M67001.AR.005923
MCB CAMP LEJUENE
5090.3a

FINAL REMEDIAL INVESTIGATION REPORT OPERABLE UNIT 6 (OU 6) SITE 54 APPENDICES A-W MCB CAMP LEJEUNE NC

08/22/1996

BAKER ENVIRONMENTAL, INC

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FINAL REMEDIAL INVESTIGATION REPORT OPERABLE UNIT 6 (OU 6) SITE 54
APPENDICES A-W MCB CAMP LEJEUNE NC
8/22/1996
BAKER ENVIRONMENTAL, INC

FINAL

REMEDIAL INVESTIGATION REPORT
OPERABLE UNIT NO. 6
(SITE 54)

MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

CONTRACT TASK ORDER 0303
APPENDICES A-W

AUGUST 22, 1996

Prepared For:

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

Under:

LANTDIV CLEAN Program
Contract N62470-89-D-4814

Prepared by:

BAKER ENVIRONMENTAL, INC.
Coraopolis, Pennsylvania

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TEST BORING RECORD

PROJECT: RI/FS at OU No. 6 - Site 54 - MCAS, New River
CTO NO.: 62470-303 BORING NO.: 54-BB-SB01
COORDINATES: EAST: 2465546.8983 NORTH: 351182.2452
ELEVATION: SURFACE: 20.07

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	3/7/95	0.0 - 11.0	P. Sun & mild	9.0	1035
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	0.1/0.1	SILT, little clay, trace fine sand & roots; dark brown; moist — 1.0	19.07
2 – 3.0	S-1	1.9 95%		0.1/0.1	CLAY, some silt, trace fine sand; brown; damp SAND (fine), some silt, little clay; brown; damp — 3.0 3.2	17.07 16.87
4 – 5.0	S-2	1.8 90%		0.1/0.1	SAND (fine), some silt, trace clay; tan; damp 5.3	14.77
6 – 7.0	S-3	1.8 90%		0.1/0.1	SAND (fine), little silt, trace medium sand; light gray; damp	
8 – 9.0	S-4	2.0 100%	04	0.1/0.1	8.1 SAND (med to coarse), little silt, trace clay; light brown; moist to wet	11.97
10	S-5	2.0 100%		0.1/0.1	GROUNDWATER @ 9.0 FT. Match to Sheet 2	

CONTRACTOR: Microseeps BAKER REP.: Mark DeJohn
OPERATOR: Art Carion BORING NO.: 54-BB-SB01 SHEET 1 OF 2

TEST BORING RECORD

PROJECT: RI/FS at OU No. 6 - Site 54 - MCAS, New River
CTO NO.: 62470-303 BORING NO.: 54-BB-SB02
COORDINATES: EAST: 2465731.4003 NORTH: 351482.7380
ELEVATION: SURFACE: 21.47

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	3/7/95	0.0 - 11.0	P. Sun & mild	9.0	1135
LENGTH	4.0'	--	4.0'					
TYPE	Piston	--	Plastic					

REMARKS:

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 = Background
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.
1 1.0	D-N		00	0.1/0.1	SILT, trace clay & fine sand; dark brown to gray; damp 1.0	20.47
2 3.0	S-1	1.7 85%		0.1/0.1	1.9 CLAY, some silt, trace fine sand; gray to brown; damp	19.57
4 5.0	S-2	1.9 95%		0.1/0.1	4.4 SILT, little clay, trace fine sand; brown; damp 5.0	17.07 16.47
6 7.0	S-3	1.6 80%		0.1/0.1	SAND (fine), some silt, trace to little clay; gray; damp 7.0	14.47
8 9.0	S-4	1.8 90%	04	0.1/0.1	SAND (fine to coarse), trace to little silt, trace clay, coarsens w/ depth gray; moist to wet GROUNDWATER @ 9.0 FT.	
10	S-5	2.0 100%		0.1/0.1	Match to Sheet 2	

CONTRACTOR: Microseeps BAKER REP.: Mark DeJohn
OPERATOR: Art Carion BORING NO.: 54-BB-SB02 SHEET 1 OF 2

TEST BORING RECORD

PROJECT: RI/FS at OU No. 6 - Site 54 - MCAS, New River
CTO NO.: 62470-303 BORING NO.: 54-BB-SB02

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	10.47
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.: 54-BB-SB02 SHEET 2 OF 2

TEST BORING RECORD

PROJECT: RI/FS at OU No. 6 - Site 54 - MCAS, New River
CTO NO.: 62470-303 BORING NO.: 54-BB-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 11.0	9.07
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.: 54-BB-SB01 SHEET 2 OF 2

TEST BORING RECORD

PROJECT: RI/FS at OU No. 6 - Site 54 - MCAS, New River
CTO NO.: 62470-303 BORING NO.: 54-DD-SB01
COORDINATES: EAST: 2465495.7324 NORTH: 350913.8146
ELEVATION: SURFACE: 15.98

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	3/10/95	0.0 - 7.0	Sunny & cold	5.0	0819
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 00D	0.8/0.1	SAND (fine), some silt, little clay; brown; moist; slight petroleum odor	
2 – 3.0	S-1	1.8 90%		0.1/0.1	1.8 SAND (fine), little silt; tan; damp	14.18
4 – 5.0	S-2	1.5 75%	02	0.1/0.1	trace clay 5.0	10.98
6 – 7.0	S-3	2.0 100%		0.2/0.1	SAND (med to coarse), little silt, trace clay; tan; wet GROUNDWATER @ 5.0 FT 7.0	8.98
8					BOH @ 7.0 FT	
9						
10						

CONTRACTOR: Microseeps BAKER REP.: Mark DeJohn
OPERATOR: Art Carion BORING NO.: 54-DD-SB01 SHEET 1 OF 1

TEST BORING RECORD

PROJECT: RI/FS at OU No. 6 - Site 54 - MCAS, New River
CTO NO.: 62470-303 BORING NO.: 54-DD-SB02
COORDINATES: EAST: 2465518.0300 NORTH: 350899.5399
ELEVATION: SURFACE: 15.93

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	3/10/95	0.0 - 7.0	Sunny & cold	5.0	0907
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	0.1/0.1	SAND (fine), some silt, little clay; trace gravel & roots; dark brown; moist	
2 3.0	S-1	1.8 90%		0.1/0.1	2.6	13.33
4 5.0	S-2	1.7 85%	02	0.1/0.0	SAND (fine), some silt, trace clay; tan; damp 5.0	10.93
6 7.0	S-3	1.9 95%		0.1/0.1	trace to little clay; wet GROUNDWATER @ 5.0 FT 7.0	8.93
8 9 10					BOH @ 7.0 FT	

CONTRACTOR: Microseeps BAKER REP.: Mark DeJohn
OPERATOR: Art Carion BORING NO.: 54-DD-SB02 SHEET 1 OF 1

TEST BORING RECORD

PROJECT: RI/FS at OU No. 6 - Site 54 - MCAS, New River
CTO NO.: 62470-303 BORING NO.: 54-DD-SB03
COORDINATES: EAST: 2465444.0014 NORTH: 350802.9006
ELEVATION: SURFACE: 13.49

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	3/10/95	0.0 - 5.0	Sunny & cold	3.0	0943
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	0.2/0.2	SAND (fine), some silt, trace clay; brown; moist — 1.0	12.49
2 – 3 – 3.0	S-1	1.5 75%	01	0.2/0.2	SAND (fine), little silt, trace clay; gray; damp to moist	
4 – 5 – 5.0	S-2	1.6 80%		0.2/0.2	wet GROUNDWATER @ 3.0 FT — 4.6	8.89
6 – 7 – 8 – 9 – 10					SAND (fine to med), some silt, trace clay; brown; wet — 5.0	8.49

CONTRACTOR: Microseeps BAKER REP.: Mark DeJohn
OPERATOR: Art Carion BORING NO.: 54-DD-SB03 SHEET 1 OF 1

TEST BORING RECORD

PROJECT: RI/FS at OU No. 6 - Site 54 - MCAS, New River
CTO NO.: 62470-303
BORING NO.: 54-DD-SB04
COORDINATES: EAST: 2465468.4444
NORTH: 350797.5538
ELEVATION: SURFACE: 13.86

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	3/10/95	0.0 - 5.0	Sunny & cold	3.0	1019
LENGTH	4.0'	--	4.0'					
TYPE	Piston	--	Plastic					

REMARKS: Notes: (1) HNu malfunction, could not take readings.

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	0.1/0.1	SAND (fine), some silt & clay dark brown; moist — 1.6	12.26
2 — 3.0	S-1	2.0 100%	01	(1)	SAND (fine), some silt, little clay; gray; moist — 3.0	10.86
4 — 5.0	S-2	1.8 90%		(1)	SAND (fine), some silt, trace clay brown; wet GROUNDWATER @ 3.0 FT — 5.0	8.86
6						
7						
8						
9						
10						

CONTRACTOR: Microseeps
BAKER REP.: Mark DeJohn
OPERATOR: Art Carion
BORING NO.: 54-DD-SB04

Baker
Baker Environmental

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: RI/FS at OU No. 6 - Site 54 MCAS, New River
CTO NO.: 62470-303 BORING NO.: 54-DD-SB05
COORDINATES: EAST: NORTH:
ELEVATION: SURFACE: TOP OF PVC CASING:

RIG: Geoprobe 5400

	LARGE BORE SAMPLER	LINER	AUGERS	CORE BARREL	DATE	PROGRESS (FT.)	WEATHER	WATER DEPTH (FT.)	TIME
SIZE (DIAM.)	1-3/8" ID	1-1/8" ID			4/11/95	0.0-5.0	Cloudy, 70s	—	—
LENGTH	4.0'	4.0'							
TYPE	Piston	Plastic							
HAMMER WT.	NA								
FALL	NA								
STICK UP									

REMARKS: Soil samples S-0 and S-1 submitted for laboratory analyses

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.)

Depth (ft.)	Samp. Type and No.	Samp. Rec. (ft. & %)	SPT or RQD	Lab Class. or Pen. Rate	PID (ppm) PS/BG	Visual Description	Well Installation Detail	Elevation (ft. MSL)
1 — 1.0	S-0 54-DD-SB05-00	—			—	SILT, some fine sand, little organics; damp; brown (strong petro odor) Black staining from 0.0'-2.3' 1.3'		
2 — 3.0	S-1 54-DD-SB05-01	1.8 90%			21.0/0.4	FINE and MEDIUM SAND, little to some silt; moist; black staining (strong petro odor) wet @ 2.0' Black staining to 3.5' (strong petro odor) 3.5'		
4 — 5.0	S-2	2.0 100%			18.3/0.5	FINE SAND, little silt; wet; lt. gray 5.0'		
6						End of Boring @ 5.0'		
7								
8								
9								
10						Match to Sheet 2		

DRILLING CO.: Microseeps, Inc. BAKER REP.: Dave Gaviglia
DRILLER: Art Carion BORING NO.: 54-DD-SB05 SHEET 1 OF 1

TEST BORING RECORD

PROJECT: RI/FS at OU No. 6 - Site 54 - MCAS, New River
CTO NO.: 62470-303 BORING NO.: 54-ES01
COORDINATES: EAST: 2465213.6854 NORTH: 350947.4018
ELEVATION: SURFACE: 17.58

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	3/6/95	0.0 - 4.0	Cloudy & mild	--	--
LENGTH	4.0'	--	4.0'					
TYPE	Piston	--	Plastic					

REMARKS: Notes: (1) Due to rainy & humid conditions, the PID was not used.
Composite sample: 0-4 ft

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, 2	S-1	3.4 85%	54-ES01	(1)	CLAY, some silt, little to some fine sand, trace roots; compacted; brown to dark brown; damp	
					2.5	15.08
3, 4					SAND (fine), some clay, little silt; brown to tan; damp	
4.0					4.0	13.58
5, 6, 7, 8, 9, 10					BOH @ 4.0 FT.	

CONTRACTOR: Microseeps BAKER REP.: Mark DeJohn
OPERATOR: Art Carion BORING NO.: 54-ES01 SHEET 1 OF 1

TEST BORING RECORD

PROJECT: RI/FS at OU No. 6 - Site 54 - MCAS, New River
CTO NO.: 62470-303 BORING NO.: 54-ES02
COORDINATES: EAST: 2465227.6735 NORTH: 350949.8419
ELEVATION: SURFACE: 18.04

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	3/6/95	0.0 - 4.0	Cloudy & mild	--	--
LENGTH	4.0'	--	4.0'					
TYPE	Piston	--	Plastic					

REMARKS: Notes: (1) Due to rainy & humid conditions, the PID was not used.
Grab sample: 1-2 ft

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, 2	S-1	3.5 88%	54-ES02	(1)	SAND (fine), some clay, little silt; brown; damp visible contamination w/ petroleum odor @ 1.0-2.0 ft — 2.0	16.04
3, 4 (4.0)					SAND (fine), little silt & clay; dark reddish-brown;damp — 4.0	14.04
5, 6, 7, 8, 9, 10					BOH @ 4.0 FT.	

CONTRACTOR: Microseeps BAKER REP.: Mark DeJohn
OPERATOR: Art Carion BORING NO.: 54-ES02 SHEET 1 OF 1

TEST BORING RECORD

PROJECT: RI/FS at OU No. 6 - Site 54 - MCAS, New River
CTO NO.: 62470-303 BORING NO.: 54-ES03
COORDINATES: EAST: 2465226.3564 NORTH: 350945.0946
ELEVATION: SURFACE: 17.97

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	3/6/95	0.0 - 4.0	Cloudy & mild	--	--
LENGTH	4.0'	--	4.0'					
TYPE	Piston	--	Plastic					

REMARKS: Notes: (1) Due to rainy & humid conditions, the PID was not used.
Composite sample: 0-4 ft

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					SAND (fine), little silt & clay, trace roots; brown; damp	1.4	16.57
2	S-1	3.4 85%	54-ES03	(1)	CLAY, some silt, little fine sand;dark brown; damp	2.1	15.87
3							
4 (4.0)					SAND (fine), some silt, little clay; brown; damp	4.0	13.97
5					BOH @ 4.0 FT.		
6							
7							
8							
9							
10							

CONTRACTOR: Microseeps BAKER REP.: Mark DeJohn
OPERATOR: Art Carion BORING NO.: 54-ES03 SHEET 1 OF 1

TEST BORING RECORD

PROJECT: RI/FS at OU No. 6 - Site 54 - MCAS, New River
CTO NO.: 62470-303 BORING NO.: 54-ES04
COORDINATES: EAST: 2465241.3095 NORTH: 350943.4992
ELEVATION: SURFACE: 18.20

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	3/6/95	0.0 - 4.0	Cloudy & mild	--	--
LENGTH	4.0'	--	4.0'					
TYPE	Piston	--	Plastic					

REMARKS: Notes: (1) Due to rainy & humid conditions, the PID was not used.
Grab sample: 1.5-2.0 ft

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					SAND (fine), some silt, little to trace clay; dark brown; damp	
2	S-1	3.4 85%	54-ES04	(1)	reddish-brown zone w/ petroleum odor @ 1.5-2.0 ft	
					2.4	15.80
3					SAND (fine), some silt, little to trace clay; brown; damp	
4 4.0					4.0	14.20
5					BOH @ 4.0 FT.	
6						
7						
8						
9						
10						

CONTRACTOR: Microseeps BAKER REP.: Mark DeJohn
OPERATOR: Art Carlon BORING NO.: 54-ES04 SHEET 1 OF 1

TEST BORING RECORD

PROJECT: RI/FS at OU No. 6 - Site 54 - MCAS, New River
CTO NO.: 62470-303 BORING NO.: 54-ES05
COORDINATES: EAST: 2465366.6490 NORTH: 351126.8881
ELEVATION: SURFACE: 20.94

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	3/7/95	0.0 - 4.0	Sunny & cool	--	--
LENGTH	4.0'	--	4.0'					
TYPE	Piston	--	Plastic					

REMARKS: Composite sample: 0-4 ft

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						
2	S-1	3.1 78%	54-ES05	0.1/0.0	SILT, little fine sand, trace to little clay; brown to dark brown; damp	
3						
4 (4.0)					4.0	16.94
5					BOH @ 4.0 FT.	
6						
7						
8						
9						
10						

CONTRACTOR: Microseeps BAKER REP.: Mark DeJohn
OPERATOR: Art Carion BORING NO.: 54-ES05 SHEET 1 OF 1

TEST BORING RECORD

PROJECT: RI/FS at OU No. 6 - Site 54 - MCAS, New River
CTO NO.: 62470-303
COORDINATES: EAST: 2465443.9678
ELEVATION: SURFACE: 21.4
BORING NO.: 54-ES06
NORTH: 351124.8162

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	3/7/95	0.0 - 4.0	Sunny & cool	--	--
LENGTH	4.0'	--	4.0'					
TYPE	Piston	--	Plastic					

REMARKS: Composite sample: 0-4 ft

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, 2, 3, 4 (4.0)	S-1	3.9 98%	54-ES06	0.1/0.1	SAND (fine), some silt, trace clay & wood; gray; damp (2.0)	
					SILT, little clay, trace fine sand; brown; damp (4.0)	
5, 6, 7, 8, 9, 10					BOH @ 4.0 FT.	

CONTRACTOR: Microseeps
OPERATOR: Art Carion
BAKER REP.: Mark DeJohn
BORING NO.: 54-ES06

TEST BORING RECORD

PROJECT: RI/FS at OU No. 6 - Site 54 - MCAS, New River
CTO NO.: 62470-303 BORING NO.: 54-ES07
COORDINATES: EAST: 2465510.7280 NORTH: 351200.9483
ELEVATION: SURFACE: 21.46

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	3/7/95	0.0 - 4.0	Sunny & cool	--	--
LENGTH	4.0'	--	4.0'					
TYPE	Piston	--	Plastic					

REMARKS: Composite sample: 0-4 ft

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-1	3.4 85%	54-ES07	0.3/0.2	CLAY, some silt, little fine sand & roots; dk brown; damp	0.8	20.66
2					SAND (fine), some silt; gray; damp	1.5	19.96
3					CLAY, some silt, trace fine sand; brown; damp	3.2	18.26
4 (4.0)					SILT, trace clay & fine sand; brown; damp	4.0	17.46
5					BOH @ 4.0 FT.		
6							
7							
8							
9							
10							

CONTRACTOR: Microseeps BAKER REP.: Mark DeJohn
OPERATOR: Art Carion BORING NO.: 54-ES07 SHEET 1 OF 1

TEST BORING RECORD

PROJECT: RI/FS at OU No. 6 - Site 54 - MCAS, New River
CTO NO.: 62470-303 BORING NO.: 54-ES08
COORDINATES: EAST: 2465520.2235 NORTH: 351143.6143
ELEVATION: SURFACE: 21.00

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	3/7/95	0.0 - 4.0	Sunny & cool	--	--
LENGTH	4.0'	--	4.0'					
TYPE	Piston	--	Plastic					

REMARKS: Grab sample: 0.8-1.7 ft

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-1	3.4 85%	54-ES08	0.5/0.0	SAND (med to coarse), & gravel, some silt; dark brown; damp (0.8)	
2					SILT, some, some clay; brown; damp; petroleum odor (1.7)	
3					SILT, trace fine samd & clay; brown; damp	
4 (4.0)						
5					BOH @ 4.0 FT.	
6						
7						
8						
9						
10						

CONTRACTOR: Microseeps BAKER REP.: Mark DeJohn
OPERATOR: Art Carion BORING NO.: 54-ES08 SHEET 1 OF 1

TEST BORING RECORD

PROJECT: RI/FS at OU No. 6 - Site 54 - MCAS, New River
CTO NO.: 62470-303
COORDINATES: EAST: 2465613.7408
ELEVATION: SURFACE: 21.72
BORING NO.: 54-ES09
NORTH: 351207.9718

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	3/7/95	0.0 - 4.0	Sunny & cool	--	--
LENGTH	4.0'	--	4.0'					
TYPE	Piston	--	Plastic					

REMARKS: Composite sample: 0-4 ft

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					SILT, little clay & roots; dark brown; moist 1.0	20.72
2	S-1	2.7 68%	54-ES09	0.1/0.1	SAND (fine), some silt, trace to little clay; brown; damp	
3						
4 4.0					4.0	17.72
5					BOH @ 4.0 FT.	
6						
7						
8						
9						
10						

CONTRACTOR: Microseeps
OPERATOR: Art Carlon
BAKER REP.: Mark DeJohn
BORING NO.: 54-ES09

TEST BORING RECORD

PROJECT: RI/FS at OU No. 6 - Site 54 - MCAS, New River
CTO NO.: 62470-303 BORING NO.: 54-ES10
COORDINATES: EAST: 2465661.0800 NORTH: 351121.1532
ELEVATION: SURFACE: 20.16

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	3/7/95	0.0 - 4.0	Sunny & cool	--	--
LENGTH	4.0'	--	4.0'					
TYPE	Piston	--	Plastic					

REMARKS: Composite sample: 0-4 ft

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 = Background
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.
1						SAND (fine), some silt, trace to little clay; brown; damp		
2		S-1	3.8 95%	54-ES10	0.0/0.0			
3							3.1	17.06
4	4.0					CLAY, some silt, trace fine sand; dark brown; v hard; damp	4.0	1616
5						BOH @ 4.0 FT.		
6								
7								
8								
9								
10								

CONTRACTOR: Microseeps BAKER REP.: Mark DeJohn
OPERATOR: Art Carion BORING NO.: 54-ES10 SHEET 1 OF 1

TEST BORING RECORD

PROJECT: RI/FS at OU No. 6 - Site 54 - MCAS, New River
CTO NO.: 62470-303 BORING NO.: 54-ES11
COORDINATES: EAST: 2465398.7227 NORTH: 351062.5554
ELEVATION: SURFACE: 21.16

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	3/7/95	0.0 - 4.0	Sunny & warm	--	--
LENGTH	4.0'	--	4.0'					
TYPE	Piston	--	Plastic					

REMARKS: Composite sample: 0-4 ft

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					SAND (fine), some silt, trace clay; brown; damp	
2	S-1	3.5 88%	54-ES11	0.1/0.1	2.0	19.16
3					SAND (fine), some silt & clay; brown; damp	
4 4.0					4.0	17.16
5					BOH @ 4.0 FT.	
6						
7						
8						
9						
10						

CONTRACTOR: Microseeps BAKER REP.: Mark DeJohn
OPERATOR: Art Carlon BORING NO.: 54-ES11 SHEET 1 OF 1

TEST BORING RECORD

PROJECT: RI/FS at OU No. 6 - Site 54 - MCAS, New River
CTO NO.: 62470-303
BORING NO.: 54-ES12
COORDINATES: EAST: 2465480.4812
NORTH: 351080.8032
ELEVATION: SURFACE: 21.10

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	3/7/95	0.0 - 12.0	Sunny & warm	11.0	1411
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, 2, 3, 4 (4.0)	S-1	3.3 83%		0.4/0.1	SAND (fine), some silt, trace to little clay, trace gravel; brwon; damp (2.9)	
					SILT, little fine sand, trace clay; brown; damp (4.0)	
5, 6, 7, 8 (8.0)	S-2	3.7 93%		0.4/0.1	SAND (fine), some silt, little clay; brown; damp (5.5)	
					SAND (fine), little silt, trace clay; gray; damp	
9, 10	S-3	3.5 88%		0.4/0.1	little clay @ 9-11 ft	

Match to Sheet 2

CONTRACTOR: Microseeps
BAKER REP.: Mark DeJohn
OPERATOR: Art Carion
BORING NO.: 54-ES12

TEST BORING RECORD

PROJECT: RI/FS at OU No. 6 - Site 54 - MCAS, New River
CTO NO.: 62470-303 BORING NO.: 54-ES12

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						Continued from Sheet 1 11.0	
12	12.0					SAND (fine to med), little silt, trace clay; gray; wet 12.0	
						GROUNDWATER @ 11.0 FT	
13						BOH @ 12.0 FT.	
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							

CONTRACTOR: Microseeps BAKER REP.: Mark DeJohn
OPERATOR: Art Carion BORING NO.: 54-ES12 SHEET 2 OF 2

TEST BORING RECORD

PROJECT: RI/FS at OU No. 6 - Site 54 - MCAS, New River
CTO NO.: 62470-303 BORING NO.: 54-ES13
COORDINATES: EAST: 2465579.8971 NORTH: 351103.5818
ELEVATION: SURFACE: 20.70

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	3/7/95	0.0 - 4.0	Sunny & warm	--	--
LENGTH	4.0'	--	4.0'					
TYPE	Piston	--	Plastic					

REMARKS: Composite sample: 0-4 ft

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					SAND (fine), some silt, trace clay; brown; damp	
2	S-1	3.3 83%	54-ES13	0.7/0.1	2.0	
3					CLAY, some fine sand & silt; taupe; damp; sl. petroleum odor throughout 0-4 ft interval	
4 (4.0)					4.0	
5					BOH @ 4.0 FT.	
6						
7						
8						
9						
10						

CONTRACTOR: Microseeps BAKER REP.: Mark DeJohn
OPERATOR: Art Carion BORING NO.: 54-ES13 SHEET 1 OF 1

TEST BORING RECORD

PROJECT: RI/FS at OU No. 6 - Site 54 - MCAS, New River
CTO NO.: 62470-303 BORING NO.: 54-ES14
COORDINATES: EAST: 2465453.5605 NORTH: 351011.9200
ELEVATION: SURFACE: 20.64

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	3/7/95	0.0 - 4.0	Sunny & warm	--	--
LENGTH	4.0'	--	4.0'					
TYPE	Piston	--	Plastic					

REMARKS: Composite sample: 0-4 ft

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 = Background
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.
1						
2	S-1	3.5 88%	54-ES14	0.1/0.1	SILTY SAND (fine), trace clay; brown; v. hard; damp	
3					black cinder-like zone @ 1.8-2.0 ft	
4 (4.0)					4.0	16.64
5					BOH @ 4.0 FT.	
6						
7						
8						
9						
10						

CONTRACTOR: Microseeps BAKER REP.: Mark DeJohn
OPERATOR: Art Carlon BORING NO.: 54-ES14 SHEET 1 OF 1

TEST BORING RECORD

PROJECT: RI/FS at OU No. 6 - Site 54 - MCAS, New River
CTO NO.: 62470-303
BORING NO.: 54-ES15
COORDINATES: EAST: 2465536.4330 NORTH: 20.70
ELEVATION: SURFACE: 351041.3405

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	3/7/95	0.0 - 4.0	Sunny & warm	--	--
LENGTH	4.0'	--	4.0'					
TYPE	Piston	--	Plastic					

REMARKS: Grab sample: 1.0-2.9 ft

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					SAND (fine), some silt, little gravel & clay; gray; damp 1.0	
2	S-1	3.6 90%	54-ES15	4.8/0.1	SAND (fine), some silt, little to some clay; gray; damp hard, black zone w/ petro. odor 2.9	
3						
4 (4.0)					CLAY, some silt, trace fien sand; brown; hard; damp 4.0	
5					BOH @ 4.0 FT.	
6						
7						
8						
9						
10						

CONTRACTOR: Microseeps
BAKER REP.: Mark DeJohn
OPERATOR: Art Carion
BORING NO.: 54-ES15

TEST BORING RECORD

PROJECT: RI/FS at OU No. 6 - Site 54 - MCAS, New River
CTO NO.: 62470-303 BORING NO.: 54-ES16
COORDINATES: EAST: 2465626.7191 NORTH: 351040.7032
ELEVATION: SURFACE: 19.88

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	3/7/95	0.0 - 4.0	Sunny & warm	--	--
LENGTH	4.0'	--	4.0'					
TYPE	Piston	--	Plastic					

REMARKS: Composite sample: 0-4 ft

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					SILT, little fine sand, trace roots; dark brown; damp	1.0	18.88
					SAND(fine to med), some silt;	1.4	18.48
2	S-1	3.5	54-ES16	0.2/0.1	brown; damp	2.0	17.88
		88%			CLAY, some fime sand, little silt; gray; damp		
3							
4	4.0				SAND (fine), some silt, trace clay; gray; damp	4.0	15.88
5					BOH @ 4.0 FT.		
6							
7							
8							
9							
10							

CONTRACTOR: Microseeps BAKER REP.: Mark DeJohn
OPERATOR: Art Carion BORING NO.: 54-ES16 SHEET 1 OF 1

TEST BORING RECORD

PROJECT: RI/FS at OU No. 6 - Site 54 - MCAS, New River
CTO NO.: 62470-303
BORING NO.: 54-ES17
COORDINATES: EAST: 2465496.1070 NORTH: 19.80
ELEVATION: SURFACE: 350965.6022

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	3/7/95	0.0 - 4.0	Sunny & warm	--	--
LENGTH	4.0'	--	4.0'					
TYPE	Piston	--	Plastic					

REMARKS: Composite sample: 0-4 ft

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, 2, 3, 4 (4.0)	S-1	3.4 85%	54-ES17	0.2/0.2	SAND (fine), some silt, trace to little clay; brown; damp (3.3)	
					SAND (fine), some silt & clay; dark brown; damp (4.0)	
5, 6, 7, 8, 9, 10					BOH @ 4.0 FT.	

CONTRACTOR: Microseeps
BAKER REP.: Mark DeJohn
OPERATOR: Art Carion
BORING NO.: 54-ES17

TEST BORING RECORD

PROJECT: RI/FS at OU No. 6 - Site 54 - MCAS, New River
CTO NO.: 62470-303 BORING NO.: 54-ES18
COORDINATES: EAST: 2465589.4136 NORTH: 350955.0243
ELEVATION: SURFACE: 17.06

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	3/7/95	0.0 - 4.0	Sunny & warm	--	--
LENGTH	4.0'	--	4.0'					
TYPE	Piston	--	Plastic					

REMARKS: Composite sample: 0-4 ft

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-1	3.4 85%	54-ES18	0.2/0.2	SAND (fine), some silt & clay, little gravel; brown; damp 1.0	16.06
2					black zone - no odor, no PID readings	
3					SAND (fine), some silt, trace clay; brown; damp	
4 4.0					4.0	13.06
5					BOH @ 4.0 FT.	
6						
7						
8						
9						
10						

CONTRACTOR: Microseeps BAKER REP.: Mark DeJohn
OPERATOR: Art Carlon BORING NO.: 54-ES18 SHEET 1 OF 1

TEST BORING RECORD

PROJECT: RI/FS at OU No. 6 - Site 54 - MCAS, New River
CTO NO.: 62470-303
BORING NO.: 54-SB01
COORDINATES: EAST: 2465546.8983 NORTH: 351182.2452
ELEVATION: SURFACE: 21.30

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	3/11/95	0.0 - 10.0	Sunny & mild	9.5	1525
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		SILT, some fine to coarse sand, trace gravel & clay; brown; dry 1.0	
2 – 3.0	S-1	1.8 90%		0.8/0.8	CLAY, some silt, trace fine sand; brown; damp 2.0 SANDY SILT, trace clay; brown; damp 3.0	
4 – 5.0	S-2	2.0 100%		0.8/0.8	SILT, little to some clay, trace fine sand; brown; damp	
6 – 7.0	S-3	1.6 80%		0.8/0.8	6.3	
8 – 10.0	S-4	2.5 83%	04	0.6/0.3	SAND (fine), little to some silt, trace clay; gray; damp to moist wet GROUNDWATER @ 9.5 FT 10.0	
					BOH @ 10.0 FT.	

CONTRACTOR: Microseeps
BAKER REP.: Mark DeJohn
OPERATOR: Art Carion
BORING NO.: 54-SB01

TEST BORING RECORD

PROJECT: RI/FS at OU No. 6 - Site 54 - MCAS, New River
CTO NO.: 62470-303
BORING NO.: 54-SB02
COORDINATES: EAST: 2465919.9270 NORTH: 351110.8018
ELEVATION: SURFACE: 20.29

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	3/11/95	0.0 - 9.0	Sunny & mild	9.0	1329
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				SAND & GRAVEL; compacted layer 1.0	19.29
2 3.0	S-1	1.8 90%	01	1.2/1.1	SILT, trace to little clay, trace fine sand; brown to gray; damp 3.0	17.29
4 5.0	S-2	1.9 95%		1.1/1.1	CLAY, some silt, trace fine sand; brown; damp 4.6	15.69
6 7.0	S-3	1.9 95%		1.1/1.0	SILT, little clay, trace fine sand; brown; damp 6.2	14.09
8 9.0	S-4	1.9 95%	04	1.0/1.0	SAND (fine), little to some silt, trace clay; gray to brown; damp moist to wet GROUNDWATER @ 9.0 FT 9.0	11.29
10					BOH @ 9.0 FT.	

CONTRACTOR: Microseeps
BAKER REP.: Mark DeJohn
OPERATOR: Art Carion
BORING NO.: 54-SB02

TEST BORING RECORD

PROJECT: RI/FS at OU No. 6 - Site 54 - MCAS, New River
CTO NO.: 62470-303 BORING NO.: 54-SB03
COORDINATES: EAST: 2465549.6204 NORTH: 350990.3424
ELEVATION: SURFACE: 19.37

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	3/11/95	0.0 - 9.0	Sunny & mild	9.0	1240
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				SAND & GRAVEL; compacted layer 1.4	17.97
2 3 3.0	S-1	1.8 90%	01	1.0/0.9	SILT, little clay, trace fine sand; brown, black zone @ 1.6-1.8 ft; damp 3.0	16.37
4 5 5.0	S-2	2.0 100%		1.2/1.1	CLAY, some silt, trace fine sand; brown & gray; mottled; damp 5.0	14.37
6 7 7.0	S-3	1.9 95%		1.1/1.1	SILT, little clay, trace fine sand; taupe; damp 7.0	12.37
8 9 9.0	S-4	1.6 80%	04	1.2/1.0	SAND (fine), some silt, trace clay; taupe; moist to wet GROUNDWATER @ 9.0 FT 9.0	10.37
10					BOH @ 9.0 FT.	

CONTRACTOR: Microseeps BAKER REP.: Mark DeJohn
OPERATOR: Art Carion BORING NO.: 54-SB03 SHEET 1 OF 1

TEST BORING RECORD

PROJECT: RI/FS at OU No. 6 - Site 54 - MCAS, New River
CTO NO.: 62470-303 BORING NO.: 54-SB04
COORDINATES: EAST: 2465446.4971 NORTH: 350944.7633
ELEVATION: SURFACE: 19.65

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	3/11/95	0.0 - 11.0	Sunny & mild	9.0	1145
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	1.0/1.0	SILT, little fine & coarse sand, & clay; dark brown; damp	
					1.4	18.25
2 – 3.0	S-1	1.8 90%	01	0.9/0.9	CLAY, some silt, trace fine sand; brown; damp silt layer @ 2.0-2.3 ft	
					3.3	16.35
4 – 5.0	S-2	1.7 85%		1.0/1.0	SILT, little clay, trace fine sand; gray; damp to moist 4.1	15.55
6 – 7.0	S-3	1.8 90%		1.1/1.1	SAND (fine), little silt, trace clay; gray; damp to moist	
8 – 9.0	S-4	1.7 85%	04	1.2/1.2	moist to wet GROUNDWATER @ 9.0 FT.	
10	S-5	1.8 90%		1.1/1.1	fine to coarse sand	

Match to Sheet 2

CONTRACTOR: Microseeps BAKER REP.: Mark DeJohn
OPERATOR: Art Carion BORING NO.: 54-SB04

TEST BORING RECORD

PROJECT: RI/FS at OU No. 6 - Site 54 - MCAS, New River
CTO NO.: 62470-303 BORING NO.: 54-SB04

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	8.65
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.: 54-SB04 SHEET 2 OF 2

TEST BORING RECORD

PROJECT: RI/FS at OU No. 6 - Site 54 - MCAS, New River
CTO NO.: 62470-303
BORING NO.: 54-SB05
COORDINATES: EAST: 2465439.7734 NORTH: 351071.4624
ELEVATION: SURFACE: 20.94

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	3/11/95	0.0 - 10.0	Sunny & mild	9.0	1616
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				SAND & GRAVEL; compacted layer (1.0)	
2 – 3.0	S-1	1.9 95%	01 01D	0.5/0.5	SILT, little to some clay, trace fine sand; brown; damp (amt of clay increasing w/ depth) (4.3)	
4 – 5.0	S-2	1.7 85%		0.4/0.4		
6 – 7.0	S-3	1.6 80%		0.3/0.3	SAND (fine), little to some silt, trace clay; gray; damp	
8 – 10.0	S-4	2.5 83%	04	0.3/0.3	moist; SAND (med to coarse), trace silt & clay; brown; wet (9.0); GROUNDWATER @ 9.0 FT (10.0)	
					BOH @ 10.0 FT.	

CONTRACTOR: Microseeps
BAKER REP.: Mark DeJohn
OPERATOR: Art Carion
BORING NO.: 54-SB05

TEST BORING RECORD

PROJECT: RI/FS at OU No. 6 - Site 54 - MCAS, New River
CTO NO.: 62470-303 BORING NO.: 54-SB06
COORDINATES: EAST: 2465480.4015 NORTH: 351153.2666
ELEVATION: SURFACE: 21.40

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	3/12/95	0.0 - 10.0	Sunny & cool	10.0	0927
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	1.5/1.5	SILT, little clay, trace fine sand & gravel; brown; damp (1.0)	
2 – 3.0	S-1	2.0 100%		1.4/1.4	SILT, little to some clay, trwace fine sand; brown, black @ 1.0-1.3 ft; moist	
4 – 5.0	S-2	1.9 95%		1.5/1.5	SILT, trace fine sand & clay; gray; damp (4.8, 5.0)	
6 – 7.0	S-3	1.6 80%		1.4/1.4	SAND (fine to med), some silt, trace to little clay; gray; damp to moist	
8 – 10.0	S-4	2.6 87%	05	1.7/1.7	SAND (fine to med), little silt, trace clay; gray; moist to wet (9.0) GROUNDWATER @ 10.0 FT (10.0)	
					BOH @ 10.0 FT.	

CONTRACTOR: Microseeps BAKER REP.: Mark DeJohn
OPERATOR: Art Carlon BORING NO.: 54-SB06 SHEET 1 OF 1

TEST BORING RECORD

PROJECT: RI/FS at OU No. 6 - Site 54 - MCAS, New River
CTO NO.: 62470-303 BORING NO.: 54-SB07
COORDINATES: EAST: 2465426.9443 NORTH: 351161.5529
ELEVATION: SURFACE: 21.23

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	3/12/95	0.0 - 12.0	Sunny & cool	10.0	0824
LENGTH	4.0'	--	4.0'					
TYPE	Piston	--	Plastic					

REMARKS:

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 = Background
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.
1 – 1.0	D-N		00	0.9/0.9	SILT, little fine sand, trace clay; dark brown; damp (0.5)	20.73
2 – 3.0	S-1	1.5 75%		0.9/0.9	SILT, little to some clay, trace fine sand; light brown; damp	
4 – 5.0	S-2	1.7 85%		0.9/0.9		
6 – 7.0	S-3	1.8 90%		0.9/0.9	(6.1)	15.13
8 – 10.0	S-4	2.6 87%	05	1.1/0.9	SAND (fine), some silt, trace to little clay; gray; moist fine to med sand; med gray; wet GROUNDWATER @ 10.0 FT	

Match to Sheet 2

CONTRACTOR: Microseeps BAKER REP.: Mark DeJohn
OPERATOR: Art Carion BORING NO.: 54-SB07

TEST BORING RECORD

PROJECT: RI/FS at OU No. 6 - Site 54 - MCAS, New River
CTO NO.: 62470-303 BORING NO.: 54-SB07

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		S-5	2.0 100%		1.2/1.2	Continued from Sheet 1	
12	12.0					12.0	9.23
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							

CONTRACTOR: Microseeps BAKER REP.: Mark DeJohn
OPERATOR: Art Carion BORING NO.: 54-SB07 SHEET 2 OF 2

TEST BORING RECORD

PROJECT: RI/FS at OU No. 6 - Site 54 - MCAS, New River
CTO NO.: 62470-303 BORING NO.: 54-SB08
COORDINATES: EAST: 2465224.3304 NORTH: 350945.0946
ELEVATION: SURFACE: 17.91

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	3/11/95	0.0 - 11.0	Sunny & cold	9.0	0855
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	18.7/4.0	SILT, some clay, trace to little fine sand; brown; damp	
2 – 3 (3.0)	S-1	1.8 90%	01	3.8/0.7	black staining @ 1.0-2.3 ft with a petroleum odor little fine sand, trace clay	
4 – 5 (5.0)	S-2	1.7 85%		0.6/0.6		
6 – 7 (7.0)	S-3	1.6 80%		0.7/0.7	6.4	11.51
					SAND (fine), little silt, trace clay; light brown; damp	
8 – 9 (9.0)	S-4	1.7 85%	04	0.8/0.8	7.9	10.01
					SAND (fine), some silt, trace to little clay; reddish-brown; moist	
10	S-5	1.5 75%		0.7/0.7	wet GROUNDWATER @ 9.0 FT	
					Match to Sheet 2	

CONTRACTOR: Microseeps BAKER REP.: Mark DeJohn
OPERATOR: Art Carion BORING NO.: 54-SB08 SHEET 1 OF 2

TEST BORING RECORD

PROJECT: RI/FS at OU No. 6 - Site 54 - MCAS, New River
CTO NO.: 62470-303 BORING NO.: 54-SB08

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	6.91
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.: 54-SB08 SHEET 2 OF 2

TEST BORING RECORD

PROJECT: RI/FS at OU No. 6 - Site 54 - MCAS, New River
CTO NO.: 62470-303 BORING NO.: 54-SB09
COORDINATES: EAST: 2465235.5027 NORTH: 350924.0514
ELEVATION: SURFACE: 18.19

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	3/11/95	0.0 - 9.0	Sunny & cold	8.0	1012
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	1.0/1.0	SILT, some clay, trace fine sand; hard; black; damp	
2 – 3.0	S-1	1.8 90%		1.0/1.0	brown	
					2.6	15.59
					SILT, trace to little fine sand & clay; gray; damp	
4 – 5.0	S-2	1.6 80%		0.8/0.8		
6 – 7.0	S-3	1.2 60%	03	0.9/0.9		
8 – 9.0	S-4	1.4 70%		0.9/0.9	wet	
					8.4	9.79
					SAND (fine), some silt, trace clay; gray; wet	
					9.0	9.19
10					GROUNDWATER @ 8.0 FT	
					BOH @ 9.0 FT.	

CONTRACTOR: Microseeps BAKER REP.: Mark DeJohn
OPERATOR: Art Carlon BORING NO.: 54-SB09 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 54 - MCAS, New River
CTO NO.: 62470-303 BORING NO.: 54-GW04
COORDINATES: EAST: 2465637.74338 NORTH: 350923.13006
ELEVATION: SURFACE: 12.24 TOP OF PVC CASING: 15.12

RIG: Rig #40					DATE	PROGRESS (FT.)	WEATHER	WATER DEPTH (FT.)	TIME
Book #1 pp 108 → 109	SPLIT SPOON	CASING	AUGERS	CORE BARREL					
SIZE (DIAM.)	1-3/8"		4¼" ID		3-7-95	0-18.0	Partly cloudy, 70's, breezy	2.0'	
LENGTH	2.0		5.0'						
TYPE	Std.		HSA						
HAMMER WT.	140 lbs.								
FALL	30"								
STICK UP									

REMARKS: Borehole continuously sampled to 16.0' (bgs). Borehole drilled out to 18.0' (bgs). Type II monitoring well set 3-7-95. 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'	2.0' (bgs)
Screen	2.0"	Schedule 40 0.01 Slot	2.0' (bgs)	17.0' (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	3 4		.3	SILTY SAND, fine grained w/trace CLAY. Brown and gray, loose to medium dense, damp to moist.	Bentonite pellets	
2 (2.0)		75%	5 6		.3		PVC riser	
3	S-2	1.4/2.0	2 9		.3			
4 (4.0)		70%	13 12		.3			
5	S-3	1.5/2.0	4 8		.3	SAND, fine to medium grained w/trace SILT and trace fine grained GRAVEL. Light gray, medium dense, wet. Oxidation (orange/yellow) staining is occasional	Sand pack	
6 (6.0)		75%	12 8		.3			
7	S-4	1.9/2.0	1 6		.3			
8 (8.0)		95%	8 8		.3		Well screen	
9	S-5	1.5/2.0	1 3		.3			
10 (10.0)		75%	3 2		.3	SILTY SAND, fine grained w/trace CLAY. Dark gray, loose, wet		
		55%				SILTY CLAY w/trace SAND		

Match to Sheet 2

DRILLING CO.: Hardin-Huber, Inc. BAKER REP.: J. E. Zimmerman
DRILLER: R. Keenan BORING NO.: 54-GW04 SHEET 1 OF 2

Baker
Baker Environmental, Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: RI/FS at OU No. 6 - Site 54 - MCAS, New River
CTO NO.: 62470-303 BORING NO.: 54-GW04

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
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)
						Continued from Sheet 1		
11	S-6	1.1 / 2.0	1 2 2 1		.3 / .3	SILTY CLAY w/trace SAND	Sand pack	
12 12.0		55%				SAND, fine grained w/trace SILT. Dark gray, loose, wet		
13	S-7	2.0 / 2.0	2 2 3 6		.3 / .3	SAND, fine to medium w/trace SILT. Reddish brown, loose, wet. Heavy oxidation throughout sample	Well screen	
14 14.0		100%						
15	S-8	.9 / 2.0	1 1 1 1		.3 / .3	SAND, fine to medium grained w/trace SILT and trace fine grained GRAVEL		
16 16.0		45%						
17	AN					SILTY SAND, fine grained. Reddish brown to dark gray very loose, wet.		
18 18.0								
19						End of Boring		
20						TD: 18.0' (695)		
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								

DRILLING CO.: Hardin-Huber, Inc. BAKER REP.: J. E. Zimmerman

DRILLER: R. Keenan BORING NO.: 54-GW04 SHEET 2 OF 2

Baker
Baker Environmental, Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: RI/FS at OU NO. 6 - Site 54 - MCAS, New River
CTO NO.: 62470-303 BORING NO.: 54-GW05
COORDINATES: EAST: 2465497.4170 NORTH: 350966.7667
ELEVATION: SURFACE: 19.62 TOP OF PVC CASING: 19.37

RIG: R 16					DATE	PROGRESS (FT.)	WEATHER	WATER DEPTH (FT.)	TIME
Book # 2 pp 116→119, 125	SPLIT SPOON	CASING	AUGERS	CORE BARREL					
SIZE (DIAM.)	1-3/8"		4¼" ID		3-23-95	0 - 20.0	clear, warm (70's), windy	6.5	
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 20.0' (bgs). Type II monitoring well set 3-23-95. HNu background = .4 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	-.5' (bgs)	14.0' (bgs)
Screen	2.0"	Schedule 40 0.01 Slot	14.0' (bgs)	19.0' (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, 2 (2.0)	S-1	2.0/2.0 100%	5 8 9 10		.4 / .4	SILT SAND, fine grained w/ ROOTED MATERIAL Dark brown, medium dense, damp; SILTY CLAY	cement grout	
3, 4 (4.0)	S-2	2.0/2.0 100%	6 9 7 6		.4 / .4	SILTY SAND, fine grained w/trace to little CLAY. Dark brown to brown, medium dense, damp	PVC riser	
5, 6 (6.0)	S-3	1.8/2.0 90%	2 2 4 5		.4 / .4	SILTY CLAY w/trace SAND, fine grained Brown to light gray stiff damp; SILTY SAND, fine grained		
7, 8 (8.0)	S-4	1.8/2.0 90%	5 9 13 20		.5 / .4	SAND, fine to medium grained w/trace SILT and trace fine GRAVEL Light gray, medium dense, wet.	Bentonite pellets	
9, 10 (10.0)	S-5	1.6/2.0 80%	3 10 13 18		.6 / .4			

Match to Sheet 2

DRILLING CO.: Hardin-Huber, Inc. BAKER REP.: J. E. Zimmerman
DRILLER: R. Keenan BORING NO.: 54-GW05 SHEET 1 OF 2

Baker
Baker Environmental, Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: RI/FS at OU No. 6 - Site 54 - MCAS, New River
CTO NO.: 62470-303 BORING NO.: 54-GW05

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
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)
						Continued from Sheet 1		
11	S-6	1.5/2.0 75%	3 10 11 15		.5/.4	SAND, fine to medium grained w/trace SILT light gray w/oxidation medium dense, wet		
12 12.0								
13	S-7	1.3/2.0 65%	5 6 6 7		.5/.4	SAND, fine to medium grained w/trace SILT and trace fine GRAVEL light gray w/oxidation medium dense, wet	PVC riser	
14 14.0								
15	S-8	1.9/2.0 95%	5 5 6 5		.5/.4	SAND, fine to medium grained w/trace coarse graines and trace SILT light gray w/oxidation medium dense, wet	well screen	
16 16.0								
17	S-9	2.0/2.0 100%	3 4 4 4		.4/.4	SAND, fine grained w/trace SILT, Brown to dark gray w/oxidation loose, wet to moist	sand pack	
18 18.0								
19	S-10	.6/2.0 30%	2 2 3 2		.4/.4	SILTY CLAY w/little SAND, fine grained dark gray, soft, moist		
20 20.0								
21						End of Boring		
22						TD: 20.0' (bgs)		
23								
24								
25								
26								
27								
28								
29								
30								

DRILLING CO.: Hardin-Huber, Inc. BAKER REP.: J. E. Zimmerman

DRILLER: R. Keenan BORING NO: 54-GW05 SHEET 2 OF 2

Baker
Baker Environmental, Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: RI/FS at OU NO. 6 - Site 54 - MCAS, New River
CTO NO.: 62470-303 BORING NO.: 54-GW06
COORDINATES: EAST: 2465377.9171 NORTH: 351059.4614
ELEVATION: SURFACE: 21.22 TOP OF PVC CASING: 20.77

RIG: R16					DATE	PROGRESS (FT.)	WEATHER	WATER DEPTH (FT.)	TIME
Page 144 #2	SPLIT SPOON	CASING	AUGERS	CORE BARREL					
SIZE (DIAM.)	1-3/8"		4 1/4" ID		3-25-95	0 - 18.0	clear, cool (50's), breezy	9.0	
LENGTH	2.0		5.0'						
TYPE	Std.		HSA						
HAMMER WT.	140 lbs.								
FALL	30"								
STICK UP									

REMARKS: Borehole continuously sampled to 18.0' (bgs). Borehole drilled out to 16.5' (bgs). Type II monitoring well set 3-25-95. HNu background = .4 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

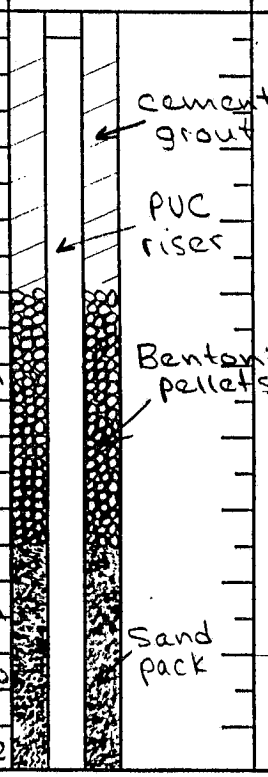
Well Information	Diam.	Type	Top Depth (ft.)	Bottom Depth (ft.)
Riser	2.0"	Schedule 40 PVC	.5' (bgs)	11.0' (bgs)
Screen	2.0"	Schedule 40 0.01 Slot	11.0' (bgs)	16.0' (bgs)

Depth (ft.)	Samp. Type and No.	Samp. Rec. (ft. & %)	SPT or RQD	Lab ID No.	PID (ppm)	Visual Description
1	S-1	1.8/2.0 90%	3 4 6 3		.4 .4	SILTY SAND, fine grained. Brown, medium dense, damp
2.0						
3	S-2	2.0/2.0 100%	3 2 3 4		.4 .4	
4.0						
5	S-3	1.5/2.0 75%	3 4 5 6		.4 .4	SAND, fine grained w/trace SILT. Brown, loose to medium dense, damp.
6.0						
7	S-4	1.5/2.0 75%	4 5 5 7		.4 .4	
8.0						
9	S-5	1.5/2.0 75%	4 5 5 6		.4 .4	SAND, fine to medium grained w/trace SILT. Light brown to brown, med. dense, moist to wet
10.0						

Match to Sheet 2

Elevation (ft. MSL)

Well Installation Detail



DRILLING CO.: Hardin-Huber, Inc. BAKER REP.: J. E. Zimmerman
DRILLER: R. Keenan BORING NO.: 54-GW06 SHEET 1 OF 2

Baker
Baker Environmental, Inc

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: RI/FS at OU No. 6 - Site 54 - MCAS, New River
CTO NO.: 62470-303 BORING NO.: 54-GW06

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
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)
						Continued from Sheet 1		
11	S-6	1.3/2.0 65%	3 3 3 7		.4/.4	SAND, fine to medium grained w/trace SILT and trace fine GRAVEL light brown to buff w/oxidation (only traceable), loose, wet	Sand pack	
12								
12.0								
13	S-7	1.8/2.0 90%	3 3 5 5		.4/.4		well screen	
14								
14.0								
15	S-8	1.8/2.0 90%	6 5 6 7		.4/.4	SAND, fine to coarse grained w/trace SILT and trace fine GRAVEL light brown to buff medium dense, wet		
16								
16.0								
17	S-9	1.9/2.0 95%	2 1 1 1		.4/.4	CLAY, soft, dark greenish gray, damp		
18						End of Boring		
18.0						TD: 18.0' (bgs)		
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								

DRILLING CO.: Hardin-Huber, Inc. BAKER REP.: J. E. Zimmerman

DRILLER: R. Keenan BORING NO.: 54-GW06 SHEET 2 OF 2

Baker

Baker Environmental, Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: RI/FS at OU NO. 6 - Site 54 - MCAS, New River
CTO NO.: 62470-303 BORING NO.: 54-GW07
COORDINATES: EAST: 2463598.2560 NORTH: 351206.1405
ELEVATION: SURFACE: 21.92 TOP OF PVC CASING: 21.47

RIG: R16

Cont # 2 PP 131 → 137	SPLIT SPOON	CASING	AUGERS	CORE BARREL	DATE	PROGRESS (FT.)	WEATHER	WATER DEPTH (FT.)	TIME
SIZE (DIAM.)	1-3/8"		4 1/4" ID		3-24-95	0 - 35.0	Clear, cool (50's) breezy	9.0	
LENGTH	2.0		5.0'						
TYPE	Std.		HSA						
HAMMER WT.	140 lbs.								
FALL	30"								
STICK UP									

REMARKS: Borehole continuously sampled to 34.0' (bgs). Borehole drilled out to 35.5' (bgs). Type II monitoring well set 3-24-95. HNU background = .4 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	+.5 (bgs)	25.0' (bgs)
Screen	2.0"	Schedule 40 0.01 Slot	25.0' (bgs)	35.0' (bgs)

Depth (ft.)	Samp. Type and No.	Samp. Rec. (ft. & %)	SPT or RQD	Lab ID No.	PID (ppm)	Visual Description
1 / 2.0	S-1	1.0/2.0 50%	7 10 13		.4 / .4	SILTY SAND, fine grained w/ ROOTED MATERIAL. Dark brown, medium dense, damp
3 / 4.0	S-2	2.0/2.0 100%	4 5 5 10		.4 / .4	SILTY SAND, fine grained w/ trace to little CLAY. Dark brown to brown, medium dense, damp
5 / 6.0	S-3	2.0/2.0 100%	3 6 9 11		.4 / .4	SILTY CLAY w/ trace SAND, fine grained. Brown to light brown, stiff, damp
7 / 8.0	S-4	2.0/2.0 100%	7 8 9 9		.4 / .4	SILTY SAND, fine grained. Light brown, medium dense, damp to moist to wet
9 / 10.0	S-5	1.6/2.0 80%	5 6 6 7		.4 / .4	

Well Installation Detail: cement grout; PVC riser

Elevation (ft. MSL)

Match to Sheet 2

DRILLING CO.: Hardin-Huber, Inc. BAKER REP.: J. E. Zimmerman
DRILLER: R. Keenan BORING NO.: 54-GW07 SHEET 1 OF 3

Baker
Baker Environmental, Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: RI/FS at OU No. 6 - Site 54 - MCAS, New River
CTO NO.: 62470-303 BORING NO.: 54-GW07

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
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	1.7/2.0	3 4		.6	Continued from Sheet 1 SAND, fine grained w/ trace SILT. Light brown, medium dense wet		
12 (12.0)		85%	6 5		.4			
13	S-7	1.5/2.0	4 2		.4	SAND, fine to medium grained w/trace SILT and trace fine GRAVEL. Light gray	Bentonite pellets	
14 (14.0)		75%	4 5		.4			
15	S-8	1.6/2.0	2 2		.4	SAND, fine to medium grained w/trace coarse graines and trace SILT. Light brown to light gray to buff w/ oxidation, loose, wet.	PVC riser	
16 (16.0)		80%	3 5		.4			
17	S-9	1.6/2.0	5 2		.4			
18 (18.0)		80%	5 7		.4			
19	S-10	1.7/2.0	4 7		.4	SAND, fine to coarse grained w/ fine GRAVEL and trace SILT. Reddish brown and light gray w/ heavy oxidation, medium dense to loose, wet.	Sand pack	
20 (20.0)		85%	9 11		.4			
21	S-11	1.5/2.0	7 8		.4			
22 (22.0)		75%	12 15		.4			
23	S-12	1.7/2.0	4 2		.4	SAND, fine grained w/trace CLAY		
24 (24.0)		85%	2 3		.4			
25	S-13	1.0/2.0	4 9		.4	FOSSILIFEROUS LIMESTONE w/ little SHELL MATERIAL and trace SHELL FRAGMENTS and trace SILT w/ micritic cement. Light gray and white, medium dense, wet		
26 (26.0)		50%	10 13		.4			
27	S-14	2.0/2.0	11 13		.4		well screen	
28 (28.0)		100%	9 8		.4			
29	S-15	2.0/2.0	5 7		.4			
30 (30.0)		100%	9 13		.4			

DRILLING CO.: Hardin-Huber, Inc. BAKER REP.: J. E. Zimmerman

DRILLER: R. Keenan BORING NO: 54-GW07 SHEET 2 OF 3

Baker
Baker Environmental, Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: RI/FS at OU No. 6 - Site 54 - MCAS, New River
CTO NO.: 62470-303 BORING NO.: 54-GW07

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
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)
31	S-16	1.4/2.0 70%	7 15 15 12		.4 .4	Continued from Sheet 2	sand pack	
32 (32.0)						SILTY SAND, fine grained w/trace SHELL MATERIAL. Light gray to Light green and white, medium dense to dense, wet		
33	S-17	1.3/2.0 65%	5 5 7 10		.4 .4		well screen	
34 (34.0)								
35 (35.5)	MD	–	–		–			
36						End of Boring		
37						TD: 35.5' (bgs)		
38								
39								
40								
1								
2								
3								
4								
5								
6								
7								
8								
9								
0								

DRILLING CO.: Hardin-Huber, Inc. BAKER REP.: J.E. Zimmerman

DRILLER: R. Keenan BORING NO: 54-GW07 SHEET 3 OF 3

Baker
Baker Environmental, Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: RI/FS at OU NO. 6 - Site 54 - MCAS, New River
CTO NO.: 62470-303 BORING NO.: 54-GW08
COORDINATES: EAST: 2465374.4268 NORTH: 351039.9769
ELEVATION: SURFACE: 21.12 TOP OF PVC CASING: 20.99

RIG: R16					DATE	PROGRESS (FT.)	WEATHER	WATER DEPTH (FT.)	TIME
Book II pp 52→53, 72→73	SPLIT SPOON	CASING	AUGERS	CORE BARREL					
SIZE (DIAM.)	1-3/8"	6"			4-7-95	0-16.0	clear, cool (50's)	9.0	
LENGTH	2.0	16.0			4-8-95	16.0-29.5	clear, mild (60's) breezy		
TYPE	Std.	Steel							
HAMMER WT.	140 lbs.								
FALL	30"								
STICK UP									

REMARKS: Borehole continuously sampled to 16.0'(bgs). Borehole drilled out to 29.5'(bgs). Type III monitoring well set 4-8-95. 6" steel casing set at 16.0'(bgs). HNU (BG) = .5 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	.5'(bgs)	24.0'(bgs)
Screen	2.0"	Schedule 40 0.01 Slot	24.0'(bgs)	29.0'(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 / 2.0	S-1	1.7/2.0 85%	9 11 12 7		.5 / .5	SILTY SAND, fine grained. Brown, medium dense, damp.	Cement grout	
3 / 4.0	S-2	1.7/2.0 80%	4 4 7 7		.5 / .5			
5 / 6.0	S-3	1.5/2.0 75%	5 9 9 9		.5 / .5	SAND, fine grained w/ trace SILT. Light brown, medium dense, damp.	6" steel casing; Bentonite slurry	
7 / 8.0	S-4	1.0/2.0 50%	4 4 6 6		.5 / .5			
9 / 10.0	S-5	1.0/2.0 50%	3 3 6 5		.5 / .5	SAND, fine to medium grained w/trace SILT. Light brown to brown, medium dense. Match to Sheet 2	PVC riser	

DRILLING CO.: Hardin-Huber, Inc. BAKER REP.: J.E. Zimmerman
DRILLER: R. Keenan BORING NO.: 54-GW08 SHEET 1 OF 2

Baker
Baker Environmental, Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: RI/FS at OU No. 6 - Site 54 - MCAS, New River
CTO NO.: 62470-303 BORING NO.: 54-GW08

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
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)
						Continued from Sheet 1		
11 / 12 (12.0)	S-6	.7 / 2.0 35%	5 3 6 4		.5 / .5	SAND, fine to medium grained w/trace SILT and trace fine GRAVEL. Light brown to buff to dark gray w/oxidation, loose to medium dense, wet.	6" steel casing; PVC riser	
13 / 14 (14.0)	S-7	2.0 / 2.0 100%	3 2 1 1		.5 / .5			
15 / 16 (16.0)	S-8	2.0 / 2.0 100%	WOH / 12" 1 1		.5 / .5	CLAY, very soft Dark greenish gray, damp to moist.		
17 / 18 (18.0)	N	NR	—		—	NO RECOVERY	Bentonite Slurry	
19 / 20 (20.0)	S-9	2.0 / 2.0 100%	WOH / 24"		.5 / .5	CLAY, very soft Dark greenish gray; SAND, fine to medium grained w/trace SILT	Bentonite pellets	
21 / 22 (22.0)	N	NR	—		—	NO RECOVERY		
23 / 24 (24.0)	S-10	2.0 / 2.0 100%	WOH / 12" 11 13		.5 / .5	SAND, fine to medium grained w/trace coarse grained, w/trace SILT Micrite is traceable	Sand pack	
25 / 26 / 27 / 28 / 29 (29.5)	N					Drill to 29.5' (bgs)	well screen	
30						End of Boring TD: 29.5' (bgs)		

DRILLING CO.: Hardin-Huber, Inc. BAKER REP.: J. E. Zimmerman

DRILLER: R. Keenan BORING NO.: 54-GW08 SHEET 2 OF 2

Baker
Baker Environmental, Inc

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: RI/FS at OU NO. 6 - Site 54 - MCAS, New River
CTO NO.: 62470-303 BORING NO.: 54-GW09
COORDINATES: EAST: 2465280.0687 NORTH: 350965.5539
ELEVATION: SURFACE: 18.92 TOP OF PVC CASING: 18.77

RIG: R16					DATE	PROGRESS (FT.)	WEATHER	WATER DEPTH (FT.)	TIME
Book III pp 58→59 G1	SPLIT SPOON	CASING	AUGERS	CORE BARREL					
SIZE (DIAM.)	1-3/8"		4¼" ID		4-7-95	0-14.0	clear, 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 14.0' (bgs). Borehole drilled out to 12.0' (bgs). Type II monitoring well set 4-7-95. HNu background is .4 ppm.

SAMPLE TYPE

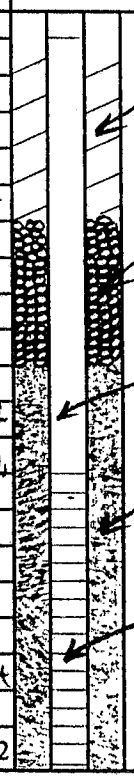
S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

Well Information	Diam.	Type	Top Depth (ft.)	Bottom Depth (ft.)
Riser	2.0"	Schedule 40 PVC	.5' (bgs)	6.5' (bgs)
Screen	2.0"	Schedule 40 0.01 Slot	6.5' (bgs)	11.5' (bgs)

Depth (ft.)	Samp. Type and No.	Samp. Rec. (ft. & %)	SPT or RQD	Lab ID No.	PID (ppm)	Visual Description
1, 2 (2.0)	S-1	1.7/2.0 85%	11 9 11 17		.4/.4	SILTY SAND, fine grained. Brown to light brown to buff, medium dense, damp
3, 4 (4.0)	S-2	1.6/2.0 80%	7 11 13 19		.4/.4	
5, 6 (6.0)	S-3	1.5/2.0 75%	7 8 9 13		.4/.4	SAND, fine grained w/ trace SILT. Light brown, medium dense, damp
7, 8 (8.0)	S-4	1.8/2.0 90%	4 3 5 8		.4/.4	
9, 10 (10.0)	S-5	1.6/2.0 80%	2 4 3 2		.4/.4	SAND, fine to medium grained w/ trace SILT. Light brown loose, wet

Match to Sheet 2

Well Installation Detail



Elevation (ft. MSL)

DRILLING CO.: Hardin-Huber, Inc. BAKER REP.: J.E. Zimmerman
DRILLER: R. Keenan BORING NO.: 54-GW09 SHEET 1 OF 2

Baker
Baker Environmental, Inc

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: RI/FS at OU No. 6 - Site 54 - MCAS, New River
CTO NO.: 62470-303 BORING NO.: 54-GW09

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
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	1.1	1 2 2 2		.4 .4	Continued from Sheet 1 SAND, fine to medium grained w/ trace SILT and trace fine GRAVEL Light brown, loose, wet	Sand pack	
12 12.0		55%					Well screen	
13	S-7	1.6	WOH 6"		.4 .4	SILTY CLAY, soft to very soft. Dark greenish gray, moist		
14 14.0		80%						
15						End of Boring		
16						TD: 14.0' (bgs)		
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								

DRILLING CO.: Hardin-Huber, Inc. BAKER REP.: J.E. Zimmerman

DRILLER: R. Keenan BORING NO.: 54-GW09 SHEET 2 OF 2

Baker
Baker Environmental, Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: RI/FS at OU NO. 6 - Site 54 - MCAS, New River
CTO NO.: 62470-303 BORING NO.: 54-GW10
COORDINATES: EAST: 2465243.0442 NORTH: 351070.4982
ELEVATION: SURFACE: 19.52 TOP OF PVC CASING: 19.43

RIG: R16					DATE	PROGRESS (FT.)	WEATHER	WATER DEPTH (FT.)	TIME
Book #2 pp 64→67	SPLIT SPOON	CASING	AUGERS	CORE BARREL					
SIZE (DIAM.)	1-3/8"		4¼" ID		4-7-95	0-13.0	Clear, warm (70's)	7.0	
LENGTH	2.0		5.0'						
TYPE	Std.		HSA						
HAMMER WT.	140 lbs.								
FALL	30"								
STICK UP									

REMARKS: Borehole continuously sampled to 12.0' (bgs). Borehole drilled out to 13.0' (bgs). Type II monitoring well set 4-7-95. Hnu background = .2 ppm.

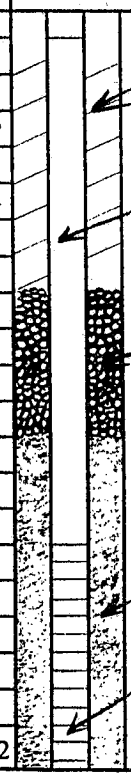
SAMPLE TYPE

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	.5' (bgs)	7.5' (bgs)
Screen	2.0"	Schedule 40 0.01 Slot	7.5' (bgs)	12.5' (bgs)

Depth (ft.)	Samp. Type and No.	Samp. Rec. (ft. & %)	SPT or RQD	Lab ID No.	PID (ppm)	Visual Description
1 / 2.0	S-1	1.8/2.0 90%	8 9 6 7		.2/.2	SILTY SAND, fine grained. Dark brown to brown, medium dense, damp
3 / 4.0	S-2	1.5/2.0 75%	4 5 8 9		.2/.2	SILTY SAND, fine grained w/ trace CLAY
5 / 6.0	S-3	1.9/2.0 95%	6 8 8 9		.2/.2	SAND, fine grained w/ trace SILT. Light brown to buff, medium dense, damp
7 / 8.0	S-4	2.0/2.0 100%	5 5 5 4		.2/.2	SAND, fine to medium grained w/ trace SILT. Brown, medium to loose, moist to wet
9 / 10.0	S-5	1.4/2.0 70%	2 4 3 4		.2/.2	

Well Installation Detail



Elevation (ft. MSL)

Match to Sheet 2

DRILLING CO.: Hardin-Huber, Inc. BAKER REP.: J.E. Zimmerman
DRILLER: R. Keenan BORING NO.: 54-GW10 SHEET 1 OF 2

Baker

Baker Environmental, Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: RI/FS at OU No. 6 - Site 54 - MCAS, New River

CTO NO.: 62470-303 BORING NO.: 54-GW10

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
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)
						Continued from Sheet 1		
11	S-6	1.5 / 2.0 75%	1 2 1 2		.2 .2	SAND, fine to medium grained w/ trace SILT and trace fine GRAVEL. Brown/dark greenish gray, loose Wet.	Sand pack	
12 12.0							Well Screen	
13 13.0	A-N	—	—		—			
14						End of Boring		
15						TD: 13.0' (bgs)		
16								
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21								
22								
23								
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27								
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29								
30								

DRILLING CO.: Hardin-Huber, Inc. BAKER REP.: J.E. Zimmerman

DRILLER: R. Keenan BORING NO.: 54-GW10 SHEET 2 OF 2

Baker

Baker Environmental, Inc

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: RI/FS at OU NO. 6 - Site 54 - MCAS, New River
CTO NO.: 62470-303 BORING NO.: 54-TW01
COORDINATES: EAST: 2465556.3466 NORTH: 351136.7799
ELEVATION: SURFACE: 20.80 TOP OF PVC CASING: —

RIG: Geoprobe 5400

	LARGE BORE SAMPLER	LINER	AUGERS	CORE BARREL	DATE	PROGRESS (FT.)	WEATHER	WATER DEPTH (FT.)	TIME
SIZE (DIAM.)	1-3/8" ID	1-1/8" ID			3/12/95	0.0-12.0	Sunny & warm	11.0	1111
LENGTH	4.0'	4.0'							
TYPE	Piston	Plastic							
HAMMER WT.	NA								
FALL	NA								
STICK UP									

REMARKS: The formation collapsed in boring, well was pushed through collapsed formation.

