6/1/02-3269

FINAL

REMEDIAL INVESTIGATION
OPERABLE UNIT NO. 19
SITE 84 / BUILDING 45 AREA

MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

VOLUME II

CONTRACT TASK ORDER 0219

JUNE 2002

Prepared for:

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

Under the:

LANTDIV CLEAN II Program
Contract N62470-95-D-6007

Prepared by:

CH2M HILL Inc.
Herndon, Virginia

BAKER ENVIRONMENTAL, INC.
Coraopolis, Pennsylvania

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APPENDIX A
BUILDING 45 HISTORICAL DRAWINGS

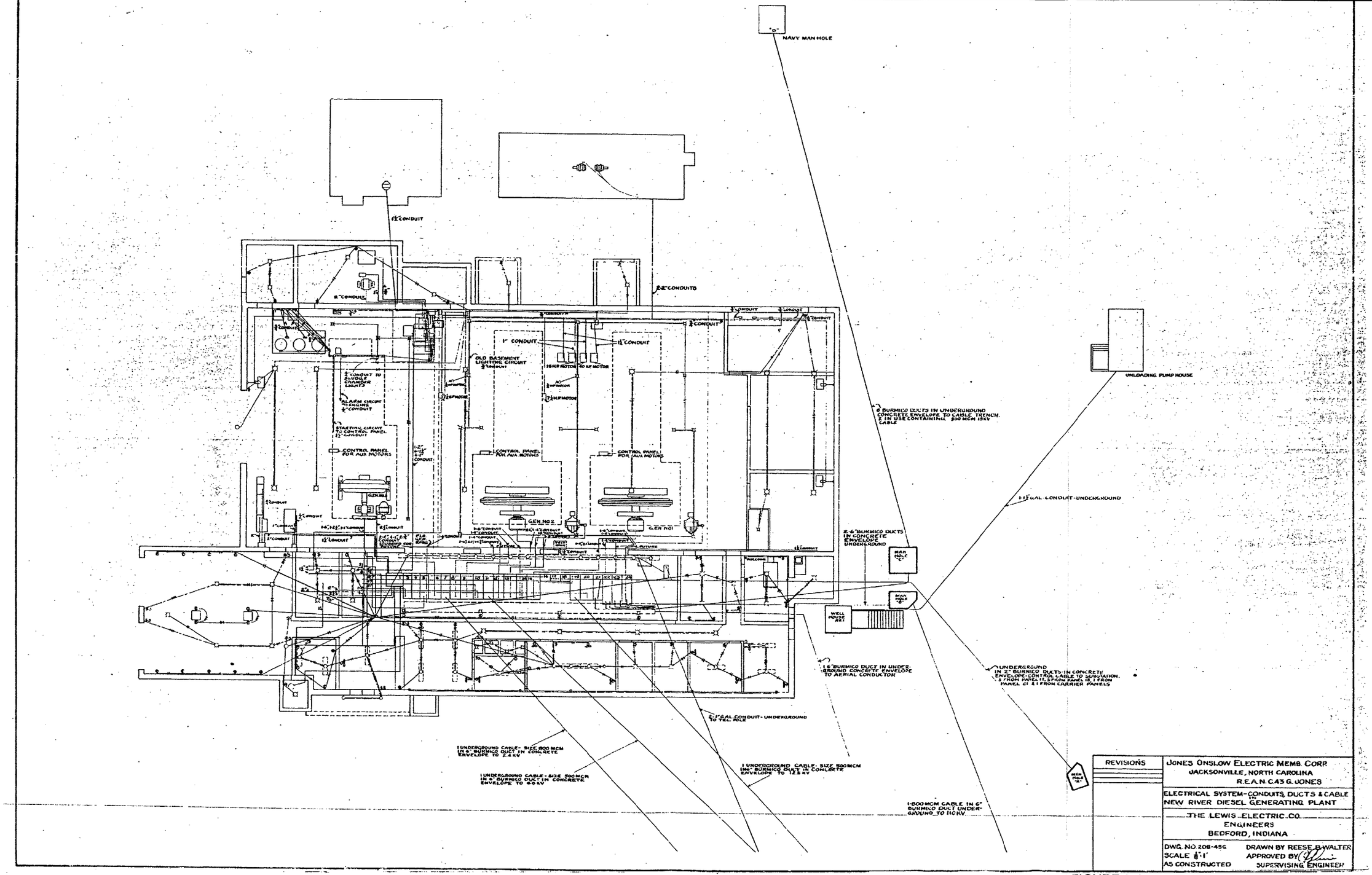

FIGURE A-1
MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA

Baker

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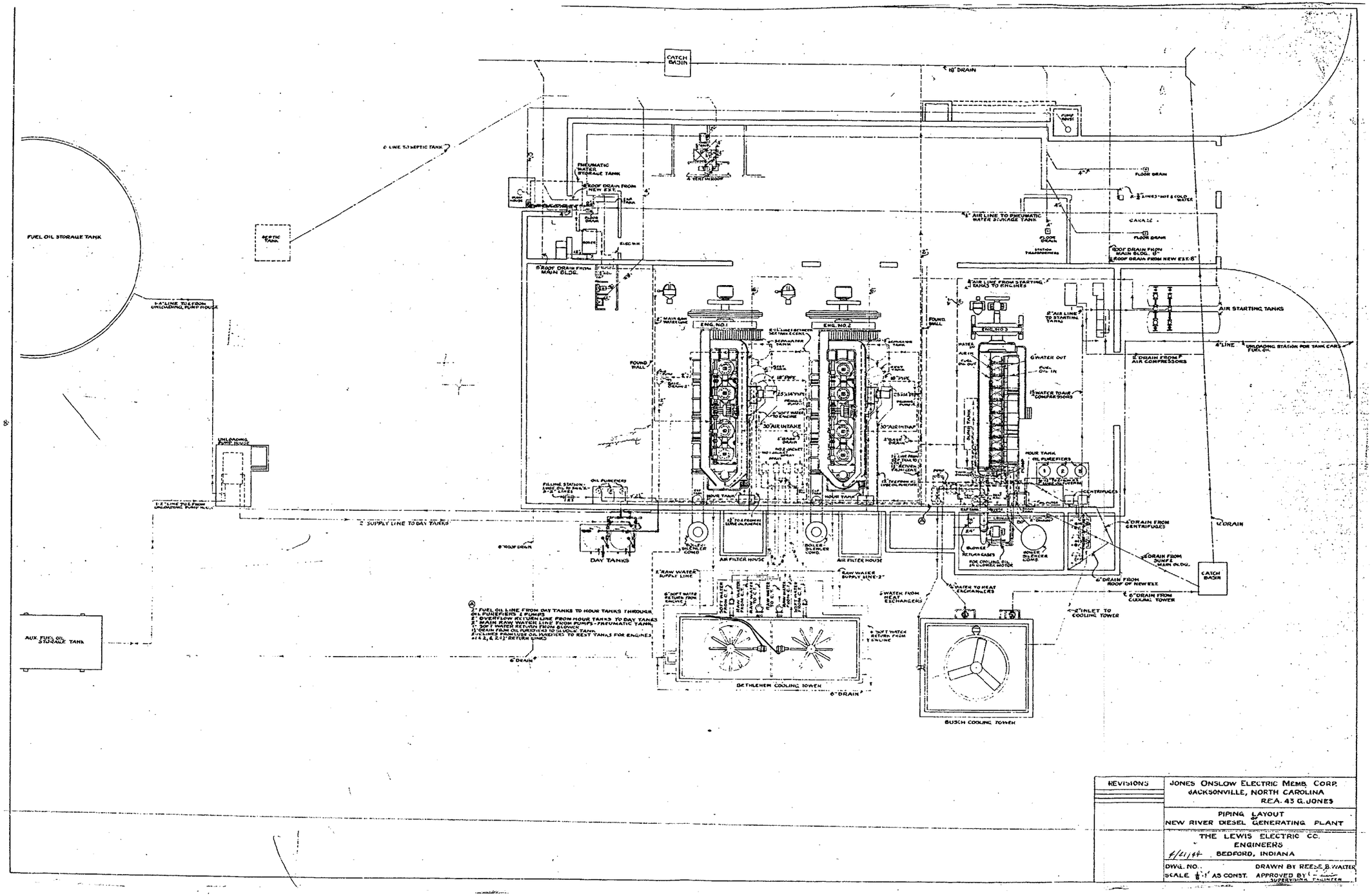

REVISIONS	JONES ONSLOW ELECTRIC MEMB. CORP. JACKSONVILLE, NORTH CAROLINA R.E.A. 43 G. JONES
	PIPING LAYOUT OF NEW RIVER DIESEL GENERATING PLANT
	THE LEWIS ELECTRIC CO. ENGINEERS 8/21/44 BEDFORD, INDIANA
	DWG. NO. DRAWN BY REESE B. WALTER
	SCALE 1/8" = 1' AS CONST. APPROVED BY SUPERVISING ENGINEER

FIGURE A-2
MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA

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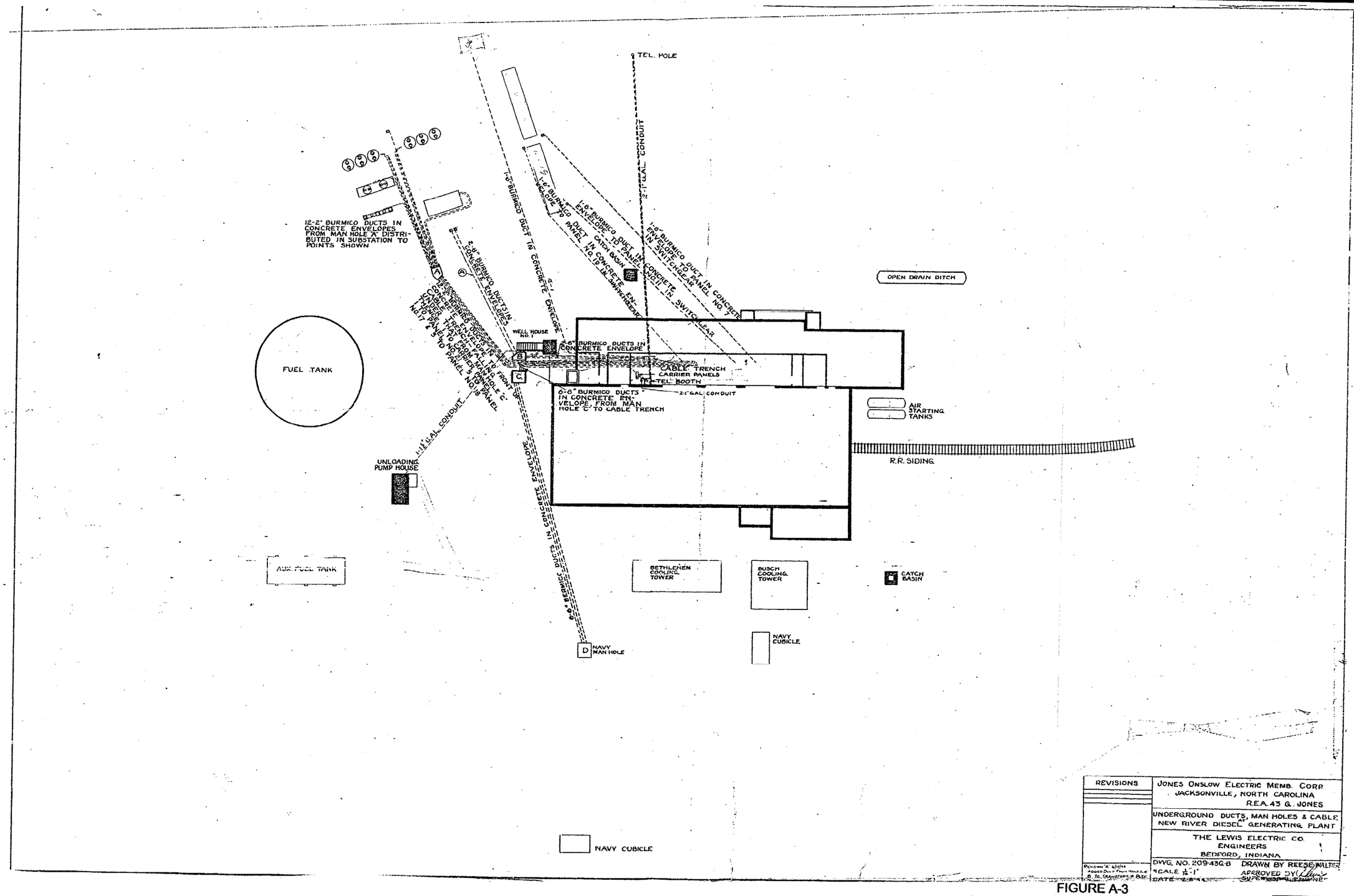
Baker



REVISIONS	JONES ONSLOW ELECTRIC MEMB. CORP JACKSONVILLE, NORTH CAROLINA R.E.A. 43 G. JONES
	UNDERGROUND DUCTS, MAN HOLES & CABLE NEW RIVER DIESEL GENERATING PLANT
	THE LEWIS ELECTRIC CO. ENGINEERS BEDFORD, INDIANA
	DWG. NO. 209-43G-8 DRAWN BY REESE WALTER SCALE 1" = 1' APPROVED BY DATE 7-8-44 SUPERINTENDENT

FIGURE A-3
MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA

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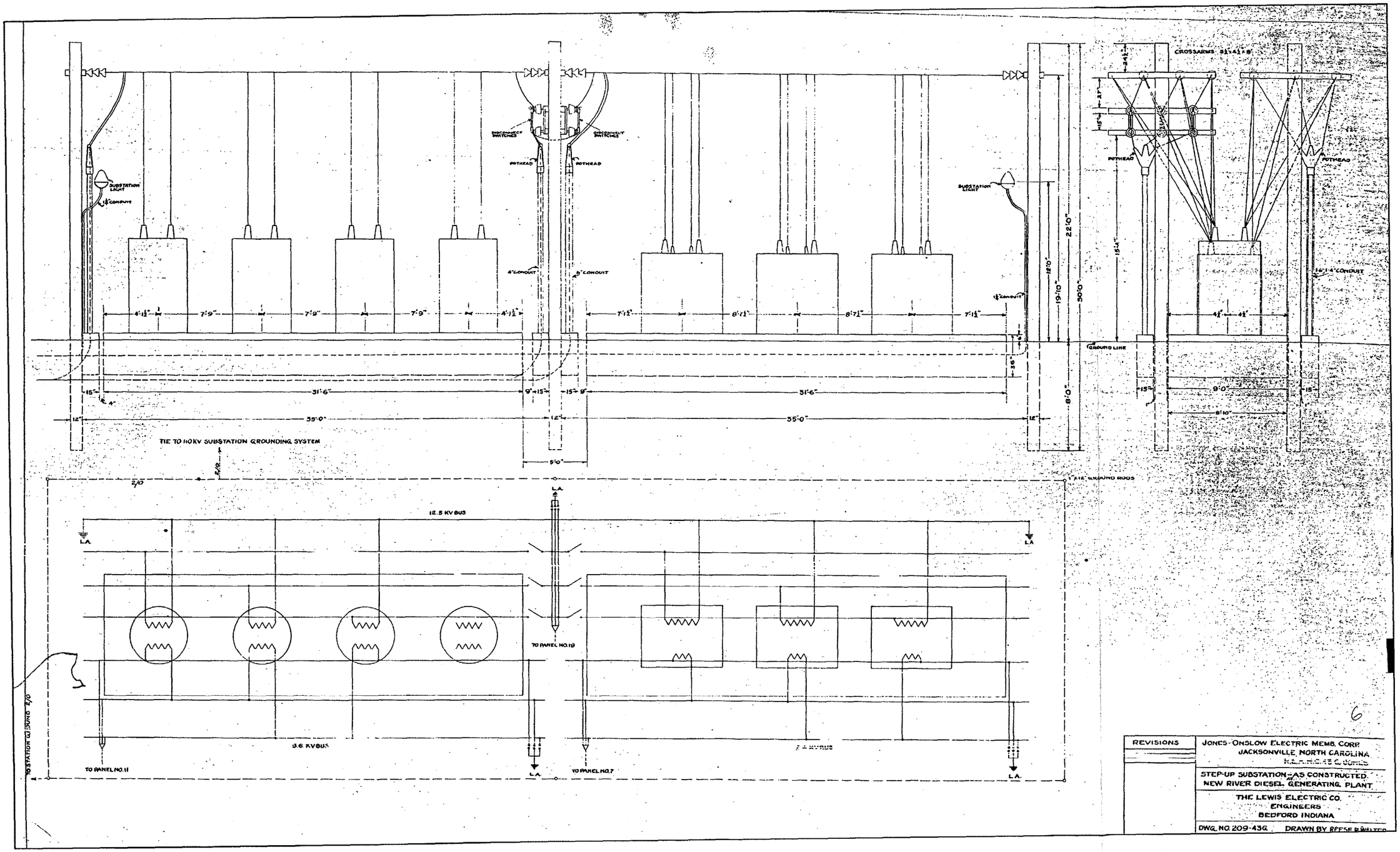
Baker



REVISIONS	JONES-ONSLOW ELECTRIC MEMB. CORP JACKSONVILLE, NORTH CAROLINA STEP-UP SUBSTATION-AS CONSTRUCTED. NEW RIVER DIESEL GENERATING PLANT THE LEWIS ELECTRIC CO. ENGINEERS BEDFORD INDIANA DWG. NO 209-436 DRAWN BY REESE B WALTON

