs)	22.0' (bgs)

Depth (ft.)	Samp. Type and No.	Samp. Rec. (ft. & %)	SPT or RQD	Lab ID No.	PID (ppm)	Visual Description	Well Installation Detail	Elevation (ft. MSL)
1	S-1	1.1/2.0 55%	2 3 2 2		.3 .3	SILTY SAND, fine grained w/ ROOTED MATERIAL. Dark brown, loose, damp	Cement grout	
2							Bentonite pellets	
3	S-2	1.4/2.0 70%	2 2 2 2		.3 .3	SILTY SAND, fine grained. Dark brown, loose, damp.		
4								
5	S-3	1.4/2.0 70%	3 3 2 3		.3 .3	SAND, fine grained w/ little SILT. Dark brown to brown w/ oxidation, loose, damp to moist	PVC riser	
6								
7	S-4	1.1/2.0 55%	2 3 5 6		.3 .3	SILTY SAND, fine grained w/ trace to little CLAY. Brown to light gray, loose moist to wet	Sand pack	
8								
9	S-5	1.6/2.0 80%	2 4 4 5		.3 .3	SAND, fine grained w/ trace SILT. Brown to light	Well Screen	
10								

Match to Sheet 2

DRILLING CO.: Hardin-Huber, Inc.
DRILLER: J. Corron
BAKER REP.: J.E. Zimmerman
BORING NO.: 44-GW04

Baker
Baker Environmental, Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: RI/FS at OU No. 6 - Site 44 - MCAS, New River
CTO NO.: 62470-303 BORING NO.: 44-GW04

SAMPLE TYPE
S = Split Spoon A = Auger
T = Shelby Tube W = Wash
R = Air Rotary C = Core
D = Denison P = Piston
N = No Sample

DEFINITIONS
SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
RQD = Rock Quality Designation (%)
Lab. Class. = USCS (ASTM D-2487) or AASHTO (ASTM D-3282)
Lab. Moist. = Moisture Content (ASTM D-2216) Dry Weight Basis

Depth (ft.)	Samp. Type and No.	Samp. Rec. (ft. & %)	SPT or RQD	Lab ID No.	PID (ppm)	Visual Description	Well Installation Detail	Elevation (ft. MSL)
11	S-6	1.3/2.0 65%	6 6 7 5		0.3	Continued from Sheet 1 gray w/oxidation (orange) staining, medium dense, wet		
12 12.0								
13	S-7	NR	3 4 4 6		-	NO RECOVERY		
14 14.0								
15	S-8	1.7/2.0 85%	10 4 2 2		0.3		Sand pack	
16 16.0								
17	S-9	1.6/2.0 80%	2 2 - 5		0.3	SAND, fine grained w/ trace SILT, light gray to brown to dark gray, w/ oxidation (orange and dark reddish brown) (14 to 16' (bgs) only), loose to very loose, wet.		
18 18.0								
19	S-10	1.8/2.0 90%	WOH/24"		0.3		Well Screen	
20 20.0								
21	S-11	2.0/2.0 100%	WOH/24"		0.3			
22 22.0								
23 23.0	A-N	-	-	-	-	End of Boring TD: 23.0' (bgs)		
24								
25								
26								
27								
28								
29								
30								

DRILLING CO.: Hardin-Huber, Inc. BAKER REP.: J. E. Zimmerman
DRILLER: J. Corron BORING NO.: 44-GW04 SHEET 2 OF 2

Baker
Baker Environmental, Inc

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: RI/FS at OU NO. 6 - Site 44 - MCAS, New River
CTO NO.: 62470-303
COORDINATES: EAST: 2467164.5079 NORTH: 360139.8878
ELEVATION: SURFACE: 12.55 TOP OF PVC CASING: 14.26
BORING NO.: 44-GW05

RIG: R40	SPLIT SPOON	CASING	AUGERS	CORE BARREL	DATE	PROGRESS (FT.)	WEATHER	WATER DEPTH (FT.)	TIME
SIZE (DIAM.)	1-3/8"		4¼" ID		3-23-95	0-22.0	clear, cool (50's) calm	8.0	
LENGTH	2.0		5.0'						
TYPE	Std.		HSA						
HAMMER WT.	140 lbs.								
FALL	30"								
STICK UP									

REMARKS: Borehole continuously sampled to 20.0'(bgs). Borehole drilled out to 22.0'(bgs). Type II monitoring well set 3-23-95. Hnu background = .4 ppm

SAMPLE TYPE

S = Split Spoon A = Auger
T = Shelby Tube W = Wash
R = Air Rotary C = Core
D = Denison P = Piston
N = No Sample

Well Information	Diam.	Type	Top Depth (ft.)	Bottom Depth (ft.)
Riser	2.0"	Schedule 40 PVC	+2.5'	6.0'(bgs)
Screen	2.0"	Schedule 40 0.01 Slot	6.0'(bgs)	21.0'(bgs)

Depth (ft.)	Samp. Type and No.	Samp. Rec. (ft. & %)	SPT or RQD	Lab ID No.	PID (ppm)	Visual Description	Well Installation Detail	Elevation (ft. MSL)
1	S-1	1.5/2.0 75%	3 5 7 12		.4/.4	ROOTED/PLANT MATERIAL SILTY CLAY w/trace SAND, fine grained, Dark brown to brown/ w/oxidation, damp, stiff	Cement grout	
2								
3	S-2	1.6/2.0 80%	5 6 10 12		.4/.4	CLAY w/SILT and trace SAND, fine grained. Brown to light gray w/oxidation (orange brown), stiff, damp.	Bentonite pellets	
4								
5	S-3	1.5/2.0 75%	6 10 14 14		.4/.4		PVC riser	
6								
7	S-4	1.1/2.0 55%	2 9 14 16		.4/.4	SAND, fine to medium grained w/trace SILT, Brown to light gray w/ oxidation (orange) staining, medium dense, moist to wet	Sand pack	
8								
9	S-5	.8/2.0 40%	2 4 8 10		.4/.4		Well screen	
10								

Match to Sheet 2

DRILLING CO.: Hardin-Huber, Inc. BAKER REP.: J.E. Zimmerman
DRILLER: R. Keenan BORING NO.: 44-GW05 SHEET 1 OF 2

Baker
Baker Environmental, Inc

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: RI/FS at OU No. 6 - Site 44 - MCAS, New River
CTO NO.: 62470-303 BORING NO.: 44-GW05

SAMPLE TYPE
S = Split Spoon A = Auger
T = Shelby Tube W = Wash
R = Air Rotary C = Core
D = Denison P = Piston
N = No Sample

DEFINITIONS
SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
RQD = Rock Quality Designation (%)
Lab. Class. = USCS (ASTM D-2487) or AASHTO (ASTM D-3282)
Lab. Moist. = Moisture Content (ASTM D-2216) Dry Weight Basis

Depth (ft.)	Samp. Type and No.	Samp. Rec. (ft. & %)	SPT or RQD	Lab ID No.	PID (ppm)	Visual Description	Well Installation Detail	Elevation (ft. MSL)
11	S-6	1.6/2.0 80%	3 4 4 6		.4/.4	Continued from Sheet 1 SAND, fine to medium grained w/trace SILT Light gray to brown, w/oxidation, loose, wet.	Sand pack	
12 12.0								
13	S-7	2.0/2.0 100%	1 1 2 2		.4/.4	SILTY SAND, fine grained w/trace CLAY. Brown to greenish gray w/oxidation (orange), very loose, damp		
14 14.0								
15	S-8	2.0/2.0 100%	1 1 2 3		.4/.4	SILTY SAND, fine grained Greenish gray, very loose, wet	Well screen	
16 16.0								
17	S-9	2.0/2.0 100%	1 2 2 4		.4/.4			
18 18.0								
19	S-10	2.0/2.0 100%	WOH/18" 1		.4/.4			
20 20.0								
21	A-N	—	—	—	—			
22 22.0						End of Boring TD: 22.0' (bgs)		
23								
24								
25								
26								
27								
28								
29								
30								

DRILLING CO.: Hardin-Huber, Inc. BAKER REP.: J. E. Zimmerman
DRILLER: R. Keenan BORING NO.: 44-GW05 SHEET 2 OF 2

Baker
Baker Environmental, Inc

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: RI/FS at OU No. 6 - Site 44 MCAS, New River
S.O. NO.: 62470-303 BORING NO.: 44-GW06
COORDINATES: EAST: 2465993.0550 NORTH: 359754.9654
ELEVATION: SURFACE: _____ TOP OF ~~STEEL~~ PVC CASING: 13.13

RIG: Mobile B-53

	SPLIT SPOON	CASING	AUGERS	CORE BARREL	DATE	PROGRESS (FT)	WEATHER	WATER DEPTH (FT)	TIME
SIZE (DIAM.)	2"		4-¼" ID		3/21/95	0.0-19.0	Cloudy, 70s	—	—
LENGTH	2'		5'						
TYPE	STD		HSA						
HAMMER WT.	140#								
FALL	30"								
STICK UP									

REMARKS:

SAMPLE TYPE
S = Split Spoon A = Auger
T = Shelby Tube W = Wash
R = Air Rotary C = Core
D = Denison P = Piston
N = No Sample

WELL INFORMATION	DIAM	TYPE	TOP DEPTH (FT)	BOTTOM DEPTH (FT)
Well Casing	2" ID	PVC Threaded	+2.0	-3.0
Well Screen	2" ID	PVC Slotted	-3.0	-18.0

Depth (Ft.)	Sample Type and No.	Samp. Rec. Ft. & %	SPT or RQD	Lab. Class. or Pen. Rate	PID (ppm)	Visual Description	Well Installation Detail	Elevation
1	S-1	1.6/2.0 80%	1 2 2 3		0.0	SILT, some fine sand, trace organics; moist; brown, lt. brown @ 0.3'	#2 #7 #2 Bentonite Pellets to Ground Surface	
2						FINE SAND, some silt, trace clay; damp to moist; brown, lt. brown clay laminant @ 1.7' 1.7'		
3	S-2	1.9/2.0 95%	3 3 4 6		0.0	SILTY CLAY, some fine sand; damp; lt. gray, orangish-tan mottling 3.4'	Top of #1 Sand @ 2' Top of screen @ 3'	
4						FINE SAND and SILT, trace to little clay; moist; lt. gray, orangish-tan mottling 4.6'		
5	S-3	1.9/2.0 95%	5 6 8 12		0.0	FINE SAND, some silt, trace clay; wet; lt. gray and orangish-tan	#5 #5	
6						lt. gray and tan @ 6'	#8	
7	S-4	1.2/2.0 60%	3 3 5 7		0.0	Some medium sand from 7.3' to 8.8'	PVC well screen 2" ID, Sch. 40 flush joint threaded	
8						8.8'		
9	S-5	1.5/2.0 75%	2 2 1 1		0.0	SILT, some fine sand, trace to little clay; wet; olive-green		
0								

DRILLING CO.: Hardin Huber Incorporated BAKER REP.: Dave Gaviglia
DRILLER: Jay Corron BORING NO.: 44-GW06 SHEET 1 OF 2

Baker
Baker Environmental, Inc

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: RI/FS at OU No. 6 - Site 44 MCAS, New River
S.O. NO.: 62470-303 BORING NO.: 44-GW06

SAMPLE TYPE
S = Split Spoon A = Auger
T = Shelby Tube W = Wash
R = Air Rotary C = Core
D = Denison P = Piston
N = No Sample

DEFINITIONS
SPT = Standard Penetration Test (ASTM D-1586) (Blows/0.5')
RQD = Rock Quality Designation (%)
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.	Samp. Rec. (Ft. & %)	SPT or RQD	Lab. Class. or Pen. Rate	Lab. Moist %	Visual Description	Well Installation Detail	Elevation
11	S-6	2.0/2.0 100%	1 2 1 2		0.0	SILT, some fine sand, trace to little clay; wet; olive-green	#1 Sand	
12 12.0								
13	S-7	2.0/2.0 100%	1 1 2 1		0.0		#8	
14 14.0						More fine sand from 14'-18'	#5 #5	
15	S-8	2.0/2.0 100%	Weight of hammer / 2'		0.0		PVC well screen 2" ID, Sch. 40, flush joint threaded	
16 16.0								
17	S-9	2.0/2.0 100%	Weight of hammer / 2'		0.0		Bottom of well @ 18'	
18 18.0								
19 19.0	A-N					19.0'	#5	19.0'
20						End of Boring @ 19.0'		
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								

DRILLING CO.: Hardin Huber Incorporated BAKER REP.: Dave Gaviglia
DRILLER: Jay Corron BORING NO.: 44-GW06 SHEET 2 OF 2

TEST BORING AND WELL CONSTRUCTION RECORD

Baker Environmental, Inc

PROJECT: RI/FS at OU No. 6 - Site 44 MCAS New River
S.O. NO.: 62470-303 BORING NO.: 44-GW06DW
COORDINATES: EAST: 2465990.8408 NORTH: 359747.7270
ELEVATION: SURFACE: _____ TOP OF ~~STEEL~~ PVC CASING: 13.29

RIG: B-80 Mobile Rig

	SPLIT SPOON	CASING	AUGERS	BIT ~~CORE BARREL~~ SIZE
SIZE (DIAM.)	2"	6"		10"/6"
LENGTH	2'	49'		
TYPE	STD.	Steel		Rotary
HAMMER WT.	140#			
FALL	30"			
STICK UP				

DATE	PROGRESS (FT)	WEATHER	WATER DEPTH (FT)	TIME
2/25/95	0.0-40.0	Sunny, 50s	—	—
2/26/95	40.0-52.0	Sunny, 60s	—	—
2/27/95	52.0-76.0	Sunny, 70s	—	—

REMARKS:

SAMPLE TYPE
S = Split Spoon A = Auger
T = Shelby Tube W = Wash
R = Air Rotary C = Core
D = Denison P = Piston
N = No Sample

WELL INFORMATION	DIAM	TYPE	TOP DEPTH (FT)	BOTTOM DEPTH (FT)
Well Casing	2"ID	PVC Threaded	+2.0	-70.0
Well Screen	2"ID	PVC Slotted	-70.0	-75.0

Depth (Ft.)	Sample Type and No.	Samp. Rec. Ft. & %	SPT or RQD	Lab. Class. or Pen. Rate	PID (ppm)	Visual Description	Well Installation Detail	Elevation
5.0	R-N						Cement/Bentonite Grout	
7.0	S-1	0.9/2.0 45%	10 12 9 2		0.0	FINE SAND, trace silt; wet; tan - lt. brown	6" steel Casing; #7; PVC riser pipe, 2"ID, Sch. 40, flush joint threaded	
10.0	R-N					10.0'		

DRILLING CO.: Hardin Huber Incorporated BAKER REP.: Dave Gaviglia
DRILLER: Jay Corron BORING NO.: 44-GW06DW SHEET 1 OF 5

TEST BORING AND WELL CONSTRUCTION RECORD

Baker Environmental, Inc

PROJECT: RI/FS at OU No. 6 - Site 44 MCAS, New River
S.O. NO.: 62470-303 BORING NO.: 44-GW06DW

SAMPLE TYPE
S = Split Spoon A = Auger
T = Shelby Tube W = Wash
R = Air Rotary C = Core
D = Denison P = Piston
N = No Sample

DEFINITIONS
SPT = Standard Penetration Test (ASTM D-1586) (Blows/0.5')
RQD = Rock Quality Designation (%)
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.	Samp. Rec. (Ft. & %)	SPT or RQD	Lab. Class. or Pen. Rate	PID ~~Lab. Moist %~~ (ppm)	Visual Description	Well Installation Detail	Elevation
11	S-2	2.0 / 2.0 100%	2 1 2 3		0.0	FINE SAND, some silt, trace clay; moist to wet; olive-green		
12 12.0								
13	R-N						Cement/ Bentonite Grout	
14								
15 15.0								
16	S-3	2.0 / 2.0 100%	WEIGHT OF HAMMER		0.0			
17 17.0						17.0		
18	R-N		--			CLAYEY SILT and SHELL FRAGMENTS, some fine sand, partial cementation; wet; lt. gray, tan	6" steel Casing	
19							#7	
20 20.0								
21	S-4	2.0 / 2.0 100%	16 15 19 22		0.0		#0 PVC riser pipe, 2" ID, Sch. 40, flush joint threaded	
22 22.0								
23	R-N						#0	
24							#0	
25 25.0						25.0		
26	S-5	1.9 / 2.0 95%	17 18 22 25		0.0	FINE SAND and SHELL FRAGMENTS, some silt, trace clay; wet; partial cementation; lt. gray		
27 27.0								
28	R-N							
29								
30 30.0								

DRILLING CO.: Hardin Huber Incorporated BAKER REP.: Dave Gavaglia
DRILLER: Jay Corron BORING NO.: 44-GW06DW SHEET 2 OF 5

TEST BORING AND WELL CONSTRUCTION RECORD

Baker Environmental, Inc

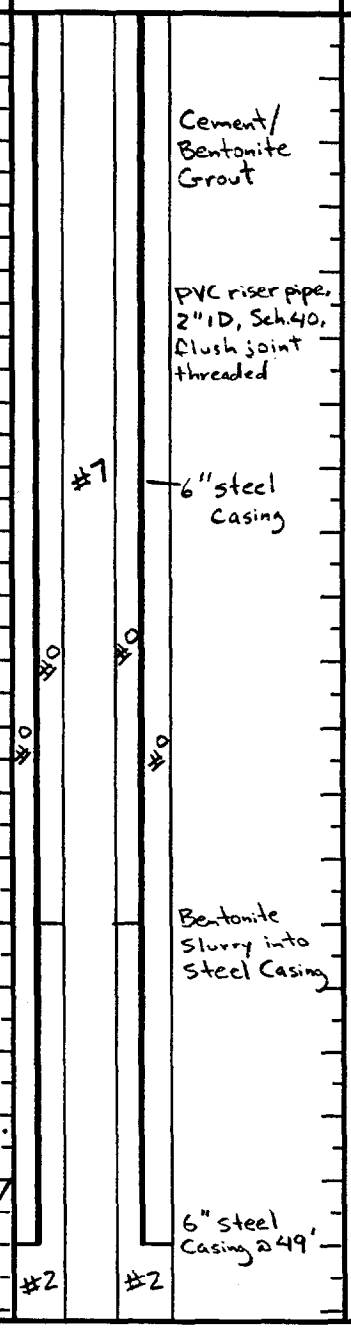
PROJECT: RI/FS at OU No. 6 - Site 44 MCAS, New River
S.O. NO.: 62470-303 BORING NO.: 44-GW06DW

SAMPLE TYPE
S = Split Spoon A = Auger
T = Shelby Tube W = Wash
R = Air Rotary C = Core
D = Denison P = Piston
N = No Sample

DEFINITIONS
SPT = Standard Penetration Test (ASTM D-1586) (Blows/0.5')
RQD = Rock Quality Designation (%)
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.	Samp. Rec. (Ft. & %)	SPT or RQD	Lab. Class. or Pen. Rate	PID (ppm)	Visual Description
31	S-6	1.6/2.0 80%	21 17 27 39		0.0	FINE SAND and SHELL FRAGMENTS, some silt, trace clay; wet; partial cementation; lt. gray
32.0						
33	S-7	1.3/2.0 65%	19 30 25 20		0.0	
34.0						
35	S-8	1.2/2.0 60%	19 25 24 24		0.3	
36.0						
37	S-9	1.2/1.9 63%	35 37 31 50/4		0.2	
37.9						
38.0	R-N					
38.9	S-10	0.5/0.9 55%	24 50/4		0.2	
40	R-N					
40.0						
40.4	S-11	0.3/0.4 75%	50/4		0.2	
41	R-N					
42.0						
43	S-12	1.3/2.0 65%	23 28 27 26		0.2	
44.0						
45	S-13	1.4/2.0 70%	23 23 24 22		0.0	
46.0						
47	S-14	1.6/1.8 88%	20 18 25 50/3		0.0	
47.8						
48.0	R-N					
49	S-15	1.9/2.0 95%	11 8 22 40		0.1	
50.0						

47.3'
SILTY CLAY, some fine sand and shell fragments; damp; trace sand cementation; lt. greenish-gray
48.0
FINE SAND and SILTY CLAY, trace shell fragments; damp; lt. greenish-gray



Well Installation Detail

Elevation

DRILLING CO.: Hardin Huber Incorporated BAKER REP.: Dave Gavigha
DRILLER: Jay Corron BORING NO.: 44-GW06DW SHEET 3 OF 5

Baker

Baker Environmental, Inc

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: RI/FS at OU No. 6 - Site 44 MCAS, New River
S.O. NO.: 62470-303 BORING NO.: 44-GW06DW

SAMPLE TYPE
S = Split Spoon, A = Auger
T = Shelby Tube, W = Wash
R = Air Rotary, C = Core
D = Denison, P = Piston
N = No Sample

DEFINITIONS
SPT = Standard Penetration Test (ASTM D-1586) (Blows/0.5')
RQD = Rock Quality Designation (%)
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.	Samp. Rec. (Ft. & %)	SPT or RQD	Lab. Class. or Pen. Rate	PID (ppm)	Visual Description	Well Installation Detail	Elevation
51–52.0	S-16	1.8/2.0 90%	8, 12, 16, 30		0.0	FINE SAND and SILTY CLAY, trace shell fragments; damp; trace sand cementation; lt. greenish-gray (52.0')		
52.0–54.0	S-17	2.0/2.0 100%	22, 18, 19, 23		HNu Malfunction	FINE SAND and CLAYEY SILT, some shell fragments; damp; lt. greenish-gray	Bentonite Slurry	
54.0–56.0	S-18	1.8/2.0 90%	13, 16, 17, 13			(56.0')	#2 #2	
56.0–58.0	S-19	1.7/2.0 85%	2, 3, 16, 20			FINE SAND and CLAYEY SILT, trace shell fragments; wet; lt. greenish-gray	PVC riser pipe, 2" ID, Sch. 40, flush joint threaded	
58.0–60.0	S-20	0.8/2.0 40%	10, 14, 15, 17				#7	
60.0–62.0	S-21	1.2/2.0 60%	14, 20, 20, 25					
62.0–64.0	S-22	1.6/2.0 80%	14, 22, 24, 20			lt. gray @ 62.0'	Top of Bentonite Pellets @ 63'	
64.0–65.4	S-23	1.3/2.0 65%	15, 24, 50/4			(64.2') FINE SAND, some shell fragments, trace silt; partial cementation; wet; lt. gray	#2 #2	
65.4–66.0	R-N							
66.0–66.3	S-24	0.3/0.3 100%	50/.3				Top of #1 Sand @ 66.5'	
66.3–70	R-N						#5 #5; Top of Screen @ 70'	

DRILLING CO.: Hardin Huber Incorporated BAKER REP.: Dave Gaviglia
DRILLER: Jay Corron BORING NO.: 44-GW06DW SHEET 4 OF 5

Baker
Baker Environmental, Inc

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: RI/FS at OU No. 6 - Site 44 MCAS, New River
S.O. NO.: 62470-303 BORING NO.: 44-GW06DW

SAMPLE TYPE
S = Split Spoon A = Auger
T = Shelby Tube W = Wash
R = Air Rotary C = Core
D = Denison P = Piston
N = No Sample

DEFINITIONS
SPT = Standard Penetration Test (ASTM D-1586) (Blows/0.5')
RQD = Rock Quality Designation (%)
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.	Samp. Rec. (Ft. & %)	SPT or RQD	Lab. Class. or Pen. Rate	Visual Description	Well Installation Detail	Elevation
71					FINE SAND, some shell fragments, trace silt; partial cementation; wet; lt. gray	#1 Sand; PVC well screen, 2" ID, Sch. 40, flush joint threaded; #8; #5; #5; Bottom of well @ 75'; #5	
2							
3	R-N						
4							
75							
6	76.0'				76.0'	76.0'	
7					End of Boring @ 76.0'		
8							
9							
80							
1							
2							
3							
4							
85							
6							
7							
8							
9							
10							

DRILLING CO.: Hardin Huber Incorporated BAKER REP.: Dave Gaviglia
DRILLER: Jay Corron BORING NO.: 44-GW06DW SHEET 5 OF 5

APPENDIX C
EXPLORATORY TEST PIT RECORDS

TEST PIT RECORD

Project: RI/FS at OU No 6 - Site 44 CTO No.: 303

Test Pit No.: 44-TP01 Date: April 21, 1995 Weather: P. Sunny & Warm

Endpoint Coordinates: North: 360161.7762 North: 360180.7337

East: 2467043.8483 East: 2467042.5491

Elevation: 10.60 Elevation: 10.00

Contractor: HHI Equipment: Backhoe Baker Rep.: DeJohn, Trebilcock, Herbst

AIR MONITORING

Time	PID (PS/BG)	FID (PS/BG)	Source

Definitions

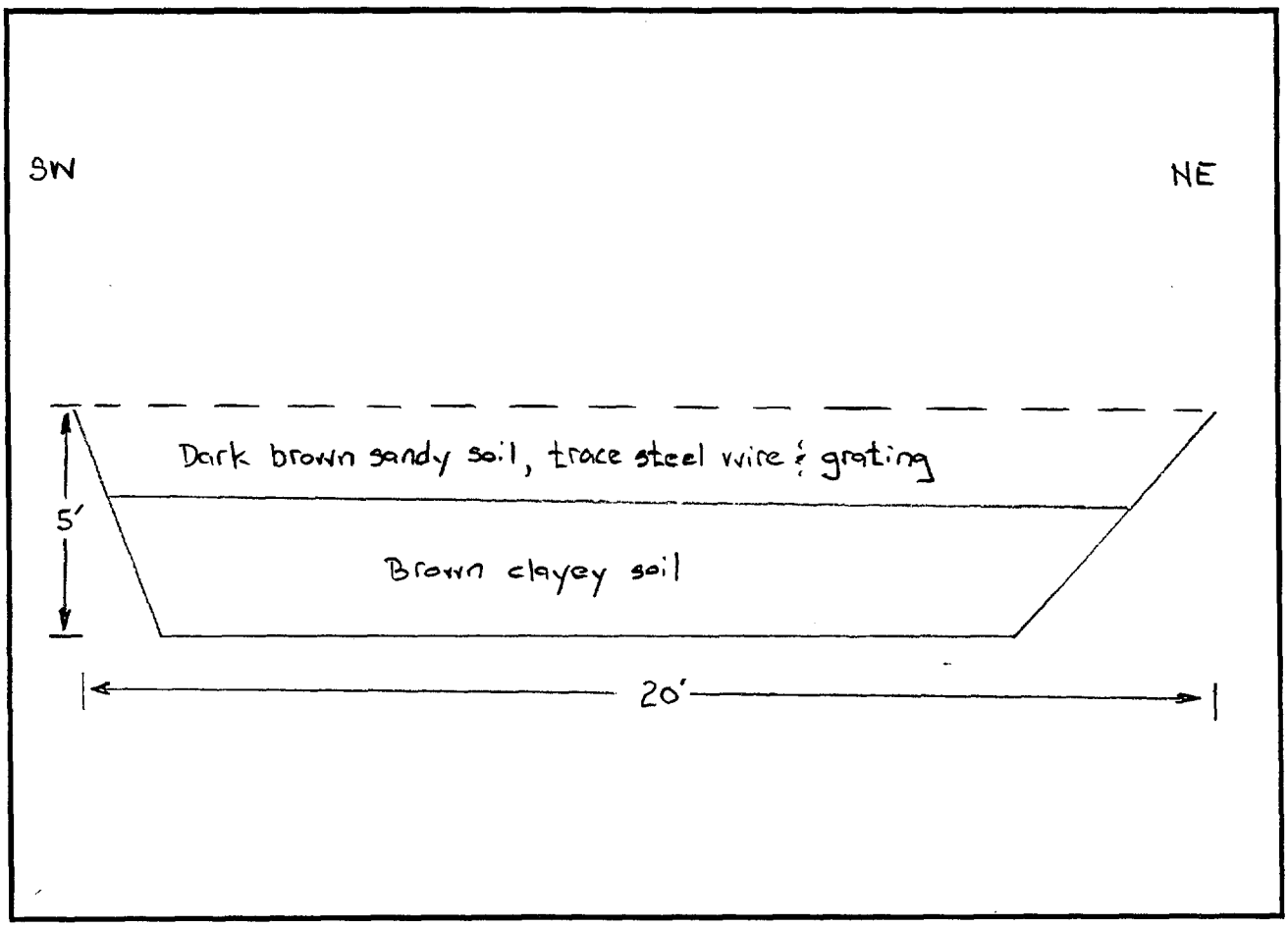
PID = Photo Ionization Detector

FID = Flame Ionization Detector

PS = Point Source (in ppm)

BG = Background (in ppm)

TEST PIT CROSS SECTION



TEST PIT RECORD

Project: RI/FS at OU No 6 - Site 44 CTO No.: 303

Test Pit No.: 44-TP02 Date: April 21, 1995 Weather: P. Sunny & Warm

Endpoint Coordinates: North: 360175.4735 North: 360185.3564

East: 2467105.7312 East: 2467106.9357

Elevation: 10.60 Elevation: 10.60

Contractor: HHI Equipment: Backhoe Baker Rep.: DeJohn, Trebilcock, Herbst

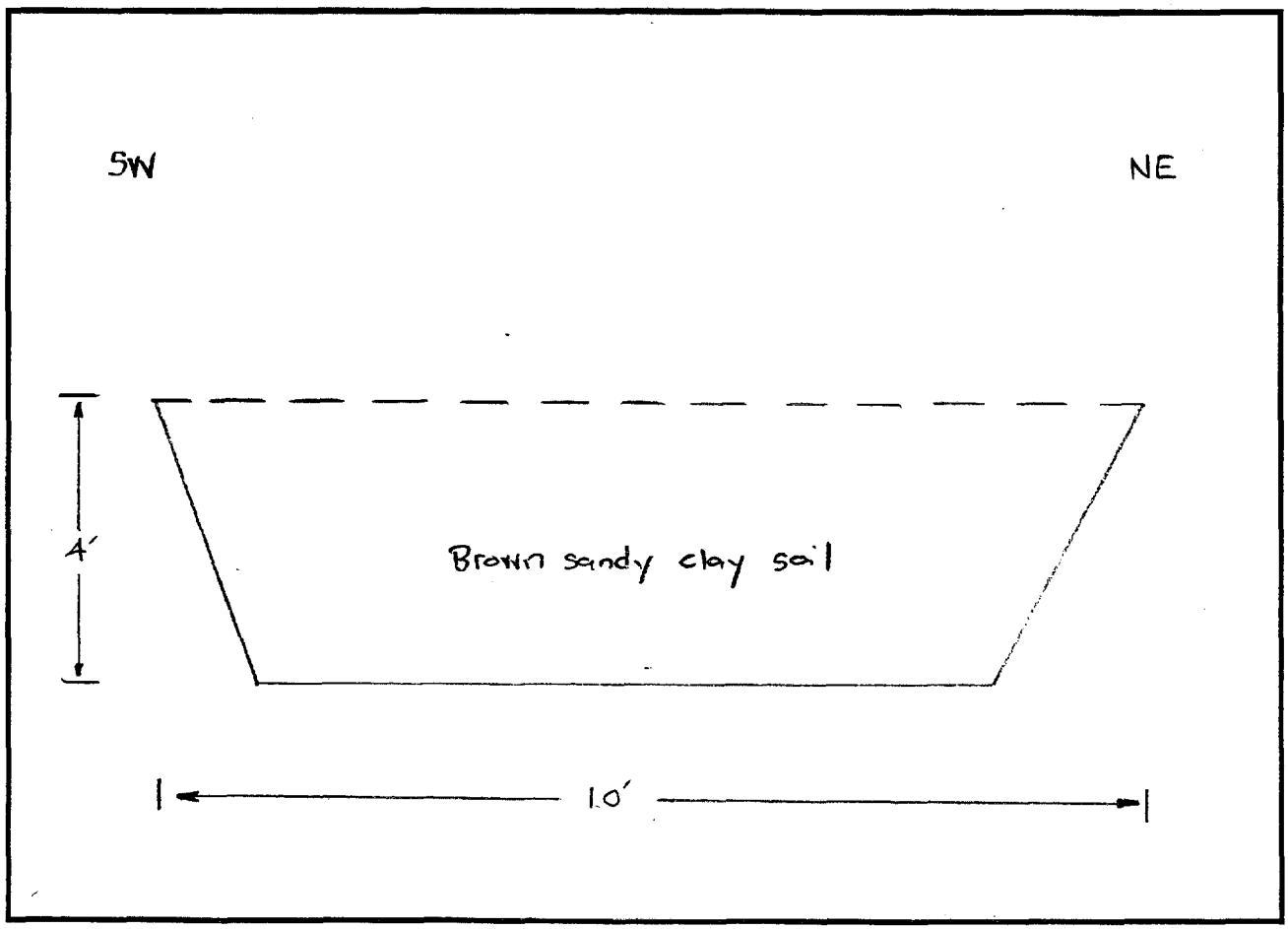
AIR MONITORING

Time	PID (PS/BG)	FID (PS/BG)	Source
1007	0.5/0.3	0.9/0.9	Soil from pit
1013	0.3/0.3	0.8/0.8	Soil from pit

Definitions

PID = Photo Ionization Detector
FID = Flame Ionization Detector
PS = Point Source (in ppm)
BG = Background (in ppm)

TEST PIT CROSS SECTION



TEST PIT RECORD

Project: RI/FS at OU No. 6 - Site 44 CTO No.: 303

Test Pit No.: 44-TP03 Date: April 21, 1995 Weather: P. Sunny & Warm

Endpoint Coordinates: North: 360017.9409 North: 360018.7217

East: 2467009.8610 East: 2466985.0702

Elevation: 7.60 Elevation: 9.40

Contractor: HHI Equipment: Backhoe Baker Rep.: DeJohn, Treblcock, Herbst

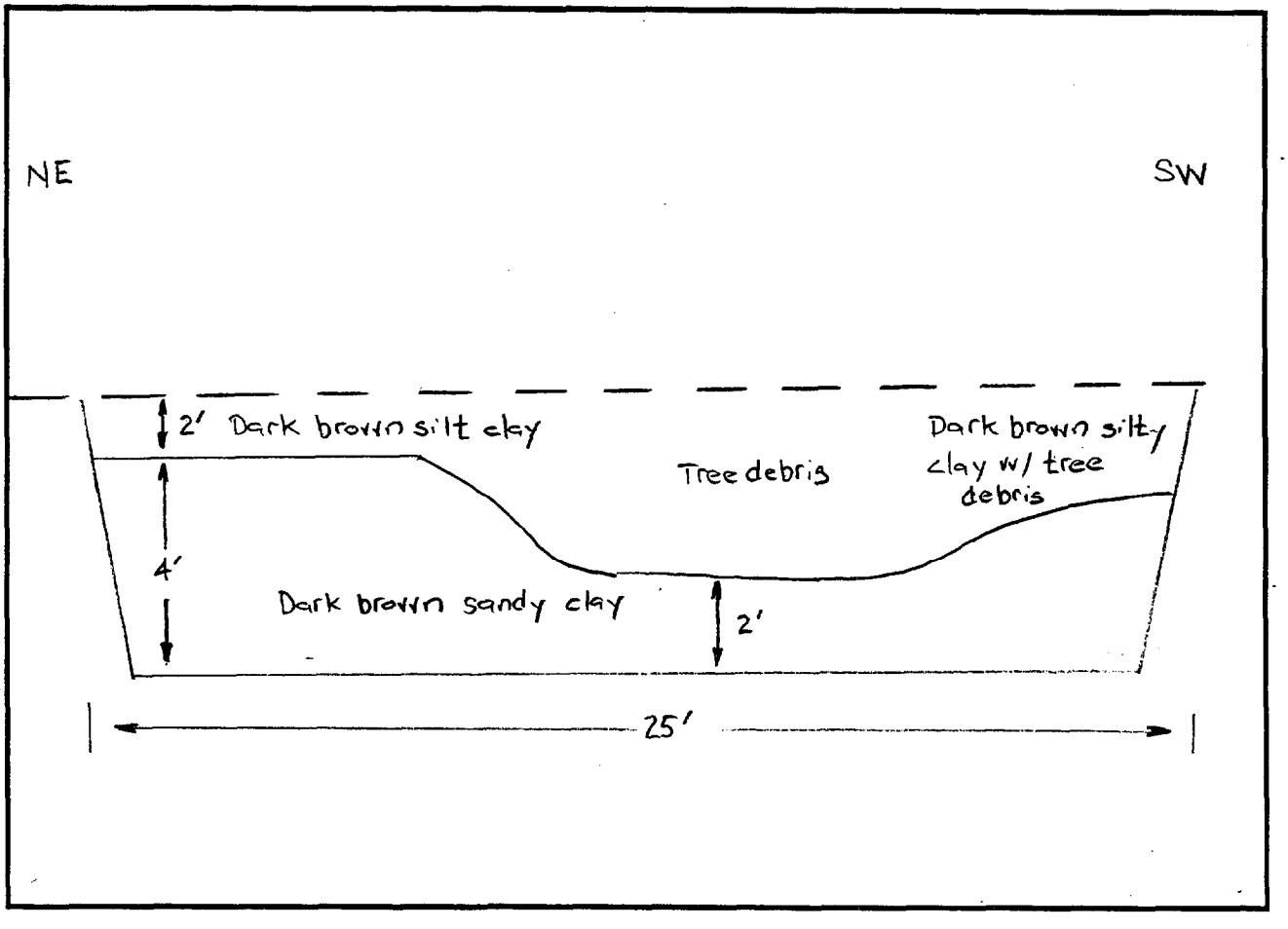
AIR MONITORING

Time	PID (PS/BG)	FID (PS/BG)	Source
1102	0.3/0.2	1.0/1.0	Soil from pit
1109	0.3/0.3	3.6/1.0	Soil from pit
1128	0.2/0.2	2.1/1.0	Soil from pit
1138	0.3/0.3	1.4/1.0	Soil from pit

Definitions

PID = Photo Ionization Detector
FID = Flame Ionization Detector
PS = Point Source (in ppm)
BG = Background (in ppm)

TEST PIT CROSS SECTION



APPENDIX D
CHAIN-OF-CUSTODY FORMS

WESTON Analytics Use Only

COC # 303012

Custody Transfer Record/Lab Work Request

WESTON MANAGERS DESIGNERS/CONSULTANTS

Client: BAKER ENVIRONMENTAL INC

Est. Final Proj. Sampling Date: 3/[illegible]/95

Work Order #:

Project Contact/Phone #: [illegible] JOHNSON / [illegible]

AD Project Manager: [illegible]

QC: Del: TAT:

Date Rec'd: Date Due:

Account #:

Refrigerator #

#/Type Container: Liquid / Solid

Volume: Liquid / Solid

Preservatives

ANALYSES REQUESTED →

MATRIX CODES: S - Soil; SE - Sediment; SO - Solid; SL - Sludge; W - Water; O - Oil; A - Air; DS - Drum Solids; DL - Drum Liquids; L - EP/TCLP Leachate; WI - Wipe; X - Other; F - Fish

Lab ID	Client ID/Description	MS	MSD	Matrix	Date Collected 1995	Time Collected	VOA (Organic)	BNA (Organic)	Pest/PCB (Organic)	Herb (Organic)	PEST ONLY			Metal (Inorg)	CN (Inorg)	ATTERBERG LIMITS	GRAIN SIZE		# BOTTLES		TURN AROUND
	54-ES12			S	3/7	1421										X	X		1		ROUTINE
	54-GW04			S	3/7	1427										X	X		1		ROUTINE
	44-BB-SB01-00			S	3/8	1139	X	X	X					X					2		ROUTINE
	44-BB-SB01-03			S	3/8	1203	X	X	X					X					2		ROUTINE
	44-OA-SB01-[illegible]			S	3/8	1355	X	X			X			X					2		ROUTINE
	44-OA-SB01-04			S	3/8	1423	X	X			X			X					2		ROUTINE
	44-OA-SB02-00			S	3/8	1523	X	X			X			X					2		ROUTINE
	44-OA-SB02-03			S	3/8	1542	X	X			X			X					2		ROUTINE
	36-GW09-00			S	3/9	0744	X	X	X					X					2		Routine
	36-GW09-04			S	3/9	0812	X	X	X					X					2		Routine

↓ WESTON Analytics Use Only ↓

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:

- SEE LAST COLUMN FOR TURN AROUND TIMES
- AIRBILL # 2124804894

DATE/REVISIONS:

1.
2.
3.
4.
5.
6.

WESTON Analytics Use Only

Samples were:
1) Shipped ___ or Hand Delivered ___
Airbill # ________
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N
COC Record Present Upon Sample Rec't Y or N

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
777.	Fed Ex	3/9/95	1700				

Discrepancies Between Samples Labels and COC Record? Y or N

NOTES:

COC# 303018

WESTON Analytics Use Only

Custody Transfer Record/Lab Work Request

WESTON MANAGERS DESIGNERS/CONSULTANTS

Client: Baker Environmental
Est. Final Proj. Sampling Date: 6-1-95
Work Order #:
Project Contact/Phone #: L. Johnson / (412) 269-6000
AD Project Manager: Denise Wattman
QC: Del: TAT:

Date Rec'd: Date Due:
Account #:

Refrigerator #																
#/Type Container	Liquid															
	Solid															
Volume	Liquid															
	Solid															
Preservatives																

MATRIX CODES: S - Soil; SE - Sediment; SO - Solid; SL - Sludge; W - Water; O - Oil; A - Air; DS - Drum Solids; DL - Drum Liquids; L - EP/TCLP Leachate; WI - Wipe; X - Other; F - Fish

ANALYSES REQUESTED → (ORGANIC: VOA, BNA, Pest/PCB, Herb; INORG: Metal, CN) — WESTON Analytics Use Only

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected 1995	Time Collected	VOA	BNA	Pest/PCB	Herb	Pest	PCB		Metal	CN	Grain Size	Atterberg Limits	Dissolved Metals	# Bottles		Turn Around
	44-GW04-00			S	3/13	0808	X	X	X					X					2		Routine
	44-GW04-04			S	3/13	0845	X	X	X					X					2		
	44-GW01DW-00			S	3/13	0936	X	X	X					X					2		
	44-GW01DW-03			S	3/13	1003	X	X	X					X					2		
	44-WA-SB01-00	X	X	S	3/13	1137	X	X			X			X					4		
	44-WA-SB01-00D			S	3/13	1137	X	X			X			X					2		
	44-WA-SB01-03			S	3/13	1200	X	X			X			X		TFT			2		
	54-TW02			S	3/12	1700									⊘ ~~X~~	X	X		1		
	54-SIER-03			W	3/13	1320	X	X				X		X					6		
	54-GWER-01			W	3/13	1330	X	X				X		X				X	7		

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:
- See last column for sample turn around times
- Airbill # 2124804846
* Weston Prepared Trip blank = 303-TB-16
Matrix: water
Date: 3/13
Time: 1500
Analysis: TCL VOA

DATE/REVISIONS:
7.7.7. 1. No CN analysis for 54-TW02
2.
3.
4.
5.
6.

WESTON Analytics Use Only

Samples were:
1) Shipped ___ or Hand Delivered ___ Airbill # ________
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N

COC Record Present Upon Sample Rec't Y or N

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
7.7.7.	FedEx	3/13/95	1530				

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:

WESTON Analytics Use Only

COC# 303019

Custody Transfer Record/Lab Work Request

WESTON MANAGERS/DESIGNERS/CONSULTANTS

Client: [illegible]
Est. Final Proj. Sampling Date: 5-1-95
Work Order #:
Project Contact/Phone #: [illegible]
AD Project Manager: [illegible]
QC: Del: TAT:
Date Rec'd: Date Due:
Account #:

Refrigerator #

#/Type Container	Liquid	
	Solid	
Volume	Liquid	
	Solid	
Preservatives		

ANALYSES REQUESTED →

ORGANIC: VOA | BNA | Pest/PCB | Herb | Pest | | |
INORG: Metal | CN
Bottles
Turn Around

MATRIX CODES: S - Soil; SE - Sediment; SO - Solid; SL - Sludge; W - Water; O - Oil; A - Air; DS - Drum Solids; DL - Drum Liquids; L - EP/TCLP Leachate; WI - Wipe; X - Other; F - Fish

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	VOA	BNA	Pest/PCB	Herb	Pest			Metal	CN				# Bottles		Turn Around
					1995		WESTON Analytics Use Only														
	44-WA-SB02-00			S	3/13	1342	X	X	X					X					2		7-day
	44-WA-SB02-03			S	3/13	1408	X	X	X					X					2		7-day
	44-WA-SB03-00			S	3/13	1456	X	X	X					X					2		7-day
	44-WA-SB03-03			S	3/13	1522	X	X	X					X					2		7-day
	44-WA-SB04-00			S	3/13	1607	X	X			X			X					2		Routine
	44-WA-SB04-03			S	3/13	1636	X	X			X			X					2		Routine
	44-WA-SB03-00 (D)			S	3/14	0736	X	X	X					X					2		7-day
	44-OA-SB03-01			S	3/14	0739	X	X	X					X					2		7-day
	86-GW19DW-00	X	X	S	3/14	0812	X	X	X					X					4		Routine
	86-GW19DW-02			S	3/14	0820	X	X	X					X					2		Routine

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:
- See last column for sample turn around times
- Airbill # 2124804861

DATE/REVISIONS:
7.7.
1. Sample = 44-OA-SB03-00 date: 3/14
2.
3.
4.
5.
6.

WESTON Analytics Use Only

Samples were:
1) Shipped ___ or Hand Delivered ___ Airbill # _____
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N

COC Record Present Upon Sample Rec't Y or N

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:

Relinquished by	Received by	Date	Time
7.7.	Fed Ex	3/14	1530

Relinquished by	Received by	Date	Time

RFW 21-21-001/A-7/91 ___ L372 ___ L373 ___ L375 ___ L377 ___ L378 Ref# _____ Cooler# 1

381-506a

COC # 303019

WESTON Analytics Use Only

Custody Transfer Record/Lab Work Request

WESTON MANAGERS / DESIGNERS / CONSULTANTS

Client: Ebasco Environmental
Est. Final Proj. Sampling Date: 5-Feb
Work Order #:
Project Contact/Phone: L. Johnson / 410-269-2600
AD Project Manager: Denise Wolfman
QC: Del: TAT:
Date Rec'd: Date Due:
Account #:

Refrigerator #
#/Type Container (Liquid / Solid)
Volume (Liquid / Solid)
Preservatives

ANALYSES REQUESTED →

ORGANIC: VOA | BNA | Pest/PCB | Herb | Pest
INORG: Metal | CN
Bottles
Turn Around

MATRIX CODES: S - Soil; SE - Sediment; SO - Solid; SL - Sludge; W - Water; O - Oil; A - Air; DS - Drum Solids; DL - Drum Liquids; L - ERA/CLP Leachate; WI - Wipe; X - Other; F - Fish

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	VOA	BNA	Pest/PCB	Herb	Pest	Metal	CN	# Bottles	Turn Around
	44-GA-SB05-0001			S	3/14/1995	0825	X	X	X			X		2	7-day
	44-GA-SB05-0002			S	3/14	0838	X	X	X			X		2	7-day
	44-WA-SB01A-00			S	3/14	0836		X						1	Routine
	44-WA-SB01B-00			S	3/14	0840		X						1	Routine
	44-WA-SB01C-00			S	3/14	0850		X						1	Routine
	44-GA-SB05-00			S	3/14	0921	X	X			X	X		2	Routine
	44-GA-SB05-002			S	3/14	0939	X	X			X	X		2	Routine
	44-GWO5-00	X	X	S	3/14	1026	X	X	X			X		4 2	TAT Routine
	44-GWO5-00D			SD	3/14	1026	X	X	X			X		2	Routine
	44-GWO5-003			S	3/14	1051	X	X	X			X			Routine

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:
- See last column for sample turn around times
- Airbill # 212480486 1

DATE/REVISIONS:
1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

WESTON Analytics Use Only

Samples were:
1) Shipped ___ or Hand Delivered ___ Airbill # _____
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N

COC Record Present Upon Sample Rec't Y or N

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:

Relinquished by	Received by	Date	Time
7.7.7	Fed Ex	3/14/95	1530

Relinquished by	Received by	Date	Time

RFW 21-21001/A-7/91 ____ L372 ____ L373 ____ L375 ____ L377 ____ L378 Ref# _____ Cooler# ____/____ 381-596a

COC # 303019

WESTON Analytics Use Only

Custody Transfer Record/Lab Work Request

WESTON MANAGERS DESIGNERS/CONSULTANTS

Page 3 of 3

Client: Baker Environmental
Est. Final Proj. Sampling Date: 5-1-95
Work Order #:
Project Contact/Phone #: L. Johnson / 412-261-6000
AD Project Manager: Denise Wohlman
QC ____ Del ____ TAT ____

Date Rec'd ____ Date Due ____
Account # ____

			VOA	BNA	Pest/PCB	Herb	Pest			Metal	CN				#Bottles		Turn Around
Refrigerator #																	
#/Type Container	Liquid																
	Solid																
Volume	Liquid																
	Solid																
Preservatives																	
ANALYSES REQUESTED →			ORGANIC							INORG							

MATRIX CODES: S - Soil; SE - Sediment; SO - Solid; SL - Sludge; W - Water; O - Oil; A - Air; DS - Drum Solids; DL - Drum Liquids; L - EP/TCLP Leachate; WI - Wipe; X - Other; F - Fish

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected 1995	Time Collected	VOA	BNA	Pest/PCB	Herb	Pest			Metal	CN				#Bottles		Turn Around
	44-OA-SB04-00			S	3/14	1137	X	X			X			X					2		Routine
	44-OA-SB04-02			S	3/14	1148	X	X			X			X					2		Routine
	44-OA-SB04-02D			S	3/14	1148	X	X			X			X					2		Routine
	44-BB-SB02-01			S	3/14	1342	X	X	X					X					2		Routine
	44-BB-SB02-00			S	3/14	1338	X	X	X					X					2		Routine
	303-TB-16			W	3/14	1400	X												2		Routine

↓ WESTON Analytics Use Only ↓

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:
- See last column for sample turn around times
- Airbill # 2124804861
* 303-TB-16 = Weston Prepared Trip Blank

DATE/REVISIONS:
____ 1. ____
____ 2. ____
____ 3. ____
____ 4. ____
____ 5. ____
____ 6. ____

WESTON Analytics Use Only

Samples were:
1) Shipped ___ or Hand Delivered ___
Airbill # ____
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N
COC Record Present Upon Sample Rec't Y or N

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
7.7.7.	Fed Ex	3/14/95	1530				

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:

RFW 21-21-001/A-7/91 ____ L372 ____ L373 ____ L375 ____ L377 ____ L378 Ref# ____ Cooler# 1 381-596a

COC # 303020

WESTON Analytics Use Only

Custody Transfer Record/Lab Work Request

WESTON MANAGERS DESIGNERS/CONSULTANTS

Client [redacted]
Est. Final Proj. Sampling Date 5-1-95
Work Order #
Project Contact/Phone # 412-269-2049
AD Project Manager Denise Wellman
QC ______ Del ______ TAT ______

Date Rec'd ______ Date Due ______
Account # ______

Refrigerator #
#/Type Container: Liquid / Solid
Volume: Liquid / Solid
Preservatives

ANALYSES REQUESTED → ORGANIC: VOA, BNA, Pest/PCB, Herb; INORG: Metal, CN

WESTON Analytics Use Only

MATRIX CODES: S - Soil; SE - Sediment; SO - Solid; SL - Sludge; W - Water; O - Oil; A - Air; DS - Drum Solids; DL - Drum Liquids; L - EP/TCLP Leachate; WI - Wipe; X - Other; F - Fish

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected 1995	Time Collected	VOA	BNA	Pest/PCB	Herb				Metal	CN						
	303-FB-02			W	7/15	1145	X												2		Routine
	303-TB-18			W	7/15	1200	X												2		Routine

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:
- See last column for turn around
- Airbill # 2124804850
- ~~TB~~ 303-TB-17 = Weston Trip Blank

DATE/REVISIONS:
1.
2.
3.
4.
5.
6.

WESTON Analytics Use Only

Samples were:
1) Shipped ___ or Hand Delivered ___ Airbill # ______
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N
COC Record Present Upon Sample Rec't Y or N

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
[signature]	FedEx	7/15/95	1530				

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:

RFW 21-21-001/A-7/91 ____ L372 ____ L373 ____ L375 ____ L377 ____ L378 Ref# ______ Cooler# 1 381-596a

COC # 303049

WESTON Analytics Use Only

Custody Transfer Record/Lab Work Request

WESTON

Page 1 of 1

Client: Baker Environmental

Est. Final Proj. Sampling Date: 5-1-95

Work Order #:

Project Contact/Phone #: L. Johnson/412 269 6608

AD Project Manager: Denise Wellman

QC: Del: TAT:

Date Rec'd: Date Due:

Account #:

Refrigerator #

#/Type Container	Liquid	
	Solid	
Volume	Liquid	
	Solid	
Preservatives		

ANALYSES REQUESTED →

ORGANIC: VOA | BNA | Pest/PCB | Herb

INORG: Metal | CN | TSS | TDS

MATRIX CODES	Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected 1995	Time Collected	VOA	BNA	Pest/PCB	Herb	Metal	CN	TSS	TDS	# of Containers	Turn Around Time
S - Soil, SE - Sediment, SO - Solid, SL - Sludge, W - Water, O - Oil, A - Air, DS - Drum Solids, DL - Drum Liquids, L - EP/TCLP Leachate, WI - Wipe, X - Other, F - Fish		303-TB-33			W	4/7	1905	X								2	Routine
		43-GW02-01			W	4/7	1925	X	X	X		X		X		8	Routine
		44-GWER-01			W	4/7	1920	X	X	X		X				6	Routine
		44-GW06DW-01			W	4/8	0930	X	X	X						6	Routine
		44-GW06-01			W	4/8	1035	X								3	Routine
		44-GW04-01			W	4/8	1236	X								3	Routine

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

DATE/REVISIONS:

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

Special Instructions:

- See last column for sample turn around times
- Airbill # 2124805152

303-TB-33 = Weston Prepared Trip Blank

WESTON Analytics Use Only

Samples were:
1) Shipped ___ or Hand Delivered ___ Airbill # _____
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N

COC Record Present Upon Sample Rec't Y or N

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:

Relinquished by	Received by	Date	Time
T.T.T.	FedEx	4/8/95	1300

Relinquished by	Received by	Date	Time

RFW 21-21-001/A-7/91

____ L372 ____ L373 ____ L375 ____ L377 ____ L378 Ref# _____ Cooler# 1

381-596a

COC# 303050

WESTON Analytics Use Only

Custody Transfer Record/Lab Work Request

WESTON MANAGERS DESIGNERS/CONSULTANTS

Client: Baker Environmental
Est. Final Proj. Sampling Date: 5/1/95
Work Order #:
Project Contact/Phone #: L. Johnson /412-269-6000
AD Project Manager: Denise Woltman
QC ____ Del ____ TAT ____

Date Rec'd ____ Date Due ____
Account # ____

Refrigerator #
#/Type Container: Liquid / Solid
Volume: Liquid / Solid
Preservatives

ANALYSES REQUESTED →

ORGANIC: VOA, BNA, Pest/PCB, Herb
INORG: Metal, CN
TSS/TDS, #Bottles, Turn Around

↓ WESTON Analytics Use Only ↓

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected 1995	Time Collected	VOA	BNA	Pest/PCB	Herb	Metal	CN	TSS/TDS	#Bottles	Turn Around
	44-GW06DW-01			W	4/8	0930					X		X	2	Routine
	44-GW06-01			W	4/8	1035		X	X		X		X	5	Routine
	44-GW04-01			W	4/8	1235		X	X		X		X	5	Routine

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:
- See last column for sample turn around times
- Airbill # 2124805152

DATE/REVISIONS:
1.
2.
3.
4.
5.
6.

WESTON Analytics Use Only

Samples were:
1) Shipped ___ or Hand Delivered ___ Airbill # ______
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N
COC Record Present Upon Sample Rec't Y or N

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
7.7.7.	FedEx	4/8/95	1300				

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:

RFW 21-21-001/A-7/91 ____ L372 ____ L373 ____ L375 ____ L377 ____ L378 Ref# ______ Cooler# 2 381-596a

COC# 303051

WESTON Analytics Use Only

Custody Transfer Record/Lab Work Request

WESTON MANAGERS/DESIGNERS/CONSULTANTS

Page 1 of 1

Client: Baker Environmental

Est. Final Proj. Sampling Date: 5-1-95

Work Order #:

Project Contact/Phone #: L. Johnson/412-269-6000

AD Project Manager: Denise Workman

QC: Del: TAT:

Date Rec'd: Date Due:

Account #:

Refrigerator #:

		ORGANIC							INORG								
#/Type Container	Liquid/Solid	VOA	BNA	Pest/PCB	Herb	Pest			Metal	CN	TSS TDS			# Bottles		Turn Around
Volume	Liquid/Solid															
Preservatives																

ANALYSES REQUESTED →

MATRIX CODES: S - Soil; SE - Sediment; SO - Solid; SL - Sludge; W - Water; O - Oil; A - Air; DS - Drum Solids; DL - Drum Liquids; L - TER/TCLP Leachate; WI - Wipe; X - Other; F - Fish

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected (1995)	Time Collected	WESTON Analytics Use Only											
	303-TB-34			W	4/9	0900	X									2		Routine
	HH-GW01DW-01			W	4/9	1005	X	X	X	X		X		X		8		Routine
	HH-GW05-01			W	4/9	1305	X									3		Routine
	HH-GW01S-01	X	X	W	4/9	1610	X									6		Routine
	HH-GW01-01D			W	4/9	1610	X									3		Routine
	HH-GWER-02			W	4/9	1830	X	X	X			X				5		Hold
	HH-TW01-01			W	4/10	0915	X									3		Routine
	HH-GW02-01			W	4/10	1110	X									3		Routine

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:
- See last column for sample turn around times
- Airbill # 2124805163
303-TB-34 = Weston Prepared Trip Blank

DATE/REVISIONS:
7.7.
1. 44-GW01DW-01 gets Pest not Pest/PCB
2.
3.
4.
5.
6.

WESTON Analytics Use Only

Samples were:
1) Shipped ___ or Hand Delivered ___ Airbill # _____
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N

COC Record Present Upon Sample Rec't Y or N

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:

Relinquished by	Received by	Date	Time
7.7.	Fed Ex	4/10/95	1530

Relinquished by	Received by	Date	Time

RFW 21-21-001/A-7/91 ___ L372 ___ L373 ___ L375 ___ L377 ___ L378 Ref# _____ Cooler# 1 381-596a

COC# 303052

WESTON Analytics Use Only

Custody Transfer Record/Lab Work Request

WESTON MANAGERS / DESIGNERS/CONSULTANTS

Client: Baker Environmental
Est. Final Proj. Sampling Date: 5-1-95
Work Order #:
Project Contact/Phone #: L. Johnson (412) 269-6000
AD Project Manager: Dennis Washington
QC: Del TAT:
Date Rec'd: Date Due:
Account #:

Refrigerator #

#/Type Container	Liquid	
	Solid	
Volume	Liquid	
	Solid	
Preservatives		

ANALYSES REQUESTED →

ORGANIC: VOA | BNA | Pest/PCB | Herb | Pest+

INORG: Metal | CN | TSS | TDS | Dissolved Metals | Bottles | Turn Around

WESTON Analytics Use Only

MATRIX CODES: S - Soil; SE - Sediment; SO - Solid; SL - Sludge; W - Water; O - Oil; A - Air; DS - Drum Solids; DL - Drum Liquids; L - EP/TCLP Leachate; WI - Wipe; X - Other; F - Fish

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected												
	HH-GW05-01			W	4/9	1305		X	X			X		X			5	Routine
	HH-GW01-01	X	X	W	4/9	1610		X			X	X		X	X	TCL	8	Routine
	HH-GW01D-01	X	X	W	4/9	1610									X		2	Routine

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:
- See last column for sample turn around times
- Airbill # 2124805163

DATE/REVISIONS:
1.
2.
3.
4.
5.
6.

WESTON Analytics Use Only

Samples were:
1) Shipped ___ or Hand Delivered ___ Airbill # _____
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N

COC Record Present Upon Sample Rec't Y or N

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:

Relinquished by	Received by	Date	Time
T.T.T.	FedEx	4/10/95	1530

Relinquished by	Received by	Date	Time

RFW 21-21-001/A-7/91

___ L372 ___ L373 ___ L375 ___ L377 ___ L378 Ref# _____ Cooler# 2

381-596a

COC # 303053

WESTON Analytics Use Only

Custody Transfer Record/Lab Work Request

WESTON MANAGERS/DESIGNERS/CONSULTANTS

Page 1 of 1

Client: Baker Environmental
Est. Final Proj. Sampling Date: 5-11-95
Work Order #:
Project Contact/Phone #: L. Johnson/412-261-6000
AD Project Manager: Denise Wellman
QC: Del: TAT:
Date Rec'd: Date Due:
Account #:

Refrigerator #

#/Type Container	Liquid:																
	Solid:																
Volume	Liquid:																
	Solid:																
Preservatives																	

ANALYSES REQUESTED →

ORGANIC							INORG							
VOA	BNA	Pest/PCB	Herb	Pest			Metal	CN	TSS	TDS	Dissolved Metals	# Bottles		Turn Around

WESTON Analytics Use Only

MATRIX CODES: S - Soil; SE - Sediment; SO - Solid; SL - Sludge; W - Water; O - Oil; A - Air; DS - Drum Solids; DL - Drum Liquids; L - EP/TCLP Leachate; WI - Wipe; X - Other; F - Fish	Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected 1995	Time Collected													
		HH-GW01-01D			W	4/9	1610		X			X		X		X		5		
		HH-GW01D-01D			W	4/9	1610									X		1		Routine
		HH-GWFRD-02			W	4/9	1610									X		1		Routine
		HH-TW01-01			W	4/10	0915		X			X		X		X		5		

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:
- See last column for sample turn around
- Airbill # 212480516 3

DATE/REVISIONS:
1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

WESTON Analytics Use Only

Samples were:
1) Shipped ___ or Hand Delivered ___
Airbill # _____
2) Ambient or Chilled
3) Received In Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N
COC Record Present Upon Sample Rec't Y or N

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:

Relinquished by	Received by	Date	Time
T.T.T.	Fed Ex	4/10/95	1530

Relinquished by	Received by	Date	Time

RFW 21-21-001/A-7/91

____ L372 ____ L373 ____ L375 ____ L377 ____ L378 Ref# _____ Cooler# 3

381-596a

WESTON Analytics Use Only

COC # 303054

Custody Transfer Record/Lab Work Request

WESTON MANAGERS / DESIGNERS / CONSULTANTS

Page 1 of 1

Client: Baker Environmental
Est. Final Proj. Sampling Date: 5-11-95
Work Order #:
Project Contact/Phone #: L. Johnson / 412-269-6000
AD Project Manager: Denise Wellman
QC: Del: TAT:
Date Rec'd: Date Due:
Account #:

Refrigerator #

#/Type Container	Liquid																
	Solid																
Volume	Liquid																
	Solid																
Preservatives																	

ANALYSES REQUESTED →

ORGANIC							INORG						
VOA	BNA	Pest/PCB	Herb	Dioxin	TPH		Metal	CN	TSS	TDS		# Bottles	Turn Around

MATRIX CODES: S - Soil; SE - Sediment; SO - Solid; SL - Sludge; W - Water; O - Oil; A - Air; DS - Drum Solids; DL - Drum Liquids; L - EP/TCLP Leachate; WI - Wipe; X - Other; F - Fish

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	WESTON Analytics Use Only												
	4H-GW002-01			W	4/10 1995	1410		X			X		X		X			5	Routine
	5H-DD-SB05-00			S	4/11	0840	X	X				X						3	Routine
	5H-DD-SB05-01			S	4/11	0851	X	X				X						3	Routine
	TS3			S	4/11	1308	X	X										2	Routine
	TS2			S	4/11	1326	X	X										2	Routine
	4H-GW003-01			W	4/10	1645	X											3	Routine
	5H-TW06-01			W	4/11	0815	X	X										5	*
	5H-TW05-01			W	4/11	1045	X											3	7-day
	303-FB-03			W	4/11	1430	X											2	Routine
	303-TB-35			W	4/11	1440	X											2	Routine

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:
- See last column for sample turn around times
- Airbill # 2124805185
* = VOA 7-day Turn, SVOA Routine Turn
303-TB-35 = Weston Prepared Trip Blank

DATE/REVISIONS:
1. 2. 3. 4. 5. 6.

WESTON Analytics Use Only

Samples were:
1) Shipped ___ or Hand Delivered ___
Airbill # _____
2) Ambient or Chilled
3) Received In Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N

COC Record Present Upon Sample Rec't Y or N

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:

Relinquished by	Received by	Date	Time
T.T.T.	FedEx	4/11/95	1530

Relinquished by	Received by	Date	Time

RFW 21-21-001/A-7/91 ____ L372 ____ L373 ____ L375 ____ L377 ____ L378 Ref# _____ Cooler# 1 381-596a

WESTON Analytics Use Only

COC # 303055

Custody Transfer Record/Lab Work Request

WESTON MANAGERS DESIGNERS/CONSULTANTS

Page 1 of 1

Client: Baker Environmental
Est. Final Proj. Sampling Date: 8-1-95
Work Order #
Project Contact/Phone #: L. Johnson/412-269-6000
AD Project Manager: Denise Wallman
QC ___ Del ___ TAT ___

Date Rec'd ___ Date Due ___
Account # ___

Refrigerator #
#/Type Container: Liquid / Solid
Volume: Liquid / Solid
Preservatives

ANALYSES REQUESTED →

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected 1995	Time Collected	ORGANIC VOA ①	BNA	Pest/PCB	Herb	Rest			INORG Metal	CN	TSS TDS			# Bottles		Turn Around
	44-GW03-01			W	4/10	1645	X	X			X			X		X			5		Routine
	54-TW05-01			W	4/11	1045		X											2		Routine
	303-FB-03			W	4/11	1430		X	X					X					3		Routine

WESTON Analytics Use Only

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:
- See last column for sample turn around times
- Airbill # 2124805185

DATE/REVISIONS:
7.7.7 1. 44-GW03-01 No VOA in cooler
2.
3.
4.
5.
6.

WESTON Analytics Use Only

Samples were:
1) Shipped ___ or Hand Delivered ___
Airbill # ___
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N
COC Record Present Upon Sample Rec't Y or N

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
7.7.7.	FedEx	4/11/95	1530				

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:

RFW 21-21-001/A-7/91 ___ L372 ___ L373 ___ L375 ___ L377 ___ L378 Ref# ___ Cooler# 2 381-596a

COC # 303060

WESTON Analytics Use Only

Custody Transfer Record/Lab Work Request

WESTON MANAGERS/DESIGNERS/CONSULTANTS

Client: Baker Environmental
Est. Final Proj. Sampling Date: 5-11-95
Work Order #:
Project Contact/Phone #: L. Johnson 412-269-6006
AD Project Manager: Denise Wittman
QC: Del TAT:
Date Rec'd: Date Due:
Account #:

Refrigerator #

#/Type Container	Liquid	
	Solid	
Volume	Liquid	
	Solid	
Preservatives		

ANALYSES REQUESTED →

ORGANIC: VOA | BNA | Pest/PCB | Herb
INORG: Metal | CN
Bottles
Turn Around

MATRIX CODES	Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	VOA	BNA	Pest/PCB	Herb	Metal	CN	# Bottles	Turn Around
S - Soil, SE - Sediment, SO - Solid, SL - Sludge, W - Water, O - Oil, A - Air, DS - Drum Solids, DL - Drum Liquids, L - EP/TCLP Leachate, WI - Wipe, X - Other, F - Fish		303-TB-39			S	4/21	1000	X						2	Routine
		44-TP03			S	4/21	1111	X	X	X		X		2	Routine

WESTON Analytics Use Only

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:
- See last column for sample turn around
- Airbill # 2124805211
303-TB-39 = Weston Prepared Trip Blank

DATE/REVISIONS:
1. 2. 3. 4. 5. 6.

Relinquished by	Received by	Date	Time
T.T.T.	FedEx	4/21/95	1530

Relinquished by	Received by	Date	Time

WESTON Analytics Use Only

Samples were: 1) Shipped ___ or Hand Delivered ___ Airbill # ___
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was: 1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N
COC Record Present Upon Sample Rec't Y or N

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:

COC# 303062

WEST Analytics Use Only

Custody Transfer Record/Lab Work Request

WESTON MANAGERS DESIGNERS/CONSULTANTS

Page 1 of 1

Client Baker Environmental
Est. Final Proj. Sampling Date 5-19-95
Work Order #
Project Contact/Phone # L. Johnson (412) 269-6000
AD Project Manager Dennis Wolfgang
QC Del TAT
Date Rec'd Date Due
Account #

Refrigerator #

#/Type Container	Liquid	
	Solid	
Volume	Liquid	
	Solid	
Preservatives		

ANALYSES REQUESTED →

ORGANIC							INORG						
VOA	BNA	Pest/PCB	Herb	Flash Point	React CN	React Sulfide	Metal	CN	Full TCLP	RCRA	# Bottles		Turn Around Time

MATRIX CODES	Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected 1995	Time Collected	WESTON Analytics Use Only												
S - Soil SE - Sediment SO - Solid SL - Sludge W - Water O - Oil A - Air DS - Drum Solids DL - Drum Liquids L - EP/TCLP Leachate WI - Wipe X - Other F - Fish		303-TB-41			W	4/25	1100	X										2		Routine
		43-TNK			W	4/25	1145	X	X	X		X	X	X	X			10		7-day
		44-RBO1			S	4/25	1206									X	X	1		7-day
		44-TNK			W	4/25	1215	X	X	X		X	X	X	X			10		7-day
		86-RBO1			S	4/25	1245									X	X	1		7-day

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

DATE/REVISIONS:

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

Special Instructions:

- See last column for sample turn around time
- Airbill #

303-TB-41 = Weston Trip Blank

Full TCLP = VOA, SVOA, PEST, PCB, HERB, Metal

RCRA (for soil) = Flash & Reactive CN/Sulfide

WESTON Analytics Use Only

Samples were:
1) Shipped ___ or Hand Delivered ___
Airbill # _____
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within *Holding Times* Y or N

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N

COC Record Present Upon Sample Rec't Y or N

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:

Relinquished by	Received by	Date	Time
T.T.T.	Fed Ex	5-25-95	1800

Relinquished by	Received by	Date	Time

RFW 21-21-001/A-7/91 ___ L372 ___ L373 ___ L375 ___ L377 ___ L378 Ref# _____ Cooler# 1 381-596a

COC # 303065

WESTON Analytics Use Only

Custody Transfer Record/Lab Work Request

WESTON MANAGERS DESIGNERS/CONSULTANTS

Client: Bake Environmental
Est. Final Proj. Sampling Date: 5-15-95
Work Order #:
Project Contact/Phone #: L. Johnson/412-269-6000
AD Project Manager: Denise Wultman
QC: ______ Del: ______ TAT: ______
Date Rec'd: ______ Date Due: ______
Account #: ______

Refrigerator #:
#/Type Container: Liquid / Solid
Volume: Liquid / Solid
Preservatives:

ANALYSES REQUESTED →

MATRIX CODES: S - Soil; SE - Sediment; SO - Solid; SL - Sludge; W - Water; O - Oil; A - Air; DS - Drum Solids; DL - Drum Liquids; L - EP/TCLP Leachate; WI - Wipe; X - Other; F - Fish

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected 1995	Time Collected	ORGANIC VOA	BNA	Pest/PCB	Herb	INORG Metal	CN	Dissolved Metals	Hardness	# Bottles	Turn Around
	303-TB-44			W	5/3	1400	X								2	Routine
	44-EC-SW02	X	X	W	5/3	1430	X	X	X		X			X	12	↓
	44-EC-DSW02	X	X	W	5/3	1430							X		2	↓
	44-EC-SW02D			W	5/3	1430	X								2	↓
	44-EC-SW01			W	5/3	1455	X								2	↓
	44-EC-SW05			W	5/3	1555	X								2	↓
	44-UT-SW03			W	5/3	1645	X								2	↓
	44-EC-SW04			W	5/3	1630	X								2	↓
	44-EC-SW03			W	5/3	1720	X								2	↓
	44-UT-SW02			W	5/3	1700	X								2	↓

↓ WESTON Analytics Use Only ↓

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:
- see last column for sample turn around
- Airbill # 2124805255
303-TB-44 = Weston Prepared Trip Blank

DATE/REVISIONS:
1. ______
2. ______
3. ______
4. ______
5. ______
6. ______

WESTON Analytics Use Only

Samples were:
1) Shipped ___ or Hand Delivered ___ Airbill # ______
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N
COC Record Present Upon Sample Rec't Y or N

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
7.7.7.	FedEx	5/4/95	1530				

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:

RFW 21-21-001/A-7/91 ___ L372 ___ L373 ___ L375 ___ L377 ___ L378 Ref# ______ Cooler# 1 381-596a

WESTON Analytics Use Only

COC# 303065

Custody Transfer Record/Lab Work Request

WESTON MANAGERS DESIGNERS/CONSULTANTS

Page 2 of 2

Client: Baker Environmental
Est. Final Proj. Sampling Date: 5-18-95
Work Order #:
Project Contact/Phone #: L. Johnson /412-269-6000
AD Project Manager: Denise Wolfinger
QC ______ Del ______ TAT ______

Date Rec'd ______ Date Due ______
Account # ______

Refrigerator #
#/Type Container: Liquid / Solid
Volume: Liquid / Solid
Preservatives

ANALYSES REQUESTED →

MATRIX CODES: S - Soil; SE - Sediment; SO - Solid; SL - Sludge; W - Water; O - Oil; A - Air; DS - Drum Solids; DL - Drum Liquids; L - EP/TCLP Leachate; WI - Wipe; X - Other; F - Fish

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected 1995	Time Collected	ORGANIC VOA	BNA	Pest/PCB	Herb	INORG Metal	CN	# Bottles	Turn Around
	44-UT-SW01			W	5/3	1710	X						2	Routine
	43-SHC-SW04			W	5/3	1800	X						2	↓
	43-SHC-SW03			W	5/3	1815	X						2	↓
	43-EC-SW02			W	5/3	1830	X						2	↓
	43-EC-SW01	X	X	W	5/3	1845	X						4	↓
	43-EC-SW01D			W	5/3	1845	X						2	↓

↓ WESTON Analytics Use Only ↓

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:
- See last column for sample turn around
- Airbill # 2124805255
Trip Blank on pg. 1 of 2 (303-TB-44)

DATE/REVISIONS:
1. ______
2. ______
3. ______
4. ______
5. ______
6. ______

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
777	Fed Ex	5/4/95	1530				

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:

WESTON Analytics Use Only

Samples were:
1) Shipped ___ or Hand Delivered ___ Airbill # ______
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N

COC Record Present Upon Sample Rec't Y or N

RFW 21-21-001/A-7/91 ___ L372 ___ L373 ___ L375 ___ L377 ___ L378 Ref# ______ Cooler# 1 381-596a

COC # 303066

WESTON Analytics Use Only

Custody Transfer Record/Lab Work Request

WESTON MANAGERS/DESIGNERS/CONSULTANTS

Page 1 of 1

Client: Baker Environmental
Est. Final Proj. Sampling Date: 5/15-95
Work Order #:
Project Contact/Phone: L. Johnson / 412-269-6000
AD Project Manager: Denise Wellman
QC: Del TAT
Date Rec'd: Date Due:
Account #:

Refrigerator #

#/Type Container	Liquid	
	Solid	
Volume	Liquid	
	Solid	
Preservatives		

ANALYSES REQUESTED →

ORGANIC: VOA | BNA | Pest/PCB | Herb
INORG: Metal | CN | Dissolved Metals | Hardness | # Bottles | Turn Around

WESTON Analytics Use Only

MATRIX CODES: S - Soil; SE - Sediment; SO - Solid; SL - Sludge; W - Water; O - Oil; A - Air; DS - Drum Solids; DL - Drum Liquids; L - EP/TCLP Leachate; WI - Wipe; X - Other; F - Fish

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected 1995	Time Collected	VOA	BNA	Pest/PCB	Herb	Metal	CN	Dissolved Metals	Hardness	# Bottles	Turn Around
	44-EC-SW02D			W	5/3	1430		X	X		X			X	4	Routine
	44-EC-DSW02D			W	5/3	1430		X	X	(1)			X		1	
	44-EC-SW01			W	5/3	1455		X	X		X			X	5	
	44-EC-DSW01			W	5/3	1455							X		1	
	44-EC-SW05			W	5/3	1655		X	X						3	

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:
- See last column for sample turn around
- Airbill # 2124805255

DATE/REVISIONS:
7.7.7. 1. No VOA or BNA for 44-EC-DSW02D
2.
3.
4.
5.
6.

WESTON Analytics Use Only

Samples were:
1) Shipped ___ or Hand Delivered ___
Airbill # _____
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N

COC Record Present Upon Sample Rec't Y or N

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:

Relinquished by	Received by	Date	Time
7.7.7.	FedEx	5/4/95	1530

Relinquished by	Received by	Date	Time

RFW 21-21-001/A-7/91

____ L372 ____ L373 ____ L375 ____ L377 ____ L378 Ref# _____ Cooler# 2

381-596a

COC# 303067

WESTON Analytics Use Only

Custody Transfer Record/Lab Work Request

WESTON MANAGERS DESIGNERS/CONSULTANTS

Client: Baker Environmental
Est. Final Proj. Sampling Date: 5/15/95
Work Order #:
Project Contact/Phone #: L. Johnson / 412-269-6000
AD Project Manager: Denise Wolfman
QC: Del TAT:
Date Rec'd: Date Due:
Account #:

Refrigerator #:
#/Type Container: Liquid / Solid
Volume: Liquid / Solid
Preservatives:

ANALYSES REQUESTED → ORGANIC: VOA, BNA, Pest/PCB, Herb; INORG: Metal, CN; Dissolved Metals; Hardness; # Bottles; Turn Around

MATRIX CODES: S - Soil, SE - Sediment, SO - Solid, SL - Sludge, W - Water, O - Oil, A - Air, DS - Drum Solids, DL - Drum Liquids, L - EP/TCLP Leachate, WI - Wipe, X - Other, F - Fish

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected 1995	Time Collected	VOA	BNA	Pest/PCB	Herb	Metal	CN	Dissolved Metals	Hardness	# Bottles	Turn Around
	HH-EC-SW05			W	5/3	1555					X			X	2	Routine
	HH-EC-DSW05			W	5/3	1555							X		1	
	HH-UT-SW03			W	5/3	1645	X	X			X			X	5	
	HH-UT-DSW03			W	5/3	1645							X		1	
	HH-EC-SW04			W	5/3	1630	X	X			X			X	5	
	HH-EC-DSW04			W	5/3	1630							X		1	
	HH-EC-DSW03			W	5/3	1720							X		1	

WESTON Analytics Use Only

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:
- See last column for sample turn around
- Airbill # 2124805255

DATE/REVISIONS:
1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

WESTON Analytics Use Only

Samples were:
1) Shipped ___ or Hand Delivered ___
Airbill # _____
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N

COC Record Present Upon Sample Rec't Y or N

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:

Relinquished by	Received by	Date	Time
T.T.	FedEx	5/4/95	1530

Relinquished by	Received by	Date	Time

RFW 21-21-001/A-7/91 ___ L372 ___ L373 ___ L375 ___ L377 ___ L378 Ref# _____ Cooler# 3 381-596a

COC # 303068

WESTON Analytics Use Only

Custody Transfer Record/Lab Work Request

WESTON MANAGERS DESIGNERS CONSULTANTS

Page 1 of 1

Client: Baker Environmental
Est. Final Proj. Sampling Date: 5-16-95
Work Order #:
Project Contact/Phone #: L. Johnson / 412-269-6000
AD Project Manager: Denise Weltman
QC: Del: TAT:

Date Rec'd: Date Due:
Account #:

Refrigerator #

#/Type Container	Liquid	
	Solid	
Volume	Liquid	
	Solid	
Preservatives		

ANALYSES REQUESTED →

ORGANIC: VOA, BNA, Pest/PCB, Herb
INORG: Metal, CN
Dissolved Metals, Hardness, BTEX, Turn Around

MATRIX CODES	Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	WESTON Analytics Use Only
S - Soil, SE - Sediment, SO - Solid, SL - Sludge, W - Water, O - Oil, A - Air, DS - Drum Solids, DL - Drum Liquids, L - EP/TCLP Leachate, WI - Wipe, X - Other, F - Fish						1995		
		HH-EC-SW02			W	5/3	1720	X X X X 5 Routine
		HH-UT-SW02			W	5/3	1700	X X X X 5
		HH-UT-DSW02			W	5/3	1700	X 1
		HH-UT-DSW01			W	5/3	1710	X 1
		HB-SHC-DSW04			W	5/3	1800	X 1
		HB-SHC-DSW03			W	5/3	1815	X 1
		HB-EC-DSW02			W	5/3	1830	X 1
		HB-EC-DSW01			W	5/3	1845	X 1 ✓

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:
- see last column for sample turn around
- Airbill # 2124805255

DATE/REVISIONS:
1.
2.
3.
4.
5.
6.

WESTON Analytics Use Only

Samples were:
1) Shipped ___ or Hand Delivered ___ Airbill # ___
2) Ambient or Chilled
3) Received In Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N

COC Record Present Upon Sample Rec't Y or N

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:

Relinquished by	Received by	Date	Time
T.T.	FedEx	5/4/95	1530

Relinquished by	Received by	Date	Time

RFW 21-21-001/A-7/91

___ L372 ___ L373 ___ L375 ___ L377 ___ L378 Ref# ___ Cooler# 4

381-596a

COC # 303069

WESTON Analytics Use Only

Custody Transfer Record/Lab Work Request

WESTON MANAGERS' DESIGNERS/CONSULTANTS

Client: Baker Environmental
Est. Final Proj. Sampling Date: 5-15-95
Work Order #:
Project Contact/Phone #: L. Johnson 412-269-6000
AD Project Manager: Denise Waltman
QC: Del: TAT:
Date Rec'd: Date Due:
Account #:

Refrigerator #

#/Type Container	Liquid																	
	Solid																	
Volume	Liquid																	
	Solid																	
Preservatives																		

ANALYSES REQUESTED → ORGANIC: VOA, BNA, Pest/PCB, Herb; INORG: Metal, CN; Dissolved Metals; Hardness; Bottle #; Turn-around

WESTON Analytics Use Only

MATRIX CODES: S - Soil, SE - Sediment, SO - Solid, SL - Sludge, W - Water, O - Oil, A - Air, DS - Drum Solids, DL - Drum Liquids, L - EP/TCLP Leachate, WI - Wipe, X - Other, F - Fish

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected 1995	Time Collected	VOA	BNA	Pest/PCB	Herb	Metal	CN	Dissolved Metals	Hardness	Bottle #	Turn-around
	HH-UT-SW01			W	5/3	1710	X	X			X			X	5	Routine
	43-SHC-SW01			W	5/3	1800	X	X			X			X	5	
	43-EC-SW01D			W	5/3	1845	X	X			X			X	4	

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:
- See last column for sample turn around
- Airbill # 2124805255

DATE/REVISIONS:
1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

WESTON Analytics Use Only

Samples were:
1) Shipped ___ or Hand Delivered ___ Airbill # _____
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N

COC Record Present Upon Sample Rec't Y or N

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:

Relinquished by	Received by	Date	Time
T.T.	FedEx	5/4/95	1530

Relinquished by	Received by	Date	Time

RFW 21-21-001/A-7/91

___ L372 ___ L373 ___ L375 ___ L377 ___ L378 Ref# _____ Cooler# 5

381-596a

COC# 303070

WESTON Analytics Use Only

Custody Transfer Record/Lab Work Request

WESTON MANAGERS DESIGNERS/CONSULTANTS

Page 1 of 1

Client [redacted]
Est. Final Proj. Sampling Date 5-15-95
Work Order #
Project Contact/Phone # L. Johnson / 412-261-1600
AD Project Manager Denise Wolfman
QC Del TAT

Date Rec'd ____ Date Due ____
Account # ____

Refrigerator #
#/Type Container: Liquid / Solid
Volume: Liquid / Solid
Preservatives

ANALYSES REQUESTED →

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected 1995	Time Collected	ORGANIC VOA	BNA	Pest/PCB	Herb		Grain Size	Atterberg Limits	INORG Metal	CN	Dissolved Metals	Hardness		#Bottles		Turn Around
	43-SHC-SW03			W	5/3	1815		X	X					X			X		5		Routine
	43-EC-SW02			W	5/3	1830		X	X					X			X		5		↓
	43-EC-DSW01	X	X	W	5/3	1845										X			2		↓
	43-EC-SW01	X	X	W	5/3	1845								X					2		↓
	44-EC-SD01			S	5/4	0857						X	X						1		↓

WESTON Analytics Use Only

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:
- See last column for sample Turn around
- Airbill # 2124805255

DATE/REVISIONS:
1.
2.
3.
4.
5.
6.

WESTON Analytics Use Only

Samples were:
1) Shipped ___ or Hand Delivered ___
Airbill # ____
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N
COC Record Present Upon Sample Rec't Y or N

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
7.7.7.	FedEx	5/4/95	1530				

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:

RFW 21-21-001/A-7/91 ____ L372 ____ L373 ____ L375 ____ L377 ____ L378 Ref# ____ Cooler# 6 381-596a

COC # 303071

WESTON Analytics Use Only

Custody Transfer Record/Lab Work Request

WESTON MANAGERS DESIGNERS/CONSULTANTS

Page 1 of 1

Client Baker Environmental
Est. Final Proj. Sampling Date 5-15-95
Work Order #
Project Contact/Phone # L. Atkinson/(412) 269-6000
AD Project Manager Denise Waitman
QC ______ Del ______ TAT ______

Date Rec'd ______ Date Due ______
Account # ______

Refrigerator #
#/Type Container: Liquid / Solid
Volume: Liquid / Solid
Preservatives

ANALYSES REQUESTED →

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected 1995	Time Collected	ORGANIC VOA	BNA	Pest/PCB	Herb		Grain Size	Atterberg Limits	INORG Metal	CN	Hardness	TOC		# Bottles		Turn Around
	43-EC-SW01	X	X	W	5/3	1845		X	X					~~X~~	①	X			5		Routine
	303-TB-45			W	5/4	1100	X												2		Routine
	44-EC-SD01-612			SE	5/4	0855	X	X	X					X		②	~~X~~		2		Routine
	44-EC-SD01-06			SE	5/4	0857	X	X	X			X	X	X			X		3		Routine
	44-EC-SD02-612			SE	5/4	0910	X	X	X					X					2		Routine
	44-EC-SD02-06			SE	5/4	0912	X	X	X					X			X		2		Routine
	44-SBER-01			W	5/4	1500	X	X	X					X					5		Routine

WESTON Analytics Use Only

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:
- See last column for sample turn around
- Airbill # 2124805-255
303-TB-45 = weston Prepared Trip Blank
TOC = total organic carbon

DATE/REVISIONS:
ZZZ 1. No metals included in this cooler
ZZZ 2. No TOC for 44-EC-SD01-612
3.
4.
5.
6.

WESTON Analytics Use Only

Samples were:
1) Shipped ___ or Hand Delivered ___
Airbill # ______
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N
COC Record Present Upon Sample Rec't Y or N

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
ZZZ	Fed Ex	5/4/95	1530				

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:

RFW 21-21-001/A-7/91 ____ L372 ____ L373 ____ L375 ____ L377 ____ L378 Ref# ______ Cooler# 7 381-596a

COC # 303072

WESTON Analytics Use Only

Custody Transfer Record/Lab Work Request

WESTON MANAGERS/DESIGNERS/CONSULTANTS

Client: Baker Environmental
Est. Final Proj. Sampling Date: 5-15-95
Work Order #:
Project Contact/Phone #: L. Johnson 414-269-6000
AD Project Manager: Denise Wellman
QC: Del: TAT:
Date Rec'd: Date Due:
Account #:

Refrigerator #

#/Type Container	Liquid																	
	Solid																	
Volume	Liquid																	
	Solid																	
Preservatives																		

ANALYSES REQUESTED →

ORGANIC							INORG						
VOA	BNA	Pest/PCB	Herb	TOC	Grain Size	Atterburg Limits	Metal	CN			# Bottles		Turn Around

MATRIX CODES: S - Soil; SE - Sediment; SO - Solid; SL - Sludge; W - Water; O - Oil; A - Air; DS - Drum Solids; DL - Drum Liquids; L - EP/TCLP Leachate; WI - Wipe; X - Other; F - Fish	Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected 1995	Time Collected	WESTON Analytics Use Only												
		303-TB-46			W	5/4	1000	X										2		Routine
		44-EC-SD05-612			SE	5/4	1018	X	X	X				X				2		Routine
		44-EC-SD05-06			SE	5/4	1020	X	X	X				X				2		Routine
		44-UT-SD02-612			SE	5/4	1040	X	X	X			X	X				3	2-3	Routine
		44-UT-SD02-06			SE	5/4	1042	X	X	X				X				2		Routine
		44-UT-SD01-612			SE	5/4	1100	X	X	X	X	X		X				2		Routine
		44-UT-SD01-612D			SE	5/4	1100	X	X	X	X	X		X				2		Routine
		44-UT-SD01-06			SE	5/4	1110	X	X	X		X		X				2		Routine
		44-UT-SD03-612			SE	5/4	1135	X	X	X				X				2		Routine
		44-UT-SD03-06			SE	5/4	1137	X	X	X				X				2		Routine

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:

- See last column for sample turn around
- Airbill # 2124804441
303-TB-46 = Weston Trip Blank
TOC = total organic carbon

DATE/REVISIONS:

7.7.7 1. Date = 5/4
7.7.7 2. No Herb for 44-UT-SD01-XX
7.7.7 3. 3 containers for 44-UT-SD02-612
4.
5.
6.

WESTON Analytics Use Only

Samples were:
1) Shipped ___ or Hand Delivered ___ Airbill # _____
2) Ambient or Chilled
3) Received In Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N

COC Record Present Upon Sample Rec't Y or N

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:

Relinquished by	Received by	Date	Time
7.7.7	FedEx	5/5/95	1530

Relinquished by	Received by	Date	Time

RFW 21-21-001/A-7/91 ____ L372 ____ L373 ____ L375 ____ L377 ____ L378 Ref# _____ Cooler# 1 381-596a

COC# 303073/2 TFT 5-5-95

WESTON Analytics Use Only

Custody Transfer Record/Lab Work Request

WESTON

Page 2 of 3

Client Baker Environmental
Est. Final Proj. Sampling Date 5-15-95
Work Order #
Project Contact/Phone # L. Johnson/412-269-6000
AD Project Manager Denise Wellman
QC Del TAT

Date Rec'd Date Due
Account #

Refrigerator #
#/Type Container: Liquid / Solid
Volume: Liquid / Solid
Preservatives

ANALYSES REQUESTED →

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected 1995	Time Collected	ORGANIC VOA	BNA	Pest/PCB	Herb	TOC	Grain Size	Atterberg Limits	INORG Metal	CN				# Bottles		Turn Around
	44-EC-SD04-612			SE	5/4	1152	X	X	X					X					2		Routine
	44-EC-SD04-06			SE	5/4	1155	X	X	X					X					2		Routine
	44-EC-SD03-612			SE	5/4	1215	X	X	X					X					2		Routine
	44-EC-SD03-06	X	X	SE	5/4	1220	X	X	X					X					4		Routine
	44-EC-SD03-06D			SE	5/4	1220	X	X	X					X					2		Routine
	303-EC-SD01-06			SE	5/4	1550	X	X	X		X	X	X	X					3		Routine
	43-EC-SD01-06			SE	5/5	1042	X	X	X		X	X	X	X					3		Routine
	43-EC-SD01-06D			SE	5/5	1042	X	X	X		X			X					2		Routine
	43-EC-SD01-612			SE	5/5	1040	X	X	X		X			X					2		Routine
	43-SHC-SD04-06	X	X	SE	5/5	0900	X	X	X		X	X	X	X					5		Routine

↓ WESTON Analytics Use Only ↓

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:
- See last column for sample turn around
- Airbill # 2124804441

DATE/REVISIONS:
1.
2.
3.
4.
5.
6.

WESTON Analytics Use Only

Samples were:
1) Shipped ___ or Hand Delivered ___ Airbill # ______
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N
COC Record Present Upon Sample Rec't Y or N

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
T.F.T.	FedEx	5/5/95	1530				

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:

RFW 21-21-001/A-7/91 ____ L372 ____ L373 ____ L375 ____ L377 ____ L378 Ref# ______ Cooler# 1 381-596a

CHAIN OF CUSTODY

NORMANDEAU ASSOCIATES
RMC ENVIRONMENTAL SERVICES DIVISION
AQUATIC TOXICOLOGY LABORATORY

3450 Schuylkill Road
Spring City, PA 19475-1124
(610) 948-4700 • Fax: (610) 948-4752

Client: Baker Environmental Client Contact: Aaron Bernhardt
Address: Airport office Park - Bldg. #3
420 Rouser Road
Coraopolis PA 15108
Phone: (412) 269-6000
Samplers:
Job No.: 62344 - 303-0000

Sample Disposal	Return To Client [ ]
	Disposal by Lab [X]

No. Container													
Container Size													

SAMPLE INFORMATION					Toxicity Test Requested								
RMC only Lab ID	Sample Identification	Matrix Code*	Sample Date	Sample Time	Acute	Chronic	Whole Sediment	Elu-triate	Bioaccu-mulation	Product Efficacy	Other	Other	Other
	Site 43	SW	5-3-95	1500		X							
	Site 44	SW	5-3-95	1430		X							

Potential Hazard Identification:
Non- Hazard [X] Flammable [ ] Unknown [ ] Skin-Irritant [ ] Poison [ ]

Relinquished By:	Received By:	Time:	Date:	Relinquished By:	Received By:	Time:	Date:
M. T. Tuhl	FedEx	5-3-95	1530				

Special Instructions: * Run 7-day Chronic w/ Fathead Minnows
Shipment includes 2 containers per sample x 1 gal. each
Airbill # 128606 5362

***Matrix Codes:**

S - soil		GW - ground water	
SE - sediment		ST - stormwater	
SL - sludge		PW - processed water	
O - oil		DW - dilution water	
WW - waste water		RW - receiving water	
SW - surface water		X - other	

RMC Use Only

Samples Were:
1. Shipped or hand delivered Notes:
2. Chilled or ambient Notes:
3. Received broken / leaking Yes No
4. Received within holding times Yes No
5. Discrepancies between sample labels and COC record? Yes No

COC Tape Was:
1. Present on outer package Yes No
2. Unbroken on outer package Yes No
3. Present on sample Yes No
4. Unbroken on sample Yes No

White Copy - RMC Yellow Copy - Client

NORTHEAU ASSOCIATES
RMC ENVIRONMENTAL SERVICES DIVISION
AQUATIC TOXICOLOGY LABORATORY

3450 Schuylkill Road
Spring City, PA 19475-1124
(610) 948-4700 • Fax: (610) 948-4752

Client: Baker Environmental, Inc. Client Contact: Aaron Bernhardt
Address: 420 Rouser Road - Bldg. #3
Coraopolis, PA 15108
Phone: (412) 269-6000
Samplers: Aaron Bernhardt / Peter Monday
Job No.: 62470-303-0000-00000

Sample Disposal	Return To Client [ ]
	Disposal by Lab [X]

CHAIN OF CUSTODY

No. Container													
Container Size													

SAMPLE INFORMATION					Toxicity Test Requested								
RMC only Lab ID	Sample Identification	Matrix Code*	Sample Date	Sample Time	Acute	Chronic	Whole Sediment	Elu-triate	Bioaccu-mulation	Product Efficacy	Other	Other	Other
	Site 44	SE	5-4-95	0910		10-day							
	Control	SE	5-4-95	1550		10-day							
	Site 43	SE	5-5-95	0900		10-day							
	Site 43	SW	5-5-95	0900		7-day							
	Site 44	SW	5-5-95	1350		~~10~~ 7-day							

Potential Hazard Identification:
Non-Hazard [ ] Flammable [ ] Unknown [ ] Skin-Irritant [ ] Poison [ ]

Relinquished By:	Received By:	Time:	Date:	Relinquished By:	Received By:	Time:	Date:
M. T. Tuhbl	FedEx	5-5-95	1530				

Special Instructions: *Run 10-day Chronic w/ H. Azteca & C. Tentans for sediments only
*Run 7-day Chronic w/ Fathead Minnows for Surface Water
Shipment includes 12 qt. jars & 4 containers (2 per) ≈ 1 gal. each

Airbill # 1286065351

***Matrix Codes:**

S	- soil		GW	- ground water	
SE	- sediment		ST	- stormwater	
SL	- sludge		PW	- processed water	
O	- oil		DW	- dilution water	
WW	- waste water		RW	- receiving water	
SW	- surface water		X	- other	

RMC Use Only

Samples Were:
1. Shipped or hand delivered Notes:
2. Chilled or ambient Notes:
3. Received broken / leaking Yes No
4. Received within holding times Yes No
5. Discrepancies between sample labels and COC record? Yes No

COC Tape Was:
1. Present on outer package Yes No
2. Unbroken on outer package Yes No
3. Present on sample Yes No
4. Unbroken on sample Yes No

White Copy - RMC Yellow Copy - Client

NORMANDEAU ASSOCIATES
RMC ENVIRONMENTAL SERVICES DIVISION
AQUATIC TOXICOLOGY LABORATORY

3450 Schuylkill Road
Spring City, PA 19475-1124
(610) 948-4700 • Fax: (610) 948-4752

Client: Baker Environmental Client Contact: Aaron Bernhardt
Address: 420 Rouser Road - Bldg. #3
Coraopolis, PA 15108
Phone: 412-269-6000
Samplers: Aaron Bernhardt / Pete Monday
Job No.: 62470-303

Sample Disposal — Return To Client [ ] / Disposal by Lab [X]

CHAIN OF CUSTODY

No. Container													
Container Size													

SAMPLE INFORMATION					Toxicity Test Requested								
RMC only Lab ID	Sample Identification	Matrix Code*	Sample Date	Sample Time	Acute	Chronic	Whole Sediment	Elu-triate	Bioaccu-mulation	Product Efficacy	Other	Other	Other
	Site 43	SW	5-8-95	0725		7-day							
	Site 44	SW	5-8-95	0700		7-day							

Potential Hazard Identification:
Non- Hazard [ ] Flammable [ ] Unknown [ ] Skin-Irritant [ ] Poison [ ]

Relinquished By:	Received By:	Time:	Date:	Relinquished By:	Received By:	Time:	Date:
Kim T. Tuhill	FedEx	5-8-95	1530				

Special Instructions: * Run 7-day Chronic w/ Fathead Minnows
Shipment contains 2 water samples per station
Airbill # 128606515 2

***Matrix Codes:**

S - soil		GW - ground water	
SE - sediment		ST - stormwater	
SL - sludge		PW - processed water	
O - oil		DW - dilution water	
WW - waste water		RW - receiving water	
SW - surface water		X - other	

RMC Use Only

Samples Were:
1. Shipped or hand delivered Notes:
2. Chilled or ambient Notes:
3. Received broken / leaking Yes No
4. Received within holding times Yes No
5. Discrepancies between sample labels and COC record? Yes No

COC Tape Was:
1. Present on outer package Yes No
2. Unbroken on outer package Yes No
3. Present on sample Yes No
4. Unbroken on sample Yes No

White Copy - RMC Yellow Copy - Client

COC# 303083

WESTON Analytics Use Only
9509C394

Custody Transfer Record/Lab Work Request

WESTON
Page 1 of 1

Client [illegible]
Est. Final Proj. Sampling Date
Work Order # [illegible]
Project Contact/Phone # [illegible]
AD Project Manager [illegible]
QC TAT

Date Rec'd ______ Date Due ______
Account # ______

Refrigerator #
#/Type Container: Liquid / Solid
Volume: Liquid / Solid
Preservatives

ANALYSES REQUESTED →
ORGANIC: VOA, BNA, Pest/PCB, Herb
INORG: Metal, CN

WESTON Analytics Use Only

MATRIX CODES: S - Soil, SE - Sediment, SO - Solid, SL - Sludge, W - Water, O - Oil, A - Air, DS - Drum Solids, DL - Drum Liquids, L - EP/TCLP Leachate, WI - Wipe, X - Other, F - Fish

Lab ID	Client ID/Description	MS	MSD	Matrix	Date Collected	Time Collected
001	44-[illegible]-01			W	[illegible]	[illegible]
002	44-[illegible]			W	[illegible]	[illegible]
003	44-[illegible]-01			W	[illegible]	[illegible]
004	44-[illegible]-01			W	[illegible]	[illegible]
005	44-[illegible]-02			W	[illegible]	[illegible]
006	44-[illegible]-02			W	[illegible]	[illegible]
007	44-[illegible]-02			W	[illegible]	[illegible]
008	44-[illegible]			W	[illegible]	[illegible]
009	44-[illegible]			W		

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:
44-SWTB-02 = Trip Blank
Fed-x Airbill- 1286063281
All samples for 7-Day Turnaround

DATE/REVISIONS:
1.
2.
3.
4. 54°c
5. LH
6. 9.29.95

WESTON Analytics Use Only

Samples were:
1) Shipped ✓ or Hand Delivered ___
Airbill # ___
2) Ambient or (Chilled)
3) Received in Good Condition Y or (N)
4) Labels Indicate Properly Preserved (Y) or N
5) Received Within Holding Times (Y) or N

COC Tape was:
1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample Y or (N)
4) Unbroken on Sample Y or N

COC Record Present Upon Sample Rec't (Y) or N

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES:

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
~~RCB~~	~~1350~~				L.H. [illegible]	9.29.95	16:03
RCB		9/28/95	1350				

RCB

RFW 21-21-001/A-7/91 ___ L372 ___ L373 ___ L375 ___ L377 ___ L378 Ref# ______ Cooler# ______ 381-596a

APPENDIX E
FIELD WELL DEVELOPMENT RECORDS

FIELD WELL DEVELOPMENT RECORD

Baker

Baker Environmental, Inc

PROJECT: SITE 44

CTO NO.: 303 WELL NO.: 44-GW01

DATE: 3-6-95

GEOLOGIST/ENGINEER: MD SMITH

TIME START: 1437

TIME FINISH: 1609

INITIAL WATER LEVEL (FT): 7.41'

TOTAL WELL DEPTH (TD): 18.00'

WELL DIAMETER (INCHES): 2"

CALCULATED WELL VOLUME: 1.73 GAL

BOREHOLE DIAMETER (INCHES): 8"

BOREHOLE VOLUME: 27.64 GAL

AMOUNT OF WATER ADDED DURING DRILLING: -

DEVELOPMENT METHOD: PUMPING

PUMP TYPE: CENTRIFUGAL

TOTAL TIME (A): 0 hrs 58 min TOTAL PUMPING TIME

AVERAGE FLOW (GPM)(B): 2 GPM (measured)

TOTAL ESTIMATED WITHDRAWAL AxB=: 121 GAL (measured)

HNU/OVA READING: Background

DEVELOPMENT DATA

TIME	CUMULATIVE VOLUME (gallons)	pH	TEMP (°C)	SPEC. COND. (µmhos/cm)	TEMP (°C)	COLOR AND TURBIDITY
1437	0	-	T	-	-	VERY TURBID
1441	5	-		-	-	TURBID
1445	10	-		-	-	TURBID
1448	15	-		-	-	TURBID
1454	30	-		-	-	SLIGHTLY TURBID
1459	43	6.53		500	17	SLIGHTLY TURBID
1505	55	-		-	-	CLEAR
1547	70	-		-	-	VERY TURBID
1549	75	-	↓	-	-	VERY TURBID
1551	80	6.61	14.1	500	17	SLIGHTLY CLEAR
1558	93	6.61	14.1	500	17	SLIGHTLY CLEAR
1600	98	6.34	12.5	450	16	CLEAR
1604	108	6.35	12.5	450	15	CLEAR
1606	113	6.35	12.5	450	16	CLEAR
1609	121					CLEAR

OBSERVATIONS/NOTES

The well was surged 1505 - 1541. Flow was stable.

Baker
Baker Environmental, Inc.

FIELD WELL DEVELOPMENT RECORD

PROJECT: RI/FS at OU No. 6 - Site 44 - MCAS, New River

CTO NO.: 62470-303 WELL NO.: 44GW01DW

DATE: 3-25-95

GEOLOGIST/ENGINEER: M. S. HERBST

TIME START	1033
TIME FINISH	1102
INITIAL WATER LEVEL (FT)	12.8'
TOTAL WELL DEPTH (TD)	71.0'
WELL DIAMETER (INCHES)	2.0"
CALCULATED WELL VOLUME	9.3 gallons
BOREHOLE DIAMETER (INCHES)	-N/A-
BOREHOLE VOLUME	-N/A-
AMOUNT OF WATER ADDED DURING DRILLING	-N/A-
DEVELOPMENT METHOD	AIR LIFT
PUMP TYPE	AIR COMPRESSOR
TOTAL TIME (A)	Ø hr. 29 min.
AVERAGE FLOW (GPM)(B)	6.5 gpm
TOTAL ESTIMATED WITHDRAWAL AxB=	189 gallons
HNU/OVA READING	-N/A-

DEVELOPMENT DATA

TIME	CUMULATIVE VOLUME (gallons)	pH	TEMP (°C)	SPEC. COND. (µmhos/cm)	TEMP (°C)	COLOR AND TURBIDITY
1044	82.5	6.82	18.0	1750	18.0	FAIRLY CLEAR - BUT SLIGHTLY MILKY.
1048	110.0	6.77	19.0	1300	19.0	SAME
1053	137.5	6.93	19.0	1300	19.0	SAME
1055	147.5	6.95	19.5	1650	19.5	VERY CLEAR; LITTLE VISIBLE TURBIDITY.
1056	165	7.22	19.5	1550	19.5	NO VISUAL TURBIDITY
1102	189	7.16	19.0	1550	19.0	SAME.

REF: pp 86-87 CTO 303 vol I.

FIELD WELL DEVELOPMENT RECORD

Baker
Baker Environmental, Inc

PROJECT: SITE 44
CTO NO.: 303 WELL NO.: 44-GW02
DATE: 3-6-95
GEOLOGIST/ENGINEER: MDSMITH

TIME START 1710 (3/6) 0822 (3/7)
TIME FINISH 1753 (3/6) 1049 (3/7)
INITIAL WATER LEVEL (FT) 5.90
TOTAL WELL DEPTH (TD) 14.92
WELL DIAMETER (INCHES) 2"
CALCULATED WELL VOLUME 1.47 GAL
BOREHOLE DIAMETER (INCHES) UNKNOWN
BOREHOLE VOLUME –
AMOUNT OF WATER ADDED DURING DRILLING –
DEVELOPMENT METHOD PUMPING
PUMP TYPE CENTRIFUGAL
TOTAL TIME (A) 2 hrs. 32 min.
AVERAGE FLOW (GPM)(B) .66 GPM
TOTAL ESTIMATED WITHDRAWAL AxB= 100 GAL MEASURED
INU/OVA READING Background

DEVELOPMENT DATA

TIME	CUMULATIVE VOLUME (gallons)	pH	TEMP (°C)	SPEC. COND. (µmhos/cm)	TEMP (°C)	COLOR AND TURBIDITY
1710 (3/6)	0					VERY TURBID
1717	9					VERY TURBID
1724	14					VERY TURBID
1731	19					TURBID
1753	24					TURBID
0825 (3/7)	29					TURBID
0838	34					TURBID
0901	44					TURBID
0918	54					TURBID
0924	58	5.61	13.3	50	16	SLIGHTLY TURBID
0931	60	5.59	12.8	45	17	SLIGHTLY TURBID
0938	62	5.48	13.6	45	18	VERY SLIGHTLY TURBID
0946	67	5.38	13.0	45	17	VERY SLIGHTLY TURBID
0956	72	5.43	20	-	13.4	VERY SLIGHTLY TURBID
1004	77			45	18	VERY SLIGHTLY TURBID
1015	82	5.42	14.9	45	18	VERY SLIGHTLY TURBID

OBSERVATIONS/NOTES

The well was surged on 3-7-95 from 749 - 0822. This well required a lot of hand surging while pump was in operation. Development data is on two pages.

FIELD WELL DEVELOPMENT RECORD

Baker

Baker Environmental, Inc.

PROJECT: SITE 44

CTO NO.: 303 WELL NO.: 44-GW02

DATE: 3-6-95

GEOLOGIST/ENGINEER: MD SMITH

TIME START 1710 (3/6)
822 (3/7)

TIME FINISH 1753 (3/6)
1049 (3/7)

INITIAL WATER LEVEL (FT)
5.90'

TOTAL WELL DEPTH (TD)
14.92'

WELL DIAMETER (INCHES)
2"

CALCULATED WELL VOLUME
1.47 GAL

BOREHOLE DIAMETER (INCHES)
UNKNOWN

BOREHOLE VOLUME
—

AMOUNT OF WATER ADDED DURING DRILLING
—

DEVELOPMENT METHOD
PUMPING

PUMP TYPE
CENTRIFUGAL

TOTAL TIME (A)
2hr 32min
TOTAL PUMPING TIME

AVERAGE FLOW (GPM)(B)
.66 GPM

TOTAL ESTIMATED WITHDRAWAL AxB= 100GAL
MEASURED

HNU/OVA READING
Background

DEVELOPMENT DATA

TIME	CUMULATIVE VOLUME (gallons)	pH	TEMP (°C)	SPEC. COND. (µmhos/cm)	TEMP (°C)	COLOR AND TURBIDITY
1023	87	5.57	13.4	45	18	SLIGHT TURBIDITY
1030	92	5.35	13.2	45	18	VERY SLIGHT TURBIDITY
1039	96	-	-	45	19.5	VERY SLIGHT TURBIDITY
1049	100					VERY SLIGHT TURBIDITY

OBSERVATIONS/NOTES

Continued from page 1.

FIELD WELL DEVELOPMENT RECORD

Baker
Baker Environmental, Inc

PROJECT: SITE 44

CTO NO.: 303 WELL NO.: 44-GW03

DATE: 3-7-98

GEOLOGIST/ENGINEER: MDSMITH

TIME START: 1343

TIME FINISH: 1504

INITIAL WATER LEVEL (FT): 6.5'

TOTAL WELL DEPTH (TD): 16.8'

WELL DIAMETER (INCHES): 2"

CALCULATED WELL VOLUME: 1.7 GAL

BOREHOLE DIAMETER (INCHES): UNKNOWN

BOREHOLE VOLUME: -

AMOUNT OF WATER ADDED DURING DRILLING: -

DEVELOPMENT METHOD: PUMPING

PUMP TYPE: CENTRIFUGAL

TOTAL TIME (A): 0 hr. 52 min. TOTAL PUMPING TIME

AVERAGE FLOW (GPM)(B): 2.7 GPM (measured)

TOTAL ESTIMATED WITHDRAWAL AxB=: 138 GAL (measured)

HNU/OVA READING: BACKGROUND

DEVELOPMENT DATA

TIME	CUMULATIVE VOLUME (gallons)	pH	TEMP (°C)	SPEC. COND. (µmhos/cm)	TEMP (°C)	COLOR AND TURBIDITY
1343	0					VERY TURBID
1350	5					VERY TURBID
1352	10					TURBID
1354	15					TURBID
1357	23					TURBID
1400	41					TURBID
1405	60					TURBID
1442	70					TURBID
1447	75	6.45	-	650	17	SLIGHTLY TURBID
1453	102	6.14	-	550	14	SLIGHTLY TURBID
1458	116	6.16	16	525	12	CLEAR
1503	138	6.03	13	550	15	CLEAR

OBSERVATIONS/NOTES

Well was surged 1406 to 1435. Initially, a lot of hand surging was required when pump was in operation.

FIELD WELL DEVELOPMENT RECORD

Baker

Baker Environmental, Inc

PROJECT: RI/FS at OU No. 6 - Site 44 - MCAS, New River

CTO NO.: 62470-303 WELL NO.: 44-GW04

DATE: 3/24/95

GEOLOGIST/ENGINEER: Dave Gaviglia

TIME START	1530
TIME FINISH	1718
INITIAL WATER LEVEL (FT)	10.61
TOTAL WELL DEPTH (TD)	22.5
WELL DIAMETER (INCHES)	2.0 ID
CALCULATED WELL VOLUME	2.36
BOREHOLE DIAMETER (INCHES)	N/A
BOREHOLE VOLUME	N/A
AMOUNT OF WATER ADDED DURING DRILLING	N/A
DEVELOPMENT METHOD	Pump
PUMP TYPE	Centrifugal
TOTAL TIME (A)	1 hr. 48 min.
AVERAGE FLOW (GPM)(B)	1.18 gpm
TOTAL ESTIMATED WITHDRAWAL AxB=	89 gallons
HNU/OVA READING	N/A

DEVELOPMENT DATA

TIME	CUMULATIVE VOLUME (gallons)	pH	TEMP (°C)	SPEC. COND. (µmhos/cm)	TEMP (°C)	COLOR AND TURBIDITY
1530	16	7.07		800	17	Chocolate Milk, Fine Sand settled out.
1553	30	6.71		1100	17	Opaque Brown. Fines settling out
1615	53	6.69		1150	17	Translucent Brown or Tan, No Settling Solids
1617 to 1646	Surge Well					
1649	56	7.12		1190	16.1	Olive-Green, Highly Turbid suspended particles
1655	63	6.84		1210	17	Highly Turbid, suspended particles
1701	70	6.69		1200	17	Slightly Less Turbid, Lot of Fines
1705	75	6.82		1200	17	Slightly Less Turbid, Lot of Fines
1711	82	6.73		1220	16.5	Less Fines
1717	89	6.72		1210	17	Clear

OBSERVATIONS/NOTES

- Pump shut down from 1617 to 1646 for surging

Baker
Baker Environmental, Inc.

FIELD WELL DEVELOPMENT RECORD

PROJECT: RI/FS at OU No. 6 - Site 44 - MCAS, New River

CTO NO.: 62470-303 WELL NO.: 44GW05

DATE: 3-24-95

GEOLOGIST/ENGINEER: M.S. HERBST

TIME START: 1720	
TIME FINISH: 1820	
INITIAL WATER LEVEL (FT): 10.51'	
TOTAL WELL DEPTH (TD): 21.5'	
WELL DIAMETER (INCHES): 2.0"	
CALCULATED WELL VOLUME: 1.75 gallons	
BOREHOLE DIAMETER (INCHES): -N/A-	
BOREHOLE VOLUME: -N/A-	
AMOUNT OF WATER ADDED DURING DRILLING: -N/A-	
DEVELOPMENT METHOD: Pump	
PUMP TYPE: CENTRIFUGAL	
TOTAL TIME (A): 1 hr. 0 min.	
AVERAGE FLOW (GPM)(B): 0.5 gpm	
TOTAL ESTIMATED WITHDRAWAL AxB=: 30 gallons	
HNU/OVA READING: -N/A-	

DEVELOPMENT DATA

TIME	CUMULATIVE VOLUME (gallons)	pH	TEMP (°C)	SPEC. COND. (µmhos/cm)	TEMP (°C)	COLOR AND TURBIDITY
1751	20	6.77	19.0	290	19.0	VERY TURBID OLIVE-BROWN.
1811	28	6.72	18.0	295	18.0	ABOUT THE SAME
1820	30	—	—	—	—	STILL TURBID. SEE NOTES BELOW.

NOTE: DUE TO THE LOSS OF DAYLIGHT, WE DID NOT COMPLETE THIS DEVELOPMENT. TFT COMPLETED IT AT A LATER DATE.

REF: pp. 82-83 CTO 303 vol. I.

FIELD WELL DEVELOPMENT RECORD

Baker
Baker Environmental, Inc

PROJECT: RI/FS at OU No. 6 - Site 44 - MCAS, New River

CTO NO.: 62470-303 WELL NO.: 44-GW06

DATE: 3/24/95

GEOLOGIST/ENGINEER: Dave Gaviglia

TIME START: 1114

TIME FINISH: 1252

INITIAL WATER LEVEL (FT): 4.51

TOTAL WELL DEPTH (TD): 18.0

WELL DIAMETER (INCHES): 2.0 ID

CALCULATED WELL VOLUME: 2.21 gallons

BOREHOLE DIAMETER (INCHES): N/A

BOREHOLE VOLUME: N/A

AMOUNT OF WATER ADDED DURING DRILLING: N/A

DEVELOPMENT METHOD: Pump

PUMP TYPE: Centrifugal

TOTAL TIME (A): 1 hr. 38 min.

AVERAGE FLOW (GPM)(B): 0.75 gpm

TOTAL ESTIMATED WITHDRAWAL AxB=: 62 gallons

HNU/OVA READING: N/A

DEVELOPMENT DATA

TIME	CUMULATIVE VOLUME (gallons)	pH	TEMP (°C)	SPEC. COND. (µmhos/cm)	TEMP (°C)	COLOR AND TURBIDITY
1114	—	6.77		2920	17	Olive-Green, Gray Highly Turbid
1124	7.4	6.63		2200	20.5	Slightly Less Turbid
1129	11.1	6.32		2110	19	Medium Turbid, Less Suspended Particles
1133	14.1	6.29		2110	19	Medium Turbid
1139	18.5	6.17		2090	19	Medium Turbid
1152	28.1	6.38		2110	21	Clear
1154 to 1209	Surge Well					
1210	28.1	6.44		2090	18	Olive-Green, Gray Highly Turbid
1217	33.3	6.31		2020	19.8	Highly Turbid
1220	35.5	6.41		1990	20.5	Highly Turbid
1227	40.7	6.43		1820	20.1	Slightly Less Turbid
1232	44.4	6.30		1780	21	Medium Turbid, Less Suspended Particles
1240	50.3	6.21		1700	21	Slightly Less Turbid
1244	53.3	6.15		1700	21	Slightly Less Turbid
1252	62	6.14		1550	21	Clear

OBSERVATIONS/NOTES

- Pump shut down from 1154 to 1209 for surging

Baker

Baker Environmental, Inc.

FIELD WELL DEVELOPMENT RECORD

PROJECT: RI/FS at OU No. 6 - Site 44 - MCAS, New River

CTO NO.: 62470-303 WELL NO.: 44-GW06DW

DATE: 3-12-95

GEOLOGIST/ENGINEER: M. S. HERBST

TIME START	1315
TIME FINISH	1345
INITIAL WATER LEVEL (FT)	4.10'
TOTAL WELL DEPTH (TD)	75.0'
WELL DIAMETER (INCHES)	2.0"
CALCULATED WELL VOLUME	11.36 gallons
BOREHOLE DIAMETER (INCHES)	-N/A-
BOREHOLE VOLUME	-N/A-
AMOUNT OF WATER ADDED DURING DRILLING	-N/A-
DEVELOPMENT METHOD	AIR LIFT
PUMP TYPE	AIR COMPRESSOR
TOTAL TIME (A)	0 hr. 30 min
AVERAGE FLOW (GPM)(B)	7.0 gpm
TOTAL ESTIMATED WITHDRAWAL AxB=	211 gallons
HNU/OVA READING	-N/A-

DEVELOPMENT DATA

TIME	CUMULATIVE VOLUME (gallons)	pH	TEMP (°C)	SPEC. COND. (µmhos/cm)	TEMP (°C)	COLOR AND TURBIDITY
1328	106.0	7.99	18.0	440	18.0	TRANSPARENT - SLIGHT TAN MILKINESS.
1334	142.0	7.89	17.5	430	17.5	VERY CLEAR
1343	205.0	7.89	17.5	425	17.5	VERY CLEAR

NOTE: ACTUAL GPM'S REMOVED IS PROBABLY HIGHER DUE TO A STOPPAGE DURING DEVELOPMENT CAUSED BY EQUIPMENT PROBLEMS.

REF: pp. 54-55 CTO 308 VOL I.

- FLOW WAS VERY GOOD.

APPENDIX F
INVESTIGATION DERIVED WASTE SUMMARY AND RECOMMENDATIONS

Baker

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

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

May 17, 1995

Commander
Atlantic Division
Naval Facilities Engineering Command
1510 Gilbert Street (Building N-26)
Norfolk, Virginia 23511-2699

Attn: Ms. Linda Saksvig, P.E.
Navy Technical Representative
Code 18231

Re: Contract N62470-D-4814
Navy CLEAN, District III
Contract Task Order (CTO) 0303
Disposal of Investigation Derived Waste
Operable Unit No. 7 (Sites 36, 43, 44, 54, and 86)
MCAS, New River, Jacksonville, North Carolina

Dear Ms. Saksvig:

This correspondence serves to inform you of the status of activities associated with the investigation derived wastes (IDW) generated during the field program conducted under Contract Task Order (CTO) 0303. Approximately 9,275 gallons of liquid (purge and development water, and decontamination fluids) and 70 cubic yards of soil/mud cuttings were generated during the field activities. Upon completion of the field program, liquid and soil/mud samples were collected to determine their waste characteristics (i.e., hazardous or non-hazardous) for disposal purposes. Samples of soil/mud were obtained by compositing three to five grab samples per roll-off box, and liquid samples from each tank/tanker were collected by using a bailer .

Liquid samples were analyzed for full Target Compound List (TCL) organics (i.e., volatiles, semivolatiles, and pesticides, and PCBs), Target Analyte List (TAL) metals, and RCRA hazardous waste characteristics (corrosivity, ignitability, and reactivity). Soil/mud samples were analyzed for full toxicity characteristic leachate procedure (TCLP), including PCBs, and RCRA parameters. A 7-day laboratory turnaround was requested for all samples to accelerate the disposal process, and reduce the cost of IDW storage.

Analytical results indicated that the liquid and soil/mud samples are non-hazardous based on the criteria outlined in 40 CFR 261, RCRA Identification and Listing of Hazardous Waste (based on TCLP and RCRA Waste Characteristic results). Accordingly, the following disposal options are proposed:

- Purge and development water will be emptied onto the ground surface at the site from which it was generated. The tanker at Site 86 will be driven to Site 36 for disposal due to the limited space and highly visible nature of the site.

- Decontamination fluids will be taken off site by a licensed waste hauler (Four Season Environmental Services) and disposed as non-hazardous.

- Roll-off boxes will be emptied on site and the soil/mud graded. The roll-off boxes at Site 86 will be transported to Site 36 for disposal due to the limited space and highly visible nature of the site.

The proposed disposal plan outlined above is consistent with the LANTDIV IDW Management Plan options and with other projects performed at MCB, Camp Lejeune. Moreover, Baker received verbal concurrence on May 13, 1995 for the proposed disposal plan from Ms. Katherine Landman, the acting Navy Technical Representative.

Baker appreciates the opportunity to serve LANTDIV on this important project. If you have any questions, please do not hesitate to contact me at (412) 269-2033 or Mr. Matthew Bartman (Activity Coordinator) at (412) 269-2053.

Sincerely,

BAKER ENVIRONMENTAL, INC.

Richard E. Bonelli
Project Manager

REB/lq

cc: Ms. Lee Ann Rapp, Code 183
Ms. Beth Collier, Code 02115
Mr. Neal Paul, MCB, Camp Lejeune

bcc: APPajak/CF; JWMentz/RPWattras/PROG F; REBonelli/PF; TFTrebilcock; MDBartman(ck); Daily File
S.O. #62470-303
Subfile 8
Initials MDB

Baker

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

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

May 17, 1995

Commander
Atlantic Division
Naval Facilities Engineering Command
1510 Gilbert Street (Building N-26)
Norfolk, Virginia 23511-2699

Attn: Ms. Linda Saksvig, P.E.
Navy Technical Representative
Code 18231

Re: Contract N62470-D-4814
Navy CLEAN, District III
Contract Task Order (CTO) 0303
Disposal of Investigation Derived Waste
Operable Unit No. 7 (Sites 36, 43, 44, 54, and 86)
MCAS, New River, Jacksonville, North Carolina

Dear Ms. Saksvig:

This correspondence serves to inform you of the status of activities associated with the investigation derived wastes (IDW) generated during the field program conducted under Contract Task Order (CTO) 0303. Approximately 9,275 gallons of liquid (purge and development water, and decontamination fluids) and 70 cubic yards of soil/mud cuttings were generated during the field activities. Upon completion of the field program, liquid and soil/mud samples were collected to determine their waste characteristics (i.e., hazardous or non-hazardous) for disposal purposes. Samples of soil/mud were obtained by compositing three to five grab samples per roll-off box, and liquid samples from each tank/tanker were collected by using a bailer.

Liquid samples were analyzed for full Target Compound List (TCL) organics (i.e., volatiles, semivolatiles, and pesticides, and PCBs), Target Analyte List (TAL) metals, and RCRA hazardous waste characteristics (corrosivity, ignitability, and reactivity). Soil/mud samples were analyzed for full toxicity characteristic leachate procedure (TCLP), including PCBs, and RCRA parameters. A 7-day laboratory turnaround was requested for all samples to accelerate the disposal process, and reduce the cost of IDW storage.

Analytical results indicated that the liquid and soil/mud samples are non-hazardous based on the criteria outlined in 40 CFR 261, RCRA Identification and Listing of Hazardous Waste (based on TCLP and RCRA Waste Characteristic results). Accordingly, the following disposal options are proposed:

- Purge and development water will be emptied onto the ground surface at the site from which it was generated. The tanker at Site 86 will be driven to Site 36 for disposal due to the limited space and highly visible nature of the site.

- Decontamination fluids will be taken off site by a licensed waste hauler (Four Season Environmental Services) and disposed as non-hazardous.

- Roll-off boxes will be emptied on site and the soil/mud graded. The roll-off boxes at Site 86 will be transported to Site 36 for disposal due to the limited space and highly visible nature of the site.

The proposed disposal plan outlined above is consistent with the LANTDIV IDW Management Plan options and with other projects performed at MCB, Camp Lejeune. Moreover, Baker received verbal concurrence on May 13, 1995 for the proposed disposal plan from Ms. Katherine Landman, the acting Navy Technical Representative.

Baker appreciates the opportunity to serve LANTDIV on this important project. If you have any questions, please do not hesitate to contact me at (412) 269-2033 or Mr. Matthew Bartman (Activity Coordinator) at (412) 269-2053.

Sincerely,

BAKER ENVIRONMENTAL, INC.