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	1.0"	Schedule 40 PVC	+2.0	8.0
Screen	1.0"	Schedule 40 0.01 Slot	8.0	13.0

Depth (ft.)	Samp. Type and No.	Samp. Rec. (ft. & %)	SPT or RQD	Lab ID No.	PID (ppm) PS/BG	Visual Description
1, 2, 3, 4 (4.0)	S-1	3.4 85%			2.1 / 2.1	SILT, trace to little clay, trace fine sand; brown; damp (4.0)
5, 6 (6.0)	S-2	3.4 85%			1.5 / 1.5	SILT, some clay, trace fine sand; gray; damp (6.0)
7, 8 (8.0), 9 (9.0)						SAND (fine), some silt, trace clay; gray; damp (9.0)
10	S-3	3.5 88%			1.5 / 1.5	SAND (fine), some clay & silt; gray & rust; mottled; damp Match to Sheet 2

Well Installation Detail: open borehole; 8.0; formation collapse

Elevation (ft. MSL)

DRILLING CO.: Microseeps, Inc BAKER REP.: Mark DeJohn
DRILLER: Art Carlson BORING NO.: 54-TW01 SHEET 1 OF 2

Baker
Baker Environmental, Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: RI/FS at OU No. 6 - Site 54 - MCAS, New River
CTO NO.: 62470-303 BORING NO.: 54-TW01

SAMPLE TYPE

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

DEFINITIONS

SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
RQD = Rock Quality Designation (%)
PID = Photoionization Detector
ppm = parts per million

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						Continued from Sheet 1		
						11.0		
12	12.0					SAND (med to coarse), some silt, trace clay; tan w/ iron staining; wet 12.0	12.0	
						GROUNDWATER @ 11.0 ft		
13						BOH @ 12.0 ft.	13.0	
14								
15								
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DRILLING CO.: Microseeps BAKER REP.: Mark DeJohn

DRILLER: Art Carion BORING NO.: 54-TW01 SHEET 2 OF 2

Baker
Baker Environmental, Inc

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: RI/FS at OU NO. 6 - Site 54 - MCAS, New River
CTO NO.: 62470-303 BORING NO.: 54-TW02
COORDINATES: EAST: 2465533.7054 NORTH: 351040.5671
ELEVATION: SURFACE: 20.70 TOP OF PVC CASING: –

RIG: Geoprobe 5400

	LARGE BORE SAMPLER	LINER	AUGERS	CORE BARREL	DATE	PROGRESS (FT.)	WEATHER	WATER DEPTH (FT.)	TIME
SIZE (DIAM.)	1-3/8" ID	1-1/8" ID			3/12/95	0.0-12.0	Sunny & Warm	10.0	1535
LENGTH	4.0'	4.0'							
TYPE	Piston	Plastic							
HAMMER WT.	NA								
FALL	NA								
STICK UP									

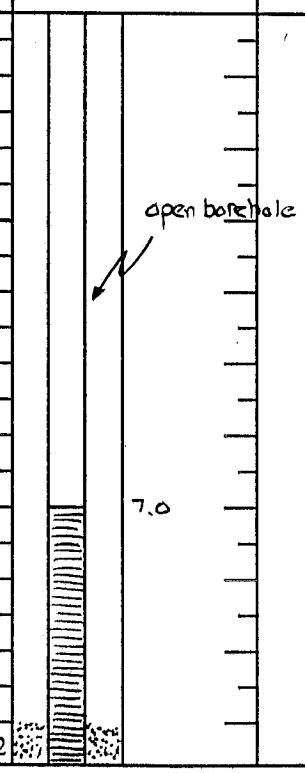
REMARKS:

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	1.0"	Schedule 40 PVC	+3.0	7.0
Screen	1.0"	Schedule 40 0.01 Slot	7.0	12.0

Depth (ft.)	Samp. Type and No.	Samp. Rec. (ft. & %)	SPT or RQD	Lab ID No.	PID (ppm)	Visual Description	Elevation (ft. MSL)
1, 2, 3, 4 (4.0)	S-1	3.5 88%			1.9 / 1.9	SILT, little clay, trace fine sand; black; hard; damp (3.0)	
						SILT, some clay, trace fine sand; black; damp (6.0)	
5, 6, 7, 8 (8.0)	S-2	3.5 88%			1.9 / 1.9		
						SAND (fine), some silt, trace clay; gray; damp (10.0)	
9, 10	S-3	3.4 85%			–	Match to Sheet 2	



DRILLING CO.: Microseeps, Inc BAKER REP.: Mark DeJohn
DRILLER: Art Carion BORING NO.: 54-TW02 SHEET 1 OF 2

Baker
Baker Environmental, Inc

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: RI/FS at OU No. 6 - Site 54 - MCAS, New River
CTO NO.: 62470-303 BORING NO.: 54-TW02

SAMPLE TYPE

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

DEFINITIONS

SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
RQD = Rock Quality Designation (%)
PID = Photoionization Detector
ppm = parts per million

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						Continued from Sheet 1		
12	12.0					SAND (Fine to med), some silt, trace to little clay; gray; wet @ WATER @ 10 ft 12.0	Formation collapse 12.0	
13						BOH @ 12.0 ft		
14								
15								
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20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								

DRILLING CO.: Microseeps, Inc. BAKER REP.: Mark DeJohn
DRILLER: Art Carion BORING NO.: 54-TW02 SHEET 2 OF 2

Baker
Baker Environmental, Inc

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: RI/FS at OU NO. 6 - Site 54 - MCAS, New River
CTO NO.: 62470-303 BORING NO.: 54-TW03
COORDINATES: EAST: 2465481.5442 NORTH: 351078.5865
ELEVATION: SURFACE: 21.10 TOP OF PVC CASING: —

RIG: Geoprobe 5400

	LARGE BORE SAMPLER	LINER	AUGERS	CORE BARREL	DATE	PROGRESS (FT.)	WEATHER	WATER DEPTH (FT.)	TIME
SIZE (DIAM.)	1-3/8" ID	1-1/8" ID			3/12/95	0.0-14.0	Sunny & warm	10.0	1452
LENGTH	4.0'	4.0'							
TYPE	Piston	Plastic							
HAMMER WT.	NA								
FALL	NA								
STICK UP									

REMARKS:

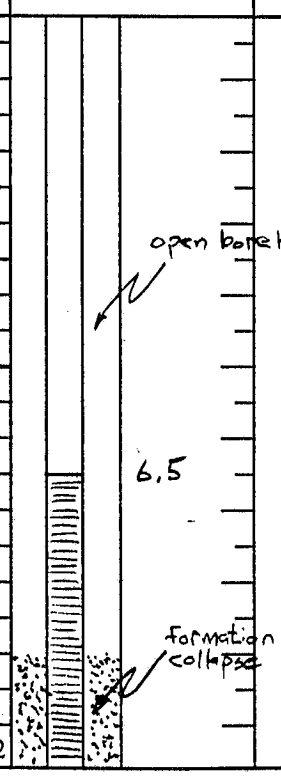
SAMPLE TYPE

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	1.0"	Schedule 40 PVC	+3.5	6.5
Screen	1.0"	Schedule 40 0.01 Slot	6.5	11.5

Depth (ft.)	Samp. Type and No.	Samp. Rec. (ft. & %)	SPT or RQD	Lab ID No.	PID (ppm)	Visual Description
1, 2, 3, 4 (4.0)	S-1	3.4 85%			1.9 / 1.9	SILT, little clay, trace fine sand; brown; hard; damp (3.5)
						SILT, some clay, trace fine sand; brown; damp (5.0)
5, 6, 7, 8 (8.0)	S-2	3.5 88%			1.8 / 1.8	SAND (fine), some silt, trace to little clay (decreasing w/depth); gray; damp
9, 10	S-3	3.2 80%			1.9 / 1.9	Wet GROUNDWATER @ 10.0 ft. Match to Sheet 2

Well Installation Detail



Elevation (ft. MSL)

DRILLING CO.: Microseeps, Inc. BAKER REP.: Mark DeJohn
DRILLER: Art Carion BORING NO.: 54-TW03 SHEET 1 OF 2

Baker
Baker Environmental, Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: RI/FS at OU No. 6 - Site 54 - MCAS, New River
CTO NO.: 62470-303 BORING NO.: 54-TW03

SAMPLE TYPE

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

DEFINITIONS

SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
RQD = Rock Quality Designation (%)
PID = Photoionization Detector
ppm = parts per million

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						Continued from Sheet 1 11.0		
12 12.0						SAND (med.), little silt, trace clay; gray; wet 12.0	11.5	
13 14.0	S-4	2.0 100%			2.2 / 2.2	SAND (med to coarse), some silt, trace to little clay; brown; wet 14.0	14.0	
15						BOH @ 14.0 ft		
16								
17								
18								
19								
20								
21								
22								
23								
24								
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27								
28								
29								
30								

DRILLING CO.: Microseeps, Inc BAKER REP.: Mark DeJohn

DRILLER: Art Carion BORING NO.: 54-TW03 SHEET 2 OF 2

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: RI/FS at OU No.6 - Site 54 MCAS, New River
CTO NO.: 62470-303 BORING NO.: 54-TW04
COORDINATES: EAST: 2465365.5797 NORTH: 351101.8106
ELEVATION: SURFACE: 19.94 TOP OF PVC CASING: –

RIG: Geoprobe 5400

	LARGE BORE SAMPLER	LINER	AUGERS	CORE BARREL	DATE	PROGRESS (FT.)	WEATHER	WATER DEPTH (FT.)	TIME
SIZE (DIAM.)	1-3/8" ID	1-1/8" ID			4/10/95	0.0 - 14.5	Sunny, 70s	—	—
LENGTH	4.0'	4.0'							
TYPE	Piston	Plastic							
HAMMER WT.	NA								
FALL	NA								
STICK UP									

REMARKS: Temporary well construction consists of PVC screen, riser and well sock

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	1.0"	Schedule 40 PVC	+1.0	-4.0
Screen	1.0"	Schedule 40 0.01 slot	-4.0	-14.0

Depth (ft.)	Samp. Type and No.	Samp. Rec. (ft. & %)	SPT or RQD	Lab Class. or Pen. Rate	PID (ppm) PS/BG	Visual Description	Well Installation Detail	Elevation (ft. MSL)
1 – 2.0	S-0	1.9 95%			0.4/0.4	SILT and FINE SAND, trace to little clay; damp; tan, brown and lt. gray mottling (fill material)		
3 – 4.0	S-1	1.6 80%			0.3/0.3			
5 – 6.0	S-2	1.6 80%			0.3/0.3		Top of Screen @ 4'	
7 – 8.0	S-3	1.5 75%			0.3/0.3			
9 – 10.0	S-4	1.6 80%			0.3/0.3	8.8' FINE SAND, trace to little silt; wet; lt. gray and tan		
						Match to Sheet 2		

DRILLING CO.: Microseeps, Inc. BAKER REP.: Dave Gaviglia
DRILLER: Art Carion BORING NO.: 54-TW04

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: R1/FS at OU No.6 - Site 54 MCAS, New River
CTO NO.: 62470-303 BORING NO.: 54-TW04

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
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 Class. or Pen. Rate	PID (ppm) PS/BG	Visual Description	Well Installation Detail	Elevation (ft. MSL)
11	S-5	2.0 100%			0.3/0.3	Continued from Sheet 1		
12 (12.0)						10.8' CLAY, trace to little silt and fine sand; damp; lt. gray w/ tan laminants	#8	
13	S-6	2.1 84%			0.3/0.3	12.9' FINE SAND and CLAYEY SILT, little medium sand, trace fine gravel; moist to wet; lt. gray and orangish-tan		
14 (14.5)						Black staining from 13.8' to 14.3' 14.5'	Bottom of well @ 14' 14.5'	
15						End of Boring @ 14.5'		
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DRILLING CO.: Microseeps, Inc. BAKER REP.: Dave Gaviglia
DRILLER: Art Carion BORING NO.: 54-TW04

Baker Environmental, Inc

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: RI/FS at OU No.6 - Site 54 MCAS, New River
CTO NO.: 62470-303
COORDINATES: EAST: 2465368.9413 NORTH: 351119.2677
ELEVATION: SURFACE: 19.94 TOP OF PVC CASING: —
BORING NO.: 54-TW05

RIG: Geoprobe 5400

	LARGE BORE SAMPLER	LINER	AUGERS	CORE BARREL	DATE	PROGRESS (FT.)	WEATHER	WATER DEPTH (FT.)	TIME
SIZE (DIAM.)	1-3/8" ID	1-1/8" ID			4/10/95	0.0-14.5	Sunny, 70s	—	—
LENGTH	4.0'	4.0'							
TYPE	Piston	Plastic							
HAMMER WT.	NA								
FALL	NA								
STICK UP									

REMARKS: Temporary well construction consists of PVC screen, riser and well sock

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	1.0"	Schedule 40 PVC	+1.0	-4.0
Screen	1.0"	Schedule 40 0.01 Slot	-4.0	-14.0

Depth (ft.)	Samp. Type and No.	Samp. Rec. (ft. & %)	SPT or RQD	Lab Class. or Pen. Rate	PID (ppm) PS/BG	Visual Description	Well Installation Detail	Elevation (ft. MSL)
1, 2 (2.0)	S-0	2.0 100%			14.8/0.3	SILT and FINE SAND, trace to little clay; damp; tan, brown and lt. gray mottling (fill material) strong petro odor @ 0'-2' interval	#1	
3, 4 (4.0)	S-1	1.7 85%			1.3/0.6		Top of screen @ 4'	
5, 6 (6.0)	S-2	1.9 95%			1.9/0.4			
7, 8 (8.0)	S-3	1.0 50%			0.4/0.4		#2	
9, 10 (10.0)	S-4	1.4 70%			0.4/0.4	8.7' FINE and MEDIUM SAND, trace to little silt; wet; lt. gray and tan		

Match to Sheet 2

DRILLING CO.: Microseeps, Inc.
DRILLER: Art Carion
BAKER REP.: Dave Gaviglia
BORING NO.: 54-TW05

Baker
Baker Environmental

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: RI/FS at OU No. 6 - Site 54 MCAS, New River
CTO NO.: 62470-303 BORING NO.: 54-TW05

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 Class. or Pen. Rate	PID (ppm) PS/BG	Visual Description	Well Installation Detail	Elevation (ft. MSL)
11	S-5	1.5 75%			0.3/0.3	Continued from Sheet 1 10.5' FINE SAND, little to some silt; wet; lt. gray	#8	
12 (12.0)								
13	S-6	1.6 64%			0.3/0.3			
14 (14.5)						13.7' FINE SAND and SILT; wet; gray 14.5'	Bottom of well @ 14' 14.5'	
15						End of Boring @ 14.5'		
16								
17								
18								
19								
20								
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30								

DRILLING CO.: Microseeps, Inc. BAKER REP.: Dave Gaviglia
DRILLER: Art Carion BORING NO.: 54-TW05

Baker
Baker Environmental, Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: RI/FS at OU No. 6 - Site 54 MCAS, New River
CTO NO.: 62470-303
COORDINATES: EAST: 2465386.5630 NORTH: 351122.7347
ELEVATION: SURFACE: 19.94 TOP OF PVC CASING: —
BORING NO.: 54-TW06

RIG: Geoprobe 5400

	LARGE BORE SAMPLER	LINER	AUGERS	CORE BARREL	DATE	PROGRESS (FT.)	WEATHER	WATER DEPTH (FT.)	TIME
SIZE (DIAM.)	1-3/8" ID	1-1/8" ID			4/10/95	0.0-14.5	Sunny, 70s	—	—
LENGTH	4.0'	4.0'							
TYPE	Piston	Plastic							
HAMMER WT.	NA								
FALL	NA								
STICK UP									

REMARKS: Temporary well construction consists of PVC screen, riser and well sock

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	1.0"	Schedule 40 PVC	+1.0	-4.0
Screen	1.0"	Schedule 40 0.01 slot	-4.0	-14.0

Depth (ft.)	Samp. Type and No.	Samp. Rec. (ft. & %)	SPT or RQD	Lab Class. or Pen. Rate	PID (ppm) PS/BG	Visual Description	Well Installation Detail	Elevation (ft. MSL)
1, 2 (2.0)	S-0	2.0 100%			0.3/0.3	SILT and FINE SAND; damp; tan (3.1')	#7	
3, 4 (4.0)	S-1	1.8 90%			0.9/1.0	FINE SAND and CLAYEY SILT; damp; tan (4.0')		Top of screen @ 4'
5, 6 (6.0)	S-2	1.1 55%			0.6/0.7	FINE SAND and SILT, trace clay; damp; lt. tan (6.4')		
7, 8 (8.0)	S-3	1.9 95%			0.3/0.3	FINE SAND and SILT; damp to moist; lt. reddish-gray (7.6')	#8	
9, 10 (10.0)	S-4	1.9 95%			0.3/0.3	CLAY, little silt; damp; lt. gray with pink mottling (8.9')		
						FINE SAND and CLAYEY SILT; damp; lt. gray with tan mottling (9.6')		
						FINE and MEDIUM SAND, trace silt; wet; lt. gray		
						Match to Sheet 2		

DRILLING CO.: Microseeps, Inc.
DRILLER: Art Carion
BAKER REP.: Dave Gavigliia
BORING NO.: 54-TW06

Baker
Baker Environmental, Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: RI/FS at OU No.6 - Site 54 MCAS, New River
CTO NO.: 62470-303 BORING NO.: 54-TW06

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
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 Class. or Pen. Rate	PID (ppm) PS/BG	Visual Description	Well Installation Detail	Elevation (ft. MSL)
11	S-5	2.0 100%			0.2/0.3	Continued from Sheet 1		
12 (12.0)						11.4' MEDIUM SAND, little silt, trace coarse sand; wet; dk. tan-lt brown	#8	
13	S-6	2.5 100%			0.5/0.5			
14 (14.5)						14.1' SILT and FINE SAND, trace clay; damp; lt. gray 14.5'	bottom of well @ 14' 14.5	
15						End of Boring @ 14.5'		
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								

DRILLING CO.: Microseeps, Inc. BAKER REP.: Dave Gavigglia
DRILLER: Art Carion BORING NO.: 54-TW06

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: RI/FS at OU No. 6 - Site 54 MCAS, New River
CTO NO.: 62470-303
COORDINATES: EAST: 2465383.3911 NORTH: 351105.1847
ELEVATION: SURFACE: 19.94 TOP OF PVC CASING: 19.94
BORING NO.: 54-TW07

RIG: Geoprobe 5400

	LARGE BORE SAMPLER	LINER	AUGERS	CORE BARREL	DATE	PROGRESS (FT.)	WEATHER	WATER DEPTH (FT.)	TIME
SIZE (DIAM.)	1-3/8" ID	1-1/8" ID			4/11/95	0.0-14.5	Cloudy, 70s	—	—
LENGTH	4.0'	4.0'							
TYPE	Piston	Plastic							
HAMMER WT.	NA								
FALL	NA								
STICK UP									

REMARKS: Temporary well construction consists of PVC screen, riser and well sock

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	1.0"	Schedule 40 PVC	+1.0	-4.0
Screen	1.0"	Schedule 40 0.01 slot	-4.0	-14.0

Depth (ft.)	Samp. Type and No.	Samp. Rec. (ft. & %)	SPT or RQD	Lab Class. or Pen. Rate	PID (ppm) PS/BG	Visual Description	Well Installation Detail	Elevation (ft. MSL)
1, 2 (2.0)	S-0	1.8 90%			0.4/0.4	SILT and FINE SAND, trace to little clay; damp; tan, lt. brown to brown, lt. gray and gray mottling (fill material) 4.8'		
3, 4 (4.0)	S-1	1.9 95%			0.4/0.4		Top of Screen ≈ 4'	
5, 6 (6.0)	S-2	1.6 80%			0.4/0.4	CLAYEY SILT, some fine sand; damp; tan 5.4'		
7, 8 (8.0)	S-3	1.6 80%			0.4/0.4	FINE SAND and SILT, trace clay; damp; lt. gray 6.9' FINE SAND, trace to little silt; damp to moist; lt. gray 8.3'		
9, 10 (10.0)	S-4	1.9 95%			0.4/0.4	FINE and MEDIUM SAND, little to some silt, trace coarse sand and fine gravel; moist; tan and lt. gray 9.6' MEDIUM SAND, little silt, trace to little coarse sand; wet; tan and lt. gray Match to Sheet 2		

DRILLING CO.: Microseeps, Inc.
DRILLER: Art Carion
BAKER REP.: Dave Gaviglia
BORING NO.: 54-TW07

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: RI/FS at OU No. 6 - Site 54 MCAS, New River
CTO NO.: 62470-303 BORING NO.: 54-TW07

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
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 Class. or Pen. Rate	PID (ppm) PS/BG	Visual Description	Well Installation Detail	Elevation (ft. MSL)
11	S-5	2.0 100%			0.4/0.4	Continued from Sheet 1 MEDIUM SAND, little silt, trace to little coarse sand; wet; tan and lt. gray 11.7		
12 12.0						FINE SAND, little to some silt, trace medium and coarse sand; moist to wet; tan and lt. gray		
13	S-6	2.0 80%			0.4/0.4			
14 14.5						14.5'	Bottom of well @ 14' 14.5'	
15						End of Boring @ 14.5'		
16								
17								
18								
19								
20								
21								
22								
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24								
25								
26								
27								
28								
29								
30								

DRILLING CO.: Microseeps, Inc. BAKER REP.: Dave Gaviglia
DRILLER: Art Carion BORING NO.: 54-TW07

APPENDIX C
IMMUNOASSAY FIELD TESTING RESULTS

IMMUNOASSAY FIELD SCREENING RESULTS
SITE 54, CRASH CREW FIRE TRAINING BURN PIT
REMEDIAL INVESTIGATION, CTO-0303
MCAS, NEW RIVER, NORTH CAROLINA

Date	Time	Soil Sample ID	Screening Results						Concentration of Total Petroleum Hydrocarbons	Confirmatory Sample ID
			Change in O.D. Standard (15 ppm)	Change in O.D. Standard (60 ppm)	O.D. Sample 15 ppm	O.D. Sample 60 ppm	10 ppm Interpretation	50 ppm Interpretation		
03/09/95	1008	54-ES01	-0.17	-0.03	0.20	0.31	-	-	<15 ppm	
03/09/95	1008	54-ES02	-0.17	-0.03	0.12	0.19	-	-	<15 ppm	
03/09/95	1008	54-ES03	-0.17	-0.03	-0.10	0.28	+	-	≥15 <60 ppm	
03/09/95	1008	54-ES04	-0.17	-0.03	-0.08	0.09	+	-	≥15 <60 ppm	
03/09/95	1152	54-ES05	-0.14	-0.04	0.14	0.15	-	-	<15 ppm	
03/09/95	1152	54-ES06	-0.14	-0.04	-0.15	0.08	+	-	≥15 <60 ppm	
03/09/95	1152	54-ES07	-0.14	-0.04	-0.16	0.08	+	-	≥15 <60 ppm	
03/09/95	1152	54-ES08	-0.14	-0.04	-0.52	-0.40	+	+	≥60 ppm	
03/09/95	1220	54-ES09	-0.01	-0.01	0.16	0.26	-	-	<15 ppm	
03/09/95	1220	54-ES10	-0.01	-0.01	0.25	0.29	-	-	<15 ppm	54-ES10
03/09/95	1220	54-ES10D	-0.01	-0.01	0.33	0.18	-	-	<15 ppm	
03/09/95	1220	54-E11	-0.01	-0.01	0.20	0.46	-	-	<15 ppm	
03/09/95	1439	54-ES12	-0.07	-0.08	-0.14	-0.17	+	+	≥60 ppm	54-ES12
03/09/95	1439	54-ES13	-0.07	-0.08	-0.05	-0.11	+	+	≥60 ppm	
03/09/95	1439	54-ES14	-0.07	-0.08	0.25	0.33	-	-	<15 ppm	
03/09/95	1439	54-ES15	-0.07	-0.08	-0.09	-0.12	+	+	≥60 ppm	54-ES15
03/09/95	1502	54-ES16	-0.09	-0.01	0.22	0.25	-	-	<15 ppm	

(Continued)

IMMUNOASSAY FIELD SCREENING RESULTS
SITE 54, CRASH CREW FIRE TRAINING BURN PIT
REMEDIAL INVESTIGATION, CTO-0303
MCAS, NEW RIVER, NORTH CAROLINA

Date	Time	Soil Sample ID	Screening Results						Concentration of Total Petroleum Hydrocarbons	Confirmatory Sample ID
			Change in O.D. Standard (15 ppm)	Change in O.D. Standard (60 ppm)	O.D. Sample 15 ppm	O.D. Sample 60 ppm	10 ppm Interpretation	50 ppm Interpretation		
03/09/95	1502	54-ES17	-0.09	-0.01	-0.08	-0.07	+	+	≥60 ppm	
03/09/95	1502	54-ES18	-0.09	-0.01	-0.06	0.13	+	-	≥15 <60 ppm	54-ES18
03/09/95	1502	54-ES18D	-0.09	-0.01	-0.00	0.07	+	-	≥15 <60 ppm	

Notes:

Analyses performed with an EnSys PETRO RIS^{C}® Soil Test System in accordance with proposed EPA Method 4030 for immunoassay-based field screening of petroleum compounds in soil.

APPENDIX D
CHAIN-OF-CUSTODY FORMS

COC # 303010

WESTON

Custody Transfer Record/Lab Work Request

WESTON Analytics Use Only

Client: Baker Environmental
Est. Final Proj. Sampling Date: 5-1-95
Work Order #:
Project Contact/Phone #: Inga 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; Atterberg Limits; Grain Size; # 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	Atterberg Limits	Grain Size	# Bottles	Turn Around
	43-OA-SB06-00			S	3/6	1355		X			X				1	7-day
	43-OA-SB06-02			S	3/6	1404		X			X				1	7-day
	36-GW07DW			S	3/6	1400							X	X	1	Routine
	43-OA-SB01-00			S	3/6	1455		X			X				1	Routine
	43-OA-SB05-00			S	3/6	1512	X	X	X		X				2	7-day
	43-OA-SB05-02			S	3/6	1518	X	X	X		X				2	7-day
	43-OA-SB05-02D			S	3/6	1518	X	X	X		X				2	7-day
	54-BB-SB01-00		MS/MSD	S	3/7	0957	X	X	X		X				2	Routine
	54-BB-SB01-04			S	3/7	1025	X	X	X		X				2	Routine
	54-BB-SB02-00			S	3/7	1104	X	X	X		X				2	Routine

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:
- See last column for sample turn around times
- Airbill # 2124804872

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.	FedEx	3/7/95	1530

Relinquished by	Received by	Date	Time

___ L372 ___ L373 ___ L375 ___ L377 ___ L378 Ref# ___ Cooler# 1

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

381-596a

COC# 303010

WESTON

WES[illegible] Analytics Use Only

Custody Transfer Record/Lab Work Request

Client: Baker Environmental
Est. Final Proj. Sampling Date: 5/13/95
Work Order #:
Project Contact/Phone #: L. Johnson 414-269-6000
AD Project Manager: Denise Wolfman
QC: Dol: STAT:

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	BNA	Pest/PCB	Herb				INORG Metal	CN				# Bottles	Turn Around
	54-BB-SB02-04			S	3/7	1126	X	X	X					X					2	Routine
	303-TB-09			W	3/7	1200	X												2	Routine
	54-STER-01			W	3/7	1300	X	X	X					X					5	Routine
	36-GW07-01			S	3/7	1415	X	X	X					X					2	ROUTINE
	36-GW07-01			S	3/7	1429	X	X	X					X					2	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
* 303-TB-09 = Weston prepared trip blank
- Airbill # 2124804872

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	3/7/95	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# 303011

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 / 912-269-6000
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; # 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	PCB	Herb	Metal	CN	# Bottles	Turn Around
	303-TB-10			W	3/6	1500	X						2	Routine
	5A-ES10			S	3/7	1310	X	X	X				2	"
	5A-ES12			S	3/7	1353	X	X	X				2	"
	5A-ES15			S	3/7	1520	X	X	X				2	"
	5A-ES18			S	3/7	1630	X	X	X				2	"

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:
- SEE LAST COLUMN FOR SAMPLE TURN AROUND TIMES
- AIRBILL # 2124804883
* 303-TB-10 = WESTON PREPARED TRIP BLNK

DATE/REVISIONS:
1.
2.
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5.
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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
K. Martin		3/9/95	1800				

___ L372 ___ L373 ___ L375 ___ L377 ___ L378 Ref# ___ Cooler# 1

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

381-596a

WESTON Analytics Use Only

COC # 303012

Custody Transfer Record/Lab Work Request

WESTON

Client: BAKER ENVIRONMENTAL INC.
Est. Final Proj. Sampling Date: 5/1/95
Work Order #:
Project Contact/Phone #: LINNE A. JOLING 412 269 6000
AD Project Manager: DENISE WOTTHAM
QC: DoI: 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	TEST ONLY			Metal	CN	ATTERBERG LIMITS	GRAIN SIZE		# 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	TEST ONLY			Metal	CN	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-SB01-00			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

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:
- SEE LAST COLUMN FOR TURN AROUND TIMES
- AIRBILL # 2124804894

DATE/REVISIONS:
1.
2.
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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
77.7.	FedEx	3/9/95	1700

Relinquished by	Received by	Date	Time

___ L372 ___ L373 ___ L375 ___ L377 ___ L378 Ref# ___ Cooler# 1

RFW 21-21 001/A-7/91

381-596a

COC# 303013

WESTON Analytics Use Only

Custody Transfer Record/Lab Work Request

WESTON

Client: Baker Environmental Inc.
Est. Final Proj. Sampling Date: 5-1-95
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 →

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected 1995	Time Collected	ORGANIC VOA	BNA	Pest/PCB	Herb	PCB			INORG Metal	CN				# Bottles		Turn Around
	36-OA-SB01C-00			S	3/9	1633	X	X	X					X					2		Routine
	36-OA-SB01C-01			S	3/9	1637	X	X	X					X					2		
	36-OA-SB01D-00			S	3/9	1603	X	X	X					X					2		
	36-OA-SB01D-01			S	3/9	1605	X	X	X					X					2		
	36-SITER-05			W	3/9	1800	X	X	X					X					5		Hold
	303-TB-12			W	3/9	2000	X												2		Routine
	54-DD-SB01-00	X	X	S	3/10	0759	X	X			X			X					4		Routine
	54-DD-SB01-00D			S	3/10	0759	X	X			X			X					2		Routine
	54-DD-SB01-20-2			S	3/10	0804	X	X			X			X					2		Routine

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 # 2124804905
* 303-TB-12 = 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.	Fed Ex	3/10/95	1530

Relinquished by	Received by	Date	Time

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

381-596a

WESTON Analytics Use Only

COC# 303014

Custody Transfer Record/Lab Work Request

WESTON

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; PCB; INORG: Metal, CN; # 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	PCB			Metal	CN				# Bottles		Turn Around
	54-DD-SB02-00			S	3/10	0846	X	X			X			X					2		Routine
	54-DD-SB02-02			S	3/10	0858	X	X			X			X					2		
	54-DD-SB03-00			S	3/10	0934	X	X			X			X					2		
	54-DD-SB03-01			S	3/10	0937	X	X			X			X					2		
	54-DD-SB04-00			S	3/10	1009	X	X			X			X					2		
	54-DD-SB04-01			S	3/10	1013	X	X			X			X					2		
	43-OA-SB03-00			S	3/10	1123		X						X					1		
	43-OA-SB03-01			S	3/10	1129		X		TET 3-10	X			X					1		
	43-OA-SB01-00			S	3/10	1154		X						X					1		
	43-OA-SB01-01			S	3/10	1157		X						X					1		

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:
- See last column for sample turn around times
- Airbill # 2124804905

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'd Y or N

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

Relinquished by	Received by	Date	Time
777.	Fed Ex	3/10/95	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 # 303015

WESTON Analytics Use Only

Custody Transfer Record/Lab Work Request

WESTON

Client: Bat Environmental
Est. Final Proj. Sampling Date: 5-1-95
Work Order #:
Project Contact/Phone #: L. Johnson / 412-269-6000
AD Project Manager: Diane Wolfman
QC: Dol STAT

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	BNA	Pest/PCB	Herb	TPH			INORG Metal	CN				# Bottles		Turn Around
	43-OA-SB04-01			S	3/10	1522		X						X					1		Routine
	43-DA1-SB01-00			S	3/10	1613		X						X					1		Routine
	43-DA1-SB01-01			S	3/10	1615		X						X					1		Routine
	43-DA1-SB02-00			S	3/10	1625		X						X					1		Routine
	43-DA1-SB02-01			S	3/10	1635		X						X					1		Routine
	43-DA1-SB03-00			S	3/10	1646	X	X	X					X					2		Routine
	43-DA1-SB03-01 ①			S	3/10	1652	X	X	X					X					2		Routine
	54-SB08-00			S	3/11	0813	X	X			X								3		Routine
	54-SB08-01			S	3/11	0817	X	X			X								3		Routine
	54-SB08-04			S	3/11	0844	X	X			X								3		Routine

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 # 2124804835

DATE/REVISIONS:
① 1. 43-DA1-SB03-01 (sample designation)
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	3/11	1300

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

Custody Transfer Record/Lab Work Request

WESTON

Client: Bowe Environmental
Est. Final Proj. Sampling Date: 5-12-95
Work Order #:
Project Contact/Phone #: L. Johnson 412-269-6000
AD Project Manager: Denise Woltman
QC: Dol 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	TPH			INORG Metal	CN				# Bottles	Turn Around
	54-SB09-00			S	3/11	0938	X	X			X								3	Routine
	54-SB09-03			S	3/11	0955	X	X			X								3	Routine
	54-SIER-02			W	3/11	1236	X	X	X					X					5	*Hold
	303-TB-14*			W	3/11	1240	X												2	Routine

WESTON Analytics Use Only

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:
- See last column for sample turn around times
- Airbill # 2124804835
* 303-TB-14 = Weston Prepared Trip Blank

DATE/REVISIONS:
1.
2.
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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	3/11/95	1300

Relinquished by	Received by	Date	Time

___ L372 ___ L373 ___ L375 ___ L377 ___ L378 Ref# ___ Cooler# 1

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

381-596a

COC# 3030166

WESTON Analytics Use Only

Custody Transfer Record/Lab Work Request

WESTON

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 Wittman
QC: DoI: 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	TPH	PCB	INORG Metal	CN	# Bottles	Turn Around
	54-SB04-00			S	1121 ↔ 3/11		X	X			X				3	Routine
	54-SB04-04			S	3/11	1145	X	X			X				3	
	54-SB03-01			S	3/11	1213	X	X			X	X	X		3	
	54-SB03-04			S	3/11	1240	X	X			X	X	X		3	
	54-SB02-01			S	3/11	1308	X	X			X				3	
	54-SB02-04			S	3/11	1329	X	X			X				3	
	54-SB01-00			S	3/11	1502	X	X			X				3	
	54-SB01-04			S	3/11	1525	X	X			X				3	
	54-SB05-01			S	3/11	1553	X	X			X	X	X		3	
	54-SB05-01D			S	3/11	1553	X	X			X	X	X		3	↓

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:
- See last column for sample turn around times
- Airbill # 2124804846

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.	FedEx	3/13/95	1530

Relinquished by	Received by	Date	Time

___ L372 ___ L373 ___ L375 ___ L377 ___ L378 Ref# ___ Cooler# 1

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

381-596a

COC# 303016

WESTON Analytics Use Only

Custody Transfer Record/Lab Work Request

WESTON

Client: Baker Environmental
Est. Final Proj. Sampling Date: 5-1-95
Work Order #:
Project Contact/Phone #: SLB Johnson/412-269-6000
AD Project Manager:
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	Time Collected	ORGANIC VOA	BNA	Pest/PCB	Herb	TPH	PCB		INORG Metal	CN	Grain Size	Atterburg Limits		# Bottles	Turn Around
					1995		WESTON Analytics Use Only													
	54-SB05-04			S	3/11	1616	X	X			X	X		X					3	Routine
	54-SB07-00	X	X	S	3/12	0748	X	X			X							TPT 3-12	6	
	54-SB07-05			S	3/12	0815	X	X			X								3	
	54-SB06-00			S	3/12	0847	X	X			X								3	
	54-SB06-02			S	3/12	0912	X	X			X								3	
	54-SB06-05			S	3/12	0927	X	X			X								3	
	43-GW01DW			S	3/12	1005										X	X			
	86-GW17IW-01			S	3/12	1657	X	X	X					X					2	
	86-GW17IW-01D			S	3/12	1657	X	X	X					X					2	
	86-GW17IW-02			S	3/12	1703	X	X	X					X					2	

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:
- See last column for sample turn around times
- Air bill # 2124804846

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	3/13/95	1530

Relinquished by	Received by	Date	Time

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

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

381-596a

COC#-303016

WESTON Analytics Use Only

Custody Transfer Record/Lab Work Request

WESTON MANAGERS DESIGNERS CONSULTANTS

Client: BAKER ENVIRONMENTAL INC.
Est. Final Proj. Sampling Date: 5-1-95
Work Order #:
Project Contact/Phone #: L. JOHNSON / 412-269-6000
AD Project Manager: DENISE WOLTMAN
QC: DOL 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	Metal	CN						# 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	# BOTTLES	TURN AROUND
	54-TW01-01			W	3/12	1350	X						3	7 DAY
	54-TW03-01			W	3/12	1645	X						3	7 DAY
	54-TW02-01			W	3/12	1750	X						3	7 DAY
	303-TB-15			W	3/13	1200	X						2	ROUTINE

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:
- SEE LAST COLUMN FOR TURN-AROUND TIMES.
- Airbill # 2124804846
* 303-TB-15 = 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.	Fed Ex	3/13/95	1530

Relinquished by	Received by	Date	Time

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

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

381-596a

WESTON Analytics Use Only

Custody Transfer Record/Lab Work Request

COC# ~~303018~~ 303017 TFT 3-13-95

WESTON

Page 1 of 1

Client: BAYER ENVIRONMENTAL INC
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							INORG								
		VOA	BNA	Pest/PCB	Herb	PCB		TDS/TSS	Metal	CN	Dissolved Metals			# 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													
	54-TW01-01			W	3/12 1995	1350		X			X		X	X				3 4 mat	ROUTINE
	54-TW03-01			W	3/12	~~1955~~ 1945		X			X		X	X				3 4 pest	↓
	54-TW02-01			W	3/12	1750		X			X		X	X		X		4 5 MSK	↓

WESTON Analytics Use Only

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:
- SEE LAST COLUMN FOR TURNAROUND TIMES
- AIRBILL # 2124804846

DATE/REVISIONS:
7.7. 1. Sample time for 54-TW03-01 = 1645
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	3/13/95	1530

Relinquished by	Received by	Date	Time

Ref# ___ Cooler# 2

381-596a

RFW 21-[illegible]01/A-7/91 ___ L372 ___ L373 ___ L375 ___ L377 ___ L378

COC# 303018

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 / 412-269-6000
AD Project Manager: Denise Wattman
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	Pest	PCB		INORG Metal	CN	Grain Size	Atterburg 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-SJER-03			W	3/13	1320	X	X				X		X					6		
	54-GWER-01			W	3/13	1330	X	X				X		X				X	7		

WESTON Analytics Use Only

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

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

Relinquished by	Received by	Date	Time
7.7.7.	Fed Ex	3/13/95	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 # 303020

WESTON

WES Analytics Use Only

Custody Transfer Record/Lab Work Request

Client: Sanofi
Est. Final Proj. Sampling Date: 3-15-95
Work Order #:
Project Contact/Phone #: 917-2695-2649
AD Project Manager: Denise Wothmann
QC: Dol: 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	Metal	CN

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						WESTON Analytics Use Only
	303-FB-02			W	3/15	1145	X												2		Routine
	303-TB-18			W	3/15	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

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

Relinquished by	Received by	Date	Time
[illegible]	FedEx	3/15/95	1330

Relinquished by	Received by	Date	Time

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

COC # 303038

WESTON Analytics Use Only

Custody Transfer Record/Lab Work Request

WESTON

Page 1 of 2

Client: Baker Environmental
Est. Final Proj. Sampling Date: 5-1-95
Work Order #:
Project Contact/Phone #: L. Johnson 1-412-269-6000
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 →

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	TSS TDS	Dissolved Metals		# Bottles		Turn Around
		303-TB-27			W	3/27	1300	X												2		Routine
		36-GW11-01			W	3/27	1330	X	X	X					X		X			8		*
		36-GW02-01			W	3/27	1610	X												3		Routine
		36-GW02-01D			W	3/27	1610	X												3		Routine
		36-GW08-01			W	3/27	1630	X												3		Routine
		36-GW01-01			W	3/28	0840	X												3		7-day
		54-GW05-01			W	3/28	0840	X												3		7-day
		54-GW04-01	X	X	W	3/28	1050	X										TFT	6	~~3~~		Routine
		54-GW04-01D			W	3/28	1050	X												3		Routine
		54-GW07-01			W	3/28	1055	X												3		7-day

WESTON Analytics Use Only

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 # 2124805082
303-TB-27 = Weston Prepared Trip Blank
* = VOA 7-day Turn, All else Routine Turn

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	3/28/95	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 # 303038

WESTON Analytics Use Only

Custody Transfer Record/Lab Work Request

WESTON

Client: Baker Environmental
Est. Final Proj. Sampling Date: 5/1/95
Work Order #:
Project Contact/Phone #:
AD Project Manager:
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	PCB			Metal	CN			# 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	VOA	BNA	Pest/PCB	Herb	PCB			Metal	CN				# Bottles	Turn Around
					1995															
	54-GWER-02			W	3/28	0915	X	X			X			X					5	Routine

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:
-See last column for sample turn around
- Airbill # 2124805082

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	3/28/95	1530

Relinquished by	Received by	Date	Time

___ L372 ___ L373 ___ L375 ___ L377 ___ L378 Ref# ___ Cooler# 1

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

381-596a

COC# 303040

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 / 412-269-6000
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 →

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	TSS TDS	Dissolved Metals		# Bottles		Turn Around
	36-GW01-01			W	3/28	0840		X	X					X		X			5		Routine
	36-GW01D-01 ← ①			W	3/28	0840											X		1		Routine
	54-GW05-01			W	3/28	0840		X	X	PCB only				X		X			5		Routine
	54-GW07-01			W	3/28	1055		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 times
- Airbill # 2124805082

DATE/REVISIONS:
7.7.7. 1. Sample reads 36-GW01D-01
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	3/28/95	1530

Relinquished by	Received by	Date	Time

___ L372 ___ L373 ___ L375 ___ L377 ___ L378 Ref# ___ Cooler# 3

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

381-596a

COC# 303041

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/412-269-6000
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							INORG					
VOA	BNA	Pest/PCB	Herb	PCB			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													
	54-GW04-01	X	X	W	3/28	1050		X			X			X		X		9	Routine
	54-GW04-01D			W	3/28	1050		X			X			X		X		5	Routine

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:
- See last column for sample turn around times
- Airbill # 2124805082

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.	FedEx	3/28/95	1530

Relinquished by	Received by	Date	Time

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

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

381-596a

COC # 303042

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 →

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected 1995	Time Collected	ORGANIC VOA	BNA	Pest/PCB	Herb	PCB			INORG Metal	CN	TSS TDS	Dissolved Metals		# Bottles	Turn Around
	54-GW06-01			W	3/28	1245	X	X			X			X		X			8	*
	54-GW06D-01			W	3/28	1245											X		1	Routine
	54-GW03-01			W	3/28	1415	X	X			X			X		X			8	Routine
	54-GW01-01			W	3/28	1450	X	X	X					X		X			8	*
	54-GW02-01			W	3/28	1655	X	X			X			X		X			8	Routine
	303-TB-28			W	3/29	0740	X												2	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 #
* = VOA gets 7-day Turn, all else Routine
303-TB-28 = 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
77.7.	FedEx	3/29/95	1200

Relinquished by	Received by	Date	Time

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

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

381-596a

COC # 303054

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/412-269-6000
AD Project Manager: Denise Woltman
QC: Dol: 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	Pest	TPH		INORG Metal	CN	TSS TDS			# Bottles		Turn Around
	44-GW02-01			W	4/10	1410		X			X			X		X			5		Routine
	54-DD-SB05-00			S	4/11	0840	X	X				X							3		Routine
	54-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
	44-GW03-01			W	4/10	1645	X												3		Routine
	54-TW06-01			W	4/11	0815	X	X											5		*
	54-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

WESTON Analytics Use Only

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 # 2124805185
* = VOA 7-day Turn, SVOA Routine Turn
303-TB-35 = 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
7.7.7.	FedEx	4/11/95	1530

Relinquished by	Received by	Date	Time

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

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

381-596a

COC # 303055

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 /412-268-6000
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							INORG					
VOA	BNA	Pest/PCB	Herb	Pest			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	Time Collected	VOA	BNA	Pest/PCB	Herb	Pest			Metal	CN	TSS TDS			# Bottles	Turn Around
					1995		①													
	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

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

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

Relinquished by	Received by	Date	Time
7.7.7.	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# 2

381-596a

COC # 303056

WESTON Analytics Use Only

Custody Transfer Record/Lab Work Request

WESTON

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				INORG						
VOA	BNA	Pest/PCB	Herb	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	Time Collected	VOA	BNA	Pest/PCB	Herb	Metal	CN	TSS TDS			# Bottles	Turn Around
	303-TB-36			W	4/11	1300	X									2	Routine
	54-TW07-01			W	4/11	1325	X	X								5	*
	54-TW04-01			W	4/11	1545	X	X								5	*
	86-GW20TW-01			W	4/11	1845	X	X			X		X				

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 #
*=VOA gets 7-day Turn, all other fractions get routine turn
303-TB-36 = 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	4/12/95	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# 303057

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 / 412-269-6000
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							INORG										
		VOA	BNA	Pest/PCB	Herb	PCB			Metal	CN	TSS TDS					# Bottles	Turn Around		
WESTON Analytics Use Only																			

MATRIX CODES:	Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected 1995	Time Collected														
S - Soil		303-TB-37			W	4/17	1300	X										2	Routine
SE - Sediment		54-GW10-01			W	4/17	1545	X	X			X		X		X		7	*
SO - Solid		54-GWER-03			W	4/17	1700	X	X			X		X				5	Routine
SL - Sludge		54-GW09-01			W	4/18	0825	X										3	7-day
W - Water		54-GW09-01D			W	4/18	0825	X										3	7-day
O - Oil		54-GW08-01			W	4/18	1130	X										3	7-day
A - Air		303-TB-03			W	4/18	1400		X									1	Routine
DS - Drum Solids																			
DL - Drum Liquids																			
L - EP/TCLP Leachate																			
WI - Wipe																			
X - Other																			
F - Fish																			

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

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

Special Instructions:
- See last column for sample turn around
- Airbill #
303-TB-37 = Weston Prepared Trip Blank
* = VOAs get 7-day Turn around, all else routine

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	4/18/95	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# 303058

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 / 412-269-6000
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 →

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	SNA	Pest/PCB	Herb	PCB			INORG Metal	CN	TSS TDS			# Bottles	Turn Around
	54-GW09-01			W	4/18	0825		X			X			X		X			4	Routine
	54-GW09-01D			W	4/18	0825		X			X			X		X			4	Routine
	54-GW08-01			W	4/18	1130		X			X			X		X			4	Routine

WESTON Analytics Use Only

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:
- see last column for sample turn around
- Airbill # 2124805196

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.	FedEx	4/18/95	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 # 303064

WESTON Analytics Use Only

Custody Transfer Record/Lab Work Request

WESTON

Page 1 of 1

Client: Baker Environmental
Est. Final Proj. Sampling Date: 5-15-95
Work Order #:
Project Contact/Phone #: L. Johnson / 412-2696000
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 →

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	Full TCLP	RCRA				
	303-TB-43			W	5/2	1600	X												2		Routine
	86-WA-SB02-00			S	5/2	1630	X	X											2		7-day
	86-WA-SB02-03			S	5/2	1707	X	X											2		7-day
	86-CP-SB02-00			S	5/2	1738	X	X											2		7-day
	86-CP-SB02-02			S	5/2	1808	X	X											2		7-day
	86-CP-SB01-00			S	5/2	1845	X	X											2		7-day
	86-CP-SB01-02			S	5/2	1900	X	X											2		7-day
	54-TNK			W	5/3	1325	X	X	X					X		Ø	X		10		7-day

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
- Air bill #
303-TB-43 = Weston Trip Blank
RCRA = Reactive CN, Reactive Sulfide & Flashpoint

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.	FedEx	5/3/95	1530

Relinquished by	Received by	Date	Time

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

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

381-596a

APPENDIX E
FIELD WELL DEVELOPMENT RECORDS

FIELD WELL DEVELOPMENT RECORD

Baker

Baker Environmental, Inc

PROJECT: SITE 54

CTO NO.: 303 WELL NO.: 54-GW01

DATE: 3-8-95

GEOLOGIST/ENGINEER: MDSMITH

TIME START 1551 (3/8) 0744 (3/9)

TIME FINISH 1640 (3/8) 0958 (3/9)

INITIAL WATER LEVEL (FT) 8.75'

TOTAL WELL DEPTH (TD) 16.96'

WELL DIAMETER (INCHES) 2"

CALCULATED WELL VOLUME 1.34 GAL

BOREHOLE DIAMETER (INCHES) UNKNOWN

BOREHOLE VOLUME -

AMOUNT OF WATER ADDED DURING DRILLING -

DEVELOPMENT METHOD PUMPING

PUMP TYPE CENTRIFUGAL

TOTAL TIME (A) 1 hr 0 min TOTAL PUMPING TIME

AVERAGE FLOW (GPM)(B) .76 GPM

TOTAL ESTIMATED WITHDRAWAL AxB = 45.5 GAL MEASURED

NU/OVA READING Background

DEVELOPMENT DATA

TIME	CUMULATIVE VOLUME (gallons)	pH	TEMP (°C)	SPEC. COND. (µmhos/cm)	TEMP (°C)	COLOR AND TURBIDITY
3/8/95 1551	-	-	-	-	-	VERY TURBID
1555	5	-	-	-	-	VERY TURBID
1558	7	-	-	-	-	VERY TURBID
1614	11	-	-	-	-	VERY TURBID
1621	22	-	-	-	-	VERY TURBID
3/9/95 0744	22	-	-	-	-	VERY TURBID
0758	26 1/2	-	-	-	-	VERY TURBID
0930	-	6.16	11.2	290	14	VERY TURBID
0937	30	6.17	12.2	280	14	VERY TURBID
0945	34	6.15	11.3	225	15	VERY TURBID
0951	41	6.15	12.6	235	15	VERY TURBID
0958	45.5	6.31	10.9	215	15	TURBID

OBSERVATIONS/NOTES

3/8/95
The system was stopped 1558 - 1610 to clean sand from the check value. At 1821 the well was dry. It was allowed to recharge and surging started at 1630 and was continued until 1640 when an intense storm begins.
3/9/95
The system was stopped between 0821 and 0930 to clean check value and allow recharge

FIELD WELL DEVELOPMENT RECORD

Baker

Baker Environmental, Inc

PROJECT: SITE 54

CTO NO.: 303 WELL NO.: 54-GW02

DATE: 3-7-95

GEOLOGIST/ENGINEER: MD SMITH

TIME START	1657
TIME FINISH	1749
INITIAL WATER LEVEL (FT)	11.25'
TOTAL WELL DEPTH (TD)	27.55'
WELL DIAMETER (INCHES)	2"
CALCULATED WELL VOLUME	2.66 GAL
BOREHOLE DIAMETER (INCHES)	UNKNOWN
BOREHOLE VOLUME	–
AMOUNT OF WATER ADDED DURING DRILLING	–
DEVELOPMENT METHOD	PUMPING
PUMP TYPE	CENTRIFUGAL
TOTAL TIME (A)	0 hrs 33 min TOTAL PUMPING TIME
AVERAGE FLOW (GPM)(B)	4 GPM
TOTAL ESTIMATED WITHDRAWAL AxB=	132 GAL MEASURED
HNU/OVA READING	Background

DEVELOPMENT DATA

TIME	CUMULATIVE VOLUME (gallons)	pH	TEMP (°C)	SPEC. COND. (µmhos/cm)	TEMP (°C)	COLOR AND TURBIDITY
1657	0					CLEAR
1730	42					CLEAR
1736	66	6.24	15.5	240	19	SLIGHTLY TURBID
1742	102	6.16	15.4	230	18	CLEAR
1744	114	6.14	16.3	220	18	CLEAR
1747	132	6.04	14.4	215	18	CLEAR

OBSERVATIONS/NOTES

This well was surged between 1704-1730.

FIELD WELL DEVELOPMENT RECORD

Baker

Baker Environmental, Inc

PROJECT: SITE 54

CTO NO.: 303 WELL NO.: 54-GW03

DATE: 3-8-95

GEOLOGIST/ENGINEER: MD SMITH

TIME START	1331
TIME FINISH	1436
INITIAL WATER LEVEL (FT)	2.38'
TOTAL WELL DEPTH (TD)	27.50'
WELL DIAMETER (INCHES)	2"
CALCULATED WELL VOLUME	4.1 GAL
BOREHOLE DIAMETER (INCHES)	UNKNOWN
BOREHOLE VOLUME	–
AMOUNT OF WATER ADDED DURING DRILLING	–
DEVELOPMENT METHOD	PUMPING
PUMP TYPE	CENTRIFUGAL
TOTAL TIME (A)	0hrs 46min TOTAL PUMPING TIME
AVERAGE FLOW (GPM)(B)	1.6 GPM
TOTAL ESTIMATED WITHDRAWAL AxB =	74 GAL MEASURED
U/OVA READING	Background

DEVELOPMENT DATA

TIME	CUMULATIVE VOLUME (gallons)	pH	TEMP (°C)	SPEC. COND. (µmhos/cm)	TEMP (°C)	COLOR AND TURBIDITY
1331	2					TURBID
1335	8					CLEAR
1339	16					CLEAR
1412	26					VERY TURBID
1423	48	6.57	18.3	395	20	SLIGHTLY TURBID
1427	56	6.50	17.2	395	20	CLEAR
1432	66	6.49	16.2	395	20	CLEAR
1436	74	6.50	16.2	395	20	CLEAR

OBSERVATIONS/NOTES

Well was surged from 1339 to 1407.

Baker

Baker Environmental, Inc

FIELD WELL DEVELOPMENT RECORD

PROJECT: RI/FS at OU No. 6 - Site 54 - MCAS, New River

CTO NO.: 62470-303 WELL NO.: 54-GW04

DATE: 3-9-95

GEOLOGIST/ENGINEER: M. S. HERBST + M. D. SMITH

TIME START	1110
TIME FINISH	1241
INITIAL WATER LEVEL (FT)	3.50'
TOTAL WELL DEPTH (TD)	19.96'
WELL DIAMETER (INCHES)	2.0"
CALCULATED WELL VOLUME	2.68 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. 31 min.
AVERAGE FLOW (GPM)(B)	4 gpm
TOTAL ESTIMATED WITHDRAWAL AxB=	220 gallons
HNU/OVA READING	-N/A-

DEVELOPMENT DATA

TIME	CUMULATIVE VOLUME (gallons)	pH	TEMP (°C)	SPEC. COND. (µmhos/cm)	TEMP (°C)	COLOR AND TURBIDITY
1116	15.0	—	—	—	—	DARK BROWN OPAQUE. LOTS OF SILT SETTLING OUT.
1215	128.0	5.04	19.0	70	19.0	DARK BROWN OPAQUE (POST-SURGING)
1227	176.0	—	17.5	70	17.5	TRANSPARENT
1234	204.0	4.91	16.5	65	16.5	VERY CLEAR
1237	220.0	4.87	17.0	65	17.0	CRYSTAL CLEAR.

- WELL PRODUCED NICELY.
- PUMP SHUT DOWN FROM 1182 TO 1208 FOR SURGING.
- SEE PP. 80 - 85, CTO 808 VOL. I.
- PROBLEMS WERE ENCOUNTERED WITH THE pH METER, ∴ NO READING @ 1227.

FIELD WELL DEVELOPMENT RECORD

Baker

Baker Environmental, Inc.

PROJECT: RI/FS at OU No. 6 - Site 54 - MCAS, New River

CTO NO.: 62470-303 WELL NO.: 54-GW05

DATE: 3-27-95

GEOLOGIST/ENGINEER: J. E. Zimmerman

TIME START: 1105

TIME FINISH: 1250

INITIAL WATER LEVEL (FT): 7.70 (TOC)

TOTAL WELL DEPTH (TD): 19.5

WELL DIAMETER (INCHES): 2.0

CALCULATED WELL VOLUME: —

BOREHOLE DIAMETER (INCHES): 6.0

BOREHOLE VOLUME: 17.28 gallons (1)

AMOUNT OF WATER ADDED DURING DRILLING: None

DEVELOPMENT METHOD: Air Lift

PUMP TYPE: Air Compressor

TOTAL TIME (A): 1 hr 45 min

AVERAGE FLOW (GPM)(B): .8 gallon/min

TOTAL ESTIMATED WITHDRAWAL AxB=: 85 gallons

HNU/OVA READING: HNU (BG) = .2 ppm

DEVELOPMENT DATA

TIME	CUMULATIVE VOLUME (gallons)	pH	TEMP (°C)	SPEC. COND. (µmhos/cm)	TEMP (°C)	COLOR AND TURBIDITY
1110	5.0 gal	-	-	230	22	100
1115	10.0 gal	-	-	140	23	>100
1120	15.0 gal	-	-	140	24	>100
1130	30.0 gal	-	-	120	24	>100
1145	40.0 gal	-	-	120	23	>100
1200	50.0 gal	-	-	120	22	>100
1215	60.0 gal	-	-	120	22	>100
1230	70.0 gal	-	-	120	23	>100
1245	80.0 gal	-	-	120	23	>100
1250	85.0 gal	-	-	120	23	>100

OBSERVATIONS/NOTES Satisfied criteria for specific conductivity, temperature and turbidity only. No pH meter reading. HNU (PS) was drummed water No elevated HNU readings occured.

FIELD WELL DEVELOPMENT RECORD

Baker

Baker Environmental, Inc.

PROJECT: RI/FS at OU NO. 6 - Site 54 - MCAS, New River

CTO NO.: 62470-303 WELL NO.: 54-GW06

DATE: 3-27-95

GEOLOGIST/ENGINEER: J.E. Zimmerman

TIME START: 0852

TIME FINISH: 1050

INITIAL WATER LEVEL (FT): 9.15 (TOC)

TOTAL WELL DEPTH (TD): 16.5

WELL DIAMETER (INCHES): 2.0

CALCULATED WELL VOLUME: —

BOREHOLE DIAMETER (INCHES): 6.0

BOREHOLE VOLUME: 10.7 gallons (1)

AMOUNT OF WATER ADDED DURING DRILLING: None

DEVELOPMENT METHOD: Air lift

PUMP TYPE: Air Compressor

TOTAL TIME (A): 1 hr. 58 min

AVERAGE FLOW (GPM)(B): .46 gallon/min

TOTAL ESTIMATED WITHDRAWAL AxB=: 55 gallons

HNU/OVA READING: HNU (BG) = .4 ppm

DEVELOPMENT DATA

TIME	CUMULATIVE VOLUME (gallons)	pH	TEMP (°C)	SPEC. COND. (µmhos/cm)	TEMP (°C)	COLOR AND TURBIDITY
0905	5.0 gal	-	-	150	20	41.0
0915	10.0 gal	-	-	130	21	32.0
0930	15.0 gal	-	-	110	20	36.0
0942	30.0 gal	-	-	110	20	55.0
0955	35.0 gal	-	-	110	21	57.0
1010	40.0 gal	-	-	110	21	59.0
1020	45.0 gal	-	-	110	22	59.0
1035	50.0 gal	-	-	110	21	57.0
1050	55.0 gal	-	-	110	21	57.0

OBSERVATIONS/NOTES Satisfied criteria for specific conductivity, temperature and turbidity only. No pH meter reading. HNU (PS) was drummed water. No elevated HNU readings occured.

FIELD WELL DEVELOPMENT RECORD

Baker
Baker Environmental, Inc.

PROJECT: RI/FS at OU No. 6 - Site 54 - MCAS, New River

CTO NO.: 62470-303 WELL NO.: 54-GW07

DATE: 3-27-95

GEOLOGIST/ENGINEER: J. E. Zimmerman

TIME START	1310
TIME FINISH	1535
INITIAL WATER LEVEL (FT)	9.30 (TOC)
TOTAL WELL DEPTH (TD)	35.5
WELL DIAMETER (INCHES)	2.0
CALCULATED WELL VOLUME	—
BOREHOLE DIAMETER (INCHES)	6.0
BOREHOLE VOLUME	38.3 gallons (1)
AMOUNT OF WATER ADDED DURING DRILLING	None
DEVELOPMENT METHOD	Air Lift
PUMP TYPE	Air Compressor
TOTAL TIME (A)	2 hrs 25 min
AVERAGE FLOW (GPM)(B)	.75 gallon/min
TOTAL ESTIMATED VITHDRAWAL AxB =	110 gallons
HNU/OVA READING	HNu (BG) = .2 ppm

DEVELOPMENT DATA

TIME	CUMULATIVE VOLUME (gallons)	pH	TEMP (°C)	SPEC. COND. (µmhos/cm)	TEMP (°C)	COLOR AND TURBIDITY
1315	5.0 gal	-	-	480	21	>100
1320	10.0 gal	-	-	450	22	>100
1325	15.0 gal	-	-	420	22	>100
1335	30.0 gal	-	-	420	23	>100
1350	40.0 gal	-	-	410	23	>100
1405	50.0 gal	-	-	410	23	>100
1420	60.0 gal	-	-	400	23	>100
1435	70.0 gal	-	-	400	23	>100
1450	80.0 gal	-	-	400	23	>100
1505	90.0 gal	-	-	400	23	>100
1520	100.0 gal	-	-	400	23	>100
1535	110.0 gal	-	-	400	23	>100

OBSERVATIONS/NOTES satisfied criteria for specific conductivity, temperature and turbidity only. No pH meter reading. HNu (PS) was drummed water. No elevated HNu readings occured.

FIELD WELL DEVELOPMENT RECORD

Baker

Baker Environmental, Inc.

PROJECT: RI/FS at OU No. 6 - Site 54 - MCAS, New River

CTO NO.: 62470-303 WELL NO.: 54-GW08

DATE: 4-9-95

GEOLOGIST/ENGINEER: J. E. Zimmerman

TIME START: 0840

TIME FINISH: 1005

INITIAL WATER LEVEL (FT): 12.3 (TOC)

TOTAL WELL DEPTH (TD): 29.0

WELL DIAMETER (INCHES): 2.0

CALCULATED WELL VOLUME: —

BOREHOLE DIAMETER (INCHES): 6.0

BOREHOLE VOLUME: 24.53 gallons (1)

AMOUNT OF WATER ADDED DURING DRILLING: None

DEVELOPMENT METHOD: Air Lift

PUMP TYPE: Air Compressor

TOTAL TIME (A): 1 hr 25 min

AVERAGE FLOW (GPM)(B): 1.35 gallons/min

TOTAL ESTIMATED WITHDRAWAL AxB = : 115 gallons

HNU/OVA READING: HNU (BG) = .4ppm

DEVELOPMENT DATA

TIME	CUMULATIVE VOLUME (gallons)	pH	TEMP (°C)	SPEC. COND. (µmhos/cm)	TEMP (°C)	COLOR AND TURBIDITY
0855	20.0 gal	10.2	18.9	300	19	Gray/v. turbid
0910	40.0 gal	9.3	19.3	400	19	Gray/v. turbid
0925	60.0 gal	8.97	19.4	420	19	Gray/v. turbid
0940	80.0 gal	8.66	19.4	420	19	Light Gray/turbid
0955	100.0 gal	8.59	19.5	420	19	Light Gray/turbid
1005	115.0 gal	8.56	20	420	20	Clearing/little turbid

OBSERVATIONS/NOTES satisfied criteria for specific conductivity, temperature and pH. HNU (PS) was drummed water. No elevated HNU readings occured.

FIELD WELL DEVELOPMENT RECORD

Baker

Baker Environmental, Inc.

PROJECT: RI/FS at OU No. 6 - Site 54 - MCAS, New River

CTO NO.: 62470 - 303 WELL NO.: 54-GW09

DATE: 4-9-95

GEOLOGIST/ENGINEER: J. E. Zimmerman

TIME START: 1055

TIME FINISH: 1225

INITIAL WATER LEVEL (FT): 8.35 (TOC)

TOTAL WELL DEPTH (TD): 12.0

WELL DIAMETER (INCHES): 2.0

CALCULATED WELL VOLUME: –

BOREHOLE DIAMETER (INCHES): 6.0

BOREHOLE VOLUME: 5.36 gallons (1)

AMOUNT OF WATER ADDED DURING DRILLING: None

DEVELOPMENT METHOD: Air Lift

PUMP TYPE: Air Compressor

TOTAL TIME (A): 1 hr 30 min

AVERAGE FLOW (GPM)(B): .13 gallon/min

TOTAL ESTIMATED WITHDRAWAL AxB = 12 gallons

HNU/OVA READING: HNU (BG) = .4 ppm

DEVELOPMENT DATA

TIME	CUMULATIVE VOLUME (gallons)	pH	TEMP (°C)	SPEC. COND. (µmhos/cm)	TEMP (°C)	COLOR AND TURBIDITY
1125	5.0 gal	6.02	17	110	17	Brown/v. turbid
1140	7.0 gal	5.90	20	110	20	Brown/v. turbid
1155	9.0 gal	5.87	20	110	20	Brown/v. turbid
1205	10.0 gal	5.72	20	110	20	Brown/v. turbid
1225	12.0 gal	5.69	20	110	20	Brown/v. turbid

OBSERVATIONS/NOTES satisfied criteria for specific conductivity, temperature and pH. HNU (PS) was drummed water. No elevated HNU readings occured. Repeated surging occured during development

FIELD WELL DEVELOPMENT RECORD

Baker

Baker Environmental, Inc.