FIGURE A-4
MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA

Baker

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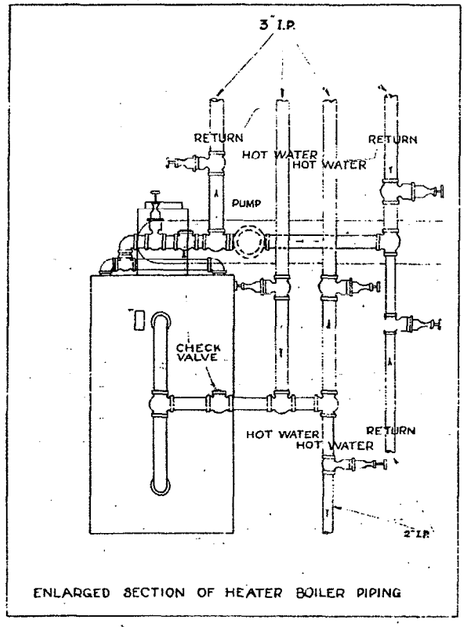
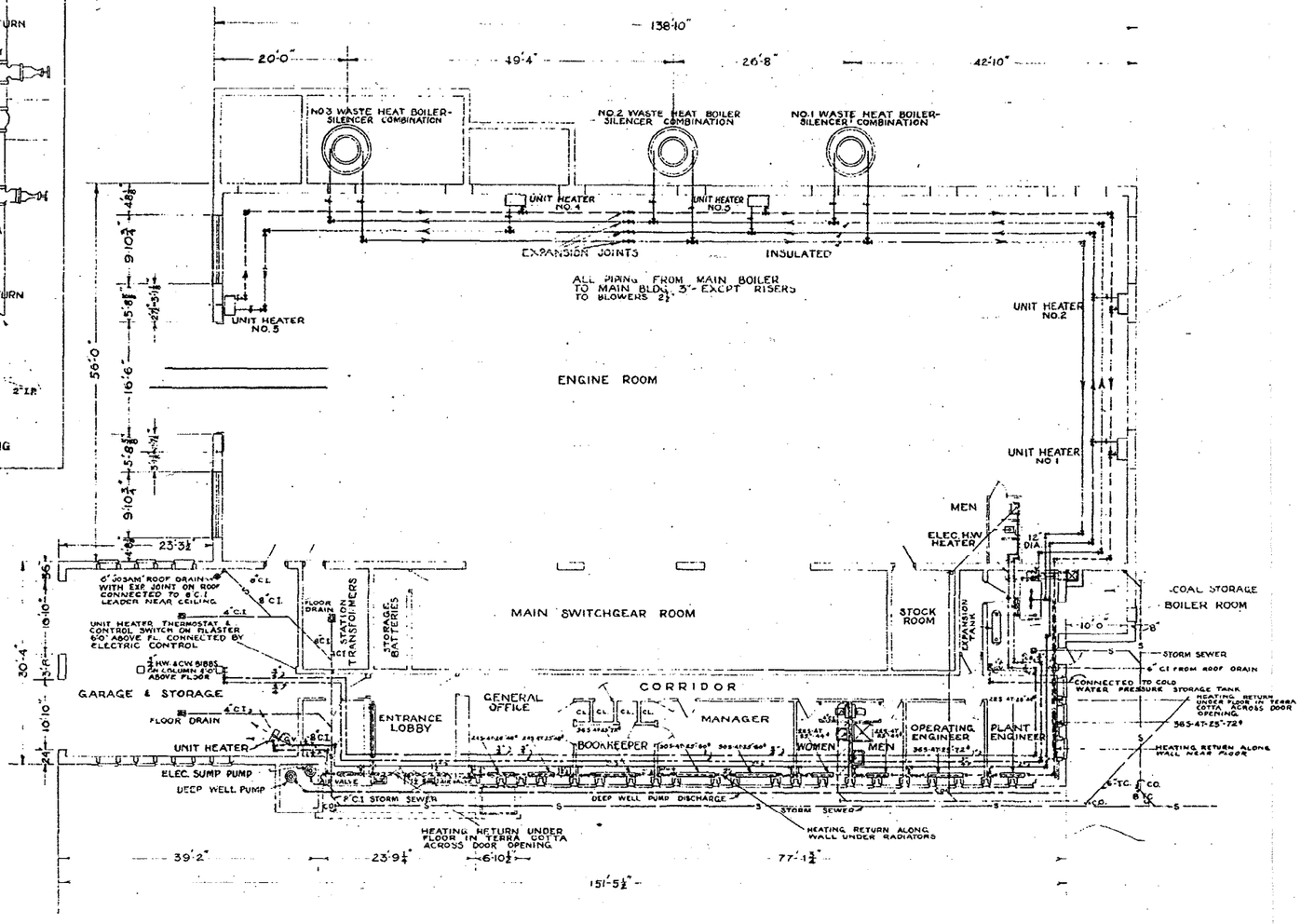


ENLARGED SECTION OF HEATER BOILER PIPING



5

REVISIONS	JONES ONSLOW ELECTRIC MEMB. CORP. JACKSONVILLE, NORTH CAROLINA R.E.A. N.C. 45 G. JONES
	BUILDING HEATING
	NEW RIVER DIESEL GENERATING PLANT
	DWG. NO. 205-430
	12-20-43
	SCALE ¼"=1'0"
	DRAWN BY REESE B WALTER
	APPROVED BY SUPERVISING ENGINEER
	LEWIS ELECTRIC CO. BEDFORD IND.

FIGURE A-5
MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA

Baker

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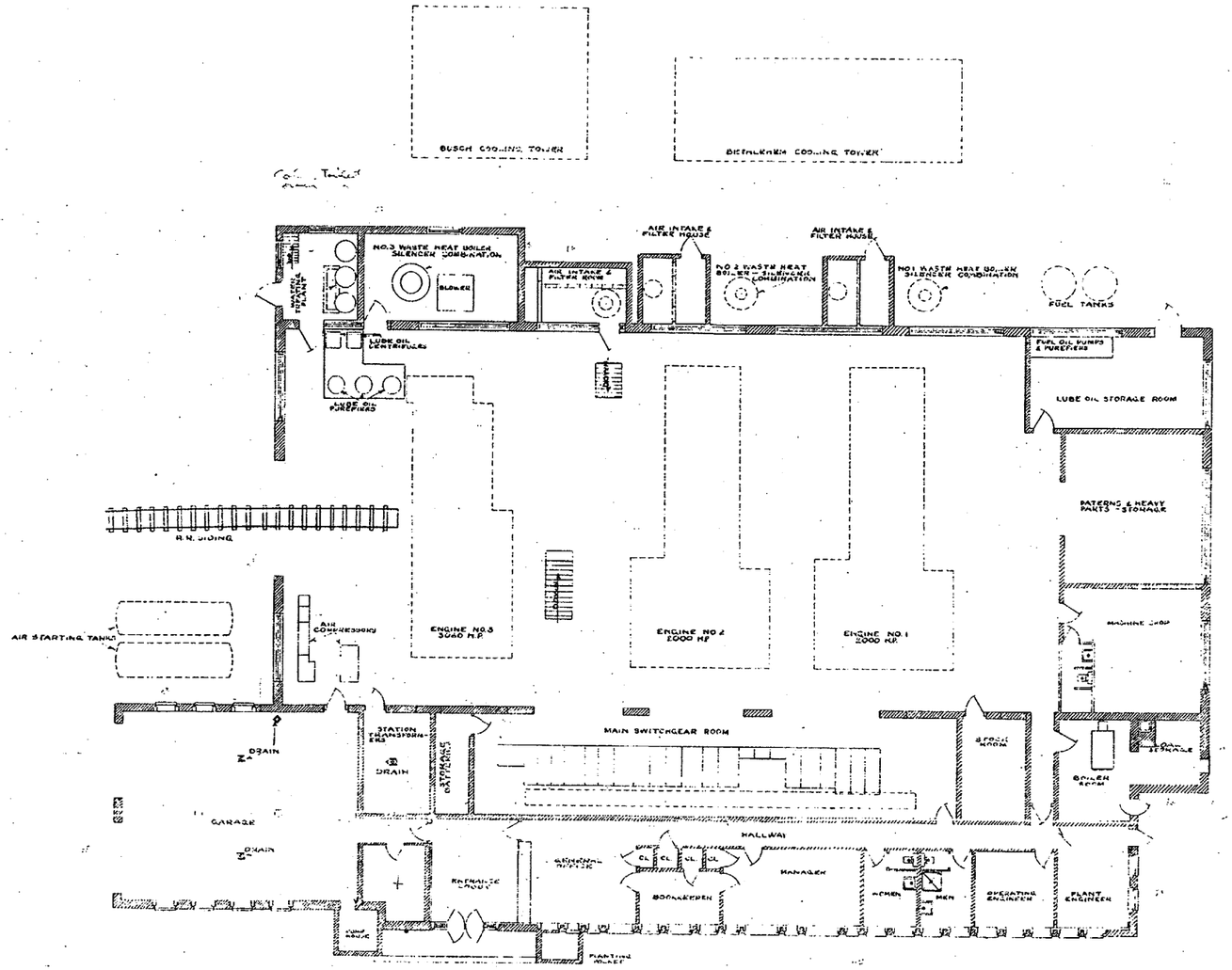

REVISIONS	JONES ONSLOW ELECTRIC MEMB. CORP JACKSONVILLE NORTH CAROLINA R.E.A. 43 G.JONES
	FLOOR PLAN - AS CONSTRUCTED NEW RIVER DIESEL GENERATING PLANT
	THE LEWIS ELECTRIC CO. ENGINEERS BEDFORD, INDIANA
	DWG NO 200-436 DRAWN BY [illegible]

FIGURE A-6
MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA

Baker

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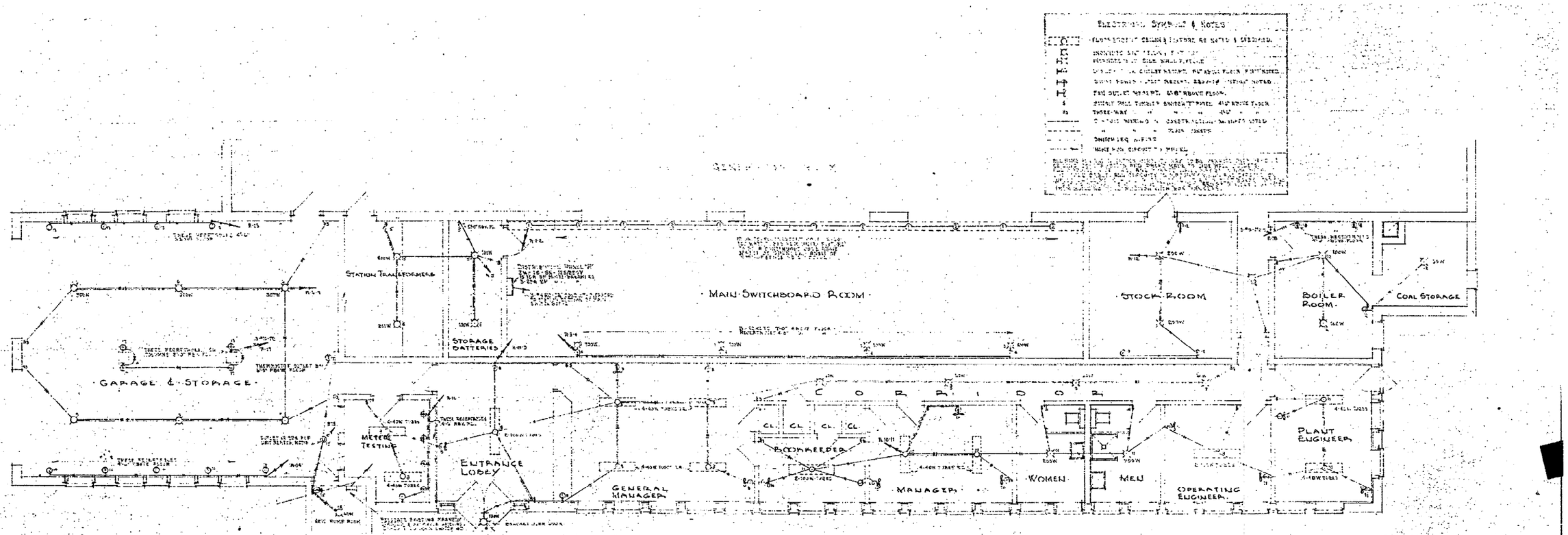

FIGURE A-7
MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA

Baker

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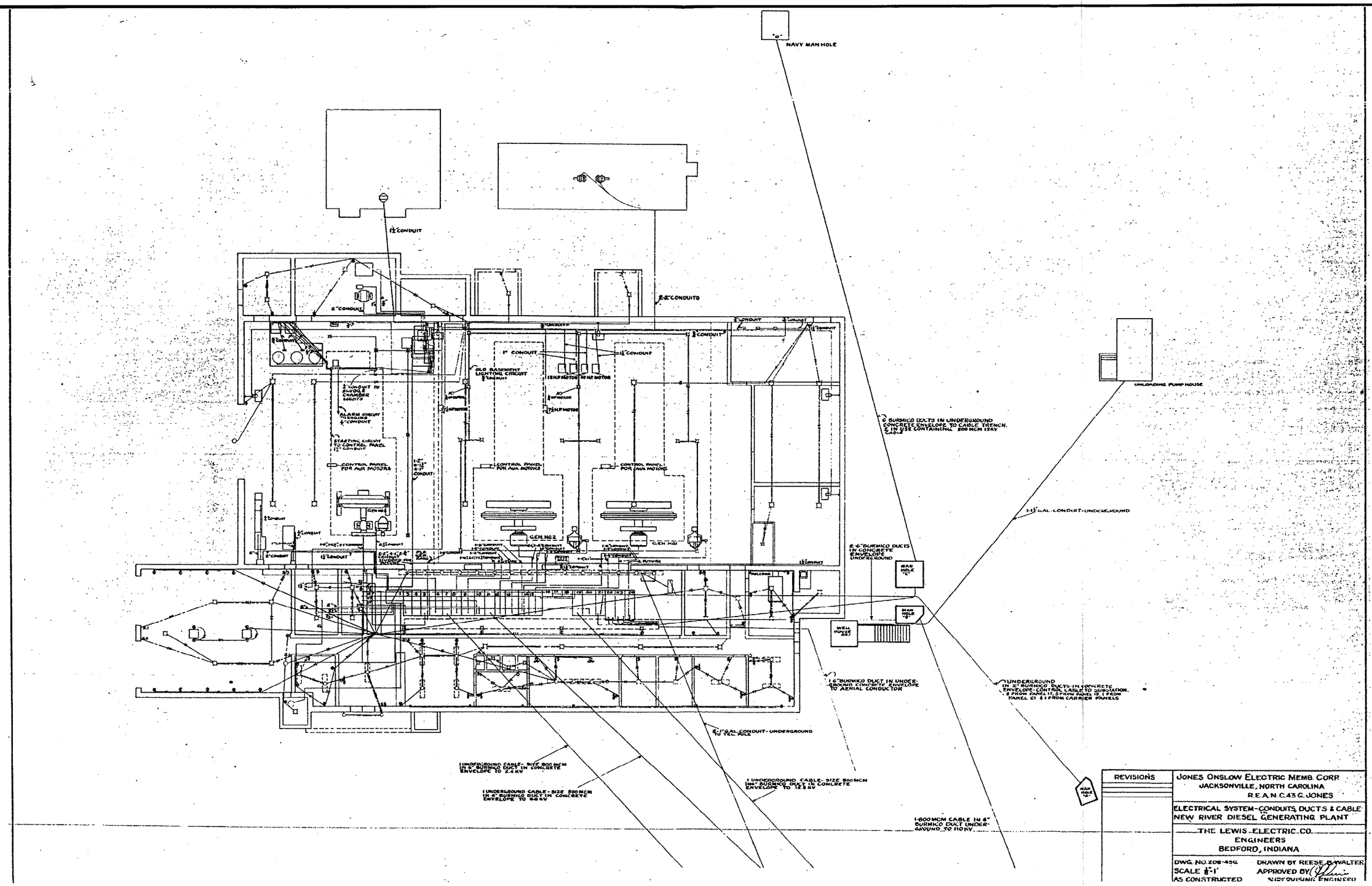

FIGURE A-8
MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA

Baker

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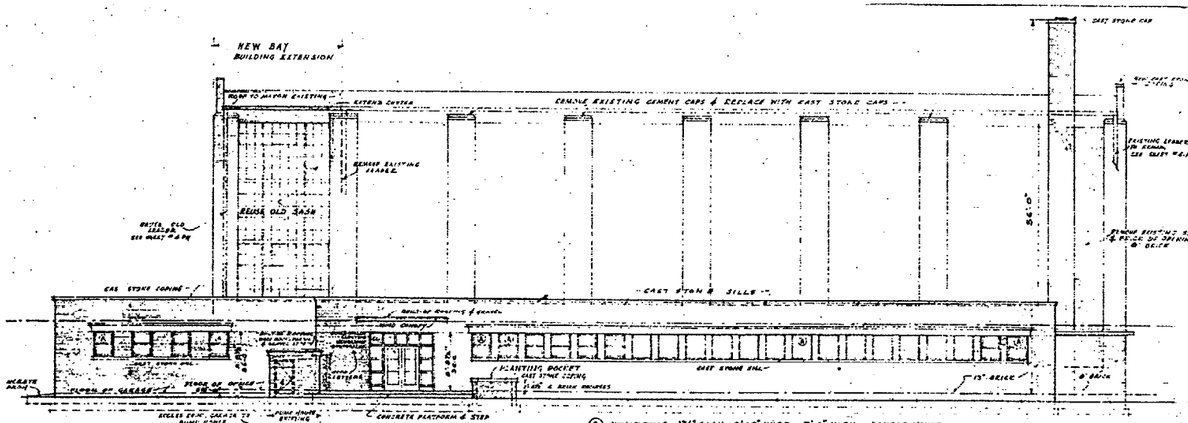
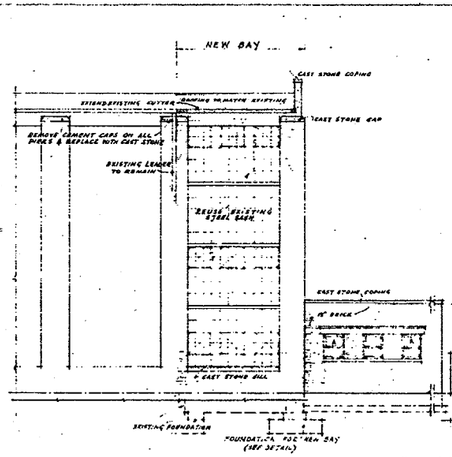
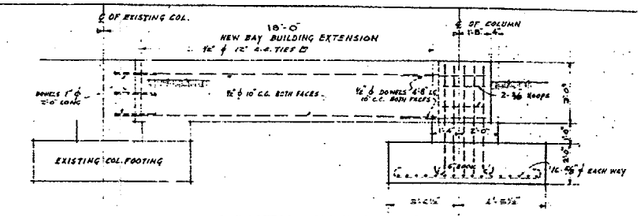