Richard E. Bonelli
Project Manager

REB/lq

cc: Ms. Lee Ann Rapp, Code 183
Ms. Beth Collier, Code 02115
Mr. Neal Paul, MCB, Camp Lejeune

WASTE CHARACTERISTIC SUMMARY

SITE 44, JONES STREET DUMP
WASTE CHARACTERIZATION SUMMARY
REMEDIAL INVESTIGATION, CTO - 303
MCB CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-RB01 TCLP	44-TNK	44-TP03
DATE SAMPLED	04/25/95	04/25/95	04/21/95
UNITS	UG/L	UG/L	UG/KG
VOLATILES			
CHLOROMETHANE	NA	10 U	12 U
BROMOMETHANE	NA	10 U	12 U
VINYL CHLORIDE	200 U	10 U	12 U
CHLOROETHANE	NA	10 U	12 U
METHYLENE CHLORIDE	NA	10 U	12 U
ACETONE	NA	10 U	12 U
CARBON DISULFIDE	NA	10 U	12 U
1,1-DICHLOROETHENE	200 U	10 U	12 U
1,1-DICHLOROETHANE	NA	10 U	12 U
1,2-DICHLOROETHENE (TOTAL)	NA	10 U	12 U
CHLOROFORM	200 U	10 U	12 U
1,2-DICHLOROETHANE	200 U	10 U	12 U
2-BUTANONE	200 U	10 U	12 U
1,1,1-TRICHLOROETHANE	NA	10 U	12 U
CARBON TETRACHLORIDE	200 U	10 U	12 U
BROMODICHLOROMETHANE	NA	10 U	12 U
1,2-DICHLOROPROPANE	NA	10 U	12 U
CIS-1,3-DICHLOROPROPENE	NA	10 U	12 U
TRICHLOROETHENE	200 U	10 U	12 U
DIBROMOCHLOROMETHANE	NA	10 U	12 U
1,1,2-TRICHLOROETHANE	NA	10 U	12 U
BENZENE	200 U	10 U	12 U
TRANS-1,3-DICHLOROPROPENE	NA	10 U	12 U
BROMOFORM	NA	10 U	12 U
4-METHYL-2-PENTANONE	NA	10 U	12 U
2-HEXANONE	NA	10 U	12 U
TETRACHLOROETHENE	200 U	10 U	12 U
1,1,2,2-TETRACHLOROETHANE	NA	10 U	12 U
TOLUENE	NA	10 U	12 U
CHLOROBENZENE	200 U	10 U	12 U
ETHYLBENZENE	NA	10 U	12 U
STYRENE	NA	10 U	12 U
XYLENE (TOTAL)	NA	10 U	12 U

SITE 44, JONES STREET DUMP
WASTE CHARACTERIZATION SUMMARY
REMEDIAL INVESTIGATION, CTO - 303
MCB CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-RB01 TCLP	44-TNK	44-TP03
DATE SAMPLED	04/25/95	04/25/95	04/21/95
UNITS	UG/L	UG/L	UG/KG
SEMIVOLATILES			
PHENOL	NA	10 U	400 U
BIS(2-CHLOROETHYL)ETHER	NA	10 U	400 U
2-CHLOROPHENOL	NA	10 U	400 U
1,3-DICHLOROBENZENE	NA	10 U	400 U
1,4-DICHLOROBENZENE	50 U	10 U	400 U
1,2-DICHLOROBENZENE	NA	10 U	400 U
2-METHYLPHENOL	NA	10 U	400 U
2,2'-OXYBIS(1-CHLOROPROPANE)	NA	10 U	400 U
4-METHYLPHENOL	NA	10 U	400 U
N-NITROSO-DI-N-PROPYLAMINE	NA	10 U	400 U
HEXACHLOROETHANE	70 U	10 U	400 U
NITROBENZENE	30 U	10 U	400 U
ISOPHORONE	NA	10 U	400 U
2-NITROPHENOL	NA	10 U	400 U
2,4-DIMETHYLPHENOL	NA	10 U	400 U
BIS(2-CHLOROETHOXY)METHANE	NA	10 U	400 U
2,4-DICHLOROPHENOL	NA	10 U	400 U
1,2,4-TRICHLOROBENZENE	NA	10 U	400 U
NAPHTHALENE	NA	10 U	400 U
4-CHLOROANILINE	NA	10 U	400 U
HEXACHLOROBUTADIENE	80 U	10 U	400 U
4-CHLORO-3-METHYLPHENOL	NA	10 U	400 U
2-METHYLNAPHTHALENE	NA	10 U	400 U
HEXACHLOROCYCLOPENTADIENE	NA	10 U	400 U
2,4,6-TRICHLOROPHENOL	30 U	10 U	400 U
2,4,5-TRICHLOROPHENOL	40 U	25 U	1000 U
2-CHLORONAPHTHALENE	NA	10 U	400 U
2-NITROANILINE	NA	25 U	1000 U
DIMETHYLPHTHALATE	NA	10 U	400 U
ACENAPHTHYLENE	NA	10 U	400 U
2,6-DINITROTOLUENE	NA	10 U	400 U
3-NITROANILINE	NA	25 U	1000 U
ACENAPHTHENE	NA	10 U	400 U
2,4-DINITROPHENOL	NA	25 U	1000 U
4-NITROPHENOL	NA	25 U	1000 U

SITE 44, JONES STREET DUMP
WASTE CHARACTERIZATION SUMMARY
REMEDIAL INVESTIGATION, CTO - 303
MCB CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-RB01 TCLP	44-TNK	44-TP03
DATE SAMPLED	04/25/95	04/25/95	04/21/95
UNITS	UG/L	UG/L	UG/KG
SEMIVOLATILES cont.			
DIBENZOFURAN	NA	10 U	400 U
2,4-DINITROTOLUENE	20 U	10 U	400 U
DIETHYLPHTHALATE	NA	10 U	400 U
4-CHLOROPHENYL-PHENYLETHER	NA	10 U	400 U
FLUORENE	NA	10 U	400 U
4-NITROANILINE	NA	25 U	1000 U
4,6-DINITRO-2-METHYLPHENOL	NA	25 U	1000 U
N-NITROSODIPHENYLAMINE (1)	NA	10 U	400 U
4-BROMOPHENYL-PHENYLETHER	NA	10 U	400 U
HEXACHLOROBENZENE	20 U	10 U	400 U
PENTACHLOROPHENOL	60 U	25 U	1000 U
PHENANTHRENE	NA	10 U	400 U
ANTHRACENE	NA	10 U	400 U
CARBAZOLE	NA	10 U	400 U
DI-N-BUTYLPHTHALATE	NA	10 U	2000 U
FLUORANTHENE	NA	10 U	400 U
PYRENE	NA	10 U	400 U
BUTYLBENZYLPHTHALATE	NA	10 U	400 U
3,3'-DICHLOROBENZIDINE	NA	10 U	400 U
BENZO(A)ANTHRACENE	NA	10 U	400 U
CHRYSENE	NA	10 U	400 U
BIS(2-ETHYLHEXYL)PHTHALATE	NA	1 J	400 U
DI-N-OCTYL PHTHALATE	NA	10 U	400 U
BENZO(B)FLUORANTHENE	NA	10 U	400 U
BENZO(K)FLUORANTHENE	NA	10 U	400 U
BENZO(A)PYRENE	NA	10 U	400 U
INDENO(1,2,3-CD)PYRENE	NA	10 U	400 U
DIBENZO(A,H)ANTHRACENE	NA	10 U	400 U
BENZO(G,H,I)PERYLENE	NA	10 U	400 U
O-CRESOL	30 U	NA	NA
META & PARA-CRESOL	30 U	NA	NA
PYRIDINE	500 U	NA	NA

SITE 44, JONES STREET DUMP
WASTE CHARACTERIZATION SUMMARY
REMEDIAL INVESTIGATION, CTO - 303
MCB CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-RB01 TCLP	44-TNK	44-TP03
DATE SAMPLED	04/25/95	04/25/95	04/21/95
UNITS	UG/L	UG/L	UG/KG
PESTICIDE/PCBS			
ALPHA-BHC	NA	0.05 UJ	2 UJ
BETA-BHC	NA	0.05 UJ	2 UJ
DELTA-BHC	NA	0.05 UJ	2 UJ
GAMMA-BHC (LINDANE)	0.5 U	0.05 UJ	2 UJ
HEPTACHLOR	0.6 U	0.05 UJ	2 UJ
ALDRIN	NA	0.05 UJ	2 UJ
HEPTACHLOR EPOXIDE	0.8 U	0.05 UJ	2 UJ
ENDOSULFAN I	NA	0.05 UJ	2 UJ
DIELDRIN	NA	0.1 UJ	4 UJ
4,4'-DDE	NA	0.1 UJ	31 J
ENDRIN	3 U	0.1 UJ	4 UJ
ENDOSULFAN II	NA	0.1 UJ	4 UJ
4,4'-DDD	NA	0.1 UJ	25 J
ENDOSULFAN SULFATE	NA	0.1 UJ	4 UJ
4,4'-DDT	NA	0.1 UJ	3.2 J
METHOXYCHLOR	7 U	0.5 UJ	20 UJ
ENDRIN KETONE	NA	0.1 UJ	4 UJ
ENDRIN ALDEHYDE	NA	0.1 UJ	4 UJ
ALPHA-CHLORDANE	NA	0.05 UJ	2 UJ
GAMMA-CHLORDANE	NA	0.05 UJ	2 UJ
TOXAPHENE	50 U	5 UJ	200 UJ
AROCLOR-1016	50 U	1 UJ	40 UJ
AROCLOR-1221	50 U	2 UJ	80 UJ
AROCLOR-1232	50 U	1 UJ	40 UJ
AROCLOR-1242	50 U	1 UJ	40 UJ
AROCLOR-1248	50 U	1 UJ	40 UJ
AROCLOR-1254	100 U	1 UJ	40 UJ
AROCLOR-1260	100 U	1 UJ	40 UJ
CHLORDANE	1 U	NA	NA

SITE 44, JONES STREET DUMP
WASTE CHARACTERIZATION SUMMARY
REMEDIAL INVESTIGATION, CTO - 303
MCB CAMP LEJEUNE, NORTH CAROLINA
INORGANIC ANALYTES

LOCATION	44-RB01 TCLP	44-TNK	44-TP03
DATE SAMPLED	04/25/95	04/25/95	04/21/95
UNITS	UG/L	UG/L	MG/KG
SILVER, TOTAL	NA	2.8 U	0.42 U
ALUMINUM, TOTAL	NA	746 J	2830
ARSENIC, TOTAL	NA	1.7 U	0.45 J
BARIUM, TOTAL	NA	5.6 U	7.4
BERYLLIUM, TOTAL	NA	0.8 U	0.07 U
CALCIUM, TOTAL	NA	5070	825
CADMIUM, TOTAL	NA	1.9 U	0.86 U
COBALT, TOTAL	NA	3.4 U	0.54
CHROMIUM, TOTAL	NA	15.9	3.9
COPPER, TOTAL	NA	7.9 U	1.1 U
IRON, TOTAL	NA	938 J	1740
MERCURY, TOTAL	NA	0.2 U	0.09 U
POTASSIUM, TOTAL	NA	12100	110
MAGNESIUM, TOTAL	NA	642	76.5
MANGANESE, TOTAL	NA	8.6 U	7
SODIUM, TOTAL	NA	89000	10.6
NICKEL, TOTAL	NA	10.9 U	1.2 U
LEAD, TOTAL	NA	1.1	4.7
ANTIMONY, TOTAL	NA	20.8 U	2.7 UJ
SELENIUM, TOTAL	NA	2.4 J	0.42 UJ
THALLIUM, TOTAL	NA	1.2 U	0.28 UJ
VANADIUM, TOTAL	NA	6.7 U	5.2
ZINC, TOTAL	NA	8.9 U	2.9
SILVER, TCLP LEACHATE	50 U	NA	NA
ARSENIC, TCLP LEACHATE	100 U	NA	NA
BARIUM, TCLP LEACHATE	500 U	NA	NA
CADMIUM, TCLP LEACHATE	50 U	NA	NA
CHROMIUM, TCLP LEACHATE	50 U	NA	NA
MERCURY, TCLP LEACHATE	10 U	NA	NA
LEAD, TCLP LEACHATE	50 U	NA	NA
SELENIUM, TCLP LEACHATE	100 U	NA	NA

SITE 44, JONES STREET DUMP
RCRA - SUMMARY
REMEDIAL INVESTIGATION, CTO - 303
MCB CAMP LEJEUNE, NORTH CAROLINA

LOCATION	44-RB01	44-TP03
DATE SAMPLED	04/25/95	04/21/95
WET CHEMISTRY		
% SOLIDS	49.7	82.3
CYANIDE, REACTIVE (mg/kg)	0.44 U	NA
SULFIDE REACTIVE (mg/kg)	48.8 U	NA
CORROSIVITY BY PH (pH)	11.5	NA
VOL THRU FILTER (ml/10)	1	NA

LOCATION	44-TNK
DATE SAMPLED	04/25/95
WET CHEMISTRY	
CYANIDE, REACTIVE (ug/L)	25 U
SULFIDE REACTIVE (mg/L)	1 U

LOCATION	44-RB01 TCLP
DATE SAMPLED	04/25/95
UNITS	UG/L
HERBICIDES	
2,4-D	100 U
2,4,5-TP	20 U

APPENDIX G
SAMPLING SUMMARIES

OU 1 SITE 44
SOIL
CTO-0303

		Requested				Received								
DATE SHIPPED	SAMPLE ID	TCL VOA	TCL SVOA	TCL PEST/PCB	TAL METALS	TCL VOA	TCL SVOA	TCL PEST/PCB	TAL METALS	DATE EXPECTED	DATE REC'D	TURNAROUND TIME	SDG NO.	COMMENTS
3/9/95	**COC#303012**													
3/9/95	44-BB-SB01-00	X	X	X	X	X	X	X	X	4/14/95	4/13/95	34	612	R
3/9/95	44-BB-SB01-03	X	X	X	X	X	X	X	X	4/14/95	4/13/95	34	612	R
3/9/95	44-OA-SB01-00	X	X	X	X	X	X	X	X	4/14/95	4/13/95	34	612	R
3/9/95	44-OA-SB01-04	X	X	X	X	X	X	X	X	4/14/95	4/13/95	34	612	R
3/9/95	44-OA-SB02-00	X	X	X	X	X	X	X	X	4/14/95	4/13/95	34	612	R
3/9/95	44-OA-SB02-03	X	X	X	X	X	X	X	X	4/14/95	4/13/95	34	612	R
3/13/95	**COC#303018**													
3/13/95	44-GW04-00	X	X	X	X	X	X	X	X	4/18/95	4/19/95	36	688	R
3/13/95	44-GW04-04	X	X	X	X	X	X	X	X	4/18/95	4/19/95	36	688	R
3/13/95	44-GW01DW-00	X	X	X	X	X	X	X	X	4/18/95	4/19/95	36	688	R
3/13/95	44-GW01DW-03	X	X	X	X	X	X	X	X	4/18/95	4/19/95	36	688	R
3/13/95	44-WA-SB01-00	X	X	X	X	X	X	X	X	4/18/95	4/19/95	36	688	R; MS/MSD
3/13/95	44-WA-SB01-00D	X	X	X	X	X	X	X	X	4/18/95	4/19/95	36	688	R
3/13/95	44-WA-SB01-03	X	X	X	X	X	X	X	X	4/18/95	4/19/95	36	688	R
3/14/95	**COC#303019**													
3/14/95	44-WA-SB02-00	X	X	X	X	X		X	X	3/22/95	4/13/95	29	754	QT; METALS 3/22; VOC 3/23; PEST 3/27
3/14/95	44-WA-SB02-03	X	X	X	X	X		X	X	3/22/95	4/13/95	29	754	QT; METALS 3/22; VOC 3/23; PEST 3/27
3/14/95	44-WA-SB03-00	X	X	X	X	X		X	X	3/22/95	4/13/95	29	754	QT; METALS 3/22; VOC 3/23; PEST 3/27
3/14/95	44-WA-SB03-03	X	X	X	X	X		X	X	3/22/95	4/13/95	29	754	QT; METALS 3/22; VOC 3/23; PEST 3/27
3/14/95	44-WA-SB04-00	X	X	X	X					4/19/95	4/13/95	29	752	R
3/14/95	44-WA-SB04-03	X	X	X	X					4/19/95	4/13/95	29	752	R
3/14/95	44-OA-SB03-00	X	X	X	X	X		X	X	3/22/95	4/13/95	29	754	QT; METALS 3/22; VOC 3/23; PEST 3/27
3/14/95	44-OA-SB03-01	X	X	X	X	X		X	X	3/22/95	4/13/95	29	754	QT; METALS 3/22; VOC 3/23; PEST 3/27
3/14/95	44-OA-SB06-00	X	X	X	X	X		X	X	3/22/95	4/13/95	29	754	QT; METALS 3/22; VOC 3/23; PEST 3/27
3/14/95	44-OA-SB06-02	X	X	X	X	X		X	X	3/22/95	4/13/95	29	754	QT; METALS 3/22; VOC 3/23; PEST 3/27
3/14/95	44-OA-SB05-00	X	X	X	X	X	X	X	X	4/19/95	4/20/95	36	753	R
3/14/95	44-OA-SB05-02	X	X	X	X	X	X	X	X	4/19/95	4/26/95	42	752	R
3/14/95	44-GW05-00	X	X	X	X	X	X	X	X	4/19/95	4/26/95	42	752	R; MS/MSD
3/14/95	44-GW05-00D	X	X	X	X	X	X	X	X	4/19/95	4/26/95	42	752	R
3/14/95	44-GW05-03	X	X	X	X	X	X	X	X	4/19/95	4/26/95	42	752	R
3/14/95	44-OA-SB04-00	X	X	X	X	X	X	X	X	4/19/95	4/26/95	42	752	R
3/14/95	44-OA-SB04-02	X	X	X	X	X	X	X	X	4/19/95	4/26/95	42	752	R
3/14/95	44-OA-SB04-02D	X	X	X	X	X	X	X	X	4/19/95	4/26/95	42	752	R
3/14/95	303-TB-17	X				X				4/19/95	4/20/95	36	726	R; TRIP BLANK
3/21/95	**COC#303060**													
3/21/95	303-TB-39	X				X				4/26/95	5/19/95	58	368	R; TRIP BLANK
3/21/95	44-TP03	X	X	X	X					4/26/95	5/31/95	70	428	R
COUNT		32	30	30	30	30	28	28	28					

OU No. 6, SITE 44
GROUNDWATER
CTO-0303

		Analysis Requested							Analysis Received											
DATE SHIPPED	SAMPLE ID	TCL VOA	TCL SVOA	TCL PEST/PCB	TAL METALS	DISSOLVED METALS	TSS	TDS	TCL VOA	TCL SVOA	TCL PEST/PCB	TAL METALS	DISSOLVED METALS	TSS	TDS	DATE EXPECTED	DATE REC'D	TURNAROUND TIME	SDG NO.	COMMENTS
4/8/95	**COC#303049**																			
4/8/95	303-TB-33	X							X							5/14/95	5/12/95	34	225	R; TRIP BLANK
4/8/95	44-GWER-01	X	X	X	X				X	X	X	X				5/14/95	5/12/95	34	225	R; RINSATE
4/8/95	44-GW06DW-01	X	X	X					X	X	X					5/14/95	5/12/95	34	225	R
4/8/95	44-GW06-01	X							X							5/14/95	5/12/95	34	225	R
4/8/95	44-GW04-01	X							X							5/14/95	5/12/95	34	225	R
4/8/95	**COC#303050**																			
4/8/95	44-GW06DW-01				X		X	X				X		X	X	5/14/95	5/12/95	34	225	R
4/8/95	44-GW06-01		X	X	X		X	X		X	X	X		X	X	5/14/95	5/12/95	34	225	R
4/8/95	44-GW04-01		X	X	X		X	X		X	X	X		X	X	5/14/95	5/12/95	34	225	R
4/10/95	**COC#303051**																			
4/10/95	303-TB-34	X							X							5/16/95	5/12/95	32	225	R; TRIP BLANK
4/10/95	44-GW01DW-01	X	X	X	X		X	X	X	X	X	X		X	X	5/16/95	5/12/95	32	225	R
4/10/95	44-GW05-01	X							X							5/16/95	5/12/95	32	225	R
4/10/95	44-GW01-01	X							X							5/16/95	5/12/95	32	225	R; MS/MSD
4/10/95	44-GW01-01D	X							X							5/16/95	5/12/95	32	225	R
4/10/95	44-GWER-02	X	X	X	X				X	X	X	X								HOLD; RINSATE
4/10/95	44-TW01-01	X							X							5/16/95	5/12/95	32	225	R
4/10/95	44-GW02-01	X							X							5/16/95	5/12/95	32	225	R
4/10/95	**COC#303052**																			
4/10/95	44-GW05-01		X	X	X		X	X		X	X	X		X	X	5/16/95	5/12/95	32	225	R
4/10/95	44-GW01-01		X	X	X		X	X		X	X	X		X	X	5/16/95	5/12/95	32	225	R; MS/MSD
4/10/95	44-GW01D-01					X							X			5/16/95	5/12/95	32	225	R; MS/MSD
4/10/95	**COC#303053**																			
4/10/95	44-GW01-01D		X	X	X		X	X		X	X	X		X	X	5/16/95	5/12/95	32	225	R
4/10/95	44-GW01D-01D					X							X			5/16/95	5/12/95	32	225	R
4/10/95	44-GWERD-02					X							X							HOLD; RINSATE
4/10/95	44-TW01-01		X	X	X		X	X		X	X	X		X	X	5/16/95	5/12/95	32	225	R
4/11/95	**COC#303054**																			
4/11/95	44-GW02-01		X	X	X		X	X		X	X	X		X	X	5/17/95	5/12/95	31	225	R
4/11/95	44-GW03-01	X							X							5/17/95	5/12/95	31	274	R
4/11/95	**COC#303055**																			
4/11/95	44-GW03-01		X	X	X		X	X		X	X	X		X	X	5/17/95	5/12/95	31	274	R
COUNT		14	12	12	12	3	10	10	14	12	12	12	3	10	10					

OU 1 SITE 44
SURFACE WATER
CTO-0303

		Analysis Requested						Analysis Received									
DATE SHIPPED	SAMPLE ID	TCL VOA	TCL SVOA	TCL PEST/PCB	TAL METALS	DISSOLVED METALS	HARDNESS	TCL VOA	TCL SVOA	TCL PEST/PCB	TAL METALS	DISSOLVED METALS	HARDNESS	DATE EXPECTED	DATE REC'D	TURNAROUND TIME	SDG NO.	COMMENTS
5/4/95	**COC#303065**																	
5/4/95	303-TB-44	X						X						6/9/95	6/16/95	42	638	R; TRIP BLANK
5/4/95	44-EC-SW07	X	X	X	X		X	X	X	X	X			6/9/95	6/16/95	42	638	R; MS/MSD
5/4/95	44-EC-DSW02					X						X		6/9/95	6/16/95	42	638	R; MS/MSD
5/4/95	44-EC-SW02D	X						X						6/9/95	6/16/95	42	638	R
5/4/95	44-EC-SW01	X						X						6/9/95	6/16/95	42	638	R
5/4/95	44-EC-SW05	X						X						6/9/95	6/16/95	42	638	R
5/4/95	44-UT-SW03	X						X						6/9/95	6/16/95	42	638	R
5/4/95	44-EC-SW04	X						X						6/9/95	6/16/95	42	638	R
5/4/95	44-EC-SW03	X						X						6/9/95	6/16/95	42	638	R
5/4/95	44-UT-SW02	X						X						6/9/95	6/16/95	42	638	R
5/4/95	44-UT-SW01	X						X						6/9/95	6/9/95	35	702	R
5/4/95	**COC#303066**																	
5/4/95	44-EC-SW02D		X	X	X		X		X	X	X		X	6/9/95	6/16/95	42	638	R
5/4/95	44-EC-DSW02D					X						X		6/9/95	6/16/95	42	638	R
5/4/95	44-EC-SW01		X	X	X		X		X	X	X		X	6/9/95	6/16/95	42	638	R
5/4/95	44-EC-DSW01					X						X		6/9/95	6/16/95	42	638	R
5/4/95	44-EC-SW05		X	X					X	X				6/9/95	6/16/95	42	638	R
5/4/95	**COC#303067**																	
5/4/95	44-EC-SW05				X		X				X		X	6/9/95	6/16/95	42	638	R
5/4/95	44-EC-DSW05					X						X		6/9/95	6/16/95	42	638	R
5/4/95	44-UT-SW03		X	X	X		X		X	X	X		X	6/9/95	6/16/95	42	638	R
5/4/95	44-UT-DSW03					X						X		6/9/95	6/16/95	42	638	R
5/4/95	44-EC-SW04		X	X	X		X		X	X	X		X	6/9/95	6/16/95	42	638	R
5/4/95	44-EC-DSW04					X						X		6/9/95	6/16/95	42	638	R
5/4/95	44-EC-DSW03					X						X		6/9/95	6/16/95	42	638	R
5/4/95	**COC#303068**																	
5/4/95	44-EC-SW03		X	X	X		X		X	X	X		X	6/9/95	6/16/95	42	638	R
5/4/95	44-UT-SW02		X	X	X		X		X	X	X		X	6/9/95	6/16/95	42	638	R
5/4/95	44-UT-DSW02					X						X		6/9/95	6/16/95	42	638	R
5/4/95	44-UT-DSW01					X						X		6/9/95	6/9/95	35	702	R
9/28/95	**COC# 303083**																	
9/28/95	44-EC-SW06-01	X						X						10/6/95	10/13/95	15	394	QT
9/28/95	44-EC-SW07-01	X						X						10/6/95	10/13/95	15	394	QT
9/28/95	44-EC-SW08-01	X						X						10/6/95	10/13/95	15	394	QT
9/28/95	44-EC-SW01-02	X						X						10/6/95	10/13/95	15	394	QT
9/28/95	44-EC-SW02-02	X						X						10/6/95	10/13/95	15	394	QT
9/28/95	44-EC-SW03-02	X						X						10/6/95	10/13/95	15	394	QT
9/28/95	44-EC-SW04-02	X						X						10/6/95	10/13/95	15	394	QT
9/28/95	44-EC-SW09-01	X						X						10/6/95	10/13/95	15	394	QT
9/28/95	44-SWTB-02	X						X						10/6/95	10/13/95	15	394	QT

OU No. 6, SITE 44
SURFACE WATER
CTO-0303

		Analysis Requested						Analysis Received										
DATE SHIPPED	SAMPLE ID	TCL VOA	TCL SVOA	TCL PEST/PCB	TAL METALS	DISSOLVED METALS	HARDNESS	TCL VOA	TCL SVOA	TCL PEST/PCB	TAL METALS	DISSOLVED METALS	HARDNESS	DATE EXPECTED	DATE REC'D	TURNAROUND TIME	SDG NO.	COMMENTS
COUNT		19	8	8	8	9	8	19	8	8	8	9	7					

OU 1 SITE 44
SEDIMENT
CTO-0303

		Analysis Requested							Analysis Received											
DATE SHIPPED	SAMPLE ID	TCL VOA	TCL SVOA	TCL PEST/PCB	TAL METALS	TOC	GRAIN SIZE	ATTERBERG LIMITS	TCL VOA	TCL SVOA	TCL PEST/PCB	TAL METALS	TOC	GRAIN SIZE	ATTERBERG LIMITS	DATE EXPECTED	DATE REC'D	TURNAROUND TIME	SDG NO.	COMMENTS
5/4/95	**COC#303071**																			
5/4/95	44-EC-SD01-612	X	X	X	X				X	X	X	X				6/9/95	6/9/95	35	637	R
5/4/95	44-EC-SD01-06	X	X	X	X	X	X	X	X	X	X	X	X	X	X	6/9/95	6/9/95	35	637	R
5/4/95	44-EC-SD02-612	X	X	X	X				X	X	X	X				6/9/95	6/9/95	35	637	R
5/4/95	44-EC-SD02-06	X	X	X	X	X	X	X	X	X	X	X	X	X	X	6/9/95	6/9/95	35	637	R
5/4/95	44-SECK-01	X	X	X	X				X	X	X	X				6/9/95	6/9/95	35	702	R; RINSATE
5/5/95	**COC#303072**																			
5/5/95	303-TB-46	X							X							6/10/95	6/9/95	34	702	R; TRIP BLANK
5/5/95	44-EC-SD05-612	X	X	X	X				X	X	X	X				6/10/95	6/9/95	34	637	R
5/5/95	44-EC-SD05-06	X	X	X	X				X	X	X	X				6/10/95	6/9/95	34	637	R
5/5/95	44-UT-SD02-612	X	X	X	X		X	X	X	X	X	X		X	X	6/10/95	6/9/95	34	637	R
5/5/95	44-UT-SD02-06	X	X	X	X				X	X	X	X				6/10/95	6/9/95	34	637	R
5/5/95	44-UT-SD01-612	X	X	X	X	X			X	X	X	X	X			6/10/95	6/9/95	34	637	R
5/5/95	44-UT-SD01-612D	X	X	X	X	X			X	X	X	X	X			6/10/95	6/9/95	34	637	R
5/5/95	44-UT-SD01-06	X	X	X	X	X			X	X	X	X	X			6/10/95	6/9/95	34	637	R
5/5/95	44-UT-SD03-612	X	X	X	X				X	X	X	X				6/10/95	6/9/95	34	637	R
5/5/95	44-UT-SD03-06	X	X	X	X				X	X	X	X				6/10/95	6/9/95	34	637	R
5/5/95	44-EC-SD04-612	X	X	X	X				X	X	X	X				6/10/95	6/9/95	34	637	R
5/5/95	44-EC-SD04-06	X	X	X	X				X	X	X	X				6/10/95	6/9/95	34	637	R
5/5/95	44-EC-SD03-612	X	X	X	X				X	X	X	X				6/10/95	6/9/95	34	724	R
5/5/95	44-EC-SD03-06	X	X	X	X				X	X	X	X				6/10/95	6/9/95	34	637	R
5/5/95	44-EC-SD03-06D	X	X	X	X				X	X	X	X				6/10/95	6/9/95	34	724	R
COUNT		20	19	19	19	5	3	3	20	19	19	19	5	3	3					

OU No. 6, SITE 44
IDW
CTO-0303

		Analysis Requested									Analysis Received												
DATE SHIPPED	SAMPLE ID	TCL VOA	TCL SVOA	TCL PEST/PCB	TAL METALS	FLASH POINT	REACTIVE CYANIDE	REACTIVE SULFIDE	FULL TCLP	RCRA	TCL VOA	TCL SVOA	TCL PEST/PCB	TAL METALS	FLASH POINT	REACTIVE CYANIDE	REACTIVE SULFIDE	FULL TCLP	RCRA	DATE EXPECTED	DATE REC'D	TURNAROUND TIME	SDG NO.	
4/25/95	**COC#303062**																							
4/25/95	44-RB01								X	X								X	X	5/3/95	5/10/95	15	501	QT
4/25/95	44-TNK	X	X	X	X	X	X	X			X	X	X	X	X	X	X			5/3/95	5/30/95	35	500	QT
COUNT		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1					

OU No. 6, SITE 44
BIOASSAY
CTO-0303

DATE SHIPPED	SAMPLE ID	CHRONIC - SW	CHRONIC - SE	DATE EXPECTED	DATE REC'D	TURNAROUND TIME	COMMENTS	COST - SW	COST - SE	TOTAL
5/3/95	SITE 44 SW	X		5/11/95	5/25/95	22	7 DAY FATHEAD MINNOWS			
5/3/95	SITE 44 SW	X		5/11/95	5/25/95	22	7 DAY DAPHNIA			
5/5/95	SITE 44 SE		X	5/16/95	5/25/95	20	10 DAY H. AZTECA			
5/5/95	SITE 44 SE		X	5/16/95	5/25/95	20	10 DAY C. TENTANS			
5/5/95	CONTROL			5/16/95	5/25/95	20	10 DAY H. AZTECA & C. TENTANS			
COUNT		2	2					$1,700.00	$2,000.00	$3,700.00

APPENDIX H
DATA AND FREQUENCY SUMMARIES

SITE 44, JONES STREET DUMP
SURFACE SOIL - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-GW01DW-00	44-GW04-00	44-GW05-00	44-OA-SB01-00	44-OA-SB02-00	44-OA-SB03-00
DATE SAMPLED	03/13/95	03/13/95	03/14/95	03/08/95	03/08/95	03/14/95
DEPTH	0-12"	0-12"	0-12"	0-12"	0-12"	0-12"
UNITS	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
VOLATILES						
CHLOROMETHANE	13 U	12 U	12 U	12 U	12 U	13 U
BROMOMETHANE	13 U	12 U	12 U	12 U	12 U	13 U
VINYL CHLORIDE	13 U	12 U	12 U	12 U	12 U	13 U
CHLOROETHANE	13 U	12 U	12 U	12 U	12 U	13 U
METHYLENE CHLORIDE	13 U	12 U	12 U	12 U	12 U	13 U
ACETONE	13 U	12 U	13 U	12 U	12 U	13 U
CARBON DISULFIDE	13 U	12 U	12 U	12 U	12 U	13 U
1,1-DICHLOROETHENE	13 U	12 U	12 U	12 U	12 U	13 U
1,1-DICHLOROETHANE	13 U	12 U	12 U	12 U	12 U	13 U
1,2-DICHLOROETHENE (TOTAL)	13 U	12 U	12 U	12 U	12 U	13 U
CHLOROFORM	13 U	12 U	12 U	12 U	12 U	13 U
1,2-DICHLOROETHANE	13 U	12 U	12 U	12 U	12 U	13 U
2-BUTANONE	13 U	12 U	12 U	12 U	12 U	13 U
1,1,1-TRICHLOROETHANE	13 U	12 U	12 U	12 U	12 U	13 U
CARBON TETRACHLORIDE	13 U	12 U	12 U	12 U	12 U	13 U
BROMODICHLOROMETHANE	13 U	12 U	12 U	12 U	12 U	13 U
1,2-DICHLOROPROPANE	13 U	12 U	12 U	12 U	12 U	13 U
CIS-1,3-DICHLOROPROPENE	13 U	12 U	12 U	12 U	12 U	13 U
TRICHLOROETHENE	13 U	12 U	12 U	12 U	12 U	13 U
DIBROMOCHLOROMETHANE	13 U	12 U	12 U	12 U	12 U	13 U
1,1,2-TRICHLOROETHANE	13 U	12 U	12 U	12 U	12 U	13 U
BENZENE	13 U	12 U	12 U	12 U	12 U	13 U
TRANS-1,3-DICHLOROPROPENE	13 U	12 U	12 U	12 U	12 U	13 U
BROMOFORM	13 U	12 U	12 U	12 U	12 U	13 U
4-METHYL-2-PENTANONE	13 U	12 U	12 U	12 U	12 U	13 U
2-HEXANONE	13 U	12 U	12 U	12 U	12 U	13 U
TETRACHLOROETHENE	13 U	12 U	12 U	12 U	12 U	13 U
1,1,2,2-TETRACHLOROETHANE	13 U	12 U	12 U	12 U	12 U	13 U
TOLUENE	13 U	12 U	12 U	12 U	12 U	13 U
CHLOROBENZENE	13 U	12 U	12 U	12 U	12 U	13 U
ETHYLBENZENE	13 U	12 U	12 U	12 U	12 U	13 U
STYRENE	13 U	12 U	12 U	12 U	12 U	13 U
XYLENE (TOTAL)	13 U	12 U	12 U	12 U	12 U	13 U

SITE 44, JONES STREET DUMP
SURFACE SOIL - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-GW01DW-00	44-GW04-00	44-GW05-00	44-OA-SB01-00	44-OA-SB02-00	44-OA-SB03-00
DATE SAMPLED	03/13/95	03/13/95	03/14/95	03/08/95	03/08/95	03/14/95
DEPTH	0-12"	0-12"	0-12"	0-12"	0-12"	0-12"
UNITS	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SEMIVOLATILES						
PHENOL	430 U	390 U	400 U	390 U	390 U	430 U
BIS(2-CHLOROETHYL)ETHER	430 U	390 U	400 U	390 U	390 U	430 U
2-CHLOROPHENOL	430 U	390 U	400 U	390 U	390 U	430 U
1,3-DICHLOROBENZENE	430 U	390 U	400 U	390 U	390 U	430 U
1,4-DICHLOROBENZENE	430 U	390 U	400 U	390 U	390 U	430 U
1,2-DICHLOROBENZENE	430 U	390 U	400 U	390 U	390 U	430 U
2-METHYLPHENOL	430 U	390 U	400 U	390 U	390 U	430 U
2,2'-OXYBIS(1-CHLOROPROPANE)	430 U	390 U	400 U	390 U	390 U	430 U
4-METHYLPHENOL	430 U	390 U	400 U	390 U	390 U	430 U
N-NITROSO-DI-N-PROPYLAMINE	430 U	390 U	400 U	390 U	390 U	430 U
HEXACHLOROETHANE	430 U	390 U	400 U	390 U	390 U	430 U
NITROBENZENE	430 U	390 U	400 U	390 U	390 U	430 U
ISOPHORONE	430 U	390 U	400 U	390 U	390 U	430 U
2-NITROPHENOL	430 U	390 U	400 U	390 U	390 U	430 U
2,4-DIMETHYLPHENOL	430 U	390 U	400 U	390 U	390 U	430 U
BIS(2-CHLOROETHOXY)METHANE	430 U	390 U	400 U	390 U	390 U	430 U
2,4-DICHLOROPHENOL	430 U	390 U	400 U	390 U	390 U	430 U
1,2,4-TRICHLOROBENZENE	430 U	390 U	400 U	390 U	390 U	430 U
NAPHTHALENE	430 U	390 U	400 U	390 U	390 U	430 U
4-CHLOROANILINE	430 U	390 U	400 U	390 U	390 U	430 U
HEXACHLOROBUTADIENE	430 U	390 U	400 U	390 U	390 U	430 U
4-CHLORO-3-METHYLPHENOL	430 U	390 U	400 U	390 U	390 U	430 U
2-METHYLNAPHTHALENE	430 U	390 U	400 U	390 U	390 U	430 U
HEXACHLOROCYCLOPENTADIENE	430 U	390 U	400 U	390 U	390 U	430 U
2,4,6-TRICHLOROPHENOL	430 U	390 U	400 U	390 U	390 U	430 U
2,4,5-TRICHLOROPHENOL	1100 U	980 U	990 U	980 U	980 U	1100 U
2-CHLORONAPHTHALENE	430 U	390 U	400 U	390 U	390 U	430 U
2-NITROANILINE	1100 U	980 U	990 U	980 U	980 U	1100 U
DIMETHYLPHTHALATE	430 U	390 U	400 U	390 U	390 U	430 U
ACENAPHTHYLENE	430 U	390 U	400 U	390 U	390 U	430 U
2,6-DINITROTOLUENE	430 U	390 U	400 U	390 U	380 J	430 U
3-NITROANILINE	1100 U	980 U	990 U	980 U	980 U	1100 U
ACENAPHTHENE	430 U	390 U	400 U	390 U	390 U	430 U
2,4-DINITROPHENOL	1100 U	980 U	990 U	980 U	980 U	1100 U

SITE 44, JONES STREET DUMP
SURFACE SOIL - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-GW01DW-00	44-GW04-00	44-GW05-00	44-OA-SB01-00	44-OA-SB02-00	44-OA-SB03-00
DATE SAMPLED	03/13/95	03/13/95	03/14/95	03/08/95	03/08/95	03/14/95
DEPTH	0-12"	0-12"	0-12"	0-12"	0-12"	0-12"
UNITS	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SEMIVOLATILES cont.						
4-NITROPHENOL	1100 U	980 U	990 U	980 U	980 U	1100 U
DIBENZOFURAN	430 U	390 U	400 U	390 U	390 U	430 U
2,4-DINITROTOLUENE	430 U	390 U	400 U	390 U	390 U	430 U
DIETHYLPHTHALATE	430 U	390 U	400 U	390 U	390 U	430 U
4-CHLOROPHENYL-PHENYLETHER	430 U	390 U	400 U	390 U	390 U	430 U
FLUORENE	430 U	390 U	400 U	390 U	390 U	430 U
4-NITROANILINE	1100 U	980 U	990 U	980 U	980 U	1100 U
4,6-DINITRO-2-METHYLPHENOL	1100 U	980 U	990 U	980 U	980 U	1100 U
N-NITROSODIPHENYLAMINE (1)	430 U	390 U	400 U	390 U	390 U	430 U
4-BROMOPHENYL-PHENYLETHER	430 U	390 U	400 U	390 U	390 U	430 U
HEXACHLOROBENZENE	430 U	390 U	400 U	390 U	390 U	430 U
PENTACHLOROPHENOL	1100 U	980 U	990 U	980 U	980 U	1100 U
PHENANTHRENE	430 U	390 U	400 U	390 U	390 U	430 U
ANTHRACENE	430 U	390 U	400 U	390 U	390 U	430 U
CARBAZOLE	430 U	390 U	400 U	390 U	390 U	430 U
DI-N-BUTYLPHTHALATE	430 U	390 U	600 U	390 U	390 U	430 U
FLUORANTHENE	430 U	390 U	400 U	390 U	390 U	430 U
PYRENE	430 U	390 U	400 U	390 U	390 U	430 U
BUTYLBENZYLPHTHALATE	430 U	390 U	400 U	390 U	390 U	430 U
3,3'-DICHLOROBENZIDINE	430 U	390 U	400 U	390 U	390 U	430 U
BENZO(A)ANTHRACENE	430 U	390 U	400 U	390 U	390 U	430 U
CHRYSENE	430 U	390 U	400 U	390 U	390 U	430 U
BIS(2-ETHYLHEXYL)PHTHALATE	430 U	390 U	400 U	390 U	260 J	430 U
DI-N-OCTYL PHTHALATE	430 U	390 U	400 U	390 U	390 U	430 U
BENZO(B)FLUORANTHENE	430 U	390 U	400 U	390 U	390 U	430 U
BENZO(K)FLUORANTHENE	430 U	390 U	400 U	390 U	390 U	430 U
BENZO(A)PYRENE	430 U	390 U	400 U	390 U	390 U	430 U
INDENO(1,2,3-CD)PYRENE	430 U	390 U	400 U	390 U	390 U	430 U
DIBENZO(A,H)ANTHRACENE	430 U	390 U	400 U	390 U	390 U	430 U
BENZO(G,H,I)PERYLENE	430 U	390 U	400 U	390 U	390 U	430 U

SITE 44, JONES STREET DUMP
SURFACE SOIL - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-GW01DW-00	44-GW04-00	44-GW05-00	44-OA-SB01-00	44-OA-SB02-00	44-OA-SB03-00
DATE SAMPLED	03/13/95	03/13/95	03/14/95	03/08/95	03/08/95	03/14/95
DEPTH	0-12"	0-12"	0-12"	0-12"	0-12"	0-12"
UNITS	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
PESTICIDE/PCBS						
ALPHA-BHC	2.2 U	2 UJ	2 U	2 U	2 U	2.2 UJ
BETA-BHC	2.2 UJ	2 UJ	2 U	2 U	2 U	2.2 UJ
DELTA-BHC	2.2 U	2 UJ	2 U	2 U	2 U	2.2 UJ
GAMMA-BHC (LINDANE)	2.2 U	2 UJ	2 U	2 U	2 U	2.2 UJ
HEPTACHLOR	2.2 U	2 UJ	2 U	2 U	2 U	2.2 UJ
ALDRIN	2.2 U	2 UJ	2 U	2 U	2 U	2.2 UJ
HEPTACHLOR EPOXIDE	2.2 U	2 UJ	2 U	2 U	2 U	2.2 UJ
ENDOSULFAN I	2.2 U	2 UJ	2 U	2 U	2 U	2.2 UJ
DIELDRIN	4.3 U	3.9 UJ	4 U	4 U	4 U	4.4 UJ
4,4'-DDE	4.3 U	3.9 UJ	4 U	4 U	4 U	80
ENDRIN	4.3 U	3.9 UJ	4 U	4 U	4 U	4.4 UJ
ENDOSULFAN II	4.3 U	3.9 UJ	4 U	4 U	4 U	4.4 UJ
4,4'-DDD	4.3 U	3.9 UJ	4 U	4 U	4 U	7.4 J
ENDOSULFAN SULFATE	4.3 U	3.9 UJ	4 U	4 U	4 U	4.4 UJ
4,4'-DDT	4.3 U	3.9 UJ	4 U	4 U	4 U	45 J
METHOXYCHLOR	22 U	20 UJ	20 U	20 U	20 U	22 UJ
ENDRIN KETONE	4.3 U	3.9 UJ	4 U	4 U	4 U	4.4 UJ
ENDRIN ALDEHYDE	4.3 U	3.9 UJ	4 U	4 U	4 U	4.4 UJ
ALPHA-CHLORDANE	2.2 U	2 UJ	2 U	2 U	2 U	2.2 UJ
GAMMA-CHLORDANE	2.2 U	2 UJ	2 U	2 U	2 U	2.2 UJ
TOXAPHENE	220 U	200 UJ	200 U	200 U	200 U	220 UJ
AROCLOR-1016	43 U	39 UJ	40 U	NA	NA	44 UJ
AROCLOR-1221	86 U	79 UJ	79 U	NA	NA	87 UJ
AROCLOR-1232	43 U	39 UJ	40 U	NA	NA	44 UJ
AROCLOR-1242	43 U	39 UJ	40 U	NA	NA	44 UJ
AROCLOR-1248	43 U	39 UJ	40 U	NA	NA	44 UJ
AROCLOR-1254	43 U	39 UJ	40 U	NA	NA	44 UJ
AROCLOR-1260	43 U	39 UJ	40 U	NA	NA	44 UJ

SITE 44, JONES STREET DUMP
SURFACE SOIL - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-OA-SB04-00	44-OA-SB05-00	44-OA-SB06-00	44-WA-SB01-00	44-WA-SB02-00	44-WA-SB03-00
DATE SAMPLED	03/14/95	03/14/95	03/14/95	03/13/95	03/13/95	03/13/95
DEPTH	0-12"	0-12"	0-12"	0-12"	0-12"	0-12"
UNITS	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
VOLATILES						
CHLOROMETHANE	13 U	12 U	13 U	12 U	12 U	12 U
BROMOMETHANE	13 U	12 U	13 U	12 U	12 U	12 U
VINYL CHLORIDE	13 U	12 U	13 U	12 U	12 U	12 U
CHLOROETHANE	13 U	12 U	13 U	12 U	12 U	12 U
METHYLENE CHLORIDE	13 U	12 U	13 U	12 U	12 U	12 U
ACETONE	13 U	19 UJ	13 U	12 U	12 U	24 U
CARBON DISULFIDE	13 U	12 U	13 U	12 U	12 U	12 U
1,1-DICHLOROETHENE	13 U	12 U	13 U	12 U	12 U	12 U
1,1-DICHLOROETHANE	13 U	12 U	13 U	12 U	12 U	12 U
1,2-DICHLOROETHENE (TOTAL)	13 U	12 U	13 U	12 U	12 U	12 U
CHLOROFORM	13 U	12 U	13 U	12 U	12 U	12 U
1,2-DICHLOROETHANE	13 U	12 U	13 U	12 U	12 U	12 U
2-BUTANONE	13 U	12 UJ	13 U	12 U	12 U	12 U
1,1,1-TRICHLOROETHANE	13 U	12 U	13 UJ	12 U	12 U	12 U
CARBON TETRACHLORIDE	13 U	12 U	13 UJ	12 U	12 U	12 U
BROMODICHLOROMETHANE	13 U	12 U	13 UJ	12 U	12 U	12 U
1,2-DICHLOROPROPANE	13 U	12 U	13 UJ	12 U	12 U	12 U
CIS-1,3-DICHLOROPROPENE	13 U	12 U	13 UJ	12 U	12 U	12 U
TRICHLOROETHENE	13 U	12 U	13 UJ	12 U	12 U	12 U
DIBROMOCHLOROMETHANE	13 U	12 U	13 UJ	12 U	12 U	12 U
1,1,2-TRICHLOROETHANE	13 U	12 U	13 UJ	12 U	12 U	12 U
BENZENE	13 U	12 U	13 UJ	12 U	12 U	12 U
TRANS-1,3-DICHLOROPROPENE	13 U	12 U	13 UJ	12 U	12 U	12 U
BROMOFORM	13 U	12 U	13 UJ	12 U	12 U	12 U
4-METHYL-2-PENTANONE	13 UJ	12 UJ	13 UJ	12 U	12 U	12 U
2-HEXANONE	13 UJ	12 UJ	13 UJ	12 U	12 U	12 U
TETRACHLOROETHENE	13 UJ	12 U	13 UJ	12 U	12 U	12 U
1,1,2,2-TETRACHLOROETHANE	13 UJ	12 U	13 UJ	12 U	12 U	12 U
TOLUENE	13 UJ	12 U	13 UJ	12 U	12 U	12 U
CHLOROBENZENE	13 UJ	12 U	13 UJ	12 U	12 U	12 U
ETHYLBENZENE	13 UJ	12 U	13 UJ	12 U	12 U	12 U
STYRENE	13 UJ	12 U	13 UJ	12 U	12 U	12 U
XYLENE (TOTAL)	13 UJ	12 U	13 UJ	12 U	12 U	12 U

SITE 44, JONES STREET DUMP
SURFACE SOIL - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-OA-SB04-00	44-OA-SB05-00	44-OA-SB06-00	44-WA-SB01-00	44-WA-SB02-00	44-WA-SB03-00
DATE SAMPLED	03/14/95	03/14/95	03/14/95	03/13/95	03/13/95	03/13/95
DEPTH	0-12"	0-12"	0-12"	0-12"	0-12"	0-12"
UNITS	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SEMIVOLATILES						
PHENOL	420 U	400 U	420 U	390 U	410 U	390 U
BIS(2-CHLOROETHYL)ETHER	420 U	400 U	550 J	390 U	410 U	390 U
2-CHLOROPHENOL	420 U	400 U	420 U	390 U	410 U	390 U
1,3-DICHLOROBENZENE	420 U	400 U	420 U	390 U	410 U	390 U
1,4-DICHLOROBENZENE	420 U	400 U	420 U	390 U	410 U	390 U
1,2-DICHLOROBENZENE	420 U	400 U	420 U	390 U	410 U	390 U
2-METHYLPHENOL	420 U	400 U	420 U	390 U	410 U	390 U
2,2'-OXYBIS(1-CHLOROPROPANE)	420 U	400 U	420 U	390 U	410 U	390 U
4-METHYLPHENOL	420 U	400 U	420 U	390 U	410 U	390 U
N-NITROSO-DI-N-PROPYLAMINE	420 U	400 U	420 U	390 U	410 U	390 U
HEXACHLOROETHANE	420 U	400 U	420 U	390 U	410 U	390 U
NITROBENZENE	420 U	400 U	420 U	390 U	410 U	390 U
ISOPHORONE	420 U	400 U	420 U	390 U	410 U	390 U
2-NITROPHENOL	420 U	400 U	420 U	390 U	410 U	390 U
2,4-DIMETHYLPHENOL	420 U	400 U	420 U	390 U	410 U	390 U
BIS(2-CHLOROETHOXY)METHANE	420 U	400 U	420 U	390 U	410 U	390 U
2,4-DICHLOROPHENOL	420 U	400 U	420 U	390 U	410 U	390 U
1,2,4-TRICHLOROBENZENE	420 U	400 U	420 U	390 U	410 U	390 U
NAPHTHALENE	420 U	400 U	420 U	390 U	410 U	390 U
4-CHLOROANILINE	420 U	400 U	420 U	390 U	410 U	390 U
HEXACHLOROBUTADIENE	420 U	400 U	420 U	390 U	410 U	390 U
4-CHLORO-3-METHYLPHENOL	420 U	400 U	420 U	390 U	410 U	390 U
2-METHYLNAPHTHALENE	420 U	400 U	420 U	390 U	410 U	390 U
HEXACHLOROCYCLOPENTADIENE	420 U	400 U	420 U	390 U	410 U	390 U
2,4,6-TRICHLOROPHENOL	420 U	400 U	420 U	390 U	410 U	390 U
2,4,5-TRICHLOROPHENOL	1000 U	1000 U	1000 U	980 U	1000 U	980 U
2-CHLORONAPHTHALENE	420 U	400 U	420 U	390 U	410 U	390 U
2-NITROANILINE	1000 U	1000 U	1000 U	980 U	1000 U	980 U
DIMETHYLPHTHALATE	420 U	400 U	420 U	390 U	410 U	390 U
ACENAPHTHYLENE	420 U	400 U	420 U	390 U	410 U	390 U
2,6-DINITROTOLUENE	420 U	400 U	420 U	390 U	410 U	390 U
3-NITROANILINE	1000 U	1000 U	1000 U	980 U	1000 U	980 U
ACENAPHTHENE	420 U	400 U	420 U	390 U	410 U	390 U
2,4-DINITROPHENOL	1000 U	1000 U	1000 U	980 U	1000 U	980 U

SITE 44, JONES STREET DUMP
SURFACE SOIL - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-OA-SB04-00	44-OA-SB05-00	44-OA-SB06-00	44-WA-SB01-00	44-WA-SB02-00	44-WA-SB03-00
DATE SAMPLED	03/14/95	03/14/95	03/14/95	03/13/95	03/13/95	03/13/95
DEPTH	0-12"	0-12"	0-12"	0-12"	0-12"	0-12"
UNITS	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SEMIVOLATILES cont.						
4-NITROPHENOL	1000 U	1000 U	1000 U	980 U	1000 U	980 U
DIBENZOFURAN	420 U	400 U	420 U	390 U	410 U	390 U
2,4-DINITROTOLUENE	420 U	400 U	420 U	390 U	410 U	390 U
DIETHYLPHTHALATE	420 U	400 U	420 U	390 U	410 U	390 U
4-CHLOROPHENYL-PHENYLETHER	420 U	400 U	420 U	390 U	410 U	390 U
FLUORENE	420 U	400 U	420 U	390 U	410 U	390 U
4-NITROANILINE	1000 U	1000 U	1000 U	980 U	1000 U	980 U
4,6-DINITRO-2-METHYLPHENOL	1000 U	1000 U	1000 U	980 U	1000 U	980 U
N-NITROSODIPHENYLAMINE (1)	420 U	400 U	420 U	390 U	410 U	390 U
4-BROMOPHENYL-PHENYLETHER	420 U	400 U	420 U	390 U	410 U	390 U
HEXACHLOROBENZENE	420 U	400 U	420 U	390 U	410 U	390 U
PENTACHLOROPHENOL	1000 U	1000 U	1000 U	980 U	1000 U	980 U
PHENANTHRENE	420 U	400 U	420 U	390 U	410 U	390 U
ANTHRACENE	420 U	400 U	420 U	390 U	410 U	390 U
CARBAZOLE	420 U	400 U	420 U	390 U	410 U	390 U
DI-N-BUTYLPHTHALATE	420 U	400 U	420 U	390 U	410 U	350 U
FLUORANTHENE	420 U	400 U	420 U	390 U	410 U	390 U
PYRENE	420 U	400 U	420 U	390 U	410 U	390 U
BUTYLBENZYLPHTHALATE	420 U	400 U	420 U	390 U	410 U	390 U
3,3'-DICHLOROBENZIDINE	420 U	400 U	420 U	390 U	410 U	390 U
BENZO(A)ANTHRACENE	420 U	400 U	420 U	390 U	410 U	390 U
CHRYSENE	420 U	400 U	420 U	390 U	410 U	390 U
BIS(2-ETHYLHEXYL)PHTHALATE	420 U	400 U	420 U	390 U	410 U	390 U
DI-N-OCTYL PHTHALATE	420 U	400 U	420 U	390 U	410 U	390 U
BENZO(B)FLUORANTHENE	420 U	400 U	420 U	390 U	410 U	390 U
BENZO(K)FLUORANTHENE	420 U	400 U	420 U	390 U	410 U	390 U
BENZO(A)PYRENE	420 U	400 U	420 U	390 U	410 U	390 U
INDENO(1,2,3-CD)PYRENE	420 U	220 J	420 U	390 U	410 U	390 U
DIBENZO(A,H)ANTHRACENE	420 U	400 U	420 U	390 U	410 U	390 U
BENZO(G,H,I)PERYLENE	57 J	200 J	420 U	390 U	410 U	390 U

SITE 44, JONES STREET DUMP
SURFACE SOIL - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-OA-SB04-00	44-OA-SB05-00	44-OA-SB06-00	44-WA-SB01-00	44-WA-SB02-00	44-WA-SB03-00
DATE SAMPLED	03/14/95	03/14/95	03/14/95	03/13/95	03/13/95	03/13/95
DEPTH	0-12"	0-12"	0-12"	0-12"	0-12"	0-12"
UNITS	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
PESTICIDE/PCBS						
ALPHA-BHC	2.1 UJ	2 UJ	2.1 UJ	2 UJ	2.1 UJ	2 UJ
BETA-BHC	2.1 UJ	2 UJ	2.1 UJ	2 UJ	2.1 U	2 U
DELTA-BHC	2.1 UJ	2 UJ	2.1 UJ	2 UJ	2.1 U	2 U
GAMMA-BHC (LINDANE)	2.1 UJ	2 UJ	2.1 UJ	2 UJ	2.1 U	2 U
HEPTACHLOR	2.1 UJ	2 UJ	2.1 UJ	2 UJ	2.1 U	2 U
ALDRIN	2.1 UJ	2 UJ	2.1 UJ	2 UJ	2.1 U	2 U
HEPTACHLOR EPOXIDE	2.1 UJ	2 UJ	2.1 UJ	2 UJ	2.1 U	2 U
ENDOSULFAN I	2.1 UJ	2 UJ	2.1 UJ	2 UJ	2.1 U	2 U
DIELDRIN	4.1 UJ	4 UJ	4.2 UJ	3.9 UJ	4.1 U	3.9 U
4,4'-DDE	50 J	140	10 J	3.9 UJ	4.1 U	3.9 U
ENDRIN	4.1 UJ	4 UJ	4.2 UJ	3.9 UJ	4.1 U	3.9 U
ENDOSULFAN II	4.1 UJ	4 UJ	4.2 UJ	3.9 UJ	4.1 U	3.9 U
4,4'-DDD	4.1 UJ	4 UJ	4.2 UJ	3.9 UJ	4.1 U	3.9 U
ENDOSULFAN SULFATE	4.1 UJ	4 UJ	4.2 UJ	3.9 UJ	4.1 U	3.9 U
4,4'-DDT	19 J	25 J	4.6 J	3.9 UJ	4.1 U	3.9 U
METHOXYCHLOR	21 UJ	20 UJ	21 UJ	20 UJ	21 U	20 U
ENDRIN KETONE	4.1 UJ	4 UJ	4.2 UJ	3.9 UJ	4.1 U	3.9 U
ENDRIN ALDEHYDE	4.1 UJ	4 UJ	4.2 UJ	3.9 UJ	4.1 U	3.9 U
ALPHA-CHLORDANE	2.1 UJ	2 UJ	2.1 UJ	2 UJ	2.1 U	2 U
GAMMA-CHLORDANE	2.1 UJ	2 UJ	2.1 UJ	2 UJ	2.1 U	2 U
TOXAPHENE	210 UJ	200 UJ	210 UJ	200 UJ	210 U	200 U
AROCLOR-1016	NA	NA	42 UJ	NA	41 U	39 U
AROCLOR-1221	NA	NA	84 UJ	NA	82 U	79 U
AROCLOR-1232	NA	NA	42 UJ	NA	41 U	39 U
AROCLOR-1242	NA	NA	42 UJ	NA	41 U	39 U
AROCLOR-1248	NA	NA	42 UJ	NA	41 U	39 U
AROCLOR-1254	NA	NA	42 UJ	NA	41 U	39 U
AROCLOR-1260	NA	NA	42 UJ	NA	41 U	39 U

SITE 44, JONES STREET DUMP
SURFACE SOIL - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-WA-SB04-00
DATE SAMPLED	03/13/95
DEPTH	0-12"
UNITS	UG/KG
VOLATILES	
CHLOROMETHANE	12 U
BROMOMETHANE	12 U
VINYL CHLORIDE	12 U
CHLOROETHANE	12 U
METHYLENE CHLORIDE	12 U
ACETONE	13 J
CARBON DISULFIDE	12 U
1,1-DICHLOROETHENE	12 U
1,1-DICHLOROETHANE	12 U
1,2-DICHLOROETHENE (TOTAL)	12 U
CHLOROFORM	12 U
1,2-DICHLOROETHANE	12 U
2-BUTANONE	12 UJ
1,1,1-TRICHLOROETHANE	12 U
CARBON TETRACHLORIDE	12 U
BROMODICHLOROMETHANE	12 U
1,2-DICHLOROPROPANE	12 U
CIS-1,3-DICHLOROPROPENE	12 U
TRICHLOROETHENE	12 U
DIBROMOCHLOROMETHANE	12 U
1,1,2-TRICHLOROETHANE	12 U
BENZENE	12 U
TRANS-1,3-DICHLOROPROPENE	12 U
BROMOFORM	12 U
4-METHYL-2-PENTANONE	12 UJ
2-HEXANONE	12 UJ
TETRACHLOROETHENE	12 U
1,1,2,2-TETRACHLOROETHANE	12 U
TOLUENE	12 U
CHLOROBENZENE	12 U
ETHYLBENZENE	12 U
STYRENE	12 U
XYLENE (TOTAL)	12 U

SITE 44, JONES STREET DUMP
SURFACE SOIL - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-WA-SB04-00
DATE SAMPLED	03/13/95
DEPTH	0-12"
UNITS	UG/KG
SEMIVOLATILES	
PHENOL	400 U
BIS(2-CHLOROETHYL)ETHER	400 U
2-CHLOROPHENOL	400 U
1,3-DICHLOROBENZENE	400 U
1,4-DICHLOROBENZENE	400 U
1,2-DICHLOROBENZENE	400 U
2-METHYLPHENOL	400 U
2,2'-OXYBIS(1-CHLOROPROPANE)	400 U
4-METHYLPHENOL	400 U
N-NITROSO-DI-N-PROPYLAMINE	400 U
HEXACHLOROETHANE	400 U
NITROBENZENE	400 U
ISOPHORONE	400 U
2-NITROPHENOL	400 U
2,4-DIMETHYLPHENOL	400 U
BIS(2-CHLOROETHOXY)METHANE	400 U
2,4-DICHLOROPHENOL	400 U
1,2,4-TRICHLOROBENZENE	400 U
NAPHTHALENE	400 U
4-CHLOROANILINE	400 U
HEXACHLOROBUTADIENE	400 U
4-CHLORO-3-METHYLPHENOL	400 U
2-METHYLNAPHTHALENE	400 U
HEXACHLOROCYCLOPENTADIENE	400 U
2,4,6-TRICHLOROPHENOL	400 U
2,4,5-TRICHLOROPHENOL	1000 U
2-CHLORONAPHTHALENE	400 U
2-NITROANILINE	1000 U
DIMETHYLPHTHALATE	400 U
ACENAPHTHYLENE	400 U
2,6-DINITROTOLUENE	400 U
3-NITROANILINE	1000 U
ACENAPHTHENE	400 U
2,4-DINITROPHENOL	1000 U

SITE 44, JONES STREET DUMP
SURFACE SOIL - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-WA-SB04-00
DATE SAMPLED	03/13/95
DEPTH	0-12"
UNITS	UG/KG
SEMIVOLATILES cont.	
4-NITROPHENOL	1000 U
DIBENZOFURAN	400 U
2,4-DINITROTOLUENE	400 U
DIETHYLPHTHALATE	400 U
4-CHLOROPHENYL-PHENYLETHER	400 U
FLUORENE	400 U
4-NITROANILINE	1000 U
4,6-DINITRO-2-METHYLPHENOL	1000 U
N-NITROSODIPHENYLAMINE (1)	400 U
4-BROMOPHENYL-PHENYLETHER	400 U
HEXACHLOROBENZENE	400 U
PENTACHLOROPHENOL	1000 U
PHENANTHRENE	400 U
ANTHRACENE	400 U
CARBAZOLE	400 U
DI-N-BUTYLPHTHALATE	400 U
FLUORANTHENE	400 U
PYRENE	400 U
BUTYLBENZYLPHTHALATE	400 U
3,3'-DICHLOROBENZIDINE	400 U
BENZO(A)ANTHRACENE	400 U
CHRYSENE	400 U
BIS(2-ETHYLHEXYL)PHTHALATE	400 U
DI-N-OCTYL PHTHALATE	400 U
BENZO(B)FLUORANTHENE	400 U
BENZO(K)FLUORANTHENE	400 U
BENZO(A)PYRENE	400 U
INDENO(1,2,3-CD)PYRENE	400 U
DIBENZO(A,H)ANTHRACENE	400 U
BENZO(G,H,I)PERYLENE	400 U

SITE 44, JONES STREET DUMP
SURFACE SOIL - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-WA-SB04-00
DATE SAMPLED	03/13/95
DEPTH	0-12"
UNITS	UG/KG
PESTICIDE/PCBS	
ALPHA-BHC	2 U
BETA-BHC	2 U
DELTA-BHC	2 U
GAMMA-BHC (LINDANE)	2 U
HEPTACHLOR	2 U
ALDRIN	2 U
HEPTACHLOR EPOXIDE	2 U
ENDOSULFAN I	2 U
DIELDRIN	4 U
4,4'-DDE	4 U
ENDRIN	4 U
ENDOSULFAN II	4 U
4,4'-DDD	4 U
ENDOSULFAN SULFATE	4 U
4,4'-DDT	4 U
METHOXYCHLOR	20 U
ENDRIN KETONE	4 U
ENDRIN ALDEHYDE	4 U
ALPHA-CHLORDANE	2 U
GAMMA-CHLORDANE	2 U
TOXAPHENE	200 U
AROCLOR-1016	NA
AROCLOR-1221	NA
AROCLOR-1232	NA
AROCLOR-1242	NA
AROCLOR-1248	NA
AROCLOR-1254	NA
AROCLOR-1260	NA

SITE 44, JONES STREET DUMP
SURFACE SOIL - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION DATE SAMPLED DEPTH UNITS	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
VOLATILES						
CHLOROMETHANE	12 U	13 U	ND	ND		0/13
BROMOMETHANE	12 U	13 U	ND	ND		0/13
VINYL CHLORIDE	12 U	13 U	ND	ND		0/13
CHLOROETHANE	12 U	13 U	ND	ND		0/13
METHYLENE CHLORIDE	12 U	13 U	ND	ND		0/13
ACETONE	12 U	24 U	13 J	13 J	44-WA-SB04-00	1/13
CARBON DISULFIDE	12 U	13 U	ND	ND		0/13
1,1-DICHLOROETHENE	12 U	13 U	ND	ND		0/13
1,1-DICHLOROETHANE	12 U	13 U	ND	ND		0/13
1,2-DICHLOROETHENE (TOTAL)	12 U	13 U	ND	ND		0/13
CHLOROFORM	12 U	13 U	ND	ND		0/13
1,2-DICHLOROETHANE	12 U	13 U	ND	ND		0/13
2-BUTANONE	12 U	13 U	ND	ND		0/13
1,1,1-TRICHLOROETHANE	12 U	13 U	ND	ND		0/13
CARBON TETRACHLORIDE	12 U	13 U	ND	ND		0/13
BROMODICHLOROMETHANE	12 U	13 U	ND	ND		0/13
1,2-DICHLOROPROPANE	12 U	13 U	ND	ND		0/13
CIS-1,3-DICHLOROPROPENE	12 U	13 U	ND	ND		0/13
TRICHLOROETHENE	12 U	13 U	ND	ND		0/13
DIBROMOCHLOROMETHANE	12 U	13 U	ND	ND		0/13
1,1,2-TRICHLOROETHANE	12 U	13 U	ND	ND		0/13
BENZENE	12 U	13 U	ND	ND		0/13
TRANS-1,3-DICHLOROPROPENE	12 U	13 U	ND	ND		0/13
BROMOFORM	12 U	13 U	ND	ND		0/13
4-METHYL-2-PENTANONE	12 U	13 U	ND	ND		0/13
2-HEXANONE	12 U	13 U	ND	ND		0/13
TETRACHLOROETHENE	12 U	13 U	ND	ND		0/13
1,1,2,2-TETRACHLOROETHANE	12 U	13 U	ND	ND		0/13
TOLUENE	12 U	13 U	ND	ND		0/13
CHLOROBENZENE	12 U	13 U	ND	ND		0/13
ETHYLBENZENE	12 U	13 U	ND	ND		0/13
STYRENE	12 U	13 U	ND	ND		0/13
XYLENE (TOTAL)	12 U	13 U	ND	ND		0/13

SITE 44, JONES STREET DUMP
SURFACE SOIL - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION DATE SAMPLED DEPTH UNITS	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
SEMIVOLATILES						
PHENOL	390 U	430 U	ND	ND		0/13
BIS(2-CHLOROETHYL)ETHER	390 U	430 U	550 J	550 J	44-OA-SB06-00	1/13
2-CHLOROPHENOL	390 U	430 U	ND	ND		0/13
1,3-DICHLOROBENZENE	390 U	430 U	ND	ND		0/13
1,4-DICHLOROBENZENE	390 U	430 U	ND	ND		0/13
1,2-DICHLOROBENZENE	390 U	430 U	ND	ND		0/13
2-METHYLPHENOL	390 U	430 U	ND	ND		0/13
2,2'-OXYBIS(1-CHLOROPROPANE)	390 U	430 U	ND	ND		0/13
4-METHYLPHENOL	390 U	430 U	ND	ND		0/13
N-NITROSO-DI-N-PROPYLAMINE	390 U	430 U	ND	ND		0/13
HEXACHLOROETHANE	390 U	430 U	ND	ND		0/13
NITROBENZENE	390 U	430 U	ND	ND		0/13
ISOPHORONE	390 U	430 U	ND	ND		0/13
2-NITROPHENOL	390 U	430 U	ND	ND		0/13
2,4-DIMETHYLPHENOL	390 U	430 U	ND	ND		0/13
BIS(2-CHLOROETHOXY)METHANE	390 U	430 U	ND	ND		0/13
2,4-DICHLOROPHENOL	390 U	430 U	ND	ND		0/13
1,2,4-TRICHLOROBENZENE	390 U	430 U	ND	ND		0/13
NAPHTHALENE	390 U	430 U	ND	ND		0/13
4-CHLOROANILINE	390 U	430 U	ND	ND		0/13
HEXACHLOROBUTADIENE	390 U	430 U	ND	ND		0/13
4-CHLORO-3-METHYLPHENOL	390 U	430 U	ND	ND		0/13
2-METHYLNAPHTHALENE	390 U	430 U	ND	ND		0/13
HEXACHLOROCYCLOPENTADIENE	390 U	430 U	ND	ND		0/13
2,4,6-TRICHLOROPHENOL	390 U	430 U	ND	ND		0/13
2,4,5-TRICHLOROPHENOL	980 U	1100 U	ND	ND		0/13
2-CHLORONAPHTHALENE	390 U	430 U	ND	ND		0/13
2-NITROANILINE	980 U	1100 U	ND	ND		0/13
DIMETHYLPHTHALATE	390 U	430 U	ND	ND		0/13
ACENAPHTHYLENE	390 U	430 U	ND	ND		0/13
2,6-DINITROTOLUENE	390 U	430 U	380 J	380 J	44-OA-SB02-00	1/13
3-NITROANILINE	980 U	1100 U	ND	ND		0/13
ACENAPHTHENE	390 U	430 U	ND	ND		0/13
2,4-DINITROPHENOL	980 U	1100 U	ND	ND		0/13

SITE 44, JONES STREET DUMP
SURFACE SOIL - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION DATE SAMPLED DEPTH UNITS	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
SEMIVOLATILES cont.						
4-NITROPHENOL	980 U	1100 U	ND	ND		0/13
DIBENZOFURAN	390 U	430 U	ND	ND		0/13
2,4-DINITROTOLUENE	390 U	430 U	ND	ND		0/13
DIETHYLPHTHALATE	390 U	430 U	ND	ND		0/13
4-CHLOROPHENYL-PHENYLETHER	390 U	430 U	ND	ND		0/13
FLUORENE	390 U	430 U	ND	ND		0/13
4-NITROANILINE	980 U	1100 U	ND	ND		0/13
4,6-DINITRO-2-METHYLPHENOL	980 U	1100 U	ND	ND		0/13
N-NITROSODIPHENYLAMINE (1)	390 U	430 U	ND	ND		0/13
4-BROMOPHENYL-PHENYLETHER	390 U	430 U	ND	ND		0/13
HEXACHLOROBENZENE	390 U	430 U	ND	ND		0/13
PENTACHLOROPHENOL	980 U	1100 U	ND	ND		0/13
PHENANTHRENE	390 U	430 U	ND	ND		0/13
ANTHRACENE	390 U	430 U	ND	ND		0/13
CARBAZOLE	390 U	430 U	ND	ND		0/13
DI-N-BUTYLPHTHALATE	350 U	600 U	ND	ND		0/13
FLUORANTHENE	390 U	430 U	ND	ND		0/13
PYRENE	390 U	430 U	ND	ND		0/13
BUTYLBENZYLPHTHALATE	390 U	430 U	ND	ND		0/13
3,3'-DICHLOROBENZIDINE	390 U	430 U	ND	ND		0/13
BENZO(A)ANTHRACENE	390 U	430 U	ND	ND		0/13
CHRYSENE	390 U	430 U	ND	ND		0/13
BIS(2-ETHYLHEXYL)PHTHALATE	390 U	430 U	260 J	260 J	44-OA-SB02-00	1/13
DI-N-OCTYL PHTHALATE	390 U	430 U	ND	ND		0/13
BENZO(B)FLUORANTHENE	390 U	430 U	ND	ND		0/13
BENZO(K)FLUORANTHENE	390 U	430 U	ND	ND		0/13
BENZO(A)PYRENE	390 U	430 U	ND	ND		0/13
INDENO(1,2,3-CD)PYRENE	390 U	430 U	220 J	220 J	44-OA-SB05-00	1/13
DIBENZO(A,H)ANTHRACENE	390 U	430 U	ND	ND		0/13
BENZO(G,H,I)PERYLENE	390 U	430 U	57 J	200 J	44-OA-SB05-00	2/13

SITE 44, JONES STREET DUMP
SURFACE SOIL - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION DATE SAMPLED DEPTH UNITS	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
PESTICIDE/PCBS						
ALPHA-BHC	2 UJ	2.2 U	ND	ND		0/13
BETA-BHC	2 UJ	2.2 UJ	ND	ND		0/13
DELTA-BHC	2 UJ	2.2 U	ND	ND		0/13
GAMMA-BHC (LINDANE)	2 UJ	2.2 U	ND	ND		0/13
HEPTACHLOR	2 UJ	2.2 U	ND	ND		0/13
ALDRIN	2 UJ	2.2 U	ND	ND		0/13
HEPTACHLOR EPOXIDE	2 UJ	2.2 U	ND	ND		0/13
ENDOSULFAN I	2 UJ	2.2 U	ND	ND		0/13
DIELDRIN	3.9 UJ	4.4 UJ	ND	ND		0/13
4,4'-DDE	3.9 UJ	4.3 U	10 J	140	44-OA-SB05-00	4/13
ENDRIN	3.9 UJ	4.4 UJ	ND	ND		0/13
ENDOSULFAN II	3.9 UJ	4.4 UJ	ND	ND		0/13
4,4'-DDD	3.9 UJ	4.3 U	7.4 J	7.4 J	44-OA-SB03-00	1/13
ENDOSULFAN SULFATE	3.9 UJ	4.4 UJ	ND	ND		0/13
4,4'-DDT	3.9 UJ	4.3 U	4.6 J	45 J	44-OA-SB03-00	4/13
METHOXYCHLOR	20 UJ	22 U	ND	ND		0/13
ENDRIN KETONE	3.9 UJ	4.4 UJ	ND	ND		0/13
ENDRIN ALDEHYDE	3.9 UJ	4.4 UJ	ND	ND		0/13
ALPHA-CHLORDANE	2 UJ	2.2 U	ND	ND		0/13
GAMMA-CHLORDANE	2 UJ	2.2 U	ND	ND		0/13
TOXAPHENE	200 UJ	220 U	ND	ND		0/13
AROCLOR-1016	39 UJ	44 UJ	ND	ND		0/7
AROCLOR-1221	79 UJ	87 UJ	ND	ND		0/7
AROCLOR-1232	39 UJ	44 UJ	ND	ND		0/7
AROCLOR-1242	39 UJ	44 UJ	ND	ND		0/7
AROCLOR-1248	39 UJ	44 UJ	ND	ND		0/7
AROCLOR-1254	39 UJ	44 UJ	ND	ND		0/7
AROCLOR-1260	39 UJ	44 UJ	ND	ND		0/7

SITE 44, JONES STREET DUMP
SURFACE SOIL - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
INORGANIC ANALYTES

LOCATION	44-GW01DW-00	44-GW04-00	44-GW05-00	44-OA-SB01-00	44-OA-SB02-00	44-OA-SB03-00
DATE SAMPLED	03/13/95	03/13/95	03/14/95	03/08/95	03/08/95	03/14/95
DEPTH	0-12"	0-12"	0-12"	0-12"	0-12"	0-12"
UNITS	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG
TOTAL METALS						
ALUMINUM, TOTAL	10100	11300	14100	11800	3520	4780
ANTIMONY, TOTAL	2.8 UJ	2.6 UJ	4.7 R	2.3 UJ	2.2 UJ	5.2 UJ
ARSENIC, TOTAL	2.1 J	4.6 J	1.4 J	3.4	0.84	1.9 J
BARIUM, TOTAL	21.7	18.7	18.1	19.9	8.3	26.2
BERYLLIUM, TOTAL	0.077 U	0.072 U	0.21 U	0.084 U	0.13 U	0.22 U
CADMIUM, TOTAL	0.74 U	0.7 U	0.64 U	0.61 U	0.59 U	0.7 U
CALCIUM, TOTAL	2390	1390	111	5800 J	343 J	2360
CHROMIUM, TOTAL	13.2	14.5	16.4	16.4	4.4 U	6.7
COBALT, TOTAL	0.59 U	0.61	1.2	1.3	0.62 U	1 U
COPPER, TOTAL	2.6	2.3	1.1	3	0.81 U	910
IRON, TOTAL	15400	12000	13100	11300 J	2430 J	4590
LEAD, TOTAL	10.7	13.9	8.5	10.3 U	5.7 U	31.7 J
MAGNESIUM, TOTAL	343	399	401	546	115	230
MANGANESE, TOTAL	6.2	9	6.9	8.7	8.2	44.2
MERCURY, TOTAL	0.097 U	0.1 U	0.08 U	0.11 U	0.1 U	0.09 U
NICKEL, TOTAL	1.3	1.6	2.5 U	1.9	1.3	2.8
POTASSIUM, TOTAL	227	293	292	339	109	187
SELENIUM, TOTAL	0.52 UJ	0.55 UJ	0.72	0.41	0.28 U	0.43 U
SILVER, TOTAL	0.64 U	0.6 U	0.69 UJ	0.53 U	0.51 U	0.75 U
SODIUM, TOTAL	32.4	17.2	34.6	44.5	7.3 U	22.7
THALLIUM, TOTAL	0.29 U	0.26 U	0.16 U	0.16 U	0.13 U	0.26 U
VANADIUM, TOTAL	23.3	28.6	27	24.3	7	11.1
ZINC, TOTAL	3.5	4.3	4.5	5.2	2.8	156

SITE 44, JONES STREET DUMP
SURFACE SOIL - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
INORGANIC ANALYTES

LOCATION	44-OA-SB04-00	44-OA-SB05-00	44-OA-SB06-00	44-WA-SB01-00	44-WA-SB02-00	44-WA-SB03-00
DATE SAMPLED	03/14/95	03/14/95	03/14/95	03/13/95	03/13/95	03/13/95
DEPTH	0-12"	0-12"	0-12"	0-12"	0-12"	0-12"
UNITS	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG
TOTAL METALS						
ALUMINUM, TOTAL	5900	7990	5470	6610	8740	7110
ANTIMONY, TOTAL	2.3 UJ	2.6 UJ	4.7 UJ	1.8 UJ	3.6 UJ	4.8 UJ
ARSENIC, TOTAL	2.6	1.4	0.79 J	2 J	4.9 J	1.7 J
BARIUM, TOTAL	15.7	20.9	11.7	12.7	20.5	14
BERYLLIUM, TOTAL	0.17 U	0.51 U	0.21 U	0.049 U	0.15 U	0.21 U
CADMIUM, TOTAL	0.62 U	0.7 U	0.64 U	0.47 U	0.48 U	0.64 U
CALCIUM, TOTAL	245	2160	163	1550	2150	5130
CHROMIUM, TOTAL	8.7	10.8	4.2	8.8	12.3	10
COBALT, TOTAL	0.49 U	0.71	0.69 U	0.38 U	0.55 U	0.69 U
COPPER, TOTAL	2.8	2.3	0.86	1.9	1.2	1
IRON, TOTAL	5420	9060	2660	7410	10500	7300
LEAD, TOTAL	14.9	8.3	12.5 J	5.9	13.6 J	7.2 J
MAGNESIUM, TOTAL	215	289	143	212	297	317
MANGANESE, TOTAL	5.1	31	6	4.9	5.3	8.1
MERCURY, TOTAL	0.1 U	0.12 U	0.11 U	0.1 U	0.11 U	0.1 U
NICKEL, TOTAL	1.3	1.4	2.5 U	0.97	1.9	2.5 U
POTASSIUM, TOTAL	286	258	156 U	170	197	208
SELENIUM, TOTAL	0.3 U	0.43	0.44 U	0.42 UJ	0.31 U	0.31 J
SILVER, TOTAL	0.54 U	0.61 U	0.69 U	0.41 U	0.51 U	0.69 U
SODIUM, TOTAL	15 U	24.2 U	16.6	17.6 U	31.3	48.3
THALLIUM, TOTAL	0.22 U	0.24 U	0.27 U	0.23 U	0.19 U	0.18 U
VANADIUM, TOTAL	14.9	16.4	9.7	15.5	20.9	14.6
ZINC, TOTAL	7.4	22.4	4.5	2.7	3.7	2.8

SITE 44, JONES STREET DUMP
SURFACE SOIL - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
INORGANIC ANALYTES

LOCATION	44-WA-SB04-00	
DATE SAMPLED	03/13/95	
DEPTH	0-12"	
UNITS	MG/KG	
TOTAL METALS		
ALUMINUM, TOTAL	13100	
ANTIMONY, TOTAL	2.1	UJ
ARSENIC, TOTAL	2.9	
BARIUM, TOTAL	20.4	
BERYLLIUM, TOTAL	0.14	U
CADMIUM, TOTAL	0.57	U
CALCIUM, TOTAL	2620	
CHROMIUM, TOTAL	15.5	
COBALT, TOTAL	0.57	
COPPER, TOTAL	2.1	
IRON, TOTAL	9670	
LEAD, TOTAL	12.5	
MAGNESIUM, TOTAL	482	
MANGANESE, TOTAL	6.4	
MERCURY, TOTAL	0.08	U
NICKEL, TOTAL	2.1	
POTASSIUM, TOTAL	315	
SELENIUM, TOTAL	0.33	
SILVER, TOTAL	0.49	U
SODIUM, TOTAL	57.1	
THALLIUM, TOTAL	0.23	U
VANADIUM, TOTAL	25.5	
ZINC, TOTAL	4.4	

SITE 44, JONES STREET DUMP
SURFACE SOIL - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
INORGANIC ANALYTES

LOCATION DATE SAMPLED DEPTH UNITS	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
TOTAL METALS						
ALUMINUM, TOTAL	NA	NA	3520	14100	44-GW05-00	13/13
ANTIMONY, TOTAL	1.8 UJ	5.2 UJ	ND	ND		0/12
ARSENIC, TOTAL	NA	NA	0.79 J	4.9 J	44-WA-SB02-00	13/13
BARIUM, TOTAL	NA	NA	8.3	26.2	44-OA-SB03-00	13/13
BERYLLIUM, TOTAL	0.049 U	0.51 U	ND	ND		0/13
CADMIUM, TOTAL	0.47 U	0.74 U	ND	ND		0/13
CALCIUM, TOTAL	NA	NA	111	5800 J	44-OA-SB01-00	13/13
CHROMIUM, TOTAL	4.4 U	4.4 U	4.2	16.4	44-OA-SB01-00	12/13
COBALT, TOTAL	0.38 U	1 U	0.57	1.3	44-OA-SB01-00	5/13
COPPER, TOTAL	0.81 U	0.81 U	0.86	910	44-OA-SB03-00	12/13
IRON, TOTAL	NA	NA	2430 J	15400	44-GW01DW-00	13/13
LEAD, TOTAL	5.7 U	10.3 U	5.9	31.7 J	44-OA-SB03-00	11/13
MAGNESIUM, TOTAL	NA	NA	115	546	44-OA-SB01-00	13/13
MANGANESE, TOTAL	NA	NA	4.9	44.2	44-OA-SB03-00	13/13
MERCURY, TOTAL	0.08 U	0.12 U	ND	ND		0/13
NICKEL, TOTAL	2.5 U	2.5 U	0.97	2.8	44-OA-SB03-00	10/13
POTASSIUM, TOTAL	156 U	156 U	109	339	44-OA-SB01-00	12/13
SELENIUM, TOTAL	0.28 U	0.55 UJ	0.31 J	0.72	44-GW05-00	5/13
SILVER, TOTAL	0.41 U	0.75 U	ND	ND		0/13
SODIUM, TOTAL	7.3 U	24.2 U	16.6	57.1	44-WA-SB04-00	9/13
THALLIUM, TOTAL	0.13 U	0.29 U	ND	ND		0/13
VANADIUM, TOTAL	NA	NA	7	28.6	44-GW04-00	13/13
ZINC, TOTAL	NA	NA	2.7	156	44-OA-SB03-00	13/13

SITE 44, JONES STREET DUMP
SUBSURFACE SOIL - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-GW01DW-03	44-GW04-04	44-GW05-03	44-OA-SB01-04	44-OA-SB02-03	44-OA-SB03-01
DATE SAMPLED	03/13/95	03/13/95	03/14/95	03/08/95	03/08/95	03/14/95
DEPTH	5-7'	7-9'	5-7'	7-9'	5-7'	1-3'
UNITS	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
VOLATILES						
CHLOROMETHANE	13 U	12 U	11 U	12 U	12 U	11 U
BROMOMETHANE	13 U	12 U	11 U	12 U	12 U	11 U
VINYL CHLORIDE	13 U	12 U	11 U	12 U	12 U	11 U
CHLOROETHANE	13 U	12 U	11 U	12 U	12 U	11 U
METHYLENE CHLORIDE	13 U	12 U	11 U	12 U	12 U	11 U
ACETONE	72 U	12 U	13 UJ	61	12 U	11 U
CARBON DISULFIDE	13 U	12 U	11 U	12 U	12 U	11 U
1,1-DICHLOROETHENE	13 U	12 U	11 U	12 U	12 U	11 U
1,1-DICHLOROETHANE	13 U	12 U	11 U	12 U	12 U	11 U
1,2-DICHLOROETHENE (TOTAL)	13 U	12 U	11 U	12 U	12 U	11 U
CHLOROFORM	13 U	12 U	11 U	12 U	12 U	11 U
1,2-DICHLOROETHANE	13 U	12 U	11 U	12 U	12 U	11 U
2-BUTANONE	13 U	12 U	11 UJ	12 U	12 U	11 U
1,1,1-TRICHLOROETHANE	13 U	12 U	11 U	12 U	12 U	11 U
CARBON TETRACHLORIDE	13 U	12 U	11 U	12 U	12 U	11 U
BROMODICHLOROMETHANE	13 U	12 U	11 U	12 U	12 U	11 U
1,2-DICHLOROPROPANE	13 U	12 U	11 U	12 U	12 U	11 U
CIS-1,3-DICHLOROPROPENE	13 U	12 U	11 U	12 U	12 U	11 U
TRICHLOROETHENE	13 U	12 U	11 U	12 U	12 U	11 U
DIBROMOCHLOROMETHANE	13 U	12 U	11 U	12 U	12 U	11 U
1,1,2-TRICHLOROETHANE	13 U	12 U	11 U	12 U	12 U	11 U
BENZENE	13 U	12 U	11 U	12 U	12 U	11 U
TRANS-1,3-DICHLOROPROPENE	13 U	12 U	11 U	12 U	12 U	11 U
BROMOFORM	13 U	12 U	11 U	12 U	12 U	11 U
4-METHYL-2-PENTANONE	13 U	12 U	11 UJ	12 U	12 U	11 U
2-HEXANONE	13 U	12 U	11 UJ	12 U	12 U	11 U
TETRACHLOROETHENE	13 U	12 U	11 U	12 U	12 U	11 U
1,1,2,2-TETRACHLOROETHANE	13 U	12 U	11 U	12 U	12 U	11 U
TOLUENE	13 U	12 U	11 U	12 U	12 U	11 U
CHLOROBENZENE	13 U	12 U	11 U	12 U	12 U	11 U
ETHYLBENZENE	13 U	12 U	11 U	12 U	12 U	11 U
STYRENE	13 U	12 U	11 U	12 U	12 U	11 U
XYLENE (TOTAL)	13 U	12 U	11 U	12 U	12 U	11 U

SITE 44, JONES STREET DUMP
SUBSURFACE SOIL - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-GW01DW-03	44-GW04-04	44-GW05-03	44-OA-SB01-04	44-OA-SB02-03	44-OA-SB03-01
DATE SAMPLED	03/13/95	03/13/95	03/14/95	03/08/95	03/08/95	03/14/95
DEPTH	5-7'	7-9'	5-7'	7-9'	5-7'	1-3'
UNITS	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SEMIVOLATILES						
PHENOL	430 U	390 U	380 U	410 U	390 U	380 U
BIS(2-CHLOROETHYL)ETHER	430 U	390 U	380 U	410 U	390 U	380 U
2-CHLOROPHENOL	430 U	390 U	380 U	410 U	390 U	380 U
1,3-DICHLOROBENZENE	430 U	390 U	380 U	410 U	390 U	380 U
1,4-DICHLOROBENZENE	430 U	390 U	380 U	410 U	390 U	380 U
1,2-DICHLOROBENZENE	430 U	390 U	380 U	410 U	390 U	380 U
2-METHYLPHENOL	430 U	390 U	380 U	410 U	390 U	380 U
2,2'-OXYBIS(1-CHLOROPROPANE)	430 U	390 U	380 U	410 U	390 U	380 U
4-METHYLPHENOL	430 U	390 U	380 U	410 U	390 U	380 U
N-NITROSO-DI-N-PROPYLAMINE	430 U	390 U	380 U	410 U	390 U	380 U
HEXACHLOROETHANE	430 U	390 U	380 U	410 U	390 U	380 U
NITROBENZENE	430 U	390 U	380 U	410 U	390 U	380 U
ISOPHORONE	430 U	390 U	380 U	410 U	390 U	380 U
2-NITROPHENOL	430 U	390 U	380 U	410 U	390 U	380 U
2,4-DIMETHYLPHENOL	430 U	390 U	380 U	410 U	390 U	380 U
BIS(2-CHLOROETHOXY)METHANE	430 U	390 U	380 U	410 U	390 U	380 U
2,4-DICHLOROPHENOL	430 U	390 U	380 U	410 U	390 U	380 U
1,2,4-TRICHLOROBENZENE	430 U	390 U	380 U	410 U	390 U	380 U
NAPHTHALENE	430 U	390 U	380 U	410 U	390 U	380 U
4-CHLOROANILINE	430 U	390 U	380 U	410 U	390 U	380 U
HEXACHLOROBUTADIENE	430 U	390 U	380 U	410 U	390 U	380 U
4-CHLORO-3-METHYLPHENOL	430 U	390 U	380 U	410 U	390 U	380 U
2-METHYLNAPHTHALENE	430 U	390 U	380 U	410 U	390 U	380 U
HEXACHLOROCYCLOPENTADIENE	430 U	390 U	380 U	410 U	390 U	380 U
2,4,6-TRICHLOROPHENOL	430 U	390 U	380 U	410 U	390 U	380 U
2,4,5-TRICHLOROPHENOL	1100 U	980 U	940 U	1000 U	980 U	940 U
2-CHLORONAPHTHALENE	430 U	390 U	380 U	410 U	390 U	380 U
2-NITROANILINE	1100 U	980 U	940 U	1000 U	980 U	940 U
DIMETHYLPHTHALATE	430 U	390 U	380 U	410 U	390 U	380 U
ACENAPHTHYLENE	430 U	390 U	380 U	410 U	390 U	380 U
2,6-DINITROTOLUENE	430 U	390 U	380 U	410 U	390 U	380 U
3-NITROANILINE	1100 U	980 U	940 U	1000 U	980 U	940 U
ACENAPHTHENE	430 U	390 U	380 U	410 U	390 U	380 U
2,4-DINITROPHENOL	1100 U	980 U	940 U	1000 U	980 U	940 U

SITE 44, JONES STREET DUMP
SUBSURFACE SOIL - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-GW01DW-03	44-GW04-04	44-GW05-03	44-OA-SB01-04	44-OA-SB02-03	44-OA-SB03-01
DATE SAMPLED	03/13/95	03/13/95	03/14/95	03/08/95	03/08/95	03/14/95
DEPTH	5-7'	7-9'	5-7'	7-9'	5-7'	1-3'
UNITS	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SEMIVOLATILES cont.						
4-NITROPHENOL	1100 U	980 U	940 U	1000 U	980 U	940 U
DIBENZOFURAN	430 U	390 U	380 U	410 U	390 U	380 U
2,4-DINITROTOLUENE	430 U	390 U	380 U	410 U	390 U	380 U
DIETHYLPHTHALATE	430 U	390 U	380 U	410 U	390 U	380 U
4-CHLOROPHENYL-PHENYLETHER	430 U	390 U	380 U	410 U	390 U	380 U
FLUORENE	430 U	390 U	380 U	410 U	390 U	380 U
4-NITROANILINE	1100 U	980 U	940 U	1000 U	980 U	940 U
4,6-DINITRO-2-METHYLPHENOL	1100 U	980 U	940 U	1000 U	980 U	940 U
N-NITROSODIPHENYLAMINE (1)	430 U	390 U	380 U	410 U	390 U	380 U
4-BROMOPHENYL-PHENYLETHER	430 U	390 U	380 U	410 U	390 U	380 U
HEXACHLOROBENZENE	430 U	390 U	380 U	410 U	390 U	380 U
PENTACHLOROPHENOL	1100 U	980 U	940 U	1000 U	980 U	940 U
PHENANTHRENE	430 U	390 U	380 U	410 U	390 U	380 U
ANTHRACENE	430 U	390 U	380 U	410 U	390 U	380 U
CARBAZOLE	430 U	390 U	380 U	410 U	390 U	380 U
DI-N-BUTYLPHTHALATE	430 U	390 U	380 U	410 U	390 U	380 U
FLUORANTHENE	430 U	390 U	380 U	410 U	390 U	380 U
PYRENE	430 U	390 U	380 U	410 U	390 U	380 U
BUTYLBENZYLPHTHALATE	430 U	390 U	380 U	410 U	390 U	380 U
3,3'-DICHLOROBENZIDINE	430 U	390 U	380 U	410 U	390 U	380 U
BENZO(A)ANTHRACENE	430 U	390 U	380 U	410 U	390 U	380 U
CHRYSENE	430 U	390 U	380 U	410 U	390 U	380 U
BIS(2-ETHYLHEXYL)PHTHALATE	430 U	390 U	380 U	410 U	83 J	380 U
DI-N-OCTYL PHTHALATE	430 U	390 U	380 U	410 U	390 U	380 U
BENZO(B)FLUORANTHENE	430 U	390 U	380 U	410 U	390 U	380 U
BENZO(K)FLUORANTHENE	430 U	390 U	380 U	410 U	390 U	380 U
BENZO(A)PYRENE	430 U	390 U	380 U	410 U	390 U	380 U
INDENO(1,2,3-CD)PYRENE	430 U	390 U	55 J	410 U	390 U	380 U
DIBENZO(A,H)ANTHRACENE	430 U	390 U	380 U	410 U	390 U	380 U
BENZO(G,H,I)PERYLENE	430 U	390 U	62 J	410 U	390 U	380 U

SITE 44, JONES STREET DUMP
SUBSURFACE SOIL - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-GW01DW-03	44-GW04-04	44-GW05-03	44-OA-SB01-04	44-OA-SB02-03	44-OA-SB03-01
DATE SAMPLED	03/13/95	03/13/95	03/14/95	03/08/95	03/08/95	03/14/95
DEPTH	5-7'	7-9'	5-7'	7-9'	5-7'	1-3'
UNITS	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
PESTICIDE/PCBS						
ALPHA-BHC	2.2 U	2 UJ	1.9 UJ	2 U	1.9 U	1.8 UJ
BETA-BHC	2.2 UJ	2 UJ	1.9 UJ	2 U	1.9 U	1.8 UJ
DELTA-BHC	2.2 U	2 UJ	1.9 UJ	2 U	1.9 U	1.8 UJ
GAMMA-BHC (LINDANE)	2.2 U	2 UJ	1.9 UJ	2 U	1.9 U	1.8 UJ
HEPTACHLOR	2.2 U	2 UJ	1.9 UJ	2 U	1.9 U	1.8 UJ
ALDRIN	2.2 U	2 UJ	1.9 UJ	2 U	1.9 U	1.8 UJ
HEPTACHLOR EPOXIDE	2.2 U	2 UJ	1.9 UJ	2 U	1.9 U	1.8 UJ
ENDOSULFAN I	2.2 U	2 UJ	1.9 UJ	2 U	1.9 U	1.8 UJ
DIELDRIN	4.4 U	3.9 UJ	3.7 UJ	4 U	3.9 U	3.7 UJ
4,4'-DDE	370 J	3.9 UJ	3.7 UJ	4	3.9 U	3.7 UJ
ENDRIN	4.4 U	3.9 UJ	3.7 UJ	4 U	3.9 U	3.7 UJ
ENDOSULFAN II	4.4 U	3.9 UJ	3.7 UJ	4 U	3.9 U	3.7 UJ
4,4'-DDD	2500	3.9 UJ	3.7 UJ	5.6	3.9 U	3.7 UJ
ENDOSULFAN SULFATE	4.4 U	3.9 UJ	3.7 UJ	4 U	3.9 U	3.7 UJ
4,4'-DDT	150 J	3.9 UJ	3.7 UJ	4 U	3.9 U	3.7 UJ
METHOXYCHLOR	22 U	20 UJ	19 UJ	20 U	19 U	18 UJ
ENDRIN KETONE	4.4 U	3.9 UJ	3.7 UJ	4 U	3.9 U	3.7 UJ
ENDRIN ALDEHYDE	4.4 U	3.9 UJ	3.7 UJ	4 U	3.9 U	3.7 UJ
ALPHA-CHLORDANE	2.2 U	2 UJ	1.9 UJ	2 U	1.9 U	1.8 UJ
GAMMA-CHLORDANE	2.2 U	2 UJ	1.9 UJ	2 U	1.9 U	1.8 UJ
TOXAPHENE	220 U	200 UJ	190 UJ	200 U	190 U	180 UJ
AROCLOR-1016	44 U	39 UJ	37 UJ	NA	NA	37 UJ
AROCLOR-1221	87 U	79 UJ	75 UJ	NA	NA	74 UJ
AROCLOR-1232	44 U	39 UJ	37 UJ	NA	NA	37 UJ
AROCLOR-1242	44 U	39 UJ	37 UJ	NA	NA	37 UJ
AROCLOR-1248	44 U	39 UJ	37 UJ	NA	NA	37 UJ
AROCLOR-1254	44 U	39 UJ	37 UJ	NA	NA	37 UJ
AROCLOR-1260	44 U	39 UJ	37 UJ	NA	NA	37 UJ

SITE 44, JONES STREET DUMP
SUBSURFACE SOIL - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-OA-SB04-02	44-OA-SB05-02	44-OA-SB06-02	44-WA-SB01-03	44-WA-SB02-03	44-WA-SB03-03
DATE SAMPLED	03/14/95	03/14/95	03/14/95	03/13/95	03/13/95	03/13/95
DEPTH	3-5'	3-5'	3-5'	5-7'	5-7'	5-7'
UNITS	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
VOLATILES						
CHLOROMETHANE	12 U	11 U	12 U	12 U	12 U	12 U
BROMOMETHANE	12 U	11 U	12 U	12 U	12 U	12 U
VINYL CHLORIDE	12 U	11 U	12 U	12 U	12 U	12 U
CHLOROETHANE	12 U	11 U	12 U	12 U	12 U	12 U
METHYLENE CHLORIDE	12 U	11 U	12 U	12 U	12 U	12 U
ACETONE	20 UJ	18 UJ	12 U	53 U	NA	33 U
CARBON DISULFIDE	12 U	11 U	12 U	12 U	12 U	12 U
1,1-DICHLOROETHENE	12 U	11 U	12 U	12 U	12 U	12 U
1,1-DICHLOROETHANE	12 U	11 U	12 U	12 U	12 U	12 U
1,2-DICHLOROETHENE (TOTAL)	12 U	11 U	12 U	12 U	12 U	12 U
CHLOROFORM	12 U	11 U	12 U	12 U	12 U	12 U
1,2-DICHLOROETHANE	12 U	11 U	12 U	12 U	12 U	12 U
2-BUTANONE	12 UJ	11 UJ	12 U	12 U	12 U	12 U
1,1,1-TRICHLOROETHANE	12 U	11 U	12 U	12 U	12 U	12 U
CARBON TETRACHLORIDE	12 U	11 U	12 U	12 U	12 U	12 U
BROMODICHLOROMETHANE	12 U	11 U	12 U	12 U	12 U	12 U
1,2-DICHLOROPROPANE	12 U	11 U	12 U	12 U	12 U	12 U
CIS-1,3-DICHLOROPROPENE	12 U	11 U	12 U	12 U	12 U	12 U
TRICHLOROETHENE	12 U	11 U	12 U	12 U	12 U	12 U
DIBROMOCHLOROMETHANE	12 U	11 U	12 U	12 U	12 U	12 U
1,1,2-TRICHLOROETHANE	12 U	11 U	12 U	12 U	12 U	12 U
BENZENE	12 U	11 U	12 U	12 U	12 U	12 U
TRANS-1,3-DICHLOROPROPENE	12 U	11 U	12 U	12 U	12 U	12 U
BROMOFORM	12 U	11 U	12 U	12 U	12 U	12 U
4-METHYL-2-PENTANONE	12 UJ	11 UJ	12 U	12 U	12 U	12 U
2-HEXANONE	12 UJ	11 UJ	12 U	12 U	12 U	12 U
TETRACHLOROETHENE	12 U	11 U	12 U	12 U	12 U	12 U
1,1,2,2-TETRACHLOROETHANE	12 U	11 U	12 U	12 U	12 U	12 U
TOLUENE	12 U	11 U	12 U	12 U	12 U	12 U
CHLOROBENZENE	12 U	11 U	12 U	12 U	12 U	12 U
ETHYLBENZENE	12 U	11 U	12 U	12 U	12 U	12 U
STYRENE	12 U	11 U	12 U	12 U	12 U	12 U
XYLENE (TOTAL)	12 U	11 U	12 U	12 U	12 U	12 U

SITE 44, JONES STREET DUMP
SUBSURFACE SOIL - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-OA-SB04-02	44-OA-SB05-02	44-OA-SB06-02	44-WA-SB01-03	44-WA-SB02-03	44-WA-SB03-03
DATE SAMPLED	03/14/95	03/14/95	03/14/95	03/13/95	03/13/95	03/13/95
DEPTH	3-5'	3-5'	3-5'	5-7'	5-7'	5-7'
UNITS	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SEMIVOLATILES						
PHENOL	390 U	370 U	390 U	390 U	370 U	400 U
BIS(2-CHLOROETHYL)ETHER	390 U	370 U	390 U	390 U	370 U	400 U
2-CHLOROPHENOL	390 U	370 U	390 U	390 U	370 U	400 U
1,3-DICHLOROBENZENE	390 U	370 U	390 U	390 U	370 U	400 U
1,4-DICHLOROBENZENE	390 U	370 U	390 U	390 U	370 U	400 U
1,2-DICHLOROBENZENE	390 U	370 U	390 U	390 U	370 U	400 U
2-METHYLPHENOL	390 U	370 U	390 U	390 U	370 U	400 U
2,2'-OXYBIS(1-CHLOROPROPANE)	390 U	370 U	390 U	390 U	370 U	400 U
4-METHYLPHENOL	390 U	370 U	390 U	390 U	370 U	400 U
N-NITROSO-DI-N-PROPYLAMINE	390 U	370 U	390 U	390 U	370 U	400 U
HEXACHLOROETHANE	390 U	370 U	390 U	390 U	370 U	400 U
NITROBENZENE	390 U	370 U	390 U	390 U	370 U	400 U
ISOPHORONE	390 U	370 U	390 U	390 U	370 U	400 U
2-NITROPHENOL	390 U	370 U	390 U	390 U	370 U	400 U
2,4-DIMETHYLPHENOL	390 U	370 U	390 U	390 U	370 U	400 U
BIS(2-CHLOROETHOXY)METHANE	390 U	370 U	390 U	390 U	370 U	400 U
2,4-DICHLOROPHENOL	390 U	370 U	390 U	390 U	370 U	400 U
1,2,4-TRICHLOROBENZENE	390 U	370 U	390 U	390 U	370 U	400 U
NAPHTHALENE	390 U	370 U	390 U	390 U	370 U	400 U
4-CHLOROANILINE	390 U	370 U	390 U	390 U	370 U	400 U
HEXACHLOROBUTADIENE	390 U	370 U	390 U	390 U	370 U	400 U
4-CHLORO-3-METHYLPHENOL	390 U	370 U	390 U	390 U	370 U	400 U
2-METHYLNAPHTHALENE	390 U	370 U	390 U	390 U	370 U	400 U
HEXACHLOROCYCLOPENTADIENE	390 U	370 U	390 U	390 U	370 U	400 U
2,4,6-TRICHLOROPHENOL	390 U	370 U	390 U	390 U	370 U	400 U
2,4,5-TRICHLOROPHENOL	970 U	940 U	980 U	960 U	930 U	1000 U
2-CHLORONAPHTHALENE	390 U	370 U	390 U	390 U	370 U	400 U
2-NITROANILINE	970 U	940 U	980 U	960 U	930 U	1000 U
DIMETHYLPHTHALATE	390 U	370 U	390 U	390 U	370 U	400 U
ACENAPHTHYLENE	390 U	370 U	390 U	390 U	370 U	400 U
2,6-DINITROTOLUENE	390 U	370 U	390 U	390 U	370 U	400 U
3-NITROANILINE	970 U	940 U	980 U	960 U	930 U	1000 U
ACENAPHTHENE	390 U	370 U	390 U	390 U	370 U	400 U
2,4-DINITROPHENOL	970 U	940 U	980 U	960 U	930 U	1000 U

SITE 44, JONES STREET DUMP
SUBSURFACE SOIL - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-OA-SB04-02	44-OA-SB05-02	44-OA-SB06-02	44-WA-SB01-03	44-WA-SB02-03	44-WA-SB03-03
DATE SAMPLED	03/14/95	03/14/95	03/14/95	03/13/95	03/13/95	03/13/95
DEPTH	3-5'	3-5'	3-5'	5-7'	5-7'	5-7'
UNITS	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SEMIVOLATILES cont.						
4-NITROPHENOL	970 U	940 U	980 U	960 U	930 U	1000 U
DIBENZOFURAN	390 U	370 U	390 U	390 U	370 U	400 U
2,4-DINITROTOLUENE	390 U	370 U	390 U	390 U	370 U	400 U
DIETHYLPHTHALATE	390 U	370 U	390 U	390 U	370 U	400 U
4-CHLOROPHENYL-PHENYLETHER	390 U	370 U	390 U	390 U	370 U	400 U
FLUORENE	390 U	370 U	390 U	390 U	370 U	400 U
4-NITROANILINE	970 U	940 U	980 U	960 U	930 U	1000 U
4,6-DINITRO-2-METHYLPHENOL	970 U	940 U	980 U	960 U	930 U	1000 U
N-NITROSODIPHENYLAMINE (1)	390 U	370 U	390 U	390 U	370 U	400 U
4-BROMOPHENYL-PHENYLETHER	390 U	370 U	390 U	390 U	370 U	400 U
HEXACHLOROBENZENE	390 U	370 U	390 U	390 U	370 U	400 U
PENTACHLOROPHENOL	970 U	940 U	980 U	960 U	930 U	1000 U
PHENANTHRENE	390 U	370 U	390 U	390 U	370 U	400 U
ANTHRACENE	390 U	370 U	390 U	390 U	370 U	400 U
CARBAZOLE	390 U	370 U	390 U	390 U	370 U	400 U
DI-N-BUTYLPHTHALATE	390 U	370 U	390 U	390 U	370 U	400 U
FLUORANTHENE	390 U	370 U	390 U	390 U	370 U	400 U
PYRENE	390 U	370 U	390 U	390 U	370 U	400 U
BUTYLBENZYLPHTHALATE	390 U	370 U	390 U	390 U	370 U	400 U
3,3'-DICHLOROBENZIDINE	390 U	370 U	390 U	390 U	370 U	400 U
BENZO(A)ANTHRACENE	390 U	370 U	390 U	390 U	370 U	400 U
CHRYSENE	390 U	370 U	390 U	390 U	370 U	400 U
BIS(2-ETHYLHEXYL)PHTHALATE	390 U	370 U	390 U	390 U	370 U	400 U
DI-N-OCTYL PHTHALATE	390 U	370 U	390 U	390 U	370 U	400 U
BENZO(B)FLUORANTHENE	390 U	370 U	390 U	390 U	370 U	400 U
BENZO(K)FLUORANTHENE	390 U	370 U	390 U	390 U	370 U	400 U
BENZO(A)PYRENE	390 U	370 U	390 U	390 U	370 U	400 U
INDENO(1,2,3-CD)PYRENE	390 U	130 J	390 U	390 U	370 U	400 U
DIBENZO(A,H)ANTHRACENE	390 U	370 U	390 U	390 U	370 U	400 U
BENZO(G,H,I)PERYLENE	40 J	120 J	390 U	390 U	370 U	400 U

SITE 44, JONES STREET DUMP
SUBSURFACE SOIL - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-OA-SB04-02	44-OA-SB05-02	44-OA-SB06-02	44-WA-SB01-03	44-WA-SB02-03	44-WA-SB03-03
DATE SAMPLED	03/14/95	03/14/95	03/14/95	03/13/95	03/13/95	03/13/95
DEPTH	3-5'	3-5'	3-5'	5-7'	5-7'	5-7'
UNITS	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
PESTICIDE/PCBS						
ALPHA-BHC	1.9 UJ	1.9 UJ	2 UJ	1.9 UJ	1.9 UJ	2 U
BETA-BHC	1.9 UJ	1.9 UJ	2 UJ	1.9 UJ	1.9 U	2 U
DELTA-BHC	1.9 UJ	1.9 UJ	2 UJ	1.9 UJ	1.9 U	2 U
GAMMA-BHC (LINDANE)	1.9 UJ	1.9 UJ	2 UJ	1.9 UJ	1.9 U	2 U
HEPTACHLOR	1.9 UJ	1.9 UJ	2 UJ	1.9 UJ	1.9 U	2 U
ALDRIN	1.9 UJ	1.9 UJ	2 UJ	1.9 UJ	1.9 U	2 U
HEPTACHLOR EPOXIDE	1.9 UJ	1.9 UJ	2 UJ	1.9 UJ	1.9 U	2 U
ENDOSULFAN I	1.9 UJ	1.9 UJ	2 UJ	1.9 UJ	1.9 U	2 U
DIELDRIN	3.9 UJ	3.7 UJ	4 UJ	3.8 UJ	3.8 U	4 U
4,4'-DDE	3.9 UJ	3.7 UJ	4 UJ	3.8 UJ	3.8 U	3.2 J
ENDRIN	3.9 UJ	3.7 UJ	4 UJ	3.8 UJ	3.8 U	4 U
ENDOSULFAN II	3.9 UJ	3.7 UJ	4 UJ	3.8 UJ	3.8 U	4 U
4,4'-DDD	3.9 UJ	3.7 UJ	4 UJ	3.8 UJ	3.8 U	8
ENDOSULFAN SULFATE	3.9 UJ	3.7 UJ	4 UJ	3.8 UJ	3.8 U	4 U
4,4'-DDT	3.9 UJ	3.7 UJ	4 UJ	3.8 UJ	3.8 U	4 U
METHOXYCHLOR	19 UJ	19 UJ	20 UJ	19 UJ	19 U	20 UJ
ENDRIN KETONE	3.9 UJ	3.7 UJ	4 UJ	3.8 UJ	3.8 U	4 U
ENDRIN ALDEHYDE	3.9 UJ	3.7 UJ	4 UJ	3.8 UJ	3.8 U	4 U
ALPHA-CHLORDANE	1.9 UJ	1.9 UJ	2 UJ	1.9 UJ	1.9 U	2 U
GAMMA-CHLORDANE	1.9 UJ	1.9 UJ	2 UJ	1.9 UJ	1.9 U	2 U
TOXAPHENE	190 UJ	190 UJ	200 UJ	190 UJ	190 U	200 U
AROCLOR-1016	NA	NA	40 UJ	NA	38 U	40 U
AROCLOR-1221	NA	NA	79 UJ	NA	75 U	80 U
AROCLOR-1232	NA	NA	40 UJ	NA	38 U	40 U
AROCLOR-1242	NA	NA	40 UJ	NA	38 U	40 U
AROCLOR-1248	NA	NA	40 UJ	NA	38 U	40 U
AROCLOR-1254	NA	NA	40 UJ	NA	38 U	40 U
AROCLOR-1260	NA	NA	40 UJ	NA	38 U	40 U

SITE 44, JONES STREET DUMP
SUBSURFACE SOIL - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-WA-SB04-03
DATE SAMPLED	03/13/95
DEPTH	5-7'
UNITS	UG/KG
VOLATILES	
CHLOROMETHANE	12 U
BROMOMETHANE	12 U
VINYL CHLORIDE	12 U
CHLOROETHANE	12 U
METHYLENE CHLORIDE	12 U
ACETONE	92 UJ
CARBON DISULFIDE	12 U
1,1-DICHLOROETHENE	12 U
1,1-DICHLOROETHANE	12 U
1,2-DICHLOROETHENE (TOTAL)	12 U
CHLOROFORM	12 U
1,2-DICHLOROETHANE	12 U
2-BUTANONE	12 UJ
1,1,1-TRICHLOROETHANE	12 U
CARBON TETRACHLORIDE	12 U
BROMODICHLOROMETHANE	12 U
1,2-DICHLOROPROPANE	12 U
CIS-1,3-DICHLOROPROPENE	12 U
TRICHLOROETHENE	12 U
DIBROMOCHLOROMETHANE	12 U
1,1,2-TRICHLOROETHANE	12 U
BENZENE	12 U
TRANS-1,3-DICHLOROPROPENE	12 U
BROMOFORM	12 U
4-METHYL-2-PENTANONE	12 UJ
2-HEXANONE	12 UJ
TETRACHLOROETHENE	12 U
1,1,2,2-TETRACHLOROETHANE	12 U
TOLUENE	12 U
CHLOROBENZENE	12 U
ETHYLBENZENE	12 U
STYRENE	12 U
XYLENE (TOTAL)	12 U

SITE 44, JONES STREET DUMP
SUBSURFACE SOIL - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-WA-SB04-03
DATE SAMPLED	03/13/95
DEPTH	5-7'
UNITS	UG/KG
SEMIVOLATILES	
PHENOL	390 U
BIS(2-CHLOROETHYL)ETHER	390 U
2-CHLOROPHENOL	390 U
1,3-DICHLOROBENZENE	390 U
1,4-DICHLOROBENZENE	390 U
1,2-DICHLOROBENZENE	390 U
2-METHYLPHENOL	390 U
2,2'-OXYBIS(1-CHLOROPROPANE)	390 U
4-METHYLPHENOL	390 U
N-NITROSO-DI-N-PROPYLAMINE	390 U
HEXACHLOROETHANE	390 U
NITROBENZENE	390 U
ISOPHORONE	390 U
2-NITROPHENOL	390 U
2,4-DIMETHYLPHENOL	390 U
BIS(2-CHLOROETHOXY)METHANE	390 U
2,4-DICHLOROPHENOL	390 U
1,2,4-TRICHLOROBENZENE	390 U
NAPHTHALENE	390 U
4-CHLOROANILINE	390 U
HEXACHLOROBUTADIENE	390 U
4-CHLORO-3-METHYLPHENOL	390 U
2-METHYLNAPHTHALENE	390 U
HEXACHLOROCYCLOPENTADIENE	390 U
2,4,6-TRICHLOROPHENOL	390 U
2,4,5-TRICHLOROPHENOL	980 U
2-CHLORONAPHTHALENE	390 U
2-NITROANILINE	980 U
DIMETHYLPHTHALATE	390 U
ACENAPHTHYLENE	390 U
2,6-DINITROTOLUENE	390 U
3-NITROANILINE	980 U
ACENAPHTHENE	390 U
2,4-DINITROPHENOL	980 U

SITE 44, JONES STREET DUMP
SUBSURFACE SOIL - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-WA-SB04-03
DATE SAMPLED	03/13/95
DEPTH	5-7'
UNITS	UG/KG
SEMIVOLATILES cont.	
4-NITROPHENOL	980 U
DIBENZOFURAN	390 U
2,4-DINITROTOLUENE	390 U
DIETHYLPHTHALATE	390 U
4-CHLOROPHENYL-PHENYLETHER	390 U
FLUORENE	390 U
4-NITROANILINE	980 U
4,6-DINITRO-2-METHYLPHENOL	980 U
N-NITROSODIPHENYLAMINE (1)	390 U
4-BROMOPHENYL-PHENYLETHER	390 U
HEXACHLOROBENZENE	390 U
PENTACHLOROPHENOL	980 U
PHENANTHRENE	390 U
ANTHRACENE	390 U
CARBAZOLE	390 U
DI-N-BUTYLPHTHALATE	390 U
FLUORANTHENE	390 U
PYRENE	390 U
BUTYLBENZYLPHTHALATE	390 U
3,3'-DICHLOROBENZIDINE	390 U
BENZO(A)ANTHRACENE	390 U
CHRYSENE	390 U
BIS(2-ETHYLHEXYL)PHTHALATE	390 U
DI-N-OCTYL PHTHALATE	390 U
BENZO(B)FLUORANTHENE	390 U
BENZO(K)FLUORANTHENE	390 U
BENZO(A)PYRENE	390 U
INDENO(1,2,3-CD)PYRENE	390 U
DIBENZO(A,H)ANTHRACENE	390 U
BENZO(G,H,I)PERYLENE	390 U

SITE 44, JONES STREET DUMP
SUBSURFACE SOIL - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-WA-SB04-03
DATE SAMPLED	03/13/95
DEPTH	5-7'
UNITS	UG/KG
PESTICIDE/PCBS	
ALPHA-BHC	2 UJ
BETA-BHC	2 UJ
DELTA-BHC	2 UJ
GAMMA-BHC (LINDANE)	2 UJ
HEPTACHLOR	2 UJ
ALDRIN	2 UJ
HEPTACHLOR EPOXIDE	2 UJ
ENDOSULFAN I	2 UJ
DIELDRIN	3.9 UJ
4,4'-DDE	3.9 J
ENDRIN	3.9 UJ
ENDOSULFAN II	3.9 UJ
4,4'-DDD	21 J
ENDOSULFAN SULFATE	3.9 UJ
4,4'-DDT	3.9 UJ
METHOXYCHLOR	20 UJ
ENDRIN KETONE	3.9 UJ
ENDRIN ALDEHYDE	3.9 UJ
ALPHA-CHLORDANE	2 UJ
GAMMA-CHLORDANE	2 UJ
TOXAPHENE	200 UJ
AROCLOR-1016	NA
AROCLOR-1221	NA
AROCLOR-1232	NA
AROCLOR-1242	NA
AROCLOR-1248	NA
AROCLOR-1254	NA
AROCLOR-1260	NA

SITE 44, JONES STREET DUMP
SUBSURFACE SOIL - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION DATE SAMPLED DEPTH UNITS	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
VOLATILES						
CHLOROMETHANE	11 U	13 U	ND	ND		0/13
BROMOMETHANE	11 U	13 U	ND	ND		0/13
VINYL CHLORIDE	11 U	13 U	ND	ND		0/13
CHLOROETHANE	11 U	13 U	ND	ND		0/13
METHYLENE CHLORIDE	11 U	13 U	ND	ND		0/13
ACETONE	11 U	92 UJ	61	61	44-OA-SB01-04	1/12
CARBON DISULFIDE	11 U	13 U	ND	ND		0/13
1,1-DICHLOROETHENE	11 U	13 U	ND	ND		0/13
1,1-DICHLOROETHANE	11 U	13 U	ND	ND		0/13
1,2-DICHLOROETHENE (TOTAL)	11 U	13 U	ND	ND		0/13
CHLOROFORM	11 U	13 U	ND	ND		0/13
1,2-DICHLOROETHANE	11 U	13 U	ND	ND		0/13
2-BUTANONE	11 UJ	13 U	ND	ND		0/13
1,1,1-TRICHLOROETHANE	11 U	13 U	ND	ND		0/13
CARBON TETRACHLORIDE	11 U	13 U	ND	ND		0/13
BROMODICHLOROMETHANE	11 U	13 U	ND	ND		0/13
1,2-DICHLOROPROPANE	11 U	13 U	ND	ND		0/13
CIS-1,3-DICHLOROPROPENE	11 U	13 U	ND	ND		0/13
TRICHLOROETHENE	11 U	13 U	ND	ND		0/13
DIBROMOCHLOROMETHANE	11 U	13 U	ND	ND		0/13
1,1,2-TRICHLOROETHANE	11 U	13 U	ND	ND		0/13
BENZENE	11 U	13 U	ND	ND		0/13
TRANS-1,3-DICHLOROPROPENE	11 U	13 U	ND	ND		0/13
BROMOFORM	11 U	13 U	ND	ND		0/13
4-METHYL-2-PENTANONE	11 UJ	13 U	ND	ND		0/13
2-HEXANONE	11 UJ	13 U	ND	ND		0/13
TETRACHLOROETHENE	11 U	13 U	ND	ND		0/13
1,1,2,2-TETRACHLOROETHANE	11 U	13 U	ND	ND		0/13
TOLUENE	11 U	13 U	ND	ND		0/13
CHLOROBENZENE	11 U	13 U	ND	ND		0/13
ETHYLBENZENE	11 U	13 U	ND	ND		0/13
STYRENE	11 U	13 U	ND	ND		0/13
XYLENE (TOTAL)	11 U	13 U	ND	ND		0/13

SITE 44, JONES STREET DUMP
SUBSURFACE SOIL - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION DATE SAMPLED DEPTH UNITS	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
SEMIVOLATILES						
PHENOL	370 U	430 U	ND	ND		0/13
BIS(2-CHLOROETHYL)ETHER	370 U	430 U	ND	ND		0/13
2-CHLOROPHENOL	370 U	430 U	ND	ND		0/13
1,3-DICHLOROBENZENE	370 U	430 U	ND	ND		0/13
1,4-DICHLOROBENZENE	370 U	430 U	ND	ND		0/13
1,2-DICHLOROBENZENE	370 U	430 U	ND	ND		0/13
2-METHYLPHENOL	370 U	430 U	ND	ND		0/13
2,2'-OXYBIS(1-CHLOROPROPANE)	370 U	430 U	ND	ND		0/13
4-METHYLPHENOL	370 U	430 U	ND	ND		0/13
N-NITROSO-DI-N-PROPYLAMINE	370 U	430 U	ND	ND		0/13
HEXACHLOROETHANE	370 U	430 U	ND	ND		0/13
NITROBENZENE	370 U	430 U	ND	ND		0/13
ISOPHORONE	370 U	430 U	ND	ND		0/13
2-NITROPHENOL	370 U	430 U	ND	ND		0/13
2,4-DIMETHYLPHENOL	370 U	430 U	ND	ND		0/13
BIS(2-CHLOROETHOXY)METHANE	370 U	430 U	ND	ND		0/13
2,4-DICHLOROPHENOL	370 U	430 U	ND	ND		0/13
1,2,4-TRICHLOROBENZENE	370 U	430 U	ND	ND		0/13
NAPHTHALENE	370 U	430 U	ND	ND		0/13
4-CHLOROANILINE	370 U	430 U	ND	ND		0/13
HEXACHLOROBUTADIENE	370 U	430 U	ND	ND		0/13
4-CHLORO-3-METHYLPHENOL	370 U	430 U	ND	ND		0/13
2-METHYLNAPHTHALENE	370 U	430 U	ND	ND		0/13
HEXACHLOROCYCLOPENTADIENE	370 U	430 U	ND	ND		0/13
2,4,6-TRICHLOROPHENOL	370 U	430 U	ND	ND		0/13
2,4,5-TRICHLOROPHENOL	930 U	1100 U	ND	ND		0/13
2-CHLORONAPHTHALENE	370 U	430 U	ND	ND		0/13
2-NITROANILINE	930 U	1100 U	ND	ND		0/13
DIMETHYLPHTHALATE	370 U	430 U	ND	ND		0/13
ACENAPHTHYLENE	370 U	430 U	ND	ND		0/13
2,6-DINITROTOLUENE	370 U	430 U	ND	ND		0/13
3-NITROANILINE	930 U	1100 U	ND	ND		0/13
ACENAPHTHENE	370 U	430 U	ND	ND		0/13
2,4-DINITROPHENOL	930 U	1100 U	ND	ND		0/13

SITE 44, JONES STREET DUMP
SUBSURFACE SOIL - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION DATE SAMPLED DEPTH UNITS	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
SEMIVOLATILES cont.						
4-NITROPHENOL	930 U	1100 U	ND	ND		0/13
DIBENZOFURAN	370 U	430 U	ND	ND		0/13
2,4-DINITROTOLUENE	370 U	430 U	ND	ND		0/13
DIETHYLPHTHALATE	370 U	430 U	ND	ND		0/13
4-CHLOROPHENYL-PHENYLETHER	370 U	430 U	ND	ND		0/13
FLUORENE	370 U	430 U	ND	ND		0/13
4-NITROANILINE	930 U	1100 U	ND	ND		0/13
4,6-DINITRO-2-METHYLPHENOL	930 U	1100 U	ND	ND		0/13
N-NITROSODIPHENYLAMINE (1)	370 U	430 U	ND	ND		0/13
4-BROMOPHENYL-PHENYLETHER	370 U	430 U	ND	ND		0/13
HEXACHLOROBENZENE	370 U	430 U	ND	ND		0/13
PENTACHLOROPHENOL	930 U	1100 U	ND	ND		0/13
PHENANTHRENE	370 U	430 U	ND	ND		0/13
ANTHRACENE	370 U	430 U	ND	ND		0/13
CARBAZOLE	370 U	430 U	ND	ND		0/13
DI-N-BUTYLPHTHALATE	370 U	430 U	ND	ND		0/13
FLUORANTHENE	370 U	430 U	ND	ND		0/13
PYRENE	370 U	430 U	ND	ND		0/13
BUTYLBENZYLPHTHALATE	370 U	430 U	ND	ND		0/13
3,3'-DICHLOROBENZIDINE	370 U	430 U	ND	ND		0/13
BENZO(A)ANTHRACENE	370 U	430 U	ND	ND		0/13
CHRYSENE	370 U	430 U	ND	ND		0/13
BIS(2-ETHYLHEXYL)PHTHALATE	370 U	430 U	83 J	83 J	44-OA-SB02-03	1/13
DI-N-OCTYL PHTHALATE	370 U	430 U	ND	ND		0/13
BENZO(B)FLUORANTHENE	370 U	430 U	ND	ND		0/13
BENZO(K)FLUORANTHENE	370 U	430 U	ND	ND		0/13
BENZO(A)PYRENE	370 U	430 U	ND	ND		0/13
INDENO(1,2,3-CD)PYRENE	370 U	430 U	55 J	130 J	44-OA-SB05-02	2/13
DIBENZO(A,H)ANTHRACENE	370 U	430 U	ND	ND		0/13
BENZO(G,H,I)PERYLENE	370 U	430 U	40 J	120 J	44-OA-SB05-02	3/13

SITE 44, JONES STREET DUMP
SUBSURFACE SOIL - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION DATE SAMPLED DEPTH UNITS	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
PESTICIDE/PCBS						
ALPHA-BHC	1.8 UJ	2.2 U	ND	ND		0/13
BETA-BHC	1.8 UJ	2.2 UJ	ND	ND		0/13
DELTA-BHC	1.8 UJ	2.2 U	ND	ND		0/13
GAMMA-BHC (LINDANE)	1.8 UJ	2.2 U	ND	ND		0/13
HEPTACHLOR	1.8 UJ	2.2 U	ND	ND		0/13
ALDRIN	1.8 UJ	2.2 U	ND	ND		0/13
HEPTACHLOR EPOXIDE	1.8 UJ	2.2 U	ND	ND		0/13
ENDOSULFAN I	1.8 UJ	2.2 U	ND	ND		0/13
DIELDRIN	3.7 UJ	4.4 U	ND	ND		0/13
4,4'-DDE	3.7 UJ	4 UJ	3.2 J	370 J	44-GW01DW-03	4/13
ENDRIN	3.7 UJ	4.4 U	ND	ND		0/13
ENDOSULFAN II	3.7 UJ	4.4 U	ND	ND		0/13
4,4'-DDD	3.7 UJ	4 UJ	5.6	2500	44-GW01DW-03	4/13
ENDOSULFAN SULFATE	3.7 UJ	4.4 U	ND	ND		0/13
4,4'-DDT	3.7 UJ	4 U	150 J	150 J	44-GW01DW-03	1/13
METHOXYCHLOR	18 UJ	22 U	ND	ND		0/13
ENDRIN KETONE	3.7 UJ	4.4 U	ND	ND		0/13
ENDRIN ALDEHYDE	3.7 UJ	4.4 U	ND	ND		0/13
ALPHA-CHLORDANE	1.8 UJ	2.2 U	ND	ND		0/13
GAMMA-CHLORDANE	1.8 UJ	2.2 U	ND	ND		0/13
TOXAPHENE	180 UJ	220 U	ND	ND		0/13
AROCLOR-1016	37 UJ	44 U	ND	ND		0/7
AROCLOR-1221	74 UJ	87 U	ND	ND		0/7
AROCLOR-1232	37 UJ	44 U	ND	ND		0/7
AROCLOR-1242	37 UJ	44 U	ND	ND		0/7
AROCLOR-1248	37 UJ	44 U	ND	ND		0/7
AROCLOR-1254	37 UJ	44 U	ND	ND		0/7
AROCLOR-1260	37 UJ	44 U	ND	ND		0/7

SITE 44, JONES STREET DUMP
SUBSURFACE SOIL - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
INORGANIC ANALYTES

LOCATION	44-GW01DW-03	44-GW04-04	44-GW05-03	44-OA-SB01-04	44-OA-SB02-03	44-OA-SB03-01
DATE SAMPLED	03/13/95	03/13/95	03/14/95	03/08/95	03/08/95	03/14/95
DEPTH	5-7'	7-9'	5-7'	7-9'	5-7'	1-3'
UNITS	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG
TOTAL METALS						
ALUMINUM, TOTAL	6020	4300	2240	7300	9940	1850
ANTIMONY, TOTAL	2.5 UJ	2.5 UJ	1.8 UJ	2.5 UJ	2.6 UJ	3.4 UJ
ARSENIC, TOTAL	1.3 J	0.51 J	0.32 U	1.2	1.1	0.31 J
BARIUM, TOTAL	11.9	6.8	5.7	10.7	10.5	2.6 U
BERYLLIUM, TOTAL	0.069 U	0.07 U	0.09 U	0.12 U	0.18 U	0.15 U
CADMIUM, TOTAL	0.66 U	0.67 U	0.49 U	0.67 U	0.68 U	0.46 U
CALCIUM, TOTAL	3880	268	15.6	702 J	40.7 J	93.9
CHROMIUM, TOTAL	9.2	5.3	2.4	8.3	9.1	2.5
COBALT, TOTAL	0.53 U	0.53 U	0.39 U	0.86 U	0.87 U	0.49 U
COPPER, TOTAL	2.9	0.93 U	0.7	1.1	0.94 U	0.42
IRON, TOTAL	8270	4810	1480	4790 J	4200 J	2690
LEAD, TOTAL	9.1	7	4.3	8.5 U	7.4 U	4.5 J
MAGNESIUM, TOTAL	236	87.9	57.1	254	250	43.2
MANGANESE, TOTAL	7.2	1.9	1.3	9.1	4.2	1.5
MERCURY, TOTAL	0.088 U	0.12 U	0.11 U	0.11 U	0.095 U	0.1 U
NICKEL, TOTAL	15.8	0.97 U	0.71 U	1.3	1.7	1.8 U
POTASSIUM, TOTAL	221	77	53	261	173	113 U
SELENIUM, TOTAL	0.4 UJ	0.51 UJ	0.25 U	0.31 U	0.3 U	0.3 U
SILVER, TOTAL	0.57 U	0.58 U	0.42 U	0.57 U	0.59 U	0.49 U
SODIUM, TOTAL	28	10.4 U	6.3 U	20.3 U	15.4 U	5.3
THALLIUM, TOTAL	0.24 U	0.25 U	0.19 U	0.14 U	0.14 U	0.18 U
VANADIUM, TOTAL	19.2	8.4	3.5	11.6	12.2	3.6
ZINC, TOTAL	4.7	1	1.5	2.7	2.5	0.94

SITE 44, JONES STREET DUMP
SUBSURFACE SOIL - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
INORGANIC ANALYTES

LOCATION	44-OA-SB04-02	44-OA-SB05-02	44-OA-SB06-02	44-WA-SB01-03	44-WA-SB02-03	44-WA-SB03-03
DATE SAMPLED	03/14/95	03/14/95	03/14/95	03/13/95	03/13/95	03/13/95
DEPTH	3-5'	3-5'	3-5'	5-7'	5-7'	5-7'
UNITS	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG
TOTAL METALS						
ALUMINUM, TOTAL	3330	5030	5550	1520	6790	6500
ANTIMONY, TOTAL	1.8 UJ	2.4 UJ	4.8 UJ	2.2 UJ	4.3 UJ	4.6 UJ
ARSENIC, TOTAL	0.36 U	0.48	1.3 J	0.4 UJ	0.41 J	1 J
BARIUM, TOTAL	5	9.4	8.7	3.4	13.7	13.3
BERYLLIUM, TOTAL	0.1 U	0.18 U	0.21 U	0.061 U	0.19 U	0.2 U
CADMIUM, TOTAL	0.48 U	0.65 U	0.65 U	0.59 U	0.58 U	0.62 U
CALCIUM, TOTAL	31.1	309	22.4	161	379	168
CHROMIUM, TOTAL	3.3	5.8	9.1	2.1	6.2	9.5
COBALT, TOTAL	0.38 U	0.51 U	0.7 U	0.47 U	0.62 U	0.66 U
COPPER, TOTAL	0.66 U	0.9	0.56	0.82 U	0.78	0.78
IRON, TOTAL	1900	1870	4040	389	3690	5680
LEAD, TOTAL	3.7	2.9	8.5 J	1.4	5.9 J	5.9 J
MAGNESIUM, TOTAL	70.3	181	117	65.9	194	218
MANGANESE, TOTAL	1.5	5.3	1.7	2.7	9.3	6.1
MERCURY, TOTAL	0.1 U	0.09 U	0.09 U	0.086 U	0.08 U	0.11 U
NICKEL, TOTAL	0.7 U	3.1	2.5 U	0.86 U	2.2 U	4.9
POTASSIUM, TOTAL	91.4	176	168	104	233	151 U
SELENIUM, TOTAL	0.28 U	0.32 U	0.38 U	0.32 UJ	0.4 U	0.42 U
SILVER, TOTAL	0.42 U	0.56 U	0.7 U	0.51 U	0.62 U	0.66 U
SODIUM, TOTAL	12.1 U	12.8 U	32	3.9	31.4	30.5
THALLIUM, TOTAL	0.21 U	0.23 U	0.23 U	0.23 U	0.25 U	0.26 U
VANADIUM, TOTAL	3.8	7.3	8.4	3.2	10.1	14.2
ZINC, TOTAL	0.79	2.3	0.88 U	0.76	1.8	2.6