PROJECT: RI/FS at OU No. 6 - Site 54 - MCAS, New River

CTO NO.: 62470-303 WELL NO.: 54-GW10

DATE: 4-9-95

GEOLOGIST/ENGINEER: J. E. Zimmerman

TIME START: 1500

TIME FINISH: 1658

INITIAL WATER LEVEL (FT): 8.91 (TOC)

TOTAL WELL DEPTH (TD): 13.0

WELL DIAMETER (INCHES): 2.0

CALCULATED WELL VOLUME: —

BOREHOLE DIAMETER (INCHES): 6.0

BOREHOLE VOLUME: 6 gallons (1)

AMOUNT OF WATER ADDED DURING DRILLING: None

DEVELOPMENT METHOD: Air Lift

PUMP TYPE: Air compressor

TOTAL TIME (A): 1 hr 58 min

AVERAGE FLOW (GPM)(B): .06 gallon/min

TOTAL ESTIMATED WITHDRAWAL AxB = : 8 gallons

HNU/OVA READING: HNu (BG): .2ppm

DEVELOPMENT DATA

TIME	CUMULATIVE VOLUME (gallons)	pH	TEMP (°C)	SPEC. COND. (µmhos/cm)	TEMP (°C)	COLOR AND TURBIDITY
1525	2.0 gal	6.26	23	100	22	Gray/V. Silty
1550	4.0 gal	5.90	23	100	23	Gray/V. Silty
1615	6.0 gal	5.83	23	100	23	Gray/V. Silty
1640	7.0 gal	5.61	23	100	23	Brown/V. Silty
1658	8.0 gal	5.70	23	100	23	Brown/V. Silty

OBSERVATIONS/NOTES Satisfied criteria for specific conductivity, temperature and pH. HNu (PS) was drummed water. No elevated HNu readings occured

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

WASTE CHARACTERISTIC SUMMARY

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
WASTE CHARACTERIZATION SUMMARY
REMEDIAL INVESTIGATION, CTO - 303
MCB CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	54-TNK
DATE SAMPLED	05/03/95
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 54, CRASH CREW FIRE TRAINING BURN PIT
WASTE CHARACTERIZATION SUMMARY
REMEDIAL INVESTIGATION, CTO - 303
MCB CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	54-TNK
DATE SAMPLED	05/03/95
UNITS	UG/L
SEMIVOLATILES	
PHENOL	10 U
BIS(2-CHLOROETHYL)ETHER	10 U
2-CHLOROPHENOL	10 U
1,3-DICHLOROBENZENE	10 U
1,4-DICHLOROBENZENE	10 U
1,2-DICHLOROBENZENE	10 U
2-METHYLPHENOL	10 U
2,2'-OXYBIS(1-CHLOROPROPANE)	10 U
4-METHYLPHENOL	10 U
N-NITROSO-DI-N-PROPYLAMINE	10 U
HEXACHLOROETHANE	10 U
NITROBENZENE	10 U
ISOPHORONE	10 U
2-NITROPHENOL	10 U
2,4-DIMETHYLPHENOL	10 U
BIS(2-CHLOROETHOXY)METHANE	10 U
2,4-DICHLOROPHENOL	10 U
1,2,4-TRICHLOROBENZENE	10 U
NAPHTHALENE	10 U
4-CHLOROANILINE	10 U
HEXACHLOROBUTADIENE	10 U
4-CHLORO-3-METHYLPHENOL	10 U
2-METHYLNAPHTHALENE	10 U
HEXACHLOROCYCLOPENTADIENE	10 U
2,4,6-TRICHLOROPHENOL	10 U
2,4,5-TRICHLOROPHENOL	26 U
2-CHLORONAPHTHALENE	10 U
2-NITROANILINE	26 U
DIMETHYLPHTHALATE	10 U
ACENAPHTHYLENE	10 U
2,6-DINITROTOLUENE	10 U
3-NITROANILINE	26 UJ
ACENAPHTHENE	10 U
2,4-DINITROPHENOL	26 UJ
4-NITROPHENOL	26 U

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
WASTE CHARACTERIZATION SUMMARY
REMEDIAL INVESTIGATION, CTO - 303
MCB CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	54-TNK
DATE SAMPLED	05/03/95
UNITS	UG/L
SEMIVOLATILES cont.	
DIBENZOFURAN	10 U
2,4-DINITROTOLUENE	10 U
DIETHYLPHTHALATE	10 U
4-CHLOROPHENYL-PHENYLETHER	10 U
FLUORENE	10 U
4-NITROANILINE	26 U
4,6-DINITRO-2-METHYLPHENOL	26 U
N-NITROSODIPHENYLAMINE (1)	10 U
4-BROMOPHENYL-PHENYLETHER	10 U
HEXACHLOROBENZENE	10 U
PENTACHLOROPHENOL	26 U
PHENANTHRENE	10 U
ANTHRACENE	10 U
CARBAZOLE	10 U
DI-N-BUTYLPHTHALATE	10 U
FLUORANTHENE	10 U
PYRENE	10 U
BUTYLBENZYLPHTHALATE	10 U
3,3'-DICHLOROBENZIDINE	10 U
BENZO(A)ANTHRACENE	10 U
CHRYSENE	10 U
BIS(2-ETHYLHEXYL)PHTHALATE	10 U
DI-N-OCTYL PHTHALATE	10 U
BENZO(B)FLUORANTHENE	10 U
BENZO(K)FLUORANTHENE	10 U
BENZO(A)PYRENE	10 U
INDENO(1,2,3-CD)PYRENE	10 U
DIBENZO(A,H)ANTHRACENE	10 U
BENZO(G,H,I)PERYLENE	10 U

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
WASTE CHARACTERIZATION SUMMARY
REMEDIAL INVESTIGATION, CTO - 303
MCB CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	54-TNK
DATE SAMPLED	05/03/95
UNITS	UG/L
PESTICIDE/PCBS	
ALPHA-BHC	0.048 U
BETA-BHC	0.048 U
DELTA-BHC	0.048 U
GAMMA-BHC (LINDANE)	0.048 U
HEPTACHLOR	0.048 U
ALDRIN	0.048 U
HEPTACHLOR EPOXIDE	0.048 U
ENDOSULFAN I	0.048 U
DIELDRIN	0.097 U
4,4'-DDE	0.097 U
ENDRIN	0.097 U
ENDOSULFAN II	0.097 U
4,4'-DDD	0.097 U
ENDOSULFAN SULFATE	0.097 U
4,4'-DDT	0.097 U
METHOXYCHLOR	0.48 U
ENDRIN KETONE	0.097 U
ENDRIN ALDEHYDE	0.097 U
ALPHA-CHLORDANE	0.048 U
GAMMA-CHLORDANE	0.048 U
TOXAPHENE	4.8 U
AROCLOR-1016	0.97 U
AROCLOR-1221	1.9 U
AROCLOR-1232	0.97 U
AROCLOR-1242	0.97 U
AROCLOR-1248	0.97 U
AROCLOR-1254	0.97 U
AROCLOR-1260	0.97 U

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
RCRA - SUMMARY
REMEDIAL INVESTIGATION, CTO - 303
MCB CAMP LEJEUNE, NORTH CAROLINA

LOCATION	54-TNK
DATE SAMPLED	05/03/95
WET CHEMISTRY	
CYANIDE, REACTIVE (ug/L)	10 U
SULFIDE REACTIVE (mg/L)	1 U

APPENDIX G
SAMPLING SUMMARIES

CTO-0303

		Analysis Requested								Analysis Received												
DATE SHIPPED	SAMPLE ID	TCL VOC	TCL SVOC	TCL PEST/PCB	TAL METALS	DISSOLVED METALS	TPH	GRAIN SIZE	ATTERBERG LIMITS	TCL VOC	TCL SVOC	TCL PEST/PCB	TAL METALS	DISSOLVED METALS	TPH	GRAIN SIZE	ATTERBERG LIMITS	DATE EXPECTED	DATE REC'D	TURNAROUND TIME	SDG NO.	COMMENTS
3/7/95	**COC#303010**																					
3/7/95	54-BB-SB01-00	X	X	X	X					X	X	X	X					4/12/95	4/12/95	35	612	R
3/7/95	54-BB-SB01-04	X	X	X	X					X	X	X	X					4/12/95	4/12/95	35	612	R
3/7/95	54-BB-SB02-00	X	X	X	X					X	X	X	X					4/12/95	4/12/95	35	612	R
3/7/95	54-BB-SB02-04	X	X	X	X					X	X	X	X					4/12/95	4/12/95	35	612	R
3/7/95	54-RIN-01	X	X	X	X					X	X	X	X					4/12/95	4/12/95	35	613	R; RINSATE
3/7/95	303-TB-09	X								X								4/12/95	4/12/95	35	613	R; TRIP BLANK
3/7/95	**COC#303011**																					
3/7/95	303-TB-10	X								X								4/12/95	4/12/95	35	613	R; TRIP BLANK
3/7/95	54-ES10	X	X	X						X	X	X						4/12/95	4/15/95	38	659	R
3/7/95	54-ES12	X	X	X						X	X	X						4/12/95	4/15/95	38	659	R
3/7/95	54-ES15	X	X	X						X	X	X						4/12/95	4/15/95	38	659	R
3/7/95	54-ES18	X	X	X						X	X	X						4/12/95	4/15/95	38	659	R
3/9/95	**COC#303012**																					
3/9/95	54-ES12							X	X							X	X	4/14/95	4/19/95	40	614	R
3/9/95	54-GW04							X	X							X	X	4/14/95	4/19/95	40	614	R
3/10/95	**COC#303013**																					
3/10/95	54-DD-SB01-00	X	X	X	X					X	X	X	X					4/15/95	4/13/95	33	686	R; MS/MSD
3/10/95	54-DD-SB01-00D	X	X	X	X					X	X	X	X					4/15/95	4/13/95	33	686	R
3/10/95	54-DD-SB01-02	X	X	X	X					X	X	X	X					4/15/95	4/13/95	33	686	R
3/10/95	**COC#303014**																					
3/10/95	54-DD-SB02-00	X	X	X	X					X	X	X	X					4/15/95	4/13/95	33	686	R
3/10/95	54-DD-SB02-02	X	X	X	X					X	X	X	X					4/15/95	4/13/95	33	686	R
3/10/95	54-DD-SB03-00	X	X	X	X					X	X	X	X					4/15/95	4/13/95	33	686	R
3/10/95	54-DD-SB03-01	X	X	X	X					X	X	X	X					4/15/95	4/13/95	33	686	R
3/10/95	54-DD-SB04-00	X	X	X	X					X	X	X	X					4/15/95	4/13/95	33	686	R
3/10/95	54-DD-SB04-01	X	X	X	X					X	X	X	X					4/15/95	4/13/95	33	686	R
3/11/95	**COC#303015**																					
3/11/95	54-SB08-00	X	X				X			X	X				X			4/17/95	4/19/95	38	688	R
3/11/95	54-SB08-01	X	X				X			X	X				X			4/17/95	4/19/95	38	688	R
3/11/95	54-SB08-04	X	X				X			X	X				X			4/17/95	4/19/95	38	688	R
3/11/95	54-SB09-00	X	X				X			X	X				X			4/17/95	4/19/95	38	688	R
3/11/95	54-SB09-03	X	X				X			X	X				X			4/17/95	4/19/95	38	688	R
3/11/95	54-RIN-02	X	X	X	X																	HOLD; RINSATE
3/11/95	303-TB-14	X								X								4/17/95	4/12/95	31	613	R; TRIP BLANK
3/13/95	**COC#303016**																					
3/13/95	54-SB04-00	X	X				X			X	X				X			4/18/95	4/19/95	36	688	R
3/13/95	54-SB04-04	X	X				X			X	X				X			4/18/95	4/19/95	36	688	R
3/13/95	54-SB03-01	X	X	X	X		X			X	X	X	X		X			4/18/95	4/19/95	36	688	R
3/13/95	54-SB03-04	X	X	X	X		X			X	X	X	X		X			4/18/95	4/20/95	37	728	R
3/13/95	54-SB02-01	X	X				X			X	X				X			4/18/95	4/20/95	37	728	R

OU No. 6, SITE 54
SOIL
CTO-0303

		Analysis Requested								Analysis Received												
DATE SHIPPED	SAMPLE ID	TCL VOC	TCL SVOC	TCL PEST/PCB	TAL METALS	DISSOLVED METALS	TPH	GRAIN SIZE	ATTERBERG LIMITS	TCL VOC	TCL SVOC	TCL PEST/PCB	TAL METALS	DISSOLVED METALS	TPH	GRAIN SIZE	ATTERBERG LIMITS	DATE EXPECTED	DATE REC'D	TURNAROUND TIME	SDG NO.	COMMENTS
3/13/95	54-SB02-04	X	X				X			X	X				X			4/18/95	4/20/95	37	728	R
3/13/95	54-SB01-00	X	X				X			X	X				X			4/18/95	4/20/95	37	728	R
3/13/95	54-SB01-04	X	X				X			X	X				X			4/18/95	4/20/95	37	728	R
3/13/95	54-SB05-01	X	X	X	X		X			X	X	X	X		X			4/18/95	4/20/95	37	728	R
3/13/95	54-SB05-01D	X	X	X	X		X			X	X	X	X		X			4/18/95	4/20/95	37	728	R
3/13/95	54-SB05-04	X	X	X	X		X			X	X	X	X		X			4/18/95	4/20/95	37	728	R
3/13/95	54-SB07-00	X	X				X			X	X				X			4/18/95	4/20/95	37	728	R; MS/MSD
3/13/95	54-SB07-05	X	X				X			X	X				X			4/18/95	4/20/95	37	728	R
3/13/95	54-SB06-00	X	X				X			X	X				X			4/18/95	4/20/95	37	728	R
3/13/95	54-SB06-02	X	X				X			X	X				X			4/18/95	4/20/95	37	728	R
3/13/95	54-SB06-05	X	X				X			X	X				X			4/18/95	4/20/95	37	728	R
3/13/95	**COC#303018**																					
3/13/95	54-TW02							X	X							X	X	4/18/95	4/19/95	36	729	R
3/13/95	54-HED-03	X	X	X	X					X	X	X	X					4/18/95	4/20/95	37	726	R; RINSATE
3/13/95	54-DWER-01	X	X	X	X													4/18/95	4/20/95	37	726	R; RINSATE
3/13/95	54-DWERD-01					X												4/18/95	4/20/95	37	726	R; RINSATE
3/13/95	303-TB-16	X								X								4/18/95	4/20/95	37	726	R;TRIP BLANK
4/11/95	**COC#303054**																					
4/11/95	54-DD-SB05-00	X	X				X			X	X				X			5/17/95	5/3/95	22	273	R
4/11/95	54-DD-SB05-01	X	X				X			X	X				X			5/17/95	5/3/95	22	273	R
4/11/95	TS3	X	X							X	X							5/17/95	5/3/95	22	273	R
4/11/95	TS2	X	X							X	X							5/17/95	5/3/95	22	273	R
COUNT		46	42	22	18	2	23	3	3	45	40	20	20	0	23	3	3					

C , SITE 54
GROUNDWATER
CTO-0303

		Analysis Requested							Analysis Received											
DATE SHIPPED	SAMPLE ID	TCL VOC	TCL SVOC	TCL PEST/PCB	TAL METALS	DISSOLVED METALS	TSS	TDS	TCL VOC	TCL SVOC	TCL PEST/PCB	TAL METALS	DISSOLVED METALS	TSS	TDS	DATE EXPECTED	DATE REC'D	TURNAROUND TIME	SDG NO.	COMMENTS
3/13/95	**COC#303016**																			
3/13/95	54-TW01-01	X							X							3/21/95	3/21/95	8	727	QT; VOC 3/21
3/13/95	54-TW03-01	X							X							3/21/95	3/21/95	8	727	QT; VOC 3/21
3/13/95	54-TW02-01	X							X							3/21/95	3/21/95	8	727	QT; VOC 3/21
3/13/95	303-TB-13	X							X							4/18/95	4/20/95	37	726	R; TRIP BLANK
3/13/95	**COC#303017**																			
3/13/95	54-TW01-01		X	X	X		X	X		X	X	X		X	X	4/18/95	4/20/95	37	726	R
3/13/95	54-TW03-01		X	X	X		X	X		X	X	X		X	X	4/18/95	4/20/95	37	726	R
3/13/95	54-TW02-01		X	X	X		X	X		X	X	X		X	X	4/18/95	4/20/95	37	726	R
3/13/95	54-TW02D-01					X							X			4/18/95	4/20/95	37	726	R
3/28/95	**COC#303038**																			
3/28/95	54-GW05-01	X							X							4/5/95	4/5/95	7	997	QT
3/28/95	54-GW04-01	X							X							5/3/95	5/1/95	33	998	R; MS/MSD
3/28/95	54-GW04-01D	X							X							5/3/95	5/1/95	33	998	R
3/28/95	54-GW07-01	X							X							4/5/95	4/5/95	7	997	QT
3/28/95	54-GWFB-02	X	X	X	X				X	X	X	X				5/3/95	5/1/95	33	998	R; RINSATE
3/28/95	**COC#303040**																			
3/28/95	54-GW05-01		X	X	X		X	X		X	X	X		X	X	5/3/95	5/1/95	33	998	R; LIMITED VOL
3/28/95	54-GW07-01		X	X	X		X	X		X	X	X		X	X	5/3/95	5/1/95	33	998	R; LIMITED VOL
3/28/95	**COC#303041**																			
3/28/95	54-GW04-01		X	X	X		X	X		X	X	X		X	X	5/3/95	5/1/95	33	998	R; MS/MSD
3/28/95	54-GW04-01D		X	X	X		X	X		X	X	X		X	X	5/3/95	5/1/95	33	998	R
3/28/95	**COC#303042**																			
3/28/95	54-GW06-01	X	X	X	X		X	X	X	X	X	X		X	X	4/5/95	4/5/95	7	22	QT VOC ONLY; LIMITED VOL; REC'D4/5
3/28/95	54-GW06D-01					X							X			5/3/95	5/1/95	33	998	R
3/28/95	54-GW03-01	X	X	X	X		X	X	X	X	X	X		X	X	5/3/95	5/1/95	33	998	R
3/28/95	54-GW01-01	X	X	X	X		X	X	X	X	X	X		X	X	4/5/95	4/5/95	7	22	QT VOC ONLY; LIMITED VOL; REC'D 4/5
3/28/95	54-GW02-01	X	X	X	X		X	X	X	X	X	X		X	X	5/3/95	5/1/95	33	998	R; LIMITED VOL
3/28/95	303-TB-28	X							X							5/3/95	5/1/95	33	998	R; TRIP BLANK
4/11/95	**COC#303054**																			
4/11/95	54-TW06-01	X	X						X	X						4/19/95	4/19/95	8	272	QT VOC ONLY
4/11/95	54-TW05-01	X							X							4/19/95	4/19/95	8	272	QT
4/11/95	303-FB-03	X							X							5/17/95	5/12/95	31	274	R; FIELD BLANK
4/11/95	303-TB-33	X							X							5/17/95	5/12/95	31	225	R; TRIP BLANK
4/11/95	**COC#303055**																			
4/11/95	54-TW05-01		X							X						5/17/95	5/12/95	31	274	R
4/11/95	303-FB-03		X	X	X					X	X	X				5/17/95	5/12/95	31	274	R; FIELD BLANK
4/12/95	**COC#303056**																			
4/12/95	303-TB-36	X							X							5/18/95	5/12/95	30	274	R; TRIP BLANK
4/12/95	54-TW07-01	X	X						X	X						4/20/95	4/19/95	7	287	QT VOC ONLY; REC'D 4/19 SDG 287
4/12/95	54-TW04-01	X	X		X		X	X	X	X		X		X	X	4/20/95	4/19/95	7	287	QT VOC ONLY; REC'D 4/19 SDG 287

OU No. 6, SITE 54
GROUNDWATER
CTO-0303

		Analysis Requested							Analysis Received											
DATE SHIPPED	SAMPLE ID	TCL VOC	TCL SVOC	TCL PEST/PCB	TAL METALS	DISSOLVED METALS	TSS	TDS	TCL VOC	TCL SVOC	TCL PEST/PCB	TAL METALS	DISSOLVED METALS	TSS	TDS	DATE EXPECTED	DATE REC'D	TURNAROUND TIME	SDG NO.	COMMENTS
4/18/95	**COC#303057**																			
4/18/95	[redacted]	X							X							5/24/95	5/19/95	31	368	R; TRIP BLANK
4/18/95	54-GW10-01	X	X	X	X		X	X	X	X	X	X		X	X	5/24/95	5/19/95	31	368	QT VOC ONLY; REC'D 4/25
4/18/95	[redacted]	X	X	X	X		X	X	X					X	X	5/24/95	5/19/95	31	368	R; RINSATE
4/18/95	54-GW09-01	X							X							4/26/95	4/25/95	7	367	QT
4/18/95	54-GW09-01D	X							X							4/26/95	4/25/95	7	367	QT
4/18/95	54-GW08-01	X							X							4/26/95	4/25/95	7	367	QT
4/18/95	[redacted]		X							X						5/24/95	5/19/95	31	368	R; EXTRA VOL FOR SAME SAMPLE 4/11
4/18/95	**COC#303058**																			
4/18/95	54-GW09-01		X	X	X		X	X		X	X	X		X	X	5/24/95	5/19/95	31	368	R
4/18/95	54-GW09-01D		X	X	X		X	X		X	X	X		X	X	5/24/95	5/19/95	31	368	R
4/18/95	54-GW08-01		X	X	X		X	X		X	X	X		X	X	5/24/95	5/19/95	31	368	R
COUNT		27	23	19	19	2	18	17	27	22	17	18	2	17	17					

O[illegible], SITE 54
IDW
CTO-0303

		Analysis Requested						Analysis Received										
DATE SHIPPED	SAMPLE ID	TCL VOA	TCL SVOA	TCL PEST/PCB	TAL METALS	TCLP	RCRA	TCL VOA	TCL SVOA	TCL PEST/PCB	TAL METALS	TCLP	RCRA	DATE EXPECTED	DATE REC'D	TURNAROUND TIME	SDG NO.	
5/3/95	COC#303064																	
5/3/95	54-TNK	X	X	X	X	X	X	X	X	X	X	X	X	5/11/95	5/19/95	16	660	QT
COUNT		1	1	1	1	1	1	1	1	1	1	1	1					

APPENDIX H
DATA AND FREQUENCY SUMMARIES

SOIL

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
SURFACE SOIL - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	54-DD-SB01-00	54-DD-SB02-00	54-DD-SB03-00	54-DD-SB04-00	54-DD-SB05-00	54-SB01-00
DATE SAMPLED	03/10/95	03/10/95	03/10/95	03/10/95	04/11/95	03/11/95
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	120 U	12 U	12 U	60 U	12 U	11 U
BROMOMETHANE	120 U	12 U	12 U	60 U	12 U	11 U
VINYL CHLORIDE	120 U	12 U	12 U	60 U	12 U	11 U
CHLOROETHANE	120 U	12 U	12 U	60 U	12 U	11 U
METHYLENE CHLORIDE	120 U	12 U	12 U	60 U	12 U	11 U
ACETONE	120 U	12 U	12 U	60 U	12 U	11 U
CARBON DISULFIDE	120 U	12 U	12 U	60 U	12 U	11 U
1,1-DICHLOROETHENE	120 U	12 U	12 U	60 U	12 U	11 U
1,1-DICHLOROETHANE	120 U	12 U	12 U	60 U	12 U	11 U
1,2-DICHLOROETHENE (TOTAL)	120 U	12 U	12 U	60 U	12 U	11 U
CHLOROFORM	120 U	12 U	12 U	60 U	12 U	11 U
1,2-DICHLOROETHANE	120 U	12 U	12 U	60 U	12 U	11 U
2-BUTANONE	120 U	12 U	12 U	60 U	12 U	11 U
1,1,1-TRICHLOROETHANE	120 U	12 U	12 U	60 U	12 U	11 U
CARBON TETRACHLORIDE	120 U	12 U	12 U	60 U	12 U	11 U
BROMODICHLOROMETHANE	120 U	12 U	12 U	60 U	12 U	11 U
1,2-DICHLOROPROPANE	120 U	12 U	12 U	60 U	12 U	11 U
CIS-1,3-DICHLOROPROPENE	120 U	12 U	12 U	60 U	12 U	11 U
TRICHLOROETHENE	120 U	12 U	12 U	60 U	12 U	11 U
DIBROMOCHLOROMETHANE	120 U	12 U	12 U	60 U	12 U	11 U
1,1,2-TRICHLOROETHANE	120 U	12 U	12 U	60 U	12 U	11 U
BENZENE	120 U	12 U	12 U	60 U	12 U	11 U
TRANS-1,3-DICHLOROPROPENE	120 U	12 U	12 U	60 U	12 U	11 U
BROMOFORM	120 U	12 U	12 U	60 U	12 U	11 U
4-METHYL-2-PENTANONE	120 U	12 U	12 U	60 U	12 U	11 U
2-HEXANONE	120 U	12 U	12 U	60 U	12 U	11 U
TETRACHLOROETHENE	120 U	12 U	12 U	60 U	12 U	11 U
1,1,2,2-TETRACHLOROETHANE	120 U	12 U	12 U	60 U	12 U	11 U
TOLUENE	120 U	12 U	12 U	60 U	12 U	11 U
CHLOROBENZENE	120 U	12 U	12 U	60 U	12 U	11 U
ETHYLBENZENE	120 U	12 U	12 U	60 U	12 U	11 U
STYRENE	120 U	12 U	12 U	60 U	12 U	11 U
XYLENE (TOTAL)	120 U	12 U	12 U	60 U	12 U	11 U

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
SURFACE SOIL - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	54-DD-SB01-00	54-DD-SB02-00	54-DD-SB03-00	54-DD-SB04-00	54-DD-SB05-00	54-SB01-00
DATE SAMPLED	03/10/95	03/10/95	03/10/95	03/10/95	04/11/95	03/11/95
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	400 U	410 U	380 U	400 U	420 U	360 U
BIS(2-CHLOROETHYL)ETHER	400 U	410 U	380 U	400 U	420 U	360 U
2-CHLOROPHENOL	400 U	410 U	380 U	400 U	420 U	360 U
1,3-DICHLOROBENZENE	400 U	410 U	380 U	400 U	420 U	360 U
1,4-DICHLOROBENZENE	400 U	410 U	380 U	400 U	420 U	360 U
1,2-DICHLOROBENZENE	400 U	410 U	380 U	400 U	420 U	360 U
2-METHYLPHENOL	400 U	410 U	380 U	400 U	420 U	360 U
2,2'-OXYBIS(1-CHLOROPROPANE)	400 U	410 U	380 U	400 U	420 U	360 U
4-METHYLPHENOL	400 U	410 U	380 U	400 U	420 U	360 U
N-NITROSO-DI-N-PROPYLAMINE	400 U	410 U	380 U	400 U	420 U	360 U
HEXACHLOROETHANE	400 U	410 U	380 U	400 U	420 U	360 U
NITROBENZENE	400 U	410 U	380 U	400 U	420 U	360 U
ISOPHORONE	400 U	410 U	380 U	400 U	420 U	360 U
2-NITROPHENOL	400 U	410 U	380 U	400 U	420 U	360 U
2,4-DIMETHYLPHENOL	400 U	410 U	380 U	400 U	420 U	360 U
BIS(2-CHLOROETHOXY)METHANE	400 U	410 U	380 U	400 U	420 U	360 U
2,4-DICHLOROPHENOL	400 U	410 U	380 U	400 U	420 U	360 U
1,2,4-TRICHLOROBENZENE	400 U	410 U	380 U	400 U	420 U	360 U
NAPHTHALENE	400 U	410 U	380 U	400 U	420 U	360 U
4-CHLOROANILINE	400 U	410 U	380 U	400 U	420 U	360 U
HEXACHLOROBUTADIENE	400 U	410 U	380 U	400 U	420 U	360 U
4-CHLORO-3-METHYLPHENOL	400 U	410 U	380 U	400 U	420 U	360 U
2-METHYLNAPHTHALENE	400 U	410 U	380 U	400 U	420 U	360 U
HEXACHLOROCYCLOPENTADIENE	400 U	410 U	380 U	400 U	420 U	360 U
2,4,6-TRICHLOROPHENOL	400 U	410 U	380 U	400 U	420 U	360 U
2,4,5-TRICHLOROPHENOL	1000 U	1000 U	960 U	1000 U	1000 U	890 U
2-CHLORONAPHTHALENE	400 UJ	410 U	380 U	400 U	420 U	360 U
2-NITROANILINE	1000 UJ	1000 U	960 U	1000 U	1000 U	890 U
DIMETHYLPHTHALATE	400 UJ	410 U	380 U	400 U	420 U	360 U
ACENAPHTHYLENE	400 UJ	410 U	380 U	400 U	420 U	360 U
2,6-DINITROTOLUENE	400 UJ	410 U	380 U	400 U	420 U	360 U
3-NITROANILINE	1000 UJ	1000 U	960 U	1000 U	1000 U	890 U
ACENAPHTHENE	400 UJ	410 U	380 U	400 U	420 U	360 U
2,4-DINITROPHENOL	1000 UJ	1000 U	960 U	1000 U	1000 U	890 U

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
SURFACE SOIL - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	54-DD-SB01-00	54-DD-SB02-00	54-DD-SB03-00	54-DD-SB04-00	54-DD-SB05-00	54-SB01-00
DATE SAMPLED	03/10/95	03/10/95	03/10/95	03/10/95	04/11/95	03/11/95
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 UJ	1000 U	960 U	1000 U	1000 U	890 U
DIBENZOFURAN	400 UJ	410 U	380 U	400 U	420 U	360 U
2,4-DINITROTOLUENE	400 UJ	410 U	380 U	400 U	420 U	360 U
DIETHYLPHTHALATE	400 UJ	410 U	380 U	400 U	420 U	360 U
4-CHLOROPHENYL-PHENYLETHER	400 UJ	410 U	380 U	400 U	420 U	360 U
FLUORENE	400 UJ	410 U	380 U	400 U	420 U	360 U
4-NITROANILINE	1000 UJ	1000 U	960 U	1000 U	1000 U	890 U
4,6-DINITRO-2-METHYLPHENOL	1000 UJ	1000 U	960 U	1000 U	1000 U	890 U
N-NITROSODIPHENYLAMINE (1)	160 J	410 U	380 U	400 U	420 U	360 U
4-BROMOPHENYL-PHENYLETHER	400 UJ	410 U	380 U	400 U	420 U	360 U
HEXACHLOROBENZENE	400 U	410 U	380 U	400 U	420 U	360 U
PENTACHLOROPHENOL	1000 U	1000 U	960 U	1000 U	1000 U	890 U
PHENANTHRENE	98 J	410 U	120 J	400 U	420 U	360 U
ANTHRACENE	400 U	410 U	380 U	400 U	420 U	360 U
CARBAZOLE	400 U	410 U	380 U	400 U	420 U	360 U
DI-N-BUTYLPHTHALATE	1700 U	410 U	380 U	2000 U	1100 U	740 U
FLUORANTHENE	67 J	410 U	62 J	400 U	420 U	360 U
PYRENE	150 J	410 U	99 J	400 U	420 U	360 U
BUTYLBENZYLPHTHALATE	400 U	410 U	380 U	320 J	400 U	360 U
3,3'-DICHLOROBENZIDINE	400 U	410 U	380 U	400 U	420 U	360 U
BENZO(A)ANTHRACENE	400 U	410 U	380 U	400 U	420 U	360 U
CHRYSENE	400 U	410 U	380 U	400 U	420 U	360 U
BIS(2-ETHYLHEXYL)PHTHALATE	820	73 J	98 J	160 J	59 J	360 U
DI-N-OCTYL PHTHALATE	400 UJ	410 U	380 U	400 U	420 U	360 U
BENZO(B)FLUORANTHENE	400 UJ	410 U	380 U	400 U	420 U	360 U
BENZO(K)FLUORANTHENE	400 UJ	410 U	380 U	400 U	420 U	360 U
BENZO(A)PYRENE	400 UJ	410 U	380 U	400 U	420 U	360 U
INDENO(1,2,3-CD)PYRENE	400 UJ	410 U	380 U	400 U	420 U	360 U
DIBENZO(A,H)ANTHRACENE	400 UJ	410 U	380 U	400 U	420 U	360 U
BENZO(G,H,I)PERYLENE	400 UJ	410 U	380 U	400 U	420 U	360 U

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
SURFACE SOIL - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	54-DD-SB01-00	54-DD-SB02-00	54-DD-SB03-00	54-DD-SB04-00	54-DD-SB05-00	54-SB01-00
DATE SAMPLED	03/10/95	03/10/95	03/10/95	03/10/95	04/11/95	03/11/95
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
PCBs						
AROCLOR-1016	41 UJ	40 UJ	38 UJ	40 UJ	NA	NA
AROCLOR-1221	81 UJ	81 UJ	77 UJ	79 UJ	NA	NA
AROCLOR-1232	41 UJ	40 UJ	38 UJ	40 UJ	NA	NA
AROCLOR-1242	41 UJ	40 UJ	38 UJ	40 UJ	NA	NA
AROCLOR-1248	41 UJ	40 UJ	38 UJ	40 UJ	NA	NA
AROCLOR-1254	41 UJ	40 UJ	38 UJ	40 UJ	NA	NA
AROCLOR-1260	41 UJ	40 UJ	38 UJ	40 UJ	NA	NA

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
SURFACE SOIL - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	54-SB04-00	54-SB06-00	54-SB07-00	54-SB08-00	54-SB09-00
DATE SAMPLED	03/11/95	03/12/95	03/12/95	03/11/95	03/11/95
DEPTH	0-12"	0-12"	0-12"	0-12"	0-12"
UNITS	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
VOLATILES					
CHLOROMETHANE	11 U	11 U	11 U	1200 U	12 U
BROMOMETHANE	11 U	11 U	11 U	1200 U	12 U
VINYL CHLORIDE	11 U	11 U	11 U	1200 U	12 U
CHLOROETHANE	11 U	11 U	11 U	1200 U	12 U
METHYLENE CHLORIDE	11 U	11 U	11 U	1200 U	12 U
ACETONE	11 U	11 U	12 U	1200 U	12 U
CARBON DISULFIDE	11 U	11 U	11 U	1200 U	12 U
1,1-DICHLOROETHENE	11 U	11 U	11 U	1200 U	12 U
1,1-DICHLOROETHANE	11 U	11 U	11 U	1200 U	12 U
1,2-DICHLOROETHENE (TOTAL)	11 U	11 U	11 U	1200 U	12 U
CHLOROFORM	11 U	11 U	11 U	1200 U	12 U
1,2-DICHLOROETHANE	11 U	11 U	11 U	1200 U	12 U
2-BUTANONE	11 U	11 U	11 U	1200 U	12 U
1,1,1-TRICHLOROETHANE	11 U	11 U	11 U	1200 U	12 UJ
CARBON TETRACHLORIDE	11 U	11 U	11 U	1200 U	12 UJ
BROMODICHLOROMETHANE	11 U	11 U	11 U	1200 U	12 UJ
1,2-DICHLOROPROPANE	11 U	11 U	11 U	1200 U	12 UJ
CIS-1,3-DICHLOROPROPENE	11 U	11 U	11 U	1200 U	12 UJ
TRICHLOROETHENE	11 U	11 U	11 U	1200 U	12 UJ
DIBROMOCHLOROMETHANE	11 U	11 U	11 U	1200 U	12 UJ
1,1,2-TRICHLOROETHANE	11 U	11 U	11 U	1200 U	12 UJ
BENZENE	11 U	11 U	11 U	1200 U	12 UJ
TRANS-1,3-DICHLOROPROPENE	11 U	11 U	11 U	1200 U	12 UJ
BROMOFORM	11 U	11 U	11 U	1200 U	12 UJ
4-METHYL-2-PENTANONE	11 UJ	11 U	11 U	1200 U	12 UJ
2-HEXANONE	11 UJ	11 U	11 U	1200 U	12 UJ
TETRACHLOROETHENE	11 UJ	11 U	11 U	1200 U	12 UJ
1,1,2,2-TETRACHLOROETHANE	11 UJ	11 U	11 U	1200 U	12 UJ
TOLUENE	11 UJ	11 U	11 U	1200 U	12 UJ
CHLOROBENZENE	11 UJ	11 U	11 U	1200 U	12 UJ
ETHYLBENZENE	11 UJ	11 U	11 U	1200 U	12 UJ
STYRENE	11 UJ	11 U	11 U	1200 U	12 UJ
XYLENE (TOTAL)	11 UJ	11 U	11 U	1200 U	12 UJ

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
SURFACE SOIL - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	54-SB04-00	54-SB06-00	54-SB07-00	54-SB08-00	54-SB09-00
DATE SAMPLED	03/11/95	03/12/95	03/12/95	03/11/95	03/11/95
DEPTH	0-12"	0-12"	0-12"	0-12"	0-12"
UNITS	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SEMIVOLATILES					
PHENOL	380 U	350 U	370 U	400 U	410 U
BIS(2-CHLOROETHYL)ETHER	380 U	350 U	370 U	400 U	410 U
2-CHLOROPHENOL	380 U	350 U	370 U	400 U	410 U
1,3-DICHLOROBENZENE	380 U	350 U	370 U	400 U	410 U
1,4-DICHLOROBENZENE	380 U	350 U	370 U	400 U	410 U
1,2-DICHLOROBENZENE	380 U	350 U	370 U	400 U	410 U
2-METHYLPHENOL	380 U	350 U	370 U	400 U	410 U
2,2'-OXYBIS(1-CHLOROPROPANE)	380 U	350 U	370 U	400 U	410 U
4-METHYLPHENOL	380 U	350 U	370 U	400 U	410 U
N-NITROSO-DI-N-PROPYLAMINE	380 U	350 U	370 U	400 U	410 U
HEXACHLOROETHANE	380 U	350 U	370 U	400 U	410 U
NITROBENZENE	380 U	350 U	370 U	400 U	410 U
ISOPHORONE	380 U	350 U	370 U	400 UJ	410 U
2-NITROPHENOL	380 U	350 U	370 U	400 UJ	410 U
2,4-DIMETHYLPHENOL	380 U	350 U	370 U	400 UJ	410 U
BIS(2-CHLOROETHOXY)METHANE	380 U	350 U	370 U	400 UJ	410 U
2,4-DICHLOROPHENOL	380 U	350 U	370 U	400 UJ	410 U
1,2,4-TRICHLOROBENZENE	380 U	350 U	370 U	400 UJ	410 U
NAPHTHALENE	380 U	350 U	370 U	400 UJ	410 U
4-CHLOROANILINE	380 U	350 U	370 U	400 UJ	410 U
HEXACHLOROBUTADIENE	380 U	350 U	370 U	400 UJ	410 U
4-CHLORO-3-METHYLPHENOL	380 U	350 U	370 U	400 UJ	410 U
2-METHYLNAPHTHALENE	380 U	350 U	370 U	400 UJ	410 U
HEXACHLOROCYCLOPENTADIENE	380 U	350 U	370 U	400 UJ	410 U
2,4,6-TRICHLOROPHENOL	380 U	350 U	370 U	400 UJ	410 U
2,4,5-TRICHLOROPHENOL	940 U	880 U	920 U	1000 UJ	1000 U
2-CHLORONAPHTHALENE	380 U	350 U	370 U	400 UJ	410 U
2-NITROANILINE	940 U	880 U	920 U	1000 U	1000 U
DIMETHYLPHTHALATE	380 U	350 U	370 U	400 U	410 U
ACENAPHTHYLENE	380 U	350 U	370 U	400 U	410 U
2,6-DINITROTOLUENE	380 U	350 U	370 U	400 U	410 U
3-NITROANILINE	940 U	880 U	920 U	1000 U	1000 U
ACENAPHTHENE	380 U	350 U	370 U	400 U	410 U
2,4-DINITROPHENOL	940 U	880 U	920 U	1000 U	1000 U

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
SURFACE SOIL - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	54-SB04-00	54-SB06-00	54-SB07-00	54-SB08-00	54-SB09-00
DATE SAMPLED	03/11/95	03/12/95	03/12/95	03/11/95	03/11/95
DEPTH	0-12"	0-12"	0-12"	0-12"	0-12"
UNITS	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SEMIVOLATILES cont.					
4-NITROPHENOL	940 U	880 U	920 U	1000 U	1000 U
DIBENZOFURAN	380 U	350 U	370 U	400 U	410 U
2,4-DINITROTOLUENE	380 U	350 U	370 U	400 U	410 U
DIETHYLPHTHALATE	380 U	350 U	370 U	400 U	410 U
4-CHLOROPHENYL-PHENYLETHER	380 U	350 U	370 U	400 U	410 U
FLUORENE	380 U	350 U	370 U	400 U	410 U
4-NITROANILINE	940 U	880 U	920 U	1000 U	1000 U
4,6-DINITRO-2-METHYLPHENOL	940 U	880 U	920 U	1000 U	1000 U
N-NITROSODIPHENYLAMINE (1)	380 U	350 U	370 U	400 U	410 U
4-BROMOPHENYL-PHENYLETHER	380 U	350 U	370 U	400 U	410 U
HEXACHLOROBENZENE	380 U	350 U	370 U	400 U	410 U
PENTACHLOROPHENOL	940 U	880 U	920 U	1000 U	1000 U
PHENANTHRENE	380 U	350 U	370 U	400 U	410 U
ANTHRACENE	380 U	350 U	370 U	400 U	410 U
CARBAZOLE	380 U	350 U	370 U	400 U	410 U
DI-N-BUTYLPHTHALATE	380 U	350 U	2300 U	400 U	410 U
FLUORANTHENE	380 U	350 U	370 U	400 U	410 U
PYRENE	380 U	350 U	370 U	400 U	410 U
BUTYLBENZYLPHTHALATE	380 U	350 U	50 J	400 U	410 U
3,3'-DICHLOROBENZIDINE	380 U	350 U	370 U	400 U	410 U
BENZO(A)ANTHRACENE	380 U	350 U	370 U	400 U	410 U
CHRYSENE	380 U	350 U	370 U	400 U	410 U
• BIS(2-ETHYLHEXYL)PHTHALATE	380 U	350 U	370 U	190 J	410 U
DI-N-OCTYL PHTHALATE	380 U	350 U	370 U	150 J	410 U
BENZO(B)FLUORANTHENE	380 U	350 U	370 U	400 U	410 U
BENZO(K)FLUORANTHENE	380 U	350 U	370 U	400 U	410 U
BENZO(A)PYRENE	380 U	350 U	370 U	400 U	410 U
INDENO(1,2,3-CD)PYRENE	380 U	350 U	370 U	400 U	410 U
DIBENZO(A,H)ANTHRACENE	380 U	350 U	370 U	400 U	410 U
BENZO(G,H,I)PERYLENE	380 U	350 U	370 U	400 U	410 U

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
SURFACE SOIL - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	54-SB04-00	54-SB06-00	54-SB07-00	54-SB08-00	54-SB09-00
DATE SAMPLED	03/11/95	03/12/95	03/12/95	03/11/95	03/11/95
DEPTH	0-12"	0-12"	0-12"	0-12"	0-12"
UNITS	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
PCBs					
AROCLOR-1016	NA	NA	NA	NA	NA
AROCLOR-1221	NA	NA	NA	NA	NA
AROCLOR-1232	NA	NA	NA	NA	NA
AROCLOR-1242	NA	NA	NA	NA	NA
AROCLOR-1248	NA	NA	NA	NA	NA
AROCLOR-1254	NA	NA	NA	NA	NA
AROCLOR-1260	NA	NA	NA	NA	NA

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
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	11 U	1200 U	ND	ND		0/11
BROMOMETHANE	11 U	1200 U	ND	ND		0/11
VINYL CHLORIDE	11 U	1200 U	ND	ND		0/11
CHLOROETHANE	11 U	1200 U	ND	ND		0/11
METHYLENE CHLORIDE	11 U	1200 U	ND	ND		0/11
ACETONE	11 U	1200 U	ND	ND		0/11
CARBON DISULFIDE	11 U	1200 U	ND	ND		0/11
1,1-DICHLOROETHENE	11 U	1200 U	ND	ND		0/11
1,1-DICHLOROETHANE	11 U	1200 U	ND	ND		0/11
1,2-DICHLOROETHENE (TOTAL)	11 U	1200 U	ND	ND		0/11
CHLOROFORM	11 U	1200 U	ND	ND		0/11
1,2-DICHLOROETHANE	11 U	1200 U	ND	ND		0/11
2-BUTANONE	11 U	1200 U	ND	ND		0/11
1,1,1-TRICHLOROETHANE	11 U	1200 U	ND	ND		0/11
CARBON TETRACHLORIDE	11 U	1200 U	ND	ND		0/11
BROMODICHLOROMETHANE	11 U	1200 U	ND	ND		0/11
1,2-DICHLOROPROPANE	11 U	1200 U	ND	ND		0/11
CIS-1,3-DICHLOROPROPENE	11 U	1200 U	ND	ND		0/11
TRICHLOROETHENE	11 U	1200 U	ND	ND		0/11
DIBROMOCHLOROMETHANE	11 U	1200 U	ND	ND		0/11
1,1,2-TRICHLOROETHANE	11 U	1200 U	ND	ND		0/11
BENZENE	11 U	1200 U	ND	ND		0/11
TRANS-1,3-DICHLOROPROPENE	11 U	1200 U	ND	ND		0/11
BROMOFORM	11 U	1200 U	ND	ND		0/11
4-METHYL-2-PENTANONE	11 U	1200 U	ND	ND		0/11
2-HEXANONE	11 U	1200 U	ND	ND		0/11
TETRACHLOROETHENE	11 U	1200 U	ND	ND		0/11
1,1,2,2-TETRACHLOROETHANE	11 U	1200 U	ND	ND		0/11
TOLUENE	11 U	1200 U	ND	ND		0/11
CHLOROBENZENE	11 U	1200 U	ND	ND		0/11
ETHYLBENZENE	11 U	1200 U	ND	ND		0/11
STYRENE	11 U	1200 U	ND	ND		0/11
XYLENE (TOTAL)	11 U	1200 U	ND	ND		0/11

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
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	350 U	420 U	ND	ND		0/11
BIS(2-CHLOROETHYL)ETHER	350 U	420 U	ND	ND		0/11
2-CHLOROPHENOL	350 U	420 U	ND	ND		0/11
1,3-DICHLOROBENZENE	350 U	420 U	ND	ND		0/11
1,4-DICHLOROBENZENE	350 U	420 U	ND	ND		0/11
1,2-DICHLOROBENZENE	350 U	420 U	ND	ND		0/11
2-METHYLPHENOL	350 U	420 U	ND	ND		0/11
2,2'-OXYBIS(1-CHLOROPROPANE)	350 U	420 U	ND	ND		0/11
4-METHYLPHENOL	350 U	420 U	ND	ND		0/11
N-NITROSO-DI-N-PROPYLAMINE	350 U	420 U	ND	ND		0/11
HEXACHLOROETHANE	350 U	420 U	ND	ND		0/11
NITROBENZENE	350 U	420 U	ND	ND		0/11
ISOPHORONE	350 U	420 U	ND	ND		0/11
2-NITROPHENOL	350 U	420 U	ND	ND		0/11
2,4-DIMETHYLPHENOL	350 U	420 U	ND	ND		0/11
BIS(2-CHLOROETHOXY)METHANE	350 U	420 U	ND	ND		0/11
2,4-DICHLOROPHENOL	350 U	420 U	ND	ND		0/11
1,2,4-TRICHLOROBENZENE	350 U	420 U	ND	ND		0/11
NAPHTHALENE	350 U	420 U	ND	ND		0/11
4-CHLOROANILINE	350 U	420 U	ND	ND		0/11
HEXACHLOROBUTADIENE	350 U	420 U	ND	ND		0/11
4-CHLORO-3-METHYLPHENOL	350 U	420 U	ND	ND		0/11
2-METHYLNAPHTHALENE	350 U	420 U	ND	ND		0/11
HEXACHLOROCYCLOPENTADIENE	350 U	420 U	ND	ND		0/11
2,4,6-TRICHLOROPHENOL	350 U	420 U	ND	ND		0/11
2,4,5-TRICHLOROPHENOL	880 U	1000 U	ND	ND		0/11
2-CHLORONAPHTHALENE	350 U	420 U	ND	ND		0/11
2-NITROANILINE	880 U	1000 UJ	ND	ND		0/11
DIMETHYLPHTHALATE	350 U	420 U	ND	ND		0/11
ACENAPHTHYLENE	350 U	420 U	ND	ND		0/11
2,6-DINITROTOLUENE	350 U	420 U	ND	ND		0/11
3-NITROANILINE	880 U	1000 UJ	ND	ND		0/11
ACENAPHTHENE	350 U	420 U	ND	ND		0/11
2,4-DINITROPHENOL	880 U	1000 UJ	ND	ND		0/11

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
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	880 U	1000 UJ	ND	ND		0/11
DIBENZOFURAN	350 U	420 U	ND	ND		0/11
2,4-DINITROTOLUENE	350 U	420 U	ND	ND		0/11
DIETHYLPHTHALATE	350 U	420 U	ND	ND		0/11
4-CHLOROPHENYL-PHENYLETHER	350 U	420 U	ND	ND		0/11
FLUORENE	350 U	420 U	ND	ND		0/11
4-NITROANILINE	880 U	1000 UJ	ND	ND		0/11
4,6-DINITRO-2-METHYLPHENOL	880 U	1000 UJ	ND	ND		0/11
N-NITROSODIPHENYLAMINE (1)	350 U	420 U	160 J	160 J	54-DD-SB01-00	1/11
4-BROMOPHENYL-PHENYLETHER	350 U	420 U	ND	ND		0/11
HEXACHLOROBENZENE	350 U	420 U	ND	ND		0/11
PENTACHLOROPHENOL	880 U	1000 U	ND	ND		0/11
PHENANTHRENE	350 U	420 U	98 J	120 J	54-DD-SB03-00	2/11
ANTHRACENE	350 U	420 U	ND	ND		0/11
CARBAZOLE	350 U	420 U	ND	ND		0/11
DI-N-BUTYLPHTHALATE	350 U	2300 U	ND	ND		0/11
FLUORANTHENE	350 U	420 U	62 J	67 J	54-DD-SB01-00	2/11
PYRENE	350 U	420 U	99 J	150 J	54-DD-SB01-00	2/11
BUTYLBENZYLPHTHALATE	350 U	410 U	50 J	320 J	54-DD-SB04-00	2/11
3,3'-DICHLOROBENZIDINE	350 U	420 U	ND	ND		0/11
BENZO(A)ANTHRACENE	350 U	420 U	ND	ND		0/11
CHRYSENE	350 U	420 U	ND	ND		0/11
BIS(2-ETHYLHEXYL)PHTHALATE	350 U	410 U	59 J	820	54-DD-SB01-00	6/11
DI-N-OCTYL PHTHALATE	350 U	420 U	150 J	150 J	54-SB08-00	1/11
BENZO(B)FLUORANTHENE	350 U	420 U	ND	ND		0/11
BENZO(K)FLUORANTHENE	350 U	420 U	ND	ND		0/11
BENZO(A)PYRENE	350 U	420 U	ND	ND		0/11
INDENO(1,2,3-CD)PYRENE	350 U	420 U	ND	ND		0/11
DIBENZO(A,H)ANTHRACENE	350 U	420 U	ND	ND		0/11
BENZO(G,H,I)PERYLENE	350 U	420 U	ND	ND		0/11

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
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
PCBs						
AROCLOR-1016	38 UJ	41 UJ	ND	ND		0/4
AROCLOR-1221	77 UJ	81 UJ	ND	ND		0/4
AROCLOR-1232	38 UJ	41 UJ	ND	ND		0/4
AROCLOR-1242	38 UJ	41 UJ	ND	ND		0/4
AROCLOR-1248	38 UJ	41 UJ	ND	ND		0/4
AROCLOR-1254	38 UJ	41 UJ	ND	ND		0/4
AROCLOR-1260	38 UJ	41 UJ	ND	ND		0/4

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
SURFACE SOIL - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
INORGANIC ANALYTES

LOCATION	54-DD-SB01-00	54-DD-SB02-00	54-DD-SB03-00	54-DD-SB04-00
DATE SAMPLED	03/10/95	03/10/95	03/10/95	03/10/95
DEPTH	0-12"	0-12"	0-12"	0-12"
UNITS	MG/KG	MG/KG	MG/KG	MG/KG
ANALYTES				
ALUMINUM, TOTAL	5130	5950	4680	6930
ANTIMONY, TOTAL	4.8 UJ	4.8 UJ	4.2 UJ	4.8 UJ
ARSENIC, TOTAL	0.65 J	0.79 J	0.3 J	0.63 J
BARIUM, TOTAL	26.9	17.5	12.3	26.3
BERYLLIUM, TOTAL	0.21 U	0.21 U	0.18 U	0.21 U
CADMIUM, TOTAL	0.65 U	0.65 U	0.57 U	0.64 U
CALCIUM, TOTAL	37700	142000	37800	60900
CHROMIUM, TOTAL	7.2	9.1	5.7	9.1
COBALT, TOTAL	0.7 U	0.69 U	0.61 U	0.71
COPPER, TOTAL	7.2	3.3	2.8	4.1
IRON, TOTAL	2630	3130	2150	3640
LEAD, TOTAL	9.7	23	19.9	14.6
MAGNESIUM, TOTAL	633	2030	654	1030
MANGANESE, TOTAL	14.5	23.9	10.5	18.3
MERCURY, TOTAL	0.09 U	0.086 U	0.08 U	0.11 U
NICKEL, TOTAL	2.5 U	2.5 U	2.2 U	2.5 U
POTASSIUM, TOTAL	367	319	140 U	273
SELENIUM, TOTAL	0.44 U	0.44 U	0.4 U	0.41 U
SILVER, TOTAL	0.7 U	0.69 U	0.61 U	0.69 U
SODIUM, TOTAL	93.6	179	101	107
THALLIUM, TOTAL	0.42 UJ	0.41 U	0.38 UJ	0.39 U
VANADIUM, TOTAL	9.1	10.1	7	11.8
ZINC, TOTAL	14.9	12.6	8.3	16.7

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
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
ANALYTES						
ALUMINUM, TOTAL	NA	NA	4680	6930	54-DD-SB04-00	4/4
ANTIMONY, TOTAL	4.2 UJ	4.8 UJ	ND	ND		0/4
ARSENIC, TOTAL	NA	NA	0.3 J	0.79 J	54-DD-SB02-00	4/4
BARIUM, TOTAL	NA	NA	12.3	26.9	54-DD-SB01-00	4/4
BERYLLIUM, TOTAL	0.18 U	0.21 U	ND	ND		0/4
CADMIUM, TOTAL	0.57 U	0.65 U	ND	ND		0/4
CALCIUM, TOTAL	NA	NA	37700	142000	54-DD-SB02-00	4/4
CHROMIUM, TOTAL	NA	NA	5.7	9.1	54-DD-SB04-00	4/4
COBALT, TOTAL	0.61 U	0.7 U	0.71	0.71	54-DD-SB04-00	1/4
COPPER, TOTAL	NA	NA	2.8	7.2	54-DD-SB01-00	4/4
IRON, TOTAL	NA	NA	2150	3640	54-DD-SB04-00	4/4
LEAD, TOTAL	NA	NA	9.7	23	54-DD-SB02-00	4/4
MAGNESIUM, TOTAL	NA	NA	633	2030	54-DD-SB02-00	4/4
MANGANESE, TOTAL	NA	NA	10.5	23.9	54-DD-SB02-00	4/4
MERCURY, TOTAL	0.08 U	0.11 U	ND	ND		0/4
NICKEL, TOTAL	2.2 U	2.5 U	ND	ND		0/4
POTASSIUM, TOTAL	140 U	140 U	273	367	54-DD-SB01-00	3/4
SELENIUM, TOTAL	0.4 U	0.44 U	ND	ND		0/4
SILVER, TOTAL	0.61 U	0.7 U	ND	ND		0/4
SODIUM, TOTAL	NA	NA	93.6	179	54-DD-SB02-00	4/4
THALLIUM, TOTAL	0.38 UJ	0.42 UJ	ND	ND		0/4
VANADIUM, TOTAL	NA	NA	7	11.8	54-DD-SB04-00	4/4
ZINC, TOTAL	NA	NA	8.3	16.7	54-DD-SB04-00	4/4

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
SUBSURFACE SOIL - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	54-DD-SB01-02	54-DD-SB02-02	54-DD-SB03-01	54-DD-SB04-01	54-DD-SB05-01	54-SB01-04
DATE SAMPLED	03/10/95	03/10/95	03/10/95	03/10/95	04/11/95	03/11/95
DEPTH	3-5'	3-5'	1-3'	1-3'	1-3'	7-9'
UNITS	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
VOLATILES						
CHLOROMETHANE	12 U	12 U	12 U	13 U	120 U	12 U
BROMOMETHANE	12 U	12 U	12 U	13 U	120 U	12 U
VINYL CHLORIDE	12 U	12 U	12 U	13 U	120 U	12 U
CHLOROETHANE	12 U	12 U	12 U	13 U	120 U	12 U
METHYLENE CHLORIDE	12 U	12 U	12 U	13 U	120 U	12 U
ACETONE	12 U	12 U	12 U	13 U	1200 J	17 U
CARBON DISULFIDE	12 U	12 U	12 U	13 U	120 U	12 U
1,1-DICHLOROETHENE	12 U	12 U	12 U	13 U	120 U	12 U
1,1-DICHLOROETHANE	12 U	12 U	12 U	13 U	120 U	12 U
1,2-DICHLOROETHENE (TOTAL)	12 U	12 U	12 U	13 U	120 U	12 U
CHLOROFORM	12 U	12 U	12 U	13 U	120 U	12 U
1,2-DICHLOROETHANE	12 U	12 U	12 U	13 U	120 U	12 U
2-BUTANONE	12 U	12 U	12 U	13 U	120 U	12 U
1,1,1-TRICHLOROETHANE	12 U	12 U	12 U	13 U	120 U	12 U
CARBON TETRACHLORIDE	12 U	12 U	12 U	13 U	120 U	12 U
BROMODICHLOROMETHANE	12 U	12 U	12 U	13 U	120 U	12 U
1,2-DICHLOROPROPANE	12 U	12 U	12 U	13 U	120 U	12 U
CIS-1,3-DICHLOROPROPENE	12 U	12 U	12 U	13 U	120 U	12 U
TRICHLOROETHENE	12 U	12 U	12 U	13 U	120 U	12 U
DIBROMOCHLOROMETHANE	12 U	12 U	12 U	13 U	120 U	12 U
1,1,2-TRICHLOROETHANE	12 U	12 U	12 U	13 U	120 U	12 U
BENZENE	12 U	12 U	12 U	13 U	120 U	12 U
TRANS-1,3-DICHLOROPROPENE	12 U	12 U	12 U	13 U	120 U	12 U
BROMOFORM	12 U	12 U	12 U	13 U	120 U	12 U
4-METHYL-2-PENTANONE	12 U	12 U	12 U	13 UJ	120 U	12 U
2-HEXANONE	12 U	12 U	12 U	13 UJ	120 U	12 U
TETRACHLOROETHENE	12 U	12 U	12 U	13 UJ	120 U	12 U
1,1,2,2-TETRACHLOROETHANE	12 U	12 U	12 U	13 UJ	120 U	12 U
TOLUENE	12 U	12 U	12 U	13 UJ	120 U	12 U
CHLOROBENZENE	12 U	12 U	12 U	13 UJ	120 U	12 U
ETHYLBENZENE	12 U	12 U	12 U	13 UJ	120 U	12 U
STYRENE	12 U	12 U	12 U	13 UJ	120 U	12 U
XYLENE (TOTAL)	12 U	12 U	12 U	13 UJ	120 U	12 U

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
SUBSURFACE SOIL - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	54-DD-SB01-02	54-DD-SB02-02	54-DD-SB03-01	54-DD-SB04-01	54-DD-SB05-01	54-SB01-04
DATE SAMPLED	03/10/95	03/10/95	03/10/95	03/10/95	04/11/95	03/11/95
DEPTH	3-5'	3-5'	1-3'	1-3'	1-3'	7-9'
UNITS	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SEMIVOLATILES						
PHENOL	390 U	380 U	390 U	420 U	390 U	380 U
BIS(2-CHLOROETHYL)ETHER	390 U	380 U	390 U	420 U	390 U	380 U
2-CHLOROPHENOL	390 U	380 U	390 U	420 U	390 U	380 U
1,3-DICHLOROBENZENE	390 U	380 U	390 U	420 U	390 U	380 U
1,4-DICHLOROBENZENE	390 U	380 U	390 U	420 U	390 U	380 U
1,2-DICHLOROBENZENE	390 U	380 U	390 U	420 U	390 U	380 U
2-METHYLPHENOL	390 U	380 U	390 U	420 U	390 U	380 U
2,2'-OXYBIS(1-CHLOROPROPANE)	390 U	380 U	390 U	420 U	390 U	380 U
4-METHYLPHENOL	390 U	380 U	390 U	420 U	390 U	380 U
N-NITROSO-DI-N-PROPYLAMINE	390 U	380 U	390 U	420 U	390 U	380 U
HEXACHLOROETHANE	390 U	380 U	390 U	420 U	390 U	380 U
NITROBENZENE	390 U	380 U	390 U	420 U	390 U	380 U
ISOPHORONE	390 U	380 U	390 U	420 U	390 U	380 U
2-NITROPHENOL	390 U	380 U	390 U	420 U	390 U	380 U
2,4-DIMETHYLPHENOL	390 U	380 U	390 U	420 U	390 U	380 U
BIS(2-CHLOROETHOXY)METHANE	390 U	380 U	390 U	420 U	390 U	380 U
2,4-DICHLOROPHENOL	390 U	380 U	390 U	420 U	390 U	380 U
1,2,4-TRICHLOROBENZENE	390 U	380 U	390 U	420 U	390 U	380 U
NAPHTHALENE	390 U	380 U	390 U	420 U	390 U	380 U
4-CHLOROANILINE	390 U	380 U	390 U	420 U	390 U	380 U
HEXACHLOROBUTADIENE	390 U	380 U	390 U	420 U	390 U	380 U
4-CHLORO-3-METHYLPHENOL	390 U	380 U	390 U	420 U	390 U	380 U
2-METHYLNAPHTHALENE	390 U	380 U	390 U	420 U	1700	380 U
HEXACHLOROCYCLOPENTADIENE	390 U	380 U	390 U	420 U	390 U	380 U
2,4,6-TRICHLOROPHENOL	390 U	380 U	390 U	420 U	390 U	380 U
2,4,5-TRICHLOROPHENOL	980 U	960 U	980 U	1100 U	980 U	940 U
2-CHLORONAPHTHALENE	390 U	380 U	390 U	420 U	390 U	380 U
2-NITROANILINE	980 U	960 U	980 U	1100 U	980 U	940 U
DIMETHYLPHTHALATE	390 U	380 U	390 U	420 U	390 U	380 U
ACENAPHTHYLENE	390 U	380 U	390 U	420 U	390 U	380 U
2,6-DINITROTOLUENE	390 U	380 U	390 U	420 U	390 U	380 U
3-NITROANILINE	980 U	960 U	980 U	1100 U	980 U	940 U
ACENAPHTHENE	390 U	380 U	390 U	420 U	94 J	380 U
2,4-DINITROPHENOL	980 U	960 U	980 U	1100 U	980 U	940 U

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
SUBSURFACE SOIL - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	54-DD-SB01-02	54-DD-SB02-02	54-DD-SB03-01	54-DD-SB04-01	54-DD-SB05-01	54-SB01-04
DATE SAMPLED	03/10/95	03/10/95	03/10/95	03/10/95	04/11/95	03/11/95
DEPTH	3-5'	3-5'	1-3'	1-3'	1-3'	7-9'
UNITS	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SEMIVOLATILES cont.						
4-NITROPHENOL	980 U	960 U	980 U	1100 U	980 U	940 U
DIBENZOFURAN	390 U	380 U	390 U	420 U	390 U	380 U
2,4-DINITROTOLUENE	390 U	380 U	390 U	420 U	390 U	380 U
DIETHYLPHTHALATE	390 U	380 U	390 U	420 U	390 U	380 U
4-CHLOROPHENYL-PHENYLETHER	390 U	380 U	390 U	420 U	390 U	380 U
FLUORENE	390 U	380 U	390 U	420 U	420	380 U
4-NITROANILINE	980 U	960 U	980 U	1100 U	980 U	940 U
4,6-DINITRO-2-METHYLPHENOL	980 U	960 U	980 U	1100 U	980 U	940 U
N-NITROSODIPHENYLAMINE (1)	390 U	380 U	390 U	420 U	390 U	380 U
4-BROMOPHENYL-PHENYLETHER	390 U	380 U	390 U	420 U	390 U	380 U
HEXACHLOROBENZENE	390 U	380 U	390 U	420 U	390 U	380 U
PENTACHLOROPHENOL	980 U	960 U	980 U	1100 U	980 U	940 U
PHENANTHRENE	390 U	380 U	390 U	420 U	160 J	380 U
ANTHRACENE	390 U	380 U	390 U	420 U	390 U	380 U
CARBAZOLE	390 U	380 U	390 U	420 U	390 U	380 U
DI-N-BUTYLPHTHALATE	390 U	380 U	2000 U	420 U	390 U	550 U
FLUORANTHENE	390 U	380 U	390 U	420 U	390 U	380 U
PYRENE	390 U	380 U	390 U	420 U	43 J	380 U
BUTYLBENZYLPHTHALATE	390 U	380 U	56 J	420 U	390 U	380 U
3,3'-DICHLOROBENZIDINE	390 U	380 U	390 U	420 U	390 U	380 U
BENZO(A)ANTHRACENE	390 U	380 U	390 U	420 U	390 U	380 U
CHRYSENE	390 U	380 U	390 U	420 U	390 U	380 U
BIS(2-ETHYLHEXYL)PHTHALATE	390 U	380 U	390 U	420 U	49 J	380 U
DI-N-OCTYL PHTHALATE	390 U	380 U	390 U	420 U	390 U	380 U
BENZO(B)FLUORANTHENE	390 U	380 U	390 U	420 U	390 U	380 U
BENZO(K)FLUORANTHENE	390 U	380 U	390 U	420 U	390 U	380 U
BENZO(A)PYRENE	390 U	380 U	390 U	420 U	390 U	380 U
INDENO(1,2,3-CD)PYRENE	390 U	380 U	390 U	420 U	390 U	380 U
DIBENZO(A,H)ANTHRACENE	390 U	380 U	390 U	420 U	390 U	380 U
BENZO(G,H,I)PERYLENE	390 U	380 U	390 U	420 U	390 U	380 U

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
SUBSURFACE SOIL - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	54-DD-SB01-02	54-DD-SB02-02	54-DD-SB03-01	54-DD-SB04-01	54-DD-SB05-01	54-SB01-04
DATE SAMPLED	03/10/95	03/10/95	03/10/95	03/10/95	04/11/95	03/11/95
DEPTH	3-5'	3-5'	1-3'	1-3'	1-3'	7-9'
UNITS	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
PCBs						
AROCLOR-1016	39 U	39 U	39 U	41 U	NA	NA
AROCLOR-1221	77 U	78 U	78 U	83 U	NA	NA
AROCLOR-1232	39 U	39 U	39 U	41 U	NA	NA
AROCLOR-1242	39 U	39 U	39 U	41 U	NA	NA
AROCLOR-1248	39 U	39 U	39 U	41 U	NA	NA
AROCLOR-1254	39 U	39 U	39 U	41 U	NA	NA
AROCLOR-1260	39 U	39 U	39 U	41 U	NA	NA

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
SUBSURFACE SOIL - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	54-SB02-01	54-SB02-04	54-SB03-01	54-SB03-04	54-SB04-04	54-SB05-01
DATE SAMPLED	03/11/95	03/11/95	03/11/95	03/11/95	03/11/95	03/11/95
DEPTH	1-3'	7-9'	1-3'	7-9'	7-9'	1-3'
UNITS	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
VOLATILES						
CHLOROMETHANE	11 U	12 U	11 U	12 U	12 U	11 U
BROMOMETHANE	11 U	12 U	11 U	12 U	12 U	11 U
VINYL CHLORIDE	11 U	12 U	11 U	12 U	12 U	11 U
CHLOROETHANE	11 U	12 U	11 U	12 U	12 U	11 U
METHYLENE CHLORIDE	11 U	12 U	11 U	12 U	12 U	11 U
ACETONE	11 UJ	23 U	16 U	22 U	13 U	11 U
CARBON DISULFIDE	11 U	12 U	11 U	12 U	12 U	11 U
1,1-DICHLOROETHENE	11 U	12 U	11 U	12 U	12 U	11 U
1,1-DICHLOROETHANE	11 U	12 U	11 U	12 U	12 U	11 U
1,2-DICHLOROETHENE (TOTAL)	11 U	12 U	11 U	12 U	12 U	11 U
CHLOROFORM	11 U	12 U	11 U	12 U	12 U	11 U
1,2-DICHLOROETHANE	11 U	12 U	11 U	12 U	12 U	11 U
2-BUTANONE	11 UJ	12 U	11 U	12 U	12 U	11 U
1,1,1-TRICHLOROETHANE	11 U	12 U	11 U	12 U	12 U	11 U
CARBON TETRACHLORIDE	11 U	12 U	11 U	12 U	12 U	11 U
BROMODICHLOROMETHANE	11 U	12 U	11 U	12 U	12 U	11 U
1,2-DICHLOROPROPANE	11 U	12 U	11 U	12 U	12 U	11 U
CIS-1,3-DICHLOROPROPENE	11 U	12 U	11 U	12 U	12 U	11 U
TRICHLOROETHENE	11 U	12 U	11 U	12 U	12 U	11 U
DIBROMOCHLOROMETHANE	11 U	12 U	11 U	12 U	12 U	11 U
1,1,2-TRICHLOROETHANE	11 U	12 U	11 U	12 U	12 U	11 U
BENZENE	11 U	12 U	11 U	12 U	12 U	11 U
TRANS-1,3-DICHLOROPROPENE	11 U	12 U	11 U	12 U	12 U	11 U
BROMOFORM	11 U	12 U	11 U	12 U	12 U	11 U
4-METHYL-2-PENTANONE	11 UJ	12 U	11 U	12 U	12 U	11 U
2-HEXANONE	11 UJ	12 U	11 U	12 U	12 U	11 U
TETRACHLOROETHENE	11 U	12 U	11 U	12 U	12 U	11 U
1,1,2,2-TETRACHLOROETHANE	11 U	12 U	11 U	12 U	12 U	11 U
TOLUENE	11 U	12 U	11 U	12 U	12 U	11 U
CHLOROBENZENE	11 U	12 U	11 U	12 U	12 U	11 U
ETHYLBENZENE	11 U	12 U	11 U	12 U	12 U	11 U
STYRENE	11 U	12 U	11 U	12 U	12 U	11 U
XYLENE (TOTAL)	11 U	12 U	11 U	12 U	12 U	11 U

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
SUBSURFACE SOIL - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	54-SB02-01	54-SB02-04	54-SB03-01	54-SB03-04	54-SB04-04	54-SB05-01
DATE SAMPLED	03/11/95	03/11/95	03/11/95	03/11/95	03/11/95	03/11/95
DEPTH	1-3'	7-9'	1-3'	7-9'	7-9'	1-3'
UNITS	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SEMIVOLATILES						
PHENOL	370 U	390 U	370 U	400 U	380 U	360 U
BIS(2-CHLOROETHYL)ETHER	370 U	390 U	370 U	400 U	380 U	360 U
2-CHLOROPHENOL	370 U	390 U	370 U	400 U	380 U	360 U
1,3-DICHLOROBENZENE	370 U	390 U	370 U	400 U	380 U	360 U
1,4-DICHLOROBENZENE	370 U	390 U	370 U	400 U	380 U	360 U
1,2-DICHLOROBENZENE	370 U	390 U	370 U	400 U	380 U	360 U
2-METHYLPHENOL	370 U	390 U	370 U	400 U	380 U	360 U
2,2'-OXYBIS(1-CHLOROPROPANE)	370 U	390 U	370 U	400 U	380 U	360 U
4-METHYLPHENOL	370 U	390 U	370 U	400 U	380 U	360 U
N-NITROSO-DI-N-PROPYLAMINE	370 U	390 U	370 U	400 U	380 U	360 U
HEXACHLOROETHANE	370 U	390 U	370 U	400 U	380 U	360 U
NITROBENZENE	370 U	390 U	370 U	400 U	380 U	360 U
ISOPHORONE	370 U	390 U	370 U	400 U	380 U	360 U
2-NITROPHENOL	370 U	390 U	370 U	400 U	380 U	360 U
2,4-DIMETHYLPHENOL	370 U	390 U	370 U	400 U	380 U	360 U
BIS(2-CHLOROETHOXY)METHANE	370 U	390 U	370 U	400 U	380 U	360 U
2,4-DICHLOROPHENOL	370 U	390 U	370 U	400 U	380 U	360 U
1,2,4-TRICHLOROBENZENE	370 U	390 U	370 U	400 U	380 U	360 U
NAPHTHALENE	370 U	390 U	370 U	400 U	380 U	360 U
4-CHLOROANILINE	370 U	390 U	370 U	400 U	380 U	360 U
HEXACHLOROBUTADIENE	370 U	390 U	370 U	400 U	380 U	360 U
4-CHLORO-3-METHYLPHENOL	370 U	390 U	370 U	400 U	380 U	360 U
2-METHYLNAPHTHALENE	370 U	390 U	370 U	400 U	380 U	360 U
HEXACHLOROCYCLOPENTADIENE	370 U	390 U	370 U	400 U	380 U	360 U
2,4,6-TRICHLOROPHENOL	370 U	390 U	370 U	400 U	380 U	360 U
2,4,5-TRICHLOROPHENOL	920 U	980 U	930 U	990 U	940 U	900 U
2-CHLORONAPHTHALENE	370 U	390 U	370 U	400 U	380 U	360 U
2-NITROANILINE	920 U	980 U	930 U	990 U	940 U	900 U
DIMETHYLPHTHALATE	370 U	390 U	370 U	400 U	380 U	360 U
ACENAPHTHYLENE	370 U	390 U	370 U	400 U	380 U	360 U
2,6-DINITROTOLUENE	370 U	390 U	370 U	400 U	380 U	360 U
3-NITROANILINE	920 U	980 U	930 U	990 U	940 U	900 U
ACENAPHTHENE	370 U	390 U	370 U	400 U	380 U	360 U
2,4-DINITROPHENOL	920 U	980 U	930 U	990 U	940 U	900 U