Ⓐ WINDOWS 1¾" SASH, 2'-10" WIDE, 3'-6" HIGH. DOUBLE HUNG

NORTH ELEVATION

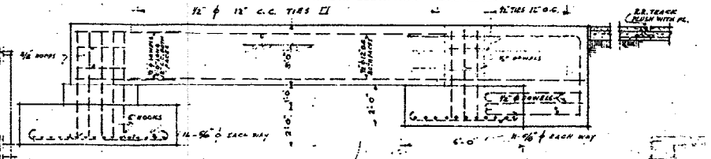


SOUTH ELEVATION EAST END



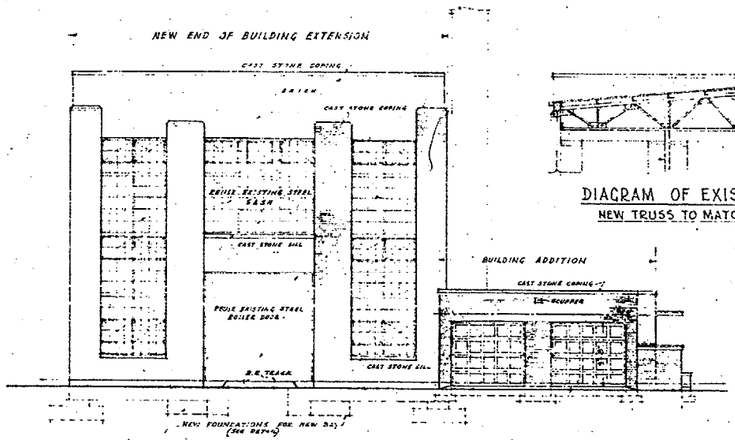
SOUTH ELEVATION

NORTH ELEVATION SAME REVERSED



LEFT HALF EAST ELEVATION

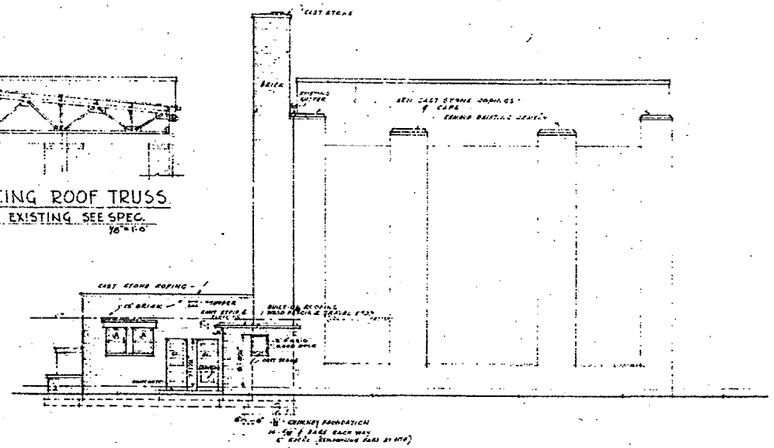
RIGHT SIDE EAST ELEVATION SAME REVERSED



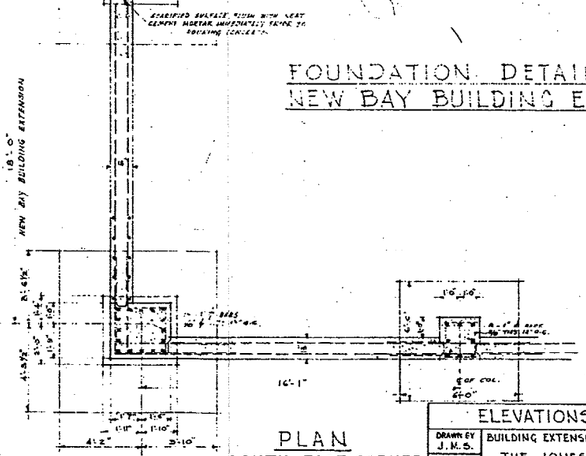
EAST ELEVATION

DIAGRAM OF EXISTING ROOF TRUSS

NEW TRUSS TO MATCH EXISTING SEE SPEC.



WEST ELEVATION



PLAN

SOUTH-EAST CORNER

NORTH-EAST CORNER SAME REVERSED.

FOUNDATION DETAILS
NEW BAY BUILDING EXTENSION
SCALE ⅜"=1'-0"

ELEVATIONS & DETAILS		
DRAWN BY J. M. S.	BUILDING EXTENSION & ADDITIONS	REVISIONS 29TH JULY 1943
CHECKED BY J. J. R.	THE JONES ONSLOW ELECTRIC MEMBERSHIP CORP.	
SCALE AS NOTED	JACKSONVILLE N.C.	
DATE 8TH JUNE 43	JOHN J. ROWLAND ARCHITECT KINSTON, NORTH CAROLINA	SHEET NO. 201-43 C 202-43 C 2-A

FIGURE A-9
MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA

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APPENDIX B
TEST BORING RECORDS

Baker
Baker Environmental

TEST BORING RECORD

PROJECT: Baker Site 84
PROJ. NO.: CTO-0219 BORING NO.: IR84-DP01
COORDINATES: EAST: 2495261.5584 NORTH: 361669.6933
ELEVATION: SURFACE: 8.46

Rig:	Powerprobe (Geoprobe rig)				Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
	Split Spoon	Casing	Augers	Macro Tube				
Size (ID)	2"				7/17/01	6.0'	Sunny, Hot	2.5'
Length	2'							
Type	Standard							
Hammer Wt.	NA							
Fall	NA							

Remarks: Used 4' macrocorer in addition to standard split spoon

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)		Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 8.46
1		S-1	1.75'				Light brown, very fine sand, trace silt	
2								
3	▲	S-2	4'					
4								
5								
6								2.46
7							TD @ 6.0'	
8								
9								
10								

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: E. Hanna
DRILLER: Louie LeFever BORING NO.: DP01 SHEET 1 OF 1

Baker

Baker Environmental

TEST BORING RECORD

PROJECT: Baker Site 84
PROJ. NO.: CTO-219 BORING NO.: IR84-DP02
COORDINATES: EAST: 2495285.0185 NORTH: 361623.9327
ELEVATION SURFACE: 13.99

Rig:	Geoprobe							
	Split Spoon	**Casing**	**Augers**	**Macro Tube**	**Date**	**Progress (Ft.)**	**Weather**	**Depth to Water (Ft.)**
Size (ID)	2"				7/17/01	8.0'	Sunny, Hot	6.5'
Length	2'							
Type	Standard							
Hammer Wt.	NA							
Fall	NA							

Remarks: Used 4' macrocorer in addition to standard split spoon

SAMPLE TYPE

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

DEFINITIONS

SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm ps/bg	Visual Description	Elevation (Ft. MSL) 13.99
1	S-1					Fine sand, gravel fill	
2						Brown fine sand, little to trace silt, damp	
3	S-2					Light gray, gravel, fine sand	
4						Gray, very fine sand, trace silt, damp	
5							
6	M-1					Light gray, fine sand, trace gravel, dry Brown, fine sand, trace silt, damp	7.49
7 ▲						Water table @ 6.5'	
8							5.99
9						TD @ 8.0'	
10							

DRILLING COMPANY Parratt Wolff Inc. BAKER REP.: E. Hanna
DRILLER: Louie LeFever BORING NO.: IR84-DP02 SHEET 1 OF 1

Baker

Baker Environmental

TEST BORING RECORD

PROJECT: Baker Site 84

PROJ. NO.: CTO-219 BORING NO.: IR84-DP03

COORDINATES: EAST: 2495223.1092 NORTH: 361698.5804

ELEVATION SURFACE: 7.08

Rig:	Geoprobe							
	Split Spoon	Casing	Augers	Macro Tube	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)	2"				7/17/01	4.0'	Sunny, Hot	3.5'
Length	4'							
Type	macrocorer							
Hammer Wt.	NA							
Fall	NA							

Remarks:

SAMPLE TYPE

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

DEFINITIONS

SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm ps/bg	Visual Description	Elevation (Ft. MSL) 7.08
1						Dark brown, very fine sand, little silt, damp	
						Sandy clay	
2	M-1	4'					
3							
							3.58
4	▲					Water table @ 3.5'	3.08
5						Petroleum odor @ 3.5 feet	
6						TD @ 4.0'	
7							
8							
9							
10							

DRILLING COMPANY Parratt Wolff Inc. BAKER REP.: E. Hanna

DRILLER: Louie LeFever BORING NO.: IR84-DP03 SHEET 1 OF 1

Baker
Baker Environmental

TEST BORING RECORD

PROJECT: Baker Site 84
PROJ. NO.: CTO-219 BORING NO.: IR84-DP04
COORDINATES: EAST: 2495431.9970 NORTH: 361479.5889
ELEVATION SURFACE: 20.59

Rig:	Geoprobe							
	Split Spoon	Casing	Augers	Macro Tube	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)	2"				7/17/01	12	Sunny, Hot	11
Length	2'							
Type	Standard							
Hammer Wt.	NA							
Fall	NA							

Remarks:

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm ps/bg	Visual Description	Elevation (Ft. MSL) 20.59
1	S-1	1.6'				Light gray, very fine sand, dry	
2						Light gray, very fine sand, slightly damp	
3	S-2	1.7'					
4							
5	S-3	1.5'					
6							
7	S-4	1.5'				Very fine sand, white, orange, stratified trace silt	
8						Light gray, very fine sand, slightly damp	
9	S-5	1.5'				Little silt, light brown sand, slightly damp	
10							
						Orange, white, very fine sand, trace, silt	

DRILLING COMPANY Parratt Wolff Inc. BAKER REP.: E. Hanna
DRILLER: Louie LeFever BORING NO.: IR84-DP04 SHEET 1 OF 2

Baker Environmental

TEST BORING RECORD

PROJECT: Baker Site 84
CTO NO.: 219 BORING NO.: DP04

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 D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
ps/bg = point source/background

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 10.09
11	▲ S-6	1.75				Light brown/gray sand Water table @ 11.0' Trace to little silt	8.59
12						TD @ 12.0'	
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30						Continued from Sheet 1	

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: E. Hanna
DRILLER: Louie LeFever BORING NO.: IR84-DP04 SHEET 2 OF 2

Baker Environmental

TEST BORING RECORD

PROJECT: Baker Site 84
PROJ. NO.: CTO-219 BORING NO.: IR84-DP05
COORDINATES: EAST: NORTH:
ELEVATION SURFACE:

Rig:	Geoprobe							
	Split Spoon	Casing	Augers	Macro Tube	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)	2"				7/17/01	12.0'	Sunny, Hot	10.5
Length	2'							
Type	Standard							
Hammer Wt.	NA							
Fall	NA							

Remarks: 4' macrocorer in addition to standart split spoon

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm ps/bg	Visual Description	Elevation (Ft. MSL)
1	S-1	1.5'				Light brown, very fine sand, dry, top .5'	
2						0.5-1', light gray, medium to coarse sand with gravel, dry	
3	S-2	1.3'				1.5-2', brown, very fine sand, slightly damp	
4							
5	S-3	1.1'				Gray, very fine sand, trace silt, damp	
6							
7	S-4	1.9'				Gray, very fine sand, trace silt, very damp	
8							
9	M-1					light gray, very fine sand	
10						Water table @ 10.5	

DRILLING COMPANY Parratt Wolff Inc. BAKER REP.: E. Hanna
DRILLER: Louie LeFever BORING NO.: IR84-DP05 SHEET 1 OF 2

Baker Environmental

TEST BORING RECORD

PROJECT: Baker Site 84
CTO NO.: 219
BORING NO.: IR84-DP05

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 D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
ps/bg = point source/background

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL)
11						light gray, very fine sand	
12							
13						TD @ 12.0'	
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30						Continued from Sheet 1	

DRILLING COMPANY: Parratt Wolff Inc.
DRILLER: Louie LeFever
BAKER REP.: E. Hanna
BORING NO.: IR84-DP05 SHEET 2 OF 2

Baker
Baker Environmental

TEST BORING RECORD

PROJECT: Baker Site 84
PROJ. NO.: CTO-0219 BORING NO.: IR84-DP06
COORDINATES: EAST: 2495516.7463 NORTH: 361261.3573
ELEVATION: SURFACE: 22.45

Rig:	Powerprobe (Geoprobe rig)				Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
	Split Spoon	Casing	Augers	Macro Tube				
Size (ID)	2"				7/17/01	2.0'	Sunny, Hot	
Length	2'							
Type	Standard							
Hammer Wt.	NA							
Fall	NA							

Remarks:

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 22.45
1	S-1	1.75'				Light brown, fine sand, trace silt, dry	
2							20.45
3						Refusal @ 2.0' TD @ 2.0'	
4							
5							
6							
7							
8							
9							
10							

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: E. Hanna
DRILLER: Louie LeFever BORING NO.: DP06 SHEET 1 OF 1

Baker
Baker Environmental

TEST BORING RECORD

PROJECT: Baker Site 84
PROJ. NO.: CTO-219 BORING NO.: IR84-DP07
COORDINATES: EAST: 2495413.2178 NORTH: 361219.1996
ELEVATION SURFACE: 20.96

Rig:	Powerprobe (Geoprobe rig)				Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
	Split Spoon	Casing	Augers	Macro Tube				
Size (ID)	2"				7/17/01	2.5'	Sunny, Hot	
Length	2'							
Type	Standard							
Hammer Wt.	NA							
Fall	NA							

Remarks:

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm ps/bg	Visual Description	Elevation (Ft. MSL) 20.96
1	S-1	2				Dark gray, very fine sand, trace silt, dry	
2						Light gray, fine sand with gravel.	
3	S-2					Refusal @ 2.5'	18.46
4						TD @ 2.5'	
5							
6							
7							
8							
9							
10							

DRILLING COMPANY Parratt Wolff Inc. BAKER REP.: E. Hanna
DRILLER: Louie LeFever BORING NO.: DP07 SHEET 1 OF 1

Baker
Baker Environmental

TEST BORING RECORD

PROJECT: Baker Site 84
PROJ. NO.: CTO-219 BORING NO.: IR84-DP08
COORDINATES: EAST: 2495372.3567 NORTH: 361252.2274
ELEVATION SURFACE: 20.93

Rig:	Powerprobe (Geoprobe rig)				Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
	Split Spoon	Casing	Augers	Macro Tube				
Size (ID)	2"				7/17/01	12.0'	Sunny, Hot	10.1
Length	2'							
Type	Standard							
Hammer Wt.	NA							
Fall	NA							

Remarks:

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm ps/bg	Visual Description	Elevation (Ft. MSL) 20.93
1	S-1	2.0'				Dark gray, very fine sand, trace silt, slightly damp	
2							
3	S-2	1.5'					
4							
5	S-3	1.6'					
6							
7	S-4	1.1'					
8						went through wood from 7.3 - 7.6'	13.63
9	M-1					Fine sand, moftled tan/dark gray Dark gray, very fine sand, trace silt, slightly damp, with trace gravel	
10	▲					Dark reddish brown (peat colored) water table @ 10.1'	10.83

DRILLING COMPANY Parratt Wolff Inc. BAKER REP.: E. Hanna
DRILLER: Louie LeFever BORING NO.: DP08 SHEET 1 OF 2

Baker

Baker Environmental

TEST BORING RECORD

PROJECT: Baker Site 84

CTO NO.: 219

BORING NO.: IR84-DP08

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 D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
ps/bg = point source/background

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 10.43
11						Dark reddish brown (peat color)	
12	12.0					12.0	8.93
13						TD @ 12.0'	
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30						Continued from Sheet 1	

DRILLING COMPANY: Parratt Wolff Inc.

DRILLER: Louie LeFever

BAKER REP.: E. Hanna

BORING NO.: DP08

Baker Environmental

TEST BORING RECORD

PROJECT: Baker Site 84
PROJ. NO.: CTO-0219 BORING NO.: IR84-DP09
COORDINATES: EAST: 2495298.2548 NORTH: 361313.5422
ELEVATION: SURFACE: 20.13

Rig:	Powerprobe (Geoprobe rig)				Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
	Split Spoon	Casing	Augers	Macro Tube				
Size (ID)	2"				7/18/01	10.0'	Hazy, Hot, Sunny	8.55
Length	2'							
Type	Standard							
Hammer Wt.	NA							
Fall	NA							

Remarks: Used 4' macrocorer in addition to standard split spoon

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)		Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 20.13
1		S-1	1.7'				Very fine sand, little silt, grayish brown	
2								
3		S-2	1.5'				Very fine sand, trace silt, light brown, slightly damp	
4								
5		S-3	1.5'				Very fine sand, trace silt, light brown/gray, damp	
6								
7								
8		M-1					Very fine sand, trace silt, light brown mottled with orange, damp	11.58
9	▲						Light grayish brown very fine sand, trace	
10							Light brown mottled with orange, wet, very fine sand, trace silt	10.13
							TD @ 10.0'	

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: E. Hanna
DRILLER: Louie LeFever BORING NO.: 01 SHEET 1 OF 1

Baker
Baker Environmental

TEST BORING RECORD

PROJECT: Baker Site 84
PROJ. NO.: CTO-0219 BORING NO.: IR84-DP10
COORDINATES: EAST: 2495262.5204 NORTH: 361348.6244
ELEVATION: SURFACE: 17.84

Rig:	Powerprobe (Geoprobe rig)				Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
	Split Spoon	Casing	Augers	Macro Tube				
Size (ID)	2"				7/18/01	10.0'	Hazy, Hot, Sunny	10
Length	2'							
Type	Standard							
Hammer Wt.	NA							
Fall	NA							

Remarks: Used 4' macrocorer in addition to standard split spoon

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 17.84
1	S-1	2.0'				Light gray, very fine sand with gravel, dry, trace silt and clay	
2						Light brown, very fine sand, trace silt, slightly damp	15.84
3	S-2	2.0'					
4							13.84
5	S-3	2.0'					
6						Light gray, very fine sand with gravel, dry Orange, very fine sand, trace silt, slightly damp	11.84
7	M-1	4.0'					
8						Light gray, very fine sand Very fine light orange sand, damp	
9							
10						Water Table @10.0'	7.84
▲						TD - 10'	

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: E. Hanna
DRILLER: Louie LeFever BORING NO.: IR84-DP10 SHEET 1 OF 1

Baker
Baker Environmental

TEST BORING RECORD

PROJECT: Baker Site 84
PROJ. NO.: CTO-0219 BORING NO.: IR84-DP11
COORDINATES: EAST: 2495222.2960 NORTH: 361381.2514
ELEVATION: SURFACE: 15.75

Rig:	Powerprobe (Geoprobe rig)				Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
	Split Spoon	Casing	Augers	Macro Tube				
Size (ID)	2"				7/18/01	8		5.71
Length	2'							
Type	Standard							
Hammer Wt.	NA							
Fall	NA							

Remarks: Used 4' macrocorer in addition to standard split spoon

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)		Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 15.75
1		S-1	1.8'				Light gray, trace silt, gravel, dry	
2							Light brown, trace silt, slightly damp	
3		S-2						
4								
5							Light gray, dry, very fine sand, little silt	
6	▲	M-1					Water table @ 5.7'	10.05
7							Light gray, striated with orange, very fine sand	
8								7.75
9							TD @ 8.0'	
10								

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: E. Hanna
DRILLER: Louie LeFever BORING NO.: IR84-DP11 SHEET 1 OF 1

Baker
Baker Environmental

TEST BORING RECORD

PROJECT: Baker Site 84
PROJ. NO.: CTO-0219 BORING NO.: IR84-DP12
COORDINATES: EAST: 2495161.6649 NORTH: 361424.5780
ELEVATION: SURFACE: 11.51

Rig:	Powerprobe (Geoprobe rig)				Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
	Split Spoon	Casing	Augers	Macro Tube				
Size (ID)	2"			2"	7/18/01	6	Hazy, Hot, Sunny	5
Length	2'			4'				
Type	Standard			acetate				
Hammer Wt.	NA			NA				
Fall	NA			NA				

Remarks: Used 4' macrocorer in addition to standard split spoon

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)		Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 11.51
1		S-1	1.6'				Light gray to tan very fine sand, damp, trace silt	
2								
3							Dark gray, very fine sand, trace silt, damp	
							Light gray, very fine sand with gravel damp	
4		M-1	2.4'				Tan, very fine sand, damp	
5							Orange, very fine sand with trace clay	6.51
	▲						Water table @ 5.0'	
6								5.51
7							TD @ 6.0'	
8								
9								
10								

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: E. Hanna
DRILLER: Louie LeFever BORING NO.: IR84-DP12 SHEET 1 OF 1

Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: IR84-DP13
COORDINATES: EAST: 2495192.3850 NORTH: 361509.9676
ELEVATION: SURFACE: 12.04

Rig:	Geoprobe							
	Split Spoon	Casing	Augers	Macro Tube	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)	2"			2"	7/18/01	6.0'	hot, hazy, sunny	5.1
Length	2'			4'				
Type	Std.			acetate				
Hammer Wt.	NA			NA				
Fall	NA			NA				

Remarks: Used 4' macrocorer in addition to std. Split spoon.