SITE 44, JONES STREET DUMP
SUBSURFACE SOIL - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
INORGANIC ANALYTES

LOCATION	44-WA-SB04-03	
DATE SAMPLED	03/13/95	
DEPTH	5-7'	
UNITS	MG/KG	
TOTAL METALS		
ALUMINUM, TOTAL	6210	
ANTIMONY, TOTAL	2.1	UJ
ARSENIC, TOTAL	2.5	
BARIUM, TOTAL	11.9	
BERYLLIUM, TOTAL	0.06	U
CADMIUM, TOTAL	0.55	U
CALCIUM, TOTAL	1080	
CHROMIUM, TOTAL	6.2	
COBALT, TOTAL	0.44	U
COPPER, TOTAL	1.1	
IRON, TOTAL	3210	
LEAD, TOTAL	7	
MAGNESIUM, TOTAL	231	
MANGANESE, TOTAL	7.6	
MERCURY, TOTAL	0.12	U
NICKEL, TOTAL	2.3	
POTASSIUM, TOTAL	203	
SELENIUM, TOTAL	0.29	U
SILVER, TOTAL	0.48	U
SODIUM, TOTAL	22	U
THALLIUM, TOTAL	0.21	U
VANADIUM, TOTAL	9.4	
ZINC, TOTAL	10.8	

SITE 44, JONES STREET DUMP
SUBSURFACE SOIL - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
INORGANIC ANALYTES

LOCATION DATE SAMPLED DEPTH UNITS	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
TOTAL METALS						
ALUMINUM, TOTAL	NA	NA	1520	9940	44-OA-SB02-03	13/13
ANTIMONY, TOTAL	1.8 UJ	4.8 UJ	ND	ND		0/13
ARSENIC, TOTAL	0.32 U	0.4 UJ	0.31 J	2.5	44-WA-SB04-03	10/13
BARIUM, TOTAL	2.6 U	2.6 U	3.4	13.7	44-WA-SB02-03	12/13
BERYLLIUM, TOTAL	0.06 U	0.21 U	ND	ND		0/13
CADMIUM, TOTAL	0.46 U	0.68 U	ND	ND		0/13
CALCIUM, TOTAL	NA	NA	15.6	3880	44-GW01DW-03	13/13
CHROMIUM, TOTAL	NA	NA	2.1	9.5	44-WA-SB03-03	13/13
COBALT, TOTAL	0.38 U	0.87 U	ND	ND		0/13
COPPER, TOTAL	0.66 U	0.94 U	0.42	2.9	44-GW01DW-03	9/13
IRON, TOTAL	NA	NA	389	8270	44-GW01DW-03	13/13
LEAD, TOTAL	7.4 U	8.5 U	1.4	9.1	44-GW01DW-03	11/13
MAGNESIUM, TOTAL	NA	NA	43.2	254	44-OA-SB01-04	13/13
MANGANESE, TOTAL	NA	NA	1.3	9.3	44-WA-SB02-03	13/13
MERCURY, TOTAL	0.08 U	0.12 U	ND	ND		0/13
NICKEL, TOTAL	0.7 U	2.5 U	1.3	15.8	44-GW01DW-03	6/13
POTASSIUM, TOTAL	113 U	151 U	53	261	44-OA-SB01-04	11/13
SELENIUM, TOTAL	0.25 U	0.51 UJ	ND	ND		0/13
SILVER, TOTAL	0.42 U	0.7 U	ND	ND		0/13
SODIUM, TOTAL	6.3 U	22 U	3.9	32	44-OA-SB06-02	6/13
THALLIUM, TOTAL	0.14 U	0.26 U	ND	ND		0/13
VANADIUM, TOTAL	NA	NA	3.2	19.2	44-GW01DW-03	13/13
ZINC, TOTAL	0.88 U	0.88 U	0.76	10.8	44-WA-SB04-03	12/13

GROUNDWATER

SITE 44, JONES STREET DUMP
GROUNDWATER - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-GW01-01	44-GW01DW-01	44-GW02-01	44-GW03-01	44-GW04-01	44-GW05-01
DATE SAMPLED	04/09/95	04/09/95	04/10/95	04/10/95	04/08/95	04/09/95
UNITS	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
VOLATILES						
CHLOROMETHANE	10 U	10 U	10 U	10 U	10 U	10 U
BROMOMETHANE	10 U	10 U	10 U	10 U	10 U	10 U
VINYL CHLORIDE	10 U	10 U	10 U	10 U	10 U	10 U
CHLOROETHANE	10 U	10 U	10 U	10 U	10 U	10 U
METHYLENE CHLORIDE	10 U	10 U	10 U	10 U	10 U	10 U
ACETONE	10 U	10 U	10 U	10 U	10 U	10 U
CARBON DISULFIDE	10 U	10 U	10 U	10 U	10 U	10 U
1,1-DICHLOROETHENE	10 U	10 U	10 U	10 U	10 U	10 U
1,1-DICHLOROETHANE	10 U	10 U	10 U	10 U	10 U	10 U
1,2-DICHLOROETHENE (TOTAL)	10 U	10 U	10 U	10 U	10 U	10 U
CHLOROFORM	10 U	10 U	10 U	10 U	10 U	10 U
1,2-DICHLOROETHANE	10 U	10 U	10 U	10 U	10 U	10 U
2-BUTANONE	10 U	10 U	10 U	10 U	10 U	10 U
1,1,1-TRICHLOROETHANE	10 U	10 U	10 U	10 U	10 U	10 U
CARBON TETRACHLORIDE	10 U	10 U	10 U	10 U	10 U	10 U
BROMODICHLOROMETHANE	10 U	10 U	10 U	10 U	10 U	10 U
1,2-DICHLOROPROPANE	10 U	10 U	10 U	10 U	10 U	10 U
CIS-1,3-DICHLOROPROPENE	10 U	10 U	10 U	10 U	10 U	10 U
TRICHLOROETHENE	10 U	10 U	10 U	10 U	10 U	10 U
DIBROMOCHLOROMETHANE	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2-TRICHLOROETHANE	10 U	10 U	10 U	10 U	10 U	10 U
BENZENE	10 U	10 U	10 U	10 U	10 U	10 U
TRANS-1,3-DICHLOROPROPENE	10 U	10 U	10 U	10 U	10 U	10 U
BROMOFORM	10 U	10 U	10 U	10 U	10 U	10 U
4-METHYL-2-PENTANONE	10 U	10 U	10 U	10 U	10 U	10 U
2-HEXANONE	10 U	10 U	10 U	10 U	10 U	10 U
TETRACHLOROETHENE	10 U	10 U	10 U	1 J	10 U	10 U
1,1,2,2-TETRACHLOROETHANE	10 U	10 U	10 U	10 U	10 U	10 U
TOLUENE	10 U	10 U	10 U	10 U	10 U	10 U
CHLOROBENZENE	10 U	10 U	10 U	10 U	10 U	10 U
ETHYLBENZENE	10 U	10 U	10 U	10 U	10 U	10 U
STYRENE	10 U	10 U	10 U	10 U	10 U	10 U
XYLENE (TOTAL)	10 U	10 U	10 U	10 U	10 U	10 U

SITE 44, JONES STREET DUMP
GROUNDWATER - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-GW01-01	44-GW01DW-01	44-GW02-01	44-GW03-01	44-GW04-01	44-GW05-01
DATE SAMPLED	04/09/95	04/09/95	04/10/95	04/10/95	04/08/95	04/09/95
UNITS	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
SEMIVOLATILES						
PHENOL	10 U	10 U	10 U	10 U	10 U	10 U
BIS(2-CHLOROETHYL)ETHER	10 U	10 U	10 U	10 U	10 U	10 U
2-CHLOROPHENOL	10 U	10 U	10 U	10 U	10 U	10 U
1,3-DICHLOROBENZENE	10 U	10 U	10 U	10 U	10 U	10 U
1,4-DICHLOROBENZENE	10 U	10 U	10 U	10 U	10 U	10 U
1,2-DICHLOROBENZENE	10 U	10 U	10 U	10 U	10 U	10 U
2-METHYLPHENOL	10 U	10 U	10 U	10 U	10 U	10 U
2,2'-OXYBIS(1-CHLOROPROPANE)	10 U	10 U	10 U	10 U	10 U	10 U
4-METHYLPHENOL	10 U	10 U	10 U	10 U	10 U	10 U
N-NITROSO-DI-N-PROPYLAMINE	10 U	10 U	10 U	10 U	10 U	10 U
HEXACHLOROETHANE	10 U	10 U	10 U	10 U	10 U	10 U
NITROBENZENE	10 U	10 U	10 U	10 U	10 U	10 U
ISOPHORONE	10 U	10 U	10 U	10 U	10 U	10 U
2-NITROPHENOL	10 U	10 U	10 U	10 U	10 U	10 U
2,4-DIMETHYLPHENOL	10 U	10 U	10 U	10 U	10 U	10 U
BIS(2-CHLOROETHOXY)METHANE	10 U	10 U	10 U	10 U	10 U	10 U
2,4-DICHLOROPHENOL	10 U	10 U	10 U	10 U	10 U	10 U
1,2,4-TRICHLOROBENZENE	10 U	10 U	10 U	10 U	10 U	10 U
NAPHTHALENE	10 U	10 U	10 U	71	10 U	10 U
4-CHLOROANILINE	10 U	10 U	10 U	10 U	10 U	10 U
HEXACHLOROBUTADIENE	10 U	10 U	10 U	10 U	10 U	10 U
4-CHLORO-3-METHYLPHENOL	10 U	10 U	10 U	10 U	10 U	10 U
2-METHYLNAPHTHALENE	10 U	10 U	10 U	4 J	10 U	10 U
HEXACHLOROCYCLOPENTADIENE	10 U	10 U	10 U	10 U	10 U	10 U
2,4,6-TRICHLOROPHENOL	10 U	10 U	10 U	10 U	10 U	10 U
2,4,5-TRICHLOROPHENOL	24 U	24 U	24 U	25 U	26 U	26 U
2-CHLORONAPHTHALENE	10 U	10 U	10 U	10 U	10 U	10 U
2-NITROANILINE	24 U	24 U	24 U	25 U	26 U	26 U
DIMETHYLPHTHALATE	10 U	10 U	10 U	10 U	10 U	10 U
ACENAPHTHYLENE	10 U	10 U	10 U	10 U	10 U	10 U
2,6-DINITROTOLUENE	10 U	10 U	10 U	10 U	10 U	10 U
3-NITROANILINE	24 U	24 U	24 U	25 U	26 U	26 U
ACENAPHTHENE	10 U	10 U	10 U	13	10 U	10 U
2,4-DINITROPHENOL	24 U	24 U	24 U	25 U	26 U	26 U

SITE 44, JONES STREET DUMP
GROUNDWATER - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-GW01-01	44-GW01DW-01	44-GW02-01	44-GW03-01	44-GW04-01	44-GW05-01
DATE SAMPLED	04/09/95	04/09/95	04/10/95	04/10/95	04/08/95	04/09/95
UNITS	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
SEMIVOLATILES cont.						
4-NITROPHENOL	24 U	24 U	24 U	25 U	26 U	26 U
DIBENZOFURAN	10 U	10 U	10 U	6 J	10 U	10 U
2,4-DINITROTOLUENE	10 U	10 U	10 U	10 U	10 U	10 U
DIETHYLPHTHALATE	10 U	10 U	10 U	10 U	10 U	10 U
4-CHLOROPHENYL-PHENYLETHER	10 U	10 U	10 U	10 U	10 U	10 U
FLUORENE	10 U	10 U	10 U	7 J	10 U	10 U
4-NITROANILINE	24 U	24 U	24 U	25 U	26 U	26 U
4,6-DINITRO-2-METHYLPHENOL	24 U	24 U	24 U	25 U	26 U	26 U
N-NITROSODIPHENYLAMINE (1)	10 U	10 U	10 U	10 U	10 U	10 U
4-BROMOPHENYL-PHENYLETHER	10 U	10 U	10 U	10 U	10 U	10 U
HEXACHLOROBENZENE	10 U	10 U	10 U	10 U	10 U	10 U
PENTACHLOROPHENOL	24 U	24 U	24 U	25 U	26 U	26 U
PHENANTHRENE	10 U	10 U	10 U	7 J	10 U	10 U
ANTHRACENE	10 U	10 U	10 U	10 U	10 U	10 U
CARBAZOLE	10 U	10 U	10 U	4 J	10 U	10 U
DI-N-BUTYLPHTHALATE	10 U	10 U	10 U	10 U	10 U	10 U
FLUORANTHENE	10 U	10 U	10 U	10 U	10 U	10 U
PYRENE	10 U	10 U	10 U	10 U	10 U	10 U
BUTYLBENZYLPHTHALATE	10 U	10 U	10 U	10 U	10 U	10 U
3,3'-DICHLOROBENZIDINE	10 U	10 U	10 U	10 U	10 U	10 U
BENZO(A)ANTHRACENE	10 U	10 U	10 U	10 U	10 U	10 U
CHRYSENE	10 U	10 U	10 U	10 U	10 U	10 U
BIS(2-ETHYLHEXYL)PHTHALATE	10 U	10 U	2 J	10 U	10 U	10 U
DI-N-OCTYL PHTHALATE	10 U	10 U	10 U	10 U	10 U	10 U
BENZO(B)FLUORANTHENE	10 U	10 U	10 U	10 U	10 U	10 U
BENZO(K)FLUORANTHENE	10 U	10 U	10 U	10 U	10 U	10 U
BENZO(A)PYRENE	10 U	10 U	10 U	10 U	10 U	10 U
INDENO(1,2,3-CD)PYRENE	10 U	10 U	10 U	10 U	10 U	10 U
DIBENZO(A,H)ANTHRACENE	10 U	10 U	10 U	10 U	10 U	10 U
BENZO(G,H,I)PERYLENE	10 U	10 U	10 U	10 U	10 U	10 U

SITE 44, JONES STREET DUMP
GROUNDWATER - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-GW01-01	44-GW01DW-01	44-GW02-01	44-GW03-01	44-GW04-01	44-GW05-01
DATE SAMPLED	04/09/95	04/09/95	04/10/95	04/10/95	04/08/95	04/09/95
UNITS	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
PESTICIDE/PCBS						
ALPHA-BHC	0.052 UJ	0.048 UJ	0.052 UJ	0.048 UJ	0.05 UJ	0.052 UJ
BETA-BHC	0.052 UJ	0.048 UJ	0.052 UJ	0.048 UJ	0.05 UJ	0.052 UJ
DELTA-BHC	0.052 UJ	0.048 UJ	0.052 UJ	0.048 UJ	0.05 UJ	0.052 UJ
GAMMA-BHC (LINDANE)	0.052 UJ	0.048 UJ	0.052 UJ	0.048 UJ	0.05 UJ	0.052 UJ
HEPTACHLOR	0.052 UJ	0.048 UJ	0.052 UJ	0.048 UJ	0.05 UJ	0.052 UJ
ALDRIN	0.052 UJ	0.048 UJ	0.052 UJ	0.048 UJ	0.05 UJ	0.052 UJ
HEPTACHLOR EPOXIDE	0.052 UJ	0.048 UJ	0.052 UJ	0.048 UJ	0.05 UJ	0.052 UJ
ENDOSULFAN I	0.052 UJ	0.048 UJ	0.052 UJ	0.048 UJ	0.05 UJ	0.052 UJ
DIELDRIN	0.1 UJ	0.097 UJ	0.1 UJ	0.097 UJ	0.1 UJ	0.1 UJ
4,4'-DDE	0.1 UJ	0.097 UJ	0.1 UJ	0.097 UJ	0.1 UJ	0.1 UJ
ENDRIN	0.1 UJ	0.097 UJ	0.1 UJ	0.097 UJ	0.1 UJ	0.1 UJ
ENDOSULFAN II	0.1 UJ	0.097 UJ	0.1 UJ	0.097 UJ	0.1 UJ	0.1 UJ
4,4'-DDD	0.1 UJ	0.097 UJ	0.1 UJ	0.097 UJ	0.1 UJ	0.1 UJ
ENDOSULFAN SULFATE	0.1 UJ	0.097 UJ	0.1 UJ	0.097 UJ	0.1 UJ	0.1 UJ
4,4'-DDT	0.1 UJ	0.097 UJ	0.1 UJ	0.097 UJ	0.1 UJ	0.1 UJ
METHOXYCHLOR	0.52 UJ	0.48 UJ	0.52 UJ	0.48 UJ	0.5 UJ	0.52 UJ
ENDRIN KETONE	0.1 UJ	0.097 UJ	0.1 UJ	0.097 UJ	0.1 UJ	0.1 UJ
ENDRIN ALDEHYDE	0.1 UJ	0.097 UJ	0.1 UJ	0.097 UJ	0.1 UJ	0.1 UJ
ALPHA-CHLORDANE	0.052 UJ	0.048 UJ	0.052 UJ	0.048 UJ	0.05 UJ	0.052 UJ
GAMMA-CHLORDANE	0.052 UJ	0.048 UJ	0.052 UJ	0.048 UJ	0.05 UJ	0.052 UJ
TOXAPHENE	5.2 UJ	4.8 UJ	5.2 UJ	4.8 UJ	5 UJ	5.2 UJ
AROCLOR-1016	NA	NA	1 UJ	NA	1 UJ	1 UJ
AROCLOR-1221	NA	NA	2.1 UJ	NA	2 UJ	2.1 UJ
AROCLOR-1232	NA	NA	1 UJ	NA	1 UJ	1 UJ
AROCLOR-1242	NA	NA	1 UJ	NA	1 UJ	1 UJ
AROCLOR-1248	NA	NA	1 UJ	NA	1 UJ	1 UJ
AROCLOR-1254	NA	NA	1 UJ	NA	1 UJ	1 UJ
AROCLOR-1260	NA	NA	1 UJ	NA	1 UJ	1 UJ

SITE 44, JONES STREET DUMP
GROUNDWATER - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-GW06-01	44-GW06DW-01	44-TW01-01
DATE SAMPLED	04/08/95	04/08/95	04/10/95
UNITS	UG/L	UG/L	UG/L
VOLATILES			
CHLOROMETHANE	10 U	10 U	10 U
BROMOMETHANE	10 U	10 U	10 U
VINYL CHLORIDE	10 U	10 U	10 J
CHLOROETHANE	10 U	10 U	10 U
METHYLENE CHLORIDE	10 U	10 U	10 U
ACETONE	10 U	10 U	10 U
CARBON DISULFIDE	10 U	10 U	10 U
1,1-DICHLOROETHENE	10 U	10 U	10 U
1,1-DICHLOROETHANE	10 U	10 U	10 U
1,2-DICHLOROETHENE (TOTAL)	10 U	10 U	15
CHLOROFORM	10 U	10 U	10 U
1,2-DICHLOROETHANE	10 U	10 U	10 U
2-BUTANONE	10 U	10 U	10 U
1,1,1-TRICHLOROETHANE	10 U	10 U	10 U
CARBON TETRACHLORIDE	10 U	10 U	10 U
BROMODICHLOROMETHANE	10 U	10 U	10 U
1,2-DICHLOROPROPANE	10 U	10 U	10 U
CIS-1,3-DICHLOROPROPENE	10 U	10 U	10 U
TRICHLOROETHENE	10 U	10 U	1 J
DIBROMOCHLOROMETHANE	10 U	10 U	10 U
1,1,2-TRICHLOROETHANE	10 U	10 U	10 U
BENZENE	10 U	10 U	10 U
TRANS-1,3-DICHLOROPROPENE	10 U	10 U	10 U
BROMOFORM	10 U	10 U	10 U
4-METHYL-2-PENTANONE	10 U	10 U	10 U
2-HEXANONE	10 U	10 U	10 U
TETRACHLOROETHENE	10 U	10 U	10 U
1,1,2,2-TETRACHLOROETHANE	10 U	10 U	10 U
TOLUENE	10 U	10 U	10 U
CHLOROBENZENE	10 U	10 U	10 U
ETHYLBENZENE	10 U	10 U	10 U
STYRENE	10 U	10 U	10 U
XYLENE (TOTAL)	10 U	10 U	10 U

SITE 44, JONES STREET DUMP
GROUNDWATER - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-GW06-01	44-GW06DW-01	44-TW01-01
DATE SAMPLED	04/08/95	04/08/95	04/10/95
UNITS	UG/L	UG/L	UG/L
SEMIVOLATILES			
PHENOL	10 U	11 U	10 U
BIS(2-CHLOROETHYL)ETHER	10 U	11 U	10 U
2-CHLOROPHENOL	10 U	11 U	10 U
1,3-DICHLOROBENZENE	10 U	11 U	10 U
1,4-DICHLOROBENZENE	10 U	11 U	10 U
1,2-DICHLOROBENZENE	10 U	11 U	10 U
2-METHYLPHENOL	10 U	11 U	10 U
2,2'-OXYBIS(1-CHLOROPROPANE)	10 U	11 U	10 U
4-METHYLPHENOL	10 U	11 U	10 U
N-NITROSO-DI-N-PROPYLAMINE	10 U	11 U	10 U
HEXACHLOROETHANE	10 U	11 U	10 U
NITROBENZENE	10 U	11 U	10 U
ISOPHORONE	10 U	11 U	10 U
2-NITROPHENOL	10 U	11 U	10 U
2,4-DIMETHYLPHENOL	10 U	11 U	10 U
BIS(2-CHLOROETHOXY)METHANE	10 U	11 U	10 U
2,4-DICHLOROPHENOL	10 U	11 U	10 U
1,2,4-TRICHLOROBENZENE	10 U	11 U	10 U
NAPHTHALENE	10 U	11 U	10 U
4-CHLOROANILINE	10 U	11 U	10 U
HEXACHLOROBUTADIENE	10 U	11 U	10 U
4-CHLORO-3-METHYLPHENOL	10 U	11 U	10 U
2-METHYLNAPHTHALENE	10 U	11 U	10 U
HEXACHLOROCYCLOPENTADIENE	10 U	11 U	10 U
2,4,6-TRICHLOROPHENOL	10 U	11 U	10 U
2,4,5-TRICHLOROPHENOL	26 U	27 U	26 U
2-CHLORONAPHTHALENE	10 U	11 U	10 U
2-NITROANILINE	26 U	27 U	26 U
DIMETHYLPHTHALATE	10 U	11 U	10 U
ACENAPHTHYLENE	10 U	11 U	10 U
2,6-DINITROTOLUENE	10 U	11 U	10 U
3-NITROANILINE	26 U	27 U	26 U
ACENAPHTHENE	10 U	11 U	10 U
2,4-DINITROPHENOL	26 U	27 U	26 U

SITE 44, JONES STREET DUMP
GROUNDWATER - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-GW06-01	44-GW06DW-01	44-TW01-01
DATE SAMPLED	04/08/95	04/08/95	04/10/95
UNITS	UG/L	UG/L	UG/L
SEMIVOLATILES cont.			
4-NITROPHENOL	26 U	27 U	26 U
DIBENZOFURAN	10 U	11 U	10 U
2,4-DINITROTOLUENE	10 U	11 U	10 U
DIETHYLPHTHALATE	10 U	11 U	10 U
4-CHLOROPHENYL-PHENYLETHER	10 U	11 U	10 U
FLUORENE	10 U	11 U	10 U
4-NITROANILINE	26 U	27 U	26 U
4,6-DINITRO-2-METHYLPHENOL	26 U	27 U	26 U
N-NITROSODIPHENYLAMINE (1)	10 U	11 U	10 U
4-BROMOPHENYL-PHENYLETHER	10 U	11 U	10 U
HEXACHLOROBENZENE	10 U	11 U	10 U
PENTACHLOROPHENOL	26 U	27 U	26 U
PHENANTHRENE	10 U	11 U	10 U
ANTHRACENE	10 U	11 U	10 U
CARBAZOLE	10 U	11 U	10 U
DI-N-BUTYLPHTHALATE	10 U	11 U	10 U
FLUORANTHENE	10 U	11 U	10 U
PYRENE	10 U	11 U	10 U
BUTYLBENZYLPHTHALATE	10 U	11 U	10 U
3,3'-DICHLOROBENZIDINE	10 U	11 U	10 U
BENZO(A)ANTHRACENE	10 U	11 U	10 U
CHRYSENE	10 U	11 U	10 U
BIS(2-ETHYLHEXYL)PHTHALATE	10 U	11 U	10 U
DI-N-OCTYL PHTHALATE	10 U	11 U	10 U
BENZO(B)FLUORANTHENE	10 U	11 U	10 U
BENZO(K)FLUORANTHENE	10 U	11 U	10 U
BENZO(A)PYRENE	10 U	11 U	10 U
INDENO(1,2,3-CD)PYRENE	10 U	11 U	10 U
DIBENZO(A,H)ANTHRACENE	10 U	11 U	10 U
BENZO(G,H,I)PERYLENE	10 U	11 U	10 U

SITE 44, JONES STREET DUMP
GROUNDWATER - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-GW06-01	44-GW06DW-01	44-TW01-01
DATE SAMPLED	04/08/95	04/08/95	04/10/95
UNITS	UG/L	UG/L	UG/L
PESTICIDE/PCBS			
ALPHA-BHC	0.054 UJ	0.054 UJ	0.052 UJ
BETA-BHC	0.054 UJ	0.054 UJ	0.052 UJ
DELTA-BHC	0.054 UJ	0.054 UJ	0.052 UJ
GAMMA-BHC (LINDANE)	0.054 UJ	0.054 UJ	0.052 UJ
HEPTACHLOR	0.054 UJ	0.054 UJ	0.052 UJ
ALDRIN	0.054 UJ	0.054 UJ	0.052 UJ
HEPTACHLOR EPOXIDE	0.054 UJ	0.054 UJ	0.052 UJ
ENDOSULFAN I	0.054 UJ	0.054 UJ	0.052 UJ
DIELDRIN	0.11 UJ	0.11 UJ	0.1 UJ
4,4'-DDE	0.11 UJ	0.11 UJ	0.1 UJ
ENDRIN	0.11 UJ	0.11 UJ	0.1 UJ
ENDOSULFAN II	0.11 UJ	0.11 UJ	0.1 UJ
4,4'-DDD	0.11 UJ	0.11 UJ	0.1 UJ
ENDOSULFAN SULFATE	0.11 UJ	0.11 UJ	0.1 UJ
4,4'-DDT	0.11 UJ	0.11 UJ	0.1 UJ
METHOXYCHLOR	0.54 UJ	0.54 UJ	0.52 UJ
ENDRIN KETONE	0.11 UJ	0.11 UJ	0.1 UJ
ENDRIN ALDEHYDE	0.11 UJ	0.11 UJ	0.1 UJ
ALPHA-CHLORDANE	0.054 UJ	0.054 UJ	0.052 UJ
GAMMA-CHLORDANE	0.054 UJ	0.054 UJ	0.052 UJ
TOXAPHENE	5.4 UJ	5.4 UJ	5.2 UJ
AROCLOR-1016	1.1 UJ	1.1 UJ	NA
AROCLOR-1221	2.2 UJ	2.2 UJ	NA
AROCLOR-1232	1.1 UJ	1.1 UJ	NA
AROCLOR-1242	1.1 UJ	1.1 UJ	NA
AROCLOR-1248	1.1 UJ	1.1 UJ	NA
AROCLOR-1254	1.1 UJ	1.1 UJ	NA
AROCLOR-1260	1.1 UJ	1.1 UJ	NA

SITE 44, JONES STREET DUMP
GROUNDWATER - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION DATE SAMPLED UNITS	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
VOLATILES						
CHLOROMETHANE	10 U	10 U	ND	ND		0/9
BROMOMETHANE	10 U	10 U	ND	ND		0/9
VINYL CHLORIDE	10 U	10 U	10 J	10 J	44-TW01-01	1/9
CHLOROETHANE	10 U	10 U	ND	ND		0/9
METHYLENE CHLORIDE	10 U	10 U	ND	ND		0/9
ACETONE	10 U	10 U	ND	ND		0/9
CARBON DISULFIDE	10 U	10 U	ND	ND		0/9
1,1-DICHLOROETHENE	10 U	10 U	ND	ND		0/9
1,1-DICHLOROETHANE	10 U	10 U	ND	ND		0/9
1,2-DICHLOROETHENE (TOTAL)	10 U	10 U	15	15	44-TW01-01	1/9
CHLOROFORM	10 U	10 U	ND	ND		0/9
1,2-DICHLOROETHANE	10 U	10 U	ND	ND		0/9
2-BUTANONE	10 U	10 U	ND	ND		0/9
1,1,1-TRICHLOROETHANE	10 U	10 U	ND	ND		0/9
CARBON TETRACHLORIDE	10 U	10 U	ND	ND		0/9
BROMODICHLOROMETHANE	10 U	10 U	ND	ND		0/9
1,2-DICHLOROPROPANE	10 U	10 U	ND	ND		0/9
CIS-1,3-DICHLOROPROPENE	10 U	10 U	ND	ND		0/9
TRICHLOROETHENE	10 U	10 U	1 J	1 J	44-TW01-01	1/9
DIBROMOCHLOROMETHANE	10 U	10 U	ND	ND		0/9
1,1,2-TRICHLOROETHANE	10 U	10 U	ND	ND		0/9
BENZENE	10 U	10 U	ND	ND		0/9
TRANS-1,3-DICHLOROPROPENE	10 U	10 U	ND	ND		0/9
BROMOFORM	10 U	10 U	ND	ND		0/9
4-METHYL-2-PENTANONE	10 U	10 U	ND	ND		0/9
2-HEXANONE	10 U	10 U	ND	ND		0/9
TETRACHLOROETHENE	10 U	10 U	1 J	1 J	44-GW03-01	1/9
1,1,2,2-TETRACHLOROETHANE	10 U	10 U	ND	ND		0/9
TOLUENE	10 U	10 U	ND	ND		0/9
CHLOROBENZENE	10 U	10 U	ND	ND		0/9
ETHYLBENZENE	10 U	10 U	ND	ND		0/9
STYRENE	10 U	10 U	ND	ND		0/9
XYLENE (TOTAL)	10 U	10 U	ND	ND		0/9

SITE 44, JONES STREET DUMP
GROUNDWATER - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION DATE SAMPLED UNITS	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
SEMIVOLATILES						
PHENOL	10 U	11 U	ND	ND		0/9
BIS(2-CHLOROETHYL)ETHER	10 U	11 U	ND	ND		0/9
2-CHLOROPHENOL	10 U	11 U	ND	ND		0/9
1,3-DICHLOROBENZENE	10 U	11 U	ND	ND		0/9
1,4-DICHLOROBENZENE	10 U	11 U	ND	ND		0/9
1,2-DICHLOROBENZENE	10 U	11 U	ND	ND		0/9
2-METHYLPHENOL	10 U	11 U	ND	ND		0/9
2,2'-OXYBIS(1-CHLOROPROPANE)	10 U	11 U	ND	ND		0/9
4-METHYLPHENOL	10 U	11 U	ND	ND		0/9
N-NITROSO-DI-N-PROPYLAMINE	10 U	11 U	ND	ND		0/9
HEXACHLOROETHANE	10 U	11 U	ND	ND		0/9
NITROBENZENE	10 U	11 U	ND	ND		0/9
ISOPHORONE	10 U	11 U	ND	ND		0/9
2-NITROPHENOL	10 U	11 U	ND	ND		0/9
2,4-DIMETHYLPHENOL	10 U	11 U	ND	ND		0/9
BIS(2-CHLOROETHOXY)METHANE	10 U	11 U	ND	ND		0/9
2,4-DICHLOROPHENOL	10 U	11 U	ND	ND		0/9
1,2,4-TRICHLOROBENZENE	10 U	11 U	ND	ND		0/9
NAPHTHALENE	10 U	11 U	71	71	44-GW03-01	1/9
4-CHLOROANILINE	10 U	11 U	ND	ND		0/9
HEXACHLOROBUTADIENE	10 U	11 U	ND	ND		0/9
4-CHLORO-3-METHYLPHENOL	10 U	11 U	ND	ND		0/9
2-METHYLNAPHTHALENE	10 U	11 U	4 J	4 J	44-GW03-01	1/9
HEXACHLOROCYCLOPENTADIENE	10 U	11 U	ND	ND		0/9
2,4,6-TRICHLOROPHENOL	10 U	11 U	ND	ND		0/9
2,4,5-TRICHLOROPHENOL	24 U	27 U	ND	ND		0/9
2-CHLORONAPHTHALENE	10 U	11 U	ND	ND		0/9
2-NITROANILINE	24 U	27 U	ND	ND		0/9
DIMETHYLPHTHALATE	10 U	11 U	ND	ND		0/9
ACENAPHTHYLENE	10 U	11 U	ND	ND		0/9
2,6-DINITROTOLUENE	10 U	11 U	ND	ND		0/9
3-NITROANILINE	24 U	27 U	ND	ND		0/9
ACENAPHTHENE	10 U	11 U	13	13	44-GW03-01	1/9
2,4-DINITROPHENOL	24 U	27 U	ND	ND		0/9

SITE 44, JONES STREET DUMP
GROUNDWATER - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION DATE SAMPLED UNITS	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
SEMIVOLATILES cont.						
4-NITROPHENOL	24 U	27 U	ND	ND		0/9
DIBENZOFURAN	10 U	11 U	6 J	6 J	44-GW03-01	1/9
2,4-DINITROTOLUENE	10 U	11 U	ND	ND		0/9
DIETHYLPHTHALATE	10 U	11 U	ND	ND		0/9
4-CHLOROPHENYL-PHENYLETHER	10 U	11 U	ND	ND		0/9
FLUORENE	10 U	11 U	7 J	7 J	44-GW03-01	1/9
4-NITROANILINE	24 U	27 U	ND	ND		0/9
4,6-DINITRO-2-METHYLPHENOL	24 U	27 U	ND	ND		0/9
N-NITROSODIPHENYLAMINE (1)	10 U	11 U	ND	ND		0/9
4-BROMOPHENYL-PHENYLETHER	10 U	11 U	ND	ND		0/9
HEXACHLOROBENZENE	10 U	11 U	ND	ND		0/9
PENTACHLOROPHENOL	24 U	27 U	ND	ND		0/9
PHENANTHRENE	10 U	11 U	7 J	7 J	44-GW03-01	1/9
ANTHRACENE	10 U	11 U	ND	ND		0/9
CARBAZOLE	10 U	11 U	4 J	4 J	44-GW03-01	1/9
DI-N-BUTYLPHTHALATE	10 U	11 U	ND	ND		0/9
FLUORANTHENE	10 U	11 U	ND	ND		0/9
PYRENE	10 U	11 U	ND	ND		0/9
BUTYLBENZYLPHTHALATE	10 U	11 U	ND	ND		0/9
3,3'-DICHLOROBENZIDINE	10 U	11 U	ND	ND		0/9
BENZO(A)ANTHRACENE	10 U	11 U	ND	ND		0/9
CHRYSENE	10 U	11 U	ND	ND		0/9
BIS(2-ETHYLHEXYL)PHTHALATE	10 U	11 U	2 J	2 J	44-GW02-01	1/9
DI-N-OCTYL PHTHALATE	10 U	11 U	ND	ND		0/9
BENZO(B)FLUORANTHENE	10 U	11 U	ND	ND		0/9
BENZO(K)FLUORANTHENE	10 U	11 U	ND	ND		0/9
BENZO(A)PYRENE	10 U	11 U	ND	ND		0/9
INDENO(1,2,3-CD)PYRENE	10 U	11 U	ND	ND		0/9
DIBENZO(A,H)ANTHRACENE	10 U	11 U	ND	ND		0/9
BENZO(G,H,I)PERYLENE	10 U	11 U	ND	ND		0/9

SITE 44, JONES STREET DUMP
GROUNDWATER - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION DATE SAMPLED UNITS	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
PESTICIDE/PCBS						
ALPHA-BHC	0.048 UJ	0.054 UJ	ND	ND		0/9
BETA-BHC	0.048 UJ	0.054 UJ	ND	ND		0/9
DELTA-BHC	0.048 UJ	0.054 UJ	ND	ND		0/9
GAMMA-BHC (LINDANE)	0.048 UJ	0.054 UJ	ND	ND		0/9
HEPTACHLOR	0.048 UJ	0.054 UJ	ND	ND		0/9
ALDRIN	0.048 UJ	0.054 UJ	ND	ND		0/9
HEPTACHLOR EPOXIDE	0.048 UJ	0.054 UJ	ND	ND		0/9
ENDOSULFAN I	0.048 UJ	0.054 UJ	ND	ND		0/9
DIELDRIN	0.097 UJ	0.11 UJ	ND	ND		0/9
4,4'-DDE	0.097 UJ	0.11 UJ	ND	ND		0/9
ENDRIN	0.097 UJ	0.11 UJ	ND	ND		0/9
ENDOSULFAN II	0.097 UJ	0.11 UJ	ND	ND		0/9
4,4'-DDD	0.097 UJ	0.11 UJ	ND	ND		0/9
ENDOSULFAN SULFATE	0.097 UJ	0.11 UJ	ND	ND		0/9
4,4'-DDT	0.097 UJ	0.11 UJ	ND	ND		0/9
METHOXYCHLOR	0.48 UJ	0.54 UJ	ND	ND		0/9
ENDRIN KETONE	0.097 UJ	0.11 UJ	ND	ND		0/9
ENDRIN ALDEHYDE	0.097 UJ	0.11 UJ	ND	ND		0/9
ALPHA-CHLORDANE	0.048 UJ	0.054 UJ	ND	ND		0/9
GAMMA-CHLORDANE	0.048 UJ	0.054 UJ	ND	ND		0/9
TOXAPHENE	4.8 UJ	5.4 UJ	ND	ND		0/9
AROCLOR-1016	1 UJ	1.1 UJ	ND	ND		0/5
AROCLOR-1221	2 UJ	2.2 UJ	ND	ND		0/5
AROCLOR-1232	1 UJ	1.1 UJ	ND	ND		0/5
AROCLOR-1242	1 UJ	1.1 UJ	ND	ND		0/5
AROCLOR-1248	1 UJ	1.1 UJ	ND	ND		0/5
AROCLOR-1254	1 UJ	1.1 UJ	ND	ND		0/5
AROCLOR-1260	1 UJ	1.1 UJ	ND	ND		0/5

SITE 44, JONES STREET DUMP
GROUNDWATER - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
INORGANIC ANALYTES

LOCATION	44-GW01-01	44-GW01DW-01	44-GW02-01	44-GW03-01	44-GW04-01	44-GW05-01
DATE SAMPLED	04/09/95	04/09/95	04/10/95	04/10/95	04/08/95	04/09/95
UNITS	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
TOTAL METALS						
ALUMINUM, TOTAL	25.9 U	21.2 U	2820	26.1 U	169 U	147 U
ANTIMONY, TOTAL	20.8 U	20.8 U	20.8 U	12 U	20.8 U	20.8 U
ARSENIC, TOTAL	1.7	1.7 U	1.7 U	1.7 U	2.8	1.7 U
BARIUM, TOTAL	62.5 J	7.4 U	19.3 U	100	56.6 J	15.6 U
BERYLLIUM, TOTAL	0.8 U	0.8 U	0.8 U	0.66 U	0.8 U	0.8 U
CADMIUM, TOTAL	3.7 U	2.2 U	1.9 U	3.9 U	1.9 U	2.4 U
CALCIUM, TOTAL	70000	48200	1290	98300	92600	29900
CHROMIUM, TOTAL	4.1 U	4.1 U	6.9	3.8 U	4.1 U	4.1 U
COBALT, TOTAL	3.4 U	3.4 U	3.4 U	2.6 U	3.5	3.4 U
COPPER, TOTAL	1.8 U	1.8 U	3.8 U	1.8 U	2 U	4.8 U
IRON, TOTAL	65500	285	3160	42000	72900	1400
LEAD, TOTAL	0.6 U	0.6 U	1.4	0.8 U	0.6 U	0.6 U
MAGNESIUM, TOTAL	8720	4370	880	11900	7510	2410
MANGANESE, TOTAL	192	60.6	12.6 U	217	241	65.2
MERCURY, TOTAL	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
NICKEL, TOTAL	10.9 U	10.9 U	10.9 U	5.4 U	10.9 U	10.9 U
POTASSIUM, TOTAL	2930	5850	2840	8160	2620	2480
SELENIUM, TOTAL	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	2
SILVER, TOTAL	2.8 U	2.8 U	3.1 U	1.9 U	2.8 U	2.8 U
SODIUM, TOTAL	5370	74100	4890	7220	5260	6260
THALLIUM, TOTAL	1.4 UJ	1.4 U	1.4 UJ	0.7 U	1.4 UJ	1.4 U
VANADIUM, TOTAL	2 U	2.2 U	6.6 U	1.5 U	2 U	2 U
ZINC, TOTAL	6 U	6 U	7	2.2 U	16.4	6.8

SITE 44, JONES STREET DUMP
GROUNDWATER - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
INORGANIC ANALYTES

LOCATION	44-GW06-01	44-GW06DW-01	44-TW01-01
DATE SAMPLED	04/08/95	04/08/95	04/10/95
UNITS	UG/L	UG/L	UG/L
TOTAL METALS			
ALUMINUM, TOTAL	374	21.2 U	668
ANTIMONY, TOTAL	20.8 U	20.8 U	20.8 U
ARSENIC, TOTAL	1.7 U	1.7 U	1.7 U
BARIUM, TOTAL	49.9 J	4.4 U	30.8 J
BERYLLIUM, TOTAL	0.8 U	0.8 U	0.8 U
CADMIUM, TOTAL	1.9 U	1.9 U	1.9 U
CALCIUM, TOTAL	23300	57000	44500
CHROMIUM, TOTAL	4.1 U	4.1 U	4.1 U
COBALT, TOTAL	3.4 U	3.4 U	3.4 U
COPPER, TOTAL	3.1 U	1.8 U	1.8 U
IRON, TOTAL	1100	743	1060
LEAD, TOTAL	0.6 U	0.6 U	1.3
MAGNESIUM, TOTAL	3140	4060	2510
MANGANESE, TOTAL	44.5	32.7	21.6
MERCURY, TOTAL	0.2 U	0.2 U	0.2 U
NICKEL, TOTAL	10.9 U	10.9 U	10.9 U
POTASSIUM, TOTAL	1340	6590	1790
SELENIUM, TOTAL	1.8 U	1.8 U	1.8 U
SILVER, TOTAL	2.8 U	2.8 U	2.8 U
SODIUM, TOTAL	14700	49100	21800
THALLIUM, TOTAL	1.4 U	1.4 U	1.4 U
VANADIUM, TOTAL	2.9 U	2 U	3.2 U
ZINC, TOTAL	11.7	6 U	6 U

SITE 44, JONES STREET DUMP
GROUNDWATER - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
INORGANIC ANALYTES

LOCATION DATE SAMPLED UNITS	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
TOTAL METALS						
ALUMINUM, TOTAL	21.2 U	169 U	374	2820	44-GW02-01	3/9
ANTIMONY, TOTAL	12 U	20.8 U	ND	ND		0/9
ARSENIC, TOTAL	1.7 U	1.7 U	1.7	2.8	44-GW04-01	2/9
BARIUM, TOTAL	4.4 U	19.3 U	30.8 J	100	44-GW03-01	5/9
BERYLLIUM, TOTAL	0.66 U	0.8 U	ND	ND		0/9
CADMIUM, TOTAL	1.9 U	3.9 U	ND	ND		0/9
CALCIUM, TOTAL	NA	NA	1290	98300	44-GW03-01	9/9
CHROMIUM, TOTAL	3.8 U	4.1 U	6.9	6.9	44-GW02-01	1/9
COBALT, TOTAL	2.6 U	3.4 U	3.5	3.5	44-GW04-01	1/9
COPPER, TOTAL	1.8 U	4.8 U	ND	ND		0/9
IRON, TOTAL	NA	NA	285	72900	44-GW04-01	9/9
LEAD, TOTAL	0.6 U	0.8 U	1.3	1.4	44-GW02-01	2/9
MAGNESIUM, TOTAL	NA	NA	880	11900	44-GW03-01	9/9
MANGANESE, TOTAL	12.6 U	12.6 U	21.6	241	44-GW04-01	8/9
MERCURY, TOTAL	0.2 U	0.2 U	ND	ND		0/9
NICKEL, TOTAL	5.4 U	10.9 U	ND	ND		0/9
POTASSIUM, TOTAL	NA	NA	1340	8160	44-GW03-01	9/9
SELENIUM, TOTAL	1.8 U	1.8 U	2	2	44-GW05-01	1/9
SILVER, TOTAL	1.9 U	3.1 U	ND	ND		0/9
SODIUM, TOTAL	NA	NA	4890	74100	44-GW01DW-01	9/9
THALLIUM, TOTAL	0.7 U	1.4 UJ	ND	ND		0/9
VANADIUM, TOTAL	1.5 U	6.6 U	ND	ND		0/9
ZINC, TOTAL	2.2 U	6 U	6.8	16.4	44-GW04-01	4/9

SITE 44, JONES STREET DUMP
GROUNDWATER - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
DISSOLVED INORGANIC ANALYTES

LOCATION	44-GW01D-01	
DATE SAMPLED	04/09/95	
UNITS	UG/L	
DISSOLVED METALS		
ALUMINUM, SOLUBLE	21.2	U
ANTIMONY, SOLUBLE	20.8	U
ARSENIC, SOLUBLE	1.7	U
BARIUM, SOLUBLE	64.9	J
BERYLLIUM, SOLUBLE	0.8	U
CADMIUM, SOLUBLE	2.8	U
CALCIUM, SOLUBLE	74000	
CHROMIUM, SOLUBLE	4.1	U
COBALT, SOLUBLE	3.4	U
COPPER, SOLUBLE	1.8	U
IRON, SOLUBLE	68400	
LEAD, SOLUBLE	0.6	U
MAGNESIUM, SOLUBLE	8980	
MANGANESE, SOLUBLE	198	
MERCURY, SOLUBLE	0.2	U
NICKEL, SOLUBLE	10.9	U
POTASSIUM, SOLUBLE	3170	
SELENIUM, SOLUBLE	1.8	U
SILVER, SOLUBLE	2.8	U
SODIUM, SOLUBLE	5460	
THALLIUM, SOLUBLE	1.4	UJ
VANADIUM, SOLUBLE	2	U
ZINC, SOLUBLE	6	U

SITE 44, JONES STREET DUMP
GROUNDWATER - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
DISSOLVED INORGANIC ANALYTES

LOCATION DATE SAMPLED UNITS	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
DISSOLVED METALS						
ALUMINUM, SOLUBLE	21.2 U	21.2 U	ND	ND		0/1
ANTIMONY, SOLUBLE	20.8 U	20.8 U	ND	ND		0/1
ARSENIC, SOLUBLE	1.7 U	1.7 U	ND	ND		0/1
BARIUM, SOLUBLE	NA	NA	64.9 J	64.9 J	44-GW01D-01	1/1
BERYLLIUM, SOLUBLE	0.8 U	0.8 U	ND	ND		0/1
CADMIUM, SOLUBLE	2.8 U	2.8 U	ND	ND		0/1
CALCIUM, SOLUBLE	NA	NA	74000	74000	44-GW01D-01	1/1
CHROMIUM, SOLUBLE	4.1 U	4.1 U	ND	ND		0/1
COBALT, SOLUBLE	3.4 U	3.4 U	ND	ND		0/1
COPPER, SOLUBLE	1.8 U	1.8 U	ND	ND		0/1
IRON, SOLUBLE	NA	NA	68400	68400	44-GW01D-01	1/1
LEAD, SOLUBLE	0.6 U	0.6 U	ND	ND		0/1
MAGNESIUM, SOLUBLE	NA	NA	8980	8980	44-GW01D-01	1/1
MANGANESE, SOLUBLE	NA	NA	198	198	44-GW01D-01	1/1
MERCURY, SOLUBLE	0.2 U	0.2 U	ND	ND		0/1
NICKEL, SOLUBLE	10.9 U	10.9 U	ND	ND		0/1
POTASSIUM, SOLUBLE	NA	NA	3170	3170	44-GW01D-01	1/1
SELENIUM, SOLUBLE	1.8 U	1.8 U	ND	ND		0/1
SILVER, SOLUBLE	2.8 U	2.8 U	ND	ND		0/1
SODIUM, SOLUBLE	NA	NA	5460	5460	44-GW01D-01	1/1
THALLIUM, SOLUBLE	1.4 UJ	1.4 UJ	ND	ND		0/1
VANADIUM, SOLUBLE	2 U	2 U	ND	ND		0/1
ZINC, SOLUBLE	6 U	6 U	ND	ND		0/1

SURFACE WATER

SITE 44, JONES STREET DUMP
SURFACE WATER - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-EC-SW01	44-EC-SW01-02	44-EC-SW02	44-EC-SW02-02	44-EC-SW03	44-EC-SW03-02
DATE SAMPLED	05/03/95	09/28/95	05/03/95	09/28/95	05/03/95	09/28/95
UNITS	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
VOLATILES						
CHLOROMETHANE	10 U	10 U	10 U	10 U	10 U	10 U
BROMOMETHANE	10 U	10 U	10 U	10 U	10 U	10 U
VINYL CHLORIDE	24	16	15	7 J	8 J	10 U
CHLOROETHANE	10 U	10 U	10 U	10 U	10 U	10 U
METHYLENE CHLORIDE	10 U	10 U	10 U	10 U	10 U	10 U
ACETONE	13	10 U	10 U	10 U	10 U	10 U
CARBON DISULFIDE	10 U	10 U	10 U	10 U	10 U	10 U
1,1-DICHLOROETHENE	10 U	1 J	10 U	10 U	10 U	10 U
1,1-DICHLOROETHANE	10 U	10 U	10 U	10 U	10 U	10 U
1,2-DICHLOROETHENE (TOTAL)	150	93 J	100	51 J	59	42 J
CHLOROFORM	10 U	10 U	10 U	10 U	10 U	10 U
1,2-DICHLOROETHANE	10 U	10 U	10 U	10 U	10 U	10 U
2-BUTANONE	10 U	10 U	10 U	10 U	10 U	10 U
1,1,1-TRICHLOROETHANE	10 U	10 U	10 U	10 U	10 U	10 U
CARBON TETRACHLORIDE	10 U	10 U	10 U	10 U	10 U	10 U
BROMODICHLOROMETHANE	10 U	10 U	10 U	10 U	10 U	10 U
1,2-DICHLOROPROPANE	10 U	10 U	10 U	10 U	10 U	10 U
CIS-1,3-DICHLOROPROPENE	10 U	10 U	10 U	10 U	10 U	10 U
TRICHLOROETHENE	66	22	54	11	34	10
DIBROMOCHLOROMETHANE	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2-TRICHLOROETHANE	10 U	10 U	10 U	10 U	10 U	10 U
BENZENE	10 U	10 U	10 U	10 U	10 U	10 U
TRANS-1,3-DICHLOROPROPENE	10 U	10 U	10 U	10 U	10 U	10 U
BROMOFORM	10 U	10 U	10 U	10 U	10 U	10 U
4-METHYL-2-PENTANONE	10 U	10 U	10 U	10 U	10 U	10 U
2-HEXANONE	10 U	10 U	10 U	10 U	10 U	10 U
TETRACHLOROETHENE	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2,2-TETRACHLOROETHANE	32	26	32	19	34	16
TOLUENE	10 U	10 U	10 U	10 U	10 U	10 U
CHLOROBENZENE	10 U	10 U	10 U	10 U	10 U	10 U
ETHYLBENZENE	10 U	10 U	10 U	10 U	10 U	10 U
STYRENE	10 U	10 U	10 U	10 U	10 U	10 U
XYLENE (TOTAL)	10 U	10 U	10 U	10 U	10 U	10 U

SITE 44, JONES STREET DUMP
SURFACE WATER - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-EC-SW01	44-EC-SW01-02	44-EC-SW02	44-EC-SW02-02	44-EC-SW03	44-EC-SW03-02
DATE SAMPLED	05/03/95	09/28/95	05/03/95	09/28/95	05/03/95	09/28/95
UNITS	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
SEMIVOLATILES						
PHENOL	11 U	NA	10 U	NA	10 U	NA
BIS(2-CHLOROETHYL)ETHER	11 U	NA	10 U	NA	10 U	NA
2-CHLOROPHENOL	11 U	NA	10 U	NA	10 U	NA
1,3-DICHLOROBENZENE	11 U	NA	10 U	NA	10 U	NA
1,4-DICHLOROBENZENE	11 U	NA	10 U	NA	10 U	NA
1,2-DICHLOROBENZENE	11 U	NA	10 U	NA	10 U	NA
2-METHYLPHENOL	11 U	NA	10 U	NA	10 U	NA
2,2'-OXYBIS(1-CHLOROPROPANE)	11 U	NA	10 U	NA	10 U	NA
4-METHYLPHENOL	11 U	NA	10 U	NA	10 U	NA
N-NITROSO-DI-N-PROPYLAMINE	11 U	NA	10 U	NA	10 U	NA
HEXACHLOROETHANE	11 U	NA	10 U	NA	10 U	NA
NITROBENZENE	11 U	NA	10 U	NA	10 U	NA
ISOPHORONE	11 U	NA	10 U	NA	10 U	NA
2-NITROPHENOL	11 U	NA	10 U	NA	10 U	NA
2,4-DIMETHYLPHENOL	11 U	NA	10 U	NA	10 U	NA
BIS(2-CHLOROETHOXY)METHANE	11 U	NA	10 U	NA	10 U	NA
2,4-DICHLOROPHENOL	11 U	NA	10 U	NA	10 U	NA
1,2,4-TRICHLOROBENZENE	11 U	NA	10 U	NA	10 U	NA
NAPHTHALENE	11 U	NA	10 U	NA	10 U	NA
4-CHLOROANILINE	11 U	NA	10 U	NA	10 U	NA
HEXACHLOROBUTADIENE	11 U	NA	10 U	NA	10 U	NA
4-CHLORO-3-METHYLPHENOL	11 U	NA	10 U	NA	10 U	NA
2-METHYLNAPHTHALENE	11 U	NA	10 U	NA	10 U	NA
HEXACHLOROCYCLOPENTADIENE	11 U	NA	10 U	NA	10 U	NA
2,4,6-TRICHLOROPHENOL	11 U	NA	10 U	NA	10 U	NA
2,4,5-TRICHLOROPHENOL	28 U	NA	26 U	NA	24 U	NA
2-CHLORONAPHTHALENE	11 U	NA	10 U	NA	10 U	NA
2-NITROANILINE	28 U	NA	26 U	NA	24 U	NA
DIMETHYLPHTHALATE	11 U	NA	10 U	NA	10 U	NA
ACENAPHTHYLENE	11 U	NA	10 U	NA	10 U	NA
2,6-DINITROTOLUENE	11 U	NA	10 U	NA	10 U	NA
3-NITROANILINE	28 U	NA	26 U	NA	24 U	NA
ACENAPHTHENE	11 U	NA	10 U	NA	10 U	NA
2,4-DINITROPHENOL	28 U	NA	26 U	NA	24 U	NA

SITE 44, JONES STREET DUMP
SURFACE WATER - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-EC-SW01	44-EC-SW01-02	44-EC-SW02	44-EC-SW02-02	44-EC-SW03	44-EC-SW03-02
DATE SAMPLED	05/03/95	09/28/95	05/03/95	09/28/95	05/03/95	09/28/95
UNITS	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
SEMIVOLATILES cont.						
4-NITROPHENOL	28 U	NA	26 U	NA	24 U	NA
DIBENZOFURAN	11 U	NA	10 U	NA	10 U	NA
2,4-DINITROTOLUENE	11 U	NA	10 U	NA	10 U	NA
DIETHYLPHTHALATE	11 U	NA	10 U	NA	10 U	NA
4-CHLOROPHENYL-PHENYLETHER	11 U	NA	10 U	NA	10 U	NA
FLUORENE	11 U	NA	10 U	NA	10 U	NA
4-NITROANILINE	28 U	NA	26 U	NA	24 U	NA
4,6-DINITRO-2-METHYLPHENOL	28 U	NA	26 U	NA	24 U	NA
N-NITROSODIPHENYLAMINE (1)	11 U	NA	10 U	NA	10 U	NA
4-BROMOPHENYL-PHENYLETHER	11 U	NA	10 U	NA	10 U	NA
HEXACHLOROBENZENE	11 U	NA	10 U	NA	10 U	NA
PENTACHLOROPHENOL	28 U	NA	26 U	NA	24 U	NA
PHENANTHRENE	11 U	NA	10 U	NA	10 U	NA
ANTHRACENE	11 U	NA	10 U	NA	10 U	NA
CARBAZOLE	11 U	NA	10 U	NA	10 U	NA
DI-N-BUTYLPHTHALATE	11 U	NA	10 U	NA	10 U	NA
FLUORANTHENE	11 U	NA	10 U	NA	10 U	NA
PYRENE	11 U	NA	10 U	NA	10 U	NA
BUTYLBENZYLPHTHALATE	11 U	NA	10 U	NA	10 U	NA
3,3'-DICHLOROBENZIDINE	11 U	NA	10 U	NA	10 U	NA
BENZO(A)ANTHRACENE	11 U	NA	10 U	NA	10 U	NA
CHRYSENE	11 U	NA	10 U	NA	10 U	NA
BIS(2-ETHYLHEXYL)PHTHALATE	1 J	NA	10 U	NA	1 J	NA
DI-N-OCTYL PHTHALATE	11 U	NA	10 U	NA	10 U	NA
BENZO(B)FLUORANTHENE	11 U	NA	10 U	NA	10 U	NA
BENZO(K)FLUORANTHENE	11 U	NA	10 U	NA	10 U	NA
BENZO(A)PYRENE	11 U	NA	10 U	NA	10 U	NA
INDENO(1,2,3-CD)PYRENE	11 U	NA	10 U	NA	10 U	NA
DIBENZO(A,H)ANTHRACENE	11 U	NA	10 U	NA	10 U	NA
BENZO(G,H,I)PERYLENE	11 U	NA	10 U	NA	10 U	NA

SITE 44, JONES STREET DUMP
SURFACE WATER - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-EC-SW01	44-EC-SW01-02	44-EC-SW02	44-EC-SW02-02	44-EC-SW03	44-EC-SW03-02
DATE SAMPLED	05/03/95	09/28/95	05/03/95	09/28/95	05/03/95	09/28/95
UNITS	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
PESTICIDE/PCBS						
ALPHA-BHC	0.048 U	NA	0.052 UJ	NA	0.047 U	NA
BETA-BHC	0.048 U	NA	0.052 UJ	NA	0.047 U	NA
DELTA-BHC	0.048 U	NA	0.052 UJ	NA	0.047 U	NA
GAMMA-BHC (LINDANE)	0.048 U	NA	0.052 UJ	NA	0.047 U	NA
HEPTACHLOR	0.048 U	NA	0.052 UJ	NA	0.047 U	NA
ALDRIN	0.048 U	NA	0.052 UJ	NA	0.047 U	NA
HEPTACHLOR EPOXIDE	0.048 U	NA	0.052 UJ	NA	0.047 U	NA
ENDOSULFAN I	0.048 U	NA	0.052 UJ	NA	0.047 U	NA
DIELDRIN	0.095 U	NA	0.1 UJ	NA	0.094 U	NA
4,4'-DDE	0.095 U	NA	0.1 UJ	NA	0.094 U	NA
ENDRIN	0.095 U	NA	0.1 UJ	NA	0.094 U	NA
ENDOSULFAN II	0.095 U	NA	0.1 UJ	NA	0.094 U	NA
4,4'-DDD	0.095 U	NA	0.1 UJ	NA	0.094 U	NA
ENDOSULFAN SULFATE	0.095 U	NA	0.1 UJ	NA	0.094 U	NA
4,4'-DDT	0.095 U	NA	0.1 UJ	NA	0.094 U	NA
METHOXYCHLOR	0.48 U	NA	0.52 UJ	NA	0.47 U	NA
ENDRIN KETONE	0.095 U	NA	0.1 UJ	NA	0.094 U	NA
ENDRIN ALDEHYDE	0.095 U	NA	0.1 UJ	NA	0.094 U	NA
ALPHA-CHLORDANE	0.048 U	NA	0.052 UJ	NA	0.047 U	NA
GAMMA-CHLORDANE	0.048 U	NA	0.052 UJ	NA	0.047 U	NA
TOXAPHENE	4.8 U	NA	5.2 UJ	NA	4.7 U	NA
AROCLOR-1016	0.95 U	NA	1 UJ	NA	0.94 U	NA
AROCLOR-1221	1.9 U	NA	2.1 UJ	NA	1.9 U	NA
AROCLOR-1232	0.95 U	NA	1 UJ	NA	0.94 U	NA
AROCLOR-1242	0.95 U	NA	1 UJ	NA	0.94 U	NA
AROCLOR-1248	0.95 U	NA	1 UJ	NA	0.94 U	NA
AROCLOR-1254	0.95 U	NA	1 UJ	NA	0.94 U	NA
AROCLOR-1260	0.95 U	NA	1 UJ	NA	0.94 U	NA

SITE 44, JONES STREET DUMP
SURFACE WATER - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-EC-SW04	44-EC-SW04-02	44-EC-SW05	44-EC-SW06-01	44-EC-SW07-01	44-EC-SW08-01
DATE SAMPLED	05/03/95	09/28/95	05/03/95	09/28/95	09/28/95	09/28/95
UNITS	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
VOLATILES						
CHLOROMETHANE	10 U	10 U	10 U	10 U	10 U	10 U
BROMOMETHANE	10 U	10 U	10 U	10 U	10 U	10 U
VINYL CHLORIDE	10 U	10 U	10 U	25	15	38
CHLOROETHANE	10 U	10 U	10 U	10 U	10 U	10 U
METHYLENE CHLORIDE	10 U	10 U	10 U	10 U	10 U	10 U
ACETONE	10 U	10 U	10	10 U	10 U	10 U
CARBON DISULFIDE	10 U	10 U	10 U	10 U	10 U	10 U
1,1-DICHLOROETHENE	10 U	10 U	10 U	2 J	10 U	1 J
1,1-DICHLOROETHANE	10 U	10 U	10 U	10 U	10 U	10 U
1,2-DICHLOROETHENE (TOTAL)	24	21 J	18	110 J	68 J	120 J
CHLOROFORM	10 U	10 U	10 U	10 U	10 U	10 U
1,2-DICHLOROETHANE	10 U	10 U	10 U	10 U	10 U	10 U
2-BUTANONE	10 U	10 U	10 U	10 U	10 U	10 U
1,1,1-TRICHLOROETHANE	10 U	10 U	10 U	10 U	10 U	10 U
CARBON TETRACHLORIDE	10 U	10 U	10 U	10 U	10 U	10 U
BROMODICHLOROMETHANE	10 U	10 U	10 U	10 U	10 U	10 U
1,2-DICHLOROPROPANE	10 U	10 U	10 U	10 U	10 U	10 U
CIS-1,3-DICHLOROPROPENE	10 U	10 U	10 U	10 U	10 U	10 U
TRICHLOROETHENE	12	5 J	7 J	22	4 J	7 J
DIBROMOCHLOROMETHANE	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2-TRICHLOROETHANE	10 U	10 U	10 U	10 U	10 U	1 J
BENZENE	10 U	10 U	10 U	10 U	10 U	10 U
TRANS-1,3-DICHLOROPROPENE	10 U	10 U	10 U	10 U	10 U	10 U
BROMOFORM	10 U	10 U	10 U	10 U	10 U	10 U
4-METHYL-2-PENTANONE	10 U	10 U	10 U	10 U	10 U	10 U
2-HEXANONE	10 U	10 U	10 U	10 U	10 U	10 U
TETRACHLOROETHENE	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2,2-TETRACHLOROETHANE	7 J	8 J	5 J	32	32	42
TOLUENE	10 U	10 U	10 U	10 U	10 U	10 U
CHLOROBENZENE	10 U	10 U	10 U	10 U	10 U	10 U
ETHYLBENZENE	10 U	10 U	10 U	10 U	10 U	10 U
STYRENE	10 U	10 U	10 U	10 U	10 U	10 U
XYLENE (TOTAL)	10 U	10 U	10 U	10 U	10 U	10 U

SITE 44, JONES STREET DUMP
SURFACE WATER - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-EC-SW04	44-EC-SW04-02	44-EC-SW05	44-EC-SW06-01	44-EC-SW07-01	44-EC-SW08-01
DATE SAMPLED	05/03/95	09/28/95	05/03/95	09/28/95	09/28/95	09/28/95
UNITS	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
SEMIVOLATILES						
PHENOL	10 U	NA	10 U	NA	NA	NA
BIS(2-CHLOROETHYL)ETHER	10 U	NA	10 U	NA	NA	NA
2-CHLOROPHENOL	10 U	NA	10 U	NA	NA	NA
1,3-DICHLOROBENZENE	10 U	NA	10 U	NA	NA	NA
1,4-DICHLOROBENZENE	10 U	NA	10 U	NA	NA	NA
1,2-DICHLOROBENZENE	10 U	NA	10 U	NA	NA	NA
2-METHYLPHENOL	10 U	NA	10 U	NA	NA	NA
2,2'-OXYBIS(1-CHLOROPROPANE)	10 U	NA	10 U	NA	NA	NA
4-METHYLPHENOL	10 U	NA	10 U	NA	NA	NA
N-NITROSO-DI-N-PROPYLAMINE	10 U	NA	10 U	NA	NA	NA
HEXACHLOROETHANE	10 U	NA	10 U	NA	NA	NA
NITROBENZENE	10 U	NA	10 U	NA	NA	NA
ISOPHORONE	10 U	NA	10 U	NA	NA	NA
2-NITROPHENOL	10 U	NA	10 U	NA	NA	NA
2,4-DIMETHYLPHENOL	10 U	NA	10 U	NA	NA	NA
BIS(2-CHLOROETHOXY)METHANE	10 U	NA	10 U	NA	NA	NA
2,4-DICHLOROPHENOL	10 U	NA	10 U	NA	NA	NA
1,2,4-TRICHLOROBENZENE	10 U	NA	10 U	NA	NA	NA
NAPHTHALENE	10 U	NA	10 U	NA	NA	NA
4-CHLOROANILINE	10 U	NA	10 U	NA	NA	NA
HEXACHLOROBUTADIENE	10 U	NA	10 U	NA	NA	NA
4-CHLORO-3-METHYLPHENOL	10 U	NA	10 U	NA	NA	NA
2-METHYLNAPHTHALENE	10 U	NA	10 U	NA	NA	NA
HEXACHLOROCYCLOPENTADIENE	10 U	NA	10 U	NA	NA	NA
2,4,6-TRICHLOROPHENOL	10 U	NA	10 U	NA	NA	NA
2,4,5-TRICHLOROPHENOL	24 U	NA	25 U	NA	NA	NA
2-CHLORONAPHTHALENE	10 U	NA	10 U	NA	NA	NA
2-NITROANILINE	24 U	NA	25 U	NA	NA	NA
DIMETHYLPHTHALATE	10 U	NA	10 U	NA	NA	NA
ACENAPHTHYLENE	10 U	NA	10 U	NA	NA	NA
2,6-DINITROTOLUENE	10 U	NA	10 U	NA	NA	NA
3-NITROANILINE	24 U	NA	25 U	NA	NA	NA
ACENAPHTHENE	10 U	NA	10 U	NA	NA	NA
2,4-DINITROPHENOL	24 U	NA	25 U	NA	NA	NA

SITE 44, JONES STREET DUMP
SURFACE WATER - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-EC-SW04	44-EC-SW04-02	44-EC-SW05	44-EC-SW06-01	44-EC-SW07-01	44-EC-SW08-01
DATE SAMPLED	05/03/95	09/28/95	05/03/95	09/28/95	09/28/95	09/28/95
UNITS	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
SEMIVOLATILES cont.						
4-NITROPHENOL	24 U	NA	25 U	NA	NA	NA
DIBENZOFURAN	10 U	NA	10 U	NA	NA	NA
2,4-DINITROTOLUENE	10 U	NA	10 U	NA	NA	NA
DIETHYLPHTHALATE	10 U	NA	10 U	NA	NA	NA
4-CHLOROPHENYL-PHENYLETHER	10 U	NA	10 U	NA	NA	NA
FLUORENE	10 U	NA	10 U	NA	NA	NA
4-NITROANILINE	24 U	NA	25 U	NA	NA	NA
4,6-DINITRO-2-METHYLPHENOL	24 U	NA	25 U	NA	NA	NA
N-NITROSODIPHENYLAMINE (1)	10 U	NA	10 U	NA	NA	NA
4-BROMOPHENYL-PHENYLETHER	10 U	NA	10 U	NA	NA	NA
HEXACHLOROBENZENE	10 U	NA	10 U	NA	NA	NA
PENTACHLOROPHENOL	24 U	NA	25 U	NA	NA	NA
PHENANTHRENE	10 U	NA	10 U	NA	NA	NA
ANTHRACENE	10 U	NA	10 U	NA	NA	NA
CARBAZOLE	10 U	NA	10 U	NA	NA	NA
DI-N-BUTYLPHTHALATE	10 U	NA	10 U	NA	NA	NA
FLUORANTHENE	10 U	NA	10 U	NA	NA	NA
PYRENE	10 U	NA	10 U	NA	NA	NA
BUTYLBENZYLPHTHALATE	10 U	NA	10 U	NA	NA	NA
3,3'-DICHLOROBENZIDINE	10 U	NA	10 U	NA	NA	NA
BENZO(A)ANTHRACENE	10 U	NA	10 U	NA	NA	NA
CHRYSENE	10 U	NA	10 U	NA	NA	NA
BIS(2-ETHYLHEXYL)PHTHALATE	1 J	NA	3 J	NA	NA	NA
DI-N-OCTYL PHTHALATE	10 U	NA	10 U	NA	NA	NA
BENZO(B)FLUORANTHENE	10 U	NA	10 U	NA	NA	NA
BENZO(K)FLUORANTHENE	10 U	NA	10 U	NA	NA	NA
BENZO(A)PYRENE	10 U	NA	10 U	NA	NA	NA
INDENO(1,2,3-CD)PYRENE	10 U	NA	10 U	NA	NA	NA
DIBENZO(A,H)ANTHRACENE	10 U	NA	10 U	NA	NA	NA
BENZO(G,H,I)PERYLENE	10 U	NA	10 U	NA	NA	NA

SITE 44, JONES STREET DUMP
SURFACE WATER - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-EC-SW04	44-EC-SW04-02	44-EC-SW05	44-EC-SW06-01	44-EC-SW07-01	44-EC-SW08-01
DATE SAMPLED	05/03/95	09/28/95	05/03/95	09/28/95	09/28/95	09/28/95
UNITS	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
PESTICIDE/PCBS						
ALPHA-BHC	0.054 U	NA	0.05 U	NA	NA	NA
BETA-BHC	0.054 U	NA	0.05 U	NA	NA	NA
DELTA-BHC	0.054 U	NA	0.05 U	NA	NA	NA
GAMMA-BHC (LINDANE)	0.054 U	NA	0.05 U	NA	NA	NA
HEPTACHLOR	0.054 U	NA	0.05 U	NA	NA	NA
ALDRIN	0.054 U	NA	0.05 U	NA	NA	NA
HEPTACHLOR EPOXIDE	0.054 U	NA	0.05 U	NA	NA	NA
ENDOSULFAN I	0.054 U	NA	0.05 U	NA	NA	NA
DIELDRIN	0.11 U	NA	0.1 U	NA	NA	NA
4,4'-DDE	0.11 U	NA	0.1 U	NA	NA	NA
ENDRIN	0.11 U	NA	0.1 U	NA	NA	NA
ENDOSULFAN II	0.11 U	NA	0.1 U	NA	NA	NA
4,4'-DDD	0.11 U	NA	0.1 U	NA	NA	NA
ENDOSULFAN SULFATE	0.11 U	NA	0.1 U	NA	NA	NA
4,4'-DDT	0.11 U	NA	0.1 U	NA	NA	NA
METHOXYCHLOR	0.54 U	NA	0.5 U	NA	NA	NA
ENDRIN KETONE	0.11 U	NA	0.1 U	NA	NA	NA
ENDRIN ALDEHYDE	0.11 U	NA	0.1 U	NA	NA	NA
ALPHA-CHLORDANE	0.054 U	NA	0.05 U	NA	NA	NA
GAMMA-CHLORDANE	0.054 U	NA	0.05 U	NA	NA	NA
TOXAPHENE	5.4 U	NA	5 U	NA	NA	NA
AROCLOR-1016	1.1 U	NA	1 U	NA	NA	NA
AROCLOR-1221	2.2 U	NA	2 U	NA	NA	NA
AROCLOR-1232	1.1 U	NA	1 U	NA	NA	NA
AROCLOR-1242	1.1 U	NA	1 U	NA	NA	NA
AROCLOR-1248	1.1 U	NA	1 U	NA	NA	NA
AROCLOR-1254	1.1 U	NA	1 U	NA	NA	NA
AROCLOR-1260	1.1 U	NA	1 U	NA	NA	NA

SITE 44, JONES STREET DUMP
SURFACE WATER - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-EC-SW09-01	44-UT-SW01	44-UT-SW02	44-UT-SW03
DATE SAMPLED	09/28/95	05/03/95	05/03/95	05/03/95
UNITS	UG/L	UG/L	UG/L	UG/L
VOLATILES				
CHLOROMETHANE	10 U	10 U	10 U	10 U
BROMOMETHANE	10 U	10 U	10 U	10 U
VINYL CHLORIDE	10 U	10 U	10 U	10 U
CHLOROETHANE	10 U	10 U	10 U	10 U
METHYLENE CHLORIDE	10 U	10 U	10 U	10 U
ACETONE	10 U	10 U	10 U	11
CARBON DISULFIDE	10 U	10 U	10 U	10 U
1,1-DICHLOROETHENE	10 U	10 U	10 U	10 U
1,1-DICHLOROETHANE	10 U	10 U	10 U	10 U
1,2-DICHLOROETHENE (TOTAL)	2 J	10 U	10 U	5 J
CHLOROFORM	10 U	10 U	10 U	10 U
1,2-DICHLOROETHANE	10 U	10 U	10 U	10 U
2-BUTANONE	10 U	10 U	10 U	10 U
1,1,1-TRICHLOROETHANE	10 U	10 U	10 U	10 U
CARBON TETRACHLORIDE	10 U	10 U	10 U	10 U
BROMODICHLOROMETHANE	10 U	10 U	10 U	10 U
1,2-DICHLOROPROPANE	10 U	10 U	10 U	10 U
CIS-1,3-DICHLOROPROPENE	10 U	10 U	10 U	10 U
TRICHLOROETHENE	4 J	10 U	10 U	2 J
DIBROMOCHLOROMETHANE	10 U	10 U	10 U	10 U
1,1,2-TRICHLOROETHANE	10 U	10 U	10 U	10 U
BENZENE	10 U	10 U	10 U	10 U
TRANS-1,3-DICHLOROPROPENE	10 U	10 U	10 U	10 U
BROMOFORM	10 U	10 U	10 U	10 U
4-METHYL-2-PENTANONE	10 U	10 U	10 U	10 U
2-HEXANONE	10 U	10 U	10 U	10 U
TETRACHLOROETHENE	10 U	10 U	10 U	10 U
1,1,2,2-TETRACHLOROETHANE	10 U	10 U	10 U	10 U
TOLUENE	10 U	10 U	10 U	10 U
CHLOROBENZENE	10 U	10 U	10 U	10 U
ETHYLBENZENE	10 U	10 U	10 U	10 U
STYRENE	10 U	10 U	10 U	10 U
XYLENE (TOTAL)	10 U	10 U	10 U	10 U

SITE 44, JONES STREET DUMP
SURFACE WATER - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-EC-SW09-01	44-UT-SW01	44-UT-SW02	44-UT-SW03
DATE SAMPLED	09/28/95	05/03/95	05/03/95	05/03/95
UNITS	UG/L	UG/L	UG/L	UG/L
SEMIVOLATILES				
PHENOL	NA	1 J	10 U	10 U
BIS(2-CHLOROETHYL)ETHER	NA	10 U	10 U	10 U
2-CHLOROPHENOL	NA	10 U	10 U	10 U
1,3-DICHLOROBENZENE	NA	10 U	10 U	10 U
1,4-DICHLOROBENZENE	NA	10 U	10 U	10 U
1,2-DICHLOROBENZENE	NA	10 U	10 U	10 U
2-METHYLPHENOL	NA	10 U	10 U	10 U
2,2'-OXYBIS(1-CHLOROPROPANE)	NA	10 U	10 U	10 U
4-METHYLPHENOL	NA	10 U	10 U	10 U
N-NITROSO-DI-N-PROPYLAMINE	NA	10 U	10 U	10 U
HEXACHLOROETHANE	NA	10 U	10 U	10 U
NITROBENZENE	NA	10 U	10 U	10 U
ISOPHORONE	NA	10 U	10 U	10 U
2-NITROPHENOL	NA	10 U	10 U	10 U
2,4-DIMETHYLPHENOL	NA	10 U	10 U	10 U
BIS(2-CHLOROETHOXY)METHANE	NA	10 U	10 U	10 U
2,4-DICHLOROPHENOL	NA	10 U	10 U	10 U
1,2,4-TRICHLOROBENZENE	NA	10 U	10 U	10 U
NAPHTHALENE	NA	10 U	10 U	10 U
4-CHLOROANILINE	NA	10 U	10 U	10 U
HEXACHLOROBUTADIENE	NA	10 U	10 U	10 U
4-CHLORO-3-METHYLPHENOL	NA	10 U	10 U	10 U
2-METHYLNAPHTHALENE	NA	10 U	10 U	10 U
HEXACHLOROCYCLOPENTADIENE	NA	10 U	10 U	10 U
2,4,6-TRICHLOROPHENOL	NA	10 U	10 U	10 U
2,4,5-TRICHLOROPHENOL	NA	25 U	24 U	25 U
2-CHLORONAPHTHALENE	NA	10 U	10 U	10 U
2-NITROANILINE	NA	25 U	24 U	25 U
DIMETHYLPHTHALATE	NA	10 U	10 U	10 U
ACENAPHTHYLENE	NA	10 U	10 U	10 U
2,6-DINITROTOLUENE	NA	10 U	10 U	10 U
3-NITROANILINE	NA	25 U	24 U	25 U
ACENAPHTHENE	NA	10 U	10 U	10 U
2,4-DINITROPHENOL	NA	25 U	24 U	25 U

SITE 44, JONES STREET DUMP
SURFACE WATER - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-EC-SW09-01	44-UT-SW01	44-UT-SW02	44-UT-SW03
DATE SAMPLED	09/28/95	05/03/95	05/03/95	05/03/95
UNITS	UG/L	UG/L	UG/L	UG/L
SEMIVOLATILES cont.				
4-NITROPHENOL	NA	25 U	24 U	25 U
DIBENZOFURAN	NA	10 U	10 U	10 U
2,4-DINITROTOLUENE	NA	10 U	10 U	10 U
DIETHYLPHTHALATE	NA	10 U	10 U	10 U
4-CHLOROPHENYL-PHENYLETHER	NA	10 U	10 U	10 U
FLUORENE	NA	10 U	10 U	10 U
4-NITROANILINE	NA	25 U	24 U	25 U
4,6-DINITRO-2-METHYLPHENOL	NA	25 U	24 U	25 U
N-NITROSODIPHENYLAMINE (1)	NA	10 U	10 U	10 U
4-BROMOPHENYL-PHENYLETHER	NA	10 U	10 U	10 U
HEXACHLOROBENZENE	NA	10 U	10 U	10 U
PENTACHLOROPHENOL	NA	25 U	24 U	25 U
PHENANTHRENE	NA	10 U	10 U	10 U
ANTHRACENE	NA	10 U	10 U	10 U
CARBAZOLE	NA	10 U	10 U	10 U
DI-N-BUTYLPHTHALATE	NA	10 U	10 U	10 U
FLUORANTHENE	NA	10 U	10 U	10 U
PYRENE	NA	10 U	10 U	10 U
BUTYLBENZYLPHTHALATE	NA	10 U	10 U	10 U
3,3'-DICHLOROBENZIDINE	NA	10 U	10 U	10 U
BENZO(A)ANTHRACENE	NA	10 U	10 U	10 U
CHRYSENE	NA	10 U	10 U	10 U
BIS(2-ETHYLHEXYL)PHTHALATE	NA	10 U	1 J	1 J
DI-N-OCTYL PHTHALATE	NA	10 U	10 U	10 U
BENZO(B)FLUORANTHENE	NA	10 U	10 U	10 U
BENZO(K)FLUORANTHENE	NA	10 U	10 U	10 U
BENZO(A)PYRENE	NA	10 U	10 U	10 U
INDENO(1,2,3-CD)PYRENE	NA	10 U	10 U	10 U
DIBENZO(A,H)ANTHRACENE	NA	10 U	10 U	10 U
BENZO(G,H,I)PERYLENE	NA	10 U	10 U	10 U

SITE 44, JONES STREET DUMP
SURFACE WATER - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-EC-SW09-01	44-UT-SW01	44-UT-SW02	44-UT-SW03
DATE SAMPLED	09/28/95	05/03/95	05/03/95	05/03/95
UNITS	UG/L	UG/L	UG/L	UG/L
PESTICIDE/PCBS				
ALPHA-BHC	NA	0.049 U	0.048 U	0.048 U
BETA-BHC	NA	0.049 U	0.048 U	0.048 U
DELTA-BHC	NA	0.049 U	0.048 U	0.048 U
GAMMA-BHC (LINDANE)	NA	0.049 U	0.048 U	0.048 U
HEPTACHLOR	NA	0.049 U	0.048 U	0.048 U
ALDRIN	NA	0.049 U	0.048 U	0.048 U
HEPTACHLOR EPOXIDE	NA	0.049 U	0.048 U	0.048 U
ENDOSULFAN I	NA	0.049 U	0.048 U	0.048 U
DIELDRIN	NA	0.098 U	0.095 U	0.095 U
4,4'-DDE	NA	0.098 U	0.095 U	0.095 U
ENDRIN	NA	0.098 U	0.095 U	0.095 U
ENDOSULFAN II	NA	0.098 U	0.095 U	0.095 U
4,4'-DDD	NA	0.098 U	0.095 U	0.095 U
ENDOSULFAN SULFATE	NA	0.098 U	0.095 U	0.095 U
4,4'-DDT	NA	0.098 U	0.095 U	0.095 U
METHOXYCHLOR	NA	0.49 UJ	0.48 U	0.48 U
ENDRIN KETONE	NA	0.098 U	0.095 U	0.095 U
ENDRIN ALDEHYDE	NA	0.098 U	0.095 U	0.095 U
ALPHA-CHLORDANE	NA	0.049 U	0.048 U	0.048 U
GAMMA-CHLORDANE	NA	0.049 U	0.048 U	0.048 U
TOXAPHENE	NA	4.9 U	4.8 U	4.8 U
AROCLOR-1016	NA	0.98 U	0.95 U	0.95 U
AROCLOR-1221	NA	2 U	1.9 U	1.9 U
AROCLOR-1232	NA	0.98 U	0.95 U	0.95 U
AROCLOR-1242	NA	0.98 U	0.95 U	0.95 U
AROCLOR-1248	NA	0.98 U	0.95 U	0.95 U
AROCLOR-1254	NA	0.98 U	0.95 U	0.95 U
AROCLOR-1260	NA	0.98 U	0.95 U	0.95 U

SITE 44, JONES STREET DUMP
SURFACE WATER - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION DATE SAMPLED UNITS	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
VOLATILES						
CHLOROMETHANE	10 U	10 U	ND	ND		0/16
BROMOMETHANE	10 U	10 U	ND	ND		0/16
VINYL CHLORIDE	10 U	10 U	7 J	38	44-EC-SW08-01	8/16
CHLOROETHANE	10 U	10 U	ND	ND		0/16
METHYLENE CHLORIDE	10 U	10 U	ND	ND		0/16
ACETONE	10 U	10 U	10	13	44-EC-SW01	3/16
CARBON DISULFIDE	10 U	10 U	ND	ND		0/16
1,1-DICHLOROETHENE	10 U	10 U	1 J	2 J	44-EC-SW06-01	3/16
1,1-DICHLOROETHANE	10 U	10 U	ND	ND		0/16
1,2-DICHLOROETHENE (TOTAL)	10 U	10 U	2 J	150	44-EC-SW01	14/16
CHLOROFORM	10 U	10 U	ND	ND		0/16
1,2-DICHLOROETHANE	10 U	10 U	ND	ND		0/16
2-BUTANONE	10 U	10 U	ND	ND		0/16
1,1,1-TRICHLOROETHANE	10 U	10 U	ND	ND		0/16
CARBON TETRACHLORIDE	10 U	10 U	ND	ND		0/16
BROMODICHLOROMETHANE	10 U	10 U	ND	ND		0/16
1,2-DICHLOROPROPANE	10 U	10 U	ND	ND		0/16
CIS-1,3-DICHLOROPROPENE	10 U	10 U	ND	ND		0/16
TRICHLOROETHENE	10 U	10 U	2 J	66	44-EC-SW01	14/16
DIBROMOCHLOROMETHANE	10 U	10 U	ND	ND		0/16
1,1,2-TRICHLOROETHANE	10 U	10 U	1 J	1 J	44-EC-SW08-01	1/16
BENZENE	10 U	10 U	ND	ND		0/16
TRANS-1,3-DICHLOROPROPENE	10 U	10 U	ND	ND		0/16
BROMOFORM	10 U	10 U	ND	ND		0/16
4-METHYL-2-PENTANONE	10 U	10 U	ND	ND		0/16
2-HEXANONE	10 U	10 U	ND	ND		0/16
TETRACHLOROETHENE	10 U	10 U	ND	ND		0/16
1,1,2,2-TETRACHLOROETHANE	10 U	10 U	5 J	42	44-EC-SW08-01	12/16
TOLUENE	10 U	10 U	ND	ND		0/16
CHLOROBENZENE	10 U	10 U	ND	ND		0/16
ETHYLBENZENE	10 U	10 U	ND	ND		0/16
STYRENE	10 U	10 U	ND	ND		0/16
XYLENE (TOTAL)	10 U	10 U	ND	ND		0/16

SITE 44, JONES STREET DUMP
SURFACE WATER - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION DATE SAMPLED UNITS	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
SEMIVOLATILES						
PHENOL	10 U	11 U	1 J	1 J	44-UT-SW01	1/8
BIS(2-CHLOROETHYL)ETHER	10 U	11 U	ND	ND		0/8
2-CHLOROPHENOL	10 U	11 U	ND	ND		0/8
1,3-DICHLOROBENZENE	10 U	11 U	ND	ND		0/8
1,4-DICHLOROBENZENE	10 U	11 U	ND	ND		0/8
1,2-DICHLOROBENZENE	10 U	11 U	ND	ND		0/8
2-METHYLPHENOL	10 U	11 U	ND	ND		0/8
2,2'-OXYBIS(1-CHLOROPROPANE)	10 U	11 U	ND	ND		0/8
4-METHYLPHENOL	10 U	11 U	ND	ND		0/8
N-NITROSO-DI-N-PROPYLAMINE	10 U	11 U	ND	ND		0/8
HEXACHLOROETHANE	10 U	11 U	ND	ND		0/8
NITROBENZENE	10 U	11 U	ND	ND		0/8
ISOPHORONE	10 U	11 U	ND	ND		0/8
2-NITROPHENOL	10 U	11 U	ND	ND		0/8
2,4-DIMETHYLPHENOL	10 U	11 U	ND	ND		0/8
BIS(2-CHLOROETHOXY)METHANE	10 U	11 U	ND	ND		0/8
2,4-DICHLOROPHENOL	10 U	11 U	ND	ND		0/8
1,2,4-TRICHLOROBENZENE	10 U	11 U	ND	ND		0/8
NAPHTHALENE	10 U	11 U	ND	ND		0/8
4-CHLOROANILINE	10 U	11 U	ND	ND		0/8
HEXACHLOROBUTADIENE	10 U	11 U	ND	ND		0/8
4-CHLORO-3-METHYLPHENOL	10 U	11 U	ND	ND		0/8
2-METHYLNAPHTHALENE	10 U	11 U	ND	ND		0/8
HEXACHLOROCYCLOPENTADIENE	10 U	11 U	ND	ND		0/8
2,4,6-TRICHLOROPHENOL	10 U	11 U	ND	ND		0/8
2,4,5-TRICHLOROPHENOL	24 U	28 U	ND	ND		0/8
2-CHLORONAPHTHALENE	10 U	11 U	ND	ND		0/8
2-NITROANILINE	24 U	28 U	ND	ND		0/8
DIMETHYLPHTHALATE	10 U	11 U	ND	ND		0/8
ACENAPHTHYLENE	10 U	11 U	ND	ND		0/8
2,6-DINITROTOLUENE	10 U	11 U	ND	ND		0/8
3-NITROANILINE	24 U	28 U	ND	ND		0/8
ACENAPHTHENE	10 U	11 U	ND	ND		0/8
2,4-DINITROPHENOL	24 U	28 U	ND	ND		0/8

SITE 44, JONES STREET DUMP
SURFACE WATER - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION DATE SAMPLED UNITS	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
SEMIVOLATILES cont.						
4-NITROPHENOL	24 U	28 U	ND	ND		0/8
DIBENZOFURAN	10 U	11 U	ND	ND		0/8
2,4-DINITROTOLUENE	10 U	11 U	ND	ND		0/8
DIETHYLPHTHALATE	10 U	11 U	ND	ND		0/8
4-CHLOROPHENYL-PHENYLETHER	10 U	11 U	ND	ND		0/8
FLUORENE	10 U	11 U	ND	ND		0/8
4-NITROANILINE	24 U	28 U	ND	ND		0/8
4,6-DINITRO-2-METHYLPHENOL	24 U	28 U	ND	ND		0/8
N-NITROSODIPHENYLAMINE (1)	10 U	11 U	ND	ND		0/8
4-BROMOPHENYL-PHENYLETHER	10 U	11 U	ND	ND		0/8
HEXACHLOROBENZENE	10 U	11 U	ND	ND		0/8
PENTACHLOROPHENOL	24 U	28 U	ND	ND		0/8
PHENANTHRENE	10 U	11 U	ND	ND		0/8
ANTHRACENE	10 U	11 U	ND	ND		0/8
CARBAZOLE	10 U	11 U	ND	ND		0/8
DI-N-BUTYLPHTHALATE	10 U	11 U	ND	ND		0/8
FLUORANTHENE	10 U	11 U	ND	ND		0/8
PYRENE	10 U	11 U	ND	ND		0/8
BUTYLBENZYLPHTHALATE	10 U	11 U	ND	ND		0/8
3,3'-DICHLOROBENZIDINE	10 U	11 U	ND	ND		0/8
BENZO(A)ANTHRACENE	10 U	11 U	ND	ND		0/8
CHRYSENE	10 U	11 U	ND	ND		0/8
BIS(2-ETHYLHEXYL)PHTHALATE	10 U	10 U	1 J	3 J	44-EC-SW05	6/8
DI-N-OCTYL PHTHALATE	10 U	11 U	ND	ND		0/8
BENZO(B)FLUORANTHENE	10 U	11 U	ND	ND		0/8
BENZO(K)FLUORANTHENE	10 U	11 U	ND	ND		0/8
BENZO(A)PYRENE	10 U	11 U	ND	ND		0/8
INDENO(1,2,3-CD)PYRENE	10 U	11 U	ND	ND		0/8
DIBENZO(A,H)ANTHRACENE	10 U	11 U	ND	ND		0/8
BENZO(G,H,I)PERYLENE	10 U	11 U	ND	ND		0/8

SITE 44, JONES STREET DUMP
SURFACE WATER - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION DATE SAMPLED UNITS	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
PESTICIDE/PCBS						
ALPHA-BHC	0.047 U	0.054 U	ND	ND		0/8
BETA-BHC	0.047 U	0.054 U	ND	ND		0/8
DELTA-BHC	0.047 U	0.054 U	ND	ND		0/8
GAMMA-BHC (LINDANE)	0.047 U	0.054 U	ND	ND		0/8
HEPTACHLOR	0.047 U	0.054 U	ND	ND		0/8
ALDRIN	0.047 U	0.054 U	ND	ND		0/8
HEPTACHLOR EPOXIDE	0.047 U	0.054 U	ND	ND		0/8
ENDOSULFAN I	0.047 U	0.054 U	ND	ND		0/8
DIELDRIN	0.094 U	0.11 U	ND	ND		0/8
4,4'-DDE	0.094 U	0.11 U	ND	ND		0/8
ENDRIN	0.094 U	0.11 U	ND	ND		0/8
ENDOSULFAN II	0.094 U	0.11 U	ND	ND		0/8
4,4'-DDD	0.094 U	0.11 U	ND	ND		0/8
ENDOSULFAN SULFATE	0.094 U	0.11 U	ND	ND		0/8
4,4'-DDT	0.094 U	0.11 U	ND	ND		0/8
METHOXYCHLOR	0.47 U	0.54 U	ND	ND		0/8
ENDRIN KETONE	0.094 U	0.11 U	ND	ND		0/8
ENDRIN ALDEHYDE	0.094 U	0.11 U	ND	ND		0/8
ALPHA-CHLORDANE	0.047 U	0.054 U	ND	ND		0/8
GAMMA-CHLORDANE	0.047 U	0.054 U	ND	ND		0/8
TOXAPHENE	4.7 U	5.4 U	ND	ND		0/8
AROCLOR-1016	0.94 U	1.1 U	ND	ND		0/8
AROCLOR-1221	1.9 U	2.2 U	ND	ND		0/8
AROCLOR-1232	0.94 U	1.1 U	ND	ND		0/8
AROCLOR-1242	0.94 U	1.1 U	ND	ND		0/8
AROCLOR-1248	0.94 U	1.1 U	ND	ND		0/8
AROCLOR-1254	0.94 U	1.1 U	ND	ND		0/8
AROCLOR-1260	0.94 U	1.1 U	ND	ND		0/8

SITE 44, JONES STREET DUMP
SURFACE WATER - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
INORGANIC ANALYTES

LOCATION	44-EC-SW01	44-EC-SW02	44-EC-SW03	44-EC-SW04	44-EC-SW05	44-UT-SW01
DATE SAMPLED	05/03/95	05/03/95	05/03/95	05/03/95	05/03/95	05/03/95
UNITS	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
TOTAL METALS						
ALUMINUM, TOTAL	353	416	206	509	232	132 U
ANTIMONY, TOTAL	12 U	12 U	12 U	12 U	12 U	20.8 U
ARSENIC, TOTAL	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
BARIUM, TOTAL	26.2	24.4	23.7	27.1	25.5	16.5 U
BERYLLIUM, TOTAL	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.8 U
CADMIUM, TOTAL	3.9 U	3.9 U	3.9 U	3.9 U	3.9 U	1.9 U
CALCIUM, TOTAL	54700	54000	53400	54600	55500	36500
CHROMIUM, TOTAL	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U	4.1 U
COBALT, TOTAL	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	3.4 U
COPPER, TOTAL	1.8 U	2.2	1.9	1.9	2.3	2.3
IRON, TOTAL	1940	1840	1700	1980	1320	1280 J
LEAD, TOTAL	5.7 U	6.2 U	11.2	8.6 U	3.4 U	0.83 J
MAGNESIUM, TOTAL	2710	2550	2530	11300	23300	5890
MANGANESE, TOTAL	231	74.9	74.7	89.8	80	47.2
MERCURY, TOTAL	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
NICKEL, TOTAL	21.1	15.3	7.7	5.4 U	5.4 U	10.9 U
POTASSIUM, TOTAL	3950	3560	3390	6170	10000	5210 J
SELENIUM, TOTAL	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 UJ
SILVER, TOTAL	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	2.8 U
SODIUM, TOTAL	17600	16200	16800	90500	195000	51200
THALLIUM, TOTAL	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U
VANADIUM, TOTAL	29.9	20	12.7	7.4 U	6 U	2 U
ZINC, TOTAL	41.9 J	61.3 J	17.3 J	26.5 J	16.8 J	12 U

SITE 44, JONES STREET DUMP
SURFACE WATER - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
INORGANIC ANALYTES

LOCATION	44-UT-SW02	44-UT-SW03
DATE SAMPLED	05/03/95	05/03/95
UNITS	UG/L	UG/L
TOTAL METALS		
ALUMINUM, TOTAL	122	140
ANTIMONY, TOTAL	12 U	12 U
ARSENIC, TOTAL	1.7 U	1.7 U
BARIUM, TOTAL	14.5	18.2
BERYLLIUM, TOTAL	0.3 U	0.3 U
CADMIUM, TOTAL	3.9 U	3.9 U
CALCIUM, TOTAL	33500	39300
CHROMIUM, TOTAL	3.8 U	3.8 U
COBALT, TOTAL	1.4 U	1.4 U
COPPER, TOTAL	2.2	2.3
IRON, TOTAL	1400	1170
LEAD, TOTAL	2.2 U	3.1 U
MAGNESIUM, TOTAL	4120	9420
MANGANESE, TOTAL	38.8	74.2
MERCURY, TOTAL	0.2 U	0.2 U
NICKEL, TOTAL	5.4 U	5.4 U
POTASSIUM, TOTAL	4590	6020
SELENIUM, TOTAL	1.8 U	1.8 U
SILVER, TOTAL	1.9 U	1.9 U
SODIUM, TOTAL	43000	81000
THALLIUM, TOTAL	0.7 U	0.7 U
VANADIUM, TOTAL	9.4 U	11.7
ZINC, TOTAL	55.8 J	42.4 J

SITE 44, JONES STREET DUMP
SURFACE WATER - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
INORGANIC ANALYTES

LOCATION DATE SAMPLED UNITS	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
TOTAL METALS						
ALUMINUM, TOTAL	132 U	132 U	122	509	44-EC-SW04	7/8
ANTIMONY, TOTAL	12 U	20.8 U	ND	ND		0/8
ARSENIC, TOTAL	1.7 U	1.7 U	ND	ND		0/8
BARIUM, TOTAL	16.5 U	16.5 U	14.5	27.1	44-EC-SW04	7/8
BERYLLIUM, TOTAL	0.3 U	0.8 U	ND	ND		0/8
CADMIUM, TOTAL	1.9 U	3.9 U	ND	ND		0/8
CALCIUM, TOTAL	NA	NA	33500	55500	44-EC-SW05	8/8
CHROMIUM, TOTAL	3.8 U	4.1 U	ND	ND		0/8
COBALT, TOTAL	1.4 U	3.4 U	ND	ND		0/8
COPPER, TOTAL	1.8 U	1.8 U	1.9	2.3	44-UT-SW03	7/8
IRON, TOTAL	NA	NA	1170	1980	44-EC-SW04	8/8
LEAD, TOTAL	2.2 U	8.6 U	0.83 J	11.2	44-EC-SW03	2/8
MAGNESIUM, TOTAL	NA	NA	2530	23300	44-EC-SW05	8/8
MANGANESE, TOTAL	NA	NA	38.8	231	44-EC-SW01	8/8
MERCURY, TOTAL	0.2 U	0.2 U	ND	ND		0/8
NICKEL, TOTAL	5.4 U	10.9 U	7.7	21.1	44-EC-SW01	3/8
POTASSIUM, TOTAL	NA	NA	3390	10000	44-EC-SW05	8/8
SELENIUM, TOTAL	1.8 U	1.8 U	ND	ND		0/8
SILVER, TOTAL	1.9 U	2.8 U	ND	ND		0/8
SODIUM, TOTAL	NA	NA	16200	195000	44-EC-SW05	8/8
THALLIUM, TOTAL	0.7 U	0.7 U	ND	ND		0/8
VANADIUM, TOTAL	2 U	9.4 U	11.7	29.9	44-EC-SW01	4/8
ZINC, TOTAL	12 U	12 U	16.8 J	61.3 J	44-EC-SW02	7/8

SITE 44, JONES STREET DUMP
SURFACE WATER - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
DISSOLVED INORGANIC ANALYTES

LOCATION	44-EC-DSW01	44-EC-DSW02	44-EC-DSW03	44-EC-DSW04	44-EC-DSW05	44-UT-DSW01
DATE SAMPLED	05/03/95	05/03/95	05/03/95	05/03/95	05/03/95	05/03/95
UNITS	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
DISSOLVED METALS						
ALUMINUM, SOLUBLE	21.9	25.2	15.7 U	15.7 U	15.7 U	21.2 U
ANTIMONY, SOLUBLE	12 U	12 U	12 U	12 U	12 U	20.8 U
ARSENIC, SOLUBLE	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
BARIUM, SOLUBLE	21.2	21.2	21.3	21	22.4	15 U
BERYLLIUM, SOLUBLE	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.8 U
CADMIUM, SOLUBLE	3.9 U	3.9 U	3.9 U	3.9 U	3.9 U	1.9 U
CALCIUM, SOLUBLE	53800	52100	52300	51200	55500	37400
CHROMIUM, SOLUBLE	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U	4.1 U
COBALT, SOLUBLE	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	3.4 U
COPPER, SOLUBLE	1.8 U	1.9	1.9	1.8 U	1.8 U	1.8 U
IRON, SOLUBLE	454	493	501	326	268	654 J
LEAD, SOLUBLE	1.1 U	0.81 U	1.1 U	0.8 U	0.8 U	0.8 UJ
MAGNESIUM, SOLUBLE	2650	2470	2490	11500	24400	6030
MANGANESE, SOLUBLE	11	17.2	20.9	20.8	33.3	26.3
MERCURY, SOLUBLE	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
NICKEL, SOLUBLE	19.8	12.1	6.2	5.4 U	5.4 U	10.9 U
POTASSIUM, SOLUBLE	3840	3490	3420	6020	10300	4820 J
SELENIUM, SOLUBLE	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 UJ
SILVER, SOLUBLE	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	2.8 U
SODIUM, SOLUBLE	17600	16200	16900	92300	205000	52500
THALLIUM, SOLUBLE	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U
VANADIUM, SOLUBLE	11.6	8.4 U	5 U	2 U	3.5 U	2.5
ZINC, SOLUBLE	17.7 J	12.2 J	8.4 J	7.3 J	8 J	6 U

SITE 44, JONES STREET DUMP
SURFACE WATER - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
DISSOLVED INORGANIC ANALYTES

LOCATION	44-UT-DSW02	44-UT-DSW03
DATE SAMPLED	05/03/95	05/03/95
UNITS	UG/L	UG/L
DISSOLVED METALS		
ALUMINUM, SOLUBLE	15.7 U	25.9
ANTIMONY, SOLUBLE	12 U	12 U
ARSENIC, SOLUBLE	1.7 U	1.7 U
BARIUM, SOLUBLE	12.7	16
BERYLLIUM, SOLUBLE	0.3 U	0.3 U
CADMIUM, SOLUBLE	3.9 U	3.9 U
CALCIUM, SOLUBLE	33200	39700
CHROMIUM, SOLUBLE	3.8 U	3.8 U
COBALT, SOLUBLE	1.4 U	1.4 U
COPPER, SOLUBLE	3.7	3
IRON, SOLUBLE	352	418
LEAD, SOLUBLE	41.8	0.8 U
MAGNESIUM, SOLUBLE	4080	9590
MANGANESE, SOLUBLE	6.5	29.7
MERCURY, SOLUBLE	0.2 U	0.2 U
NICKEL, SOLUBLE	5.4 U	5.4 U
POTASSIUM, SOLUBLE	4550	6070
SELENIUM, SOLUBLE	1.8 U	1.8 U
SILVER, SOLUBLE	1.9 U	1.9 U
SODIUM, SOLUBLE	42800	83400
THALLIUM, SOLUBLE	0.7 U	0.7 U
VANADIUM, SOLUBLE	5.8 U	7.7 U
ZINC, SOLUBLE	8 J	24.3 J

SITE 44, JONES STREET DUMP
SURFACE WATER - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
DISSOLVED INORGANIC ANALYTES

LOCATION DATE SAMPLED UNITS	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
DISSOLVED METALS						
ALUMINUM, SOLUBLE	15.7 U	21.2 U	21.9	25.9	44-UT-DSW03	3/8
ANTIMONY, SOLUBLE	12 U	20.8 U	ND	ND		0/8
ARSENIC, SOLUBLE	1.7 U	1.7 U	ND	ND		0/8
BARIUM, SOLUBLE	15 U	15 U	12.7	22.4	44-EC-DSW05	7/8
BERYLLIUM, SOLUBLE	0.3 U	0.8 U	ND	ND		0/8
CADMIUM, SOLUBLE	1.9 U	3.9 U	ND	ND		0/8
CALCIUM, SOLUBLE	NA	NA	33200	55500	44-EC-DSW05	8/8
CHROMIUM, SOLUBLE	3.8 U	4.1 U	ND	ND		0/8
COBALT, SOLUBLE	1.4 U	3.4 U	ND	ND		0/8
COPPER, SOLUBLE	1.8 U	1.8 U	1.9	3.7	44-UT-DSW02	4/8
IRON, SOLUBLE	NA	NA	268	654 J	44-UT-DSW01	8/8
LEAD, SOLUBLE	0.8 U	1.1 U	41.8	41.8	44-UT-DSW02	1/8
MAGNESIUM, SOLUBLE	NA	NA	2470	24400	44-EC-DSW05	8/8
MANGANESE, SOLUBLE	NA	NA	6.5	33.3	44-EC-DSW05	8/8
MERCURY, SOLUBLE	0.2 U	0.2 U	ND	ND		0/8
NICKEL, SOLUBLE	5.4 U	10.9 U	6.2	19.8	44-EC-DSW01	3/8
POTASSIUM, SOLUBLE	NA	NA	3420	10300	44-EC-DSW05	8/8
SELENIUM, SOLUBLE	1.8 U	1.8 U	ND	ND		0/8
SILVER, SOLUBLE	1.9 U	2.8 U	ND	ND		0/8
SODIUM, SOLUBLE	NA	NA	16200	205000	44-EC-DSW05	8/8
THALLIUM, SOLUBLE	0.7 U	0.7 U	ND	ND		0/8
VANADIUM, SOLUBLE	2 U	8.4 U	2.5	11.6	44-EC-DSW01	2/8
ZINC, SOLUBLE	6 U	6 U	7.3 J	24.3 J	44-UT-DSW03	7/8

SEDIMENT

SITE 44, JONES STREET DUMP
SEDIMENT - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-EC-SD01-06	44-EC-SD01-612	44-EC-SD02-06	44-EC-SD02-612	44-EC-SD03-06	44-EC-SD03-612
DATE SAMPLED	05/04/95	05/04/95	05/04/95	05/04/95	05/04/95	05/04/95
DEPTH	0-6"	6-12"	0-6"	6-12"	0-6"	6-12"
UNITS	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
VOLATILES						
CHLOROMETHANE	12 U	12 U	12 U	13 U	12 U	12 U
BROMOMETHANE	12 U	12 U	12 U	13 U	12 U	12 U
VINYL CHLORIDE	12 U	12 U	12 U	13 U	12 U	12 U
CHLOROETHANE	12 U	12 U	12 U	13 U	12 U	12 U
METHYLENE CHLORIDE	12 U	12 U	12 U	13 U	12 U	12 U
ACETONE	12 U	12 U	12 U	33	12 U	29
CARBON DISULFIDE	12 U	12 U	12 U	13 U	12 U	12 U
1,1-DICHLOROETHENE	12 U	12 U	12 U	13 U	12 U	12 U
1,1-DICHLOROETHANE	12 U	12 U	12 U	13 U	12 U	12 U
1,2-DICHLOROETHENE (TOTAL)	12 U	12 U	12 U	13 U	12 U	12 U
CHLOROFORM	12 U	12 U	12 U	13 U	12 U	12 U
1,2-DICHLOROETHANE	12 U	12 U	12 U	13 U	12 U	12 U
2-BUTANONE	12 U	12 U	12 U	13 U	12 U	12 U
1,1,1-TRICHLOROETHANE	12 U	12 U	12 U	13 U	12 U	12 U
CARBON TETRACHLORIDE	12 U	12 U	12 U	13 U	12 U	12 U
BROMODICHLOROMETHANE	12 U	12 U	12 U	13 U	12 U	12 U
1,2-DICHLOROPROPANE	12 U	12 U	12 U	13 U	12 U	12 U
CIS-1,3-DICHLOROPROPENE	12 U	12 U	12 U	13 U	12 U	12 U
TRICHLOROETHENE	12 U	12 U	12 U	13 U	12 U	12 U
DIBROMOCHLOROMETHANE	12 U	12 U	12 U	13 U	12 U	12 U
1,1,2-TRICHLOROETHANE	12 U	12 U	12 U	13 U	12 U	12 U
BENZENE	12 U	12 U	12 U	13 U	12 U	12 U
TRANS-1,3-DICHLOROPROPENE	12 U	12 U	12 U	13 U	12 U	12 U
BROMOFORM	12 U	12 U	12 U	13 U	12 U	12 U
4-METHYL-2-PENTANONE	12 U	12 U	12 U	13 U	12 U	12 U
2-HEXANONE	12 U	12 U	12 U	13 U	12 U	12 UJ
TETRACHLOROETHENE	12 U	12 U	12 U	13 U	12 U	12 U
1,1,2,2-TETRACHLOROETHANE	12 U	12 U	12 U	13 U	12 U	12 U
TOLUENE	12 U	12 U	12 U	13 U	12 U	12 U
CHLOROBENZENE	12 U	12 U	12 U	13 U	12 U	12 U
ETHYLBENZENE	12 U	12 U	12 U	13 U	12 U	12 U
STYRENE	12 U	12 U	12 U	13 U	12 U	12 U
XYLENE (TOTAL)	12 U	12 U	12 U	13 U	12 U	12 U

SITE 44, JONES STREET DUMP
SEDIMENT - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-EC-SD01-06	44-EC-SD01-612	44-EC-SD02-06	44-EC-SD02-612	44-EC-SD03-06	44-EC-SD03-612
DATE SAMPLED	05/04/95	05/04/95	05/04/95	05/04/95	05/04/95	05/04/95
DEPTH	0-6"	6-12"	0-6"	6-12"	0-6"	6-12"
UNITS	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SEMIVOLATILES						
PHENOL	390 U	390 U	400 U	420 U	400 U	390 U
BIS(2-CHLOROETHYL)ETHER	390 U	390 U	400 U	420 U	400 U	390 U
2-CHLOROPHENOL	390 U	390 U	400 U	420 U	400 U	390 U
1,3-DICHLOROBENZENE	390 U	390 U	400 U	420 U	400 U	390 U
1,4-DICHLOROBENZENE	390 U	390 U	400 U	420 U	400 U	390 U
1,2-DICHLOROBENZENE	390 U	390 U	400 U	420 U	400 U	390 U
2-METHYLPHENOL	390 U	390 U	400 U	420 U	400 U	390 U
2,2'-OXYBIS(1-CHLOROPROPANE)	390 U	390 U	400 U	420 U	400 U	390 U
4-METHYLPHENOL	390 U	390 U	400 U	420 U	400 U	390 U
N-NITROSO-DI-N-PROPYLAMINE	390 U	390 U	400 U	420 U	400 U	390 U
HEXACHLOROETHANE	390 U	390 U	400 U	420 U	400 U	390 U
NITROBENZENE	390 U	390 U	400 U	420 U	400 U	390 U
ISOPHORONE	390 U	390 U	400 U	420 U	400 U	390 U
2-NITROPHENOL	390 U	390 U	400 U	420 U	400 U	390 U
2,4-DIMETHYLPHENOL	390 U	390 U	400 U	420 U	400 U	390 U
BIS(2-CHLOROETHOXY)METHANE	390 U	390 U	400 U	420 U	400 U	390 U
2,4-DICHLOROPHENOL	390 U	390 U	400 U	420 U	400 U	390 U
1,2,4-TRICHLOROBENZENE	390 U	390 U	400 U	420 U	400 U	390 U
NAPHTHALENE	390 U	390 U	400 U	420 U	400 U	390 U
4-CHLOROANILINE	390 U	390 U	400 U	420 U	400 U	390 U
HEXACHLOROBUTADIENE	390 U	390 U	400 U	420 U	400 U	390 U
4-CHLORO-3-METHYLPHENOL	390 U	390 U	400 U	420 U	400 U	390 U
2-METHYLNAPHTHALENE	390 U	390 U	400 U	420 U	400 U	390 U
HEXACHLOROCYCLOPENTADIENE	390 U	390 U	400 U	420 U	400 U	390 U
2,4,6-TRICHLOROPHENOL	390 U	390 U	400 U	420 U	400 U	390 U
2,4,5-TRICHLOROPHENOL	980 U	960 U	1000 U	1100 U	1000 U	980 U
2-CHLORONAPHTHALENE	390 U	390 U	400 U	420 U	400 U	390 U
2-NITROANILINE	980 U	960 U	1000 U	1100 U	1000 U	980 U
DIMETHYLPHTHALATE	390 U	390 U	400 U	420 U	400 U	390 U
ACENAPHTHYLENE	390 U	390 U	400 U	420 U	400 U	390 U
2,6-DINITROTOLUENE	390 U	390 U	400 U	420 U	400 U	390 U
3-NITROANILINE	980 U	960 U	1000 U	1100 U	1000 U	980 U
ACENAPHTHENE	390 U	390 U	400 U	420 U	400 U	390 U
2,4-DINITROPHENOL	980 U	960 U	1000 U	1100 U	1000 U	980 U

SITE 44, JONES STREET DUMP
SEDIMENT - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-EC-SD01-06	44-EC-SD01-612	44-EC-SD02-06	44-EC-SD02-612	44-EC-SD03-06	44-EC-SD03-612
DATE SAMPLED	05/04/95	05/04/95	05/04/95	05/04/95	05/04/95	05/04/95
DEPTH	0-6"	6-12"	0-6"	6-12"	0-6"	6-12"
UNITS	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SEMIVOLATILES cont.						
4-NITROPHENOL	980 U	960 U	1000 U	1100 U	1000 U	980 U
DIBENZOFURAN	390 U	390 U	400 U	420 U	400 U	390 U
2,4-DINITROTOLUENE	390 U	390 U	400 U	420 U	400 U	390 U
DIETHYLPHTHALATE	390 U	390 U	400 U	420 U	400 U	390 U
4-CHLOROPHENYL-PHENYLETHER	390 U	390 U	400 U	420 U	400 U	390 U
FLUORENE	390 U	390 U	400 U	420 U	400 U	390 U
4-NITROANILINE	980 U	960 U	1000 U	1100 U	1000 U	980 U
4,6-DINITRO-2-METHYLPHENOL	980 U	960 U	1000 U	1100 U	1000 U	980 U
N-NITROSODIPHENYLAMINE (1)	390 U	390 U	400 U	420 U	400 U	390 U
4-BROMOPHENYL-PHENYLETHER	390 U	390 U	400 U	420 U	400 U	390 U
HEXACHLOROBENZENE	390 U	390 U	400 U	420 U	400 U	390 U
PENTACHLOROPHENOL	980 U	740 J	1000 U	1100 U	1000 U	340 J
PHENANTHRENE	390 U	390 U	400 U	420 U	400 U	390 U
ANTHRACENE	390 U	390 U	400 U	420 U	400 U	390 U
CARBAZOLE	390 U	390 U	400 U	420 U	400 U	390 U
DI-N-BUTYLPHTHALATE	390 U	390 U	400 U	420 U	400 U	390 U
FLUORANTHENE	390 U	390 U	400 U	95 J	400 U	390 U
PYRENE	390 U	390 U	400 U	81 J	400 U	390 U
BUTYLBENZYLPHTHALATE	390 U	390 U	400 U	420 U	400 U	390 U
3,3'-DICHLOROBENZIDINE	390 U	390 U	400 U	420 U	400 U	390 U
BENZO(A)ANTHRACENE	390 U	390 U	400 U	420 U	400 U	390 U
CHRYSENE	44 J	390 U	400 U	50 J	400 U	390 U
BIS(2-ETHYLHEXYL)PHTHALATE	390 U	390 U	400 U	420 U	400 U	160 J
DI-N-OCTYL PHTHALATE	390 U	390 U	400 U	420 U	400 U	390 U
BENZO(B)FLUORANTHENE	66 J	390 U	400 U	52 J	400 U	390 U
BENZO(K)FLUORANTHENE	390 U	390 U	400 U	420 U	400 U	390 U
BENZO(A)PYRENE	390 U	390 U	400 U	420 U	400 U	390 U
INDENO(1,2,3-CD)PYRENE	390 U	390 U	400 U	420 U	400 U	390 U
DIBENZO(A,H)ANTHRACENE	390 U	390 U	400 U	420 U	400 U	390 U
BENZO(G,H,I)PERYLENE	390 U	390 U	400 U	420 U	400 U	390 U

SITE 44, JONES STREET DUMP
SEDIMENT - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-EC-SD01-06	44-EC-SD01-612	44-EC-SD02-06	44-EC-SD02-612	44-EC-SD03-06	44-EC-SD03-612
DATE SAMPLED	05/04/95	05/04/95	05/04/95	05/04/95	05/04/95	05/04/95
DEPTH	0-6"	6-12"	0-6"	6-12"	0-6"	6-12"
UNITS	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
PESTICIDE/PCBS						
ALPHA-BHC	1.9 UJ	1.9 UJ	2 UJ	2.1 UJ	2 UJ	2 UJ
BETA-BHC	1.9 UJ	1.9 UJ	2 U	2.1 UJ	2 UJ	2 UJ
DELTA-BHC	1.9 UJ	1.9 UJ	2 U	2.1 UJ	2 UJ	2 UJ
GAMMA-BHC (LINDANE)	1.9 UJ	1.9 UJ	2 U	2.1 UJ	2 UJ	2 UJ
HEPTACHLOR	1.9 UJ	1.9 UJ	2 U	2.1 UJ	2 UJ	2 UJ
ALDRIN	1.9 UJ	1.9 UJ	2 U	2.1 UJ	2 UJ	2 UJ
HEPTACHLOR EPOXIDE	1.9 UJ	1.9 UJ	2 U	2.1 UJ	2 UJ	2 UJ
ENDOSULFAN I	1.9 UJ	1.9 UJ	2 U	2.1 UJ	2 UJ	2 UJ
DIELDRIN	3.9 UJ	3.9 UJ	4 U	4.2 UJ	4.1 UJ	4 UJ
4,4'-DDE	30 J	21 J	24 J	58 J	9.3 J	17 J
ENDRIN	3.9 UJ	3.9 UJ	4 U	4.2 UJ	4.1 UJ	4 UJ
ENDOSULFAN II	3.9 UJ	3.9 UJ	4 U	4.2 UJ	4.1 UJ	4 UJ
4,4'-DDD	81	34 J	66	120	23 J	35 J
ENDOSULFAN SULFATE	3.9 UJ	3.9 UJ	4 U	4.2 UJ	4.1 UJ	4 UJ
4,4'-DDT	9 J	3.1 J	4.4 J	3.8 J	4.1 UJ	4 UJ
METHOXYCHLOR	19 UJ	19 UJ	20 UJ	21 UJ	20 UJ	20 UJ
ENDRIN KETONE	3.9 UJ	3.9 UJ	4 U	4.2 UJ	4.1 UJ	4 UJ
ENDRIN ALDEHYDE	3.9 UJ	3.9 UJ	4 U	4.2 UJ	4.1 UJ	4 UJ
ALPHA-CHLORDANE	2.3 J	2.7 J	2	3.3 J	2 UJ	2.4 J
GAMMA-CHLORDANE	2.7 J	2.7 J	2.8	4.2 J	2 UJ	2.8 J
TOXAPHENE	190 UJ	190 UJ	200 U	210 UJ	200 UJ	200 UJ
AROCLOR-1016	39 UJ	39 UJ	40 U	42 UJ	41 UJ	40 UJ
AROCLOR-1221	78 UJ	78 UJ	81 U	84 UJ	81 UJ	81 UJ
AROCLOR-1232	39 UJ	39 UJ	40 U	42 UJ	41 UJ	40 UJ
AROCLOR-1242	39 UJ	39 UJ	40 U	42 UJ	41 UJ	40 UJ
AROCLOR-1248	39 UJ	39 UJ	40 U	42 UJ	41 UJ	40 UJ
AROCLOR-1254	39 UJ	39 UJ	40 U	42 UJ	41 UJ	40 UJ
AROCLOR-1260	39 UJ	39 UJ	40 U	42 UJ	41 UJ	40 UJ

SITE 44, JONES STREET DUMP
SEDIMENT - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-EC-SD04-06	44-EC-SD04-612	44-EC-SD05-06	44-EC-SD05-612	44-UT-SD01-06	44-UT-SD01-612
DATE SAMPLED	05/04/95	05/04/95	05/04/95	05/04/95	05/04/95	05/04/95
DEPTH	0-6"	6-12"	0-6"	6-12"	0-6"	6-12"
UNITS	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
VOLATILES						
CHLOROMETHANE	13 U	13 U	14 U	14 U	21 U	24 U
BROMOMETHANE	13 U	13 U	14 U	14 U	21 U	24 U
VINYL CHLORIDE	13 U	13 U	14 U	14 U	21 U	24 U
CHLOROETHANE	13 U	13 U	14 U	14 U	21 U	24 U
METHYLENE CHLORIDE	13 U	13 U	14 U	14 U	21 U	24 U
ACETONE	13 U	61	160	72	610 J	220
CARBON DISULFIDE	13 U	13 U	14 U	14 U	21 U	24 U
1,1-DICHLOROETHENE	13 U	13 U	14 U	14 U	21 U	24 U
1,1-DICHLOROETHANE	13 U	13 U	14 U	14 U	21 U	24 U
1,2-DICHLOROETHENE (TOTAL)	13 U	13 U	14 U	14 U	21 U	24 U
CHLOROFORM	13 U	13 U	14 U	14 U	21 U	24 U
1,2-DICHLOROETHANE	13 U	13 U	14 U	14 U	21 U	24 U
2-BUTANONE	13 U	13 U	14 U	14 U	200	51
1,1,1-TRICHLOROETHANE	13 U	13 U	14 U	14 U	21 U	24 UJ
CARBON TETRACHLORIDE	13 U	13 U	14 U	14 U	21 U	24 UJ
BROMODICHLOROMETHANE	13 U	13 U	14 U	14 U	21 U	24 UJ
1,2-DICHLOROPROPANE	13 U	13 U	14 U	14 U	21 U	24 UJ
CIS-1,3-DICHLOROPROPENE	13 U	13 U	14 U	14 U	21 U	24 UJ
TRICHLOROETHENE	13 U	13 U	14 U	14 U	21 U	24 UJ
DIBROMOCHLOROMETHANE	13 U	13 U	14 U	14 U	21 U	24 UJ
1,1,2-TRICHLOROETHANE	13 U	13 U	14 U	14 U	21 U	24 UJ
BENZENE	13 U	13 U	14 U	14 U	21 U	24 UJ
TRANS-1,3-DICHLOROPROPENE	13 U	13 U	14 U	14 U	21 U	24 UJ
BROMOFORM	13 U	13 U	14 U	14 U	21 U	24 UJ
4-METHYL-2-PENTANONE	13 U	13 U	14 U	14 U	21 U	24 UJ
2-HEXANONE	13 U	13 U	14 U	14 U	21 U	24 UJ
TETRACHLOROETHENE	13 U	13 U	14 U	14 U	21 U	24 UJ
1,1,2,2-TETRACHLOROETHANE	13 U	13 U	14 U	14 U	21 U	24 UJ
TOLUENE	13 U	13 U	14 U	14 U	21 U	24 UJ
CHLOROBENZENE	13 U	13 U	14 U	14 U	21 U	24 UJ
ETHYLBENZENE	13 U	13 U	14 U	14 U	21 U	24 UJ
STYRENE	13 U	13 U	14 U	14 U	21 U	24 UJ
XYLENE (TOTAL)	13 U	13 U	14 U	14 U	21 U	24 UJ

SITE 44, JONES STREET DUMP
SEDIMENT - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-EC-SD04-06	44-EC-SD04-612	44-EC-SD05-06	44-EC-SD05-612	44-UT-SD01-06	44-UT-SD01-612
DATE SAMPLED	05/04/95	05/04/95	05/04/95	05/04/95	05/04/95	05/04/95
DEPTH	0-6"	6-12"	0-6"	6-12"	0-6"	6-12"
UNITS	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SEMIVOLATILES						
PHENOL	430 U	420 U	470 U	480 U	680 U	750 U
BIS(2-CHLOROETHYL)ETHER	430 U	420 U	470 U	480 U	680 U	750 U
2-CHLOROPHENOL	430 U	420 U	470 U	480 U	680 U	750 U
1,3-DICHLOROBENZENE	430 U	420 U	470 U	480 U	680 U	750 U
1,4-DICHLOROBENZENE	430 U	420 U	470 U	480 U	680 U	750 U
1,2-DICHLOROBENZENE	430 U	420 U	470 U	480 U	680 U	750 U
2-METHYLPHENOL	430 U	420 U	470 U	480 U	680 U	750 U
2,2'-OXYBIS(1-CHLOROPROPANE)	430 U	420 U	470 U	480 U	680 U	750 U
4-METHYLPHENOL	430 U	420 U	470 U	480 U	680 U	750 U
N-NITROSO-DI-N-PROPYLAMINE	430 U	420 U	470 U	480 U	680 U	750 U
HEXACHLOROETHANE	430 U	420 U	470 U	480 U	680 U	750 U
NITROBENZENE	430 U	420 U	470 U	480 U	680 U	750 U
ISOPHORONE	430 U	420 U	470 U	480 U	680 U	750 U
2-NITROPHENOL	430 U	420 U	470 U	480 U	680 U	750 U
2,4-DIMETHYLPHENOL	430 U	420 U	470 U	480 U	680 U	750 U
BIS(2-CHLOROETHOXY)METHANE	430 U	420 U	470 U	480 U	680 U	750 U
2,4-DICHLOROPHENOL	430 U	420 U	470 U	480 U	680 U	750 U
1,2,4-TRICHLOROBENZENE	430 U	420 U	470 U	480 U	680 U	750 U
NAPHTHALENE	430 U	420 U	470 U	480 U	680 U	750 U
4-CHLOROANILINE	430 U	420 U	470 U	480 U	680 U	750 U
HEXACHLOROBUTADIENE	430 U	420 U	470 U	480 U	680 U	750 U
4-CHLORO-3-METHYLPHENOL	430 U	420 U	470 U	480 U	680 U	750 U
2-METHYLNAPHTHALENE	430 U	420 U	470 U	480 U	680 U	750 U
HEXACHLOROCYCLOPENTADIENE	430 U	420 U	470 U	480 U	680 U	750 U
2,4,6-TRICHLOROPHENOL	430 U	420 U	470 U	480 U	680 U	750 U
2,4,5-TRICHLOROPHENOL	1100 U	1000 U	1200 U	1200 U	1700 U	1900 U
2-CHLORONAPHTHALENE	430 U	420 U	470 U	480 U	680 U	750 U
2-NITROANILINE	1100 U	1000 U	1200 U	1200 U	1700 U	1900 U
DIMETHYLPHTHALATE	430 U	420 U	470 U	480 U	680 U	750 U
ACENAPHTHYLENE	430 U	420 U	470 U	480 U	680 U	750 U
2,6-DINITROTOLUENE	430 U	420 U	470 U	480 U	680 U	750 U
3-NITROANILINE	1100 U	1000 U	1200 U	1200 U	1700 U	1900 U
ACENAPHTHENE	430 U	420 U	470 U	480 U	680 U	750 U
2,4-DINITROPHENOL	1100 U	1000 U	1200 U	1200 U	1700 U	1900 U

SITE 44, JONES STREET DUMP
SEDIMENT - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-EC-SD04-06	44-EC-SD04-612	44-EC-SD05-06	44-EC-SD05-612	44-UT-SD01-06	44-UT-SD01-612
DATE SAMPLED	05/04/95	05/04/95	05/04/95	05/04/95	05/04/95	05/04/95
DEPTH	0-6"	6-12"	0-6"	6-12"	0-6"	6-12"
UNITS	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SEMIVOLATILES cont.						
4-NITROPHENOL	1100 U	1000 U	1200 U	1200 U	1700 U	1900 U
DIBENZOFURAN	430 U	420 U	470 U	480 U	680 U	750 U
2,4-DINITROTOLUENE	430 U	420 U	470 U	480 U	680 U	750 U
DIETHYLPHTHALATE	430 U	420 U	470 U	480 U	680 U	750 U
4-CHLOROPHENYL-PHENYLETHER	430 U	420 U	470 U	480 U	680 U	750 U
FLUORENE	430 U	420 U	470 U	480 U	680 U	750 U
4-NITROANILINE	1100 U	1000 U	1200 U	1200 U	1700 U	1900 U
4,6-DINITRO-2-METHYLPHENOL	1100 U	1000 U	1200 U	1200 U	1700 U	1900 U
N-NITROSODIPHENYLAMINE (1)	430 U	420 U	470 U	480 U	680 U	750 U
4-BROMOPHENYL-PHENYLETHER	430 U	420 U	470 U	480 U	680 U	750 U
HEXACHLOROBENZENE	430 U	420 U	470 U	480 U	680 U	750 U
PENTACHLOROPHENOL	1100 U	1000 U	1200 U	1200 U	1700 U	1900 U
PHENANTHRENE	430 U	420 U	470 U	77 J	680 U	750 U
ANTHRACENE	430 U	420 U	470 U	480 U	680 U	750 U
CARBAZOLE	430 U	420 U	470 U	480 U	680 U	750 U
DI-N-BUTYLPHTHALATE	430 U	420 U	470 U	480 U	680 R	750 U
FLUORANTHENE	430 U	420 U	120 J	100 J	680 U	750 U
PYRENE	430 U	42 J	100 J	100 J	680 U	750 U
BUTYLBENZYLPHTHALATE	430 U	420 U	470 U	480 U	680 U	750 U
3,3'-DICHLOROBENZIDINE	430 U	420 U	470 U	480 U	680 U	750 U
BENZO(A)ANTHRACENE	430 U	420 U	470 U	480 U	680 U	750 U
CHRYSENE	430 U	420 U	84 J	61 J	680 U	750 U
BIS(2-ETHYLHEXYL)PHTHALATE	430 U	420 U	470 U	530	680 U	750 U
DI-N-OCTYL PHTHALATE	430 U	420 U	470 U	480 U	680 U	750 U
BENZO(B)FLUORANTHENE	430 U	420 U	99 J	480 U	680 U	750 U
BENZO(K)FLUORANTHENE	430 U	420 U	470 U	480 U	680 U	750 U
BENZO(A)PYRENE	430 U	420 U	470 U	480 U	680 U	750 U
INDENO(1,2,3-CD)PYRENE	430 U	420 U	470 U	480 U	680 U	750 U
DIBENZO(A,H)ANTHRACENE	430 U	420 U	470 U	480 U	680 U	750 U
BENZO(G,H,I)PERYLENE	430 U	420 U	49 J	480 U	680 U	750 U