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
SUBSURFACE SOIL - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	54-SB02-01	54-SB02-04	54-SB03-01	54-SB03-04	54-SB04-04	54-SB05-01
DATE SAMPLED	03/11/95	03/11/95	03/11/95	03/11/95	03/11/95	03/11/95
DEPTH	1-3'	7-9'	1-3'	7-9'	7-9'	1-3'
UNITS	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SEMIVOLATILES cont.						
4-NITROPHENOL	920 U	980 U	930 U	990 U	940 U	900 U
DIBENZOFURAN	370 U	390 U	370 U	400 U	380 U	360 U
2,4-DINITROTOLUENE	370 U	390 U	370 U	400 U	380 U	360 U
DIETHYLPHTHALATE	370 U	390 U	370 U	400 U	380 U	360 U
4-CHLOROPHENYL-PHENYLETHER	370 U	390 U	370 U	400 U	380 U	360 U
FLUORENE	370 U	390 U	370 U	400 U	380 U	360 U
4-NITROANILINE	920 U	980 U	930 U	990 U	940 U	900 U
4,6-DINITRO-2-METHYLPHENOL	920 U	980 U	930 U	990 U	940 U	900 U
N-NITROSODIPHENYLAMINE (1)	370 U	390 U	370 U	400 U	380 U	360 U
4-BROMOPHENYL-PHENYLETHER	370 U	390 U	370 U	400 U	380 U	360 U
HEXACHLOROBENZENE	370 U	390 U	370 U	400 U	380 U	360 U
PENTACHLOROPHENOL	920 U	980 U	930 U	990 U	940 U	900 U
PHENANTHRENE	370 U	390 U	370 U	400 U	380 U	360 U
ANTHRACENE	370 U	390 U	370 U	400 U	380 U	360 U
CARBAZOLE	370 U	390 U	370 U	400 U	380 U	360 U
DI-N-BUTYLPHTHALATE	1500 U	880 U	540 U	1500 U	380 U	360 U
FLUORANTHENE	370 U	390 U	370 U	400 U	380 U	360 U
PYRENE	370 U	390 U	370 U	400 U	380 U	360 U
BUTYLBENZYLPHTHALATE	370 U	390 U	370 U	400 U	380 U	360 U
3,3'-DICHLOROBENZIDINE	370 U	390 U	370 U	400 U	380 U	360 U
BENZO(A)ANTHRACENE	370 U	390 U	370 U	400 U	380 U	360 U
CHRYSENE	370 U	390 U	370 U	400 U	380 U	360 U
BIS(2-ETHYLHEXYL)PHTHALATE	370 U	390 U	370 U	400 U	380 U	360 U
DI-N-OCTYL PHTHALATE	370 U	390 U	370 U	400 U	380 U	360 U
BENZO(B)FLUORANTHENE	370 U	390 U	370 U	400 U	380 U	360 U
BENZO(K)FLUORANTHENE	370 U	390 U	370 U	400 U	380 U	360 U
BENZO(A)PYRENE	370 U	390 U	370 U	400 U	380 U	360 U
INDENO(1,2,3-CD)PYRENE	370 U	390 U	370 U	400 U	380 U	360 U
DIBENZO(A,H)ANTHRACENE	370 U	390 U	370 U	400 U	380 U	360 U
BENZO(G,H,I)PERYLENE	370 U	390 U	370 U	400 U	380 U	360 U

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
SUBSURFACE SOIL - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	54-SB02-01	54-SB02-04	54-SB03-01	54-SB03-04	54-SB04-04	54-SB05-01
DATE SAMPLED	03/11/95	03/11/95	03/11/95	03/11/95	03/11/95	03/11/95
DEPTH	1-3'	7-9'	1-3'	7-9'	7-9'	1-3'
UNITS	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
PCBs						
AROCLOR-1016	NA	NA	37 UJ	40 UJ	NA	36 UJ
AROCLOR-1221	NA	NA	74 UJ	80 UJ	NA	73 UJ
AROCLOR-1232	NA	NA	37 UJ	40 UJ	NA	36 UJ
AROCLOR-1242	NA	NA	37 UJ	40 UJ	NA	36 UJ
AROCLOR-1248	NA	NA	37 UJ	40 UJ	NA	36 UJ
AROCLOR-1254	NA	NA	37 UJ	40 UJ	NA	36 UJ
AROCLOR-1260	NA	NA	37 UJ	40 UJ	NA	36 UJ

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
SUBSURFACE SOIL - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	54-SB05-04	54-SB06-02	54-SB06-05	54-SB07-05	54-SB08-01	54-SB08-04
DATE SAMPLED	03/11/95	03/12/95	03/12/95	03/12/95	03/11/95	03/11/95
DEPTH	7-9'	3-5'	9-11'	9-11'	1-3'	7-9'
UNITS	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
VOLATILES						
CHLOROMETHANE	11 U	12 U	12 U	12 U	120 U	12 U
BROMOMETHANE	11 U	12 U	12 U	12 U	120 U	12 U
VINYL CHLORIDE	11 U	12 U	12 U	12 U	120 U	12 U
CHLOROETHANE	11 U	12 U	12 U	12 U	120 U	12 U
METHYLENE CHLORIDE	11 U	12 U	12 U	12 U	120 U	12 U
ACETONE	15 U	16 U	34 U	20 U	120 U	14 U
CARBON DISULFIDE	11 U	12 U	12 U	12 U	120 U	12 U
1,1-DICHLOROETHENE	11 U	12 U	12 U	12 U	120 U	12 U
1,1-DICHLOROETHANE	11 U	12 U	12 U	12 U	120 U	12 U
1,2-DICHLOROETHENE (TOTAL)	11 U	12 U	12 U	12 U	120 U	12 U
CHLOROFORM	11 U	12 U	12 U	12 U	120 U	12 U
1,2-DICHLOROETHANE	11 U	12 U	12 U	12 U	120 U	12 U
2-BUTANONE	11 U	12 U	12 U	12 U	120 U	12 U
1,1,1-TRICHLOROETHANE	11 U	12 U	12 U	12 U	120 U	12 U
CARBON TETRACHLORIDE	11 U	12 U	12 U	12 U	120 U	12 U
BROMODICHLOROMETHANE	11 U	12 U	12 U	12 U	120 U	12 U
1,2-DICHLOROPROPANE	11 U	12 U	12 U	12 U	120 U	12 U
CIS-1,3-DICHLOROPROPENE	11 U	12 U	12 U	12 U	120 U	12 U
TRICHLOROETHENE	11 U	12 U	12 U	12 U	120 U	12 U
DIBROMOCHLOROMETHANE	11 U	12 U	12 U	12 U	120 U	12 U
1,1,2-TRICHLOROETHANE	11 U	12 U	12 U	12 U	120 U	12 U
BENZENE	11 U	12 U	12 U	12 U	120 U	12 U
TRANS-1,3-DICHLOROPROPENE	11 U	12 U	12 U	12 U	120 U	12 U
BROMOFORM	11 U	12 U	12 U	12 U	120 U	12 U
4-METHYL-2-PENTANONE	11 U	12 U	12 U	12 U	120 U	12 U
2-HEXANONE	11 U	12 U	12 U	12 U	120 U	12 U
TETRACHLOROETHENE	11 U	12 U	12 U	12 U	120 U	12 U
I,1,2,2-TETRACHLOROETHANE	11 U	12 U	12 U	12 U	120 U	12 U
TOLUENE	11 U	12 U	12 U	12 U	120 U	12 U
CHLOROBENZENE	11 U	12 U	12 U	12 U	120 U	12 U
ETHYLBENZENE	11 U	12 U	12 U	12 U	120 U	12 U
STYRENE	11 U	12 U	12 U	12 U	120 U	12 U
XYLENE (TOTAL)	11 U	12 U	12 U	12 U	300	12 U

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
SUBSURFACE SOIL - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	54-SB05-04	54-SB06-02	54-SB06-05	54-SB07-05	54-SB08-01	54-SB08-04
DATE SAMPLED	03/11/95	03/12/95	03/12/95	03/12/95	03/11/95	03/11/95
DEPTH	7-9'	3-5'	9-11'	9-11'	1-3'	7-9'
UNITS	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SEMIVOLATILES						
PHENOL	340 U	380 U	400 U	400 U	390 U	380 U
BIS(2-CHLOROETHYL)ETHER	340 U	380 U	400 U	400 U	390 U	380 U
2-CHLOROPHENOL	340 U	380 U	400 U	400 U	390 U	380 U
1,3-DICHLOROBENZENE	340 U	380 U	400 U	400 U	390 U	380 U
1,4-DICHLOROBENZENE	340 U	380 U	400 U	400 U	390 U	380 U
1,2-DICHLOROBENZENE	340 U	380 U	400 U	400 U	390 U	380 U
2-METHYLPHENOL	340 U	380 U	400 U	400 U	390 U	380 U
2,2'-OXYBIS(1-CHLOROPROPANE)	340 U	380 U	400 U	400 U	390 U	380 U
4-METHYLPHENOL	340 U	380 U	400 U	400 U	390 U	380 U
N-NITROSO-DI-N-PROPYLAMINE	340 U	380 U	400 U	400 U	390 U	380 U
HEXACHLOROETHANE	340 U	380 U	400 U	400 U	390 U	380 U
NITROBENZENE	340 U	380 U	400 U	400 U	390 U	380 U
ISOPHORONE	340 U	380 U	400 U	400 U	390 U	380 U
2-NITROPHENOL	340 U	380 U	400 U	400 U	390 U	380 U
2,4-DIMETHYLPHENOL	340 U	380 U	400 U	400 U	390 U	380 U
BIS(2-CHLOROETHOXY)METHANE	340 U	380 U	400 U	400 U	390 U	380 U
2,4-DICHLOROPHENOL	340 U	380 U	400 U	400 U	390 U	380 U
1,2,4-TRICHLOROBENZENE	340 U	380 U	400 U	400 U	390 U	380 U
NAPHTHALENE	340 U	380 U	400 U	400 U	760	380 U
4-CHLOROANILINE	340 U	380 U	400 U	400 U	390 U	380 U
HEXACHLOROBUTADIENE	340 U	380 U	400 U	400 U	390 U	380 U
4-CHLORO-3-METHYLPHENOL	340 U	380 U	400 U	400 U	390 U	380 U
2-METHYLNAPHTHALENE	340 U	380 U	400 U	400 U	390 U	380 U
HEXACHLOROCYCLOPENTADIENE	340 U	380 U	400 U	400 U	390 U	380 U
2,4,6-TRICHLOROPHENOL	340 U	380 U	400 U	400 U	390 U	380 U
2,4,5-TRICHLOROPHENOL	860 U	960 U	1000 U	1000 U	980 U	960 U
2-CHLORONAPHTHALENE	340 U	380 U	400 U	400 U	390 U	380 U
2-NITROANILINE	860 U	960 U	1000 U	1000 U	980 U	960 U
DIMETHYLPHTHALATE	340 U	380 U	400 U	400 U	390 U	380 U
ACENAPHTHYLENE	340 U	380 U	400 U	400 U	390 U	380 U
2,6-DINITROTOLUENE	340 U	380 U	400 U	400 U	390 U	380 U
3-NITROANILINE	860 U	960 U	1000 U	1000 U	980 U	960 U
ACENAPHTHENE	340 U	380 U	400 U	400 U	390 U	380 U
2,4-DINITROPHENOL	860 U	960 U	1000 U	1000 U	980 U	960 U

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
SUBSURFACE SOIL - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	54-SB05-04	54-SB06-02	54-SB06-05	54-SB07-05	54-SB08-01	54-SB08-04
DATE SAMPLED	03/11/95	03/12/95	03/12/95	03/12/95	03/11/95	03/11/95
DEPTH	7-9'	3-5'	9-11'	9-11'	1-3'	7-9'
UNITS	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SEMIVOLATILES cont.						
4-NITROPHENOL	860 U	960 U	1000 U	1000 U	980 U	960 U
DIBENZOFURAN	340 U	380 U	400 U	400 U	390 U	380 U
2,4-DINITROTOLUENE	340 U	380 U	400 U	400 U	390 U	380 U
DIETHYLPHTHALATE	340 U	380 U	400 U	400 U	390 U	380 U
4-CHLOROPHENYL-PHENYLETHER	340 U	380 U	400 U	400 U	390 U	380 U
FLUORENE	340 U	380 U	400 U	400 U	390 U	380 U
4-NITROANILINE	860 U	960 U	1000 U	1000 U	980 U	960 U
4,6-DINITRO-2-METHYLPHENOL	860 U	960 U	1000 U	1000 U	980 U	960 U
N-NITROSODIPHENYLAMINE (1)	340 U	380 U	400 U	400 U	390 U	380 U
4-BROMOPHENYL-PHENYLETHER	340 U	380 U	400 U	400 U	390 U	380 U
HEXACHLOROBENZENE	340 U	380 U	400 U	400 U	390 U	380 U
PENTACHLOROPHENOL	860 U	960 U	1000 U	1000 U	980 U	960 U
PHENANTHRENE	340 U	380 U	400 U	400 U	390 U	380 U
ANTHRACENE	340 U	380 U	400 U	400 U	390 U	380 U
CARBAZOLE	340 U	380 U	400 U	400 U	390 U	380 U
DI-N-BUTYLPHTHALATE	340 U	380 U	400 U	400 U	390 U	380 U
FLUORANTHENE	340 U	380 U	400 U	400 U	390 U	380 U
PYRENE	340 U	380 U	400 U	400 U	390 U	380 U
BUTYLBENZYLPHTHALATE	340 U	380 U	400 U	400 U	390 U	380 U
3,3'-DICHLOROBENZIDINE	340 U	380 U	400 U	400 U	390 U	380 U
BENZO(A)ANTHRACENE	340 U	380 U	400 U	400 U	390 U	380 U
CHRYSENE	340 U	380 U	400 U	400 U	390 U	380 U
BIS(2-ETHYLHEXYL)PHTHALATE	340 U	380 U	400 U	400 U	390 U	380 U
DI-N-OCTYL PHTHALATE	340 U	380 U	400 U	400 U	390 U	380 U
BENZO(B)FLUORANTHENE	340 U	380 U	400 U	400 U	390 U	380 U
BENZO(K)FLUORANTHENE	340 U	380 U	400 U	400 U	390 U	380 U
BENZO(A)PYRENE	340 U	380 U	400 U	400 U	390 U	380 U
INDENO(1,2,3-CD)PYRENE	340 U	380 U	400 U	400 U	390 U	380 U
DIBENZO(A,H)ANTHRACENE	340 U	380 U	400 U	400 U	390 U	380 U
BENZO(G,H,I)PERYLENE	340 U	380 U	400 U	400 U	390 U	380 U

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
SUBSURFACE SOIL - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	54-SB05-04	54-SB06-02	54-SB06-05	54-SB07-05	54-SB08-01	54-SB08-04
DATE SAMPLED	03/11/95	03/12/95	03/12/95	03/12/95	03/11/95	03/11/95
DEPTH	7-9'	3-5'	9-11'	9-11'	1-3'	7-9'
UNITS	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
PCBs						
AROCLOR-1016	35 UJ	NA	NA	NA	NA	NA
AROCLOR-1221	69 UJ	NA	NA	NA	NA	NA
AROCLOR-1232	35 UJ	NA	NA	NA	NA	NA
AROCLOR-1242	35 UJ	NA	NA	NA	NA	NA
AROCLOR-1248	35 UJ	NA	NA	NA	NA	NA
AROCLOR-1254	35 UJ	NA	NA	NA	NA	NA
AROCLOR-1260	35 UJ	NA	NA	NA	NA	NA

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
SUBSURFACE SOIL - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	54-SB09-03
DATE SAMPLED	03/11/95
DEPTH	5-7'
UNITS	UG/KG
VOLATILES	
CHLOROMETHANE	11 U
BROMOMETHANE	11 U
VINYL CHLORIDE	11 U
CHLOROETHANE	11 U
METHYLENE CHLORIDE	11 U
ACETONE	40 U
CARBON DISULFIDE	11 U
1,1-DICHLOROETHENE	11 U
1,1-DICHLOROETHANE	11 U
1,2-DICHLOROETHENE (TOTAL)	11 U
CHLOROFORM	11 U
1,2-DICHLOROETHANE	11 U
2-BUTANONE	11 U
1,1,1-TRICHLOROETHANE	11 U
CARBON TETRACHLORIDE	11 U
BROMODICHLOROMETHANE	11 U
1,2-DICHLOROPROPANE	11 U
CIS-1,3-DICHLOROPROPENE	11 U
TRICHLOROETHENE	11 U
DIBROMOCHLOROMETHANE	11 U
1,1,2-TRICHLOROETHANE	11 U
BENZENE	11 U
TRANS-1,3-DICHLOROPROPENE	11 U
BROMOFORM	11 U
4-METHYL-2-PENTANONE	11 U
2-HEXANONE	11 U
TETRACHLOROETHENE	11 U
1,1,2,2-TETRACHLOROETHANE	11 U
TOLUENE	11 U
CHLOROBENZENE	11 U
ETHYLBENZENE	11 U
STYRENE	11 U
XYLENE (TOTAL)	12

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
SUBSURFACE SOIL - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	54-SB09-03
DATE SAMPLED	03/11/95
DEPTH	5-7'
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	940 U
2-CHLORONAPHTHALENE	380 U
2-NITROANILINE	940 U
DIMETHYLPHTHALATE	380 U
ACENAPHTHYLENE	380 U
2,6-DINITROTOLUENE	380 U
3-NITROANILINE	940 U
ACENAPHTHENE	380 U
2,4-DINITROPHENOL	940 U

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
SUBSURFACE SOIL - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	54-SB09-03
DATE SAMPLED	03/11/95
DEPTH	5-7'
UNITS	UG/KG
SEMIVOLATILES cont.	
4-NITROPHENOL	940 U
DIBENZOFURAN	380 U
2,4-DINITROTOLUENE	380 U
DIETHYLPHTHALATE	380 U
4-CHLOROPHENYL-PHENYLETHER	380 U
FLUORENE	380 U
4-NITROANILINE	940 U
4,6-DINITRO-2-METHYLPHENOL	940 U
N-NITROSODIPHENYLAMINE (1)	380 U
4-BROMOPHENYL-PHENYLETHER	380 U
HEXACHLOROBENZENE	380 U
PENTACHLOROPHENOL	940 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 54, CRASH CREW FIRE TRAINING BURN PIT
SUBSURFACE SOIL - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	54-SB09-03
DATE SAMPLED	03/11/95
DEPTH	5-7'
UNITS	UG/KG
PCBs	
AROCLOR-1016	NA
AROCLOR-1221	NA
AROCLOR-1232	NA
AROCLOR-1242	NA
AROCLOR-1248	NA
AROCLOR-1254	NA
AROCLOR-1260	NA

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
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	120 U	ND	ND		0/19
BROMOMETHANE	11 U	120 U	ND	ND		0/19
VINYL CHLORIDE	11 U	120 U	ND	ND		0/19
CHLOROETHANE	11 U	120 U	ND	ND		0/19
METHYLENE CHLORIDE	11 U	120 U	ND	ND		0/19
ACETONE	11 UJ	120 U	1200 J	1200 J	54-DD-SB05-01	1/19
CARBON DISULFIDE	11 U	120 U	ND	ND		0/19
1,1-DICHLOROETHENE	11 U	120 U	ND	ND		0/19
1,1-DICHLOROETHANE	11 U	120 U	ND	ND		0/19
1,2-DICHLOROETHENE (TOTAL)	11 U	120 U	ND	ND		0/19
CHLOROFORM	11 U	120 U	ND	ND		0/19
1,2-DICHLOROETHANE	11 U	120 U	ND	ND		0/19
2-BUTANONE	11 UJ	120 U	ND	ND		0/19
1,1,1-TRICHLOROETHANE	11 U	120 U	ND	ND		0/19
CARBON TETRACHLORIDE	11 U	120 U	ND	ND		0/19
BROMODICHLOROMETHANE	11 U	120 U	ND	ND		0/19
1,2-DICHLOROPROPANE	11 U	120 U	ND	ND		0/19
CIS-1,3-DICHLOROPROPENE	11 U	120 U	ND	ND		0/19
TRICHLOROETHENE	11 U	120 U	ND	ND		0/19
DIBROMOCHLOROMETHANE	11 U	120 U	ND	ND		0/19
1,1,2-TRICHLOROETHANE	11 U	120 U	ND	ND		0/19
BENZENE	11 U	120 U	ND	ND		0/19
TRANS-1,3-DICHLOROPROPENE	11 U	120 U	ND	ND		0/19
BROMOFORM	11 U	120 U	ND	ND		0/19
4-METHYL-2-PENTANONE	11 UJ	120 U	ND	ND		0/19
2-HEXANONE	11 UJ	120 U	ND	ND		0/19
TETRACHLOROETHENE	11 U	120 U	ND	ND		0/19
1,1,2,2-TETRACHLOROETHANE	11 U	120 U	ND	ND		0/19
TOLUENE	11 U	120 U	ND	ND		0/19
CHLOROBENZENE	11 U	120 U	ND	ND		0/19
ETHYLBENZENE	11 U	120 U	ND	ND		0/19
STYRENE	11 U	120 U	ND	ND		0/19
XYLENE (TOTAL)	11 U	120 U	12	300	54-SB08-01	2/19

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
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	340 U	420 U	ND	ND		0/19
BIS(2-CHLOROETHYL)ETHER	340 U	420 U	ND	ND		0/19
2-CHLOROPHENOL	340 U	420 U	ND	ND		0/19
1,3-DICHLOROBENZENE	340 U	420 U	ND	ND		0/19
1,4-DICHLOROBENZENE	340 U	420 U	ND	ND		0/19
1,2-DICHLOROBENZENE	340 U	420 U	ND	ND		0/19
2-METHYLPHENOL	340 U	420 U	ND	ND		0/19
2,2'-OXYBIS(1-CHLOROPROPANE)	340 U	420 U	ND	ND		0/19
4-METHYLPHENOL	340 U	420 U	ND	ND		0/19
N-NITROSO-DI-N-PROPYLAMINE	340 U	420 U	ND	ND		0/19
HEXACHLOROETHANE	340 U	420 U	ND	ND		0/19
NITROBENZENE	340 U	420 U	ND	ND		0/19
ISOPHORONE	340 U	420 U	ND	ND		0/19
2-NITROPHENOL	340 U	420 U	ND	ND		0/19
2,4-DIMETHYLPHENOL	340 U	420 U	ND	ND		0/19
BIS(2-CHLOROETHOXY)METHANE	340 U	420 U	ND	ND		0/19
2,4-DICHLOROPHENOL	340 U	420 U	ND	ND		0/19
1,2,4-TRICHLOROBENZENE	340 U	420 U	ND	ND		0/19
NAPHTHALENE	340 U	420 U	760	760	54-SB08-01	1/19
4-CHLOROANILINE	340 U	420 U	ND	ND		0/19
HEXACHLOROBUTADIENE	340 U	420 U	ND	ND		0/19
4-CHLORO-3-METHYLPHENOL	340 U	420 U	ND	ND		0/19
2-METHYLNAPHTHALENE	340 U	420 U	1700	1700	54-DD-SB05-01	1/19
HEXACHLOROCYCLOPENTADIENE	340 U	420 U	ND	ND		0/19
2,4,6-TRICHLOROPHENOL	340 U	420 U	ND	ND		0/19
2,4,5-TRICHLOROPHENOL	860 U	1100 U	ND	ND		0/19
2-CHLORONAPHTHALENE	340 U	420 U	ND	ND		0/19
2-NITROANILINE	860 U	1100 U	ND	ND		0/19
DIMETHYLPHTHALATE	340 U	420 U	ND	ND		0/19
ACENAPHTHYLENE	340 U	420 U	ND	ND		0/19
2,6-DINITROTOLUENE	340 U	420 U	ND	ND		0/19
3-NITROANILINE	860 U	1100 U	ND	ND		0/19
ACENAPHTHENE	340 U	420 U	94 J	94 J	54-DD-SB05-01	1/19
2,4-DINITROPHENOL	860 U	1100 U	ND	ND		0/19

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
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	860 U	1100 U	ND	ND		0/19
DIBENZOFURAN	340 U	420 U	ND	ND		0/19
2,4-DINITROTOLUENE	340 U	420 U	ND	ND		0/19
DIETHYLPHTHALATE	340 U	420 U	ND	ND		0/19
4-CHLOROPHENYL-PHENYLETHER	340 U	420 U	ND	ND		0/19
FLUORENE	340 U	420 U	420	420	54-DD-SB05-01	1/19
4-NITROANILINE	860 U	1100 U	ND	ND		0/19
4,6-DINITRO-2-METHYLPHENOL	860 U	1100 U	ND	ND		0/19
N-NITROSODIPHENYLAMINE (1)	340 U	420 U	ND	ND		0/19
4-BROMOPHENYL-PHENYLETHER	340 U	420 U	ND	ND		0/19
HEXACHLOROBENZENE	340 U	420 U	ND	ND		0/19
PENTACHLOROPHENOL	860 U	1100 U	ND	ND		0/19
PHENANTHRENE	340 U	420 U	160 J	160 J	54-DD-SB05-01	1/19
ANTHRACENE	340 U	420 U	ND	ND		0/19
CARBAZOLE	340 U	420 U	ND	ND		0/19
DI-N-BUTYLPHTHALATE	340 U	2000 U	ND	ND		0/19
FLUORANTHENE	340 U	420 U	ND	ND		0/19
PYRENE	340 U	420 U	43 J	43 J	54-DD-SB05-01	1/19
BUTYLBENZYLPHTHALATE	340 U	420 U	56 J	56 J	54-DD-SB03-01	1/19
3,3'-DICHLOROBENZIDINE	340 U	420 U	ND	ND		0/19
BENZO(A)ANTHRACENE	340 U	420 U	ND	ND		0/19
CHRYSENE	340 U	420 U	ND	ND		0/19
BIS(2-ETHYLHEXYL)PHTHALATE	340 U	420 U	49 J	49 J	54-DD-SB05-01	1/19
DI-N-OCTYL PHTHALATE	340 U	420 U	ND	ND		0/19
BENZO(B)FLUORANTHENE	340 U	420 U	ND	ND		0/19
BENZO(K)FLUORANTHENE	340 U	420 U	ND	ND		0/19
BENZO(A)PYRENE	340 U	420 U	ND	ND		0/19
INDENO(1,2,3-CD)PYRENE	340 U	420 U	ND	ND		0/19
DIBENZO(A,H)ANTHRACENE	340 U	420 U	ND	ND		0/19
BENZO(G,H,I)PERYLENE	340 U	420 U	ND	ND		0/19

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
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
PCBs						
AROCLOR-1016	35 UJ	41 U	ND	ND		0/8
AROCLOR-1221	69 UJ	83 U	ND	ND		0/8
AROCLOR-1232	35 UJ	41 U	ND	ND		0/8
AROCLOR-1242	35 UJ	41 U	ND	ND		0/8
AROCLOR-1248	35 UJ	41 U	ND	ND		0/8
AROCLOR-1254	35 UJ	41 U	ND	ND		0/8
AROCLOR-1260	35 UJ	41 U	ND	ND		0/8

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
SUBSURFACE SOIL - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
INORGANIC ANALYTES

LOCATION	54-DD-SB01-02	54-DD-SB02-02	54-DD-SB03-01	54-DD-SB04-01	54-SB03-01	54-SB03-04
DATE SAMPLED	03/10/95	03/10/95	03/10/95	03/10/95	03/11/95	03/11/95
DEPTH	3-5'	3-5'	1-3'	1-3'	1-3'	7-9'
UNITS	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG
TOTAL METALS						
ALUMINUM, TOTAL	1920	2350	2870	13400	6000	2680
ANTIMONY, TOTAL	4.4 UJ	4.1 UJ	4.6 UJ	4.8 UJ	2.4 UJ	2.3 UJ
ARSENIC, TOTAL	0.26 UJ	0.23 UJ	0.28 UJ	0.31 UJ	0.46 J	0.39 U
BARIUM, TOTAL	3	4.5	4.9	27.5	13.7	5.4
BERYLLIUM, TOTAL	0.19 U	0.18 U	0.2 U	0.21 U	0.067 U	0.06 U
CADMIUM, TOTAL	0.59 U	0.56 U	0.62 U	0.65 U	0.64 U	0.6 U
CALCIUM, TOTAL	60.9	74.9	2720	1100	5220	70.5
CHROMIUM, TOTAL	2.1 U	3.2	3.3	12	6	2.6
COBALT, TOTAL	0.64 U	0.6 U	0.66 U	1.2	0.51 U	0.48 U
COPPER, TOTAL	0.4 U	0.48	0.42 U	0.76	1.1	0.83 U
IRON, TOTAL	833	1040	801	3130	3150	1090
LEAD, TOTAL	1.7 J	3.2	11.5	10	6.5	3.3
MAGNESIUM, TOTAL	47.8	60.4	110	387	196	75.5
MANGANESE, TOTAL	1.8	2.8	3.1	7.4	6.4	1.9
MERCURY, TOTAL	0.1 U	0.09 U	0.11 U	0.095 U	0.087 U	0.08 U
NICKEL, TOTAL	3.3	6.2	2.4 U	2.5 U	1.3	4.9
POTASSIUM, TOTAL	146 U	137 U	151 U	248	91.4	72.9
SELENIUM, TOTAL	0.36 U	0.31 U	0.39 U	0.43 UJ	0.31 UJ	0.31 UJ
SILVER, TOTAL	0.64 U	0.6 U	0.66 U	0.7 U	0.56 U	0.52 U
SODIUM, TOTAL	6.5 U	11.7	6.7 U	10.3	26.7	12 U
THALLIUM, TOTAL	0.34 U	0.29 U	0.37 UJ	0.41 U	0.23 U	0.23 U
VANADIUM, TOTAL	2.5 U	3.3	3.1	12.6	8.6	4.4
ZINC, TOTAL	1.5	1.8	2	4	2	1.2

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
SUBSURFACE SOIL - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
INORGANIC ANALYTES

LOCATION	54-SB05-01	54-SB05-04
DATE SAMPLED	03/11/95	03/11/95
DEPTH	1-3'	7-9'
UNITS	MG/KG	MG/KG
TOTAL METALS		
ALUMINUM, TOTAL	4190	344
ANTIMONY, TOTAL	1.9 UJ	1.7 UJ
ARSENIC, TOTAL	0.4 U	0.36 U
BARIUM, TOTAL	13.1	1.1 U
BERYLLIUM, TOTAL	0.05 U	0.05 U
CADMIUM, TOTAL	0.51 U	0.46 U
CALCIUM, TOTAL	2500	16.7 U
CHROMIUM, TOTAL	3.9	0.88
COBALT, TOTAL	0.4 U	0.37 U
COPPER, TOTAL	0.81	0.64 U
IRON, TOTAL	2350	125
LEAD, TOTAL	8.8	1.4
MAGNESIUM, TOTAL	146	16.3
MANGANESE, TOTAL	7.5	0.38
MERCURY, TOTAL	0.1 U	0.08 U
NICKEL, TOTAL	1.1	3.5
POTASSIUM, TOTAL	105	18
SELENIUM, TOTAL	0.36 UJ	0.3 UJ
SILVER, TOTAL	0.44 U	0.4 U
SODIUM, TOTAL	38.6	5 U
THALLIUM, TOTAL	0.23 U	0.21 U
VANADIUM, TOTAL	5.8	0.54
ZINC, TOTAL	2.7	0.3 U

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
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	344	13400	54-DD-SB04-01	8/8
ANTIMONY, TOTAL	1.7 UJ	4.8 UJ	ND	ND		0/8
ARSENIC, TOTAL	0.23 UJ	0.4 U	0.46 J	0.46 J	54-SB03-01	1/8
BARIUM, TOTAL	1.1 U	1.1 U	3	27.5	54-DD-SB04-01	7/8
BERYLLIUM, TOTAL	0.05 U	0.21 U	ND	ND		0/8
CADMIUM, TOTAL	0.46 U	0.65 U	ND	ND		0/8
CALCIUM, TOTAL	16.7 U	16.7 U	60.9	5220	54-SB03-01	7/8
CHROMIUM, TOTAL	2.1 U	2.1 U	0.88	12	54-DD-SB04-01	7/8
COBALT, TOTAL	0.37 U	0.66 U	1.2	1.2	54-DD-SB04-01	1/8
COPPER, TOTAL	0.4 U	0.83 U	0.48	1.1	54-SB03-01	4/8
IRON, TOTAL	NA	NA	125	3150	54-SB03-01	8/8
LEAD, TOTAL	NA	NA	1.4	11.5	54-DD-SB03-01	8/8
MAGNESIUM, TOTAL	NA	NA	16.3	387	54-DD-SB04-01	8/8
MANGANESE, TOTAL	NA	NA	0.38	7.5	54-SB05-01	8/8
MERCURY, TOTAL	0.08 U	0.11 U	ND	ND		0/8
NICKEL, TOTAL	2.4 U	2.5 U	1.1	6.2	54-DD-SB02-02	6/8
POTASSIUM, TOTAL	137 U	151 U	18	248	54-DD-SB04-01	5/8
SELENIUM, TOTAL	0.3 UJ	0.43 UJ	ND	ND		0/8
SILVER, TOTAL	0.4 U	0.7 U	ND	ND		0/8
SODIUM, TOTAL	5 U	12 U	10.3	38.6	54-SB05-01	4/8
THALLIUM, TOTAL	0.21 U	0.41 U	ND	ND		0/8
VANADIUM, TOTAL	2.5 U	2.5 U	0.54	12.6	54-DD-SB04-01	7/8
ZINC, TOTAL	0.3 U	0.3 U	1.2	4	54-DD-SB04-01	7/8

GROUNDWATER

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
GROUNDWATER - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	54-GW01-01	54-GW02-01	54-GW03-01	54-GW04-01	54-GW05-01	54-GW06-01
DATE SAMPLED	03/28/95	03/28/95	03/28/95	03/28/95	03/28/95	03/28/95
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	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)	5 J	10 U	10 U	10 U	10 U	8 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	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	5 J	10 U	10 U	10 U	10 U	8 J
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	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 54, CRASH CREW FIRE TRAINING BURN PIT
GROUNDWATER - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	54-GW01-01	54-GW02-01	54-GW03-01	54-GW04-01	54-GW05-01	54-GW06-01
DATE SAMPLED	03/28/95	03/28/95	03/28/95	03/28/95	03/28/95	03/28/95
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 R	10 R	10 R	10 R
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	3 J
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	5 J	10 U	10 U	10 U	10 U	55
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	.1 J	10 U	10 U	10 U	24
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	24 U	24 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	24 U	24 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	24 U	24 U
ACENAPHTHENE	10 U	10 U	10 U	10 U	10 U	10 U
2,4-DINITROPHENOL	24 U	24 U	24 UJ	25 UJ	24 UJ	24 UJ

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
GROUNDWATER - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	54-GW01-01	54-GW02-01	54-GW03-01	54-GW04-01	54-GW05-01	54-GW06-01
DATE SAMPLED	03/28/95	03/28/95	03/28/95	03/28/95	03/28/95	03/28/95
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	24 U	24 U
DIBENZOFURAN	10 U	10 U	10 U	10 U	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
4-CHLOROPHENYL-PHENYLETHER	10 U	10 U	10 U	10 U	10 U	10 U
FLUORENE	10 U	10 U	10 U	10 U	10 U	10 U
4-NITROANILINE	24 U	24 U	24 U	25 U	24 U	24 U
4,6-DINITRO-2-METHYLPHENOL	24 U	24 U	24 U	25 U	24 U	24 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	24 U	24 U
PHENANTHRENE	10 U	10 U	10 U	10 U	10 U	10 U
ANTHRACENE	10 U	10 U	10 U	10 U	10 U	10 U
CARBAZOLE	10 U	10 U	10 U	10 U	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	10 U	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 54, CRASH CREW FIRE TRAINING BURN PIT
GROUNDWATER - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	54-GW01-01	54-GW02-01	54-GW03-01	54-GW04-01	54-GW05-01	54-GW06-01
DATE SAMPLED	03/28/95	03/28/95	03/28/95	03/28/95	03/28/95	03/28/95
UNITS	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
PESTICIDE/PCBS						
ALPHA-BHC	0.046 UJ	NA	NA	NA	NA	NA
BETA-BHC	0.046 UJ	NA	NA	NA	NA	NA
DELTA-BHC	0.046 UJ	NA	NA	NA	NA	NA
GAMMA-BHC (LINDANE)	0.046 UJ	NA	NA	NA	NA	NA
HEPTACHLOR	0.046 UJ	NA	NA	NA	NA	NA
ALDRIN	0.046 UJ	NA	NA	NA	NA	NA
HEPTACHLOR EPOXIDE	0.046 UJ	NA	NA	NA	NA	NA
ENDOSULFAN I	0.046 UJ	NA	NA	NA	NA	NA
DIELDRIN	0.093 UJ	NA	NA	NA	NA	NA
4,4'-DDE	0.093 UJ	NA	NA	NA	NA	NA
ENDRIN	0.093 UJ	NA	NA	NA	NA	NA
ENDOSULFAN II	0.093 UJ	NA	NA	NA	NA	NA
4,4'-DDD	0.093 UJ	NA	NA	NA	NA	NA
ENDOSULFAN SULFATE	0.093 UJ	NA	NA	NA	NA	NA
4,4'-DDT	0.093 UJ	NA	NA	NA	NA	NA
METHOXYCHLOR	0.46 UJ	NA	NA	NA	NA	NA
ENDRIN KETONE	0.093 UJ	NA	NA	NA	NA	NA
ENDRIN ALDEHYDE	0.093 UJ	NA	NA	NA	NA	NA
ALPHA-CHLORDANE	0.046 UJ	NA	NA	NA	NA	NA
GAMMA-CHLORDANE	0.046 UJ	NA	NA	NA	NA	NA
TOXAPHENE	4.6 UJ	NA	NA	NA	NA	NA
AROCLOR-1016	0.93 UJ	0.95 UJ	0.93 UJ	0.95 U	0.92 U	0.9 UJ
AROCLOR-1221	1.9 UJ	1.9 UJ	1.9 UJ	1.9 U	1.8 U	1.8 UJ
AROCLOR-1232	0.93 UJ	0.95 UJ	0.93 UJ	0.95 U	0.92 U	0.9 UJ
AROCLOR-1242	0.93 UJ	0.95 UJ	0.93 UJ	0.95 U	0.92 U	0.9 UJ
AROCLOR-1248	0.93 UJ	0.95 UJ	0.93 UJ	0.95 U	0.92 U	0.9 UJ
AROCLOR-1254	0.93 UJ	0.95 UJ	0.93 UJ	0.95 U	0.92 U	0.9 UJ
AROCLOR-1260	0.93 UJ	0.95 UJ	0.93 UJ	0.95 U	0.92 U	0.9 UJ

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
GROUNDWATER - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	54-GW07-01	54-GW08-01	54-GW09-01	54-GW10-01	54-TW01-01	54-TW02-01
DATE SAMPLED	03/28/95	04/18/95	04/18/95	04/17/95	03/12/95	03/12/95
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	4 J	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	9 J
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	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	6 J
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	27

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
GROUNDWATER - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	54-GW07-01	54-GW08-01	54-GW09-01	54-GW10-01	54-TW01-01	54-TW02-01
DATE SAMPLED	03/28/95	04/18/95	04/18/95	04/17/95	03/12/95	03/12/95
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 R	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	10 U	10 U	100
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	10 U	10 U	52
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	26 U	24 U	26 U	25 U
2-CHLORONAPHTHALENE	10 U	10 U	10 U	10 U	10 U	10 U
2-NITROANILINE	24 U	24 U	26 U	24 U	26 U	25 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	26 U	24 U	26 U	25 U
ACENAPHTHENE	10 U	10 U	10 U	10 U	10 U	10 U
2,4-DINITROPHENOL	24 UJ	24 UJ	26 UJ	24 UJ	26 U	25 U

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
GROUNDWATER - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	54-GW07-01	54-GW08-01	54-GW09-01	54-GW10-01	54-TW01-01	54-TW02-01
DATE SAMPLED	03/28/95	04/18/95	04/18/95	04/17/95	03/12/95	03/12/95
UNITS	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
SEMIVOLATILES cont.						
4-NITROPHENOL	24 U	24 U	26 U	24 U	26 U	25 U
DIBENZOFURAN	10 U	10 U	10 U	10 U	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	2 J
4-CHLOROPHENYL-PHENYLETHER	10 U	10 U	10 U	10 U	10 U	10 U
FLUORENE	10 U	10 U	10 U	10 U	10 U	10 U
4-NITROANILINE	24 U	24 U	26 U	24 U	26 U	25 U
4,6-DINITRO-2-METHYLPHENOL	24 U	24 U	26 U	24 U	26 U	25 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	26 U	24 U	26 U	25 U
PHENANTHRENE	10 U	10 U	10 U	10 U	10 U	10 U
ANTHRACENE	10 U	10 U	10 U	10 U	10 U	10 U
CARBAZOLE	10 U	10 U	10 U	10 U	10 U	10 U
DI-N-BUTYLPHTHALATE	10 U	10 U	2 J	1 J	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 UJ
BUTYLBENZYLPHTHALATE	10 U	10 U	10 U	10 U	10 U	10 UJ
3,3'-DICHLOROBENZIDINE	10 U	10 U	10 U	10 U	10 U	10 UJ
BENZO(A)ANTHRACENE	10 U	10 U	10 U	10 U	10 U	10 UJ
CHRYSENE	10 U	10 U	10 U	10 U	10 U	10 UJ
BIS(2-ETHYLHEXYL)PHTHALATE	10 U	10 U	1 J	1 J	10 U	10 UJ
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 54, CRASH CREW FIRE TRAINING BURN PIT
GROUNDWATER - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	54-GW07-01	54-GW08-01	54-GW09-01	54-GW10-01	54-TW01-01	54-TW02-01
DATE SAMPLED	03/28/95	04/18/95	04/18/95	04/17/95	03/12/95	03/12/95
UNITS	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
PESTICIDE/PCBS						
ALPHA-BHC	NA	NA	NA	NA	NA	NA
BETA-BHC	NA	NA	NA	NA	NA	NA
DELTA-BHC	NA	NA	NA	NA	NA	NA
GAMMA-BHC (LINDANE)	NA	NA	NA	NA	NA	NA
HEPTACHLOR	NA	NA	NA	NA	NA	NA
ALDRIN	NA	NA	NA	NA	NA	NA
HEPTACHLOR EPOXIDE	NA	NA	NA	NA	NA	NA
ENDOSULFAN I	NA	NA	NA	NA	NA	NA
DIELDRIN	NA	NA	NA	NA	NA	NA
4,4'-DDE	NA	NA	NA	NA	NA	NA
ENDRIN	NA	NA	NA	NA	NA	NA
ENDOSULFAN II	NA	NA	NA	NA	NA	NA
4,4'-DDD	NA	NA	NA	NA	NA	NA
ENDOSULFAN SULFATE	NA	NA	NA	NA	NA	NA
4,4'-DDT	NA	NA	NA	NA	NA	NA
METHOXYCHLOR	NA	NA	NA	NA	NA	NA
ENDRIN KETONE	NA	NA	NA	NA	NA	NA
ENDRIN ALDEHYDE	NA	NA	NA	NA	NA	NA
ALPHA-CHLORDANE	NA	NA	NA	NA	NA	NA
GAMMA-CHLORDANE	NA	NA	NA	NA	NA	NA
TOXAPHENE	NA	NA	NA	NA	NA	NA
AROCLOR-1016	0.93 UJ	0.96 U	1 U	0.99 UJ	1 UJ	1 UJ
AROCLOR-1221	1.9 UJ	1.9 U	2.1 U	2 UJ	2 UJ	2 UJ
AROCLOR-1232	0.93 UJ	0.96 U	1 U	0.99 UJ	1 UJ	1 UJ
AROCLOR-1242	0.93 UJ	0.96 U	1 U	0.99 UJ	1 UJ	1 UJ
AROCLOR-1248	0.93 UJ	0.96 U	1 U	0.99 UJ	1 UJ	1 UJ
AROCLOR-1254	0.93 UJ	0.96 U	1 U	0.99 UJ	1 UJ	1 UJ
AROCLOR-1260	0.93 UJ	0.96 U	1 U	0.99 UJ	1 UJ	1 UJ

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
GROUNDWATER - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	54-TW03-01	54-TW04-01	54-TW05-01	54-TW06-01	54-TW07-01
DATE SAMPLED	03/12/95	04/11/95	04/11/95	04/11/95	04/11/95
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	10 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)	23	10 U	10 U	10 U	10 UJ
CHLOROFORM	10 U	10 U	10 U	10 U	10 U
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	1 J	10 U	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	38	40	25	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	83	22	10 U	10 U	10 U
CHLOROBENZENE	10 U	10 U	10 U	10 U	10 U
ETHYLBENZENE	25	26	10 U	10 U	10 U
STYRENE	10 U	10 U	10 U	10 U	10 U
XYLENE (TOTAL)	130	30	10 U	10 U	10 U

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
GROUNDWATER - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	54-TW03-01	54-TW04-01	54-TW05-01	54-TW06-01	54-TW07-01
DATE SAMPLED	03/12/95	04/11/95	04/11/95	04/11/95	04/11/95
UNITS	UG/L	UG/L	UG/L	UG/L	UG/L
SEMIVOLATILES					
PHENOL	100 U	1 J	11 U	10 U	10 U
BIS(2-CHLOROETHYL)ETHER	100 U	11 U	11 U	10 U	10 U
2-CHLOROPHENOL	100 U	11 U	11 U	10 U	10 U
1,3-DICHLOROBENZENE	100 U	11 U	11 U	10 U	10 U
1,4-DICHLOROBENZENE	100 U	11 U	11 U	10 U	10 U
1,2-DICHLOROBENZENE	100 U	11 U	11 U	10 U	10 U
2-METHYLPHENOL	100 U	11 U	11 U	10 U	10 U
2,2'-OXYBIS(1-CHLOROPROPANE)	100 U	11 U	11 U	10 U	10 U
4-METHYLPHENOL	100 U	11 U	11 U	10 U	10 U
N-NITROSO-DI-N-PROPYLAMINE	100 U	11 U	11 U	10 U	10 U
HEXACHLOROETHANE	100 U	11 U	11 U	10 U	10 U
NITROBENZENE	100 U	2 J	11 U	10 U	10 U
ISOPHORONE	100 U	11 U	11 U	10 U	10 U
2-NITROPHENOL	100 U	11 U	11 U	10 U	10 U
2,4-DIMETHYLPHENOL	100 U	11 U	11 U	10 U	10 U
BIS(2-CHLOROETHOXY)METHANE	100 U	11 U	11 U	10 U	10 U
2,4-DICHLOROPHENOL	100 U	11 U	11 U	10 U	10 U
1,2,4-TRICHLOROBENZENE	100 U	11 U	11 U	10 U	10 U
NAPHTHALENE	240	56	99	10 U	1 J
4-CHLOROANILINE	100 U	11 U	11 U	10 U	10 U
HEXACHLOROBUTADIENE	100 U	11 U	11 U	10 U	10 U
4-CHLORO-3-METHYLPHENOL	100 U	11 U	11 U	10 U	10 U
2-METHYLNAPHTHALENE	160	44	16	10 U	10 U
HEXACHLOROCYCLOPENTADIENE	100 U	11 U	11 U	10 U	10 U
2,4,6-TRICHLOROPHENOL	100 U	11 U	11 U	10 U	10 U
2,4,5-TRICHLOROPHENOL	260 U	27 U	28 U	24 U	26 U
2-CHLORONAPHTHALENE	100 U	11 U	11 U	10 U	10 U
2-NITROANILINE	260 U	27 U	28 U	24 U	26 U
DIMETHYLPHTHALATE	100 U	11 U	11 U	10 U	10 U
ACENAPHTHYLENE	100 U	11 U	11 U	10 U	10 U
2,6-DINITROTOLUENE	100 U	11 U	11 U	10 U	10 U
3-NITROANILINE	260 U	27 U	28 U	24 U	26 U
ACENAPHTHENE	100 U	11 U	11 U	10 U	10 U
2,4-DINITROPHENOL	260 U	27 U	28 U	24 U	26 U

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
GROUNDWATER - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	54-TW03-01	54-TW04-01	54-TW05-01	54-TW06-01	54-TW07-01
DATE SAMPLED	03/12/95	04/11/95	04/11/95	04/11/95	04/11/95
UNITS	UG/L	UG/L	UG/L	UG/L	UG/L
SEMIVOLATILES cont.					
4-NITROPHENOL	260 U	27 U	28 U	24 U	26 U
DIBENZOFURAN	100 U	11 U	11 U	10 U	10 U
2,4-DINITROTOLUENE	100 U	11 U	11 U	10 U	10 U
DIETHYLPHTHALATE	37 J	3 J	1 J	10 U	10 U
4-CHLOROPHENYL-PHENYLETHER	100 U	11 U	11 U	10 U	10 U
FLUORENE	100 U	11 U	11 U	10 U	10 U
4-NITROANILINE	260 U	27 U	28 U	24 U	26 U
4,6-DINITRO-2-METHYLPHENOL	260 U	27 U	28 U	24 U	26 U
N-NITROSODIPHENYLAMINE (1)	100 U	11 U	11 U	10 U	10 U
4-BROMOPHENYL-PHENYLETHER	100 U	11 U	11 U	10 U	10 U
HEXACHLOROBENZENE	100 U	11 U	11 U	10 U	10 U
PENTACHLOROPHENOL	260 U	27 U	28 U	24 U	26 U
PHENANTHRENE	100 U	11 U	11 U	10 U	10 U
ANTHRACENE	100 U	11 U	1 J	10 U	10 U
CARBAZOLE	100 U	11 U	11 U	10 U	10 U
DI-N-BUTYLPHTHALATE	100 U	11 U	11 U	10 U	10 U
FLUORANTHENE	100 U	11 U	11 U	10 U	10 U
PYRENE	100 U	11 U	11 U	10 U	10 U
BUTYLBENZYLPHTHALATE	100 U	11 U	11 U	10 U	10 U
3,3'-DICHLOROBENZIDINE	100 U	11 U	11 U	10 U	10 U
BENZO(A)ANTHRACENE	100 U	11 U	11 U	10 U	10 U
CHRYSENE	100 U	11 U	11 U	10 U	10 U
BIS(2-ETHYLHEXYL)PHTHALATE	100 U	11 U	11 U	10 U	10 U
DI-N-OCTYL PHTHALATE	100 U	11 U	11 U	10 U	10 U
BENZO(B)FLUORANTHENE	100 U	11 U	11 U	10 U	10 U
BENZO(K)FLUORANTHENE	100 U	11 U	11 U	10 U	10 U
BENZO(A)PYRENE	100 U	11 U	11 U	10 U	10 U
INDENO(1,2,3-CD)PYRENE	100 U	11 U	11 U	10 U	10 U
DIBENZO(A,H)ANTHRACENE	100 U	11 U	11 U	10 U	10 U
BENZO(G,H,I)PERYLENE	100 U	11 U	11 U	10 U	10 U

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
GROUNDWATER - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	54-TW03-01	54-TW04-01	54-TW05-01	54-TW06-01	54-TW07-01
DATE SAMPLED	03/12/95	04/11/95	04/11/95	04/11/95	04/11/95
UNITS	UG/L	UG/L	UG/L	UG/L	UG/L
PESTICIDE/PCBS					
ALPHA-BHC	NA	NA	NA	NA	NA
BETA-BHC	NA	NA	NA	NA	NA
DELTA-BHC	NA	NA	NA	NA	NA
GAMMA-BHC (LINDANE)	NA	NA	NA	NA	NA
HEPTACHLOR	NA	NA	NA	NA	NA
ALDRIN	NA	NA	NA	NA	NA
HEPTACHLOR EPOXIDE	NA	NA	NA	NA	NA
ENDOSULFAN I	NA	NA	NA	NA	NA
DIELDRIN	NA	NA	NA	NA	NA
4,4'-DDE	NA	NA	NA	NA	NA
ENDRIN	NA	NA	NA	NA	NA
ENDOSULFAN II	NA	NA	NA	NA	NA
4,4'-DDD	NA	NA	NA	NA	NA
ENDOSULFAN SULFATE	NA	NA	NA	NA	NA
4,4'-DDT	NA	NA	NA	NA	NA
METHOXYCHLOR	NA	NA	NA	NA	NA
ENDRIN KETONE	NA	NA	NA	NA	NA
ENDRIN ALDEHYDE	NA	NA	NA	NA	NA
ALPHA-CHLORDANE	NA	NA	NA	NA	NA
GAMMA-CHLORDANE	NA	NA	NA	NA	NA
TOXAPHENE	NA	NA	NA	NA	NA
AROCLOR-1016	10 U	NA	NA	NA	NA
AROCLOR-1221	20 U	NA	NA	NA	NA
AROCLOR-1232	10 U	NA	NA	NA	NA
AROCLOR-1242	10 U	NA	NA	NA	NA
AROCLOR-1248	10 U	NA	NA	NA	NA
AROCLOR-1254	10 U	NA	NA	NA	NA
AROCLOR-1260	10 U	NA	NA	NA	NA

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
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		0/17
BROMOMETHANE	10 U	10 U	ND	ND		0/17
VINYL CHLORIDE	10 U	10 U	ND	ND		0/17
CHLOROETHANE	10 U	10 U	ND	ND		0/17
METHYLENE CHLORIDE	10 U	10 U	ND	ND		0/17
ACETONE	10 U	10 U	ND	ND		0/17
CARBON DISULFIDE	10 U	10 U	4 J	4 J	54-GW10-01	1/17
1,1-DICHLOROETHENE	10 U	10 U	ND	ND		0/17
1,1-DICHLOROETHANE	10 U	10 U	ND	ND		0/17
1,2-DICHLOROETHENE (TOTAL)	10 U	10 U	5 J	23	54-TW03-01	3/17
CHLOROFORM	10 U	10 U	ND	ND		0/17
1,2-DICHLOROETHANE	10 U	10 U	ND	ND		0/17
2-BUTANONE	10 U	10 U	ND	ND		0/17
1,1,1-TRICHLOROETHANE	10 U	10 U	ND	ND		0/17
CARBON TETRACHLORIDE	10 U	10 U	ND	ND		0/17
BROMODICHLOROMETHANE	10 U	10 U	ND	ND		0/17
1,2-DICHLOROPROPANE	10 U	10 U	ND	ND		0/17
CIS-1,3-DICHLOROPROPENE	10 U	10 U	ND	ND		0/17
TRICHLOROETHENE	10 U	10 U	1 J	1 J	54-TW03-01	1/17
DIBROMOCHLOROMETHANE	10 U	10 U	ND	ND		0/17
1,1,2-TRICHLOROETHANE	10 U	10 U	ND	ND		0/17
BENZENE	10 U	10 U	5 J	40	54-TW04-01	6/17
TRANS-1,3-DICHLOROPROPENE	10 U	10 U	ND	ND		0/17
BROMOFORM	10 U	10 U	ND	ND		0/17
4-METHYL-2-PENTANONE	10 U	10 U	ND	ND		0/17
2-HEXANONE	10 U	10 U	ND	ND		0/17
TETRACHLOROETHENE	10 U	10 U	ND	ND		0/17
1,1,2,2-TETRACHLOROETHANE	10 U	10 U	ND	ND		0/17
TOLUENE	10 U	10 U	22	83	54-TW03-01	2/17
CHLOROBENZENE	10 U	10 U	ND	ND		0/17
ETHYLBENZENE	10 U	10 U	6 J	26	54-TW04-01	3/17
STYRENE	10 U	10 U	ND	ND		0/17
XYLENE (TOTAL)	10 U	10 U	27	130	54-TW03-01	3/17

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
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	100 U	1 J	1 J	54-TW04-01	1/17
BIS(2-CHLOROETHYL)ETHER	10 U	100 U	ND	ND		0/17
2-CHLOROPHENOL	10 U	100 U	ND	ND		0/17
1,3-DICHLOROBENZENE	10 U	100 U	ND	ND		0/17
1,4-DICHLOROBENZENE	10 U	100 U	ND	ND		0/17
1,2-DICHLOROBENZENE	10 U	100 U	ND	ND		0/17
2-METHYLPHENOL	10 U	100 U	ND	ND		0/17
2,2'-OXYBIS(1-CHLOROPROPANE)	10 U	100 U	ND	ND		0/12
4-METHYLPHENOL	10 U	100 U	ND	ND		0/17
N-NITROSO-DI-N-PROPYLAMINE	10 U	100 U	ND	ND		0/17
HEXACHLOROETHANE	10 U	100 U	ND	ND		0/17
NITROBENZENE	10 U	100 U	2 J	2 J	54-TW04-01	1/17
ISOPHORONE	10 U	100 U	ND	ND		0/17
2-NITROPHENOL	10 U	100 U	ND	ND		0/17
2,4-DIMETHYLPHENOL	10 U	100 U	3 J	3 J	54-GW06-01	1/17
BIS(2-CHLOROETHOXY)METHANE	10 U	100 U	ND	ND		0/17
2,4-DICHLOROPHENOL	10 U	100 U	ND	ND		0/17
1,2,4-TRICHLOROBENZENE	10 U	100 U	ND	ND		0/17
NAPHTHALENE	10 U	10 U	1 J	240	54-TW03-01	7/17
4-CHLOROANILINE	10 U	100 U	ND	ND		0/17
HEXACHLOROBUTADIENE	10 U	100 U	ND	ND		0/17
4-CHLORO-3-METHYLPHENOL	10 U	100 U	ND	ND		0/17
2-METHYLNAPHTHALENE	10 U	10 U	1 J	160	54-TW03-01	6/17
HEXACHLOROCYCLOPENTADIENE	10 U	100 U	ND	ND		0/17
2,4,6-TRICHLOROPHENOL	10 U	100 U	ND	ND		0/17
2,4,5-TRICHLOROPHENOL	24 U	260 U	ND	ND		0/17
2-CHLORONAPHTHALENE	10 U	100 U	ND	ND		0/17
2-NITROANILINE	24 U	260 U	ND	ND		0/17
DIMETHYLPHTHALATE	10 U	100 U	ND	ND		0/17
ACENAPHTHYLENE	10 U	100 U	ND	ND		0/17
2,6-DINITROTOLUENE	10 U	100 U	ND	ND		0/17
3-NITROANILINE	24 U	260 U	ND	ND		0/17
ACENAPHTHENE	10 U	100 U	ND	ND		0/17
2,4-DINITROPHENOL	24 U	260 U	ND	ND		0/17

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
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	260 U	ND	ND		0/17
DIBENZOFURAN	10 U	100 U	ND	ND		0/17
2,4-DINITROTOLUENE	10 U	100 U	ND	ND		0/17
DIETHYLPHTHALATE	10 U	10 U	1 J	37 J	54-TW03-01	5/17
4-CHLOROPHENYL-PHENYLETHER	10 U	100 U	ND	ND		0/17
FLUORENE	10 U	100 U	ND	ND		0/17
4-NITROANILINE	24 U	260 U	ND	ND		0/17
4,6-DINITRO-2-METHYLPHENOL	24 U	260 U	ND	ND		0/17
N-NITROSODIPHENYLAMINE (1)	10 U	100 U	ND	ND		0/17
4-BROMOPHENYL-PHENYLETHER	10 U	100 U	ND	ND		0/17
HEXACHLOROBENZENE	10 U	100 U	ND	ND		0/17
PENTACHLOROPHENOL	24 U	260 U	ND	ND		0/17
PHENANTHRENE	10 U	100 U	ND	ND		0/17
ANTHRACENE	10 U	100 U	1 J	1 J	54-TW05-01	1/17
CARBAZOLE	10 U	100 U	ND	ND		0/17
DI-N-BUTYLPHTHALATE	10 U	100 U	1 J	2 J	54-GW09-01	2/17
FLUORANTHENE	10 U	100 U	ND	ND		0/17
PYRENE	10 U	100 U	ND	ND		0/17
BUTYLBENZYLPHTHALATE	10 U	100 U	ND	ND		0/17
3,3'-DICHLOROBENZIDINE	10 U	100 U	ND	ND		0/17
BENZO(A)ANTHRACENE	10 U	100 U	ND	ND		0/17
CHRYSENE	10 U	100 U	ND	ND		0/17
BIS(2-ETHYLHEXYL)PHTHALATE	10 U	100 U	1 J	1 J	54-GW10-01	2/17
DI-N-OCTYL PHTHALATE	10 U	100 U	ND	ND		0/17
BENZO(B)FLUORANTHENE	10 U	100 U	ND	ND		0/17
BENZO(K)FLUORANTHENE	10 U	100 U	ND	ND		0/17
BENZO(A)PYRENE	10 U	100 U	ND	ND		0/17
INDENO(1,2,3-CD)PYRENE	10 U	100 U	ND	ND		0/17
DIBENZO(A,H)ANTHRACENE	10 U	100 U	ND	ND		0/17
BENZO(G,H,I)PERYLENE	10 U	100 U	ND	ND		0/17

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
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	0.046 UJ	0.046 UJ	ND	ND		0/1
BETA-BHC	0.046 UJ	0.046 UJ	ND	ND		0/1
DELTA-BHC	0.046 UJ	0.046 UJ	ND	ND		0/1
GAMMA-BHC (LINDANE)	0.046 UJ	0.046 UJ	ND	ND		0/1
HEPTACHLOR	0.046 UJ	0.046 UJ	ND	ND		0/1
ALDRIN	0.046 UJ	0.046 UJ	ND	ND		0/1
HEPTACHLOR EPOXIDE	0.046 UJ	0.046 UJ	ND	ND		0/1
ENDOSULFAN I	0.046 UJ	0.046 UJ	ND	ND		0/1
DIELDRIN	0.093 UJ	0.093 UJ	ND	ND		0/1
4,4'-DDE	0.093 UJ	0.093 UJ	ND	ND		0/1
ENDRIN	0.093 UJ	0.093 UJ	ND	ND		0/1
ENDOSULFAN II	0.093 UJ	0.093 UJ	ND	ND		0/1
4,4'-DDD	0.093 UJ	0.093 UJ	ND	ND		0/1
ENDOSULFAN SULFATE	0.093 UJ	0.093 UJ	ND	ND		0/1
4,4'-DDT	0.093 UJ	0.093 UJ	ND	ND		0/1
METHOXYCHLOR	0.46 UJ	0.46 UJ	ND	ND		0/1
ENDRIN KETONE	0.093 UJ	0.093 UJ	ND	ND		0/1
ENDRIN ALDEHYDE	0.093 UJ	0.093 UJ	ND	ND		0/1
ALPHA-CHLORDANE	0.046 UJ	0.046 UJ	ND	ND		0/1
GAMMA-CHLORDANE	0.046 UJ	0.046 UJ	ND	ND		0/1
TOXAPHENE	4.6 UJ	4.6 UJ	ND	ND		0/1
AROCLOR-1016	0.9 UJ	10 U	ND	ND		0/13
AROCLOR-1221	1.8 U	20 U	ND	ND		0/13
AROCLOR-1232	0.9 UJ	10 U	ND	ND		0/13
AROCLOR-1242	0.9 UJ	10 U	ND	ND		0/13
AROCLOR-1248	0.9 UJ	10 U	ND	ND		0/13
AROCLOR-1254	0.9 UJ	10 U	ND	ND		0/13
AROCLOR-1260	0.9 UJ	10 U	ND	ND		0/13

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
GROUNDWATER - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
INORGANIC ANALYTES

LOCATION	54-GW01-01	54-GW02-01	54-GW03-01	54-GW04-01	54-GW05-01	54-GW06-01
DATE SAMPLED	03/28/95	03/28/95	03/28/95	03/28/95	03/28/95	03/28/95
UNITS	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
TOTAL METALS						
ALUMINUM, TOTAL	206	30.1 U	85 U	219	116 U	109 U
ANTIMONY, TOTAL	20.7 U	20.7 U	20.7 U	20.7 U	20.7 U	20.7 U
ARSENIC, TOTAL	1.6 U	4.8	2.8	1.6 U	1.6 U	1.6 U
BARIUM, TOTAL	36.4	26.3	28.5	39.6	68.9	43.1
BERYLLIUM, TOTAL	0.9 U	0.9 U	0.9 U	0.9 U	0.9 U	0.9 U
CADMIUM, TOTAL	2.8 U	2.8 U	2.8 U	2.8 U	2.8 U	2.8 U
CALCIUM, TOTAL	4610	52300	68900	3460	6510	3810
CHROMIUM, TOTAL	2.9 U	2.9 U	2.9 U	2.9 U	2.9 U	2.9 U
COBALT, TOTAL	11.3	3 U	17.6	5.9	3 U	20.9
COPPER, TOTAL	2 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
IRON, TOTAL	3620 J	13100 J	16800 J	572 J	193 J	1570 J
LEAD, TOTAL	2.8	39.7	1.9	1.6 U	1.6 U	4.9
MAGNESIUM, TOTAL	1810	4320	3550	1430	3940	2380
MANGANESE, TOTAL	640	31.3	1280	132	135	1160
MERCURY, TOTAL	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
NICKEL, TOTAL	10.8 U	10.8 U	10.8 U	10.8 U	10.8 U	10.8 U
POTASSIUM, TOTAL	685 U	3960	2920	1380	1570	885
SELENIUM, TOTAL	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U
SILVER, TOTAL	3 U	3 U	3 U	3 U	3 U	3 U
SODIUM, TOTAL	9010	3390	4650	4040	7450	14300
THALLIUM, TOTAL	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U
VANADIUM, TOTAL	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U
ZINC, TOTAL	10.1 U	3.8 U	4.2 U	22 U	4.5 U	8.1 U

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
GROUNDWATER - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
INORGANIC ANALYTES

LOCATION	54-GW07-01	54-GW08-01	54-GW09-01	54-GW10-01	54-TW01-01	54-TW02-01
DATE SAMPLED	03/28/95	04/18/95	04/18/95	04/17/95	03/12/95	03/12/95
UNITS	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
TOTAL METALS						
ALUMINUM, TOTAL	24 U	121 U	107 U	5340	142 U	257 U
ANTIMONY, TOTAL	20.7 U	20.8 U	20.8 U	20.8 U	20.7 U	20.7 U
ARSENIC, TOTAL	1.6 U	1.7 U	1.7 U	3.2	1.9 U	1.9 U
BARIUM, TOTAL	27.2	30.2	43.6	40.6	59.5	29.2
BERYLLIUM, TOTAL	0.9 U	0.8 U	0.8 U	0.8 U	0.9 U	0.9 U
CADMIUM, TOTAL	2.8 U	2.2 U	1.9 U	2.8 U	2.8 U	2.8 U
CALCIUM, TOTAL	79000	91500	3230	8230	7930	6850
CHROMIUM, TOTAL	2.9 U	4.1 U	4.1 U	10.3	2.9 U	2.9 U
COBALT, TOTAL	3 U	3.4 U	9.4 U	6 U	3 U	3 U
COPPER, TOTAL	1.9 U	1.8 U	1.8 U	3.2 U	2.3 U	1.9 U
IRON, TOTAL	229 J	249	886	5000	145 U	7510
LEAD, TOTAL	1.6 U	0.8 U	0.8 U	3.9	1 U	1 U
MAGNESIUM, TOTAL	2620	3240	2050	1570	6550	2430
MANGANESE, TOTAL	41.7	89.9	349	89.3	25.2	39.8
MERCURY, TOTAL	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
NICKEL, TOTAL	10.8 U	10.9 U	10.9 U	14.1	37.2	61.6
POTASSIUM, TOTAL	1570	1160	768 U	890	685 U	685 U
SELENIUM, TOTAL	1.4 U	1.8 U	1.8 U	1.8 U	1.5 UJ	1.5 U
SILVER, TOTAL	3 U	2.8 U	2.8 U	2.8 U	3 U	3 U
SODIUM, TOTAL	4620	4460	10500	4550	7510	10100
THALLIUM, TOTAL	0.7 U	1.4 U	1.4 U	1.4 UJ	1.1 U	1.1 U
VANADIUM, TOTAL	2.3 U	2.6 U	2 U	12.2 U	2.3 U	2.3 U
ZINC, TOTAL	9.3 U	6 U	8.2	24.7	3.8 U	17.2

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
GROUNDWATER - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
INORGANIC ANALYTES

LOCATION	54-TW03-01
DATE SAMPLED	03/12/95
UNITS	UG/L
TOTAL METALS	
ALUMINUM, TOTAL	45 U
ANTIMONY, TOTAL	20.7 U
ARSENIC, TOTAL	24.7
BARIUM, TOTAL	16.7 U
BERYLLIUM, TOTAL	0.9 U
CADMIUM, TOTAL	2.8 U
CALCIUM, TOTAL	4830
CHROMIUM, TOTAL	2.9 U
COBALT, TOTAL	3 U
COPPER, TOTAL	1.9 U
IRON, TOTAL	74100
LEAD, TOTAL	1 U
MAGNESIUM, TOTAL	3720
MANGANESE, TOTAL	141
MERCURY, TOTAL	0.2 U
NICKEL, TOTAL	19
POTASSIUM, TOTAL	685 U
SELENIUM, TOTAL	2.2 U
SILVER, TOTAL	3 U
SODIUM, TOTAL	27800
THALLIUM, TOTAL	1.1 U
VANADIUM, TOTAL	2.3 U
ZINC, TOTAL	3.8 U

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
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	24 U	257 U	206	5340	54-GW10-01	3/13
ANTIMONY, TOTAL	20.7 U	20.8 U	ND	ND		0/13
ARSENIC, TOTAL	1.6 U	1.9 U	2.8	24.7	54-TW03-01	4/13
BARIUM, TOTAL	16.7 U	16.7 U	26.3	68.9	54-GW05-01	12/13
BERYLLIUM, TOTAL	0.8 U	0.9 U	ND	ND		0/13
CADMIUM, TOTAL	1.9 U	2.8 U	ND	ND		0/13
CALCIUM, TOTAL	NA	NA	3230	91500	54-GW08-01	13/13
CHROMIUM, TOTAL	2.9 U	4.1 U	10.3	10.3	54-GW10-01	1/13
COBALT, TOTAL	3 U	9.4 U	5.9	20.9	54-GW06-01	4/13
COPPER, TOTAL	1.8 U	3.2 U	ND	ND		0/13
IRON, TOTAL	145 U	145 U	193 J	74100	54-TW03-01	12/13
LEAD, TOTAL	0.8 U	1.6 U	1.9	39.7	54-GW02-01	5/13
MAGNESIUM, TOTAL	NA	NA	1430	6550	54-TW01-01	13/13
MANGANESE, TOTAL	NA	NA	25.2	1280	54-GW03-01	13/13
MERCURY, TOTAL	0.2 U	0.2 U	ND	ND		0/13
NICKEL, TOTAL	10.8 U	10.9 U	14.1	61.6	54-TW02-01	4/13
POTASSIUM, TOTAL	685 U	768 U	885	3960	54-GW02-01	8/13
SELENIUM, TOTAL	1.4 U	2.2 U	ND	ND		0/13
SILVER, TOTAL	2.8 U	3 U	ND	ND		0/13
SODIUM, TOTAL	NA	NA	3390	27800	54-TW03-01	13/13
THALLIUM, TOTAL	0.7 U	1.4 U	ND	ND		0/13
VANADIUM, TOTAL	2 U	12.2 U	ND	ND		0/13
ZINC, TOTAL	3.8 U	22 U	8.2	24.7	54-GW10-01	3/13