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)		Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 12.04
1		S-1	2.0'				Light gray, very fine sand with gravel, trace silt dry	
2							Brownish gray, very fine sand with gravel, trace silt	
3								
4		M-1	2.0'				Light gray, very fine sand with trace silt, gravel dry	
5								6.94
6	▲						Tan, very fine sand, trace silt, damp to water table, water table @5.1'	6.04
7							End of Boring = 6.0'	
8								
9								
10								

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: E. Hanna
DRILLER: Lewis LeFever BORING NO.: DP-13 SHEET 1 OF 1

Baker
Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: IR84-DP14
COORDINATES: EAST: 2496248.9616 NORTH: 361436.0497
ELEVATION: SURFACE: 15.16

Rig:	Geoprobe							
	Split Spoon	Casing	Augers	Macro Tube	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)	2"			2"	7/18/01	10.0'	hot, sunny	7.7'
Length	2'			4'				
Type	Std.			acetate				
Hammer Wt.	NA			NA				
Fall	NA			NA				

Remarks: Used 4' macrocorer in addition to std. split spoon

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)		Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 15.16
1		S-1	2.0'				Very fine to fine sand, with trace clay, light brown	
2							Dry @ 1.5', dark brown with petroleum odor	13.66
3		S-2	2.0'				Light brown, very fine, fine sand, damp @ 3.0'	12.16
4							thin layer of black, petroleum odor @ 3.0'	
5		S-3	1.5'					
6							(no odor)	9.16
7							6.0 to 7.4' dark brown to black layers with petroleum odor water table @ 7.7'	
8	▲	M-1					7.4' to 10.0' light gray, very fine sand, wet	7.76
9								
10							TD @ 10.0'	5.16

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: E. Hanna
DRILLER: Lewis LeFever BORING NO.: DP-14 SHEET 1 OF 1

Baker
Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: IR84-DP15
COORDINATES: EAST: NORTH:
ELEVATION: SURFACE:

Rig:	Geoprobe				Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
	Split Spoon	Casing	Augers	Macro Tube				
Size (ID)	2"			2"	7/18/01	10.0'	hot, sunny	6.75'
Length	2'			4'				
Type	Std.			acetate				
Hammer Wt.	NA			NA				
Fall	NA			NA				

Remarks: Used 4' macrocorer in addition to std. split spoon

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)		Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL)
1		S-1	1.5'				Light gray, very fine to coarse sand, gravel dry	
2							Dry @ 1.5', dark brown with petroleum odor	
3		S-2	1.6'				Dark brown, slightly damp, petroleum odor, very fine sand, trace silt	
4							Light gray, very fine to coarse sand, gravel dry petroleum odor	
5		S-3	1.5'					
6							Product, black sand glistening with product	
7	▼						WT @ 6.75'	
8		M-1	4.0'				Black sludge @ 7.0' to bottom of boring very fine sand; light gray stained to dark, brown/ black by product	
9								
10							TD @ 10.0'	

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: E. Hanna
DRILLER: Lewis LeFever BORING NO.: DP-15 SHEET 1 OF 1

Baker

Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation

PROJ. NO.: CTO-0219 BORING NO.: IR84-DP16

COORDINATES: EAST: 2495308.6434 NORTH: 361448.4669

ELEVATION SURFACE: 19.39

Rig:	Geoprobe				Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
	Split Spoon	Casing	Augers	Macro Tube				
Size (ID)	2"			2"	7/18/01	12.0'	hot, sunny	8.9'
Length	2'			4'				
Type	Std.			Acetate				
Hammer Wt.	NA			NA				
Fall	NA			NA				

Remarks: Used 4' macrocorer in addition to std. split spoon

SAMPLE TYPE

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

DEFINITIONS

SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)		Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm ps/bg	Visual Description	Elevation (Ft. MSL) 19.39
1		S-1	1.7'				Dark gray, very fine sand, little sand	
2							Light brown very fine sand, little silt, slightly damp	
3		S-2	1.4'					
4								
5		S-3	1.1'					
6							Tan, very fine soil, trace silt, slightly damp	
7		S-4	1.6'					
8							Dark brown, very fine sand, trace silt	
9	▼	M-1	4.0'				Very fine sand, light brown, damp WT @ 8.9'	10.49
10							Dark to medium brown, very fine sand, trace silt	

DRILLING COMPANY Parratt Wolff Inc. BAKER REP.: E. Hanna

DRILLER: Lewis LeFever BORING NO.: DP-16 SHEET 1 OF 2

Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
CTO NO.: 219 BORING NO.: IR84-DP16

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 D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
ps/bg = point source/background

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 8.89
11	M-1 (cont.)					Continued from Sheet 1 Light gray, very fine sand, trace silt	
12							7.39
13						TD @ 12.0'	
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							

DRILLING COMPANY: Parratt - Wolff BAKER REP.: E. Hanna
DRILLER: Lewis LeFever BORING NO.: DP-16 SHEE 2 of 2

Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: IR84-DP17
COORDINATES: EAST: 2495327.6759 NORTH: 361444.1491
ELEVATION: SURFACE: 17.36

Rig:	Geoprobe							
	Split Spoon	Casing	Augers	Macro Tube	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)	2"				7/19/01	4.2'	overcast, warm	--
Length	2'							
Type	Std.							
Hammer Wt.	NA							
Fall	NA							

Remarks: Used 4' macrocorer in addition to std. split spoon

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 17.36
1–2	S-1	1.5'				Light brown, very fine sand, trace silt, damp	
3–4	S-2	1.5'					13.16
5–6	S-3	0.2'				TD @ 4.2' Refusal @ 4.2'	
7							
8							
9							
10							

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: E. Hanna
DRILLER: Lewis LeFever BORING NO.: DP-17 SHEET 1 OF 1

Baker
Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: IR84-DP18
COORDINATES: EAST: 2495250.4213 NORTH: 361509.9675
ELEVATION: SURFACE: 12.40

Rig:	Geoprobe				Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
	Split Spoon	Casing	Augers	Macro Tube				
Size (ID)	2"			2"	7/19/01	6.01	overcast, warm	4.35
Length	2'			4'				
Type	Std.			acetate				
Hammer Wt.	NA			NA				
Fall	NA			NA				

Remarks: Used 4' macrocorer in addition to std. split spoon

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)		Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 12.4
1		S-1	2.0'				Light brownish, gray, very fine sand with little clay, slight petroleum odor @ 1.5'	
2							Damp	10.90
3		M-1	2.7'					
4	▼						Tan, very fine sand, trace silt, damp to wet W.T. @ 4.35'	8.05
5								
6								6.40
7							TD @ 6.0'	
8								
9								
10								

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: E. Hanna
DRILLER: Lewis LeFever BORING NO.: IR84-DP18 SHEET 1 OF 1

Baker
Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: IR84-DP19
COORDINATES: EAST: 2495277.6132 NORTH: 361660.4346
ELEVATION: SURFACE: 12.04

Rig:	Geoprobe							
	Split Spoon	Casing	Augers	Macro Tube	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)	2"			2"	7/19/01	6.0'	overcast, warm	2.8'
Length	2'			4'				
Type	Std.			acetate				
Hammer Wt.	NA			NA				
Fall	NA			NA				

Remarks: Used 4' macrocorer in addition to std. split spoon

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)		Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 12.04
1		S-1	1.4'				Very fine sand, light brown, little silt	11.54
2							Black layer @0.5', very fine sand, trace silt W.T. @ 2.8'	
3	▼	M-1						9.24
4								
5								
6								6.04
7							TD @ 6.0'	
8								
9								
10								

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: E. Hanna
DRILLER: Lewis LeFever BORING NO.: IR84-DP19 SHEET 1 OF 1

Baker
Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: IR84-DP20
COORDINATES: EAST: 2495319.4451 NORTH: 361521.6893
ELEVATION: SURFACE: 14.46

Rig:	Geoprobe				Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
	Split Spoon	Casing	Augers	Macro Tube				
Size (ID)	2"			2"	7/19/01	6.0'	overcast, warm	3.7'
Length	2'			4'				
Type	Std.			Acetate				
Hammer Wt.	NA			NA				
Fall	NA			NA				

Remarks: Used 4' macrocorer in addition to std. split spoon

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)		Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 14.46
1		S-1	2.0'				Small pieces of brick, light brownish gray, very fine sand, little silt, dry	
2							Slightly damp, light brown, very fine sand, trace silt	
3								
4	▼	M-1	3.0'				WT @ 3.7'	10.76
5								
6								8.46
7							TD - 6.0'	
8								
9								
10								

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: E. Hanna
DRILLER: Lewis LeFever BORING NO.: IR84-DP20 SHEET 1 OF 1

Baker
Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: IR84-DP21
COORDINATES: EAST: 2495354.9775 NORTH: 361487.0325
ELEVATION: SURFACE: 17.37

Rig:	Geoprobe							
	Split Spoon	Casing	Augers	Macro Tube	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)	2"			2"	7/19/01	10.0'	overcast, warm,	--
Length	2'			4'			sprinkling	
Type	Std.			acetate				
Hammer Wt.	NA			NA				
Fall	NA			NA				

Remarks: Used 4' macrocorer in addition to std. split spoon

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 17.37
1	S-1	2.0'				Light brown, very fine sand, trace silt, slightly damp, pebbles @ 0.5'	16.87
2						Tan, very fine sand, damp	
3	S-2	2.0'				Tan, slightly orange, very fine sand, trace silt and some clay	
4							
5	S-3	1.0'				Gray clay with some very fine sand, damp	
6							
7	M-1					Acetate sleeve stuck in macrocorer could not determine WT depth collected sample @ approximately 8.0'?	
8							9.37
9							
10							7.37
						TD @ 10.0'	

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: E. Hanna
DRILLER: Lewis LeFever BORING NO.: IR84-DP21 SHEET 1 OF 1

Baker
Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: IR84-DP22
COORDINATES: EAST: NORTH:
ELEVATION: SURFACE:

Rig:	Hand Auger				Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
	Split Spoon	Casing	Augers	Macro Tube				
Size (ID)	3"				7/19/01	0.5'	overcast, warm,	--
Length	8"						sprinkling	
Type	Std.							
Hammer Wt.	NA							
Fall	NA							

Remarks:

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL)
	S-1	0.5'				Small coated wires/cable stuck in auger, very fine dark brown sand, some silt, dry to slightly damp, roots	
1							
2						TD @ 0.5'	
3							
4							
5							
6							
7							
8							
9							
10							

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: E. Hanna
DRILLER: Lewis LeFever BORING NO.: IR84-DP22 SHEET 1 OF 1

Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: IR84-DP23
COORDINATES: EAST: 2495199.8947 NORTH: 361759.7729
ELEVATION: SURFACE: 6.00

Rig:	Hand Auger							
	Split Spoon	Casing	Augers	Macro Tube	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)	3"				7/19/01	0.5'	overcast, warm,	--
Length	8"							
Type	Std.							
Hammer Wt.	NA							
Fall	NA							

Remarks:

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 6
	S-1	0.5'				Light brown to dark brown, very fine sand, trace silt and clay roots, damp	5.50
1							
2						TD @ 0.5'	
3							
4						Sucking sound when pulled out bucket	
5							
6							
7							
8							
9							
10							

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: E. Hanna
DRILLER: Lewis LeFever BORING NO.: IR84-DP23 SHEET 1 OF 1

Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: IR84-DP24
COORDINATES: EAST: 2495182.0073 NORTH: 361728.6810
ELEVATION: SURFACE: 6.37

Rig:	Geoprobe							
	Split Spoon	**Casing**	**Augers**	**Macro Tube**	**Date**	**Progress (Ft.)**	**Weather**	**Depth to Water (Ft.)**
Size (ID)	2"				7/19/01	4.0'	overcast, warm,	0.7'
Length	4"							
Type	macro.							
Hammer Wt.	NA							
Fall	NA							

Remarks:

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 6.37
1 ▲	M-1	3.5'				0.4' dark brown, very fine sand, some silt trace clay	
2						W.T. @ 0.7'	
3						0.4' to 4.0'	
4						Light gray, very fine sand, little silt	2.37
5						TD @ 4.0'	
6							
7							
8							
9							
10							

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: E. Hanna
DRILLER: Lewis LeFever BORING NO.: IR84-DP24 SHEET 1 OF 1

Baker
Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: IR84-DP25
COORDINATES: EAST: 2495136.0365 NORTH: 361758.0701
ELEVATION: SURFACE: 6.27

Rig:	Geoprobe							
	Split Spoon	Casing	Augers	Macro Tube	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)	2"				7/19/01	4.0'	overcast, warm,	0.9'
Length	4"							
Type	macro.							
Hammer Wt.	NA							
Fall	NA							

Remarks:

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)		Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 6.27
1	▲	M-1					W.T. @ 0.9'	5.37
							Dark brown, very fine sand, trace silt @ 1.4'	
2							changes to light brown very fine sand,	4.87
							trace silt	
3								
4								2.27
5							TD @ 4.0'	
6								
7								
8								
9								
10								

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: E. Hanna
DRILLER: Lewis LeFever BORING NO.: IR84-DP25 SHEET 1 OF 1

Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: IR84-DP26
COORDINATES: EAST: 2495163.6073 NORTH: 361796.7266
ELEVATION: SURFACE: 6.22

Rig:	Geoprobe							
	Split Spoon	Casing	Augers	Macro Tube	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)	2"				7/19/01	4.0'	overcast, warm,	
Length	4"							
Type	macro.							
Hammer Wt.	NA							
Fall	NA							

Remarks:

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 6.22
1	S-1	2.9'				Dark gray, very fine sand with trace silt and clay	
2						Light brown sand mottled with dark brown very fine sand with trace clay	
3							
4 ▲						W.T. @ 3.5' black at end of 4.0'	2.72 2.22
5						Slight petroleum odor	
6							
7							
8							
9							
10							

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: E. Hanna
DRILLER: Lewis LeFever BORING NO.: IR84-DP26 SHEET 1 OF 1

Baker
Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: IR84-DP27
COORDINATES: EAST: 2495106.1500 NORTH: 361718.0032
ELEVATION: SURFACE: 6.37

Rig:	Geoprobe				Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
	Split Spoon	Casing	Augers	Macro Tube				
Size (ID)	2"				7/19/01	4.0'	overcast, hot	2.1'
Length	4"							
Type	macro.							
Hammer Wt.	NA							
Fall	NA							

Remarks:

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 6.37
1	M-1	2.9'				Dark brown, lite brown, mottled very fine sand with little silt, damp	
2	▲					W.T. @ 2.1' Light brown sand with trace silt	4.27
3							
4							2.37
5						TD @ 4.0'	
6							
7							
8							
9							
10							

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: E. Hanna
DRILLER: Lewis LeFever BORING NO.: IR84-DP27 SHEET 1 OF 1

Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: IR84-DP28
COORDINATES: EAST: 2495155.1896 NORTH: 361695.6763
ELEVATION: SURFACE: 6.94

Rig:	Geoprobe				Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
	Split Spoon	Casing	Augers	Macro Tube				
Size (ID)	2"				7/19/01	4.0'	overcast, hot	2.5'
Length	4"							
Type	macro.							
Hammer Wt.	NA							
Fall	NA							

Remarks:

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)		Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 6.94
1							Dark brown, very fine sand, little silt, trace silt, trace clay, damp	
2	▼	M-1	2.9'				W.T. @ 2.5' Light brown, very fine sand trace silt	4.44
3								
4								2.94
5							TD @ 4.0'	
6								
7								
8								
9								
10								

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: E. Hanna
DRILLER: Lewis LeFever BORING NO.: IR84-DP28 SHEET 1 OF 1

Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: IR84-DP29
COORDINATES: EAST: 2495297.8143 NORTH: 361358.0013
ELEVATION: SURFACE: 6.94

Rig:	Geoprobe				Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
	Split Spoon	Casing	Augers	Macro Tube				
Size (ID)	2"				7/19/01	4.0'	Hazy, hot	2.1'
Length	4"							
Type	macro.							
Hammer Wt.	NA							
Fall	NA							