SITE 44, JONES STREET DUMP
SEDIMENT - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-EC-SD04-06	44-EC-SD04-612	44-EC-SD05-06	44-EC-SD05-612	44-UT-SD01-06	44-UT-SD01-612
DATE SAMPLED	05/04/95	05/04/95	05/04/95	05/04/95	05/04/95	05/04/95
DEPTH	0-6"	6-12"	0-6"	6-12"	0-6"	6-12"
UNITS	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
PESTICIDE/PCBS						
ALPHA-BHC	2.2 R	2.1 UJ	2.3 UJ	2.4 UJ	3.5 UJ	3.7 UJ
BETA-BHC	2.2 R	2.1 UJ	2.3 UJ	2.4 UJ	3.5 U	3.7 U
DELTA-BHC	2.2 R	2.1 UJ	2.3 UJ	2.4 UJ	3.5 U	3.7 U
GAMMA-BHC (LINDANE)	2.2 R	2.1 UJ	2.3 UJ	2.4 UJ	3.5 U	3.7 U
HEPTACHLOR	2.2 R	2.1 UJ	2.3 UJ	2.4 UJ	3.5 U	3.7 U
ALDRIN	2.2 R	2.1 UJ	2.3 UJ	2.4 UJ	3.5 U	3.7 U
HEPTACHLOR EPOXIDE	2.2 R	2.1 UJ	2.3 UJ	2.4 UJ	3.5 U	3.7 U
ENDOSULFAN I	2.2 R	2.1 UJ	2.3 UJ	2.4 UJ	3.5 U	3.7 U
DIELDRIN	4.3 R	4.1 UJ	4.7 UJ	4.7 UJ	6.9 U	7.5 U
4,4'-DDE	20 J	21 J	56 J	150 J	20 J	25 J
ENDRIN	4.3 R	4.1 UJ	4.7 UJ	4.7 UJ	6.9 U	7.5 U
ENDOSULFAN II	4.3 R	4.1 UJ	4.7 UJ	4.7 UJ	6.9 U	7.5 U
4,4'-DDD	33 J	43 J	140	370	5.5 J	13 J
ENDOSULFAN SULFATE	4.3 R	4.1 UJ	4.7 UJ	4.7 UJ	6.9 U	7.5 U
4,4'-DDT	2.6 J	2.5 J	6.5 J	130	6.9 UJ	7.5 UJ
METHOXYCHLOR	22 R	21 UJ	23 UJ	24 UJ	35 UJ	37 UJ
ENDRIN KETONE	4.3 R	4.1 UJ	4.7 UJ	4.7 UJ	6.9 U	7.5 U
ENDRIN ALDEHYDE	4.3 R	4.1 UJ	4.7 UJ	4.7 UJ	6.9 U	7.5 U
ALPHA-CHLORDANE	2.6 J	2.9 J	6.1 J	14 J	3.5 U	3.7 U
GAMMA-CHLORDANE	3 J	3.3 J	6.5 J	16 J	3.5 U	3.7 U
TOXAPHENE	220 R	210 UJ	230 UJ	240 UJ	350 U	370 U
AROCLOR-1016	43 R	41 UJ	47 UJ	47 UJ	69 U	75 U
AROCLOR-1221	87 R	83 UJ	93 UJ	94 UJ	140 U	150 U
AROCLOR-1232	43 R	41 UJ	47 UJ	47 UJ	69 U	75 U
AROCLOR-1242	43 R	41 UJ	47 UJ	47 UJ	69 U	75 U
AROCLOR-1248	43 R	41 UJ	47 UJ	47 UJ	69 U	75 U
AROCLOR-1254	43 R	41 UJ	47 UJ	47 UJ	69 U	75 U
AROCLOR-1260	43 R	41 UJ	47 UJ	47 UJ	69 U	75 U

SITE 44, JONES STREET DUMP
SEDIMENT - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-UT-SD02-06	44-UT-SD02-612	44-UT-SD03-06	44-UT-SD03-612
DATE SAMPLED	05/04/95	05/04/95	05/04/95	05/04/95
DEPTH	0-6"	6-12"	0-6"	6-12"
UNITS	UG/KG	UG/KG	UG/KG	UG/KG
VOLATILES				
CHLOROMETHANE	14 U	16 U	13 U	13 U
BROMOMETHANE	14 U	16 U	13 U	13 U
VINYL CHLORIDE	14 U	16 U	13 U	13 U
CHLOROETHANE	14 U	16 U	13 U	13 U
METHYLENE CHLORIDE	14 U	16 U	13 U	13 U
ACETONE	38	44	15	37
CARBON DISULFIDE	14 U	16 U	13 U	13 U
1,1-DICHLOROETHENE	14 U	16 U	13 U	13 U
1,1-DICHLOROETHANE	14 U	16 U	13 U	13 U
1,2-DICHLOROETHENE (TOTAL)	14 U	16 U	13 U	13 U
CHLOROFORM	14 U	16 U	13 U	13 U
1,2-DICHLOROETHANE	14 U	16 U	13 U	13 U
2-BUTANONE	14 U	16 U	13 U	13 U
1,1,1-TRICHLOROETHANE	14 U	16 U	13 U	13 U
CARBON TETRACHLORIDE	14 U	16 U	13 U	13 U
BROMODICHLOROMETHANE	14 U	16 U	13 U	13 U
1,2-DICHLOROPROPANE	14 U	16 U	13 U	13 U
CIS-1,3-DICHLOROPROPENE	14 U	16 U	13 U	13 U
TRICHLOROETHENE	14 U	16 U	13 U	13 U
DIBROMOCHLOROMETHANE	14 U	16 U	13 U	13 U
1,1,2-TRICHLOROETHANE	14 U	16 U	13 U	13 U
BENZENE	14 U	16 U	13 U	13 U
TRANS-1,3-DICHLOROPROPENE	14 U	16 U	13 U	13 U
BROMOFORM	14 U	16 U	13 U	13 U
4-METHYL-2-PENTANONE	14 U	16 U	13 U	13 U
2-HEXANONE	14 U	16 U	13 U	13 UJ
TETRACHLOROETHENE	14 U	16 U	13 U	13 U
1,1,2,2-TETRACHLOROETHANE	14 U	16 U	13 U	13 U
TOLUENE	14 U	16 U	13 U	13 U
CHLOROBENZENE	14 U	16 U	13 U	13 U
ETHYLBENZENE	14 U	16 U	13 U	13 U
STYRENE	14 U	16 U	13 U	13 U
XYLENE (TOTAL)	14 U	16 U	13 U	13 U

SITE 44, JONES STREET DUMP
SEDIMENT - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-UT-SD02-06	44-UT-SD02-612	44-UT-SD03-06	44-UT-SD03-612
DATE SAMPLED	05/04/95	05/04/95	05/04/95	05/04/95
DEPTH	0-6"	6-12"	0-6"	6-12"
UNITS	UG/KG	UG/KG	UG/KG	UG/KG
SEMIVOLATILES				
PHENOL	460 U	510 U	430 U	440 U
BIS(2-CHLOROETHYL)ETHER	460 U	510 U	430 U	440 U
2-CHLOROPHENOL	460 U	510 U	430 U	440 U
1,3-DICHLOROBENZENE	460 U	510 U	430 U	440 U
1,4-DICHLOROBENZENE	460 U	510 U	430 U	440 U
1,2-DICHLOROBENZENE	460 U	510 U	430 U	440 U
2-METHYLPHENOL	460 U	510 U	430 U	440 U
2,2'-OXYBIS(1-CHLOROPROPANE)	460 U	510 U	430 U	440 U
4-METHYLPHENOL	460 U	510 U	430 U	440 U
N-NITROSO-DI-N-PROPYLAMINE	460 U	510 U	430 U	440 U
HEXACHLOROETHANE	460 U	510 U	430 U	440 U
NITROBENZENE	460 U	510 U	430 U	440 U
ISOPHORONE	460 U	510 U	430 U	440 U
2-NITROPHENOL	460 U	510 U	430 U	440 U
2,4-DIMETHYLPHENOL	460 U	510 U	430 U	440 U
BIS(2-CHLOROETHOXY)METHANE	460 U	510 U	430 U	440 U
2,4-DICHLOROPHENOL	460 U	510 U	430 U	440 U
1,2,4-TRICHLOROBENZENE	460 U	510 U	430 U	440 U
NAPHTHALENE	460 U	510 U	430 U	440 U
4-CHLOROANILINE	460 U	510 U	430 U	440 U
HEXACHLOROBUTADIENE	460 U	510 U	430 U	440 U
4-CHLORO-3-METHYLPHENOL	460 U	510 U	430 U	440 U
2-METHYLNAPHTHALENE	460 U	510 U	430 U	440 U
HEXACHLOROCYCLOPENTADIENE	460 U	510 U	430 U	440 U
2,4,6-TRICHLOROPHENOL	460 U	510 U	430 U	440 U
2,4,5-TRICHLOROPHENOL	1200 U	1300 U	1100 U	1100 U
2-CHLORONAPHTHALENE	460 U	510 U	430 U	440 U
2-NITROANILINE	1200 U	1300 U	1100 U	1100 U
DIMETHYLPHTHALATE	460 U	510 U	430 U	440 U
ACENAPHTHYLENE	460 U	510 U	430 U	440 U
2,6-DINITROTOLUENE	460 U	510 U	430 U	440 U
3-NITROANILINE	1200 U	1300 U	1100 U	1100 U
ACENAPHTHENE	460 U	510 U	430 U	440 U
2,4-DINITROPHENOL	1200 U	1300 U	1100 U	1100 U

SITE 44, JONES STREET DUMP
SEDIMENT - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-UT-SD02-06	44-UT-SD02-612	44-UT-SD03-06	44-UT-SD03-612
DATE SAMPLED	05/04/95	05/04/95	05/04/95	05/04/95
DEPTH	0-6"	6-12"	0-6"	6-12"
UNITS	UG/KG	UG/KG	UG/KG	UG/KG
SEMIVOLATILES cont.				
4-NITROPHENOL	1200 U	1300 U	1100 U	1100 U
DIBENZOFURAN	460 U	510 U	430 U	440 U
2,4-DINITROTOLUENE	460 U	510 U	430 U	440 U
DIETHYLPHTHALATE	460 U	510 U	430 U	440 U
4-CHLOROPHENYL-PHENYLETHER	460 U	510 U	430 U	440 U
FLUORENE	460 U	510 U	430 U	440 U
4-NITROANILINE	1200 U	1300 U	1100 U	1100 U
4,6-DINITRO-2-METHYLPHENOL	1200 U	1300 U	1100 U	1100 U
N-NITROSODIPHENYLAMINE (1)	460 U	510 U	430 U	440 U
4-BROMOPHENYL-PHENYLETHER	460 U	510 U	430 U	440 U
HEXACHLOROBENZENE	460 U	510 U	430 U	440 U
PENTACHLOROPHENOL	1200 U	1300 U	1100 U	1100 U
PHENANTHRENE	65 J	69 J	49 J	250 J
ANTHRACENE	460 U	510 U	430 U	440 U
CARBAZOLE	460 U	510 U	430 U	79 J
DI-N-BUTYLPHTHALATE	460 U	510 U	430 U	440 U
FLUORANTHENE	170 J	510 U	210 J	740
PYRENE	120 J	510 U	150 J	490
BUTYLBENZYLPHTHALATE	48 J	510 U	430 U	440 U
3,3'-DICHLOROBENZIDINE	460 U	510 U	430 U	440 U
BENZO(A)ANTHRACENE	50 J	510 U	59 J	170 J
CHRYSENE	99 J	510 U	130 J	460
BIS(2-ETHYLHEXYL)PHTHALATE	570	510 U	560	870
DI-N-OCTYL PHTHALATE	460 U	510 U	430 U	440 U
BENZO(B)FLUORANTHENE	110 J	510 U	160 J	600
BENZO(K)FLUORANTHENE	49 J	510 U	160 J	200 J
BENZO(A)PYRENE	56 J	510 U	89 J	300 J
INDENO(1,2,3-CD)PYRENE	460 U	510 U	430 U	440 U
DIBENZO(A,H)ANTHRACENE	460 U	510 U	430 U	440 U
BENZO(G,H,I)PERYLENE	71 J	510 U	430 U	440 U

SITE 44, JONES STREET DUMP
SEDIMENT - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-UT-SD02-06	44-UT-SD02-612	44-UT-SD03-06	44-UT-SD03-612
DATE SAMPLED	05/04/95	05/04/95	05/04/95	05/04/95
DEPTH	0-6"	6-12"	0-6"	6-12"
UNITS	UG/KG	UG/KG	UG/KG	UG/KG
PESTICIDE/PCBS				
ALPHA-BHC	2.3 UJ	2.6 UJ	2.1 R	2.2 R
BETA-BHC	2.3 UJ	2.6 UJ	2.1 R	2.2 R
DELTA-BHC	2.3 UJ	2.6 UJ	2.1 R	2.2 R
GAMMA-BHC (LINDANE)	2.3 UJ	2.6 UJ	2.1 R	2.2 R
HEPTACHLOR	2.3 UJ	2.6 UJ	2.1 R	2.2 R
ALDRIN	2.3 UJ	2.6 UJ	2.1 R	2.6 J
HEPTACHLOR EPOXIDE	2.3 UJ	2.6 UJ	2.1 R	5.2 J
ENDOSULFAN I	2.3 UJ	2.6 UJ	2.1 R	2.2 R
DIELDRIN	4.6 UJ	5.1 UJ	4.3 R	4.3 R
4,4'-DDE	110 J	310 J	9.9 J	15 J
ENDRIN	4.6 UJ	5.1 UJ	4.3 R	4.3 R
ENDOSULFAN II	4.6 UJ	5.1 UJ	4.3 R	4.3 R
4,4'-DDD	85	770	14 J	21 J
ENDOSULFAN SULFATE	4.6 UJ	5.1 UJ	4.3 R	4.3 R
4,4'-DDT	3.7 J	3.1 J	4.3 R	4.3 R
METHOXYCHLOR	23 UJ	26 UJ	21 R	22 R
ENDRIN KETONE	4.6 UJ	5.1 UJ	4.3 R	4.3 R
ENDRIN ALDEHYDE	4.6 UJ	5.1 UJ	4.3 R	4.3 R
ALPHA-CHLORDANE	5.1 NJ	2.6 NJ	5.6 J	7.8 J
GAMMA-CHLORDANE	5.1 J	3.6 J	6.9 J	9.5 J
TOXAPHENE	230 UJ	260 UJ	210 R	220 R
AROCLOR-1016	46 UJ	51 UJ	43 R	43 R
AROCLOR-1221	92 UJ	100 UJ	86 R	87 R
AROCLOR-1232	46 UJ	51 UJ	43 R	43 R
AROCLOR-1242	46 UJ	51 UJ	43 R	43 R
AROCLOR-1248	46 UJ	51 UJ	43 R	43 R
AROCLOR-1254	46 UJ	51 UJ	43 R	43 R
AROCLOR-1260	46 UJ	51 UJ	43 R	43 R

SITE 44, JONES STREET DUMP
SEDIMENT - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION DATE SAMPLED DEPTH UNITS	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
VOLATILES						
CHLOROMETHANE	12 U	24 U	ND	ND		0/16
BROMOMETHANE	12 U	24 U	ND	ND		0/16
VINYL CHLORIDE	12 U	24 U	ND	ND		0/16
CHLOROETHANE	12 U	24 U	ND	ND		0/16
METHYLENE CHLORIDE	12 U	24 U	ND	ND		0/16
ACETONE	12 U	13 U	15	610 J	44-UT-SD01-06	11/16
CARBON DISULFIDE	12 U	24 U	ND	ND		0/16
1,1-DICHLOROETHENE	12 U	24 U	ND	ND		0/16
1,1-DICHLOROETHANE	12 U	24 U	ND	ND		0/16
1,2-DICHLOROETHENE (TOTAL)	12 U	24 U	ND	ND		0/16
CHLOROFORM	12 U	24 U	ND	ND		0/16
1,2-DICHLOROETHANE	12 U	24 U	ND	ND		0/16
2-BUTANONE	12 U	16 U	51	200	44-UT-SD01-06	2/16
1,1,1-TRICHLOROETHANE	12 U	24 UJ	ND	ND		0/16
CARBON TETRACHLORIDE	12 U	24 UJ	ND	ND		0/16
BROMODICHLOROMETHANE	12 U	24 UJ	ND	ND		0/16
1,2-DICHLOROPROPANE	12 U	24 UJ	ND	ND		0/16
CIS-1,3-DICHLOROPROPENE	12 U	24 UJ	ND	ND		0/16
TRICHLOROETHENE	12 U	24 UJ	ND	ND		0/16
DIBROMOCHLOROMETHANE	12 U	24 UJ	ND	ND		0/16
1,1,2-TRICHLOROETHANE	12 U	24 UJ	ND	ND		0/16
BENZENE	12 U	24 UJ	ND	ND		0/16
TRANS-1,3-DICHLOROPROPENE	12 U	24 UJ	ND	ND		0/16
BROMOFORM	12 U	24 UJ	ND	ND		0/16
4-METHYL-2-PENTANONE	12 U	24 UJ	ND	ND		0/16
2-HEXANONE	12 U	24 UJ	ND	ND		0/16
TETRACHLOROETHENE	12 U	24 UJ	ND	ND		0/16
1,1,2,2-TETRACHLOROETHANE	12 U	24 UJ	ND	ND		0/16
TOLUENE	12 U	24 UJ	ND	ND		0/16
CHLOROBENZENE	12 U	24 UJ	ND	ND		0/16
ETHYLBENZENE	12 U	24 UJ	ND	ND		0/16
STYRENE	12 U	24 UJ	ND	ND		0/16
XYLENE (TOTAL)	12 U	24 UJ	ND	ND		0/16

SITE 44, JONES STREET DUMP
SEDIMENT - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION DATE SAMPLED DEPTH UNITS	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
SEMIVOLATILES						
PHENOL	390 U	750 U	ND	ND		0/16
BIS(2-CHLOROETHYL)ETHER	390 U	750 U	ND	ND		0/16
2-CHLOROPHENOL	390 U	750 U	ND	ND		0/16
1,3-DICHLOROBENZENE	390 U	750 U	ND	ND		0/16
1,4-DICHLOROBENZENE	390 U	750 U	ND	ND		0/16
1,2-DICHLOROBENZENE	390 U	750 U	ND	ND		0/16
2-METHYLPHENOL	390 U	750 U	ND	ND		0/16
2,2'-OXYBIS(1-CHLOROPROPANE)	390 U	750 U	ND	ND		0/16
4-METHYLPHENOL	390 U	750 U	ND	ND		0/16
N-NITROSO-DI-N-PROPYLAMINE	390 U	750 U	ND	ND		0/16
HEXACHLOROETHANE	390 U	750 U	ND	ND		0/16
NITROBENZENE	390 U	750 U	ND	ND		0/16
ISOPHORONE	390 U	750 U	ND	ND		0/16
2-NITROPHENOL	390 U	750 U	ND	ND		0/16
2,4-DIMETHYLPHENOL	390 U	750 U	ND	ND		0/16
BIS(2-CHLOROETHOXY)METHANE	390 U	750 U	ND	ND		0/16
2,4-DICHLOROPHENOL	390 U	750 U	ND	ND		0/16
1,2,4-TRICHLOROBENZENE	390 U	750 U	ND	ND		0/16
NAPHTHALENE	390 U	750 U	ND	ND		0/16
4-CHLOROANILINE	390 U	750 U	ND	ND		0/16
HEXACHLOROBUTADIENE	390 U	750 U	ND	ND		0/16
4-CHLORO-3-METHYLPHENOL	390 U	750 U	ND	ND		0/16
2-METHYLNAPHTHALENE	390 U	750 U	ND	ND		0/16
HEXACHLOROCYCLOPENTADIENE	390 U	750 U	ND	ND		0/16
2,4,6-TRICHLOROPHENOL	390 U	750 U	ND	ND		0/16
2,4,5-TRICHLOROPHENOL	960 U	1900 U	ND	ND		0/16
2-CHLORONAPHTHALENE	390 U	750 U	ND	ND		0/16
2-NITROANILINE	960 U	1900 U	ND	ND		0/16
DIMETHYLPHTHALATE	390 U	750 U	ND	ND		0/16
ACENAPHTHYLENE	390 U	750 U	ND	ND		0/16
2,6-DINITROTOLUENE	390 U	750 U	ND	ND		0/16
3-NITROANILINE	960 U	1900 U	ND	ND		0/16
ACENAPHTHENE	390 U	750 U	ND	ND		0/16
2,4-DINITROPHENOL	960 U	1900 U	ND	ND		0/16

SITE 44, JONES STREET DUMP
SEDIMENT - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION DATE SAMPLED DEPTH UNITS	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
SEMIVOLATILES cont.						
4-NITROPHENOL	960 U	1900 U	ND	ND		0/16
DIBENZOFURAN	390 U	750 U	ND	ND		0/16
2,4-DINITROTOLUENE	390 U	750 U	ND	ND		0/16
DIETHYLPHTHALATE	390 U	750 U	ND	ND		0/16
4-CHLOROPHENYL-PHENYLETHER	390 U	750 U	ND	ND		0/16
FLUORENE	390 U	750 U	ND	ND		0/16
4-NITROANILINE	960 U	1900 U	ND	ND		0/16
4,6-DINITRO-2-METHYLPHENOL	960 U	1900 U	ND	ND		0/16
N-NITROSODIPHENYLAMINE (1)	390 U	750 U	ND	ND		0/16
4-BROMOPHENYL-PHENYLETHER	390 U	750 U	ND	ND		0/16
HEXACHLOROBENZENE	390 U	750 U	ND	ND		0/16
PENTACHLOROPHENOL	980 U	1900 U	340 J	740 J	44-EC-SD01-612	2/16
PHENANTHRENE	390 U	750 U	49 J	250 J	44-UT-SD03-612	5/16
ANTHRACENE	390 U	750 U	ND	ND		0/16
CARBAZOLE	390 U	750 U	79 J	79 J	44-UT-SD03-612	1/16
DI-N-BUTYLPHTHALATE	390 U	750 U	ND	ND		0/15
FLUORANTHENE	390 U	750 U	95 J	740	44-UT-SD03-612	6/16
PYRENE	390 U	750 U	42 J	490	44-UT-SD03-612	7/16
BUTYLBENZYLPHTHALATE	390 U	750 U	48 J	48 J	44-UT-SD02-06	1/16
3,3'-DICHLOROBENZIDINE	390 U	750 U	ND	ND		0/16
BENZO(A)ANTHRACENE	390 U	750 U	50 J	170 J	44-UT-SD03-612	3/16
CHRYSENE	390 U	750 U	44 J	460	44-UT-SD03-612	7/16
BIS(2-ETHYLHEXYL)PHTHALATE	390 U	750 U	160 J	870	44-UT-SD03-612	5/16
DI-N-OCTYL PHTHALATE	390 U	750 U	ND	ND		0/16
BENZO(B)FLUORANTHENE	390 U	750 U	52 J	600	44-UT-SD03-612	6/16
BENZO(K)FLUORANTHENE	390 U	750 U	49 J	200 J	44-UT-SD03-612	3/16
BENZO(A)PYRENE	390 U	750 U	56 J	300 J	44-UT-SD03-612	3/16
INDENO(1,2,3-CD)PYRENE	390 U	750 U	ND	ND		0/16
DIBENZO(A,H)ANTHRACENE	390 U	750 U	ND	ND		0/16
BENZO(G,H,I)PERYLENE	390 U	750 U	49 J	71 J	44-UT-SD02-06	2/16

SITE 44, JONES STREET DUMP
SEDIMENT - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION DATE SAMPLED DEPTH UNITS	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
PESTICIDE/PCBS						
ALPHA-BHC	1.9 UJ	3.7 UJ	ND	ND		0/13
BETA-BHC	1.9 UJ	3.7 U	ND	ND		0/13
DELTA-BHC	1.9 UJ	3.7 U	ND	ND		0/13
GAMMA-BHC (LINDANE)	1.9 UJ	3.7 U	ND	ND		0/13
HEPTACHLOR	1.9 UJ	3.7 U	ND	ND		0/13
ALDRIN	1.9 UJ	3.7 U	2.6 J	2.6 J	44-UT-SD03-612	1/14
HEPTACHLOR EPOXIDE	1.9 UJ	3.7 U	5.2 J	5.2 J	44-UT-SD03-612	1/14
ENDOSULFAN I	1.9 UJ	3.7 U	ND	ND		0/13
DIELDRIN	3.9 UJ	7.5 U	ND	ND		0/13
4,4'-DDE	NA	NA	9.3 J	310 J	44-UT-SD02-612	16/16
ENDRIN	3.9 UJ	7.5 U	ND	ND		0/13
ENDOSULFAN II	3.9 UJ	7.5 U	ND	ND		0/13
4,4'-DDD	NA	NA	5.5 J	770	44-UT-SD02-612	16/16
ENDOSULFAN SULFATE	3.9 UJ	7.5 U	ND	ND		0/13
4,4'-DDT	4 UJ	7.5 UJ	2.5 J	130	44-EC-SD05-612	10/14
METHOXYCHLOR	19 UJ	37 UJ	ND	ND		0/13
ENDRIN KETONE	3.9 UJ	7.5 U	ND	ND		0/13
ENDRIN ALDEHYDE	3.9 UJ	7.5 U	ND	ND		0/13
ALPHA-CHLORDANE	2 UJ	3.7 U	2	14 J	44-EC-SD05-612	13/16
GAMMA-CHLORDANE	2 UJ	3.7 U	2.7 J	16 J	44-EC-SD05-612	13/16
TOXAPHENE	190 UJ	370 U	ND	ND		0/13
AROCLOR-1016	39 UJ	75 U	ND	ND		0/13
AROCLOR-1221	78 UJ	150 U	ND	ND		0/13
AROCLOR-1232	39 UJ	75 U	ND	ND		0/13
AROCLOR-1242	39 UJ	75 U	ND	ND		0/13
AROCLOR-1248	39 UJ	75 U	ND	ND		0/13
AROCLOR-1254	39 UJ	75 U	ND	ND		0/13
AROCLOR-1260	39 UJ	75 U	ND	ND		0/13

SITE 44, JONES STREET DUMP
SEDIMENT - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
INORGANIC ANALYTES

LOCATION	44-EC-SD01-06	44-EC-SD01-612	44-EC-SD02-06	44-EC-SD02-612	44-EC-SD03-06	44-EC-SD03-612
DATE SAMPLED	05/04/95	05/04/95	05/04/95	05/04/95	05/04/95	05/04/95
DEPTH	0-6"	6-12"	0-6"	6-12"	0-6"	6-12"
UNITS	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG
TOTAL METALS						
ALUMINUM, TOTAL	1420 J	787 J	811 J	1020 J	556 J	795
ANTIMONY, TOTAL	2.2 U	2.2 U	2.4 U	2.8 U	2.6 U	2.6 UJ
ARSENIC, TOTAL	0.8 J	0.45 J	0.32 U	0.59 J	0.29 U	0.36 U
BARIUM, TOTAL	7	5.1	7.7	7.1	4.9	5.5
BERYLLIUM, TOTAL	0.11 U	0.11	0.1 U	0.07 U	0.07 U	0.06 U
CADMIUM, TOTAL	0.7 U	0.71 U	0.79 U	0.91 U	0.85 U	0.83 U
CALCIUM, TOTAL	40000	33500	15600	9910	4190	7850
CHROMIUM, TOTAL	3.9	3.2	3.1	3	2.6	2.8
COBALT, TOTAL	0.59 U	0.26 U	0.95 U	0.54 U	0.56 U	0.48
COPPER, TOTAL	2.2	2.4	2.9	5.5	2	2.2
IRON, TOTAL	3380	1320	1100	1340	613	1040
LEAD, TOTAL	15.2 J	13.6 J	9.3 J	24.9 J	8.4 J	14.2
MAGNESIUM, TOTAL	637	534	288	171	95.8	156
MANGANESE, TOTAL	10.1	7	4.5	3.3	2	3.4
MERCURY, TOTAL	0.1 U	0.09 U	0.11 U	0.09 U	0.1 U	0.1 U
NICKEL, TOTAL	1.7	1.1	2.1	1.9	1.2	1.2 U
POTASSIUM, TOTAL	49.5 U	53.5 U	71.5 U	58.2 U	56.3 U	60.2
SELENIUM, TOTAL	0.3 U	0.28 U	0.33 U	0.34 U	0.31 U	0.38 U
SILVER, TOTAL	0.34 U	0.35 U	0.38 U	0.44 U	0.42 U	0.41 U
SODIUM, TOTAL	90	96.1	58.7	35.6	34.2	42.7
THALLIUM, TOTAL	0.12 U	0.11 U	0.13 U	0.13 U	0.12 U	0.15 U
VANADIUM, TOTAL	7.8	5.3	3.4	4.4	1.9	3.2
ZINC, TOTAL	25	19.2	21.6	26	18.4	23.3

SITE 44, JONES STREET DUMP
SEDIMENT - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
INORGANIC ANALYTES

LOCATION	44-EC-SD04-06	44-EC-SD04-612	44-EC-SD05-06	44-EC-SD05-612	44-UT-SD01-06	44-UT-SD01-612
DATE SAMPLED	05/04/95	05/04/95	05/04/95	05/04/95	05/04/95	05/04/95
DEPTH	0-6"	6-12"	0-6"	6-12"	0-6"	6-12"
UNITS	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG
TOTAL METALS						
ALUMINUM, TOTAL	934 J	841 J	1420 J	2650 J	10700 J	12200 J
ANTIMONY, TOTAL	2.5 U	2.9 U	3 U	3.3 U	4.4 U	5 U
ARSENIC, TOTAL	0.29 U	0.33 U	0.75 J	0.83 J	1.1	1.1
BARIUM, TOTAL	6.9	8.9	9	13	41.5	49.5
BERYLLIUM, TOTAL	0.06 U	0.07 U	0.08 U	0.17	0.22 U	0.25 U
CADMIUM, TOTAL	0.8 U	0.96 U	0.99 U	1.2	1.4 U	1.6 U
CALCIUM, TOTAL	3140	4650	3540	5490	5140	5840
CHROMIUM, TOTAL	3.9	2.8	4.5	8.8	10	11.1
COBALT, TOTAL	0.7 U	0.58 U	0.88 U	0.94 U	0.69 U	0.93 U
COPPER, TOTAL	3.8	3.7	4.9	7.7	1.9	2.8
IRON, TOTAL	1540	1490	1940	5290	5340	5830
LEAD, TOTAL	25.4 J	16.3 J	43.5 J	34.6 J	14.7 J	14.1 J
MAGNESIUM, TOTAL	116	124	246	250	383	588
MANGANESE, TOTAL	2.9	2.6	5.5	15.3	15.9	15.1
MERCURY, TOTAL	0.11 U	0.09 U	0.1 U	0.1 U	0.23 U	0.17 U
NICKEL, TOTAL	2.6	2.1	2.6	4	2.8	3.9
POTASSIUM, TOTAL	55.9 U	53.9 U	96.8 U	123	275	299
SELENIUM, TOTAL	0.3 U	0.35 U	0.38 U	0.47	1	1.4
SILVER, TOTAL	0.39 U	0.47 U	0.51	0.53 U	0.7 U	0.8 U
SODIUM, TOTAL	34.4	30.3	185	71.8	107	224
THALLIUM, TOTAL	0.12 U	0.14 U	0.15 U	0.15 U	0.2 U	0.24 U
VANADIUM, TOTAL	4.3	4.3	6	9.2	13.7	15.1
ZINC, TOTAL	30.2	28.6	144	41.7	9	6.3

SITE 44, JONES STREET DUMP
SEDIMENT - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
INORGANIC ANALYTES

LOCATION	44-UT-SD02-06	44-UT-SD02-612	44-UT-SD03-06	44-UT-SD03-612
DATE SAMPLED	05/04/95	05/04/95	05/04/95	05/04/95
DEPTH	0-6"	6-12"	0-6"	6-12"
UNITS	MG/KG	MG/KG	MG/KG	MG/KG
TOTAL METALS				
ALUMINUM, TOTAL	2670 J	7830 J	1070 J	1110 J
ANTIMONY, TOTAL	3.1 U	3.3 U	2 U	2.6 U
ARSENIC, TOTAL	1.4	0.8	0.38	0.34
BARIUM, TOTAL	8.3	16	6.4	5.5
BERYLLIUM, TOTAL	0.08 U	0.17 U	0.06 U	0.6 U
CADMIUM, TOTAL	1 U	1.1 U	0.64 U	0.83 U
CALCIUM, TOTAL	6400	2610	16100	7540
CHROMIUM, TOTAL	5	7.8	4	3.4
COBALT, TOTAL	0.64 U	0.9 U	0.44 U	0.57 U
COPPER, TOTAL	3.4	2.2	2.7	2.8
IRON, TOTAL	2950	5150	1240	1340
LEAD, TOTAL	15.9 J	11 J	53 J	56.3 J
MAGNESIUM, TOTAL	194	205	348	283
MANGANESE, TOTAL	4.8	5.5	5.3	5.3
MERCURY, TOTAL	0.11 U	0.11 U	0.1 U	0.13 U
NICKEL, TOTAL	2.3	2.3	1.4	1.6
POTASSIUM, TOTAL	91.2 U	173	75.7 U	96.4 U
SELENIUM, TOTAL	0.38 U	0.79	0.31 U	0.31 U
SILVER, TOTAL	0.5 U	0.52 U	0.31 U	0.41 U
SODIUM, TOTAL	59.4	48.1	98.7	155
THALLIUM, TOTAL	0.15 U	0.15 U	0.12 U	0.12 U
VANADIUM, TOTAL	6.8	9.9	5.5	5.4
ZINC, TOTAL	46.6	9	70.9	67.8

SITE 44, JONES STREET DUMP
SEDIMENT - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
INORGANIC ANALYTES

LOCATION DATE SAMPLED DEPTH UNITS	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
TOTAL METALS						
ALUMINUM, TOTAL	NA	NA	556 J	12200 J	44-UT-SD01-612	16/16
ANTIMONY, TOTAL	2 U	5 U	ND	ND		0/16
ARSENIC, TOTAL	0.29 U	0.36 U	0.34	1.4	44-UT-SD02-06	11/16
BARIUM, TOTAL	NA	NA	4.9	49.5	44-UT-SD01-612	16/16
BERYLLIUM, TOTAL	0.06 U	0.6 U	0.11	0.17	44-EC-SD05-612	2/16
CADMIUM, TOTAL	0.64 U	1.6 U	1.2	1.2	44-EC-SD05-612	1/16
CALCIUM, TOTAL	NA	NA	2610	40000	44-EC-SD01-06	16/16
CHROMIUM, TOTAL	NA	NA	2.6	11.1	44-UT-SD01-612	16/16
COBALT, TOTAL	0.26 U	0.95 U	0.48	0.48	44-EC-SD03-612	1/16
COPPER, TOTAL	NA	NA	1.9	7.7	44-EC-SD05-612	16/16
IRON, TOTAL	NA	NA	613	5830	44-UT-SD01-612	16/16
LEAD, TOTAL	NA	NA	8.4 J	56.3 J	44-UT-SD03-612	16/16
MAGNESIUM, TOTAL	NA	NA	95.8	637	44-EC-SD01-06	16/16
MANGANESE, TOTAL	NA	NA	2	15.9	44-UT-SD01-06	16/16
MERCURY, TOTAL	0.09 U	0.23 U	ND	ND		0/16
NICKEL, TOTAL	1.2 U	1.2 U	1.1	4	44-EC-SD05-612	15/16
POTASSIUM, TOTAL	49.5 U	96.8 U	60.2	299	44-UT-SD01-612	5/16
SELENIUM, TOTAL	0.28 U	0.38 U	0.47	1.4	44-UT-SD01-612	4/16
SILVER, TOTAL	0.31 U	0.8 U	0.51	0.51	44-EC-SD05-06	1/16
SODIUM, TOTAL	NA	NA	30.3	224	44-UT-SD01-612	16/16
THALLIUM, TOTAL	0.11 U	0.24 U	ND	ND		0/16
VANADIUM, TOTAL	NA	NA	1.9	15.1	44-UT-SD01-612	16/16
ZINC, TOTAL	NA	NA	6.3	144	44-EC-SD05-06	16/16

APPENDIX I
STATISTICAL SUMMARIES

SITE 44, JONES STREET DUMP
SURFACE SOIL - STATISTICAL SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

	NORMAL ARITHMETIC MEAN	NORMAL STANDARD DEVIATION	NORMAL UPPER 95% CONFIDENCE INTERVAL	LOG ARITHMETIC MEAN	LOG STANDARD DEVIATION	LOG UPPER 95% CONFIDENCE INTERVAL
VOLATILES						
ACETONE	7.46	2.43	8.66	1.97	0.27	8.67
SEMIVOLATILES						
BIS(2-CHLOROETHYL)ETHER	228.46	96.90	276.35	5.38	0.28	264.44
2,6-DINITROTOLUENE	216.54	49.68	241.09	5.36	0.18	237.55
BIS(2-ETHYLHEXYL)PHTHALATE	207.31	17.51	215.96	5.33	0.08	215.74
INDENO(1,2,3-CD)PYRENE	203.85	9.16	208.38	5.32	0.04	208.55
BENZO(G,H,I)PERYLENE	190.54	40.81	210.71	5.21	0.35	238.60
PESTICIDE/PCBS						
4,4'-DDE	22.93	42.63	43.99	1.68	1.63	155.08
4,4'-DDD	2.43	1.49	3.17	0.80	0.36	2.93
4,4'-DDT	8.59	13.26	15.14	1.37	1.15	22.97

SITE 44, JONES STREET DUMP
SURFACE SOIL - STATISTICAL SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
INORGANIC ANALYTES

	NORMAL ARITHMETIC MEAN	NORMAL STANDARD DEVIATION	NORMAL UPPER 95% CONFIDENCE INTERVAL	LOG ARITHMETIC MEAN	LOG STANDARD DEVIATION	LOG UPPER 95% CONFIDENCE INTERVAL
TOTAL METALS						
ALUMINUM, TOTAL	8501.54	3344.29	10154.41	8.97	0.42	11112.40
ARSENIC, TOTAL	2.35	1.30	2.99	0.71	0.57	3.45
BARIUM, TOTAL	17.60	4.89	20.02	2.83	0.31	21.26
CALCIUM, TOTAL	2031.69	1786.09	2914.44	7.05	1.31	11530.61
CHROMIUM, TOTAL	10.75	4.56	13.00	2.25	0.59	16.49
COBALT, TOTAL	0.53	0.36	0.71	-0.81	0.60	0.78
COPPER, TOTAL	71.66	251.89	196.15	0.94	1.86	191.27
IRON, TOTAL	8526.15	4009.23	10507.67	8.92	0.59	12930.25
LEAD, TOTAL	11.36	7.17	14.90	2.27	0.59	16.98
MAGNESIUM, TOTAL	306.85	127.16	369.69	5.64	0.46	411.42
MANGANESE, TOTAL	11.54	11.95	17.45	2.16	0.68	17.38
NICKEL, TOTAL	1.56	0.49	1.81	0.41	0.28	1.83
POTASSIUM, TOTAL	227.62	79.34	266.83	5.35	0.43	302.03
SELENIUM, TOTAL	0.29	0.16	0.37	-1.33	0.47	0.39
SODIUM, TOTAL	25.90	16.97	.34.29	3.00	0.82	53.03
VANADIUM, TOTAL	18.37	7.02	21.84	2.83	0.43	24.30
ZINC, TOTAL	17.25	42.01	38.01	1.80	1.12	33.14

SITE 44, JONES STREET DUMP
SUBSURFACE SOIL - STATISTICAL SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

	NORMAL ARITHMETIC MEAN	NORMAL STANDARD DEVIATION	NORMAL UPPER 95% CONFIDENCE INTERVAL	LOG ARITHMETIC MEAN	LOG STANDARD DEVIATION	LOG UPPER 95% CONFIDENCE INTERVAL
VOLATILES						
ACETONE	19.58	18.75	29.30	2.59	0.89	41.53
SEMIVOLATILES						
BIS(2-ETHYLHEXYL)PHTHALATE	186.77	32.20	202.68	5.21	0.24	214.93
INDENO(1,2,3-CD)PYRENE	180.77	42.66	201.86	5.15	0.36	227.91
BENZO(G,H,I)PERYLENE	168.62	56.96	196.77	5.03	0.53	247.64
PESTICIDE/PCBS						
4,4'-DDE	30.64	101.97	81.04	1.20	1.44	46.15
4,4'-DDD	196.29	692.20	538.40	1.58	2.03	1183.84
4,4'-DDT	13.32	41.07	33.62	0.99	1.21	17.75

SITE 44, JONES STREET DUMP
SUBSURFACE SOIL - STATISTICAL SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
INORGANIC ANALYTES

	NORMAL ARITHMETIC MEAN	NORMAL STANDARD DEVIATION	NORMAL UPPER 95% CONFIDENCE INTERVAL	LOG ARITHMETIC MEAN	LOG STANDARD DEVIATION	LOG UPPER 95% CONFIDENCE INTERVAL
TOTAL METALS						
ALUMINUM, TOTAL	5121.54	2427.15	6321.13	8.41	0.57	7678.15
ARSENIC, TOTAL	0.82	0.67	1.15	-0.53	0.88	1.73
BARIUM, TOTAL	8.64	3.91	10.57	2.00	0.67	14.68
CALCIUM, TOTAL	550.05	1047.12	1067.58	5.14	1.62	4760.48
CHROMIUM, TOTAL	6.08	2.82	7.47	1.68	0.56	8.99
COPPER, TOTAL	0.84	0.67	1.17	-0.36	0.58	1.20
IRON, TOTAL	3616.85	2066.43	4638.15	7.98	0.78	6991.68
LEAD, TOTAL	5.24	2.24	6.35	1.56	0.50	7.45
MAGNESIUM, TOTAL	154.26	81.89	194.73	4.87	0.65	249.78
MANGANESE, TOTAL	4.57	3.03	6.07	1.28	0.76	8.29
NICKEL, TOTAL	2.61	4.17	4.67	0.28	1.11	7.17
POTASSIUM, TOTAL	145.57	72.41	181.36	4.85	0.56	214.33
SODIUM, TOTAL	13.90	11.73	19.70	2.30	0.84	27.41
VANADIUM, TOTAL	8.84	4.77	11.20	2.03	0.59	13.29
ZINC, TOTAL	2.53	2.74	3.88	0.56	0.86	4.89

GROUNDWATER

SITE 44, JONES STREET DUMP
GROUNDWATER - STATISTICAL SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

	NORMAL ARITHMETIC MEAN	NORMAL STANDARD DEVIATION	NORMAL UPPER 95% CONFIDENCE INTERVAL	LOG ARITHMETIC MEAN	LOG STANDARD DEVIATION	LOG UPPER 95% CONFIDENCE INTERVAL
VOLATILES						
VINYL CHLORIDE	5.56	1.67	6.59	1.69	0.23	6.54
1,2-DICHLOROETHENE (TOTAL)	6.11	3.33	8.18	1.73	0.37	7.98
TRICHLOROETHENE	4.56	1.33	5.38	1.43	0.54	7.71
TETRACHLOROETHENE	4.56	1.33	5.38	1.43	0.54	7.71
SEMIVOLATILES						
NAPHTHALENE	12.39	21.98	26.02	1.91	0.88	26.07
2-METHYLNAPHTHALENE	4.94	0.39	5.19	1.60	0.08	5.22
ACENAPHTHENE	5.94	2.65	7.59	1.73	0.32	7.51
DIBENZOFURAN	5.17	0.35	5.39	1.64	0.06	5.39
FLUORENE	5.28	0.67	5.69	1.66	0.11	5.70
PHENANTHRENE	5.28	0.67	5.69	1.66	0.11	5.70
CARBAZOLE	4.94	0.39	5.19	1.60	0.08	5.22
BIS(2-ETHYLHEXYL)PHTHALATE	4.72	1.03	5.36	1.52	0.31	6.07

SITE 44, JONES STREET DUMP
GROUNDWATER - STATISTICAL SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
INORGANIC ANALYTES

	NORMAL ARITHMETIC MEAN	NORMAL STANDARD DEVIATION	NORMAL UPPER 95% CONFIDENCE INTERVAL	LOG ARITHMETIC MEAN	LOG STANDARD DEVIATION	LOG UPPER 95% CONFIDENCE INTERVAL
TOTAL METALS						
ALUMINUM, TOTAL	451.91	916.08	1019.88	4.33	2.07	125905.73
ARSENIC, TOTAL	1.16	0.68	1.58	0.05	0.43	1.64
BARIUM, TOTAL	35.91	33.76	56.84	2.95	1.37	443.51
CALCIUM, TOTAL	51676.67	31808.81	71398.13	10.45	1.32	687920.24
CHROMIUM, TOTAL	2.57	1.62	3.58	0.84	0.41	3.53
COBALT, TOTAL	1.86	0.63	2.25	0.58	0.27	2.24
IRON, TOTAL	20905.33	30516.95	39825.84	8.27	2.13	8388194.94
LEAD, TOTAL	0.54	0.46	0.83	-0.84	0.65	0.99
MAGNESIUM, TOTAL	5055.56	3576.72	7273.12	8.28	0.79	12027.05
MANGANESE, TOTAL	97.88	91.71	154.74	4.07	1.20	627.59
POTASSIUM, TOTAL	3844.44	2394.88	5329.27	8.09	0.61	6953.62
SELENIUM, TOTAL	1.02	0.37	1.25	-0.02	0.27	1.23
SODIUM, TOTAL	20966.67	24516.00	36166.58	9.43	1.03	87872.54
ZINC, TOTAL	6.11	5.03	9.23	1.51	0.84	15.97

SURFACE WATER

SITE 44, JONES STREET DUMP
SURFACE WATER - STATISTICAL SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

	NORMAL ARITHMETIC MEAN	NORMAL STANDARD DEVIATION	NORMAL UPPER 95% CONFIDENCE INTERVAL	LOG ARITHMETIC MEAN	LOG STANDARD DEVIATION	LOG UPPER 95% CONFIDENCE INTERVAL
VOLATILES						
VINYL CHLORIDE	11.75	9.85	16.07	2.20	0.72	17.87
ACETONE	6.19	2.61	7.33	1.76	0.33	7.24
1,1-DICHLOROETHENE	4.31	1.49	4.97	1.35	0.57	6.20
1,2-DICHLOROETHENE (TOTAL)	54.56	47.54	75.40	3.39	1.36	240.61
TRICHLOROETHENE	16.88	19.00	25.20	2.33	1.00	36.30
1,1,2-TRICHLOROETHANE	4.75	1.00	5.19	1.51	0.40	6.03
1,1,2,2-TETRACHLOROETHANE	19.06	13.50	24.98	2.64	0.87	35.11
SEMIVOLATILES						
PHENOL	4.56	1.45	5.53	1.42	0.57	8.53
BIS(2-ETHYLHEXYL)PHTHALATE	2.25	1.83	3.48	0.54	0.76	5.45

SITE 44, JONES STREET DUMP
SURFACE WATER - STATISTICAL SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
INORGANIC ANALYTES

	NORMAL ARITHMETIC MEAN	NORMAL STANDARD DEVIATION	NORMAL UPPER 95% CONFIDENCE INTERVAL	LOG ARITHMETIC MEAN	LOG STANDARD DEVIATION	LOG UPPER 95% CONFIDENCE INTERVAL
TOTAL METALS						
ALUMINUM, TOTAL	255.50	155.66	359.79	5.35	0.69	554.16
BARIUM, TOTAL	20.98	6.72	25.48	2.98	0.41	31.09
CALCIUM, TOTAL	47687.50	9466.25	54029.73	10.75	0.21	56596.51
COPPER, TOTAL	2.00	0.48	2.32	0.66	0.32	2.65
IRON, TOTAL	1578.75	322.86	1795.06	7.35	0.21	1862.49
LEAD, TOTAL	3.33	3.39	5.60	0.87	0.83	9.35
MAGNESIUM, TOTAL	7727.50	7106.50	12488.74	8.64	0.82	21523.81
MANGANESE, TOTAL	88.83	59.92	128.97	4.35	0.53	148.04
NICKEL, TOTAL	7.54	6.99	12.23	1.69	0.84	21.73
POTASSIUM, TOTAL	5361.25	2149.61	6801.45	8.53	0.36	7255.76
SODIUM, TOTAL	63912.50	60264.50	104288.73	10.70	0.92	227754.01
VANADIUM, TOTAL	10.84	9.99	17.53	1.92	1.13	75.76
ZINC, TOTAL	33.50	19.88	46.82	3.30	0.78	89.10

SITE 44, JONES STREET DUMP
SURFACE WATER - STATISTICAL SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
DISSOLVED INORGANIC ANALYTES

	NORMAL ARITHMETIC MEAN	NORMAL STANDARD DEVIATION	NORMAL UPPER 95% CONFIDENCE INTERVAL	LOG ARITHMETIC MEAN	LOG STANDARD DEVIATION	LOG UPPER 95% CONFIDENCE INTERVAL
DISSOLVED METALS						
ALUMINUM, SOLUBLE	14.38	8.38	19.99	2.52	0.56	25.26
BARIUM, SOLUBLE	17.91	5.37	21.51	2.83	0.38	25.17
CALCIUM, SOLUBLE	46900.00	8668.83	52707.97	10.74	0.20	54457.13
COPPER, SOLUBLE	1.76	1.09	2.49	0.41	0.59	3.19
IRON, SOLUBLE	433.25	121.28	514.51	6.04	0.28	543.36
LEAD, SOLUBLE	5.61	14.62	15.41	-0.25	1.62	86.45
MAGNESIUM, SOLUBLE	7901.25	7487.81	12917.96	8.64	0.84	22752.37
MANGANESE, SOLUBLE	20.71	9.10	26.81	2.92	0.55	36.60
NICKEL, SOLUBLE	6.79	6.17	10.93	1.62	0.78	16.61
POTASSIUM, SOLUBLE	5313.75	2262.89	6829.85	8.51	0.37	7253.90
SODIUM, SOLUBLE	65837.50	63548.79	108414.15	10.72	0.93	239914.33
VANADIUM, SOLUBLE	3.79	3.32	6.01	1.09	0.71	8.61
ZINC, SOLUBLE	11.11	6.82	15.68	2.24	0.63	22.37

SEDIMENT

SITE 44, JONES STREET DUMP
SEDIMENT - STATISTICAL SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

	NORMAL ARITHMETIC MEAN	NORMAL STANDARD DEVIATION	NORMAL UPPER 95% CONFIDENCE INTERVAL	LOG ARITHMETIC MEAN	LOG STANDARD DEVIATION	LOG UPPER 95% CONFIDENCE INTERVAL
VOLATILES						
ACETONE	84.34	152.38	151.12	3.43	1.43	289.98
2-BUTANONE	21.41	48.90	42.84	2.22	0.97	28.01
SEMIVOLATILES						
PENTACHLOROPHENOL	595.00	147.51	659.65	6.36	0.24	667.18
PHENANTHRENE	192.50	91.97	232.80	5.12	0.61	282.45
CARBAZOLE	224.31	64.75	252.69	5.37	0.33	266.08
FLUORANTHENE	238.44	152.76	305.38	5.34	0.50	309.80
PYRENE	203.31	117.05	254.61	5.15	0.62	296.93
BUTYLBENZYLPHTHALATE	221.75	69.63	252.27	5.33	0.43	285.00
BENZO(A)ANTHRACENE	209.00	81.06	244.52	5.24	0.53	288.44
CHRYSENE	194.56	119.85	247.09	5.06	0.71	310.82
BIS(2-ETHYLHEXYL)PHTHALATE	332.50	199.99	420.15	5.67	0.51	434.22
BENZO(B)FLUORANTHENE	219.50	133.89	278.18	5.22	0.62	320.25
BENZO(K)FLUORANTHENE	217.13	71.31	248.38	5.31	0.43	278.39
BENZO(A)PYRENE	219.38	79.00	254.00	5.31	0.47	285.87
BENZO(G,H,I)PERYLENE	211.56	78.86	246.12	5.26	0.50	287.24
PESTICIDE/PCBS						
ALDRIN	1.29	0.47	1.51	0.20	0.30	1.51
HEPTACHLOR EPOXIDE	1.47	1.11	2.00	0.25	0.45	1.86
4,4'-DDE	56.01	78.10	90.24	3.47	0.99	99.95
4,4'-DDD	115.84	195.60	201.57	3.92	1.27	331.86
4,4'-DDT	12.85	33.77	28.84	1.51	1.05	20.16
ALPHA-CHLORDANE	4.00	3.25	5.42	1.16	0.66	5.75
GAMMA-CHLORDANE	4.61	3.75	6.25	1.29	0.68	6.78

SITE 44, JONES STREET DUMP
SEDIMENT - STATISTICAL SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
INORGANIC ANALYTES

	NORMAL ARITHMETIC MEAN	NORMAL STANDARD DEVIATION	NORMAL UPPER 95% CONFIDENCE INTERVAL	LOG ARITHMETIC MEAN	LOG STANDARD DEVIATION	LOG UPPER 95% CONFIDENCE INTERVAL
TOTAL METALS						
ALUMINUM, TOTAL	2925.88	3768.88	4577.59	7.42	0.98	5225.89
ARSENIC, TOTAL	0.58	0.40	0.76	-0.81	0.81	1.03
BARIUM, TOTAL	12.64	13.23	18.44	2.24	0.69	17.65
BERYLLIUM, TOTAL	0.08	0.07	0.11	-2.80	0.72	0.12
CADMIUM, TOTAL	0.52	0.22	0.61	-0.72	0.34	0.61
CALCIUM, TOTAL	10718.75	10964.32	15523.86	8.93	0.80	16773.73
CHROMIUM, TOTAL	4.99	2.79	6.22	1.49	0.48	6.38
COBALT, TOTAL	0.35	0.11	0.39	-1.11	0.35	0.42
COPPER, TOTAL	3.32	1.56	4.00	1.12	0.39	4.02
IRON, TOTAL	2556.44	1834.23	3360.29	7.61	0.70	3939.07
LEAD, TOTAL	23.15	15.47	29.93	2.96	0.60	31.91
MAGNESIUM, TOTAL	288.68	169.00	362.74	5.51	0.58	398.07
MANGANESE, TOTAL	6.78	4.70	8.84	1.71	0.64	9.80
NICKEL, TOTAL	2.14	0.93	2.54	0.66	0.48	2.79
POTASSIUM, TOTAL	81.85	89.61	121.12	4.00	0.85	133.25
SELENIUM, TOTAL	0.35	0.38	0.52	-1.39	0.77	0.53
SILVER, TOTAL	0.25	0.09	0.29	-1.44	0.32	0.29
SODIUM, TOTAL	85.69	57.90	111.06	4.26	0.63	123.44
VANADIUM, TOTAL	6.64	3.70	8.26	1.76	0.54	8.99
ZINC, TOTAL	36.73	34.29	51.75	3.29	0.81	62.17

APPENDIX J
FIELD DUPLICATE SUMMARIES

SITE 44, JONES STREET DUMP
SURFACE SOIL - DUPLICATE SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-GW05-00D	44-WA-SB01-00D
DATE SAMPLED	03/14/95	03/13/95
DEPTH	0-12"	0-12"
UNITS	UG/KG	UG/KG
VOLATILES		
CHLOROMETHANE	12 U	12 R
BROMOMETHANE	12 U	12 R
VINYL CHLORIDE	12 U	12 R
CHLOROETHANE	12 U	12 R
METHYLENE CHLORIDE	12 U	12 R
ACETONE	25 UJ	14 U
CARBON DISULFIDE	12 U	12 R
1,1-DICHLOROETHENE	12 U	12 R
1,1-DICHLOROETHANE	12 U	12 R
1,2-DICHLOROETHENE (TOTAL)	12 U	12 R
CHLOROFORM	12 U	12 R
1,2-DICHLOROETHANE	12 U	12 R
2-BUTANONE	12 UJ	12 R
1,1,1-TRICHLOROETHANE	12 U	12 R
CARBON TETRACHLORIDE	12 U	12 R
BROMODICHLOROMETHANE	12 U	12 R
1,2-DICHLOROPROPANE	12 U	12 R
CIS-1,3-DICHLOROPROPENE	12 U	12 R
TRICHLOROETHENE	12 U	12 R
DIBROMOCHLOROMETHANE	12 U	12 R
1,1,2-TRICHLOROETHANE	12 U	12 R
BENZENE	12 U	12 R
TRANS-1,3-DICHLOROPROPENE	12 U	12 R
BROMOFORM	12 U	12 R
4-METHYL-2-PENTANONE	12 UJ	12 R
2-HEXANONE	12 UJ	12 R
TETRACHLOROETHENE	12 U	12 R
1,1,2,2-TETRACHLOROETHANE	12 U	12 R
TOLUENE	12 U	12 R
CHLOROBENZENE	12 U	12 R
ETHYLBENZENE	12 U	12 R
STYRENE	12 U	12 R
XYLENE (TOTAL)	12 U	12 R

SITE 44, JONES STREET DUMP
SURFACE SOIL - DUPLICATE SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-GW05-00D	44-WA-SB01-00D
DATE SAMPLED	03/14/95	03/13/95
DEPTH	0-12"	0-12"
UNITS	UG/KG	UG/KG
SEMIVOLATILES		
PHENOL	390 U	390 U
BIS(2-CHLOROETHYL)ETHER	390 U	390 U
2-CHLOROPHENOL	390 U	390 U
1,3-DICHLOROBENZENE	390 U	390 U
1,4-DICHLOROBENZENE	390 U	390 U
1,2-DICHLOROBENZENE	390 U	390 U
2-METHYLPHENOL	390 U	390 U
2,2'-OXYBIS(1-CHLOROPROPANE)	390 U	390 U
4-METHYLPHENOL	390 U	390 U
N-NITROSO-DI-N-PROPYLAMINE	390 U	390 U
HEXACHLOROETHANE	390 U	390 U
NITROBENZENE	390 U	390 U
ISOPHORONE	390 U	390 U
2-NITROPHENOL	390 U	390 U
2,4-DIMETHYLPHENOL	390 U	390 U
BIS(2-CHLOROETHOXY)METHANE	390 U	390 U
2,4-DICHLOROPHENOL	390 U	390 U
1,2,4-TRICHLOROBENZENE	390 U	390 U
NAPHTHALENE	390 U	390 U
4-CHLOROANILINE	390 U	390 U
HEXACHLOROBUTADIENE	390 U	390 U
4-CHLORO-3-METHYLPHENOL	390 U	390 U
2-METHYLNAPHTHALENE	390 U	390 U
HEXACHLOROCYCLOPENTADIENE	390 U	390 U
2,4,6-TRICHLOROPHENOL	390 U	390 U
2,4,5-TRICHLOROPHENOL	970 U	960 U
2-CHLORONAPHTHALENE	390 U	390 U
2-NITROANILINE	970 U	960 U
DIMETHYLPHTHALATE	390 U	390 U
ACENAPHTHYLENE	390 U	390 U
2,6-DINITROTOLUENE	390 U	390 U
3-NITROANILINE	970 U	960 U
ACENAPHTHENE	390 U	390 U
2,4-DINITROPHENOL	970 U	960 U

SITE 44, JONES STREET DUMP
SURFACE SOIL - DUPLICATE SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-GW05-00D	44-WA-SB01-00D
DATE SAMPLED	03/14/95	03/13/95
DEPTH	0-12"	0-12"
UNITS	UG/KG	UG/KG
SEMIVOLATILES cont.		
4-NITROPHENOL	970 U	960 U
DIBENZOFURAN	390 U	390 U
2,4-DINITROTOLUENE	390 U	390 U
DIETHYLPHTHALATE	390 U	390 U
4-CHLOROPHENYL-PHENYLETHER	390 U	390 U
FLUORENE	390 U	390 U
4-NITROANILINE	970 U	960 U
4,6-DINITRO-2-METHYLPHENOL	970 U	960 U
N-NITROSODIPHENYLAMINE (1)	390 U	390 U
4-BROMOPHENYL-PHENYLETHER	390 U	390 U
HEXACHLOROBENZENE	390 U	390 U
PENTACHLOROPHENOL	970 U	960 U
PHENANTHRENE	390 U	390 U
ANTHRACENE	390 U	390 U
CARBAZOLE	390 U	390 U
DI-N-BUTYLPHTHALATE	390 U	390 U
FLUORANTHENE	390 U	390 U
PYRENE	390 U	390 U
BUTYLBENZYLPHTHALATE	390 U	390 U
3,3'-DICHLOROBENZIDINE	390 U	390 U
BENZO(A)ANTHRACENE	390 U	390 U
CHRYSENE	390 U	390 U
BIS(2-ETHYLHEXYL)PHTHALATE	390 U	390 U
DI-N-OCTYL PHTHALATE	390 U	390 U
BENZO(B)FLUORANTHENE	390 U	390 U
BENZO(K)FLUORANTHENE	390 U	390 U
BENZO(A)PYRENE	390 U	390 U
INDENO(1,2,3-CD)PYRENE	72 J	390 U
DIBENZO(A,H)ANTHRACENE	390 U	390 U
BENZO(G,H,I)PERYLENE	83 J	390 U

SITE 44, JONES STREET DUMP
SURFACE SOIL - DUPLICATE SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-GW05-00D	44-WA-SB01-00D
DATE SAMPLED	03/14/95	03/13/95
DEPTH	0-12"	0-12"
UNITS	UG/KG	UG/KG
PESTICIDE/PCBS		
ALPHA-BHC	2 UJ	2 UJ
BETA-BHC	2 UJ	2 UJ
DELTA-BHC	2 UJ	2 UJ
GAMMA-BHC (LINDANE)	2 UJ	2 UJ
HEPTACHLOR	2 UJ	2 UJ
ALDRIN	2 UJ	2 UJ
HEPTACHLOR EPOXIDE	2 UJ	2 UJ
ENDOSULFAN I	2 UJ	2 UJ
DIELDRIN	3.9 UJ	3.9 UJ
4,4'-DDE	3.9 UJ	3.9 UJ
ENDRIN	3.9 UJ	3.9 UJ
ENDOSULFAN II	3.9 UJ	3.9 UJ
4,4'-DDD	3.9 UJ	3.9 UJ
ENDOSULFAN SULFATE	3.9 UJ	3.9 UJ
4,4'-DDT	3.9 UJ	3.9 UJ
METHOXYCHLOR	20 UJ	20 UJ
ENDRIN KETONE	3.9 UJ	3.9 UJ
ENDRIN ALDEHYDE	3.9 UJ	3.9 UJ
ALPHA-CHLORDANE	2 UJ	2 UJ
GAMMA-CHLORDANE	2 UJ	2 UJ
TOXAPHENE	200 UJ	200 UJ
AROCLOR-1016	39 UJ	NA
AROCLOR-1221	79 UJ	NA
AROCLOR-1232	39 UJ	NA
AROCLOR-1242	39 UJ	NA
AROCLOR-1248	39 UJ	NA
AROCLOR-1254	39 UJ	NA
AROCLOR-1260	39 UJ	NA

SITE 44, JONES STREET DUMP
SURFACE SOIL - DUPLICATE SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
INORGANIC ANALYTES

LOCATION	44-GW05-00D	44-WA-SB01-00D
DATE SAMPLED	03/14/95	03/13/95
DEPTH	0-12"	0-12"
UNITS	MG/KG	MG/KG
TOTAL METALS		
ALUMINUM, TOTAL	12500	7010
ANTIMONY, TOTAL	2.6 UJ	2 UJ
ARSENIC, TOTAL	1.4	1.8 J
BARIUM, TOTAL	16.7	13
BERYLLIUM, TOTAL	0.22 U	0.056 U
CADMIUM, TOTAL	0.68 U	0.54 U
CALCIUM, TOTAL	106	1990
CHROMIUM, TOTAL	15.9	9.4
COBALT, TOTAL	1.1	0.45
COPPER, TOTAL	1.6	2
IRON, TOTAL	14400	7100
LEAD, TOTAL	9.3	7.6
MAGNESIUM, TOTAL	311	238
MANGANESE, TOTAL	5.9	5.1
MERCURY, TOTAL	0.1 U	0.088 U
NICKEL, TOTAL	2.3	1.5
POTASSIUM, TOTAL	283	180
SELENIUM, TOTAL	0.56	0.41 UJ
SILVER, TOTAL	0.59 U	0.46 U
SODIUM, TOTAL	23.6 U	29.3
THALLIUM, TOTAL	0.22 U	0.2 U
VANADIUM, TOTAL	27.9	15.1
ZINC, TOTAL	3.6	2.8

SITE 44, JONES STREET DUMP
SUBSURFACE SOIL - DUPLICATE SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-OA-SB04-02D
DATE SAMPLED	03/14/95
DEPTH	2-5'
UNITS	UG/KG
VOLATILES	
CHLOROMETHANE	12 U
BROMOMETHANE	12 U
VINYL CHLORIDE	12 U
CHLOROETHANE	12 U
METHYLENE CHLORIDE	12 U
ACETONE	14 UJ
CARBON DISULFIDE	12 U
1,1-DICHLOROETHENE	12 U
1,1-DICHLOROETHANE	12 U
1,2-DICHLOROETHENE (TOTAL)	12 U
CHLOROFORM	12 U
1,2-DICHLOROETHANE	12 U
2-BUTANONE	12 UJ
1,1,1-TRICHLOROETHANE	12 U
CARBON TETRACHLORIDE	12 U
BROMODICHLOROMETHANE	12 U
1,2-DICHLOROPROPANE	12 U
CIS-1,3-DICHLOROPROPENE	12 U
TRICHLOROETHENE	12 U
DIBROMOCHLOROMETHANE	12 U
1,1,2-TRICHLOROETHANE	12 U
BENZENE	12 U
TRANS-1,3-DICHLOROPROPENE	12 U
BROMOFORM	12 U
4-METHYL-2-PENTANONE	12 UJ
2-HEXANONE	12 UJ
TETRACHLOROETHENE	12 U
1,1,2,2-TETRACHLOROETHANE	12 U
TOLUENE	12 U
CHLOROBENZENE	12 U
ETHYLBENZENE	12 U
STYRENE	12 U
XYLENE (TOTAL)	12 U

SITE 44, JONES STREET DUMP
SUBSURFACE SOIL - DUPLICATE SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-OA-SB04-02D
DATE SAMPLED	03/14/95
DEPTH	2-5'
UNITS	UG/KG
SEMIVOLATILES	
PHENOL	380 U
BIS(2-CHLOROETHYL)ETHER	380 U
2-CHLOROPHENOL	380 U
1,3-DICHLOROBENZENE	380 U
1,4-DICHLOROBENZENE	380 U
1,2-DICHLOROBENZENE	380 U
2-METHYLPHENOL	380 U
2,2'-OXYBIS(1-CHLOROPROPANE)	380 U
4-METHYLPHENOL	380 U
N-NITROSO-DI-N-PROPYLAMINE	380 U
HEXACHLOROETHANE	380 U
NITROBENZENE	380 U
ISOPHORONE	380 U
2-NITROPHENOL	380 U
2,4-DIMETHYLPHENOL	380 U
BIS(2-CHLOROETHOXY)METHANE	380 U
2,4-DICHLOROPHENOL	380 U
1,2,4-TRICHLOROBENZENE	380 U
NAPHTHALENE	380 U
4-CHLOROANILINE	380 U
HEXACHLOROBUTADIENE	380 U
4-CHLORO-3-METHYLPHENOL	380 U
2-METHYLNAPHTHALENE	380 U
HEXACHLOROCYCLOPENTADIENE	380 U
2,4,6-TRICHLOROPHENOL	380 U
2,4,5-TRICHLOROPHENOL	960 U
2-CHLORONAPHTHALENE	380 U
2-NITROANILINE	960 U
DIMETHYLPHTHALATE	380 U
ACENAPHTHYLENE	380 U
2,6-DINITROTOLUENE	380 U
3-NITROANILINE	960 U
ACENAPHTHENE	380 U
2,4-DINITROPHENOL	960 U

SITE 44, JONES STREET DUMP
SUBSURFACE SOIL - DUPLICATE SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-OA-SB04-02D
DATE SAMPLED	03/14/95
DEPTH	2-5'
UNITS	UG/KG
SEMIVOLATILES cont.	
4-NITROPHENOL	960 U
DIBENZOFURAN	380 U
2,4-DINITROTOLUENE	380 U
DIETHYLPHTHALATE	380 U
4-CHLOROPHENYL-PHENYLETHER	380 U
FLUORENE	380 U
4-NITROANILINE	960 U
4,6-DINITRO-2-METHYLPHENOL	960 U
N-NITROSODIPHENYLAMINE (1)	380 U
4-BROMOPHENYL-PHENYLETHER	380 U
HEXACHLOROBENZENE	380 U
PENTACHLOROPHENOL	960 U
PHENANTHRENE	380 U
ANTHRACENE	380 U
CARBAZOLE	380 U
DI-N-BUTYLPHTHALATE	380 U
FLUORANTHENE	380 U
PYRENE	380 U
BUTYLBENZYLPHTHALATE	380 U
3,3'-DICHLOROBENZIDINE	380 U
BENZO(A)ANTHRACENE	380 U
CHRYSENE	380 U
BIS(2-ETHYLHEXYL)PHTHALATE	380 U
DI-N-OCTYL PHTHALATE	380 U
BENZO(B)FLUORANTHENE	380 U
BENZO(K)FLUORANTHENE	380 U
BENZO(A)PYRENE	380 U
INDENO(1,2,3-CD)PYRENE	380 U
DIBENZO(A,H)ANTHRACENE	380 U
BENZO(G,H,I)PERYLENE	380 U

SITE 44, JONES STREET DUMP
SUBSURFACE SOIL - DUPLICATE SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-OA-SB04-02D
DATE SAMPLED	03/14/95
DEPTH	2-5'
UNITS	UG/KG
PESTICIDE/PCBS	
ALPHA-BHC	1.9 UJ
BETA-BHC	1.9 UJ
DELTA-BHC	1.9 UJ
GAMMA-BHC (LINDANE)	1.9 UJ
HEPTACHLOR	1.9 UJ
ALDRIN	1.9 UJ
HEPTACHLOR EPOXIDE	1.9 UJ
ENDOSULFAN I	1.9 UJ
DIELDRIN	3.8 UJ
4,4'-DDE	3.8 UJ
ENDRIN	3.8 UJ
ENDOSULFAN II	3.8 UJ
4,4'-DDD	3.8 UJ
ENDOSULFAN SULFATE	3.8 UJ
4,4'-DDT	3.8 UJ
METHOXYCHLOR	19 UJ
ENDRIN KETONE	3.8 UJ
ENDRIN ALDEHYDE	3.8 UJ
ALPHA-CHLORDANE	1.9 UJ
GAMMA-CHLORDANE	1.9 UJ
TOXAPHENE	190 UJ

SITE 44, JONES STREET DUMP
SUBSURFACE SOIL - DUPLICATE SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
INORGANIC ANALYTES

LOCATION	44-OA-SB04-02D	
DATE SAMPLED	03/14/95	
DEPTH	3-5'	
UNITS	MG/KG	
TOTAL METALS		
ALUMINUM, TOTAL	3230	
ANTIMONY, TOTAL	1.8	UJ
ARSENIC, TOTAL	0.39	U
BARIUM, TOTAL	5	
BERYLLIUM, TOTAL	0.05	U
CADMIUM, TOTAL	0.48	U
CALCIUM, TOTAL	27.2	
CHROMIUM, TOTAL	3.4	
COBALT, TOTAL	0.38	U
COPPER, TOTAL	0.67	U
IRON, TOTAL	1930	
LEAD, TOTAL	3.9	
MAGNESIUM, TOTAL	72.9	
MANGANESE, TOTAL	1.5	
MERCURY, TOTAL	0.09	U
NICKEL, TOTAL	0.7	U
POTASSIUM, TOTAL	87.8	
SELENIUM, TOTAL	0.31	U
SILVER, TOTAL	0.42	U
SODIUM, TOTAL	15.1	U
THALLIUM, TOTAL	0.23	U
VANADIUM, TOTAL	4.2	
ZINC, TOTAL	0.51	

GROUNDWATER

SITE 44, JONES STREET DUMP
GROUNDWATER - DUPLICATE SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-GW01-01D
DATE SAMPLED	04/09/95
UNITS	UG/L
VOLATILES	
CHLOROMETHANE	10 U
BROMOMETHANE	10 U
VINYL CHLORIDE	10 U
CHLOROETHANE	10 U
METHYLENE CHLORIDE	10 U
ACETONE	10 U
CARBON DISULFIDE	10 U
1,1-DICHLOROETHENE	10 U
1,1-DICHLOROETHANE	10 U
1,2-DICHLOROETHENE (TOTAL)	10 U
CHLOROFORM	10 U
1,2-DICHLOROETHANE	10 U
2-BUTANONE	10 U
1,1,1-TRICHLOROETHANE	10 U
CARBON TETRACHLORIDE	10 U
BROMODICHLOROMETHANE	10 U
1,2-DICHLOROPROPANE	10 U
CIS-1,3-DICHLOROPROPENE	10 U
TRICHLOROETHENE	10 U
DIBROMOCHLOROMETHANE	10 U
1,1,2-TRICHLOROETHANE	10 U
BENZENE	10 U
TRANS-1,3-DICHLOROPROPENE	10 U
BROMOFORM	10 U
4-METHYL-2-PENTANONE	10 U
2-HEXANONE	10 U
TETRACHLOROETHENE	10 U
1,1,2,2-TETRACHLOROETHANE	10 U
TOLUENE	10 U
CHLOROBENZENE	10 U
ETHYLBENZENE	10 U
STYRENE	10 U
XYLENE (TOTAL)	10 U

SITE 44, JONES STREET DUMP
GROUNDWATER - DUPLICATE SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-GW01-01D
DATE SAMPLED	04/09/95
UNITS	UG/L
SEMIVOLATILES	
PHENOL	11 U
BIS(2-CHLOROETHYL)ETHER	11 U
2-CHLOROPHENOL	11 U
1,3-DICHLOROBENZENE	11 U
1,4-DICHLOROBENZENE	11 U
1,2-DICHLOROBENZENE	11 U
2-METHYLPHENOL	11 U
2,2'-OXYBIS(1-CHLOROPROPANE)	11 U
4-METHYLPHENOL	11 U
N-NITROSO-DI-N-PROPYLAMINE	11 U
HEXACHLOROETHANE	11 U
NITROBENZENE	11 U
ISOPHORONE	11 U
2-NITROPHENOL	11 U
2,4-DIMETHYLPHENOL	11 U
BIS(2-CHLOROETHOXY)METHANE	11 U
2,4-DICHLOROPHENOL	11 U
1,2,4-TRICHLOROBENZENE	11 U
NAPHTHALENE	11 U
4-CHLOROANILINE	11 U
HEXACHLOROBUTADIENE	11 U
4-CHLORO-3-METHYLPHENOL	11 U
2-METHYLNAPHTHALENE	11 U
HEXACHLOROCYCLOPENTADIENE	11 U
2,4,6-TRICHLOROPHENOL	11 U
2,4,5-TRICHLOROPHENOL	26 U
2-CHLORONAPHTHALENE	11 U
2-NITROANILINE	26 U
DIMETHYLPHTHALATE	11 U
ACENAPHTHYLENE	11 U
2,6-DINITROTOLUENE	11 U
3-NITROANILINE	26 U
ACENAPHTHENE	11 U
2,4-DINITROPHENOL	26 U

SITE 44, JONES STREET DUMP
GROUNDWATER - DUPLICATE SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-GW01-01D
DATE SAMPLED	04/09/95
UNITS	UG/L
SEMIVOLATILES cont.	
4-NITROPHENOL	26 U
DIBENZOFURAN	11 U
2,4-DINITROTOLUENE	11 U
DIETHYLPHTHALATE	11 U
4-CHLOROPHENYL-PHENYLETHER	11 U
FLUORENE	11 U
4-NITROANILINE	26 U
4,6-DINITRO-2-METHYLPHENOL	26 U
N-NITROSODIPHENYLAMINE (1)	11 U
4-BROMOPHENYL-PHENYLETHER	11 U
HEXACHLOROBENZENE	11 U
PENTACHLOROPHENOL	26 U
PHENANTHRENE	11 U
ANTHRACENE	11 U
CARBAZOLE	11 U
DI-N-BUTYLPHTHALATE	11 U
FLUORANTHENE	11 U
PYRENE	11 U
BUTYLBENZYLPHTHALATE	11 U
3,3'-DICHLOROBENZIDINE	11 U
BENZO(A)ANTHRACENE	11 U
CHRYSENE	11 U
BIS(2-ETHYLHEXYL)PHTHALATE	11 U
DI-N-OCTYL PHTHALATE	11 U
BENZO(B)FLUORANTHENE	11 U
BENZO(K)FLUORANTHENE	11 U
BENZO(A)PYRENE	11 U
INDENO(1,2,3-CD)PYRENE	11 U
DIBENZO(A,H)ANTHRACENE	11 U
BENZO(G,H,I)PERYLENE	11 U

SITE 44, JONES STREET DUMP
GROUNDWATER - DUPLICATE SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-GW01-01D
DATE SAMPLED	04/09/95
UNITS	UG/L
PESTICIDE/PCBS	
ALPHA-BHC	0.048 UJ
BETA-BHC	0.048 UJ
DELTA-BHC	0.048 UJ
GAMMA-BHC (LINDANE)	0.048 UJ
HEPTACHLOR	0.048 UJ
ALDRIN	0.048 UJ
HEPTACHLOR EPOXIDE	0.048 UJ
ENDOSULFAN I	0.048 UJ
DIELDRIN	0.096 UJ
4,4'-DDE	0.096 UJ
ENDRIN	0.096 UJ
ENDOSULFAN II	0.096 UJ
4,4'-DDD	0.096 UJ
ENDOSULFAN SULFATE	0.096 UJ
4,4'-DDT	0.096 UJ
METHOXYCHLOR	0.48 UJ
ENDRIN KETONE	0.096 UJ
ENDRIN ALDEHYDE	0.096 UJ
ALPHA-CHLORDANE	0.048 UJ
GAMMA-CHLORDANE	0.048 UJ
TOXAPHENE	4.8 UJ

SITE 44, JONES STREET DUMP
GROUNDWATER - DUPLICATE SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
INORGANIC ANALYTES

LOCATION	44-GW01-01D	
DATE SAMPLED	04/09/95	
UNITS	UG/L	
TOTAL METALS		
ALUMINUM, TOTAL	21.2	U
ANTIMONY, TOTAL	20.8	U
ARSENIC, TOTAL	1.7	UJ
BARIUM, TOTAL	64.7	J
BERYLLIUM, TOTAL	0.8	U
CADMIUM, TOTAL	1.9	U
CALCIUM, TOTAL	69800	
CHROMIUM, TOTAL	4.1	U
COBALT, TOTAL	3.4	U
COPPER, TOTAL	1.8	U
IRON, TOTAL	66500	
LEAD, TOTAL	0.8	
MAGNESIUM, TOTAL	8910	
MANGANESE, TOTAL	199	
MERCURY, TOTAL	0.2	U
NICKEL, TOTAL	10.9	U
POTASSIUM, TOTAL	3500	
SELENIUM, TOTAL	1.8	U
SILVER, TOTAL	2.8	U
SODIUM, TOTAL	5570	
THALLIUM, TOTAL	1.4	U
VANADIUM, TOTAL	2	U
ZINC, TOTAL	6	U

SITE 44, JONES STREET DUMP
GROUNDWATER - DUPLICATE SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
DISSOLVED INORGANIC ANALYTES

LOCATION	44-GW01D-01D	
DATE SAMPLED	04/09/95	
UNITS	UG/L	
DISSOLVED METALS		
ALUMINUM, SOLUBLE	38.5	U
ANTIMONY, SOLUBLE	20.8	U
ARSENIC, SOLUBLE	1.8	
BARIUM, SOLUBLE	61.8	J
BERYLLIUM, SOLUBLE	0.8	U
CADMIUM, SOLUBLE	2	U
CALCIUM, SOLUBLE	70400	
CHROMIUM, SOLUBLE	4.1	U
COBALT, SOLUBLE	3.4	U
COPPER, SOLUBLE	1.8	U
IRON, SOLUBLE	64800	
LEAD, SOLUBLE	0.6	U
MAGNESIUM, SOLUBLE	8650	
MANGANESE, SOLUBLE	193	
MERCURY, SOLUBLE	0.24	
NICKEL, SOLUBLE	10.9	U
POTASSIUM, SOLUBLE	2880	
SELENIUM, SOLUBLE	1.8	U
SILVER, SOLUBLE	2.8	U
SODIUM, SOLUBLE	5320	
THALLIUM, SOLUBLE	1.4	UJ
VANADIUM, SOLUBLE	2	U
ZINC, SOLUBLE	6	U

SURFACE WATER

SITE 44, JONES STREET DUMP
SURFACE WATER - DUPLICATE SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-EC-SW02D
DATE SAMPLED	05/03/95
DEPTH	N/A
UNITS	UG/L
VOLATILES	
CHLOROMETHANE	10 U
BROMOMETHANE	10 U
VINYL CHLORIDE	13
CHLOROETHANE	10 U
METHYLENE CHLORIDE	10 U
ACETONE	10 U
CARBON DISULFIDE	10 U
1,1-DICHLOROETHENE	10 U
1,1-DICHLOROETHANE	10 U
1,2-DICHLOROETHENE (TOTAL)	94
CHLOROFORM	10 U
1,2-DICHLOROETHANE	10 U
2-BUTANONE	10 U
1,1,1-TRICHLOROETHANE	10 U
CARBON TETRACHLORIDE	10 U
BROMODICHLOROMETHANE	10 U
1,2-DICHLOROPROPANE	10 U
CIS-1,3-DICHLOROPROPENE	10 U
TRICHLOROETHENE	47
DIBROMOCHLOROMETHANE	10 U
1,1,2-TRICHLOROETHANE	10 U
BENZENE	10 U
TRANS-1,3-DICHLOROPROPENE	10 U
BROMOFORM	10 U
4-METHYL-2-PENTANONE	10 U
2-HEXANONE	10 U
TETRACHLOROETHENE	10 U
1,1,2,2-TETRACHLOROETHANE	25
TOLUENE	10 U
CHLOROBENZENE	10 U
ETHYLBENZENE	10 U
STYRENE	10 U
XYLENE (TOTAL)	10 U

SITE 44, JONES STREET DUMP
SURFACE WATER - DUPLICATE SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-EC-SW02D
DATE SAMPLED	05/03/95
DEPTH	N/A
UNITS	UG/L
SEMIVOLATILES	
PHENOL	11 U
BIS(2-CHLOROETHYL)ETHER	11 U
2-CHLOROPHENOL	11 U
1,3-DICHLOROBENZENE	11 U
1,4-DICHLOROBENZENE	11 U
1,2-DICHLOROBENZENE	11 U
2-METHYLPHENOL	11 U
2,2'-OXYBIS(1-CHLOROPROPANE)	11 U
4-METHYLPHENOL	11 U
N-NITROSO-DI-N-PROPYLAMINE	11 U
HEXACHLOROETHANE	11 U
NITROBENZENE	11 U
ISOPHORONE	11 U
2-NITROPHENOL	11 U
2,4-DIMETHYLPHENOL	11 U
BIS(2-CHLOROETHOXY)METHANE	11 U
2,4-DICHLOROPHENOL	11 U
1,2,4-TRICHLOROBENZENE	11 U
NAPHTHALENE	11 U
4-CHLOROANILINE	11 U
HEXACHLOROBUTADIENE	11 U
4-CHLORO-3-METHYLPHENOL	11 U
2-METHYLNAPHTHALENE	11 U
HEXACHLOROCYCLOPENTADIENE	11 U
2,4,6-TRICHLOROPHENOL	11 U
2,4,5-TRICHLOROPHENOL	26 U
2-CHLORONAPHTHALENE	11 U
2-NITROANILINE	26 U
DIMETHYLPHTHALATE	11 U
ACENAPHTHYLENE	11 U
2,6-DINITROTOLUENE	11 U
3-NITROANILINE	26 U
ACENAPHTHENE	11 U
2,4-DINITROPHENOL	26 U

SITE 44, JONES STREET DUMP
SURFACE WATER - DUPLICATE SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-EC-SW02D
DATE SAMPLED	05/03/95
DEPTH	N/A
UNITS	UG/L

SEMIVOLATILES cont.	
4-NITROPHENOL	26 U
DIBENZOFURAN	11 U
2,4-DINITROTOLUENE	11 U
DIETHYLPHTHALATE	11 U
4-CHLOROPHENYL-PHENYLETHER	11 U
FLUORENE	11 U
4-NITROANILINE	26 U
4,6-DINITRO-2-METHYLPHENOL	26 U
N-NITROSODIPHENYLAMINE (1)	11 U
4-BROMOPHENYL-PHENYLETHER	11 U
HEXACHLOROBENZENE	11 U
PENTACHLOROPHENOL	26 U
PHENANTHRENE	11 U
ANTHRACENE	11 U
CARBAZOLE	11 U
DI-N-BUTYLPHTHALATE	11 U
FLUORANTHENE	11 U
PYRENE	11 U
BUTYLBENZYLPHTHALATE	11 U
3,3'-DICHLOROBENZIDINE	11 U
BENZO(A)ANTHRACENE	11 U
CHRYSENE	11 U
BIS(2-ETHYLHEXYL)PHTHALATE	2 J
DI-N-OCTYL PHTHALATE	11 U
BENZO(B)FLUORANTHENE	11 U
BENZO(K)FLUORANTHENE	11 U
BENZO(A)PYRENE	11 U
INDENO(1,2,3-CD)PYRENE	11 U
DIBENZO(A,H)ANTHRACENE	11 U
BENZO(G,H,I)PERYLENE	11 U

SITE 44, JONES STREET DUMP
SURFACE WATER - DUPLICATE SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-EC-SW02D
DATE SAMPLED	05/03/95
DEPTH	N/A
UNITS	UG/L
PESTICIDE/PCBS	
ALPHA-BHC	0.052 UJ
BETA-BHC	0.052 UJ
DELTA-BHC	0.052 UJ
GAMMA-BHC (LINDANE)	0.052 UJ
HEPTACHLOR	0.052 UJ
ALDRIN	0.052 UJ
HEPTACHLOR EPOXIDE	0.052 UJ
ENDOSULFAN I	0.052 UJ
DIELDRIN	0.1 UJ
4,4'-DDE	0.1 UJ
ENDRIN	0.1 UJ
ENDOSULFAN II	0.1 UJ
4,4'-DDD	0.1 UJ
ENDOSULFAN SULFATE	0.1 UJ
4,4'-DDT	0.1 UJ
METHOXYCHLOR	0.52 UJ
ENDRIN KETONE	0.1 UJ
ENDRIN ALDEHYDE	0.1 UJ
ALPHA-CHLORDANE	0.052 UJ
GAMMA-CHLORDANE	0.052 UJ
TOXAPHENE	5.2 UJ
AROCLOR-1016	1 UJ
AROCLOR-1221	2.1 UJ
AROCLOR-1232	1 UJ
AROCLOR-1242	1 UJ
AROCLOR-1248	1 UJ
AROCLOR-1254	1 UJ
AROCLOR-1260	1 UJ

SITE 44, JONES STREET DUMP
SURFACE WATER - DUPLICATE SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
DISSOLVED INORGANIC ANALYTES

LOCATION	44-EC-DSW02D	
DATE SAMPLED	05/03/95	
DEPTH	N/A	
UNITS	UG/L	
DISSOLVED METALS		
ALUMINUM, SOLUBLE	15.7	U
ANTIMONY, SOLUBLE	12	U
ARSENIC, SOLUBLE	1.8	
BARIUM, SOLUBLE	20.6	
BERYLLIUM, SOLUBLE	0.3	U
CADMIUM, SOLUBLE	3.9	U
CALCIUM, SOLUBLE	52200	
CHROMIUM, SOLUBLE	3.8	U
COBALT, SOLUBLE	1.4	U
COPPER, SOLUBLE	2.2	
IRON, SOLUBLE	404	
LEAD, SOLUBLE	0.8	U
MAGNESIUM, SOLUBLE	2500	
MANGANESE, SOLUBLE	19.5	
MERCURY, SOLUBLE	0.2	U
NICKEL, SOLUBLE	15.3	
POTASSIUM, SOLUBLE	3520	
SELENIUM, SOLUBLE	1.8	U
SILVER, SOLUBLE	1.9	U
SODIUM, SOLUBLE	16000	
THALLIUM, SOLUBLE	0.7	U
VANADIUM, SOLUBLE	7.7	U
ZINC, SOLUBLE	6.8	J

SEDIMENT

SITE 44, JONES STREET DUMP
SEDIMENT - DUPLICATE SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-EC-SD03-06D	44-UT-SD01-612D
DATE SAMPLED	05/04/95	05/04/95
DEPTH	N/A	N/A
UNITS	UG/KG	UG/KG
VOLATILES		
CHLOROMETHANE	12 U	24 U
BROMOMETHANE	12 U	24 U
VINYL CHLORIDE	12 U	24 U
CHLOROETHANE	12 U	24 U
METHYLENE CHLORIDE	12 U	24 U
ACETONE	12 U	220
CARBON DISULFIDE	12 U	24 U
1,1-DICHLOROETHENE	12 U	24 U
1,1-DICHLOROETHANE	12 U	24 U
1,2-DICHLOROETHENE (TOTAL)	12 U	24 U
CHLOROFORM	12 U	24 U
1,2-DICHLOROETHANE	12 U	24 U
2-BUTANONE	12 U	51
1,1,1-TRICHLOROETHANE	12 U	24 UJ
CARBON TETRACHLORIDE	12 U	24 UJ
BROMODICHLOROMETHANE	12 U	24 UJ
1,2-DICHLOROPROPANE	12 U	24 UJ
CIS-1,3-DICHLOROPROPENE	12 U	24 UJ
TRICHLOROETHENE	12 U	24 UJ
DIBROMOCHLOROMETHANE	12 U	24 UJ
1,1,2-TRICHLOROETHANE	12 U	24 UJ
BENZENE	12 U	24 UJ
TRANS-1,3-DICHLOROPROPENE	12 U	24 UJ
BROMOFORM	12 U	24 UJ
4-METHYL-2-PENTANONE	12 U	24 UJ
2-HEXANONE	12 UJ	24 UJ
TETRACHLOROETHENE	12 U	24 UJ
1,1,2,2-TETRACHLOROETHANE	12 U	24 UJ
TOLUENE	12 U	24 UJ
CHLOROBENZENE	12 U	24 UJ
ETHYLBENZENE	12 U	24 UJ
STYRENE	12 U	24 UJ
XYLENE (TOTAL)	12 U	24 UJ

SITE 44, JONES STREET DUMP
SEDIMENT - DUPLICATE SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-EC-SD03-06D	44-UT-SD01-612D
DATE SAMPLED	05/04/95	05/04/95
DEPTH	N/A	N/A
UNITS	UG/KG	UG/KG
SEMIVOLATILES		
PHENOL	390 U	790 U
BIS(2-CHLOROETHYL)ETHER	390 U	790 U
2-CHLOROPHENOL	390 U	790 U
1,3-DICHLOROBENZENE	390 U	790 U
1,4-DICHLOROBENZENE	390 U	790 U
1,2-DICHLOROBENZENE	390 U	790 U
2-METHYLPHENOL	390 U	790 U
2,2'-OXYBIS(1-CHLOROPROPANE)	390 U	790 U
4-METHYLPHENOL	390 U	790 U
N-NITROSO-DI-N-PROPYLAMINE	390 U	790 U
HEXACHLOROETHANE	390 U	790 U
NITROBENZENE	390 U	790 U
ISOPHORONE	390 U	790 U
2-NITROPHENOL	390 U	790 U
2,4-DIMETHYLPHENOL	390 U	790 U
BIS(2-CHLOROETHOXY)METHANE	390 U	790 U
2,4-DICHLOROPHENOL	390 U	790 U
1,2,4-TRICHLOROBENZENE	390 U	790 U
NAPHTHALENE	390 U	790 U
4-CHLOROANILINE	390 U	790 U
HEXACHLOROBUTADIENE	390 U	790 U
4-CHLORO-3-METHYLPHENOL	390 U	790 U
2-METHYLNAPHTHALENE	390 U	790 U
HEXACHLOROCYCLOPENTADIENE	390 U	790 U
2,4,6-TRICHLOROPHENOL	390 U	790 U
2,4,5-TRICHLOROPHENOL	980 U	2000 U
2-CHLORONAPHTHALENE	390 U	790 U
2-NITROANILINE	980 U	2000 U
DIMETHYLPHTHALATE	390 U	790 U
ACENAPHTHYLENE	390 U	790 U
2,6-DINITROTOLUENE	390 U	790 U
3-NITROANILINE	980 U	2000 U
ACENAPHTHENE	390 U	790 U
2,4-DINITROPHENOL	980 U	2000 U

SITE 44, JONES STREET DUMP
SEDIMENT - DUPLICATE SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-EC-SD03-06D	44-UT-SD01-612D
DATE SAMPLED	05/04/95	05/04/95
DEPTH	N/A	N/A
UNITS	UG/KG	UG/KG
SEMIVOLATILES cont.		
4-NITROPHENOL	980 U	2000 U
DIBENZOFURAN	390 U	790 U
2,4-DINITROTOLUENE	390 U	790 U
DIETHYLPHTHALATE	390 U	790 U
4-CHLOROPHENYL-PHENYLETHER	390 U	790 U
FLUORENE	390 U	790 U
4-NITROANILINE	980 U	2000 U
4,6-DINITRO-2-METHYLPHENOL	980 U	2000 U
N-NITROSODIPHENYLAMINE (1)	390 U	790 U
4-BROMOPHENYL-PHENYLETHER	390 U	790 U
HEXACHLOROBENZENE	390 U	790 U
PENTACHLOROPHENOL	980 U	2000 U
PHENANTHRENE	390 U	790 U
ANTHRACENE	390 U	790 U
CARBAZOLE	390 U	790 U
DI-N-BUTYLPHTHALATE	390 U	790 U
FLUORANTHENE	390 U	790 U
PYRENE	390 U	790 U
BUTYLBENZYLPHTHALATE	390 U	790 U
3,3'-DICHLOROBENZIDINE	390 U	790 U
BENZO(A)ANTHRACENE	390 U	790 U
CHRYSENE	390 U	790 U
BIS(2-ETHYLHEXYL)PHTHALATE	100 J	790 U
DI-N-OCTYL PHTHALATE	390 U	790 U
BENZO(B)FLUORANTHENE	390 U	790 U
BENZO(K)FLUORANTHENE	390 U	790 U
BENZO(A)PYRENE	390 U	790 U
INDENO(1,2,3-CD)PYRENE	390 U	790 U
DIBENZO(A,H)ANTHRACENE	390 U	790 U
BENZO(G,H,I)PERYLENE	390 U	790 U

SITE 44, JONES STREET DUMP
SEDIMENT - DUPLICATE SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	44-EC-SD03-06D	44-UT-SD01-612D
DATE SAMPLED	05/04/95	05/04/95
DEPTH	N/A	N/A
UNITS	UG/KG	UG/KG
PESTICIDE/PCBS		
ALPHA-BHC	2 UJ	3.9 UJ
BETA-BHC	2 UJ	3.9 U
DELTA-BHC	2 UJ	3.9 U
GAMMA-BHC (LINDANE)	2 UJ	3.9 U
HEPTACHLOR	2 UJ	3.9 U
ALDRIN	2 UJ	3.9 U
HEPTACHLOR EPOXIDE	2 UJ	3.9 U
ENDOSULFAN I	2 UJ	3.9 U
DIELDRIN	4 UJ	7.8 U
4,4'-DDE	14 J	5.5 J
ENDRIN	4 UJ	7.8 U
ENDOSULFAN II	4 UJ	7.8 U
4,4'-DDD	34 J	3.9 J
ENDOSULFAN SULFATE	4 UJ	7.8 U
4,4'-DDT	4 UJ	7.8 UJ
METHOXYCHLOR	20 UJ	39 UJ
ENDRIN KETONE	4 UJ	7.8 U
ENDRIN ALDEHYDE	4 UJ	7.8 U
ALPHA-CHLORDANE	1.6 J	3.9 U
GAMMA-CHLORDANE	2 J	3.9 U
TOXAPHENE	200 UJ	390 U
AROCLOR-1016	40 UJ	78 U
AROCLOR-1221	80 UJ	160 U
AROCLOR-1232	40 UJ	78 U
AROCLOR-1242	40 UJ	78 U
AROCLOR-1248	40 UJ	78 U
AROCLOR-1254	40 UJ	78 U
AROCLOR-1260	40 UJ	78 U

SITE 44, JONES STREET DUMP
SEDIMENT - DUPLICATE SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
INORGANIC ANALYTES

LOCATION	44-EC-SD03-06D	44-UT-SD01-612D
DATE SAMPLED	05/04/95	05/04/95
DEPTH	N/A	N/A
UNITS	MG/KG	MG/KG
TOTAL METALS		
ALUMINUM, TOTAL	699	13900 J
ANTIMONY, TOTAL	2.3 UJ	4.7 U
ARSENIC, TOTAL	0.39 U	1.2
BARIUM, TOTAL	5	51.2
BERYLLIUM, TOTAL	0.06 U	0.24 U
CADMIUM, TOTAL	0.75 U	1.5 U
CALCIUM, TOTAL	11800	6420
CHROMIUM, TOTAL	1.8	12.1
COBALT, TOTAL	0.6	0.83 U
COPPER, TOTAL	1.2	3.1
IRON, TOTAL	786	6440
LEAD, TOTAL	11.5	21.9 J
MAGNESIUM, TOTAL	224	544
MANGANESE, TOTAL	3.2	15.8
MERCURY, TOTAL	0.09 U	0.18 U
NICKEL, TOTAL	1.4	2.6
POTASSIUM, TOTAL	28.9	367
SELENIUM, TOTAL	0.41 U	1.2
SILVER, TOTAL	0.37 U	0.75 U
SODIUM, TOTAL	49.9	225
THALLIUM, TOTAL	0.16 U	0.24 U
VANADIUM, TOTAL	2	16.3
ZINC, TOTAL	20.7	6.1

APPENDIX K
QA/QC SAMPLING SUMMARY

SITE 44, JONES STREET DUMP
SOIL QA/QC - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

SAMPLE	303-TB-17	303-TB-39
DATE SAMPLED	03/14/95	04/21/95
UNITS	UG/L	UG/L
VOLATILES		
CHLOROMETHANE	10 U	10 U
BROMOMETHANE	10 U	10 U
VINYL CHLORIDE	10 U	10 U
CHLOROETHANE	10 U	10 U
METHYLENE CHLORIDE	10 U	10 U
ACETONE	17 U	10 U
CARBON DISULFIDE	10 U	10 U
1,1-DICHLOROETHENE	10 U	10 U
1,1-DICHLOROETHANE	10 U	10 U
1,2-DICHLOROETHENE (TOTAL)	10 U	10 U
CHLOROFORM	10 U	10 U
1,2-DICHLOROETHANE	10 U	10 U
2-BUTANONE	29 J	10 U
1,1,1-TRICHLOROETHANE	10 U	10 U
CARBON TETRACHLORIDE	10 U	10 U
BROMODICHLOROMETHANE	10 U	10 U
1,2-DICHLOROPROPANE	10 U	10 U
CIS-1,3-DICHLOROPROPENE	10 U	10 U
TRICHLOROETHENE	10 U	10 U
DIBROMOCHLOROMETHANE	10 U	10 U
1,1,2-TRICHLOROETHANE	10 U	10 U
BENZENE	10 U	10 U
TRANS-1,3-DICHLOROPROPENE	10 U	10 U
BROMOFORM	10 U	10 U
4-METHYL-2-PENTANONE	10 U	10 U
2-HEXANONE	10 U	10 U
TETRACHLOROETHENE	10 U	10 U
1,1,2,2-TETRACHLOROETHANE	10 U	10 U
TOLUENE	10 U	10 U
CHLOROBENZENE	10 U	10 U
ETHYLBENZENE	10 U	10 U
STYRENE	10 U	10 U
XYLENE (TOTAL)	10 U	10 U

SITE 44, JONES STREET DUMP
SOIL QA/QC - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

SAMPLE DATE SAMPLED UNITS	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
VOLATILES						
CHLOROMETHANE	10 U	10 U	ND	ND		0/2
BROMOMETHANE	10 U	10 U	ND	ND		0/2
VINYL CHLORIDE	10 U	10 U	ND	ND		0/2
CHLOROETHANE	10 U	10 U	ND	ND		0/2
METHYLENE CHLORIDE	10 U	10 U	ND	ND		0/2
ACETONE	10 U	17 U	ND	ND		0/2
CARBON DISULFIDE	10 U	10 U	ND	ND		0/2
1,1-DICHLOROETHENE	10 U	10 U	ND	ND		0/2
1,1-DICHLOROETHANE	10 U	10 U	ND	ND		0/2
1,2-DICHLOROETHENE (TOTAL)	10 U	10 U	ND	ND		0/2
CHLOROFORM	10 U	10 U	ND	ND		0/2
1,2-DICHLOROETHANE	10 U	10 U	ND	ND		0/2
2-BUTANONE	10 U	10 U	29 J	29 J	303-TB-17	1/2
1,1,1-TRICHLOROETHANE	10 U	10 U	ND	ND		0/2
CARBON TETRACHLORIDE	10 U	10 U	ND	ND		0/2
BROMODICHLOROMETHANE	10 U	10 U	ND	ND		0/2
1,2-DICHLOROPROPANE	10 U	10 U	ND	ND		0/2
CIS-1,3-DICHLOROPROPENE	10 U	10 U	ND	ND		0/2
TRICHLOROETHENE	10 U	10 U	ND	ND		0/2
DIBROMOCHLOROMETHANE	10 U	10 U	ND	ND		0/2
1,1,2-TRICHLOROETHANE	10 U	10 U	ND	ND		0/2
BENZENE	10 U	10 U	ND	ND		0/2
TRANS-1,3-DICHLOROPROPENE	10 U	10 U	ND	ND		0/2
BROMOFORM	10 U	10 U	ND	ND		0/2
4-METHYL-2-PENTANONE	10 U	10 U	ND	ND		0/2
2-HEXANONE	10 U	10 U	ND	ND		0/2
TETRACHLOROETHENE	10 U	10 U	ND	ND		0/2
1,1,2,2-TETRACHLOROETHANE	10 U	10 U	ND	ND		0/2
TOLUENE	10 U	10 U	ND	ND		0/2
CHLOROBENZENE	10 U	10 U	ND	ND		0/2
ETHYLBENZENE	10 U	10 U	ND	ND		0/2
STYRENE	10 U	10 U	ND	ND		0/2
XYLENE (TOTAL)	10 U	10 U	ND	ND		0/2

GROUNDWATER

SITE 44, JONES STREET DUMP
GROUNDWATER QA/QC - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

SAMPLE	303-FB-03	303-TB-33	303-TB-34	303-TB-35	44-GWER-01
DATE SAMPLED	04/18/95	04/07/95	04/09/95	04/11/95	04/07/95
UNITS	UG/L	UG/L	UG/L	UG/L	UG/L
VOLATILES					
CHLOROMETHANE	10 U	10 U	10 U	10 U	10 U
BROMOMETHANE	10 U	10 U	10 U	10 U	10 U
VINYL CHLORIDE	10 U	10 U	10 U	10 U	10 U
CHLOROETHANE	10 U	10 U	10 U	10 U	10 U
METHYLENE CHLORIDE	10 U	10 U	10 U	10 U	10 U
ACETONE	15 U	10 U	10 U	10 U	10 U
CARBON DISULFIDE	10 U	10 U	10 U	10 U	10 U
1,1-DICHLOROETHENE	10 U	10 U	10 U	10 U	10 U
1,1-DICHLOROETHANE	10 U	10 U	10 U	10 U	10 U
1,2-DICHLOROETHENE (TOTAL)	10 U	10 UJ	10 U	10 U	10 U
CHLOROFORM	10 U	10 U	10 U	10 U	4 J
1,2-DICHLOROETHANE	10 U	10 U	10 U	10 U	10 U
2-BUTANONE	10 U	10 U	10 U	10 U	10 U
1,1,1-TRICHLOROETHANE	10 U	10 U	10 U	10 U	10 U
CARBON TETRACHLORIDE	10 U	10 U	10 U	10 U	10 U
BROMODICHLOROMETHANE	10 U	10 U	10 U	10 U	10 U
1,2-DICHLOROPROPANE	10 U	10 U	10 U	10 U	10 U
CIS-1,3-DICHLOROPROPENE	10 U	10 U	10 U	10 U	10 U
TRICHLOROETHENE	10 U	1 J	10 U	10 U	10 U
DIBROMOCHLOROMETHANE	10 U	10 U	10 U	10 U	10 U
1,1,2-TRICHLOROETHANE	10 U	10 U	10 U	10 U	10 U
BENZENE	10 U	10 U	10 U	10 U	10 U
TRANS-1,3-DICHLOROPROPENE	10 U	10 U	10 U	10 U	10 U
BROMOFORM	10 U	10 U	10 U	10 U	10 U
4-METHYL-2-PENTANONE	10 U	10 U	10 U	10 U	10 U
2-HEXANONE	10 U	10 U	10 U	10 U	10 U
TETRACHLOROETHENE	10 U	10 U	10 U	10 U	10 U
1,1,2,2-TETRACHLOROETHANE	10 U	10 U	10 U	10 U	10 U
TOLUENE	10 U	10 U	10 U	10 U	10 U
CHLOROBENZENE	10 U	10 U	10 U	10 U	10 U
ETHYLBENZENE	10 U	10 U	10 U	10 U	10 U
STYRENE	10 U	10 U	10 U	10 U	10 U
XYLENE (TOTAL)	10 U	10 U	10 U	10 U	10 U

SITE 44, JONES STREET DUMP
GROUNDWATER QA/QC - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

SAMPLE	303-FB-03	303-TB-33	303-TB-34	303-TB-35	44-GWER-01
DATE SAMPLED	04/18/95	04/07/95	04/09/95	04/11/95	04/07/95
UNITS	UG/L	UG/L	UG/L	UG/L	UG/L
SEMIVOLATILES					
PHENOL	10 U	NA	NA	NA	10 U
BIS(2-CHLOROETHYL)ETHER	10 U	NA	NA	NA	10 U
2-CHLOROPHENOL	10 U	NA	NA	NA	10 U
1,3-DICHLOROBENZENE	10 U	NA	NA	NA	10 U
1,4-DICHLOROBENZENE	10 U	NA	NA	NA	10 U
1,2-DICHLOROBENZENE	10 U	NA	NA	NA	10 U
2-METHYLPHENOL	10 U	NA	NA	NA	10 U
2,2'-OXYBIS(1-CHLOROPROPANE)	10 U	NA	NA	NA	10 U
4-METHYLPHENOL	10 U	NA	NA	NA	10 U
N-NITROSO-DI-N-PROPYLAMINE	10 U	NA	NA	NA	10 U
HEXACHLOROETHANE	10 U	NA	NA	NA	10 U
NITROBENZENE	10 U	NA	NA	NA	10 U
ISOPHORONE	10 U	NA	NA	NA	10 U
2-NITROPHENOL	10 U	NA	NA	NA	10 U
2,4-DIMETHYLPHENOL	10 U	NA	NA	NA	10 U
BIS(2-CHLOROETHOXY)METHANE	10 U	NA	NA	NA	10 U
2,4-DICHLOROPHENOL	10 U	NA	NA	NA	10 U
1,2,4-TRICHLOROBENZENE	10 U	NA	NA	NA	10 U
NAPHTHALENE	10 U	NA	NA	NA	10 U
4-CHLOROANILINE	10 U	NA	NA	NA	10 U
HEXACHLOROBUTADIENE	10 U	NA	NA	NA	10 U
4-CHLORO-3-METHYLPHENOL	10 U	NA	NA	NA	10 U
2-METHYLNAPHTHALENE	10 U	NA	NA	NA	10 U
HEXACHLOROCYCLOPENTADIENE	10 U	NA	NA	NA	10 U
2,4,6-TRICHLOROPHENOL	10 U	NA	NA	NA	10 U
2,4,5-TRICHLOROPHENOL	25 U	NA	NA	NA	26 U
2-CHLORONAPHTHALENE	10 U	NA	NA	NA	10 U
2-NITROANILINE	25 U	NA	NA	NA	26 U
DIMETHYLPHTHALATE	10 U	NA	NA	NA	10 U
ACENAPHTHYLENE	10 U	NA	NA	NA	10 U
2,6-DINITROTOLUENE	10 U	NA	NA	NA	10 U
3-NITROANILINE	25 U	NA	NA	NA	26 U
ACENAPHTHENE	10 U	NA	NA	NA	10 U
2,4-DINITROPHENOL	25 UJ	NA	NA	NA	26 U

SITE 44, JONES STREET DUMP
GROUNDWATER QA/QC - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

SAMPLE	303-FB-03	303-TB-33	303-TB-34	303-TB-35	44-GWER-01
DATE SAMPLED	04/18/95	04/07/95	04/09/95	04/11/95	04/07/95
UNITS	UG/L	UG/L	UG/L	UG/L	UG/L
SEMIVOLATILES cont.					
4-NITROPHENOL	25 U	NA	NA	NA	26 U
DIBENZOFURAN	10 U	NA	NA	NA	10 U
2,4-DINITROTOLUENE	10 U	NA	NA	NA	10 U
DIETHYLPHTHALATE	10 U	NA	NA	NA	10 U
4-CHLOROPHENYL-PHENYLETHER	10 U	NA	NA	NA	10 U
FLUORENE	10 U	NA	NA	NA	10 U
4-NITROANILINE	25 U	NA	NA	NA	26 U
4,6-DINITRO-2-METHYLPHENOL	25 U	NA	NA	NA	26 U
N-NITROSODIPHENYLAMINE (1)	10 U	NA	NA	NA	10 U
4-BROMOPHENYL-PHENYLETHER	10 U	NA	NA	NA	10 U
HEXACHLOROBENZENE	10 U	NA	NA	NA	10 U
PENTACHLOROPHENOL	25 U	NA	NA	NA	26 U
PHENANTHRENE	10 U	NA	NA	NA	10 U
ANTHRACENE	10 U	NA	NA	NA	10 U
CARBAZOLE	10 U	NA	NA	NA	10 U
DI-N-BUTYLPHTHALATE	10 U	NA	NA	NA	10 U
FLUORANTHENE	10 U	NA	NA	NA	10 U
PYRENE	10 U	NA	NA	NA	10 U
BUTYLBENZYLPHTHALATE	10 U	NA	NA	NA	10 U
3,3'-DICHLOROBENZIDINE	10 U	NA	NA	NA	10 U
BENZO(A)ANTHRACENE	10 U	NA	NA	NA	10 U
CHRYSENE	10 U	NA	NA	NA	10 U
BIS(2-ETHYLHEXYL)PHTHALATE	10 U	NA	NA	NA	2 J
DI-N-OCTYL PHTHALATE	10 U	NA	NA	NA	10 U
BENZO(B)FLUORANTHENE	10 U	NA	NA	NA	10 U
BENZO(K)FLUORANTHENE	10 U	NA	NA	NA	10 U
BENZO(A)PYRENE	10 U	NA	NA	NA	10 U
INDENO(1,2,3-CD)PYRENE	10 U	NA	NA	NA	10 U
DIBENZO(A,H)ANTHRACENE	10 U	NA	NA	NA	10 U
BENZO(G,H,I)PERYLENE	10 U	NA	NA	NA	10 U

SITE 44, JONES STREET DUMP
GROUNDWATER QA/QC - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

SAMPLE	303-FB-03	303-TB-33	303-TB-34	303-TB-35	44-GWER-01
DATE SAMPLED	04/18/95	04/07/95	04/09/95	04/11/95	04/07/95
UNITS	UG/L	UG/L	UG/L	UG/L	UG/L
PESTICIDE/PCBS					
ALPHA-BHC	0.046 U	NA	NA	NA	0.056 UJ
BETA-BHC	0.046 U	NA	NA	NA	0.056 UJ
DELTA-BHC	0.046 U	NA	NA	NA	0.056 UJ
GAMMA-BHC (LINDANE)	0.046 U	NA	NA	NA	0.056 UJ
HEPTACHLOR	0.046 U	NA	NA	NA	0.056 UJ
ALDRIN	0.046 U	NA	NA	NA	0.056 UJ
HEPTACHLOR EPOXIDE	0.046 U	NA	NA	NA	0.056 UJ
ENDOSULFAN I	0.046 U	NA	NA	NA	0.056 UJ
DIELDRIN	0.092 U	NA	NA	NA	0.11 UJ
4,4'-DDE	0.092 U	NA	NA	NA	0.11 UJ
ENDRIN	0.092 U	NA	NA	NA	0.11 UJ
ENDOSULFAN II	0.092 U	NA	NA	NA	0.11 UJ
4,4'-DDD	0.092 U	NA	NA	NA	0.11 UJ
ENDOSULFAN SULFATE	0.092 U	NA	NA	NA	0.11 UJ
4,4'-DDT	0.092 U	NA	NA	NA	0.11 UJ
METHOXYCHLOR	0.46 UJ	NA	NA	NA	0.56 UJ
ENDRIN KETONE	0.092 U	NA	NA	NA	0.11 UJ
ENDRIN ALDEHYDE	0.092 U	NA	NA	NA	0.11 UJ
ALPHA-CHLORDANE	0.046 U	NA	NA	NA	0.056 UJ
GAMMA-CHLORDANE	0.046 U	NA	NA	NA	0.056 UJ
TOXAPHENE	4.6 U	NA	NA	NA	5.6 UJ
AROCLOR-1016	0.92 U	NA	NA	NA	1.1 UJ
AROCLOR-1221	1.8 U	NA	NA	NA	2.2 UJ
AROCLOR-1232	0.92 U	NA	NA	NA	1.1 UJ
AROCLOR-1242	0.92 U	NA	NA	NA	1.1 UJ
AROCLOR-1248	0.92 U	NA	NA	NA	1.1 UJ
AROCLOR-1254	0.92 U	NA	NA	NA	1.1 UJ
AROCLOR-1260	0.92 U	NA	NA	NA	1.1 UJ

SITE 44, JONES STREET DUMP
GROUNDWATER - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

SAMPLE DATE SAMPLED UNITS	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
VOLATILES						
CHLOROMETHANE	10 U	10 U	ND	ND		0/5
BROMOMETHANE	10 U	10 U	ND	ND		0/5
VINYL CHLORIDE	10 U	10 U	ND	ND		0/5
CHLOROETHANE	10 U	10 U	ND	ND		0/5
METHYLENE CHLORIDE	10 U	10 U	ND	ND		0/5
ACETONE	10 U	15 U	ND	ND		0/5
CARBON DISULFIDE	10 U	10 U	ND	ND		0/5
1,1-DICHLOROETHENE	10 U	10 U	ND	ND		0/5
1,1-DICHLOROETHANE	10 U	10 U	ND	ND		0/5
1,2-DICHLOROETHENE (TOTAL)	10 U	10 U	ND	ND		0/5
CHLOROFORM	10 U	10 U	4 J	4 J	44-GWER-01	1/5
1,2-DICHLOROETHANE	10 U	10 U	ND	ND		0/5
2-BUTANONE	10 U	10 U	ND	ND		0/5
1,1,1-TRICHLOROETHANE	10 U	10 U	ND	ND		0/5
CARBON TETRACHLORIDE	10 U	10 U	ND	ND		0/5
BROMODICHLOROMETHANE	10 U	10 U	ND	ND		0/5
1,2-DICHLOROPROPANE	10 U	10 U	ND	ND		0/5
CIS-1,3-DICHLOROPROPENE	10 U	10 U	ND	ND		0/5
TRICHLOROETHENE	10 U	10 U	1 J	1 J	303-TB-33	1/5
DIBROMOCHLOROMETHANE	10 U	10 U	ND	ND		0/5
1,1,2-TRICHLOROETHANE	10 U	10 U	ND	ND		0/5
BENZENE	10 U	10 U	ND	ND		0/5
TRANS-1,3-DICHLOROPROPENE	10 U	10 U	ND	ND		0/5
BROMOFORM	10 U	10 U	ND	ND		0/5
4-METHYL-2-PENTANONE	10 U	10 U	ND	ND		0/5
2-HEXANONE	10 U	10 U	ND	ND		0/5
TETRACHLOROETHENE	10 U	10 U	ND	ND		0/5
1,1,2,2-TETRACHLOROETHANE	10 U	10 U	ND	ND		0/5
TOLUENE	10 U	10 U	ND	ND		0/5
CHLOROBENZENE	10 U	10 U	ND	ND		0/5
ETHYLBENZENE	10 U	10 U	ND	ND		0/5
STYRENE	10 U	10 U	ND	ND		0/5
XYLENE (TOTAL)	10 U	10 U	ND	ND		0/5

SITE 44, JONES STREET DUMP
GROUNDWATER - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

SAMPLE DATE SAMPLED UNITS	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
SEMIVOLATILES						
PHENOL	10 U	10 U	ND	ND		0/2
BIS(2-CHLOROETHYL)ETHER	10 U	10 U	ND	ND		0/2
2-CHLOROPHENOL	10 U	10 U	ND	ND		0/2
1,3-DICHLOROBENZENE	10 U	10 U	ND	ND		0/2
1,4-DICHLOROBENZENE	10 U	10 U	ND	ND		0/2
1,2-DICHLOROBENZENE	10 U	10 U	ND	ND		0/2
2-METHYLPHENOL	10 U	10 U	ND	ND		0/2
2,2'-OXYBIS(1-CHLOROPROPANE)	10 U	10 U	ND	ND		0/2
4-METHYLPHENOL	10 U	10 U	ND	ND		0/2
N-NITROSO-DI-N-PROPYLAMINE	10 U	10 U	ND	ND		0/2
HEXACHLOROETHANE	10 U	10 U	ND	ND		0/2
NITROBENZENE	10 U	10 U	ND	ND		0/2
ISOPHORONE	10 U	10 U	ND	ND		0/2
2-NITROPHENOL	10 U	10 U	ND	ND		0/2
2,4-DIMETHYLPHENOL	10 U	10 U	ND	ND		0/2
BIS(2-CHLOROETHOXY)METHANE	10 U	10 U	ND	ND		0/2
2,4-DICHLOROPHENOL	10 U	10 U	ND	ND		0/2
1,2,4-TRICHLOROBENZENE	10 U	10 U	ND	ND		0/2
NAPHTHALENE	10 U	10 U	ND	ND		0/2
4-CHLOROANILINE	10 U	10 U	ND	ND		0/2
HEXACHLOROBUTADIENE	10 U	10 U	ND	ND		0/2
4-CHLORO-3-METHYLPHENOL	10 U	10 U	ND	ND		0/2
2-METHYLNAPHTHALENE	10 U	10 U	ND	ND		0/2
HEXACHLOROCYCLOPENTADIENE	10 U	10 U	ND	ND		0/2
2,4,6-TRICHLOROPHENOL	10 U	10 U	ND	ND		0/2
2,4,5-TRICHLOROPHENOL	25 U	26 U	ND	ND		0/2
2-CHLORONAPHTHALENE	10 U	10 U	ND	ND		0/2
2-NITROANILINE	25 U	26 U	ND	ND		0/2
DIMETHYLPHTHALATE	10 U	10 U	ND	ND		0/2
ACENAPHTHYLENE	10 U	10 U	ND	ND		0/2
2,6-DINITROTOLUENE	10 U	10 U	ND	ND		0/2
3-NITROANILINE	25 U	26 U	ND	ND		0/2
ACENAPHTHENE	10 U	10 U	ND	ND		0/2
2,4-DINITROPHENOL	25 UJ	26 U	ND	ND		0/2

SITE 44, JONES STREET DUMP
GROUNDWATER - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

SAMPLE DATE SAMPLED UNITS	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
SEMIVOLATILES cont.						
4-NITROPHENOL	25 U	26 U	ND	ND		0/2
DIBENZOFURAN	10 U	10 U	ND	ND		0/2
2,4-DINITROTOLUENE	10 U	10 U	ND	ND		0/2
DIETHYLPHTHALATE	10 U	10 U	ND	ND		0/2
4-CHLOROPHENYL-PHENYLETHER	10 U	10 U	ND	ND		0/2
FLUORENE	10 U	10 U	ND	ND		0/2
4-NITROANILINE	25 U	26 U	ND	ND		0/2
4,6-DINITRO-2-METHYLPHENOL	25 U	26 U	ND	ND		0/2
N-NITROSODIPHENYLAMINE (1)	10 U	10 U	ND	ND		0/2
4-BROMOPHENYL-PHENYLETHER	10 U	10 U	ND	ND		0/2
HEXACHLOROBENZENE	10 U	10 U	ND	ND		0/2
PENTACHLOROPHENOL	25 U	26 U	ND	ND		0/2
PHENANTHRENE	10 U	10 U	ND	ND		0/2
ANTHRACENE	10 U	10 U	ND	ND		0/2
CARBAZOLE	10 U	10 U	ND	ND		0/2
DI-N-BUTYLPHTHALATE	10 U	10 U	ND	ND		0/2
FLUORANTHENE	10 U	10 U	ND	ND		0/2
PYRENE	10 U	10 U	ND	ND		0/2
BUTYLBENZYLPHTHALATE	10 U	10 U	ND	ND		0/2
3,3'-DICHLOROBENZIDINE	10 U	10 U	ND	ND		0/2
BENZO(A)ANTHRACENE	10 U	10 U	ND	ND		0/2
CHRYSENE	10 U	10 U	ND	ND		0/2
BIS(2-ETHYLHEXYL)PHTHALATE	10 U	10 U	2 J	2 J	44-GWER-01	1/2
DI-N-OCTYL PHTHALATE	10 U	10 U	ND	ND		0/2
BENZO(B)FLUORANTHENE	10 U	10 U	ND	ND		0/2
BENZO(K)FLUORANTHENE	10 U	10 U	ND	ND		0/2
BENZO(A)PYRENE	10 U	10 U	ND	ND		0/2
INDENO(1,2,3-CD)PYRENE	10 U	10 U	ND	ND		0/2
DIBENZO(A,H)ANTHRACENE	10 U	10 U	ND	ND		0/2
BENZO(G,H,I)PERYLENE	10 U	10 U	ND	ND		0/2

SITE 44, JONES STREET DUMP
GROUNDWATER - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

SAMPLE DATE SAMPLED UNITS	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
PESTICIDE/PCBS						
ALPHA-BHC	0.046 U	0.056 UJ	ND	ND		0/2
BETA-BHC	0.046 U	0.056 UJ	ND	ND		0/2
DELTA-BHC	0.046 U	0.056 UJ	ND	ND		0/2
GAMMA-BHC (LINDANE)	0.046 U	0.056 UJ	ND	ND		0/2
HEPTACHLOR	0.046 U	0.056 UJ	ND	ND		0/2
ALDRIN	0.046 U	0.056 UJ	ND	ND		0/2
HEPTACHLOR EPOXIDE	0.046 U	0.056 UJ	ND	ND		0/2
ENDOSULFAN I	0.046 U	0.056 UJ	ND	ND		0/2
DIELDRIN	0.092 U	0.11 UJ	ND	ND		0/2
4,4'-DDE	0.092 U	0.11 UJ	ND	ND		0/2
ENDRIN	0.092 U	0.11 UJ	ND	ND		0/2
ENDOSULFAN II	0.092 U	0.11 UJ	ND	ND		0/2
4,4'-DDD	0.092 U	0.11 UJ	ND	ND		0/2
ENDOSULFAN SULFATE	0.092 U	0.11 UJ	ND	ND		0/2
4,4'-DDT	0.092 U	0.11 UJ	ND	ND		0/2
METHOXYCHLOR	0.46 UJ	0.56 UJ	ND	ND		0/2
ENDRIN KETONE	0.092 U	0.11 UJ	ND	ND		0/2
ENDRIN ALDEHYDE	0.092 U	0.11 UJ	ND	ND		0/2
ALPHA-CHLORDANE	0.046 U	0.056 UJ	ND	ND		0/2
GAMMA-CHLORDANE	0.046 U	0.056 UJ	ND	ND		0/2
TOXAPHENE	4.6 U	5.6 UJ	ND	ND		0/2
AROCLOR-1016	0.92 U	1.1 UJ	ND	ND		0/2
AROCLOR-1221	1.8 U	2.2 UJ	ND	ND		0/2
AROCLOR-1232	0.92 U	1.1 UJ	ND	ND		0/2
AROCLOR-1242	0.92 U	1.1 UJ	ND	ND		0/2
AROCLOR-1248	0.92 U	1.1 UJ	ND	ND		0/2
AROCLOR-1254	0.92 U	1.1 UJ	ND	ND		0/2
AROCLOR-1260	0.92 U	1.1 UJ	ND	ND		0/2

SITE 44, JONES STREET DUMP
GROUNDWATER QA/QC - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
INORGANIC ANALYTES

SAMPLE	303-FB-03	44-GWER-01
DATE SAMPLED	04/11/95	04/07/95
UNITS	UG/L	UG/L
TOTAL METALS		
ALUMINUM, TOTAL	15.7 U	21.2 U
ANTIMONY, TOTAL	12 U	20.8 U
ARSENIC, TOTAL	1.7 U	1.7 U
BARIUM, TOTAL	0.8 U	1 U
BERYLLIUM, TOTAL	0.3 U	0.8 U
CADMIUM, TOTAL	3.9 U	1.9 U
CALCIUM, TOTAL	349 U	61.6 U
CHROMIUM, TOTAL	3.8 U	4.1 U
COBALT, TOTAL	1.4 U	3.4 U
COPPER, TOTAL	1.8 U	1.8 U
IRON, TOTAL	16 U	21.6 U
LEAD, TOTAL	0.8 U	0.6 U
MAGNESIUM, TOTAL	64.6	26.2 U
MANGANESE, TOTAL	0.7 U	1.7 U
MERCURY, TOTAL	0.2 U	0.2 U
NICKEL, TOTAL	5.4 U	10.9 U
POTASSIUM, TOTAL	85.7 U	768 U
SELENIUM, TOTAL	1.8 U	1.8 U
SILVER, TOTAL	1.9 U	2.8 U
SODIUM, TOTAL	206 U	92.3 U
THALLIUM, TOTAL	0.7 U	1.4 U
VANADIUM, TOTAL	1.5 U	2 U
ZINC, TOTAL	2.4 U	6 U

SITE 44, JONES STREET DUMP
GROUNDWATER QA/QC - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
INORGANIC ANALYTES

SAMPLE DATE SAMPLED UNITS	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
TOTAL METALS						
ALUMINUM, TOTAL	15.7 U	21.2 U	ND	ND		0/2
ANTIMONY, TOTAL	12 U	20.8 U	ND	ND		0/2
ARSENIC, TOTAL	1.7 U	1.7 U	ND	ND		0/2
BARIUM, TOTAL	0.8 U	1 U	ND	ND		0/2
BERYLLIUM, TOTAL	0.3 U	0.8 U	ND	ND		0/2
CADMIUM, TOTAL	1.9 U	3.9 U	ND	ND		0/2
CALCIUM, TOTAL	61.6 U	349 U	ND	ND		0/2
CHROMIUM, TOTAL	3.8 U	4.1 U	ND	ND		0/2
COBALT, TOTAL	1.4 U	3.4 U	ND	ND		0/2
COPPER, TOTAL	1.8 U	1.8 U	ND	ND		0/2
IRON, TOTAL	16 U	21.6 U	ND	ND		0/2
LEAD, TOTAL	0.6 U	0.8 U	ND	ND		0/2
MAGNESIUM, TOTAL	26.2 U	26.2 U	64.6	64.6	303-FB-03	1/2
MANGANESE, TOTAL	0.7 U	1.7 U	ND	ND		0/2
MERCURY, TOTAL	0.2 U	0.2 U	ND	ND		0/2
NICKEL, TOTAL	5.4 U	10.9 U	ND	ND		0/2
POTASSIUM, TOTAL	85.7 U	768 U	ND	ND		0/2
SELENIUM, TOTAL	1.8 U	1.8 U	ND	ND		0/2
SILVER, TOTAL	1.9 U	2.8 U	ND	ND		0/2
SODIUM, TOTAL	92.3 U	206 U	ND	ND		0/2
THALLIUM, TOTAL	0.7 U	1.4 U	ND	ND		0/2
VANADIUM, TOTAL	1.5 U	2 U	ND	ND		0/2
ZINC, TOTAL	2.4 U	6 U	ND	ND		0/2

SURFACE WATER

SITE 44, JONES STREET DUMP
SURFACE WATER QA/QC - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COPOUNDS

SAMPLE	303-TB-44	44-SWTB-02
DATE SAMPLED	05/03/95	09/28/95
UNITS	UG/L	UG/L
VOLATILES		
CHLOROMETHANE	10 U	10 U
BROMOMETHANE	10 U	10 U
VINYL CHLORIDE	10 U	10 U
CHLOROETHANE	10 U	10 U
METHYLENE CHLORIDE	10 U	10 U
ACETONE	10 U	10 U
CARBON DISULFIDE	10 U	10 U
1,1-DICHLOROETHENE	10 U	10 U
1,1-DICHLOROETHANE	10 U	10 U
1,2-DICHLOROETHENE (TOTAL)	10 U	10 UJ
CHLOROFORM	10 U	10 U
1,2-DICHLOROETHANE	10 U	10 U
2-BUTANONE	10 U	10 U
1,1,1-TRICHLOROETHANE	10 U	10 U
CARBON TETRACHLORIDE	10 U	10 U
BROMODICHLOROMETHANE	10 U	10 U
1,2-DICHLOROPROPANE	10 U	10 U
CIS-1,3-DICHLOROPROPENE	10 U	10 U
TRICHLOROETHENE	10 U	10 U
DIBROMOCHLOROMETHANE	10 U	10 U
1,1,2-TRICHLOROETHANE	10 U	10 U
BENZENE	10 U	10 U
TRANS-1,3-DICHLOROPROPENE	10 U	10 U
BROMOFORM	10 U	10 U
4-METHYL-2-PENTANONE	10 U	10 U
2-HEXANONE	10 U	10 U
TETRACHLOROETHENE	10 U	10 U
1,1,2,2-TETRACHLOROETHANE	10 U	10 U
TOLUENE	10 U	10 U
CHLOROBENZENE	10 U	10 U
ETHYLBENZENE	10 U	10 U
STYRENE	10 U	10 U
XYLENE (TOTAL)	10 U	10 U

SITE 44, JONES STREET DUMP
SURFACE WATER QA/QC - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COPOUNDS

SAMPLE DATE SAMPLED UNITS	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
VOLATILES						
CHLOROMETHANE	10 U	10 U	ND	ND		0/2
BROMOMETHANE	10 U	10 U	ND	ND		0/2
VINYL CHLORIDE	10 U	10 U	ND	ND		0/2
CHLOROETHANE	10 U	10 U	ND	ND		0/2
METHYLENE CHLORIDE	10 U	10 U	ND	ND		0/2
ACETONE	10 U	10 U	ND	ND		0/2
CARBON DISULFIDE	10 U	10 U	ND	ND		0/2
1,1-DICHLOROETHENE	10 U	10 U	ND	ND		0/2
1,1-DICHLOROETHANE	10 U	10 U	ND	ND		0/2
1,2-DICHLOROETHENE (TOTAL)	10 U	10 U	ND	ND		0/2
CHLOROFORM	10 U	10 U	ND	ND		0/2
1,2-DICHLOROETHANE	10 U	10 U	ND	ND		0/2
2-BUTANONE	10 U	10 U	ND	ND		0/2
1,1,1-TRICHLOROETHANE	10 U	10 U	ND	ND		0/2
CARBON TETRACHLORIDE	10 U	10 U	ND	ND		0/2
BROMODICHLOROMETHANE	10 U	10 U	ND	ND		0/2
1,2-DICHLOROPROPANE	10 U	10 U	ND	ND		0/2
CIS-1,3-DICHLOROPROPENE	10 U	10 U	ND	ND		0/2
TRICHLOROETHENE	10 U	10 U	ND	ND		0/2
DIBROMOCHLOROMETHANE	10 U	10 U	ND	ND		0/2
1,1,2-TRICHLOROETHANE	10 U	10 U	ND	ND		0/2
BENZENE	10 U	10 U	ND	ND		0/2
TRANS-1,3-DICHLOROPROPENE	10 U	10 U	ND	ND		0/2
BROMOFORM	10 U	10 U	ND	ND		0/2
4-METHYL-2-PENTANONE	10 U	10 U	ND	ND		0/2
2-HEXANONE	10 U	10 U	ND	ND		0/2
TETRACHLOROETHENE	10 U	10 U	ND	ND		0/2
1,1,2,2-TETRACHLOROETHANE	10 U	10 U	ND	ND		0/2
TOLUENE	10 U	10 U	ND	ND		0/2
CHLOROBENZENE	10 U	10 U	ND	ND		0/2
ETHYLBENZENE	10 U	10 U	ND	ND		0/2
STYRENE	10 U	10 U	ND	ND		0/2
XYLENE (TOTAL)	10 U	10 U	ND	ND		0/2