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
GROUNDWATER - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
DISSOLVED INORGANIC ANALYTES

LOCATION	54-GW06D-01	54-TW02D-01
DATE SAMPLED	03/28/95	03/12/95
UNITS	UG/L	UG/L
DISSOLVED METALS		
ALUMINUM, SOLUBLE	38 U	74.8 U
ANTIMONY, SOLUBLE	20.7 U	20.7 U
ARSENIC, SOLUBLE	1.6 U	1.9 U
BARIUM, SOLUBLE	43.4	28.6
BERYLLIUM, SOLUBLE	0.9 U	0.9 U
CADMIUM, SOLUBLE	2.8 U	2.8 U
CALCIUM, SOLUBLE	4160	6680
CHROMIUM, SOLUBLE	2.9 U	2.9 U
COBALT, SOLUBLE	21.9	3 U
COPPER, SOLUBLE	1.9 U	2.7 U
IRON, SOLUBLE	1130 J	8100
LEAD, SOLUBLE	1.6 U	7.4 J
MAGNESIUM, SOLUBLE	2490	2460
MANGANESE, SOLUBLE	1150	40.5
MERCURY, SOLUBLE	0.2 U	0.2 U
NICKEL, SOLUBLE	10.8 U	65.4
POTASSIUM, SOLUBLE	1630	1200
SELENIUM, SOLUBLE	1.4 U	1.5 U
SILVER, SOLUBLE	3 U	3 U
SODIUM, SOLUBLE	14700	9930
THALLIUM, SOLUBLE	0.7 U	1.1 U
VANADIUM, SOLUBLE	2.3 U	2.3 U
ZINC, SOLUBLE	5.6 U	12.8

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
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	38 U	74.8 U	ND	ND		0/2
ANTIMONY, SOLUBLE	20.7 U	20.7 U	ND	ND		0/2
ARSENIC, SOLUBLE	1.6 U	1.9 U	ND	ND		0/2
BARIUM, SOLUBLE	NA	NA	28.6	43.4	54-GW06D-01	2/2
BERYLLIUM, SOLUBLE	0.9 U	0.9 U	ND	ND		0/2
CADMIUM, SOLUBLE	2.8 U	2.8 U	ND	ND		0/2
CALCIUM, SOLUBLE	NA	NA	4160	6680	54-TW02D-01	2/2
CHROMIUM, SOLUBLE	2.9 U	2.9 U	ND	ND		0/2
COBALT, SOLUBLE	3 U	3 U	21.9	21.9	54-GW06D-01	1/2
COPPER, SOLUBLE	1.9 U	2.7 U	ND	ND		0/2
IRON, SOLUBLE	NA	NA	1130 J	8100	54-TW02D-01	2/2
LEAD, SOLUBLE	1.6 U	1.6 U	7.4 J	7.4 J	54-TW02D-01	1/2
MAGNESIUM, SOLUBLE	NA	NA	2460	2490	54-GW06D-01	2/2
MANGANESE, SOLUBLE	NA	NA	40.5	1150	54-GW06D-01	2/2
MERCURY, SOLUBLE	0.2 U	0.2 U	ND	ND		0/2
NICKEL, SOLUBLE	10.8 U	10.8 U	65.4	65.4	54-TW02D-01	1/2
POTASSIUM, SOLUBLE	NA	NA	1200	1630	54-GW06D-01	2/2
SELENIUM, SOLUBLE	1.4 U	1.5 U	ND	ND		0/2
SILVER, SOLUBLE	3 U	3 U	ND	ND		0/2
SODIUM, SOLUBLE	NA	NA	9930	14700	54-GW06D-01	2/2
THALLIUM, SOLUBLE	0.7 U	1.1 U	ND	ND		0/2
VANADIUM, SOLUBLE	2.3 U	2.3 U	ND	ND		0/2
ZINC, SOLUBLE	5.6 U	5.6 U	12.8	12.8	54-TW02D-01	1/2

APPENDIX I
STATISTICAL SUMMARIES

SOIL

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
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
SEMIVOLATILES						
N-NITROSODIPHENYLAMINE (1)	190.91	15.14	199.18	5.25	0.08	200.01
PHENANTHRENE	178.91	36.62	198.92	5.16	0.25	209.58
FLUORANTHENE	170.82	53.73	200.17	5.07	0.45	239.70
PYRENE	181.73	32.45	199.45	5.18	0.22	208.88
BUTYLBENZYLPHTHALATE	192.27	61.25	225.74	5.19	0.45	271.13
BIS(2-ETHYLHEXYL)PHTHALATE	212.27	207.90	325.86	5.10	0.68	354.82
DI-N-OCTYL PHTHALATE	190.00	17.32	199.46	5.24	0.10	200.76

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
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	5672.50	989.56	6836.71	8.63	0.17	7480.58
ARSENIC, TOTAL	0.59	0.21	0.84	-0.58	0.43	1.95
BARIUM, TOTAL	20.75	7.08	29.09	2.98	0.37	49.37
CALCIUM, TOTAL	69600.00	49485.01	127819.12	10.99	0.62	722261.47
CHROMIUM, TOTAL	7.78	1.65	9.71	2.03	0.22	11.93
COBALT, TOTAL	0.43	0.19	0.65	-0.91	0.38	1.04
COPPER, TOTAL	4.35	1.97	6.67	1.40	0.41	13.60
IRON, TOTAL	2887.50	641.68	3642.44	7.95	0.23	4452.63
LEAD, TOTAL	16.80	5.87	23.70	2.77	0.38	40.90
MAGNESIUM, TOTAL	1086.75	654.75	1857.07	6.87	0.54	6375.60
MANGANESE, TOTAL	16.80	5.70	23.51	2.78	0.35	37.76
POTASSIUM, TOTAL	257.25	130.60	410.90	5.38	0.77	7164.38
SODIUM, TOTAL	120.15	39.61	166.76	4.75	0.29	210.64
VANADIUM, TOTAL	9.50	2.00	11.86	2.23	0.22	14.45
ZINC, TOTAL	13.13	3.63	17.39	2.54	0.31	26.70

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
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	74.24	272.89	182.80	2.47	1.26	76.54
XYLENE (TOTAL)	24.55	67.84	51.54	2.14	1.02	30.74
SEMIVOLATILES						
NAPHTHALENE	221.58	130.66	273.56	5.33	0.32	251.26
2-METHYLNAPHTHALENE	271.05	346.14	408.75	5.37	0.50	315.68
ACENAPHTHENE	186.53	23.96	196.06	5.22	0.17	201.10
FLUORENE	203.68	53.07	224.80	5.30	0.19	219.76
PHENANTHRENE	190.00	11.18	194.45	5.25	0.06	194.86
PYRENE	183.84	35.15	197.82	5.18	0.35	220.56
BUTYLBENZYLPHTHALATE	184.53	32.26	197.36	5.19	0.29	212.20
BIS(2-ETHYLHEXYL)PHTHALATE	184.16	33.82	197.61	5.18	0.32	216.90

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
SUBSURFACE SOIL - STATISTICAL SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
INORGANIC ANALYTES

ANALYTES	NORMAL ARITHMETIC MEAN	NORMAL STANDARD DEVIATION	NORMAL UPPER 95% CONFIDENCE INTERVAL	LOG ARITHMETIC MEAN	LOG STANDARD DEVIATION	LOG UPPER 95% CONFIDENCE INTERVAL
ALUMINUM, TOTAL	4219.25	4061.07	6940.10	7.95	1.05	25783.18
ARSENIC, TOTAL	0.20	0.11	0.27	-1.72	0.43	0.29
BARIUM, TOTAL	9.08	8.77	14.96	1.72	1.19	73.79
CALCIUM, TOTAL	1469.33	1884.13	2731.67	5.76	2.35	4913545.73
CHROMIUM, TOTAL	4.12	3.57	6.51	1.11	0.85	12.46
COBALT, TOTAL	0.38	0.34	0.60	-1.17	0.59	0.65
COPPER, TOTAL	0.54	0.32	0.75	-0.79	0.63	1.08
IRON, TOTAL	1564.88	1150.90	2335.96	7.01	1.05	9937.21
LEAD, TOTAL	5.80	3.94	8.44	1.50	0.81	16.95
MAGNESIUM, TOTAL	129.88	118.66	209.37	4.50	0.96	514.07
MANGANESE, TOTAL	3.91	2.78	5.77	1.04	1.00	17.29
NICKEL, TOTAL	2.84	1.96	4.15	0.83	0.71	6.60
POTASSIUM, TOTAL	94.04	67.08	138.98	4.34	0.72	224.70
SODIUM, TOTAL	12.80	13.09	21.57	2.10	1.01	66.83
VANADIUM, TOTAL	4.95	4.00	7.63	1.23	1.02	28.94
ZINC, TOTAL	1.92	1.12	2.67	0.38	0.99	8.84

GROUNDWATER

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
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						
CARBON DISULFIDE	4.94	0.24	5.04	1.60	0.05	5.06
1,2-DICHLOROETHENE (TOTAL)	6.24	4.38	8.09	1.73	0.38	7.21
TRICHLOROETHENE	4.76	0.97	5.18	1.51	0.39	5.88
BENZENE	10.59	11.75	15.56	2.01	0.75	14.83
TOLUENE	10.59	19.11	18.68	1.86	0.75	12.89
ETHYLBENZENE	7.47	6.79	10.35	1.81	0.54	9.28
XYLENE (TOTAL)	15.12	30.61	28.08	2.01	0.94	20.28
SEMIVOLATILES						
PHENOL	7.44	11.01	12.10	1.66	0.70	9.85
NITROBENZENE	7.50	10.98	12.15	1.70	0.61	9.09
2,4-DIMETHYLPHENOL	7.59	10.94	12.22	1.73	0.58	8.88
NAPHTHALENE	35.65	62.37	62.06	2.38	1.52	126.66
2-METHYLNAPHTHALENE	20.71	38.78	37.13	2.15	1.22	41.30
DIETHYLPHTHALATE	6.65	8.03	10.05	1.59	0.71	9.37
ANTHRACENE	7.44	11.01	12.10	1.66	0.70	9.85
DI-N-BUTYLPHTHALATE	7.29	11.07	11.98	1.61	0.74	9.86
BIS(2-ETHYLHEXYL)PHTHALATE	7.24	11.10	11.94	1.57	0.81	10.60

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
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	483.31	1460.78	1205.28	4.36	1.55	1759.43
ARSENIC, TOTAL	3.32	6.55	6.55	0.42	1.05	7.17
BARIUM, TOTAL	37.03	15.37	44.63	3.51	0.51	53.22
CALCIUM, TOTAL	26243.08	33471.49	42785.95	9.36	1.30	112296.57
CHROMIUM, TOTAL	2.22	2.44	3.43	0.58	0.54	2.93
COBALT, TOTAL	5.70	6.67	9.00	1.21	1.02	14.81
IRON, TOTAL	9530.88	20128.77	19479.28	7.47	2.07	512096.09
LEAD, TOTAL	4.45	10.69	9.74	0.29	1.34	14.28
MAGNESIUM, TOTAL	3046.92	1407.14	3742.38	7.93	0.44	4006.83
MANGANESE, TOTAL	319.55	434.40	534.25	4.95	1.33	1461.46
NICKEL, TOTAL	13.89	17.06	22.32	2.19	0.86	25.17
POTASSIUM, TOTAL	1237.62	1105.58	1784.04	6.78	0.86	2487.69
SODIUM, TOTAL	8644.62	6599.02	11906.10	8.87	0.60	12933.90
ZINC, TOTAL	6.76	7.03	10.23	1.51	0.88	13.30

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
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	483.31	1460.78	1205.28	4.36	1.55	1759.43
ARSENIC, TOTAL	3.32	6.55	6.55	0.42	1.05	7.17
BARIUM, TOTAL	37.03	15.37	44.63	3.51	0.51	53.22
CALCIUM, TOTAL	26243.08	33471.49	42785.95	9.36	1.30	112296.57
CHROMIUM, TOTAL	2.22	2.44	3.43	0.58	0.54	2.93
COBALT, TOTAL	5.70	6.67	9.00	1.21	1.02	14.81
IRON, TOTAL	9530.88	20128.77	19479.28	7.47	2.07	512096.09
LEAD, TOTAL	4.45	10.69	9.74	0.29	1.34	14.28
MAGNESIUM, TOTAL	3046.92	1407.14	3742.38	7.93	0.44	4006.83
MANGANESE, TOTAL	319.55	434.40	534.25	4.95	1.33	1461.46
NICKEL, TOTAL	13.89	17.06	22.32	2.19	0.86	25.17
POTASSIUM, TOTAL	1237.62	1105.58	1784.04	6.78	0.86	2487.69
SODIUM, TOTAL	8644.62	6599.02	11906.10	8.87	0.60	12933.90
ZINC, TOTAL	6.76	7.03	10.23	1.51	0.88	13.30

APPENDIX J
FIELD DUPLICATE SUMMARIES

SOIL

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
SURFACE SOIL - DUPLICATE SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	54-DD-SB01-00D
DATE SAMPLED	03/10/95
DEPTH	0-12"
UNITS	UG/KG
VOLATILES	
CHLOROMETHANE	13 U
BROMOMETHANE	13 U
VINYL CHLORIDE	13 U
CHLOROETHANE	13 U
METHYLENE CHLORIDE	13 U
ACETONE	13 U
CARBON DISULFIDE	13 U
1,1-DICHLOROETHENE	13 U
1,1-DICHLOROETHANE	13 U
1,2-DICHLOROETHENE (TOTAL)	13 U
CHLOROFORM	13 U
1,2-DICHLOROETHANE	13 U
2-BUTANONE	13 U
1,1,1-TRICHLOROETHANE	13 U
CARBON TETRACHLORIDE	13 U
BROMODICHLOROMETHANE	13 U
1,2-DICHLOROPROPANE	13 U
CIS-1,3-DICHLOROPROPENE	13 U
TRICHLOROETHENE	13 U
DIBROMOCHLOROMETHANE	13 U
1,1,2-TRICHLOROETHANE	13 U
BENZENE	13 U
TRANS-1,3-DICHLOROPROPENE	13 U
BROMOFORM	13 U
4-METHYL-2-PENTANONE	13 U
2-HEXANONE	13 U
TETRACHLOROETHENE	13 U
1,1,2,2-TETRACHLOROETHANE	13 U
TOLUENE	13 U
CHLOROBENZENE	13 U
ETHYLBENZENE	13 U
STYRENE	13 U
XYLENE (TOTAL)	13 U

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
SURFACE SOIL - DUPLICATE SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	54-DD-SB01-00D
DATE SAMPLED	03/10/95
DEPTH	0-12"
UNITS	UG/KG
SEMIVOLATILES	
PHENOL	420 U
BIS(2-CHLOROETHYL)ETHER	420 U
2-CHLOROPHENOL	420 U
1,3-DICHLOROBENZENE	420 U
1,4-DICHLOROBENZENE	420 U
1,2-DICHLOROBENZENE	420 U
2-METHYLPHENOL	420 U
2,2'-OXYBIS(1-CHLOROPROPANE)	420 U
4-METHYLPHENOL	420 U
N-NITROSO-DI-N-PROPYLAMINE	420 U
HEXACHLOROETHANE	420 U
NITROBENZENE	420 U
ISOPHORONE	420 U
2-NITROPHENOL	420 U
2,4-DIMETHYLPHENOL	420 U
BIS(2-CHLOROETHOXY)METHANE	420 U
2,4-DICHLOROPHENOL	420 U
1,2,4-TRICHLOROBENZENE	420 U
NAPHTHALENE	420 U
4-CHLOROANILINE	420 U
HEXACHLOROBUTADIENE	420 U
4-CHLORO-3-METHYLPHENOL	420 U
2-METHYLNAPHTHALENE	420 U
HEXACHLOROCYCLOPENTADIENE	420 U
2,4,6-TRICHLOROPHENOL	420 U
2,4,5-TRICHLOROPHENOL	1000 U
2-CHLORONAPHTHALENE	420 U
2-NITROANILINE	1000 U
DIMETHYLPHTHALATE	420 U
ACENAPHTHYLENE	420 U
2,6-DINITROTOLUENE	420 U
3-NITROANILINE	1000 U
ACENAPHTHENE	420 U
2,4-DINITROPHENOL	1000 U

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
SURFACE SOIL - DUPLICATE SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	54-DD-SB01-00D
DATE SAMPLED	03/10/95
DEPTH	0-12"
UNITS	UG/KG
SEMIVOLATILES cont.	
4-NITROPHENOL	1000 U
DIBENZOFURAN	420 U
2,4-DINITROTOLUENE	420 U
DIETHYLPHTHALATE	420 U
4-CHLOROPHENYL-PHENYLETHER	420 U
FLUORENE	420 U
4-NITROANILINE	1000 U
4,6-DINITRO-2-METHYLPHENOL	1000 U
N-NITROSODIPHENYLAMINE (1)	420 U
4-BROMOPHENYL-PHENYLETHER	420 U
HEXACHLOROBENZENE	420 U
PENTACHLOROPHENOL	1000 U
PHENANTHRENE	130 J
ANTHRACENE	420 U
CARBAZOLE	420 U
DI-N-BUTYLPHTHALATE	420 U
FLUORANTHENE	86 J
PYRENE	140 J
BUTYLBENZYLPHTHALATE	420 U
3,3'-DICHLOROBENZIDINE	420 U
BENZO(A)ANTHRACENE	420 U
CHRYSENE	420 U
BIS(2-ETHYLHEXYL)PHTHALATE	690
DI-N-OCTYL PHTHALATE	420 U
BENZO(B)FLUORANTHENE	420 U
BENZO(K)FLUORANTHENE	420 U
BENZO(A)PYRENE	420 U
INDENO(1,2,3-CD)PYRENE	420 U
DIBENZO(A,H)ANTHRACENE	420 U
BENZO(G,H,I)PERYLENE	420 U

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
SURFACE SOIL - DUPLICATE SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	54-DD-SB01-00D
DATE SAMPLED	03/10/95
DEPTH	0-12"
UNITS	UG/KG
PCBs	
AROCLOR-1016	41 UJ
AROCLOR-1221	83 UJ
AROCLOR-1232	41 UJ
AROCLOR-1242	41 UJ
AROCLOR-1248	41 UJ
AROCLOR-1254	41 UJ
AROCLOR-1260	41 UJ

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
SURFACE SOIL - DUPLICATE SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
INORGANIC ANALYTES

LOCATION	54-DD-SB01-00D	
DATE SAMPLED	03/10/95	
DEPTH	0-12"	
UNITS	MG/KG	
TOTAL METALS		
ALUMINUM, TOTAL	5240	
ANTIMONY, TOTAL	4.6	UJ
ARSENIC, TOTAL	0.54	J
BARIUM, TOTAL	29.6	
BERYLLIUM, TOTAL	0.2	U
CADMIUM, TOTAL	0.62	U
CALCIUM, TOTAL	37000	
CHROMIUM, TOTAL	7.4	
COBALT, TOTAL	0.67	U
COPPER, TOTAL	10.5	
IRON, TOTAL	2520	
LEAD, TOTAL	14	
MAGNESIUM, TOTAL	618	
MANGANESE, TOTAL	13.2	
MERCURY, TOTAL	0.11	U
NICKEL, TOTAL	2.4	U
POTASSIUM, TOTAL	226	
SELENIUM, TOTAL	0.4	U
SILVER, TOTAL	0.67	U
SODIUM, TOTAL	101	
THALLIUM, TOTAL	0.38	U
VANADIUM, TOTAL	8	
ZINC, TOTAL	19.4	

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
SUBSURFACE SOIL - DUPLICATE SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	54-SB05-01D
DATE SAMPLED	03/11/95
DEPTH	1-3'
UNITS	UG/KG
VOLATILES	
CHLOROMETHANE	11 U
BROMOMETHANE	11 U
VINYL CHLORIDE	11 U
CHLOROETHANE	11 U
METHYLENE CHLORIDE	11 U
ACETONE	11 U
CARBON DISULFIDE	11 U
1,1-DICHLOROETHENE	11 U
1,1-DICHLOROETHANE	11 U
1,2-DICHLOROETHENE (TOTAL)	11 U
CHLOROFORM	11 U
1,2-DICHLOROETHANE	11 U
2-BUTANONE	11 U
1,1,1-TRICHLOROETHANE	11 U
CARBON TETRACHLORIDE	11 U
BROMODICHLOROMETHANE	11 U
1,2-DICHLOROPROPANE	11 U
CIS-1,3-DICHLOROPROPENE	11 U
TRICHLOROETHENE	11 U
DIBROMOCHLOROMETHANE	11 U
1,1,2-TRICHLOROETHANE	11 U
BENZENE	11 U
TRANS-1,3-DICHLOROPROPENE	11 U
BROMOFORM	11 U
4-METHYL-2-PENTANONE	11 U
2-HEXANONE	11 U
TETRACHLOROETHENE	11 U
1,1,2,2-TETRACHLOROETHANE	11 U
TOLUENE	11 U
CHLOROBENZENE	11 U
ETHYLBENZENE	11 U
STYRENE	11 U
XYLENE (TOTAL)	11 U

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
SUBSURFACE SOIL - DUPLICATE SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	54-SB05-01D
DATE SAMPLED	03/11/95
DEPTH	1-3'
UNITS	UG/KG
SEMIVOLATILES	
PHENOL	350 U
BIS(2-CHLOROETHYL)ETHER	350 U
2-CHLOROPHENOL	350 U
1,3-DICHLOROBENZENE	350 U
1,4-DICHLOROBENZENE	350 U
1,2-DICHLOROBENZENE	350 U
2-METHYLPHENOL	350 U
2,2'-OXYBIS(1-CHLOROPROPANE)	350 U
4-METHYLPHENOL	350 U
N-NITROSO-DI-N-PROPYLAMINE	350 U
HEXACHLOROETHANE	350 U
NITROBENZENE	350 U
ISOPHORONE	350 U
2-NITROPHENOL	350 U
2,4-DIMETHYLPHENOL	350 U
BIS(2-CHLOROETHOXY)METHANE	350 U
2,4-DICHLOROPHENOL	350 U
1,2,4-TRICHLOROBENZENE	350 U
NAPHTHALENE	350 U
4-CHLOROANILINE	350 U
HEXACHLOROBUTADIENE	350 U
4-CHLORO-3-METHYLPHENOL	350 U
2-METHYLNAPHTHALENE	350 U
HEXACHLOROCYCLOPENTADIENE	350 U
2,4,6-TRICHLOROPHENOL	350 U
2,4,5-TRICHLOROPHENOL	880 U
2-CHLORONAPHTHALENE	350 U
2-NITROANILINE	880 U
DIMETHYLPHTHALATE	350 U
ACENAPHTHYLENE	350 U
2,6-DINITROTOLUENE	350 U
3-NITROANILINE	880 U
ACENAPHTHENE	350 U
2,4-DINITROPHENOL	880 U

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
SUBSURFACE SOIL - DUPLICATE SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	54-SB05-01D
DATE SAMPLED	03/11/95
DEPTH	1-3'
UNITS	UG/KG
SEMIVOLATILES cont.	
4-NITROPHENOL	880 U
DIBENZOFURAN	350 U
2,4-DINITROTOLUENE	350 U
DIETHYLPHTHALATE	350 U
4-CHLOROPHENYL-PHENYLETHER	350 U
FLUORENE	350 U
4-NITROANILINE	880 U
4,6-DINITRO-2-METHYLPHENOL	880 U
N-NITROSODIPHENYLAMINE (1)	350 U
4-BROMOPHENYL-PHENYLETHER	350 U
HEXACHLOROBENZENE	350 U
PENTACHLOROPHENOL	880 U
PHENANTHRENE	350 U
ANTHRACENE	350 U
CARBAZOLE	350 U
DI-N-BUTYLPHTHALATE	350 U
FLUORANTHENE	350 U
PYRENE	350 U
BUTYLBENZYLPHTHALATE	350 U
3,3'-DICHLOROBENZIDINE	350 U
BENZO(A)ANTHRACENE	350 U
CHRYSENE	350 U
BIS(2-ETHYLHEXYL)PHTHALATE	350 U
DI-N-OCTYL PHTHALATE	350 U
BENZO(B)FLUORANTHENE	350 U
BENZO(K)FLUORANTHENE	350 U
BENZO(A)PYRENE	350 U
INDENO(1,2,3-CD)PYRENE	350 U
DIBENZO(A,H)ANTHRACENE	350 U
BENZO(G,H,I)PERYLENE	350 U

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
SUBSURFACE SOIL - DUPLICATE SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	54-SB05-01D
DATE SAMPLED	03/11/95
DEPTH	1-3'
UNITS	UG/KG
PCBs	
AROCLOR-1016	35 UJ
AROCLOR-1221	71 UJ
AROCLOR-1232	35 UJ
AROCLOR-1242	35 UJ
AROCLOR-1248	35 UJ
AROCLOR-1254	35 UJ
AROCLOR-1260	35 UJ

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
SUBSURFACE SOIL - DUPLICATE SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
INORGANIC ANALYTES

LOCATION	54-SB05-01D
DATE SAMPLED	03/11/95
DEPTH	1-3'
UNITS	MG/KG
TOTAL METALS	
ALUMINUM, TOTAL	3530
ANTIMONY, TOTAL	2.1 UJ
ARSENIC, TOTAL	0.39 U
BARIUM, TOTAL	12.5
BERYLLIUM, TOTAL	0.067
CADMIUM, TOTAL	0.57 U
CALCIUM, TOTAL	1640
CHROMIUM, TOTAL	3.3
COBALT, TOTAL	0.45 U
COPPER, TOTAL	0.78 U
IRON, TOTAL	2080
LEAD, TOTAL	8.5
MAGNESIUM, TOTAL	111
MANGANESE, TOTAL	7.1
MERCURY, TOTAL	0.08 U
NICKEL, TOTAL	1.3
POTASSIUM, TOTAL	92.8
SELENIUM, TOTAL	0.37 UJ
SILVER, TOTAL	0.49 U
SODIUM, TOTAL	23.9 U
THALLIUM, TOTAL	0.23 U
VANADIUM, TOTAL	4.7
ZINC, TOTAL	2.5

GROUNDWATER

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
GROUNDWATER - DUPLICATE SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	54-GW04-01D	54-GW09-01D
DATE SAMPLED	03/28/95	04/18/95
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 U
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 54, CRASH CREW FIRE TRAINING BURN PIT
GROUNDWATER - DUPLICATE SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	54-GW04-01D	54-GW09-01D
DATE SAMPLED	03/28/95	04/18/95
UNITS	UG/L	UG/L
SEMIVOLATILES		
PHENOL	10 U	10 U
BIS(2-CHLOROETHYL)ETHER	10 U	10 U
2-CHLOROPHENOL	10 U	10 U
1,3-DICHLOROBENZENE	10 U	10 U
1,4-DICHLOROBENZENE	10 U	10 U
1,2-DICHLOROBENZENE	10 U	10 U
2-METHYLPHENOL	10 U	10 U
2,2'-OXYBIS(1-CHLOROPROPANE)	10 R	10 U
4-METHYLPHENOL	10 U	10 U
N-NITROSO-DI-N-PROPYLAMINE	10 U	10 U
HEXACHLOROETHANE	10 U	10 U
NITROBENZENE	10 U	10 U
ISOPHORONE	10 U	10 U
2-NITROPHENOL	10 U	10 U
2,4-DIMETHYLPHENOL	10 U	10 U
BIS(2-CHLOROETHOXY)METHANE	10 U	10 U
2,4-DICHLOROPHENOL	10 U	10 U
1,2,4-TRICHLOROBENZENE	10 U	10 U
NAPHTHALENE	10 U	10 U
4-CHLOROANILINE	10 U	10 U
HEXACHLOROBUTADIENE	10 U	10 U
4-CHLORO-3-METHYLPHENOL	10 U	10 U
2-METHYLNAPHTHALENE	10 U	10 U
HEXACHLOROCYCLOPENTADIENE	10 U	10 U
2,4,6-TRICHLOROPHENOL	10 U	10 U
2,4,5-TRICHLOROPHENOL	24 U	26 U
2-CHLORONAPHTHALENE	10 U	10 U
2-NITROANILINE	24 U	26 U
DIMETHYLPHTHALATE	10 U	10 U
ACENAPHTHYLENE	10 U	10 U
2,6-DINITROTOLUENE	10 U	10 U
3-NITROANILINE	24 U	26 U
ACENAPHTHENE	10 U	10 U
2,4-DINITROPHENOL	24 UJ	26 UJ

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
GROUNDWATER - DUPLICATE SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	54-GW04-01D	54-GW09-01D
DATE SAMPLED	03/28/95	04/18/95
UNITS	UG/L	UG/L
SEMIVOLATILES cont.		
4-NITROPHENOL	24 U	26 U
DIBENZOFURAN	10 U	10 U
2,4-DINITROTOLUENE	10 U	10 U
DIETHYLPHTHALATE	10 U	10 U
4-CHLOROPHENYL-PHENYLETHER	10 U	10 U
FLUORENE	10 U	10 U
4-NITROANILINE	24 U	26 U
4,6-DINITRO-2-METHYLPHENOL	24 U	26 U
N-NITROSODIPHENYLAMINE (1)	10 U	10 U
4-BROMOPHENYL-PHENYLETHER	10 U	10 U
HEXACHLOROBENZENE	10 U	10 U
PENTACHLOROPHENOL	24 U	26 U
PHENANTHRENE	10 U	10 U
ANTHRACENE	10 U	10 U
CARBAZOLE	10 U	10 U
DI-N-BUTYLPHTHALATE	10 U	10 U
FLUORANTHENE	10 U	10 U
PYRENE	10 U	10 U
BUTYLBENZYLPHTHALATE	10 U	10 U
3,3'-DICHLOROBENZIDINE	10 U	10 U
BENZO(A)ANTHRACENE	10 U	10 U
CHRYSENE	10 U	10 U
BIS(2-ETHYLHEXYL)PHTHALATE	10 U	6 J
DI-N-OCTYL PHTHALATE	10 U	10 U
BENZO(B)FLUORANTHENE	10 U	10 U
BENZO(K)FLUORANTHENE	10 U	10 U
BENZO(A)PYRENE	10 U	10 U
INDENO(1,2,3-CD)PYRENE	10 U	10 U
DIBENZO(A,H)ANTHRACENE	10 U	10 U
BENZO(G,H,I)PERYLENE	10 U	10 U

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
GROUNDWATER - DUPLICATE SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

LOCATION	54-GW04-01D	54-GW09-01D
DATE SAMPLED	03/28/95	04/18/95
UNITS	UG/L	UG/L
PCBS		
AROCLOR-1016	0.96 U	1 U
AROCLOR-1221	1.9 U	2 U
AROCLOR-1232	0.96 U	1 U
AROCLOR-1242	0.96 U	1 U
AROCLOR-1248	0.96 U	1 U
AROCLOR-1254	0.96 U	1 U
AROCLOR-1260	0.96 U	1 U

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
GROUNDWATER - DUPLICATE SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
INORGANIC ANALYTES

LOCATION	54-GW04-01D	54-GW09-01D
DATE SAMPLED	03/28/95	04/18/95
UNITS	UG/L	UG/L
ANALYTES		
ALUMINUM, TOTAL	230	106 U
ANTIMONY, TOTAL	20.7 U	20.8 U
ARSENIC, TOTAL	1.6 U	1.7 U
BARIUM, TOTAL	38.7	43.6
BERYLLIUM, TOTAL	0.9 U	0.8 U
CADMIUM, TOTAL	2.8 U	1.9 U
CALCIUM, TOTAL	3380	3220
CHROMIUM, TOTAL	2.9 U	4.1 U
COBALT, TOTAL	4.1	8 U
COPPER, TOTAL	1.9 U	1.8 U
IRON, TOTAL	517 J	878
LEAD, TOTAL	1.6 U	0.8 U
MAGNESIUM, TOTAL	1380	2060
MANGANESE, TOTAL	129	345
MERCURY, TOTAL	0.2 U	0.2 U
NICKEL, TOTAL	10.8 U	10.9 U
POTASSIUM, TOTAL	1330	768 U
SELENIUM, TOTAL	1.4 U	1.8 U
SILVER, TOTAL	3 U	2.8 U
SODIUM, TOTAL	3940	10400
THALLIUM, TOTAL	0.7 U	1.4 U
VANADIUM, TOTAL	2.3 U	2 U
ZINC, TOTAL	21.1 U	6.8

APPENDIX K
QA/QC SAMPLING SUMMARIES

SOIL

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
SOIL QA/QC - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

SAMPLE	303-TB-09	303-TB-10	303-TB-12	303-TB-13	303-TB-14	303-TB-15
DATE SAMPLED	03/07/95	03/06/95	03/09/95	03/10/95	03/11/95	03/13/95
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	20	15 U	16 U	16 U	17 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	23	28	29	32	29	28 J
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	10 U	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 54, CRASH CREW FIRE TRAINING BURN PIT
SOIL QA/QC - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

SAMPLE	303-TB-09	303-TB-10	303-TB-12	303-TB-13	303-TB-14	303-TB-15
DATE SAMPLED	03/07/95	03/06/95	03/09/95	03/10/95	03/11/95	03/13/95
UNITS	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
SEMIVOLATILES						
PHENOL	NA	NA	NA	NA	NA	NA
BIS(2-CHLOROETHYL)ETHER	NA	NA	NA	NA	NA	NA
2-CHLOROPHENOL	NA	NA	NA	NA	NA	NA
1,3-DICHLOROBENZENE	NA	NA	NA	NA	NA	NA
1,4-DICHLOROBENZENE	NA	NA	NA	NA	NA	NA
1,2-DICHLOROBENZENE	NA	NA	NA	NA	NA	NA
2-METHYLPHENOL	NA	NA	NA	NA	NA	NA
2,2'-OXYBIS(1-CHLOROPROPANE)	NA	NA	NA	NA	NA	NA
4-METHYLPHENOL	NA	NA	NA	NA	NA	NA
N-NITROSO-DI-N-PROPYLAMINE	NA	NA	NA	NA	NA	NA
HEXACHLOROETHANE	NA	NA	NA	NA	NA	NA
NITROBENZENE	NA	NA	NA	NA	NA	NA
ISOPHORONE	NA	NA	NA	NA	NA	NA
2-NITROPHENOL	NA	NA	NA	NA	NA	NA
2,4-DIMETHYLPHENOL	NA	NA	NA	NA	NA	NA
BIS(2-CHLOROETHOXY)METHANE	NA	NA	NA	NA	NA	NA
2,4-DICHLOROPHENOL	NA	NA	NA	NA	NA	NA
1,2,4-TRICHLOROBENZENE	NA	NA	NA	NA	NA	NA
NAPHTHALENE	NA	NA	NA	NA	NA	NA
4-CHLOROANILINE	NA	NA	NA	NA	NA	NA
HEXACHLOROBUTADIENE	NA	NA	NA	NA	NA	NA
4-CHLORO-3-METHYLPHENOL	NA	NA	NA	NA	NA	NA
2-METHYLNAPHTHALENE	NA	NA	NA	NA	NA	NA
HEXACHLOROCYCLOPENTADIENE	NA	NA	NA	NA	NA	NA
2,4,6-TRICHLOROPHENOL	NA	NA	NA	NA	NA	NA
2,4,5-TRICHLOROPHENOL	NA	NA	NA	NA	NA	NA
2-CHLORONAPHTHALENE	NA	NA	NA	NA	NA	NA
2-NITROANILINE	NA	NA	NA	NA	NA	NA
DIMETHYLPHTHALATE	NA	NA	NA	NA	NA	NA
ACENAPHTHYLENE	NA	NA	NA	NA	NA	NA
2,6-DINITROTOLUENE	NA	NA	NA	NA	NA	NA
3-NITROANILINE	NA	NA	NA	NA	NA	NA
ACENAPHTHENE	NA	NA	NA	NA	NA	NA
2,4-DINITROPHENOL	NA	NA	NA	NA	NA	NA

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
SOIL QA/QC - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

SAMPLE	303-TB-09	303-TB-10	303-TB-12	303-TB-13	303-TB-14	303-TB-15
DATE SAMPLED	03/07/95	03/06/95	03/09/95	03/10/95	03/11/95	03/13/95
UNITS	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
SEMIVOLATILES cont.						
4-NITROPHENOL	NA	NA	NA	NA	NA	NA
DIBENZOFURAN	NA	NA	NA	NA	NA	NA
2,4-DINITROTOLUENE	NA	NA	NA	NA	NA	NA
DIETHYLPHTHALATE	NA	NA	NA	NA	NA	NA
4-CHLOROPHENYL-PHENYLETHER	NA	NA	NA	NA	NA	NA
FLUORENE	NA	NA	NA	NA	NA	NA
4-NITROANILINE	NA	NA	NA	NA	NA	NA
4,6-DINITRO-2-METHYLPHENOL	NA	NA	NA	NA	NA	NA
N-NITROSODIPHENYLAMINE (1)	NA	NA	NA	NA	NA	NA
4-BROMOPHENYL-PHENYLETHER	NA	NA	NA	NA	NA	NA
HEXACHLOROBENZENE	NA	NA	NA	NA	NA	NA
PENTACHLOROPHENOL	NA	NA	NA	NA	NA	NA
PHENANTHRENE	NA	NA	NA	NA	NA	NA
ANTHRACENE	NA	NA	NA	NA	NA	NA
CARBAZOLE	NA	NA	NA	NA	NA	NA
DI-N-BUTYLPHTHALATE	NA	NA	NA	NA	NA	NA
FLUORANTHENE	NA	NA	NA	NA	NA	NA
PYRENE	NA	NA	NA	NA	NA	NA
BUTYLBENZYLPHTHALATE	NA	NA	NA	NA	NA	NA
3,3'-DICHLOROBENZIDINE	NA	NA	NA	NA	NA	NA
BENZO(A)ANTHRACENE	NA	NA	NA	NA	NA	NA
CHRYSENE	NA	NA	NA	NA	NA	NA
BIS(2-ETHYLHEXYL)PHTHALATE	NA	NA	NA	NA	NA	NA
DI-N-OCTYL PHTHALATE	NA	NA	NA	NA	NA	NA
BENZO(B)FLUORANTHENE	NA	NA	NA	NA	NA	NA
BENZO(K)FLUORANTHENE	NA	NA	NA	NA	NA	NA
BENZO(A)PYRENE	NA	NA	NA	NA	NA	NA
INDENO(1,2,3-CD)PYRENE	NA	NA	NA	NA	NA	NA
DIBENZO(A,H)ANTHRACENE	NA	NA	NA	NA	NA	NA
BENZO(G,H,I)PERYLENE	NA	NA	NA	NA	NA	NA

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
SOIL QA/QC - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

SAMPLE	303-TB-09	303-TB-10	303-TB-12	303-TB-13	303-TB-14	303-TB-15
DATE SAMPLED	03/07/95	03/06/95	03/09/95	03/10/95	03/11/95	03/13/95
UNITS	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
PESTICIDE/PCBS						
ALPHA-BHC	NA	NA	NA	NA	NA	NA
BETA-BHC	NA	NA	NA	NA	NA	NA
DELTA-BHC	NA	NA	NA	NA	NA	NA
GAMMA-BHC (LINDANE)	NA	NA	NA	NA	NA	NA
HEPTACHLOR	NA	NA	NA	NA	NA	NA
ALDRIN	NA	NA	NA	NA	NA	NA
HEPTACHLOR EPOXIDE	NA	NA	NA	NA	NA	NA
ENDOSULFAN I	NA	NA	NA	NA	NA	NA
DIELDRIN	NA	NA	NA	NA	NA	NA
4,4'-DDE	NA	NA	NA	NA	NA	NA
ENDRIN	NA	NA	NA	NA	NA	NA
ENDOSULFAN II	NA	NA	NA	NA	NA	NA
4,4'-DDD	NA	NA	NA	NA	NA	NA
ENDOSULFAN SULFATE	NA	NA	NA	NA	NA	NA
4,4'-DDT	NA	NA	NA	NA	NA	NA
METHOXYCHLOR	NA	NA	NA	NA	NA	NA
ENDRIN KETONE	NA	NA	NA	NA	NA	NA
ENDRIN ALDEHYDE	NA	NA	NA	NA	NA	NA
ALPHA-CHLORDANE	NA	NA	NA	NA	NA	NA
GAMMA-CHLORDANE	NA	NA	NA	NA	NA	NA
TOXAPHENE	NA	NA	NA	NA	NA	NA
AROCLOR-1016	NA	NA	NA	NA	NA	NA
AROCLOR-1221	NA	NA	NA	NA	NA	NA
AROCLOR-1232	NA	NA	NA	NA	NA	NA
AROCLOR-1242	NA	NA	NA	NA	NA	NA
AROCLOR-1248	NA	NA	NA	NA	NA	NA
AROCLOR-1254	NA	NA	NA	NA	NA	NA
AROCLOR-1260	NA	NA	NA	NA	NA	NA

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
SOIL QA/QC - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

SAMPLE	303-TB-16	54-SIER-01	54-SIER-03
DATE SAMPLED	03/13/95	03/07/95	03/13/95
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	16 U	10 U	10 U
CARBON DISULFIDE	10 U	5 J	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	4 J	10 U
1,2-DICHLOROETHANE	10 U	10 U	10 U
2-BUTANONE	28	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 54, CRASH CREW FIRE TRAINING BURN PIT
SOIL QA/QC - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

SAMPLE	303-TB-16	54-SIER-01	54-SIER-03
DATE SAMPLED	03/13/95	03/07/95	03/13/95
UNITS	UG/L	UG/L	UG/L
SEMIVOLATILES			
PHENOL	NA	11 U	10 U
BIS(2-CHLOROETHYL)ETHER	NA	11 UJ	10 U
2-CHLOROPHENOL	NA	11 U	10 U
1,3-DICHLOROBENZENE	NA	11 UJ	10 U
1,4-DICHLOROBENZENE	NA	11 UJ	10 U
1,2-DICHLOROBENZENE	NA	11 UJ	10 U
2-METHYLPHENOL	NA	11 U	10 U
2,2'-OXYBIS(1-CHLOROPROPANE)	NA	11 UJ	10 U
4-METHYLPHENOL	NA	11 U	10 U
N-NITROSO-DI-N-PROPYLAMINE	NA	11 UJ	10 U
HEXACHLOROETHANE	NA	11 UJ	10 U
NITROBENZENE	NA	11 UJ	10 U
ISOPHORONE	NA	11 UJ	10 U
2-NITROPHENOL	NA	11 U	10 U
2,4-DIMETHYLPHENOL	NA	11 U	10 U
BIS(2-CHLOROETHOXY)METHANE	NA	11 UJ	10 U
2,4-DICHLOROPHENOL	NA	11 U	10 U
1,2,4-TRICHLOROBENZENE	NA	11 UJ	10 U
NAPHTHALENE	NA	11 UJ	1 J
4-CHLOROANILINE	NA	11 UJ	10 U
HEXACHLOROBUTADIENE	NA	11 UJ	10 U
4-CHLORO-3-METHYLPHENOL	NA	11 U	10 U
2-METHYLNAPHTHALENE	NA	11 UJ	10 U
HEXACHLOROCYCLOPENTADIENE	NA	11 UJ	10 U
2,4,6-TRICHLOROPHENOL	NA	11 U	10 U
2,4,5-TRICHLOROPHENOL	NA	27 U	26 U
2-CHLORONAPHTHALENE	NA	11 UJ	10 U
2-NITROANILINE	NA	27 UJ	26 U
DIMETHYLPHTHALATE	NA	11 UJ	10 U
ACENAPHTHYLENE	NA	11 UJ	10 U
2,6-DINITROTOLUENE	NA	11 UJ	10 U
3-NITROANILINE	NA	27 UJ	26 U
ACENAPHTHENE	NA	11 UJ	10 U
2,4-DINITROPHENOL	NA	27 U	26 U

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
SOIL QA/QC - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

SAMPLE	303-TB-16	54-SIER-01	54-SIER-03
DATE SAMPLED	03/13/95	03/07/95	03/13/95
UNITS	UG/L	UG/L	UG/L
SEMIVOLATILES cont.			
4-NITROPHENOL	NA	27 U	26 U
DIBENZOFURAN	NA	11 UJ	10 U
2,4-DINITROTOLUENE	NA	11 UJ	10 U
DIETHYLPHTHALATE	NA	11 UJ	10 U
4-CHLOROPHENYL-PHENYLETHER	NA	11 UJ	10 U
FLUORENE	NA	11 UJ	10 U
4-NITROANILINE	NA	27 U	26 U
4,6-DINITRO-2-METHYLPHENOL	NA	27 U	26 U
N-NITROSODIPHENYLAMINE (1)	NA	11 UJ	10 U
4-BROMOPHENYL-PHENYLETHER	NA	11 UJ	10 U
HEXACHLOROBENZENE	NA	11 UJ	10 U
PENTACHLOROPHENOL	NA	27 U	26 U
PHENANTHRENE	NA	11 UJ	10 U
ANTHRACENE	NA	11 UJ	10 U
CARBAZOLE	NA	11 UJ	10 U
DI-N-BUTYLPHTHALATE	NA	11 UJ	10 U
FLUORANTHENE	NA	11 UJ	10 U
PYRENE	NA	11 UJ	10 U
BUTYLBENZYLPHTHALATE	NA	11 UJ	10 U
3,3'-DICHLOROBENZIDINE	NA	11 UJ	10 U
BENZO(A)ANTHRACENE	NA	11 UJ	10 U
CHRYSENE	NA	11 UJ	10 U
BIS(2-ETHYLHEXYL)PHTHALATE	NA	11 UJ	1 J
DI-N-OCTYL PHTHALATE	NA	11 UJ	10 U
BENZO(B)FLUORANTHENE	NA	11 UJ	10 U
BENZO(K)FLUORANTHENE	NA	11 UJ	10 U
BENZO(A)PYRENE	NA	11 UJ	10 U
INDENO(1,2,3-CD)PYRENE	NA	11 UJ	10 U
DIBENZO(A,H)ANTHRACENE	NA	11 UJ	10 U
BENZO(G,H,I)PERYLENE	NA	11 UJ	10 U

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
SOIL QA/QC - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

SAMPLE	303-TB-16	54-SIER-01	54-SIER-03
DATE SAMPLED	03/13/95	03/07/95	03/13/95
UNITS	UG/L	UG/L	UG/L
PESTICIDE/PCBS			
ALPHA-BHC	NA	0.05 UJ	NA
BETA-BHC	NA	0.05 UJ	NA
DELTA-BHC	NA	0.05 UJ	NA
GAMMA-BHC (LINDANE)	NA	0.05 UJ	NA
HEPTACHLOR	NA	0.05 UJ	NA
ALDRIN	NA	0.05 UJ	NA
HEPTACHLOR EPOXIDE	NA	0.05 UJ	NA
ENDOSULFAN I	NA	0.05 UJ	NA
DIELDRIN	NA	0.1 UJ	NA
4,4'-DDE	NA	0.1 UJ	NA
ENDRIN	NA	0.1 UJ	NA
ENDOSULFAN II	NA	0.1 UJ	NA
4,4'-DDD	NA	0.1 UJ	NA
ENDOSULFAN SULFATE	NA	0.1 UJ	NA
4,4'-DDT	NA	0.1 UJ	NA
METHOXYCHLOR	NA	0.5 UJ	NA
ENDRIN KETONE	NA	0.1 UJ	NA
ENDRIN ALDEHYDE	NA	0.12 J	NA
ALPHA-CHLORDANE	NA	0.05 UJ	NA
GAMMA-CHLORDANE	NA	0.05 UJ	NA
TOXAPHENE	NA	5 UJ	NA
AROCLOR-1016	NA	1 UJ	1 UJ
AROCLOR-1221	NA	2 UJ	2 UJ
AROCLOR-1232	NA	1 UJ	1 UJ
AROCLOR-1242	NA	1 UJ	1 UJ
AROCLOR-1248	NA	1 UJ	1 UJ
AROCLOR-1254	NA	1 UJ	1 UJ
AROCLOR-1260	NA	1 UJ	1 UJ

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
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		0/9
BROMOMETHANE	10 U	10 U	ND	ND		0/9
VINYL CHLORIDE	10 U	10 U	ND	ND		0/9
CHLOROETHANE	10 U	10 U	ND	ND		0/9
METHYLENE CHLORIDE	10 U	10 U	ND	ND		0/9
ACETONE	10 U	17 U	20	20	303-TB-10	1/9
CARBON DISULFIDE	10 U	10 U	5 J	5 J	54-SIER-01	1/9
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	ND	ND		0/9
CHLOROFORM	10 U	10 U	4 J	4 J	54-SIER-01	1/9
1,2-DICHLOROETHANE	10 U	10 U	ND	ND		0/9
2-BUTANONE	10 U	10 U	23	32	303-TB-13	7/9
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	ND	ND		0/9
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	ND	ND		0/9
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 54, CRASH CREW FIRE TRAINING BURN PIT
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
SEMIVOLATILES						
PHENOL	10 U	11 U	ND	ND		0/2
BIS(2-CHLOROETHYL)ETHER	10 U	11 UJ	ND	ND		0/2
2-CHLOROPHENOL	10 U	11 U	ND	ND		0/2
1,3-DICHLOROBENZENE	10 U	11 UJ	ND	ND		0/2
1,4-DICHLOROBENZENE	10 U	11 UJ	ND	ND		0/2
1,2-DICHLOROBENZENE	10 U	11 UJ	ND	ND		0/2
2-METHYLPHENOL	10 U	11 U	ND	ND		0/2
2,2'-OXYBIS(1-CHLOROPROPANE)	10 U	11 UJ	ND	ND		0/2
4-METHYLPHENOL	10 U	11 U	ND	ND		0/2
N-NITROSO-DI-N-PROPYLAMINE	10 U	11 UJ	ND	ND		0/2
HEXACHLOROETHANE	10 U	11 UJ	ND	ND		0/2
NITROBENZENE	10 U	11 UJ	ND	ND		0/2
ISOPHORONE	10 U	11 UJ	ND	ND		0/2
2-NITROPHENOL	10 U	11 U	ND	ND		0/2
2,4-DIMETHYLPHENOL	10 U	11 U	ND	ND		0/2
BIS(2-CHLOROETHOXY)METHANE	10 U	11 UJ	ND	ND		0/2
2,4-DICHLOROPHENOL	10 U	11 U	ND	ND		0/2
1,2,4-TRICHLOROBENZENE	10 U	11 UJ	ND	ND		0/2
NAPHTHALENE	11 UJ	11 UJ	1 J	1 J	[redacted]	1/2
4-CHLOROANILINE	10 U	11 UJ	ND	ND		0/2
HEXACHLOROBUTADIENE	10 U	11 UJ	ND	ND		0/2
4-CHLORO-3-METHYLPHENOL	10 U	11 U	ND	ND		0/2
2-METHYLNAPHTHALENE	10 U	11 UJ	ND	ND		0/2
HEXACHLOROCYCLOPENTADIENE	10 U	11 UJ	ND	ND		0/2
2,4,6-TRICHLOROPHENOL	10 U	11 U	ND	ND		0/2
2,4,5-TRICHLOROPHENOL	26 U	27 U	ND	ND		0/2
2-CHLORONAPHTHALENE	10 U	11 UJ	ND	ND		0/2
2-NITROANILINE	26 U	27 UJ	ND	ND		0/2
DIMETHYLPHTHALATE	10 U	11 UJ	ND	ND		0/2
ACENAPHTHYLENE	10 U	11 UJ	ND	ND		0/2
2,6-DINITROTOLUENE	10 U	11 UJ	ND	ND		0/2
3-NITROANILINE	26 U	27 UJ	ND	ND		0/2
ACENAPHTHENE	10 U	11 UJ	ND	ND		0/2
2,4-DINITROPHENOL	26 U	27 U	ND	ND		0/2

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
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
SEMIVOLATILES cont.						
4-NITROPHENOL	26 U	27 U	ND	ND		0/2
DIBENZOFURAN	10 U	11 UJ	ND	ND		0/2
2,4-DINITROTOLUENE	10 U	11 UJ	ND	ND		0/2
DIETHYLPHTHALATE	10 U	11 UJ	ND	ND		0/2
4-CHLOROPHENYL-PHENYLETHER	10 U	11 UJ	ND	ND		0/2
FLUORENE	10 U	11 UJ	ND	ND		0/2
4-NITROANILINE	26 U	27 U	ND	ND		0/2
4,6-DINITRO-2-METHYLPHENOL	26 U	27 U	ND	ND		0/2
N-NITROSODIPHENYLAMINE (1)	10 U	11 UJ	ND	ND		0/2
4-BROMOPHENYL-PHENYLETHER	10 U	11 UJ	ND	ND		0/2
HEXACHLOROBENZENE	10 U	11 UJ	ND	ND		0/2
PENTACHLOROPHENOL	26 U	27 U	ND	ND		0/2
PHENANTHRENE	10 U	11 UJ	ND	ND		0/2
ANTHRACENE	10 U	11 UJ	ND	ND		0/2
CARBAZOLE	10 U	11 UJ	ND	ND		0/2
DI-N-BUTYLPHTHALATE	10 U	11 UJ	ND	ND		0/2
FLUORANTHENE	10 U	11 UJ	ND	ND		0/2
PYRENE	10 U	11 UJ	ND	ND		0/2
BUTYLBENZYLPHTHALATE	10 U	11 UJ	ND	ND		0/2
3,3'-DICHLOROBENZIDINE	10 U	11 UJ	ND	ND		0/2
BENZO(A)ANTHRACENE	10 U	11 UJ	ND	ND		0/2
CHRYSENE	10 U	11 UJ	ND	ND		0/2
BIS(2-ETHYLHEXYL)PHTHALATE	11 UJ	11 UJ	1 J	1 J	54-SIER-03	1/2
DI-N-OCTYL PHTHALATE	10 U	11 UJ	ND	ND		0/2
BENZO(B)FLUORANTHENE	10 U	11 UJ	ND	ND		0/2
BENZO(K)FLUORANTHENE	10 U	11 UJ	ND	ND		0/2
BENZO(A)PYRENE	10 U	11 UJ	ND	ND		0/2
INDENO(1,2,3-CD)PYRENE	10 U	11 UJ	ND	ND		0/2
DIBENZO(A,H)ANTHRACENE	10 U	11 UJ	ND	ND		0/2
BENZO(G,H,I)PERYLENE	10 U	11 UJ	ND	ND		0/2

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
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
PESTICIDE/PCBS						
ALPHA-BHC	0.05 UJ	0.05 UJ	ND	ND		0/1
BETA-BHC	0.05 UJ	0.05 UJ	ND	ND		0/1
DELTA-BHC	0.05 UJ	0.05 UJ	ND	ND		0/1
GAMMA-BHC (LINDANE)	0.05 UJ	0.05 UJ	ND	ND		0/1
HEPTACHLOR	0.05 UJ	0.05 UJ	ND	ND		0/1
ALDRIN	0.05 UJ	0.05 UJ	ND	ND		0/1
HEPTACHLOR EPOXIDE	0.05 UJ	0.05 UJ	ND	ND		0/1
ENDOSULFAN I	0.05 UJ	0.05 UJ	ND	ND		0/1
DIELDRIN	0.1 UJ	0.1 UJ	ND	ND		0/1
4,4'-DDE	0.1 UJ	0.1 UJ	ND	ND		0/1
ENDRIN	0.1 UJ	0.1 UJ	ND	ND		0/1
ENDOSULFAN II	0.1 UJ	0.1 UJ	ND	ND		0/1
4,4'-DDD	0.1 UJ	0.1 UJ	ND	ND		0/1
ENDOSULFAN SULFATE	0.1 UJ	0.1 UJ	ND	ND		0/1
4,4'-DDT	0.1 UJ	0.1 UJ	ND	ND		0/1
METHOXYCHLOR	0.5 UJ	0.5 UJ	ND	ND		0/1
ENDRIN KETONE	0.1 UJ	0.1 UJ	ND	ND		0/1
ENDRIN ALDEHYDE	NA	NA	0.12 J	0.12 J	54-SIER-01	1/1
ALPHA-CHLORDANE	0.05 UJ	0.05 UJ	ND	ND		0/1
GAMMA-CHLORDANE	0.05 UJ	0.05 UJ	ND	ND		0/1
TOXAPHENE	5 UJ	5 UJ	ND	ND		0/1
AROCLOR-1016	1 UJ	1 UJ	ND	ND		0/2
AROCLOR-1221	2 UJ	2 UJ	ND	ND		0/2
AROCLOR-1232	1 UJ	1 UJ	ND	ND		0/2
AROCLOR-1242	1 UJ	1 UJ	ND	ND		0/2
AROCLOR-1248	1 UJ	1 UJ	ND	ND		0/2
AROCLOR-1254	1 UJ	1 UJ	ND	ND		0/2
AROCLOR-1260	1 UJ	1 UJ	ND	ND		0/2

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
SOIL QA/QC - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
INORGANIC ANALYTES

SAMPLE	54-SIER-01	54-SIER-03
DATE SAMPLED	03/07/95	03/13/95
UNITS	UG/L	UG/L
TOTAL METALS		
ALUMINUM, TOTAL	24 U	30.2 U
ANTIMONY, TOTAL	20.7 U	20.7 U
ARSENIC, TOTAL	1.7 U	1.9 U
BARIUM, TOTAL	1.7 U	1.7 U
BERYLLIUM, TOTAL	0.9 U	0.9 U
CADMIUM, TOTAL	2.8 U	2.8 U
CALCIUM, TOTAL	660 J	270 U
CHROMIUM, TOTAL	2.9 U	2.9 U
COBALT, TOTAL	3 U	3 U
COPPER, TOTAL	1.9 U	2.8 U
IRON, TOTAL	8.5 U	40.4
LEAD, TOTAL	1.2 U	1 U
MAGNESIUM, TOTAL	18.3 U	59.1 U
MANGANESE, TOTAL	1.8 U	1.8 U
MERCURY, TOTAL	0.2 U	0.2 U
NICKEL, TOTAL	10.8 U	12.2
POTASSIUM, TOTAL	685 U	715
SELENIUM, TOTAL	1.5 U	1.5 U
SILVER, TOTAL	3 U	3 U
SODIUM, TOTAL	133 U	127 U
THALLIUM, TOTAL	0.7 U	1.1 U
VANADIUM, TOTAL	2.3 U	2.4
ZINC, TOTAL	3.8 U	3.8 U

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
SOIL 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	24 U	30.2 U	ND	ND		0/2
ANTIMONY, TOTAL	20.7 U	20.7 U	ND	ND		0/2
ARSENIC, TOTAL	1.7 U	1.9 U	ND	ND		0/2
BARIUM, TOTAL	1.7 U	1.7 U	ND	ND		0/2
BERYLLIUM, TOTAL	0.9 U	0.9 U	ND	ND		0/2
CADMIUM, TOTAL	2.8 U	2.8 U	ND	ND		0/2
CALCIUM, TOTAL	270 U	270 U	660 J	660 J	54-SIER-01	1/2
CHROMIUM, TOTAL	2.9 U	2.9 U	ND	ND		0/2
COBALT, TOTAL	3 U	3 U	ND	ND		0/2
COPPER, TOTAL	1.9 U	2.8 U	ND	ND		0/2
IRON, TOTAL	8.5 U	8.5 U	40.4	40.4	54-SIER-03	1/2
LEAD, TOTAL	1 U	1.2 U	ND	ND		0/2
MAGNESIUM, TOTAL	18.3 U	59.1 U	ND	ND		0/2
MANGANESE, TOTAL	1.8 U	1.8 U	ND	ND		0/2
MERCURY, TOTAL	0.2 U	0.2 U	ND	ND		0/2
NICKEL, TOTAL	10.8 U	10.8 U	12.2	12.2	54-SIER-03	1/2
POTASSIUM, TOTAL	685 U	685 U	715	715	54-SIER-03	1/2
SELENIUM, TOTAL	1.5 U	1.5 U	ND	ND		0/2
SILVER, TOTAL	3 U	3 U	ND	ND		0/2
SODIUM, TOTAL	127 U	133 U	ND	ND		0/2
THALLIUM, TOTAL	0.7 U	1.1 U	ND	ND		0/2
VANADIUM, TOTAL	2.3 U	2.3 U	2.4	2.4	54-SIER-03	1/2
ZINC, TOTAL	3.8 U	3.8 U	ND	ND		0/2

GROUNDWATER

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
GROUNDWATER QA/QC - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

SAMPLE	303-FB-03	303-TB-15	303-TB-27	303-TB-28	303-TB-35	303-TB-36
DATE SAMPLED	04/11/95	03/13/95	03/27/95	03/28/95	04/11/95	04/11/95
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	15 U	17 U	17 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	28 J	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	10 U	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 54, CRASH CREW FIRE TRAINING BURN PIT
GROUNDWATER QA/QC - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

SAMPLE	303-FB-03	303-TB-15	303-TB-27	303-TB-28	303-TB-35	303-TB-36
DATE SAMPLED	04/11/95	03/13/95	03/27/95	03/28/95	04/11/95	04/11/95
UNITS	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
SEMIVOLATILES						
PHENOL	10 U	NA	NA	NA	NA	NA
BIS(2-CHLOROETHYL)ETHER	10 U	NA	NA	NA	NA	NA
2-CHLOROPHENOL	10 U	NA	NA	NA	NA	NA
1,3-DICHLOROBENZENE	10 U	NA	NA	NA	NA	NA
1,4-DICHLOROBENZENE	10 U	NA	NA	NA	NA	NA
1,2-DICHLOROBENZENE	10 U	NA	NA	NA	NA	NA
2-METHYLPHENOL	10 U	NA	NA	NA	NA	NA
2,2'-OXYBIS(1-CHLOROPROPANE)	10 U	NA	NA	NA	NA	NA
4-METHYLPHENOL	10 U	NA	NA	NA	NA	NA
N-NITROSO-DI-N-PROPYLAMINE	10 U	NA	NA	NA	NA	NA
HEXACHLOROETHANE	10 U	NA	NA	NA	NA	NA
NITROBENZENE	10 U	NA	NA	NA	NA	NA
ISOPHORONE	10 U	NA	NA	NA	NA	NA
2-NITROPHENOL	10 U	NA	NA	NA	NA	NA
2,4-DIMETHYLPHENOL	10 U	NA	NA	NA	NA	NA
BIS(2-CHLOROETHOXY)METHANE	10 U	NA	NA	NA	NA	NA
2,4-DICHLOROPHENOL	10 U	NA	NA	NA	NA	NA
1,2,4-TRICHLOROBENZENE	10 U	NA	NA	NA	NA	NA
NAPHTHALENE	10 U	NA	NA	NA	NA	NA
4-CHLOROANILINE	10 U	NA	NA	NA	NA	NA
HEXACHLOROBUTADIENE	10 U	NA	NA	NA	NA	NA
4-CHLORO-3-METHYLPHENOL	10 U	NA	NA	NA	NA	NA
2-METHYLNAPHTHALENE	10 U	NA	NA	NA	NA	NA
HEXACHLOROCYCLOPENTADIENE	10 U	NA	NA	NA	NA	NA
2,4,6-TRICHLOROPHENOL	10 U	NA	NA	NA	NA	NA
2,4,5-TRICHLOROPHENOL	25 U	NA	NA	NA	NA	NA
2-CHLORONAPHTHALENE	10 U	NA	NA	NA	NA	NA
2-NITROANILINE	25 U	NA	NA	NA	NA	NA
DIMETHYLPHTHALATE	10 U	NA	NA	NA	NA	NA
ACENAPHTHYLENE	10 U	NA	NA	NA	NA	NA
2,6-DINITROTOLUENE	10 U	NA	NA	NA	NA	NA
3-NITROANILINE	25 U	NA	NA	NA	NA	NA
ACENAPHTHENE	10 U	NA	NA	NA	NA	NA
2,4-DINITROPHENOL	25 UJ	NA	NA	NA	NA	NA

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
GROUNDWATER QA/QC - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

SAMPLE	303-FB-03	303-TB-15	303-TB-27	303-TB-28	303-TB-35	303-TB-36
DATE SAMPLED	04/11/95	03/13/95	03/27/95	03/28/95	04/11/95	04/11/95
UNITS	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
SEMIVOLATILES cont.						
4-NITROPHENOL	25 U	NA	NA	NA	NA	NA
DIBENZOFURAN	10 U	NA	NA	NA	NA	NA
2,4-DINITROTOLUENE	10 U	NA	NA	NA	NA	NA
DIETHYLPHTHALATE	10 U	NA	NA	NA	NA	NA
4-CHLOROPHENYL-PHENYLETHER	10 U	NA	NA	NA	NA	NA
FLUORENE	10 U	NA	NA	NA	NA	NA
4-NITROANILINE	25 U	NA	NA	NA	NA	NA
4,6-DINITRO-2-METHYLPHENOL	25 U	NA	NA	NA	NA	NA
N-NITROSODIPHENYLAMINE (1)	10 U	NA	NA	NA	NA	NA
4-BROMOPHENYL-PHENYLETHER	10 U	NA	NA	NA	NA	NA
HEXACHLOROBENZENE	10 U	NA	NA	NA	NA	NA
PENTACHLOROPHENOL	25 U	NA	NA	NA	NA	NA
PHENANTHRENE	10 U	NA	NA	NA	NA	NA
ANTHRACENE	10 U	NA	NA	NA	NA	NA
CARBAZOLE	10 U	NA	NA	NA	NA	NA
DI-N-BUTYLPHTHALATE	10 U	NA	NA	NA	NA	NA
FLUORANTHENE	10 U	NA	NA	NA	NA	NA
PYRENE	10 U	NA	NA	NA	NA	NA
BUTYLBENZYLPHTHALATE	10 U	NA	NA	NA	NA	NA
3,3'-DICHLOROBENZIDINE	10 U	NA	NA	NA	NA	NA
BENZO(A)ANTHRACENE	10 U	NA	NA	NA	NA	NA
CHRYSENE	10 U	NA	NA	NA	NA	NA
BIS(2-ETHYLHEXYL)PHTHALATE	10 U	NA	NA	NA	NA	NA
DI-N-OCTYL PHTHALATE	10 U	NA	NA	NA	NA	NA
BENZO(B)FLUORANTHENE	10 U	NA	NA	NA	NA	NA
BENZO(K)FLUORANTHENE	10 U	NA	NA	NA	NA	NA
BENZO(A)PYRENE	10 U	NA	NA	NA	NA	NA
INDENO(1,2,3-CD)PYRENE	10 U	NA	NA	NA	NA	NA
DIBENZO(A,H)ANTHRACENE	10 U	NA	NA	NA	NA	NA
BENZO(G,H,I)PERYLENE	10 U	NA	NA	NA	NA	NA

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
GROUNDWATER QA/QC - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

SAMPLE	303-FB-03	303-TB-15	303-TB-27	303-TB-28	303-TB-35	303-TB-36
DATE SAMPLED	04/11/95	03/13/95	03/27/95	03/28/95	04/11/95	04/11/95
UNITS	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
PESTICIDE/PCBS						
ALPHA-BHC	0.046 U	NA	NA	NA	NA	NA
BETA-BHC	0.046 U	NA	NA	NA	NA	NA
DELTA-BHC	0.046 U	NA	NA	NA	NA	NA
GAMMA-BHC (LINDANE)	0.046 U	NA	NA	NA	NA	NA
HEPTACHLOR	0.046 U	NA	NA	NA	NA	NA
ALDRIN	0.046 U	NA	NA	NA	NA	NA
HEPTACHLOR EPOXIDE	0.046 U	NA	NA	NA	NA	NA
ENDOSULFAN I	0.046 U	NA	NA	NA	NA	NA
DIELDRIN	0.092 U	NA	NA	NA	NA	NA
4,4'-DDE	0.092 U	NA	NA	NA	NA	NA
ENDRIN	0.092 U	NA	NA	NA	NA	NA
ENDOSULFAN II	0.092 U	NA	NA	NA	NA	NA
4,4'-DDD	0.092 U	NA	NA	NA	NA	NA
ENDOSULFAN SULFATE	0.092 U	NA	NA	NA	NA	NA
4,4'-DDT	0.092 U	NA	NA	NA	NA	NA
METHOXYCHLOR	0.46 UJ	NA	NA	NA	NA	NA
ENDRIN KETONE	0.092 U	NA	NA	NA	NA	NA
ENDRIN ALDEHYDE	0.092 U	NA	NA	NA	NA	NA
ALPHA-CHLORDANE	0.046 U	NA	NA	NA	NA	NA
GAMMA-CHLORDANE	0.046 U	NA	NA	NA	NA	NA
TOXAPHENE	4.6 U	NA	NA	NA	NA	NA
AROCLOR-1016	0.92 U	NA	NA	NA	NA	NA
AROCLOR-1221	1.8 U	NA	NA	NA	NA	NA
AROCLOR-1232	0.92 U	NA	NA	NA	NA	NA
AROCLOR-1242	0.92 U	NA	NA	NA	NA	NA
AROCLOR-1248	0.92 U	NA	NA	NA	NA	NA
AROCLOR-1254	0.92 U	NA	NA	NA	NA	NA
AROCLOR-1260	0.92 U	NA	NA	NA	NA	NA

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
GROUNDWATER QA/QC - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

SAMPLE	303-TB-37	54-GWER-02	54-GWER-03
DATE SAMPLED	04/17/95	03/28/95	04/17/95
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	5 J	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 54, CRASH CREW FIRE TRAINING BURN PIT
GROUNDWATER QA/QC - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