Remarks:

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)		Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 6.94
1							Dark gray, very fine sand with trace silt	
2	▼	M-1	3.3'				W.T. @ 2.1'	4.84
3								
4							1.8' to 4.0' petroleum odor	2.94
5							TD @ 4.0'	
6								
7								
8								
9								
10								

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: E. Hanna
DRILLER: Lewis LeFever BORING NO.: IR84-DP29 SHEET 1 OF 1

Baker
Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: IR84-DP30
COORDINATES: EAST: 2495358.4006 NORTH: 361545.9271
ELEVATION: SURFACE: 14.76

Rig:	Geoprobe				Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
	Split Spoon	Casing	Augers	Macro Tube				
Size (ID)	2"			2"	7/19/01	8.0'	overcast, hot	6.6'
Length	2"			4'				
Type	Standard			acetate				
Hammer Wt.	NA			NA				
Fall	NA			NA				

Remarks:

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)		Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 14.76
1		S-1	1.3'				Light brown, very fine sand, trace to no silt, dry	
2								
3		S-2	1.8'				Light gray very fine sand, trace silt, damp, then dry with trace gravel	
4								
5		S-3	4.7'					
6							Light gray with orangish tan straitions, very fine sand	8.16
7	▼						W. T. @ 6.6'	
8							with trace silt and clay	6.76
9							TD @ 8.0'	
10								

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: E. Hanna
DRILLER: Lewis LeFever BORING NO.: IR84-DP30 SHEET 1 OF 1

Baker
Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: IR84-DP31
COORDINATES: EAST: 2495108.7587 NORTH: 361768.0654
ELEVATION: SURFACE: 5.95

Rig:	Hand Auger							
	Split Spoon	Casing	Augers	Macro Tube	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)						0.5'	overcast, hot	
Length								
Type								
Hammer Wt.								
Fall								

Remarks:

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 5.95
	S-1	0.5'				Dark brown, very fine sand with trace silt and clay, very damp, sacking sound when pulled bucket out	5.45
1							
2						TD @ 0.5'	
3							
4							
5							
6							
7							
8							
9							
10							

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: E. Hanna
DRILLER: Lewis LeFever BORING NO.: IR84-DP31 SHEET 1 OF 1

Baker

Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation

PROJ. NO.: CTO-0219 BORING NO.: IR84-DP32

COORDINATES: EAST: 2495358.4006 NORTH: 361545.9271

ELEVATION: SURFACE: 7.03

Rig:	Geoprobe							
	Split Spoon	**Casing**	**Augers**	**Macro Tube**	**Date**	**Progress (Ft.)**	**Weather**	**Depth to Water (Ft.)**
Size (ID)	2"				7/20/01	2.0'	overcast, warm	0.0
Length	2"							
Type	Standard							
Hammer Wt.	NA							
Fall	NA							

Remarks:

SAMPLE TYPE

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

DEFINITIONS

SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.) ▼	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 7.03
1	S-1	1.85'				Dark gray, very fine sand with trace coarse sand and silt	
2						W.T. @ 0.0'	5.03
3						TD @ 2.0'	
4							
5							
6							
7							
8							
9							
10							

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: E. Hanna

DRILLER: Lewis LeFever BORING NO.: IR84-DP32 SHEET 1 OF 1

Baker
Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: IR84-DP33
COORDINATES: EAST: 2495237.5529 NORTH: 361610.5651
ELEVATION: SURFACE: 8.55

Rig:	Geoprobe				Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
	Split Spoon	Casing	Augers	Macro Tube				
Size (ID)	2"				7/20/01	4.0'	overcast, warm	2.4'
Length	4"							
Type	Macro.							
Hammer Wt.	NA							
Fall	NA							

Remarks:

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 8.55
1						Light brown, very fine sand, with trace silt damp	
2 ▼	M-1	4.0'				Dary gray, very fine sand, trace silt	6.15
3						W.T. @ 2.4'	
4							4.55
5						TD @ 4.0'	
6							
7							
8							
9							
10							

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: E. Hanna
DRILLER: Lewis LeFever BORING NO.: IR84-DP33 SHEET 1 OF 1

Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: IR84-DP34
COORDINATES: EAST: 2495310.2454 NORTH: 361571.7829
ELEVATION: SURFACE: 12.07

Rig:	Geoprobe							
	Split Spoon	Casing	Augers	Macro Tube	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)	2"				7/20/01	6.0'	overcast, warm	3.4'
Length	2"							
Type	Standard							
Hammer Wt.	NA							
Fall	NA							

Remarks: Used 4.0' macrocorer in addition to standard split spoon.

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 12.07
1–2	S-1	1.6'				Medium brown, very fine sand, trace silt	
3 ▼						Damp	
3–4						Light brown, very fine sand, trace to no silt	8.67
4–5	M-1	3.4'				W. T. @ 3.4'	
6							6.07
7–10						TD @ 4.0'	

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: E. Hanna
DRILLER: Lewis LeFever BORING NO.: IR84-DP34 SHEET 1 OF 1

Baker
Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: IR84-DP35
COORDINATES: EAST: 2495240.9792 NORTH: 361364.4289
ELEVATION: SURFACE: 16.31

Rig:	Geoprobe				Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
	Split Spoon	Casing	Augers	Macro Tube				
Size (ID)	2'			2"	7/20/01	8.0'	partly cloudy, warm	7.3'
Length	2"			4'				
Type	Standard			acetate				
Hammer Wt.	NA			NA				
Fall	NA			NA				

Remarks: Used 4.0' macrocorer in addition to standard split spoon.

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)		Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 16.31
1		S-1	2.0'				Light brownish gray with trace gravel, with trace silt	
2							Orangish tan, very fine sand with trace to no silt	
3								
4		S-2	3.4'				Orangish tan, very fine sand with trace to no silt, very damp	
5								
6		M-1						
7	▼							
8							W. T. @ 7.3'	9.01 8.31
9							TD @ 8.0'	
10								

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: E. Hanna
DRILLER: Lewis LeFever BORING NO.: IR84-DP35 SHEET 1 OF 1

Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: IR84-DP36
COORDINATES: EAST: 2495239.5820 NORTH: 361387.3441
ELEVATION: SURFACE: 16.48

Rig:	Geoprobe							
	Split Spoon	Casing	Augers	Macro Tube	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)	2'			2"	7/20/01	10.0'	partly cloudy, warm	7.2'
Length	2"			4'				
Type	Standard			acetate				
Hammer Wt.	NA			NA				
Fall	NA			NA				

Remarks: Used 4.0' macrocorer in addition to standard split spoon.

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 16.48
1	S-1	2.0'				Light gray with gravel, very fine sand, dry,	
2						dark gray, very fine sand	
3	S-2	3.4'				Light brown, very fine sand, dry with trace medium sand	
4						Orange, very fine sand, trace medium sand, tree silk, damp	
5	S-3	0.5'					11.98
6						Hit concrete/stone @ 4.5', went through Orange, very fine sand, trace medium sand, tree silk, damp	10.48
7	▼					Concrete/granite looking chunks @ 6'-7' coarse sand just beneath	9.48
8	M-1	3.2'				W. T. @ 7.2'	9.28
9						Light brown, very fine sand, orange striations @ 7.5'	
10						TD @ 10.0'	6.48

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: E. Hanna
DRILLER: Lewis LeFever BORING NO.: IR84-DP36 SHEET 1 OF 1

Baker

Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation

PROJ. NO.: CTO-0219 BORING NO.: IR84-DP37

COORDINATES: EAST: 2495278.9562 NORTH: 361292.9401

ELEVATION SURFACE: 19.14

Rig:	Geoprobe							
	Split Spoon	Casing	Augers	Macro Tube	Date	Progress (Ft.)	Weather breezy,	Depth to Water (Ft.)
Size (ID)	2'			2"	7/20/01	14.0'	partly cloudy, warm	12.4'
Length	2"			4'				
Type	Standard			acetate				
Hammer Wt.	NA			NA				
Fall	NA			NA				

Remarks: Used 4.0' macrocorer in addition to standard split spoon.

SAMPLE TYPE

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

DEFINITIONS

SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm ps/bg	Visual Description	Elevation (Ft. MSL) 19.14
1	S-1	2.0'				Dark gray, very fine sand, dry	
2						Tan, very fine sand, slightly damp	
3	S-2	2.0'					
4						Light gray, very fine sand, slightly damp	
5	S-3	1.5'					
6							
7	S-4	1.3'					
8							
9	S-5	4.0'					
10						Dark brown, very fine sand with trace gravel, dry	

DRILLING COMPANY Parratt Wolff Inc. BAKER REP.: E. Hanna

DRILLER: Lewis LeFever BORING NO.: IR84-DP37 SHEET 1 OF 2

Baker

Baker Environmental

TEST BORING RECORD

PROJECT: Baker Site 84

CTO NO.: 219 BORING NO.: IR84-DP37

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 D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
ps/bg = point source/background

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 8.64
11	S-5 cont.					Orangish tan, very fine sand with trace silt and clay	
12							
13	S-6	2.0'					6.74
14						W. L. @ 12.4'	5.14
15						T. D. @ 14.0'	
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30						Continued from Sheet 1	

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: E. Hanna

DRILLER: Louie LeFever BORING NO.: DP37 SHEET 2 OF 2

Baker

Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation

PROJ. NO.: CTO-0219 BORING NO.: IR84-DP38

COORDINATES: EAST: 361262.8501 NORTH: 2495321.8467

ELEVATION: SURFACE: 19.90

Rig:	Hand Auger				Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
	Split Spoon	Casing	Augers	Macro Tube				
Size (ID)	3"				7/20/01	8'	Sunny, hot	
Length	8"							
Type	Auger							
Hammer Wt.	NA							
Fall	NA							

Remarks:

SAMPLE TYPE

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

DEFINITIONS

SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 19.9
	S-1					Dark, grayish brown, fine sand with little silt, dry	19.40
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: E. Hanna

DRILLER: Lewis LeFever BORING NO.: IR84-DP38 SHEET 1 OF 1

Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: IR84-DP39
COORDINATES: EAST: 2495338.9870 NORTH: 361283.6958
ELEVATION: SURFACE: 21.14

Rig:	Hand Auger							
	Split Spoon	Casing	Augers	Macro Tube	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)	3"							
Length	8"							
Type	Auger							
Hammer Wt.	NA							
Fall	NA							

Remarks:

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 21.14
	S-1	8"				Dark grayish brown, very fine sand with little silt, dry	
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: E. Hanna
DRILLER: Lewis LeFever BORING NO.: IR84-DP39 SHEET 1 OF 1

Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: IR84-DP40
COORDINATES: EAST: 2495139.1226 NORTH: 361820.7469
ELEVATION: SURFACE: 5.59

Rig:	Hand Auger							
	Split Spoon	Casing	Augers	Macro Tube	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)	3"				7/20/01	8"	Hot, sunny	3"
Length	8"							
Type	Bucket							
Hammer Wt.	NA							
Fall	NA							

Remarks: Heavily wooded area with standing water in spots.

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.) ▼	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 5.59
	S-1	8"				Dark grayish brown, very fine sand with little silt, wet	
1							
2						W. T. @ 3 inches	
3						TD @ 8"	
4							
5							
6							
7							
8							
9							
10							

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: E. Hanna
DRILLER: Lewis LeFever BORING NO.: IR84-DP40 SHEET 1 OF 1

Baker
Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: IR84-DP41
COORDINATES: EAST: 2495122.8614 NORTH: 361837.0731
ELEVATION: SURFACE: 5.61

Rig:	Hand Auger				Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
	Split Spoon	Casing	Augers	Macro Tube				
Size (ID)	3"				7/20/01	8"	Hot, sunny	0.0'
Length	8"							
Type	Bucket							
Hammer Wt.	NA							
Fall	NA							

Remarks: Heavily wooded area with standing water in spots.

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.) ▼	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 5.61
	S-1	8"				Very fine sand, little silt, trace clay, dark brown, slightly greyed	
1							
2						TD @ 8"	
3						W. T. @ 0.0"	
4							
5							
6							
7							
8							
9							
10							

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: E. Hanna
DRILLER: Lewis LeFever BORING NO.: IR84-DP41 SHEET 1 OF 1

Baker
Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: IR84-DP42
COORDINATES: EAST: 2495079.1710 NORTH: 361796.4477
ELEVATION: SURFACE: 5.70

Rig:	Hand Auger							
	Split Spoon	Casing	Augers	Macro Tube	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)	3"				7/20/01	8"	Hot, sunny	2"
Length	8"							
Type	Bucket							
Hammer Wt.	NA							
Fall	NA							

Remarks: Heavily wooded, ponded water in spots

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 5.70
	S-1	8"				Light brown, very fine sand with trace clay, silt, wet	
1							
2						W. T. @ 2 inches	
3						TD @ 8 inches	
4							
5							
6							
7							
8							
9							
10							

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: E. Hanna
DRILLER: Lewis LeFever BORING NO.: IR84-DP42 SHEET 1 OF 1

Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: IR84-DP43
COORDINATES: EAST: 2495081.3071 NORTH: 361737.1083
ELEVATION: SURFACE: 5.91

Rig:	Hand Auger							
	Split Spoon	Casing	Augers	Macro Tube	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)	3"				7/20/01	8"	Hot, sunny	3"
Length	8"							
Type	Bucket							
Hammer Wt.	NA							
Fall	NA							

Remarks: Heavily wooded

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 5.91
	S-1	8"				Dark brown, very fine sand with silt	
1							
2						W. T. @ 3 inches	
3						TD @ 8 inches	
4							
5							
6							
7							
8							
9							
10							

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: E. Hanna
DRILLER: Lewis LeFever BORING NO.: IR84-DP43 SHEET 1 OF 1

Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: IR84-DP44
COORDINATES: EAST: 2495066.9091 NORTH: 361819.6628
ELEVATION: SURFACE: 5.61

Rig:	Hand Auger				Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
	Split Spoon	Casing	Augers	Macro Tube				
Size (ID)	3"				7/20/01	8"	Hot, sunny	3"
Length	8"							
Type	Bucket							
Hammer Wt.	NA							
Fall	NA							

Remarks: Heavily wooded

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 5.61
▼	S-1	8"				Dark brown, very fine sand with silt	
1							
2						W. T. @ 3 inches	
3						TD @ 8 inches	
4							
5							
6							
7							
8							
9							
10							

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: E. Hanna
DRILLER: Lewis LeFever BORING NO.: IR84-DP44 SHEET 1 OF 1

Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: IR84-DP45
COORDINATES: EAST: 2495407.9431 NORTH: 361413.3054
ELEVATION: SURFACE: 21.14

Rig:	Geoprobe							
	Split Spoon	Casing	Augers	Macro Tube	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)	2"				7/21/01	8'	Hot, sunny	7.5'
Length	2"							
Type	Standard							
Hammer Wt.	NA							
Fall	NA							

Remarks: Heavily wooded

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)		Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 21.14
1		S-1	1.7"				Small pieces of brick, very fine sand with little silt, medium brown to light brown	
2							Light brown, very fine sand with trace silt	
3		S-2	1.7'					
4								
5		S-3	1.3'					
6							Light gray, very fine sand with trace silt	
7	▼	S-4	2.0'					13.64
8							W. T. @ 7.5'	13.14
9							TD @ 8.0'	
10								

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: E. Hanna
DRILLER: Lewis LeFever BORING NO.: IR84-DP45 SHEET 1 OF 1

Baker

Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation

PROJ. NO.: CTO-0219 BORING NO.: IR84-DP47

COORDINATES: EAST: 2495488.0144 NORTH: 361337.8133

ELEVATION: SURFACE: 21.49

Rig:	Geoprobe				Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
	Split Spoon	Casing	Augers	Macro Tube				
Size (ID)	2"			2"	7/21/01		Hot, sunny, breezy	
Length	4"			4'				
Type	Macro.			Acetate				
Hammer Wt.	NA			NA				
Fall	NA			NA				

Remarks:

SAMPLE TYPE

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

DEFINITIONS

SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)		Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 21.49
1							Very fine sand with trace, medium sand, light brown, trace to no silt, damp	
2	▼	M-1	2.9'					19.39
3							W. T. @ 2.1'	
4								17.49
5							TD @ 4.0'	
6								
7								
8								
9								
10								

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: E. Hanna

DRILLER: Lewis LeFever BORING NO.: IR84-DP47 SHEET 1 OF 1

Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: IR84-DP48
COORDINATES: EAST: 2495485.0432 NORTH: 361310.6159
ELEVATION: SURFACE: 22.20

Rig:	Geoprobe							
	Split Spoon	Casing	Augers	Macro Tube	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)	2"			2"	7/21/01		Hot, sunny, breezy	2.65
Length	4"			4'				
Type	Macro.			acetate				
Hammer Wt.	NA			NA				
Fall	NA			NA				

Remarks:

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)		Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 22.2
1							Light brown, very fine sand with trace silt brick @ the top	
2		M-1	2.7'					
3	▼						W. T. @ 2.65'	19.55
4								18.20
5							TD @ 4.0'	
6								
7								
8								
9								
10								

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: E. Hanna
DRILLER: Lewis LeFever BORING NO.: IR84-DP48 SHEET 1 OF 1

Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: IR84-DP49
COORDINATES: EAST: 2495458.9683 NORTH: 361287.0687
ELEVATION: SURFACE: 21.59

Rig:	Geoprobe				Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
	Split Spoon	Casing	Augers	Macro Tube				
Size (ID)	2"				7/21/01	4.0'	Hot, sunny	3.0
Length	4'							
Type	Macro.							
Hammer Wt.	NA							
Fall	NA							

Remarks:

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)		Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 21.59
1							Very fine, light gray sand with trace coarse sand, dry	
2		M-1	3.2'				Very fine, medium brown sand with trace silt	
3	▼						Very fine, light sand with trace silt	18.59
4							W. T. @ 3.0'	17.59
5							TD @ 4.0'	
6								
7								
8								
9								
10								

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: E. Hanna
DRILLER: Lewis LeFever BORING NO.: IR84-DP49 SHEET 1 OF 1

Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: IR84-DP50
COORDINATES: EAST: 2495439.0748 NORTH: 361274.0884
ELEVATION: SURFACE: 21.42

Rig:	Geoprobe							
	Split Spoon	Casing	Augers	Macro Tube	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)	2"				7/21/01	4.0'	Hot, sunny	3.0
Length	4'							
Type	Macro.							
Hammer Wt.	NA							
Fall	NA							