SEDIMENT

SITE 44, JONES STREET DUMP
SEDIMENT QA/QC - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

SAMPLE	303-TB-45	303-TB-46	44-SEER-01
DATE SAMPLED	05/03/95	05/04/95	05/04/95
UNITS	UG/L	UG/L	UG/L
VOLATILES			
CHLOROMETHANE	10 U	10 U	10 U
BROMOMETHANE	10 U	10 U	10 U
VINYL CHLORIDE	10 U	10 U	10 U
CHLOROETHANE	10 U	10 U	10 U
METHYLENE CHLORIDE	10 U	10 U	10 U
ACETONE	10 U	10 U	10 U
CARBON DISULFIDE	10 U	10 U	10 U
1,1-DICHLOROETHENE	10 U	10 U	10 U
1,1-DICHLOROETHANE	10 U	10 U	10 U
1,2-DICHLOROETHENE (TOTAL)	10 U	10 U	10 U
CHLOROFORM	10 U	10 U	4 J
1,2-DICHLOROETHANE	10 U	10 U	10 U
2-BUTANONE	10 U	10 U	10 U
1,1,1-TRICHLOROETHANE	10 U	10 U	10 U
CARBON TETRACHLORIDE	10 U	10 U	10 U
BROMODICHLOROMETHANE	10 U	10 U	10 U
1,2-DICHLOROPROPANE	10 U	10 U	10 U
CIS-1,3-DICHLOROPROPENE	10 U	10 U	10 U
TRICHLOROETHENE	10 U	10 U	10 U
DIBROMOCHLOROMETHANE	10 U	10 U	10 U
1,1,2-TRICHLOROETHANE	10 U	10 U	10 U
BENZENE	10 U	10 U	10 U
TRANS-1,3-DICHLOROPROPENE	10 U	10 U	10 U
BROMOFORM	10 U	10 U	10 U
4-METHYL-2-PENTANONE	10 U	10 U	10 U
2-HEXANONE	10 U	10 U	10 U
TETRACHLOROETHENE	10 U	10 U	10 U
1,1,2,2-TETRACHLOROETHANE	10 U	10 U	10 U
TOLUENE	10 U	10 U	10 U
CHLOROBENZENE	10 U	10 U	10 U
ETHYLBENZENE	10 U	10 U	10 U
STYRENE	10 U	10 U	10 U
XYLENE (TOTAL)	10 U	10 U	10 U

SITE 44, JONES STREET DUMP
SEDIMENT QA/QC - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

SAMPLE	303-TB-45	303-TB-46	44-SEER-01
DATE SAMPLED	05/03/95	05/04/95	05/04/95
UNITS	UG/L	UG/L	UG/L
SEMIVOLATILES			
PHENOL	NA	NA	10 U
BIS(2-CHLOROETHYL)ETHER	NA	NA	10 U
2-CHLOROPHENOL	NA	NA	10 U
1,3-DICHLOROBENZENE	NA	NA	10 U
1,4-DICHLOROBENZENE	NA	NA	10 U
1,2-DICHLOROBENZENE	NA	NA	10 U
2-METHYLPHENOL	NA	NA	10 U
2,2'-OXYBIS(1-CHLOROPROPANE)	NA	NA	10 U
4-METHYLPHENOL	NA	NA	10 U
N-NITROSO-DI-N-PROPYLAMINE	NA	NA	10 U
HEXACHLOROETHANE	NA	NA	10 U
NITROBENZENE	NA	NA	10 U
ISOPHORONE	NA	NA	10 U
2-NITROPHENOL	NA	NA	10 U
2,4-DIMETHYLPHENOL	NA	NA	10 U
BIS(2-CHLOROETHOXY)METHANE	NA	NA	10 U
2,4-DICHLOROPHENOL	NA	NA	10 U
1,2,4-TRICHLOROBENZENE	NA	NA	10 U
NAPHTHALENE	NA	NA	10 U
4-CHLOROANILINE	NA	NA	10 U
HEXACHLOROBUTADIENE	NA	NA	10 U
4-CHLORO-3-METHYLPHENOL	NA	NA	10 U
2-METHYLNAPHTHALENE	NA	NA	10 U
HEXACHLOROCYCLOPENTADIENE	NA	NA	10 U
2,4,6-TRICHLOROPHENOL	NA	NA	10 U
2,4,5-TRICHLOROPHENOL	NA	NA	26 U
2-CHLORONAPHTHALENE	NA	NA	10 U
2-NITROANILINE	NA	NA	26 U
DIMETHYLPHTHALATE	NA	NA	10 U
ACENAPHTHYLENE	NA	NA	10 U
2,6-DINITROTOLUENE	NA	NA	10 U
3-NITROANILINE	NA	NA	26 U
ACENAPHTHENE	NA	NA	10 U
2,4-DINITROPHENOL	NA	NA	26 U

SITE 44, JONES STREET DUMP
SEDIMENT QA/QC - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

SAMPLE	303-TB-45	303-TB-46	44-SEER-01
DATE SAMPLED	05/03/95	05/04/95	05/04/95
UNITS	UG/L	UG/L	UG/L
SEMIVOLATILES cont.			
4-NITROPHENOL	NA	NA	26 U
DIBENZOFURAN	NA	NA	10 U
2,4-DINITROTOLUENE	NA	NA	10 U
DIETHYLPHTHALATE	NA	NA	10 U
4-CHLOROPHENYL-PHENYLETHER	NA	NA	10 U
FLUORENE	NA	NA	10 U
4-NITROANILINE	NA	NA	26 U
4,6-DINITRO-2-METHYLPHENOL	NA	NA	26 U
N-NITROSODIPHENYLAMINE (1)	NA	NA	10 U
4-BROMOPHENYL-PHENYLETHER	NA	NA	10 U
HEXACHLOROBENZENE	NA	NA	10 U
PENTACHLOROPHENOL	NA	NA	26 U
PHENANTHRENE	NA	NA	10 U
ANTHRACENE	NA	NA	10 U
CARBAZOLE	NA	NA	10 U
DI-N-BUTYLPHTHALATE	NA	NA	10 U
FLUORANTHENE	NA	NA	10 U
PYRENE	NA	NA	10 U
BUTYLBENZYLPHTHALATE	NA	NA	10 U
3,3'-DICHLOROBENZIDINE	NA	NA	10 U
BENZO(A)ANTHRACENE	NA	NA	10 U
CHRYSENE	NA	NA	10 U
BIS(2-ETHYLHEXYL)PHTHALATE	NA	NA	10 U
DI-N-OCTYL PHTHALATE	NA	NA	10 U
BENZO(B)FLUORANTHENE	NA	NA	10 U
BENZO(K)FLUORANTHENE	NA	NA	10 U
BENZO(A)PYRENE	NA	NA	10 U
INDENO(1,2,3-CD)PYRENE	NA	NA	10 U
DIBENZO(A,H)ANTHRACENE	NA	NA	10 U
BENZO(G,H,I)PERYLENE	NA	NA	10 U

SITE 44, JONES STREET DUMP
SEDIMENT QA/QC - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

SAMPLE	303-TB-45	303-TB-46	44-SEER-01
DATE SAMPLED	05/03/95	05/04/95	05/04/95
UNITS	UG/L	UG/L	UG/L
PESTICIDE/PCBS			
ALPHA-BHC	NA	NA	0.05 U
BETA-BHC	NA	NA	0.05 U
DELTA-BHC	NA	NA	0.05 U
GAMMA-BHC (LINDANE)	NA	NA	0.05 U
HEPTACHLOR	NA	NA	0.05 U
ALDRIN	NA	NA	0.05 U
HEPTACHLOR EPOXIDE	NA	NA	0.05 U
ENDOSULFAN I	NA	NA	0.05 U
DIELDRIN	NA	NA	0.1 U
4,4'-DDE	NA	NA	0.1 U
ENDRIN	NA	NA	0.1 U
ENDOSULFAN II	NA	NA	0.1 U
4,4'-DDD	NA	NA	0.1 U
ENDOSULFAN SULFATE	NA	NA	0.1 U
4,4'-DDT	NA	NA	0.1 U
METHOXYCHLOR	NA	NA	0.5 UJ
ENDRIN KETONE	NA	NA	0.1 U
ENDRIN ALDEHYDE	NA	NA	0.1 U
ALPHA-CHLORDANE	NA	NA	0.05 U
GAMMA-CHLORDANE	NA	NA	0.05 U
TOXAPHENE	NA	NA	5 U
AROCLOR-1016	NA	NA	1 U
AROCLOR-1221	NA	NA	2 U
AROCLOR-1232	NA	NA	1 U
AROCLOR-1242	NA	NA	1 U
AROCLOR-1248	NA	NA	1 U
AROCLOR-1254	NA	NA	1 U
AROCLOR-1260	NA	NA	1 U

SITE 44, JONES STREET DUMP
SEDIMENT QA/QC - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

SAMPLE DATE SAMPLED UNITS	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
VOLATILES						
CHLOROMETHANE	10 U	10 U	ND	ND		0/3
BROMOMETHANE	10 U	10 U	ND	ND		0/3
VINYL CHLORIDE	10 U	10 U	ND	ND		0/3
CHLOROETHANE	10 U	10 U	ND	ND		0/3
METHYLENE CHLORIDE	10 U	10 U	ND	ND		0/3
ACETONE	10 U	10 U	ND	ND		0/3
CARBON DISULFIDE	10 U	10 U	ND	ND		0/3
1,1-DICHLOROETHENE	10 U	10 U	ND	ND		0/3
1,1-DICHLOROETHANE	10 U	10 U	ND	ND		0/3
1,2-DICHLOROETHENE (TOTAL)	10 U	10 U	ND	ND		0/3
CHLOROFORM	10 U	10 U	4 J	4 J	44-SEER-01	1/3
1,2-DICHLOROETHANE	10 U	10 U	ND	ND		0/3
2-BUTANONE	10 U	10 U	ND	ND		0/3
1,1,1-TRICHLOROETHANE	10 U	10 U	ND	ND		0/3
CARBON TETRACHLORIDE	10 U	10 U	ND	ND		0/3
BROMODICHLOROMETHANE	10 U	10 U	ND	ND		0/3
1,2-DICHLOROPROPANE	10 U	10 U	ND	ND		0/3
CIS-1,3-DICHLOROPROPENE	10 U	10 U	ND	ND		0/3
TRICHLOROETHENE	10 U	10 U	ND	ND		0/3
DIBROMOCHLOROMETHANE	10 U	10 U	ND	ND		0/3
1,1,2-TRICHLOROETHANE	10 U	10 U	ND	ND		0/3
BENZENE	10 U	10 U	ND	ND		0/3
TRANS-1,3-DICHLOROPROPENE	10 U	10 U	ND	ND		0/3
BROMOFORM	10 U	10 U	ND	ND		0/3
4-METHYL-2-PENTANONE	10 U	10 U	ND	ND		0/3
2-HEXANONE	10 U	10 U	ND	ND		0/3
TETRACHLOROETHENE	10 U	10 U	ND	ND		0/3
1,1,2,2-TETRACHLOROETHANE	10 U	10 U	ND	ND		0/3
TOLUENE	10 U	10 U	ND	ND		0/3
CHLOROBENZENE	10 U	10 U	ND	ND		0/3
ETHYLBENZENE	10 U	10 U	ND	ND		0/3
STYRENE	10 U	10 U	ND	ND		0/3
XYLENE (TOTAL)	10 U	10 U	ND	ND		0/3

SITE 44, JONES STREET DUMP
SEDIMENT QA/QC - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

SAMPLE DATE SAMPLED UNITS	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
SEMIVOLATILES						
PHENOL	10 U	10 U	ND	ND		0/1
BIS(2-CHLOROETHYL)ETHER	10 U	10 U	ND	ND		0/1
2-CHLOROPHENOL	10 U	10 U	ND	ND		0/1
1,3-DICHLOROBENZENE	10 U	10 U	ND	ND		0/1
1,4-DICHLOROBENZENE	10 U	10 U	ND	ND		0/1
1,2-DICHLOROBENZENE	10 U	10 U	ND	ND		0/1
2-METHYLPHENOL	10 U	10 U	ND	ND		0/1
2,2'-OXYBIS(1-CHLOROPROPANE)	10 U	10 U	ND	ND		0/1
4-METHYLPHENOL	10 U	10 U	ND	ND		0/1
N-NITROSO-DI-N-PROPYLAMINE	10 U	10 U	ND	ND		0/1
HEXACHLOROETHANE	10 U	10 U	ND	ND		0/1
NITROBENZENE	10 U	10 U	ND	ND		0/1
ISOPHORONE	10 U	10 U	ND	ND		0/1
2-NITROPHENOL	10 U	10 U	ND	ND		0/1
2,4-DIMETHYLPHENOL	10 U	10 U	ND	ND		0/1
BIS(2-CHLOROETHOXY)METHANE	10 U	10 U	ND	ND		0/1
2,4-DICHLOROPHENOL	10 U	10 U	ND	ND		0/1
1,2,4-TRICHLOROBENZENE	10 U	10 U	ND	ND		0/1
NAPHTHALENE	10 U	10 U	ND	ND		0/1
4-CHLOROANILINE	10 U	10 U	ND	ND		0/1
HEXACHLOROBUTADIENE	10 U	10 U	ND	ND		0/1
4-CHLORO-3-METHYLPHENOL	10 U	10 U	ND	ND		0/1
2-METHYLNAPHTHALENE	10 U	10 U	ND	ND		0/1
HEXACHLOROCYCLOPENTADIENE	10 U	10 U	ND	ND		0/1
2,4,6-TRICHLOROPHENOL	10 U	10 U	ND	ND		0/1
2,4,5-TRICHLOROPHENOL	26 U	26 U	ND	ND		0/1
2-CHLORONAPHTHALENE	10 U	10 U	ND	ND		0/1
2-NITROANILINE	26 U	26 U	ND	ND		0/1
DIMETHYLPHTHALATE	10 U	10 U	ND	ND		0/1
ACENAPHTHYLENE	10 U	10 U	ND	ND		0/1
2,6-DINITROTOLUENE	10 U	10 U	ND	ND		0/1
3-NITROANILINE	26 U	26 U	ND	ND		0/1
ACENAPHTHENE	10 U	10 U	ND	ND		0/1
2,4-DINITROPHENOL	26 U	26 U	ND	ND		0/1

SITE 44, JONES STREET DUMP
SEDIMENT QA/QC - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

SAMPLE DATE SAMPLED UNITS	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
SEMIVOLATILES cont.						
4-NITROPHENOL	26 U	26 U	ND	ND		0/1
DIBENZOFURAN	10 U	10 U	ND	ND		0/1
2,4-DINITROTOLUENE	10 U	10 U	ND	ND		0/1
DIETHYLPHTHALATE	10 U	10 U	ND	ND		0/1
4-CHLOROPHENYL-PHENYLETHER	10 U	10 U	ND	ND		0/1
FLUORENE	10 U	10 U	ND	ND		0/1
4-NITROANILINE	26 U	26 U	ND	ND		0/1
4,6-DINITRO-2-METHYLPHENOL	26 U	26 U	ND	ND		0/1
N-NITROSODIPHENYLAMINE (1)	10 U	10 U	ND	ND		0/1
4-BROMOPHENYL-PHENYLETHER	10 U	10 U	ND	ND		0/1
HEXACHLOROBENZENE	10 U	10 U	ND	ND		0/1
PENTACHLOROPHENOL	26 U	26 U	ND	ND		0/1
PHENANTHRENE	10 U	10 U	ND	ND		0/1
ANTHRACENE	10 U	10 U	ND	ND		0/1
CARBAZOLE	10 U	10 U	ND	ND		0/1
DI-N-BUTYLPHTHALATE	10 U	10 U	ND	ND		0/1
FLUORANTHENE	10 U	10 U	ND	ND		0/1
PYRENE	10 U	10 U	ND	ND		0/1
BUTYLBENZYLPHTHALATE	10 U	10 U	ND	ND		0/1
3,3'-DICHLOROBENZIDINE	10 U	10 U	ND	ND		0/1
BENZO(A)ANTHRACENE	10 U	10 U	ND	ND		0/1
CHRYSENE	10 U	10 U	ND	ND		0/1
BIS(2-ETHYLHEXYL)PHTHALATE	10 U	10 U	ND	ND		0/1
DI-N-OCTYL PHTHALATE	10 U	10 U	ND	ND		0/1
BENZO(B)FLUORANTHENE	10 U	10 U	ND	ND		0/1
BENZO(K)FLUORANTHENE	10 U	10 U	ND	ND		0/1
BENZO(A)PYRENE	10 U	10 U	ND	ND		0/1
INDENO(1,2,3-CD)PYRENE	10 U	10 U	ND	ND		0/1
DIBENZO(A,H)ANTHRACENE	10 U	10 U	ND	ND		0/1
BENZO(G,H,I)PERYLENE	10 U	10 U	ND	ND		0/1

SITE 44, JONES STREET DUMP
SEDIMENT QA/QC - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

SAMPLE DATE SAMPLED UNITS	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
PESTICIDE/PCBS						
ALPHA-BHC	0.05 U	0.05 U	ND	ND		0/1
BETA-BHC	0.05 U	0.05 U	ND	ND		0/1
DELTA-BHC	0.05 U	0.05 U	ND	ND		0/1
GAMMA-BHC (LINDANE)	0.05 U	0.05 U	ND	ND		0/1
HEPTACHLOR	0.05 U	0.05 U	ND	ND		0/1
ALDRIN	0.05 U	0.05 U	ND	ND		0/1
HEPTACHLOR EPOXIDE	0.05 U	0.05 U	ND	ND		0/1
ENDOSULFAN I	0.05 U	0.05 U	ND	ND		0/1
DIELDRIN	0.1 U	0.1 U	ND	ND		0/1
4,4'-DDE	0.1 U	0.1 U	ND	ND		0/1
ENDRIN	0.1 U	0.1 U	ND	ND		0/1
ENDOSULFAN II	0.1 U	0.1 U	ND	ND		0/1
4,4'-DDD	0.1 U	0.1 U	ND	ND		0/1
ENDOSULFAN SULFATE	0.1 U	0.1 U	ND	ND		0/1
4,4'-DDT	0.1 U	0.1 U	ND	ND		0/1
METHOXYCHLOR	0.5 UJ	0.5 UJ	ND	ND		0/1
ENDRIN KETONE	0.1 U	0.1 U	ND	ND		0/1
ENDRIN ALDEHYDE	0.1 U	0.1 U	ND	ND		0/1
ALPHA-CHLORDANE	0.05 U	0.05 U	ND	ND		0/1
GAMMA-CHLORDANE	0.05 U	0.05 U	ND	ND		0/1
TOXAPHENE	5 U	5 U	ND	ND		0/1
AROCLOR-1016	1 U	1 U	ND	ND		0/1
AROCLOR-1221	2 U	2 U	ND	ND		0/1
AROCLOR-1232	1 U	1 U	ND	ND		0/1
AROCLOR-1242	1 U	1 U	ND	ND		0/1
AROCLOR-1248	1 U	1 U	ND	ND		0/1
AROCLOR-1254	1 U	1 U	ND	ND		0/1
AROCLOR-1260	1 U	1 U	ND	ND		0/1

SITE 44, JONES STREET DUMP
SEDIMENT QA/QC - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
INORGANIC ANALYTES

SAMPLE	44-SEER-01
DATE SAMPLED	05/04/95
UNITS	UG/L

TOTAL METALS	
ALUMINUM, TOTAL	21.2 U
ANTIMONY, TOTAL	20.8 U
ARSENIC, TOTAL	1.7 U
BARIUM, TOTAL	1 U
BERYLLIUM, TOTAL	0.8 U
CADMIUM, TOTAL	2.2 U
CALCIUM, TOTAL	82.4 U
CHROMIUM, TOTAL	4.1 U
COBALT, TOTAL	3.4 U
COPPER, TOTAL	1.8 U
IRON, TOTAL	22.7 U
LEAD, TOTAL	0.8 UJ
MAGNESIUM, TOTAL	49.7 U
MANGANESE, TOTAL	1.7 U
MERCURY, TOTAL	0.2 U
NICKEL, TOTAL	10.9 U
POTASSIUM, TOTAL	768 U
SELENIUM, TOTAL	1.8 UJ
SILVER, TOTAL	2.8 U
SODIUM, TOTAL	507
THALLIUM, TOTAL	0.7 U
VANADIUM, TOTAL	2 U
ZINC, TOTAL	6 U

SITE 44, JONES STREET DUMP
SEDIMENT QA/QC - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
INORGANIC ANALYTES

SAMPLE DATE SAMPLED UNITS	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
TOTAL METALS						
ALUMINUM, TOTAL	21.2 U	21.2 U	ND	ND		0/1
ANTIMONY, TOTAL	20.8 U	20.8 U	ND	ND		0/1
ARSENIC, TOTAL	1.7 U	1.7 U	ND	ND		0/1
BARIUM, TOTAL	1 U	1 U	ND	ND		0/1
BERYLLIUM, TOTAL	0.8 U	0.8 U	ND	ND		0/1
CADMIUM, TOTAL	2.2 U	2.2 U	ND	ND		0/1
CALCIUM, TOTAL	82.4 U	82.4 U	ND	ND		0/1
CHROMIUM, TOTAL	4.1 U	4.1 U	ND	ND		0/1
COBALT, TOTAL	3.4 U	3.4 U	ND	ND		0/1
COPPER, TOTAL	1.8 U	1.8 U	ND	ND		0/1
IRON, TOTAL	22.7 U	22.7 U	ND	ND		0/1
LEAD, TOTAL	0.8 UJ	0.8 UJ	ND	ND		0/1
MAGNESIUM, TOTAL	49.7 U	49.7 U	ND	ND		0/1
MANGANESE, TOTAL	1.7 U	1.7 U	ND	ND		0/1
MERCURY, TOTAL	0.2 U	0.2 U	ND	ND		0/1
NICKEL, TOTAL	10.9 U	10.9 U	ND	ND		0/1
POTASSIUM, TOTAL	768 U	768 U	ND	ND		0/1
SELENIUM, TOTAL	1.8 UJ	1.8 UJ	ND	ND		0/1
SILVER, TOTAL	2.8 U	2.8 U	ND	ND		0/1
SODIUM, TOTAL	NA	NA	507	507	05/04/95	1/1
THALLIUM, TOTAL	0.7 U	0.7 U	ND	ND		0/1
VANADIUM, TOTAL	2 U	2 U	ND	ND		0/1
ZINC, TOTAL	6 U	6 U	ND	ND		0/1

APPENDIX L
GRAIN SIZE AND PERMEABILITY ANALYTICAL RESULTS

GRAIN SIZE ANALYTICAL RESULTS

ROY F. WESTON, INC. ENVIRONMENTAL TECHNOLOGY LABORATORY

GEOTECHNICAL TESTING DATA AND RESULTS

PROJECT	Baker Environmental	PROJECT SAMPLE I.D.	44-EC-SD01-06	PROJECT ANALYST	WB
JOB NUMBER	9505G704	ETL SAMPLE NUMBER	001	QA/QC ANALYST	RWF
W. O. NUMBER	06629-009-004-0001-00	DATE RECEIVED	05/08/95	DATE COMPLETED	05/14/95

PARTICLE SIZE DISTRIBUTION

U. S. Standard Sieve Size	Diameter mm	% Finer
3"	75.00	100.0
1 1/2"	37.50	100.0
3/4"	19.00	99.0
3/8"	9.500	94.2
#4	4.750	89.3
#10	2.000	84.9
#20	0.850	70.7
#50	0.300	24.4
#100	0.150	6.8
#200	0.075	3.9
HYDROMETER	0.0511	4.8
	0.0364	4.1
	0.0259	3.4
	0.0183	3.4
	0.0134	3.4
	0.0094	3.4
	0.0067	2.8
	0.0047	2.8
	0.0034	2.8
	0.0024	2.8
	0.0014	2.1
	0.0010	2.1

EFFECTIVE SIZES

% Finer	Diameter mm
60	0.723
30	0.367
10	0.178
Uniformity Coefficient	Gradation Coefficient
4.1	1.0

SAMPLE DESCRIPTION

gray poorly graded SAND
with 11% gravel and 4% silt of low plasticity

Unified Soil Classification System (USCS) Group Symbol

SP

INDEX PROPERTIES

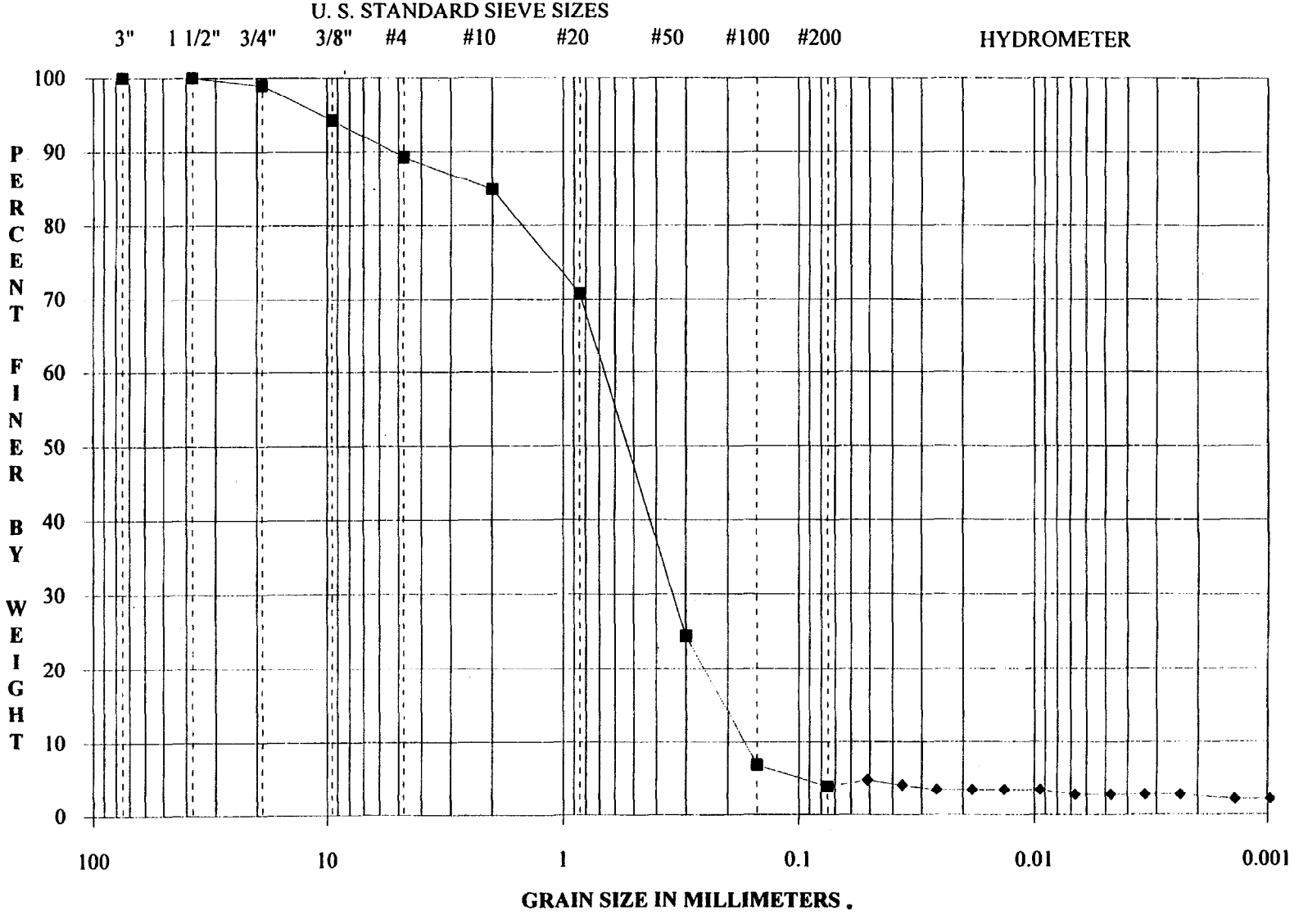
% moisture dry basis

Liquid Limit	Plastic Limit	Plasticity Index
non-plastic; non-cohesive		

NOTES

GSC1.XLS

PARTICLE-SIZE DISTRIBUTION CURVE FOR
PROJECT SAMPLE 44-EC-SD01-06, ETL SAMPLE 9505G704-001



GSC1.XLS

ROY F. WESTON, INC. ENVIRONMENTAL TECHNOLOGY LABORATORY

GEOTECHNICAL TESTING DATA AND RESULTS

PROJECT	Baker Environmental	PROJECT SAMPLE I.D.	44-EC-SD02-06	PROJECT ANALYST	WB
JOB NUMBER	9505G704	ETL SAMPLE NUMBER	002	QA/QC ANALYST	RWF
W. O. NUMBER	06629-009-004-0001-00	DATE RECEIVED	05/08/95	DATE COMPLETED	05/14/95

PARTICLE SIZE DISTRIBUTION

U. S. Standard Sieve Size	Diameter mm	% Finer
3"	75.00	100.0
1 1/2"	37.50	100.0
3/4"	19.00	99.2
3/8"	9.500	98.4
#4	4.750	96.9
#10	2.000	94.8
#20	0.850	86.3
#50	0.300	38.8
#100	0.150	6.4
#200	0.075	1.4
HYDROMETER	0.0517	3.8
	0.0366	3.8
	0.0259	3.8
	0.0184	3.0
	0.0134	3.0
	0.0095	3.0
	0.0067	3.0
	0.0047	3.0
	0.0034	2.3
	0.0024	2.3
	0.0014	2.3
	0.0010	2.3

EFFECTIVE SIZES

% Finer	Diameter mm
60	0.546
30	0.259
10	0.167
Uniformity Coefficient	Gradation Coefficient
3.3	0.7

SAMPLE DESCRIPTION

gray poorly graded SAND
with 3% gravel and 1% silt of low plasticity

Unified Soil Classification System (USCS) Group Symbol

SP

INDEX PROPERTIES

% moisture dry basis

Liquid Limit	Plastic Limit	Plasticity Index
non-plastic; non-cohesive		

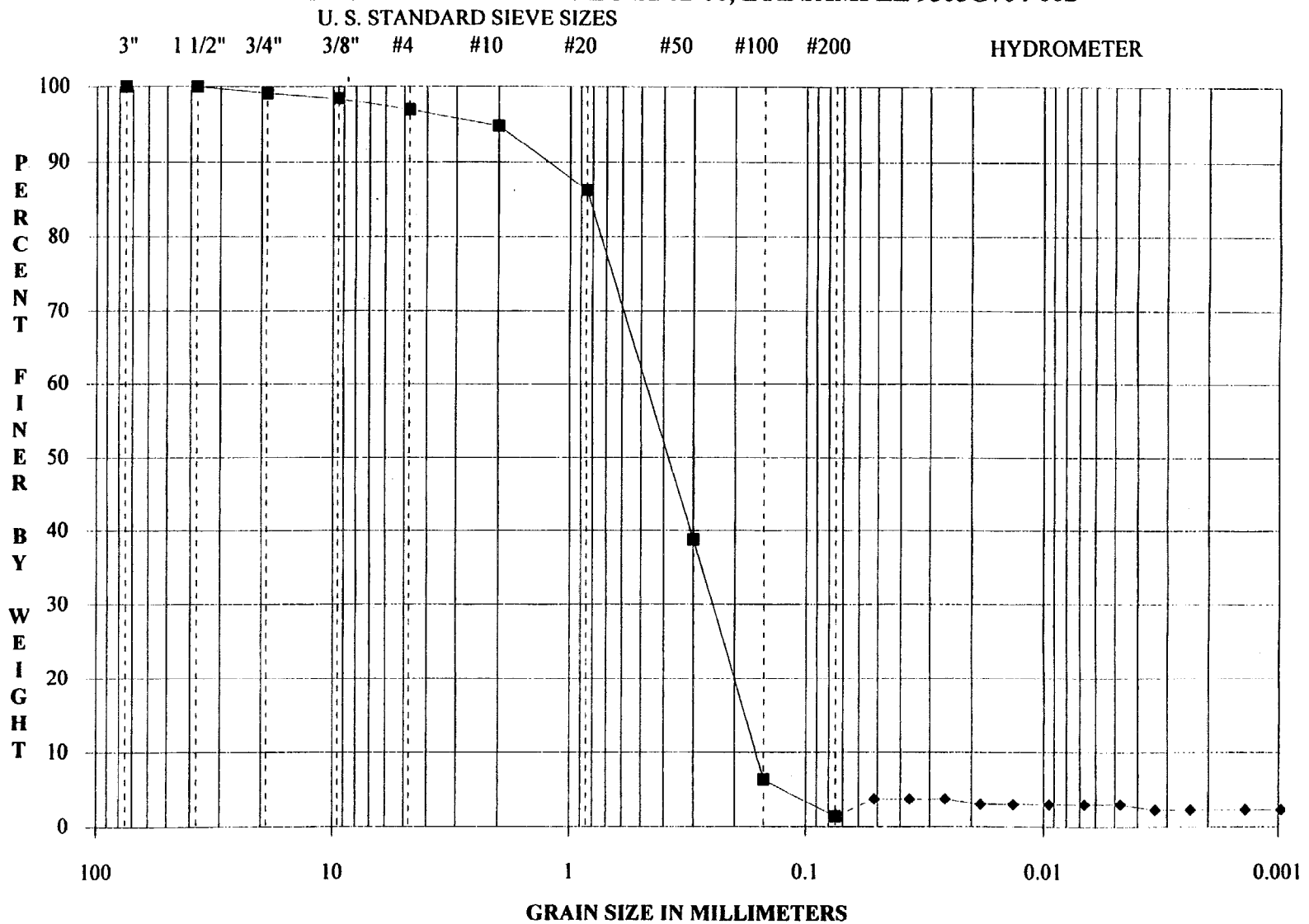
NOTES

GSC2.XLS

ROY F. WESTON, INC. ENVIRONMENTAL TECHNOLOGY LABORATORY

PARTICLE-SIZE DISTRIBUTION CURVE FOR

PROJECT SAMPLE 44-EC-SD02-06, ETL SAMPLE 9505G704-002



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ROY F. WESTON, INC. ENVIRONMENTAL TECHNOLOGY LABORATORY

GEOTECHNICAL TESTING DATA AND RESULTS

PROJECT	Baker Environmental	PROJECT SAMPLE I.D.	44-UT-SD02-612	PROJECT ANALYST	WB
JOB NUMBER	9505G704	ETL SAMPLE NUMBER	003	QA/QC ANALYST	RWF
W. O. NUMBER	06629-009-004-0001-00	DATE RECEIVED	05/08/95	DATE COMPLETED	05/14/95

PARTICLE SIZE DISTRIBUTION

U. S. Standard Sieve Size	Diameter mm	% Finer
3"	75.00	100.0
1 1/2"	37.50	100.0
3/4"	19.00	100.0
3/8"	9.500	100.0
#4	4.750	99.7
#10	2.000	99.6
#20	0.850	98.0
#50	0.300	92.7
#100	0.150	60.8
#200	0.075	29.5
HYDROMETER	0.0418	29.0
	0.0313	23.4
	0.0224	21.8
	0.0162	19.4
	0.0120	17.8
	0.0086	16.2
	0.0063	13.0
	0.0045	11.4
	0.0032	10.6
	0.0023	9.8
	0.0013	8.2
	0.0009	8.2

EFFECTIVE SIZES

% Finer	Diameter mm
60	0.148
30	0.076
10	NA
Uniformity Coefficient	Gradation Coefficient
NA	NA

SAMPLE DESCRIPTION

gray silty SAND
with 29% silt of low plasticity

Unified Soil Classification System (USCS) Group Symbol

SM

INDEX PROPERTIES

% moisture dry basis

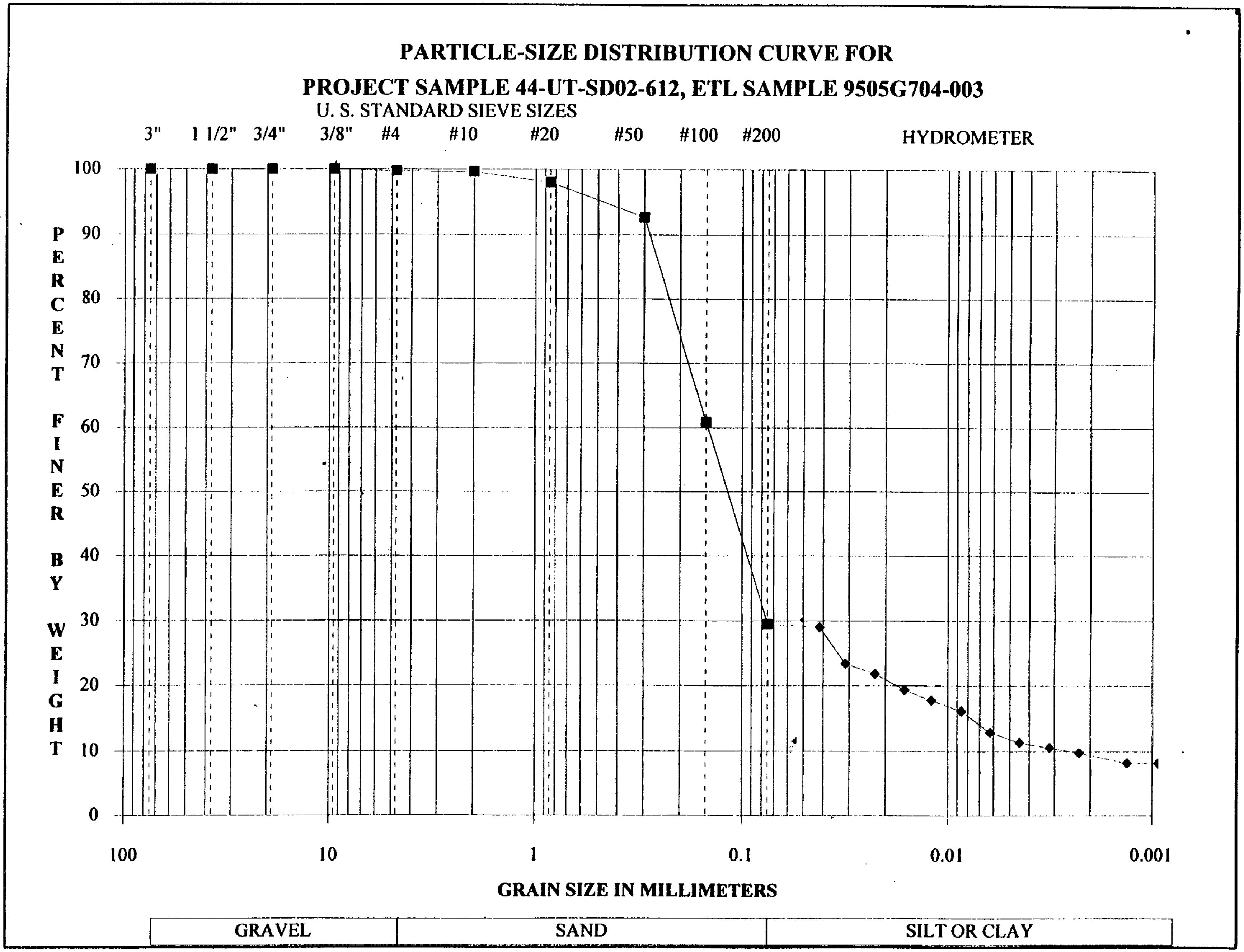
Liquid Limit	Plastic Limit	Plasticity Index
non-plastic; non-cohesive		

NOTES

NA=NOT APPLICABLE

GSC3.XLS

ROY F. WESTON, INC. ENVIRONMENTAL TECHNOLOGY LABORATORY



GSC-XLS

PERMEABILITY ANALYTICAL RESULTS

SOIL TECH ENGINEERING

May 10, 1995

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

Attention: Mr. Richard Bonelli

Reference: White Road Extension - Lot 1005
Marine Corp. Air Station
Jacksonville, North Carolina
Job No. 684-95

Dear Mr. Bonelli:

Soil Tech Engineering, Inc. has recently conducted laboratory testing on a subsurface soil specimen recently delivered to our laboratory. We understand the sample was obtained from the Whites Road Extension Project on Lot 1005, at the Marine Corp. Air Station, located at Camp Lejeune, North Carolina.

An undistributed soil sample was picked up from the project site and delivered to our laboratory. Once received, each sample was tested in accordance with the following procedures:

1. ASTM D-422, "Particle Size Analysis of Soils."

2. ASTM D-423 & D-424; "Liquid Limit, Plastic Limit and Plasticity Index of Soils"

3. Coefficient of Permeability - Falling Head Method, "Engineering Properties of Soils and Their Measurements" by Joseph E. Bowles.

Based on our laboratory testing, the sample was found to be a silty sand which exhibited a permeability of 1.3 x 10-5 centimeters per second.

Laboratory Analysis
White Road Extension - Lot 1005
Marine Corp. Air Station - Camp Lejeune

	Location	44-GW01DW
	Depth	54.0 - 54.7'
I)	Permeability (Cm/Sec)	1.3 x 10-5 centimeter/second
	Wet Unit Weight (pcf)	110.7 pcf
	Existing Moisture, %	34.8%
	Saturation Moisture, %	63.7%
II)	Particle Size Analysis	

SIEVE SIZE	% PASSING
3/4	100.0
1/2	94.5
3/8	89.8
4	72.2
10	59.2
40	52.7
80	30.6
200	18.5
MOISTURE CONTENT	34.8%
SOIL DESCRIPTION	Gray Silty Fine To Medium SAND With Rock

III)	Attenberg Limits	
	Plastic Limit	Non-Plastic
	Liquid Limit	Non-Plastic
	Plasticity Index	Non-Plastic

Attached please find the results of our laboratory testing. If you have any questions after reviewing this letter, please do not hesitate to contact us.

Very truly yours,

SOIL TECH ENGINEERING

Parks A. Downing, Jr.
Manager

John S. Tunstall, P.E.
Staff Engineer

PADjr:JST/bs

684a5-10

Attachments

APPENDIX M
WET CHEMISTRY ANALYTICAL RESULTS

SITE 44, JONES STREET DUMP
WET CHEMISTRY ANALYTICAL
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA

LOCATION	44-GW01-01	44-GW01-01D	44-GW01DW-01	44-GW02-01	44-GW03-01	44-GW04-01
DATE_SAMPLED	04/09/95	04/09/95	04/09/95	04/10/95	04/10/95	04/08/95
UNITS	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L
TOTAL DISSOLVED SOLIDS	350	360	400	62	420	330
TOTAL SUSPENDED SOLIDS	22	30	5 U	9	49	70

SITE 44, JONES STREET DUMP
WET CHEMISTRY ANALYTICAL
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA

LOCATION	44-GW05-01	44-GW06-01	44-GW06DW-01	44-TW01-01
DATE_SAMPLED	04/09/95	04/08/95	04/08/95	04/10/95
UNITS	MG/L	MG/L	MG/L	MG/L
TOTAL DISSOLVED SOLIDS	140	140	330	220
TOTAL SUSPENDED SOLIDS	5	5 U	5 U	16

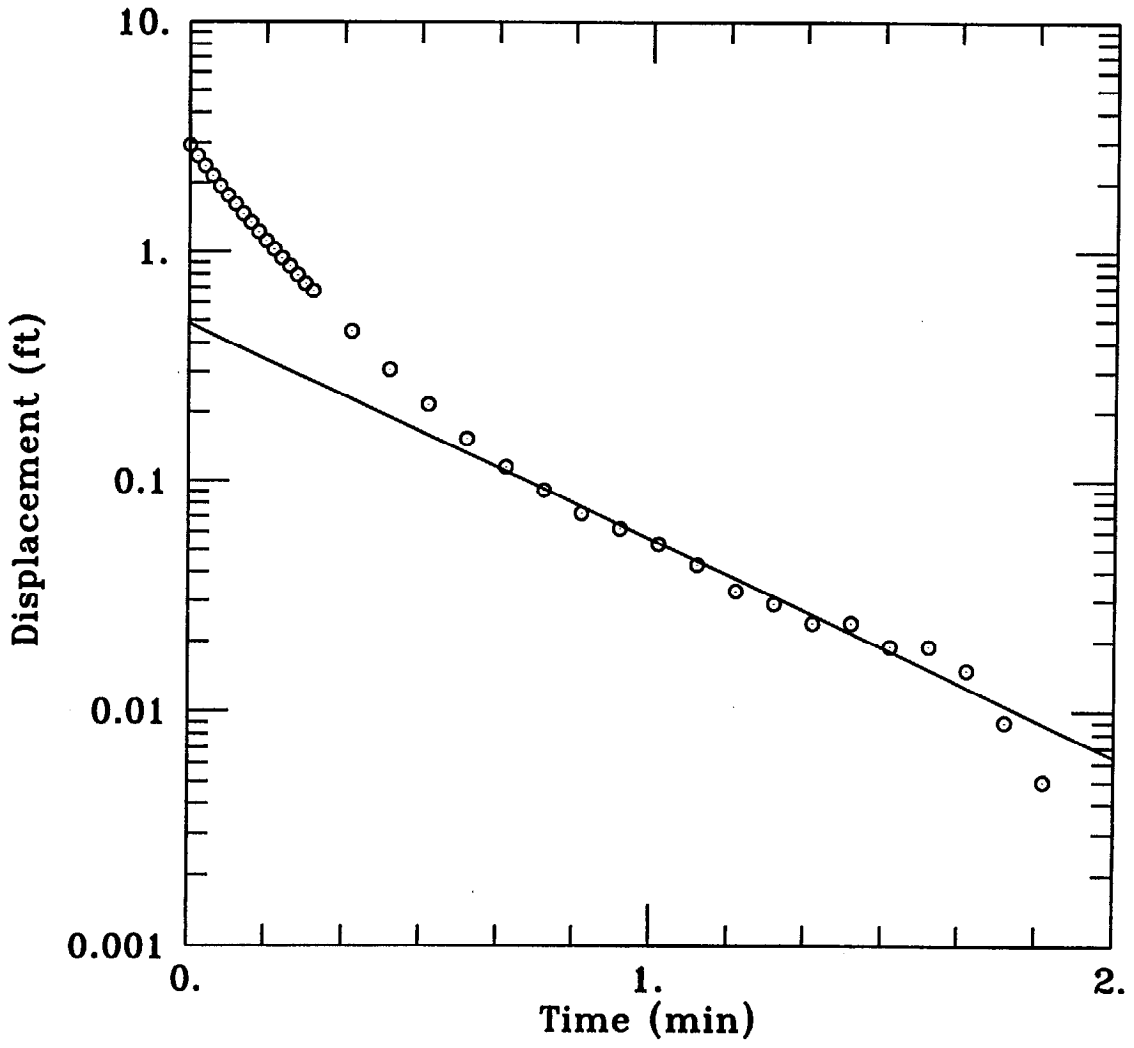
SITE 44, JONES STREET DUMP
SEDIMENT TOTAL ORGANIC CARBON RESULTS
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA

LOCATION	44-EC-SD01-06	44-EC-SD02-06	44-UT-SD01-06	44-UT-SD01-612	44-UT-SD01-612D
DATE_SAMPLED	05/04/95	05/04/95	05/04/95	05/04/95	05/04/95
DEPTH	0-6'	0-6'	0-6'	6-12'	6-12'
UNITS	%	%	%	%	%
TOTAL ORGANIC CARBON	0.13 U	0.25	11.2	16.1	13.5

APPENDIX N
AQUIFER TEST RESULTS

Client: **LANTDIV**	Company: **BAKER ENVIRONMENTAL, INC.**
Location: **SITE 44, CAMP LEJEUNE**	Project: **CTO-303**

44-GW01DW RISING HEAD TEST



DATA SET:
44GW01DR.DAT
05/30/95

AQUIFER MODEL:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

PROJECT DATA:
test date: APRIL 9, 1995

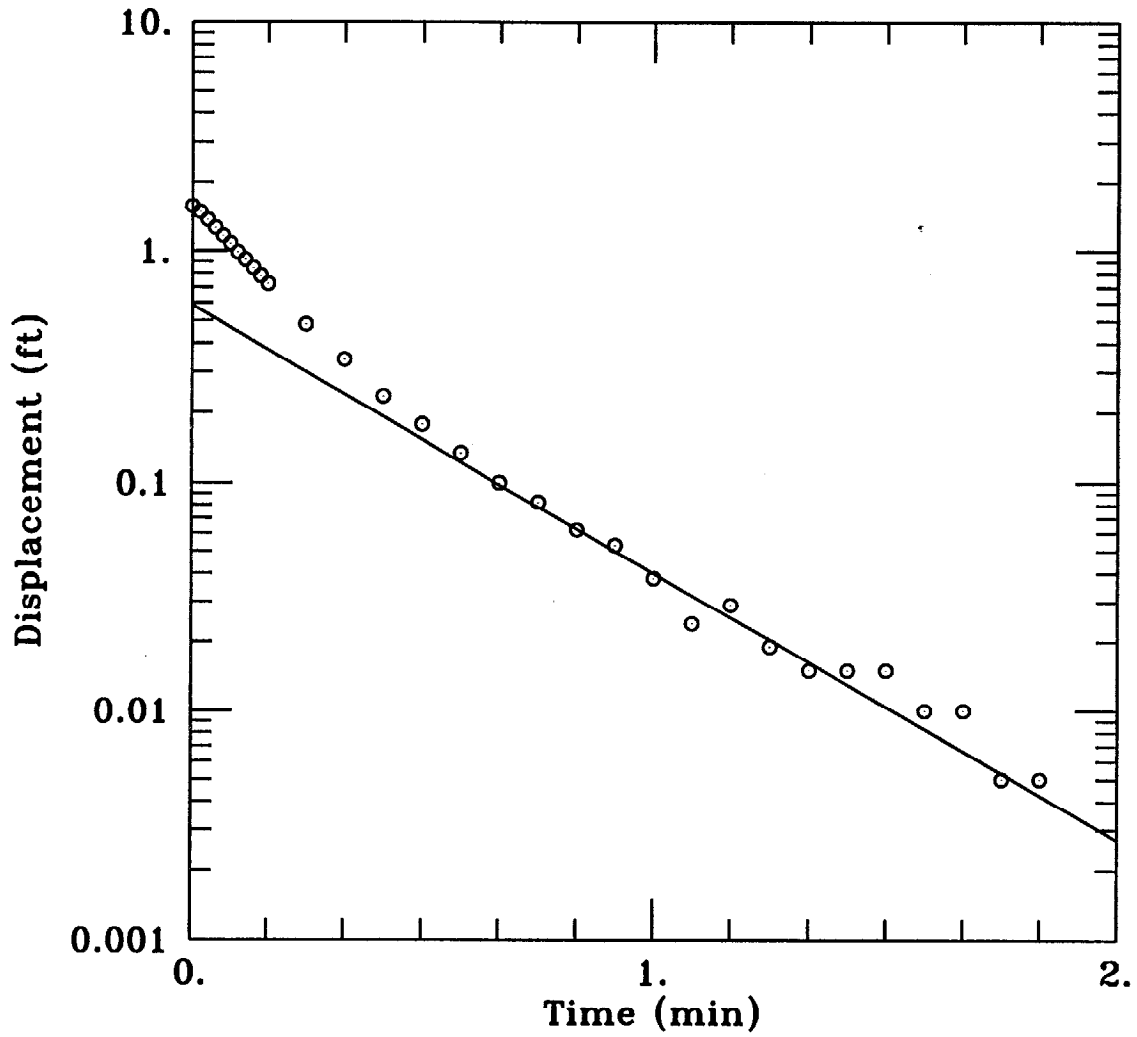
TEST DATA:
H0 = 2.913 ft
rc = 0.0833 ft
rw = 0.25 ft
L = 5. ft
b = 160. ft
H = 64.43 ft

PARAMETER ESTIMATES:
K = 18.16 ft/day
y0 = 0.4858 ft

AQTESOLV

Client: **LANTDIV**	Company: **BAKER ENVIRONMENTAL, INC.**
Location: **SITE 44, CAMP LEJEUNE**	Project: **CTO-303**

44-GW01DW FALLING HEAD TEST



DATA SET:
44GW01DF.DAT
05/30/95

AQUIFER MODEL:
Unconfined
SOLUTION METHOD:
Bouwer-Rice

PROJECT DATA:
test date: APRIL 9, 1995

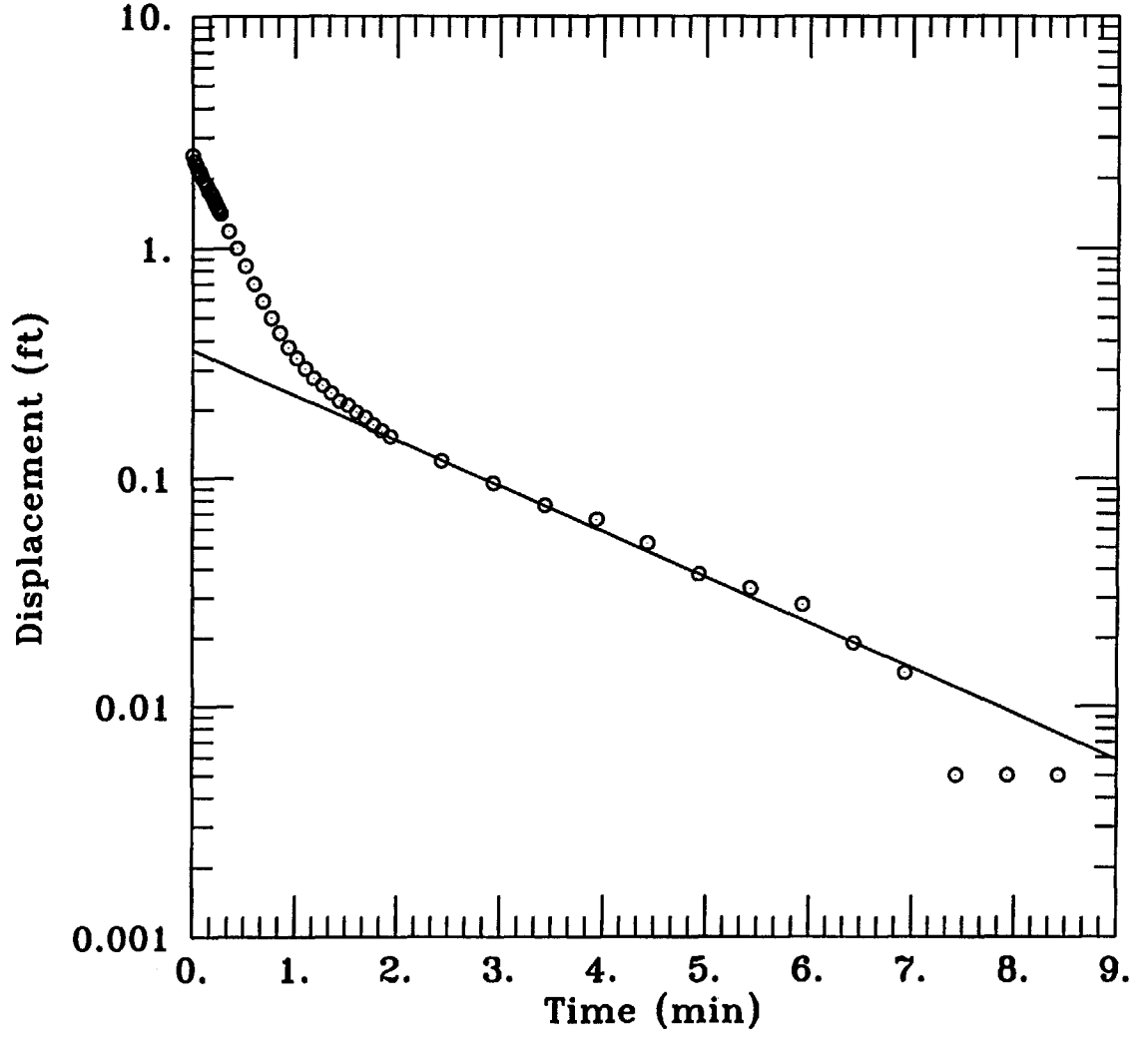
TEST DATA:
H0 = 1.572 ft
rc = 0.0833 ft
rw = 0.25 ft
L = 5. ft
b = 160. ft
H = 64.43 ft

PARAMETER ESTIMATES:
K = 22.5 ft/day
y0 = 0.585 ft

AQTESOLV

Client: **LANTDIV**	Company: **BAKER ENVIRONMENTAL, INC.**
Location: **SITE 44, CAMP LEJEUNE**	Project: **CTO-303**

44-GW04 RISING HEAD TEST



DATA SET:
44GW04R.DAT
05/30/95

AQUIFER MODEL:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

PROJECT DATA:
test date: APRIL 9, 1995

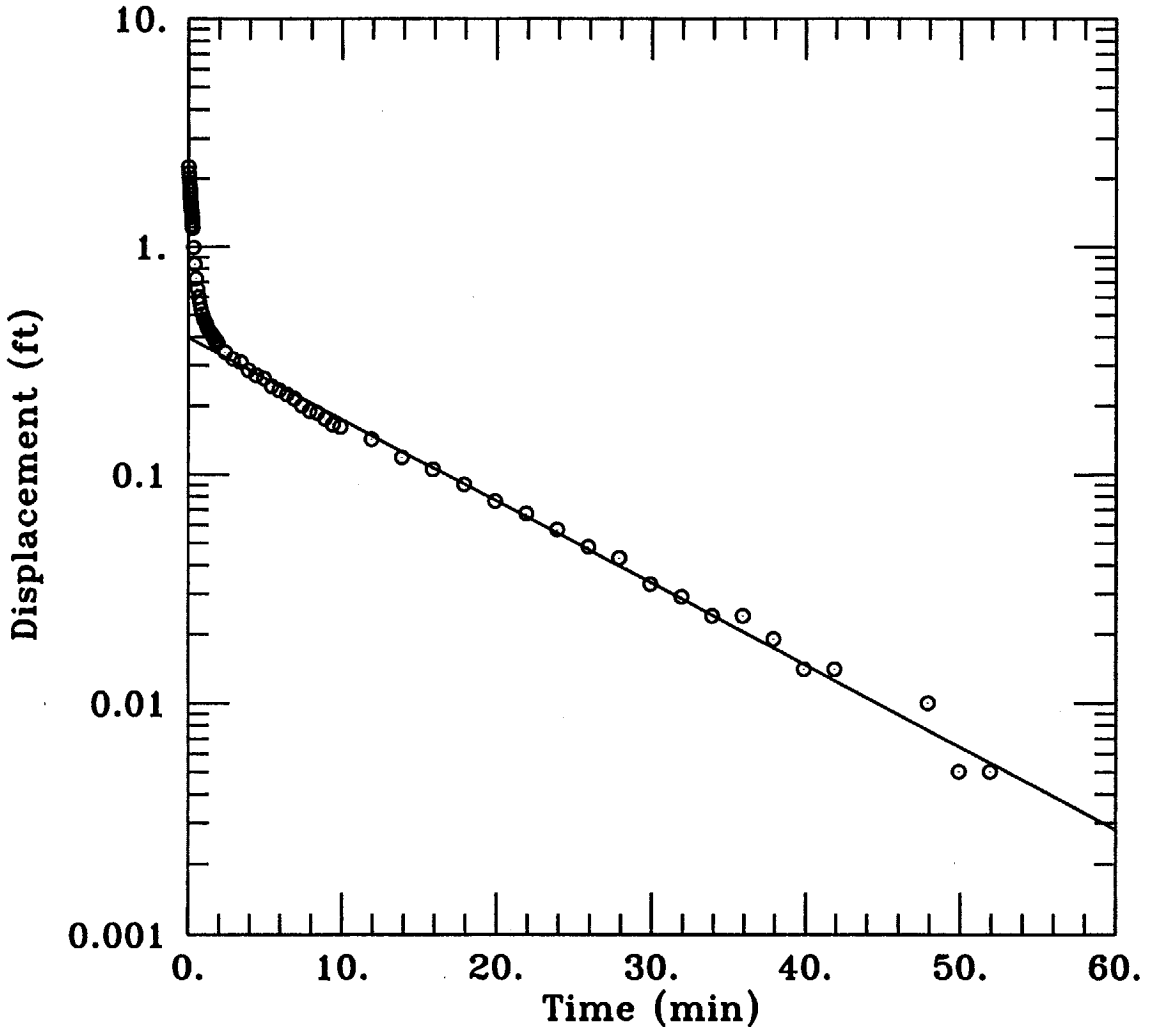
TEST DATA:
H0 = 2.513 ft
rc = 0.0833 ft
rw = 0.33 ft
L = 15. ft
b = 45. ft
H = 12.93 ft

PARAMETER ESTIMATES:
K = 2.006 ft/day
y0 = 0.3655 ft

AQTESOLV

Client: **LANTDIV**	Company: **BAKER ENVIRONMENTAL, INC.**
Location: **SITE 44, CAMP LEJEUNE**	Project: **CTO-303**

44-GW05 RISING HEAD TEST



DATA SET:
44GW05.DAT
05/30/95

AQUIFER MODEL:
Unconfined
SOLUTION METHOD:
Bouwer-Rice

PROJECT DATA:
test date: APRIL 9, 1995

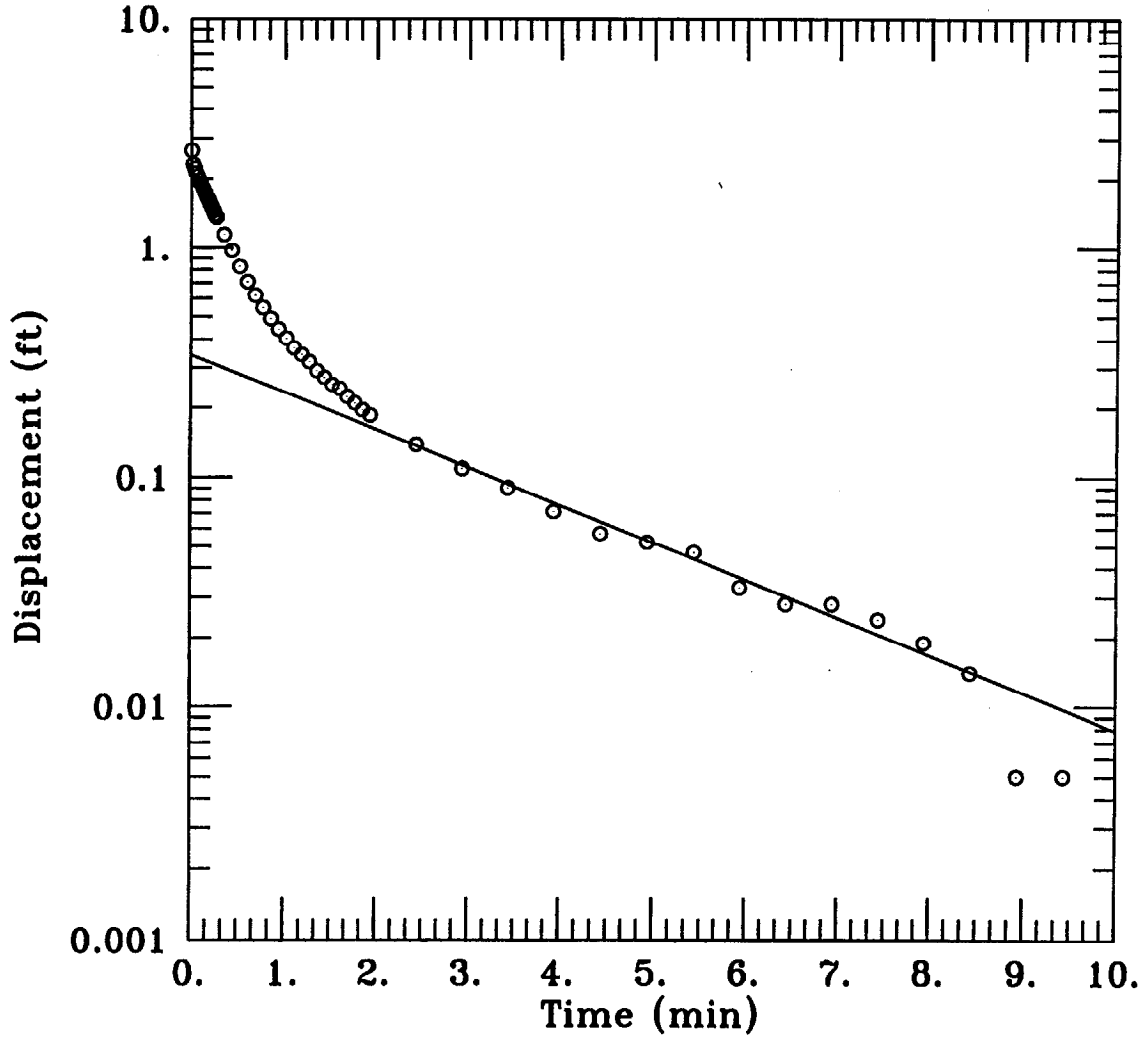
TEST DATA:
H0 = 2.243 ft
rc = 0.0833 ft
rw = 0.33 ft
L = 15. ft
b = 45. ft
H = 14.24 ft

PARAMETER ESTIMATES:
K = 0.368 ft/day
y0 = 0.397 ft

AQTESOLV

Client: **LANTDIV**	Company: **BAKER ENVIRONMENTAL, INC.**
Location: **SITE 44, CAMP LEJEUNE**	Project: **CTO-303**

44-GW06 RISING HEAD TEST



DATA SET:
44GW06R.DAT
05/30/95

AQUIFER MODEL:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

PROJECT DATA:
test date: APRIL 9, 1995

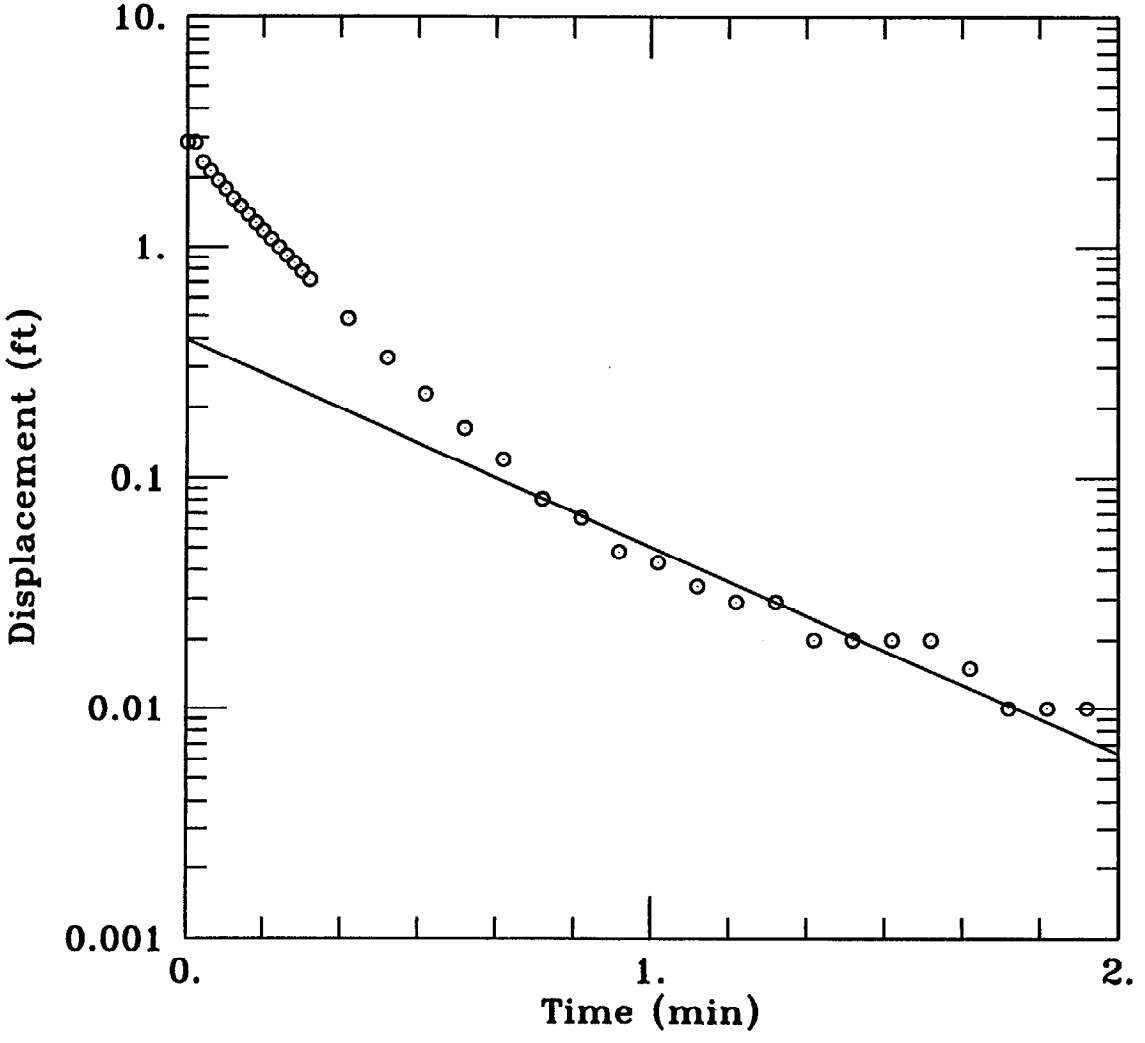
TEST DATA:
H0 = 2.642 ft
rc = 0.0833 ft
rw = 0.33 ft
L = 15. ft
b = 45. ft
H = 14.72 ft

PARAMETER ESTIMATES:
K = 1.691 ft/day
y0 = 0.3406 ft

AQTESOLV

Client: **LANTDIV**	Company: **BAKER ENVIRONMENTAL, INC.**
Location: **SITE 44, CAMP LEJEUNE**	Project: **CTO-303**

44-GW06DW RISING HEAD TEST



DATA SET:
44GW06DR.DAT
05/30/95

AQUIFER MODEL:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

PROJECT DATA:
test date: APRIL 9, 1995

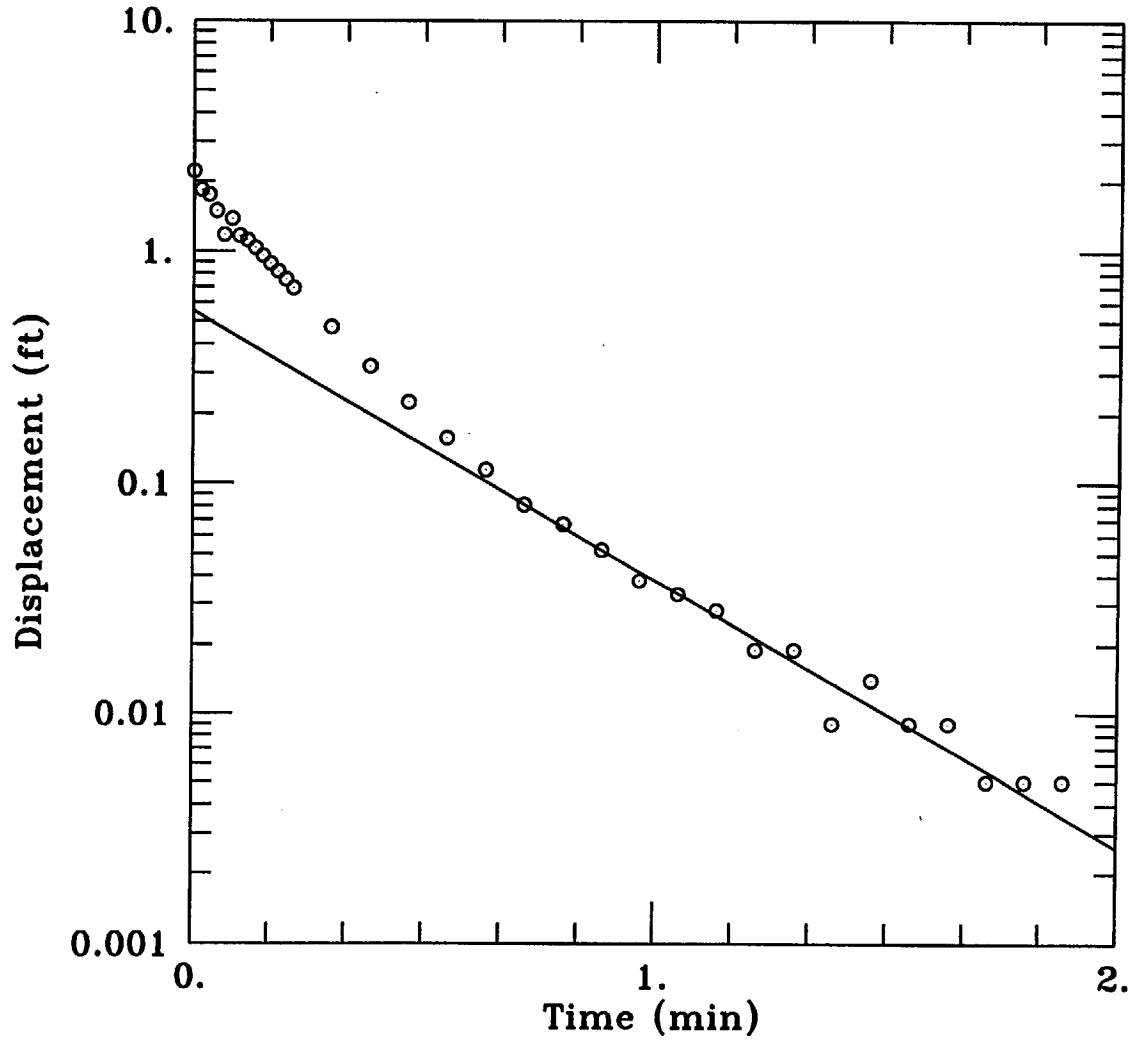
TEST DATA:
H0 = 2.855 ft
rc = 0.0833 ft
rw = 0.25 ft
L = 5. ft
b = 160. ft
H = 71.78 ft

PARAMETER ESTIMATES:
K = 17.52 ft/day
y0 = 0.396 ft

AQTESOLV

Client: **LANTDIV**	Company: **BAKER ENVIRONMENTAL, INC.**
Location: **SITE 44, CAMP LEJEUNE**	Project: **CTO-303**

44-GW06DW FALLING HEAD TEST



DATA SET:
44GW06DF.DAT
05/30/95

AQUIFER MODEL:
Unconfined
SOLUTION METHOD:
Bouwer-Rice

PROJECT DATA:
test date: APRIL 9, 1995

TEST DATA:
H0 = 2.208 ft
rc = 0.0833 ft
rw = 0.25 ft
L = 5. ft
b = 160. ft
H = 71.78 ft

PARAMETER ESTIMATES:
K = 22.73 ft/day
y0 = 0.5534 ft

AQTESOLV

APPENDIX O
AQUIFER PROPERTY CALCULATIONS

S.O. No. 62470-303

Subject: GROUNDWATER FLOW GRADIENTS
SITE 44

Sheet No. 1 of 1

Drawing No.

Computed by MKD Checked By Date JAN 10, 1996

Baker

EQUATION $i = \Delta E / D$ WHERE: ΔE = CHANGE IN GROUNDWATER ELEVATION

D = DISTANCE OVER WHICH ΔE OCCURS

SHALLOW WELLS

- EASTERN SIDE OF SITE

$\Delta E = 2.0$ ft $\quad i = 2.0$ ft / 300 ft

$D = 300$ ft $\quad \simeq 0.007$ ft/ft

- WESTER SIDE OF SITE

$\Delta E = 2.0$ ft $\quad i = 2.0$ ft / 345 ft

$D = 345$ ft $\quad \simeq 0.006$ ft/ft

DEEP WELLS

$\Delta E = 2.2$ ft $\quad i = 2.2$ ft / 1,030 ft

$D = 1{,}030$ ft $\quad \simeq 0.002$ ft/ft

S.O. No. 62470-303

Subject: GROUNDWATER FLOW VELOCITY CALCULATIONS

SITE 44 Sheet No. 1 of

Drawing No.

Computed by MKD Checked By JEZ 1/2/96 Date DEC 12, 1995

Baker

$V = Ki/n_e$

WHERE: V = VELOCITY
K = HYDRAULIC CONDUCTIVITY
i = GRADIENT
n_e = EFFECTIVE POROSITY

44-GW04

K = 2.0 ft/day
i = 0.006 ft/ft
n_e = ASSUME 30%

$V = (2.0 \text{ ft/day})(0.006 \text{ ft/ft}) / 0.30$ OK
≈ 0.04 ft/day

44-GW05

K = 0.4 ft/day
i = 0.007 ft/ft
n_e = ASSUME 30%

$V = (0.4 \text{ ft/day})(0.007 \text{ ft/ft}) / 0.30$ OK
≈ 0.01 ft/day

44-GW06

K = 1.7 ft/day
i = 0.006 ft/ft
n_e = ASSUME 30%

$V = (1.7 \text{ ft/day})(0.006 \text{ ft/ft}) / 0.30$ OK
≈ 0.03 ft/day

44-GW01DW

K = 18.1 ft/day
i = 0.002 ft/ft
n_e = ASSUME 30%

$V = (18.1 \text{ ft/day})(0.002 \text{ ft/ft}) / 0.30$ OK
≈ 0.12 ft/day

44-GW06DW

K = 17.5 ft/day
i = 0.002 ft/ft
n_e = ASSUME 30%

$V = (17.5 \text{ ft/day})(0.002 \text{ ft/ft}) / 0.30$ OK
≈ 0.12 ft/day

APPENDIX P
BASE BACKGROUND ANALYTICAL RESULTS AND EVALUATION REPORT

This appendix provides background concentration values for inorganic elements in the following media: surface and subsurface soils, groundwater, surface water, and sediment. These background samples were collected in areas not known to have been impacted by site operations and have been collected during Baker Remedial Investigations since 1993. The following information regarding base background samples is provided in the back of each media section:

- minimum concentration per inorganic analyte
- maximum concentration per inorganic analyte
- average concentration per inorganic analyte
- twice the average concentration per inorganic analyte (soils only).

The minimum and maximum concentrations are used for comparison bases only. Whereas twice the average concentration is used to compare the inorganic analytical results from on-site soil samples to what is considered to be naturally occurring by USEPA Region IV.

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 millograms 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 millograms 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 millograms 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 millograms 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 millograms per kilogram (mg/kg).
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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	36-BB-SB01-00	36-BB-SB02-00	36-BB-SB03-00	43-BB-SB01-00	43-BB-SB02-00
Aluminum	7180.0	3770.0	5800.0	6950	2300	2380	3520	2510
Antimony	6.05	5.50	5.60	1.15	1.2	1.75	2.35	2.3
Arsenic	1.200	1.100	3.900	0.42	0.205	0.17	0.51	0.55
Barium	12.0	10.2	9.7	13.2	12.4	14	6.3	10.8
Beryllium	0.26	0.11	0.11	0.03	0.035	0.075	0.105	0.1
Cadmium	0.600	0.550	0.550	0.31	0.3	0.235	0.335	0.31
Calcium	397.0	69.5	615.0	462	897	1690	1180	908
Chromium	8.4	3.8	10.6	7.9	2.7	3.1	2.8	2.8
Cobalt	1.20	1.10	1.10	0.245	0.255	0.255	0.345	0.335
Copper	1.20	1.10	2.30	2.8	2.8	4.9	0.7	11.2
Iron	3050.0	2170.0	7510.0	6670	1750	1560	1050	2050
Lead	7.10	6.40	8.70	10.3	17.5	39.6	6.6	13.6
Magnesium	104.0	50.5	79.5	185	105	86	68.9	56.4
Manganese	3.25	3.1	1.8	6.9	14.3	21.4	3	5
Mercury	0.060	0.060	0.060	0.045	0.05	0.045	0.13	0.12
Nickel	2.40	2.20	2.25	0.45	1.6	0.9	1.25	1.2
Potassium	121.0	110.0	111.5	138	60.2	58	78.5	76
Selenium	0.600	0.550	1.300	0.12	0.16	0.135	0.195	0.17
Silver	0.60	0.55	0.55	0.265	0.275	0.255	0.345	0.335
Sodium	15.80	15.25	17.30	13.1	14.1	14.05	14.45	9.9
Thallium	1.200	1.100	1.100	0.055	0.075	0.1	0.12	0.105
Vanadium	9.70	5.40	18.20	15.4	8.3	6.4	1.6	3.7
Zinc	5.3	2.9	3.8	6	12.7	20.8	2.6	16.7
Cyanide								

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BASE BACKGROUND
SURFACE SOILS
TAL INORGANICS
MCB CAMP LEJEUNE, NORTH CAROLINA

	43-BB-SB03-00	44-BB-SB01-00	54-BB-SB01-00	54-BB-SB02-00	86-BB-SB01-00	MIN	MAX	AVG	2Xaverage
Aluminum	2730	4950	8990	4950	6590	17.7	9570	2970.297	5940.594
Antimony	2.2	1.2	1.25	1.3	1.95	0.33	8	2.672	5.344
Arsenic	0.67	1.3	1.1	1.2	0.45	0.065	3.9	0.652	1.305
Barium	13	14.9	18.7	13.3	13.9	0.65	20.8	8.680	17.360
Beryllium	0.095	0.08	0.0345	0.0375	0.085	0.02	0.26	0.103	0.205
Cadmium	0.3	0.325	0.335	0.34	0.265	0.04	1	0.344	0.688
Calcium	1610	668	1020	3590	3960	4.25	10700	698.394	1396.788
Chromium	2.9	5.9	9.2	6.8	6.5	0.33	12.5	3.346	6.693
Cobalt	0.32	0.43	0.375	0.41	0.285	0.185	2.355	0.961	1.923
Copper	0.75	2.5	2.1	4.2	2.2	0.5	87.2	3.600	7.200
Iron	1110	3220	4700	2780	4030	69.7	9640	1877.531	3755.063
Lead	13.8	19.6	3.95	12.3	21.5	0.47	142	11.875	23.749
Magnesium	60.5	189	371	259	233	2.55	610	102.875	205.751
Manganese	6.5	6.7	14.8	19.9	11.5	0.87	66	9.248	18.497
Mercury	0.05	0.06	0.041	0.04	0.04	0.01	0.13	0.047	0.094
Nickel	1.15	1.7	1.3	1.6	7.2	0.45	7.2	1.717	3.434
Potassium	73.5	220	223	175	160	1	416	99.805	199.610
Selenium	0.185	0.34	0.145	0.13	0.43	0.075	1.3	0.373	0.746
Silver	0.32	0.28	0.285	0.295	0.285	0.0435	4.3	0.438	0.875
Sodium	12.7	12.75	8.3	9.55	18.3	4.7	126	29.649	59.298
Thallium	0.11	0.065	0.065	0.06	0.13	0.055	1.2	0.450	0.899
Vanadium	4	11.8	13.4	9.1	48.6	0.305	48.6	5.814	11.628
Zinc	4.5	7.4	7.2	9.1	18.4	0.3	28.3	6.940	13.880
Cyanide						0.265	2.4	1.453	2.905

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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	6180	5980	4160
Antimony	4.7	4.85	1.4	1.25	0.355	1.6	4.2	3.25	2.95	6.9
Arsenic	0.31	0.315	0.033	0.305	0.24	0.47	1.1	0.29	0.26	0.285
Barium	2	2.05	7.6	6.5	10.9	6.6	7.5	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	10.5	5.5	5.3	7.1
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	6.6	0.6	0.5	2.1
Iron	257	126	456	833	822	2840	4940	1510	1210	567
Lead	1.2	1.6	11.5	2.7	6.1	4.3	5.1	3.8	3.1	3.3
Magnesium	13.1	12.7	133	86.8	188	260	222	189	217	131
Manganese	0.475	0.395	7.5	2.6	2.4	5.2	4.1	4.9	5.4	2.0
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	191	268	98
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	21.6	9.2	9.6
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

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	5170	2830	5730	2970	17.1	25.7	42.6	777	16.9
Antimony	3.2	3.55	3.55	3.75	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	8.3	7.3	3.4	4.7	3.9	0.7	0.8	0.8	0.7	0.8
Cobalt	0.375	0.42	0.42	0.93	0.45	0.37	0.42	0.43	0.40	0.46
Copper	1.6	0.65	0.65	0.65	0.7	0.6	0.7	0.7	0.6	0.7
Iron	959	2090	749	2780	908	95.9	155	63.3	514	74.5
Lead	4.0	4.1	2.3	7.4	0.7	0.47	1.9	0.91	3.2	0.59
Magnesium	262	153	66	157	24.7	7.5	2.9	2.9	30.2	3.1
Manganese	4.5	3.2	1.5	5.3	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	0.8	0.7	0.8	2.2	1.7	0.8
Potassium	308	122	91.3	136	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	10.9	33.8	28.6	20.3	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	6.4	2.8	8.5	6.2	0.73	1.0	0.84	1.6	0.34
Zinc	2.700	1.9	1.0	4.2	0.35	0.32	0.39	1.2	1.7	1.3

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	888	2330	11000	2520	5950	9600	9500	1060	1400
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	1.1	7	0.42	0.71	1.40	0.75	0.20	1.05
Copper	0.550	1	1.1	9.5	0.670	1.6	4.4	2.2	0.630	1.05
Iron	442	1220	1870	90500	795	2920	12800	3350	557	571
Lead	8.1	2.4	3.8	21.4	2.9	5	11.7	7.8	5.4	3
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	2.250	0.600	0.455	1.4	0.6	2.2	0.450	2.050
Potassium	145	100.5	228	1250	161	297	1020	458	130	103
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	3.0	3.9	4.9	69.4	2.3	10.8	18.4	13.5	2.4	2.3
Zinc	2.6	8.7	4.9	26.6	2.0	3.5	8.1	4.8	1.7	3.1

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	36-BB-SB01-02	36-BB-SB02-02	36-BB-SB03-03	43-BB-SB01-02	43-BB-SB02-01
Aluminum	1700	581	1940	888	2330	4480	8700	3810	4320	959
Antimony	5.150	5.750	5.8	5	5.6	1.15	1.2	1.9	2.3	1.75
Arsenic	1.05	1.15	1.15	1	1.1	0.155	0.69	0.185	0.44	0.115
Barium	22.6	10.8	3.7	0.8	3.8	13.9	13.7	5.5	8.9	2.2
Beryllium	0.105	0.115	0.115	0.1	0.11	0.032	0.035	0.08	0.1	0.075
Cadmium	0.50	0.550	0.6	0.5	0.55	0.31	0.315	0.255	0.31	0.235
Calcium	41.55	32.15	135	74.2	290	116	225	48.2	76.9	77.6
Chromium	6.2	3.9	4.7	2.4	4.2	4.2	13.5	3.7	5.5	1.2
Cobalt	1.05	1.15	1.15	1	1.1	0.245	0.25	0.275	0.335	0.255
Copper	1.05	1.15	1.15	1	1.1	0.43	0.98	0.175	0.21	0.16
Iron	709	1620	1150	1220	1870	2690	4080	976	2370	414
Lead	1.8	1.1	2.9	2.4	3.8	5.4	6.6	4	6.1	1.6
Magnesium	44.1	12.25	104	35.7	115	78.6	292	110	121	17.9
Manganese	2.65	2.1	5	2.7	2.4	2.5	6.7	3.6	3	1.3
Mercury	0.050	0.060	0.06	0.055	0.06	0.06	0.06	0.045	0.045	0.05
Nickel	2.050	2.300	2.3	2	2.25	1	9.1	1	1.2	0.9
Potassium	102.5	114.5	116	100.5	228	91.3	222	62.5	76	57.5
Selenium	0.50	0.55	0.6	0.5	0.55	0.12	0.175	0.145	0.185	0.155
Silver	0.50	0.55	0.6	0.5	0.55	0.27	0.27	0.275	0.335	0.255
Sodium	13.6	15.65	29.8	10.3	28.2	11.3	25.6	6.1	36.65	4.2
Thallium	1.05	1.15	1.15	1	1.1	0.055	0.085	0.105	0.11	0.095
Vanadium	3.1	2.5	4	3.9	4.9	8.2	17	2.05	5.9	0.9
Zinc	2.1	3.15	15	4.35	2.45	0.82	2.6	0.89	2.3	0.76

BASE BACKGROUND
SUBSURFACE SOIL
TAL INORGANICS
MCB CAMP LEJEUNE, NORTH CAROLINA

	43-BB-SB03-02	44-BB-SB01-03	54-BB-SB01-04	54-BB-SB02-04	86-BB-SB01-02	MIN	MAX	AVG	2Xaverage
Aluminum	2260	10300	1100	1040	2460	16.900	11000.000	3687.651	7375.302
Antimony	2.25	1.15	1.25	1.25	2	0.355	6.900	3.205	6.409
Arsenic	0.31	1.2	0.16	0.195	0.22	0.033	15.400	0.984	1.968
Barium	9.1	12.5	1.15	1.05	4.4	0.650	22.600	7.102	14.204
Beryllium	0.1	0.065	0.06	0.0345	0.09	0.010	0.310	0.095	0.191
Cadmium	0.305	0.305	0.325	0.335	0.275	0.155	1.200	0.356	0.712
Calcium	295	20.9	24.6	14.7	50.8	4.750	4410.000	195.754	391.509
Chromium	2	11	1.15	1	3.1	0.650	66.400	6.281	12.562
Cobalt	0.33	0.495	0.26	0.305	0.29	0.175	7.000	0.752	1.504
Copper	0.265	0.86	0.45	0.46	0.185	0.160	9.500	1.208	2.416
Iron	507	4720	392	319	3160	63.300	90500.000	3626.038	7252.076
Lead	2.8	4.15	0.8	1.75	2.4	0.465	21.400	4.164	8.327
Magnesium	49.3	302	16.4	17.35	71.3	2.850	852.000	130.359	260.718
Manganese	2.5	3.9	0.5	0.6	1.8	0.395	19.900	3.959	7.919
Mercury	0.055	0.0425	0.11	0.05	0.055	0.010	0.680	0.065	0.130
Nickel	1.2	0.92	9.2	7.7	1.05	0.450	9.200	1.857	3.714
Potassium	75	207	29.9	14.45	66.5	1.050	1250.000	173.618	347.236
Selenium	0.17	0.155	0.145	0.17	0.175	0.085	2.400	0.401	0.801
Silver	0.33	0.26	0.28	0.29	0.29	0.175	1.000	0.433	0.866
Sodium	8.75	86.4	4.4	2.2	6.8	2.200	141.000	26.338	52.676
Thallium	0.105	0.07	0.065	0.08	0.13	0.055	2.700	0.477	0.955
Vanadium	1.7	17.1	0.85	0.8	1.85	0.340	69.400	6.727	13.454
Zinc	1.6	2.5	0.92	1.3	0.37	0.320	26.600	3.331	6.662

GROUNDWATER

DRAFT

EVALUATION OF METALS IN GROUNDWATER

MARINE CORPS BASE, CAMP LEJEUNE, NORTH CAROLINA

CONTRACT TASK ORDER 0177

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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 (83µ/l), lead (27.2µ/l) and manganese (747µ/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	55.2 - 999	220 - 745	315 - 3180
Beryllium	NE	4	2.7 J - 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	61301 - 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	59 - 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 - 759
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 - 115000	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	5670 - 36500	5800 - 33000	ND - 9390	ND - 7630
Vanadium	3.4 - 12.8	7.9 - 163	59.8 - 433	17.3 - 210	ND - 1700	ND - 256	ND - 45	70 - 739	ND - 64.7
Zinc	ND - 30.3	58.5J - 11103	148J - 406J	36.2 - 12100	61 - 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	2GW01		2GW03		2GW06		2GW08		2GW09	
Date	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	78GW05		78GW08		78GW15		78GW16		78GW19	
Date	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 - 59	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 UPGRADIENT WELLS
SHALLOW MONITORING WELLS
MCB, CAMP LEJEUNE, NORTH CAROLINA

Well Number	NCWQS	FEDERAL MCL	Upgradient of Site 1	Upgradient of Site 2	Upgradient of Site 6	Upgradient of Site 7	Upgradient of Site 9	Upgradient of Sites 21 and 78	Upgradient of Site 24	Upgradient of Site 28	Upgradient of Site 30	Upgradient of Site 41	Upgradient of Site 43	Upgradient of Site 44
			1GW06	2GW09	6BP6S	7GW03	9GW4S	78GW26	24GW07	28GW04		41GW05		
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L		ug/L		
Arsenic	50	50	17.8 J	12.9	ND	ND	ND	ND	3.7 J	7.4 J	No Upgradient Well Sites	13.1	No Upgradient Well Sites	No Upgradient Well Sites
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	85.3		38.1		
Zinc	2100	5000 (1)	ND	103	56.6	86.4 J	ND	68.1	41	ND		173		

Well Number	Upgradient of Site 48	Upgradient of Site 63	Upgradient of Site 65	Upgradient of Site 69	Upgradient of Site 78	Upgradient of Site 82	Upgradient of ABC Cleaners	Upgradient of Offsite Property #1	Upgradient of Offsite Property #2
	48GW1			69GW07	9GW04	6MW3S	MW-S01		
Units	ug/L			ug/L	ug/L	ug/L	ug/L		
Arsenic	ND	No Upgradient Well Sites	No Upgradient Well Sites	2.9	ND	ND	ND	No Upgradient Well Sites	No Upgradient Well Sites
Barium	29.4 J			46.5	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		

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

	Camp Lejeune Background Subsurface Soil Data	Site 1		Site 2		Site 6		Site 7		Site 9		Site 21	
		"Clean"	"Contaminated"	"Clean"	"Contaminated"	"Clean"	"Contaminated"	"Clean"	"Contaminated"	"Clean"	"Contaminated"	"Clean"	"Contaminated"
Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Well Number		--	--	2GW07	2GW09	6GW18	6GW15	7GW03	7GW02	9GW5	9GW1	21GW03	21GW02
Soil Sample Number		--	--	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	3.6	5.2	6	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	12	2.5	34.4	1.6	[illegible]	7.1	6.9 J
Manganese	0.40 - 8	NA	NA	4.3 J	4.1	ND	1.8 B	3	11.5	ND	3.7 J	9.5	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 - 5.0	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

	Site 24		Site 28		Site 30		Site 41		Site 43		Site 44	
	"Clean"	"Contaminated"	"Clean"	"Contaminated"	"Clean"	"Contaminated"	"Clean"	"Contaminated"	"Clean"	"Contaminated"	"Clean"	"Contaminated"
Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Well Number	24GW10	24GW02	--	--	--	--	41GW04	41-GW11	43GW01	43GW02	44GW02	44GW01
Soil Sample Number	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 J	NA	NA	NA	NA	3.6	11.2	8.3	6.7	3.6 J	10 J
Copper	ND	ND	NA	NA	NA	NA	3.7	22.3	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	3.9	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	7.1	3.1	5.4
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.
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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

	Site 48		Site 63		Site 65		Site 69		Site 78		Site 82	
Units	"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
Well Number	48-GW01	48-GW03	63MW03	63MW02	65MW03	65MW01	69-GW11	69-GW03	78GW34	78GW24-1	6-GW28	82MW3
Soil Sample Number	*48-GW1A-01*	*48-CD-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	13	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	0.9	10.7	6.8	10	18.5	9.2	2.6	21
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	10	3.2	4.3	4.1	4.5 J	2.6 J	2.7	4.5
Manganese	411	7	4.9	18.9	3.5	6.9	4	12	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	10	7.9	ND	ND	ND

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

	ABC Cleaners		Offsite Property #1		Offsite Property #2	
Units	"Clean" mg/kg	"Contaminated" mg/kg	"Clean" mg/kg	"Contaminated" mg/kg	"Clean" mg/kg	"Contaminated" mg/kg
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 28	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	No Deep Wells	ND	ND	No Deep Wells	ND	No Deep Wells	No Deep Wells	No Deep Wells	No Deep Wells	2.2 - 9.6	No Deep Wells	No Deep Wells	No Deep Wells	No Deep Wells	No Deep Wells	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		ND	ND		ND					4.2 - 4.7						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.

Appendix A
Data Summary Tables for Sites 2 and 78

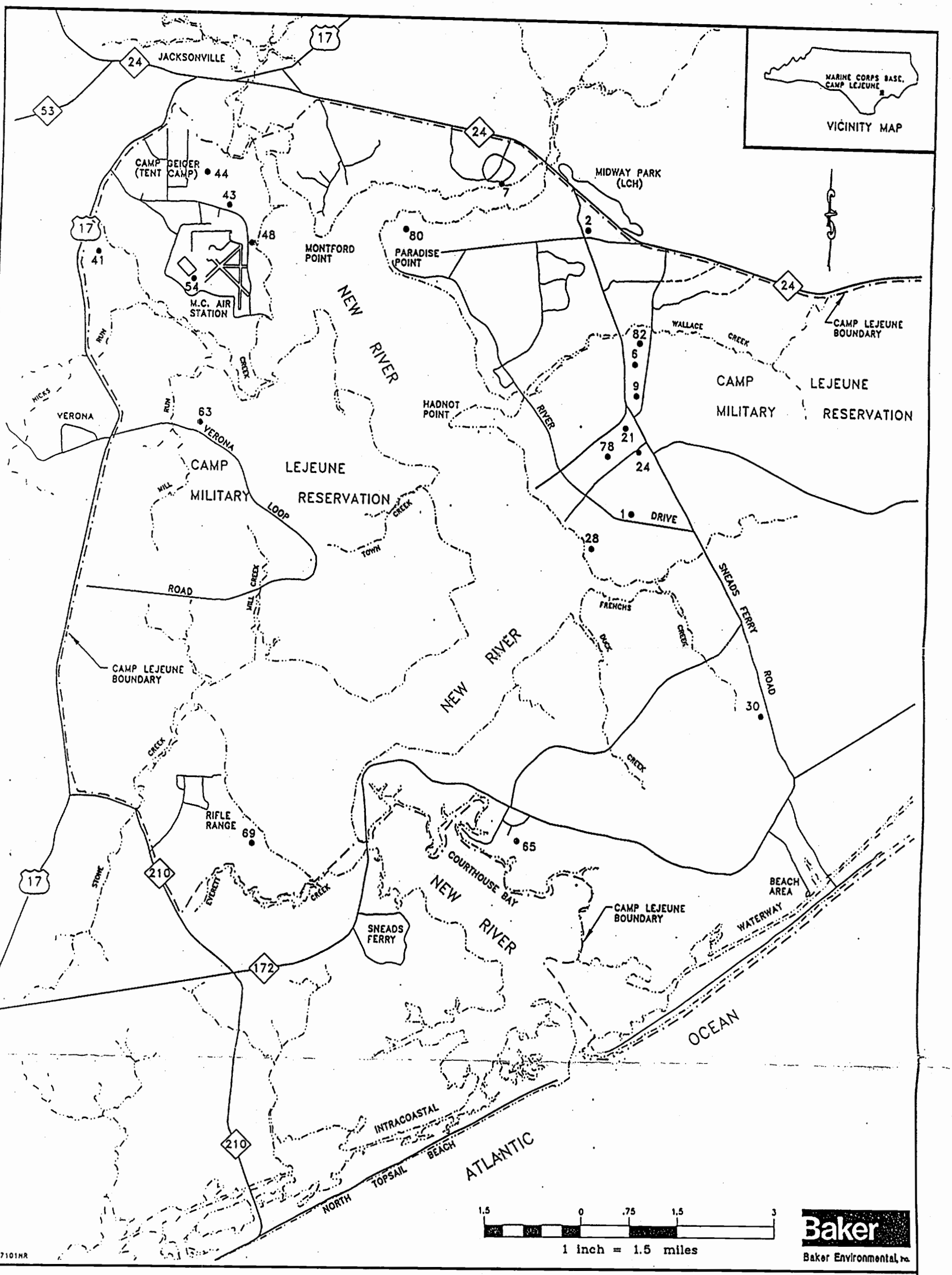


FIGURE 1
SITE LOCATION MAP
INORGANIC GROUNDWATER STUDY

MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA

01716YB1Z

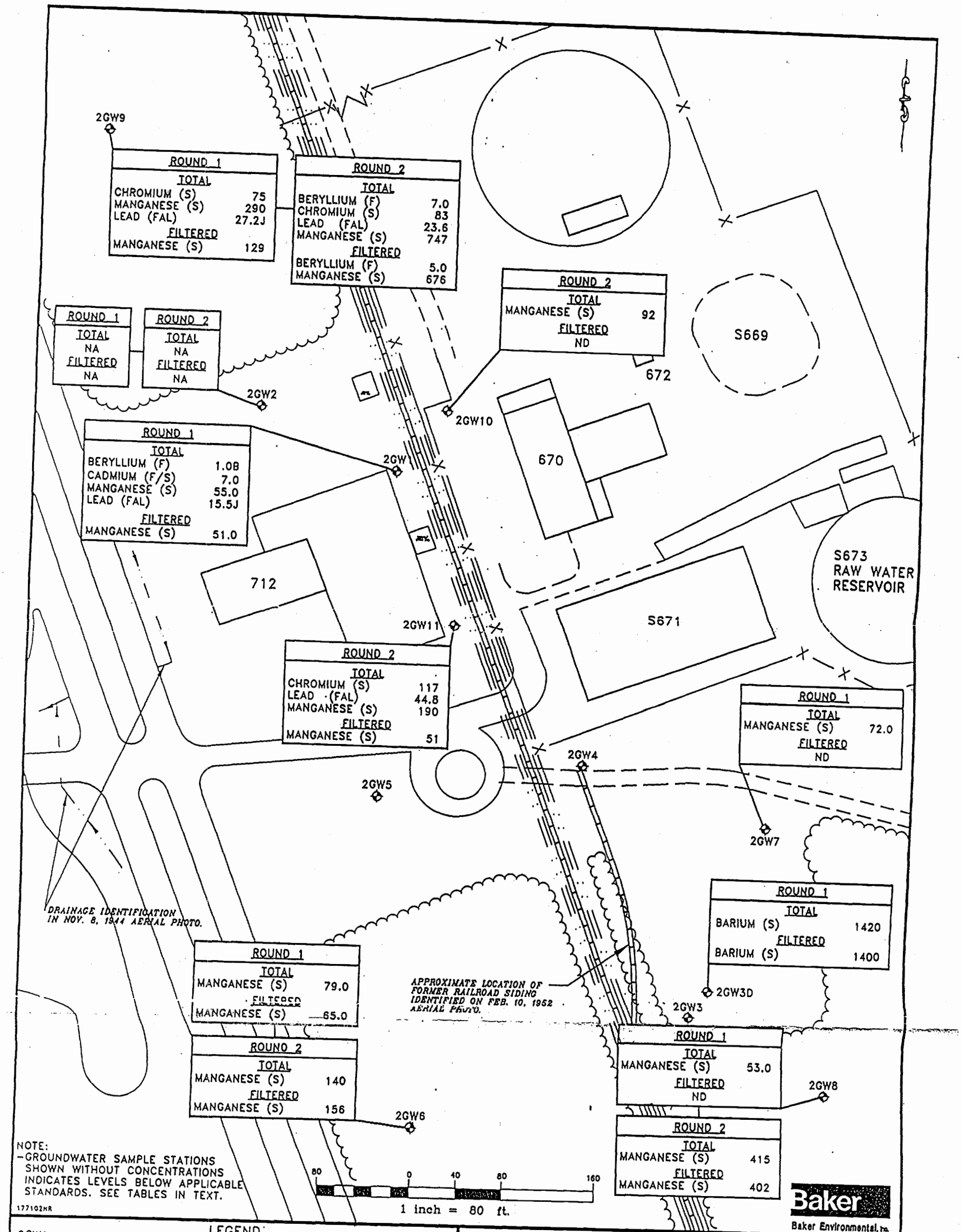
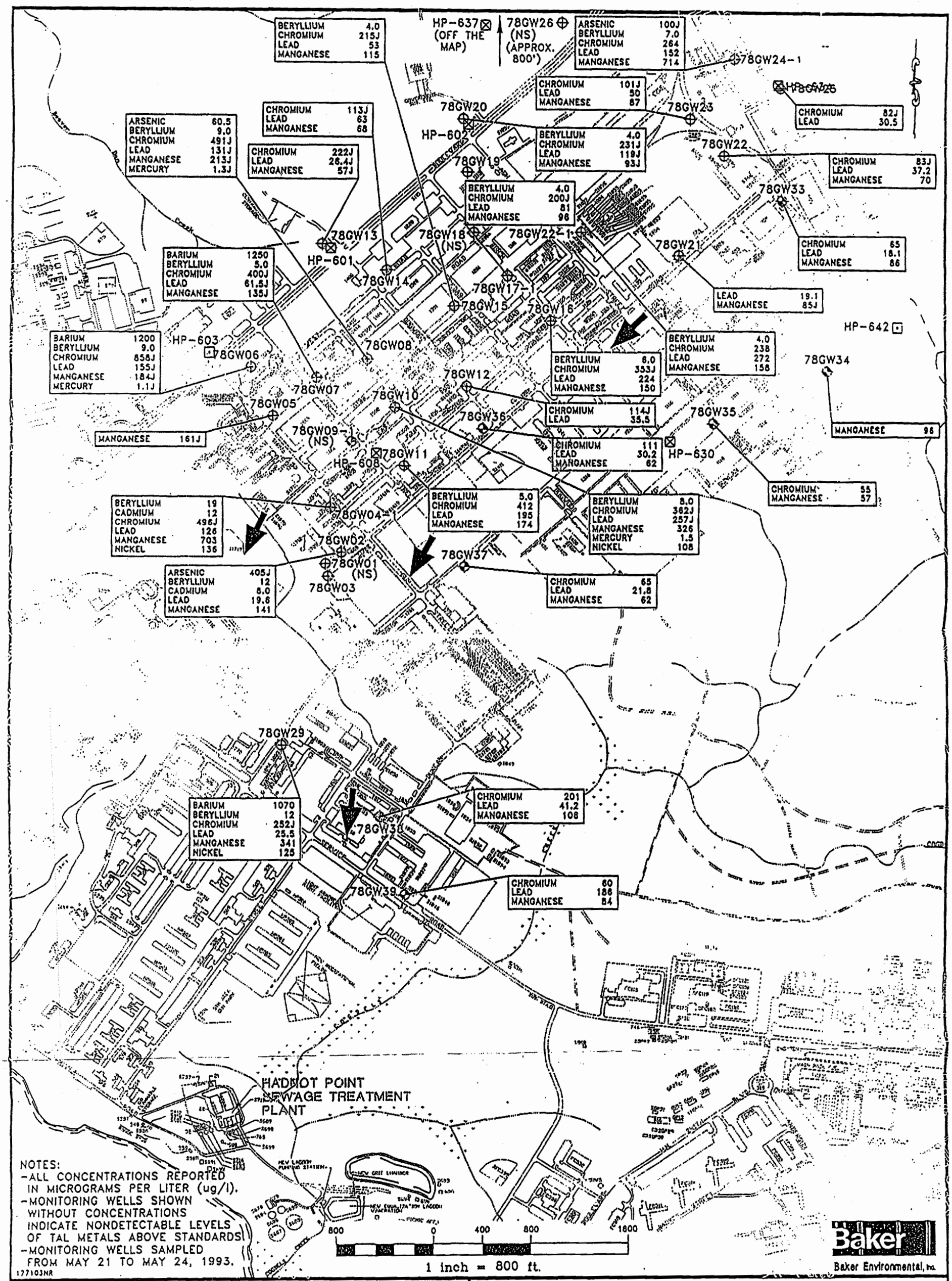


FIGURE 2
POSITIVE DETECTIONS ABOVE APPLICABLE FEDERAL AND STATE STANDARDS FOR TOTAL AND FILTERED INORGANIC ANALYTES IN GROUNDWATER
SITE 2
REMEDIAL INVESTIGATION CTO-0174
MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA

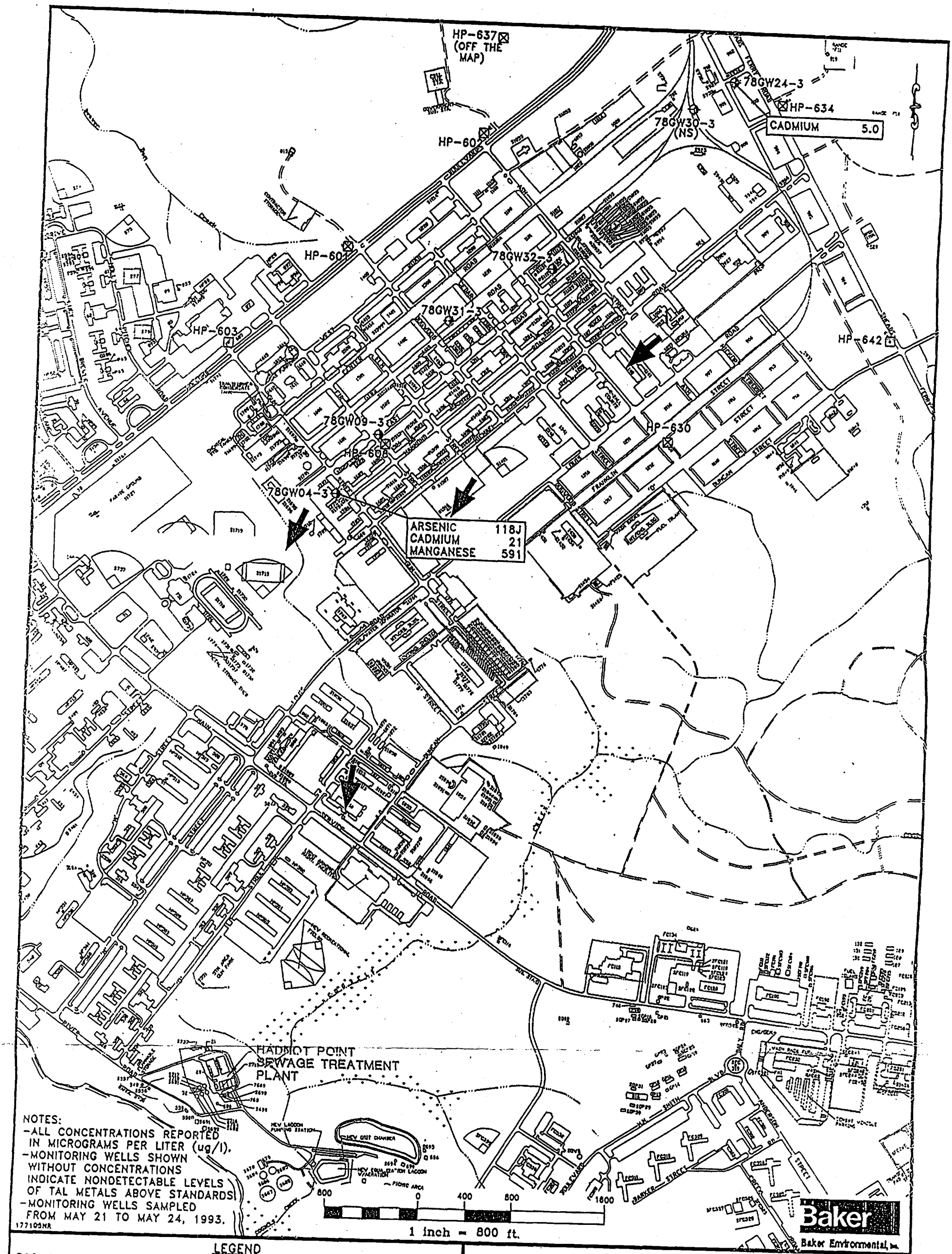


LEGEND

- 78GW02 — EXISTING SHALLOW MONITORING WELL INSTALLED BY ESE, 1984-1991
- 78GW33 — SHALLOW MONITORING WELL INSTALLED BY BAKER ENVIRONMENTAL, INC., 1993
- → 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 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



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

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-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	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.	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

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-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

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-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-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

OPERABL .IT 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 J		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 U 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

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						

SURFACE WATER

BASE BACKGROUND
SURFACE WATER
MCB, CAMP LEJEUNE, NORTH CAROLINA
TAL INORGANICS

Sample ID:	6-BH01-SW-06B	6-BH01-SW-06M	6-BH02-SW-06M	6-WC01-SW-06B	6-WC01-SW-06M	6-WC02-SW-06B	6-WC03-SW-06B
ALUMINUM	1210	1230	868	1350	1220	633	747
ANTIMONY	17.2 UJ	14 U	14 U	14 U	14 U	16.2 UJ	49 U
ARSENIC	3 U	3 U	3 UJ	3 UJ	3 UJ	2 U	2 U
BARIUM	13.4 JB	14 JB	25.1 JB	16 JB	16.2 JB	19.3 B	21 U
BERYLLIUM	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	1 U
CADMIUM	1.9 UJ	2.6 UJ	1.9 U	1.9 U	1.9 U	1.9 U	3 U
CALCIUM	612 B	600 B	16100	3640 B	3670 B	9990	9360
CHROMIUM	3.6 U	3.6 U	7 U	3.6 UJ	3.6 UJ	3.6 U	5 U
COBALT	2 U	2 U	3 UJ	2 U	2 U	2 U	6 U
COPPER	3.2 UJ	3 UJ	7 UJ	1.9 U	1.9 U	1.9 U	4 U
CYANIDE	10 U	10 U	10 U	10 U	10 U	10 UJ	10 U
IRON	958	818	921	1050	941	844	849
LEAD	1 U	1 U	3 U	2.3 JB	1.9 JB	1.2 B	5
MAGNESIUM	588 B	612 B	1010 B	632 B	639 B	1110 B	916 B
MANGANESE	6.5 B	6.2 B	14 JB	9 UJ	8.9 UJ	8.8 B	9.8 JB
MERCURY	0.04 U	0.05 U	0.04 U	0.04 U	0.04 U	0.07 U	0.2 U
NICKEL	7.9 UJ	7.9 UJ	7.9 U	7.9 UJ	7.9 UJ	7.9 U	17 U
POTASSIUM	117 UJ	146 UJ	685 B	376 B	341 B	604 B	610 B
SELENIUM	5 U	5 U	5 U	5 UJ	5 UJ	5 U	5 U
SILVER	2 UJ	2 UJ	4 UJ	2 UJ	2 UJ	3.8 UJ	10 U
SODIUM	4680 B	4850 B	5250	3930 B	3980 B	7790	6240
THALLIUM	2 UJ	2 UJ	2 UJ	2 U	2 UJ	2 UJ	2 UJ
VANADIUM	1.8 UJ	1.8 UJ	2 JB	3.3 JB	1.9 JB	2.1 JB	5 U
ZINC	4.5 U	4.9 U	13.1 U	8.7 U	7.6 U	7.5 U	7.4 U

Concentrations presented in micrograms per liter (UG/L)

BASE BACKGROUND
SURFACE WATER
MCB, CAMP LEJEUNE, NORTH CAROLINA
TAL INORGANICS

Sample ID:	6-WC03-SW-06M	6-WC03-SW-312M	41-TC-SW06	41-UN-SW01	41-NE-SW05	2-OC-SW01	69-UT1-SW-06
ALUMINUM	633	676	390.0	447.0 J	178.0	556	1110
ANTIMONY	49 U	49 U	7.60 U	7.60 U	7.60 U	7 U	49 U
ARSENIC	2 U	2 U	2.90 U	2.20 U	2.90 U	2 U	3 U
BARIUM	21 U	21 U	23.6	23.3	27.2	18 B	23 B
BERYLLIUM	1 U	1 U	0.760 U	0.760 U	0.760 U	1 U	1 U
CADMIUM	3 U	3 U	3.19 U	3.19 U	3.19 U	5 U	3 JB
CALCIUM	8890	9430	18900.0	41600.0	40300.0	22900	1380 B
CHROMIUM	5 U	5 U	8.31 U	8.31 U	8.31 U	10 U	5 U
COBALT	6 U	6 U	16.0 U	16.0 U	16.0 U	8 U	8 JB
COPPER	4 U	129	16.3 U	16.3 U	16.3 U	4 B	7 JB
CYANIDE	10 U	10 U	NZ	NZ	NZ	NZ	10 U
IRON	756	830	1460.0	1300.0 J	469.0	413	1000
LEAD	5	10.4	1.40	1.85	1.17	2 U	2 B
MAGNESIUM	883 B	936 B	1620.0	1770.0	2410.0	1960 B	846 B
MANGANESE	8.2 JB	9.2 JB	25.7	17.5	40.0	24	9 JB
MERCURY	0.2 U	0.52	0.171 U	0.182 UJ	0.160 U	0.2 U	0.2 U
NICKEL	17 U	1380	17.4 U	28.8 U	17.4 U	20 U	17 U
POTASSIUM	603 B	640 B	2210	1860	1620	809 B	385 B
SELENIUM	5 U	5 U	1.60 UJ	1.60 UJ	1.60 UJ	1 U	5 U
SILVER	10 U	10 U	1.60 U	1.60 U	1.60 U	3 UJ	10 U
SODIUM	6100	6500	15000	22100	12300	6190	4790 JB
THALLIUM	2 UJ	2 UJ	3.00 U	3.00 U	3.00 U	1 U	2 UJ
VANADIUM	5 U	5 U	20.4 U	20.4 U	20.4 U	4 U	10 JB
ZINC	10.4 U	111	21.4	24.9	33.2	23 UJ	18 B

Concentrations presented in micrograms per liter (UG/L)

BASE BACKGROUND
SURFACE WATER
MCB, CAMP LEJEUNE, NORTH CAROLINA
TAL INORGANICS

	Minumum (ug/L)	Maximum (ug/L)	Average (ug/L)
ALUMINUM	178	1350	803.4
ANTIMONY	ND	ND	NA
ARSENIC	ND	ND	NA
BARIUM	13.4	27.2	17.9
BERYLLIUM	ND	ND	NA
CADMIUM	3	3	1.5
CALCIUM	600	41600	13383.7
CHROMIUM	ND	ND	NA
COBALT	8	8	3.7
COPPER	4	129	12.7
CYANIDE	ND	ND	NA
IRON	413	1460	900.6
LEAD	1.17	10.4	2.6
MAGNESIUM	588	2410	1138.0
MANGANESE	6.2	40	13.4
MERCURY	0.52	0.52	0.1
NICKEL	1380	1380	105.1
POTASSIUM	341	2210	776.8
SELENIUM	ND	ND	NA
SILVER	ND	ND	NA
SODIUM	3930	22100	7835.7
THALLIUM	ND	ND	NA
VANADIUM	1.9	10	4.4
ZINC	18	111	18.0

Qualifiers have been removed per Baker's standards.
Qualifiers U and UJ have been given one-half the detection value.
Qualifiers J, NJ, and B have been removed with no detection value change.

SEDIMENT

BASE BACKGROUND
SEDIMENT
MCB, CAMP LEJEUNE, NORTH CAROLINA
TAL INORGANICS

Sample ID:	2-OCSD01-06	2-OCSD01-612	6-BH01-SD-612B	6-BH01-SD-612M	6-BH01-SD-6B	6-BH01-SD-6M	6-BH02-SD-06M
ALUMINUM	8680	9090	6760	7790	5610	6360	3010
ANTIMONY	R	R	4.7 UJ	5.9 U	4.9 UJ	4.8 U	3.8 U
ARSENIC	0.56 UJ	0.57 UJ	1 U	1.1 U	1.1 U	0.93 U	0.77 U
BARIUM	30.5 B	30 B	9.7 JB	14.4 B	8.5 UJ	9.9 JB	12.5 B
BERYLLIUM	0.85 B	0.86 B	0.13 B	0.17 B	0.14 B	0.1 U	0.08 U
CADMIUM	1.4 U	1.4 U	0.51 UJ	0.8 UJ	0.86 UJ	0.65 UJ	0.54 JB
CALCIUM	6320	6180	59.3 U	82.8 U	61.9 U	70.2 U	1410
CHROMIUM	9.9	10	5.1	4.7	4.9	3.6	3.3 U
COBALT	2.3 U	2.3 U	0.53 U	0.84 U	0.55 U	0.69 U	1.1 UJ
COPPER	1.1 B	0.86 B	3.2 JB	10.1 JB	4.2 JB	6.2 JB	2.5 UJ
IRON	842	845	765	1590	638	956	1240
LEAD	8.8	8	8.9	12.3	11.3	10.2	6.9
MAGNESIUM	322 B	307 B	128 B	160 B	103 B	130 B	77.9 B
MANGANESE	4.8	5.7	4.9	6 B	4.7	4.9 B	4.4 J
MERCURY	0.14 U	0.14 U	0.05 U	0.05 U	0.05 U	0.04 UJ	0.03 U
NICKEL	5.6 U	5.7 U	2.1 UJ	3.3 UJ	2.2 UJ	2.7 UJ	2.7 UJ
POTASSIUM	229 B	237 B	125 B	163 B	122 B	140 B	76.8 UJ
SELENIUM	1.7 J	2.1 J	1.7 UJ	1.9 U	1.8 UJ	1.6 UJ	1.3 U
SILVER	0.85 UJ	0.86 UJ	0.53 UJ	0.84 UJ	0.55 UJ	0.69 UJ	0.82 UJ
SODIUM	86.2 B	78.9 B	35.5 UJ	42.8 UJ	41.5 UJ	39.4 UJ	25.4 UJ
THALLIUM	0.31 J	0.29 J	0.69 U	0.76 U	0.73 U	0.62 U	0.51 U
VANADIUM	6.8 B	6.6 B	5.7 B	6.5 B	4.8 B	4.9 B	3.3 JB
ZINC	18.9	18.9	2.1 U	1.4 U	1.6 U	1.8 U	12

Concentrations presented in milligrams per kilogram (mg/kg).

BASE BACKGROUND
SEDIMENT
MCB, CAMP LEJEUNE, NORTH CAROLINA
TAL INORGANICS

Sample ID:	6-BH02-SD-612M	6-WC01-SD-06B	6-WC01-SD-612B	6-WC02-SD-06B	6-WC02-SD-612B	6-WC03-SD-06B	6-WC03-SD-06M
ALUMINUM	7780	2090 J	2510	6540 J	5390 J	6480 J	4780 J
ANTIMONY	4.6 U	3.3 U	3.1 U	3.1 U	4.1 U	6.8 UJ	3.4 U
ARSENIC	1.6 JB	1.2 JB	0.73 UJ	0.81 U	0.64 U	1.4 UJ	0.82 UJ
BARIUM	30 B	5.2 JB	15.3 B	19.6 JB	23.7 JB	15.8 JB	37.1 JB
BERYLLIUM	0.33 B	0.07 U	0.07 U	0.26 U	0.33 U	0.27 U	0.32 U
CADMIUM	1.3 JB	0.45 U	0.42 U	0.42 U	0.74 UJ	1.2 UJ	0.46 U
CALCIUM	3890	329 B	1060 B	1090 JB	1790 J	2850 J	22200 J
CHROMIUM	9.9	3 UJ	2.5 UJ	4.2	3.4	6.2	6.4
COBALT	2.6 UJ	0.48 U	0.44 U	0.6 JB	0.87 JB	0.94 U	1.3 JB
COPPER	2.3 UJ	0.86 UJ	0.64 UJ	0.43 JB	0.62 JB	5.8 JB	53200
IRON	3150	724 J	1430 J	1200 J	1570 J	6870 J	6940 J
LEAD	8.9	9.7 J	2.3 J	4.8 J	4.8 J	9 J	314 J
MAGNESIUM	187 B	50.5 B	57 B	372 JB	356 JB	440 JB	852 JB
MANGANESE	8.6 J	2.4 UJ	4.7 J	8.8	6.5	9.7	23
MERCURY	0.07 U	0.03 U	0.04 U	0.08 U	0.06 U	0.11 U	0.06 U
NICKEL	7.2 UJ	1.9 UJ	1.8 UJ	1.7 UJ	2.8 B	3.7 UJ	1.9 UJ
POTASSIUM	151 U	92.1 B	98.1 B	145 B	97 U	220 B	360 B
SELENIUM	2.9	1.4 UJ	1.2 UJ	1 U	1.3 U	2.7 U	1 UJ
SILVER	1.3 UJ	0.48 UJ	0.44 UJ	0.52 UJ	1.2 UJ	1.5 UJ	7.3
SODIUM	39.9 UJ	38.3 UJ	27 UJ	491 JB	469 JB	277 UJ	489 JB
THALLIUM	0.65 UJ	0.55 U	0.49 U	0.4 UJ	0.5 UJ	1.1 UJ	0.4 UJ
VANADIUM	14.1 B	5.7 B	4.4 B	5.8 B	7 B	11.6 B	9.1 B
ZINC	12.6	3.1 U	3.1 U	1.6 U	2.4 U	16.3 U	926

Concentrations presented in milligrams per kilogram (mg/kg).

BASE BACKGROUND
SEDIMENT
MCB, CAMP LEJEUNE, NORTH CAROLINA
TAL INORGANICS

Sample ID:	6-WC03-SD-612B	41-UN-SD01-06	41-UN-SD01-612	41-NE-SD05-06	41-NE-SD05-612	41-TC-SD06-06
ALUMINUM	7040 J	1720.0	2780.0	437 J	351 J	2580.0 J
ANTIMONY	6.8 U	2.15 U	2.09 U	1.91 U	1.88 U	2.28 U
ARSENIC	1.3 JB	0.789 U	0.768 U	0.542 U	0.532 U	0.702
BARIUM	25.2 JB	5.24	7.66	3.2 U	3.14 U	13.5
BERYLLIUM	0.26 U	0.351 U	0.342 U	0.196 U	0.193 U	0.234 U
CADMIUM	0.92 U	0.639 U	0.622 U	0.823 U	0.809 U	0.982 U
CALCIUM	4500 J	1250.0	1660.0	314 J	216 J	1090.0 J
CHROMIUM	8.3	4.81 U	3.18 U	2.42 J	2.11 UJ	3.42 J
COBALT	0.97 U	2.65 U	2.58 U	4.13 U	4.06 U	4.92 U
COPPER	79.6	4.41 U	4.29 U	4.21 U	4.13 U	5.02 U
IRON	6050 J	924.0 J	1160.0 J	354 J	262 J	2840.0 J
LEAD	10.3 J	13.8 J	12.6 J	1.94	2.19	18.7
MAGNESIUM	333 JB	62.5	59.4	21.5	18.2 U	99.8
MANGANESE	8.3	2.94	2.67	1.96 J	1.79 UJ	8.72 J
MERCURY	0.11 U	0.068 U	0.066 U	0.064 U	0.063 U	0.077 U
NICKEL	3.8 UJ	5.97	3.79	7.4 U	7.3 U	8.90 U
POTASSIUM	457 B	136.0 U	132.0 U	197 U	193 U	235.0 U
SELENIUM	2.3 U	0.688 U	0.670 U	0.387 UJ	0.38 UJ	0.462 UJ
SILVER	1.3 UJ	0.435 U	0.424 U	0.413 UJ	0.406 UJ	0.492 UJ
SODIUM	382 UJ	73.6 J	49.3 UJ	95 U	117	347.0
THALLIUM	0.93 UJ	1.25 U	1.22 U	0.748 UJ	0.735 UJ	0.892 UJ
VANADIUM	15.7 B	4.52 U	4.40 U	5.26 U	5.17 U	6.28 U
ZINC	12.3 U	10.5 U	15.2 U	7.41 U	13.6	18.0

Concentrations presented in milligrams per kilogram (mg/kg).

BASE BACKGROUND
SEDIMENT
MCB, CAMP LEJEUNE, NORTH CAROLINA
TAL INORGANICS

Sample ID:	410TC-SD06-612	69-UT1-SD-06
ALUMINUM	6600.0 J	1240
ANTIMONY	2.11 U	9.4 U
ARSENIC	0.864	0.62 U
BARIUM	25.3	4 U
BERYLLIUM	0.377	0.19 U
CADMIUM	0.909 U	0.58 U
CALCIUM	1230.0 J	264 B
CHROMIUM	8.72 J	3.3
COBALT	4.56 U	1.2 UJ
COPPER	4.64 U	1.5 UJ
IRON	6030.0 J	3530
LEAD	13.6	1
MAGNESIUM	235.0	48.9 B
MANGANESE	13.7 J	2.9 J
MERCURY	0.071 U	0.11 U
NICKEL	8.20 U	3.3 U
POTASSIUM	381.0	81.1 B
SELENIUM	0.862 J	1 U
SILVER	0.456 UJ	1.9 U
SODIUM	105.0 U	122 JB
THALLIUM	0.826 UJ	0.42 UJ
VANADIUM	12.7	4 UJ
ZINC	19.9	4.4 U

Concentrations presented in milligrams per kilogram (mg/kg).

BASE BACKGROUND
SEDIMENT
MCB CAMP LEJEUNE, NORTH CAROLINA
TAL INORGANICS

	Minimum (mg/kg)	Maximum (mg/kg)	Average (mg/kg)
ALUMINUM	351	9090	4800.8
ANTIMONY	ND	ND	NA
ARSENIC	0.702	1.6	0.6
BARIUM	5.2	37.1	15.5
BERYLLIUM	0.13	0.86	0.2
CADMIUM	0.54	1.3	0.4
CALCIUM	216	22200	2626.4
CHROMIUM	2.42	10	4.7
COBALT	0.6	1.3	1.0
COPPER	0.43	53200	2424.1
IRON	262	6940	2268.6
LEAD	1	314	22.5
MAGNESIUM	21.5	852	200.5
MANGANESE	1.96	23	6.4
MERCURY	ND	ND	NA
NICKEL	2.8	5.97	2.4
POTASSIUM	81.1	457	157.2
SELENIUM	0.862	2.9	0.9
SILVER	7.3	7.3	0.7
SODIUM	73.6	491	130.6
THALLIUM	0.29	0.31	0.4
VANADIUM	3.3	15.7	6.3
ZINC	12	926	49.2

Qualifiers have been removed per Baker's standards.
Qualifiers U and UJ have been given one-half the detection limit.
Qualifiers J, NJ, and B have been removed with no detection value change.

APPENDIX Q
SHOWER MODEL

APPENDIX Q
SHOWER INHALATION MODEL

INHALATION OF CONTAMINANTS VOLATILIZED FROM SHOWER WATER

In the model developed by Foster and Chrostowski (1986), inhalation exposures to volatile organic chemicals (VOCs) while showering are modeled by estimating the rate of chemical releases into the air (generation rate), the buildup of VOCs in the shower room air while the shower is on, and the decay of VOCs in the shower room air after the shower is turned off, and the quantity of airborne VOCs inhaled while the shower is both on and off.