SAMPLE	303-TB-37	54-GWER-02	54-GWER-03
DATE SAMPLED	04/17/95	03/28/95	04/17/95
UNITS	UG/L	UG/L	UG/L
SEMIVOLATILES			
PHENOL	NA	10 U	10 U
BIS(2-CHLOROETHYL)ETHER	NA	10 U	10 U
2-CHLOROPHENOL	NA	10 U	10 U
1,3-DICHLOROBENZENE	NA	10 U	10 U
1,4-DICHLOROBENZENE	NA	10 U	10 U
1,2-DICHLOROBENZENE	NA	10 U	10 U
2-METHYLPHENOL	NA	10 U	10 U
2,2'-OXYBIS(1-CHLOROPROPANE)	NA	10 R	10 U
4-METHYLPHENOL	NA	10 U	10 U
N-NITROSO-DI-N-PROPYLAMINE	NA	10 U	10 U
HEXACHLOROETHANE	NA	10 U	10 U
NITROBENZENE	NA	10 U	10 U
ISOPHORONE	NA	10 U	10 U
2-NITROPHENOL	NA	10 U	10 U
2,4-DIMETHYLPHENOL	NA	10 U	10 U
BIS(2-CHLOROETHOXY)METHANE	NA	10 U	10 U
2,4-DICHLOROPHENOL	NA	10 U	10 U
1,2,4-TRICHLOROBENZENE	NA	10 U	10 U
NAPHTHALENE	NA	10 U	10 U
4-CHLOROANILINE	NA	10 U	10 U
HEXACHLOROBUTADIENE	NA	10 U	10 U
4-CHLORO-3-METHYLPHENOL	NA	10 U	10 U
2-METHYLNAPHTHALENE	NA	10 U	10 U
HEXACHLOROCYCLOPENTADIENE	NA	10 U	10 U
2,4,6-TRICHLOROPHENOL	NA	10 U	10 U
2,4,5-TRICHLOROPHENOL	NA	24 U	25 U
2-CHLORONAPHTHALENE	NA	10 U	10 U
2-NITROANILINE	NA	24 U	25 U
DIMETHYLPHTHALATE	NA	10 U	10 U
ACENAPHTHYLENE	NA	10 U	10 U
2,6-DINITROTOLUENE	NA	10 U	10 U
3-NITROANILINE	NA	24 U	25 U
ACENAPHTHENE	NA	10 U	10 U
2,4-DINITROPHENOL	NA	24 UJ	25 UJ

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
GROUNDWATER QA/QC - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

SAMPLE	303-TB-37	54-GWER-02	54-GWER-03
DATE SAMPLED	04/17/95	03/28/95	04/17/95
UNITS	UG/L	UG/L	UG/L
SEMIVOLATILES cont.			
4-NITROPHENOL	NA	24 U	25 U
DIBENZOFURAN	NA	10 U	10 U
2,4-DINITROTOLUENE	NA	10 U	10 U
DIETHYLPHTHALATE	NA	10 U	10 U
4-CHLOROPHENYL-PHENYLETHER	NA	10 U	10 U
FLUORENE	NA	10 U	10 U
4-NITROANILINE	NA	24 U	25 U
4,6-DINITRO-2-METHYLPHENOL	NA	24 U	25 U
N-NITROSODIPHENYLAMINE (1)	NA	10 U	10 U
4-BROMOPHENYL-PHENYLETHER	NA	10 U	10 U
HEXACHLOROBENZENE	NA	10 U	10 U
PENTACHLOROPHENOL	NA	24 U	25 U
PHENANTHRENE	NA	10 U	10 U
ANTHRACENE	NA	10 U	10 U
CARBAZOLE	NA	10 U	10 U
DI-N-BUTYLPHTHALATE	NA	10 U	10 U
FLUORANTHENE	NA	10 U	10 U
PYRENE	NA	10 U	10 U
BUTYLBENZYLPHTHALATE	NA	10 U	10 U
3,3'-DICHLOROBENZIDINE	NA	10 U	10 U
BENZO(A)ANTHRACENE	NA	10 U	10 U
CHRYSENE	NA	10 U	10 U
BIS(2-ETHYLHEXYL)PHTHALATE	NA	280 J	10 U
DI-N-OCTYL PHTHALATE	NA	10 U	10 U
BENZO(B)FLUORANTHENE	NA	10 U	10 U
BENZO(K)FLUORANTHENE	NA	10 U	10 U
BENZO(A)PYRENE	NA	10 U	10 U
INDENO(1,2,3-CD)PYRENE	NA	10 U	10 U
DIBENZO(A,H)ANTHRACENE	NA	10 U	10 U
BENZO(G,H,I)PERYLENE	NA	10 U	10 U

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
GROUNDWATER QA/QC - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
ORGANIC COMPOUNDS

SAMPLE	303-TB-37	54-GWER-02	54-GWER-03
DATE SAMPLED	04/17/95	03/28/95	04/17/95
UNITS	UG/L	UG/L	UG/L
PESTICIDE/PCBS			
ALPHA-BHC	NA	NA	NA
BETA-BHC	NA	NA	NA
DELTA-BHC	NA	NA	NA
GAMMA-BHC (LINDANE)	NA	NA	NA
HEPTACHLOR	NA	NA	NA
ALDRIN	NA	NA	NA
HEPTACHLOR EPOXIDE	NA	NA	NA
ENDOSULFAN I	NA	NA	NA
DIELDRIN	NA	NA	NA
4,4'-DDE	NA	NA	NA
ENDRIN	NA	NA	NA
ENDOSULFAN II	NA	NA	NA
4,4'-DDD	NA	NA	NA
ENDOSULFAN SULFATE	NA	NA	NA
4,4'-DDT	NA	NA	NA
METHOXYCHLOR	NA	NA	NA
ENDRIN KETONE	NA	NA	NA
ENDRIN ALDEHYDE	NA	NA	NA
ALPHA-CHLORDANE	NA	NA	NA
GAMMA-CHLORDANE	NA	NA	NA
TOXAPHENE	NA	NA	NA
AROCLOR-1016	NA	0.93 UJ	1 U
AROCLOR-1221	NA	1.9 UJ	2 U
AROCLOR-1232	NA	0.93 UJ	1 U
AROCLOR-1242	NA	0.93 UJ	1 U
AROCLOR-1248	NA	0.93 UJ	1 U
AROCLOR-1254	NA	0.93 UJ	1 U
AROCLOR-1260	NA	0.93 UJ	1 U

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
GROUNDWATER 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		0/9
BROMOMETHANE	10 U	10 U	ND	ND		0/9
VINYL CHLORIDE	10 U	10 U	ND	ND		0/9
CHLOROETHANE	10 U	10 U	ND	ND		0/9
METHYLENE CHLORIDE	10 U	10 U	ND	ND		0/9
ACETONE	10 U	17 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	ND	ND		0/9
CHLOROFORM	10 U	10 U	4 J	5 J	54-GWER-02	2/9
1,2-DICHLOROETHANE	10 U	10 U	ND	ND		0/9
2-BUTANONE	10 U	10 U	28 J	28 J	303-TB-15	1/9
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	ND	ND		0/9
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	ND	ND		0/9
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 54, CRASH CREW FIRE TRAINING BURN PIT
GROUNDWATER 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		0/3
BIS(2-CHLOROETHYL)ETHER	10 U	10 U	ND	ND		0/3
2-CHLOROPHENOL	10 U	10 U	ND	ND		0/3
1,3-DICHLOROBENZENE	10 U	10 U	ND	ND		0/3
1,4-DICHLOROBENZENE	10 U	10 U	ND	ND		0/3
1,2-DICHLOROBENZENE	10 U	10 U	ND	ND		0/3
2-METHYLPHENOL	10 U	10 U	ND	ND		0/3
2,2'-OXYBIS(1-CHLOROPROPANE)	10 U	10 U	ND	ND		0/2
4-METHYLPHENOL	10 U	10 U	ND	ND		0/3
N-NITROSO-DI-N-PROPYLAMINE	10 U	10 U	ND	ND		0/3
HEXACHLOROETHANE	10 U	10 U	ND	ND		0/3
NITROBENZENE	10 U	10 U	ND	ND		0/3
ISOPHORONE	10 U	10 U	ND	ND		0/3
2-NITROPHENOL	10 U	10 U	ND	ND		0/3
2,4-DIMETHYLPHENOL	10 U	10 U	ND	ND		0/3
BIS(2-CHLOROETHOXY)METHANE	10 U	10 U	ND	ND		0/3
2,4-DICHLOROPHENOL	10 U	10 U	ND	ND		0/3
1,2,4-TRICHLOROBENZENE	10 U	10 U	ND	ND		0/3
NAPHTHALENE	10 U	10 U	ND	ND		0/3
4-CHLOROANILINE	10 U	10 U	ND	ND		0/3
HEXACHLOROBUTADIENE	10 U	10 U	ND	ND		0/3
4-CHLORO-3-METHYLPHENOL	10 U	10 U	ND	ND		0/3
2-METHYLNAPHTHALENE	10 U	10 U	ND	ND		0/3
HEXACHLOROCYCLOPENTADIENE	10 U	10 U	ND	ND		0/3
2,4,6-TRICHLOROPHENOL	10 U	10 U	ND	ND		0/3
2,4,5-TRICHLOROPHENOL	24 U	25 U	ND	ND		0/3
2-CHLORONAPHTHALENE	10 U	10 U	ND	ND		0/3
2-NITROANILINE	24 U	25 U	ND	ND		0/3
DIMETHYLPHTHALATE	10 U	10 U	ND	ND		0/3
ACENAPHTHYLENE	10 U	10 U	ND	ND		0/3
2,6-DINITROTOLUENE	10 U	10 U	ND	ND		0/3
3-NITROANILINE	24 U	25 U	ND	ND		0/3
ACENAPHTHENE	10 U	10 U	ND	ND		0/3
2,4-DINITROPHENOL	24 UJ	25 UJ	ND	ND		0/3

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
GROUNDWATER 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	24 U	25 U	ND	ND		0/3
DIBENZOFURAN	10 U	10 U	ND	ND		0/3
2,4-DINITROTOLUENE	10 U	10 U	ND	ND		0/3
DIETHYLPHTHALATE	10 U	10 U	ND	ND		0/3
4-CHLOROPHENYL-PHENYLETHER	10 U	10 U	ND	ND		0/3
FLUORENE	10 U	10 U	ND	ND		0/3
4-NITROANILINE	24 U	25 U	ND	ND		0/3
4,6-DINITRO-2-METHYLPHENOL	24 U	25 U	ND	ND		0/3
N-NITROSODIPHENYLAMINE (1)	10 U	10 U	ND	ND		0/3
4-BROMOPHENYL-PHENYLETHER	10 U	10 U	ND	ND		0/3
HEXACHLOROBENZENE	10 U	10 U	ND	ND		0/3
PENTACHLOROPHENOL	24 U	25 U	ND	ND		0/3
PHENANTHRENE	10 U	10 U	ND	ND		0/3
ANTHRACENE	10 U	10 U	ND	ND		0/3
CARBAZOLE	10 U	10 U	ND	ND		0/3
DI-N-BUTYLPHTHALATE	10 U	10 U	ND	ND		0/3
FLUORANTHENE	10 U	10 U	ND	ND		0/3
PYRENE	10 U	10 U	ND	ND		0/3
BUTYLBENZYLPHTHALATE	10 U	10 U	ND	ND		0/3
3,3'-DICHLOROBENZIDINE	10 U	10 U	ND	ND		0/3
BENZO(A)ANTHRACENE	10 U	10 U	ND	ND		0/3
CHRYSENE	10 U	10 U	ND	ND		0/3
BIS(2-ETHYLHEXYL)PHTHALATE	10 U	10 U	280 J	280 J	54-GWER-02	1/3
DI-N-OCTYL PHTHALATE	10 U	10 U	ND	ND		0/3
BENZO(B)FLUORANTHENE	10 U	10 U	ND	ND		0/3
BENZO(K)FLUORANTHENE	10 U	10 U	ND	ND		0/3
BENZO(A)PYRENE	10 U	10 U	ND	ND		0/3
INDENO(1,2,3-CD)PYRENE	10 U	10 U	ND	ND		0/3
DIBENZO(A,H)ANTHRACENE	10 U	10 U	ND	ND		0/3
BENZO(G,H,I)PERYLENE	10 U	10 U	ND	ND		0/3

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
GROUNDWATER 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	0.046 U	0.046 U	ND	ND		0/1
BETA-BHC	0.046 U	0.046 U	ND	ND		0/1
DELTA-BHC	0.046 U	0.046 U	ND	ND		0/1
GAMMA-BHC (LINDANE)	0.046 U	0.046 U	ND	ND		0/1
HEPTACHLOR	0.046 U	0.046 U	ND	ND		0/1
ALDRIN	0.046 U	0.046 U	ND	ND		0/1
HEPTACHLOR EPOXIDE	0.046 U	0.046 U	ND	ND		0/1
ENDOSULFAN I	0.046 U	0.046 U	ND	ND		0/1
DIELDRIN	0.092 U	0.092 U	ND	ND		0/1
4,4'-DDE	0.092 U	0.092 U	ND	ND		0/1
ENDRIN	0.092 U	0.092 U	ND	ND		0/1
ENDOSULFAN II	0.092 U	0.092 U	ND	ND		0/1
4,4'-DDD	0.092 U	0.092 U	ND	ND		0/1
ENDOSULFAN SULFATE	0.092 U	0.092 U	ND	ND		0/1
4,4'-DDT	0.092 U	0.092 U	ND	ND		0/1
METHOXYCHLOR	0.46 UJ	0.46 UJ	ND	ND		0/1
ENDRIN KETONE	0.092 U	0.092 U	ND	ND		0/1
ENDRIN ALDEHYDE	0.092 U	0.092 U	ND	ND		0/1
ALPHA-CHLORDANE	0.046 U	0.046 U	ND	ND		0/1
GAMMA-CHLORDANE	0.046 U	0.046 U	ND	ND		0/1
TOXAPHENE	4.6 U	4.6 U	ND	ND		0/1
AROCLOR-1016	0.92 U	1 U	ND	ND		0/3
AROCLOR-1221	1.8 U	2 U	ND	ND		0/3
AROCLOR-1232	0.92 U	1 U	ND	ND		0/3
AROCLOR-1242	0.92 U	1 U	ND	ND		0/3
AROCLOR-1248	0.92 U	1 U	ND	ND		0/3
AROCLOR-1254	0.92 U	1 U	ND	ND		0/3
AROCLOR-1260	0.92 U	1 U	ND	ND		0/3

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
GROUNDWATER QA/QC - FREQUENCY OF DETECTION SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA
INORGANIC ANALYTES

SAMPLE	303-FB-03	54-GWER-02	54-GWER-03
DATE SAMPLED	04/11/95	03/28/95	04/17/95
UNITS	UG/L	UG/L	UG/L
TOTAL METALS			
ALUMINUM, TOTAL	15.7 U	24 U	36.6 U
ANTIMONY, TOTAL	12 U	20.7 U	20.8 U
ARSENIC, TOTAL	1.7 U	1.6 U	1.7 U
BARIUM, TOTAL	0.8 U	1.7 U	1 U
BERYLLIUM, TOTAL	0.3 U	0.9 U	0.8 U
CADMIUM, TOTAL	3.9 U	2.8 U	1.9 U
CALCIUM, TOTAL	349 U	159 U	82.4 U
CHROMIUM, TOTAL	3.8 U	2.9 U	4.1 U
COBALT, TOTAL	1.4 U	3 U	3.4 U
COPPER, TOTAL	1.8 U	1.9 U	2.6 U
IRON, TOTAL	16 U	8.5 U	3.9 U
LEAD, TOTAL	0.8 U	1.6 U	0.8 U
MAGNESIUM, TOTAL	64.6	18.3 U	45 U
MANGANESE, TOTAL	0.7 U	2.1 U	1.7 U
MERCURY, TOTAL	0.2 U	0.2 U	0.2 U
NICKEL, TOTAL	5.4 U	10.8 U	10.9 U
POTASSIUM, TOTAL	85.7 U	685 U	768 U
SELENIUM, TOTAL	1.8 U	1.4 U	1.8 U
SILVER, TOTAL	1.9 U	3 U	2.8 U
SODIUM, TOTAL	206 U	219 U	49 U
THALLIUM, TOTAL	0.7 U	0.7 U	1.4 U
VANADIUM, TOTAL	1.5 U	2.3 U	2.3 U
ZINC, TOTAL	2.4 U	4.6 U	6 U

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
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	36.6 U	ND	ND		0/3
ANTIMONY, TOTAL	12 U	20.8 U	ND	ND		0/3
ARSENIC, TOTAL	1.6 U	1.7 U	ND	ND		0/3
BARIUM, TOTAL	0.8 U	1.7 U	ND	ND		0/3
BERYLLIUM, TOTAL	0.3 U	0.9 U	ND	ND		0/3
CADMIUM, TOTAL	1.9 U	3.9 U	ND	ND		0/3
CALCIUM, TOTAL	82.4 U	349 U	ND	ND		0/3
CHROMIUM, TOTAL	2.9 U	4.1 U	ND	ND		0/3
COBALT, TOTAL	1.4 U	3.4 U	ND	ND		0/3
COPPER, TOTAL	1.8 U	2.6 U	ND	ND		0/3
IRON, TOTAL	3.9 U	16 U	ND	ND		0/3
LEAD, TOTAL	0.8 U	1.6 U	ND	ND		0/3
MAGNESIUM, TOTAL	18.3 U	45 U	64.6	64.6	303-FB-03	1/3
MANGANESE, TOTAL	0.7 U	2.1 U	ND	ND		0/3
MERCURY, TOTAL	0.2 U	0.2 U	ND	ND		0/3
NICKEL, TOTAL	5.4 U	10.9 U	ND	ND		0/3
POTASSIUM, TOTAL	85.7 U	768 U	ND	ND		0/3
SELENIUM, TOTAL	1.4 U	1.8 U	ND	ND		0/3
SILVER, TOTAL	1.9 U	3 U	ND	ND		0/3
SODIUM, TOTAL	49 U	219 U	ND	ND		0/3
THALLIUM, TOTAL	0.7 U	1.4 U	ND	ND		0/3
VANADIUM, TOTAL	1.5 U	2.3 U	ND	ND		0/3
ZINC, TOTAL	2.4 U	6 U	ND	ND		0/3

APPENDIX L
GRAIN SIZE AND TPH ANALYTICAL RESULTS

ROY F. WESTON, INC. ENVIRONMENTAL TECHNOLOGY LABORATORY

GEOTECHNICAL TESTING DATA AND RESULTS

PROJECT	Baker Environmental	PROJECT SAMPLE I.D.	54-TW02	PROJECT ANALYST	RJA
JOB NUMBER	9503G729	ETL SAMPLE NUMBER	001	QA/QC ANALYST	RWF
W. O. NUMBER	06629-009-004-0001-00	DATE RECEIVED	03/20/95	DATE COMPLETED	03/26/95

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	99.4
#10	2.000	98.5
#20	0.850	97.6
#50	0.300	96.0
#100	0.150	75.9
#200	0.075	38.2
HYDROMETER	0.0388	32.3
	0.0283	30.2
	0.0205	28.0
	0.0148	26.5
	0.0112	22.8
	0.0081	21.4
	0.0058	20.6
	0.0041	19.9
	0.0030	17.0
	0.0021	16.2
	0.0012	15.5
	0.0009	14.8

EFFECTIVE SIZES

% Finer	Diameter mm
60	0.118
30	NA
10	NA
Uniformity Coefficient	Gradation Coefficient
NA	NA

SAMPLE DESCRIPTION

light brown silty SAND
with 38% 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

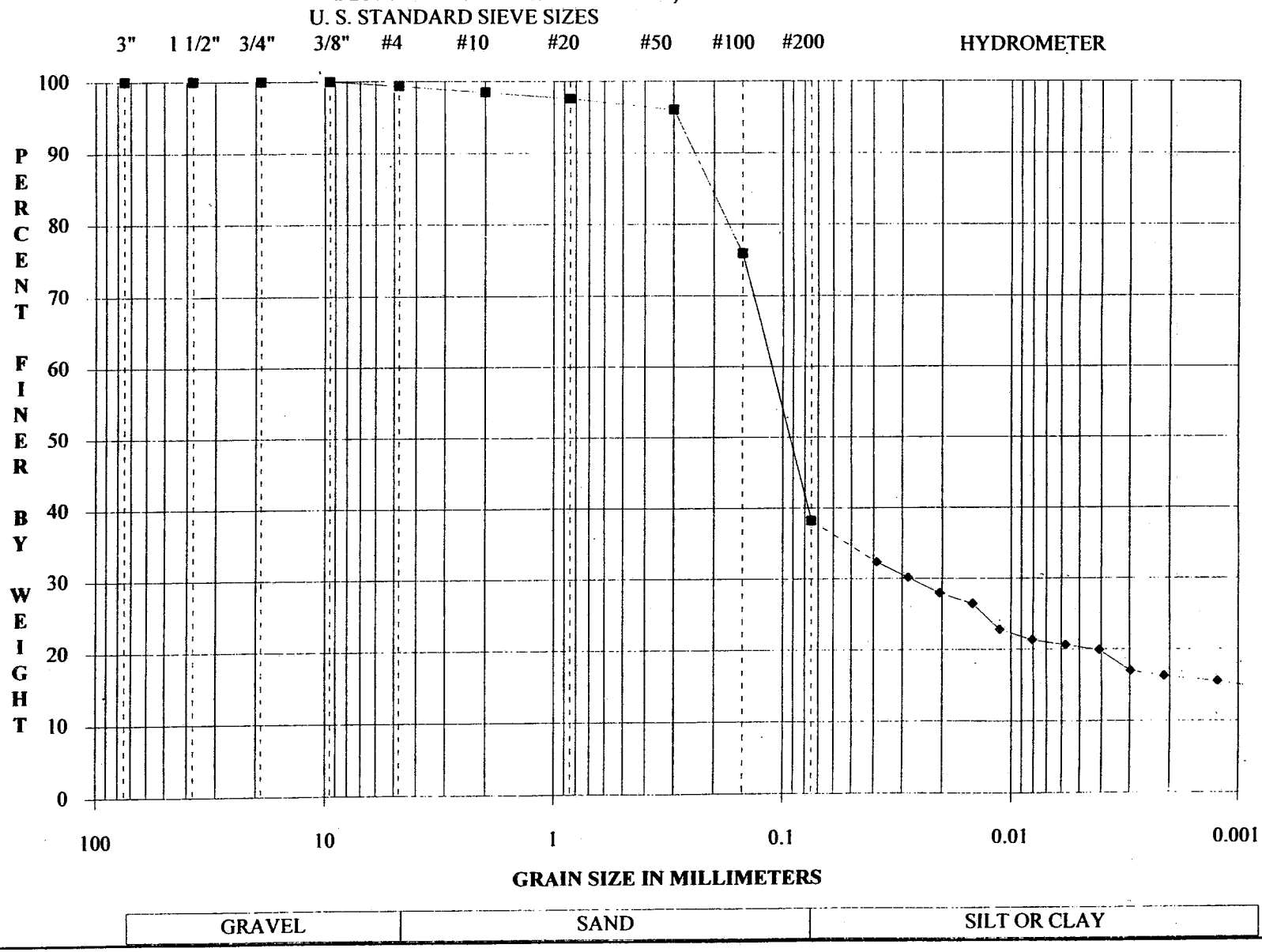
NA=NOT APPLICABLE

GSC1.XLS

ROY F. WESTON, INC. ENVIRONMENTAL TECHNOLOGY LABORATORY

PARTICLE-SIZE DISTRIBUTION CURVE FOR

PROJECT SAMPLE 54-TW02, ETL SAMPLE 9503G729-001



GSC! XLS

ROY F. WESTON, INC. ENVIRONMENTAL TECHNOLOGY LABORATORY

GEOTECHNICAL TESTING DATA AND RESULTS

PROJECT	Baker Environmental	PROJECT SAMPLE I.D.	54-ES12	PROJECT ANALYST	JRA
JOB NUMBER	9503G614	ETL SAMPLE NUMBER	002	QA/QC ANALYST	RWF
W. O. NUMBER	06629-009-004-0001-00	DATE RECEIVED	03/13/95	DATE COMPLETED	03/23/95

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	100.0
#10	2.000	99.9
#20	0.850	99.5
#50	0.300	95.7
#100	0.150	56.1
#200	0.075	23.2
HYDROMETER	0.0459	18.3
	0.0334	15.3
	0.0239	13.8
	0.0170	13.0
	0.0125	12.2
	0.0090	10.7
	0.0064	10.0
	0.0046	8.5
	0.0032	7.7
	0.0023	7.7
	0.0013	7.7
	0.0009	7.0

EFFECTIVE SIZES

% Finer	Diameter mm
60	0.165
30	0.091
10	NA
Uniformity Coefficient	Gradation Coefficient
NA	NA

SAMPLE DESCRIPTION

light brown silty SAND
with 23% silt of low plasticity

Unified Soil Classification System (USCS) Group Symbol

SM

INDEX PROPERTIES

% moisture dry basis

Liquid Limit	Plastic Limit	Plasticity Index
non-cohesive, non-plastic		

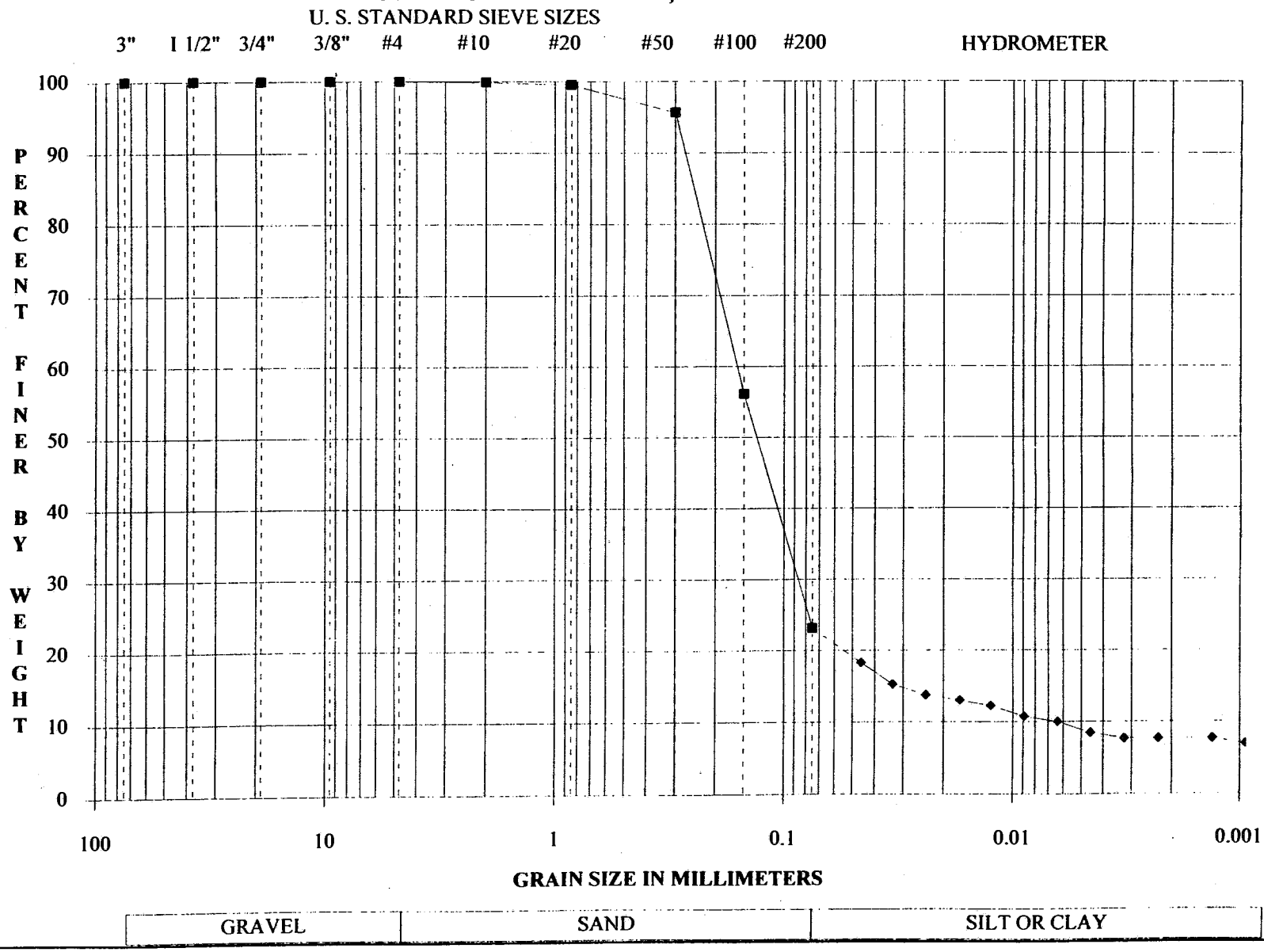
NOTES

NA=NOT APPLICABLE

GSC2.XLS

ROY F. WESTON, INC. ENVIRONMENTAL TECHNOLOGY LABORATORY

PARTICLE-SIZE DISTRIBUTION CURVE FOR
PROJECT SAMPLE 54-ES12, ETL SAMPLE 9503G614-002



GSC2 XLS

ROY F. WESTON, INC. ENVIRONMENTAL TECHNOLOGY LABORATORY

GEOTECHNICAL TESTING DATA AND RESULTS

PROJECT	Baker Environmental	PROJECT SAMPLE I.D.	54-GW04	PROJECT ANALYST	JRA
JOB NUMBER	9503G614	ETL SAMPLE NUMBER	003	QA/QC ANALYST	RWF
W. O. NUMBER	06629-009-004-0001-00	DATE RECEIVED	03/13/95	DATE COMPLETED	03/23/95

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	100.0
#10	2.000	99.9
#20	0.850	99.0
#50	0.300	91.3
#100	0.150	61.3
#200	0.075	40.6
HYDROMETER	0.0384	34.0
	0.0288	29.5
	0.0209	27.3
	0.0152	25.0
	0.0112	24.2
	0.0081	22.0
	0.0058	20.5
	0.0041	19.7
	0.0030	17.5
	0.0021	17.5
	0.0012	16.7
	0.0009	16.0

EFFECTIVE SIZES

% Finer	Diameter mm
60	0.145
30	NA
10	NA
Uniformity Coefficient	Gradation Coefficient
NA	NA

SAMPLE DESCRIPTION

light brown silty SAND
with 41% silt of low plasticity

Unified Soil Classification System (USCS) Group Symbol

SM

INDEX PROPERTIES

% moisture dry basis

Liquid Limit	Plastic Limit	Plasticity Index
19.0	19.0	0.0

NOTES

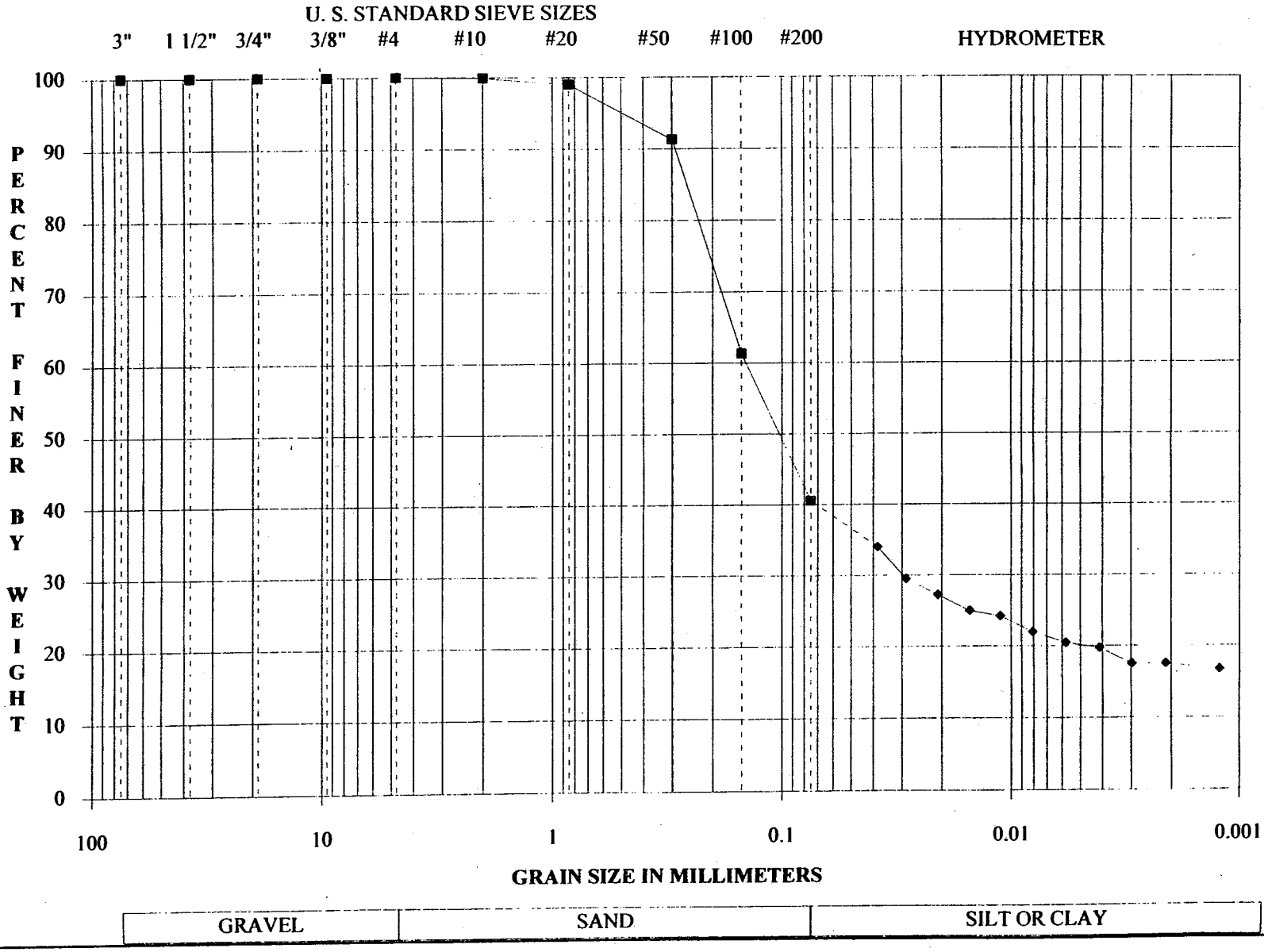
NA=NOT APPLICABLE

GSC3.XLS

ROY F. WESTON, INC. ENVIRONMENTAL TECHNOLOGY LABORATORY

PARTICLE-SIZE DISTRIBUTION CURVE FOR

PROJECT SAMPLE 54-GW04, ETL SAMPLE 9503G614-003



GSC3.XLS

TPH ANALYTICAL RESULTS

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
TOTAL PETROLEUM HYDROCARBONS
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA

LOCATION	54-DD-SB05-00	54-DD-SB05-01	54-SB01-00	54-SB01-04	54-SB02-01	54-SB02-04	54-SB03-01
DATE SAMP	04/11/95	04/11/95	03/11/95	03/11/95	03/11/95	03/11/95	03/11/95
DEPTH	0-6'	1-3'	0-6'	7-9'	1-3'	7-9'	1-3'
DIESEL FUEL (MG/KG)	5.2 U	490 U	8.9 U	9.4 U	9.3 U	9.7 U	9.4 U
GASOLINE (UG/KG)	36 U	18000 U	33 U	36 U	33 U	36 U	33 U

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
TOTAL PETROLEUM HYDROCARBONS
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA

LOCATION	54-SB03-04	54-SB04-00	54-SB04-04	54-SB05-01	54-SB05-01D	54-SB05-04	54-SB06-00
DATE SAMP	03/11/95	03/11/95	03/11/95	03/11/95	03/11/95	03/11/95	03/12/95
DEPTH	7-9'	0-6'	7-9'	1-3'	1-3'	7-9'	0-6'
DIESEL FUEL (MG/KG)	9.8 U	9.4 U	9.3 U	8.9 U	9 U	8.8 U	8.7 U
GASOLINE (UG/KG)	36 U	33 U	36 U	33 U	33 U	33 U	33 U

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
TOTAL PETROLEUM HYDROCARBONS
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA

LOCATION	54-SB06-02	54-SB06-05	54-SB07-00	54-SB07-05	54-SB08-00	54-SB08-01	54-SB08-04
DATE SAMP	03/12/95	03/12/95	03/12/95	03/12/95	03/11/95	03/11/95	03/11/95
DEPTH	3-5'	9-11'	0-6'	9-11'	0-6'	1-3'	7-9'
DIESEL FUEL (MG/KG)	9.4 U	9.8 U	9.2 U	10 U	1000 U	100 U	9.5 U
GASOLINE (UG/KG)	36 U	36 U	33 U	36 U	1800 U	360 U	36 U

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
TOTAL PETROLEUM HYDROCARBONS
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA

LOCATION	54-SB09-00	54-SB09-03
DATE SAMP	03/11/95	03/11/95
DEPTH	0-6'	5-7'
DIESEL FUEL (MG/KG)	10 U	9.3 U
GASOLINE (UG/KG)	36 U	64

APPENDIX M
WET CHEMISTRY ANALYTICAL RESULTS

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
WET CHEMISTRY ANALYTICAL SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA

LOCATION	54-GW01-01	54-GW02-01	54-GW03-01	54-GW04-01	54-GW04-01D	54-GW05-01	54-GW06-01
DATE_SAMPLED	03/28/95	03/28/95	03/28/95	03/28/95	03/28/95	03/28/95	03/28/95
DEPTH	N/A	N/A	N/A	N/A	N/A	N/A	N/A
UNITS	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L
TOTAL DISSOLVED SOLIDS	66	200	230	38	36	74	88
TOTAL SUSPENDED SOLIDS	12	6	27	5	5 U	5 U	10

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
WET CHEMISTRY ANALYTICAL SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA

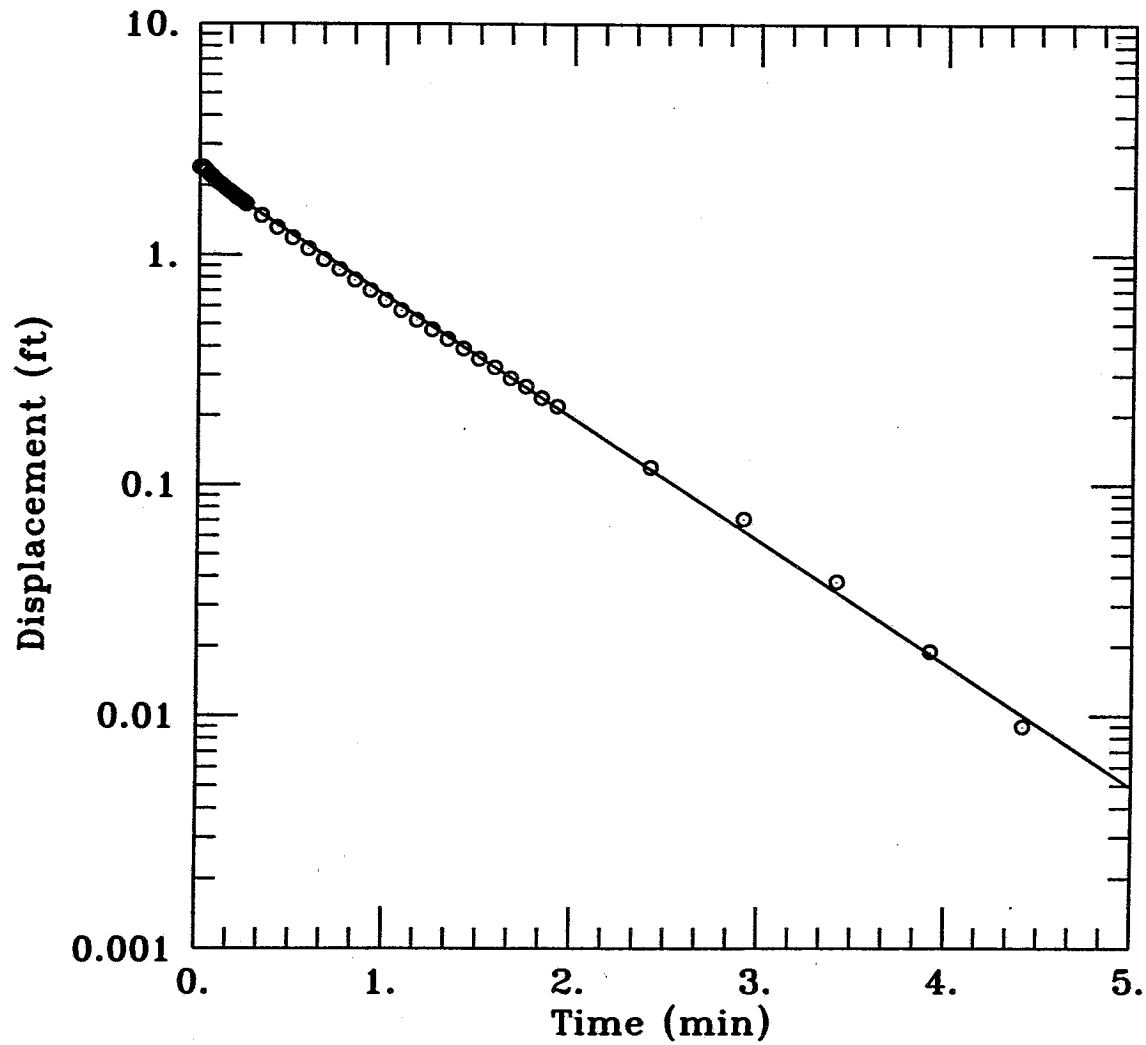
LOCATION	54-GW07-01	54-GW08-01	54-GW09-01	54-GW09-01D	54-GW10-01	54-TW01-01	54-TW02-01
DATE_SAMPLED	03/28/95	04/18/95	04/18/95	04/18/95	04/17/95	03/12/95	03/12/95
DEPTH	N/A	N/A	N/A	N/A	N/A	N/A	N/A
UNITS	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L
TOTAL DISSOLVED SOLIDS	240	270	58	54	70	88	74
TOTAL SUSPENDED SOLIDS	5	5 U	5 U	5 U	140	5 U	5 U

SITE 54, CRASH CREW FIRE TRAINING BURN PIT
WET CHEMISTRY ANALYTICAL SUMMARY
REMEDIAL INVESTIGATION, CTO-0303
MCB, CAMP LEJEUNE, NORTH CAROLINA

LOCATION	54-TW03-01
DATE_SAMPLED	03/12/95
DEPTH	N/A
UNITS	MG/L
TOTAL DISSOLVED SOLIDS	270
TOTAL SUSPENDED SOLIDS	34

Client: **LANTDIV**	Company: **BAKER ENVIRONMENTAL, INC.**
Location: **SITE 54, CAMP LEJEUNE**	Project: **CTO-303**

54-GW03 RISING HEAD TEST



DATA SET:
54GW03R.DAT
05/31/95

AQUIFER MODEL:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

PROJECT DATA:
test date: APRIL 8, 1995

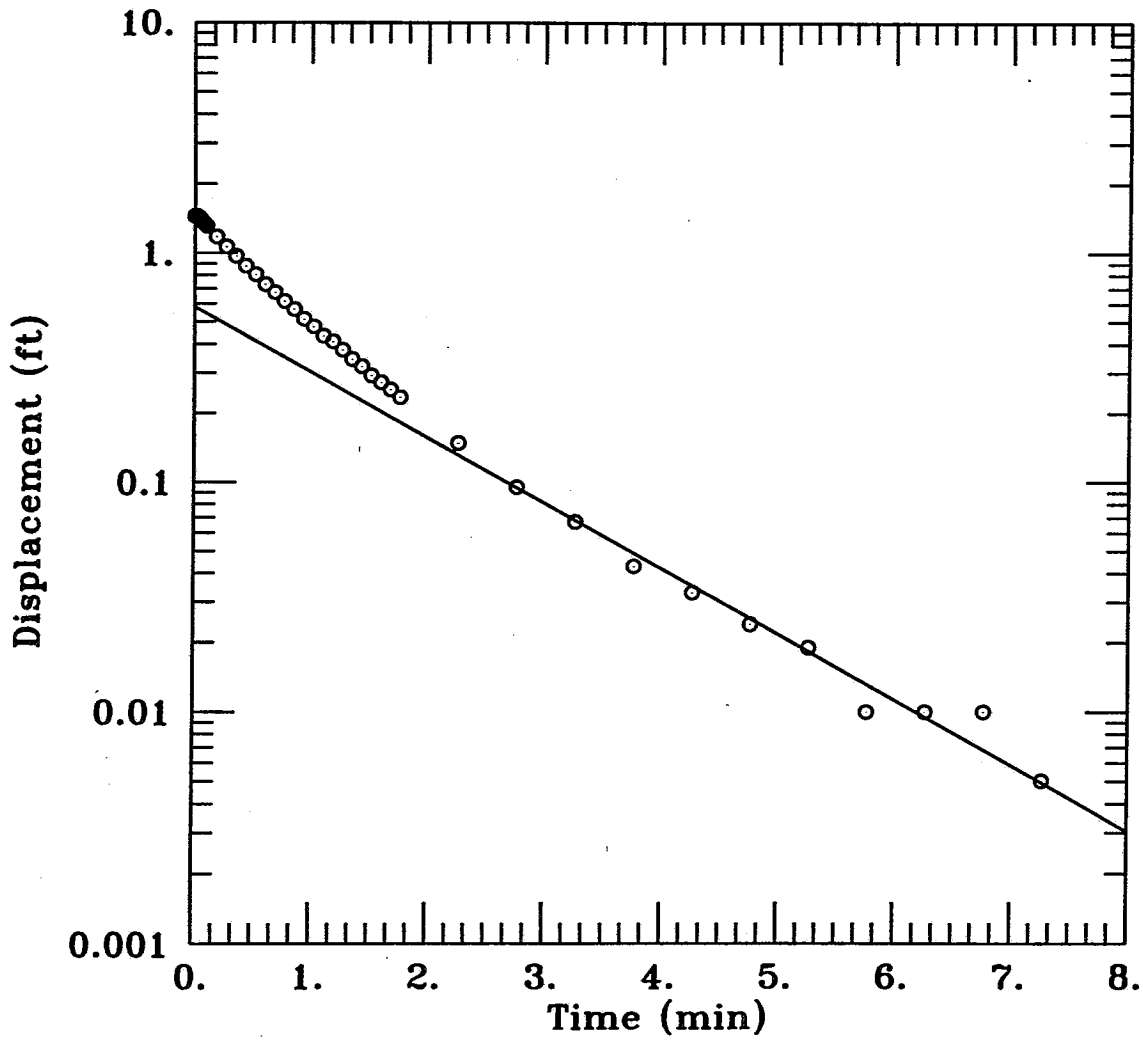
TEST DATA:
H0 = 2.383 ft
rc = 0.0833 ft
rw = 0.33 ft
L = 10. ft
b = 15. ft
H = 12.99 ft

PARAMETER ESTIMATES:
K = 8.205 ft/day
y0 = 2.262 ft

AQTESOLV

Client: **LANTDIV**	Company: **BAKER ENVIRONMENTAL, INC.**
Location: **SITE 54, CAMP LEJEUNE**	Project: **CTO-303**

54-GW03 FALLING HEAD TEST



DATA SET:
54GW03F.DAT
05/30/95

AQUIFER MODEL:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

PROJECT DATA:
test date: APRIL 8, 1995

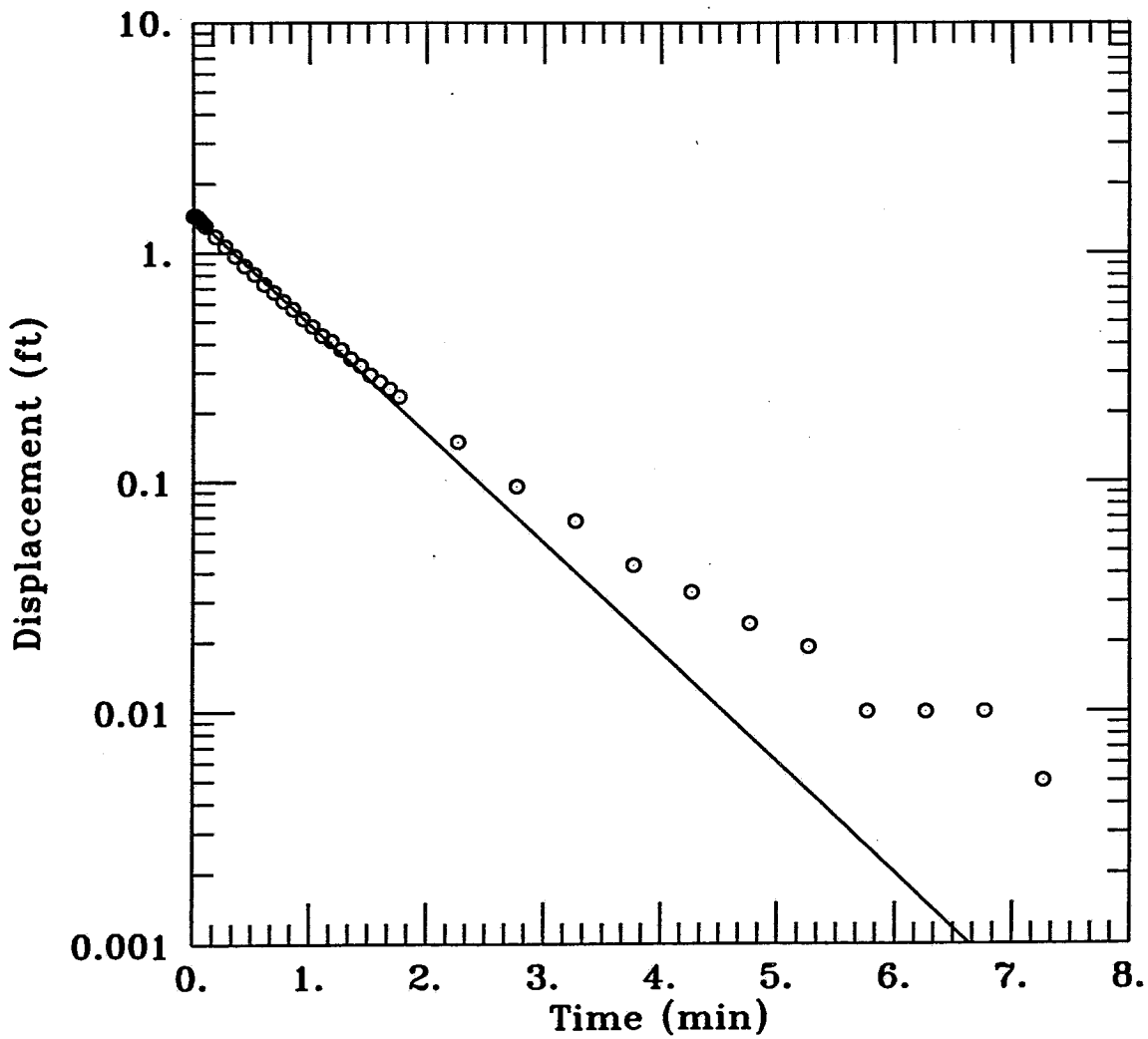
TEST DATA:
H0 = 1.445 ft
rc = 0.0833 ft
rw = 0.33 ft
L = 10. ft
b = 15. ft
H = 12.99 ft

PARAMETER ESTIMATES:
K = 4.388 ft/day
y0 = 0.5802 ft

AQTESOLV

Client: **LANTDIV**	Company: **BAKER ENVIRONMENTAL, INC.**
Location: **SITE 54, CAMP LEJEUNE**	Project: **CTO-303**

54-GW03 FALLING HEAD TEST



DATA SET:
54GW03F.DAT
05/30/95

AQUIFER MODEL:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

PROJECT DATA:
test date: APRIL 8, 1995

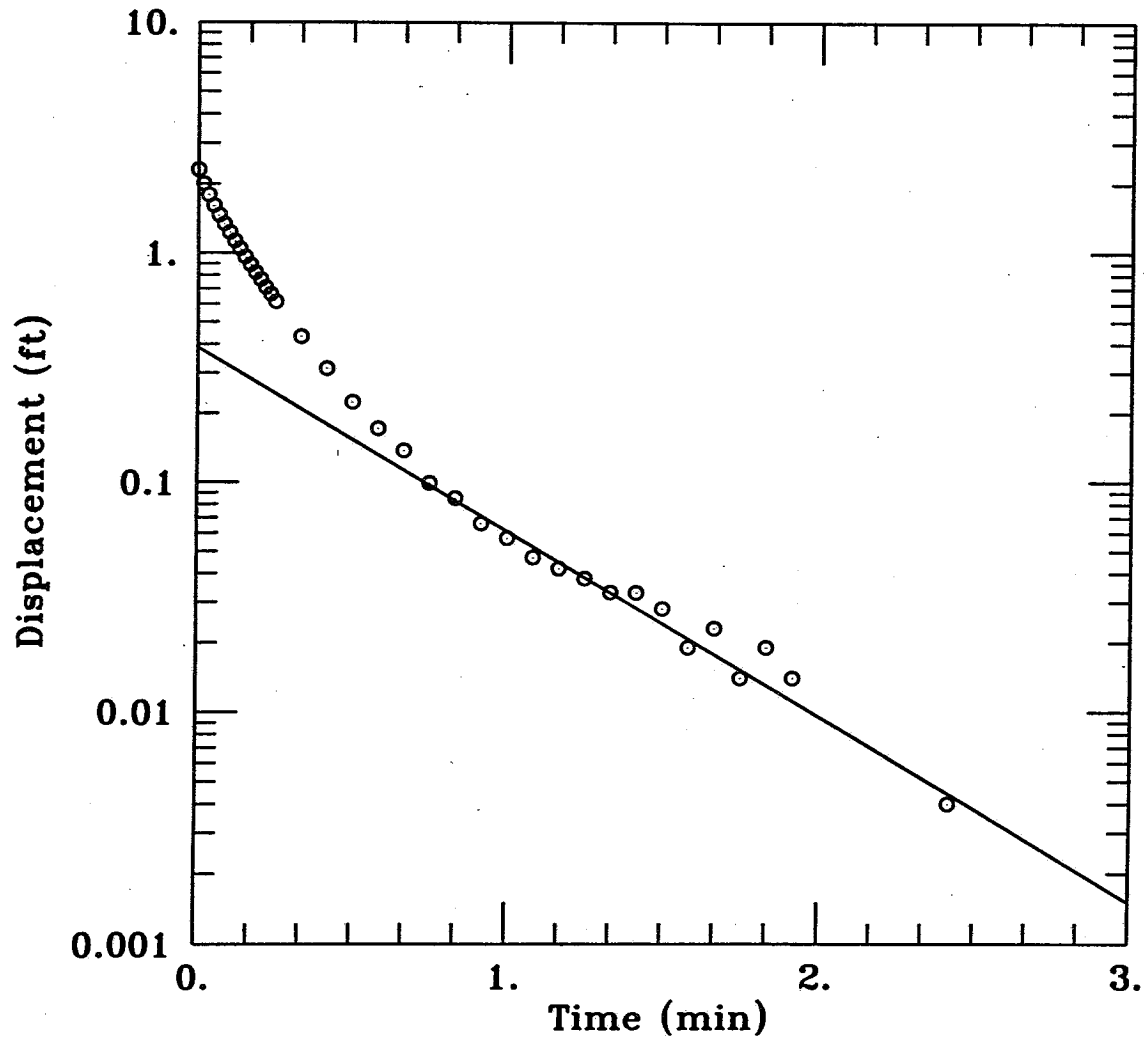
TEST DATA:
H0 = 1.445 ft
rc = 0.0833 ft
rw = 0.33 ft
L = 10. ft
b = 15. ft
H = 12.99 ft

PARAMETER ESTIMATES:
K = 7.329 ft/day
y0 = 1.449 ft

AQTESOLV

Client: **LANTDIV**	Company: **BAKER ENVIRONMENTAL, INC.**
Location: **SITE 54, CAMP LEJEUNE**	Project: **CTO-303**

54-GW04 RISING HEAD TEST



DATA SET:
54GW04R.DAT
05/30/95

AQUIFER MODEL:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

PROJECT DATA:
test date: APRIL 8, 1995

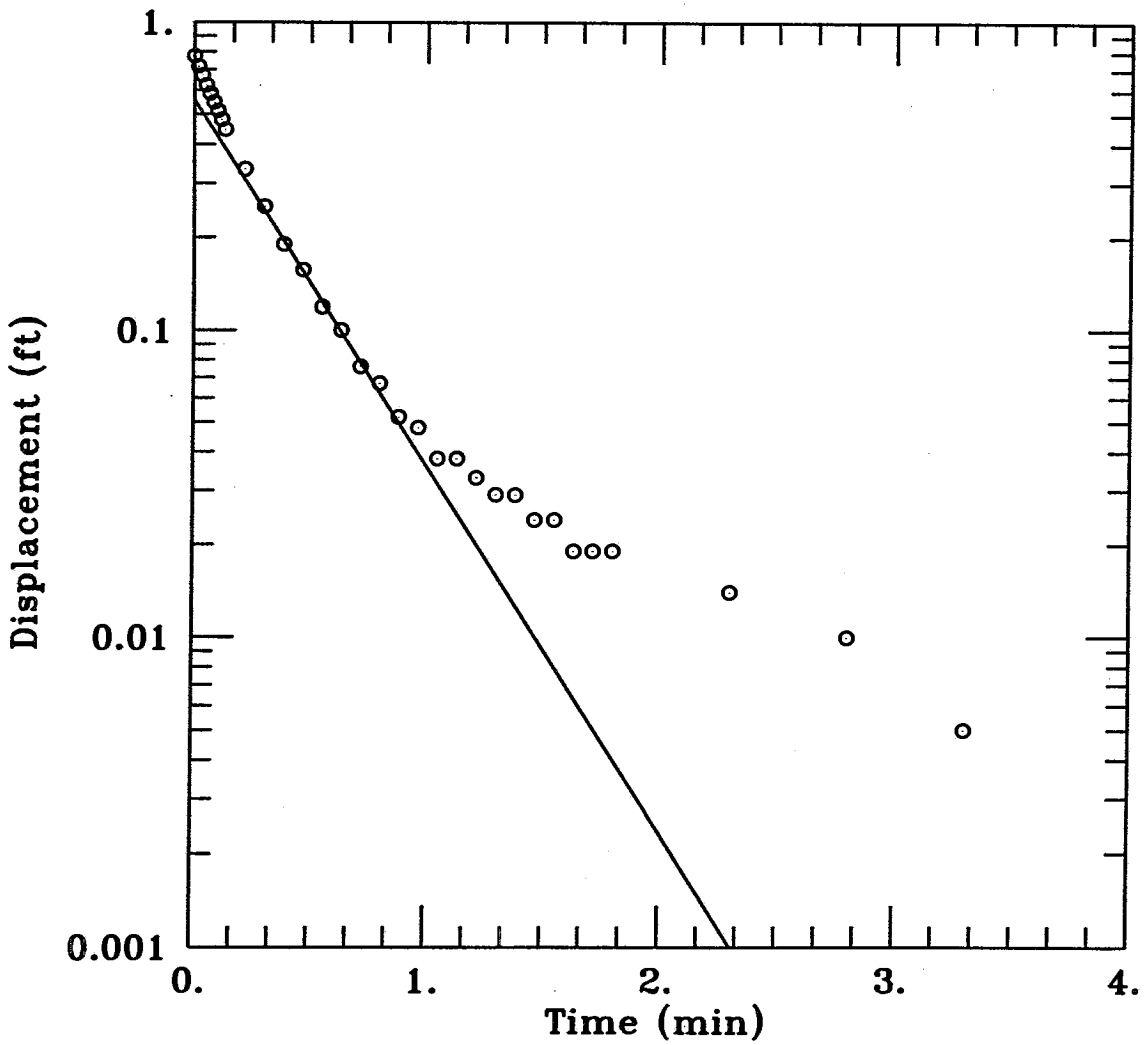
TEST DATA:
H0 = 2.301 ft
rc = 0.0833 ft
rw = 0.33 ft
L = 15. ft
b = 20. ft
H = 15.43 ft

PARAMETER ESTIMATES:
K = 8.821 ft/day
y0 = 0.3873 ft

AQTESOLV

Client: **LANTDIV**	Company: **BAKER ENVIRONMENTAL, INC.**
Location: **SITE 54, CAMP LEJEUNE**	Project: **CTO-303**

54-GW04 FALLING HEAD TEST



DATA SET:
54GW04F.DAT
05/30/95

AQUIFER MODEL:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

PROJECT DATA:
test date: APRIL 8, 1995

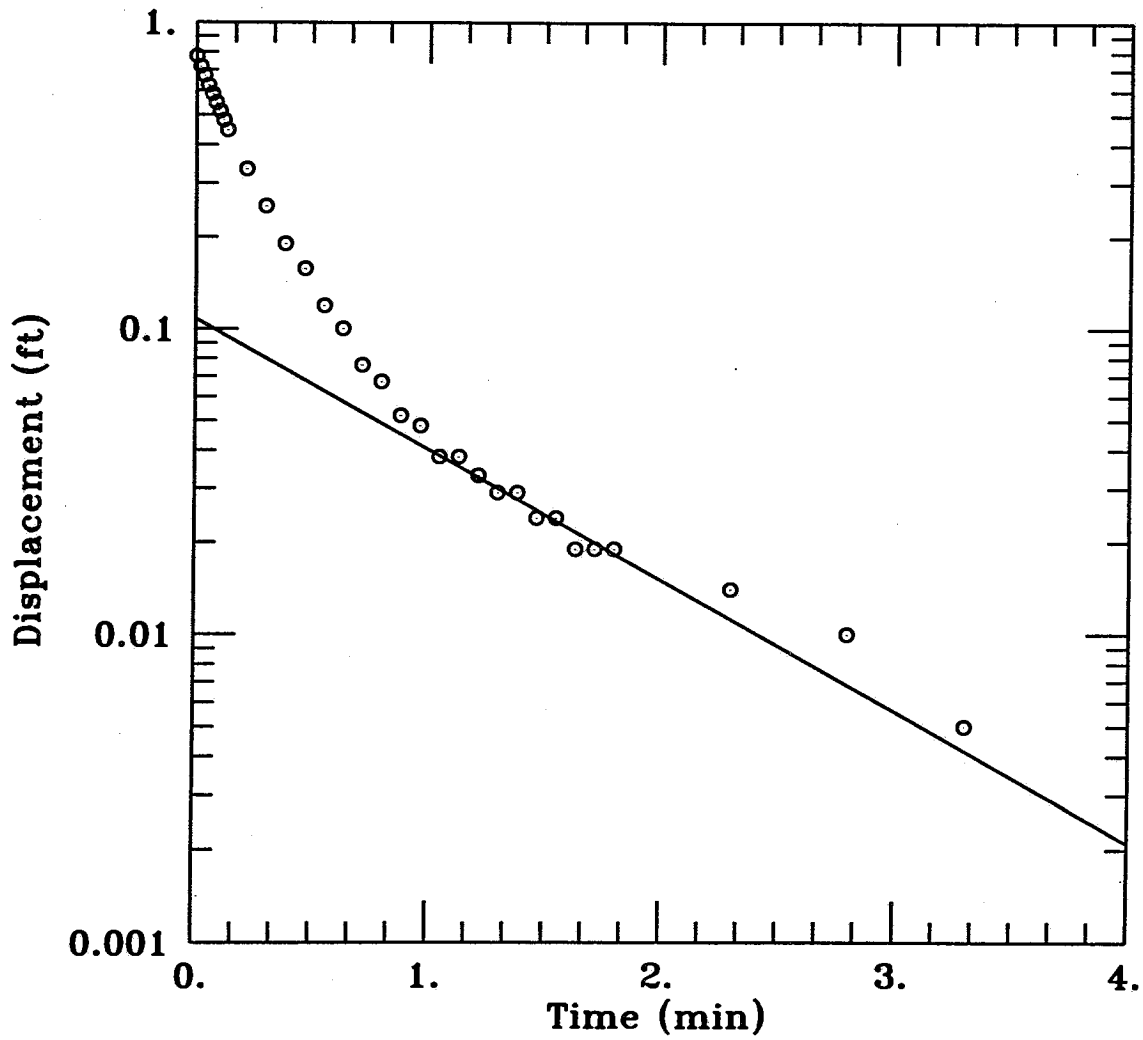
TEST DATA:
H0 = 0.775 ft
rc = 0.0833 ft
rw = 0.33 ft
L = 15. ft
b = 20. ft
H = 15.43 ft

PARAMETER ESTIMATES:
K = 13.03 ft/day
y0 = 0.5558 ft

AQTESOLV

Client: **LANTDIV**	Company: **BAKER ENVIRONMENTAL, INC.**
Location: **SITE 54, CAMP LEJEUNE**	Project: **CTO-303**

54-GW04 FALLING HEAD TEST



DATA SET:
54GW04F.DAT
05/30/95

AQUIFER MODEL:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

PROJECT DATA:
test date: APRIL 8, 1995

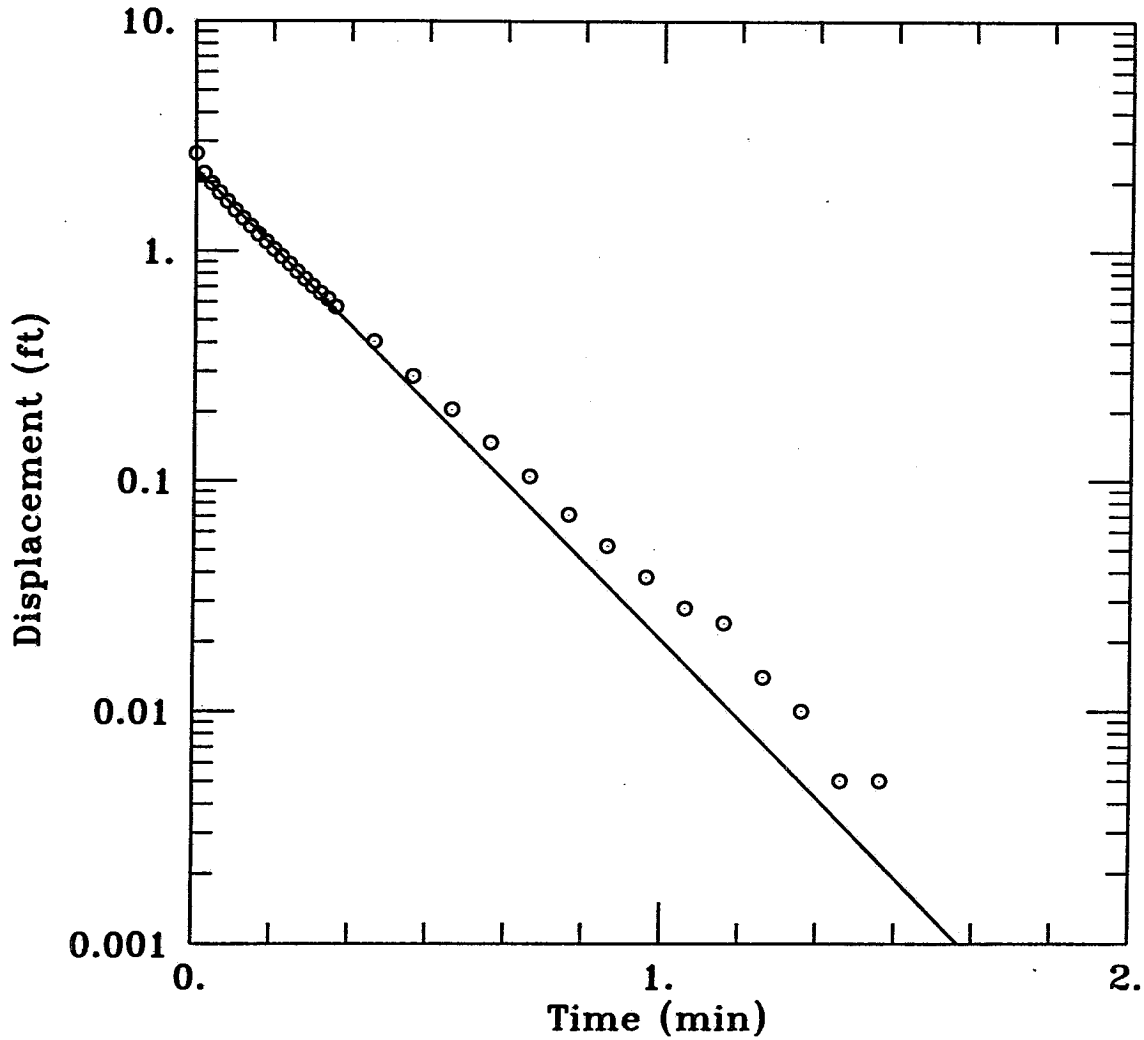
TEST DATA:
H0 = 0.775 ft
rc = 0.0833 ft
rw = 0.33 ft
L = 15. ft
b = 20. ft
H = 15.43 ft

PARAMETER ESTIMATES:
K = 4.695 ft/day
y0 = 0.1077 ft

AQTESOLV

Client: **LANTDIV**	Company: **BAKER ENVIRONMENTAL, INC.**
Location: **SITE 54, CAMP LEJEUNE**	Project: **CTO-303**