Remarks:

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)		Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 21.42
1		S-1	3.1'				Light brown, very thin sand with trace silt, dry	
2							Light brown, very fine sand with light brown in very fine sand with trace silt	
3	▼						W. T. @ 3.0'	18.42
4								17.42
5							TD @ 4.0'	
6								
7								
8								
9								
10								

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: E. Hanna
DRILLER: Lewis LeFever BORING NO.: IR84-DP50 SHEET 1 OF 1

Baker
Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: IR84-DP51
COORDINATES: EAST: 2495399.8867 NORTH: 361305.0134
ELEVATION: SURFACE: 20.70

Rig:	Geoprobe							
	Split Spoon	Casing	Augers	Macro Tube	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)	2"				7/21/01	4.0'	Hot, sunny, breezy	3.2'
Length	4.'							
Type	Macro.							
Hammer Wt.	NA							
Fall	NA							

Remarks:

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)		Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 20.7
1							Dark brown, very fine sand with trace silt	
							dry	
2		M-1	3.3'				damp	
3	▼							17.50
							W. T. @ 3.2'	
4							Light brown, very fine sand, trace silt	16.70
5							TD @ 4.0'	
6								
7								
8								
9								
10								

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: E. Hanna
DRILLER: Lewis LeFever BORING NO.: IR84-DP51 SHEET 1 OF 1

Baker

Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: IR84-DP52
COORDINATES: EAST: 2495354.8867 NORTH: 361339.9829
ELEVATION: SURFACE: 20.37

Rig:	Geoprobe				Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
	Split Spoon	Casing	Augers	Macro Tube				
Size (ID)	2"				7/21/01	4.0'	Hot, sunny	2.8'
Length	4'							
Type	Macro.							
Hammer Wt.	NA							
Fall	NA							

Remarks:

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)		Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 20.37
1		M-1	3.2'				Very fine, grayish, dark brown, dry, sand with trace silt, gravel	
2							damp	
3	▼						W. T. @ 2.8'	17.57
4								16.37
5							TD@4'	
6								
7								
8								
9								
10								

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: E. Hanna
DRILLER: Lewis LeFever BORING NO.: IR84-DP52 SHEET 1 OF 1

Baker
Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: IR84-DP53
COORDINATES: EAST: 2495393.1942 NORTH: 361421.5177
ELEVATION: SURFACE: 19.10

Rig:	Hand Auger				Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
	Split Spoon	Casing	Augers	Macro Tube				
Size (ID)	3"				7/21/01	8"	Hot, sunny	
Length	8"							
Type	Bucket							
Hammer Wt.	NA							
Fall	NA							

Remarks:

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 19.1
1	S-1	8"				Light brown, very fine sand with trace silt, damp	
2						TD @ 8"	
3							
4							
5							
6							
7							
8							
9							
10							

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: E. Hanna
DRILLER: Lewis LeFever BORING NO.: IR84-DP53 SHEET 1 OF 1

Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: IR84-DP54
COORDINATES: EAST: 2495368.2070 NORTH: 361400.4450
ELEVATION: SURFACE: 20.19

Rig:	Hand Auger				Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
	Split Spoon	Casing	Augers	Macro Tube				
Size (ID)	3"				7/21/01	8"	Hot, sunny	
Length	8"							
Type	Bucket							
Hammer Wt.	NA							
Fall	NA							

Remarks:

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 20.19
1	S-1	8"				Light brown/tan, very fine sand with trace silt, damp	
2						TD @ 8"	
3							
4							
5							
6							
7							
8							
9							
10							

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: E. Hanna
DRILLER: Lewis LeFever BORING NO.: IR84-DP54 SHEET 1 OF 1

Baker
Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: IR84-DP55
COORDINATES: EAST: 2495350.0240 NORTH: 361378.3935
ELEVATION: SURFACE: 20.62

Rig:	Hand Auger							
	Split Spoon	Casing	Augers	Macro Tube	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)	3"				7/21/01	8"	Hot, sunny	
Length	8"							
Type	Bucket							
Hammer Wt.	NA							
Fall	NA							

Remarks:

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 20.62
1	S-1	8"				Light brown, very fine sand with trace silt, gravel	
2						TD @ 8"	
3							
4							
5							
6							
7							
8							
9							
10							

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: E. Hanna
DRILLER: Lewis LeFever BORING NO.: IR84-DP55 SHEET 1 OF 1

Baker
Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: IR84-DP56
COORDINATES: EAST: 2495369.5322 NORTH: 361410.4369
ELEVATION: SURFACE: 19.94

Rig:	Geoprobe							
	Split Spoon	Casing	Augers	Macro Tube	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)	2"				7/21/01	4.0"	Hot, sunny	2.5'
Length	4'							
Type	Macro							
Hammer Wt.	NA							
Fall	NA							

Remarks:

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)		Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 19.94
1							Dark brownish gray, very fine sand	
							Light gray, very fine sand	
2							Light brown, very fine sand w/ trace silt	
	▼	M-1	3.1'					17.44
3							W. T. @ 2.5'	
4								15.94
5							TD @ 4.0'	
6								
7								
8								
9								
10								

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: E. Hanna
DRILLER: Lewis LeFever BORING NO.: IR84-DP56 SHEET 1 OF 1

Baker

Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: IR84-DP57
COORDINATES: EAST: 2495249.3540 NORTH: 361319.4970
ELEVATION: SURFACE: 17.86

Rig:	Hand Auger				Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
	Split Spoon	Casing	Augers	Macro Tube				
Size (ID)	3"				7/21/01	8"	Hot, sunny	
Length	8"							
Type	Bucket							
Hammer Wt.	NA							
Fall	NA							

Remarks:

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 17.86
1	S-1	8"				Medium grayish brown, dry, very fine sand with little gravel, trace silt	
2						TD @ 8"	
3							
4							
5							
6							
7							
8							
9							
10							

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: E. Hanna
DRILLER: Lewis LeFever BORING NO.: IR84-DP57 SHEET 1 OF 1

Baker
Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: IR84-DP58
COORDINATES: EAST: 2495192.2287 NORTH: 361617.2460
ELEVATION: SURFACE: 7.72

Rig:	Geoprobe							
	Split Spoon	Casing	Augers	Macro Tube	Date	Progress (Ft.)	Weather Hot,	Depth to Water (Ft.)
Size (ID)	2"				7/22/01	4'	sunny/partly cloudy	3.3
Length	4'							
Type	Macro.							
Hammer Wt.	NA							
Fall	NA							

Remarks:

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)		Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 7.72
1							Dark brown, very fine sand with little silt, very damp	
2		M-1	3.6'				Light brown, very fine sand with little silt	
3	▼						W. T. @ 3.3'	4.42
4								3.72
5							TD @ 4.0"	
6								
7								
8								
9								
10								

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: E. Hanna
DRILLER: Lewis LeFever BORING NO.: IR84-DP58 SHEET 1 OF 1

Baker
Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: IR84-DP59
COORDINATES: EAST: 2495140.6130 NORTH: 361664.6432
ELEVATION: SURFACE: 6.64

Rig:	Geoprobe							
	Split Spoon	Casing	Augers	Macro Tube	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)	2"				7/22/01	4.0'	Hot, Partly Cloudy	3.2
Length	4'							
Type	Macro.							
Hammer Wt.	NA							
Fall	NA							

Remarks:

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)		Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 6.64
1							Very damp, very fine sand with trace silt mottled with dark brown from 2 - 3'	
2		M-1	3.0'					
3	▼						W. T. @ 3.2'	3.44
4							Black sand, petroleum	2.64
5							TD @ 4.0"	
6								
7								
8								
9								
10								

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: E. Hanna
DRILLER: Lewis LeFever BORING NO.: IR84-DP59 SHEET 1 OF 1

Baker
Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: IR84-DP60
COORDINATES: EAST: 2495090.7965 NORTH: 361690.6668
ELEVATION: SURFACE: 7.54

Rig:	Geoprobe				Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
	Split Spoon	Casing	Augers	Macro Tube				
Size (ID)	2"				7/22/01	4.0'	Hot, overcast	3.2
Length	4'							
Type	Macro.							
Hammer Wt.	NA							
Fall	NA							

Remarks:

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 7.54
1	M-1	2.9'				Very fine, medium to dark brown sand, trace silt	
2							
3 ▼						Light brown, very fine sand with trace clay W. T. @ 3.2'	4.34
4							3.54
5						TD @ 4.0"	
6							
7							
8							
9							
10							

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: E. Hanna
DRILLER: Lewis LeFever BORING NO.: IR84-DP60 SHEET 1 OF 1

Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: IR84-DP61
COORDINATES: EAST: 2495065.6438 NORTH: 361649.8154
ELEVATION: SURFACE: 5.81

Rig:	Geoprobe				Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
	Split Spoon	Casing	Augers	Macro Tube				
Size (ID)	2"				7/22/01	4.0'	Hot, partly cloudy	3.0
Length	4'							
Type	Macro.							
Hammer Wt.	NA							
Fall	NA							

Remarks:

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)		Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 5.81
1		M-1	3.4'				Dark brown, very fine sand w/ little silt, little clay	
2							Light very fine sand, trace to no silt	
3	▼						Light brown/orangish, very fine sand with trace to no silty, trace clay W. T. @ 3.0'	2.81
4								1.81
5							TD @ 4.0"	
6								
7								
8								
9								
10								

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: E. Hanna
DRILLER: Lewis LeFever BORING NO.: IR84-DP61 SHEET 1 OF 1

Baker
Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: IR84-DP62
COORDINATES: EAST: 2495125.2465 NORTH: 361642.2883
ELEVATION: SURFACE: 6.83

Rig:	Geoprobe							
	Split Spoon	Casing	Augers	Macro Tube	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)	2"				7/22/01	4.0'	Hot, partly cloudy	3.0
Length	4'							
Type	Macro.							
Hammer Wt.	NA							
Fall	NA							

Remarks:

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)		Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 6.83
1							Dark brown, silty, very fine sand	
2		M-1	3.4'					
3	▼						Light brown, very fine sand, trace to no silt	4.03
4							W. T. @ 2.8'	2.83
5							TD @ 4.0"	
6								
7								
8								
9								
10								

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: E. Hanna
DRILLER: Lewis LeFever BORING NO.: IR84-DP62 SHEET 1 OF 1

Baker
Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: IR84-DP63
COORDINATES: EAST: 2495158.5544 NORTH: 361605.8421
ELEVATION: SURFACE: 7.82

Rig:	Geoprobe				Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
	Split Spoon	Casing	Augers	Macro Tube				
Size (ID)	2"				7/22/01	4.0'	Hot, partly cloudy	2.5'
Length	4'							
Type	Macro.							
Hammer Wt.	NA							
Fall	NA							

Remarks:

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)		Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 7.82
1							Dark brown, very fine sand, trace silt, trace clay	
2	▼	M-1	3.3'				Light brown, very fine sand, trace silt	5.32
3							W. T. @ 2.5'	
4								3.82
5							TD @ 4.0"	
6								
7								
8								
9								
10								

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: E. Hanna
DRILLER: Lewis LeFever BORING NO.: IR84-DP63 SHEET 1 OF 1

Baker
Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: IR84-DP64
COORDINATES: EAST: 2495165.3817 NORTH: 361575.0525
ELEVATION: SURFACE: 8.80

Rig:	Geoprobe							
	Split Spoon	Casing	Augers	Macro Tube	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)	2"				7/22/01	4.0'	Hot, partly cloudy	3.1
Length	4'							
Type	Macro.							
Hammer Wt.	NA							
Fall	NA							

Remarks:

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)		Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 8.8
1							Very fine, dark brown sand with trace to no silt, dry	
2		M-1	3.3'				Very fine, tan sand with trace silt, damp	
3	▼						W. T. @ 3.1'	5.70
4								4.80
5							TD @ 4.0"	
6								
7								
8								
9								
10								

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: E. Hanna
DRILLER: Lewis LeFever BORING NO.: IR84-DP64 SHEET 1 OF 1

Baker
Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: IR84-DP65
COORDINATES: EAST: 2495095.9883 NORTH: 361603.0141
ELEVATION: SURFACE: 7.51

Rig:	Geoprobe							
	Split Spoon	Casing	Augers	Macro Tube	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)	2"				7/22/01	4.0'	hot, partly cloudy	4.0'
Length	4'							
Type	Macro							
Hammer Wt.	NA							
Fall	NA							

Remarks:

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 7.51
1	M-1					Dark brown, very fine sand, trace silt, trace medium sand	
2							
3						Slightly damp	
4 ▼						W.T. @ 4.0'	3.51
5							
6							
7							
8							
9							
10							

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: E. Hanna
DRILLER: Lewis LeFever BORING NO.: IR84-DP65 SHEET 1 OF 1

Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: IR84-DP66
COORDINATES: EAST: 2495271.6319 NORTH: 361494.8397
ELEVATION: SURFACE: 13.84

Rig:	Geoprobe				Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
	Split Spoon	Casing	Augers	Macro Tube				
Size (ID)	2"			2"	7/22/01	6.0'	hot, partly cloudy	5.5'
Length	2'			4'				
Type	std.			acetate				
Hammer Wt.	NA			NA				
Fall	NA			NA				

Remarks:

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)		Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 13.84
1		S-1					Light to medium brown, very fine sand with trace silt slightly damp	
2								
3		M-1					Light brown, very fine sand with trace silt	
4								
5	▼						W.T. @ 5.5'	8.34
6								7.84
7							TD @ 6.0'	
8								
9								
10								

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: E. Hanna
DRILLER: Lewis LeFever BORING NO.: IR84-DP66 SHEET 1 OF 1

Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: IR84-DP67
COORDINATES: EAST: 2495032.4524 NORTH: 381690.4423
ELEVATION: SURFACE: 6.01

Rig:	Hand Auger				Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
	Split Spoon	Casing	Augers	Macro Tube				
Size (ID)	3"				7/22/01	8"	hot, partly cloudy	2"
Length	8"							
Type	Bucket							
Hammer Wt.	NA							
Fall	NA							

Remarks:

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 6.01
	S-1	8"				Dark brown, very fine sand with silt	
1							
2						W.T. @ 2"	
3						TD @ 8"	
4							
5							
6							
7							
8							
9							
10							

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: E. Hanna
DRILLER: Lewis LeFever BORING NO.: IR84-DP67 SHEET 1 OF 1

Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: IR84-DP68
COORDINATES: EAST: NORTH:
ELEVATION: SURFACE:

Rig:	Hand Auger							
	Split Spoon	Casing	Augers	Macro Tube	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)	3"				7/22/01	8"	hot, partly cloudy	2"
Length	8"							
Type	Bucket							
Hammer Wt.	NA							
Fall	NA							

Remarks: Heavily wooded

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL)
	S-1	8"				Light brown sand w/trace silt	
1							
2						W.T. @ 2"	
3						TD @ 8"	
4							
5							
6							
7							
8							
9							
10							

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: E. Hanna
DRILLER: Lewis LeFever BORING NO.: IR84-DP68 SHEET 1 OF 1

Baker

Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation

PROJ. NO.: CTO-0219 BORING NO.: IR84-DP69

COORDINATES: EAST: 2494909.0840 NORTH: 361851.2857

ELEVATION: SURFACE: 2.73

Rig:	Hand Auger				Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
	Split Spoon	Casing	Augers	Macro Tube				
Size (ID)	3"				7/22/01	8"	hot, partly cloudy	4"
Length	8"							
Type	Bucket							
Hammer Wt.	NA							
Fall	NA							

Remarks: Woody, edge of wetland area

SAMPLE TYPE

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

DEFINITIONS

SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 2.73
	S-1	8"				Dark brown, very fine sand with silt, trace clay	
1							
2						W.T. @ 4"	
3						TD @ 8"	
4							
5							
6							
7							
8							
9							
10							

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: E. Hanna

DRILLER: Lewis LeFever BORING NO.: IR84-DP69 SHEET 1 OF 1

Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: IR84-DP70
COORDINATES: EAST: 2494941.5316 NORTH: 361870.4090
ELEVATION: SURFACE: 3.43

Rig:	Hand Auger				Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
	Split Spoon	Casing	Augers	Macro Tube				
Size (ID)	3"				7/22/01	8"	hot, partly cloudy	4"
Length	8"							
Type	Bucket							
Hammer Wt.	NA							
Fall	NA							

Remarks: Wooded at edge of wetland

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 3.43
	S-1	8"				Dark brown, very fine sand with trace clay, silt	
1						TD @ 8"	
2						WT @ 4"	
3							
4							
5							
6							
7							
8							
9							
10							

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: E. Hanna
DRILLER: Lewis LeFever BORING NO.: IR84-DP70 SHEET 1 OF 1

Baker

Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation

PROJ. NO.: CTO-0219 BORING NO.: IR84-DP71

COORDINATES: EAST: 2494982.1039 NORTH: 361916.2681

ELEVATION: SURFACE: 3.61

Rig:	Hand Auger				Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
	Split Spoon	Casing	Augers	Macro Tube				
Size (ID)	3"				7/22/01	8"	hot, partly cloudy	4"
Length	8"							
Type	Bucket							
Hammer Wt.	NA							
Fall	NA							

Remarks: Wooded at edge of wetland

SAMPLE TYPE

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

DEFINITIONS

SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 3.61
	S-1	8"				Dark brown, very fine sand with silt	
1						W.T. @ 4"	
2						TD @ 8"	
3							
4							
5							
6							
7							
8							
9							
10							

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: E. Hanna

DRILLER: Lewis LeFever BORING NO.: IR84-DP71 SHEET 1 OF 1

Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: IR84-DP72
COORDINATES: EAST: 2495223.5072 NORTH: 361344.1377
ELEVATION: SURFACE: 17.10

Rig:	Hand Auger				Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
	Split Spoon	Casing	Augers	Macro Tube				
Size (ID)	3"				7/23/01	8"	partly cloudy, warm	--
Length	8"							
Type	Bucket							
Hammer Wt.	NA							
Fall	NA							

Remarks:

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 17.1
	S-1	8"				Very fine sand, grayish brown, trace silt with gravel	
1							
2						TD @ 8"	
3							
4							
5							
6							
7							
8							
9							
10							

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: E. Hanna
DRILLER: Lewis LeFever BORING NO.: IR84-DP72 SHEET 1 OF 1

Baker
Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: IR84-DP73
COORDINATES: EAST: 2495260.7049 NORTH: 361389.9503
ELEVATION: SURFACE: 16.45