Estimation of the rate of VOC release into the air is based upon Liss and Slater's (1974) adaptation of the two-film gas-liquid mass transfer theory. The two-film boundary theory provides the basis for estimating the overall mass transfer coefficient (K_L) for each VOC of interest, according to the following equation:

$$K_L = (1/k_l + RT/Hk_g)^{-1} \qquad (1)$$

where,

K_L = overall mass transfer coefficient (centimeter per hour [cm/hr]),

H = Henry's law constant (atm-m^3/mol-K),

RT = 2.4×10^{-2} atm-m^3/mole (gas constant of 8.2×10^{-5} atm-m^3/mole-K times absolute temperature of 293 K),

kg = gas-film mass transfer coefficient (cm/hr), and

k_l = liquid-film mass transfer coefficient (cm/hr).

Equation 1 describes the mass transfer rate of a compound at an air-water interface where diffusion may be limited by both liquid- and gas-phase resistances.

Typical values of k_l (20 cm/hr) and k_g (3,000 cm/hr), which have been measured for CO_2 and H_2O, respectively, may be used to estimate VOC-specific values for these parameters (Liss and Slater, 1974):

$$k_g(VOC) = k_g(H_2O(18/MW_{VOC})^{0.5} \quad (2)$$

$$k_l(VOC) = k_l(CO_2(44/MW_{VOC})^{0.5} \quad (3)$$

where,

MW = molecular weight (g/mol).

The mass transfer coefficient, K_L, is adjusted to the shower water temperature, T_s, according to a semi-empirical equation developed to estimate the effect of temperature on oxygen mass-transfer rate (O'Connor and Dobbins, 1956):

$$K_{aL} = K_L(T_{l\mu s}/T_{s\mu l})^{-0.5} \quad (4)$$

where,

K_aL = adjusted overall mass transfer coefficient (cm/hr),
T_l = calibration water temperature of K_L (K),
T_s = shower water temperature (K),
μl = water viscosity at T_l (cp), and
μs = water viscosity at T_s (cp).

The concentration leaving the shower droplet, C_{wd}, is obtained from an integrated rate equation based on a mass-balance approach:

$$C_{wd} = C_{w0}(1-\exp[-K_{aL}t_s/60d]) \quad (5)$$

where,

C_{wd} = concentration leaving shower droplet after time t_s ($\mu g/\ell$),
C_{w0} = shower water concentration ($\mu g/\ell$),
$_d$ = shower droplet diameter (mm), and
t_s = shower droplet drop time (sec).

The term $K_{aL}/60d$ combines both the rate transfer and the available interfacial area across which volatilization can occur. The value 1/60d equals the specific interfacial area, 6/d, for a special shower droplet of diameter "d" multiplied by conversion factors (hr/3,600 sec and 10 mm/cm).

The VOC generation rate in the shower room, S, can then be calculated by the equation:

$$S = C_{wd}(Fr) / SV \quad (6)$$

where,

s	=	indoor VOC generation rate (μg/m³-min),
FR	=	shower water flow rate (liter/min), and
SV	=	shower room air volume (m³).

A simple one-box indoor air pollution model was used to estimate VOC air concentrations in the shower room. This model can be expressed as a differential equation describing the rate of change of the indoor pollutant concentration with time:

$$dC_a / dt = RC_a + S \quad (7)$$

where,

C_a	=	indoor VOC air concentration (μg/m³, and
R	=	air exchange rate (min^{-1}).

When Equation 7 is integrated, the time-dependent indoor concentration can be estimated as follows:

$$C_a(t) = (S/R)(1-\exp[-Rt]) \text{ for } t = D_s$$

and

$$C_a(t) = (S/R)(\exp[RDs]-1)\exp(-Rt)) \quad t > D_s$$

where,

$C_a(t)$	=	indoor air VOC concentration at time t (μg/m²),
D_s	=	shower duration (min), and
t	=	time (min).

The inhalation exposure per shower can then be calculated according to the equation:

$$E_{inh} = [VR/(BW)(10^6)] \int_0^{D_t} C_a(t)\,dt$$

where,

E_{inh}	=	inhalation exposure per shower (mg/kg/shower),
VR	=	ventilation rate (liter/min),
BW	=	body weight (kg), and
D_t	=	total duration in shower room (min.)

This equation can be solved as:

$$E_{inh} = (VR)(S)/[(BW)(R)(10^6)]\ [D_s - 1/R + \exp(-RD_s)/R]$$

for the duration of the shower, and as

$$E_{inh} = (VR)(S)/[(BW)(R)(10^6)]\ x\ \left([D_s + \frac{\exp(-RD_t)}{R}] - \frac{[\exp[R(D_s - D_t]}{R}\right)$$

for both the duration of the shower and the duration in the room after the shower is turned off.

Assuming that an individual showers daily, E_{inh} is then equivalent to the chronic daily intake.

Table Q-1 lists the input parameters to the shower model.

Molecular weights and Henry's Law constants for the contaminants of potential concern are provided in Section 6.0 of this report in Table 6-1 and Appendix S, the CDI calculation spreadsheets.

LIST OF REFERENCES

Foster, S. A. and P. C. Chrostowski, 1986. Integrated Household Exposure Model for Use of Tap Water Contaminated with Volatile Organic Chemicals, presented at the 79th Annual Meeting of the Air Pollution Control Association, Minneapolis, Minnesota, June 22-17, 1986.

Liss, P. S. and P. G. Slater, 1974. Flux of Gases Across the Air-Sea Interface. Nature 247:181-184.

O'Connor, D. J. and W. Dobbins, 1956. The Mechanics of Reaeration in Natural Streams, J. Sanit, Eng. Div., ASCE 82:SA6, In Schroeder, E. D. Water and Wastewater Treatment, Chapter 4: Gas Transfer. McGraw-Hill, 1977.

TABLE Q-1

PARAMETERS USED IN THE CALCULATION OF SHOWER DOSE

PARAMETER	UNITS	VALUE
Calibration water temperature, T_1	K	293
Shower water temperature, T_s	K	318
Water viscosity at T_1, μ_1	Centipoise	1.002
Water viscosity at T_s, μ_s	Centipoise	0.596
Shower water droplet diameter, d	mm	1.0
Shower droplet drop time, t_s	sec	2
Shower water flow rate, FR	liter/min	10
Shower room air volume, SV	m^3	6
Air exchange rate, R	min^{-1}	0.0083
Shower duration, D_s	min	12
Total duration in shower room, D_t	min	15
Ventilation rate, VR (adult)	liter/min	10
Ventilation rate, VR (child)	liter/min	13.3
Body weight, BW (Adult)	kg	70
Body weight, BW (Child)	kg	15

APPENDIX Q

CALCULATION OF PERMEABILITY CONSTANTS

Chemical-specific permeability constants (PCs or k_p) were calculated using the following equation. (Reference: USEPA, 1992)

$$\textbf{Log kp} = -2.72 + 0.71 \log k_{ow} - 0.0061\ \textbf{MW}$$

Where,

k_p = permeability constant (cm/hr)
k_{ow} = octanol/water coefficient (unitless)
MW = molecular weight (g/mole)

Parameter	Log k_{ow}	MW	k_p
acenapthene	4	154	0.01
2-methylnaphthalene	3.86	142.2	1.5×10^{-3}

PC VALUES
11-Jan-96

FILE: PCVAL.WQ1

PARAMETER	[CM/HR] linked here	
	1.50E-03	
1,1-Dichloroethane	0.0126	
1,1-Dichloroethene	0.0015	
1,2,4-Trichlorobenzene	0.1000	
1,2-Dichloroethane	0.0053	
1,2-Dichloroethene (total)	0.0100	
1,2-Dichloropropane	0.0225	
1,3-Dichlorobenzene	0.0573	
1,4-Dichlorobenzene	0.0804	
2,4-Dimethylphenol	0.0150	
2,4-Dinitrotoluene	0.1000	
2-Butanone	0.0060	
2-Chlorophenol	0.0300	
2-Methylnaphthalene	0.1423	
2-Methylphenol	0.0160	
2-methylnaphthalene	0.1423	
4,4'-DDD	0.2800	
4,4'-DDE	0.2400	
4,4'-DDT	0.4300	
4-Methylphenol	0.0180	
Acenaphthene	0.1516	
Acenaphthene	1.50E-03	
Acenaphthylene	1.50E-03	
Acetone	0.0015	
Aldrin	0.0016	
Aluminum	0.0010	
Anthracene	0.0015	
Antimony	0.0010	
Arsenic	0.0010	
Barium	0.0010	
Benzene	0.0210	
Benzo(a)anthracene	0.0079	
Benzo(a)pyrene	0.9000	
Benzo(b)fluoranthene	0.6200	
Benzo(g,h,i)perylene	0.0015	
Benzo(k)fluoranthene	0.6200	
Benzoic acid	0.7120	
Beryllium	0.0010	
Bis(2-chloroethyl)ether	0.0021	
Bis(2-ethylhexyl)phthalate	3.30E-02	
Boron	0.0010	
Cadmium (soil)	0.0010	cadmium chloride
Cadmium (water)	0.0010	cadmium chloride
Carbazole	0.0015	
Carbon disulfide	0.5300	
Chlorobenzene	0.0404	
Chloroform	0.0089	
Chromium	0.0010	
Chrysene	0.6200	
Cis-1,2-Dichloroethene	0.0100	
Cobalt	0.0010	
Copper	0.0010	
Cyanide	0.0010	
Di-n-butylphthalate	2.3E-06	
Dibenz(a,h)anthracene	2.7	
Dibenzofuran	1.5E-03	
Diethyl phthalate	1.1E-05	
Dimethyl phthalate	3.3E-05	

Endosulfan sulfate	1.5E-03	
Endrin	0.0160	
Ethylbenzene	1.2000	
Fluoranthene	0.2970	
Fluorene	1.5E-03	
Heptachlor	0.0094	
Indeno(1,2,3-cd)pyrene	1.9000	
Iron	0.0010	
Isobutyl Alcohol	0.0015	
Kepone	0.0010	
Lead	4.0E-06	(lead acetate)
Magnesium	0.0010	
Manganese (soil)	0.0010	
Manganese (water)	0.0010	
Mercury	0.0010	
Molybdenum	0.0010	
Methylene Chloride	0.0051	
N-nitroso-di-n-propylamine	0.0028	
N-nitrosodiphenylamine	0.0005	
Naphthalene	0.0690	
Nickel	0.0001	(nickel chloride)
Pentachlorophenol	0.4900	
Phenanthrene	0.2700	
Phenol	0.0081	
Pyrene	0.0015	
Selenium	0.0010	
Silicon	0.0010	
Strontium	0.0010	
Styrene	0.6500	
Tetrachloroethene	0.0450	
1,1,2,2-Tetrachloroethane	0.009	
Thallium	0.001	
Tin	0.0010	
Toluene	1.0000	
Total Xylenes	0.0800	
1,1,2-Trichloroethane	0.0167	
Trichloroethene	0.0160	
Trichlorotrifluoroethane	0.0015	
Vanadium	0.0010	
Vinyl Chloride	0.0073	
Zinc	0.0006	(zinc chloride)
Acenapthene	0.1516	
beta-BHC	0.0015	
delta-BHC	0.0015	
gamma-BHC (Lindane)	0.0140	
p-Chloro-m-cresol	0.0500	
p-Cresol	0.0100	

Calculations

log Kp = -2.72 + 0.71 log Kw - 0.0061 MW

	Kp	log Kw	MW (g/mole)
acenapthene	0.15156537557	4	154
2-methylnaphthalene	0.142291841526	3.86	142.2
1,1,2-Trichloroethane	0.016687835114	2.47	133

APPENDIX R
SITE CONCEPTUAL MODEL

PRELIMINARY HUMAN HEALTH RISK ASSESSMENT CONCEPTUAL EVALUATION MODEL

OPERABLE UNIT NO. 6
SITES 36, 43, 44, 86, AND 54

MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

CONTRACT TASK ORDER 0303

AUGUST 3, 1995

Prepared for:

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

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LANTDIV CLEAN Program
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5 Flowchart of Potential Exposure Pathways and Receptors
Site 86: Aboveground Storage Tank Area

INTRODUCTION

As part of the review of available site information for use in a risk assessment (RA) and feasibility study (FS), a conceptual evaluation model has been formulated for the sites. Originally developed to assist in planning site activities for the remedial investigation (RI), the conceptual site model also can be used to identify the key elements in a risk assessment, such as: potential exposure pathways, exposure points and data needs.

As part of the RA, a conceptual evaluation model has been developed for Operable Unit (OU) No. 6, which includes sites 36, 43, 44, 54 and 86. The conceptual models briefly describe each site and present potential sources of contamination, constituents present at the site, potentially contaminated media, constituent migration routes, potential receptors and exposure pathways. Ecological receptors are addressed in the conceptual evaluation model for ecological risk assessment. The model was developed in accordance with the guidance provided in USEPA Data Quality Objectives for Remedial Response Activities Development Process (USEPA, 1987).

APPROACH

For the baseline human health risk assessment, both current and future land use exposure scenarios will be assumed for each site. A reasonable maximum exposure (RME) case scenario (i.e., worst case or upper bound risk estimate) will be utilized in the assessments. Consequently, the exposure scenarios presented will include RME assumptions for the input parameters in the exposure dose equations. Table 1 is a summary of these values.

The baseline risk assessment for each site will be conducted in concordance with the United States Environmental Protection Agency (USEPA) documents: Risk Assessment Guidance for Superfund: Human Health Evaluation Manual, Part A (USEPA, 1989) and Region IV Supplemental Risk Guidance (USEPA, 1992). The documents to be used in the assessment include, but are not limited to the following references: Risk Assessment Guidance for Superfund: Development of Risk-based Preliminary Remediation Goals, Part B (USEPA, 1991); "Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Factors" (USEPA, 1991); Exposure Factors Handbook (USEPA, 1989); Dermal Exposure Assessment: Principles and Applications, Interim Report (USEPA, 1992); and Superfund Exposure Assessment Manual (USEPA, 1988).

Toxicity values will be obtained from USEPA's Integrated Risk Information System (IRIS, 1995), the Health Effects Assessment Summary Tables (HEAST, 1994), and provisional or recommended USEPA toxicity values (i.e., values provided by the USEPA Environmental Criteria and Assessment Office [ECAO]), in accordance with Region IV and North Carolina Department of Environmental Health and Natural Resources (NCDEHNR) recommendations.

A mathematical model will be used to estimate exposure point concentrations. To estimate exposure from the inhalation of volatile contaminants in groundwater while showering, the "Integrated Household Exposure Model for Use of Tap Water Contaminated with Volatile Organic Chemicals" developed by S.A. Foster and P.C. Chrostowski will be applied. To evaluate the health effects of lead, the USEPA lead uptake/biokinetic model will be used.

The acceptable cancer risk range, as stipulated by the USEPA, is $1x10^{-4}$ to $1x10^{-6}$. Cancer risks that fall above the upper end of this risk range will be considered unacceptable as protective of human health. The total noncarcinogenic acceptable risk level is a hazard index (HI) less than or equal to

1.0. This value depicts a level at or below which adverse systemic effects are not expected to occur in the exposed population.

SITE 36 - CAMP GEIGER AREA DUMP

The Camp Geiger Area Dump (Site 36) is located approximately 1,000 feet east of Camp Geiger and 500 feet west of the New River, adjacent to the Camp Geiger Sewage Treatment Plant (STP). Camp Geiger is situated in the northwestern portion of MCB Camp Lejeune, approximately 3 miles southwest of Jacksonville, North Carolina.

During an initial assessment of potential sites at MCB Camp Lejeune, Site 36 was estimated to be approximately 1.5 acres in size. Based upon a review of aerial photographs and observations recorded during the RI scoping site visit, however, the size of the site was adjusted to include nearly 20 acres. The site is comprised primarily of open fields and wooded areas with dense understory. A gravel road bisects the site and provides access to Jack's Point Recreation Area, located approximately one-quarter mile east of the study area. The site is bordered to the north by Brinson Creek, to the east by woods, to the south by an unnamed tributary to the New River, and to the west by an improved (i.e., coarse gravel) road. Further to the west of the improved road lies an abandoned railroad right-of-way, once part of the Seaboard Coastline Railroad.

Background

From the late 1940s to the late 1950s, Site 36 was used for the disposal of municipal wastes and mixed industrial wastes, including garbage, waste oils, solvents, and hydraulic fluids from the air station. Disposal records indicate that all waste solvents and oils were burned at this site. Previous investigations have indicated that most of this material was initially burned and then buried. However, unburned material was also reportedly buried.

According to interviews conducted by Water and Air Research, Inc. (WAR) during the Initial Assessment Study (IAS), less than five percent of all waste hydrocarbon material generated at the air station was disposed of at Site 36. The remaining waste oil was reportedly used for dust control on roads or went directly into storm drains (WAR, 1983).

During a site visit conducted in March, 1994, scattered debris (i.e., trees, glass, and metal) , buried wire, and general litter was noted on-site. In addition, a few partially buried containers and 55-gallon drums and several mounds of construction debris were located in a swampy area southwest of the former dump. Fifty-five gallon drums containing unidentifiable material and 5-gallon pails labeled with "alkaline material" and "lubrication oil" were found south of the area where the unnamed tributary crosses the main access road.

A site investigation was performed by Water and Air Research, Inc. (WAR) in 1984. Additional investigations were conducted in 1986 and 1987 by Environmental Science and Engineering, Inc. (ESE). Levels of cadmium, chromium, lead, and phenols were detected in the groundwater (i.e., at both downgradient and upgradient wells) during the 1984 investigation. These levels exceeded federal and state groundwater criteria. Trans-1,2-dichloroethene (i.e., 2 µg/L), was detected at a low concentration, in the upgradient well only. The surface water and sediment from Brinson Creek and the unnamed tributary were also sampled. Trace levels of trans-1,2-dichloroethane, lead, and total phenols were detected in surface water and sediment. Chromium, lead, oil and grease, and phenols were detected in sediment.

The most recent sampling event included investigations of the following environmental media: background surface and subsurface soil, on-site surface and subsurface soil, shallow and deep groundwater, and surface water and sediment from Brinson Creek and the unnamed tributary. In addition, aquatic organisms were collected from Brinson Creek. A preliminary review of the unvalidated laboratory data indicates the presence of organic solvent constituents in the groundwater (i.e., trichloroethane [TCE], 1,2-dichloroethene [1,2-DCE], and 1,1,2,2-tetrachloroethene [1,1,2,2-PCE]) and soil, pesticides and PCBs in the surface soil, and metals, namely lead, in the soil and sediment.

Current and Future Exposure Scenarios

At present, the site is used for military training exercises and recreation (i.e., fishing, swimming, jogging, etc.) for off-site visitors from nearby residences. Dirt roads are located throughout the site, which may contribute to fugitive dust generation from vehicular traffic. The majority of the site is heavily wooded and vegetated.

Current receptors include on-site military personnel, off-site trespassers from nearby residences (i.e., child and adult receptors), construction workers, and fishermen. For military receptors and trespassers, potential exposure pathways are surface soil incidental ingestion, dermal contact and inhalation of fugitive dust, and surface water and sediment incidental ingestion and dermal contact from the surrounding surface water. Fishermen will be similarly evaluated for surface water and sediment exposure via incidental ingestion and dermal contact. These receptors will also be assessed for exposure to contaminants in fish tissue via ingestion. Presently, a pipeline is being installed on the eastern portion of Site 36, so current subsurface soil exposure will be evaluated for construction workers. Workers are exposed to subsurface soil when it is excavated during groundbreaking for construction activities.

At present, groundwater at the site is not used for potable purposes. Consequently, current exposure to groundwater will not be evaluated.

In the future case, it is expected that the site will remain a military restricted area. As stated previously, groundwater is not currently used for potable purposes. It is assumed that this will continue into the future. As a result, groundwater exposure will not be assessed for future military personnel. Although it is unlikely that a future residence will be implemented at this site, in accordance with conservative guidance, it is assumed that a private well will be installed on-site in the future case. Consequently, groundwater exposure to a future residential child and adult receptor will be assessed. The potential groundwater exposure pathways are ingestion, dermal contact and inhalation while showering.

Figure 1 presents a flowchart of the potential exposure pathways and receptors at this site.

SITE 43 - AGAN STREET DUMP

The Agan Street Dump (Site 43) is comprised of approximately 11 acres and is located within the operations area of Marine Corps Air Station (MCAS) New River, 2 miles west of the main entrance (see Figure 1-1). There is vehicle access to the site via Agan Street, from Curtis Road. Site 43 is located at the northern terminus of Agan Street, adjacent to an abandoned sewage disposal facility. The site is bordered to the north by Edwards Creek, to the east and south by Strawhorn Creek, and

to the west by Agan Street and the former sewage disposal facility. Strawhorn Creek discharges into Edwards Creek at Site 43. Edwards Creek then discharges into the New River approximately 2,000 feet north of the study area, near Site 36.

Much of the study area is heavily vegetated with dense understory and trees greater than three inches in diameter. Marsh areas prone to flooding line both Strawhorn and Edwards Creeks. An improved gravel loop road provides access to the main portion of the study area, other unimproved paths extend outward from this road. Presently, Site 43 is unrestricted.

Background

Reportedly, municipal waste, fiberglass and sewage treatment plant sludge were dumped on the ground surface at Site 43; however, it is not known exactly how long Site 43 was officially used as a dump (Halliburton/NUS, 1991). It has also been reported that other solid wastes may have been disposed at this site. The particular types and quantities of these wastes, however, are not known.

Baker Environmental, Inc. (Baker) conducted an SI at Site 43 in 1991. Soil samples contained polynuclear aromatic hydrocarbons (PAHs) and inorganic concentrations exceeding twice the base-specific background levels. Groundwater samples did not contain PAHs; however, they did contain carbon disulfide. Inorganics were also detected in groundwater and surface water at concentrations exceeding state and federal criteria. Sediment contained PAHs at locations downgradient from soil sample locations exhibiting PAH contamination at the confluence of Edwards Creek and at Strawhorn Creek. The presence of PAHs in sediment samples confirms the presence of PAHs in soil, as sediment contamination may be caused by surface runoff. Pesticides were also detected in sediment samples; however, there were no pesticides present in soil samples. Recent investigations indicate the presence of PAHs in soil (Baker, 1995).

Current and Future Exposure Scenarios

Site 43 no longer serves as a waste dump. Presently, Site 43 has no official use.

Receptors exposed to surface soil include: future residents (i.e., children and adults), current military personnel, and current trespassers (i.e., children and adults) from adjacent, off-site residences. Surface soil exposure pathways for these receptors include incidental ingestion, dermal contact, and inhalation of fugitive dust.

Future construction workers are the only receptors exposed to subsurface soil. Exposure to subsurface soil exposure may occur during ground excavation for on-site construction activities. Exposure pathways include: incidental ingestion of subsurface soil, dermal contact with subsurface soil and inhalation of fugitive dust.

Presently, groundwater at Site 43 is not used for potable supplies. For this reason, current groundwater exposure is not evaluated. In a future scenario, it is possible that residential developments may be constructed at Site 43. Consequently, future groundwater exposure will be assessed for residential children and adults. Groundwater exposure pathways include: ingestion, dermal contact with groundwater and inhalation of volatilized organics while showering.

Groundwater exposure will not be evaluated for future military personnel, for the same reasons it is not evaluated for these receptors at Site 36.

Receptors exposed to surface water and sediment are current on-site trespassers and future residents. Exposure pathways for these receptors are incidental ingestion of surface water/sediment and dermal contact with surface water/sediment.

Figure 2 presents a flowchart of the potential exposure pathways and receptors at Site 43.

SITE 44 - JONES STREET DUMP

The Jones Street Dump (Site 44) encompasses approximately 5 acres and is situated within the operations area of MCAS New River. There is vehicle access to the site via Baxter Street, from Curtis Road. Site 44 is located at the northern terminus of Baxter Street, behind base housing units along Jones Street. The site is partially surrounded by a six-foot chain-link fence, and a portion of the site lies to the east of the fenced compound. The site is bordered to the north and west by Edwards Creek, to the south by base housing units along Jones Street, and to the east by woods and an unnamed tributary to Edwards Creek. Edwards Creek flows east from the study area toward Site 43, which is located about 2,000 feet to the east of Site 44.

A majority of the site is comprised of a gently dipping open field that slopes toward Edwards Creek. The field is covered with high grass, weeds, and small pine trees that are less than two inches in diameter. Surrounding the open field is a mature wooded area with dense understory.

Background

The Jones Street Dump reportedly operated in the 1950's. Site 44 served as a dump for municipal waste and various debris. It has also been reported that some potentially hazardous materials may have been disposed at this site. The particular types and quantities of these wastes, however, are not known.

WAR conducted an IAS at Site 44 in 1983. This study produced evidence that construction debris and small quantities of potentially hazardous waste were disposed at the dump.

Baker conducted an SI at Site 44 in 1991. Soil samples contained low levels of PAHs and specific pesticides (i.e., 4,4'-DDE and 4,4'-DDD). Inorganics were detected in soil samples at concentrations exceeding twice the base-specific background levels. Groundwater contained inorganics at concentrations exceeding state and federal criteria. Low concentrations of PAHs were detected in one well, and toluene and ethylbenzene were detected in another well at concentrations below state and federal standards. Surface water samples contained inorganics at low levels. Sediment samples contained trace levels of pesticides and semivolatiles, as well as slightly elevated concentrations of copper, lead and zinc.

Current and Future Exposure Scenarios

Site 44 no longer serves as a dump. Presently, Site 44 has no official use.

Receptors exposed to surface soil include: future residents, (i.e., children and adults) current military personnel and on-site trespassers (i.e., children and adults) from adjacent, off-site residences. Soil exposure pathways for these receptors include: incidental ingestion of surface soil, dermal contact with surface soil and inhalation of fugitive dust.

Future construction workers are the only receptors exposed to subsurface soil. Exposure to subsurface soil exposure may occur during ground excavation for on-site construction activities. Exposure pathways include: incidental ingestion of subsurface soil, dermal contact with subsurface soil and inhalation of fugitive dust.

Presently, Site 44 groundwater is not tapped for potable supplies. For this reason, current groundwater exposure is not evaluated. In a future scenario, it is possible that residential developments may be constructed at Site 44. Consequently, future groundwater exposure will be assessed for residential children and adults. Groundwater exposure pathways include: ingestion of groundwater, dermal contact with groundwater and inhalation of volatilized organics while showering.

Groundwater exposure will not be evaluated for future military personnel, for the same reasons it is not evaluated for these receptors at Site 36.

Receptors exposed to surface water and sediment are current on-site trespassers and future residents. Exposure pathways for these receptors are incidental ingestion of surface water/sediment and dermal contact with surface water/sediment.

Figure 3 presents a flowchart of the potential exposure pathways and receptors at this site.

SITE 54 - CRASH CREW FIRE TRAINING BURN PIT

The Crash Crew Fire Training Burn Pit (Site 54) is located near the southwest end of runway 5-23, within the operations area of MCAS New River. The burn pit is approximately 50 feet in diameter and is situated at the center of this 1.5 acre site. An 8,000-gallon underground storage tank (UST) lies to the northwest of the burn pit. Fire training exercises are conducted within the burn pit using JP-type fuel, which is stored in the nearby UST. An oil and water separator, located approximately 100 feet to the southeast of the burn pit, is used for temporary storage and collection of the spent fuel.

An improved gravel surface surrounds the burn pit, the remaining portion of the site is comprised of maintained lawn area. The ground surface slopes away from the central portion of the study area toward the south, southwest, and southeast. Two drainage ditches lead away from the burn pit area toward the south, on either side of an improved road. During periods of heavy precipitation, the ditches serve as channels for surface water runoff.

Background

Site 54 has served as a fire training burn pit since the mid-1950s. Waste fuels, oils, and solvents were used to simulate fire conditions that would result from aircraft crashes. Fire training at Site 54 was originally conducted on the ground surface, within a bermed area. In 1975 a lined burn pit was constructed (WAR, 1983). The same burn pit remains in operation today, however, only JP-type fuels are currently used during training exercises.

The site media (i.e, soil, groundwater, surface water, and sediment) were previously investigated by WAR in 1983, and by ESE in 1986 and 1987. POL contamination was noted in the soil at depth. The 1984 groundwater results indicated levels of chromium, oil and grease, and phenols. In later

studies, these same chemicals were detected in the groundwater; no VOCs were detected. Total phenols were found in surface water. Chromium, lead, oil and grease, and total phenols were detected in sediment.

During a recent site visit conducted in March, 1994, fuel odor and residue on standing water were observed in the pit. A stressed vegetated area, which may have been used as a burn area, was identified southwest of the burn pit. Broken glass and metal debris were scattered on the ground along Perimeter Road. A small spill area was also noted in this area.

The most recent sampling event investigated these same site media. A preliminary assessment of the unvalidated laboratory results indicates PAHs in the soil and VOCs, including benzene, toluene, ethylbenzene, xylenes (BTEX), and 1,2-DCE, in the groundwater.

Current and Future Scenarios

Site 54 is currently used for emergency fire response training. Current receptors include on-site military personnel and trespassers (i.e., child and adult receptors). Exposure pathways for these receptors include surface soil incidental ingestion, dermal contact, and inhalation of fugitive dust.

At present, groundwater is not utilized for potable purposes. As a result, current groundwater exposure will not be assessed. Exposure to subsurface soil in the current scenario is unlikely for the receptor population. Consequently, subsurface soil is not considered to be a viable medium for exposure.

In the future case, it is unlikely that a residential scenario will be implemented at the site. It is assumed that the present activities will continue into the foreseeable future. However, to be conservative, groundwater exposure to a residential child and adult receptor will be assessed. Surface soil exposure, as calculated in the current scenario for the child and adult trespassers, is expected to remain the same in the future case.

Groundwater exposure for future on-site military personnel will not be assessed, for the same reasons it is not evaluated for the other sites. However, a construction worker will be evaluated in the future case. It is assumed that subsurface soil exposure may occur as a result of excavation for potential construction activities at the site. In addition, subsurface soil exposure will be assessed for future residents (i.e., child and adult receptor). The exposure pathways for these receptors are incidental ingestion, dermal contact, and inhalation.

Figure 4 presents a flowchart of the potential exposure pathways and receptors at this site.

SITE 86 - ABOVEGROUND STORAGE TANK AREA

Site 86 is located on the southwest corner of the Foster and Campbell Street intersection, within the operations area of MCAS New River. The site is comprised of a lawn area surrounded by buildings, asphalt roads, and parking lots. Concrete pylons, upon which electric and steam overhead utilities are mounted, line the northern, western, and southern boundaries of the site. Campbell Street borders the site to the north and Foster Street lies adjacent to the east. Immediately to the south of the study area is Building AS-502, the MCAS fire station. The entrance road to the fire station borders the study area to the west.

The ground surface at Site 86 gently slopes to the south, toward a drainage ditch and culvert. Storm water drains that are located along Campbell Street receive runoff from only the northernmost portion of the study area. Stormwater from Site 86 eventually discharges into the New River, which lies approximately three quarters of a mile to the east.

Background

Site 86 served as a storage area for petroleum products from 1954 to 1988. In 1954, three 25,000-gallon above ground storage tanks (ASTs) were installed within an earthen berm. Additionally, a small pump house was constructed to transfer fuel oil to and from the ASTs. The three tanks were reportedly used for No.6 fuel oil storage until 1979. From 1979 to 1988 the tanks were then used for temporary storage of waste oil (O'Brien & Gere, 1992). The three tanks were emptied in 1988 and are believed to have been removed in 1992. Today, the former location of the tanks is grass-covered and only a very slight depression remains.

A preliminary site investigation was conducted in 1990 by Dewberry and Davis. Several VOCs were found in the subsurface soil, including chloroform, methylene chloride, 1,1,1-trichloroethane (TCA), and 1,1,2-trichlorofluoroethane. These detections were attributed to localized surface spills. In 1992, O'Brien and Gere conducted a site assessment, investigating soil and groundwater at this site. Soil samples were analyzed for TPH and TCLP compounds. Most of the samples showed detections that did not exceed regulatory criteria for these parameters.

In the groundwater, several organic compounds were found: benzene, toluene, 1,1-dichloroethane (1,1-DCA), 1,2-dichloroethene (1,2-DCE), TCE, tetrachloroethene (PCE), chloroethane, and TCA. The detections of benzene, TCE, and PCE exceeded North Carolina groundwater criteria in a few samples. Toluene and TCA were detected below the state groundwater criteria. There are no criteria available for chloroethane, 1,1-DCA, and 1,2-DCE.

Baker conducted the latest investigation at this site in 1995, addressing soil and groundwater. A preliminary assessment of the unvalidated data indicated the presence of VOCs (i.e., TCE, 1,2-dichloroethane [1,2-DCA], 1,2-DCE, benzene, and PCE) in soil and groundwater.

Current and Future Scenarios

Site 86 currently has no official uses. Current receptors include on-site military personnel and trespassers (i.e., child and adult receptors). Exposure pathways for these receptors include surface soil incidental ingestion, dermal contact, and inhalation of fugitive dust.

At present, groundwater is not utilized for potable purposes. As a result, current groundwater exposure will not be assessed. Exposure to subsurface soil in the current scenario is unlikely for the receptor population. Consequently, subsurface soil exposure is not considered to be viable.

In the future case, it is unlikely that a residential scenario will be implemented at the site. It is assumed that the present activities will continue into the foreseeable future. However, to be conservative, groundwater exposure to a residential child and adult receptor will be assessed. Surface soil exposure, as calculated in the current scenario for the child and adult trespassers, is expected to remain the same in the future case.

Like the previous sites, groundwater exposure for future on-site military personnel will not be assessed. However, a construction worker will be evaluated in the future case. It is assumed that subsurface soil exposure may occur as a result of excavation for potential construction activities at the site. In addition, subsurface soil exposure will be assessed for future residents (i.e., child and adult receptor). The exposure pathways for these receptors are incidental ingestion, dermal contact, and inhalation.

Figure 5 presents a flowchart of the potential exposure pathways and receptors at this site.

TABLES

TABLE 1

SUMMARY OF PRELIMINARY EXPOSURE DOSE INPUT PARAMETERS FOR SITES 36, 43, 44, 54, AND 86

Input Parameter	Units	Receptor					
		Trespasser Child	Trespasser Adult	Military Personnel	Construction Worker	Residential Child	Residential Adult
Soil (mg/kg)							
Ingestion Rate, IR	mg/d	100	50	100	480	200	100
Fraction Ingested, FI	unitless	1	1	1	1	1	1
Exposure Frequency, EF	d/y	43	130	250	90	350	350
Exposure Duration, ED	y	6	30	4	1	6	30
Surface Area, SA	cm^2	2,000	5,000	4,300	4,300	2,300	5,800
Absorption Factor, AF	mg/cm^3	1	1	1	1	1	1
Averaging Time, Noncarc., ATnc	d	2,190	10,950	1,460	365	2,190	10,950
Averaging Time, Carc., ATcarc	d	25,550	25,550	25,550	25,550	25,550	25,550
Body Weight, BW	kg	15	70	70	70	15	70
Conversion Factor, CF	kg/mg	$1x10^{-6}$	$1x10^{-6}$	$1x10^{-6}$	$1x10^{-6}$	$1x10^{-6}$	$1x10^{-6}$
Absorbance Factor, ABS	unitless	Organics = 0.01; Inorganics = 0.001					
Groundwater (mg/L)							
Ingestion Rate, IR	L/d	NA	NA	NA	NA	1	2
Exposure Frequency, EF	d/y	NA	NA	NA	NA	350	350
Exposure Duration, ED	y	NA	NA	NA	NA	6	30
Exposure Time, ET	h/d	NA	NA	NA	NA	0.25	0.25
Surface Area, SA	cm^2	NA	NA	NA	NA	10,000	23,000
Averaging Time, Noncarc., ATnc	d	NA	NA	NA	NA	2,190	10,950
Averaging Time, Carc., ATcarc	d	NA	NA	NA	NA	25,550	25,550
Conversion Factor, CF	L/cm^3	NA	NA	NA	NA	0.001	0.001
Body Weight, BW	kg	NA	NA	NA	NA	15	70
Sediment (mg/kg)							
Ingestion Rate, IR	mg/d	200	100	NA	NA	200	100
Fraction Ingested, FI	unitless	1	1	NA	NA	1	1

TABLE 1 (Continued)

SUMMARY OF PRELIMINARY EXPOSURE DOSE INPUT PARAMETERS FOR SITES 36, 43, 44, 54, AND 86

Input Parameter	Units	Receptor					
		Trespasser Child	Trespasser Adult	Military Personnel	Construction Worker	Residential Child	Residential Adult
Exposure Frequency, EF	d/y	45	45	NA	NA	45	45
Exposure Duration, ED	y	6	30	NA	NA	6	30
Surface Area, SA	cm^2	2,000	5,000	NA	NA	2,300	5,800
Absorption Factor, AF	mg/cm^3	1	1	NA	NA	1	1
Averaging Time, Noncarc., ATnc	d	2,190	10,950	NA	NA	2,190	10,950
Averaging Time, Carc., ATcarc	d	25,550	25,550	NA	NA	25,550	25,550
Body Weight, BW	kg	15	70	NA	NA	15	70
Conversion Factor, CF	kg/mg	$1x10^{-6}$	$1x10^{-6}$	NA	NA	$1x10^{-6}$	$1x10^{-6}$
Absorbance Factor, ABS	unitless	Organics = 0.01; Inorganics = 0.001					
Surface Water (mg/L)							
Ingestion Rate, IR	L/d	0.005	0.005	NA	NA	0.005	0.005
Exposure Time, ET	h/d	2.6	2.6	NA	NA	2.6	2.6
Exposure Frequency, EF	d/y	45	45	NA	NA	45	45
Exposure Duration, ED	y	6	30	NA	NA	6	30
Surface Area, SA	cm^2	2,000	5,000	NA	NA	2,300	5,800
Averaging Time, Noncarc., ATnc	d	2,190	10,950	NA	NA	2,190	10,950
Averaging Time, Carc., ATcarc	d	25,550	25,550	NA	NA	25,550	25,550
Conversion Factor, CF	L/cm^3	0.001	0.001	NA	NA	0.001	0.001
Air (mg/m^3)							
Outdoor Air							
Inhalation Rate, IR	m^3/d	10	20	30	20	10	20
Exposure Frequency, EF	d/y	43	130	250	90	350	350
Exposure Duration, ED	y	6	30	4	1	6	30
Averaging Time, Noncarc., ATnc	d	2,190	10,950	1,460	365	2,190	10,950
Averaging Time, Carc,. ATcarc	d	25,550	25,550	25,550	25,550	25,550	25,550

TABLE 1 (Continued)

SUMMARY OF PRELIMINARY EXPOSURE DOSE INPUT PARAMETERS FOR SITES 36, 43, 44, 54, AND 86

Input Parameter	Units	Receptor					
		Trespasser Child	Trespasser Adult	Military Personnel	Construction Worker	Residential Child	Residential Adult
Body Weight, BW	kg	15	70	70	70	15	70
Shower Air							
Inhalation Rate, IR	m^3/h	NA	NA	NA	NA	0.6	0.6
Exposure Time, ET	h/d	NA	NA	NA	NA	0.25	0.25
Exposure Frequency, EF	d/y	NA	NA	NA	NA	350	350
Exposure Duration, ED	y	NA	NA	NA	NA	6	30
Averaging Time, Noncarc., ATnc	d	NA	NA	NA	NA	2,190	10,950
Averaging Time, Carc., ATcarc	d	NA	NA	NA	NA	25,550	25,550
Body Weight, BW	kg	NA	NA	NA	NA	15	70
Fish (mg/kg)							
Ingestion rate, IR	kg/d	NA	NA	NA	NA	NA	0.284
Fraction Ingested, FI	unitless	NA	NA	NA	NA	NA	1
Exposure Frequency, EF	meals/yr	NA	NA	NA	NA	NA	48
Exposure Duration, ED	y	NA	NA	NA	NA	NA	30
Averaging Time, Noncarc., ATnc	d	NA	NA	NA	NA	NA	10,950
Averaging Time, Carc, ATcarc	d	NA	NA	NA	NA	NA	25,550
Body Weight, BW	kg	NA	NA	NA	NA	NA	70

References:

USEPA Risk Assessment For Superfund Volume I. Human Health Manual (Part A) Interim Final, December, 1989.

USEPA Exposure Factors Handbook, July, 1989.

USEPA Risk Assessment For Superfund Volume I. Human Health Evaluation Manual Supplemental Guidance. "Standard Default Exposure Factors" Interim Final. March 25, 1991.

USEPA Dermal Exposure Assessment: Principles and Applications. Interim Report. January, 1992.

USEPA Region IV Guidance for Soil Absorbance. (USEPA, 1992)

TABLE 1 (Continued)

SUMMARY OF PRELIMINARY EXPOSURE DOSE INPUT PARAMETERS FOR SITES 36, 43, 44, 54, AND 86

Notes:
The exposure frequency for the trespasser receptors is based on the typical exposure pattern (i.e., more time spent outdoors in the warmer months vs. the cooler months) for people who actively garden or play outdoors. It is an upper-bound estimate (USEPA, 1992).

The skin surface area for the trespasser receptors is based on approximately 25 percent of the total surface body area for a child and adult receptor. These values are upper-bound estimates.

FIGURES

FIGURE 1

FLOWCHART OF POTENTIAL EXPOSURE PATHWAYS AND RECEPTORS
SITE 36: CAMP GEIGER AREA DUMP

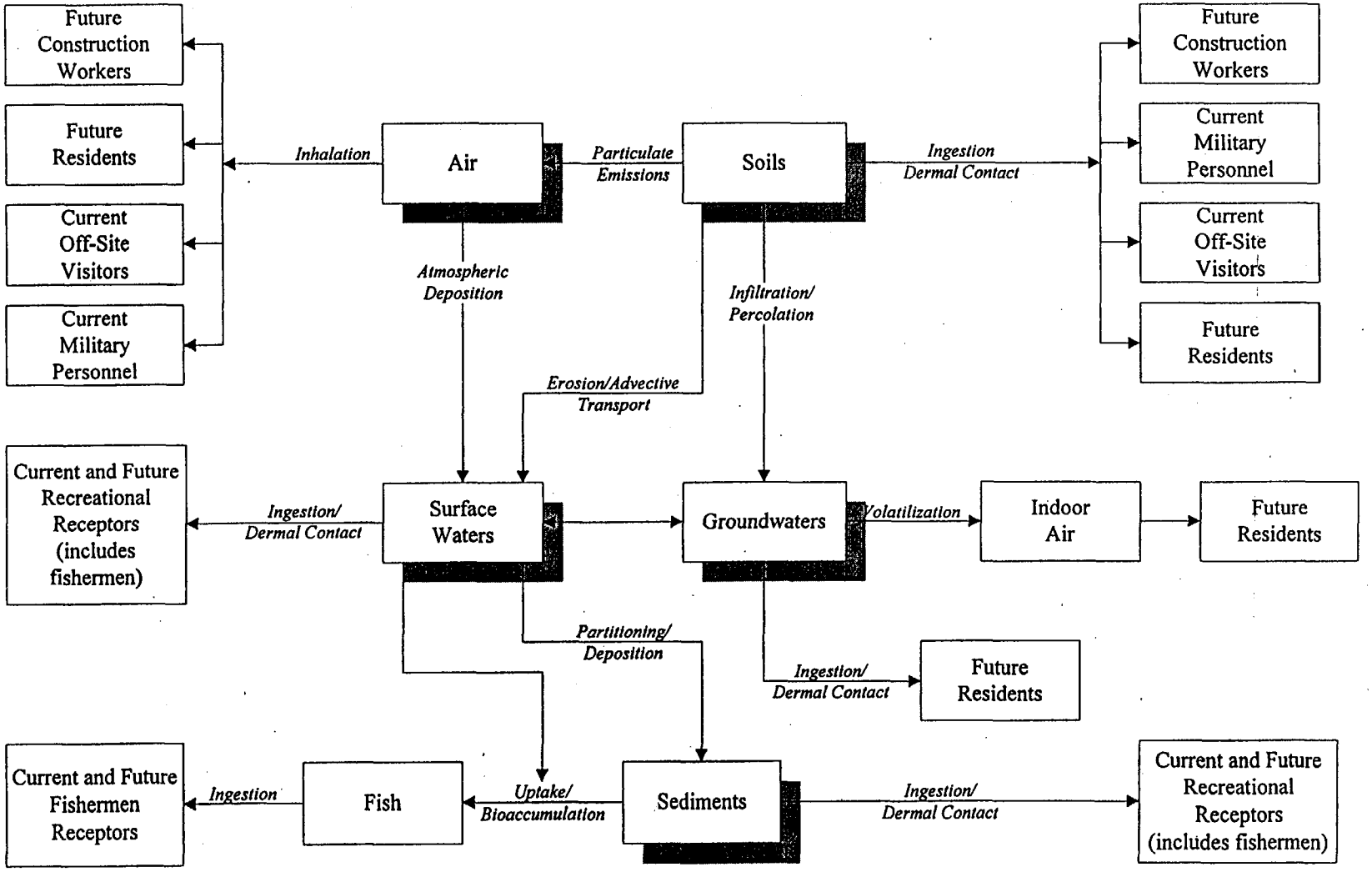


FIGURE 2

FLOWCHART OF POTENTIAL EXPOSURE PATHWAYS AND RECEPTORS
SITE 43: AGAN STREET DUMP

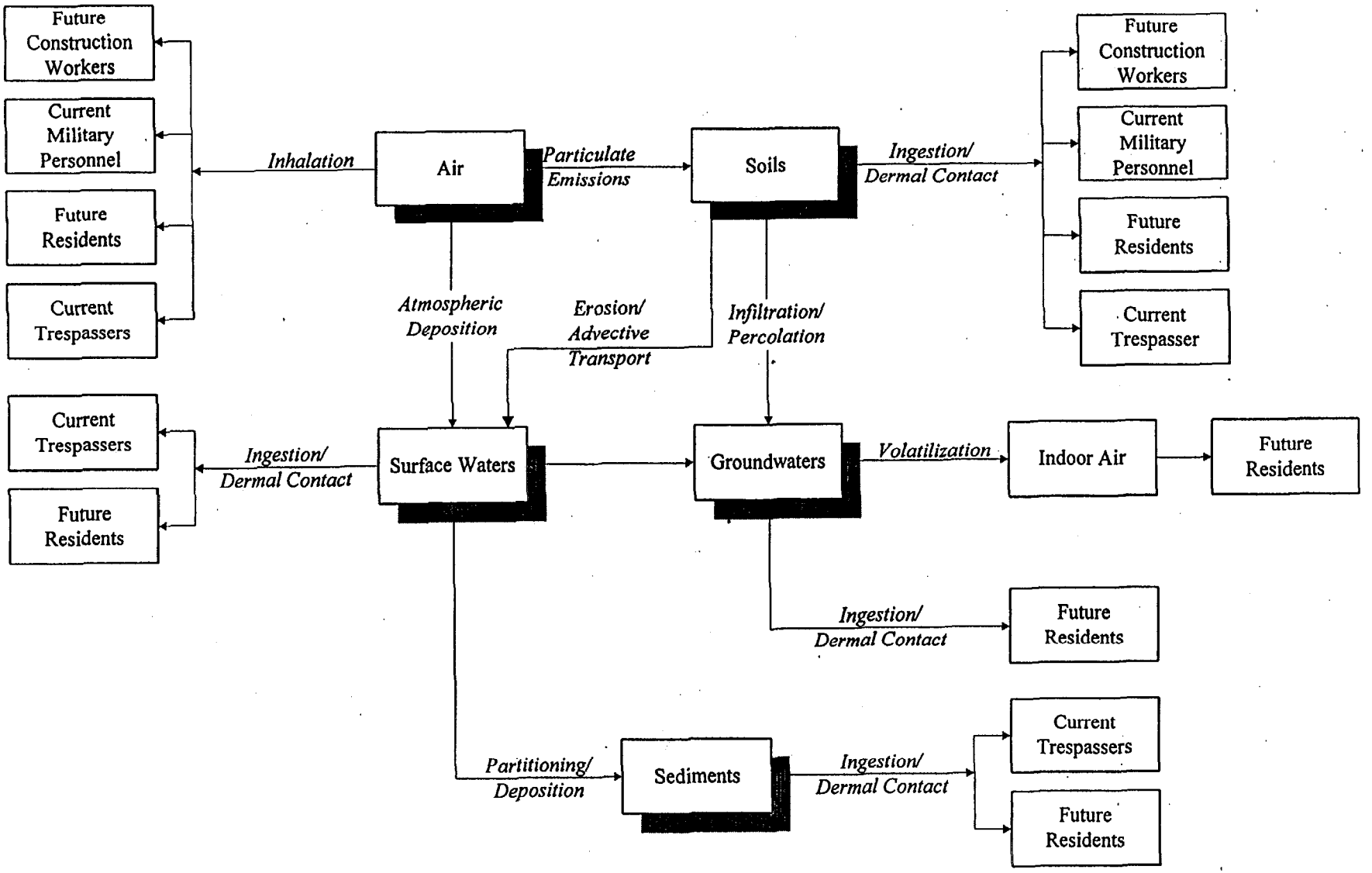


FIGURE 3

FLOWCHART OF POTENTIAL EXPOSURE PATHWAYS AND RECEPTORS
SITE 44: JONES STREET DUMP

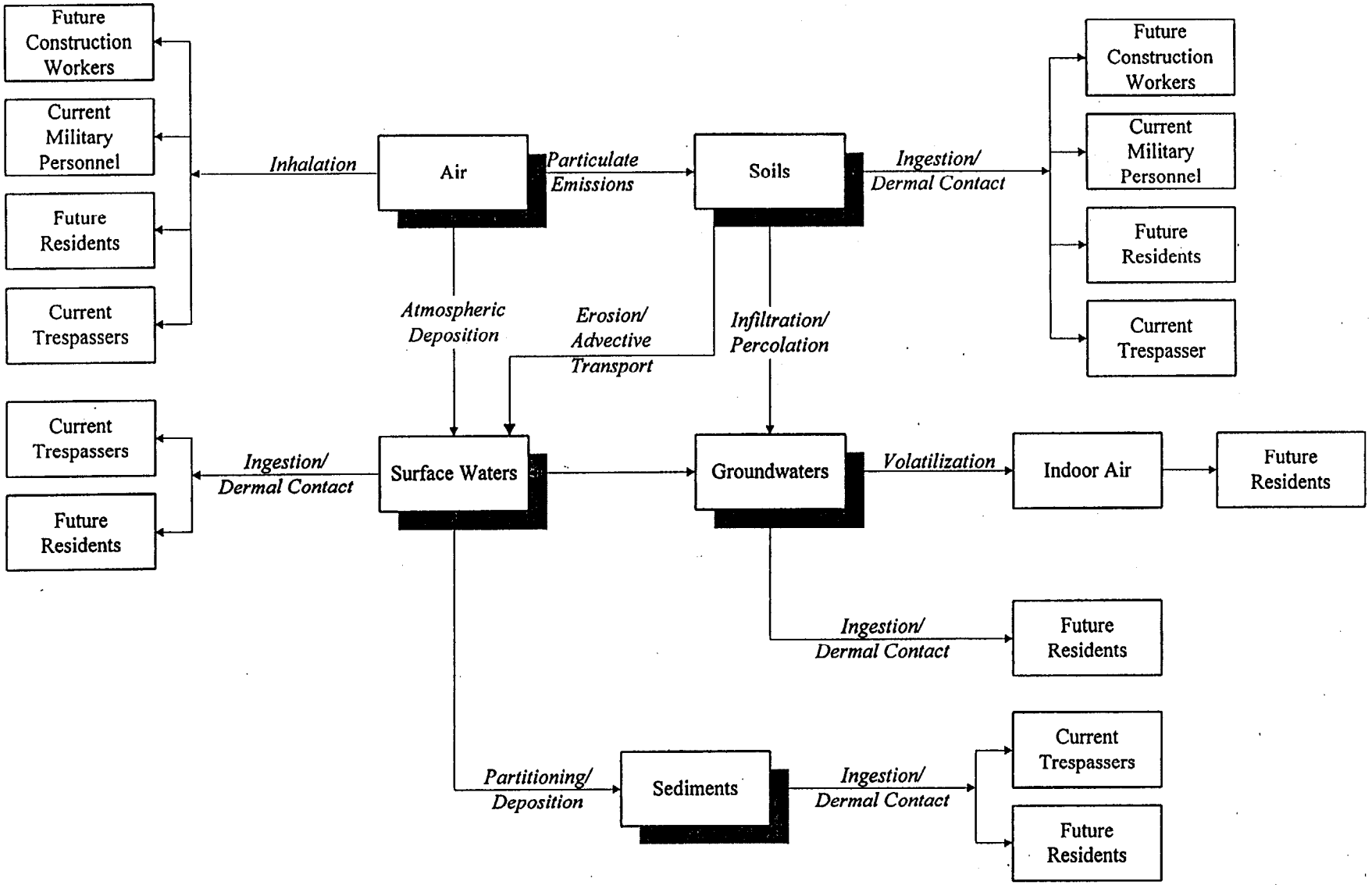


FIGURE 4

FLOWCHART OF POTENTIAL EXPOSURE PATHWAYS AND RECEPTORS
SITE 54: CRASH CREW FIRE TRAINING BURN PIT

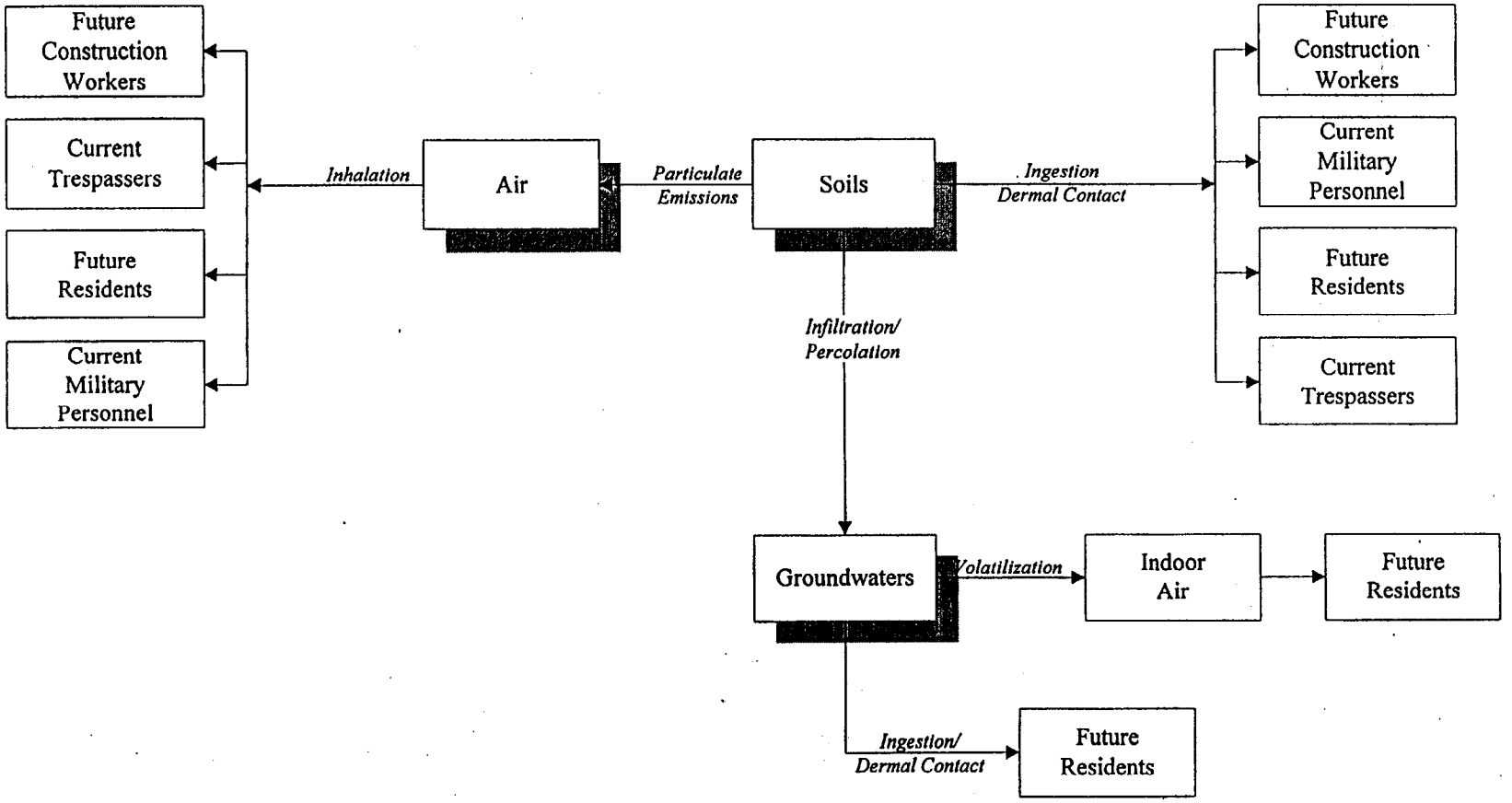
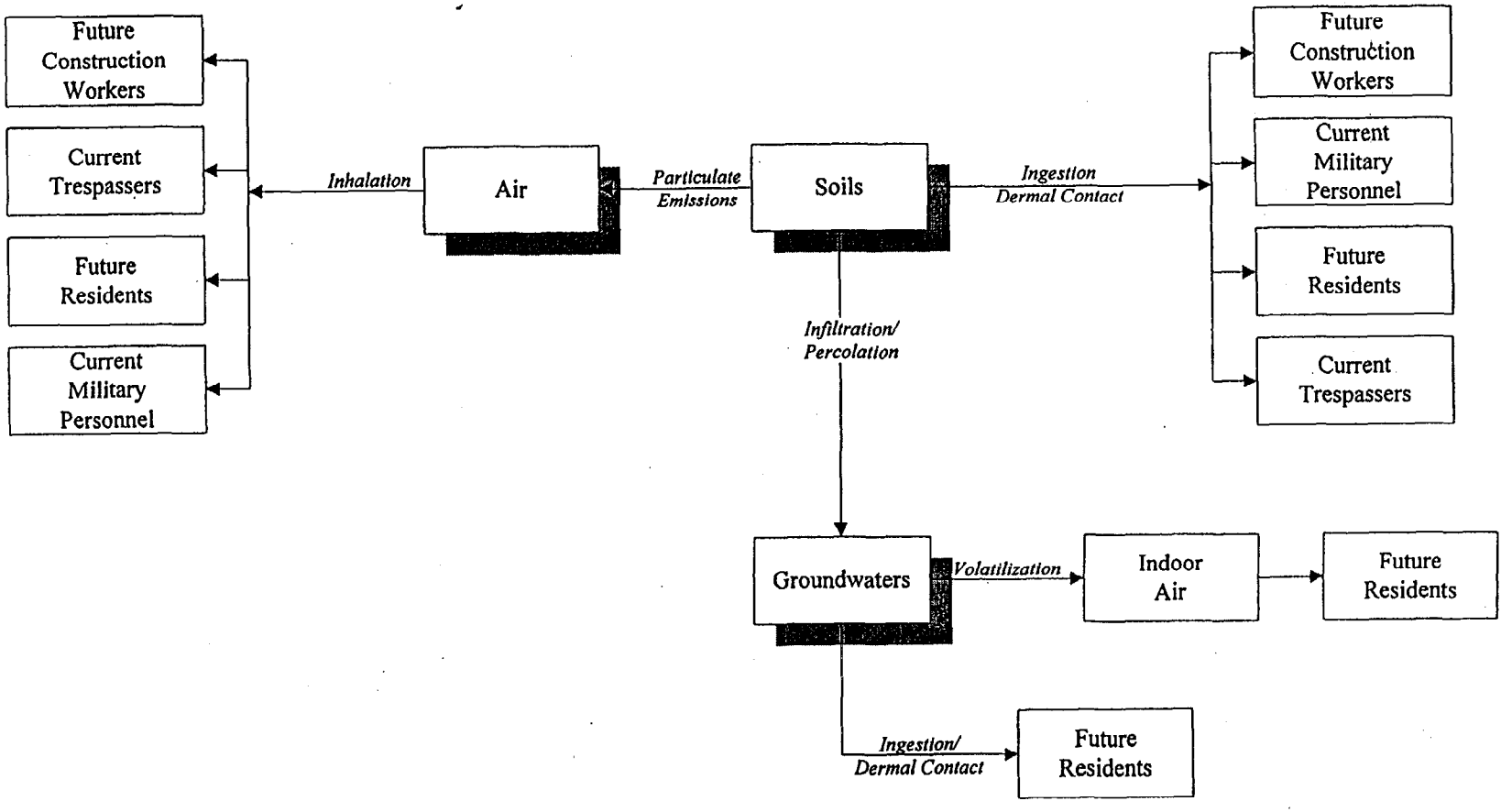


FIGURE 5

FLOWCHART OF POTENTIAL EXPOSURE PATHWAYS AND RECEPTORS
SITE 86: ABOVEGROUND STORAGE TANK AREA



APPENDIX S
CDI CALCULATIONS

Computed by: KTW Checked by: RSP Date: 1/96

EXAMPLE SOIL* INGESTION CALCULATIONS
OPERABLE UNIT NO. 6
CONTRACT TASK ORDER 0303

Purpose: Estimate intake/risk from ingestion of soil

$$Intake\ (mg/kg{\cdot}day) = \frac{C \times CF \times EF \times ED \times IR}{BW \times AT}$$

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:

Carcinogens = Intake (mg/kg·day) x CSF $(mg/kg{\cdot}day)^{-1}$
Noncarcinogens = Intake (mg/kg·day)/RfD (mg/kg·day)

Example Carcinogen: Arsenic

$$Intake\ (mg/kg{\cdot}day) = \frac{3.45\ mg/kg \times 100\ mg/day \times 350\ days/yr \times 30\ yrs \times 1.0E{-}6\ kg/mg}{70\ kg \times 25{,}550\ days}$$

$$= 2.0E\text{-}06$$

Risk = 2.0E-06 mg/kg·day x 1.5 $mg/kg{\cdot}day^{-1}$ = 3.0E-06

Example Noncarcinogen: Copper

$$Intake\ (mg/kg{\cdot}day) = \frac{191.27\ mg/kg \times 100\ mg/day \times 350\ days/yr \times 30\ yrs \times 1.0E{-}6\ kg/mg}{70\ kg \times 10{,}950\ days}$$

$$= 2.6E\text{-}04$$

$$Risk = \frac{2.6E{-}04\ mg/kg{\cdot}day}{4.0E{-}02\ mg/kg{\cdot}day} = 6.6E{-}03$$

* This example calculation also is applicable for sediment ingestion.
Re: Site 44 Future Residential Adult

SURFACE SOIL INGESTION EXPOSURE ASSESSMENT
OPERABLE UNIT NO. 6 (SITE 44)
REMEDIAL INVESTIGATION CTO-0303
MCB CAMP LEJEUNE, NORTH CAROLINA
CURRENT MILITARY PERSONNEL

Intake from ingestion of soil is calculated as follows:

Intake (mg/kg-day) = C * CF * EF * ED * IR/BW * ATc or ATnc * DY

Risk = Intake * CSF or /RfD

Where:	INPUTS
C = contaminant concentration in soil (mg/kg)	
CF = conversion for kg to mg	1E-06
EF = adult exposure frequency (days/yr)	250
ED = adult exposure duration (yr)	4
IR = adult soil ingestion rate (mg/day)	100
BW = adult 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

COPC	Concentration Carcinogen (mg/kg)	Exposure Frequency (days/yr) Adult	Exposure Duration (yr) Adult	Conversio Factor (kg/mg)	Ingestion Rate (mg/day) Adult	Body Weight (kg) Adult	Average Carc Tim (days)	Carc Dose (mg/kg/day) Adult	Slope Factor (mg/kg/day)-1	Carcinogenic Risk Adult	Percent Carcinogenic Risk Adult	Average Noncarc Time (days)	Noncarc Dose (mg/kg/day) Adult	Reference Dose (mg/kg/day)	Noncarcinogenic Risk Adult	Percent Noncarcinogenic Risk Adult
Aluminum	11112.40	250	4	1E-06	100	70	25550	6.2E-04	0.0E+00	0.00E+00	0%	1460	1.1E-02	1.0E+00	1.09E-02	16%
Arsenic	3.45	250	4	1E-06	100	70	25550	1.9E-07	1.5E+00	2.90E-07	100%	1460	3.4E-06	3.0E-04	1.13E-02	16%
Copper	191.27	250	4	1E-06	100	70	25550	1.1E-05	0.0E+00	0.00E+00	0%	1460	1.9E-04	4.0E-02	4.68E-03	7%
Iron	12930.25	250	4	1E-06	100	70	25550	7.2E-04	0.0E+00	0.00E+00	0%	1460	1.3E-02	3.0E-01	4.22E-02	61%
TOTAL										2.9E-07					6.9E-02	

SURFACE SOIL INGESTION EXPOSURE ASSESSMENT
OPERABLE UNIT NO. 6 (SITE 44)
REMEDIAL INVESTIGATION CTO-0303
MCB CAMP LEJEUNE, NORTH CAROLINA
CURRENT CHILD TRESPASSER

Intake from ingestion of soil is calculated as follows:

Intake (mg/kg-day) = C * CF * EF * ED * IR/BW * ATc or ATnc * DY

Risk = Intake * CSF or /RfD

Where:	INPUTS
C = contaminant concentration in soil (mg/kg)	
CF = conversion for kg to mg	1E-06
EF = child exposure frequency (days/yr)	130
ED = child exposure duration (yr)	6
IR = child soil ingestion rate (mg/day)	100
BW = child 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
RfD = reference dose (mg/kg-day)	specific

COPC	Concentration (mg/kg)	Exposure Frequency (days/yr) Child	Exposure Duration (yr) Child	Conversion Factor (kg/mg)	Ingestion Rate (mg/day) Child	Body Weight (kg) Child	Average Carc Time (days)	Carc Dose (mg/kg/day) Child	Slope Factor (mg/kg/day)-1	Carcinogenic Risk Child	Percent Carcinogenic Risk Child	Average Noncarc Time (days)	Noncarc Dose (mg/kg/day) Child	Reference Dose (mg/kg/day)	Noncarcinogenic Risk Child	Percent Noncarcinogenic Risk Child
Aluminum	11112.40	130	6	1E-06	100	15	25550	2.3E-03	0.00E+00	0.00E+00	0%	2190	2.6E-02	1.00E+00	2.64E-02	16%
Arsenic	3.45	130	6	1E-06	100	15	25550	7.0E-07	1.50E+00	1.05E-06	100%	2190	8.2E-06	3.00E-04	2.73E-02	16%
Copper	191.27	130	6	1E-06	100	15	25550	3.9E-05	0.00E+00	0.00E+00	0%	2190	4.5E-04	4.00E-02	1.14E-02	7%
Iron	12930.25	130	6	1E-06	100	15	25550	2.6E-03	0.00E+00	0.00E+00	0%	2190	3.1E-02	3.00E-01	1.02E-01	61%
TOTAL										1.1E-06					1.7E-01	

SEDIMENT INGESTION EXPOSURE ASSESSMENT
OPERABLE UNIT NO. 6 (SITE 44)
REMEDIAL INVESTIGATION CTO-0303
MCB CAMP LEJEUNE, NORTH CAROLINA
CURRENT CHILD TRESPASSER

Intake from ingestion of sediment is calculated as follows:

Intake (mg/kg-day) = C * IR * CF * EF * ED/ BW * ATC or ATnc * DY

Risk = Intake * CSF or /RfD

Where:	INPUTS
C = contaminant concentration in sediment (mg/kg)	
CF = conversion for kg to mg	1E-06
EF = exposure frequency for child (days/yr)	45
ED = exposure duration for child (yr)	6
IR = soil ingestion rate for child (mg/day)	200
BW = body weight for child (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
RfD = reference dose (mg/kg-day)	Specific

COPC	Concentration (mg/kg)	Exposure Frequency (days/yr) Child	Exposure Duration (yr) Child	Ingestion Rate (mg/day) Child	Conversio Factor (kg/mg)	Body Weight (kg) Child	Average Carc Tim (days)	Carc Dose (mg/kg/day) Child	Slope Factor (mg/kg/day)-1	Carcinogenic Risk Child	Percent Carcinogenic Risk Child	Average Noncarc Time (days)	Noncarc Dose (mg/kg/day) Child	Reference Dose (mg/kg/day)	Noncarcinogenic Risk Child	Percent Noncarcinogenic Risk Child
Acetone	0.290	45	6	200	1E-06	15	25550	4.1E-08	0.0E+00	0.0E+00	0%	2190	4.8E-07	1.0E-01	4.8E-06	0%
Pentachlorophenol	0.667	45	6	200	1E-06	15	25550	9.4E-08	1.2E-01	1.1E-08	2%	2190	1.1E-06	3.0E-02	3.7E-05	0%
Phenanthrene	0.250	45	6	200	1E-06	15	25550	3.5E-08	0.0E+00	0.0E+00	0%	2190	4.1E-07	3.0E-02	1.4E-05	0%
Carbazole	0.079	45	6	200	1E-06	15	25550	1.1E-08	2.0E-02	2.2E-10	0%	2190	1.3E-07	0.0E+00	0.0E+00	0%
Fluoranthene	0.310	45	6	200	1E-06	15	25550	4.4E-08	0.0E+00	0.0E+00	0%	2190	5.1E-07	4.0E-02	1.3E-05	0%
Pyrene	0.297	45	6	200	1E-06	15	25550	4.2E-08	0.0E+00	0.0E+00	0%	2190	4.9E-07	3.0E-02	1.6E-05	0%
Butylbenzylphthalate	0.048	45	6	200	1E-06	15	25550	6.8E-09	0.0E+00	0.0E+00	0%	2190	7.9E-08	2.0E-01	3.9E-07	0%
Benzo(a)anthracene	0.170	45	6	200	1E-06	15	25550	2.4E-08	7.3E-01	1.7E-08	3%	2190	2.8E-07	0.0E+00	0.0E+00	0%
Chrysene	0.311	45	6	200	1E-06	15	25550	4.4E-08	7.3E-03	3.2E-10	0%	2190	5.1E-07	0.0E+00	0.0E+00	0%
Bis(2-ethylhexyl)phthalate	0.434	45	6	200	1E-06	15	25550	6.1E-08	1.4E-02	8.6E-10	0%	2190	7.1E-07	2.0E-02	3.6E-05	0%
Benzo(b)fluoranthene	0.320	45	6	200	1E-06	15	25550	4.5E-08	7.3E-01	3.3E-08	5%	2190	5.3E-07	0.0E+00	0.0E+00	0%
Benzo(k)fluoranthene	0.200	45	6	200	1E-06	15	25550	2.8E-08	7.3E-02	2.1E-09	0%	2190	3.3E-07	0.0E+00	0.0E+00	0%
Benzo(a)pyrene	0.286	45	6	200	1E-06	15	25550	4.0E-08	7.3E+00	2.9E-07	44%	2190	4.7E-07	0.0E+00	0.0E+00	0%
Benzo(g,h,i)perylene	0.071	45	6	200	1E-06	15	25550	1.0E-08	0.0E+00	0.0E+00	0%	2190	1.2E-07	3.0E-02	3.9E-06	0%
Aldrin	0.002	45	6	200	1E-06	15	25550	2.1E-10	1.7E+01	3.6E-09	1%	2190	2.5E-09	3.0E-05	8.3E-05	0%
Heptachlor epoxide	0.002	45	6	200	1E-06	15	25550	2.6E-10	9.1E+00	2.4E-09	0%	2190	3.1E-09	1.3E-05	2.3E-04	1%
4,4'-DDE	0.100	45	6	200	1E-06	15	25550	1.4E-08	3.4E-01	4.8E-09	1%	2190	1.6E-07	0.0E+00	0.0E+00	0%
4,4'-DDD	0.332	45	6	200	1E-06	15	25550	4.7E-08	2.4E-01	1.1E-08	2%	2190	5.5E-07	0.0E+00	0.0E+00	0%
4,4'-DDT	0.020	45	6	200	1E-06	15	25550	2.8E-09	3.4E-01	9.7E-10	0%	2190	3.3E-08	5.0E-04	6.6E-05	0%
alpha-Chlordane	0.006	45	6	200	1E-06	15	25550	8.1E-10	1.3E+00	1.1E-09	0%	2190	9.5E-09	6.0E-05	1.6E-04	0%
gamma-Chlordane	0.007	45	6	200	1E-06	15	25550	9.6E-10	1.3E+00	1.2E-09	0%	2190	1.1E-08	6.0E-05	1.9E-04	0%
Aluminum	5225.890	45	6	200	1E-06	15	25550	7.4E-04	0.0E+00	0.0E+00	0%	2190	8.6E-03	1.0E+00	8.6E-03	20%
Arsenic	1.026	45	6	200	1E-06	15	25550	1.4E-07	1.5E+00	2.2E-07	32%	2190	1.7E-06	3.0E-04	5.6E-03	13%
Barium	17.652	45	6	200	1E-06	15	25550	2.5E-06	0.0E+00	0.0E+00	0%	2190	2.9E-05	7.0E-02	4.1E-04	1%
Beryllium	0.120	45	6	200	1E-06	15	25550	1.7E-08	4.3E+00	7.3E-08	11%	2190	2.0E-07	5.0E-03	4.0E-05	0%
Cadmium (soil)	0.607	45	6	200	1E-06	15	25550	8.6E-08	0.0E+00	0.0E+00	0%	2190	1.0E-06	1.0E-03	1.0E-03	2%
Chromium	6.378	45	6	200	1E-06	15	25550	9.0E-07	0.0E+00	0.0E+00	0%	2190	1.0E-05	5.0E-03	2.1E-03	5%
Cobalt	0.418	45	6	200	1E-06	15	25550	5.9E-08	0.0E+00	0.0E+00	0%	2190	6.9E-07	6.0E-02	1.1E-05	0%
Copper	4.017	45	6	200	1E-06	15	25550	5.7E-07	0.0E+00	0.0E+00	0%	2190	6.6E-06	4.0E-02	1.7E-04	0%
Iron	3939.070	45	6	200	1E-06	15	25550	5.6E-04	0.0E+00	0.0E+00	0%	2190	6.5E-03	3.0E-01	2.2E-02	50%
Lead	31.914	45	6	200	1E-06	15	25550	4.5E-06	0.0E+00	0.0E+00	0%	2190	5.2E-05	0.0E+00	0.0E+00	0%
Manganese (soil)	9.795	45	6	200	1E-06	15	25550	1.4E-06	0.0E+00	0.0E+00	0%	2190	1.6E-05	1.4E-01	1.2E-04	0%
Nickel	2.786	45	6	200	1E-06	15	25550	3.9E-07	0.0E+00	0.0E+00	0%	2190	4.6E-06	2.0E-02	2.3E-04	1%
Selenium	0.526	45	6	200	1E-06	15	25550	7.4E-08	0.0E+00	0.0E+00	0%	2190	8.6E-07	5.0E-03	1.7E-04	0%
Silver	0.292	45	6	200	1E-06	15	25550	4.1E-08	0.0E+00	0.0E+00	0%	2190	4.8E-07	5.0E-03	9.6E-05	0%
Vanadium	8.985	45	6	200	1E-06	15	25550	1.3E-06	0.0E+00	0.0E+00	0%	2190	1.5E-05	7.0E-03	2.1E-03	5%
Zinc	62.169	45	6	200	1E-06	15	25550	8.8E-06	0.0E+00	0.0E+00	0%	2190	1.0E-04	3.0E-01	3.4E-04	1%
TOTAL										6.7E-07					4.3E-02	

SURFACE SOIL INGESTION EXPOSURE ASSESSMENT
OPERABLE UNIT NO. 6 (SITE 44)
REMEDIAL INVESTIGATION CTO-0303
MCB CAMP LEJEUNE, NORTH CAROLINA
FUTURE RESIDENTIAL CHILD

Intake from ingestion of soil is calculated as follows:

Intake (mg/kg-day) = C * CF * EF * ED * IR/BW * ATc or ATnc * DY

Risk = Intake * CSF or /RfD

Where:	INPUTS
C = contaminant concentration in soil (mg/kg)	
CF = conversion for kg to mg	1E-06
EF = child exposure frequency (days/yr)	350
ED = child exposure duration (yr)	6
IR = child soil ingestion rate (mg/day)	200
BW = child 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
RfD = reference dose (mg/kg-day)	specific

COPC	Concentration (mg/kg)	Exposure Frequency (days/yr) Child	Exposure Duration (yr) Child	Conversion Factor (kg/mg)	Ingestion Rate (mg/day) Child	Body Weight (kg) Child	Average Carc Time (days)	Carc Dose (mg/kg/day) Child	Slope Factor (mg/kg/day)-1	Carcinogenic Risk Child	Percent Carcinogenic Risk Child	Average Noncarc Time (days)	Noncarc Dose (mg/kg/day) Child	Reference Dose (mg/kg/day)	Noncarcinogenic Risk Child	Percent Noncarcinogenic Risk Child
Aluminum	11112.40	350	6	1E-06	200	15	25550	1.2E-02	0.00E+00	0.00E+00	0%	2190	1.4E-01	1.00E+00	1.4E-01	16%
Arsenic	3.45	350	6	1E-06	200	15	25550	3.8E-06	1.50E+00	5.68E-06	100%	2190	4.4E-05	3.00E-04	1.5E-01	16%
Copper	191.27	350	6	1E-06	200	15	25550	2.1E-04	0.00E+00	0.00E+00	0%	2190	2.4E-03	4.00E-02	6.1E-02	7%
Iron	12930.25	350	6	1E-06	200	15	25550	1.4E-02	0.00E+00	0.00E+00	0%	2190	1.7E-01	3.00E-01	5.5E-01	61%
TOTAL										5.7E-06					9.0E-01	

SEDIMENT INGESTION EXPOSURE ASSESSMENT
OPERABLE UNIT NO. 6 (SITE 44)
REMEDIAL INVESTIGATION CTO-0303
MCB CAMP LEJEUNE, NORTH CAROLINA
FUTURE RESIDENTIAL CHILD

Intake from ingestion of sediment is calculated as follows:

Intake (mg/kg-day) = C * IR * CF * EF * ED/ BW * ATC or ATnc * DY

Risk = Intake * CSF or /RfD

Where:	INPUTS
C = contaminant concentration in sediment (mg/kg)	
CF = conversion for kg to mg	1E-06
EF = exposure frequency for child (days/yr)	45
ED = exposure duration for child (yr)	6
IR = soil ingestion rate for child (mg/day)	200
BW = body weight for child (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
RfD = reference dose (mg/kg-day)	Specific

COPC	Concentration (mg/kg)	Exposure Frequency (days/yr) Child	Exposure Duration (yr) Child	Ingestion Rate (mg/day) Child	Conversion Factor (kg/mg)	Body Weight (kg) Child	Average Carc Tim (days)	Carc Dose (mg/kg/day) Child	Slope Factor (mg/kg/day)-1	Carcinogenic Risk Child	Percent Carcinogenic Risk Child	Average Noncarc Time (days)	Noncarc Dose (mg/kg/day) Child	Reference Dose (mg/kg/day)	Noncarcinogenic Risk Child	Percent Noncarcinogeni Risk Child
Acetone	0.290	45	6	200	1E-06	15	25550	4.1E-08	0.0E+00	0.0E+00	0%	2190	4.8E-07	1.0E-01	4.8E-06	0%
Pentachlorophenol	0.667	45	6	200	1E-06	15	25550	9.4E-08	1.2E-01	1.1E-08	2%	2190	1.1E-06	3.0E-02	3.7E-05	0%
Phenanthrene	0.250	45	6	200	1E-06	15	25550	3.5E-08	0.0E+00	0.0E+00	0%	2190	4.1E-07	3.0E-02	1.4E-05	0%
Carbazole	0.079	45	6	200	1E-06	15	25550	1.1E-08	2.0E-02	2.2E-10	0%	2190	1.3E-07	0.0E+00	0.0E+00	0%
Fluoranthene	0.310	45	6	200	1E-06	15	25550	4.4E-08	0.0E+00	0.0E+00	0%	2190	5.1E-07	4.0E-02	1.3E-05	0%
Pyrene	0.297	45	6	200	1E-06	15	25550	4.2E-08	0.0E+00	0.0E+00	0%	2190	4.9E-07	3.0E-02	1.6E-05	0%
Butylbenzylphthalate	0.048	45	6	200	1E-06	15	25550	6.8E-09	0.0E+00	0.0E+00	0%	2190	7.9E-08	2.0E-01	3.9E-07	0%
Benzo(a)anthracene	0.170	45	6	200	1E-06	15	25550	2.4E-08	7.3E-01	1.7E-08	3%	2190	2.8E-07	0.0E+00	0.0E+00	0%
Chrysene	0.311	45	6	200	1E-06	15	25550	4.4E-08	7.3E-03	3.2E-10	0%	2190	5.1E-07	0.0E+00	0.0E+00	0%
Bis(2-ethylhexyl)phthalate	0.434	45	6	200	1E-06	15	25550	6.1E-08	1.4E-02	8.6E-10	0%	2190	7.1E-07	2.0E-02	3.6E-05	0%
Benzo(b)fluoranthene	0.320	45	6	200	1E-06	15	25550	4.5E-08	7.3E-01	3.3E-08	5%	2190	5.3E-07	0.0E+00	0.0E+00	0%
Benzo(k)fluoranthene	0.200	45	6	200	1E-06	15	25550	2.8E-08	7.3E-02	2.1E-09	0%	2190	3.3E-07	0.0E+00	0.0E+00	0%
Benzo(a)pyrene	0.286	45	6	200	1E-06	15	25550	4.0E-08	7.3E+00	2.9E-07	44%	2190	4.7E-07	0.0E+00	0.0E+00	0%
Benzo(g,h,i)perylene	0.071	45	6	200	1E-06	15	25550	1.0E-08	0.0E+00	0.0E+00	0%	2190	1.2E-07	3.0E-02	3.9E-06	0%
Aldrin	0.002	45	6	200	1E-06	15	25550	2.1E-10	1.7E+01	3.6E-09	1%	2190	2.5E-09	3.0E-05	8.3E-05	0%
Heptachlor epoxide	0.002	45	6	200	1E-06	15	25550	2.6E-10	9.1E+00	2.4E-09	0%	2190	3.1E-09	1.3E-05	2.3E-04	1%
4,4'-DDE	0.100	45	6	200	1E-06	15	25550	1.4E-08	3.4E-01	4.8E-09	1%	2190	1.6E-07	0.0E+00	0.0E+00	0%
4,4'-DDD	0.332	45	6	200	1E-06	15	25550	4.7E-08	2.4E-01	1.1E-08	2%	2190	5.5E-07	0.0E+00	0.0E+00	0%
4,4'-DDT	0.020	45	6	200	1E-06	15	25550	2.8E-09	3.4E-01	9.7E-10	0%	2190	3.3E-08	5.0E-04	6.6E-05	0%
alpha-Chlordane	0.006	45	6	200	1E-06	15	25550	8.1E-10	1.3E+00	1.1E-09	0%	2190	9.5E-09	6.0E-05	1.6E-04	0%
gamma-Chlordane	0.007	45	6	200	1E-06	15	25550	9.6E-10	1.3E+00	1.2E-09	0%	2190	1.1E-08	6.0E-05	1.9E-04	0%
Aluminum	5225.890	45	6	200	1E-06	15	25550	7.4E-04	0.0E+00	0.0E+00	0%	2190	8.6E-03	1.0E+00	8.6E-03	20%
Arsenic	1.026	45	6	200	1E-06	15	25550	1.4E-07	1.5E+00	2.2E-07	32%	2190	1.7E-06	3.0E-04	5.6E-03	13%
Barium	17.652	45	6	200	1E-06	15	25550	2.5E-06	0.0E+00	0.0E+00	0%	2190	2.9E-05	7.0E-02	4.1E-04	1%
Beryllium	0.120	45	6	200	1E-06	15	25550	1.7E-08	4.3E+00	7.3E-08	11%	2190	2.0E-07	5.0E-03	4.0E-05	0%
Cadmium (soil)	0.607	45	6	200	1E-06	15	25550	8.6E-08	0.0E+00	0.0E+00	0%	2190	1.0E-06	1.0E-03	1.0E-03	2%
Chromium	6.378	45	6	200	1E-06	15	25550	9.0E-07	0.0E+00	0.0E+00	0%	2190	1.0E-05	5.0E-03	2.1E-03	5%
Cobalt	0.418	45	6	200	1E-06	15	25550	5.9E-08	0.0E+00	0.0E+00	0%	2190	6.9E-07	6.0E-02	1.1E-05	0%
Copper	4.017	45	6	200	1E-06	15	25550	5.7E-07	0.0E+00	0.0E+00	0%	2190	6.6E-06	4.0E-02	1.7E-04	0%
Iron	3939.070	45	6	200	1E-06	15	25550	5.6E-04	0.0E+00	0.0E+00	0%	2190	6.5E-03	3.0E-01	2.2E-02	50%
Lead	31.914	45	6	200	1E-06	15	25550	4.5E-06	0.0E+00	0.0E+00	0%	2190	5.2E-05	0.0E+00	0.0E+00	0%
Manganese (soil)	9.795	45	6	200	1E-06	15	25550	1.4E-06	0.0E+00	0.0E+00	0%	2190	1.6E-05	1.4E-01	1.2E-04	0%
Nickel	2.786	45	6	200	1E-06	15	25550	3.9E-07	0.0E+00	0.0E+00	0%	2190	4.6E-06	2.0E-02	2.3E-04	1%
Selenium	0.526	45	6	200	1E-06	15	25550	7.4E-08	0.0E+00	0.0E+00	0%	2190	8.6E-07	5.0E-03	1.7E-04	0%
Silver	0.292	45	6	200	1E-06	15	25550	4.1E-08	0.0E+00	0.0E+00	0%	2190	4.8E-07	5.0E-03	9.6E-05	0%
Vanadium	8.985	45	6	200	1E-06	15	25550	1.3E-06	0.0E+00	0.0E+00	0%	2190	1.5E-05	7.0E-03	2.1E-03	5%
Zinc	62.169	45	6	200	1E-06	15	25550	8.8E-06	0.0E+00	0.0E+00	0%	2190	1.0E-04	3.0E-01	3.4E-04	1%
TOTAL										6.7E-07					4.3E-02	

SURFACE SOIL INGESTION EXPOSURE ASSESSMENT
OPERABLE UNIT NO. 6 (SITE 44)
REMEDIAL INVESTIGATION CTO-0303
MCB CAMP LEJEUNE, NORTH CAROLINA
CURRENT ADULT TRESPASSER

Intake from ingestion of soil is calculated as follows:

Intake (mg/kg-day) = C * CF * EF * ED * IR/BW * ATc or ATnc * DY

Risk = Intake * CSF or /RfD

Where:	INPUTS
C = contaminant concentration in soil (mg/kg)	
CF = conversion for kg to mg	1E-06
EF = adult exposure frequency (days/yr)	43
ED = adult exposure duration (yr)	30
IR = adult soil ingestion rate (mg/day)	50
BW = adult body weight (kg)	70
ATc = averaging time for carcinogen (yr)	70
ATnc = averaging time for noncarcinogen (yr)	30
DY = days per year (days/year)	365
CSF = cancer slope factor (mg/kg-day)-1	specific
RfD = reference dose (mg/kg-day)	specific

COPC	Concentration (mg/kg)	Exposure Frequency (days/yr) Adult	Exposure Duration (yr) Adult	Conversion Factor (kg/mg)	Ingestion Rate (mg/day) Adult	Body Weight (kg) Adult	Average Carc Tim (days)	Carc Dose (mg/kg/day) Adult	Slope Factor (mg/kg/day)-1	Carcinogenic Risk Adult	Percent Carcinogenic Risk Adult	Average Noncarc Time (days)	Noncarc Dose (mg/kg/day) Adult	Reference Dose (mg/kg/day)	Noncarcinogenic Risk Adult	Percent Noncarcinogenic Risk Adult
Aluminum	11112.40	43	30	1E-06	50	70	25550	4.0E-04	0.0E+00	0.0E+00	0%	10950	9.4E-04	1.0E+00	9.4E-04	16%
Arsenic	3.45	43	30	1E-06	50	70	25550	1.2E-07	1.5E+00	1.9E-07	100%	10950	2.9E-07	3.0E-04	9.7E-04	16%
Copper	191.27	43	30	1E-06	50	70	25550	6.9E-06	0.0E+00	0.0E+00	0%	10950	1.6E-05	4.0E-02	4.0E-04	7%
Iron	12930.25	43	30	1E-06	50	70	25550	4.7E-04	0.0E+00	0.0E+00	0%	10950	1.1E-03	3.0E-01	3.6E-03	61%
TOTAL										1.9E-07					5.9E-03	

SEDIMENT INGESTION EXPOSURE ASSESSMENT
OPERABLE UNIT NO. 6 (SITE 44)
REMEDIAL INVESTIGATION CTO-0303
MCB CAMP LEJEUNE, NORTH CAROLINA
CURRENT ADULT TRESPASSER

Intake from ingestion of sediment is calculated as follows:

Intake (mg/kg-day) = C * IR * CF * EF * ED/ BW * ATC or ATnc * DY

Risk = Intake * CSF or /RfD

Where:	INPUTS
C = contaminant concentration in sediment (mg/kg)	
CF = conversion for kg to mg	1E-06
EF = exposure frequency (days/yr)	45
ED = exposure duration (yr)	30
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)	30
DY = days per year (days/year)	365
CSF = cancer slope factor (mg/kg-day)-1	Specific
RfD = reference dose (mg/kg-day)	Specific

COPC	Concentration (mg/kg)	Exposure Frequency (days/yr)	Exposure Duration (yr)	Ingestion Rate (mg/day)	Conversion Factor (kg/mg)	Body Weight (kg)	Average Carc Tim (days)	Carc Dose (mg/kg/day)	Slope Factor (mg/kg/day)-1	Carcinogeni Risk	Percent Carcinogenic Risk	Average Noncarc Time (days)	Noncarc Dose (mg/kg/day)	Reference Dose (mg/kg/day)	Noncarcinogenic Risk	Percent Noncarcinogeni Risk
Acetone	0.290	45	30	100	1E-06	70	25550	2.2E-08	0.0E+00	0.0E+00	0%	10950	5.1E-08	1.0E-01	5.1E-07	0%
Pentachlorophenol	0.667	45	30	100	1E-06	70	25550	5.0E-08	1.2E-01	6.0E-09	2%	10950	1.2E-07	3.0E-02	3.9E-06	0%
Phenanthrene	0.250	45	30	100	1E-06	70	25550	1.9E-08	0.0E+00	0.0E+00	0%	10950	4.4E-08	3.0E-02	1.5E-06	0%
Carbazole	0.079	45	30	100	1E-06	70	25550	6.0E-09	2.0E-02	1.2E-10	0%	10950	1.4E-08	0.0E+00	0.0E+00	0%
Fluoranthene	0.310	45	30	100	1E-06	70	25550	2.3E-08	0.0E+00	0.0E+00	0%	10950	5.5E-08	4.0E-02	1.4E-06	0%
Pyrene	0.297	45	30	100	1E-06	70	25550	2.2E-08	0.0E+00	0.0E+00	0%	10950	5.2E-08	3.0E-02	1.7E-06	0%
Butylbenzylphthalate	0.048	45	30	100	1E-06	70	25550	3.6E-09	0.0E+00	0.0E+00	0%	10950	8.5E-09	2.0E-01	4.2E-08	0%
Benzo(a)anthracene	0.170	45	30	100	1E-06	70	25550	1.3E-08	7.3E-01	9.4E-09	3%	10950	3.0E-08	0.0E+00	0.0E+00	0%
Chrysene	0.311	45	30	100	1E-06	70	25550	2.3E-08	7.3E-03	1.7E-10	0%	10950	5.5E-08	0.0E+00	0.0E+00	0%
Bis(2-ethylhexyl)phthalate	0.434	45	30	100	1E-06	70	25550	3.3E-08	1.4E-02	4.6E-10	0%	10950	7.6E-08	2.0E-02	3.8E-06	0%
Benzo(b)fluoranthene	0.320	45	30	100	1E-06	70	25550	2.4E-08	7.3E-01	1.8E-08	5%	10950	5.6E-08	0.0E+00	0.0E+00	0%
Benzo(k)fluoranthene	0.200	45	30	100	1E-06	70	25550	1.5E-08	7.3E-02	1.1E-09	0%	10950	3.5E-08	0.0E+00	0.0E+00	0%
Benzo(a)pyrene	0.286	45	30	100	1E-06	70	25550	2.2E-08	7.3E+00	1.6E-07	44%	10950	5.0E-08	0.0E+00	0.0E+00	0%
Benzo(g,h,i)perylene	0.071	45	30	100	1E-06	70	25550	5.4E-09	0.0E+00	0.0E+00	0%	10950	1.3E-08	3.0E-02	4.2E-07	0%
Aldrin	0.002	45	30	100	1E-06	70	25550	1.1E-10	1.7E+01	1.9E-09	1%	10950	2.7E-10	3.0E-05	8.9E-06	0%
Heptachlor epoxide	0.002	45	30	100	1E-06	70	25550	1.4E-10	9.1E+00	1.3E-09	0%	10950	3.3E-10	1.3E-05	2.5E-05	1%
4,4'-DDE	0.100	45	30	100	1E-06	70	25550	7.5E-09	3.4E-01	2.6E-09	1%	10950	1.8E-08	0.0E+00	0.0E+00	0%
4,4'-DDD	0.332	45	30	100	1E-06	70	25550	2.5E-08	2.4E-01	6.0E-09	2%	10950	5.8E-08	0.0E+00	0.0E+00	0%
4,4'-DDT	0.020	45	30	100	1E-06	70	25550	1.5E-09	3.4E-01	5.2E-10	0%	10950	3.6E-09	5.0E-04	7.1E-06	0%
alpha-Chlordane	0.006	45	30	100	1E-06	70	25550	4.3E-10	1.3E+00	5.6E-10	0%	10950	1.0E-09	6.0E-05	1.7E-05	0%
gamma-Chlordane	0.007	45	30	100	1E-06	70	25550	5.1E-10	1.3E+00	6.7E-10	0%	10950	1.2E-09	6.0E-05	2.0E-05	0%
Aluminum	5225.890	45	30	100	1E-06	70	25550	3.9E-04	0.0E+00	0.0E+00	0%	10950	9.2E-04	1.0E+00	9.2E-04	20%
Arsenic	1.026	45	30	100	1E-06	70	25550	7.7E-08	1.5E+00	1.2E-07	32%	10950	1.8E-07	3.0E-04	6.0E-04	13%
Barium	17.652	45	30	100	1E-06	70	25550	1.3E-06	0.0E+00	0.0E+00	0%	10950	3.1E-06	7.0E-02	4.4E-05	1%
Beryllium	0.120	45	30	100	1E-06	70	25550	9.1E-09	4.3E+00	3.9E-08	11%	10950	2.1E-08	5.0E-03	4.2E-06	0%
Cadmium (soil)	0.607	45	30	100	1E-06	70	25550	4.6E-08	0.0E+00	0.0E+00	0%	10950	1.1E-07	1.0E-03	1.1E-04	2%
Chromium	6.378	45	30	100	1E-06	70	25550	4.8E-07	0.0E+00	0.0E+00	0%	10950	1.1E-06	5.0E-03	2.2E-04	5%
Cobalt	0.418	45	30	100	1E-06	70	25550	3.2E-08	0.0E+00	0.0E+00	0%	10950	7.4E-08	6.0E-02	1.2E-06	0%
Copper	4.017	45	30	100	1E-06	70	25550	3.0E-07	0.0E+00	0.0E+00	0%	10950	7.1E-07	4.0E-02	1.8E-05	0%
Iron	3939.070	45	30	100	1E-06	70	25550	3.0E-04	0.0E+00	0.0E+00	0%	10950	6.9E-04	3.0E-01	2.3E-03	50%
Lead	31.914	45	30	100	1E-06	70	25550	2.4E-06	0.0E+00	0.0E+00	0%	10950	5.6E-06	0.0E+00	0.0E+00	0%
Manganese (soil)	9.795	45	30	100	1E-06	70	25550	7.4E-07	0.0E+00	0.0E+00	0%	10950	1.7E-06	1.4E-01	1.2E-05	0%
Nickel	2.786	45	30	100	1E-06	70	25550	2.1E-07	0.0E+00	0.0E+00	0%	10950	4.9E-07	2.0E-02	2.5E-05	1%
Selenium	0.526	45	30	100	1E-06	70	25550	4.0E-08	0.0E+00	0.0E+00	0%	10950	9.3E-08	5.0E-03	1.9E-05	0%
Silver	0.292	45	30	100	1E-06	70	25550	2.2E-08	0.0E+00	0.0E+00	0%	10950	5.1E-08	5.0E-03	1.0E-05	0%
Vanadium	8.985	45	30	100	1E-06	70	25550	6.8E-07	0.0E+00	0.0E+00	0%	10950	1.6E-06	7.0E-03	2.3E-04	5%
Zinc	62.169	45	30	100	1E-06	70	25550	4.7E-06	0.0E+00	0.0E+00	0%	10950	1.1E-05	3.0E-01	3.6E-05	1%
TOTAL										3.6E-07					4.7E-03	

SURFACE SOIL INGESTION EXPOSURE ASSESSMENT
OPERABLE UNIT NO. 6 (SITE 44)
REMEDIAL INVESTIGATION CTO-0303
MCB CAMP LEJEUNE, NORTH CAROLINA
FUTURE RESIDENTIAL ADULT

Intake from ingestion of soil is calculated as follows:

Intake (mg/kg-day) = C * CF * EF * ED * IR/BW * ATc or ATnc * DY

Risk = Intake * CSF or /RfD

Where:		INPUTS
C = contaminant concentration in soil (mg/kg)		
CF = conversion for kg to mg		1E-06
EF = adult exposure frequency (days/yr)		350
ED = adult exposure duration (yr)		30
IR = adult soil ingestion rate (mg/day)		100
BW = adult body weight (kg)		70
ATc = averaging time for carcinogen (yr)		70
ATnc = averaging time for noncarcinogen (yr)		30
DY = days per year (days/year)		365
CSF = cancer slope factor (mg/kg-day)-1	specific	
RfD = reference dose (mg/kg-day)	specific	

COPC	Concentration (mg/kg)	Exposure Frequency (days/yr) Adult	Exposure Duration (yr) Adult	Conversion Factor (kg/mg)	Ingestion Rate (mg/day) Adult	Body Weight (kg) Adult	Average Carc Time (days)	Carc Dose (mg/kg/day) Adult	Slope Factor (mg/kg/day)-1	Carcinogenic Risk Adult	Percent Carcinogenic Risk Adult	Average Noncarc Time (days)	Noncarc Dose (mg/kg/day) Adult	Reference Dose (mg/kg/day)	Noncarcinogenic Risk Adult	Percent Noncarcinogenic Risk Adult
Aluminum	11112.40	350	30	1E-06	100	70	25550	6.5E-03	0.0E+00	0.00E+00	0%	10950	1.5E-02	1.0E+00	1.5E-02	16%
Arsenic	3.45	350	30	1E-06	100	70	25550	2.0E-06	1.5E+00	3.04E-06	100%	10950	4.7E-06	3.0E-04	1.6E-02	16%
Copper	191.27	350	30	1E-06	100	70	25550	1.1E-04	0.0E+00	0.00E+00	0%	10950	2.6E-04	4.0E-02	6.6E-03	7%
Iron	12930.25	350	30	1E-06	100	70	25550	7.6E-03	0.0E+00	0.00E+00	0%	10950	1.8E-02	3.0E-01	5.9E-02	61%
TOTAL										3.0E-06					9.7E-02	

SEDIMENT INGESTION EXPOSURE ASSESSMENT
OPERABLE UNIT NO. 6 (SITE 44)
REMEDIAL INVESTIGATION CTO-0303
MCB CAMP LEJEUNE, NORTH CAROLINA
FUTURE RESIDENTIAL ADULT

Intake from ingestion of sediment is calculated as follows:

Intake (mg/kg-day) = C * IR * CF * EF * ED/ BW * ATC or ATnc * DY

Risk = Intake * CSF or /RfD

Where:	INPUTS
C = contaminant concentration in sediment (mg/kg)	
CF = conversion for kg to mg	1E-06
EF = exposure frequency (days/yr)	45
ED = exposure duration (yr)	30
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)	30
DY = days per year (days/year)	365
CSF = cancer slope factor (mg/kg-day)-1	Specific
RfD = reference dose (mg/kg-day)	Specific

COPC	Concentration (mg/kg)	Exposure Frequency (days/yr)	Exposure Duration (yr)	Ingestion Rate (mg/day)	Conversion Factor (kg/mg)	Body Weight (kg)	Average Carc Time (days)	Carc Dose (mg/kg/day)	Slope Factor (mg/kg/day)-1	Carcinogenic Risk	Percent Carcinogenic Risk	Average Noncarc Time (days)	Noncarc Dose (mg/kg/day)	Reference Dose (mg/kg/day)	Noncarcinogenic Risk	Percent Noncarcinogenic Risk
Acetone	0.290	45	30	100	1E-06	70	25550	2.2E-08	0.0E+00	0.0E+00	0%	10950	5.1E-08	1.0E-01	5.1E-07	0%
Pentachlorophenol	0.667	45	30	100	1E-06	70	25550	5.0E-08	1.2E-01	6.0E-09	2%	10950	1.2E-07	3.0E-02	3.9E-06	0%
Phenanthrene	0.250	45	30	100	1E-06	70	25550	1.9E-08	0.0E+00	0.0E+00	0%	10950	4.4E-08	3.0E-02	1.5E-06	0%
Carbazole	0.079	45	30	100	1E-06	70	25550	6.0E-09	2.0E-02	1.2E-10	0%	10950	1.4E-08	0.0E+00	0.0E+00	0%
Fluoranthene	0.310	45	30	100	1E-06	70	25550	2.3E-08	0.0E+00	0.0E+00	0%	10950	5.5E-08	4.0E-02	1.4E-06	0%
Pyrene	0.297	45	30	100	1E-06	70	25550	2.2E-08	0.0E+00	0.0E+00	0%	10950	5.2E-08	3.0E-02	1.7E-06	0%
Butylbenzylphthalate	0.048	45	30	100	1E-06	70	25550	3.6E-09	0.0E+00	0.0E+00	0%	10950	8.5E-09	2.0E-01	4.2E-08	0%
Benzo(a)anthracene	0.170	45	30	100	1E-06	70	25550	1.3E-08	7.3E-01	9.4E-09	3%	10950	3.0E-08	0.0E+00	0.0E+00	0%
Chrysene	0.311	45	30	100	1E-06	70	25550	2.3E-08	7.3E-03	1.7E-10	0%	10950	5.5E-08	0.0E+00	0.0E+00	0%
Bis(2-ethylhexyl)phthalate	0.434	45	30	100	1E-06	70	25550	3.3E-08	1.4E-02	4.6E-10	0%	10950	7.6E-08	2.0E-02	3.8E-06	0%
Benzo(b)fluoranthene	0.320	45	30	100	1E-06	70	25550	2.4E-08	7.3E-01	1.8E-08	5%	10950	5.6E-08	0.0E+00	0.0E+00	0%
Benzo(k)fluoranthene	0.200	45	30	100	1E-06	70	25550	1.5E-08	7.3E-02	1.1E-09	0%	10950	3.5E-08	0.0E+00	0.0E+00	0%
Benzo(a)pyrene	0.286	45	30	100	1E-06	70	25550	2.2E-08	7.3E+00	1.6E-07	44%	10950	5.0E-08	0.0E+00	0.0E+00	0%
Benzo(g,h,i)perylene	0.071	45	30	100	1E-06	70	25550	5.4E-09	0.0E+00	0.0E+00	0%	10950	1.3E-08	3.0E-02	4.2E-07	0%
Aldrin	0.002	45	30	100	1E-06	70	25550	1.1E-10	1.7E+01	1.9E-09	1%	10950	2.7E-10	3.0E-05	8.9E-06	0%
Heptachlor epoxide	0.002	45	30	100	1E-06	70	25550	1.4E-10	9.1E+00	1.3E-09	0%	10950	3.3E-10	1.3E-05	2.5E-05	1%
4,4'-DDE	0.100	45	30	100	1E-06	70	25550	7.5E-09	3.4E-01	2.6E-09	1%	10950	1.8E-08	0.0E+00	0.0E+00	0%
4,4'-DDD	0.332	45	30	100	1E-06	70	25550	2.5E-08	2.4E-01	6.0E-09	2%	10950	5.8E-08	0.0E+00	0.0E+00	0%
4,4'-DDT	0.020	45	30	100	1E-06	70	25550	1.5E-09	3.4E-01	5.2E-10	0%	10950	3.6E-09	5.0E-04	7.1E-06	0%
alpha-Chlordane	0.006	45	30	100	1E-06	70	25550	4.3E-10	1.3E+00	5.6E-10	0%	10950	1.0E-09	6.0E-05	1.7E-05	0%
gamma-Chlordane	0.007	45	30	100	1E-06	70	25550	5.1E-10	1.3E+00	6.7E-10	0%	10950	1.2E-09	6.0E-05	2.0E-05	0%
Aluminum	5225.890	45	30	100	1E-06	70	25550	3.9E-04	0.0E+00	0.0E+00	0%	10950	9.2E-04	1.0E+00	9.2E-04	20%
Arsenic	1.026	45	30	100	1E-06	70	25550	7.7E-08	1.5E+00	1.2E-07	32%	10950	1.8E-07	3.0E-04	6.0E-04	13%
Barium	17.652	45	30	100	1E-06	70	25550	1.3E-06	0.0E+00	0.0E+00	0%	10950	3.1E-06	7.0E-02	4.4E-05	1%
Beryllium	0.120	45	30	100	1E-06	70	25550	9.1E-09	4.3E+00	3.9E-08	11%	10950	2.1E-08	5.0E-03	4.2E-06	0%
Cadmium (soil)	0.607	45	30	100	1E-06	70	25550	4.6E-08	0.0E+00	0.0E+00	0%	10950	1.1E-07	1.0E-03	1.1E-04	2%
Chromium	6.378	45	30	100	1E-06	70	25550	4.8E-07	0.0E+00	0.0E+00	0%	10950	1.1E-06	5.0E-03	2.2E-04	5%
Cobalt	0.418	45	30	100	1E-06	70	25550	3.2E-08	0.0E+00	0.0E+00	0%	10950	7.4E-08	6.0E-02	1.2E-06	0%
Copper	4.017	45	30	100	1E-06	70	25550	3.0E-07	0.0E+00	0.0E+00	0%	10950	7.1E-07	4.0E-02	1.8E-05	0%
Iron	3939.070	45	30	100	1E-06	70	25550	3.0E-04	0.0E+00	0.0E+00	0%	10950	6.9E-04	3.0E-01	2.3E-03	50%
Lead	31.914	45	30	100	1E-06	70	25550	2.4E-06	0.0E+00	0.0E+00	0%	10950	5.6E-06	0.0E+00	0.0E+00	0%
Manganese (soil)	9.795	45	30	100	1E-06	70	25550	7.4E-07	0.0E+00	0.0E+00	0%	10950	1.7E-06	1.4E-01	1.2E-05	0%
Nickel	2.786	45	30	100	1E-06	70	25550	2.1E-07	0.0E+00	0.0E+00	0%	10950	4.9E-07	2.0E-02	2.5E-05	1%
Selenium	0.526	45	30	100	1E-06	70	25550	4.0E-08	0.0E+00	0.0E+00	0%	10950	9.3E-08	5.0E-03	1.9E-05	0%
Silver	0.292	45	30	100	1E-06	70	25550	2.2E-08	0.0E+00	0.0E+00	0%	10950	5.1E-08	5.0E-03	1.0E-05	0%
Vanadium	8.985	45	30	100	1E-06	70	25550	6.8E-07	0.0E+00	0.0E+00	0%	10950	1.6E-06	7.0E-03	2.3E-04	5%
Zinc	62.169	45	30	100	1E-06	70	25550	4.7E-06	0.0E+00	0.0E+00	0%	10950	1.1E-05	3.0E-01	3.6E-05	1%
TOTAL										3.6E-07					4.7E-03	

SUBSURFACE SOIL INGESTION EXPOSURE ASSESSMENT
OPERABLE UNIT NO. 6 (SITE 44)
REMEDIAL INVESTIGATION CTO-0303
MCB CAMP LEJEUNE, NORTH CAROLINA
FUTURE CONSTRUCTION WORKER

Intake from ingestion of soil is calculated as follows:

Intake (mg/kg-day) = C * CF * EF * ED * IR/BW * ATc or ATnc * DY

Risk = Intake * CSF or /RfD

Where:	INPUTS
C = contaminant concentration in soil (mg/kg)	
CF = conversion for kg to mg	1E-06
EF = adult exposure frequency (days/yr)	90
ED = adult exposure duration (yr)	1
IR = adult soil ingestion rate (mg/day)	480
BW = adult body weight (kg)	70
ATc = averaging time for carcinogen (yr)	70
ATnc = averaging time for noncarcinogen (yr)	1
DY = days per year (days/year)	365
CSF = cancer slope factor (mg/kg-day)-1	specific
RfD = reference dose (mg/kg-day)	specific

COPC	Concentration Carcinogen (mg/kg)	Exposure Frequency (days/yr) Adult	Exposure Duration (yr) Adult	Conversion Factor (kg/mg)	Ingestion Rate (mg/day) Adult	Body Weight (kg) Adult	Average Carc Time (days)	Carc Dose (mg/kg/day) Adult	Slope Factor (mg/kg/day)-1	Carcinogenic Risk Adult	Percent Carcinogenic Risk Adult	Average Noncarc Time (days)	Noncarc Dose (mg/kg/day) Adult	Reference Dose (mg/kg/day)	Noncarcinogenic Risk Adult	Percent Noncarcinogenic Risk Adult
Aluminum	7678.15	90	1	1E-06	480	70	25550	1.9E-04	0.0E+00	0.0E+00	0%	365	1.3E-02	1.0E+00	1.3E-02	21%
Arsenic	1.73	90	1	1E-06	480	70	25550	4.2E-08	1.5E+00	6.3E-08	100%	365	2.9E-06	3.0E-04	9.8E-03	16%
Iron	6991.68	90	1	1E-06	480	70	25550	1.7E-04	0.0E+00	0.0E+00	0%	365	1.2E-02	3.0E-01	3.9E-02	63%
TOTAL										6.3E-08					6.2E-02	

Computed by: KTW Checked by: RSP Date: 1/96

EXAMPLE DERMAL CONTACT WITH SOIL* CALCULATIONS
OPERABLE UNIT NO. 6
CONTRACT TASK ORDER 0303

Purpose: Estimate intake/risk from dermal contact with soil

$$Intake\ (mg/kg{\cdot}day) = \frac{C \times CF \times SA \times AF \times ABS \times EF \times ED}{BW \times AT}$$

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) - 0.01 organics, 0.001 inorganics
	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:

Carcinogens = Intake (mg/kg·day) x dermally - adjusted CSF $(mg/kg{\cdot}day)^{-1}$
Noncarcinogens = Intake (mg/kg·day)/ dermally - adjusted RfD (mg/kg·day)

Example Carcinogen: Arsenic

$$ntake\ (mg/kg{\cdot}day) = \frac{3.45\ mg/kg \times 1.0E\text{-}06\ kg/mg \times 5{,}800\ cm^2/event \times 0.01 \times 1\ mg/cm^2 \times 350\ days/yr \times 30\ yrs}{70\ kg \times 25{,}550\ days}$$

$$= 1.2E\text{-}07$$

Risk = 1.2E-07 mg/kg·day x 7.5 $mg/kg{\cdot}day^{-1}$ = 8.8E-07

Example Noncarcinogen: Copper

$$Intake\ (mg/kg{\cdot}day) = \frac{191.27\ mg/kg \times 1.0E\text{-}06\ kg/mg \times 5{,}800\ cm^2/event \times 1\ mg/cm^2 \times 0.01 \times 350\ days/yr \times 30\ yrs}{70\ kg \times 10{,}950\ days}$$

$$= 1.5E\text{-}05$$

$$Risk = \frac{1.5E\text{-}05\ mg/kg{\cdot}day}{8.0E\text{-}03\ mg/kg{\cdot}day} = 1.9E\text{-}03$$

* This example calculation also is applicable for sediment dermal contact.
Re: Site 44 Future Residential Adult

SURFACE SOIL DERMAL CONTACT EXPOSURE ASSESSMENT
OPERABLE UNIT NO. 6 (SITE 36)
REMEDIAL INVESTIGATION CTO-0303
MCB CAMP LEJEUNE, NORTH CAROLINA
CURRENT MILITARY PERSONNEL

Dermal contact with soil is calculated as follows:

Intake (mg/kg-day) = C * CF * SA * AF * Abs * EF * ED/BW * ATc or ATnc * DY

Risk = Intake * CSF or /RfD

Where:	INPUTS
C = contaminant concentration in soil (mg/kg)	
CF = conversion factor (kg/mg)	1E-06
SA = adult exposed skin surface area (cm2)	4300
AF = soil to skin adherence factor (mg/cm2)	1
Abs = fraction absorbed (unitless)	Specific
EF = adult exposure frequency (events/yr)	250
ED = adult exposure duration (years)	4
BW = adult 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

COPC	Concentration Carcinogen (mg/kg)	Conversion Factor (kg/mg)	Surface Area (cm2) Adult	Adherence Factor (mg/cm2)	Fraction Absorbed (%)	Exposure Frequency (events/yr) Adult	Exposure Duration (yrs) Adult	Body Weight (kg) Adult	Average Carc Time (days)	Carc Dose (mg/kg/day) Adult	Dermal Adjust. Slope Factor (mg/kg-day)-1	Carcinogenic Risk Adult	Percent Carcinogenic Risk Adult	Average Noncarc Tim (days)	Noncarc Dose (mg/kg/day) Adult	Dermal Adjust. Reference Dose (mg/kg-day)	Noncarcinogenic Risk Adult	Percent Noncarcinogenic Risk Adult
Aluminum	11112.40	1E-06	4300	1	0.001	250	4	70	25550	2.7E-05	0.00E+00	0.00E+00	0%	1460	4.7E-04	2.00E-01	2.34E-03	16%
Arsenic	3.45	1E-06	4300	1	0.001	250	4	70	25550	8.3E-09	7.50E+00	6.23E-08	100%	1460	1.5E-07	6.00E-05	2.42E-03	16%
Copper	191.27	1E-06	4300	1	0.001	250	4	70	25550	4.6E-07	0.00E+00	0.00E+00	0%	1460	8.0E-06	8.00E-03	1.01E-03	7%
Iron	12930.25	1E-06	4300	1	0.001	250	4	70	25550	3.1E-05	0.00E+00	0.00E+00	0%	1460	5.4E-04	6.00E-02	9.07E-03	61%
TOTAL												6.2E-08					1.5E-02	

SURFACE SOIL DERMAL CONTACT EXPOSURE ASSESSMENT
OPERABLE UNIT NO. 6 (SITE 44)
REMEDIAL INVESTIGATION CTO-0303
MCB CAMP LEJEUNE, NORTH CAROLINA
CURRENT CHILD TRESPASSER

Dermal contact with soil is calculated as follows:

Intake (mg/kg-day) = C * CF * SA * AF * Abs * EF * ED/BW * ATc or ATnc * DY

Risk = Intake * CSF or /RfD

Where:	INPUTS
C = contaminant concentration in soil (mg/kg)	
CF = conversion factor (kg/mg)	1E-06
SA = child exposed skin surface area (cm2)	2000
AF = soil to skin adherence factor (mg/cm2)	1
Abs = fraction absorbed (unitless)	Specific
EF = child exposure frequency (events/yr)	130
ED = child exposure duration (years)	6
BW = child 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

COPC	Concentration (mg/kg)	Conversion Factor (kg/mg)	Surface Area (cm2) Child	Adherence Factor (mg/cm2)	Fraction Absorbed (%)	Exposure Frequency (events/yr) Child	Exposure Duration (yrs) Child	Body Weight (kg) Child	Average Carc Time (days)	Carc Dose (mg/kg/day) Child	Dermal Adjust. Slope Factor (mg/kg-day)-1	Carcinogenic Risk Child	Percent Carcinogenic Risk Child	Average Noncarc Time (days)	Noncarc Dose (mg/kg/day) Child	Dermal Adjust. Reference Dose (mg/kg-day)	Noncarcinogenic Risk Child	Percent Noncarcinogenic Risk Child
Aluminum	11112.40	1E-06	2000	1	0.001	130	6	15	25550	4.5E-05	0.0E+00	0.00E+00	0%	2190	5.3E-04	2.0E-01	2.64E-03	16%
Arsenic	3.45	1E-06	2000	1	0.001	130	6	15	25550	1.4E-08	7.5E+00	1.05E-07	100%	2190	1.6E-07	6.0E-05	2.73E-03	16%
Copper	191.27	1E-06	2000	1	0.001	130	6	15	25550	7.8E-07	0.0E+00	0.00E+00	0%	2190	9.1E-06	8.0E-03	1.14E-03	7%
Iron	12930.25	1E-06	2000	1	0.001	130	6	15	25550	5.3E-05	0.0E+00	0.00E+00	0%	2190	6.1E-04	6.0E-02	1.02E-02	61%
TOTAL												1.1E-07					1.7E-02	

SEDIMENT DERMAL CONTACT EXPOSURE ASSESSMENT
OPERABLE UNIT NO. 6 (SITE 44)
REMEDIAL INVESTIGATION CTO-0303
MCB CAMP LEJEUNE, NORTH CAROLINA
CURRENT CHILD TRESPASSER

The intake from dermal contact to sediment is calculated as follows:

Intake (mg/kg-day) = C * CF * SA * AF * Abs * EF * ED/BW * ATc or ATnc * DY

Risk = Intake * CSF or /RfD

Where:	INPUTS
C = contaminant concentration in soil (mg/kg)	
CF = conversion factor (kg/mg)	1.00E-06
SA = child exposed skin surface area (cm2)	2000
AF = sediment to skin adherence factor (mg/cm2)	1
Abs = fraction absorbed (unitless) (contaminant specific)	Specific
EF = child exposure frequency (events/yr)	45
ED = child expsosure duration (years)	6
BW = child 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

COPC	Concentration Carcinogen (mg/kg)	Conversion Factor (kg/mg)	Surface Area (cm2) Child	Adherence Factor (mg/cm2)	ABS Factor (%)	Exposure Frequency (events/yr Child	Exposure Duration (yrs) Child	Body Weight (kg) Child	Average Carc Time (days)	Carc Dose (mg/kg/day) Child	Dermal Adjust. Slope Factor (mg/kg-day)-1	Carcinogenic Risk Child	Percent Carcinogenic Risk Child	Average Noncarc Time (days)	Noncarc Dose (mg/kg/day) Child	Dermal Adjust. Reference Dose (mg/kg-day)	Noncarcinogenic Risk Child	Percent Noncarcinogenic Risk Child
Acetone	0.290	1E-06	2000	1	0.01	45	6	15	25550	4.1E-09	0.0E+00	0.0E+00	0%	2190	4.8E-08	8.0E-02	6.0E-07	0%
Pentachlorophenol	0.667	1E-06	2000	1	0.01	45	6	15	25550	9.4E-09	2.4E-01	2.3E-09	2%	2190	1.1E-07	1.5E-02	7.3E-06	0%
Phenanthrene	0.250	1E-06	2000	1	0.01	45	6	15	25550	3.5E-09	0.0E+00	0.0E+00	0%	2190	4.1E-08	1.5E-02	2.7E-06	0%
Carbazole	0.079	1E-06	2000	1	0.01	45	6	15	25550	1.1E-09	4.0E-02	4.5E-11	0%	2190	1.3E-08	0.0E+00	0.0E+00	0%
Fluoranthene	0.310	1E-06	2000	1	0.01	45	6	15	25550	4.4E-09	0.0E+00	0.0E+00	0%	2190	5.1E-08	2.0E-02	2.5E-06	0%
Pyrene	0.297	1E-06	2000	1	0.01	45	6	15	25550	4.2E-09	0.0E+00	0.0E+00	0%	2190	4.9E-08	1.5E-02	3.3E-06	0%
Butylbenzylphthalate	0.048	1E-06	2000	1	0.01	45	6	15	25550	6.8E-10	0.0E+00	0.0E+00	0%	2190	7.9E-09	1.0E-01	7.9E-08	0%
Benzo(a)anthracene	0.170	1E-06	2000	1	0.01	45	6	15	25550	2.4E-09	1.5E+00	3.5E-09	4%	2190	2.8E-08	0.0E+00	0.0E+00	0%
Chrysene	0.311	1E-06	2000	1	0.01	45	6	15	25550	4.4E-09	1.5E-02	6.4E-11	0%	2190	5.1E-08	0.0E+00	0.0E+00	0%
Bis(2-ethylhexyl)phthalate	0.434	1E-06	2000	1	0.01	45	6	15	25550	6.1E-09	2.8E-02	1.7E-10	0%	2190	7.1E-08	1.0E-02	7.1E-06	0%
Benzo(b)fluoranthene	0.320	1E-06	2000	1	0.01	45	6	15	25550	4.5E-09	1.5E+00	6.6E-09	7%	2190	5.3E-08	0.0E+00	0.0E+00	0%
Benzo(k)fluoranthene	0.200	1E-06	2000	1	0.01	45	6	15	25550	2.8E-09	1.5E-01	4.1E-10	0%	2190	3.3E-08	0.0E+00	0.0E+00	0%
Benzo(a)pyrene	0.286	1E-06	2000	1	0.01	45	6	15	25550	4.0E-09	1.5E+01	5.9E-08	64%	2190	4.7E-08	0.0E+00	0.0E+00	0%
Benzo(g,h,i)perylene	0.071	1E-06	2000	1	0.01	45	6	15	25550	1.0E-09	0.0E+00	0.0E+00	0%	2190	1.2E-08	1.5E-02	7.8E-07	0%
Aldrin	0.002	1E-06	2000	1	0.01	45	6	15	25550	2.1E-11	3.4E+01	7.3E-10	1%	2190	2.5E-10	1.5E-05	1.7E-05	1%
Heptachlor epoxide	0.002	1E-06	2000	1	0.01	45	6	15	25550	2.6E-11	1.8E+01	4.8E-10	1%	2190	3.1E-10	6.5E-06	4.7E-05	2%
4,4'-DDE	0.100	1E-06	2000	1	0.01	45	6	15	25550	1.4E-09	6.8E-01	9.6E-10	1%	2190	1.6E-08	0.0E+00	0.0E+00	0%
4,4'-DDD	0.332	1E-06	2000	1	0.01	45	6	15	25550	4.7E-09	4.8E-01	2.2E-09	2%	2190	5.5E-08	0.0E+00	0.0E+00	0%
4,4'-DDT	0.020	1E-06	2000	1	0.01	45	6	15	25550	2.8E-10	6.8E-01	1.9E-10	0%	2190	3.3E-09	2.5E-04	1.3E-05	1%
alpha-Chlordane	0.006	1E-06	2000	1	0.01	45	6	15	25550	8.1E-11	2.6E+00	2.1E-10	0%	2190	9.5E-10	3.0E-05	3.2E-05	1%
gamma-Chlordane	0.007	1E-06	2000	1	0.01	45	6	15	25550	9.6E-11	2.6E+00	2.5E-10	0%	2190	1.1E-09	3.0E-05	3.7E-05	2%
Aluminum	5225.890	1E-06	2000	1	0.001	45	6	15	25550	7.4E-06	0.0E+00	0.0E+00	0%	2190	8.6E-05	2.0E-01	4.3E-04	19%
Arsenic	1.026	1E-06	2000	1	0.001	45	6	15	25550	1.4E-09	7.5E+00	1.1E-08	12%	2190	1.7E-08	6.0E-05	2.8E-04	12%
Barium	17.652	1E-06	2000	1	0.001	45	6	15	25550	2.5E-08	0.0E+00	0.0E+00	0%	2190	2.9E-07	1.4E-02	2.1E-05	1%
Beryllium	0.120	1E-06	2000	1	0.001	45	6	15	25550	1.7E-10	2.1E+01	3.6E-09	4%	2190	2.0E-09	1.0E-03	2.0E-06	0%
Cadmium (soil)	0.607	1E-06	2000	1	0.001	45	6	15	25550	8.6E-10	0.0E+00	0.0E+00	0%	2190	1.0E-08	2.0E-04	5.0E-05	2%
Chromium	6.378	1E-06	2000	1	0.001	45	6	15	25550	9.0E-09	0.0E+00	0.0E+00	0%	2190	1.0E-07	1.0E-03	1.0E-04	5%
Cobalt	0.418	1E-06	2000	1	0.001	45	6	15	25550	5.9E-10	0.0E+00	0.0E+00	0%	2190	6.9E-09	1.2E-02	5.7E-07	0%
Copper	4.017	1E-06	2000	1	0.001	45	6	15	25550	5.7E-09	0.0E+00	0.0E+00	0%	2190	6.6E-08	8.0E-03	8.3E-06	0%
Iron	3939.070	1E-06	2000	1	0.001	45	6	15	25550	5.6E-06	0.0E+00	0.0E+00	0%	2190	6.5E-05	6.0E-02	1.1E-03	47%
Lead	31.914	1E-06	2000	1	0.001	45	6	15	25550	4.5E-08	0.0E+00	0.0E+00	0%	2190	5.2E-07	0.0E+00	0.0E+00	0%
Manganese (soil)	9.795	1E-06	2000	1	0.001	45	6	15	25550	1.4E-08	0.0E+00	0.0E+00	0%	2190	1.6E-07	2.8E-02	5.8E-06	0%
Nickel	2.786	1E-06	2000	1	0.001	45	6	15	25550	3.9E-09	0.0E+00	0.0E+00	0%	2190	4.6E-08	4.0E-03	1.1E-05	0%
Selenium	0.526	1E-06	2000	1	0.001	45	6	15	25550	7.4E-10	0.0E+00	0.0E+00	0%	2190	8.6E-09	1.0E-03	8.6E-06	0%
Silver	0.292	1E-06	2000	1	0.001	45	6	15	25550	4.1E-10	0.0E+00	0.0E+00	0%	2190	4.8E-09	1.0E-03	4.8E-06	0%
Vanadium	8.985	1E-06	2000	1	0.001	45	6	15	25550	1.3E-08	0.0E+00	0.0E+00	0%	2190	1.5E-07	1.4E-03	1.1E-04	5%
Zinc	62.169	1E-06	2000	1	0.001	45	6	15	25550	8.8E-08	0.0E+00	0.0E+00	0%	2190	1.0E-06	6.0E-02	1.7E-05	1%
TOTAL												9.1E-08					2.3E-03	

SURFACE SOIL DERMAL CONTACT EXPOSURE ASSESSMENT
OPERABLE UNIT NO. 6 (SITE 44)
REMEDIAL INVESTIGATION CTO-0303
MCB CAMP LEJEUNE, NORTH CAROLINA
FUTURE RESIDENTIAL CHILD

Dermal contact with soil is calculated as follows:

Intake (mg/kg-day) = C * CF * SA * AF * Abs * EF * ED/BW * ATc or ATnc * DY

Risk = Intake * CSF or /RfD

Where:	INPUTS
C = contaminant concentration in soil (mg/kg)	
CF = conversion factor (kg/mg)	1E-06
SA = child exposed skin surface area (cm2)	2300
AF = soil to skin adherence factor (mg/cm2)	1
Abs = fraction absorbed (unitless)	Specific
EF = child exposure frequency (events/yr)	350
ED = child exposure duration (years)	6
BW = child 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

COPC	Concentration (mg/kg)	Conversion Factor (kg/mg)	Surface Area (cm2) Child	Adherence Factor (mg/cm2)	Fraction Absorbed (%)	Exposure Frequency (events/yr) Child	Exposure Duration (yrs) Child	Body Weight (kg) Child	Average Carc Time (days)	Carc Dose (mg/kg/day) Child	Dermal Adjust. Slope Factor (mg/kg-day)-1	Carcinogenic Risk Child	Percent Carcinogenic Risk Child	Average Noncarc Time (days)	Noncarc Dose (mg/kg/day) Child	Dermal Adjust. Reference Dose (mg/kg-day)	Noncarcinogenic Risk Child	Percent Noncarcinogenic Risk Child
Aluminum	11112.40	1E-06	2300	1	0.001	350	6	15	25550	1.4E-04	0.0E+00	0.00E+00	0%	2190	1.6E-03	2.0E-01	8.2E-03	16%
Arsenic	3.45	1E-06	2300	1	0.001	350	6	15	25550	4.4E-08	7.5E+00	3.27E-07	100%	2190	5.1E-07	6.0E-05	8.5E-03	16%
Copper	191.27	1E-06	2300	1	0.001	350	6	15	25550	2.4E-06	0.0E+00	0.00E+00	0%	2190	2.8E-05	8.0E-03	3.5E-03	7%
Iron	12930.25	1E-06	2300	1	0.001	350	6	15	25550	1.6E-04	0.0E+00	0.00E+00	0%	2190	1.9E-03	6.0E-02	3.2E-02	61%
TOTAL												3.3E-07					5.2E-02	

SEDIMENT DERMAL CONTACT EXPOSURE ASSESSMENT
OPERABLE UNIT NO. 6 (SITE 44)
REMEDIAL INVESTIGATION CTO-0303
MCB CAMP LEJEUNE, NORTH CAROLINA
FUTURE RESIDENTIAL CHILD

The intake from dermal contact to sediment is calculated as follows:

Intake (mg/kg-day) = C * CF * SA * AF * Abs * EF * ED/BW * ATc or ATnc * DY

Risk = Intake * CSF or /RfD

Where:	INPUTS
C = contaminant concentration in soil (mg/kg)	
CF = conversion factor (kg/mg)	1.00E-06
SA = child exposed skin surface area (cm2)	2300
AF = sediment to skin adherence factor (mg/cm2)	1
Abs = fraction absorbed (unitless) (contaminant specific)	Specific
EF = child exposure frequency (events/yr)	45
ED = child expsosure duration (years)	6
BW = child 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