54-GW06 RISING HEAD TEST



DATA SET:
54GW06R.DAT
05/30/95

AQUIFER MODEL:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

PROJECT DATA:
test date: APRIL 8, 1995

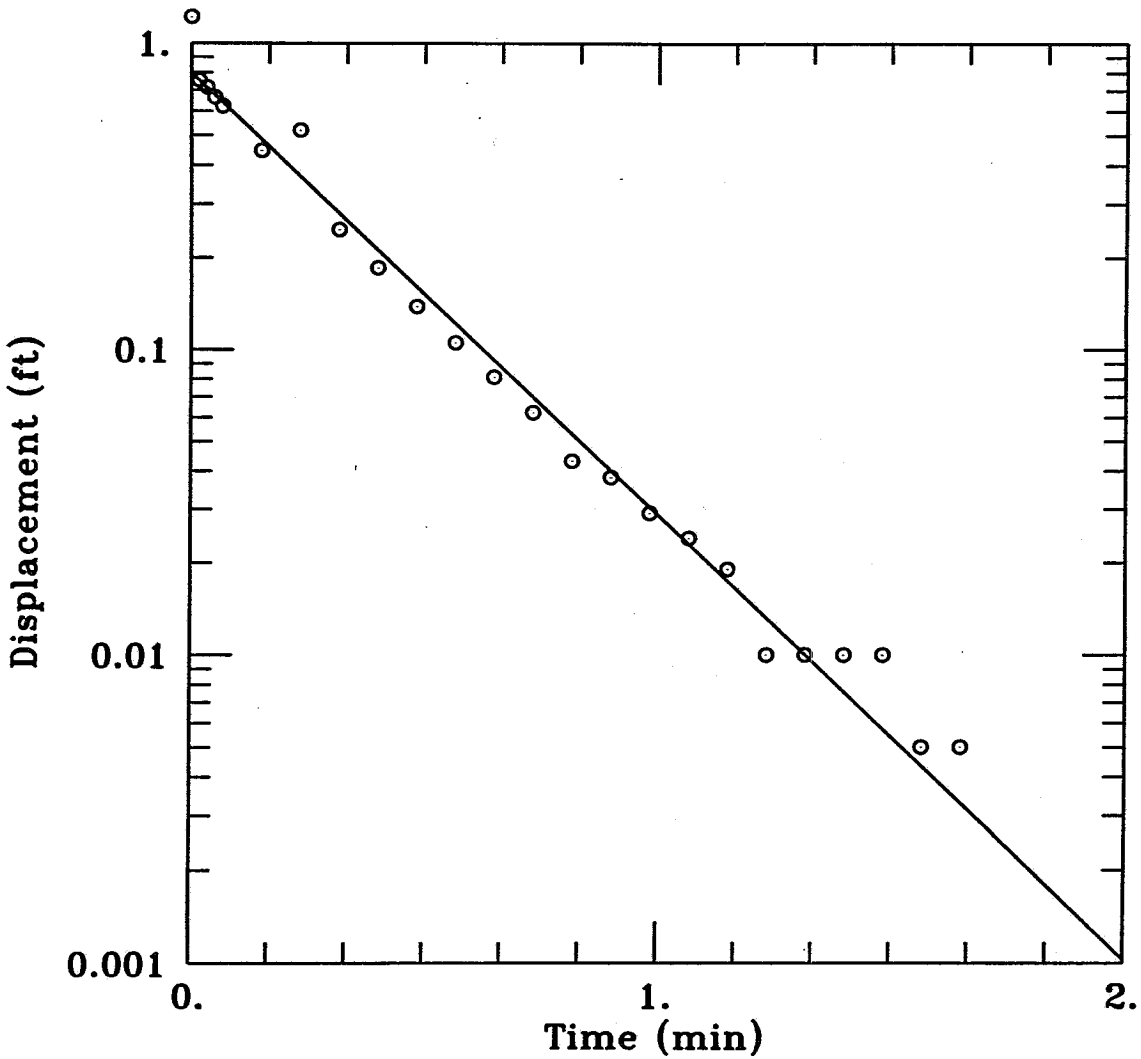
TEST DATA:
H0 = 2.648 ft
rc = 0.0833 ft
rw = 0.33 ft
L = 5. ft
b = 7. ft
H = 6.59 ft

PARAMETER ESTIMATES:
K = 50.5 ft/day
y0 = 2.273 ft

AQTESOLV

Client: **LANTDIV**	Company: **BAKER ENVIRONMENTAL, INC.**
Location: **SITE 54, CAMP LEJEUNE**	Project: **CTO-303**

54-GW06 FALLING HEAD TEST



DATA SET:
54GW06F.DAT
05/30/95

AQUIFER MODEL:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

PROJECT DATA:
test date: APRIL 8, 1995

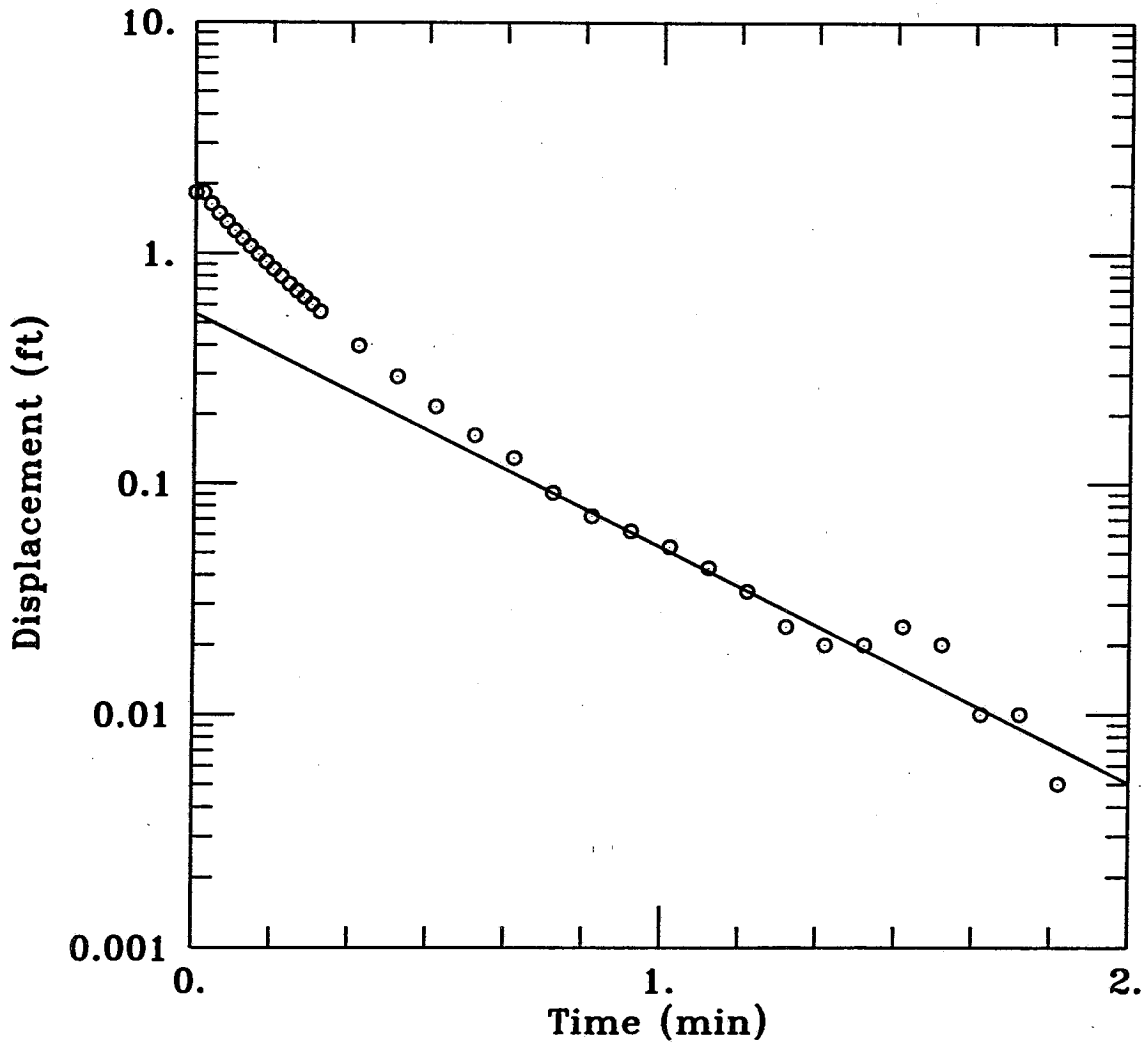
TEST DATA:
H0 = 1.216 ft
rc = 0.0833 ft
rw = 0.33 ft
L = 5. ft
b = 7. ft
H = 6.59 ft

PARAMETER ESTIMATES:
K = 35.58 ft/day
y0 = 0.7977 ft

AQTESOLV

Client: **LANTDIV**	Company: **BAKER ENVIRONMENTAL, INC.**
Location: **SITE 54, CAMP LEJEUNE**	Project: **CTO-303**

54-GW07 RISING HEAD TEST



DATA SET:
54GW07R.DAT
05/30/95

AQUIFER MODEL:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

PROJECT DATA:
test date: APRIL 10, 1995

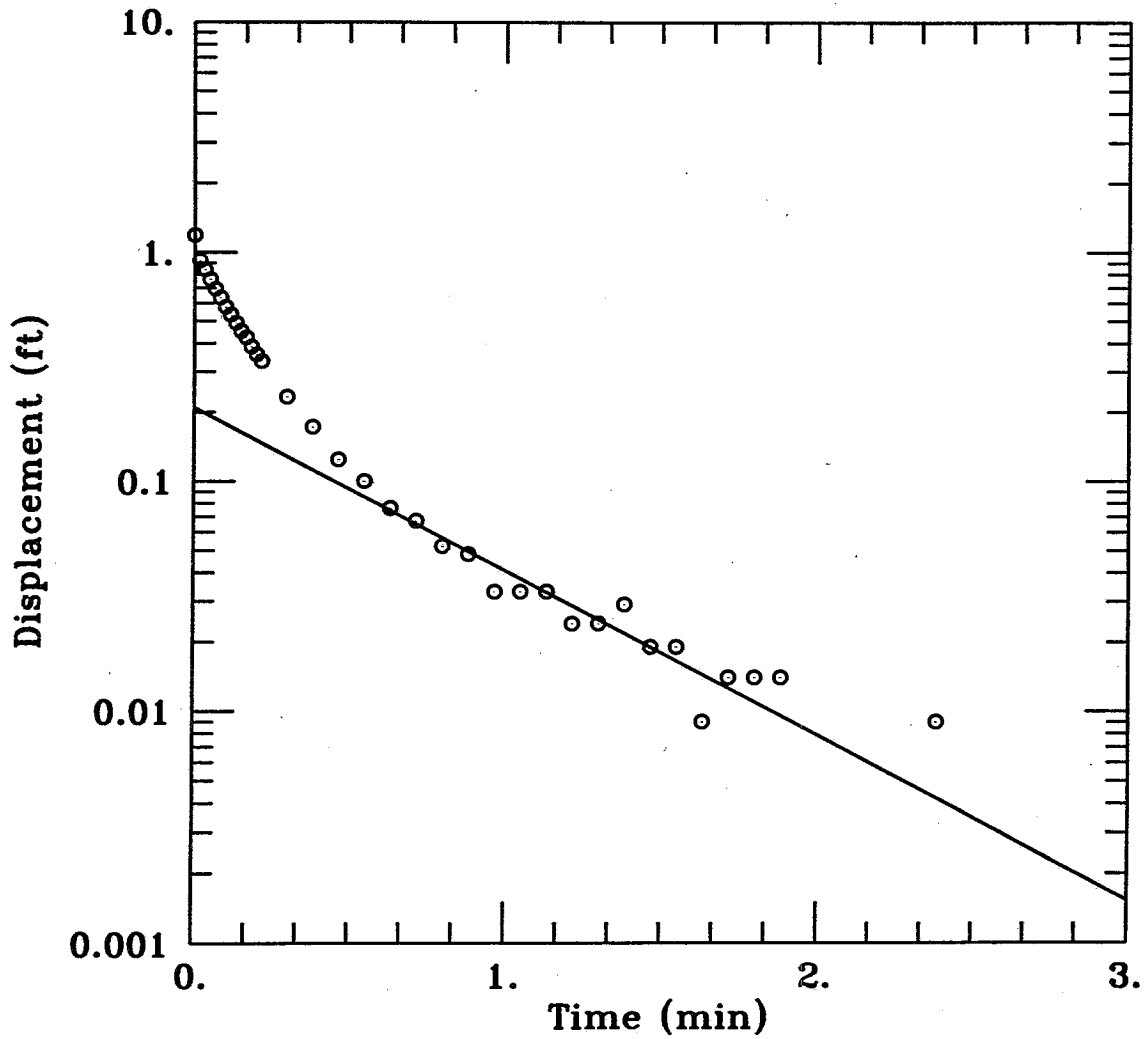
TEST DATA:
H0 = 1.831 ft
rc = 0.0833 ft
rw = 0.33 ft
L = 10. ft
b = 30. ft
H = 25.35 ft

PARAMETER ESTIMATES:
K = 17.16 ft/day
y0 = 0.548 ft

AQTESOLV

Client: **LANTDIV**	Company: **BAKER ENVIRONMENTAL, INC.**
Location: **SITE 54, CAMP LEJEUNE**	Project: **CTO-303**

54-GW07 FALLING HEAD TEST



DATA SET:
54GW07F.DAT
05/30/95

AQUIFER MODEL:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

PROJECT DATA:
test date: APRIL 10, 1995

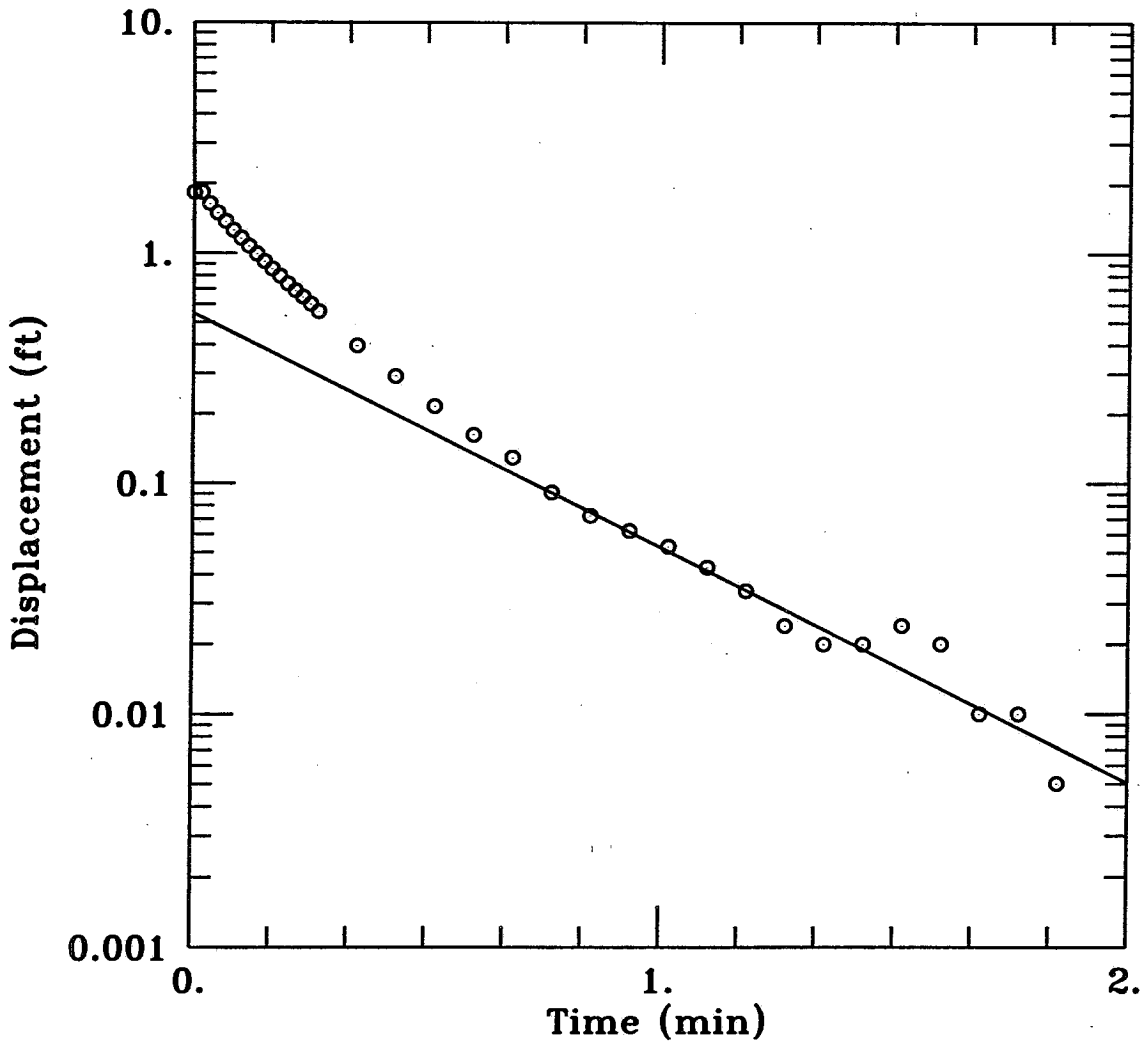
TEST DATA:
H0 = 1.187 ft
rc = 0.0833 ft
rw = 0.33 ft
L = 10. ft
b = 30. ft
H = 25.35 ft

PARAMETER ESTIMATES:
K = 12. ft/day
y0 = 0.2097 ft

AQTESOLV

Client: **LANTDIV**	Company: **BAKER ENVIRONMENTAL, INC.**
Location: **SITE 54, CAMP LEJEUNE**	Project: **CTO-303**

54-GW07 RISING HEAD TEST



DATA SET:
54GW07R.DAT
05/30/95

AQUIFER MODEL:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

PROJECT DATA:
test date: APRIL 10, 1995

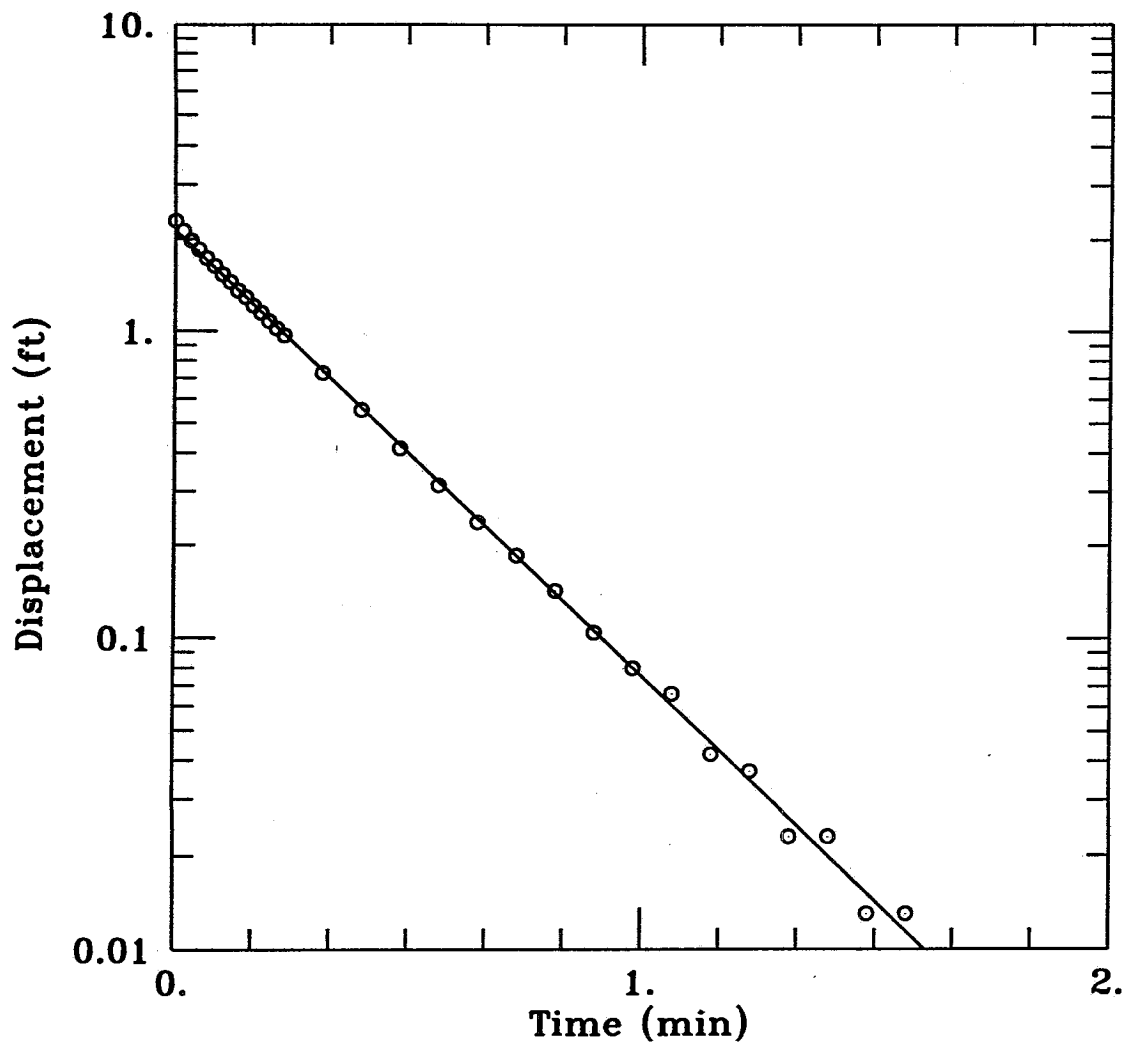
TEST DATA:
H0 = 1.831 ft
rc = 0.0833 ft
rw = 0.33 ft
L = 10. ft
b = 30. ft
H = 25.35 ft

PARAMETER ESTIMATES:
K = 17.16 ft/day
y0 = 0.548 ft

AQTESOLV

Client: **LANTDIV**	Company: **BAKER ENVIRONMENTAL, INC.**
Location: **SITE 54, CAMP LEJEUNE**	Project: **CTO-303**

54-GW08 RISING HEAD TEST



DATA SET:
54GW08R.DAT
05/30/95

AQUIFER MODEL:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

PROJECT DATA:
test date: APRIL 10, 1995

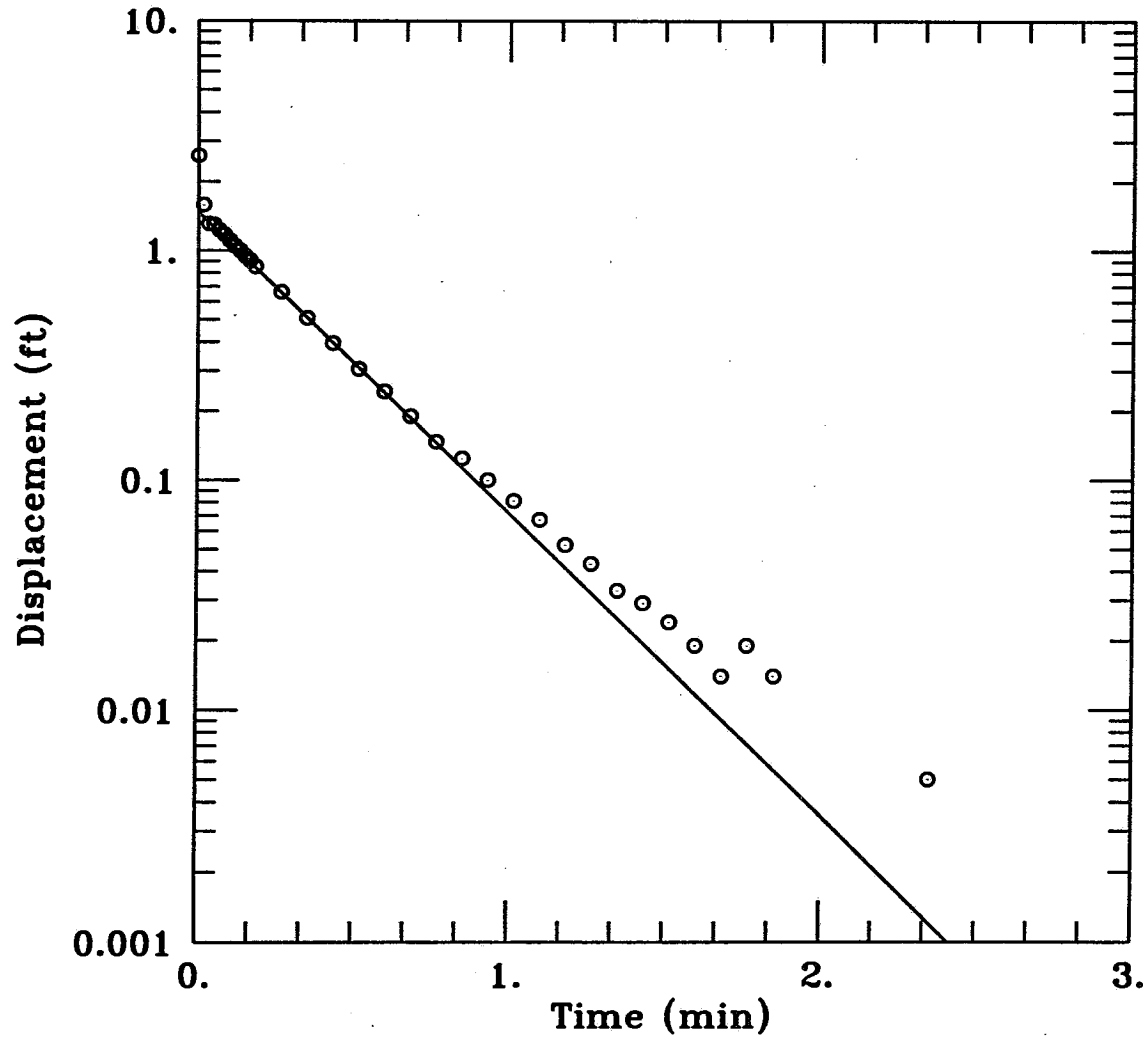
TEST DATA:
H0 = 2.288 ft
rc = 0.0833 ft
rw = 0.42 ft
L = 5. ft
b = 160. ft
H = 17.39 ft

PARAMETER ESTIMATES:
K = 46.69 ft/day
y0 = 2.13 ft

AQTESOLV

Client: **LANTDIV**	Company: **BAKER ENVIRONMENTAL, INC.**
Location: **SITE 54, CAMP LEJEUNE**	Project: **CTO-303**

54-GW08 FALLING HEAD TEST



DATA SET:
54GW08F.DAT
05/30/95

AQUIFER MODEL:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

PROJECT DATA:
test date: APRIL 10, 1995

TEST DATA:
H0 = 2.591 ft
rc = 0.0833 ft
rw = 0.42 ft
L = 5. ft
b = 160. ft
H = 17.39 ft

PARAMETER ESTIMATES:
K = 42.23 ft/day
y0 = 1.467 ft

AQTESOLV

APPENDIX O
AQUIFER PROPERTY CALCULATIONS

S.O. No. 62470-303

Subject: GROUNDWATER FLOW GRADIENTS
SITE 54

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

- SOUTH OF BURN PIT

$\Delta E = 1.0$ ft
$D = 180$ ft

$i = 1.0 \text{ ft} / 180 \text{ ft}$
$\simeq 0.006$ ft/ft

- WEST OF BURN PIT

$\Delta E = 3.0$ ft
$D = 350$ ft

$i = 3.0 \text{ ft} / 350 \text{ ft}$
$\simeq 0.009$ ft/ft

DEEP WELLS

$\Delta E = 2.0$ ft
$D = 250$ ft

$i = 2.0 \text{ ft} / 250 \text{ ft}$
$\simeq 0.008$ ft/ft

S.O. No. 62470-303

Subject: GROUNDWATER FLOW GRADIENTS
SITE 54

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

- SOUTH OF BURN PIT

$\Delta E = 1.0$ ft
$D = 180$ ft

$i = 1.0 \text{ ft} / 180 \text{ ft}$
$\simeq 0.006$ ft/ft

- WEST OF BURN PIT

$\Delta E = 3.0$ ft
$D = 350$ ft

$i = 3.0 \text{ ft} / 350 \text{ ft}$
$\simeq 0.009$ ft/ft

DEEP WELLS

$\Delta E = 2.0$ ft
$D = 250$ ft

$i = 2.0 \text{ ft} / 250 \text{ ft}$
$\simeq 0.008$ ft/ft

RETARDATION ESTIMATES
SITE 54
REMEDIAL INVESTIGATION CTO-0303

Equation: $R=1+(Pb/n)x(Kd)$ Where: Pb=Bulk density (Dry)
n=porosity
Kd=Distribution coefficient
(Koc x TOC Fraction)

Distribution Coefficient Estimates

Solute	Koc(1) (mL/g)	TOC(2) (%)	Kd
Benzene	83	0.0043	0.3569
Toluene	300	0.0043	1.29
Ethylbenzene	1,100	0.0043	4.73
Xylene (total)	240	0.0043	1.032
1,2-Dichloroethene (total)	54	0.0043	0.2322
Naphthalene	1,072	0.0043	4.6096
2-Methylnaphthalene	1,072	0.0043	4.6096

Retardation Factor Estimates

Solute	Pb(3) (g/mL)	n(4) (%)	Kd	R	
Benzene	1.0	0.3	0.3569	2.19	ok
Toluene	1.0	0.3	1.29	5.30	ok
Ethylbenzene	1.0	0.3	4.73	16.77	ok
Xylene (total)	1.0	0.3	1.032	4.44	ok
1,2-Dichloroethene (total)	1.0	0.3	0.2322	1.77	ok
Naphthalene	1.0	0.3	4.6096	16.37	ok
2-Methylnaphthalene	1.0	0.3	4.6096	16.37	ok

NOTES: (1) Koc values taken from Table 5-1
(2) TOC data average of 4,263 (0.43%), from:

9-AST-SB19	3,600	mg/Kg
78-B903-SB03-02	5,200	mg/Kg
65-SB06	3,290	mg/Kg
35-MW21S-02	4,960	mg/Kg

(3) Bulk Density of Baymeade soil estimated from USDA-SCS "Soil Survey Camp Lejeune, NC", 1984.
(4) A porosity of 30%, based on a silty fine sand - taken from Fetter, 1988.

S.O. No. 62470-303

Subject: GROUNDWATER FLOW VELOCITY CALCULATIONS
SITE 54

Sheet No. 1 of

Drawing No. —

Computed by MKD Checked By JEZ 1/2/96 Date 12/18/95

Baker

$V = Ki/n_e$

WHERE
V = VELOCITY
K = HYDRAULIC CONDUCTIVITY
i = GRADIENT
n_e = EFFECTIVE POROSITY

54-GW03
K = 8.2 ft/day
i = 0.006 ft/ft
n_e = ASSUME 30%

V = (8.2 ft/day) × (0.006 ft/ft) / 0.30 ok
≃ 0.16 ft/day

54-GW04
K = 8.8 ft/day
i = 0.006 ft/ft
n_e = ASSUME 30%

V = (8.8 ft/day) × (0.006 ft/ft) / 0.30
≃ 0.18 ft/day ok

54-GW06
K = 50.5 ft/day
i = 0.006 ft/day
n_e = ASSUME 30%

V = (50.5 ft/day) × (0.006 ft/ft) / 0.30 ok
≃ 1.01 ft/day

54-GW07
K = 17.2 ft/day
i = 0.008 ft/ft
n_e = ASSUME 30%

V = (17.2 ft/day) × (0.008 ft/ft) / 0.30 ok
≃ 0.46 ft/day

54-GW08
K = 46.7 ft/day
i = 0.008 ft/ft
n_e = ASSUME 30%

V = (46.7 ft/day) × (0.008 ft/ft) / 0.30 ok
≃ 1.25 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.

SOIL

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								

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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

JUNE 3, 1994

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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	6130J - 63000J	ND - 151000	20200 - 160000	1730 - 11900	8750 - 828000	10300 - 91900	2430 - 191000
Chromium	50	100	172 - 627	11 - 117	ND - 201	47.8 - 220	ND - 214	ND - 348J	19 - 316	9.0J - 140	42.8 - 106J	10.5 - 244	161 - 249	126 - 895
Copper	1000	1300	44.6 - 117	3 - 23	ND - 175	17.7 - 36.4	ND - 39.7	ND - 84	ND - 52	18.8J - 75.4	15.8 - 42.5	16.3 - 1030	64.2 - 104	28.6 - 313
Lead	15	15	40.8J - 176J	2.7 - 44.8	ND - 200	23 - 37.3	ND - 127	ND - 2000J	5.1 - 89	20.3J - 234J	7.7J - 115J	4.8 - 9340	16.5 - 28.8	15.8 - 508
Manganese	50	50 (1)	125 - 1720	21 - 190	ND - 362	56.9 - 220	ND - 91.3	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 - 29.6	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 - 1110J	148J - 406J	36.2 - 12100	6J - 967J	ND - 204	14 - 220	ND - 736	ND - 40.8

NOTES:
J - Value is estimated.
JB - Value is estimated below the CRDL, but greater than the IDL.
NE - Not established.
NA - Not analyzed.
ND - Not detected.
NCWQS - North Carolina Water Quality Standard
MCL - Maximum Contaminant Level
(1) - Secondary MCL

TABLE 2
COMPARISON OF REPEAT SAMPLING OF SHALLOW WELLS
MCB, CAMP LEJEUNE, NORTH CAROLINA

Well	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	2.3 J	15.2	3.3 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	3.6	2.5	34.4	1.6	5.7 J	7.1	6.9 J
Manganese	0.40 - 8	NA	NA	4.3 J	4.1	ND	1.8 B	3	11.6	ND	3.7 J	9.1	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	[illegible]
Beryllium	ND	ND	NA	NA	NA	NA	0.18	0.18	ND	ND	ND	ND
Cadmium	ND	ND	NA	NA	NA	NA	0.73	[illegible]	8.3	ND	ND	ND
Chromium	11.2	[illegible]	NA	NA	NA	NA	3.6	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Copper	ND	ND	NA	NA	NA	NA	3.7	[illegible]	3.4	ND	6.2 J	25.4 J
Lead	4.6 J	[illegible]	NA	NA	NA	NA	4.8	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Manganese	4.7	[illegible]	NA	NA	NA	NA	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Mercury	ND	ND	NA	NA	NA	NA	0.06	0.31	ND	ND	ND	ND
Nickel	ND	ND	NA	NA	NA	NA	6.6	[illegible]	7.6	[illegible]	3.1	[illegible]
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	[illegible]	20.1	3	3.2	[illegible]

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 48		Site 63		Site 65		Site 69		Site 78		Site 82	
	"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	48-GW01	48-GW03	63MW03	63MW02	65MW03	65MW02	69-GW11	69-GW03	78GW34	78GW24-1	6-GW28	82MW3
Soil Sample Number	48-GW1A-01	48-C3-03	63-MW03-04	63-MW02-06	65-MW03-11	65-MW02-06	69-GW11-04	69-C8A-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	6.9	3.1	6.8	12	18.5	21	2.6	3
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	12	3.7	4.3	11	4.5 J	2.6	2.7	4.9
Manganese	11	7	4.9	110	3.5	6.9	4	12	92	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.
JB - Value is estimated below the CRDL, but greater than the IDL.
NA - No available wells to compare OR compound was not analyzed.
ND - Not detected.
NCWQS - North Carolina Water Quality Standard
MCL - Maximum Contaminant Level
(1) - Secondary MCL

TABLE 5
COMPARISON OF INORGANIC SUBSURFACE SOIL CONCENTRATIONS IN "CLEAN" AND "CONTAMINATED" WELLS
MCB, CAMP LEJEUNE, NORTH CAROLINA

	ABC Cleaners		Offsite Property #1		Offsite Property #2	
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.

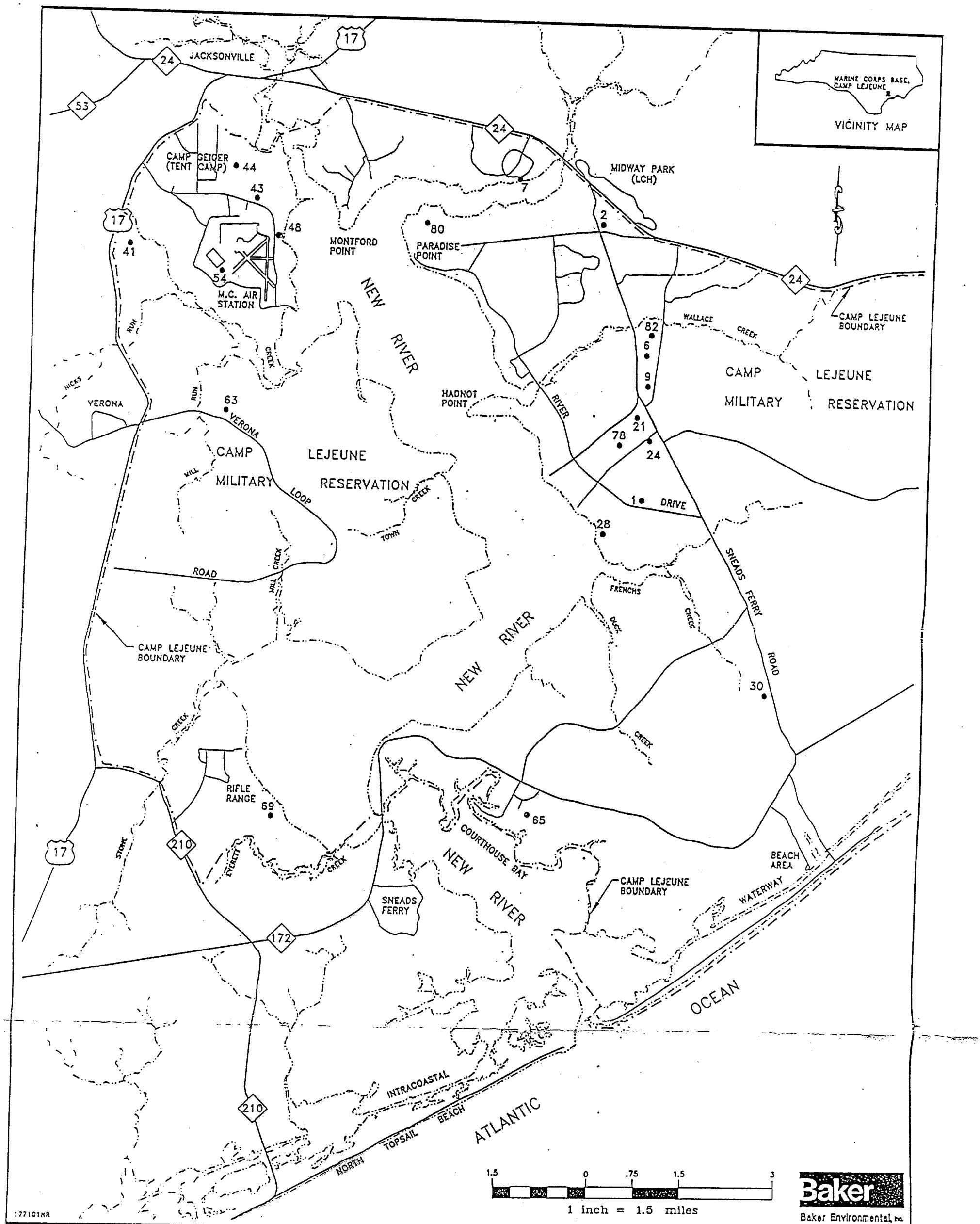
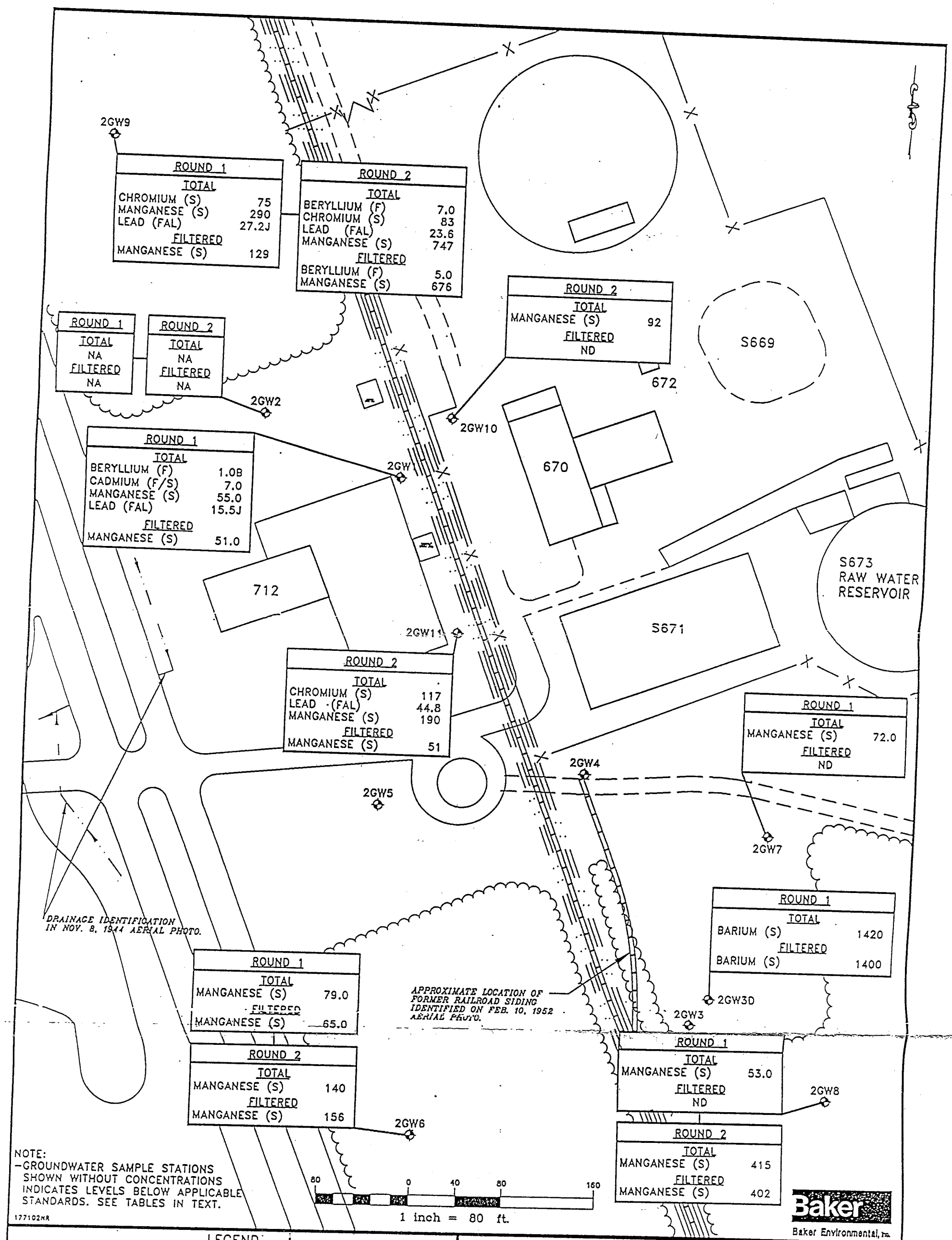


FIGURE 1
SITE LOCATION MAP
INORGANIC GROUNDWATER STUDY

MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA



LEGEND

2GW1 GROUNDWATER WELL
(F) EXCEEDS FEDERAL STANDARD
(S) EXCEEDS STATE STANDARD
(FAL) FEDERAL ACTION LEVEL
ND NOT DETECTED ABOVE APPLICABLE STANDARDS
NA NOT ANALYZED
J ESTIMATED CONCENTRATIONS
CONCENTRATIONS EXPRESSED IN ug/l(ppb)
SOURCE: LANTDIV, FEB. 1992

FIGURE 2
POSITIVE DETECTIONS ABOVE APPLICABLE FEDERAL AND STATE STANDARDS FOR TOTAL AND FILTERED INORGANIC ANALYTES IN GROUNDWATER
SITE 2
REMEDIAL INVESTIGATION CTO-0174
MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA

Appendix A
Data Summary Tables for Sites 2 and 78

OPERABLE UNIT NO. 1 - SITES 21, 24, 78
SHALLOW, INTERMEDIATE AND DEEP MONITORING WELLS
GROUNDWATER DATA AND FREQUENCY SUMMARY
REMEDIAL INVESTIGATION CTO - 19177
MCB CAMP LEJEUNE, NORTH CAROLINA
TAL METALS AND CYANIDE

	MINIMUM NONDETECTED UG/L	MAXIMUM NONDETECTED UG/L	MINIMUM DETECTED UG/L	MAXIMUM DETECTED UG/L	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
ALUMINUM	NA	NA	68 J	542000 J	78-GW06-01	59 / 59
ANTIMONY	3 U	20 U	3.3 B	169 J	78-GW02-01	7 / 33
ARSENIC	2 U	10 U	2.3 J	405 J	78-GW02-01	44 / 48
BARIUM	NA	NA	17 B	1250	78-GW07-01	59 / 59
BERYLLIUM	1 U	4 U	1 B	19	24-GW02-01	52 / 59
CADMIUM	5 U	25 U	5	21	78-GW04-3-01	9 / 59
CALCIUM	NA	NA	2420 B	642000	78-GW04-1-01	59 / 59
CHROMIUM	10 U	50 U	10	858 J	78-GW06-01	46 / 59
COBALT	8 U	8 U	8 B	170	78-GW22-2-01	25 / 59
COPPER	2 U	2 U	3 B	699	78-GW39-01	58 / 59
IRON	NA	NA	32 B	523000	78-GW04-3-01	59 / 59
LEAD	1.8 U	4.9 U	2.9 B	2000 J	21-GW0B-01	50 / 59
MAGNESIUM	NA	NA	88 B	37100	24-GW03-01	59 / 59
MANGANESE	2 U	2 U	2 B	714	78-GW24-1-01	57 / 59
MERCURY	0.2 U	0.2 U	0.23 J	3.2	24-GW06-01	24 / 52
NICKEL	20 U	20 U	20 B	234	78-GW22-2-01	31 / 59
POTASSIUM	NA	NA	982 B	67300	78-GW32-3-01	59 / 59
SELENIUM	1 U	5 U	1.1 J	99.5 J	78-GW32-2-01	41 / 54
SILVER	3 U	15 U	5 J	5 J	78-GW09-3-01	1 / 59
SODIUM	NA	NA	2450 B	42500	78-GW32-3-01	59 / 59
THALLIUM	1 U	1 U	1 B	7.3 J	78-GW32-2-01	16 / 59
VANADIUM	4 U	4 U	4 J	1700	78-GW08-01	55 / 59
ZINC	6 U	6 U	6 J	967 J	78-GW22-2-01	57 / 59
CYANIDE	10 U	10 U	ND	ND	ND	0 / 54

OPERABLE UNIT NO. 1 - SITES 21, 24, 78
SHALLOW, INTERMEDIATE AND DEEP MONITORING WELLS
GROUNDWATER DATA AND FREQUENCY SUMMARY
REMEDIAL INVESTIGATION CTO - 19177
MCB CAMP LEJEUNE, NORTH CAROLINA
TAL METALS AND CYANIDE

SAMPLE NO.	21-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

OPERAL .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 L		3.5 J	1.1 UJ	2.7 J	0.5 UJ
MAGNESIUM	5660		1600 B	75 B	1920 B	4800 B
MANGANESE	55		21	2 U	21	46
MERCURY	0.1 U		0.1 U	0.1 U	0.1 U	0.1 U
NICKEL	10 U		10 U	10 U	10 U	10 U
POTASSIUM	2560 B		1030 B	187000	1210 B	2130 B
SELENIUM	4.2 B		0.5 U	0.5 U	0.5 U	0.5 U
SILVER	1.5 U		1.5 U	1.5 U	1.5 U	1.5 U
SODIUM	4040 B		5490	103000	5560	10100
THALLIUM	0.5 U		0.5 U	0.5 UJ	0.5 U	0.5 U
VANADIUM	72		10 B	2 U	89	9 B
ZINC	146		13 B	9 B	16 B	6 B
CYANIDE	5 U		5 U	5 U	5 U	5 U

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						

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:

$$K_L = (1/k_1 + RT/Hk_g)^{-1} \qquad (1)$$

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):

$$k_g(VOC) = k_g(H_2O(18/MW_{VOC})^{0.5} \qquad (2)$$

$$k_1(VOC) = k_1(CO_2(44/MW_{VOC})^{0.5} \qquad (3)$$

where,

MW	=	molecular weight (g/mol).

APPENDIX Q
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kg	=	gas-film mass transfer coefficient (cm/hr), and
k_1	=	liquid-film mass transfer coefficient (cm/hr).

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$$k_g(VOC) = k_g(H_2O(18/MW_{VOC})^{0.5} \qquad (2)$$

$$k_1(VOC) = k_1(CO_2(44/MW_{VOC})^{0.5} \qquad (3)$$

where,

MW	=	molecular weight (g/mol).

$$dC_a/dt = RC_a + S \tag{7}$$

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:

$$C_a(t) = (S/R)\ (1-\exp[-Rt])\ for\ t = D_s$$

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

$$E_{inh} = (VR)\ (S)/[(BW)\ (R)\ (10^6)]\ x\ ([D_s + \frac{\exp(-RD_t)}{R}] - \frac{[\exp[R(D_s - D_t]}{R})$$

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 T, 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)

$$\text{Log kp} = -2.72 + 0.71 \log k_{ow} - 0.0061\ MW$$

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}

APPENDIX R
LEAD UBK MODEL

APPENDIX R
LEAD UBK MODEL

Lead exposure at the project site was evaluated using USEPA's lead UBK model. This model incorporates exposure from six different media (air, soil, drinking water, diet, indoor dust, and paint) to estimate blood lead levels in infants and young children. The lead UBK model addresses the lowest age groups because children are exceptionally sensitive to the adverse effects of lead. Factors contributing to this sensitivity include: 1) an apparent intrinsic sensitivity of developing organ systems, 2) behavioral traits that result in increased contact with dust and soil, 3) certain physiological factors that result in greater deposition of lead in the respiratory tract and higher absorption rate from the gastrointestinal tract in children, and 4) sufficient transplacental transfer of lead to result in a fetal burden (USEPA, 1990). In contrast to typical exposure estimation techniques, the UBK model predicts blood lead levels in younger children.

The UBK model is flexible in that the user can apply site-specific exposure parameters to estimate blood lead levels. In evaluating exposure at the project site, it was assumed that infants and younger children are exposed to lead in soil, drinking water, diet, air, and indoor dust. The following is a discussion of lead exposure via these five pathways and a description of the exposure parameters used for each pathway.

Soil and Indoor Dust

Soil concentrations of lead at the site were entered into the UBK model to establish the soil and indoor dust contribution to blood lead levels. The UBK model assumes that infants and younger children ingestion both soil and indoor dust that is contaminated with lead. For the site, the maximum concentration of lead in soil were modeled. These values are presented in Appendix H. The following section discusses the exposure parameters used in estimating the blood lead levels from soil and indoor dust exposure.

The UBK model estimates the indoor lead dust concentration as a percentage of the outdoor soil lead concentration. A conversion factor of 0.28 is used in the model for establishing the indoor lead dust concentration from an outdoor soil source. This value is derived from a study by Davis et al. (1990) where they identified a 0.28 dust/soil ration for aluminum and silicon. Because site-specific data are not available for the site, the default factor of 0.28 was utilized. The model also distributes the infant and young child's exposure between the soil and indoor dust. This soil/dust ingestion weighting factor is dependent on the amount of time spent indoors and outdoors. It is expected that the amount of time spent indoors is greater than the amount of time spent outdoors for infants and younger children (USEPA, 1990). As a result, the USEPA has selected a default value of 45 (i.e., 45% of lead intake from soil and dust is derived from ingestion of soil, 55% from ingestion of indoor dust).

Soil ingestion rates for the various age groups are required in the prediction of blood lead levels. The default values in Version 0.4 UBK model are 100 mg/day for each of the age groups. These values are unrealistic in that they assume a relatively high ingestion rate for the lower age groups (e.g., 0-1 and 1-2 yr.). As a result, the ingestion rate of 100 mg/day, especially in the lower age groups (0-2 years), is not representative for the site. USEPA's Exposure Factors Handbook (USEPA, 1989) presents values for soil ingestion for the various age groups. In particular, soil ingestion values that represent an intermediate tendency to ingest soil are presented. These values are more representative of the exposure at the site and were used in calculating the blood lead levels. Table R-1 presents the values for each of the age groups.

Drinking Water

Typically, the UBK model assumes that infants and younger children will be exposed to lead via consumption of drinking water at their place of residence. it was assumed that the younger children and infants will be exposed via direct ingestion of the groundwater at their place of residence. An ingestion rate of 1 L/day, which is consistent with the groundwater pathway, was used in estimating the blood lead contribution of surface water. Both the RME and average groundwater concentrations were used in estimating an overall blood lead level.

Diet

In creating the UBK model, the USEPA assumed a dietary contribution of lead based on Food and Drug Administration Market Basket Surveys and analysis of food lead content (USEPA, 1990). As a result , the default exposure parameters do not vary based on medium-specific concentrations (i.e., air, soil, water) at the site. The rationale is that foods are harvested from geographically diverse regions of the country and, for the most part, are not produced locally. Consequently, the lead concentrations in the food are not related to the lead levels in the local media. The default values supplied in the UBK model were used in estimating the blood lead contributions from dietary intake.

Air

Generation of wind blown dust is expected to occur to some extent at the project site. The modelled air concentrations were used as input parameters for the UBK model. These values were used in estimating the blood lead contribution of the air pathway at the project site. The indoor air concentration was calculated as a portion of the outdoor lead level. A default conversion factor of 0.3 was applied to the outdoor concentration to derive an indoor air lead level. Default values also were used for the amount of time spent indoors versus outdoors and the daily breathing volumes for each of the age groups.

TABLE R-1

UBK SOIL INGESTION RATES

AGE (Years)	SOIL INGESTION RATES (mg/day)	
	Default UBK Values	Site Specific Values*
0-1	100	0
1-2	100	50
2-3	100	200
3-4	100	200
4-5	100	50
5-6	100	10
6-7	100	10

* Intermediate tendence ingestion rate values from the Exposure Factors Handbook (USEPA, 1989).

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APPENDIX R

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APPENDIX S
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:

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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

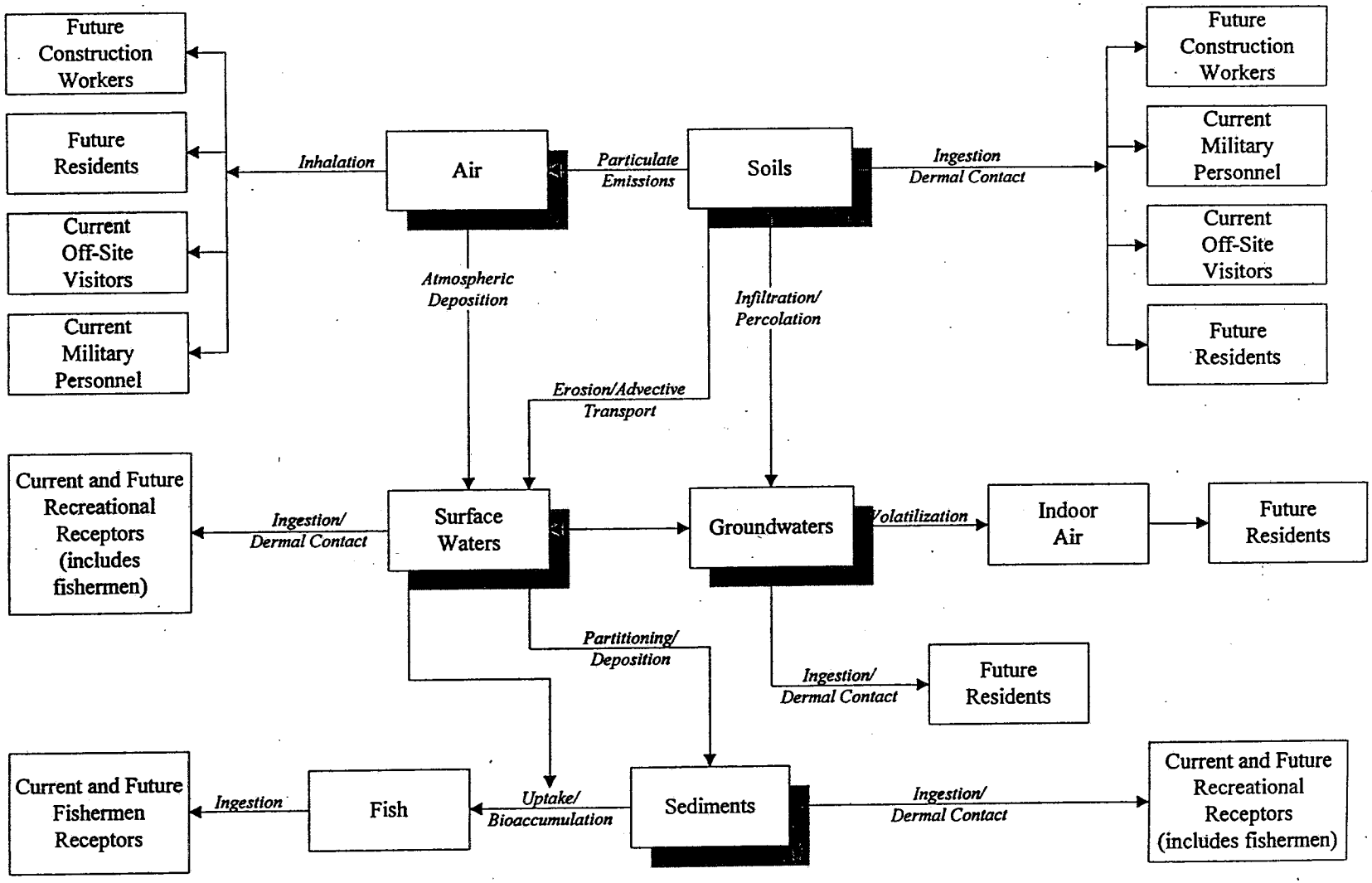


FIGURE 2

FLOWCHART OF POTENTIAL EXPOSURE PATHWAYS AND RECEPTORS
SITE 43: AGAN STREET DUMP

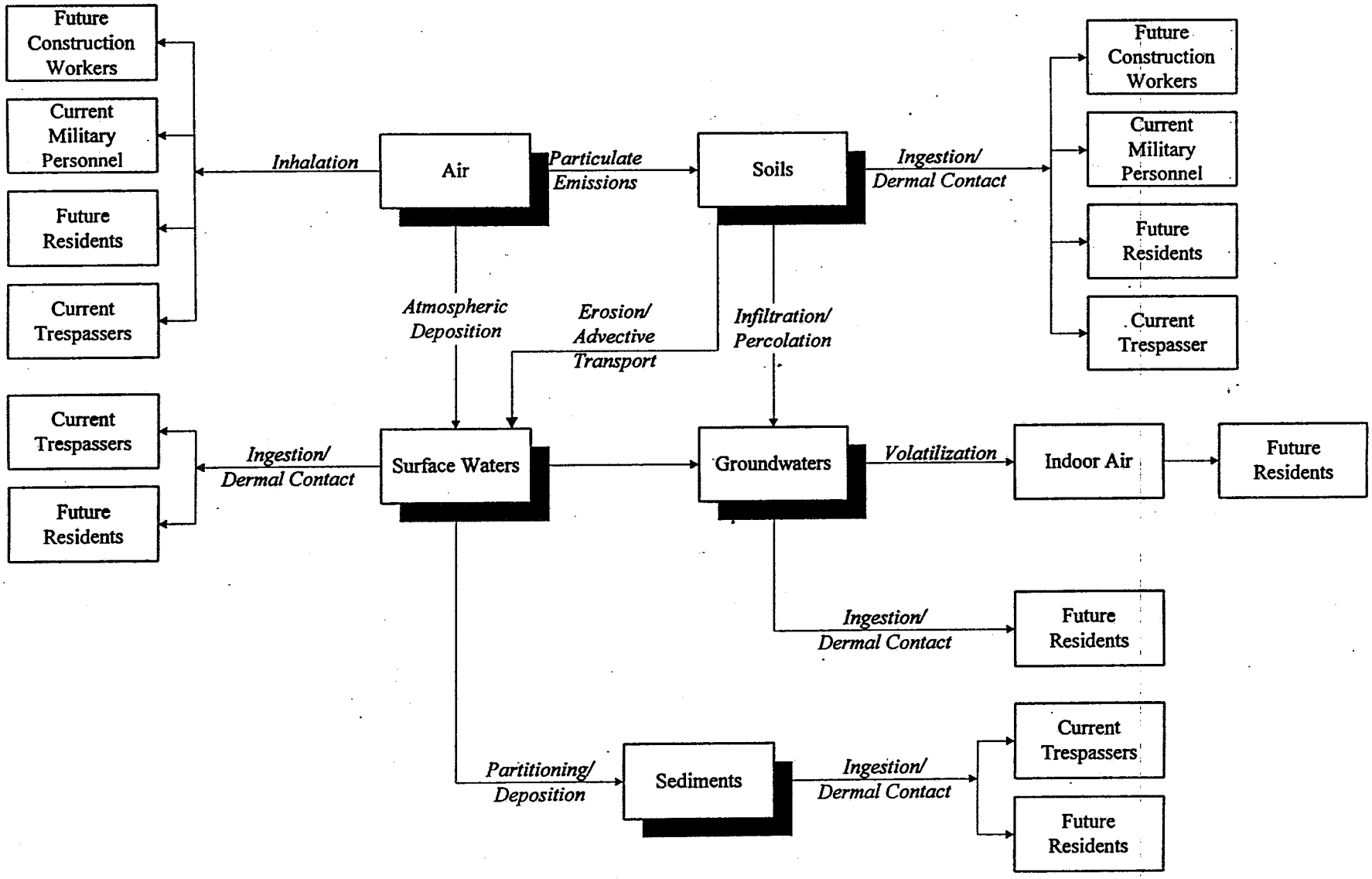


FIGURE 3

FLOWCHART OF POTENTIAL EXPOSURE PATHWAYS AND RECEPTORS
SITE 44: JONES STREET DUMP

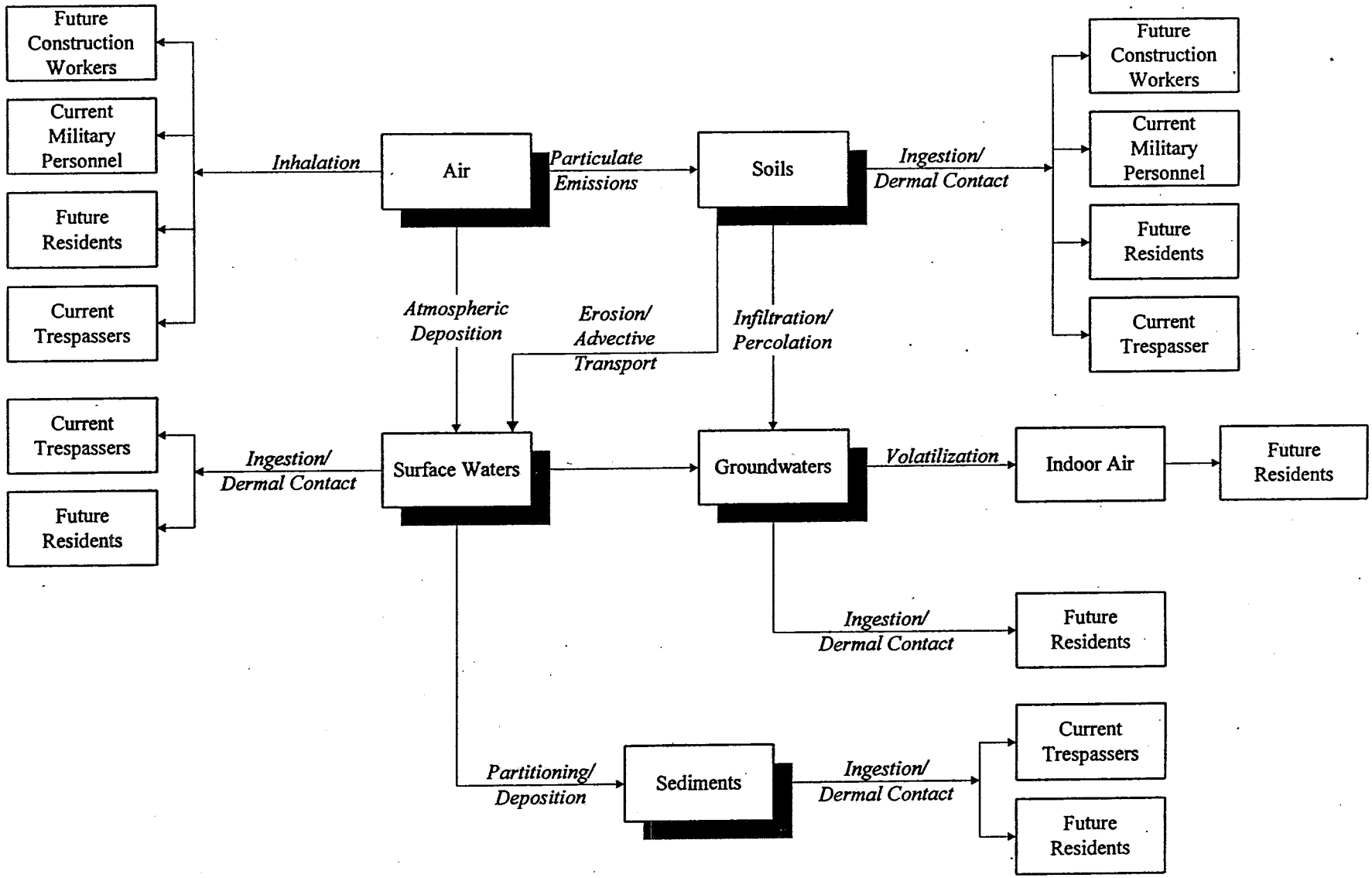


FIGURE 4

FLOWCHART OF POTENTIAL EXPOSURE PATHWAYS AND RECEPTORS
SITE 54: CRASH CREW FIRE TRAINING BURN PIT

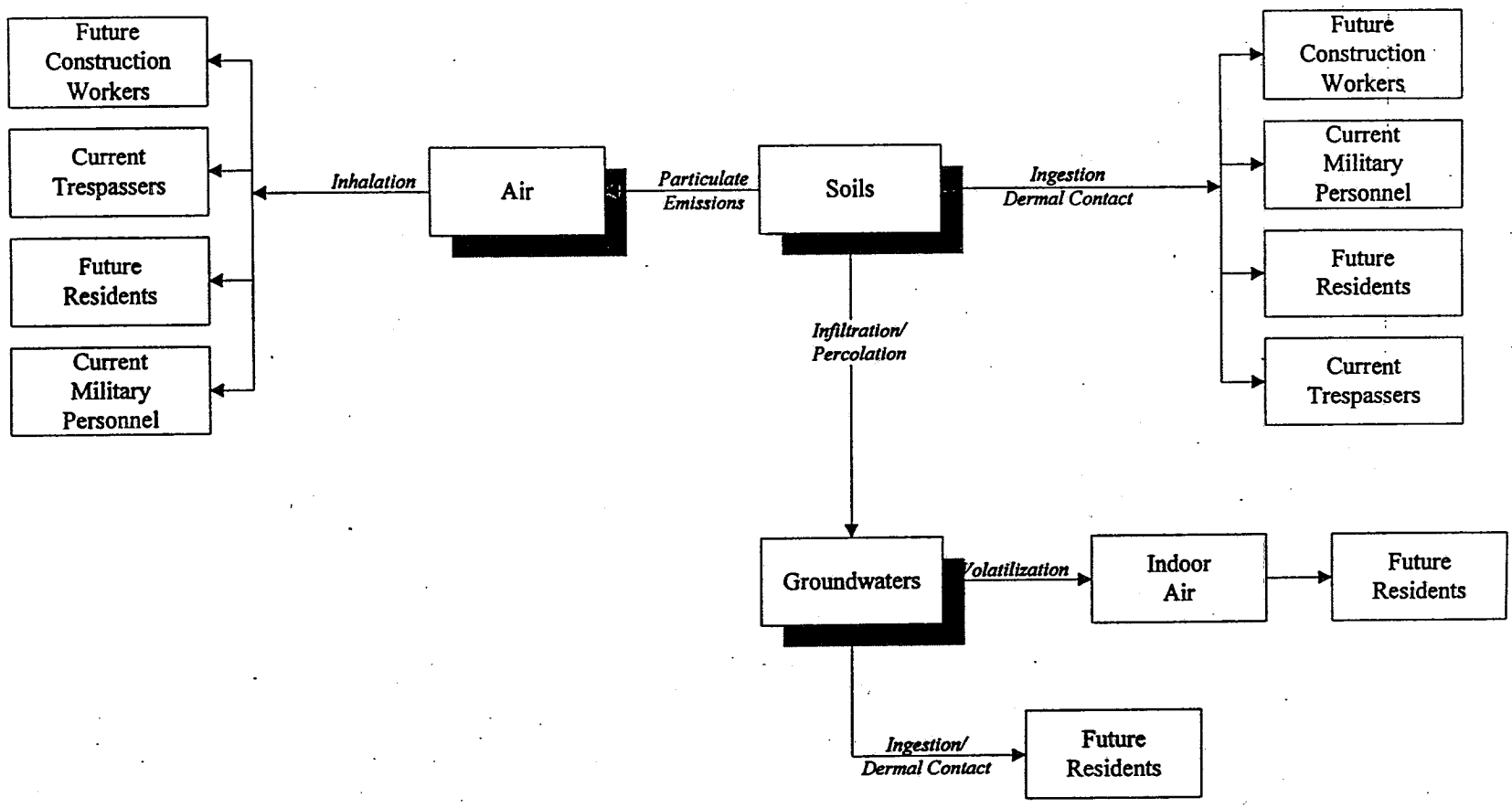
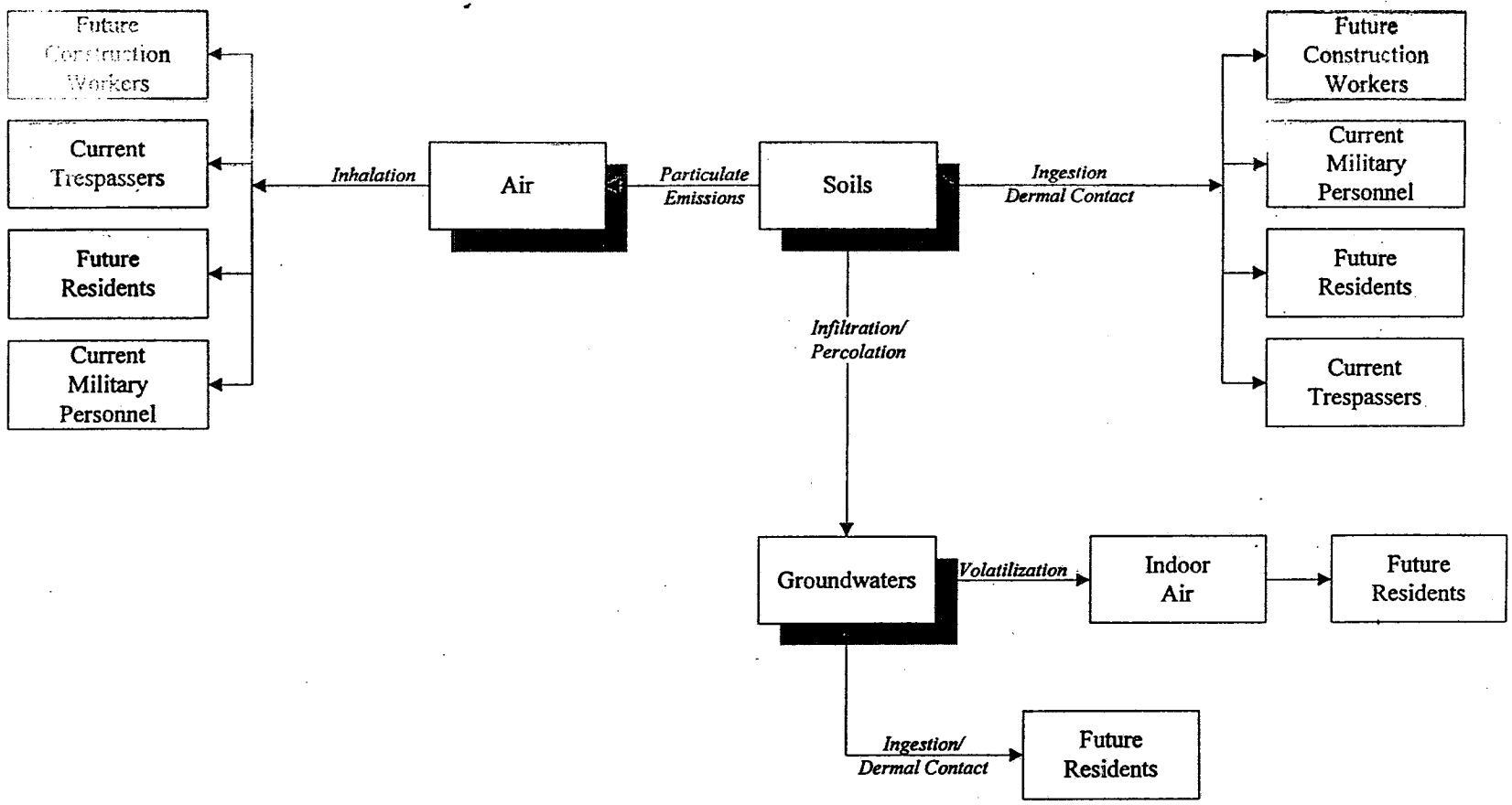