Rig:	Hand Auger				Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
	Split Spoon	Casing	Augers	Macro Tube				
Size (ID)	3"				7/23/01	8"	partly cloudy, warm	--
Length	8"							
Type	Bucket							
Hammer Wt.	NA							
Fall	NA							

Remarks:

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 16.45
	S-1	8"				Very fine sand, grayish brown, trace silt with gravel	
1							
2						TD @ 8"	
3							
4							
5							
6							
7							
8							
9							
10							

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: E. Hanna
DRILLER: Lewis LeFever BORING NO.: IR84-DP73 SHEET 1 OF 1

Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: DP74
COORDINATES: EAST: 2495560.308 NORTH: 361331.3077
ELEVATION: SURFACE: 21.11

Rig:	Geoprobe				Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
	Split Spoon	Casing	Augers	Macro Tube				
Size (ID)	2"			2"	8/2/01	8'	sunny, high 80s	7
Length	24"			48"				
Type	SS			Acetate				
Hammer Wt.								
Fall								

Remarks:

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)		Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 21.11
1							Fine sand, trace silt, damp, brown	
2		M-1	2.7 68%		IR84-DP74-00	0.0 / 0.0	2.1	19.01
							Red bricks, some fine sand, damp, red 2.3	18.81
3							Fine sand, trace silt, damp, brown 2.5	18.61
4	4.0						Wood debris, sewer odor, black, moist	
							4.3	16.81
5							Red brick, some fine sand, moist, red 4.5	16.61
6		M-2	1.6 40%		IR84-DP74-04	0.0 / 0.0	Fine sand, trace silt, wet, brown	
7								
8	8.0						8.0	13.11
9							End of Boring = 8.0'	
10								

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: David D. Schilling
DRILLER: Louie LeFever BORING NO.: DP74 SHEET 1 OF 1

Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: DP74
COORDINATES: EAST: 2495560.308 NORTH: 361331.3077
ELEVATION: SURFACE: 21.11

Rig: Geoprobe	Split Spoon	Casing	Augers	Macro Tube	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)	2"			2"	8/2/01	8'	sunny, high 80s	7
Length	24"			48"				
Type	SS			Acetate				
Hammer Wt.								
Fall								

Remarks:

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)		Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 21.11
1							Fine sand, trace silt, damp, brown	
2		M-1	2.7 68%		IR84-DP74-00	0.0 0.0	2.1	19.01
							Red bricks, some fine sand, damp, red 2.3	18.81
3							Fine sand, trace silt, damp, brown 2.5	18.61
4	4.0						Wood debris, sewer odor, black, moist	
							4.3	16.81
5							Red brick, some fine sand, moist, red 4.5	16.61
6		M-2	1.6 40%		IR84-DP74-04	0.0 0.0	Fine sand, trace silt, wet, brown	
7								
8	8.0						8.0	13.11
9							End of Boring = 8.0'	
10								

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: David D. Schilling
DRILLER: Louie LeFever BORING NO.: DP74 SHEET 1 OF 1

Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: DP75
COORDINATES: EAST: 2495506.463 NORTH: 361317.9508
ELEVATION: SURFACE: 21.35

Rig:	Geoprobe							
	Split Spoon	Casing	Augers	Macro Tube	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)				2"	8/2/01	12'	Sunny high 80s	9
Length				48"				
Type				Acetate				
Hammer Wt.								
Fall								

Remarks:

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 21.35
1				IR84-DP75-00		Fine sand, trace silt, moist, brown	
2	M-1	2.7 67.5			0.0 0.0		
3							
4	4.0					4.0	17.35
5							
6	M-2	2.3 57.5			0.0 0.0		
7							
8	8.0					8.0	13.35
9						9.0	12.35
10 ▲	M-3	3.5 87.5		IR84-DP75-05	225 0.0	Fine sand, trace silt, wet, dark gray, petroleum odor 10.2 Wood debris, wet, petroleum odor	11.15

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: David D. Schilling
DRILLER: Louie LeFever BORING NO.: DP75 SHEET 1 OF 2

Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
CTO NO.: CTO-0219 BORING NO.: DP75

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 D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
ps/bg = point source/background

Depth (Ft.)		Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 10.85
11		M-3					Wood debris, wet, petroleum odor 11.3	10.05
12	12.0						Fine sand, trace silt, wet, dark brown, petroleum odor 12.0	9.35
13							End of Boring = 12.0'	
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30							Match to Sheet 3	

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: David D. Schilling
DRILLER: Louie LeFever BORING NO.: DP75 SHEET 2 OF 2

Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: DP76
COORDINATES: EAST: 2495499.483 NORTH: 361284.0629
ELEVATION: SURFACE: 22.18

Rig:	Geoprobe							
	Split Spoon	Casing	Augers	Macro Tube	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)				2"	8/2/01	8	Sunny high 80s	8
Length				48"				
Type				Acetate				
Hammer Wt.								
Fall								

Remarks:

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)		Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 22.18
1					IR84-DP76-00		Fine sand, some gravel, trace silt, damp brown	
2		M-1	2.9 72.5%			0.0 / 0.0		
3								
4	4.0						4.0	18.18
5							Fine sand, trace silt, moist, brown	
6		M-2	4 100.0%			0.0 / 0.0		
7					IR84-DP76-04		7.8	14.38
8	8.0						Fine sand, trace silt, wet, brown 8.0	14.18
9	▲						End of Boring = 8.0'	
10								

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: David D. Schilling
DRILLER: Louie LeFever BORING NO.: DP76 SHEET 1 OF 1

Baker
Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: DP77
COORDINATES: EAST: 2495094.324 NORTH: 361456.1753
ELEVATION: SURFACE: 10.25

Rig: Geoprobe	Split Spoon	Casing	Augers	Macro Tube	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)				2"	8/5/01	8	Partly cloudy 90's	5
Length				48"				
Type				Acetate				
Hammer Wt.								
Fall								

Remarks:

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 10.25
1–4	M-1	3.1 77.5%		IR84-DP77-00	0.0 / 0.0	Fine sand, trace silt, moist, brown	
4.0							6.25
4.9							5.35
5–8	M-2 ▲	3.6 90.0%		IR84-DP77-03	0.0 / 0.0	Fine sand, trace silt, wet, brown	
8.0							2.25
9–10						End of Boring = 8.0'	

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: David D. Schilling
DRILLER: Louie LeFever BORING NO.: DP77 SHEET 1 OF 1

Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: DP78
COORDINATES: EAST: 2495042.026 NORTH: 361486.7887
ELEVATION: SURFACE: 9.36

Rig:	Geoprobe							
	Split Spoon	Casing	Augers	Macro Tube	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)				2"	8/5/01	8	Partly cloudy 90's	6
Length				48"				
Type				Acetate				
Hammer Wt.								
Fall								

Remarks:

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 9.36
1				IR84-DP78-00		Fine sand, trace silt, moist, brown	
2	M-1	3.5 87.5%			0.0 / 0.0		
3							
4	4.0					4.0	5.36
5							
6	M-2	3.2 80.0%		IR84-DP78-03	0.0 / 0.0	5.7	3.66
7	▲					Fine sand, trace silt, wet, brown	
8	8.0					8.0	1.36
9						End of Boring = 8.0'	
10							

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: David D. Schilling
DRILLER: Louie LeFever BORING NO.: DP78 SHEET 1 OF 1

Baker
Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: DP79
COORDINATES: EAST: 2495046.772 NORTH: 361421.5646
ELEVATION: SURFACE: 10.26

Rig: Geoprobe	Split Spoon	Casing	Augers	Macro Tube	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)				2"	8/5/01	8	Partly cloudy 90's	4
Length				48"				
Type				Acetate				
Hammer Wt.								
Fall								

Remarks:

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)		Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 10.26
1					IR84-DP79-00		Fine sand, trace silt, moist, brown	
2		M-1	3.3 82.5%			0.0 0.0		
3							3.0	7.26
4	4.0				IR84-DP79-02 &02D		Fine sand, trace silt, wet, brown	
5	▲							
6		M-2	3.8 95.0%			0.0 0.0		
7								
8	8.0						8.0	2.26
9							End of Boring = 8.0'	
10								

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: David D. Schilling
DRILLER: Louie LeFever BORING NO.: DP79 SHEET 1 OF 1

Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: DP80
COORDINATES: EAST: 2495059.802 NORTH: 361345.5071
ELEVATION: SURFACE: 11.09

Rig:	Geoprobe				Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
	Split Spoon	Casing	Augers	Macro Tube				
Size (ID)				2"	8/5/01	8	Partly cloudy 90's	4
Length				48"				
Type				Acetate				
Hammer Wt.								
Fall								

Remarks:

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 11.09
1–3	M-1	3.6 90.0%		IR84-DP80-00	0.0 / 0.0	Fine sand, trace silt, moist, light brown	
3.4							7.69
4.0				IR84-DP80-02		Fine sand, trace silt, wet, light brown	7.09
5–7	M-2	3.4 85.0%			0.0 / 0.0		
8.0							3.09
9–10						End of Boring = 8.0'	

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: David D. Schilling
DRILLER: Louie LeFever BORING NO.: DP80 SHEET 1 OF 1

Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: DP81
COORDINATES: EAST: 2495281.652 NORTH: 361462.6635
ELEVATION: SURFACE: 15.16

Rig:	Geoprobe							
	Split Spoon	Casing	Augers	Macro Tube	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)				2"	8/5/01	12'	Partly cloudy 90's	8
Length				48"				
Type				Acetate				
Hammer Wt.								
Fall								

Remarks:

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 15.16
1				IR84-DP81-00		Fine sand, trace silt, damp, brown	
2	M-1	2.9 72.50%			0.0 / 0.0		
3							
4	4.0					4.0	11.16
5						Fine sand, trace silt, moist, brown	
6	M-2	3.4 85.00%			0.8 / 0.0		
7						6.7 Fine sand, trace silt, moist, black	8.46
8	8.0 ▲					8.0	7.16
9				IR84-DP81-04		Fine sand, trace silt, wet, black	
10	M-3	3.5 87.50%			3.5 / 0.0	Match to page 2	

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: David D. Schilling
DRILLER: Louie LeFever BORING NO.: DP81 SHEET 1 OF 2

Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
CTO NO.: CTO-0219 BORING NO.: DP81

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 D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
ps/bg = point source/background

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 4.66
11	M-3					Continued from page 1	
12 12.0							3.16
13						End of Boring = 12.0'	
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30						Match to Sheet 3	

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: David D. Schilling
DRILLER: Louie LeFever BORING NO.: DP81 SHEET 2 OF 2

Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: DP82
COORDINATES: EAST: NORTH:
ELEVATION: SURFACE:

Rig:	Geoprobe							
	Split Spoon	Casing	Augers	Macro Tube	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)				2"	8/5/01	12'	Partly cloudy 90's	8
Length				48"				
Type				Acetate				
Hammer Wt.								
Fall								

Remarks:

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)		Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL)
1					IR84-DP82-00		Fine sand, trace silt, trace gravel, moist, dark gray, petroleum odor	
2		M-1	3.2 80.00%			36.6 0.0		
3								
4	4.0						4.0	
5							Fine sand, trace silt, moist, brown	
6		M-2	4 100.0%			0.9 0.0		
7								
8	8.0						8.0	
9	▲				IR84-DP82-04		Fine sand, trace silt, wet, brown	
10		M-3	4 100.0%			32.7 0.0	Match to page 2	

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: David D. Schilling
DRILLER: Louie LeFever BORING NO.: DP82 SHEET 1 OF 2

Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
CTO NO.: CTO-0219 BORING NO.: DP82

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 D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
ps/bg = point source/background

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL)
11	M-3					Continued from page 1	
12 12.0							
13						End of Boring = 12.0'	
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30						Match to Sheet 3	

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: David D. Schilling
DRILLER: Louie LeFever BORING NO.: DP82 SHEET 2 OF 2

Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: DP83
COORDINATES: EAST: 2495240.116 NORTH: 361393.5959
ELEVATION: SURFACE: 16.08

Rig: Geoprobe	Split Spoon	Casing	Augers	Macro Tube	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)				2"	8/5/01	8	Partly cloudy 90's	6
Length				48"				
Type				Acetate				
Hammer Wt.								
Fall								

Remarks:

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 16.08
1–4	M-1	3.2 80.0%		IR84-DP83-00	0.0 / 0.0	Fine sand, trace silt, moist, brown, red brick and gravel fragments	12.08 (4.0)
5–6.5	M-2	3.4 85.0%		IR84-DP83-03	0.0 / 0.0	Fine sand, trace silt, moist, brown	9.58 (6.5)
7–8						Fine sand, trace silt, wet, brown	8.08 (8.0)
9–10						End of Boring = 8.0'	

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: David D. Schilling
DRILLER: Louie LeFever BORING NO.: DP83 SHEET 1 OF 1

Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: DP84
COORDINATES: EAST: 2494950.551 NORTH: 361926.4302
ELEVATION: SURFACE: 1.92

Rig:	Hand Driven							
	Split Spoon	Casing	Augers	Macro Tube	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)				2"	8/3/01	1	Sunny high 80s	1
Length				48"				
Type				Acetate				
Hammer Wt.								
Fall								

Remarks: Location was inaccessible by rig, and soil was soft, so acetate tube was hand driven

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)		Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 1.92
1	1.0	M-1	1 100.0%		IR84- DP84	0.0 0.0	Fine sand, trace silt, wet, dark brown 1.0	0.92
2	▲				-00		End of Boring = 1.0'	
3								
4								
5								
6								
7								
8								
9								
10								

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: David D. Schilling
DRILLER: Louie LeFever BORING NO.: DP84 SHEET 1 OF 1

Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: MW15
COORDINATES: EAST: 2495541.202 NORTH: 361295.9998
ELEVATION: SURFACE: 21.82

Rig:	Split Spoon	Casing	Augers	Core Barrel	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)	2"		3.25"		7/31/01	12'	Sunny mid 80s	7.5'
Length	24"		5'					
Type	SS		S					
Hammer Wt.	140lb		NA					
Fall	30"		NA					

Remarks:

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)		Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 21.82
1		S-1	2	4 4	84-		Fine sand, trace silt, damp, loose, brown	
			100%	5	MW15	0.0		
2	2.0			5	-00	0.0	2.0	19.82
3		S-2	0.8	5 5		0.0	Fine sand, trace silt, damp, loose, light brown	
			40%	5		0.0		
4	4.0			5			4.0	17.82
5		S-3	0.0	4 3		NA	No Recovery : spoon was wet and had strong petroleum odor when it was opened	
	▲		0%	3				
6	6.0			2			6.0	15.82
7		S-4	2.0	2 3	84-		Fine sand, trace silt, wet, very loose, black, petroleum product, strong petroleum odor	
			100%	3	MW15	513		
8	8.0			3	-04	0.0	8.0	13.82
9		S-5	0.8	2 2		330	Fine sand, trace silt, wet, very loose, black, strong petroleum odor	
			40%	2		0.0		
10	10.0			2			10.0	11.82
				3			Match to Sheet 2	

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: David D. Schilling
DRILLER: Louie LeFever BORING NO.: MW15 SHEET 1 OF 2

Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
CTO NO.: CTO-0219 BORING NO.: MW15

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 D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
ps/bg = point source/background

Depth (Ft.)		Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL)
11		S-6	2.0	4		330	Fine sand, trace silt, wet, loose, black, strong	
			100%	4		0.0	petroleum odor	
12	12.0			6			12.0	9.82
13							End of Boring = 12.0'	
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30							Match to Sheet 3	

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: David D. Schilling
DRILLER: Louie LeFever BORING NO.: MW15 SHEET 2 OF 2

Baker Environmental

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: MW16
COORDINATES: EAST: 2495466.451 NORTH: 361519.1496
ELEVATION: SURFACE: 20.13 TOP OF PVC CASING: 19.84

Rig:	Split Spoon	Casing	Augers	Core Barrel	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)	2"				7/31/01	20'	Sunny mid 80s	13.5'
Length	24"							
Type	SS							
Hammer Wt.	140Lbs							
Fall	30"							

Remarks:

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

WELL INFORMATION

Type	Diam.	Top Depth (Ft.)	Bottom Depth (Ft.)
Schedule 40 PVC casing	2"	20.13	10.13
Schedule 40 0.010" screen	2"	10.13	0.13

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Well Installation Detail	Elevation (Ft. MSL) 20.13
1	S-1	1.4	4	84-		Fine sand, trace silt, loose,		
			8	MW16	0.0	damp, brown		
		70.0%	8	0	0.0			
2			9				2.0	18.13
							sand	
3	S-2	1.1	4					
			6		0.0			
		55.0%	8		0.0			
4			9				4.0	16.13
							sand	
5	S-3	2.0	7					
			8		0.0		4.7	15.43
		100.0%	11		0.0	Fine sand, trace silt, damp,		
6			12			medium dense light tan	6.0	14.13
7	S-4	2.0	10					
			13		0.0		bentonite	
		100.0%	17		0.0		chips	
8			15				8.0	12.13
9	S-5	2.0	8					
			7		0.0		sand	
		100.0%	7		0.0			
10			9				10.0	10.13
			6			Match to Sheet 2	screen	

DRILLING CO.: Parratt Wolff Inc. BAKER REP.: David D. Schilling
DRILLER: Louie Lefever BORING NO.: MW16 SHEET 1 OF 2

Baker Environmental

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Site 84 field investigation
CTO NO.: CTO-0219 BORING NO.: MW16

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 D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
ps/bg = point source/background

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Well Installation Detail	Elevation (Ft. MSL) 9.63
11	S-6	1.4	7		0.0	Fine sand, trace silt, moist,		
		70.0%	6		0.0	medium dense, light tan	sand	
12			6			12.0		8.13
			5			Fine sand, trace silt, moist,		
13	S-7	1.8	3		0.0	loose, light tan		
		90.0%	3	84-	0.0	13.4		6.73
14	▲		2	MW16		Fine sand, trace silt, wet, 14.0		6.13
			5	-07		very loose, light gray 14.6		5.53
15	S-8	1.5	5		0.0	Fine sand, some clay, wet,		
		75.0%	13		0.0	loose, orangish brown		
16			13			Fine sand, trace silt, wet 16.0	sand	4.13
			12			medium dense, light gray		
17	S-9	2.0	13		0.0	Fine sand, trace clay, dense, wet		
		100.0%	14		0.0	orangish brown		
18			13			18.0		2.13
			3			Fine sand, trace silt, loose, wet		
19	S-10	1.2	1		0.0	orangish brown		
		60.0%	4		0.0			
20			8			20.0	sand	0.13
21						End of Boring = 20.0'		
22								
23								
24								
25								
26								
27								
28								
29								
30						Match to Sheet 3		