COPC	Concentration Carcinogen (mg/kg)	Conversion Factor (kg/mg)	Surface Area (cm2) Child	Adherence Factor (mg/cm2)	ABS Factor (%)	Exposure Frequency (events/yr) Child	Exposure Duration (yrs) Child	Body Weight (kg) Child	Average Carc Time (days)	Carc Dose (mg/kg/day) Child	Dermal Adjust. Slope Factor (mg/kg-day)-1	Carcinogenic Risk Child	Percent Carcinogenic Risk Child	Average Noncarc Tim (days)	Noncarc Dose (mg/kg/day) Child	Dermal Adjust. Reference Dose (mg/kg-day)	Noncarcinogeni Risk Child	Percent Noncarcinogenic Risk Child
Acetone	0.290	1E-06	2300	1	0.01	45	6	15	25550	4.7E-09	0.0E+00	0.0E+00	0%	2190	5.5E-08	8.0E-02	6.9E-07	0%
Pentachlorophenol	0.667	1E-06	2300	1	0.01	45	6	15	25550	1.1E-08	2.4E-01	2.6E-09	2%	2190	1.3E-07	1.5E-02	8.4E-06	0%
Phenanthrene	0.250	1E-06	2300	1	0.01	45	6	15	25550	4.1E-09	0.0E+00	0.0E+00	0%	2190	4.7E-08	1.5E-02	3.2E-06	0%
Carbazole	0.079	1E-06	2300	1	0.01	45	6	15	25550	1.3E-09	4.0E-02	5.1E-11	0%	2190	1.5E-08	0.0E+00	0.0E+00	0%
Fluoranthene	0.310	1E-06	2300	1	0.01	45	6	15	25550	5.0E-09	0.0E+00	0.0E+00	0%	2190	5.9E-08	2.0E-02	2.9E-06	0%
Pyrene	0.297	1E-06	2300	1	0.01	45	6	15	25550	4.8E-09	0.0E+00	0.0E+00	0%	2190	5.6E-08	1.5E-02	3.7E-06	0%
Butylbenzylphthalate	0.048	1E-06	2300	1	0.01	45	6	15	25550	7.8E-10	0.0E+00	0.0E+00	0%	2190	9.1E-09	1.0E-01	9.1E-08	0%
Benzo(a)anthracene	0.170	1E-06	2300	1	0.01	45	6	15	25550	2.8E-09	1.5E+00	4.0E-09	4%	2190	3.2E-08	0.0E+00	0.0E+00	0%
Chrysene	0.311	1E-06	2300	1	0.01	45	6	15	25550	5.0E-09	1.5E-02	7.4E-11	0%	2190	5.9E-08	0.0E+00	0.0E+00	0%
Bis(2-ethylhexyl)phthalate	0.434	1E-06	2300	1	0.01	45	6	15	25550	7.0E-09	2.8E-02	2.0E-10	0%	2190	8.2E-08	1.0E-02	8.2E-06	0%
Benzo(b)fluoranthene	0.320	1E-06	2300	1	0.01	45	6	15	25550	5.2E-09	1.5E+00	7.6E-09	7%	2190	6.1E-08	0.0E+00	0.0E+00	0%
Benzo(k)fluoranthene	0.200	1E-06	2300	1	0.01	45	6	15	25550	3.2E-09	1.5E-01	4.7E-10	0%	2190	3.8E-08	0.0E+00	0.0E+00	0%
Benzo(a)pyrene	0.286	1E-06	2300	1	0.01	45	6	15	25550	4.6E-09	1.5E+01	6.8E-08	64%	2190	5.4E-08	0.0E+00	0.0E+00	0%
Benzo(g,h,i)perylene	0.071	1E-06	2300	1	0.01	45	6	15	25550	1.2E-09	0.0E+00	0.0E+00	0%	2190	1.3E-08	1.5E-02	8.9E-07	0%
Aldrin	0.002	1E-06	2300	1	0.01	45	6	15	25550	2.5E-11	3.4E+01	8.3E-10	1%	2190	2.9E-10	1.5E-05	1.9E-05	1%
Heptachlor epoxide	0.002	1E-06	2300	1	0.01	45	6	15	25550	3.0E-11	1.8E+01	5.5E-10	1%	2190	3.5E-10	6.5E-06	5.4E-05	2%
4,4'-DDE	0.100	1E-06	2300	1	0.01	45	6	15	25550	1.6E-09	6.8E-01	1.1E-09	1%	2190	1.9E-08	0.0E+00	0.0E+00	0%
4,4'-DDD	0.332	1E-06	2300	1	0.01	45	6	15	25550	5.4E-09	4.8E-01	2.6E-09	2%	2190	6.3E-08	0.0E+00	0.0E+00	0%
4,4'-DDT	0.020	1E-06	2300	1	0.01	45	6	15	25550	3.3E-10	6.8E-01	2.2E-10	0%	2190	3.8E-09	2.5E-04	1.5E-05	1%
alpha-Chlordane	0.006	1E-06	2300	1	0.01	45	6	15	25550	9.3E-11	2.6E+00	2.4E-10	0%	2190	1.1E-09	3.0E-05	3.6E-05	1%
gamma-Chlordane	0.007	1E-06	2300	1	0.01	45	6	15	25550	1.1E-10	2.6E+00	2.9E-10	0%	2190	1.3E-09	3.0E-05	4.3E-05	2%
Aluminum	5225.890	1E-06	2300	1	0.001	45	6	15	25550	8.5E-06	0.0E+00	0.0E+00	0%	2190	9.9E-05	2.0E-01	4.9E-04	19%
Arsenic	1.026	1E-06	2300	1	0.001	45	6	15	25550	1.7E-09	7.5E+00	1.2E-08	12%	2190	1.9E-08	6.0E-05	3.2E-04	12%
Barium	17.652	1E-06	2300	1	0.001	45	6	15	25550	2.9E-08	0.0E+00	0.0E+00	0%	2190	3.3E-07	1.4E-02	2.4E-05	1%
Beryllium	0.120	1E-06	2300	1	0.001	45	6	15	25550	2.0E-10	2.1E+01	4.2E-09	4%	2190	2.3E-09	1.0E-03	2.3E-06	0%
Cadmium (soil)	0.607	1E-06	2300	1	0.001	45	6	15	25550	9.8E-10	0.0E+00	0.0E+00	0%	2190	1.1E-08	2.0E-04	5.7E-05	2%
Chromium	6.378	1E-06	2300	1	0.001	45	6	15	25550	1.0E-08	0.0E+00	0.0E+00	0%	2190	1.2E-07	1.0E-03	1.2E-04	5%
Cobalt	0.418	1E-06	2300	1	0.001	45	6	15	25550	6.8E-10	0.0E+00	0.0E+00	0%	2190	7.9E-09	1.2E-02	6.6E-07	0%
Copper	4.017	1E-06	2300	1	0.001	45	6	15	25550	6.5E-09	0.0E+00	0.0E+00	0%	2190	7.6E-08	8.0E-03	9.5E-06	0%
Iron	3939.070	1E-06	2300	1	0.001	45	6	15	25550	6.4E-06	0.0E+00	0.0E+00	0%	2190	7.4E-05	6.0E-02	1.2E-03	47%
Lead	31.914	1E-06	2300	1	0.001	45	6	15	25550	5.2E-08	0.0E+00	0.0E+00	0%	2190	6.0E-07	0.0E+00	0.0E+00	0%
Manganese (soil)	9.795	1E-06	2300	1	0.001	45	6	15	25550	1.6E-08	0.0E+00	0.0E+00	0%	2190	1.9E-07	2.8E-02	6.6E-06	0%
Nickel	2.786	1E-06	2300	1	0.001	45	6	15	25550	4.5E-09	0.0E+00	0.0E+00	0%	2190	5.3E-08	4.0E-03	1.3E-05	0%
Selenium	0.526	1E-06	2300	1	0.001	45	6	15	25550	8.5E-10	0.0E+00	0.0E+00	0%	2190	9.9E-09	1.0E-03	9.9E-06	0%
Silver	0.292	1E-06	2300	1	0.001	45	6	15	25550	4.7E-10	0.0E+00	0.0E+00	0%	2190	5.5E-09	1.0E-03	5.5E-06	0%
Vanadium	8.985	1E-06	2300	1	0.001	45	6	15	25550	1.5E-08	0.0E+00	0.0E+00	0%	2190	1.7E-07	1.4E-03	1.2E-04	5%
Zinc	62.169	1E-06	2300	1	0.001	45	6	15	25550	1.0E-07	0.0E+00	0.0E+00	0%	2190	1.2E-06	6.0E-02	2.0E-05	1%
TOTAL												1.1E-07					2.6E-03	

SURFACE SOIL DERMAL CONTACT EXPOSURE ASSESSMENT
OPERABLE UNIT NO. 6 (SITE 44)
REMEDIAL INVESTIGATION CTO-0303
MCB CAMP LEJEUNE, NORTH CAROLINA
CURRENT ADULT TRESPASSER

Dermal contact with soil is calculated as follows:

Intake (mg/kg-day) = C * CF * SA * AF * Abs * EF * ED/BW * ATc or ATnc * DY

Risk = Intake * CSF or /RfD

Where:	INPUTS
C = contaminant concentration in soil (mg/kg)	
CF = conversion factor (kg/mg)	1E-06
SA = adult exposed skin surface area (cm2)	5000
AF = soil to skin adherence factor (mg/cm2)	1
Abs = fraction absorbed (unitless)	Specific
EF = adult exposure frequency (events/yr)	43
ED = adult exposure duration (years)	30
BW = adult body weight (kg)	70
ATc = averaging time for carcinogen (yr)	70
ATnc = averaging time for noncarcinogen (yr)	30
DY = day per year (day/yr)	365
CSF = cancer slope factor (mg/kg-day)-1	specific
RfD = reference dose (mg/kg-day)	specific

COPC	Concentration (mg/kg)	Conversion Factor (kg/mg)	Surface Area (cm2) Adult	Adherence Factor (mg/cm2)	Fraction Absorbed (%)	Exposure Frequency (events/yr) Adult	Exposure Duration (yrs) Adult	Body Weight (kg) Adult	Average Carc Time (days)	Carc Dose (mg/kg/day) Adult	Dermal Adjust. Slope Factor (mg/kg-day)-1	Carcinogenic Risk Adult	Percent Carcinogenic Risk Adult	Average Noncarc Time (days)	Noncarc Dose (mg/kg/day) Adult	Dermal Adjust. Reference Dose (mg/kg-day)	Noncarcinogenic Risk Adult	Percent Noncarcinogenic Risk Adult
Aluminum	1.1E+04	1E-06	5000	1	0.001	43	30	70	25550	4.0E-05	0.0E+00	0.0E+00	0%	10950	9.35E-05	2.00E-01	4.68E-04	16%
Arsenic	3.5E+00	1E-06	5000	1	0.001	43	30	70	25550	1.2E-08	7.5E+00	9.3E-08	100%	10950	2.91E-08	6.00E-05	4.85E-04	16%
Copper	1.9E+02	1E-06	5000	1	0.001	43	30	70	25550	6.9E-07	0.0E+00	0.0E+00	0%	10950	1.61E-06	8.00E-03	2.01E-04	7%
Iron	1.3E+04	1E-06	5000	1	0.001	43	30	70	25550	4.7E-05	0.0E+00	0.0E+00	0%	10950	1.09E-04	6.00E-02	1.81E-03	61%
TOTAL												9.3E-08					3.0E-03	

SEDIMENT DERMAL CONTACT EXPOSURE ASSESSMENT
OPERABLE UNIT NO. 6 (SITE 44)
REMEDIAL INVESTIGATION CTO-0303
MCB CAMP LEJEUNE, NORTH CAROLINA
CURRENT ADULT TRESPASSER

The intake from dermal contact to sediment is calculted as follows:

Intake (mg/kg-day) = C * CF * SA * AF * Abs * EF * ED/BW * ATc or ATnc * DY

Risk = Intake * CSF or /RfD

Where:	INPUTS
C = contaminant concentration in soil (mg/kg)	
CF = conversion factor (kg/mg)	1.00E-06
SA = exposed skin surface area (cm2)	5000
AF = sediment to skin adherence factor (mg/cm2)	1
Abs = fraction absorbed (unitless) (contaminant specific)	Specific
EF = exposure frequency (events/yr)	45
ED = exposure duration (years)	30
BW = body weight (kg)	70
ATc = averaging time for carcinogen (yr)	70
ATnc = averaging time for noncarcinogen (yr)	30
DY = day per year (day/yr)	365
CSF = cancer slope factor (mg/kg-day)-1	Specific
RfD = reference dose (mg/kg-day)	Specific

COPC	Concentration (mg/kg)	Conversion Factor (kg/mg)	Surface Area (cm2)	Adherence Factor (mg/cm2)	ABS Factor (%)	Exposure Frequency (events/yr)	Exposure Duration (yrs)	Body Weight (kg)	Average Carc Time (days)	Carc Dose (mg/kg/day)	Dermal Adjust. Slope Factor (mg/kg-day)-1	Carcinogenic Risk	Percent Carcinogenic Risk	Average Noncarc Time (days)	Noncarc Dose (mg/kg/day)	Dermal Adjust. Reference Dose (mg/kg-day)	Noncarcinogeni Risk	Percent Noncarcinogenic Risk
Acetone	0.290	1E-06	5000	1	0.01	45	30	70	25550	1.1E-08	0.0E+00	0.0E+00	0%	10950	2.6E-08	8.0E-02	3.2E-07	0%
Pentachlorophenol	0.667	1E-06	5000	1	0.01	45	30	70	25550	2.5E-08	1.5E-01	3.8E-09	2%	10950	5.9E-08	1.5E-02	3.9E-06	0%
Phenanthrene	0.250	1E-06	5000	1	0.01	45	30	70	25550	9.4E-09	0.0E+00	0.0E+00	0%	10950	2.2E-08	1.5E-02	1.5E-06	0%
Carbazole	0.079	1E-06	5000	1	0.01	45	30	70	25550	3.0E-09	4.0E-02	1.2E-10	0%	10950	7.0E-09	0.0E+00	0.0E+00	0%
Fluoranthene	0.310	1E-06	5000	1	0.01	45	30	70	25550	1.2E-08	0.0E+00	0.0E+00	0%	10950	2.7E-08	2.0E-02	1.4E-06	0%
Pyrene	0.297	1E-06	5000	1	0.01	45	30	70	25550	1.1E-08	0.0E+00	0.0E+00	0%	10950	2.6E-08	1.5E-02	1.7E-06	0%
Butylbenzylphthalate	0.048	1E-06	5000	1	0.01	45	30	70	25550	1.8E-09	0.0E+00	0.0E+00	0%	10950	4.2E-09	1.0E-01	4.2E-08	0%
Benzo(a)anthracene	0.170	1E-06	5000	1	0.01	45	30	70	25550	6.4E-09	1.5E+00	9.4E-09	4%	10950	1.5E-08	0.0E+00	0.0E+00	0%
Chrysene	0.311	1E-06	5000	1	0.01	45	30	70	25550	1.2E-08	1.5E-02	1.7E-10	0%	10950	2.7E-08	0.0E+00	0.0E+00	0%
Bis(2-ethylhexyl)phthalate	0.434	1E-06	5000	1	0.01	45	30	70	25550	1.6E-08	2.8E-02	4.6E-10	0%	10950	3.8E-08	1.0E-02	3.8E-06	0%
Benzo(b)fluoranthene	0.320	1E-06	5000	1	0.01	45	30	70	25550	1.2E-08	1.5E+00	1.8E-08	7%	10950	2.8E-08	0.0E+00	0.0E+00	0%
Benzo(k)fluoranthene	0.200	1E-06	5000	1	0.01	45	30	70	25550	7.5E-09	1.5E-01	1.1E-09	0%	10950	1.8E-08	0.0E+00	0.0E+00	0%
Benzo(a)pyrene	0.286	1E-06	5000	1	0.01	45	30	70	25550	1.1E-08	1.5E+01	1.6E-07	65%	10950	2.5E-08	0.0E+00	0.0E+00	0%
Benzo(g,h,i)perylene	0.071	1E-06	5000	1	0.01	45	30	70	25550	2.7E-09	0.0E+00	0.0E+00	0%	10950	6.3E-09	1.5E-02	4.2E-07	0%
Aldrin	0.002	1E-06	5000	1	0.01	45	30	70	25550	5.7E-11	3.4E+01	1.9E-09	1%	10950	1.3E-10	1.5E-05	8.9E-06	1%
Heptachlor epoxide	0.002	1E-06	5000	1	0.01	45	30	70	25550	7.0E-11	1.8E+01	1.3E-09	1%	10950	1.6E-10	6.5E-06	2.5E-05	2%
4,4'-DDE	0.100	1E-06	5000	1	0.01	45	30	70	25550	3.8E-09	6.8E-01	2.6E-09	1%	10950	8.8E-09	0.0E+00	0.0E+00	0%
4,4'-DDD	0.332	1E-06	5000	1	0.01	45	30	70	25550	1.3E-08	4.8E-01	6.0E-09	2%	10950	2.9E-08	0.0E+00	0.0E+00	0%
4,4'-DDT	0.020	1E-06	5000	1	0.01	45	30	70	25550	7.6E-10	6.8E-01	5.2E-10	0%	10950	1.8E-09	2.5E-04	7.1E-06	1%
alpha-Chlordane	0.006	1E-06	5000	1	0.01	45	30	70	25550	2.2E-10	2.6E+00	5.6E-10	0%	10950	5.1E-10	3.0E-05	1.7E-05	1%
gamma-Chlordane	0.007	1E-06	5000	1	0.01	45	30	70	25550	2.6E-10	2.6E+00	6.7E-10	0%	10950	6.0E-10	3.0E-05	2.0E-05	2%
Aluminum	5225.890	1E-06	5000	1	0.001	45	30	70	25550	2.0E-05	0.0E+00	0.0E+00	0%	10950	4.6E-05	2.0E-01	2.3E-04	19%
Arsenic	1.026	1E-06	5000	1	0.001	45	30	70	25550	3.9E-09	7.5E+00	2.9E-08	12%	10950	9.0E-09	6.0E-05	1.5E-04	12%
Barium	17.652	1E-06	5000	1	0.001	45	30	70	25550	6.7E-08	0.0E+00	0.0E+00	0%	10950	1.6E-07	1.4E-02	1.1E-05	1%
Beryllium	0.120	1E-06	5000	1	0.001	45	30	70	25550	4.5E-10	2.1E+01	9.8E-09	4%	10950	1.1E-09	1.0E-03	1.1E-06	0%
Cadmium (soil)	0.607	1E-06	5000	1	0.001	45	30	70	25550	2.3E-09	0.0E+00	0.0E+00	0%	10950	5.3E-09	2.0E-04	2.7E-05	2%
Chromium	6.378	1E-06	5000	1	0.001	45	30	70	25550	2.4E-08	0.0E+00	0.0E+00	0%	10950	5.6E-08	1.0E-03	5.6E-05	5%
Cobalt	0.418	1E-06	5000	1	0.001	45	30	70	25550	1.6E-09	0.0E+00	0.0E+00	0%	10950	3.7E-09	1.2E-02	3.1E-07	0%
Copper	4.017	1E-06	5000	1	0.001	45	30	70	25550	1.5E-08	0.0E+00	0.0E+00	0%	10950	3.5E-08	8.0E-03	4.4E-06	0%
Iron	3939.070	1E-06	5000	1	0.001	45	30	70	25550	1.5E-05	0.0E+00	0.0E+00	0%	10950	3.5E-05	6.0E-02	5.8E-04	47%
Lead	31.914	1E-06	5000	1	0.001	45	30	70	25550	1.2E-07	0.0E+00	0.0E+00	0%	10950	2.8E-07	0.0E+00	0.0E+00	0%
Manganese (soil)	9.795	1E-06	5000	1	0.001	45	30	70	25550	3.7E-08	0.0E+00	0.0E+00	0%	10950	8.6E-08	2.8E-02	3.1E-06	0%
Nickel	2.786	1E-06	5000	1	0.001	45	30	70	25550	1.1E-08	0.0E+00	0.0E+00	0%	10950	2.5E-08	4.0E-03	6.1E-06	0%
Selenium	0.526	1E-06	5000	1	0.001	45	30	70	25550	2.0E-09	0.0E+00	0.0E+00	0%	10950	4.6E-09	1.0E-03	4.6E-06	0%
Silver	0.292	1E-06	5000	1	0.001	45	30	70	25550	1.1E-09	0.0E+00	0.0E+00	0%	10950	2.6E-09	1.0E-03	2.6E-06	0%
Vanadium	8.985	1E-06	5000	1	0.001	45	30	70	25550	3.4E-08	0.0E+00	0.0E+00	0%	10950	7.9E-08	1.4E-03	5.7E-05	5%
Zinc	62.169	1E-06	5000	1	0.001	45	30	70	25550	2.3E-07	0.0E+00	0.0E+00	0%	10950	5.5E-07	6.0E-02	9.1E-06	1%
TOTAL												2.4E-07					1.2E-03	

SURFACE SOIL DERMAL CONTACT EXPOSURE ASSESSMENT
OPERABLE UNIT NO. 6 (SITE 44)
REMEDIAL INVESTIGATION CTO-0303
MCB CAMP LEJEUNE, NORTH CAROLINA
FUTURE RESIDENTIAL ADULT

Dermal contact with soil is calculated as follows:

Intake (mg/kg-day) = C * CF * SA * AF * Abs * EF * ED/BW * ATc or ATnc * DY

Risk = Intake * CSF or /RfD

Where:	INPUTS
C = contaminant concentration in soil (mg/kg)	
CF = conversion factor (kg/mg)	1E-06
SA = adult exposed skin surface area (cm2)	5800
AF = soil to skin adherence factor (mg/cm2)	1
Abs = fraction absorbed (unitless)	Specific
EF = adult exposure frequency (events/yr)	350
ED = adult exposure duration (years)	30
BW = adult body weight (kg)	70
ATc = averaging time for carcinogen (yr)	70
ATnc = averaging time for noncarcinogen (yr)	30
DY = day per year (day/yr)	365
CSF = cancer slope factor (mg/kg-day)-1	specific
RfD = reference dose (mg/kg-day)	*specific*

COPC	Concentration (mg/kg)	Conversion Factor (kg/mg)	Surface Area (cm2) Adult	Adherence Factor (mg/cm2)	Fraction Absorbed (%)	Exposure Frequency (events/yr) Adult	Exposure Duration (yrs) Adult	Body Weight (kg) Adult	Average Carc Time (days)	Carc Dose (mg/kg/day) Adult	Dermal Adjust. Slope Factor (mg/kg-day)-1	Carcinogenic Risk Adult	Percent Carcinogenic Risk Adult	Average Noncarc Time (days)	Noncarc Dose (mg/kg/day) Adult	Dermal Adjust. Reference Dose (mg/kg-day)	Noncarcinogenic Risk Adult	Percent Noncarcinogenic Risk Adult
Aluminum	11112.40	1E-06	5800	1	0.001	350	30	70	25550	3.8E-04	0.0E+00	0.00E+00	0%	10950	8.8E-04	2.0E-01	4.4E-03	16%
Arsenic	3.45	1E-06	5800	1	0.001	350	30	70	25550	1.2E-07	7.5E+00	8.82E-07	100%	10950	2.7E-07	6.0E-05	4.6E-03	16%
Copper	191.27	1E-06	5800	1	0.001	350	30	70	25550	6.5E-06	0.0E+00	0.00E+00	0%	10950	1.5E-05	8.0E-03	1.9E-03	7%
Iron	12930.25	1E-06	5800	1	0.001	350	30	70	25550	4.4E-04	0.0E+00	0.00E+00	0%	10950	1.0E-03	6.0E-02	1.7E-02	61%
TOTAL												8.8E-07					2.8E-02	

SEDIMENT DERMAL CONTACT EXPOSURE ASSESSMENT
OPERABLE UNIT NO. 6 (SITE 44)
REMEDIAL INVESTIGATION CTO-0303
MCB CAMP LEJEUNE, NORTH CAROLINA
FUTURE RESIDENTIAL ADULT

The intake from dermal contact to sediment is calculated as follows:

Intake (mg/kg-day) = C * CF * SA * AF * Abs * EF * ED/BW * ATc or ATnc * DY

Risk = Intake * CSF or /RfD

Where:	INPUTS
C = contaminant concentration in soil (mg/kg)	
CF = conversion factor (kg/mg)	1.00E-06
SA = exposed skin surface area (cm2)	5800
AF = sediment to skin adherence factor (mg/cm2)	1
Abs = fraction absorbed (unitless) (contaminant specific)	Specific
EF = exposure frequency (events/yr)	45
ED = exposure duration (years)	30
BW = body weight (kg)	70
ATc = averaging time for carcinogen (yr)	70
ATnc = averaging time for noncarcinogen (yr)	30
DY = day per year (day/yr)	365
CSF = cancer slope factor (mg/kg-day)-1	Specific
RfD = reference dose (mg/kg-day)	Specific

COPC	Concentration (mg/kg)	Conversion Factor (kg/mg)	Surface Area (cm2)	Adherence Factor (mg/cm2)	ABS Factor (%)	Exposure Frequency (events/yr)	Exposure Duration (yrs)	Body Weight (kg)	Average Carc Time (days)	Carc Dose (mg/kg/day)	Dermal Adjust. Slope Factor (mg/kg-day)-1	Carcinogenic Risk	Percent Carcinogenic Risk	Average Noncarc Tim (days)	Noncarc Dose (mg/kg/day)	Dermal Adjust. Reference Dose (mg/kg-day)	Noncarcinogenic Risk	Percent Noncarcinogeni Risk
Acetone	0.290	1E-06	5800	1	0.01	45	30	70	25550	1.3E-08	0.0E+00	0.0E+00	0%	10950	3.0E-08	8.0E-02	3.7E-07	0%
Pentachlorophenol	0.667	1E-06	5800	1	0.01	45	30	70	25550	2.9E-08	2.4E-01	7.0E-09	2%	10950	6.8E-08	1.5E-02	4.5E-06	0%
Phenanthrene	0.250	1E-06	5800	1	0.01	45	30	70	25550	1.1E-08	0.0E+00	0.0E+00	0%	10950	2.6E-08	1.5E-02	1.7E-06	0%
Carbazole	0.079	1E-06	5800	1	0.01	45	30	70	25550	3.5E-09	4.0E-02	1.4E-10	0%	10950	8.1E-09	0.0E+00	0.0E+00	0%
Fluoranthene	0.310	1E-06	5800	1	0.01	45	30	70	25550	1.4E-08	0.0E+00	0.0E+00	0%	10950	3.2E-08	2.0E-02	1.6E-06	0%
Pyrene	0.297	1E-06	5800	1	0.01	45	30	70	25550	1.3E-08	0.0E+00	0.0E+00	0%	10950	3.0E-08	1.5E-02	2.0E-06	0%
Butylbenzylphthalate	0.048	1E-06	5800	1	0.01	45	30	70	25550	2.1E-09	0.0E+00	0.0E+00	0%	10950	4.9E-09	1.0E-01	4.9E-08	0%
Benzo(a)anthracene	0.170	1E-06	5800	1	0.01	45	30	70	25550	7.4E-09	1.5E+00	1.1E-08	4%	10950	1.7E-08	0.0E+00	0.0E+00	0%
Chrysene	0.311	1E-06	5800	1	0.01	45	30	70	25550	1.4E-08	1.5E-02	2.0E-10	0%	10950	3.2E-08	0.0E+00	0.0E+00	0%
Bis(2-ethylhexyl)phthalate	0.434	1E-06	5800	1	0.01	45	30	70	25550	1.9E-08	2.8E-02	5.3E-10	0%	10950	4.4E-08	1.0E-02	4.4E-06	0%
Benzo(b)fluoranthene	0.320	1E-06	5800	1	0.01	45	30	70	25550	1.4E-08	1.5E+00	2.0E-08	7%	10950	3.3E-08	0.0E+00	0.0E+00	0%
Benzo(k)fluoranthene	0.200	1E-06	5800	1	0.01	45	30	70	25550	8.8E-09	1.5E-01	1.3E-09	0%	10950	2.0E-08	0.0E+00	0.0E+00	0%
Benzo(a)pyrene	0.286	1E-06	5800	1	0.01	45	30	70	25550	1.3E-08	1.5E+01	1.8E-07	64%	10950	2.9E-08	0.0E+00	0.0E+00	0%
Benzo(g,h,i)perylene	0.071	1E-06	5800	1	0.01	45	30	70	25550	3.1E-09	0.0E+00	0.0E+00	0%	10950	7.3E-09	1.5E-02	4.8E-07	0%
Aldrin	0.002	1E-06	5800	1	0.01	45	30	70	25550	6.6E-11	3.4E+01	2.3E-09	1%	10950	1.5E-10	1.5E-05	1.0E-05	1%
Heptachlor epoxide	0.002	1E-06	5800	1	0.01	45	30	70	25550	6.1E-11	1.8E+01	1.5E-09	1%	10950	1.9E-10	6.5E-06	2.9E-05	2%
4,4'-DDE	0.100	1E-06	5800	1	0.01	45	30	70	25550	4.4E-09	6.8E-01	3.0E-09	1%	10950	1.0E-08	0.0E+00	0.0E+00	0%
4,4'-DDD	0.332	1E-06	5800	1	0.01	45	30	70	25550	1.5E-08	4.8E-01	7.0E-09	2%	10950	3.4E-08	0.0E+00	0.0E+00	0%
4,4'-DDT	0.020	1E-06	5800	1	0.01	45	30	70	25550	8.8E-10	6.8E-01	6.0E-10	0%	10950	2.1E-09	2.5E-04	8.2E-06	1%
alpha-Chlordane	0.006	1E-06	5800	1	0.01	45	30	70	25550	2.5E-10	2.6E+00	6.5E-10	0%	10950	5.9E-10	3.0E-05	2.0E-05	1%
gamma-Chlordane	0.007	1E-06	5800	1	0.01	45	30	70	25550	3.0E-10	2.6E+00	7.7E-10	0%	10950	6.9E-10	3.0E-05	2.3E-05	2%
Aluminum	5225.890	1E-06	5800	1	0.001	45	30	70	25550	2.3E-05	0.0E+00	0.0E+00	0%	10950	5.3E-05	2.0E-01	2.7E-04	19%
Arsenic	1.026	1E-06	5800	1	0.001	45	30	70	25550	4.5E-09	7.5E+00	3.4E-08	12%	10950	1.0E-08	6.0E-05	1.7E-04	12%
Barium	17.652	1E-06	5800	1	0.001	45	30	70	25550	7.7E-08	0.0E+00	0.0E+00	0%	10950	1.8E-07	1.4E-02	1.3E-05	1%
Beryllium	0.120	1E-06	5800	1	0.001	45	30	70	25550	5.3E-10	2.1E+01	1.1E-08	4%	10950	1.2E-09	1.0E-03	1.2E-06	0%
Cadmium (soil)	0.607	1E-06	5800	1	0.001	45	30	70	25550	2.7E-09	0.0E+00	0.0E+00	0%	10950	6.2E-09	2.0E-04	3.1E-05	2%
Chromium	6.378	1E-06	5800	1	0.001	45	30	70	25550	2.8E-08	0.0E+00	0.0E+00	0%	10950	6.5E-08	1.0E-03	6.5E-05	5%
Cobalt	0.418	1E-06	5800	1	0.001	45	30	70	25550	1.8E-09	0.0E+00	0.0E+00	0%	10950	4.3E-09	1.2E-02	3.6E-07	0%
Copper	4.017	1E-06	5800	1	0.001	45	30	70	25550	1.8E-08	0.0E+00	0.0E+00	0%	10950	4.1E-08	8.0E-03	5.1E-06	0%
Iron	3939.070	1E-06	5800	1	0.001	45	30	70	25550	1.7E-05	0.0E+00	0.0E+00	0%	10950	4.0E-05	6.0E-02	6.7E-04	47%
Lead	31.914	1E-06	5800	1	0.001	45	30	70	25550	1.4E-07	0.0E+00	0.0E+00	0%	10950	3.3E-07	0.0E+00	0.0E+00	0%
Manganese (soil)	9.795	1E-06	5800	1	0.001	45	30	70	25550	4.3E-08	0.0E+00	0.0E+00	0%	10950	1.0E-07	2.8E-02	3.6E-06	0%
Nickel	2.788	1E-06	5800	1	0.001	45	30	70	25550	1.2E-08	0.0E+00	0.0E+00	0%	10950	2.8E-08	4.0E-03	7.1E-06	0%
Selenium	0.520	1E-06	5800	1	0.001	45	30	70	25550	2.3E-09	0.0E+00	0.0E+00	0%	10950	5.4E-09	1.0E-03	5.4E-06	0%
Silver	0.292	1E-06	5800	1	0.001	45	30	70	25550	1.3E-09	0.0E+00	0.0E+00	0%	10950	3.0E-09	1.0E-03	3.0E-06	0%
Vanadium	8.985	1E-06	5800	1	0.001	45	30	70	25550	3.9E-08	0.0E+00	0.0E+00	0%	10950	9.2E-08	1.4E-03	6.6E-05	5%
Zinc	62.169	1E-06	5800	1	0.001	45	30	70	25550	2.7E-07	0.0E+00	0.0E+00	0%	10950	6.4E-07	6.0E-02	1.1E-05	1%
TOTAL												2.8E-07					1.4E-03	

SUBSURFACE SOIL DERMAL CONTACT EXPOSURE ASSESSMENT
OPERABLE UNIT NO. 6 (SITE 44)
REMEDIAL INVESTIGATION CTO-0303
MCB CAMP LEJEUNE, NORTH CAROLINA
FUTURE CONSTRUCTION WORKER

Dermal contact with soil is calculated as follows:

Intake (mg/kg-day) = C * CF * SA * AF * Abs * EF * ED/BW * ATc or ATnc * DY

Risk = Intake * CSF or /RfD

Where:	INPUTS
C = contaminant concentration in soil (mg/kg)	
CF = conversion factor (kg/mg)	1E-06
SA = adult exposed skin surface area (cm2)	4300
AF = soil to skin adherence factor (mg/cm2)	1
Abs = fraction absorbed (unitless)	Specific
EF = adult exposure frequency (events/yr)	90
ED = adult exposure duration (years)	1
BW = adult body weight (kg)	70
ATc = averaging time for carcinogen (yr)	70
ATnc = averaging time for noncarcinogen (yr)	1
DY = day per year (day/yr)	365
CSF = cancer slope factor (mg/kg-day)-1	specific
RfD = reference dose (mg/kg-day)	specific

COPC	Concentration Carcinogen (mg/kg)	Conversion Factor (kg/mg)	Surface Area (cm2) Adult	Adherence Factor (mg/cm2)	Fraction Absorbed (%)	Exposure Frequency (events/yr) Adult	Exposure Duration (yrs) Adult	Body Weight (kg) Adult	Average Carc Time (days)	Carc Dose (mg/kg/day) Adult	Dermal Adjust. Slope Factor (mg/kg-day)-1	Carcinogenic Risk Adult	Percent Carcinogenic Risk Adult	Average Noncarc Time (days)	Noncarc Dose (mg/kg/day) Adult	Dermally-Adjusted Reference Dose (mg/kg-day)	Noncarcinogenic Risk Adult	Percent Noncarcinogenic Risk Adult
Aluminum	7678.15	1E-06	4300	1	0.001	90	1	70	25550	1.7E-06	0.0E+00	0.0E+00	0%	365	1.2E-04	2.0E-01	5.8E-04	21%
Arsenic	1.73	1E-06	4300	1	0.001	90	1	70	25550	3.7E-10	7.5E+00	2.8E-09	100%	365	2.6E-08	6.0E-05	4.4E-04	16%
Iron	6991.68	1E-06	4300	1	0.001	90	1	70	25550	1.5E-06	0.0E+00	0.0E+00	0%	365	1.1E-04	6.0E-02	1.8E-03	63%
TOTAL												2.8E-09					2.8E-03	

Computed by: KTW Checked by: RSP Date: 1/96

EXAMPLE INHALATION OF PARTICULATES CALCULATIONS
OPERABLE UNIT NO. 6
CONTRACT TASK ORDER 0303

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 $(mg/kg{\cdot}day)^{-1}$
Noncarcinogens = Intake (mg/kg·day)/RfD (mg/kg·day)

Example Carcinogen: Arsenic

$$Intake\ (mg/kg{\cdot}day) = \frac{3.45\ mg/kg \times 20\ m^3/day \times 350\ days/yr \times 30\ yrs \times 1/1.3E{+}09\ m^3/kg}{70\ kg \times 25{,}550\ days}$$

$$= 3.1E\text{-}10$$

Risk = 3.1E-10 mg/kg·day x 15.1 $mg/kg{\cdot}day^{-1}$ = 4.6E-09

Example Noncarcinogen: No noncarcinogenic COPCs with inhalation RfDs.

SURFACE SOIL PARTICULATE INHALATION EXPOSURE ASSESSMENT
OPERABLE UNIT NO. 6 (SITE 44)
REMEDIAL INVESTIGATION CTO-0303
MCB CAMP LEJEUNE, NORTH CAROLINA
CURRENT MILITARY PERSONNEL

Intake from the inhalation of particulates is calculated as follows:

Intake (mg/kg-day) = (C * EF * ED * IR * 1/PEF)/(BW * ATc or ATnc * DY)

Risk = Intake * CSF 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)	30
EF = adult exposure frequency (days)	250
ED = adult exposure duration (years)	4
BW = adult 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)	1.32E+09

COPC	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 Tim (days)	Carc Dose (mg/kg/day)	Slope Factor (mg/kg-day)-1	Carcinogenic Risk	Percent Contribution to Risk	Average Noncarc Time (days)	Noncarc Dose (mg/kg/day)	Reference Dose (mg/kg-day)	Noncarcinogenic Risk	Percent Noncarcinogenic Risk
Aluminum	11112.40	1.3E+09	250	30	4	70	25550	1.4E-07	0.0E+00	0.0E+00	0%	1460	2.5E-06	0.0E+00	0.0E+00	0%
Arsenic	3.45	1.3E+09	250	30	4	70	25550	4.4E-11	1.5E+01	6.6E-10	100%	1460	7.7E-10	0.0E+00	0.0E+00	0%
Copper	191.27	1.3E+09	250	30	4	70	25550	2.4E-09	0.0E+00	0.0E+00	0%	1460	4.3E-08	0.0E+00	0.0E+00	0%
Iron	12930.25	1.3E+09	250	30	4	70	25550	1.6E-07	0.0E+00	0.0E+00	0%	1460	2.9E-06	0.0E+00	0.0E+00	0%
TOTAL										6.6E-10					0.0E+00	

SURFACE SOIL PARTICULATE INHALATION EXPOSURE ASSESSMENT
OPERABLE UNIT NO. 6 (SITE 44)
REMEDIAL INVESTIGATION CTO-0303
MCB CAMP LEJEUNE, NORTH CAROLINA
CURRENT CHILD TRESPASSER

Intake from the inhalation of particulates is calculated as follows:

Intake (mg/kg-day) = (C * EF * ED * IR * 1/PEF)/(BW * ATc or ATnc * DY)

Risk = Intake * CSF 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)	15
EF = child exposure frequency (days)	130
ED = child exposure duration (years)	6
BW = child 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)	1.32E+09

COPC	Concentration (mg/kg)	Particulate Emission Factor (m3/kg)	Exposure Frequency (events/yr)	Inhalation Rate (m3/day)	Exposure Duration (yrs)	Body Weight (kg)	Average Carc Time (days)	Carc Dose (mg/kg/day)	Slope Factor (mg/kg-day)-1	Carcinogenic Risk	Percent Contribution to Risk	Average Noncarc Time (days)	Noncarc Dose (mg/kg/day)	Reference Dose (mg/kg-day)	Noncarcinogenic Risk	Percent Noncarcinogenic Risk
Aluminum	11112.40	1.3E+09	130	15	6	15	25550	2.6E-07	0.0E+00	0.0E+00	0%	2190	3.0E-06	0.0E+00	0.0E+00	0%
Arsenic	3.45	1.3E+09	130	15	6	15	25550	8.0E-11	1.5E+01	1.2E-09	100%	2190	9.3E-10	0.0E+00	0.0E+00	0%
Copper	191.27	1.3E+09	130	15	6	15	25550	4.4E-09	0.0E+00	0.0E+00	0%	2190	5.2E-08	0.0E+00	0.0E+00	0%
Iron	12930.25	1.3E+09	130	15	6	15	25550	3.0E-07	0.0E+00	0.0E+00	0%	2190	3.5E-06	0.0E+00	0.0E+00	0%
TOTAL										1.2E-09					0.0E+00	

SURFACE SOIL PARTICULATE INHALATION EXPOSURE ASSESSMENT
OPERABLE UNIT NO. 6 (SITE 44)
REMEDIAL INVESTIGATION CTO-0303
MCB CAMP LEJEUNE, NORTH CAROLINA
FUTURE RESIDENTIAL CHILD

Intake from the inhalation of particulates is calculated as follows:

Intake (mg/kg-day) = (C * EF * ED * IR * 1/PEF)/(BW * ATc or ATnc * DY)

Risk = Intake * CSF 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)	15
EF = child exposure frequency (days)	350
ED = child exposure duration (years)	6
BW = child 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)	1.32E+09

COPC	Concentration (mg/kg)	Particulate Emission Factor (m3/kg)	Exposure Frequency (events/yr)	Inhalation Rate (m3/day)	Exposure Duration (yrs)	Body Weight (kg)	Average Carc Time (days)	Carc Dose (mg/kg/day)	Slope Factor (mg/kg-day)-1	Carcinogenic Risk	Percent Contribution to Risk	Average Noncarc Time (days)	Noncarc Dose (mg/kg/day)	Reference Dose (mg/kg-day)	Noncarcinogenic Risk	Percent Noncarcinogenic Risk
Aluminum	11112.40	1.3E+09	350	15	6	15	25550	6.9E-07	0.0E+00	0.0E+00	0%	2190	8.1E-06	0.0E+00	0.0E+00	0%
Arsenic	3.45	1.3E+09	350	15	6	15	25550	2.2E-10	1.5E+01	3.2E-09	100%	2190	2.5E-09	0.0E+00	0.0E+00	0%
Copper	191.27	1.3E+09	350	15	6	15	25550	1.2E-08	0.0E+00	0.0E+00	0%	2190	1.4E-07	0.0E+00	0.0E+00	0%
Iron	12930.25	1.3E+09	350	15	6	15	25550	8.1E-07	0.0E+00	0.0E+00	0%	2190	9.4E-06	0.0E+00	0.0E+00	0%
TOTAL										3.2E-09					0.0E+00	

SURFACE SOIL PARTICULATE INHALATION EXPOSURE ASSESSMENT
OPERABLE UNIT NO. 6 (SITE 44)
REMEDIAL INVESTIGATION CTO-0303
MCB CAMP LEJEUNE, NORTH CAROLINA
CURRENT ADULT TRESPASSER

Intake from the inhalation of particulates is calculated as follows:

Intake (mg/kg-day) = (C * EF * ED * IR * 1/PEF)/(BW * ATc or ATnc * DY)

Risk = Intake * CSF or /RfD

Where:	INPUTS
C = contaminant concentration in soil (mg/kg)	Specific
CSF = carcinogenic slope factor	Specific
RfD = reference dose for noncarcinogen	Specific
IR = inhalation rate (m3)	20
EF = adult exposure frequency (days)	43
ED = adult exposure duration (years)	30
BW = adult body weight (kg)	70
ATc = averaging time for carcinogen (yr)	70
ATnc = averaging time for noncarcinogen (yr)	30
DY = day per year (day/yr)	365
PEF = particulate emission factor (m3/kg)	1.32E+09

COPC	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 Tim (days)	Carc Dose (mg/kg/day)	Slope Factor (mg/kg-day)-1	Carcinogenic Risk	Percent Contribution to Risk	Average Noncarc Time (days)	Noncarc Dose (mg/kg/day)	Reference Dose (mg/kg-day)	Noncarcinogenic Risk	Percent Noncarcinogenic Risk
Aluminum	11112.40	1.3E+09	43	20	30	70	25550	1.2E-07	0.0E+00	0.00E+00	0%	10950	2.8E-07	0.0E+00	0.0E+00	0%
Arsenic	3.45	1.3E+09	43	20	30	70	25550	3.8E-11	1.5E+01	5.70E-10	100%	10950	8.8E-11	0.0E+00	0.0E+00	0%
Copper	191.27	1.3E+09	43	20	30	70	25550	2.1E-09	0.0E+00	0.00E+00	0%	10950	4.9E-09	0.0E+00	0.0E+00	0%
Iron	12930.25	1.3E+09	43	20	30	70	25550	1.4E-07	0.0E+00	0.00E+00	0%	10950	3.3E-07	0.0E+00	0.0E+00	0%
TOTAL										5.7E-10					0.0E+00	

SURFACE SOIL PARTICULATE INHALATION EXPOSURE ASSESSMENT
OPERABLE UNIT NO. 6 (SITE 44)
REMEDIAL INVESTIGATION CTO-0303
MCB CAMP LEJEUNE, NORTH CAROLINA
FUTURE RESIDENTIAL ADULT

Intake from the inhalation of particulates is calculated as follows:

Intake (mg/kg-day) = (C * EF * ED * IR * 1/PEF)/(BW * ATc or ATnc * DY)

Risk = Intake * CSF 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 = adult exposure frequency (days)	350
ED = adult exposure duration (years)	30
BW = adult body weight (kg)	70
ATc = averaging time for carcinogen (yr)	70
ATnc = averaging time for noncarcinogen (yr)	30
DY = day per year (day/yr)	365
PEF = particulate emission factor (m3/kg)	1.32E+09

COPC	Concentration (mg/kg)	Particulate Emission Factor (m3/kg)	Exposure Frequency (events/yr)	Inhalation Rate (m3/day)	Exposure Duration (yrs)	Body Weight (kg)	Average Carc Time (days)	Carc Dose (mg/kg/day)	Slope Factor (mg/kg-day)-1	Carcinogenic Risk	Percent Contribution to Risk	Average Noncarc Time (days)	Noncarc Dose (mg/kg/day)	Reference Dose (mg/kg-day)	Noncarcinogenic Risk	Percent Noncarcinogenic Risk
Aluminum	11112.40	1.3E+09	350	20	30	70	25550	9.9E-07	0.0E+00	0.0E+00	0%	10950	2.3E-06	0.0E+00	0.0E+00	0%
Arsenic	3.45	1.3E+09	350	20	30	70	25550	3.1E-10	1.5E+01	4.6E-09	100%	10950	7.2E-10	0.0E+00	0.0E+00	0%
Copper	191.27	1.3E+09	350	20	30	70	25550	1.7E-08	0.0E+00	0.0E+00	0%	10950	4.0E-08	0.0E+00	0.0E+00	0%
Iron	12930.25	1.3E+09	350	20	30	70	25550	1.2E-06	0.0E+00	0.0E+00	0%	10950	2.7E-06	0.0E+00	0.0E+00	0%
TOTAL										4.6E-09					0.0E+00	

SUBSURFACE SOIL PARTICULATE INHALATION EXPOSURE ASSESSMENT
OPERABLE UNIT NO. 6 (SITE 44)
REMEDIAL INVESTIGATION CTO-0303
MCB CAMP LEJEUNE, NORTH CAROLINA
FUTURE CONSTRUCTION WORKER

Intake from the inhalation of particulates is calculated as follows:

Intake (mg/kg-day) = (C * EF * ED * IR * 1/PEF)/(BW * ATc or ATnc * DY)

Risk = Intake * CSF or /RfD

Where:	INPUTS
C = contaminant concentration in soil (mg/kg)	Specific
CSF = carcinogenic slope factor	Specific
RfD = reference dose for noncarcinogen	Specific
IR = inhalation rate (m3)	20
EF = adult exposure frequency (days)	90
ED = adult exposure duration (years)	1
BW = adult body weight (kg)	70
ATc = averaging time for carcinogen (yr)	70
ATnc = averaging time for noncarcinogen (yr)	1
DY = day per year (day/yr)	365
PEF = particulate emission factor (m3/kg)	1.32E+09

COPC	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 (days)	Carc Dose (mg/kg/day)	Slope Factor (mg/kg-day)-1	Carcinogenic Risk	Percent Contribution to Risk	Average Noncarc Time (days)	Noncarc Dose (mg/kg/day)	Reference Dose (mg/kg-day)	Noncarcinogenic Risk	Percent Noncarcinogenic Risk
Aluminum	7678.15	1.3E+09	90	20	1	70	25550	5.9E-09	0.0E+00	0.0E+00	0%	365	4.1E-07	0.0E+00	0.0E+00	0%
Arsenic	1.73	1.3E+09	90	20	1	70	25550	1.3E-12	1.5E+01	2.0E-11	100%	365	9.2E-11	0.0E+00	0.0E+00	0%
Iron	6991.68	1.3E+09	90	20	1	70	25550	5.3E-09	0.0E+00	0.0E+00	0%	365	3.7E-07	0.0E+00	0.0E+00	0%
TOTAL										2.0E-11					0.0E+00	

Computed by: KTW Checked by: RSP Date: 1/96

EXAMPLE GROUNDWATER INGESTION CALCULATIONS
OPERABLE UNIT NO. 6
CONTRACT TASK ORDER 0303

Purpose: Estimate intake/risk from ingestion of groundwater

$$Intake\ (mg/kg{\cdot}day) = \frac{C \times IR \times EF \times ED}{BW \times AT}$$

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 $(mg/kg{\cdot}day)^{-1}$
Noncarcinogens = Intake (mg/kg·day)/RfD (mg/kg·day)

Example Carcinogen: Vinyl Chloride

$$Intake\ (mg/kg{\cdot}day) = \frac{7.0E{-}03\ mg/L \times 2\ L/day \times 350\ days/yr \times 30\ yrs}{70\ kg \times 25{,}550\ days}$$

$$= 7.7E{-}05$$

Risk = 7.7E-05 mg/kg·day x 1.9 $mg/kg{\cdot}day^{-1}$ = 1.5E-04

Example Noncarcinogen: Arsenic

$$Intake\ (mg/kg{\cdot}day) = \frac{2.0E{-}3\ mg/L \times 2\ L/day \times 350\ days/yr \times 30\ yrs}{70\ kg \times 10{,}950\ days}$$

$$= 4.5E{-}05$$

$$Risk = \frac{4.5E{-}05\ mg/kg{\cdot}day}{3.0E{-}04\ mg/kg{\cdot}day} = 1.5E{-}01$$

GROUNDWATER INGESTION EXPOSURE ASSESSMENT
OPERABLE UNIT NO. 6 (SITE 44)
REMEDIAL INVESTIGATION CTO-0303
MCB CAMP LEJEUNE, NORTH CAROLINA
FUTURE RESIDENTIAL ADULT

Intake from drinking water is calculated as follows:

Intake (mg/kg-day) = C * IRw * EF * ED/BW * AT or ATnc * DY

Risk = Intake * CSF or /RfD

Where:		INPUTS
C = contaminant concentration in water (mg/l)		
IRw = adult daily water ingestion rate (L/Day)		2
EF = adult exposure frequency (days/yr)		350
ED = adult exposure duration (yr)		30
BW = adult 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	
RfD = reference dose (mg/kg-day)	specific	

Shallow and Deep Groundwater

COPC	Concentration (mg/l)	Ingestion Rate (L/day) Adult	Exposure Frequency (day/year) Adult	Exposure Duration (year) Adult	Body Weight (kg) Adult	Average Carc Time (days)	Carc Dose (mg/kg-day) Adult	Slope Factor (mg/kg-day)-1	Carcinogenic Risk Adult	Percent Carcinogenic Risk Adult	Average Noncarc Time (days)	Noncarc Dose (mg/kg-day) Adult	Reference Dose (mg/kg-day)	Noncarcinogenic Risk Adult	Percent Noncarcionogenic Risk Adult
Vinyl Chloride	0.007	2	350	30	70	25550	7.7E-05	1.9E+00	1.5E-04	83%	10950	1.8E-04	0.0E+00	0.0E+00	0%
Carbazole	0.004	2	350	30	70	25550	4.7E-05	2.0E-02	9.4E-07	1%	10950	1.1E-04	0.0E+00	0.0E+00	0%
Arsenic	0.002	2	350	30	70	25550	1.9E-05	1.5E+00	2.9E-05	16%	10950	4.5E-05	3.0E-04	1.5E-01	2%
Iron	72.900	2	350	30	70	25550	8.6E-01	0.0E+00	0.0E+00	0%	10950	2.0E+00	3.0E-01	6.7E+00	98%
TOTAL									1.76E-04					6.81	

GROUNDWATER INGESTION EXPOSURE ASSESSMENT
OPERABLE UNIT NO. 6 (SITE 44)
REMEDIAL INVESTIGATION CTO-0303
MCB CAMP LEJEUNE, NORTH CAROLINA
FUTURE RESIDENTIAL CHILD

Intake from drinking water is calculated as follows:

Intake (mg/kg-day) = C * IRw * EF * ED/BW * AT or ATnc * DY

Risk = Intake * CSF or /RfD

Where:	INPUTS
C = contaminant concentration in water (mg/l)	
IRw = child daily water ingestion rate (L/Day)	1
EF = child exposure frequency (days/yr)	350
ED = child exposure duration (yr)	6
BW = child 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

SHALLOW AND DEEP GROUNDWATER

COPC	Concentration Carcinogen (mg/l)	Ingestion Rate (L/day) Child	Exposure Frequency (day/year) Child	Exposure Duration (year) Child	Body Weight (kg) Child	Average Carc Time (days)	Carc Dose (mg/kg-day) Child	Slope Factor (mg/kg-day)-1	Carcinogenic Risk Child	Percent Carcinogenic Risk Child	Average Noncarc Time (days)	Noncarc Dose (mg/kg-day) Child	Reference Dose (mg/kg-day)	Noncarcinogenic Risk Child	Percent Noncarcinogenic Risk Child
Vinyl Chloride	0.007	1	350	6	15	25550	3.6E-05	1.9E+00	6.8E-05	83%	2190	4.2E-04	0.0E+00	0.0E+00	0%
Carbazole	0.004	1	350	6	15	25550	2.2E-05	2.0E-02	4.4E-07	1%	2190	2.6E-04	0.0E+00	0.0E+00	0%
Arsenic	0.002	1	350	6	15	25550	9.0E-06	1.5E+00	1.3E-05	16%	2190	1.0E-04	3.0E-04	3.5E-01	2%
Iron	72.900	1	350	6	15	25550	4.0E-01	0.0E+00	0.0E+00	0%	2190	4.7E+00	3.0E-01	1.6E+01	98%
TOTAL									8.2E-05					15.9	

Computed by: KTW Checked by: RSP Date: 1/96

EXAMPLE DERMAL CONTACT WITH GROUNDWATER CALCULATIONS
OPERABLE UNIT NO. 6
CONTRACT TASK ORDER 0303

Purpose: Estimate intake/risk from dermal contact with groundwater

$$Intake\ (mg/kg{\cdot}day) = \frac{C \times CF \times SA \times PC \times ET \times EF \times ED}{BW \times AT}$$

Where:	C	=	Contaminant concentration in groundwater (mg/L)
	CF	=	Conversion factor (1 L/1,000 cm^3)
	SA	=	Exposed skin surface available for contact (cm^2)
	PC	=	Chemical-specific dermal permeability constant (cm/hr)
	ET	=	Exposure time (hr/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 $(mg/kg{\cdot}day)^{-1}$
Noncarcinogens = Intake (mg/kg·day)/RfD (mg/kg·day)

Example Carcinogen: Arsenic

$$Intake\ (mg/kgday) = \frac{7.0E{-}03\ mg/L \times 1.0E{-}03\ L/cm^3 \times 23{,}000\ cm^2/event \times 7.3E{-}03\ cm/hr \times 0.25\ hr/day \times 350\ days/yr \times 30\ yrs}{70\ kg \times 25{,}550\ days}$$

$$= 1.6E\text{-}06$$

Risk = 1.6E-06 mg/kg·day x 2.4 $mg/kg{\cdot}day^{-1}$ = 3.8E-06

Example Noncarcinogen: Arsenic

$$Intake\ (mg/kg{\cdot}day) = \frac{2.0E{-}03\ mg/L \times 1.0E{-}03\ L/cm^3 \times 23{,}000\ cm^2/event \times 1.0E{-}03\ cm/hr \times 0.25\ hr/day \times 350\ days/yr \times 30\ yrs}{70\ kg \times 10{,}950\ days}$$

$$= 1.3E\text{-}07$$

$$Risk = \frac{1.3E{-}07\ mg/kg{\cdot}day}{6E{-}05\ mg/kg{\cdot}day} = 2.2E{-}03$$

Re: Site 44 Future Residential Adult

GROUNDWATER DERMAL CONTACT EXPOSURE ASSESSMENT
OPERABLE UNIT NO. 6 (SITE 44)
REMEDIAL INVESTIGATION CTO-0303
MCB CAMP LEJEUNE, NORTH CAROLINA
FUTURE RESIDENTIAL CHILD

Dermal Contact from groundwater is calcuated as follows:

Intake (mg/kg-day) = CW * SA * PC * ET * EF * ED * CF/BW * ATc or ATnc * DY

Risk = Intake * CSF or /RfD

Where:	INPUTS
CW = contaminant concentration in water (mg/l)	
SA = child skin surface available for contact (cm2)	10000
PC = contaminant specific dermal permability (cm/hr)	Specific
ET = child exposure time (hours/day)	0.25
EF = child exposure frequency (days/yr)	350
ED = child exposure duration (years)	6
CF = volumetric conversion factor for water (1liter/1000 cm3)	0.001
BW = child body weight (kg)	15
ATc = averaging time for carcinogen (yr)	70
ATnc = averaging time for noncarcinogen (yr)	6
DY = days per year (days)	365

SHALLOW AND DEEP GROUNDWATER

COPC	Concentration Carcinogen (mg/l)	Surface Area (cm2) Child	Dermal Permeability (cm/hr)	Exposure Time (hours/day) Child	Exposure Frequency (days/yr) Child	Exposure Duration (years) Child	Volumetric Conversion (L/m3)	Body Weight (kg) Child	Averaging Carc Time (days)	Carc Dose (mg/kg-day) Child	Dermal Adjust. Slope Factor (mg/kg-day)-1	Carcinogenic Risk Child	Percent Carcinogenic Risk Child	Average Noncarc Time (days)	Noncarc Dose (mg/kg-day) Child	Dermal. Adjust. Reference Dose (mg/kg-day)	Noncarc Risk Child	Percent Noncarcinogenic Risk Child
Vinyl Chloride	0.007	10000	7.30E-03	0.25	350	6	0.001	15	25550	6.5E-07	2.4E+00	1.6E-06	90%	2190	7.6E-06	0.0E+00	0.0E+00	0%
Carbazole	0.004	10000	1.50E-03	0.25	350	6	0.001	15	25550	8.2E-08	4.0E-02	3.3E-09	0%	2190	9.6E-07	0.0E+00	0.0E+00	0%
Arsenic	0.002	10000	1.00E-03	0.25	350	6	0.001	15	25550	2.2E-08	7.5E+00	1.7E-07	10%	2190	2.6E-07	6.0E-05	4.4E-03	2%
Iron	72.900	10000	1.00E-03	0.25	350	6	0.001	15	25550	1.0E-03	0.0E+00	0.0E+00	0%	2190	1.2E-02	6.0E-02	1.9E-01	98%
TOTAL												1.7E-06					2.0E-01	

GROUNDWATER DERMAL CONTACT EXPOSURE ASSESSMENT
OPERABLE UNIT NO. 6 (SITE 44)
REMEDIAL INVESTIGATION CTO-0303
MCB CAMP LEJEUNE, NORTH CAROLINA
FUTURE RESIDENTIAL ADULT

Dermal Contact from groundwater is calcuated as follows:

Intake (mg/kg-day) = CW * SA * PC * ET * EF * ED * CF/BW * ATc or ATnc * DY

Risk = Intake * CSF or /RfD

Where:	INPUTS
CW = contaminant concentration in water (mg/l)	
SA = adult skin surface available for contact (cm2)	23000
PC = contaminant specific dermal permability (cm/hr)	Specific
ET = adult exposure time (hours/day)	0.25
EF = adult exposure frequency (days/yr)	350
ED = adult exposure duration (years)	30
CF = volumetric conversion factor for water (1liter/1000 cm3)	0.001
BW = adult 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

SHALLOW AND DEEP GROUNDWATER

COPC	Concentration Carcinogen (mg/l)	Surface Area (cm2) Adult	Dermal Permeability (cm/hr)	Exposure Time (hours/day) Adult	Exposure Frequency (days/yr) Adult	Exposure Duration (years) Adult	Volumetric Conversion (L/m3)	Body Weight (kg) Adult	Averaging Carc Time (years)	Carc Dose (mg/kg-day) Adult	Derm. Adj. Slope Factor (mg/kg-day)-1	Carcinogenic Risk Adult	Percent Carcinogenic Risk Adult	Average Noncarc Time (years)	Noncarc Dose (mg/kg-day) Adult	Dermal Adjust. Reference Dose (mg/kg-day)	Noncarc Risk Adult	Percent Noncarcinogenic Risk Adult
Vinyl Chloride	0.007	23000	7.30E-03	0.25	350	30	0.001	70	25550	1.6E-08	2.4E+00	3.8E-08	90%	10950	3.8E-08	0.0E+00	0.0E+00	0%
Carbazole	0.004	23000	1.50E-03	0.25	350	30	0.001	70	25550	2.0E-07	4.0E-02	8.1E-09	0%	10950	4.7E-07	0.0E+00	0.0E+00	0%
Arsenic	0.002	23000	1.00E-03	0.25	350	30	0.001	70	25550	5.5E-08	7.5E+00	4.2E-07	10%	10950	1.3E-07	6.0E-05	2.2E-03	2%
Iron	72.900	23000	1.00E-03	0.25	350	30	0.001	70	25550	2.5E-03	0.0E+00	0.0E+00	0%	10950	5.7E-03	6.0E-02	9.6E-02	98%
TOTAL												4.3E-08					9.8E-02	

Computed by: KTW Checked by: RSP Date: 1/96

EXAMPLE INHALATION OF GROUNDWATER VOLATILES CALCULATIONS
OPERABLE UNIT NO. 6
CONTRACT TASK ORDER 0303

Purpose: Estimate intake/risk from the inhalation of groundwater volatiles

$$Intake\ (mg/kg{\cdot}day) = \frac{C \times EF \times ED}{AT}$$

Where:	C	=	Contaminant concentration in shower air (mg/kg/shower) - Foster Model (Appendix Q)
	EF	=	Exposure frequency (days/year)
	ED	=	Exposure duration (years)
	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: Vinyl Chloride

$$Intake\ (mg/kg{\cdot}day) = \frac{1.3E-04\ mg/kg/shower \times 350\ days/yr \times 30\ yrs}{25{,}550\ days}$$

$$= 5.4E\text{-}05$$

Risk = 5.4E-05 mg/kg·day x 3.0E-01 mg/kg·day^{-1} = 1.6E-05

Example Noncarcinogen: None identified as a COPC

GROUNDWATER INHALATION - RME CASE
OPERABLE UNIT NO. 6 (SITE 44)
REMEDIAL INVESTIGATION CTO-0303
MCB CAMP LEJEUNE, NORTH CAROLINA
FUTURE RESIDENTIAL CHILD

CHILD CHEMICAL	C rme mg/kg/shwr	ED y	EF shwr/y	AT d	ATC d	CDI mg/kg/d	CDIC mg/kg/d	RFDinh mg/kg/d	PFinh (mg/kg/d)^-1	HI	CR	% CONTRIB NC RISK	% CONTRIB CARC RISK
Vinyl Chloride	7.91E-04	6	350	2190	25550	7.6E-04	6.5E-05	0.0E+00	3.0E-01	---	2.0E-05	0%	100%
									TOTAL	0.0E+00	2.0E-05		

GROUNDWATER INHALATION EXPOSURE ASSESSMENT
OPERABLE UNIT NO. 6 (SITE 44)
REMEDIAL INVESTIGATION CTO-0303
MCB CAMP LEJEUNE, NORTH CAROLINA
FUTURE RESIDENTIAL ADULT

ADULT CHEMICAL	C rme mg/kg/shwr	ED y	EF shwr/y	AT d	ATC d	CDI mg/kg/d	CDIC mg/kg/d	RFD mg/kg/d	PF (mg/kg/d)^-1	HI	CR	% CONTRIB NC RISK	% CONTRIB CARC RISK
Vinyl Chloride	1.3E-04		30	350	10950	25550	1.3E-04	5.4E-05	0.0E+00	3.0E-01	---	1.61E-05	0%	100%
										TOTAL	—	1.6E-05		

SHOWER MODEL CALCULATIONS

site 44 groundwater
11-Jan-96

SHRADLEN WK1
SEPT 6, 1991

SHOWER EXPOSURE SCENARIO FOR THE LEACHATE (NONHOT SPOT)
FIRESTONE WOODLAWN LANDFILL, CECIL COUNTY, MARYLAND

CAS No	TARGET COMPOUND LIST CONSTITUENT	OVERALL MASS TRANSFER COEFFICIENT (KL) (cm/hr)	HENRY'S LAW CONSTANT (H) (atm-m3/mol-K)	GAS CONSTANT (R) (at.-m3/ mol-K)	ABSOLUTE TEMP. (T1) (K)	GAS CONST. * ABS. TEMP (RT)	GAS-FILM MASS TRANSF. COEFFICIENT (kg) (cm/hr)	LIQUID-FILM MASS TRANS COEFFICIENT (kl) (cm/hr)	CARBON DIOXIDE TRANS. COEFF. (kl-CO2) (cm/hr)	WATER TRANS. COEFF. (kg-H2O) (cm/hr)	MOLECULAR WEIGHT (gram/mole)	RECIPROCAL OF (kl)	(RT)/ ((H)*(kg))	OVERALL MASS TRANSF. COEFF. TEMP. COMP. (KaL) (cm/hr)	WATER VISCOSITY (AT Ts) (Us) (cp)	WATER VISCOSITY (AT T1) (U1) (cp)	SHOWER WATER TEMP. (Ts) (K)	((T1)*(Us) ((Ts)*(U1)	CONCENTRATION LEAVING SHWR DROPLET Cwd (ug/l)	SHOWER WATER CONCENTRATION Cwo (ug/l)	SHOWER DROPLET DIAMETER d (mm)
Adult (RME)																					
75-01-4	VINYL CHLORIDE (A)	1.67E+01	8.60E-02	8.20E-05	293.0	2.40E-02	1.61E+03	1.68E+01	20.0	3000.0	62.50	5.96E-02	1.74E-04	2.26E+01	0.596	1.002	318.0	5.48E-01	5.29E+00	10.000	1.00
Child (RME)																					
75-01-4	VINYL CHLORIDE (A)	1.67E+01	8.60E-02	8.20E-05	293.0	2.40E-02	1.61E+03	1.68E+01	20.0	3000.0	62.50	5.96E-02	1.74E-04	2.26E+01	0.596	1.002	318.0	5.48E-01	5.29E+00	10.000	1.00

site 44 groundwater
11-Jan-96

SHRADLEN.WK1
SEPT 6, 1991

CAS No.	TARGET COMPOUND LIST CONSTITUENT	SHOWER DROPLET DROP TIME ts (sec)	Kal,*ts	60*d	-[Kal,*ts] /[60*d]	exp [-Kal,*ts/ 60*d]	INDOOR VOC GENERATION RATE (S) (ug/m3-min)	SHOWER WATER FLOW RATE (FR) (liter/min)	SHOWER ROOM AIR VOLUME (SV) (m3)	INDOOR AIR VOC CONC AT TIME t Ca(t) (ug/m3)	AIR EXCHANGE RATE R (min-1)	SHOWER DURATION Ds (min)	TOTAL TIME DURATION t (min)	exp(R(Ds)-	exp(-R(t))	INHALATION EXPOSURE PER SHOWER Enh (mg/kg/shw)	VENTILATION RATE VR (liter/min)	BODY WEIGHT BW (kg)	exp(-R(Dt))	DURATION IN THE SHOWER ROOM Dt (min)	Ds + exp(-RDt)/R	exp[R(Ds-Dt)] /R	(Ds-Dt)	(VR,* SV (BW)(R)(K)
Adult (RME)																								
75-01-4	VINYL CHLORIDE (A)	2 00	4 52E+01	6 00E+01	-7 53E-01	4 7077E-01	8 82E+00	10	6	3 81E+02	0 0083	12	15	4 06E-01	8 83E-01	1 30E-04	10	70	8 83E-01	15	1 184E+02	1 175E+02	-3	1 52E-04
Child (RME)																								
75-01-4	VINYL CHLORIDE (A)	2 00	4 52E+01	6 00E+01	-7 53E-01	4 7077E-01	8 82E+00	10	6	3 81E+02	0 0083	12	15	4 06E-01	8 83E-01	7 91E-04	13	15	8 83E-01	15	1 184E+02	1 175E+02	-3	9 21E-04

Computed by: KTW Checked by: RSP Date: 1/96

EXAMPLE SURFACE WATER INGESTION CALCULATIONS
OPERABLE UNIT NO. 6
CONTRACT TASK ORDER 0303

Purpose: Estimate intake/risk from ingestion of surface water

$$Intake\ (mg/kg{\cdot}day) = \frac{C \times IR \times EF \times ED\ ET}{BW \times AT}$$

Where:	C	=	Contaminant concentration in surface water (mg/L)
	IR	=	Daily intake ingestion rate (kg/meal)
	EF	=	Exposure frequency (meal/year)
	ED	=	Exposure duration (years)
	ET	=	Exposure time (hrs/day)
	BW	=	Body weight (kg)
	AT_c	=	Averaging time carcinogen (days)
	AT_{nc}	=	Averaging time noncarcinogen (days)

Risks:

Carcinogens = Intake (mg/kg·day) x CSF $(mg/kg{\cdot}day)^{-1}$
Noncarcinogens = Intake (mg/kg·day)/RfD (mg/kg·day)

Example Carcinogen: Vinyl Chloride

$$Intake\ (mg/kgday) = \frac{0.018\ mg/L \times 0.005\ L/day \times 45\ days/yr \times 30\ yrs \times 2.6\ hrs/day}{70\ kg \times 25{,}550\ days}$$

$$= 1.8E\text{-}07$$

Risk $= 1.8E\text{-}07\ mg/kg{\cdot}day \times 1.9\ mg/kg{\cdot}day^{-1} = 3.3E\text{-}07$

Example Noncarcinogen: Vanadium

$$Intake\ (mg/kgday) = \frac{0.03\ mg/L \times 0.005\ L/day \times 45\ days/yr \times 30\ yrs \times 2.6\ hrs/day}{70\ kg \times 10{,}950\ days}$$

$$= 6.8E\text{-}07$$

$$Risk = \frac{6.8E\text{-}07\ mg/kgday}{7.0E\text{-}03\ mg/kgday} = 9.8E\text{-}05$$

SURFACE WATER INGESTION EXPOSURE ASSESSMENT
OPERABLE UNIT NO. 6 (SITE 44)
REMEDIAL INVESTIGATION CTO-0303
MCB CAMP LEJEUNE, NORTH CAROLINA
CURRENT CHILD TRESPASSER

The intake from the ingestion of surface water is calculated as follows:

Intake (mg/kg-day) = Cw * CR * ET * EF * ED/BW * ATc or ATnc * DY

Risk = Intake * CSF or /RfD

Where:	INPUT
Cw = contaminant concentration in surface water (mg/l)	
CR = contact rate (Liter/hour)	0.005
ET = child exposure time (hours/event)	2.6
EF = child exposure frequency (events/yr)	45
ED = child exposure duration (yrs)	6
BW = child body weight (kg)	15
ATc = averaging time for carcinogen (yr)	70
ATnc = averaging time for noncarcinogen (yr)	6
DY = days per year (days)	365
CSF = cancer slope factor (mg/kg-day)-1	specific
RfD = reference dose (mg/kg-day)	specific

COPC	Concentration (mg/l)	Contact Rate (l/hour)	Exposure Time (hrs/event) Child	Exposure Frequency (events/yr) Child	Exposure Duration (years) Child	Body Weight (kg) Child	Averaging Carc. Time (days)	Carc Dose (mg/kg-day) Child	Cancer Slope Factor (mg/kg-day)-1	Carcinogenic Risk Child	Percent Carcinogenic Risk Child	Averaging Time Noncarc (days)	Noncarc Dose (mg/kg-day) Child	Reference Dose (mg/kg-day)	Noncarcinogenic Risk Child	Percent Noncarcinogenic Risk Child
Vinyl Chloride	0.018	0.005	2.6	45	6	15	25550	1.6E-07	1.9E+00	3.1E-07	80%	2190	1.9E-06	0.0E+00	0.0E+00	0%
Acetone	0.007	0.005	2.6	45	6	15	25550	6.6E-08	0.0E+00	0.0E+00	0%	2190	7.7E-07	1.0E-01	7.7E-06	0%
1,1-Dichloroethene	0.002	0.005	2.6	45	6	15	25550	1.8E-08	6.0E-01	1.1E-08	3%	2190	2.1E-07	9.0E-03	2.4E-05	1%
1,2-Dichloroethene (total)	0.150	0.005	2.6	45	6	15	25550	1.4E-06	0.0E+00	0.0E+00	0%	2190	1.6E-05	9.0E-03	1.8E-03	45%
Trichloroethene	0.036	0.005	2.6	45	6	15	25550	3.3E-07	1.1E-02	3.7E-09	1%	2190	3.9E-06	6.0E-03	6.5E-04	16%
1,1,2-Trichloroethane	0.001	0.005	2.6	45	6	15	25550	9.2E-09	5.7E-02	5.2E-10	0%	2190	1.1E-07	4.0E-03	2.7E-05	1%
1,1,2,2-Tetrachloroethane	0.035	0.005	2.6	45	6	15	25550	3.2E-07	2.0E-01	6.4E-08	16%	2190	3.8E-06	0.0E+00	0.0E+00	0%
Phenol	0.001	0.005	2.6	45	6	15	25550	9.2E-09	0.0E+00	0.0E+00	0%	2190	1.1E-07	6.0E-01	1.8E-07	0%
Bis(2-ethylhexyl)phthalate	0.003	0.005	2.6	45	6	15	25550	2.7E-08	1.4E-02	3.8E-10	0%	2190	3.2E-07	2.0E-02	1.6E-05	0%
Aluminum	0.509	0.005	2.6	45	6	15	25550	4.7E-06	0.0E+00	0.0E+00	0%	2190	5.4E-05	1.0E+00	5.4E-05	1%
Barium	0.027	0.005	2.6	45	6	15	25550	2.5E-07	0.0E+00	0.0E+00	0%	2190	2.9E-06	7.0E-02	4.1E-05	1%
Copper	0.002	0.005	2.6	45	6	15	25550	2.1E-08	0.0E+00	0.0E+00	0%	2190	2.5E-07	4.0E-02	6.1E-06	0%
Iron	1.860	0.005	2.6	45	6	15	25550	1.7E-05	0.0E+00	0.0E+00	0%	2190	2.0E-04	3.0E-01	6.6E-04	17%
Lead	0.009	0.005	2.6	45	6	15	25550	8.6E-08	0.0E+00	0.0E+00	0%	2190	1.0E-06	0.0E+00	0.0E+00	0%
Manganese (water)	0.148	0.005	2.6	45	6	15	25550	1.4E-06	0.0E+00	0.0E+00	0%	2190	1.6E-05	1.4E-01	1.1E-04	3%
Nickel	0.021	0.005	2.6	45	6	15	25550	1.9E-07	0.0E+00	0.0E+00	0%	2190	2.3E-06	2.0E-02	1.1E-04	3%
Vanadium	0.030	0.005	2.6	45	6	15	25550	2.7E-07	0.0E+00	0.0E+00	0%	2190	3.2E-06	7.0E-03	4.6E-04	11%
Zinc	0.061	0.005	2.6	45	6	15	25550	5.6E-07	0.0E+00	0.0E+00	0%	2190	6.5E-06	3.0E-01	2.2E-05	1%
TOTAL										3.9E-07					4.0E-03	

SURFACE WATER INGESTION EXPOSURE ASSESSMENT
OPERABLE UNIT NO.6 (SITE 44)
REMEDIAL INVESTIGATION CTO-0303
MCB CAMP LEJEUNE, NORTH CAROLINA
FUTURE CHILD RESIDENT

The intake from the ingestion of surface water is calculated as follows:

Intake (mg/kg-day) = Cw * CR * ET * EF * ED/BW * ATc or ATnc * DY

Risk = Intake * CSF or /RfD

Where:	INPUT
Cw = contaminant concentration in surface water (mg/l)	
CR = contact rate (Liter/hour)	0.005
ET = child exposure time (hours/event)	2.6
EF = child exposure frequency (events/yr)	45
ED = child exposure duration (yrs)	6
BW = child body weight (kg)	15
ATc = averaging time for carcinogen (yr)	70
ATnc = averaging time for noncarcinogen (yr)	6
DY = days per year (days)	365
CSF = cancer slope factor (mg/kg-day)-1	specific
RfD = reference dose (mg/kg-day)	specific

COPC	Concentration Carcinogen (mg/l)	Contact Rate (l/hour)	Exposure Time (hrs/event) Child	Exposure Frequency (events/yr) Child	Exposure Duration (years) Child	Body Weight (kg) Child	Averaging Carc. Time (days)	Carc Dose (mg/kg-day) Child	Cancer Slope Factor (mg/kg-day)-1	Carcinogenic Risk Child	Percent Carcinogenic Risk Child	Averaging Time Noncarc (days)	Noncarc Dose (mg/kg-day) Child	Reference Dose (mg/kg-day)	Noncarcinogenic Risk Child	Percent Noncarcinogenic Risk Child
Vinyl Chloride	0.018	0.005	2.6	45	6	15	25550	1.6E-07	1.9E+00	3.1E-07	80%	2190	1.9E-06	0.0E+00	0.0E+00	0%
Acetone	0.007	0.005	2.6	45	6	15	25550	6.6E-08	0.0E+00	0.0E+00	0%	2190	7.7E-07	1.0E-01	7.7E-06	0%
1,1-Dichloroethene	0.002	0.005	2.6	45	6	15	25550	1.8E-08	6.0E-01	1.1E-08	3%	2190	2.1E-07	9.0E-03	2.4E-05	1%
1,2-Dichloroethene (total)	0.150	0.005	2.6	45	6	15	25550	1.4E-06	0.0E+00	0.0E+00	0%	2190	1.6E-05	9.0E-03	1.8E-03	45%
Trichloroethene	0.036	0.005	2.6	45	6	15	25550	3.3E-07	1.1E-02	3.7E-09	1%	2190	3.9E-06	6.0E-03	6.5E-04	16%
1,1,2-Trichloroethane	0.001	0.005	2.6	45	6	15	25550	9.2E-09	5.7E-02	5.2E-10	0%	2190	1.1E-07	4.0E-03	2.7E-05	1%
1,1,2,2-Tetrachloroethane	0.035	0.005	2.6	45	6	15	25550	3.2E-07	2.0E-01	6.4E-08	16%	2190	3.8E-06	0.0E+00	0.0E+00	0%
Phenol	0.001	0.005	2.6	45	6	15	25550	9.2E-09	0.0E+00	0.0E+00	0%	2190	1.1E-07	6.0E-01	1.8E-07	0%
Bis(2-ethylhexyl)phthalate	0.003	0.005	2.6	45	6	15	25550	2.7E-08	1.4E-02	3.8E-10	0%	2190	3.2E-07	2.0E-02	1.6E-05	0%
Aluminum	0.509	0.005	2.6	45	6	15	25550	4.7E-06	0.0E+00	0.0E+00	0%	2190	5.4E-05	1.0E+00	5.4E-05	1%
Barium	0.027	0.005	2.6	45	6	15	25550	2.5E-07	0.0E+00	0.0E+00	0%	2190	2.9E-06	7.0E-02	4.1E-05	1%
Copper	0.002	0.005	2.6	45	6	15	25550	2.1E-08	0.0E+00	0.0E+00	0%	2190	2.5E-07	4.0E-02	6.1E-06	0%
Iron	1.860	0.005	2.6	45	6	15	25550	1.7E-05	0.0E+00	0.0E+00	0%	2190	2.0E-04	3.0E-01	6.6E-04	17%
Lead	0.009	0.005	2.6	45	6	15	25550	8.6E-08	0.0E+00	0.0E+00	0%	2190	1.0E-06	0.0E+00	0.0E+00	0%
Manganese (water)	0.148	0.005	2.6	45	6	15	25550	1.4E-06	0.0E+00	0.0E+00	0%	2190	1.6E-05	1.4E-01	1.1E-04	3%
Nickel	0.021	0.005	2.6	45	6	15	25550	1.9E-07	0.0E+00	0.0E+00	0%	2190	2.3E-06	2.0E-02	1.1E-04	3%
Vanadium	0.030	0.005	2.6	45	6	15	25550	2.7E-07	0.0E+00	0.0E+00	0%	2190	3.2E-06	7.0E-03	4.6E-04	11%
Zinc	0.061	0.005	2.6	45	6	15	25550	5.6E-07	0.0E+00	0.0E+00	0%	2190	6.5E-06	3.0E-01	2.2E-05	1%
TOTAL										3.9E-07					4.0E-03	

SURFACE WATER INGESTION EXPOSURE ASSESSMENT
OPERABLE UNIT NO.6 (SITE 44)
REMEDIAL INVESTIGATION CTO-0303
MCB CAMP LEJEUNE, NORTH CAROLINA
CURRENT ADULT TRESPASSER

The intake from the ingestion of surface water is calculated as follows:

Intake (mg/kg-day) = Cw * CR * ET * EF * ED/BW * ATc or ATnc * DY

Risk = Intake * CSF or /RfD

Where:	INPUT
Cw = contaminant concentration in surface water (mg/l)	
CR = ingestion rate (Liter/hour)	0.005
ET = exposure time (hours/event)	2.6
EF = exposure frequency (events/yr)	45
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
RfD = reference dose (mg/kg day)	specific

COPC	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 (days)	Carc Dose (mg/kg-day)	Cancer Slope Factor (mg/kg-day)-1	Carcinogenic Risk	Percent Carcinogenic Risk	Averaging Time Noncarc. (days)	Noncarc Dose (mg/kg-day)	Reference Dose (mg/kg-day)	Noncarcinogenic Risk	Percent Noncarcinogenic Risk
Vinyl Chloride	0.018	0.005	2.6	45	30	70	25550	1.8E-07	1.9E+00	3.3E-07	80%	10950	4.1E-07	0.0E+00	0.0E+00	0%
Acetone	0.007	0.005	2.6	45	30	70	25550	7.1E-08	0.0E+00	0.0E+00	0%	10950	1.7E-07	1.0E-01	1.7E-06	0%
1,1-Dichloroethene	0.002	0.005	2.6	45	30	70	25550	2.0E-08	6.0E-01	1.2E-08	3%	10950	4.6E-08	9.0E-03	5.1E-06	1%
1,2-Dichloroethene (total)	0.150	0.005	2.6	45	30	70	25550	1.5E-06	0.0E+00	0.0E+00	0%	10950	3.4E-06	9.0E-03	3.8E-04	45%
Trichloroethene	0.036	0.005	2.6	45	30	70	25550	3.6E-07	1.1E-02	3.9E-09	1%	10950	8.3E-07	6.0E-03	1.4E-04	16%
1,1,2-Trichloroethane	0.001	0.005	2.6	45	30	70	25550	9.8E-09	5.7E-02	5.6E-10	0%	10950	2.3E-08	4.0E-03	5.7E-06	1%
1,1,2,2-Tetrachloroethane	0.035	0.005	2.6	45	30	70	25550	3.4E-07	2.0E-01	6.9E-08	16%	10950	8.0E-07	0.0E+00	0.0E+00	0%
Phenol	0.001	0.005	2.6	45	30	70	25550	9.8E-09	0.0E+00	0.0E+00	0%	10950	2.3E-08	6.0E-01	3.8E-08	0%
Bis(2-ethylhexyl)phthalate	0.003	0.005	2.6	45	30	70	25550	2.9E-08	1.4E-02	4.1E-10	0%	10950	6.9E-08	2.0E-02	3.4E-06	0%
Aluminum	0.509	0.005	2.6	45	30	70	25550	5.0E-06	0.0E+00	0.0E+00	0%	10950	1.2E-05	1.0E+00	1.2E-05	1%
Barium	0.027	0.005	2.6	45	30	70	25550	2.7E-07	0.0E+00	0.0E+00	0%	10950	6.2E-07	7.0E-02	8.9E-06	1%
Copper	0.002	0.005	2.6	45	30	70	25550	2.3E-08	0.0E+00	0.0E+00	0%	10950	5.3E-08	4.0E-02	1.3E-06	0%
Iron	1.860	0.005	2.6	45	30	70	25550	1.8E-05	0.0E+00	0.0E+00	0%	10950	4.3E-05	3.0E-01	1.4E-04	17%
Lead	0.009	0.005	2.6	45	30	70	25550	9.2E-08	0.0E+00	0.0E+00	0%	10950	2.1E-07	0.0E+00	0.0E+00	0%
Manganese (water)	0.148	0.005	2.6	45	30	70	25550	1.5E-06	0.0E+00	0.0E+00	0%	10950	3.4E-06	1.4E-01	2.4E-05	3%
Nickel	0.021	0.005	2.6	45	30	70	25550	2.1E-07	0.0E+00	0.0E+00	0%	10950	4.8E-07	2.0E-02	2.4E-05	3%
Vanadium	0.030	0.005	2.6	45	30	70	25550	2.9E-07	0.0E+00	0.0E+00	0%	10950	6.8E-07	7.0E-03	9.8E-05	11%
Zinc	0.061	0.005	2.6	45	30	70	25550	6.0E-07	0.0E+00	0.0E+00	0%	10950	1.4E-06	3.0E-01	4.7E-06	1%
TOTAL										4.2E-07					8.5E-04	

SURFACE WATER INGESTION EXPOSURE ASSESSMENT
OPERABLE UNIT NO.6 (SITE 44)
REMEDIAL INVESTIGATION CTO-0303
MCB CAMP LEJEUNE, NORTH CAROLINA
FUTURE ADULT RESIDENT

The intake from the ingestion of surface water is calculated as follows:

Intake (mg/kg-day) = Cw * CR * ET * EF * ED/BW * ATc or ATnc * DY

Risk = Intake * CSF or /RfD

Where:	INPUT
Cw = contaminant concentration in surface water (mg/l)	
CR = ingestion rate (Liter/hour)	0.005
ET = exposure time (hours/event)	2.6
EF = exposure frequency (events/yr)	45
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
RfD = reference dose (mg/kg-day)	specific

COPC	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 (days)	Carc Dose (mg/kg-da	Cancer Slope Factor (mg/kg-day)-1	Carcinogenic Risk	Percent Carcinogenic Risk	Averaging Tim Noncarc. (days)	Noncarc Dose (mg/kg-day)	Reference Dose (mg/kg-day)	Noncarcinogenic Risk	Percent Noncarcinogenic Risk
Vinyl Chloride	0.018	0.005	2.6	45	30	70	25550	1.8E-07	1.9E+00	3.3E-07	80%	10950	4.1E-07	0.0E+00	0.0E+00	0%
Acetone	0.007	0.005	2.6	45	30	70	25550	7.1E-08	0.0E+00	0.0E+00	0%	10950	1.7E-07	1.0E-01	1.7E-06	0%
1,1-Dichloroethene	0.002	0.005	2.6	45	30	70	25550	2.0E-08	6.0E-01	1.2E-08	3%	10950	4.6E-08	9.0E-03	5.1E-06	1%
1,2-Dichloroethene (total)	0.150	0.005	2.6	45	30	70	25550	1.5E-06	0.0E+00	0.0E+00	0%	10950	3.4E-06	9.0E-03	3.8E-04	45%
Trichloroethene	0.036	0.005	2.6	45	30	70	25550	3.6E-07	1.1E-02	3.9E-09	1%	10950	8.3E-07	6.0E-03	1.4E-04	16%
1,1,2-Trichloroethane	0.001	0.005	2.6	45	30	70	25550	9.8E-09	5.7E-02	5.6E-10	0%	10950	2.3E-08	4.0E-03	5.7E-06	1%
1,1,2,2-Tetrachloroethane	0.035	0.005	2.6	45	30	70	25550	3.4E-07	2.0E-01	6.9E-08	16%	10950	8.0E-07	0.0E+00	0.0E+00	0%
Phenol	0.001	0.005	2.6	45	30	70	25550	9.8E-09	0.0E+00	0.0E+00	0%	10950	2.3E-08	6.0E-01	3.8E-08	0%
Bis(2-ethylhexyl)phthalate	0.003	0.005	2.6	45	30	70	25550	2.9E-08	1.4E-02	4.1E-10	0%	10950	6.9E-08	2.0E-02	3.4E-06	0%
Aluminum	0.509	0.005	2.6	45	30	70	25550	5.0E-06	0.0E+00	0.0E+00	0%	10950	1.2E-05	1.0E+00	1.2E-05	1%
Barium	0.027	0.005	2.6	45	30	70	25550	2.7E-07	0.0E+00	0.0E+00	0%	10950	6.2E-07	7.0E-02	8.9E-06	1%
Copper	0.002	0.005	2.6	45	30	70	25550	2.3E-08	0.0E+00	0.0E+00	0%	10950	5.3E-08	4.0E-02	1.3E-06	0%
Iron	1.860	0.005	2.6	45	30	70	25550	1.8E-05	0.0E+00	0.0E+00	0%	10950	4.3E-05	3.0E-01	1.4E-04	17%
Lead	0.009	0.005	2.6	45	30	70	25550	9.2E-08	0.0E+00	0.0E+00	0%	10950	2.1E-07	0.0E+00	0.0E+00	0%
Manganese (water)	0.148	0.005	2.6	45	30	70	25550	1.5E-06	0.0E+00	0.0E+00	0%	10950	3.4E-06	1.4E-01	2.4E-05	3%
Nickel	0.021	0.005	2.6	45	30	70	25550	2.1E-07	0.0E+00	0.0E+00	0%	10950	4.8E-07	2.0E-02	2.4E-05	3%
Vanadium	0.030	0.005	2.6	45	30	70	25550	2.9E-07	0.0E+00	0.0E+00	0%	10950	6.8E-07	7.0E-03	9.8E-05	11%
Zinc	0.061	0.005	2.6	45	30	70	25550	6.0E-07	0.0E+00	0.0E+00	0%	10950	1.4E-06	3.0E-01	4.7E-06	1%
TOTAL										4.2E-07					8.5E-04	

Computed by: KTW Checked by: RSP Date: 1/96

EXAMPLE SURFACE WATER DERMAL CONTACT CALCULATIONS
OPERABLE UNIT NO. 6
CONTRACT TASK ORDER 0303

Purpose: Estimate intake/risk from dermal contact with surface water

$$Intake\ (mg/kgday) = \frac{C \times SA \times CF \times EF \times ED \times ET \times PC}{BW \times AT}$$

Where:	C	=	Contaminant concentration in surface water (mg/L)
	SA	=	Skin surface area (cm^2)
	CF	=	Conversion factor (1 L/1,000 cm^3)
	EF	=	Exposure frequency (days/year)
	ED	=	Exposure duration (years)
	ET	=	Exposure time (hrs/day)
	PC	=	Chemical-specific dermal permeability constant (cm/hr)
	BW	=	Body weight (kg)
	AT_c	=	Averaging time carcinogen (days)
	AT_{nc}	=	Averaging time noncarcinogen (days)

Risks:

Carcinogens = Intake (mg/kg·day) x CSF $(mg/kg \cdot day)^{-1}$
Noncarcinogens = Intake (mg/kg·day)/RfD (mg/kg·day)

Example Carcinogen: Vinyl Chloride

$$Intake\ (mg/kgday) = \frac{0.018\ mg/L \times 5{,}800\ cm^2 \times 45\ days/yr \times 30\ yrs \times 2.6\ hrs/day\ 1.0E{-}3\ L/cm^3 \times 7.3E{-}03\ cm/hr}{70\ kg \times 25{,}550\ days}$$

$$= 1.5E\text{-}06$$

Risk = 1.5E-06 mg/kg·day x 2.4 $mg/kg \cdot day^{-1}$ = 3.5E-06

Example Noncarcinogen: Vanadium

$$Intake\ (mg/kgday) = \frac{0.03\ mg/L \times 5{,}800\ cm^2 \times 45\ days/yr \times 30\ yrs \times 2.6\ hrs/day\ 1.0E{-}3\ L/cm^3 \times 1E{-}03\ cm/hr}{70\ kg \times 10{,}950\ days}$$

$$= 7.9E\text{-}07$$

$$Risk = \frac{7.9E{-}07\ mg/kgday}{1.4E{-}03\ mg/kgday} = 5.7E{-}04$$

Re: Site 44 Future Residential Adult

SURFACE WATER DERMAL CONTACT EXPOSURE ASSESSMENT
OPERABLE UNIT NO. 6 (SITE 44)
REMEDIAL INVESTIGATION - CTO-0303
MCB CAMP LEJEUNE, NORTH CAROLINA
CURRENT CHILD TRESPASSER

The intake from dermal contact with surface water is calculated as follows:

Intake (mg/kg-day) = Cw * SA * PC * ET * EF * ED * CF/BW * ATc or ATnc * DY

Risk = Intake * CSF or /RfD

Where:	INPUTS
CW = contaminant concentration in water (mg/l)	
SA = child skin surface available for contact (cm2)	2000
PC = contaminant specific dermal permability (cm/hr)	Specific
ET = child exposure time (hours/day)	2.6
EF = child exposure frequency (days/yr)	45
ED = child exposure duration (years)	6
CF = volumetric conversion factor for water (1liter/1000 cm3)	0.001
BW = child body weight (kg)	15
ATc = averaging time for carcinogen (yr)	70
ATnc = averaging time for noncarcinogen (yr)	6
DY = days per year (days)	365
CSF = cancer slope factor (mg/kg-day)-1	Specific
RfD = reference dose (mg/kg-day)	Specific

COPC	Concentration Carcinogen (mg/l)	Surface Area (cm2) Child	Dermal Permeability (cm/hr)	Exposure Time (hours/day) Child	Exposure Frequency (days/yr) Child	Exposure Duration (years) Child	Volumetric Conversion (L/m3)	Body Weight (kg) Child	Averaging Carc Time (days)	Carc Dose (mg/kg-day) Child	Dermal Adjust. Slope Factor (mg/kg-day)-1	Carcinogenic Risk Child	Percent Carcinogenic Risk Child	Average Noncarc Time (days)	Noncarc Dose (mg/kg-day) Child	Dermal Adjust. Reference Dose (mg/kg-day)	Noncarc. Risk Child	Percent Noncarcinogenic Risk Child
Vinyl Chloride	0.018	2000	7.3E-03	2.6	45	6	0.001	15	25550	4.8E-07	2.4E+00	1.1E-06	77%	2190	5.6E-06	0.0E+00	0.0E+00	0%
Acetone	0.007	2000	1.5E-03	2.6	45	6	0.001	15	25550	4.0E-08	0.0E+00	0.0E+00	0%	2190	4.6E-07	8.0E-02	5.8E-06	0%
1,1-Dichloroethene	0.002	2000	1.5E-03	2.6	45	6	0.001	15	25550	1.1E-08	7.5E-01	8.2E-09	1%	2190	1.3E-07	7.2E-03	1.8E-05	0%
1,2-Dichloroethene (total)	0.150	2000	1.0E-02	2.6	45	6	0.001	15	25550	5.5E-06	0.0E+00	0.0E+00	0%	2190	6.4E-05	7.2E-03	8.9E-03	51%
Trichloroethene	0.036	2000	1.6E-02	2.6	45	6	0.001	15	25550	2.1E-06	1.4E-02	2.9E-08	2%	2190	2.5E-05	4.8E-03	5.2E-03	30%
1,1,2-Trichloroethane	0.001	2000	1.7E-02	2.6	45	6	0.001	15	25550	6.1E-08	7.1E-02	4.4E-09	0%	2190	7.1E-07	3.2E-03	2.2E-04	1%
1,1,2,2-Tetrachloroethane	0.035	2000	9.0E-03	2.6	45	6	0.001	15	25550	1.2E-06	2.5E-01	2.9E-07	20%	2190	1.4E-05	0.0E+00	0.0E+00	0%
Phenol	0.001	2000	8.1E-03	2.6	45	6	0.001	15	25550	3.0E-08	0.0E+00	0.0E+00	0%	2190	3.5E-07	3.0E-01	1.2E-06	0%
Bis(2-ethylhexyl)phthalate	0.003	2000	3.3E-02	2.6	45	6	0.001	15	25550	3.6E-07	2.8E-02	1.0E-08	1%	2190	4.2E-06	1.0E-02	4.2E-04	2%
Aluminum	0.509	2000	1.0E-03	2.6	45	6	0.001	15	25550	1.9E-06	0.0E+00	0.0E+00	0%	2190	2.2E-05	2.0E-01	1.1E-04	1%
Barium	0.027	2000	1.0E-03	2.6	45	6	0.001	15	25550	9.9E-08	0.0E+00	0.0E+00	0%	2190	1.2E-06	1.4E-02	8.3E-05	0%
Copper	0.002	2000	1.0E-03	2.6	45	6	0.001	15	25550	8.4E-09	0.0E+00	0.0E+00	0%	2190	9.8E-08	8.0E-03	1.2E-05	0%
Iron	1.860	2000	1.0E-03	2.6	45	6	0.001	15	25550	6.8E-06	0.0E+00	0.0E+00	0%	2190	7.9E-05	6.0E-02	1.3E-03	8%
Lead	0.009	2000	4.0E-06	2.6	45	6	0.001	15	25550	1.4E-10	0.0E+00	0.0E+00	0%	2190	1.6E-09	0.0E+00	0.0E+00	0%
Manganese (water)	0.148	2000	1.0E-03	2.6	45	6	0.001	15	25550	5.4E-07	0.0E+00	0.0E+00	0%	2190	6.3E-06	2.8E-02	2.3E-04	1%
Nickel	0.021	2000	1.0E-04	2.6	45	6	0.001	15	25550	7.7E-09	0.0E+00	0.0E+00	0%	2190	9.0E-08	4.0E-03	2.3E-05	0%
Vanadium	0.030	2000	1.0E-03	2.6	45	6	0.001	15	25550	1.1E-07	0.0E+00	0.0E+00	0%	2190	1.3E-06	1.4E-03	9.1E-04	5%
Zinc	0.061	2000	6.0E-04	2.6	45	6	0.001	15	25550	1.3E-07	0.0E+00	0.0E+00	0%	2190	1.6E-06	6.0E-02	2.6E-05	0%
TOTAL												1.5E-06					1.7E-02	

SURFACE WATER DERMAL CONTACT EXPOSURE ASSESSMENT
OPERABLE UNIT NO. 6 (SITE 44)
REMEDIAL INVESTIGATION - CTO-0303
MCB CAMP LEJEUNE, NORTH CAROLINA
FUTURE CHILD RESIDENT

The intake from dermal contact with surface water is calculated as follows:

Intake (mg/kg-day) = Cw * SA * PC * ET * EF * ED * CF/BW * ATc or ATnc * DY

Risk = Intake * CSF or /RfD

Where:	INPUTS
CW = contaminant concentration in water (mg/l)	
SA = child skin surface available for contact (cm2)	2300
PC = contaminant specific dermal permability (cm/hr)	Specific
ET = child exposure time (hours/day)	2.6
EF = child exposure frequency (days/yr)	45
ED = child exposure duration (years)	6
CF = volumetric conversion factor for water (1liter/1000 cm3)	0.001
BW = child body weight (kg)	15
ATc = averaging time for carcinogen (yr)	70
ATnc = averaging time for noncarcinogen (yr)	6
DY = days per year (days)	365
CSF = cancer slope factor (mg/kg-day)-1	Specific
RfD = reference dose (mg/kg-day)	Specific

COPC	Concentration Carcinogen (mg/l)	Surface Area (cm2) Child	Dermal Permeability (cm/hr)	Exposure Time (hours/day) Child	Exposure Frequency (days/yr) Child	Exposure Duration (years) Child	Volumetric Conversion (L/m3)	Body Weight (kg) Child	Averaging Carc Time (days)	Carc Dose (mg/kg-day) Child	Dermal Adjust. Slope Factor (mg/kg-day)-1	Carcinogenic Risk Child	Percent Carcinogenic Risk Child	Average Noncarc Time (days)	Noncarc Dose (mg/kg-day) Child	Dermal Adjust. Reference Dose (mg/kg-day)	Noncarc. Risk Child	Percent Noncarcinogenic Risk Child
Vinyl Chloride	0.018	2300	7.3E-03	2.6	45	6	0.001	15	25550	5.5E-07	2.4E+00	1.3E-06	77%	2190	6.4E-06	0.0E+00	0.0E+00	0%
Acetone	0.007	2300	1.5E-03	2.6	45	6	0.001	15	25550	4.6E-08	0.0E+00	0.0E+00	0%	2190	5.3E-07	8.0E-02	6.7E-06	0%
1,1-Dichloroethene	0.002	2300	1.5E-03	2.6	45	6	0.001	15	25550	1.3E-08	7.5E-01	9.5E-09	1%	2190	1.5E-07	7.2E-03	2.0E-05	0%
1,2-Dichloroethene (total)	0.150	2300	1.0E-02	2.6	45	6	0.001	15	25550	6.3E-06	0.0E+00	0.0E+00	0%	2190	7.4E-05	7.2E-03	1.0E-02	51%
Trichloroethene	0.036	2300	1.6E-02	2.6	45	6	0.001	15	25550	2.4E-06	1.4E-02	3.4E-08	2%	2190	2.9E-05	4.8E-03	5.9E-03	30%
1,1,2-Trichloroethane	0.001	2300	1.7E-02	2.6	45	6	0.001	15	25550	7.0E-08	7.1E-02	5.0E-09	0%	2190	8.2E-07	3.2E-03	2.6E-04	1%
1,1,2,2-Tetrachloroethane	0.035	2300	9.0E-03	2.6	45	6	0.001	15	25550	1.3E-06	2.5E-01	3.3E-07	20%	2190	1.6E-05	0.0E+00	0.0E+00	0%
Phenol	0.001	2300	8.1E-03	2.6	45	6	0.001	15	25550	3.4E-08	0.0E+00	0.0E+00	0%	2190	4.0E-07	3.0E-01	1.3E-06	0%
Bis(2-ethylhexyl)phthalate	0.003	2300	3.3E-02	2.6	45	6	0.001	15	25550	4.2E-07	2.8E-02	1.2E-08	1%	2190	4.9E-06	1.0E-02	4.9E-04	2%
Aluminum	0.509	2300	1.0E-03	2.6	45	6	0.001	15	25550	2.1E-06	0.0E+00	0.0E+00	0%	2190	2.5E-05	2.0E-01	1.3E-04	1%
Barium	0.027	2300	1.0E-03	2.6	45	6	0.001	15	25550	1.1E-07	0.0E+00	0.0E+00	0%	2190	1.3E-06	1.4E-02	9.5E-05	0%
Copper	0.002	2300	1.0E-03	2.6	45	6	0.001	15	25550	9.7E-09	0.0E+00	0.0E+00	0%	2190	1.1E-07	8.0E-03	1.4E-05	0%
Iron	1.860	2300	1.0E-03	2.6	45	6	0.001	15	25550	7.8E-06	0.0E+00	0.0E+00	0%	2190	9.1E-05	6.0E-02	1.5E-03	8%
Lead	0.009	2300	4.0E-06	2.6	45	6	0.001	15	25550	1.6E-10	0.0E+00	0.0E+00	0%	2190	1.8E-09	0.0E+00	0.0E+00	0%
Manganese (water)	0.148	2300	1.0E-03	2.6	45	6	0.001	15	25550	6.2E-07	0.0E+00	0.0E+00	0%	2190	7.3E-06	2.8E-02	2.6E-04	1%
Nickel	0.021	2300	1.0E-04	2.6	45	6	0.001	15	25550	8.9E-09	0.0E+00	0.0E+00	0%	2190	1.0E-07	4.0E-03	2.6E-05	0%
Vanadium	0.030	2300	1.0E-03	2.6	45	6	0.001	15	25550	1.3E-07	0.0E+00	0.0E+00	0%	2190	1.5E-06	1.4E-03	1.0E-03	5%
Zinc	0.061	2300	6.0E-04	2.6	45	6	0.001	15	25550	1.5E-07	0.0E+00	0.0E+00	0%	2190	1.8E-06	6.0E-02	3.0E-05	0%
TOTAL												1.7E-06					2.0E-02	

SURFACE WATER DERMAL CONTACT EXPOSURE ASSESSMENT
OPERABLE UNIT NO. 6 (SITE 44)
REMEDIAL INVESTIGATION - CTO-0303
MCB CAMP LEJEUNE, NORTH CAROLINA
CURRENT ADULT TRESPASSER

The intake from dermal contact with surface water is calculated as follows:

Intake (mg/kg-day) = Cw * SA * PC * ET * EF * ED * CF/BW * ATc or ATnc * DY

Risk = Intake * CSF or /RfD

Where:	INPUTS
CW = contaminant concentration in water (mg/l)	
SA = skin surface available for contact (cm2)	5000
PC = contaminant specific dermal permability (cm/hr)	Specific
ET = exposure time (hours/day)	2.6
EF = exposure frequency (days/yr)	45
ED = exposure duration (years)	30
CF = volumetric conversion factor for water (1liter/10	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
CSF = cancer slope factor (mg/kg-day)-1	Specific
RfD = reference dose (mg/kg-day)	Specific

COPC	Concentration (mg/l)	Surface Area (cm2)	Dermal Permeability (cm/hr)	Exposure Time (hours/day)	Exposure Frequency (days/yr)	Exposure Duration (years)	Volumetric Conversion (L/m3)	Body Weight (kg)	Averaging Carc Time (days)	Carc Dose (mg/kg-day)	Dermal Adjust. Slope Factor (mg/kg-day)-1	Carcinogenic Risk	Percent Carcinogenic Risk	Average Noncarc Time (days)	Noncarc Dose (mg/kg-day)	Dermal Adjust. Reference Dose (mg/kg-day)	Noncarc Risk	Percent Noncarcinogenic Risk
Vinyl Chloride	0.018	5000	7.3E-03	2.6	45	30	0.001	70	25550	1.3E-06	2.4E+00	3.0E-06	77%	10950	3.0E-06	0.0E+00	0.0E+00	0%
Acetone	0.007	5000	1.5E-03	2.6	45	30	0.001	70	25550	1.1E-07	0.0E+00	0.0E+00	0%	10950	2.5E-07	8.0E-02	3.1E-06	0%
1,1-Dichloroethene	0.002	5000	1.5E-03	2.6	45	30	0.001	70	25550	2.9E-08	7.5E-01	2.2E-08	1%	10950	6.9E-08	7.2E-03	9.5E-06	0%
1,2-Dichloroethene (total)	0.150	5000	1.0E-02	2.6	45	30	0.001	70	25550	1.5E-05	0.0E+00	0.0E+00	0%	10950	3.4E-05	7.2E-03	4.8E-03	51%
Trichloroethene	0.036	5000	1.6E-02	2.6	45	30	0.001	70	25550	5.7E-06	1.4E-02	7.8E-08	2%	10950	1.3E-05	4.8E-03	2.8E-03	30%
1,1,2-Trichloroethane	0.001	5000	1.7E-02	2.6	45	30	0.001	70	25550	1.6E-07	7.1E-02	1.2E-08	0%	10950	3.8E-07	3.2E-03	1.2E-04	1%
1,1,2,2-Tetrachloroethane	0.035	5000	9.0E-03	2.6	45	30	0.001	70	25550	3.1E-06	2.5E-01	7.8E-07	20%	10950	7.2E-06	0.0E+00	0.0E+00	0%
Phenol	0.001	5000	8.1E-03	2.6	45	30	0.001	70	25550	7.9E-08	0.0E+00	0.0E+00	0%	10950	1.9E-07	3.0E-01	6.2E-07	0%
Bis(2-ethylhexyl)phthalate	0.003	5000	3.3E-02	2.6	45	30	0.001	70	25550	9.7E-07	2.8E-02	2.7E-08	1%	10950	2.3E-06	1.0E-02	2.3E-04	2%
Aluminum	0.509	5000	1.0E-03	2.6	45	30	0.001	70	25550	5.0E-06	0.0E+00	0.0E+00	0%	10950	1.2E-05	2.0E-01	5.8E-05	1%
Barium	0.027	5000	1.0E-03	2.6	45	30	0.001	70	25550	2.7E-07	0.0E+00	0.0E+00	0%	10950	6.2E-07	1.4E-02	4.4E-05	0%
Copper	0.002	5000	1.0E-03	2.6	45	30	0.001	70	25550	2.3E-08	0.0E+00	0.0E+00	0%	10950	5.3E-08	8.0E-03	6.6E-06	0%
Iron	1.860	5000	1.0E-03	2.6	45	30	0.001	70	25550	1.8E-05	0.0E+00	0.0E+00	0%	10950	4.3E-05	6.0E-02	7.1E-04	8%
Lead	0.009	5000	4.0E-06	2.6	45	30	0.001	70	25550	3.7E-10	0.0E+00	0.0E+00	0%	10950	8.6E-10	0.0E+00	0.0E+00	0%
Manganese (water)	0.148	5000	1.0E-03	2.6	45	30	0.001	70	25550	1.5E-06	0.0E+00	0.0E+00	0%	10950	3.4E-06	2.8E-02	1.2E-04	1%
Nickel	0.021	5000	1.0E-04	2.6	45	30	0.001	70	25550	2.1E-08	0.0E+00	0.0E+00	0%	10950	4.8E-08	4.0E-03	1.2E-05	0%
Vanadium	0.030	5000	1.0E-03	2.6	45	30	0.001	70	25550	2.9E-07	0.0E+00	0.0E+00	0%	10950	6.6E-07	1.4E-03	4.9E-04	5%
Zinc	0.061	5000	6.0E-04	2.6	45	30	0.001	70	25550	3.6E-07	0.0E+00	0.0E+00	0%	10950	8.4E-07	6.0E-02	1.4E-05	0%
TOTAL												4.0E-06					9.4E-03	

SURFACE WATER DERMAL CONTACT EXPOSURE ASSESSMENT
OPERABLE UNIT NO.6 (SITE 44)
REMEDIAL INVESTIGATION - CTO-0303
MCB CAMP LEJEUNE, NORTH CAROLINA
FUTURE ADULT RESIDENT

The intake from dermal contact with surface water is calculated as follows:

Intake (mg/kg-day) = Cw * SA * PC * ET * EF * ED * CF/BW * ATc or ATnc * DY

Risk = Intake * CSF or /RfD

Where:	INPUTS
CW = contaminant concentration in water (mg/l)	
SA = skin surface available for contact (cm2)	5800
PC = contaminant specific dermal permability (cm/hr)	Specific
ET = exposure time (hours/day)	2.6
EF = exposure frequency (days/yr)	45
ED = exposure duration (years)	30
CF = volumetric conversion factor for water (1liter/100	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
CSF = cancer slope factor (mg/kg-day)-1	Specific
RfD = reference dose (mg/kg-day)	Specific

COPC	Concentration (mg/l)	Surface Area (cm2)	Dermal Permeability (cm/hr)	Exposure Time (hours/day)	Exposure Frequency (days/yr)	Exposure Duration (years)	Volumetric Conversion (L/m3)	Body Weight (kg)	Averaging Carc Time (days)	Carc Dose (mg/kg-day)	Dermal Adjust. Slope Factor (mg/kg-day)-1	Carcinogenic Risk	Percent Carcinogenic Risk	Average Noncarc Time (days)	Noncarc Dose (mg/kg-day)	Dermal Adjust. Reference Dose (mg/kg-day)	Noncarc Risk	Percent Noncarcinogenic Risk
Vinyl Chloride	0.018	5800	7.3E-03	2.6	45	30	0.001	70	25550	1.5E-06	2.4E+00	3.5E-06	77%	10950	3.5E-06	0.0E+00	0.0E+00	0%
Acetone	0.007	5800	1.5E-03	2.6	45	30	0.001	70	25550	1.2E-07	0.0E+00	0.0E+00	0%	10950	2.9E-07	8.0E-02	3.6E-06	0%
1,1-Dichloroethene	0.002	5800	1.5E-03	2.6	45	30	0.001	70	25550	3.4E-08	7.5E-01	2.6E-08	1%	10950	8.0E-08	7.2E-03	1.1E-05	0%
1,2-Dichloroethene (total)	0.150	5800	1.0E-02	2.6	45	30	0.001	70	25550	1.7E-05	0.0E+00	0.0E+00	0%	10950	4.0E-05	7.2E-03	5.5E-03	51%
Trichloroethene	0.036	5800	1.6E-02	2.6	45	30	0.001	70	25550	6.6E-06	1.4E-02	9.1E-08	2%	10950	1.5E-05	4.8E-03	3.2E-03	30%
1,1,2-Trichloroethane	0.001	5800	1.7E-02	2.6	45	30	0.001	70	25550	1.9E-07	7.1E-02	1.4E-08	0%	10950	4.4E-07	3.2E-03	1.4E-04	1%
1,1,2,2-Tetrachloroethane	0.035	5800	9.0E-03	2.6	45	30	0.001	70	25550	3.6E-06	2.5E-01	9.0E-07	20%	10950	8.4E-06	0.0E+00	0.0E+00	0%
Phenol	0.001	5800	8.1E-03	2.6	45	30	0.001	70	25550	9.2E-08	0.0E+00	0.0E+00	0%	10950	2.2E-07	3.0E-01	7.2E-07	0%
Bis(2-ethylhexyl)phthalate	0.003	5800	3.3E-02	2.6	45	30	0.001	70	25550	1.1E-06	2.8E-02	3.2E-08	1%	10950	2.6E-06	1.0E-02	2.6E-04	2%
Aluminum	0.509	5800	1.0E-03	2.6	45	30	0.001	70	25550	5.8E-06	0.0E+00	0.0E+00	0%	10950	1.4E-05	2.0E-01	6.8E-05	1%
Barium	0.027	5800	1.0E-03	2.6	45	30	0.001	70	25550	3.1E-07	0.0E+00	0.0E+00	0%	10950	7.2E-07	1.4E-02	5.1E-05	0%
Copper	0.002	5800	1.0E-03	2.6	45	30	0.001	70	25550	2.6E-08	0.0E+00	0.0E+00	0%	10950	6.1E-08	8.0E-03	7.6E-06	0%
Iron	1.860	5800	1.0E-03	2.6	45	30	0.001	70	25550	2.1E-05	0.0E+00	0.0E+00	0%	10950	4.9E-05	6.0E-02	8.2E-04	8%
Lead	0.009	5800	4.0E-06	2.6	45	30	0.001	70	25550	4.3E-10	0.0E+00	0.0E+00	0%	10950	9.9E-10	0.0E+00	0.0E+00	0%
Manganese (water)	0.148	5800	1.0E-03	2.6	45	30	0.001	70	25550	1.7E-06	0.0E+00	0.0E+00	0%	10950	3.9E-06	2.8E-02	1.4E-04	1%
Nickel	0.021	5800	1.0E-04	2.6	45	30	0.001	70	25550	2.4E-08	0.0E+00	0.0E+00	0%	10950	5.6E-08	4.0E-03	1.4E-05	0%
Vanadium	0.030	5800	1.0E-03	2.6	45	30	0.001	70	25550	3.4E-07	0.0E+00	0.0E+00	0%	10950	7.9E-07	1.4E-03	5.7E-04	5%
Zinc	0.061	5800	6.0E-04	2.6	45	30	0.001	70	25550	4.2E-07	0.0E+00	0.0E+00	0%	10950	9.8E-07	6.0E-02	1.6E-05	0%
TOTAL												4.6E-06					1.1E-02	

APPENDIX T
FIELD DATA SHEETS

SAMPLING STATION CHARACTERIZATION DATA SHEET

Station Number: 44-EC-SW01 Date: May 3, 95 Time: 1455 (Sa)

Samplers: AMB, PAM Date: May 4, 95 Time: 855 (SD)

Water Body: Edwards 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

liner only

Riparian Zone/Instream Features

Predominant Surrounding Land Use: (Forest) (Urban) , road ~ 75' upstream Industrial Other:

Shore Vegetation:

Aquatic Vegetation: None

Estimated Stream Width: 10 ft Est. Stream Depth: 1-2' ft Riffle: — ft Run: 100+ ft Pool: ft

Stream Type: Cold Water (Warm Water) Velocity: None observed Channelized: Yes X 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: Coarse Sand / Gravel, Black / Gray

Water:

Depth	Temp. °C	pH (s.u.)	Dissolved Oxygen (mg/L)	Conductivity (micromhos/cm)	Salinity (ppt)
mid ~ 0.5'	18.1	358	82.9	6.84	0

Water Odors: (Normal) Sewage Petroleum Chemical Other:

Water Surface Oils: Slick Sheen (None) Secchi: ft.

Turbidity: Clear Slightly Turbid (Turbid) Opaque Water Color: Brown

Weather Conditions: Partly Cloudy ~ 70°F (SD) Tide: ~~In~~ ~~Out~~

Comments: There is a tire & misc scrap metal in creek ~ 80-100' upstream of this station.

SAMPLING STATION CHARACTERIZATION DATA SHEET

Station Number: 44-EC-SW-SD02 Date: May 3, 95 (SW) Time: 1430 (SW)

Samplers: AMB, PAM Date: May 4, 95 (SD) Time: 0910 (SD)

Water Body: Edwards 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

liner only

Riparian Zone/Instream Features

Predominant Surrounding Land Use: (Forest) Urban Industrial Other: _____

Shore Vegetation: _____

Aquatic Vegetation: None

Estimated Stream Width: 5 ft Est. Stream Depth: 0.5 ft Riffle: — ft Run: 100% ft Pool: — ft

Stream Type: Cold Water (Warm Water) Velocity: Slow Channelized: Yes X No _

Canopy Cover: Open Partly Open Partly Shaded (Shaded)

Sediment/Substrate:

Sediment Odors: (Normal) Sewage Petroleum Chemical (Anaerobic) Other: _____ very slight

Sediment Oils: (Absent) Slight Moderate Profuse ~~Hau~~

Ponar Grab: Number of Jars Filled with Sediments Replicate: #1: NA Replicate #2: NA Replicate #3: NA

Sediment Description: 1/2" brown sand, root block/fine coarse sand/gravel

for 10-12" block - coarse sticks / twigs

Water:

Depth	Temp. °C	pH (s.u.)	Dissolved Oxygen (mg/L)	Conductivity (micromhos/cm)	Salinity (ppt)
Surface	16.4	6.57	2.6	350	0
1354/ 5/5/95 SURF	18.4	7.14	6.9	441	

Water Odors: (Normal) Sewage Petroleum Chemical Other: _____

Water Surface Oils: Slick Sheen (None) Secchi: NA ft.

Turbidity: (Clear) Slightly Turbid Turbid Opaque Water Color: None

Weather Conditions: PartlyCloudy, 70°F (5-3-95) Tide: ~~In~~ ~~Out~~

Comments: small minnows

5/5/95 - COLLECTION OF 2ND BIOASSAY H2O.

SAMPLING STATION CHARACTERIZATION DATA SHEET

Station Number: EC L4-SW/SD03 Date: May 3, 95 (SW) Time: 1720 (SW)

Samplers: AMB, DAM Date: 5/4/95 1220. Time: _____

Water Body: Edwards Creek State: NC County: Dashw

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: 10 ft Est. Stream Depth: 0.5 ft Riffle: — ft Run: 100 ft Pool: — ft

Stream Type: Cold Water (Warm Water) Velocity: None 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: BLACKISH GRAY / COARSE SAND

Water:

	Depth	Temp. °C	pH (s.u.)	Dissolved Oxygen (mg/L)	Conductivity (micromhos/cm)	Salinity (ppt)
5/3	surface	15.8	6.92	3.0	354	0.1
5/4	SEDS.	13.0			320	0.1

Water Odors: (Normal) Sewage Petroleum Chemical Other: _____

Water Surface Oils: Slick Sheen (None) Secchi: NA ft.

Turbidity: Clear (Slightly Turbid) Turbid Opaque Water Color: None

Weather Conditions: Partly Cloudy - 70°F (5/3) Tide: In (Out)

Comments: _____

SAMPLING STATION CHARACTERIZATION DATA SHEET

Station Number: 44-EC-SW04 Date: May 3, 95 (Sa) Time: 1630 (Sa)

Samplers: A.M.B. PMM Date: May 4, 95 (Su) Time: 1152 (Su)

Water Body: Edwards 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: 15 ft Est. Stream Depth: 1 ft Riffle: — ft Run: 100 ft Pool: — ft

Stream Type: Cold Water (Warm Water) Velocity: Very slow Channelized: Yes __ No X

Canopy Cover: Open Partly Open Partly Shaded (Shaded)

Sediment/Substrate: root slight of a bit

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: Grey-Black/ coarse sand

Water:

	Depth	Temp. °C	pH (s.u.)	Dissolved Oxygen (mg/L)	Conductivity (micromhos/cm)	Salinity (ppt)
5/3	surface	16.5	7.08	3.2	909	40.8
5/4	4'	16	NM	NM	950	0.9

Water Odors: (Normal) Sewage Petroleum Chemical Other: _____

Water Surface Oils: Slick Sheen (None) Secchi: NA ft.

Turbidity: Clear Slightly Turbid Turbid (Opaque) Water Color: none

Weather Conditions: Partly Cloudy - 270°F Tide: In (Out)

Comments: _____

SAMPLING STATION CHARACTERIZATION DATA SHEET

Station Number: 44-EC-SW/SD05 Date: May 3, 95 (SW) Time: 16/1555 (SW)

Samplers: AMB, PAM Date: 5/4/95 1020 (SED) Time: _____

Water Body: Edwards Creek State: NC County: Gaston

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: _____

Estimated Stream Width: 20 ft Est. Stream Depth: 1-2 ft Riffle: — ft Run: 1000 ft Pool: — ft

Stream Type: Cold Water (Warm Water) Velocity: None Observed Channelized: Yes __ No X

Canopy Cover: Open Partly Open Partly Shaded (Shaded)

Sediment/Substrate: 6-12"

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: BLACK TO BROWN SILTY/SAND.

Water:

	Depth	Temp. °C	pH (s.u.)	Dissolved Oxygen (mg/L)	Conductivity (micromhos/cm)	Salinity (ppt)
SW3	surface	17.7°	7.16	4.3	2320	1.8
	1.5'	18.5	7.32	5.1	5170	4.1
	SURFACE.				950	0.9
SD5	1.5'				5400	4.0.

Water Odors: (Normal) Sewage Petroleum Chemical Other: _____

Water Surface Oils: Slick Sheen (None) Secchi: NA ft.

Turbidity: Clear Slightly Turbid Turbid (Opaque) Water Color: _____

Weather Conditions: Partly Cloudy - 70°F (SW3) Tide: In (Out)

Comments: _____

SAMPLING STATION CHARACTERIZATION DATA SHEET

Station Number: 44-UT-SW/01 (CD)
Date: May 3 95
Time: 1710(SW)

Samplers: AMB, PBM
Date: May 3, 4, 95
Time: 1100(SD)

Water Body: Unnamed trib
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: 3-4 ft Est. Stream Depth: 0.5 ft Riffle: — ft Run: 100 ft ft Pool: — ft

Stream Type: Cold Water **(Warm Water)** Velocity: Slow 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: Silty Sand - 6-12 portion very silty/sandy - could only collect from 6-8" - refusal

Water:

	Depth	Temp. °C	pH (s.u.)	Dissolved Oxygen (mg/L)	Conductivity (micromhos/cm)	Salinity (ppt)
5/3	—	16.6	6.87	3.0	511	0.1
5/4	—	16.3	nm	nm	425	0.1

Water Odors: **(Normal)** Sewage Petroleum Chemical Other:

Water Surface Oils: Slick Sheen **(None)** Secchi: NA ft.

Turbidity: Clear **(Slightly Turbid)** Turbid Opaque Water Color: None

Weather Conditions: Partly Cloudy ~70°F (5/3) Tide: In **(Out)**

Comments:

SAMPLING STATION CHARACTERIZATION DATA SHEET

Station Number: 44-OT-SW02 Date: May 3-95 Time: 1200 (sa)

Samplers: AMR, PAM Date: May 4-95 Time: 1040 (sa)

Water Body: Unnamed trib 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: 15-20 ft Est. Stream Depth: 0.5 ft Riffle: ~ ft Run: 1006 ft Pool: ~ ft

Stream Type: Cold Water (Warm Water) Velocity: Visual Obs Channelized: Yes __ No ~~X~~

Canopy Cover: Open Partly Open (Partly Shaded) Shaded

Sediment/Substrate:

Sediment Odors: Normal Sewage (Petroleum) 4-6" 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: Fine silt sand (6-12") Brown, Black layer coarse sand @ 6"

Water:

	Depth	Temp. °C	pH (s.u.)	Dissolved Oxygen (mg/L)	Conductivity (micromhos/cm)	Salinity (ppt)
SI3	0.5	15.9	6.93	8.7	509	0.2
SW1	0.5	~~15.5~~	NM	NM	850	1

Water Odors: (Normal) Sewage Petroleum Chemical Other: _____

Water Surface Oils: Slick Sheen (None) Secchi: NA ft.

Turbidity: Clear (Slightly Turbid) Turbid Opaque Water Color: None

Weather Conditions: Partly Cloudy 70°F (SI3) Tide: In (Out)

Comments: _____

SAMPLING STATION CHARACTERIZATION DATA SHEET

Station Number: 44-UT-SW/SD03 Date: May 3, 95 Time: 1645(SW)

Samplers: AMB, PHM Date: May 4, 95 Time: 1135(SD)

Water Body: Unnamed trib 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: 10-15 ft Est. Stream Depth: 1.5 ft Riffle: — ft Run: [illegible] ft Pool: — ft

Stream Type: Cold Water (Warm Water) Velocity: [illegible] 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: ~~Silty Sands / Clay - Brown - 6-12 [illegible] clay~~

Gray - Black - medium / fine sand & silt - some organic material

Water:

	Depth	Temp. °C	pH (s.u.)	Dissolved Oxygen (mg/L)	Conductivity (micromhos/cm)	Salinity (ppt)
5/3	Surface	15.9	6.78	1.7	~~793~~ 824	0.5
5/3	1.5	16.4	6.93	0.7	2020	1.6
5/4	Surface	15.5	NM	NM	750	0.5
5/4	1.5	16.5	NM	NM	1950	2.1

Water Odors: (Normal) Sewage Petroleum Chemical Other: ______

Water Surface Oils: Slick Sheen (None) Secchi: NA ft.

Turbidity: Clear Slightly Turbid (Turbid) Opaque Water Color: None

Weather Conditions: Partly Cloudy 70°F (5/3) Tide: NA In (Out)

Comments: ______

ECOLOGICAL EVALUATION
FIELD DATA SHEET - TERRESTRIAL

Project Name: OU 7a, 6, MCB Camp Lejeune

Location: Jacksonville, NC

Date: 3/23/95

Sampling Location: Jones Street Dump

Data Collected By: JES, CMC

Habitat Type: mixed forest

Vegetation:

Trees:

Dominant Species:

1. _____
2. Loblolly Pine - Pinus taeda
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

Secondary Species: Liquidambar Styraciflua

1. Sweetgum - _____
2. Water Oak - Quercus nigra
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

Saplings/Shrubs:

Dominant Species:

1. _____ 6. _____
2. _____ 7. _____
3. none dominant 8. _____
4. _____ 9. _____
5. _____ 10. _____

Secondary Species:

1. Privit - Ligustrum vulgare 6. _____
2. Juniper - Juniperus Virginianus 7. _____
3. Blueberry - Vaccinum sp. 8. _____
4. Redbay - Persea borbonia 9. _____
5. Olive - Elaeagnus pungens 10. _____

Woody Vines:

Dominant Species:

1. _____ 6. _____
2. Japanese honeysuckle - 7. _____
3. seedlings dom. in 8. _____
4. Sun areas of yard + floor 9. _____
5. Lonicera japonica 10. _____

Secondary Species: Smilax

1. Greenbrier rotundifolia 6. _____
2. _____ 7. _____
3. _____ 8. _____
4. _____ 9. _____
5. _____ 10. _____

Herbs:

Dominant Species:

1. _____ 6. _____
2. more dominant - little 7. _____
3. certain in new area 8. _____
4. _____ 9. _____
5. _____ 10. _____

Secondary Species:

1. heartleaf - Hexastylis arifolia 6. _____
2. Carex sp. 7. _____
3. _____ 8. _____
4. _____ 9. _____
5. _____ 10. _____

Birds: _____

Time: _____

Weather Conditions:

Species	Sex	Feeding	Nesting	Approx. No.
1.				
2.				
3.				
4.			listed with area	
5.				
6.				
7.				
8.				
9.				

10. _____

Mammals: _____

Time: _____

Weather Conditions:

Species	Observed	Sign	Adult/Juvenile	Sex

1. _____
2. _____
3. _____
4. _____
5. _____ [illegible] w. open area
6. _____
7. _____
8. _____
9. _____
10. _____

Reptiles and Amphibians: _____

Time: _____

Weather Conditions:

Species	Observed	Sign	Adult/Juvenile	Sex

1. _____
2. _____
3. _____
4. _____ [illegible] w. open area
5. _____
6. _____

7. _____

8. _____

9. _____

10. _____

Miscellaneous Notes:

ECOLOGICAL EVALUATION
FIELD DATA SHEET - TERRESTRIAL

Project Name: 2070.6, MCB Camp Lejeune

Location: Jacksonville, NC

Date: 3/23/95

Sampling Location: Jones Street Dump

Data Collected By: ZSS, CMA

Habitat Type: Upland Forest

Vegetation:

Trees:

Dominant Species:

1. _____
2. _____
3. none dominant
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

Secondary Species:

1. White oak - Quercus alba
2. Tulip - Liriodendron tulipifera
3. Black Cherry - Prunus serotina
4. Sweetgum - Liquidambar styraciflua
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

Saplings/Shrubs:

Dominant Species:

1. _____
2. _____
3. none dominant
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

Secondary Species:

1. Holly - Ilex opaca
2. Dogwood - Cornus florida
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

Woody Vines:

Dominant Species:

1. _____
2. _____
3. none present
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

Secondary Species:

1. _____
2. _____
3. none present
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

Herbs:

Dominant Species:

1. _____ 6. _____
2. _____ 7. _____
3. not dominant 8. _____
4. _____ 9. _____
5. _____ 10. _____

Secondary Species:

1. Crane Fly Orchid - Tipularia discolor 6. _____
2. Heartleaf - Hexastylis arifolia 7. _____
3. Christmas Fern - Aspidium acrostichoides 8. _____
4. Partridgeberry - Mitchella repens 9. _____
5. _____ 10. _____

Birds: _____

Time: _____

Weather Conditions:

Species	Sex	Feeding	Nesting	Approx. No.
1.				
2.				
3.				
4.				
5.		listed with open area		
6.				
7.				
8.				
9.				

10. _____

Mammals: _____

Time: _____

Weather Conditions:

Species	Observed	Sign	Adult/Juvenile	Sex
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				

Reptiles and Amphibians: _____

Time: _____

Weather Conditions:

Species	Observed	Sign	Adult/Juvenile	Sex
1.				
2.				
3.				
4.				
5.				
6.				

7. _____

8. _____

9. _____

10. _____

Miscellaneous Notes:

ECOLOGICAL EVALUATION
FIELD DATA SHEET - TERRESTRIAL

Project Name: S.S. No. 6, MCB Camp Lejeune

Location: Jacksonville, NC

Date: 3/23/95

Sampling Location: Jones Street Dump

Data Collected By: ZBS, CONC

Habitat Type: Swamp

Vegetation:

Trees:

Dominant Species:

1. _____
2. _____
3. none dominant
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

Secondary Species:

1. Red maple - Acer rubrum
2. Swamp Chestnut Oak - Quercus michauxii
3. Ironwood - Carpinus caroliniana
4. Sourgum - Oxydendrum arboreum
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

Saplings/Shrubs:

Dominant Species:

1. _____ 6. _____
2. _____ 7. _____
3. _____ 8. _____
4. _____ 9. _____
5. _____ 10. _____

Secondary Species:

1. Rose bay - Magnolia virginiana 6. _____
2. Redbay - Persea borbonia 7. _____
3. Privit - Ligustrum vulgare 8. _____
4. Fetterbush - Lyonia lucida 9. _____
5. _____ 10. _____

Woody Vines:

Dominant Species:

1. _____ 6. _____
2. _____ 7. _____
3. none present 8. _____
4. _____ 9. _____
5. _____ 10. _____

Secondary Species:

1. _____ 6. _____
2. _____ 7. _____
3. none present 8. _____
4. _____ 9. _____
5. _____ 10. _____

Herbs:

Dominant Species:

1. _____
2. _____
3. none dominant
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

Secondary Species:

1. Sensitive Fern - Onoclea sensibilis
2. Switch Cane - Arundinaria tecta
3. May Apple - Podophyllum peltatum
4. Arrow Arum - Peltandra virginica
5. Jewelweed - Impatiens capensis
6. Hydrosolyk - Hydrocotyle americana
7. Southern Shield Fern - Dryopteris ludoviciana
8. Blue Violet - Viola papilionacea
9. Watercress - Nasturtium officinale
10. Water smartweed - Polygonum amphibium

Birds: _____

Time: _____

Weather Conditions:

Species	Sex	Feeding	Nesting	Approx. No.
1.				
2.				
3.				
4.		bird with open area		
5.				
6.				
7.				
8.				
9.				