FIGURE 5

FLOWCHART OF POTENTIAL EXPOSURE PATHWAYS AND RECEPTORS
SITE 86: ABOVEGROUND STORAGE TANK AREA



APPENDIX T
CDI CALCULATIONS

SAMPLE CALCULATIONS

Computed by: RSP Checked by: KTW Date: 1/96

EXAMPLE SOIL* INGESTION CALCULATIONS
OPERABLE UNIT NO. 6
CONTRACT TASK ORDER 0303

Purpose: Estimate intake/risk from ingestion of soil

$$Intake\ (mg/kg{\cdot}day) = \frac{C\ x\ CF\ x\ EF\ x\ ED\ x\ IR}{BW\ x\ AT}$$

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

$$Intake\ (mg/kg{\cdot}day) = \frac{0.79\ mg/kg\ x\ 100\ mg/day\ x\ 350\ days/yr\ x\ 30\ yrs\ x\ 1.0E{-}6\ kg/mg}{70\ kg\ x\ 25{,}550\ days}$$

= 4.6E-07

Risk = 4.06E-07 mg/kg·day x 1.5 $mg/kg{\cdot}day^{-1}$ = 7.0E-07

Example Noncarcinogen: Arsenic

$$Intake\ (mg/kg{\cdot}day) = \frac{0.79\ mg/kg\ x\ 100\ mg/day\ x\ 350\ days/yr\ x\ 30\ yrs\ x\ 1.0E{-}6\ kg/mg}{70\ kg\ x\ 10{,}950\ days}$$

= 1.1E-06

$$Risk = \frac{1.1E{-}06\ mg/kg{\cdot}day}{3.0E{-}04\ mg/kg{\cdot}day} = 3.6E{-}03$$

* This example calculation also is applicable for sediment ingestion.
Re: Site 54 Future Residential Adult - Surface Soil

Computed by: RSP Checked by: KTW 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

$$Intake\ (mg/kg{\cdot}day) = \frac{C\ x\ CF\ x\ SA\ x\ AF\ x\ ABS\ x\ EF\ x\ ED}{BW\ x\ AT}$$

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)
	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

$$Intake\ (mg/kg{\cdot}day) = \frac{0.79\ mg/kg\ x\ 1.0E{-}06\ kg/mg\ x\ 5{,}800\ cm^2/event\ x\ 0.001\ x\ 1\ mg/cm^2\ x\ 350\ days/yr\ x\ 30\ yrs}{70\ kg\ x\ 25{,}550\ days}$$

= 2.7E-08

Risk = 2.7E-08 mg/kg·day x 7.5 $mg/kg{\cdot}day^{-1}$ = 2.0E-07

Example Noncarcinogen: Arsenic

$$Intake\ (mg/kg{\cdot}day) = \frac{0.79\ mg/kg\ x\ 1.0E{-}06\ kg/mg\ x\ 5{,}800\ cm^2/event\ x\ 1\ mg/cm^2\ x\ 0.001\ x\ 350\ days/yr\ x\ 30\ yrs}{70\ kg\ x\ 10{,}950\ days}$$

= 6.3E-08

$$Risk = \frac{6.3E{-}08\ mg/kg{\cdot}day}{6.0E{-}05\ mg/kg{\cdot}day} = 1.0E{-}03$$

* This example calculation also is applicable for sediment dermal contact.
Re: Site 54 Future Residential Adult - Surface Soil

Computed by: RSP Checked by: KTW 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

$$Intake\ (mg/kg{\cdot}day) = \frac{C\ x\ IR\ x\ EF\ x\ ED\ x\ 1/PEF}{BW\ x\ AT}$$

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

$$Intake\ (mg/kg{\cdot}day) = \frac{0.79\ mg/kg\ x\ 20\ m^3/day\ x\ 350\ days/yr\ x\ 30\ yrs\ x\ 1/1.32E{+}09\ m^3/kg}{70\ kg\ x\ 25{,}550\ days}$$

= 2.0E-11

Risk = 2.0E-11 mg/kg·day x 15.1 $mg/kg{\cdot}day^{-1}$ = 3.0E-10

Example Noncarcinogen: Not Applicable

Re: Site 54 Future Residential Adult

Computed by: RSP Checked by: KTW Date: 1/96

EXAMPLE GROUNDWATER INGESTION CALCULATIONS
OPERABLE UNIT NO. 6
CONTRACT TASK ORDER 0303

Purpose: Estimate intake/risk from ingestion of groundwater

$$Intake\ (mg/kg{\cdot}day) = \frac{C\ x\ IR\ x\ EF\ x\ ED}{BW\ x\ AT}$$

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: Arsenic

$$Intake\ (mg/kg{\cdot}day) = \frac{0.007\ mg/L\ x\ 1\ L/day\ x\ 350\ days/yr\ x\ 6\ yrs}{15\ kg\ x\ 25{,}550\ days}$$

= 3.9-05

Risk = 3.9-05 mg/kg·day x 1.5 $mg/kg{\cdot}day^{-1}$ = 5.9E-05

Example Noncarcinogen: Iron

$$Intake\ (mg/kg{\cdot}day) = \frac{74.1\ mg/L\ x\ 1\ L/day\ x\ 350\ days/yr\ x\ 6\ yrs}{15\ kg\ x\ 2{,}190\ days}$$

= 4.7

$$Risk = \frac{4.7\ mg/kg{\cdot}day}{0.3\ mg/kg{\cdot}day} = 16.0$$

Re: Site 54 Future Residential Child

Computed by: RSP Checked by: KTW 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

$$Intake\ (mg/kg{\cdot}day) = \frac{C \times SA \times CF \times PC \times ET \times EF \times ED}{BW \times AT}$$

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

$$Intake\ (mg/kgday) = \frac{0.007\ mg/L \times 1.0E{-}03\ L/cm^3 \times 10{,}000\ cm^2/event \times 1.0E{-}03\ cm/hr \times 0.25\ hr/day \times 350\ days/yr \times 6\ yrs}{15\ kg \times 25{,}550\ days}$$

= 9.8E-08

Risk = 9.8E-08 mg/kg·day x 7.5 $mg/kg{\cdot}day^{-1}$ = 7.4E-07

Example Noncarcinogen: Iron

$$Intake\ (mg/kg{\cdot}day) = \frac{74.1\ mg/L \times 1.0E{-}03\ L/cm^3 \times 10{,}000\ cm^2/event \times 1.0E{-}03\ cm/hr \times 0.25\ hr/day \times 350\ days/yr \times 6\ yrs}{15\ kg \times 2{,}190\ days}$$

= 1.2E-02

$$Risk = \frac{1.2E{-}02\ mg/kg{\cdot}day}{6E{-}02\ mg/kg{\cdot}day} = 2.0E{-}01$$

Re: Site 54 Future Residential Child

Computed by: RSP Checked by: KTW 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

$$Intake\ (mg/kg{\cdot}day) = \frac{C\ x\ EF\ x\ ED}{AT}$$

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 $(mg/kg{\cdot}day)^{-1}$
Noncarcinogens = Intake (mg/kg·day)/RfD (mg/kg·day)

Example Carcinogen: Benzene

$$Intake\ (mg/kg{\cdot}day) = \frac{9.84E{-}04\ mg/kg/shower\ x\ 350\ days/yr\ x\ 24\ yrs}{25{,}550\ days}$$

= 8.1E-05

Risk = 8.1E-05 mg/kg·day x 2.9E-02 $mg/kg{\cdot}day^{-1}$ = 2.4E-06

Example Noncarcinogen: Benzene

$$Intake\ (mg/kg{\cdot}day) = \frac{9.84E{-}04\ mg/L\ x\ 350\ days/yr\ x\ 24\ yrs}{10{,}950\ days}$$

= 9.4E-04

$$Risk = \frac{9.4E{-}04\ mg/kg{\cdot}day}{1.7E{-}03\ mg/kg{\cdot}day} = 0.55$$

Re: Site 54 Future Residential Adult

CURRENT MILITARY RECEPTOR

SURFACE SOIL INGESTION EXPOSURE ASSESSMENT
OPERABLE UNIT NO. 6 (SITE 54)
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
Arsenic	0.79	250	4	1E-06	100	70	25550	4.4E-08	1.5E+00	6.6E-08	100%	1460	7.7E-07	3.0E-04	2.6E-03	100%
TOTAL										6.6E-08					2.6E-03	

SURFACE SOIL DERMAL CONTACT EXPOSURE ASSESSMENT
OPERABLE UNIT NO. 6 (SITE 54)
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

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
Arsenic	7.9E-01	1E-06	4300	1	0.001	250	4	70	25550	1.9E-09	7.50E+00	1.4E-08	100%	1460	3.3E-08	6.00E-05	5.5E-04	100%
TOTAL												1.4E-08					5.5E-04	

SURFACE SOIL PARTICULATE INHALATION EXPOSURE ASSESSMENT
OPERABLE UNIT NO. 6 (SITE 54)
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
Arsenic	7.9E-01	1.3E+09	250	30	4	70	25550	1.0E-11	1.51E+01	1.5E-10	100%	1460	1.8E-10	0.00E+00	0.0E+00	0%
TOTAL										1.5E-10					0.0E+00	

CURRENT CHILD TRESPASSER

SURFACE SOIL INGESTION EXPOSURE ASSESSMENT
OPERABLE UNIT NO. 6 (SITE 54)
REMEDIAL INVESTIGATION CTO-0303
MCB CAMP LEJEUNE, NORTH CAROLINA
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
Arsenic	0.790	130	6	1E-06	100	15	25550	1.6E-07	1.50E+00	2.4E-07	100%	2190	1.9E-06	3.00E-04	6.3E-03	100%
TOTAL										2.4E-07					6.3E-03	

SURFACE SOIL DERMAL CONTACT EXPOSURE ASSESSMENT
OPERABLE UNIT NO. 6 (SITE 54)
REMEDIAL INVESTIGATION CTO-0303
MCB CAMP LEJEUNE, NORTH CAROLINA
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
Arsenic	0.790	1E-06	2000	1	0.001	130	6	15	25550	3.2E-09	7.5E+00	2.4E-08	100%	2190	3.8E-08	6.0E-05	6.3E-04	100%
TOTAL												2.4E-08					6.3E-04	

SURFACE SOIL PARTICULATE INHALATION EXPOSURE ASSESSMENT
OPERABLE UNIT NO. 6 (SITE 54)
REMEDIAL INVESTIGATION CTO-0303
MCB CAMP LEJEUNE, NORTH CAROLINA
CURRENT 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)	Carcinogenic Risk	Percent Conrtribution to Risk	Average Noncarc Time (days)	Noncarc Dose (mg/kg/day)	Reference Dose (mg/kg-day)	Noncarcinogenic Risk	Percent Noncarcinogenic Risk
Arsenic	7.9E-01	1.3E+09	350	15	6	15	25550	4.9E-11	1.5E+01	7.4E-10	100%	2190	5.7E-10	0.0E+00	0.0E+00	0%
TOTAL										7.4E-10					0.0E+00	

FUTURE CHILD RESIDENT

SUBSURFACE SOIL INGESTION EXPOSURE ASSESSMENT
OPERABLE UNIT NO. 6 (SITE 54)
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	13400.000	350	6	1E-06	200	15	25550	1.5E-02	0.00E+00	0.0E+00	0%	2190	1.7E-01	1.00E+00	1.7E-01	93%
Arsenic	0.289	350	6	1E-06	200	15	25550	3.2E-07	1.50E+00	4.7E-07	100%	2190	3.7E-06	3.00E-04	1.2E-02	7%
TOTAL										4.7E-07					1.8E-01	

SUBSURFACE SOIL DERMAL CONTACT EXPOSURE ASSESSMENT
OPERABLE UNIT NO. 6 (SITE 54)
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 (%)	Exposur Frequen (events/ 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)	Noncarcinogenic Risk Child	Percent Noncarcinogenic Risk Child
Aluminum	13400.000	1E-06	2300	1	0.001	350	6	15	25550	1.7E-04	0.0E+00	0.0E+00	0%	2190	2.0E-03	2.0E-01	9.9E-03	93%
Arsenic	0.289	1E-06	2300	1	0.001	350	6	15	25550	3.6E-09	7.5E+00	2.7E-08	100%	2190	4.2E-08	6.0E-05	7.1E-04	7%
TOTAL												2.7E-08					1.1E-02	

SUBSURFACE SO... ...RTICULATE INHALATION EXPOSURE ASSESSMENT
OPERABLE UNIT NO. 6 (SITE 54)
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 Conrtribution to Risk	Average Noncarc Time (days)	Noncarc Dose (mg/kg/day)	Reference Dose (mg/kg-day)	Noncarcinogenic Risk	Percent Noncarcinogenic Risk
Aluminum	13400.00	1.3E+09	350	15	6	15	25550	8.3E-07	0.0E+00	0.0E+00	0%	2190	9.7E-06	0.0E+00	0.0E+00	0%
Arsenic	0.289	1.3E+09	350	15	6	15	25550	1.8E-11	1.5E+01	2.7E-10	100%	2190	2.1E-10	0.0E+00	0.0E+00	0%
TOTAL										2.7E-10					0.0E+00	

GROUNDWATER INGESTION EXPOSURE ASSESSMENT
OPERABLE UNIT NO. 6 (SITE 54)
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/	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 noncarcinoge	6
DY = days per year (day/year)	365
CSF = cancer slope factor (mg/kg-day)-	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
1,2-Dichloroethene (total)	0.007	1	350	6	15	25550	4.0E-05	0.0E+00	0.0E+00	0%	2190	4.6E-04	9.0E-03	5.1E-02	0%
Benzene	0.015	1	350	6	15	25550	8.1E-05	2.9E-02	2.4E-06	4%	2190	9.5E-04	0.0E+00	0.0E+00	0%
Toluene	0.013	1	350	6	15	25550	7.1E-05	0.0E+00	0.0E+00	0%	2190	8.2E-04	2.0E-01	4.1E-03	0%
Nitrobenzene	0.002	1	350	6	15	25550	1.1E-05	0.0E+00	0.0E+00	0%	2190	1.3E-04	5.0E-04	2.6E-01	1%
Naphthalene	0.127	1	350	6	15	25550	6.9E-04	0.0E+00	0.0E+00	0%	2190	8.1E-03	4.0E-02	2.0E-01	1%
2-Methylnaphthalene	0.041	1	350	6	15	25550	2.3E-04	0.0E+00	0.0E+00	0%	2190	2.6E-03	4.0E-02	6.6E-02	0%
Aluminum	1.759	1	350	6	15	25550	9.6E-03	0.0E+00	0.0E+00	0%	2190	1.1E-01	1.0E+00	1.1E-01	1%
Arsenic	0.007	1	350	6	15	25550	3.9E-05	1.5E+00	5.9E-05	96%	2190	4.6E-04	3.0E-04	1.5E+00	8%
Iron	74.100	1	350	6	15	25550	4.1E-01	0.0E+00	0.0E+00	0%	2190	4.7E+00	3.0E-01	1.6E+01	85%
Lead	0.014	1	350	6	15	25550	7.8E-05	0.0E+00	0.0E+00	0%	2190	9.1E-04	0.0E+00	0.0E+00	0%
Manganese (water)	1.280	1	350	6	15	25550	7.0E-03	0.0E+00	0.0E+00	0%	2190	8.2E-02	1.4E-01	5.8E-01	3%
TOTAL									6.1E-05					1.9E+01	

GROUNDWATER DERMAL CONTACT EXPOSURE ASSESSMENT
OPERABLE UNIT NO. 6 (SITE 54)
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
1,2-Dichloroethene (total)	0.007	10000	1.00E-02	0.25	350	6	0.001	15	25550	9.9E-07	0.0E+00	0.0E+00	0%	2190	1.2E-05	7.2E-03	1.6E-03	0%
Benzene	0.015	10000	2.10E-02	0.25	350	6	0.001	15	25550	4.3E-06	3.6E-02	1.5E-07	17%	2190	5.0E-05	0.0E+00	0.0E+00	0%
Toluene	0.013	10000	1.00E+00	0.25	350	6	0.001	15	25550	1.8E-04	0.0E+00	0.0E+00	0%	2190	2.1E-03	1.6E-01	1.3E-02	4%
Nitrobenzene	0.002	10000	1.50E-03	0.25	350	6	0.001	15	25550	4.1E-08	0.0E+00	0.0E+00	0%	2190	4.8E-07	2.5E-04	1.9E-03	1%
Naphthalene	0.127	10000	6.90E-02	0.25	350	6	0.001	15	25550	1.2E-04	0.0E+00	0.0E+00	0%	2190	1.4E-03	2.0E-02	7.0E-02	19%
2-Methylnaphthalene	0.041	10000	1.42E-01	0.25	350	6	0.001	15	25550	8.1E-05	0.0E+00	0.0E+00	0%	2190	9.4E-04	2.0E-02	4.7E-02	13%
Aluminum	1.759	10000	1.00E-03	0.25	350	6	0.001	15	25550	2.4E-05	0.0E+00	0.0E+00	0%	2190	2.8E-04	2.0E-01	1.4E-03	0%
Arsenic	0.007	10000	1.00E-03	0.25	350	6	0.001	15	25550	9.8E-08	7.5E+00	7.4E-07	83%	2190	1.1E-06	6.0E-05	1.9E-02	5%
Iron	74.100	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	2.0E-01	55%
Lead	0.014	10000	4.00E-06	0.25	350	6	0.001	15	25550	7.8E-10	0.0E+00	0.0E+00	0%	2190	9.1E-09	0.0E+00	0.0E+00	0%
Manganese (water)	1.280	10000	1.00E-03	0.25	350	6	0.001	15	25550	1.8E-05	0.0E+00	0.0E+00	0%	2190	2.0E-04	2.8E-02	7.3E-03	2%
TOTAL												8.9E-07					3.6E-01	

GROUNDWATER INHALATION - RME CASE
OPERABLE UNIT NO. 6 (SITE 54)
REMEDIAL INVESTIGATION CTO-0303
MCB CAMP LEJEUNE, NORTH CAROLINA
FUTURE RESIDENTIAL CHILD

CHILD CHEMICAL	C me 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
1,2-Dichloroethene (total)	4.13E-04	6	350	2190	25550	4.0E-04	3.4E-05	0.0E+00	0.0E+00	—	0.0E+00	0%	0%
Benzene	9.84E-04	6	350	2190	25550	9.4E-04	8.1E-05	1.7E-03	2.9E-02	5.5E-01	2.4E-06	70%	100%
Toluene	9.17E-04	6	350	2190	25550	8.8E-04	7.5E-05	1.1E-01	0.0E+00	7.7E-03	0.0E+00	1%	0%
Nitrobenzene	1.35E-04	6	350	2190	25550	1.3E-04	1.1E-05	5.7E-04	0.0E+00	2.3E-01	0.0E+00	29%	0%
Naphthalene	8.84E-04	6	350	2190	25550	8.5E-04	7.3E-05	0.0E+00	0.0E+00	—	0.0E+00	0%	0%
2-Methylnaphthalene	1.81E-03	6	350	2190	25550	1.7E-03	1.5E-04	0.0E+00	0.0E+00	—	0.0E+00	0%	0%
										7.9E-01	2.4E-06		

CURRENT ADULT TRESPASSER

SURFACE SOIL INGESTION EXPOSURE ASSESSMENT
OPERABLE UNIT NO. 6 (SITE 54)
REMEDIAL INVESTIGATION CTO-0303
MCB CAMP LEJEUNE, NORTH CAROLINA
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
Arsenic	0.79	43	30	1E-06	50	70	25550	2.8E-08	1.5E+00	4.3E-08	100%	10950	6.6E-08	3.0E-04	2.2E-04	100%
TOTAL										4.3E-08					2.2E-04	

SURFACE SOIL DERMAL CONTACT EXPOSURE ASSESSMENT
OPERABLE UNIT NO. 6 (SITE 54)
REMEDIAL INVESTIGATION CTO-0303
MCB CAMP LEJEUNE, NORTH CAROLINA
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
Arsenic	7.9E-01	1E-06	5000	1	0.001	43	30	70	25550	2.8E-09	7.5E+00	2.1E-08	100%	10950	6.6E-09	6.0E-05	1.1E-04	100%
TOTAL												2.1E-08					1.1E-04	

SURFACE SOIL PARTICULATE INHALATION EXPOSURE ASSESSMENT
OPERABLE UNIT NO. 6 (SITE 54)
REMEDIAL INVESTIGATION CTO-0303
MCB CAMP LEJEUNE, NORTH CAROLINA
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
Arsenic	7.9E-01	1.3E+09	43	20	30	70	25550	8.6E-12	1.5E+01	1.3E-10	100%	10950	2.0E-11	0.0E+00	0.0E+00	0%
TOTAL										1.3E-10					0.0E+00	

FUTURE ADULT RESIDENT

SUBSURFACE SOIL INGESTION EXPOSURE ASSESSMENT
OPERABLE UNIT NO. 6 (SITE 54)
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 Tim (days)	Carc Dose (mg/kg/day) Adult	Slope Factor (mg/kg/day)-	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 Noncarcinogeni Risk Adult
Aluminum	13400	350	30	1E-06	100	70	25550	7.9E-03	0.0E+00	0.0E+00	0%	10950	1.8E-02	1.0E+00	1.8E-02	93%
Arsenic	0.289	350	30	1E-06	100	70	25550	1.7E-07	1.5E+00	2.5E-07	100%	10950	4.0E-07	3.0E-04	1.3E-03	7%
TOTAL										2.5E-07					2.0E-02	

SUBSURFACE SOIL DERMAL CONTACT EXPOSURE ASSESSMENT
OPERABLE UNIT NO. 6 (SITE 54)
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	13400	1E-06	5800	1	0.001	350	30	70	25550	4.6E-04	0.0E+00	0.0E+00	0%	10950	1.1E-03	2.0E-01	5.3E-03	93%
Arsenic	0.289	1E-06	5800	1	0.001	350	30	70	25550	9.8E-09	7.5E+00	7.4E-08	100%	10950	2.3E-08	6.0E-05	3.8E-04	7%
TOTAL												7.4E-08					5.7E-03	

SUBSURFACE SOIL PARTICULATE INHALATION EXPOSURE ASSESSMENT
OPERABLE UNIT NO. 6 (SITE 54)
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 Tim (days)	Carc Dose (mg/kg/day)	Slope Factor (mg/kg-day)-	Carcinogenic Risk	Percent Contribution to Risk	Average Noncarc Time (days)	Noncarc Dose (mg/kg/day)	Reference Dose (mg/kg-day)	Noncarcinogenic Risk	Percent Noncarcinogeni Risk
Aluminum	13400	1.3E+09	350	20	30	70	25550	1.2E-06	0.0E+00	0.0E+00	0%	10950	2.8E-06	0.0E+00	0.0E+00	0%
Arsenic	0.289	1.3E+09	350	20	30	70	25550	2.6E-11	1.5E+01	3.9E-10	100%	10950	6.0E-11	0.0E+00	0.0E+00	0%
TOTAL										3.9E-10					0.0E+00	

GROUNDWATER INGESTION EXPOSURE ASSESSMENT
OPERABLE UNIT NO. 6 (SITE 54)
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
1,2-Dichloroethene (total)	0.007	2	350	30	70	25550	8.5E-05	0.0E+00	0.0E+00	0%	10950	2.0E-04	9.0E-03	2.2E-02	0%
Benzene	0.015	2	350	30	70	25550	1.7E-04	2.9E-02	5.0E-06	4%	10950	4.1E-04	0.0E+00	0.0E+00	0%
Toluene	0.013	2	350	30	70	25550	1.5E-04	0.0E+00	0.0E+00	0%	10950	3.5E-04	2.0E-01	1.8E-03	0%
Nitrobenzene	0.002	2	350	30	70	25550	2.3E-05	0.0E+00	0.0E+00	0%	10950	5.5E-05	5.0E-04	1.1E-01	1%
Naphthalene	0.127	2	350	30	70	25550	1.5E-03	0.0E+00	0.0E+00	0%	10950	3.5E-03	4.0E-02	8.7E-02	1%
2-Methylnaphthalene	0.041	2	350	30	70	25550	4.8E-04	0.0E+00	0.0E+00	0%	10950	1.1E-03	4.0E-02	2.8E-02	0%
Aluminum	1.759	2	350	30	70	25550	2.1E-02	0.0E+00	0.0E+00	0%	10950	4.8E-02	1.0E+00	4.8E-02	1%
Arsenic	0.007	2	350	30	70	25550	8.4E-05	1.5E+00	1.3E-04	96%	10950	2.0E-04	3.0E-04	6.6E-01	8%
Iron	74.100	2	350	30	70	25550	8.7E-01	0.0E+00	0.0E+00	0%	10950	2.0E+00	3.0E-01	6.8E+00	85%
Lead	0.014	2	350	30	70	25550	1.7E-04	0.0E+00	0.0E+00	0%	10950	3.9E-04	0.0E+00	0.0E+00	0%
Manganese (water)	1.280	2	350	30	70	25550	1.5E-02	0.0E+00	0.0E+00	0%	10950	3.5E-02	1.4E-01	2.5E-01	3%
TOTAL									1.3E-04					8.0E+00	

GROUNDWATER DERMAL CONTACT EXPOSURE ASSESSMENT
OPERABLE UNIT NO. 6 (SITE 54)
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

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
1,2-Dichloroethene (total)	0.007	23000	1.00E-02	0.25	350	30	0.001	70	25550	2.4E-06	0.0E+00	0.0E+00	0%	10950	5.7E-06	7.2E-03	7.9E-04	0%
Benzene	0.015	23000	2.10E-02	0.25	350	30	0.001	70	25550	1.1E-05	3.6E-02	3.8E-07	17%	10950	2.5E-05	0.0E+00	0.0E+00	0%
Toluene	0.013	23000	1.00E+00	0.25	350	30	0.001	70	25550	4.4E-04	0.0E+00	0.0E+00	0%	10950	1.0E-03	1.6E-01	6.3E-03	4%
Nitrobenzene	0.002	23000	1.50E-03	0.25	350	30	0.001	70	25550	1.0E-07	0.0E+00	0.0E+00	0%	10950	2.4E-07	2.5E-04	9.5E-04	1%
Naphthalene	0.127	23000	6.90E-02	0.25	350	30	0.001	70	25550	3.0E-04	0.0E+00	0.0E+00	0%	10950	6.9E-04	2.0E-02	3.4E-02	19%
2-Methylnaphthalene	0.041	23000	1.42E-01	0.25	350	30	0.001	70	25550	2.0E-04	0.0E+00	0.0E+00	0%	10950	4.6E-04	2.0E-02	2.3E-02	13%
Aluminum	1.759	23000	1.00E-03	0.25	350	30	0.001	70	25550	5.9E-05	0.0E+00	0.0E+00	0%	10950	1.4E-04	2.0E-01	6.9E-04	0%
Arsenic	0.007	23000	1.00E-03	0.25	350	30	0.001	70	25550	2.4E-07	7.5E+00	1.8E-06	83%	10950	5.7E-07	6.0E-05	9.4E-03	5%
Iron	74.100	23000	1.00E-03	0.25	350	30	0.001	70	25550	2.5E-03	0.0E+00	0.0E+00	0%	10950	5.8E-03	6.0E-02	9.7E-02	55%
Lead	0.014	23000	4.00E-06	0.25	350	30	0.001	70	25550	1.9E-09	0.0E+00	0.0E+00	0%	10950	4.5E-09	0.0E+00	0.0E+00	0%
Manganese (water)	1.280	23000	1.00E-03	0.25	350	30	0.001	70	25550	4.3E-05	0.0E+00	0.0E+00	0%	10950	1.0E-04	2.8E-02	3.6E-03	2%
TOTAL												2.2E-06					1.8E-01	

GROUNDWATER INHALATION EXPOSURE ASSESSMENT
OPERABLE UNIT NO. 6 (SITE 54)
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
1,2-Dichloroethene (total)	6.8E-05	30	350	10950	25550	6.5E-05	2.8E-05	0.0E+00	0.0E+00	—	0.0E+00	0%	0%
Benzene	1.6E-04	30	350	10950	25550	1.6E-04	6.7E-05	1.7E-03	2.9E-02	9.1E-02	1.9E-06	70%	100%
Toluene	1.5E-04	30	350	10950	25550	1.5E-04	6.2E-05	1.1E-01	0.0E+00	1.3E-03	0.0E+00	1%	0%
Nitrobenzene	2.2E-05	30	350	10950	25550	2.1E-05	9.1E-06	5.7E-04	0.0E+00	3.7E-02	0.0E+00	29%	0%
Naphthalene	1.5E-04	30	350	10950	25550	1.4E-04	6.0E-05	0.0E+00	0.0E+00	—	0.0E+00	0%	0%
2-Methylnaphthalene	3.0E-04	30	350	10950	25550	2.9E-04	1.2E-04	0.0E+00	0.0E+00	—	0.0E+00	0%	0%
									TOTAL		1.3E-01	1.9E-06	

FUTURE CONSTRUCTION WORKER

SURFACE SOIL INGESTION EXPOSURE ASSESSMENT
OPERABLE UNIT NO. 6 (SITE 54)
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 (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
Arsenic	0.79	90	1	1E-06	480	70	25550	1.9E-08	1.5E+00	2.9E-08	100%	365	1.3E-06	3.0E-04	4.5E-03	100%
TOTAL										2.9E-08					4.5E-03	

SURFACE SOIL DERMAL CONTACT EXPOSURE ASSESSMENT
OPERABLE UNIT NO. 6 (SITE 54)
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 (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 Noncarcinogen Risk Adult
Arsenic	0.79	1E-06	4300	1	0.001	90	1	70	25550	1.7E-10	7.5E+00	1.3E-09	100%	365	1.2E-08	6.0E-05	2.0E-04	100%
TOTAL												1.3E-09					2.0E-04	

SURFACE SOIL INGESTION EXPOSURE ASSESSMENT
OPERABLE UNIT NO. 6 (SITE 54)
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 (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
Arsenic	0.79	90	1	1E-06	480	70	25550	1.9E-08	1.5E+00	2.9E-08	100%	365	1.3E-06	3.0E-04	4.5E-03	100%
TOTAL										2.9E-08					4.5E-03	

SURFACE SOIL PARTICULATE INHALATION EXPOSURE ASSESSMENT
OPERABLE UNIT NO. 6 (SITE 54)
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 (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
Arsenic	0.79	1.3E+09	90	20	1	70	25550	6.0E-13	1.5E+01	9.1E-12	100%	365	4.2E-11	0.0E+00	0.0E+00	0%
TOTAL										9.1E-12					0.0E+00	

SUBSURFACE SOIL INGESTION EXPOSURE ASSESSMENT
OPERABLE UNIT NO. 6 (SITE 54)
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	13400	90	1	1E-06	480	70	25550	3.2E-04	0.0E+00	0.0E+00	0%	365	2.3E-02	1.0E+00	2.3E-02	93%
Arsenic	0.29	90	1	1E-06	480	70	25550	7.0E-09	1.5E+00	1.0E-08	100%	365	4.9E-07	3.0E-04	1.6E-03	7%
TOTAL										1.0E-08					2.4E-02	

SUBSURFACE SOIL DERMAL CONTACT EXPOSURE ASSESSMENT
OPERABLE UNIT NO. 6 (SITE 54)
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	13400	1E-06	4300	1	0.001	90	1	70	25550	2.9E-06	0.0E+00	0.0E+00	0%	365	2.0E-04	2.0E-01	1.0E-03	93%
Arsenic	0.29	1E-06	4300	1	0.001	90	1	70	25550	6.2E-11	7.5E+00	4.7E-10	100%	365	4.4E-09	6.0E-05	7.3E-05	7%
TOTAL												4.7E-10					1.1E-03	

SUBSURFACE SOIL PARTICULATE INHALATION EXPOSURE ASSESSMENT
OPERABLE UNIT NO. 6 (SITE 54)
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	13400.00	1.3E+09	90	20	1	70	25550	1.0E-08	0.0E+00	0.0E+00	0%	365	7.2E-07	0.0E+00	0.0E+00	0%
Arsenic	0.29	1.3E+09	90	20	1	70	25550	2.2E-13	1.5E+01	3.3E-12	100%	365	1.5E-11	0.0E+00	0.0E+00	0%
TOTAL										3.3E-12					0.0E+00	

SHOWER MODEL CALCULATIONS

site 54 groundwater
11-Jan-96

CAS No.	TARGET COMPOUND LIST CONSTITUEN	OVERALL MASS TRANSFER COEFFICIENT (KL) (cm/hr)	HENRY'S LAW CONSTANT (H) (atm-m3/mol-K)	GAS CONSTANT (R) (aL-m3/ mol-K)	ABSOLUTE TEMP. (T1) (K)	GAS CONST. * ABS. TEMP (RT)	GAS-FILM MASS TRANSF. COEFFICIENT (kg) (cm/hr)	LIQUID-FILM MASS TRANS COEFFICIEN (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 M TRANSF. C TEMP. CO (KaL) (cm/hr)	WATER VISCOSITY (AT Ts) (Us) (cp)	WATER VISCOSITY (AT T1) (U1) (cp)	SHOWER WATER TEMP. (Ts) (K)	((T1)*(Us) ((Ts)*(U1)	CONCENTRATIO LEAVING SHWR DROPLET Cwd (ug/l)	SHOWER WATER CONCENTRATI Cwo (ug/l)	SHOWER DROPLET DIAMETER d (mm)
adult																					
75-15-0	1,2-Dichloroethene (total)	1.07E+01	1.23E-02	8.20E-05	293.0	2.40E-02	1.05E+03	1.09E+01	20.0	3000.0	147.00	9.14E-02	1.86E-03	1.45E+01	0.596	1.002	318.0	5.48E-01	2.76E+00	7.21E+00	1.00
540-59-0	Benzene	1.30E+01	7.58E-03	8.20E-05	293.0	2.40E-02	1.29E+03	1.35E+01	20.0	3000.0	97.00	7.42E-02	2.45E-03	1.76E+01	0.596	1.002	318.0	5.48E-01	6.58E+00	1.48E+01	1.00
71-43-2	Toluene	1.44E+01	5.50E-03	8.20E-05	293.0	2.40E-02	1.44E+03	1.50E+01	20.0	3000.0	78.10	6.66E-02	3.03E-03	1.94E+01	0.596	1.002	318.0	5.48E-01	6.14E+00	1.29E+01	1.00
108-88-3	Nitrobenzene	1.33E+01	6.66E-03	8.20E-05	293.0	2.40E-02	1.33E+03	1.38E+01	20.0	3000.0	92.10	7.23E-02	2.72E-03	1.80E+01	0.596	1.002	318.0	5.48E-01	9.02E-01	2.00E+00	1.00
	Naphthalene	1.06E+00	2.44E-05	8.20E-05	293.0	2.40E-02	1.15E+03	1.20E+01	20.0	3000.0	123.11	8.36E-02	8.58E-01	1.43E+00	0.596	1.002	318.0	5.48E-01	5.91E+00	1.27E+02	1.00
	2-Methylnaphthalene	7.72E+00	4.83E-04	8.20E-05	293.0	2.40E-02	1.12E+03	1.17E+01	20.0	3000.0	128.16	8.53E-02	4.42E-02	1.04E+01	0.596	1.002	318.0	5.48E-01	1.21E+01	4.13E+01	1.00

site 54 groundwater
11-Jan-96

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 Einh (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																								
75-15-0	1,2-Dichloroethene (total)	2.00	2.90E+01	6.00E+01	-4.83E-01	6.1701E-01	4.60E+00	10	6	1.99E+02	0.0083	12	15	4.08E-01	8.83E-01	6.81E-05	10	70	8.83E-01	15	1.184E+02	1.175E+02	-3	7.92E-05
540-59-0	Benzene	2.00	3.52E+01	6.00E+01	-5.87E-01	5.5593E-01	1.10E+01	10	6	4.74E+02	0.0083	12	15	4.08E-01	8.83E-01	1.62E-04	10	70	8.83E-01	15	1.184E+02	1.175E+02	-3	1.89E-04
71-43-2	Toluene	2.00	3.88E+01	6.00E+01	-6.46E-01	5.2388E-01	1.02E+01	10	6	4.42E+02	0.0083	12	15	4.08E-01	8.83E-01	1.51E-04	10	70	8.83E-01	15	1.184E+02	1.175E+02	-3	1.76E-04
108-88-3	Nitrobenzene	2.00	3.60E+01	6.00E+01	-6.00E-01	5.4888E-01	1.50E+00	10	6	6.50E+01	0.0083	12	15	4.08E-01	8.83E-01	2.22E-05	10	70	8.83E-01	15	1.184E+02	1.175E+02	-3	2.59E-05
	Naphthalene	2.00	2.87E+00	6.00E+01	-4.78E-02	9.5333E-01	9.85E+00	10	6	4.26E+02	0.0083	12	15	4.08E-01	8.83E-01	1.46E-04	10	70	8.83E-01	15	1.184E+02	1.175E+02	-3	1.70E-04
	2-Methylnaphthalene	2.00	2.08E+01	6.00E+01	-3.47E-01	7.0646E-01	2.02E+01	10	6	8.74E+02	0.0083	12	15	4.08E-01	8.83E-01	2.99E-04	10	70	8.83E-01	15	1.184E+02	1.175E+02	-3	3.48E-04

site 54 groundwater
11-Jan-96

CAS No.	TARGET COMPOUND LIST CONSTITUEN	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 TRANSF. 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 VISCOSI (AT T1) (U1) (cp)	SHOWE WATER TEMP. (Ts) (K)	((T1)*(Us))/ ((Ts)*(U1))	CONCENTRATIO LEAVING SHWR DROPLET Cwd (ug/l)	SHOWER WATER CONCENTRATION Cwo (ug/l)	SHOWER DROPLET DIAMETER d (mm)
75-15-0	1,2-Dichloroethene (total)	1.07E+01	1.23E-02	8.20E-05	293.0	2.40E-02	1.05E+03	1.09E+01	20.0	3000.0	147.00	9.14E-02	1.86E-03	1.45E+01	0.596	1.002	318.0	5.48E-01	2.76E+00	7.21E+00	1.00
540-59-0	Benzene	1.30E+01	7.58E-03	8.20E-05	293.0	2.40E-02	1.29E+03	1.35E+01	20.0	3000.0	97.00	7.42E-02	2.45E-03	1.76E+01	0.596	1.002	318.0	5.48E-01	6.58E+00	1.48E+01	1.00
71-43-2	Toluene	1.44E+01	5.50E-03	8.20E-05	293.0	2.40E-02	1.44E+03	1.50E+01	20.0	3000.0	78.10	6.66E-02	3.03E-03	1.94E+01	0.596	1.002	318.0	5.48E-01	6.14E+00	1.29E+01	1.00
108-88-3	Nitrobenzene	1.33E+01	6.66E-03	8.20E-05	293.0	2.40E-02	1.33E+03	1.38E+01	20.0	3000.0	92.10	7.23E-02	2.72E-03	1.80E+01	0.596	1.002	318.0	5.48E-01	9.02E-01	2.00E+00	1.00
	Naphthalene	1.06E+00	2.44E-05	8.20E-05	293.0	2.40E-02	1.15E+03	1.20E+01	20.0	3000.0	123.11	8.36E-02	8.58E-01	1.43E+00	0.596	1.002	318.0	5.48E-01	5.91E+00	1.27E+02	1.00
	2-Methylnaphthalene	7.72E+00	4.83E-04	8.20E-05	293.0	2.40E-02	1.12E+03	1.17E+01	20.0	3000.0	128.16	8.53E-02	4.42E-02	1.04E+01	0.596	1.002	318.0	5.48E-01	1.21E+01	4.13E+01	1.00

site 54 groundwater
11-Jan-96

CAS No.	TARGET COMPOUND LIST CONSTITUE	SHOWE 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)-1	exp(-R[t])	INHALATION EXPOSURE PER SHOWER Einh (mg/kg/shwr)	VENTILATIO RATE VR (liter/min)	BODY WEIGH BW (kg)	exp(-R[Dt])	DURATION IN THE SHOWER ROOM Dt (min)	Ds + exp(-RDt)/R	exp[R(Ds-Dt /R	(Ds-Dt)	(VR * S)/ (BW)(R)(K)
75-15-0	1,2-Dichloroethene (total)	2.00	2.90E+01	6.00E+01	-4.83E-01	6.1701E-01	4.60E+00	10	6	1.99E+02	0.0083	12	15	4.06E-01	8.83E-01	4.13E-04	13	15	8.83E-01	15	1.184E+02	1.175E+02	-3	4.81E-04
540-59-0	Benzene	2.00	3.52E+01	6.00E+01	-5.87E-01	5.5593E-01	1.10E+01	10	6	4.74E+02	0.0083	12	15	4.06E-01	8.83E-01	9.84E-04	13	15	8.83E-01	15	1.184E+02	1.175E+02	-3	1.15E-03
71-43-2	Toluene	2.00	3.88E+01	6.00E+01	-6.46E-01	5.2388E-01	1.02E+01	10	6	4.42E+02	0.0083	12	15	4.06E-01	8.83E-01	9.17E-04	13	15	8.83E-01	15	1.184E+02	1.175E+02	-3	1.07E-03
108-88-3	Nitrobenzene	2.00	3.60E+01	6.00E+01	-6.00E-01	5.4888E-01	1.50E+00	10	6	6.50E+01	0.0083	12	15	4.06E-01	8.83E-01	1.35E-04	13	15	8.83E-01	15	1.184E+02	1.175E+02	-3	1.57E-04
	Naphthalene	2.00	2.87E+00	6.00E+01	-4.78E-02	9.5333E-01	9.85E+00	10	6	4.26E+02	0.0083	12	15	4.06E-01	8.83E-01	8.84E-04	13	15	8.83E-01	15	1.184E+02	1.175E+02	-3	1.03E-03
	2-Methylnaphthalene	2.00	2.08E+01	6.00E+01	-3.47E-01	7.0646E-01	2.02E+01	10	6	8.74E+02	0.0083	12	15	4.06E-01	8.83E-01	1.81E-03	13	15	8.83E-01	15	1.184E+02	1.175E+02	-3	2.11E-03

PC VALUES FILE: PCVAL.WQ1

11-Jan-96

PARAMETER	[CM/HR] linked here	
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	0.1422918415	
2-Methylphenol	0.0160	
2-methylnaphthalene	0.1422918415	
4,4'-DDD	0.28	
4,4'-DDE	0.24	
4,4'-DDT	0.43	
4-Methylphenol	0.0180	
Acenaphthene	0.1515653756	
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
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	

PC VALUES FILE: PCVAL.WQ1

11-Jan-96

PARAMETER	[CM/HR]	
	linked here	
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	
Trichloroethene	0.0160	
Trichlorotrifluoroethane	0.0015	
Vanadium	0.0010	
Vinyl Chloride	0.0073	
Zinc	0.0006	zinc chloride
Acenapthene	0.1515653756	
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	0.1516	4	154
2-methylnaphthalene	0.1423	3.86	142.2

APPENDIX U
FIELD DATA SHEETS

ECOLOGICAL EVALUATION
FIELD DATA SHEET - TERRESTRIAL

Project Name: OU No. 6, MCB Camp Lejeune, Jacksonville, NC

Location: Site 54 Burn Pit on Air Field

Date: 3/21/95

Sampling Location: Forest along side of air field

Data Collected By: JBS, CMC

Habitat Type: Mixed Forest

Vegetation:

Trees:

Dominant Species:

1. Loblolly Pine - dom. in
2. canopy - Pinus taeda
3.
4.
5.
6.
7.
8.
9.
10.

Secondary Species:

1. water oak - Quercus nigra
2. tulip poplar - Liriodendron tulipifera
3. southern red oak Q. falcata
4. white oak - (U) Q. alba
5. beech - (U) Fagus grandifolium
6. red maple (w) Acer rubrum
7. ash (w) - Fraxinus sp.
8.
9.
10.

u - upland
w - wetland

Saplings/Shrubs:

Dominant Species:

1. _____
2. none dominant
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

Secondary Species:

1. Sweet myrtle - Myrica cerifera
2. juniper - Juniperus virginiana
3. ~~[illegible]~~ alder (w) - Alnus serrulata
4. bay - Magnolia virginiana
5. dogwood (w) - Cornus florida
6. holly (w) - Ilex opaca
7. _____
8. _____
9. _____
10. _____

Woody Vines:

Dominant Species:

1. _____
2. none dominant
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

Secondary Species:

1. Bullbriar - Smilax bona-nox
2. Jasmine - Gelsemium sempervirens
3. Japanese honeysuckle - Lonicera japonica
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

Herbs:

Dominant Species:

1. _____
2. none dominant
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

Secondary Species:

1. switch cane - Arundinaria tecta
2. sensitive fern (w) Onoclea sensibilis
3. arrow arum (w) Peltandra virginica
4. partridgeberry (w) Mitchella repens
5. heartleaf (w) - Hexastylis arifolia
6. beechdrops (w) Epifagus virginiana
7. Giant Cane - Arundinaria gigantea
8. yellow thistle - Cirsium horridulum
9. Andropogon glomeratus
10. _____

Birds: _____

Time: _____

Weather Conditions:

Species	Sex	Feeding	Nesting	Approx. No.
1.				
2.	listed w. open area			
3.				
4.				
5.				
6.				
7.				
8.				
9.				

10. _____

Mammals: _____

Time: _____

Weather Conditions:

Species	Observed	Sign	Adult/Juvenile	Sex
1.				
2.				
3.				
4.				
5.	listed w. open area			
6.				
7.				
8.				
9.				
10.				

Reptiles and Amphibians: _____

Time: _____

Weather Conditions:

Species	Observed	Sign	Adult/Juvenile	Sex
1.	small frogs & fish in wetlands in forest -			
2.	prob. same species as in wetland (i.e., drainage			
3.	ditch)			
4.				
5.				
6.				

ECOLOGICAL EVALUATION
FIELD DATA SHEET - TERRESTRIAL

Project Name: OU No 6, MCB Camp Lejeune, Jacksonville, NC

Location: Site 54 - Burn Pit on Air Field

Date: 3/21/95

Sampling Location: wetland along drainage

Data Collected By: LBS, CMC

Habitat Type: wetland

Vegetation: grasses, wetland veg.

Trees:

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. _____

Saplings/Shrubs:

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. _____

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. _____ 6. _____

2. _____ 7. _____

3. _____ 8. _____

4. _____ 9. _____

5. _____ 10. _____

Secondary Species:

1. Water Pennywort - Hydrocotyle americana 6. _____

2. Water Dock - Rumex orbiculatus 7. _____

3. Red Fescue - Festuca rubra 8. _____

4. Vernal Iris - Iris verna 9. _____

5. _____ 10. _____

also unident. emergent, floating veg. - type of pondweed -

Birds: _____

Time: _____

Weather Conditions:

Species	Sex	Feeding	Nesting	Approx. No.
1.				
2.	listed w. open area			
3.				
4.				
5.				
6.				
7.				
8.				
9.				

10. _____

Mammals: _____

Time: _____

Weather Conditions:

Species	Observed	Sign	Adult/Juvenile	Sex
1.				
2.				
3.				
4.	listed w. open area			
5.				
6.				
7.				
8.				
9.				
10.				

Reptiles and Amphibians: _____

Time: _____

Weather Conditions:

Species	Observed	Sign	Adult/Juvenile	Sex
1.	Green Frog - Rana clamitans			
2.				
3.				
4.				
5.				
6.				

7. _____

8. _____

9. _____

10. _____

Miscellaneous Notes:

Also present in wetland area - small freshwater snails w. no operculum and small fish -- minnow-sized with yellow stripe. Some areas of the drainage ditch are 2 ft. deep

ECOLOGICAL EVALUATION
FIELD DATA SHEET - TERRESTRIAL

Project Name: OU No 6, MCB Camp Lejeune

Location: Site 54, Jacksonville, NC

Date: 3/21/95

Sampling Location: Air Field

Data Collected By: LSS, CMC

Habitat Type: open field

Vegetation: grass, herbaceous annuals and perennials

Trees:

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.

Saplings/Shrubs:

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. _____

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. grasses dom. in
4. some areas
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

Secondary Species:

1. Dandelion Taraxacum officinale
2. Quaker ladies - Houstonia caerulea
3. Wood Sorrel - Oxalis europaea
4. Mouse-ear Chickweed - Cerastium vulgare
5. Wild Onion - Allium vineale
   white clover - Trifolium repens
   Blue-eyed grass -
6. Narrow-leaved Plantain - Plantago lanceolata
7. Field pansy - Viola kitaibeliana
8. lyre-leaved sage - Salvia lyrata
9. vetch - Vicia sp.
10. thistle - Cirsium sp.
    black medic - Medicago lupulina
    Dwarf dandelion - Krigia virginica
    Carolina cranesbill - Geranium carolinianum

Birds: _____

Time: _____

Weather Conditions:

Species	Sex	Feeding	Nesting	Approx. No.
1. Catbird - Dumetella carolinensis				
2. Savannah Sparrow - Passerculus sandwichensis				
3. Carolina Wren ~~Thryo~~ Thryothorus ludovicianus				
4. Mourning Dove - Zenaida macroura				
5. Killdeer - Charadrius vociferus				
6.				
7.				
8.				
9.				

10. _____

Mammals: _____

Time: _____

Weather Conditions:

Species	Observed	Sign	Adult/Juvenile	Sex
1.	white tail deer - Odocoileus virginianus			
2.	squirrel	Sciurus sp.		
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				

Reptiles and Amphibians: _____

Time: _____

Weather Conditions:

Species	Observed	Sign	Adult/Juvenile	Sex
1.	Green frog - Rana clamitans			
2.				
3.				
4.				
5.				
6.				

7. _____

8. _____

9. _____

10. _____

Miscellaneous Notes:

ECOLOGICAL EVALUATION
FIELD DATA SHEET - TERRESTRIAL

Project Name: OU No. 6, MCB Camp Lejeune, Jacksonville, NC

Location: Site 54 Burn Pit on Air Field

Date: 3/21/95

Sampling Location: open area across from field

Data Collected By: LSS, CMC

Habitat Type: overgrown field

Vegetation:

Trees:

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.

Saplings/Shrubs:

Dominant Species:

1. _____ 6. _____

2. _____ 7. _____

3. none dominant 8. _____

4. _____ 9. _____

5. _____ 10. _____

Secondary Species:

1. loblolly pine - Pinus taeda 6. _____

2. Sweetgum - Liquidambar Styraciflua 7. _____

3. marsh elder - Iva frutescens 8. _____

4. _____ 9. _____

5. _____ 10. _____

Woody Vines:

Dominant Species:

1. _____ 6. _____

2. _____ 7. _____

3. _____ 8. _____

4. _____ 9. _____

5. _____ 10. _____

Secondary Species:

1. dewberry - 6. _____

2. _____ 7. _____

3. _____ 8. _____

4. _____ 9. _____

5. _____ 10. _____

Herbs:

Dominant Species:

1. Broom Sedge - Andropogon virginianus
2. - Andropogon glomeratus
3.
4.
5.
6.
7.
8.
9.
10.

Secondary Species:

1. Dog Fennel - Eupatorium capillifolium
2. Vetch - Vicia sp.
3.
4.
5.
6.
7.
8.
9.
10.

Birds:

Time:

Weather Conditions:

Species	Sex	Feeding	Nesting	Approx. No.
1.				
2.	listed w. open area			
3.				
4.				
5.				
6.				
7.				
8.				
9.				

10. _____

Mammals: _____

Time: _____

Weather Conditions:

Species	Observed	Sign	Adult/Juvenile	Sex
1.				
2.				
3.				
4.				
5.	listed w. open area			
6.				
7.				
8.				
9.				
10.				

Reptiles and Amphibians: _____

Time: _____

Weather Conditions:

Species	Observed	Sign	Adult/Juvenile	Sex
1.				
2.				
3.	listed w. open area			
4.				
5.				
6.				

7. _____

8. _____

9. _____

10. _____

Miscellaneous Notes:

APPENDIX V
SCREENING VALUE AND QUOTIENT INDEX CALCULATIONS

HARDNESS CALCULATION FOR METALS
SITE 54, CRASH CREW FIRE TRAINING BURN PIT
REMEDIAL INVESTIGATION, CTO-0303
MCAS, NEW RIVER, NORTH CAROLINA

	54-GW01		54-GW02		54-GW03		54-GW04		54-GW05		54-GW06		54-GW07	
	Acute (ug/L)	Chronic (ug/L)	Acute (ug/L)	Chronic (ug/L)	Acute (ug/L)	Chronic (ug/L)	Acute (ug/L)	Chronic (ug/L)	Acute (ug/L)	Chronic (ug/L)	Acute (ug/L)	Chronic (ug/L)	Acute (ug/L)	Chronic (ug/L)
Cadmium	0.82	0.38	6.12	1.53	7.93	1.83	0.82	0.38	1.10	0.46	0.82	0.38	8.96	1.99
Chromium	558	67	2399	286	2895	345	558	67	691	82	558	67	3164	377
Copper	4.80	3.62	25.71	16.57	31.91	20.15	4.80	3.62	6.14	4.52	4.80	3.62	35.35	22.11
Lead	13.98	0.54	134.93	5.26	180.71	7.04	13.98	0.54	19.51	0.76	13.98	0.54	207.47	8.08
Nickel	439	49	1980	220	2405	267	439	49	548	61	439	49	2636	293
Silver	0.37	NE	8.00	NE	11.87	NE	0.37	NE	0.59	NE	0.37	NE	14.31	NE
Zinc	36	33	163	148	199	180	36	33	45	41	36	33	218	197
Calcium	4.61	4.61	52.3	52.3	68.9	68.9	3.46	3.46	6.51	6.51	3.81	3.81	79	79
Magnesium	1.81	1.81	4.32	4.32	3.55	3.55	1.43	1.43	3.94	3.94	2.38	2.38	2.62	2.62
Sample Hardness	18.96	18.96	148.38	148.38	186.66	186.66	14.53	14.53	32.48	32.48	19.31	19.31	208.05	208.05
Hardness Used	25.0	25.0	148.4	148.4	186.7	186.7	25.0	25.0	32.5	32.5	25.0	25.0	208.1	208.1

	54-GW08		54-GW09		54-GW10		54-TW01		54-TW02		54-TW03	
	Acute (ug/L)	Chronic (ug/L)	Acute (ug/L)	Chronic (ug/L)	Acute (ug/L)	Chronic (ug/L)	Acute (ug/L)	Chronic (ug/L)	Acute (ug/L)	Chronic (ug/L)	Acute (ug/L)	Chronic (ug/L)
Cadmium	10.62	2.24	0.82	0.38	0.90	0.40	1.66	0.62	0.90	0.40	0.91	0.41
Chromium	3579	427	558	67	595	71	932	111	596	71	601	72
Copper	40.73	25.14	4.80	3.62	5.16	3.86	8.66	6.18	5.18	3.88	5.23	3.91
Lead	251.25	9.79	13.98	0.54	15.43	0.60	31.03	1.21	15.50	0.60	15.70	0.61
Nickel	2994	333	439	49	469	52	746	83	470	52	474	53
Silver	18.54	NE	0.37	NE	0.43	NE	1.10	NE	0.43	NE	0.44	NE
Zinc	247	224	36	33	39	35	61	56	39	35	39	35
Calcium	91.5	91.5	3.23	3.23	8.23	8.23	7.93	7.93	6.85	6.85	4.83	4.83
Magnesium	3.24	3.24	2.05	2.05	1.57	1.57	6.55	6.55	2.43	2.43	3.72	3.72
Sample Hardness	241.82	241.82	16.51	16.51	27.02	27.02	46.77	46.77	27.11	27.11	27.38	27.38
Hardness Used	241.8	241.8	25.0	25.0	27.0	27.0	46.8	46.8	27.1	27.1	27.4	27.4

NOTE: All Water Quality Values are Region IV (USEPA, 1995a)
Sample Hardness Calculation = 2.497(Ca, mg/L) + 4.118(Mg, mg/L)

NE - Not Established

SURFACE WATER QUOTIENT INDEX
SITE 54, CRASH CREW FIRE TRAINING BURN PIT
REMEDIAL INVESTIGATION CTO-0303
MCAS, NEW RIVER, NORTH CAROLINA

Contaminant	Monitoring Well	Concentration (ug/L)		North Carolin WQS	USEPA WQSV Acute	USEPA WQSV Chronic	QI North Carolin WQS	QI USEPA SWSV Acute	QI USEPA SWSV Chronic
Semivolatiles									
Anthracene	54-TW05	1	J	NE	0.024	0.0013	NA	41.7	769.2
Naphthalene	54-GW06	55		NE	353	23.4	NA	0.2	2.4
Naphthalene	54-TW02	100		NE	353	23.4	NA	0.3	4.3
Naphthalene	54-TW03	240		NE	353	23.4	NA	0.7	10.3
Naphthalene	54-TW04	56		NE	353	23.4	NA	0.2	2.4
Naphthalene	54-TW05	99		NE	353	23.4	NA	0.3	4.2
Volatiles									
Xylenes (total)	54-TW03	130		NE	1540	86.2	NA	0.1	1.5
Inorganics									
Aluminum	54-GW01	206		NE	750	87	NA	0.3	2.4
Aluminum	54-GW04	219		NE	750	87	NA	0.3	2.5
Aluminum	54-GW10	5340		NE	750	87	NA	7.1	61.4
Barium	54-GW01	36.4		NE	69.1	3.8	NA	0.5	9.6
Barium	54-GW02	26.3		NE	69.1	3.8	NA	0.4	6.9
Barium	54-GW03	28.5		NE	69.1	3.8	NA	0.4	7.5
Barium	54-GW04	39.6		NE	69.1	3.8	NA	0.6	10.4
Barium	54-GW05	68.9		NE	69.1	3.8	NA	0.997	18.1
Barium	54-GW06	43.1		NE	69.1	3.8	NA	0.6	11.3
Barium	54-GW07	27.2		NE	69.1	3.8	NA	0.4	7.2
Barium	54-GW08	30.2		NE	69.1	3.8	NA	0.4	7.9
Barium	54-GW09	43.6		NE	69.1	3.8	NA	0.6	11.5
Barium	54-GW10	40.6		NE	69.1	3.8	NA	0.6	10.7
Barium	54-TW01	59.5		NE	69.1	3.8	NA	0.9	15.7
Barium	54-TW02	29.2		NE	69.1	3.8	NA	0.4	7.7
Cobalt	54-GW01	11.3		NE	195	3.06	NA	0.1	3.7
Cobalt	54-GW03	17.6		NE	195	3.06	NA	0.1	5.8
Cobalt	54-GW04	5.9		NE	195	3.06	NA	0.0	1.9
Cobalt	54-GW06	20.9		NE	195	3.06	NA	0.1	6.8
Iron	54-GW01	3620	J	1000	NE	1000	3.6	NA	3.6
Iron	54-GW02	13100	J	1000	NE	1000	13.1	NA	13.1
Iron	54-GW03	16800	J	1000	NE	1000	16.8	NA	16.8
Iron	54-GW06	1570	J	1000	NE	1000	1.6	NA	1.6
Iron	54-GW10	5000		1000	NE	1000	5.0	NA	5.0
Iron	54-TW02	7510		1000	NE	1000	7.5	NA	7.5
Iron	54-TW03	74100		1000	NE	1000	74.1	NA	74.1
Lead	54-GW01	2.8		25	13.98	0.54	0.1	0.3	7.4
Lead	54-GW02	39.7		25	134.93	5.26	1.6	0.3	7.5
Lead	54-GW06	4.9		25	13.98	0.54	0.2	0.5	12.6
Lead	54-GW10	3.9		25	15.43	0.6	0.2	0.3	6.5
Manganese	54-GW01	640		NE	1470	80.3	NA	0.4	8.0
Manganese	54-GW03	1280		NE	1470	80.3	NA	0.9	15.9
Manganese	54-GW04	132		NE	1470	80.3	NA	0.1	1.6
Manganese	54-GW05	135		NE	1470	80.3	NA	0.1	1.7
Manganese	54-GW06	1160		NE	1470	80.3	NA	0.8	14.4
Manganese	54-GW08	89.9		NE	1470	80.3	NA	0.1	1.1
Manganese	54-GW09	349		NE	1470	80.3	NA	0.2	4.3
Manganese	54-GW10	89.3		NE	1470	80.3	NA	0.1	1.1
Manganese	54-TW03	141		NE	1470	80.3	NA	0.1	1.8
								0.1	1.2

APPENDIX W
TERRESTRIAL REFERENCE VALUES AND CDI CALCULATIONS

EQUATIONS USED TO CALCULATE EXPOSURE FOR THE WHITETAILED DEER
SITE 54, CRASH CREW FIRE TRAINING BURN PIT
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	0.019	1.100	NA	NA	NA	1.600	45.400	454.000	4.7	0.010	$E=\frac{(Cw)(Iw)+[(Cs)(Bv)(Iv)+(Cs)(Is)][H]}{BW}$

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
Bis(2-ethylhexyl)phthalate	0.044	ND	0.35	NA	NA	NA	7.09E-06	4.89E-02	1.45E-04
Butylbenzylphthalate	0.057	ND	0.27	NA	NA	NA	6.72E-06	3.14E+00	2.14E-06
Di-n-octylphthalate	0.000	ND	0.15	NA	NA	NA	6.38E-07	3.46E+00	1.84E-07
Fluoranthene	0.044	ND	0.07	NA	NA	NA	1.35E-06	1.09E+00	1.24E-06
Phenanthrene	0.097	ND	0.12	NA	NA	NA	4.71E-06	8.10E+00	5.82E-07
Pyrene	0.033	ND	0.15	NA	NA	NA	2.44E-06	6.53E-01	3.74E-06
n-Nitrosodiphenylamine	0.625	ND	0.16	NA	NA	NA	3.69E-05	9.88E+00	3.73E-06
Aluminum	0.004	ND	6930.00	NA	NA	NA	3.90E-02	6.51E+00	6.00E-03
Barium	0.150	ND	26.90	NA	NA	NA	1.57E-03	1.30E-01	1.21E-02
Chromium	0.008	ND	9.10	NA	NA	NA	6.28E-05	6.51E+00	9.65E-06
Manganese	0.250	ND	23.90	NA	NA	NA	2.26E-03	1.30E+00	1.74E-03
Vanadium	0.006	ND	11.80	NA	NA	NA	7.28E-05	3.25E-01	2.24E-04
Zinc	1.500	ND	16.70	NA	NA	NA	9.13E-03	3.25E+00	2.81E-03
								SU	2.30E-02

ND - Not Detected
NA - Not Applicable

EQUATIONS USED TO CALCULATE EXPOSURE FOR THE WHITETAILED DEER
SITE 54, CRASH CREW FIRE TRAINING BURN PIT
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	0.019	1.100	NA	NA	NA	1.600	45.400	454.000	4.7	0.010	$E=\frac{(Cw)(Iw)+[(Cs)(Bv)(Iv)+(Cs)(Is)][H]}{BW}$

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
Bis(2-ethylhexyl)phthalate	0.044	ND	0.35	NA	NA	NA	7.09E-06	4.89E-02	1.45E-04
Butylbenzylphthalate	0.057	ND	0.27	NA	NA	NA	6.72E-06	3.14E+00	2.14E-06
Di-n-octylphthalate	0.000	ND	0.15	NA	NA	NA	6.38E-07	3.46E+00	1.84E-07
Fluoranthene	0.044	ND	0.07	NA	NA	NA	1.35E-06	1.09E+00	1.24E-06
Phenanthrene	0.097	ND	0.12	NA	NA	NA	4.71E-06	8.10E+00	5.82E-07
Pyrene	0.033	ND	0.15	NA	NA	NA	2.44E-06	6.53E-01	3.74E-06
n-Nitrosodiphenylamine	0.625	ND	0.16	NA	NA	NA	3.69E-05	9.88E+00	3.73E-06
Aluminum	0.004	ND	6930.00	NA	NA	NA	3.90E-02	6.51E+00	6.00E-03
Barium	0.150	ND	26.90	NA	NA	NA	1.57E-03	1.30E-01	1.21E-02
Chromium	0.008	ND	9.10	NA	NA	NA	6.28E-05	6.51E+00	9.65E-06
Manganese	0.250	ND	23.90	NA	NA	NA	2.26E-03	1.30E+00	1.74E-03
Vanadium	0.006	ND	11.80	NA	NA	NA	7.28E-05	3.25E-01	2.24E-04
Zinc	1.500	ND	16.70	NA	NA	NA	9.13E-03	3.25E+00	2.81E-03
								SU	2.30E-02

ND - Not Detected
NA - Not Applicable

EQUATIONS TO CALCULATE EXPOSURE FOR THE BOBWHITE QUAIL
SITE 54, CRASH CREW FIRE TRAINING BURN PIT
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	0.001	0.019	NA	NA	NA	0.013	0.174	26.242	4.7	0.178	$E=\frac{(Cw)(Iw) + [(Cs)(Bv)(Iv)+(Cs)(Is))][H]}{BW}$

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
Bis(2-ethylhexyl)phthalate	0.044	ND	0.35	NA	NA	NA	0.001	2.30E+00	2.68E-04
Butylbenzylphthalate	0.057	ND	0.27	NA	NA	NA	0.001	4.32E+01	1.20E-05
Di-n-octylphthalate	0.000	ND	0.15	NA	NA	NA	0.000	4.76E+01	3.58E-06
Fluoranthene	0.044	ND	0.07	NA	NA	NA	0.000	1.50E+01	7.79E-06
Phenanthrene	0.097	ND	0.12	NA	NA	NA	0.000	1.12E+02	2.66E-06
Pyrene	0.033	ND	0.15	NA	NA	NA	0.000	8.99E+00	2.66E-05
n-Nitrosodiphenylamine	0.625	ND	0.16	NA	NA	NA	0.002	1.36E+02	1.15E-05
Aluminum	0.004	ND	6930.00	NA	NA	NA	8.229	3.06E+01	2.69E-01
Barium	0.150	ND	26.90	NA	NA	NA	0.086	3.06E+00	2.82E-02
Chromium	0.008	ND	9.10	NA	NA	NA	0.011	1.53E+02	7.35E-05
Manganese	0.250	ND	23.90	NA	NA	NA	0.110	3.06E+02	3.58E-04
Vanadium	0.006	ND	11.80	NA	NA	NA	0.014	4.39E+01	3.25E-04
Zinc	1.500	ND	16.70	NA	NA	NA	0.365	1.53E+02	2.38E-03
								SUM	3.01E-01

ND - Not Detected
NA - Not Applicable

EQUATIONS USED TO CALCULATE EXPOSURE FOR THE RED FOX
SITE 54, CRASH CREW FIRE TRAINING BURN PIT
REMEDIAL INVESTIGATION, CTO-303
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	4.7	0.004	$E=\frac{(Cw)(Iw)+[(cm)(Im)+(Cs)(Bv)(Iv)+(Cs)(Is)][H]}{BW}$
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
Bis(2-ethylhexyl)phthalate	0.044	ND	0.35	NA	3.16E-03	2.28E-05	6.47E-06	1.05E-01	6.14E-05
Butylbenzylphthalate	0.057	ND	0.27	NA	2.00E-03	1.32E-05	5.30E-06	6.77E+00	7.83E-07
Di-n-octylphthalate	0.000	ND	0.15	NA	3.98E+01	4.35E-02	1.93E-05	7.45E+00	2.59E-06
Fluoranthene	0.044	ND	0.07	NA	3.09E-03	4.25E-06	1.23E-06	2.35E+00	5.22E-07
Phenanthrene	0.097	ND	0.12	NA	7.94E-04	3.47E-06	2.82E-06	1.75E+01	1.62E-07
Pyrene	0.033	ND	0.15	NA	5.01E-03	1.30E-05	2.59E-06	1.41E+00	1.84E-06
n-Nitrosodiphenylamine	0.625	ND	0.16	NA	3.16E-05	9.88E-07	1.21E-05	2.13E+01	5.70E-07
Aluminum	0.004	ND	6930.00	NA	1.50E-03	8.76E-02	9.90E-02	1.95E+01	5.07E-03
Barium	0.150	ND	26.90	NA	1.50E-04	2.11E-04	7.74E-04	1.07E-01	7.26E-03
Chromium	0.008	ND	9.10	NA	5.50E-03	4.74E-04	1.33E-04	1.03E+00	1.30E-04
Manganese	0.250	ND	23.90	NA	4.00E-04	7.88E-04	9.25E-04	3.75E+00	2.47E-04
Vanadium	0.006	ND	11.80	NA	2.50E-03	2.62E-04	1.70E-04	2.77E-01	6.16E-04
Zinc	1.500	ND	16.70	NA	1.00E-01	7.65E-01	3.02E-03	1.30E+00	2.32E-03
								SUM	1.57E-02

ND - Not Detected
NA - Not Applicable

DERIVATION OF TERRESTRIAL REFERENCE VALUES
SITE 54, CRASH CREW FIRE TRAINING BURN PIT
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 54, CRASH CREW FIRE TRAINING BURN PIT
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 54 - CRASH CREW FIRE TRAINING BURN PIT
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 54 - CRASH CREW FIRE TRAINING BURN PIT
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

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BODY WEIGHTS FOR TERRESTRIAL REFERENCE VALUE CALCULATION
SITE 54 - CRASH CREW FIRE TRAINING BURN PIT
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 54 - CRASH CREW FIRE TRAINING BURN PIT
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 54 - CRASH CREW FIRE TRAINING BURN PIT
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 develope 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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