10. ____________________

Mammals: ____________________

Time: __________

Weather Conditions:

Species **Observed** **Sign** **Adult/Juvenile** **Sex**

1. ____________________
2. ____________________
3. ____________________
4. ____________________
5. listed with open area
6. ____________________
7. ____________________
8. ____________________
9. ____________________
10. ____________________

Reptiles and Amphibians: ____________________

Time: ____________________

Weather Conditions:

Species **Observed** **Sign** **Adult/Juvenile** **Sex**

1. ____________________
2. ____________________
3. listed with open area
4. ____________________
5. ____________________
6. ____________________

7. _____

8. _____

9. _____

10. _____

Miscellaneous Notes:

ECOLOGICAL EVALUATION
FIELD DATA SHEET - TERRESTRIAL

Project Name: OU No. 6, MCB Camp Lejeune

Location: Jacksonville, NC

Date: 3/23/95

Sampling Location: Jones St. Dump, Site 44

Data Collected By: LBS, CMC

Habitat Type: Open area

Vegetation: _____

Trees:

Dominant Species:

1. _____
2. Loblolly - Pinus taeda
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

Secondary Species:

1. _____
2. none
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

Saplings/Shrubs:

Dominant Species:

1. _____ 6. _____
2. _____ 7. _____
3. none dominant 8. _____
4. _____ 9. _____
5. _____ 10. _____

Secondary Species:

1. _____ 6. _____
2. _____ 7. _____
3. none present 8. _____
4. _____ 9. _____
5. _____ 10. _____

Woody Vines:

Dominant Species:

1. _____ 6. _____
2. none dominant 7. _____
3. _____ 8. _____
4. _____ 9. _____
5. _____ 10. _____

Secondary Species:

1. Japanese honeysuckle - Lonicera japonica 6. _____
2. Dewberry - Rubus hispida 7. _____
3. Jasmine - Gelsemium sempervirens 8. _____
4. _____ 9. _____
5. _____ 10. _____

Herbs:

Dominant Species:

1. _____
2. grasses
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

Secondary Species:

1. White Clover - Trifolium repens
2. Vetch - Vicia sp.
3. dog fennel - Eupatorium capillifolium
4. _____ - Andropogon glomeratus
5. Dandelion - Taraxacum officinale
6. Creeping Buttercup - Ranunculus repens
7. Peppergrass - Lepidium virginicum
8. Narrow-leaved Plantain - Plantago lanceolata
9. Curly Dock - Rumex crispus
10. Ebony Spleenwort - Asplenium platyneuron

Birds: _____

Time: _____

Weather Conditions:

Species	Sex	Feeding	Nesting	Approx. No.
1. Robin - Turdus migratorius				
2. Cardinal - Richmondena cardinalis				
3. Carolina Chickadee - Parus				
4. Fish Crow - Corvus ossifragus				
5. Carolina wren - Thryothorus ludovicianus				
6. Yellow warbler - Dendroica petechia				
7. Blue Jay - Cyanocitta cristata				
8. Mourning Dove - Zenaida macroura				
9. Red-bellied woodpecker - melanerpes carolinus				
Grackle - Quiscalus quiscula				

10. _____

Mammals: _____

Time: _____

Weather Conditions:

Species	Observed	Sign	Adult/Juvenile	Sex
1.	Deer - Odocoileus virginianus		tracks, buck rub,	
2.	Opposum - Didelphis marsupialis		tracks	
3.	raccoon - Procyon lotor		tracks	
4.	Squirrel - Sciurus spp.		feeding sign	
5.				
6.				
7.				
8.				
9.				
10.				

Reptiles and Amphibians: _____

Time: _____

Weather Conditions:

Species	Observed	Sign	Adult/Juvenile	Sex
1.	Frog -	not seen closely enough to		
2.		identify species		
3.				
4.				
5.				
6.				

7. _____

8. _____

9. _____

10. _____

Miscellaneous Notes:

APPENDIX U
WHITE OAK RIVER BASIN REFERENCE STATIONS

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 cm^2 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 taxonimic 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:

	Minimum (mg/kg)	Maximum (mg/kg)
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 potssium 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:

	Minimum (ug/kg)	Maximum (ug/kg)
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:

	Minimum (ug/kg)	Maximum (ug/kg)
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	11600.00	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
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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
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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									

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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									

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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
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%

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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
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
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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
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 - 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									

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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 - 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									

* = THE RME IS GREATER THAN THE MAXIMUM DETECTED VALUE; THEREFORE, THE MAXIMUM VALUE IS USED TO CALCULATE CHRONIC DAILY INTAKE
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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	56.26	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
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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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RME = REASONABLE MAXIMUM EXPOSURE
NA = NOT APPLICABLE

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									

* = 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
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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RME = REASONABLE MAXIMUM EXPOSURE
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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RME = REASONABLE MAXIMUM EXPOSURE
NA = NOT APPLICABLE

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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RME = REASONABLE MAXIMUM EXPOSURE
NA = NOT APPLICABLE

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									

* = THE RME IS GREATER THAN THE MAXIMUM DETECTED VALUE; THEREFORE, THE MAXIMUM VALUE IS USED TO CALCULATE CHRONIC DAILY INTAKE
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RME = REASONABLE MAXIMUM EXPOSURE
NA = NOT APPLICABLE

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%

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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%

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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
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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
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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 LEJEUNE
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	1.6 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
	surface	0	1,050	NA	NA	20.5
	bottom	16.5	22,800	NA	NA	21
HC03-SW/SD	surface	17	25,500	12	7.79	17.5
	bottom	NA	NA	NA	NA	NA
HC03-FS/BN	surface	17.9	26,500	NA	7.69	17.8
	bottom	NA	NA	NA	NA	NA
HC04-SW/SD-FS/BN	surface	0	65	5.3	6.16	17.3
	bottom	NA	NA	NA	NA	NA
HM01-SW/SD-FS/BN	surface	0	140	8.0	6.9	17.5
	bottom	NA	NA	NA	NA	NA
HM02-SW/SD	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
	surface	1	2,490	5.8	6.85	15.5
	bottom	1.1	2,700	5.0	6.72	15.2
HM03-SW/SD	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	0.0046	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	Brevoortia tyrannus	20	46	Brackish or marine, enters freshwater	Rivers, streams	NA	Intermediate	Clupeidae	1,2,3,4
Spot	Leiostomas xanthurus	NA	NA	Brackish or marine, enters freshwater	NA	NA	NA	Sciaenidae	1
Stripped Mullet	Mugil cephalus	NA	23-35	Brackish or marine, enters freshwater	Rivers	NA	NA	Mugilidae	1,2
Pinfish	Lagodon rhomboides	NA	38	Marine, seldom enters freshwater	Shallow waters	NA	NA	Sparidae	1,2
Mud Catfish (Yellow Bullhead)	Ictalupus natalis	24	-38	Freshwater	Rivers Streams	April through May	Tolerant	Ictaluridae	1,2,3
Redbreast Sunfish	Lepomis auritus	18	6-15	Freshwater	Streams	April through June	NA	Centrarchidae	1,2,3
Atlantic Croaker	Micropogonias undulatus	NA	61	Estuaries, brackish-water or marine	NA	NA	NA	Sciaenidae	1,2
Pumpkinseed	Lepomis gibbosus	20	8-20	Freshwater	Streams Creeks	April through October	Moderately Tolerant	Centrarchidae	1,2,3,4
Longnose Gar	Lepisosteus osseus	80	-150	Freshwater; May enter brackish water	Rivers	April through May	Intermediate	Lepisosteidae	1,2,3
Summer Flounder	Paralichthys dentatus	NA	37	Brackish or marine, enters freshwater	Rivers	NA	NA	Bothidae	1
Flier	Centrarchus macropterus	12	7-19	Freshwater	Streams	April through May	NA	Centrarchidae	1,2,3
Chain Pickerel	Esox niger	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	Lepomis microlophus	18	14-25	Freshwater	Streams	May through August	Intermediate	Centrarchidae	1,2,3
Warmouth	Lepomis gulosus	16	8-26	Freshwater	Rivers Streams	May through August	Intermediate	Centrarchidae	1,2,3
White Perch	Morone americana	NA	to 48	Brackish water; Freshwater	Bays and estuaries; Rivers and lakes	NA	Intermediate	Percichthyidae	3,5
Bluefish	Pomatomus saltatrix	NA	NA	Coastal waters	Surface waters; Near shore and off shore	NA	NA	Pomatomidae	2
Bluegill	Lepomis macrochirus	25	18-20	Freshwater	Rivers Streams Creeks	May through October	Intermediate	Centrarchidae	1,2,3
White Catfish	Ictalurus catus	31	-46	Freshwater	Rivers	May through June	Intermediate	Ictaluridae	1,2,3
Largemouth Bass	Micropterus salmoides	48	12-70	Freshwater	Rivers Streams Creeks	May through June	Intermediate	Centrarchidae	1,2,3
Mummichog	Fundulus heteroclitus	7	8-10	Shallow coastal waters	Rivers Streams	April through August	NA	Cyprinodontidae	1,2,3
Redfin Pickerel	Esox americanus	23	25-30	Freshwater	Streams Creeks	February through March	NA	Esocidae	1,2,3
Hog Choker	Trinectes maculatus	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	Aphredoderus sayanus	9	7-14	Freshwater	Streams Creeks	January through March	Intermediate	Aphredoderidae	1,2,3
Eastern Mosquito (Mosquitofish) –	Gambusia affinis	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	HC02	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	HCO2	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 Fish Length (cm)	Mass Weight	Average Weight (g)	HC02 Fish Length (cm)	Mass Weight	Average Weight (g)	HC03 Fish Length (cm)	Mass Weight	Average Weight (g)	HC04 Fish Length (cm)	Mass Weight	Average Weight (g)
Strippet Mullet	HC03							15.25	45	45			
								12.5	20	20			
								12.5	20	20			
	COUNT							3		3			
	AVERAGE							13.416666667		28.333333333			
	MAXIMUM							15.25		45			
	MINIMUM							12.5		20			
								+1 collected, no length or weight					
Atlantic Menhaden	HC03							5	<5	2.5			
	COUNT							2		2			
	AVERAGE							5		2.5			
	MAXIMUM							5		2.5			
	MINIMUM							5		2.5			
Blue Fish	HC03							7	7	7			
								11	17	17			
								8	8	8			
	COUNT							3		3			
	AVERAGE							8.6666666667		10.666666667			
	MAXIMUM							11		17			
	MINIMUM							7		7			
Spot	HC03							12.5	22	22			
								5.5	<5.0	2.5			
								5.75	<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							9.0208333333		16.833333333			
	MAXIMUM							14		40			
	MINIMUM							3.5		2.5			

HADNOT CREEK - BACKGROUND STATIONS

SPECIES	COC SAMPLE NO.	HC01 Fish Length (cm)	Mass Weight	Average Weight (g)	HC02 Fish Length (cm)	Mass Weight	Average Weight (g)	HC03 Fish Length (cm)	Mass Weight	Average Weight (g)	HC04 Fish Length (cm)	Mass Weight	Average Weight (g)
White Perch	HC03							18.5	105	105			
	COUNT							1		1			
	AVERAGE							18.5		105			
	MAXIMUM							18.5		105			
	MINIMUM							18.5		105			
Hogchoker	HC03							5.5	5	5			
	COUNT							1		1			
	AVERAGE							5.5		5			
	MAXIMUM							5.5		5			
	MINIMUM							5.5		5			
Pinfish													
	HC03							13	35	35			
								10.8	25	25			
								11	22	22			
								10.5	25	25			
								13	37	37			
	COUNT							5		5			
	AVERAGE							11.66		26.8			
	MAXIMUM							13		37			
	MINIMUM							10.5		22			
Atlantic Croaker	HC03							11.5	20	20			
								10.5	18	18			
								9	10	10			
								10.5	14	14			
								7.5	<5	2.5			
	COUNT							5		5			
	AVERAGE							9.8		12.5			
	MAXIMUM							11.5		20			
	MINIMUM							7.5		2.5			
Redbreast Sunfish	HC01	23.5	265	265									
		20	175	175									
	COUNT	2		2									
	AVERAGE	21.75		220									
	MAXIMUM	23.5		265									
	MINIMUM	20		175									
American Flyer	HC01	16.5	65	65									
		9.5	15	15									
		+1 collected, no length or weight											
	COUNT	3		3									
	AVERAGE	13		40									
	MAXIMUM	16.5		65									
	MINIMUM	9.5		15									

HADNOT CREEK - BACKGROUND STATIONS

SPECIES	COC SAMPLE NO.	HC01 Fish Length (cm)	Mass Weight	Average Weight (g)	HC02 Fish Length (cm)	Mass Weight	Average Weight (g)	HC03 Fish Length (cm)	Mass Weight	Average Weight (g)	HC04 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						
											+1 collected, no length or weight		
Redfin Pickerel	HC04										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 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)
Strippet 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				34.81818182		438.1818182	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
								5.5		1.8
								6		1.8
								5.5		1.8
								5.5		1.8
								5.5	20	2
								4.5		2
								5		2
								5.5		2
								5.5		2
								5.5		2
								5.5		2
								6		2
								5.5		2
								6		2
								6		2
								138 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 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)
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			
	MINIMUM				28		350			
Spotted Sunfish	HM02				15.5	65	65			
					17	110	110			
	COUNT				2		2			
	AVERAGE				16.25		87.5			
	MAXIMUM				17		110			
	MINIMUM				15.5		65			
Largemouth Bass	HM02				34	540	540			
	COUNT				1		1			
	AVERAGE				34		540			
	MAXIMUM				34		540			
	MINIMUM				34		540			
Hogchoker	HM03							+1 collected, no length or weight		
								6	10	10
	COUNT							2		1
	AVERAGE							6		10
	MAXIMUM							6		10
	MINIMUM							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							5.82857143		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			
	MAXIMUM	10.5		10	17		105			
	MINIMUM	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				76.16666667		1630			
	MAXIMUM				83		2000			
	MINIMUM				72.5		1250			
Pinfish	HM02				17.5	80	80			
	HM03							5	<5	2.5
					+6 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	480	480			
					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						
	COUNT	6		6						
	AVERAGE	6		3						
	MAXIMUM	6		3						
	MINIMUM	6		3						

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	Avr Wt (g)
Crayfish	HM01	8.5	15	5						
		4.5		5						
		5.5		5						
	COUNT	3		3						
	AVERAGE	6.16666667		5						
	MAXIMUM	8.5		5						
	MINIMUM	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

SPECIES	COC SAMPLE NO.	WC02 Fish Length (cm)	Mass Weight	Average Weight (g)	WC03 Fish Length (cm)	Mass Weight	Average Weight (g)
Strippet Mullet	WC02	39.5	500	500			
		35.5	380	380			
		41.5	700	700			
		37	600	600			
	COUNT	4		4			
	AVERAGE	38.375		545			
	MAXIMUM	41.5		700			
	MINIMUM	35.5		380			
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			
Redbreast 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 Fish Length (cm)	Mass Weight	Average Weight (g)	WC03 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			
	MAXIMUM	38.5		900			
	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

MARINE CORPS BASE CAMP LEJEUNE
BACKGROUND - WEBB CREEK
BENTHIC MACROINVERTEBRATES

	WC02-BN			WC03-BN		
	01	02	03	01	02	03
NEMERTEA						
Anopla						
Heteronemertea						
Lineidae						
Micrura leidyl				1	2	2
ANNELIDA						
Polychaeta						
Capitellida						
Capitellidae						
Capitella capitata	2					
Phyllodocida						
Nereidae						
Nereis succinea			1			
Spionida						
Spionidae						
Scolecolepides viridis						1
Terebellida						
Ampharetidae						
Hypaniola grayi		4	10			
ARTHROPODA						
Crustacea						
Amphipoda						
Gammaridae						
Gammarus tigrinus	10			1	1	
Insecta						
Diptera						
Chironomidae						
Chironomus decorus gr.	8	24	13	38	17	6
Procladius sp.	1	3		2		1
Tanytarsus sp.		2	1			
MOLLUSCA						
Bivalvia						
Veneroida						
Corbiculidae						
Polymesoda caroliniana					1	
Tellinidae						
Macoma tenta					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	4.425	10.532	6.185	18.339	7.057	2.380
Brillouin's Diversity		0.518			0.279	
SPECIES DENSITY (#/M^2)	134	210	159	268	140	64
SPECIES DIVERSITY (Shannon-Wiener)	0.473	0.380	0.419	0.180	0.364	0.473

MARINE CORPS BASE CAMP LEJEUNE
BACKGROUND - HADNOT CREEK
BENTHIC MACROINVERTEBRATES

	HC01-BN			HC02-BN			HC03-BN			HC04-BN		
	01	02	03	01	02	03	01	02	03	01	02	03
NEMERTEA												
Anopla												
Heteronemertea												
Lineidae												
Micrura leidyi						6	5	3				
ANNELIDA												
Oligochaeta												
Lumbriculida												
Lumbriculidae												
Eclipidrilus sp.			1									
Tubificida												
Tubificidae												
Isochaetides freyi	77	42	36							21	21	8
Limnodrilus hoffmeisteri											1	
Spirosperma carolinensis		3									1	3
Polychaeta												
Capitellida												
Capitellidae												
Heteromastus filiformis							14	9				
Phyllodocida												
Nereidae												
Nereis succinea							6		18			
Phyllodocidae												
Eteone heteropoda									1			
Terebellida												
Ampharetidae												
Hypaniola grayi (ampharetid worm)				18	6	46						
ARTHROPODA												
Crustacea												
Amphipoda												
Corophiidae												
Corophium lacustre									62			
Gammaridae												
Crangonyx pseudogracilis					1	1					15	20
Gammarus tigrinus												
Tanaidacea												
Tanaidae												
Leptochelia rapax									80			
Insecta												
Coleoptera												
Dytiscidae												
Hydroporus sp.			1							5	2	6
Elmidae												
Dubiraphia sp.		1										
Diptera												
Ceratopogonidae												
Palpomyia/sphaeromias sp. (biting midges)	5	7	4			1						
Chironomidae												
Ablabesmyia annulata	2	7	1									
Ablabesmyia rhamphe gr.	4	7	9									
Clinotanypus pinguis											1	
Cryptochironomus fulvus gr.		2	3									
Epoicladius sp.			1									
Glyptotendipes sp.												1
Nilothauma sp.		2	1									
Parasutterbomiella nigrohalteralis	1	5	2									
Polypedilum illinoense	3	1										
Procladius sp. (midges)		1										
Tanytarsus sp.	2	9	2									
Tribelos lucundum	4	8	9								9	9
Tipulidae												
Pseudolimnophila sp.											1	2
Ephemeroptera												
Ephemeridae												
Hexagenia bilineata	3	3	1									
Megaloptera												
Sialidae												
Sialis sp.										1		
Odonata												
Coenagrionidae												
Argia sp.		1										
Libellulidae												
Pachydiplax longipennis											1	
Trichoptera												
Polycentropodidae												
Phylocentropus sp.	1	5	7							17	13	4
MOLLUSCA												
Bivalvia												
Mytiloida												
Mytilidae												
Geukensia demissa									1			
Veneroida												
Sphaeriidae												
Pisidium casertanum		2	1								4	
Tellinidae												
Macoma tenta							5	19	1			
Total Taxa	10	17	15	1	2	4	4	3	6	4	11	8
Total Specimens	102	108	78	18	7	54	30	31	163	44	89	52
Replicate Specimens Average		95.33333			26.33333			81.33333			55	
Standard Deviation	23.30782	9.814633	8.961824	NA	3.535534	21.79449	4.358899	8.082904	39.67241	9.321906	7.128887	6.047432
Brillouin's Diversity		0.755			0.072			0.675			0.757	
SPECIES DENSITY (#/M^2)	850	676	487	115	45	344	191	198	1166	280	440	331
SPECIES DIVERSITY (Shannon-Wiener)	0.463	0.856	0.831	0.000	0.178	0.230	0.554	0.384	0.449	0.456	0.803	0.763

MARINE CORPS BASE CAMP LEJEUNE
BACKGROUND - HOLLAND MILL CREEK
BENTHIC MACROINVERTEBRATES

	HM01-BN			HM02-BN			HM03-BN		
	01	02	03	01	02	03	01	02	03
NEMERTEA									
Anopla									
Heteronemertea									
Lineidae									
Micrura leidyi							3	4	2
ANNELIDA									
Oligochaeta									
Tubificida									
Tubificidae									
Limnodrilus hoffmeisteri	3	1	3						
Polychaeta									
Ariciida									
Orbiniidae									
Scoloplos fragilis							3	20	8
Capitellida									
Capitellidae									
Heteromastus filiformis							1	1	1
Phyllodocida									
Nereidae									
Nereis succinea				7	9	6			
Spionida									
Spionidae									
Streblospio benedicti							1		
Terebellida									
Ampharetidae									
Hypaniola grayi (ampharetid worm)				3		2			
ARTHROPODA									
Crustacea									
Decapoda									
Palaemonidae									
Palaemonetes pugio						1			
Insecta									
Coleoptera									
Dytiscidae									
Hydroporus sp.	1								
Elmidae									
Dubiraphis sp.			8						
Diptera									
Chaoboridae									
Chaoborus sp.			1						
Chironomidae									
Ablabesmyia mallochi	1								
Chironomus decorus gr.	2	2	2	120	180	76	1		
Dicrotendipes nervosus	5		3						
Larsia sp.			1						
Polypedilum illinoense	12		7						
Polypedilum scalaenum	18		11						
Tanytarsus sp.	11		12						
Tribelos lucundum	50	159	31						
Megaloptera									
Sialidae									
Sialis sp.	1								
MOLLUSCA									
Bivalvia									
Veneroida									
Mactridae									
Mulinia lateralis							3		
Tellinidae									
Macoma tenta							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
Replicate 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
Brillouin's Diversity		0.5			0.122			0.497	
SPECIES DENSITY (#/M ^ 2)	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	0.480

SYSTEMATIC LIST OF BENTHIC MACROINVERTEBRATE SPECIES AT BACKGROUND STATIONS (WEBB, HADNOT, AND HOLLAND MILL CREEKS) MCB CAMP LEJEUNE, NORTH CAROLINA

Species	Systematic Listing
NERMERTEA	Phylum
Anopla	Class
Heteronemertea	Order
Lineidae	Family
Micrura leidyl	Genus Species
ANNELIDA	Phylum
Oligochaeta	Class
Lumbriculida	Order
Lumbriculiae	Family
Eclipidrillus sp.	Genus Species
Tubificida	Order
Tubificidae	Family
Isochaetides freyi	Genus Species
Limnodrilus hoffmeisteri	Genus Species
Spirosperma carolinensis	Genus Species
Polychaeta	Class
Ariciida	Order
Orbiniidae	Family
Scoloplos fragilis	Genus Species
Capitellida	Order
Capitellidae	Family
Heteromastus filiformis	Genus Species
Capitella capitata	Genus Species
Phyllodocida	Order
Nereidae	Family
Nereis succinea	Genus Species
Phyliodocidae	Family
Eteone heteropoda	Genus Species
Spionida	Order
Spionidae	Family
Scolecolepides virdis	Genus Species
Streblospio benedicti	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	Systematic Listing
Ampharetidae	Family
Hypaniola grayi	Genus Species
ARTHROPODA	Phylum
Crustacea	Class
Amphipoda	Order
Corophiidae	Family
Corophium lacuatre	Genus Species
Gammaridae	Family
Crangonyx pseudogracillus	Genus Species
Gammarus tigrinus	Genus Species
Tanaidacea	Order
Tanaidae	Family
Leptochelia rapox	Genus Species
Decapoda	Order
Palaemonidae	Family
Palaemonetes pugio	Genus Species
Insecta	Class
Coleoptera	Order
Dytiscidae	Family
Hydroporus sp.	Genus Species
Elmidae	Family
Dubiraphia sp.	Genus Species
Diptera	Order
Ceratopogonidae	Family
Palpomyia/sphaeromias sp.	Genus Species
Chaoboridae	Family
Chaoborus sp.	Genus Species
Chironomidae	Family
Ablabesmyia annulata	Genus Species
Ablabesmyia mallochi	Genus Species
Ablabesmyia ramphe gr.	Genus Species
Clinotanypus pinguis	Genus Species
Chironomus decorus gr.	Genus Species
Cryptochironomus fulvus gr	Genus Species

SYSTEMATIC LIST OF BENTHIC MACROINVERTEBRATE SPECIES AT BACKGROUND STATIONS (WEBB, HADNOT, AND HOLLAND MILL CREEKS) MCB CAMP LEJEUNE, NORTH CAROLINA

Species	Systematic Listing
Dicrotendipes nervosus	Genus Species
Epoicladius sp.	Genus Species
Glyptotendipes sp.	Genus Species
Larsia sp.	Genus Species
Nilothauma sp.	Genus Species
Paraiauterborniella nigrohaite	Genus Species
Polypedilum illinoense	Genus Species
Polypedilum scalaenum	Genus Species
Procladius sp.	Genus Species
Tanytarsus sp.	Genus Species
Tribelos jucundum	Genus Species
Tribelos lucundum	Genus Species
Tipulidae	Family
Psuedolimnophila sp.	Genus Species
Ephemeroptera	Order
Ephemeridae	Family
Hexagenia billineata	Genus Species
Megaloptera	Order
Sialidae	Family
Sialis sp.	Genus Species
Odonata	Order
Coenagrionidae	Family
Argia sp.	Genus Species
Libelluiidae	Family
Pechydiplax longipennis	Genus Species
Trichoptera	Order
Polycentropodidae	Family
Phylacentropus sp.	Genus Species
MOLLUSCA	Phylum
Bivalvia	Class
Mytiloida	Order
Mytilldae	Family
Geukensia demissa	Genus Species
Veneroida	Order

SYSTEMATIC LIST OF BENTHIC MACROINVERTEBRATE SPECIES AT BACKGROUND STATIONS (WEBB, HADNOT, AND HOLLAND MILL CREEKS) MCB CAMP LEJEUNE, NORTH CAROLINA

Species	Systematic Listing
Corbiculidae	Family
Polymesoda caroliniana	Genus Species
Mactridae	Family
Mullinia lateralis	Genus Species
Sphaeriidae	Family
Pisidium casertanum	Genus Species
Tellinidae	Family
Macoma tenta	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			
Micrura leidyl	NA	NA	NA
ANNELIDA			
Oligochaeta			
Lumbriculida			
Lumbriculiae			
Eclipidrillus sp.	NA	NA	NA
Tubificida			
Tubificidae			
Isochaetides freyi	NA	NA	8.6
Limnodrilus hoffmeisteri	NA	5	9.4
Spirosperma carolinensis	NA	3	NA
Polychaeta			
Ariciida			
Orbiniidae			
Scoloplos fragilis	NA	NA	NA
Capitellida			
Capitellidae			
Heteromastus filiformis	NA	NA	NA
Capitella capitata	NA	NA	NA
Phyllodocida			
Nereidae			
Nereis succinea	NA	NA	NA
Phyliodocidae			
Eteone heteropoda	NA	NA	NA
Spionida			
Spionidae			
Scolecolepides virdis	NA	NA	NA
Streblospio benedicti	NA	NA	NA

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
Terebellida			
Ampharetidae			
Hypaniola grayi	NA	NA	NA
ARTHROPODA			
Crustacea			
Amphipoda			
Corophiidae			
Corophium lacuatre	NA	NA	NA
Gammaridae			
Crangonyx pseudogracillus	NA	NA	7.9
Gammarus tigrinus	NA	2	NA
Tanaidacea			
Tanaidae			
Leptochelia rapox	NA	NA	NA
Decapoda			
Palaemonidae			
Palaemonetes pugio	NA	NA	NA
Insecta			
Coleoptera			
Dytiscidae			
Hydroporus sp.	NA	NA	8.6
Elmidae			
Dubiraphia sp.	NA	NA	5.9
Diptera			
Ceratopogonidae			
Palpomyia/sphaeromias sp.	NA	NA	7.0
Chaoboridae			
Chaoborus sp.	NA	NA	8.5
Chironomidae			
Ablabesmyia annulata	NA	1	3.5
Ablabesmyia mallochi	S	2	7.2
Ablabesmyia ramphe gr.	NA	2	NA
Clinotanypus pinguis	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
Chironomus decorus gr.	NA	NA	9.6
Cryptochironomus fulvus gr	NA	3	6.4
Dicrotendipes nervosus	S	2	9.7
Epoicladius sp.	NA	NA	0.0
Glyptotendipes sp.	NA	NA	9.4
Larsia sp.	NA	2	9.3
Nilothauma sp.	NA	NA	5.0
Paraiauterborniella nigrohaite	NA	NA	NA
Polypedilum illinoense	NA	3	9.0
Polypedilum scalaenum	NA	2	8.4
Procladius sp.	NA	NA	9.1
Tanytarsus sp.	NA	NA	6.7
Tribelos jucundum	S	1	6.3
Tribelos lucundum	NA	NA	6.3
Tipulidae			
Psuedolimnophila sp.	NA	NA	7.2
Ephemeroptera			
Ephemeridae			
Hexagenia billineata	NA	2	NA
Megaloptera			
Sialidae			
Sialis sp.	T	4	7.2
Odonata			
Coenagrionidae			
Argia sp.	NA	NA	8.2
Libelluiidae			
Pechydiplax longipennis	NA	NA	NA
Trichoptera			
Polycentropodidae			
Phylacentropus sp.	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
Mytiloida			
Mytilldae			
Geukensia demissa	NA	NA	NA
Veneroida			
Corbiculidae			
Polymesoda caroliniana	NA	NA	NA
Mactridae			
Mullinia lateralis	NA	NA	NA
Sphaeriidae			
Pisidium casertanum	NA	4	6.5
Tellinidae			
Macoma tenta	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

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 (#m^2) is based on a sample area of 0.0523 m^2.

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			
Micrura leidyl	NA	NA	NA
ANNELIDA			
Oligochaeta			
Lumbriculida			
Lumbriculiae			
Eclipidrillus sp.	NA	NA	NA
Tubificida			
Tubificidae			
Isochaetides freyi	NA	NA	8.6
Limnodrilus hoffmeisteri	NA	5	9.4
Spirosperma carolinensis	NA	3	NA
Polychaeta			
Ariciida			
Orbiniidae			
Scoloplos fragilis	NA	NA	NA
Capitellida			
Capitellidae			
Capitella capitata	NA	NA	NA
Phyllodocida			
Nereidae			
Nereis succinea	NA	NA	NA
Phyliodocidae			
Eteone heteropoda	NA	NA	NA
Spionida			
Spionidae			
Scolecolepides virdis	NA	NA	NA
Streblospio benedicti	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			
Hypaniola grayi	NA	NA	NA
ARTHROPODA			
Crustacea			
Amphipoda			
Corophiidae			
Corophium lacuatre	NA	NA	NA
Gammaridae			
Crangonyx pseudogracillus	NA	NA	7.9
Gammarus tigrinus	NA	2	NA
Tanaidacea			
Tanaidae			
Leptochelia rapox	NA	NA	NA
Decapoda			
Palaemonidae			
Palaemonetes pugio	NA	NA	NA
Insecta			
Coleoptera			
Dytiscidae			
Hydroporus sp.	NA	NA	8.6
Elmidae			
Dubiraphia sp.	NA	NA	5.9
Diptera			
Ceratopogonidae			
Palpomyia/sphaeromias sp.	NA	NA	7.0
Chaoboridae			
Chaoborus sp.	NA	NA	8.5
Chironomidae			
Ablabesmyia annulata	NA	1	3.5
Ablabesmyia mallochi	S	2	7.2
Ablabesmyia ramphe gr.	NA	2	NA
Clinotanypus pinguis	S	3	8.7
Chironomus decorus gr.	NA	NA	9.6

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
Cryptochironomus fulvus gr	NA	3	6.4
Dicrotendipes nervosus	S	2	9.7
Epoicladius sp.	NA	NA	0.0
Glyptotendipes sp.	NA	NA	9.4
Larsia sp.	NA	2	9.3
Nilothauma sp.	NA	NA	5.0
Paraiauterborniella nigrohaite	NA	NA	NA
Polypedilum illinoense	NA	3	9.0
Polypedilum scalaenum	NA	2	8.4
Procladius sp.	NA	NA	9.1
Tanytarsus sp.	NA	NA	6.7
Tribelos jucundum	S	1	6.3
Tribelos lucundum	NA	NA	6.3
Tipulidae			
Psuedolimnophila sp.	NA	NA	7.2
Ephemeroptera			
Ephemeridae			
Hexagenia billineata	NA	2	NA
Megaloptera			
Sialidae			
Sialis sp.	T	4	7.2
Odonata			
Coenagrionidae			
Argia sp.	NA	NA	8.2
Libelluiidae			
Pechydiplax longipennis	NA	NA	NA
Trichoptera			
Polycentropodidae			
Phylacentropus sp.	NA	NA	6.2
MOLLUSCA			
Bivalvia			
Mytiloida			

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
Mytilldae			
Geukensia demissa	NA	NA	NA
Veneroida			
Corbiculidae			
Polymesoda caroliniana	NA	NA	NA
Mactridae			
Mullinia lateralis	NA	NA	NA
Sphaeriidae			
Pisidium casertanum	NA	4	6.5
Tellinidae			
Macoma tenta	NA	NA	NA

(1) Macroinvertebrate Field and Laboratory Methods for Evaluating the Biological Integrity of Surface Waters

(2) Lenat, 1993

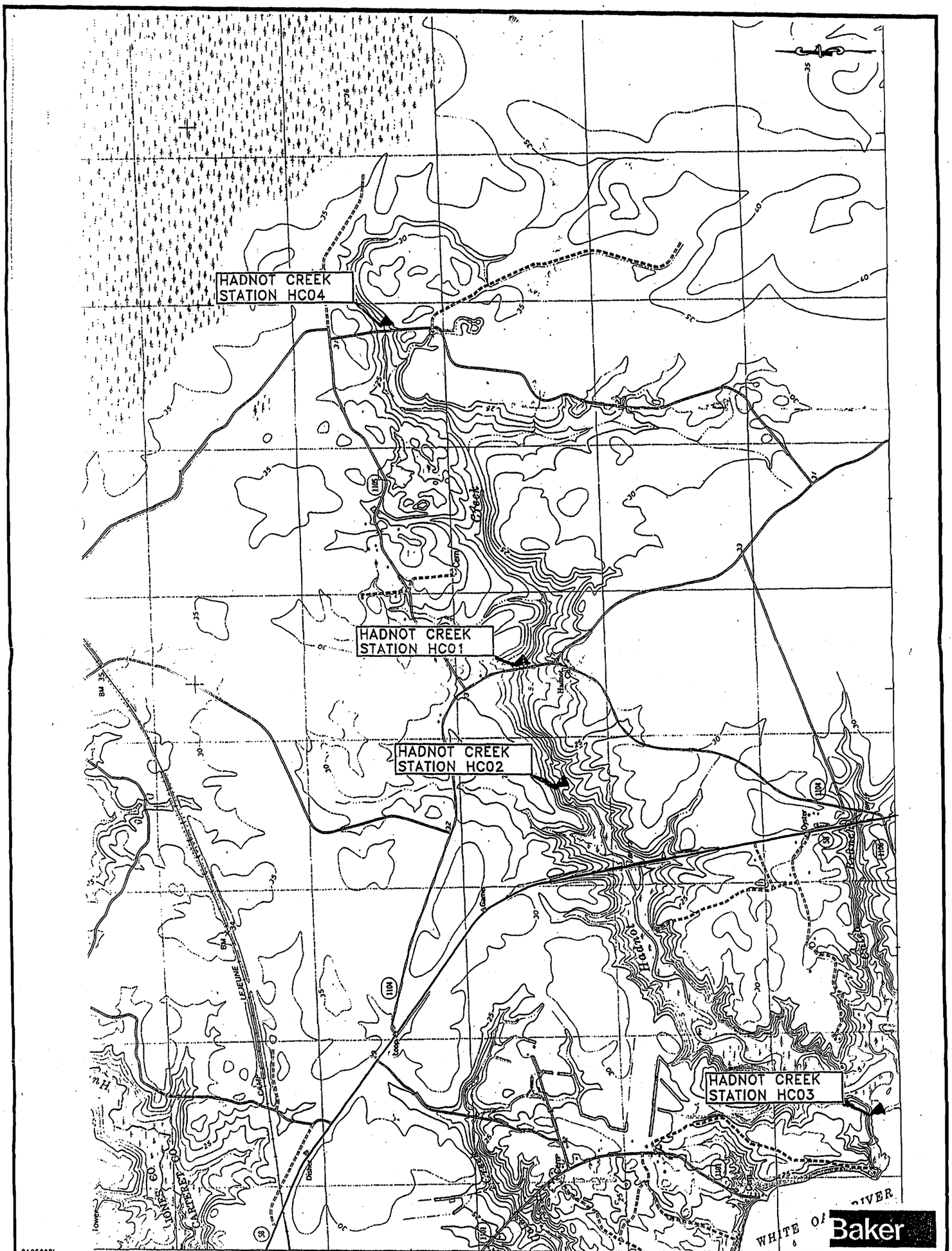
NA = Not Available

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



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Baker

Baker Environmental, Inc.

FISH AND BENTHIC MACROINVERTERBRATE
SAMPLING LOCATION IN HADNOT CREEK

MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA

SOURCE: N.C. DIVISION OF MARINE
FISHERIES, REPORT AFC-9, NOV. 1975.

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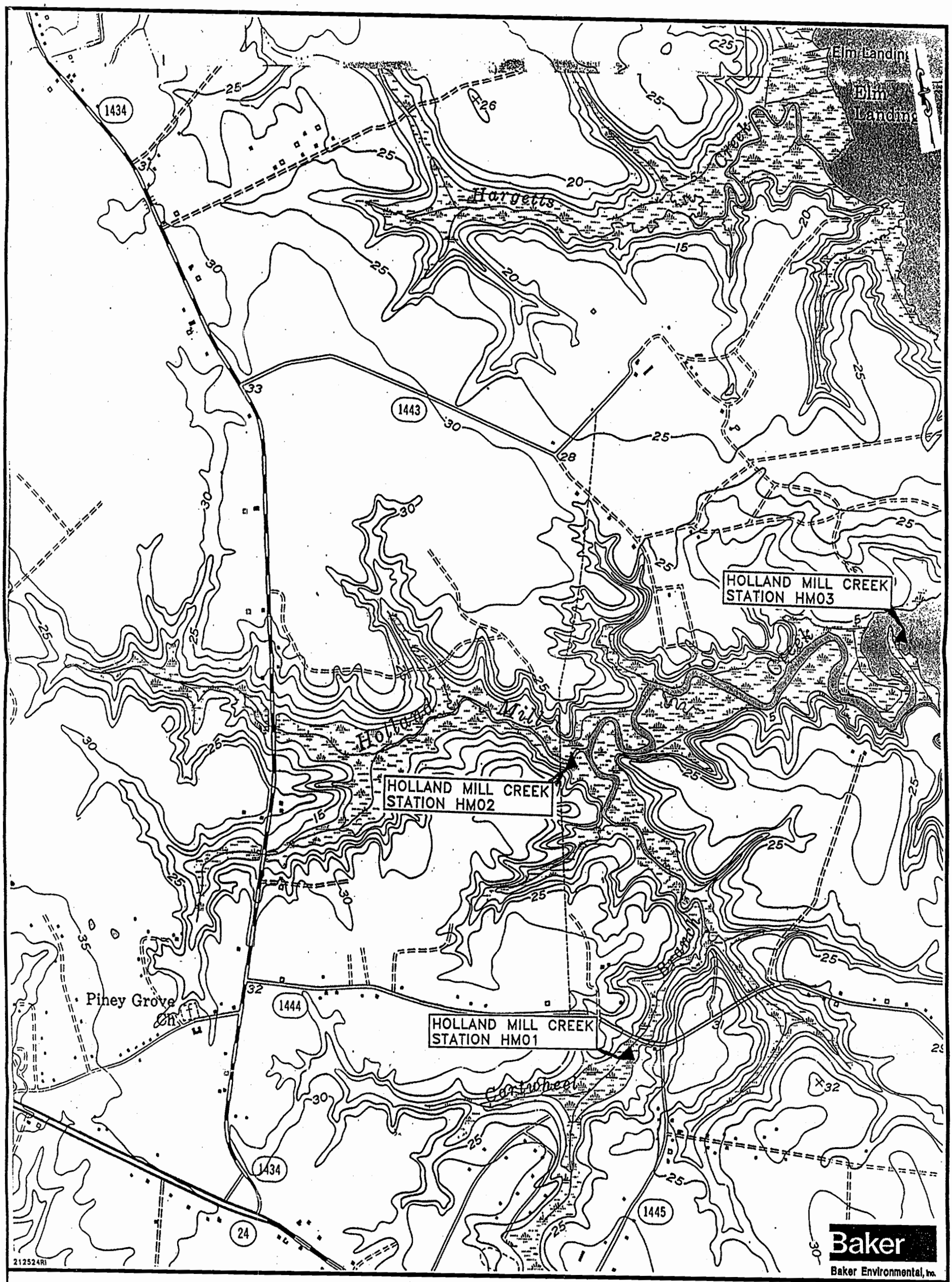
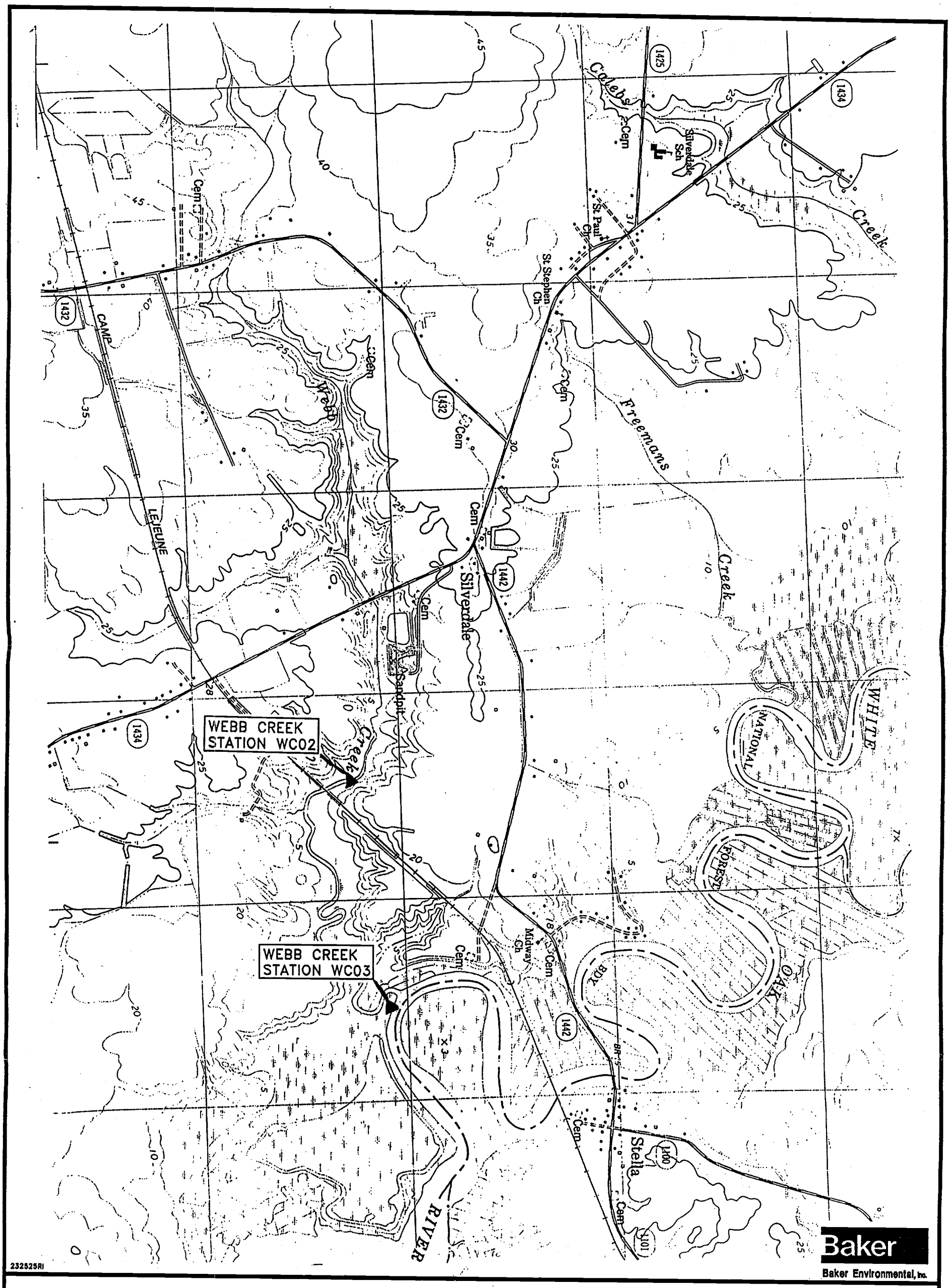


FISH AND BENTHIC MACROINVERTERBRATE
SAMPLING LOCATION IN HOLLAND MILL CREEK

MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA

SOURCE: N.C. DIVISION OF MARINE FIDHERIES, REPORT AFC-9, NOV. 1975.



FISH AND BENTHIC MACROINVERTERBRATE
SAMPLING LOCATION IN WEBB CREEK

MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA

SOURCE: N.C. DIVISION OF MARINE
FISHERIES, REPORT AFC-9, NOV. 1975.

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, Norfork, Virginia.

APPENDIX V
SCREENING VALUE AND QUOTIENT INDEX CALCULATIONS

CALCULATION OF SEDIMENT QUALITY CRITERIA
SALTWATER SEDIMENT SAMPLES
SITE 44, JONES STREET DUMP
REMEDIAL INVESTIGATION CTO-0303
MCAS, NEW RIVER, NORTH CAROLINA

Contaminant	Koc (mL/g)	SWSV (ug/L)	Sample No.	EC-SD01-06 SQC (ug/kg)	EC-SD02-06 SQC (ug/kg)	UT-SD01-06 SQC (ug/kg)	UT-SD01-612 SQC (ug/kg)
Aldrin	9.60E+04	0.003	(1)	0.37	0.72	32.26	46.37
4,4'-DDD	7.70E+05	0.001	(5)	1.00	1.93	86.24	123.97
4,4'-DDE	4.40E+06	0.001	(5)	5.72	11.00	492.80	708.40
4,4'-DDT	2.43E+05	0.001	(1)	0.32	0.61	27.22	39.12
Heptachlor epoxide	2.20E+02	0.0036	(4)	0.0010	0.0020	0.09	0.13
Alpha-chlordane	1.40E+05	0.004	(1)	0.73	1.40	62.72	90.16
Gamma-chlordane	1.40E+05	0.004	(1)	0.73	1.40	62.72	90.16
Benzo(a)anthracene	1.38E+06	8.13	(4)	14,585	28,049	1,256,573	1,806,323
Benzo(a)pyrene	5.50E+06	0.21	(4)	1,502	2,888	129,360	185,955
Benzo(b)fluoranthene	5.50E+05	300	(4)	214,500	412,500	18,480,000	26,565,000
Benzo(k)fluoranthene	5.50E+05	300	(4)	214,500	412,500	18,480,000	26,565,000
Benzo(ghi)perylene	1.60E+06	300	(4)	624,000	1,200,000	53,760,000	77,280,000
Bis(2-ethylhexyl)phthalate	1.00E+05	360	(2)	46,800	90,000	4,032,000	5,796,000
Butylbenzylphthalate	67.6	3.4		0.30	0.57	26	37
Carbazole	ND	NA		NA	NA	NA	NA
Chrysene	2.00E+05	300	(4)	78,000	150,000	6,720,000	9,660,000
Fluoranthene	1.00E+05	6.16	(6)	801	1,540	68,992	99,176
Pentachlorophenol	5.30E+04	7.9	(3)	544	1,047	46,894	67,411
Phenanthrene	2.88E+04	6.32	(7)	237	456	20,414	29,345
Pyrene	3.80E+04	300	(4)	14,820	28,500	1,276,800	1,835,400
Acetone	2.20E+00	NA		NA	NA	NA	NA
2-Butanone	4.50E+00	NA	(4)	NA	NA	NA	NA
SQC = (Koc*SWSV*Foc)/1000000			**Foc (mg/kg**	**1300**	**2500**	**112000**	**161000**

NA - Not Available
SWSV - Surface Water Screening Value
SQC - Sediment Quality Criteria
Foc - Fraction of organic carbon in mg/kg
Koc - Organic-carbon partition coefficient
(1) North Carolina Water Quality Standards
(2) USEPA, 1991 (Lowest Observed effects Level)
(3) USEPA, 1995a (Region IV Water Quality Screening Values)
(4) USEPA, 1995b (Region III Water Quality Screening Values)
(5) Used 4,4'-DDT Value
(6) USEPA, 1993 (Sediment Quality Criteria for Fluoranthene)
(7) USEPA, 1993 (Sediment Quality Criteria for Phenanthrene)

SURFACE WATER QUOTIENT INDEX CALCULATIONS
SITE 44, JONES STREET DUMP
REMEDIAL INVESTIGATION CTO-0303
MCAS, NEW RIVER, NORTH CAROLINA

Contaminant	Station	Sample Concentration (ug/L)	North Carolina WQS	USEPA WQSV Acute	USEPA WQSV Chronic	QI North Carolina WQS	QI USEPA SWSV Acute	QI USEPA SWSV Chronic
Total Inorganics								
Lead	44-EC-SW03	11.2	25	220	8.5	0.4	0.1	1.3
Manganese	44-EC-SW01	231	NE	NE	10	NA	NA	23.1
Manganese	44-EC-SW02	74.9	NE	NE	10	NA	NA	7.5
Manganese	44-EC-SW03	74.7	NE	NE	10	NA	NA	7.5
Manganese	44-EC-SW04	89.8	NE	NE	10	NA	NA	9.0
Manganese	44-EC-SW05	80	NE	NE	10	NA	NA	8.0
Manganese	44-UT-SW01	47.2	NE	NE	10	NA	NA	4.7
Manganese	44-UT-SW02	38.8	NE	NE	10	NA	NA	3.9
Manganese	44-UT-SW03	74.2	NE	NE	10	NA	NA	7.4
Nickel	44-EC-SW01	21.1	8.3	75	8.3	2.5	0.3	2.5
Nickel	44-EC-SW02	15.3	8.3	75	8.3	1.8	0.2	1.8
Dissolved Inorganics								
Copper	44-UT-DSW0	3.7	3	2.9	2.9	1.2	1.3	1.3
Copper	44-UT-DSW0	3	3	2.9	2.9	1.0	1.0	1.0
Lead	44-UT-DSW0	41.8	25	220	8.5	1.7	0.2	4.9
Manganese	44-EC-DSW0	11	NE	NE	10	NA	NA	1.1
Manganese	44-EC-DSW0	17.2	NE	NE	10	NA	NA	1.7
Manganese	44-EC-DSW0	20.9	NE	NE	10	NA	NA	2.1
Manganese	44-EC-DSW0	20.8	NE	NE	10	NA	NA	2.1
Manganese	44-EC-DSW0	33.3	NE	NE	10	NA	NA	3.3
Manganese	44-UT-DSW0	26.3	NE	NE	10	NA	NA	2.6
Manganese	44-UT-DSW0	29.7	NE	NE	10	NA	NA	3.0
Nickel	44-EC-DSW0	19.8	8.3	75	8.3	2.4	0.3	2.4
Nickel	44-EC-DSW0	12.1	8.3	75	8.3	1.5	0.2	1.5

NE - No Value Established
NA - Not Applicable

SEDIMENT QUOTIENT INDEX CALCULATIONS
SITE 44, JONES STREET DUMP
REMEDIAL INVESTIGATION CTO-0303
MCAS, NEW RIVER, NORTH CAROLINA

Contaminant	Station	Sample Concentratio	ER-L	ER-M	SQC	QI ER-L	QI ER-M	QI SQC
Semivolatiles (ug/kg)								
Butylbenzylphthalate	44-UT-SD02-06	48 J	63	NE	0.57	0.8	NA	84.2
Chrysene	44-UT-SD03-06	460	384	2800	6720000	1.2	0.2	0.00
Fluoranthene	44-UT-SD03-06	740	600	5100	68992	1.2	0.1	0.01
Pentachlorophenol	44-EC-SD01-612	740 J	360	NE	544	2.1	NA	1.36
Phenanthrene	44-UT-SD03-06	250	240	1500	20414	1.04	0.2	0.01
Pesticides (ug/kg)								
Aldrin	44-UT-SD03-612	2.6 J	10	NE	32.26	0.3	NA	0.1
Alpha-chlordane	44-EC-SD01-06	2.3 J	0.5	6	0.73	4.6	0.4	3.2
Alpha-chlordane	44-EC-SD01-612	2.7 J	0.5	6	0.73	5.4	0.5	3.7
Alpha-chlordane	44-EC-SD02-06	2	0.5	6	1.4	4.0	0.3	1.4
Alpha-chlordane	44-EC-SD02-612	3.3 J	0.5	6	0.73	6.6	0.6	4.5
Alpha-chlordane	44-EC-SD03-612	2.4 J	0.5	6	0.73	4.8	0.4	3.3
Alpha-chlordane	44-EC-SD04-06	2.6 J	0.5	6	0.73	5.2	0.4	3.6
Alpha-chlordane	44-EC-SD04-612	2.9 J	0.5	6	0.73	5.8	0.5	4.0
Alpha-chlordane	44-EC-SD05-06	6.1 J	0.5	6	0.73	12.2	1.0	8.4
Alpha-chlordane	44-EC-SD05-612	14 J	0.5	6	0.73	28.0	2.3	19.2
Alpha-chlordane	44-UT-SD02-06	5.1 NJ	0.5	6	62.72	10.2	0.9	0.1
Alpha-chlordane	44-UT-SD02-612	2.6 NJ	0.5	6	62.72	5.2	0.4	0.0
Alpha-chlordane	44-UT-SD03-06	5.6 J	0.5	6	62.72	11.2	0.9	0.1
Alpha-chlordane	44-UT-SD03-612	7.8 J	0.5	6	62.72	15.6	1.3	0.1
Gamma-chlordane	44-EC-SD01-06	2.7 J	0.5	6	0.73	5.4	0.5	3.7
Gamma-chlordane	44-EC-SD01-612	2.7 J	0.5	6	0.73	5.4	0.5	3.7
Gamma-chlordane	44-EC-SD02-06	2.8	0.5	6	1.4	5.6	0.5	2.0
Gamma-chlordane	44-EC-SD02-612	4.2 J	0.5	6	0.73	8.4	0.7	5.8
Gamma-chlordane	44-EC-SD03-612	2.8 J	0.5	6	0.73	5.6	0.5	3.8
Gamma-chlordane	44-EC-SD04-06	3 J	0.5	6	0.73	6.0	0.5	4.1
Gamma-chlordane	44-EC-SD04-612	3.3 J	0.5	6	0.73	6.6	0.6	4.5
Gamma-chlordane	44-EC-SD05-06	6.5 J	0.5	6	0.73	13.0	1.1	8.9
Gamma-chlordane	44-EC-SD05-612	16 J	0.5	6	0.73	32.0	2.7	21.9
Gamma-chlordane	44-UT-SD02-06	5.1 J	0.5	6	62.72	10.2	0.9	0.1
Gamma-chlordane	44-UT-SD02-612	3.6 J	0.5	6	62.72	7.2	0.6	0.1
Gamma-chlordane	44-UT-SD03-06	6.9 J	0.5	6	62.72	13.8	1.2	0.1
Gamma-chlordane	44-UT-SD03-612	9.5 J	0.5	6	62.72	19.0	1.6	0.2
4'4-DDD	44-EC-SD01-06	81	2	20	1	40.5	4.1	81.0
4'4-DDD	44-EC-SD01-612	34 J	2	20	1	17.0	1.7	34.0
4'4-DDD	44-EC-SD02-06	66	2	20	1.93	33.0	3.3	34.2
4'4-DDD	44-EC-SD02-612	120	2	20	1	60	6.0	120.0
4'4-DDD	44-EC-SD03-06	23 J	2	20	1	12	1.2	23.0
4'4-DDD	44-EC-SD03-612	35 J	2	20	1	18	1.8	35.0
4'4-DDD	44-EC-SD04-06	33 J	2	20	1	16.5	1.7	33.0
4'4-DDD	44-EC-SD04-612	43 J	2	20	1	22	2.2	43.0
4'4-DDD	44-EC-SD05-06	140 J	2	20	1	70.0	7.0	140.0
4'4-DDD	44-EC-SD05-612	370	2	20	1	185	18.5	370.0
4'4-DDD	44-UT-SD01-06	5.5 J	2	20	86.24	2.8	0.3	0.1
4'4-DDD	44-UT-SD01-612	13 J	2	20	123.97	6.5	0.7	0.1
4'4-DDD	44-UT-SD02-06	85	2	20	86.24	42.5	4.3	1.0
4'4-DDD	44-UT-SD02-612	770	2	20	86.24	385	38.5	8.9
4'4-DDD	44-UT-SD03-06	14 J	2	20	86.24	7.0	0.7	0.2
4'4-DDD	44-UT-SD03-612	21 J	2	20	86.24	10.5	1.1	0.2
4'4-DDE	44-EC-SD01-06	30 J	2.2	27	5.72	13.6	1.1	5.2
4'4-DDE	44-EC-SD01-612	21 J	2.2	27	5.72	9.5	0.8	3.7
4'4-DDE	44-EC-SD02-06	24 J	2.2	27	11	10.9	0.9	2.2
4'4-DDE	44-EC-SD02-612	58 J	2.2	27	5.72	26	2.1	10.1
4'4-DDE	44-EC-SD03-06	9.3 J	2.2	27	5.72	4	0.3	1.6
4'4-DDE	44-EC-SD03-612	17 J	2.2	27	5.72	8	0.6	3.0
4'4-DDE	44-EC-SD04-06	20 J	2.2	27	5.72	9.1	0.7	3.5
4'4-DDE	44-EC-SD04-612	21 J	2.2	27	5.72	9.5	0.8	3.7
4'4-DDE	44-EC-SD05-06	56 J	2.2	27	5.72	25.5	2.1	9.8
4'4-DDE	44-EC-SD05-612	150 J	2.2	27	5.72	68.2	5.6	26.2
4'4-DDE	44-UT-SD01-06	20 J	2.2	27	492.8	9.1	0.7	0.0
4'4-DDE	44-UT-SD01-612	25 J	2.2	27	708.4	11.4	0.9	0.0
4'4-DDE	44-UT-SD02-06	110 J	2.2	27	492.8	50.0	4.1	0.2
4'4-DDE	44-UT-SD02-612	310 J	2.2	27	492.8	141	11.5	0.6
4'4-DDE	44-UT-SD03-06	9.9 J	2.2	27	492.8	4.5	0.4	0.0
4'4-DDE	44-UT-SD03-612	15 J	2.2	27	492.8	6.8	0.6	0.0
4'4-DDT	44-EC-SD01-06	9 J	1	7	0.32	9	1.3	28.1
4'4-DDT	44-EC-SD01-612	3.1 J	1	7	0.32	3	0.4	9.7
4'4-DDT	44-EC-SD02-06	4.4 J	1	7	0.61	4.4	0.6	7.2
4'4-DDT	44-EC-SD02-612	3.8 J	1	7	0.32	3.8	0.5	11.9
4'4-DDT	44-EC-SD04-06	2.6 J	1	7	0.32	2.6	0.4	8.1
4'4-DDT	44-EC-SD04-612	2.5 J	1	7	0.32	2.5	0.4	7.8
4'4-DDT	44-EC-SD05-06	6.5 J	1	7	0.32	6.5	0.9	20.3
4'4-DDT	44-EC-SD05-612	130	1	7	0.32	130	18.6	406.3
4'4-DDT	44-UT-SD02-06	3.7 J	1	7	27.22	3.7	0.5	0.1
4'4-DDT	44-UT-SD02-612	3.1 J	1	7	27.22	3.1	0.4	0.1
Heptachlor epoxide	44-UT-SD03-612	5.2 J	NE	NE	0.09	NA	NA	57.8
Inorganics (mg/kg)								
Lead	44-UT-SD03-06	53 J	46.7	218	NE	1.1	0.2	NA
Lead	44-UT-SD03-612	56.3 J	46.7	218	NE	1.2	0.3	NA
Selenium	44-UT-SD01-612	1.4	1	NE	NE	1.4	NA	NA

NE - No Value Established
NA - Not Applicable

APPENDIX W
BIOASSAY TESTING RESULTS

INTRODUCTION

A set of four 7-day, daily renewal chronic toxicity tests were conducted with larval fathead minnows (Pimephales promelas) and the freshwater cladoceran Ceriodaphnia dubia to determine the relative toxicity of surface water samples #43 and #44 from the Camp LeJeune Navy Clean, District III Project, Jacksonville, North Carolina. The larval fish survival and growth test and the C. dubia survival and reproduction test were conducted by Normandeau Associates, Spring City, Pennsylvania. The tests were conducted from 4 through 11 May 1995.

All tests were conducted according to procedures outlined in Methods for Measuring the Acute Toxicity of Effluents to Freshwater and Marine Organisms, Fourth Edition (EPA/600/4-90/027F), and Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Water to Freshwater Organisms, Second Edition (EPA/600/4-89/001).

MATERIALS

TEST ORGANISMS

Fathead Minnow (Pimephales promelas)

Larval fathead minnows used in testing were obtained from Aqua Tox, Inc., a commercial laboratory located in Hot Springs, Arkansas. The minnow eggs were placed in a cubitainer containing culture water, and shipped overnight to Normandeau. Minnows that hatched during shipping were acclimated to laboratory environmental conditions for several hours before test initiation. The larvae were fed freshly hatched Artemia (brine shrimp) nauplii twice daily. No larval mortality was observed during the acclimation period. The larvae were less than 24 hours old at test initiation.

Freshwater Cladoceran Ceriodaphnia dubia

Cladoceran neonates, C. dubia, were obtained from Normandeau's in-house cultures. Individual cultures are maintained in 30 ml borosilicate glass culture tubes containing 10 ml of moderately hard reconstituted culture media. These animals are transferred daily to fresh reconstituted water and fed a combination of a unicellular green alga (Selenastrum capricornutum) concentrate and yeast/CEROPHYLL/trout chow (YCT) suspension.

The broods released during an 8-hr period were pooled, and used to initiate the chronic test. Since the neonates used in the test were released into moderately hard reconstituted water, they were fully acclimated to the dilution water used for this test.

DILUTION WATER

Moderately hard reconstituted water was prepared according to procedures outlined in EPA/600/4-90/027F and was used as dilution/control water for the toxicity tests. Distilled water was decanted through a deionizing column (Specialty Filtration mixed bed) and reagent grade chemicals were dissolved into solution in the following concentrations: 96.0 mg/L of $NaHCO_3$, 60.0 mg/L $CaSO_4 \cdot 2H_2O$, 60.0 mg/L $MgSO_4$, and 4 mg/L KCl. The reconstituted water was then aerated for at least 24 hours prior to use as either acclimation water, dilution water, or control water.

TEST MATERIAL

The material tested was surface water collected from sites 43 and 44 by Baker Environmental personnel. Three grab samples were collected for each of the four tests.

For the tests, the first samples collected 3 May were used to initiate the tests on 4 May (Day 1) and for renewals on Day 2. The samples collected 5 May were used for Days 3, 4, and 5, and the third samples collected 8 May were used for renewals on Days 6 and 7.

The samples were packed on ice and shipped overnight to Normandeau Associates on 4, 6, and 9 May. Chain-of-Custody forms accompanied all samples.

All samples were stored at 4°C and then used for test solution renewals. The maximum sample storage time at Normandeau was approximately 72 hours. Samples were warmed to test temperature prior to preparing test solutions for renewal.

METHODS

FATHEAD MINNOW STATIC RENEWAL CHRONIC TEST METHOD

Fathead minnow larvae were exposed to the surface water samples for 7 days under static renewal conditions. Minnows were exposed in groups of ten 400 mL plastic beakers containing 250-ml of test solution with four replicates per concentration (40 minnows per concentration). Test chambers were placed in randomized positions in a temperature controlled environment (Precision Scientific Incubator) maintained at 25 ± 1°C. The highest concentration used was 100%. A 0.5 dilution factor was used to prepare sample concentrations of 50%, 25%, 12.5%, and 6.25%. A control sample consisting of 100% dilution water was also tested.

Test animals were fed 0.1 ml of freshly hatched brine shrimp twice daily. Test solutions were renewed daily by siphoning off the 24-hour-old solution and replacing it with freshly prepared test solution. Surviving minnows were counted and debris was removed from test chambers during the renewal process. Any dead organisms were also removed and recorded. Dissolved oxygen, and pH were measured at the beginning and end of each 24-hr exposure period in at least one replicate at each test concentration. Temperature was measured daily in at least one replicate of each test concentration. Conductivity, alkalinity, and hardness were measured in each sample and in the dilution water. The lighting regime was 16 hours light, 8 hours dark.

The test was terminated at the end of 7 days. All live minnows within each replicate were counted, rinsed with deionized water, and transferred as a group to pre-weighed pans. Minnows were dried in an oven at 100°C to 105°C for at least 8 hours and immediately transferred to a desiccator. Each pan containing minnows was weighed to the nearest 0.1 mg on a Mettler balance and the total dry minnow weight was divided by the number of minnows weighed to obtain the average minnow weight per replicate exposure.

CERIODAPHNIA STATIC RENEWAL CHRONIC TEST METHOD

Young C. dubia (<24 hr old at test initiation) were continuously exposed for 7 days under static renewal conditions to the test solutions. Individual animals were exposed in 30-ml glass culture tubes containing 15 ml of test solution. Each treatment level, including the controls included 10 replicate test tubes (10 animals per concentration). Test tubes were placed in randomized positions within the test array, which was placed in a temperature controlled environment (Precision Scientific Incubator) maintained at 25 ± 1°C. The highest concentration used was 100%. A 0.5 dilution factor was used to prepare lesser sample concentrations of 50%, 25%, 12.5%, and 6.25% sample. A control sample of 100% dilution water was also tested. After test initiation, surviving parent C. dubia were transferred daily to freshly prepared test solutions. The food ration per test tube, which was added after transfer, consisted of 0.2 ml of Selenastrum concentrate and 0.05 ml YCT concentrate.

Observations of the number of live or dead animals were made daily. Reproduction was monitored daily by counting the number of neonates viewed on a light table while the adults were being transferred to new test solutions. The young were discarded after counting.

Dissolved oxygen and pH were measured at the beginning and end of each 24-hr exposure period in one replicate of each test concentration. Temperature was measured daily in one replicate of each test treatment. Conductivity, salinity, alkalinity, and hardness were measured in each sample of test material and in the controls. The lighting regime was 16 hours light, 8 hours dark.

STATISTICAL ANALYSIS

The statistical analysis of chronic toxicity tests with aquatic organisms follows a decision process illustrated in the flow chart in Figure 1 (EPA/600/4-89/001). All chronic test data are statistically analyzed to estimate the highest "safe" or "no-effect concentration" (NOEC) and "lowest-effect concentration" (LOEC) of the surface water sample for fathead minnow survival and growth, and C. dubia survival and reproduction. That is, the NOEC is the highest concentration of surface water sample that causes no observable adverse effects on the test organisms (i.e., the highest concentration of surface water in which the values for the observed responses are not statistically significantly different from the controls). The LOEC is the lowest concentration of surface water sample which causes adverse effects on the test organisms (i.e., where the values for the observed responses are statistically significantly different from the controls). Therefore, the results of the tests are expressed in terms of the two endpoints.

In data analysis, the test data first undergo hypothesis testing to determine if the distribution of the results is normal using the Shapiro-Wilk's Test or Chi-Square Test. The variance is then tested for homogeneity using Bartlett's Test. The endpoint estimates, NOEC and LOEC are determined using an Analysis of Variance Test (ANOVA) followed by a multiple comparison method comparing each of the treatment means with the control. Dunnett's Test (one-sided), Bonferroni's T-Test, Steel's Many-One Rank Test, and Wilcoxon Rank Sum Test are several types of multiple comparison tests used.

Acute endpoints are derived from data obtained 48 hours into the chronic test. The acute endpoints consist of the 48 hour LC_{50}, which is the concentration of surface water sample that will kill half of the organisms in a test population in 48 hours. LC_{50} and 95% confidence limits are calculated using one of the following methods: Probit, Spearman-Karber, Trimmed Spearman-Karber, or the Graphical Method (EPA/600/4-90/027F).

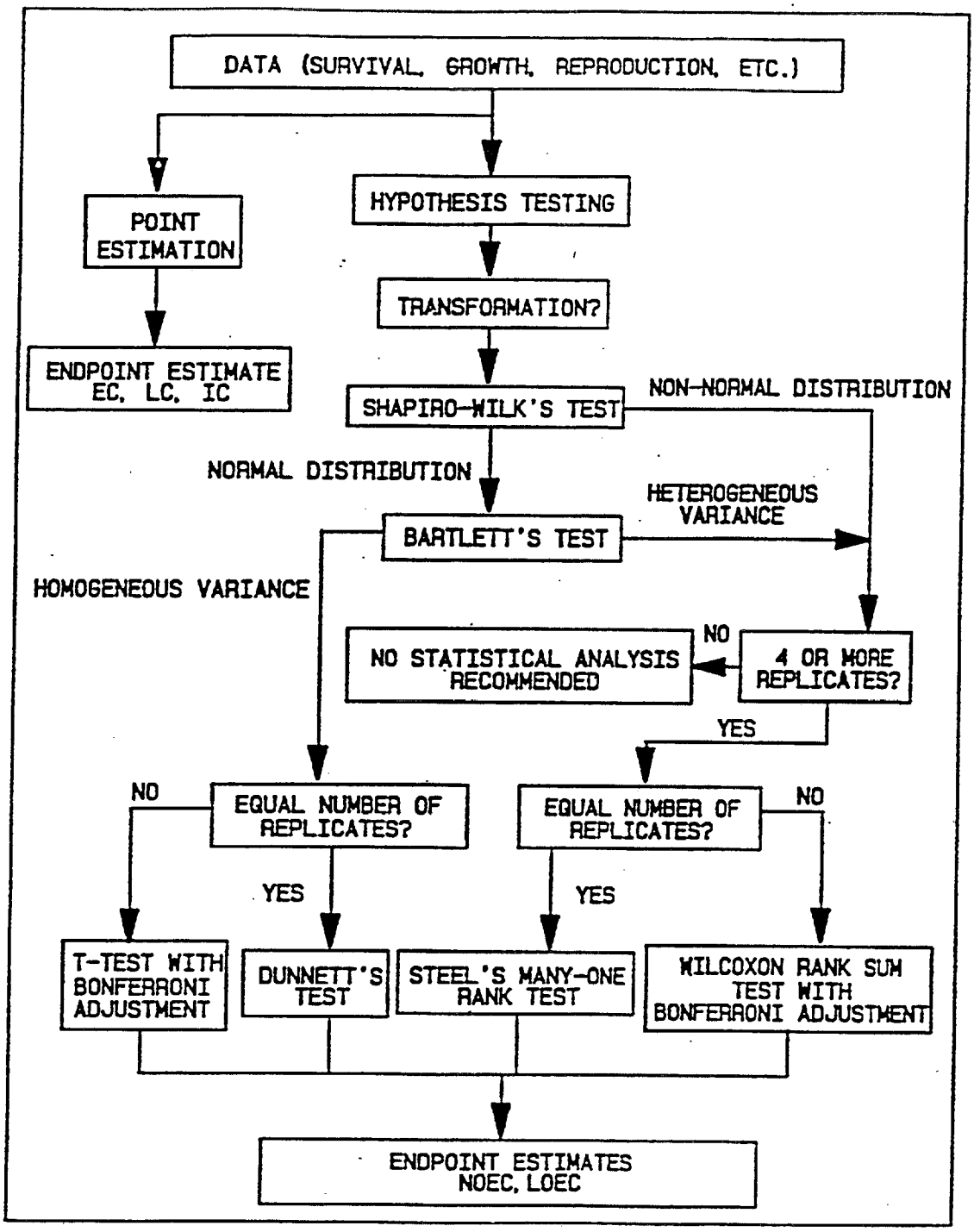


Figure 1. Flow chart for statistical analysis of test data.

RESULTS

FATHEAD MINNOW SURVIVAL AND GROWTH

Normality testing using Shapiro-Wilk's Test revealed that Arcsine transformed survival data were normally distributed for both sample #43 and #44. Bartlett's Test for Variance Equality revealed survival data were homogeneous for both sample #43 and #44. Survival data for both sample #43 and #44 were evaluated using Analysis of Variance (ANOVA)/Dunnett's Test for endpoint determination. This statistical comparison revealed no significant mortality occurred between the control and test concentrations during testing in either sample #43 or #44. Therefore, the no effect concentration (NOEC) for both sample #43 and #44 in the survival toxicity evaluation is 100 percent surface water and the low effect concentration (LOEC) was not detected in either sample #43 or #44. Acute endpoints were calculated from data obtained 48 hours into the test. The 48 hour LC_{50} (lethal concentration) was greater than 100 percent surface water for both samples.

Normality testing using Shapiro-Wilk's Test revealed that growth raw sample data were normally distributed for both sample #43 and #44. Bartlett's Test for Variance Equality revealed growth data are homogeneous for both sample #43 and #44. Analysis of Variance (ANOVA)/Dunnett's Test was used for end point determination for both sample #43 and #44. No significant differences in growth were observed in any of the test concentrations. Therefore, the no effect concentration (NOEC) for both sample #43 and #44 in the growth toxicity evaluation is 100 percent surface water and the low effect concentration (LOEC) was not detected to 100 percent surface water in either sample #43 or #44.

CERIODAPHNIA DUBIA SURVIVAL AND REPRODUCTION

Survival data were evaluated using Fisher's Exact Test for endpoint determination. Significant differences were observed in the 100 percent surface water for both sample #43 and #44 concentrations. Therefore, the no effect concentration (NOEC) for survival in both sample #43 and #44 for the cladoceran toxicity test is 50 percent surface water and the low effect concentration (LOEC) was 100 percent surface water for both sample #43 and #44. Acute endpoints were calculated from data obtained 48 hours into the test. The 48 hour LC_{50} (lethal concentration) was greater than 100 percent surface water for sample #44 and 53.6 percent surface water for sample #43.

Due to a significant survival effect the 100 percent surface water concentrations were excluded from the reproduction evaluation for both sample #43 and #44. The reproduction data for both sample #43 and #44 passed when tested for homogeneity using Bartlett's Test for Variance Equality and passed normality using Chi-Square Test. Reproduction data were evaluated using Analysis of Variance (ANOVA)/Bonferroni T-Test for endpoint determination (i.e., sample #43 due to an unequal number of replicates). This statistical comparison revealed that the 50 percent test concentrations was significantly different ($p = 0.05$) from the control in the reproduction evaluation. Therefore, the no effect concentration (NOEC) for reproduction is 25 percent surface water and the low effect concentration (LOEC) was 50 percent surface water for sample #43. Reproduction data for sample #44 were evaluated using Analysis of Variance (ANOVA)/Dunnett's Test for endpoint determination. This statistical comparison revealed none of the remaining test concentrations were significantly different ($p = 0.05$) from the control.

Therefore, the no effect concentration (NOEC) for reproduction is 50 percent surface water and the low effect concentration (LOEC) was not detected to 50 percent surface water for sample #44.

INTRODUCTION

Two 10-day static sediment toxicity tests were conducted with the amphipod Hyalella azteca (H. azteca) and the midge Chironomus tentans (C. tentans) to determine the short-term effects of Camp LeJeune sediment material. The objective of the tests was to determine the impact of Camp LeJeune sediment on H. azteca survival and C. tentans survival and growth. The sediment toxicity tests were conducted by Normandeau Associates, Spring City, Pennsylvania. The tests were conducted from 12 through 22 May 1995.

All tests were conducted according to the United States Environmental Protection Agency guidance document, Methods for Measuring the Toxicity and Bioaccumulation of Sediment-Associated Contaminants with Freshwater Invertebrates, (EPA/600/R-94/024).

MATERIALS

TEST ORGANISMS

Hyalella azteca

Immature H. azteca (10-day old) were laboratory reared by Aquatic Research Organisms (ARO), a commercial laboratory located in Hampton, New Hampshire. The organisms were placed in a plastic cubitainer containing moderately hard reconstituted water and detrital material and shipped overnight to Normandeau Associates. The amphipods were acclimated to laboratory test temperature for one day prior to test initiation. No mortality was observed during the acclimation period.

Chironomus tentans

Third instar C. tentans larvae were laboratory reared by Aquatic Research Organisms (ARO), a commercial laboratory located in Hampton, New Hampshire. Third instar larvae were confirmed by ARO personnel using head capsul measurements prior to shipping. The organisms were placed in a plastic cubitainer containing moderately hard reconstituted water and a monolayer of sand and shipped overnight to Normandeau Associates. The midges were acclimated to laboratory test temperature for one day prior to test initiation. No mortality was observed during the acclimation period.

DILUTION WATER

Moderately hard reconstituted water was prepared according to procedures outlined in EPA/600/4-90/027F and was used as dilution/control water for the toxicity tests. Distilled water was decanted through a deionizing column (Specialty Filtration mixed bed) and reagent grade chemicals were dissolved into solution in the following concentrations: 96.0 mg/L of $NaHCO_3$, 60.0 mg/L $CaSO_4 \cdot 2H_2O$, 60.0 mg/L $MgSO_4$, and 4 mg/L KCl. The reconstituted water was then aerated for at least 24 hours prior to use as either acclimation water, dilution water, or control water.

TEST MATERIAL

The material tested was sediment collected from the Camp LeJeune Navy Clean Site by Baker Environmental personnel. Two separate locations were sampled, Site 43 and 44. Within each site, several discrete samples were taken using a sediment corer sampler and composited. The samples were collected 4 and 5 May 1995, and transported to Normandeau's Aquatic Toxicology Laboratory via overnight shipping. Chain-of-Custody Forms accompanied all samples (Appendix C).

CONTROL SEDIMENT

Control sediment was collected from the site on 4 May 1995 by Baker Environmental personnel, at a location considered free of contamination, and was a tan sand with some detrital material.

METHODS

SAMPLE PREPARATION

The samples for the sediment toxicity tests were stored in the Aquatic Toxicology Laboratory at 4°C prior to test initiation. The samples were warmed in a water bath to test temperature before preparation of the test sediment. Both samples were fairly uniform in their composition. The sample from Site 43 was thick with detrital material and a fine black mud, and the sample from Site 44 was a tan sand. The samples were then placed in the test chambers and allowed to settle.

HAYALLELA AZTECA STATIC RENEWAL SEDIMENT TOXICITY TEST METHOD

Ten day old Hayallela azteca (H. azteca) were exposed to the sediment samples for ten days under static renewal conditions. H. azteca were exposed in groups of ten in 7.6 cm x 16 cm x 8.0 cm glass aquaria containing 200 to 250 mL of test sediment with eight replicates per sample (80 amphipods per sample). Overlying water (moderately hard reconstituted water) was used to fill the test aquaria to 900 mL. Test chambers were placed in randomized positions in a temperature controlled environment maintained at 23 ± 1°C. A control sediment was also tested.

Test animals were fed 3.0 mL of YCT suspension daily. Test overlying water was renewed twice daily by siphoning off the old solution and replacing it with freshly prepared overlying water. Any dead organisms observed during the renewal process were removed and recorded. Dissolved oxygen, and temperature were measured daily during the exposure period in at least one replicate at each sediment sample. Conductivity, pH, ammonia, alkalinity, and hardness were measured in each sediment sample and in the control at the beginning and end of the test. The lighting regime was 16 hours light, 8 hours dark.

The test was terminated at the end of ten days. All live H. azteca within each replicate were collected with a sieve and counted.

CHIRONOMUS TENTANS STATIC RENEWAL SEDIMENT TOXICITY TEST METHOD

Third instar Chironomus tentans (C. tentans) larvae were exposed to the sediment samples for ten days under static renewal conditions. C. tentans were exposed in groups of ten in 7.6 cm x 16 cm x 8.0 cm glass aquaria containing 200 to 250 mL of test sediment with eight replicates per sample (80 midges per sample). Overlying water (moderately hard reconstituted water) was used to fill the test aquaria to 900 mL. Test chambers were placed in randomized positions in a temperature controlled environment maintained at 23 ± 1°C. A control sediment was also tested.

Test animals were fed 3.0 mL of Tetrafin suspension (4.0 mg dry solids) daily. Test overlying water was renewed twice daily by siphoning off the old solution and replacing it with freshly prepared overlying water. Any dead organisms observed during the renewal process were removed and recorded. Dissolved oxygen, and temperature were measured daily during the exposure period in at least one replicate at each sediment sample. Conductivity, pH, ammonia, alkalinity, and hardness were measured in each sediment sample and in the control at the beginning and end of the test. The lighting regime was 16 hours light, 8 hours dark.

The test was terminated at the end of ten days. All live C. tentans within each replicate collected with a sieve were counted, rinsed with deionized water, and transferred as a group to pre-weighed pans. Midges were dried in an oven at 100°C to 105°C for at least 8 hours and immediately transferred to a desiccator. Each pan containing midges was weighed to the nearest 0.1 mg on a Mettler balance and the total dry midge weight was divided by the number of midges weighed to obtain the average midge weight per replicate exposure.

RESULTS

HYALELLA AZTECA SURVIVAL

Individual data points and sediment sample means for the Hyalella azteca survival toxicity test are presented in Table 1.

Arc-sine Transformed survival data passed when tested for normality using Shapiro-Wilk's Test and for homogeneity using Bartlett's Test for Variance Equality. Therefore, the parametric procedure Analysis of Variance (ANOVA)/Dunnett's Test was used to identify significant differences from the control sediment and test sediments. This statistical comparison revealed a significant difference between the control site and Site 43. No significant difference was observed at Site 44.

CHIRONOMUS TENTANS SURVIVAL AND GROWTH

Individual data points and sediment sample means for the Chironomus tentans survival and growth toxicity tests are presented in Tables 2 and 3.

Arc-sine Transformed survival data passed when tested for normality using Shapiro-Wilk's Test and for homogeneity using Bartlett's Test for Variance Equality. Therefore, the parametric procedure Analysis of Variance (ANOVA)/Dunnett's Test was used to identify significant differences from the control sediment and test sediments. This statistical comparison revealed no significant differences between the control sediment and sediment from Sites 43 and 44.

Growth raw sample data passed when tested for normality using Shapiro-Wilk's Test and for homogeneity using Bartlett's Test for Variance Equality. Therefore, the parametric procedure Analysis of Variance (ANOVA)/Dunnett's Test was used to identify statistical differences between the control sediment and test sediments. This statistical comparison revealed no significant differences between the control sediment and sediments from Sites 43 and 44.

APPENDIX X
TERRESTRIAL REFERENCE VALUES AND CDI CALCULATIONS

EQUATION[illegible]ED TO CALCULATE EXPOSURE FOR THE WHITETAILED DEER
SITE 44, JONES STREET DUMP
REMEDIAL INVESTIGATION, CTO-0303
MCAS, NEW RIVER, NORTH CAROLINA

Food Source ingestion of: Iv=vegetation If=fish Im=mammals Iw=worms Ifr=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 (Ifr 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)	Contaminate Area (acres)	H Ratio	Equation Used to Calculate Total Exposure E=total exposure Cw=constituent conc. in water Cs=constituent conc. in soil Cwo=constituent conc. in worms Cfr=constituent conc. in fruit H=ratio of home range area to site area
Vegetation(Iv) 100 percent	1.600	1.85E-02	1.10E+00	NA	NA	NA	1.600	45.400	454.000	6.2	0.014	$E=\frac{(Cw)(Iw)+[(Cs)(Bv)(Iv)+(Cs)(Is)][H]}{BW}$

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
Acetone	53.299	7.24E-03	8.67E-03	NA	NA	NA	3.99E-04	1.98E+00	2.02E-04
1,1-Dichloroethene	2.367	2.00E-03	ND	NA	NA	NA	4.85E-05	5.53E+00	8.76E-06
1,2-Dichloroethene (total)	2.704	1.50E-01	ND	NA	NA	NA	3.63E-03	9.88E-01	3.68E-03
1,1,2,2-Tetrachloroethane	0.714	3.51E-02	ND	NA	NA	NA	8.51E-04	1.50E+01	5.67E-05
1,1,2-Trichloroethane	2.072	1.00E-03	ND	NA	NA	NA	2.42E-05	3.40E-02	7.13E-04
Trichloroethene	1.588	3.63E-02	ND	NA	NA	NA	8.80E-04	1.98E+01	4.45E-05
Vinyl chloride	6.009	1.79E-02	ND	NA	NA	NA	4.33E-04	3.36E-02	1.29E-02
Bis(2-chloroethyl)ether	6.864	ND	2.64E-01	NA	NA	NA	8.78E-04	NA	NA
Benzo(g,h,i)perylene	0.007	ND	2.00E-01	NA	NA	NA	1.77E-06	8.71E-02	2.03E-05
Bis(2-ethylhexyl)phthalate	0.044	3.00E-03	2.16E-01	NA	NA	NA	7.84E-05	4.89E-02	1.61E-03
2,6-Dinitrotoluene	2.367	ND	2.38E-01	NA	NA	NA	2.73E-04	2.42E-01	1.13E-03
Indeno(1,2,3-cd)pyrene	0.007	ND	2.09E-01	NA	NA	NA	1.84E-06	8.71E-02	2.11E-05
Phenol	5.260	1.00E-03	ND	NA	NA	NA	2.42E-05	1.19E+00	2.04E-05
4,4'-DDD	0.013	ND	2.93E-03	NA	NA	NA	3.50E-08	1.58E-01	2.22E-07
4,4'-DDE	0.020	ND	1.40E-01	NA	NA	NA	2.11E-06	1.58E-01	1.34E-05
4,4'-DDT	0.008	ND	2.30E-02	NA	NA	NA	2.14E-07	1.58E-01	1.35E-06
Aluminum	0.004	5.09E-01	1.11E+04	NA	NA	NA	9.58E-02	6.51E+00	1.47E-02
Arsenic	0.040	ND	3.45E+00	NA	NA	NA	8.59E-05	3.25E-01	2.64E-04
Barium	0.150	2.71E-02	2.13E+01	NA	NA	NA	2.32E-03	1.30E-01	1.78E-02
Chromium	0.008	ND	1.64E+01	NA	NA	NA	1.51E-04	6.51E+00	2.32E-05
Copper	0.400	2.30E-03	1.91E+02	NA	NA	NA	3.81E-02	6.51E-01	5.85E-02
Iron	0.004	1.86E+00	1.29E+04	NA	NA	NA	1.42E-01	6.51E+00	2.19E-02
Lead	0.045	9.35E-03	1.70E+01	NA	NA	NA	6.90E-04	1.95E-01	3.54E-03
Manganese	0.250	1.48E-01	1.74E+01	NA	NA	NA	5.78E-03	1.30E+00	4.44E-03
Nickel	0.060	2.11E-02	1.83E+00	NA	NA	NA	5.74E-04	3.25E-01	1.77E-03
Vanadium	0.006	2.99E-02	2.43E+01	NA	NA	NA	9.25E-04	3.25E-01	2.84E-03
Zinc	1.500	6.13E-02	3.31E+01	NA	NA	NA	2.57E-02	3.25E+00	7.89E-03
								SU	1.54E-01

ND - Not Detected
NA - Not Applicable

EQUATIONS USED TO CALCULATE EXPOSURE FOR THE EASTERN COTTONTAIL RABBIT
SITE 44, JONES STREET DUMP
REMEDIAL INVESTIGATION, CTO-0303
MCAS, NEW RIVER, NORTH CAROLINA

Food Source ingestion of: Iv=vegetation If=fish Im=mammals Iw=worms Ifr=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 (Ifr 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 Cwo=constituent conc. in worms Cfr=constituent conc. in fruit H=ratio of home range area to site area
Vegetation (Iv) 100 percent	0.237	5.69E-03	1.19E-01	NA	NA	NA	0.237	1.229	9.297	6.2	0.669	$E=\frac{(Cw)(Iw)+[(Cs)(Bv)(Iv)+(Cs)(Is)][H]}{BW}$

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
Acetone	53.299	7.24E-03	8.67E-03	NA	NA	NA	6.04E-02	6.58E+00	9.17E-03
1,1-Dichloroethene	2.367	2.00E-03	ND	NA	NA	NA	1.94E-04	1.84E+01	1.05E-05
1,2-Dichloroethene (total)	2.704	1.50E-01	ND	NA	NA	NA	1.46E-02	3.29E+00	4.42E-03
1,1,2,2-Tetrachloroethane	0.714	3.51E-02	ND	NA	NA	NA	3.41E-03	5.00E+01	6.81E-05
1,1,2-Trichloroethane	2.072	1.00E-03	ND	NA	NA	NA	9.70E-05	1.13E-01	8.57E-04
Trichloroethene	1.588	3.63E-02	ND	NA	NA	NA	3.52E-03	6.58E+01	5.35E-05
Vinyl chloride	6.009	1.79E-02	ND	NA	NA	NA	1.73E-03	1.12E-01	1.55E-02
Bis(2-chloroethyl)ether	6.864	ND	2.64E-01	NA	NA	NA	2.35E-01	NA	NA
Benzo(g,h,i)perylene	0.007	ND	2.00E-01	NA	NA	NA	7.94E-04	2.90E-01	2.74E-03
Bis(2-ethylhexyl)phthalate	0.044	3.00E-03	2.16E-01	NA	NA	NA	2.16E-03	1.63E-01	1.34E-02
2,6-Dinitrotoluene	2.367	ND	2.38E-01	NA	NA	NA	7.33E-02	8.05E-01	9.11E-02
Indeno(1,2,3-cd)pyrene	0.007	ND	2.09E-01	NA	NA	NA	8.26E-04	2.90E-01	2.85E-03
Phenol	5.280	1.00E-03	ND	NA	NA	NA	9.70E-05	3.95E+00	2.46E-05
4,4'-DDD	0.013	ND	2.93E-03	NA	NA	NA	1.41E-05	5.26E-01	2.67E-05
4,4'-DDE	0.020	ND	1.40E-01	NA	NA	NA	7.89E-04	5.26E-01	1.50E-03
4,4'-DDT	0.008	ND	2.30E-02	NA	NA	NA	9.41E-05	5.26E-01	1.79E-04
Aluminum	0.004	5.09E-01	1.11E+04	NA	NA	NA	4.02E+01	1.16E+01	3.46E+00
Arsenic	0.040	ND	3.45E+00	NA	NA	NA	2.85E-02	2.90E+00	9.83E-03
Barium	0.150	2.71E-02	2.13E+01	NA	NA	NA	4.80E-01	1.16E+00	4.14E-01
Chromium	0.008	ND	1.64E+01	NA	NA	NA	6.67E-02	5.80E+01	1.15E-03
Copper	0.400	2.30E-03	1.91E+02	NA	NA	NA	1.05E+01	1.16E+01	9.02E-01
Iron	0.004	1.86E+00	1.29E+04	NA	NA	NA	4.69E+01	2.90E+01	1.62E+00
Lead	0.045	9.35E-03	1.70E+01	NA	NA	NA	1.52E-01	1.74E+00	8.74E-02
Manganese	0.250	1.48E-01	1.74E+01	NA	NA	NA	6.29E-01	2.32E+01	2.71E-02
Nickel	0.060	2.11E-02	1.83E+00	NA	NA	NA	2.19E-02	2.90E+00	7.55E-03
Vanadium	0.006	2.99E-02	2.43E+01	NA	NA	NA	9.54E-02	5.80E-02	1.65E+00
Zinc	1.500	6.13E-02	3.31E+01	NA	NA	NA	6.52E+00	2.90E+01	2.25E-01
								SUM	8.54E+00

ND - Not Detected
NA - Not Applicable

EQUATIONS USED TO CALCULATE EXPOSURE FOR THE BOBWHITE QUAIL
SITE 44, JONES STREET DUMP
REMEDIAL INVESTIGATION, CTO-0303
MCAS, NEW RIVER, NORTH CAROLINA

Food Source Ingestion of: Iv=vegetation If=fish Im=mammals Iw=worms Ifr=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 (Ifr 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 Cwo=constituent conc. in worms Cfr=constituent conc. in fruit H=ratio of home range area to site area
Vegetation (Iv) 100%	0.013	1.11E-03	1.91E-02	NA	NA	NA	0.013	0.174	26.242	6.2	0.237	$E=\frac{(Cw)(Iw)+[(Cs)(Bv)(Iv)+(Cs)(Is)][H]}{BW}$

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
Acetone	53.299	7.24E-03	8.67E-03	NA	NA	NA	0.009	2.72E+01	3.43E-04
1,1-Dichloroethene	2.367	2.00E-03	ND	NA	NA	NA	0.000	7.61E+01	2.89E-06
1,2-Dichloroethene (total)	2.704	1.50E-01	ND	NA	NA	NA	0.017	1.36E+01	1.21E-03
1,1,2,2-Tetrachloroethane	0.714	3.51E-02	ND	NA	NA	NA	0.004	2.07E+02	1.87E-05
1,1,2-Trichloroethane	2.072	1.00E-03	ND	NA	NA	NA	0.000	4.68E-01	2.35E-04
Trichloroethene	1.588	3.63E-02	ND	NA	NA	NA	0.004	2.72E+02	1.47E-05
Vinyl chloride	6.009	1.79E-02	ND	NA	NA	NA	0.002	4.62E-01	4.25E-03
Bis(2-chloroethyl)ether	6.864	ND	2.64E-01	NA	NA	NA	0.034	NA	NA
Benzo(g,h,i)perylene	0.007	ND	2.00E-01	NA	NA	NA	0.000	1.20E+00	2.73E-04
Bis(2-ethylhexyl)phthalate	0.044	3.00E-03	2.16E-01	NA	NA	NA	0.001	2.30E+00	3.61E-04
2,6-Dinitrotoluene	2.367	ND	2.38E-01	NA	NA	NA	0.011	3.33E+00	3.22E-03
Indeno(1,2,3-cd)pyrene	0.007	ND	2.09E-01	NA	NA	NA	0.000	1.20E+00	2.84E-04
Phenol	5.260	1.00E-03	ND	NA	NA	NA	0.000	1.63E+01	6.74E-06
4,4'-DDD	0.013	ND	2.93E-03	NA	NA	NA	0.000	8.80E-02	5.84E-05
4,4'-DDE	0.020	ND	1.40E-01	NA	NA	NA	0.000	8.80E-02	2.98E-03
4,4'-DDT	0.008	ND	2.30E-02	NA	NA	NA	0.000	8.80E-02	4.32E-04
Aluminum	0.004	5.09E-01	1.11E+04	NA	NA	NA	17.668	3.06E+01	5.77E-01
Arsenic	0.040	ND	3.45E+00	NA	NA	NA	0.008	1.98E+01	3.92E-04
Barium	0.150	2.71E-02	2.13E+01	NA	NA	NA	0.094	3.06E+00	3.07E-02
Chromium	0.008	ND	1.64E+01	NA	NA	NA	0.027	1.53E+02	1.77E-04
Copper	0.400	2.30E-03	1.91E+02	NA	NA	NA	1.699	4.59E+01	3.70E-02
Iron	0.004	1.86E+00	1.29E+04	NA	NA	NA	20.898	1.53E+02	1.35E-01
Lead	0.045	9.35E-03	1.70E+01	NA	NA	NA	0.041	7.52E+00	5.42E-03
Manganese	0.250	1.48E-01	1.74E+01	NA	NA	NA	0.123	3.06E+02	4.01E-04
Nickel	0.060	2.11E-02	1.83E+00	NA	NA	NA	0.007	4.59E+01	1.55E-04
Vanadium	0.008	2.99E-02	2.43E+01	NA	NA	NA	0.042	4.39E+01	9.68E-04
Zinc	1.500	6.13E-02	3.31E+01	NA	NA	NA	0.973	1.53E+02	6.36E-03
								SUM	8.08E-01

ND - Not Detected
NA - Not Applicable

EQUATIONS USED TO CALCULATE EXPOSURE FOR THE RED FOX
SITE 44, JONES STREET DUMP
REMEDIAL INVESTIGATION, CTO-0303
MCAS, NEW RIVER, NORTH CAROLINA

Food Source ingestion of: Iv=vegetation If=fish Im=mammals Iw=worms Ifr=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 (Ifr 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 Cwo=constituent conc. in worms Cfr=constituent conc. in fruit H=ratio of home range area to site area
Small Mammals Im=80%	0.601	0.017	0.385	NA	NA	0.481	0.1202	4.535	1245.4	6.2	0.005	$E=\frac{(Cw)(Iw)+[(cm)(Im)+(Cs)(Bv)(Iv)+(Cs)(Is)][H]}{BW}$
Vegetation Iv=20%	0.112 Small Mammal	0.00269 Small Mammal	0.0652 Small Mammal	NA	NA	NA	0.112 Small Mammal	0.3725 Small Mammal				$Cm=\frac{[(Cw)(Iw)+((Cs)(Bv)(Iv)+(Cs)(Is))(H)][Bb]}{BW}$
								Small Mammal	0.032	1	All AOCs	

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)	Ingestion-to-tissue Biotransfer Factor (Bb)	Constituent Concentration in Mammals (mg/kg) (Cm)	Total Exposure (mg/kg/d)	TRV	RATIO
Acetone	53.299	7.24E-03	8.67E-03	NA	1.45E-06	2.03E-09	6.77E-04	4.26E+00	1.59E-04
1,1-Dichloroethene	2.387	2.00E-03	ND	NA	3.16E-06	1.11E-09	1.70E-04	1.19E+01	1.43E-05
1,2-Dichloroethene (total)	2.704	1.50E-01	ND	NA	2.51E-06	6.59E-08	1.26E-02	2.13E+00	5.90E-03
1,1,2,2-Tetrachloroethane	0.714	3.51E-02	ND	NA	2.51E-05	1.54E-07	2.98E-03	3.24E+01	9.22E-05
1,1,2-Trichloroethane	2.072	1.00E-03	ND	NA	3.98E-06	6.87E-10	8.50E-05	7.32E-02	1.16E-03
Trichloroethene	1.588	3.63E-02	ND	NA	6.31E-06	4.01E-08	3.09E-03	4.26E+01	7.25E-05
Vinyl chloride	6.009	1.79E-02	ND	NA	6.31E-07	1.97E-09	1.52E-03	7.24E-02	2.10E-02
Bis(2-chloroethyl)ether	6.864	ND	2.64E-01	NA	5.01E-07	2.74E-07	2.45E-04	NA	NA
Benzo(g,h,i)perylene	0.007	ND	2.00E-01	NA	7.94E-02	1.47E-04	3.96E-06	1.88E-01	2.11E-05
Bis(2-ethylhexyl)phthalate	0.044	3.00E-03	2.16E-01	NA	3.16E-03	1.55E-05	2.60E-04	1.05E-01	2.47E-03
2,6-Dinitrotoluene	2.367	ND	2.38E-01	NA	3.16E-06	5.40E-07	7.88E-05	5.20E-01	1.51E-04
Indeno(1,2,3-cd)pyrene	0.007	ND	2.09E-01	NA	8.13E-02	1.58E-04	4.13E-06	1.88E-01	2.20E-05
Phenol	5.260	1.00E-03	ND	NA	7.94E-07	1.39E-10	8.50E-05	2.55E+00	3.33E-05
4,4'-DDD	0.013	ND	2.93E-03	NA	2.51E-02	8.23E-07	5.98E-08	3.41E-01	1.76E-07
4,4'-DDE	0.020	ND	1.40E-01	NA	1.26E-02	2.31E-05	2.97E-06	3.41E-01	8.72E-06
4,4'-DDT	0.008	ND	2.30E-02	NA	6.31E-02	1.38E-05	4.56E-07	3.41E-01	1.34E-06
Aluminum	0.004	5.09E-01	1.11E+04	NA	1.50E-03	1.41E-01	2.55E-01	1.95E+01	1.31E-02
Arsenic	0.040	ND	3.45E+00	NA	2.00E-03	1.33E-04	8.23E-05	2.37E-02	3.48E-03
Barium	0.150	2.71E-02	2.13E+01	NA	1.50E-04	1.68E-04	3.12E-03	1.07E-01	2.93E-02
Chromium	0.008	ND	1.64E+01	NA	5.50E-03	8.55E-04	3.21E-04	1.03E+00	3.12E-04
Copper	0.400	2.30E-03	1.91E+02	NA	1.00E-02	2.44E-01	1.40E-02	7.80E+00	1.79E-03
Iron	0.004	1.66E+00	1.29E+04	NA	2.00E-02	2.19E+00	4.06E-01	1.88E+01	2.16E-02
Lead	0.045	9.35E-03	1.70E+01	NA	3.00E-04	1.06E-04	1.21E-03	3.41E+00	3.55E-04
Manganese	0.250	1.48E-01	1.74E+01	NA	4.00E-04	5.83E-04	1.35E-02	3.75E+00	3.60E-03
Nickel	0.060	2.11E-02	1.83E+00	NA	6.00E-03	3.00E-04	1.84E-03	3.25E+01	5.66E-05
Vanadium	0.006	2.99E-02	2.43E+01	NA	2.50E-03	5.52E-04	3.01E-03	2.77E-01	1.09E-02
Zinc	1.500	6.13E-02	3.31E+01	NA	1.00E-01	1.52E+00	1.32E-02	1.30E+00	1.02E-02
								SUM	1.26E-01

ND - Not Detected
NA - Not Applicable

EQUATION: J TO CALCULATE EXPOSURE FOR THE RACCOON
SITE 44, JONES STREET DUMP
REMEDIAL INVESTIGATION, CTO-0303
MCAS, NEW RIVER, NORTH CAROLINA

Food Source ingestion of: Iv=vegetation If=fish Im=mammals Iw=worms Ifr=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 (Ifr in kg/d)	Rate of Fish Ingestion (If in kg/d)	Rate of Vegetation Ingestion (Iv in kg/d)	Body Weight (BW) (kg)	Home Range Size (acres)	Contaminate Area (acres)	H Ratio	Equation Used to Calculate Total Exposure E=total exposure Cw=constituent conc. in water Cs=constituent conc. in soil Cwo=constituent conc. in worms Cfr=constituent conc. in fruit H=ratio of home range area to site area
Vegetation Iv=40% Fish If=60%	0.214	2.01E-02	4.22E-01	NA	0.088	1.29E-01	NA	5.120	256.984	6.2	0.024	$E=\frac{(Cw)(Iw)+(Cf)(If)+[(Cs)(Bv)(Iv)+(Cs)(Is)][H]}{BW}$

Contaminant of Concern	Soil to Plant Transfer Coefficient (fruit) (Br)	Constituent Concentration in Water (mg/l) (Cw)	Constituent Concentration in Soil (mg/kg) (Cs)	Constituent Concentration in Worms (mg/kg) (Cwo)	Fish Bioconcentration Factor (BCF)	Constituent Concentration in Fishes (mg/kg) (Cf) (=SW*BCF)	Total Exposure (mg/kg/d)	TRV	RATIO
Acetone	53.289	7.24E-03	8.67E-03	NA	0.690	5.00E-03	9.11E-04	4.09E+00	2.23E-04
1,1-Dichloroethene	2.367	2.00E-03	ND	NA	5.600	1.12E-02	4.46E-04	1.14E+01	3.90E-05
1,2-Dichloroethene (total)	2.704	1.50E-01	ND	NA	5.600	8.40E-01	3.35E-02	2.04E+00	1.64E-02
1,1,2,2-Tetrachloroethane	0.714	3.51E-02	ND	NA	5.000	1.76E-01	7.30E-03	3.11E+01	2.35E-04
1,1,2-Trichloroethane	2.072	1.00E-03	ND	NA	4.500	4.50E-03	1.95E-04	7.03E-02	2.78E-03
Trichloroethene	1.588	3.63E-02	ND	NA	10.600	3.85E-01	1.27E-02	4.09E+01	3.10E-04
Vinyl chloride	6.009	1.79E-02	ND	NA	1.170	2.09E-02	2.00E-03	6.95E-02	2.88E-02
Bis(2-chloroethyl)ether	6.864	ND	2.64E-01	NA	6.900	0.00E+00	7.61E-04	NA	NA
Benzo(g,h,i)perylene	0.007	ND	2.00E-01	NA	30.000	0.00E+00	1.96E-05	1.80E-01	1.09E-04
Bis(2-ethylhexyl)phthalate	0.044	3.00E-03	2.16E-01	NA	130.000	3.90E-01	1.01E-02	1.01E-01	9.95E-02
2,6-Dinitrotoluene	2.367	ND	2.36E-01	NA	ND	0.00E+00	2.50E-04	5.00E-01	5.01E-04
Indeno(1,2,3-cd)pyrene	0.007	ND	2.09E-01	NA	30.000	0.00E+00	2.04E-05	1.80E-01	1.13E-04
Phenol	5.260	1.00E-03	ND	NA	1.400	1.40E-03	1.18E-04	2.45E+00	4.80E-05
4,4'-DDD	0.013	ND	2.93E-03	NA	53600.000	0.00E+00	2.95E-07	3.27E-01	9.01E-07
4,4'-DDE	0.020	ND	1.40E-01	NA	53600.000	0.00E+00	1.44E-05	3.27E-01	4.42E-05
4,4'-DDT	0.008	ND	2.30E-02	NA	53600.000	0.00E+00	2.26E-06	3.27E-01	6.91E-06
Aluminum	0.001	5.09E-01	1.11E+04	NA	231.000	1.18E+02	4.06E+00	3.48E-01	1.17E+01
Arsenic	0.008	ND	3.45E+00	NA	44.000	0.00E+00	3.37E-04	2.27E-02	1.48E-02
Barium	0.015	2.71E-02	2.13E+01	NA	8.000	2.17E-01	9.83E-03	1.02E-01	9.61E-02
Chromium	0.005	ND	1.64E+01	NA	16.000	0.00E+00	1.59E-03	9.86E-01	1.61E-03
Copper	0.250	2.30E-03	1.91E+02	NA	36.000	8.28E-02	3.99E-02	7.49E+00	5.32E-03
Iron	0.001	1.86E+00	1.29E+04	NA	ND	0.00E+00	1.39E+00	1.80E+01	7.70E-02
Lead	0.009	9.35E-03	1.70E+01	NA	49.000	4.58E-01	1.40E-02	3.27E+00	4.26E-03
Manganese	0.050	1.48E-01	1.74E+01	NA	35.000	5.18E+00	1.44E-01	3.60E+00	4.01E-02
Nickel	0.060	2.11E-02	1.83E+00	NA	47.000	9.92E-01	2.69E-02	2.05E+00	1.31E-02
Vanadium	0.003	2.99E-02	2.43E+01	NA	ND	0.00E+00	4.81E-03	2.66E-01	1.81E-02
Zinc	0.900	6.13E-02	3.31E+01	NA	47.000	2.88E+00	9.26E-02	6.54E+01	1.42E-03
								SUM	1.21E+01

ND - Not Detected
NA - Not Applicable

DERIVATION OF TERRESTRIAL REFERENCE VALUES
SITE 44, JONES STREET DUMP
REMEDIAL INVESTIGATION, CTO-0303
MCAS, NEW RIVER, NORTH CAROLINA

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 et.al., 1993):

TRV = MTL * 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 et.al., 1993):

TRV (deer) = [TRV (cow)]*[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)

DERIVATION OF TERRESTRIAL REFERENCE VALUES
SITE 44, JONES STREET DUMP
REMEDIAL INVESTIGATION, CTO-0303
MCAS, NEW RIVER, NORTH CAROLINA

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):

CR (birds) = 0.648 (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:

CR (rabbit) = FR/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 or 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.

TOXICITY DATA USED TO CALCULATE TERRESTRIAL REFERENCE VALUES
SITE 44, JONES STREET DUMP
REMEDIAL INVESTIGATION, CTO-0303
MCAS, NEW RIVER, NORTH CAROLINA

Chemical	Substitute Chemical Used	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)	58.03 (1)	NA	2.41 (5)	NA	NA	NA
Cobalt		0.05 (1)	0.5 (1)	0.58 (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. kestral	1.74 (1)	NA	8 (6)	NA	NA	NA
Manganese		1 (24)	100 (1)	23.21 (1)	NA	8.8 (66)	NA	NA	NA
Mercury		0.01 (1)	0.1 (1)	0.12 (1)	NA	0.32 (18)	NA	NA	NA
Molydenum		NA	NA	NA	NA	0.02 (82)	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)	11.38 (68) Mallard	0.06 (1)	NA	0.65 (58)	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)	10.8 (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
gamma-BHC	(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
Dibenzo(a,h)anthracene	(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	4583 (53)	NA	NA
2,4-Dimethylphenol		NA	NA	NA	NA	NA	5 (85)	NA	NA
Di-n-butylphthalate		NA	0.11 (16) Ringed Dove	NA	NA	125 (63)	NA	NA	NA
Di-n-octylphthalate		NA	NA	NA	NA	17.5 (79)	NA	NA	NA
2,6-Dinitrotoluene		NA	NA	NA	0.4 (84)	NA	NA	NA	NA
Fluoranthene		NA	NA	NA	NA	NA	12.5 (8)	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
Nitrobenzene		NA	NA	NA	NA	0.25 (80)	NA	NA	NA
n-Nitrosodiphenylamine		NA	NA	NA	NA	50 (81)	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

TOXICITY DATA USED TO CALCULATE TERRESTRIAL REFERENCE VALUES
SITE 44, JONES STREET DUMP
REMEDIAL INVESTIGATION, CTO-0303
MCAS, NEW RIVER, NORTH CAROLINA

Chemical	Substitute Chemical Used	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 (49)	NA	NA	NA
Gamma-chlordane	(Chlordane)	1 (24)	2.14 (70) Blackbird	NA	0.075 (48)	0.055 (49)	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 DDT	NA	NA	NA
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 I		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 (29)
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 (59)	NA	NA	NA
1,2-Dichloroethene (total)		NA	NA	NA	NA	5 (44)	NA	NA	NA
Chloroform		NA	NA	NA	30 (36)	38 (37)	NA	NA	NA
2-Butanone		NA	NA	NA	NA	NA	NA	NA	NA
1,1,1-Trichloroethane		NA	NA	NA	NA	NA	1000 (38)	NA	NA
Trichloroethene		NA	NA	NA	NA	100 (39)	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
1,1,2,2-Tetrachloroethane		NA	NA	NA	NA	76 (85)	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
Xylenes (total)		NA	NA	NA	NA	179 (43)	NA	NA	NA
Vinyl chloride		NA	NA	NA	NA	0.17 (83)	NA	NA	NA
Acetone		NA	NA	NA	NA	10 (46)	NA	NA	NA

(1) NAS, 1980
(2) Ambrose et.al., 1976
(3) Drinker et. al., 1927
(4) Schroder and Mitchner, 1975a,b
(5) Mackenzie et.al., 1958
(6) Azar et.al., 1973
(7) Mackenzie and Angevine, 1981
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(11) Lamb, et.al., 1987
(12) Schroeder et.al., 1976
(13) Schroeder and Mitchner, 1971
(14) Loser and Lorke, 1977
(15) Kopp et.al., 1982
(16) Peakall et.al., 1974
(17) Aulerich et.al., 1982
(18) Fitzhugh et.al., 1950
(19) Halverson et.al., 1966
(20) Rungby and Dansher, 19
(21) Gomez et.al., 1983, 1988
(22) USEPA, 1980
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(24) Ford et.al., 1991
(25) Walker et.al., 1969
(26) Hoechst, 1989
(27) Vesicol, 1969
(28) Treon et.al., 1955
(29) Aulerich et.al., 1990
(30) Wasserman and Culos, 1
(31) Bruckner et.al., 1974
(32) Byrne et.al., 1988
(33) USEPA, 1989b
(34) NCA., 1982
(35) Hardin et.al., 1981
(36) Heywood et.al., 1979
(37) Jorgenson et.al., 1985
(38) Lane, et.al., 1982
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(40) White et.al., 1985
(41) Wolf et.al., 1956
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(43) NTP, 1986a
(44) Quast et.al., 1983
(45) Vesicol, 1955
(46) USEPA, 1986a
(47) Fitzhugh, 1948
(48) WHO, 1984 and NRCC, 1975
(49) Vesicol, 1983
(50) Ringer, 1983
(51) Ito et.al., 1975
(52) NTP, 1985b
(53) McClane and Hughs, 1980
(54) USEPA, 1986b
(55) NCI, 1978
(56) USEPA, 1989b
(57) NTP, 1983a
(58) Schroeder et.al., 1970
(59) Nitchke, et.al., 1983
(60) Ondreicka, et.al., 1966
(61) USFWS, 1964
(62) Thomas and Hinsdill, 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, 1968
(70) Stickel, e.al., 1983
(71) Nebeker et.al., 1992
(72) Abiola, 1992
(73) Spann, et.al., 1986
(74) Dow, 1958
(75) Villeneuve, et.al., 1972
(76) Dahlgren, et.al., 1972
(77) FAO/WHO, 1978
(78) McLane and Hughes, 1980
(79) Piekacz, 1971
(80) CIIT, 1984
(81) NCI, 1979
(82) Jeter et.al., 1954
(83) Til et.al., 1983
(84) Lee et.al., 1976
(85) USEPA, 1989c

BODY WEIGHTS FOR TERRESTRIAL REFERENCE VALUE CALCULATION
SITE 44, JONES STREET DUMP
REMEDIAL INVESTIGATION, CTO-0303
MCAS, NEW RIVER, NORTH CAROLINA

Body Weight (kg)		
Cattle	100	(IT Corp, 1992)
Whitetailed Deer	45.4	(Dee, 1991)
Bobwhite Quail	0.0174	(USEPA, 1993b)
Eastern Cottontail	1.2285	(USEPA, 1993b)
Lab Rat	0.35	(USEPA, 1988)
Lab Dog	10	(USEPA, 1988)
Poultry	0.5	(IT Corp, 1992)
Red Fox	4.535	(Storm et.al., 1976)
Racoon	5.12	(USEPA, 1993b)
Lab Mouse	0.03	(USEPA, 1988)
Guinea pig	0.86	(USEPA, 1988)
Mink	1	(USEPA, 1993b)
Mallard Duck	1	(Heinze et.al., 1989)
Short-tailed Shrew	0.017	(Schlesinger and Potter, 1974)
Americal Kestral	0.13	(Pattee, 1984)
Blackbird	0.064	(Stickel, 1983)
Pheasant	1	(USEPA, 1993b)
Ringed Dove	0.155	(Terres, 1980)
Screech Owl	0.181	(Dunning, 1984)
Partridge	0.4	(Abiola, 1992)

REGION IV TERRESTRIAL REFERENCE VALUE CALCULATION
SITE 44, JONES STREET DUMP
REMEDIAL INVESTIGATION, CTO-0303
MCAS, NEW RIVER, NORTH CAROLINA

Chemical	Whitetailed Deer (mg/kg/day)	Bobwhite Quail (mg/kg/day)	Eastern Cottontail (mg/kg/day)	Red Fox (mg/kg/day)	Racoon (mg/kg/day)
Aluminum	6.51E+00 (ct)	3.06E+01 (bi)	1.16E+01 (rb)	1.95E+01 (dg)	3.48E-01 (mo)
Antimony	6.91E-03 (rt)	9.52E-02 (rt)	4.06E+00 (rb)	1.49E-02 (rt)	1.43E-02 (rt)
Arsenic	3.25E-01 (ct)	1.98E+01 (bi)	2.90E+00 (rb)	2.37E-02 (mo)	2.27E-02 (mo)
Barium	1.30E-01 (ct)	3.06E+00 (bi)	1.16E+00 (rb)	1.07E-01 (rt)	1.02E-01 (rt)
Beryllium	1.07E-01 (rt)	1.47E+00 (rt)	3.55E-01 (rt)	2.30E-01 (rt)	2.21E-01 (rt)
Cadmium	3.25E-03 (ct)	5.59E+00 (bi)	2.90E-02 (rb)	9.76E-02 (dg)	1.64E-03 (rt)
Chromium	6.51E+00 (ct)	1.53E+02 (bi)	5.80E+01 (rb)	1.03E+00 (rt)	9.86E-01 (rt)
Cobalt	6.51E-02 (ct)	1.53E+00 (bi)	5.80E-01 (rb)	3.75E-01 (rb)	3.61E-01 (rb)
Copper	6.51E-01 (ct)	4.59E+01 (bi)	1.16E+01 (rb)	7.80E+00 (mk)	7.49E+00 (mk)
Iron	6.51E+00 (ct)	1.53E+02 (bi)	2.90E+01 (rb)	1.88E+01 (rb)	1.80E+01 (rb)
Lead	1.95E-01 (ct)	7.52E+00 (bi)	1.74E+00 (rb)	3.41E+00 (rt)	3.27E+00 (rt)
Manganese	1.30E+00 (ct)	3.06E+02 (bi)	2.32E+01 (rb)	3.75E+00 (rt)	3.60E+00 (rt)
Mercury	1.30E-02 (ct)	3.06E-01 (bi)	1.20E-01 (rb)	1.36E-01 (rt)	1.31E-01 (rt)
Molybdenum	3.95E-03 (rt)	5.44E-02 (rt)	1.32E-02 (rt)	8.52E-03 (rt)	8.18E-03 (rt)
Nickel	3.25E-01 (ct)	4.59E+01 (bi)	2.90E+00 (rb)	3.25E+01 (dg)	2.05E+00 (rt)
Selenium	1.30E-02 (ct)	1.93E+00 (bi)	1.20E-01 (rb)	1.70E-02 (rt)	1.64E-02 (rt)
Silver	1.58E-02 (mo)	1.53E+01 (bi)	5.25E-02 (mo)	3.40E-02 (mo)	3.26E-02 (mo)
Thallium	4.54E-03 (rt)	6.26E-02 (rt)	1.51E-02 (rt)	9.79E-03 (rt)	9.40E-03 (rt)
Vanadium	3.25E-01 (ct)	4.39E+01 (bi)	5.80E-02 (rb)	2.77E-01 (rt)	2.66E-01 (rt)
Zinc	3.25E+00 (ct)	1.53E+02 (bi)	2.90E+01 (rb)	1.30E+00 (dg)	6.54E+01 (rt)
Cyanide	2.13E+00 (rt)	1.38E+01 (bi)	7.11E+00 (rt)	4.88E-01 (dg)	4.42E+00 (rt)
Acenaphthene	3.46E+00 (rt)	4.76E+01 (rt)	1.15E+01 (rt)	7.45E+00 (rt)	7.16E+00 (rt)
Acenaphthylene	3.46E+00 (rt)	4.76E+01 (rt)	1.15E+01 (rt)	7.45E+00 (rt)	7.16E+00 (rt)
Anthracene	8.71E+00 (mo)	1.20E+02 (mo)	2.90E+01 (mo)	1.88E+01 (mo)	1.80E+01 (mo)
Benzo(a)anthracene	8.71E-02 (mo)	1.20E+00 (mo)	2.90E-01 (mo)	1.88E-01 (mo)	1.80E-01 (mo)
Benzo(b)fluoranthene	8.71E-02 (mo)	1.20E+00 (mo)	2.90E-01 (mo)	1.88E-01 (mo)	1.80E-01 (mo)
Benzo(k)fluoranthene	8.71E-02 (mo)	1.20E+00 (mo)	2.90E-01 (mo)	1.88E-01 (mo)	1.80E-01 (mo)
Benzo(ghi)perylene	8.71E-02 (mo)	1.20E+00 (mo)	2.90E-01 (mo)	1.88E-01 (mo)	1.80E-01 (mo)
Benzo(g,h,i)perylene	8.71E-02 (mo)	1.20E+00 (mo)	2.90E-01 (mo)	1.88E-01 (mo)	1.80E-01 (mo)
Benzo(a)pyrene	8.71E-02 (mo)	1.20E+00 (mo)	2.90E-01 (mo)	1.88E-01 (mo)	1.80E-01 (mo)
beta-BHC	9.88E-01 (rt)	1.36E+01 (rt)	3.29E+00 (rt)	2.13E+00 (rt)	2.04E+00 (rt)
gamma-BHC	9.88E-01 (rt)	1.36E+01 (rt)	3.29E+00 (rt)	2.13E+00 (rt)	2.04E+00 (rt)
Bis(2-ethylhexyl)phthalate	4.89E-02 (gp)	2.30E+00 (bi)	1.63E-01 (gp)	1.05E-01 (gp)	1.01E-01 (gp)
Bis(2-chloroethyl)ether	NA	NA	NA	NA	NA
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)	1.88E-01 (mo)	1.80E-01 (mo)
Chrysene	8.71E-02 (mo)	1.20E+00 (mo)	2.90E-01 (mo)	1.88E-01 (mo)	1.80E-01 (mo)
Dibenzofuran	8.71E-02 (mo)	1.20E+00 (mo)	2.90E-01 (mo)	1.88E-01 (mo)	1.80E-01 (mo)
Dibenzo(a,h)anthracene	8.71E-02 (mo)	1.20E+00 (mo)	2.90E-01 (mo)	1.88E-01 (mo)	1.80E-01 (mo)
Dibenz(a,h)anthracene	8.71E-02 (mo)	1.20E+00 (mo)	2.90E-01 (mo)	1.88E-01 (mo)	1.80E-01 (mo)
Diethylphthalate	3.99E+02 (mo)	5.50E+03 (mo)	1.33E+03 (mo)	8.60E+02 (mo)	8.26E+02 (mo)
2,4-Dimethylphenol	4.36E-01 (mo)	6.00E+00 (mo)	1.45E+00 (mo)	9.39E-01 (mo)	9.01E-01 (mo)
Di-n-butylphthalate	2.47E+01 (rt)	2.28E-01 (bi)	8.23E+01 (rt)	5.32E+01 (rt)	5.11E+01 (rt)
Di-n-octylphthalate	3.46E+00 (rt)	4.76E+01 (bi)	1.15E+01 (rt)	7.45E+00 (rt)	7.16E+00 (rt)
2,6-Dinitrotoluene	2.42E-01 (dg)	3.33E+00 (dg)	8.05E-01 (dg)	5.20E-01 (dg)	5.00E-01 (dg)
Fluoranthene	1.09E+00 (mo)	1.50E+01 (mo)	3.63E+00 (mo)	2.35E+00 (mo)	2.25E+00 (mo)
Fluorene	2.47E+00 (rt)	3.40E+01 (rt)	8.23E+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)	1.88E-01 (mo)	1.80E-01 (mo)
2-Methylnaphthalene	8.10E+00 (rt)	1.12E+02 (rt)	2.70E+01 (rt)	1.75E+01 (rt)	1.68E+01 (rt)
Naphthalene	8.10E+00 (rt)	1.12E+02 (rt)	2.70E+01 (rt)	1.75E+01 (rt)	1.68E+01 (rt)
Nitrobenzene	4.94E-02 (rt)	6.80E-01 (rt)	1.65E-01 (rt)	1.06E-01 (rt)	1.02E-01 (rt)
N-Nitrosodiphenylamine	9.88E+00 (rt)	1.36E+02 (rt)	3.29E+01 (rt)	2.13E+01 (rt)	2.04E+01 (rt)
Phenanthrene	8.10E+00 (rt)	1.12E+02 (rt)	2.70E+01 (rt)	1.75E+01 (rt)	1.68E+01 (rt)
Phenol	1.19E+00 (rt)	1.63E+01 (rt)	3.95E+00 (rt)	2.55E+00 (rt)	2.45E+00 (rt)
Pyrene	6.53E-01 (mo)	8.99E+00 (mo)	2.18E+00 (mo)	1.41E+00 (mo)	1.35E+00 (mo)

REGION IV TERRESTRIAL REFERENCE VALUE CALCULATION
SITE 44, JONES STREET DUMP
REMEDIAL INVESTIGATION, CTO-0303
MCAS, NEW RIVER, NORTH CAROLINA

Chemical	Whitetailed Deer (mg/kg/day)	Bobwhite Quail (mg/kg/day)	Eastern Cottontail (mg/kg/day)	Red Fox (mg/kg/day)	Racoon (mg/kg/day)
Aldrin	6.51E-01 (ct)	6.80E-02 (rt)	1.65E-02 (rt)	3.25E-02 (dg)	1.02E-02 (rt)
Alpha-chlordane	1.30E+00 (ct)	3.30E+00 (bi)	3.62E-02 (rt)	9.76E-02 (dg)	2.25E-02 (rt)
Gamma-chlordane	1.30E+00 (ct)	3.30E+00 (bi)	3.62E-02 (rt)	9.76E-02 (dg)	2.25E-02 (rt)
Dieldrin	6.51E-01 (ct)	1.16E-01 (bi)	3.29E-03 (rt)	6.51E-03 (dg)	2.04E-03 (rt)
4,4'-DDD	1.58E-01 (rt)	8.80E-02 (bi)	5.26E-01 (rt)	3.41E-01 (rt)	3.27E-01 (rt)
4,4'-DDE	1.58E-01 (rt)	8.80E-02 (bi)	5.26E-01 (rt)	3.41E-01 (rt)	3.27E-01 (rt)
4,4'-DDT	1.58E-01 (rt)	8.80E-02 (bi)	5.26E-01 (rt)	3.41E-01 (rt)	3.27E-01 (rt)
Endosulfan	1.19E-01 (rt)	2.84E+01 (bi)	3.95E-01 (rt)	7.42E-01 (dg)	2.45E-01 (rt)
Endosulfan I	1.19E-01 (rt)	2.84E+01 (bi)	3.95E-01 (rt)	7.42E-01 (dg)	2.45E-01 (rt)
Endosulfan II	1.19E-01 (rt)	2.84E+01 (bi)	3.95E-01 (rt)	7.42E-01 (dg)	2.45E-01 (rt)
Endosulfan sulfate	1.19E-01 (rt)	2.84E+01 (bi)	3.95E-01 (rt)	7.42E-01 (dg)	2.45E-01 (rt)
Endrin	4.94E-02 (rt)	1.16E+00 (bi)	1.65E-01 (rt)	3.25E-02 (dg)	1.02E-01 (rt)
Endrin aldehyde	4.94E-02 (rt)	1.16E+00 (bi)	1.65E-01 (rt)	3.25E-02 (dg)	1.02E-01 (rt)
Endrin ketone	4.94E-02 (rt)	1.16E+00 (bi)	1.65E-01 (rt)	3.25E-02 (dg)	1.02E-01 (rt)
Heptachlor	2.96E-02 (rt)	4.08E-01 (rt)	9.87E-02 (rt)	6.39E-02 (rt)	6.13E-02 (rt)
Heptachlor epoxide	7.55E-05 (dg)	1.04E-03 (dg)	2.51E-04 (dg)	1.63E-04 (dg)	1.56E-04 (dg)
Aroclor-1221	6.91E-01 (rt)	9.52E+00 (rt)	2.30E+00 (rt)	1.49E+00 (rt)	1.43E+00 (rt)
Aroclor-1232	2.96E-02 (rt)	8.95E-01 (bi)	9.87E-02 (rt)	6.39E-02 (rt)	6.13E-02 (rt)
Aroclor-1260	9.88E-04 (rt)	1.36E-02 (rt)	3.29E-03 (rt)	2.13E-03 (rt)	2.04E-03 (rt)
Aroclor-1254	2.80E-02 (mk)	6.95E-01 (bi)	1.00E+00 (rb)	6.47E-01 (rb)	6.21E-01 (rb)
Aroclor-1248	1.13E-02 (mo)	1.56E-01 (mo)	2.80E-01 (rb)	1.81E-01 (rb)	2.34E-02 (mo)
Methylene chloride	1.16E+00 (rt)	1.59E+01 (rt)	3.85E+00 (rt)	2.49E+00 (rt)	2.39E+00 (rt)
Carbon disulfide	3.30E-01 (rb)	4.55E+00 (rb)	1.10E+00 (rb)	7.12E-01 (rb)	6.84E-01 (rb)
1,1-Dichloroethene	5.53E+00 (rt)	7.61E+01 (rt)	1.84E+01 (rt)	1.19E+01 (rt)	1.14E+01 (rt)
1,2-Dichloroethene (total)	9.88E-01 (rt)	1.36E+01 (rt)	3.29E+00 (rt)	2.13E+00 (rt)	2.04E+00 (rt)
Chloroform	7.51E+00 (rt)	1.03E+02 (rt)	2.50E+01 (rt)	3.90E+01 (dg)	1.55E+01 (rt)
2-Butanone	NA	NA	NA	NA	NA
1,1,1-Trichloroethane	8.71E+01 (rt)	1.20E+03 (rt)	2.90E+02 (rt)	1.88E+02 (rt)	1.80E+02 (rt)
Trichloroethene	1.98E+01 (rt)	2.72E+02 (rt)	6.58E+01 (rt)	4.26E+01 (rt)	4.09E+01 (rt)
1,1,2-Trichloroethane	3.40E-02 (mo)	4.68E-01 (mo)	1.13E-01 (mo)	7.32E-02 (mo)	7.03E-02 (mo)
Benzene	1.98E-02 (rt)	2.72E-01 (rt)	6.58E-02 (rt)	4.26E-02 (rt)	4.09E-02 (rt)
1,1,2,2-Tetrachloroethane	1.50E+01 (rt)	2.07E+02 (rt)	5.00E+01 (rt)	3.24E+01 (rt)	3.11E+01 (rt)
Tetrachloroethene	2.77E-01 (rt)	3.81E+00 (rt)	9.21E-01 (rt)	5.96E-01 (rt)	5.72E-01 (rt)
Toluene	4.41E+00 (rt)	6.06E+01 (rt)	1.47E+01 (rt)	9.49E+00 (rt)	9.12E+00 (rt)
Ethylbenzene	1.92E+00 (rt)	2.64E+01 (rt)	6.39E+00 (rt)	4.13E+00 (rt)	3.97E+00 (rt)
Xylenes	3.54E+01 (rt)	4.87E+02 (rt)	1.18E+02 (rt)	7.62E+01 (rt)	7.32E+01 (rt)
Xylenes (total)	3.54E+01 (rt)	4.87E+02 (rt)	1.18E+02 (rt)	7.62E+01 (rt)	7.32E+01 (rt)
Vinyl chloride	3.36E-02 (rt)	4.62E-01 (rt)	1.12E-01 (rt)	7.24E-02 (rt)	6.95E-02 (rt)
Acetone	1.98E+00 (rt)	2.72E+01 (rt)	6.58E+00 (rt)	4.26E+00 (rt)	4.09E+00 (rt)
2-Hexanone	NA	NA	NA	NA	NA

Note: The following abbreviations indicate which species was used to develop the TRV

(ct) = cattle	(rb) = rabbit
(rt) = rat	(dg) = dog
(bi) = bird	(mo) = mouse
(gp) = guinea pig	(mk) = mink

NA - No Data Available

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NOTE: Some of the references in this list are not specifically referenced in the proceeding table. This reference list also includes other toxicity values not used in the development of the terrestrial reference values.