DRILLING CO.: Parratt Wolff Inc. BAKER REP.: David D. Schilling
DRILLER: Louie Lefever BORING NO.: MW16 SHEET 2 OF 2

Baker Environmental

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: MW17
COORDINATES: EAST: 2495308.643 NORTH: 361448.4669
ELEVATION: SURFACE: 16.53 TOP OF PVC CASING: 18.73

Rig:	Split Spoon	Casing	Augers	Core Barrel	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)	2"				7/31/01	17.5	Sunny mid 80s	8.5
Length	24"							
Type	SS							
Hammer Wt.	140Lbs							
Fall	30"							

Remarks:

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

WELL INFORMATION

Type	Diam.	Top Depth (Ft.)	Bottom Depth (Ft.)
Schedule 40 PVC casing	2"	20.13	10.13
Schedule 40 0.010" screen	2"	10.13	0.13

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Well Installation Detail	Elevation (Ft. MSL) 16.53
1	S-1	1.6	2	84-	0.0	Fine sand, trace silt, damp, loose		
2		80.0%	3 3 4	MW17 -00 84-	0.0	brown, coal fragments	concrete	14.53
3	S-2	0.9	4 3	MW17 -02	0.0	Fine sand, trace silt, wet, very loose, brown	Bentonite chips	14.23
4		45.0%	3 3		0.0			12.53
5	S-3	2.0	2 2		0.0	Fine sand, trace silt, wet, very loose, orangish brown		
6		100.0%	3 3		0.0			10.53
7	S-4	1.1	3 3		0.0	Fine sand, trace silt, moist, loose, orangish brown	sand	
8		55.0%	5 5		0.0			8.53
9	S-5	1.7	3 3		0.0		sand	
10	▲	85.0%	4 5		0.0			6.93
			6			Fine sand, trace silt, wet, loose, orangish brown	screen	6.53

DRILLING CO.: Parratt Wolff Inc. BAKER REP.: David D. Schilling
DRILLER: Louie Lefever BORING NO.: MW17 SHEET 1 OF 2

Baker Environmental

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Site 84 field investigation
CTO NO.: CTO-0219 BORING NO.: MW17

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 D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
ps/bg = point source/background

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Well Installation Detail	Elevation (Ft. MSL) 6.03
11	S-6	1.1	6		0.0	Fine sand, trace silt, wet, loose,		
		55.0%	6		0.0	orangish brown, to tan	sand	
12			7			12.0		4.53
			7					
13	S-7	2.0	7		80.2	13.0		3.53
		100.0%	7	84-	0.0	Fine sand, little silt, wet, loose	screen	
14			9	MW17		tan, petroleum odor 14.0		2.53
			5	-07		Fine sand, trace silt, wet, loose,		
15	S-8	2.0	5		153.0	gray		
		100.0%	5		0.0			
16			5			16.0	sand	0.53
17	AN					17.5		-0.97
18						End of Boring = 17.5'		
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30						Match to Sheet 3		

DRILLING CO.: Parratt Wolff Inc. BAKER REP.: David D. Schilling
DRILLER: Louie Lefever BORING NO.: MW17 SHEET 2 OF 2

Baker Environmental

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: MW18
COORDINATES: EAST: 2495589.981 NORTH: 361204.2411
ELEVATION: SURFACE: 22.75 TOP OF PVC CASING: 22.56

Rig:	Split Spoon	Casing	Augers	Core Barrel	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)	2"		6.25"		8/1/01	15.0	Sunny mid 80s	8.0
Length	24"		5'					
Type	SS		S					
Hammer Wt.	140Lbs							
Fall	30"							

Remarks:

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

WELL INFORMATION

Type	Diam.	Top Depth (Ft.)	Bottom Depth (Ft.)
Schedule 40 PVC casing	2"	22.56	17.56
Schedule 40 0.010" screen	2"	17.56	7.56

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Well Installation Detail	Elevation (Ft. MSL) 22.75
1	S-1	1.6	11	84-		Fine sand, trace silt, medium		
			13	MW18	0.0	dense, damp, brown		
		80.0%	12	-00	0.0			
2			12				2.0 Bentonite	20.75
			8				chips	
3	S-2	1	10		0.0			
		50.0%	12		0.0		sand	
4			7				4.0	18.75
			5			Fine sand, trace silt, damp,		
5	S-3	0.8	2		0.0	loose, brown	4.7 screen	18.05
		40.0%	2		0.0	Fine sand, trace silt, wet,		
6			3			very loose, dark brown	6.0	16.75
			4			Fine sand, some silt, moist,	sand	
7	S-4	1.5	4		0.0	loose, gray		
		75.0%	4		0.0			
8			5	84-			8.0	14.75
	▲		12	MW18		Fine sand, trace silt, wet,	8.3	14.45
9	S-5	1.2	13	-04	0.0	loose, light gray	sand	
		60.0%	18		0.0	Fine sand, trace silt, wet, loose		
10			17			orangish brown	10.0	12.75
			2				screen	

DRILLING CO.: Parratt Wolff Inc. BAKER REP.: David D. Schilling
DRILLER: Louie Lefever BORING NO.: MW18 SHEET 1 OF 2

Baker Environmental

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Site 84 field investigation
CTO NO.: CTO-0219 BORING NO.: MW18

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 D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
ps/bg = point source/background

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Well Installation Detail	Elevation (Ft. MSL) 12.25
11	S-6	1.7	4		0.0	Fine sand, trace silt, wet, loose, 11.1		11.65
		85.0%	6		0.0	orangish brown	sand	
12			10			Fine sand, trace silt, loose 12.0		10.75
			6			wet, light gray		
13	S-7	1.7	6		0.0	Fine sand trace silt, loose		
		85.0%	6		0.0	wet, light brown 13.3	screen	9.45
14			2			Fine sand, trace silt, wet, 14.0		8.75
						very loose, gray		
15	AN					15.0	sand	7.75
16						End of Boring = 15.0'		
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30						Match to Sheet 3		

DRILLING CO.: Parratt Wolff Inc. BAKER REP.: David D. Schilling
DRILLER: Louie Lefever BORING NO.: MW18 SHEET 2 OF 2

Baker Environmental

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: MW19
COORDINATES: EAST: 2495250.629 NORTH: 361296.4235
ELEVATION: SURFACE: 18.26 TOP OF PVC CASING: 18.00

Rig:	Split Spoon	Casing	Augers	Core Barrel	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)	2"		6.25"		8/1/01	19.0	Sunny mid 80s	12.0
Length	24"		5'					
Type	SS		S					
Hammer Wt.	140Lbs							
Fall	30"							

Remarks:

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

WELL INFORMATION

Type	Diam.	Top Depth (Ft.)	Bottom Depth (Ft.)
Schedule 40 PVC casing	2"	18.00	9.00
Schedule 40 0.010" screen	2"	9.00	-1.00

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Well Installation Detail	Elevation (Ft. MSL) 18.26
1	S-1	1.3	12	84-		Fine sand, trace silt, damp,		
2		65.0%	20 26 30	MW19 -00	0.0 0.0	dense, brown, gravel fragments	sand	16.26
3	S-2	1.1	12			Fine sand, trace silt, damp,		
4		55.0%	16 16 15		0.0 0.0	medium dense, orangish brown	sand	14.26
5	S-3	0.9	3 3		0.0	Fine sand, trace silt, moist, loose, orangish brown		
6		45.0%	3 3		0.0		Bentonite chips	12.26
7	S-4	1.6	4 3		0.0			
8		80.0%	3 3		0.0			10.26
9	S-5	1.2	3 4		0.0		sand	
10		60.0%	4 6		0.0			8.26
			3				screen	

DRILLING CO.: Parratt Wolff Inc. BAKER REP.: David D. Schilling
DRILLER: Louie Lefever BORING NO.: MW19 SHEET 1 OF 2

Baker Environmental

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Site 84 field investigation
CTO NO.: CTO-0219 BORING NO.: MW19

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 D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
ps/bg = point source/background

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Well Installation Detail	Elevation (Ft. MSL) 7.76
11	S-6	1.6	5		0.0	Fine sand, trace silt, moist,		
		80.0%	10		0.0	medium dense, orangish brown	sand	
12			15	84-		12.0		6.26
			10	MW19		Fine sand, trace silt, wet, medium		
13	S-7	1.2	16	-06	0.0	dense, orangish brown 12.9		5.36
		60.0%	20		0.0	Fine sand, trace silt, wet, dense	screen	
14			23			gray 14.0		4.26
			7			Fine sand, trace silt, wet, loose		
15	S-8	1.4	7		0.0	gray, orange staining		
		70.0%	12		0.0		sand	
16			11			16.0		2.26
			8					
17	S-9	1.8	8		0.0			
		90.0%	8		0.0			
18			4			18.0		0.26
							sand	
19	AN					19.0		-0.74
20						End of Boring = 19.0		
21								
22								
23								
24								
25								
26								
27								
28								
29								
30						Match to Sheet 3		

DRILLING CO.: Parratt Wolff Inc. BAKER REP.: David D. Schilling
DRILLER: Louie Lefever BORING NO.: MW19 SHEET 2 OF 2

Baker Environmental

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: MW20
COORDINATES: EAST: 2495130.973 NORTH: 361583.9157
ELEVATION: SURFACE: 8.61 TOP OF PVC CASING: 11.41

Rig:	Split Spoon	Casing	Augers	Core Barrel	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)	2"		6.25"		8/1/01	12.0	Sunny mid 80s	2.0
Length	24"		5'					
Type	SS		S					
Hammer Wt.	140Lbs							
Fall	30"							

Remarks:

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

WELL INFORMATION

Type	Diam.	Top Depth (Ft.)	Bottom Depth (Ft.)
Schedule 40 PVC casing	2"	11.41	6.61
Schedule 40 0.010" screen	2"	6.61	-3.39

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Well Installation Detail	Elevation (Ft. MSL) 8.61
1	S-1	1.7	2 2	84-MW20	0.5	Fine sand, trace silt, moist, loose brown	Bentonite Chips	
		85.0%	5 7	-00 & -00D	0.0		1.5	7.11
2						Fine sand, trace silt, wet, loose dark gray	2.0	6.61
3	S-2	0.8	7 7		0.2	Fine sand trace silt, wet, loose gray	sand	
		40.0%	7 6		0.0		4.0	4.61
5	S-3	0.8	1 1		1.0	Fine sand, trace silt, wet, very loose, gray	screen	
		40.0%	2 6		0.0		sand 6.0	2.61
7	S-4	1.8	5 6		0.2	Fine sand, trace silt, wet, loose, brown		
		90.0%	6 6		0.0		screen 8.0	0.61
9	S-5	2.0	4 4		0.0	Fine sand, trace silt, wet, loose, grayish brown	sand	
		100.0%	4 4		0.0		10.0	-1.39
			4				screen	

DRILLING CO.: Parratt Wolff Inc. BAKER REP.: David D. Schilling
DRILLER: Louie Lefever BORING NO.: MW20 SHEET 1 OF 2

Baker Environmental

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Site 84 field investigation
CTO NO.: CTO-0219 BORING NO.: MW20

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 D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
ps/bg = point source/background

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Well Installation Detail	Elevation (Ft. MSL) -1.89
11	S-6	1.9	5		0.0	Fine sand, trace silt, wet,		
		95.0%	4		0.0	loose, grayish brown	sand	
12			3			12.0		-3.39
13						End of Boring = 12.0		
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30						Match to Sheet 3		

DRILLING CO.: Parratt Wolff Inc. BAKER REP.: David D. Schilling
DRILLER: Louie Lefever BORING NO.: MW20 SHEET 2 OF 2

Baker Environmental

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: MW21
COORDINATES: EAST: 2495406.375 NORTH: 361257.5801
ELEVATION: SURFACE: 21.44 TOP OF PVC CASING: 21.05

Rig:	Split Spoon	Casing	Augers	Core Barrel	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)	2"		6.25"		8/2/01	15.0	Sunny mid 80s	7.0
Length	24"		5'					
Type	SS		S					
Hammer Wt.	140Lbs							
Fall	30"							

Remarks:

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

WELL INFORMATION

Type	Diam.	Top Depth (Ft.)	Bottom Depth (Ft.)
Schedule 40 PVC casing	2"	21.05	16.05
Schedule 40 0.010" screen	2"	16.05	6.05

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Well Installation Detail	Elevation (Ft. MSL) 21.44
1	S-1	1.1	2		0.0	Fine sand, trace silt, damp, loose gray		
2		55.0%	5 12 11		0.0		Bentonite chips	19.44
3	S-2	1.6	7 8		0.0			
4		80.0%	8 7		0.0			17.44
5	S-3	1.5	4 5		0.0	Fine sand, trace silt, moist, loose grayish brown	sand	
6		75.0%	4 4		0.0			15.44
7	S-4	1.5	2 1		0.0	Fine sand, trace silt, moist, very loose, light brown	screen	15.04
8	▲	75.0%	2 2	84-	0.0	Fine sand, trace silt, wet, very loose, black		13.44
9	S-5	1.0	27 36	MW21 -04	0.0	Fine sand and gravel, trace silt, wet, very dense, reddish brown	sand	
10		50.0%	31 31		0.0			11.44
			4				screen	

DRILLING CO.: Parratt Wolff Inc. BAKER REP.: David D. Schilling
DRILLER: Louie Lefever BORING NO.: MW21 SHEET 1 OF 2

Baker Environmental

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Site 84 field investigation
CTO NO.: CTO-0219 BORING NO.: MW21

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 D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
ps/bg = point source/background

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Well Installation Detail	Elevation (Ft. MSL) 10.94
11	S-6	2.0	10		2.2	Fine sand, trace silt, wet,		
		100.0%	16		0.0	medium dense, dark brown	sand	
12			16			12.0		9.44
			10			Fine sand, trace silt, wet,		
13	S-7	1.6	11		0.0	medium dense, brown	screen	
		80.0%	12		0.0			
14			8			14.0		7.44
							sand	
15	AN					15.0		6.44
16						End of Boring = 15.0'		
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30						Match to Sheet 3		

DRILLING CO.: Parratt Wolff Inc. BAKER REP.: David D. Schilling
DRILLER: Louie Lefever BORING NO.: MW21 SHEET 2 OF 2

Baker Environmental

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: MW22
COORDINATES: EAST: 2495374.167 NORTH: 361413.6927
ELEVATION: SURFACE: 19.91 TOP OF PVC CASING: 19.52

Rig:	Split Spoon	Casing	Augers	Core Barrel	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)	2"		6.25"		8/3/01	22.0	Sunny mid 80s	15.0
Length	24"		5'					
Type	SS		S					
Hammer Wt.	140Lbs							
Fall	30"							

Remarks:

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

WELL INFORMATION

Type	Diam.	Top Depth (Ft.)	Bottom Depth (Ft.)
Schedule 40 PVC casing	2"	19.52	7.52
Schedule 40 0.010" screen	2"	7.52	-2.48

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Well Installation Detail	Elevation (Ft. MSL) 19.91
1	S-1	0.4	4		0.0	Fine sand, trace silt, damp, loose		
		20.0%	3		0.0	brown, red brick fragments		
2			4					
			4			2.0	casing	17.91
3	S-2	0.9	4		0.0	Fine sand, trace silt, moist, loose	sand	
		45.0%	4		0.0	brown		
4			3					
			4	84-		4.0		15.91
5	S-3	1.7	4	MW22		Fine sand, trace silt, wet, loose,	casing	
			3	-02	0.0	brown	sand	
		85.0%	4		0.0			
6			6			6.0		13.91
7	S-4	0.8	8			Fine sand, trace silt, moist,	casing	
			10		0.0	medium dense, marbled white &	sand	
		40.0%	10		0.0	brown		
8			11			8.0		11.91
			6			Fine sand, trace silt, moist 8.2	bentonite	11.71
9	S-5	1.2	10		0.0	medium dense, brown	chips	
		60.0%	13		0.0	Fine sand, trace silt, wet		
10			21			medium dense, brown 10.0		9.91
			10				sand	

DRILLING CO.: Parratt Wolff Inc. BAKER REP.: David D. Schilling
DRILLER: Louie Lefever BORING NO.: MW22 SHEET 1 OF 2

Baker Environmental

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Site 84 field investigation
CTO NO.: CTO-0219 BORING NO.: MW22

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 D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
ps/bg = point source/background

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Well Installation Detail	Elevation (Ft. MSL) 9.41
11	S-6	1.8	12		0.0	Fine sand, trace silt, moist,		
		90.0%	17		0.0	medium dense, light gray	sand	
12			20			12.0		7.91
			12			Fine sand, trace silt, moist,		
13	S-7	1.3	15		0.0	medium dense, light gray,	screen	
		65.0%	16		0.0	orange staining		
14			19			14.0		5.91
			9			14.4	sand	5.51
15	S-8	1.3	13		0.0	Fine sand, trace silt, wet,		
	▲	65.0%	16		0.0	medium dense, orangish brown,		
16			14			orange staining 16.0	screen	3.91
			6			Fine sand, trace silt, wet,		
17	S-9	1.6	6		0.0	medium dense, orangish brown		
		80.0%	11		0.0			
18			18			18.0		1.91
			4				sand	
19	S-10	1.2	8		0.0			
		60.0%	8		0.0			
20			4			20.0		-0.09
21	AN						screen	
22						22.0		-2.09
						End of Boring = 22.0'		
23								
24								
25								
26								
27								
28								
29								
30						Match to Sheet 3		

DRILLING CO.: Parratt Wolff Inc. BAKER REP.: David D. Schilling
DRILLER: Louie Lefever BORING NO.: MW22 SHEET 2 OF 2

Baker Environmental

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: MW23
COORDINATES: EAST: 2494960.047 NORTH: 361951.2888
ELEVATION: SURFACE: 5.34 TOP OF PVC CASING: 8.52

Rig: Tripod	Split Spoon	Casing	Augers	Core Barrel	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)	2"	3"	6.25"		8/3/01	12.0	Sunny mid 80s	4.0
Length	24"	4'	5'					
Type	SS	S	S					
Hammer Wt.	140Lbs	140Lbs						
Fall	30"	30"						

Remarks: A tripod was used to istall MW23

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

WELL INFORMATION

Type	Diam.	Top Depth (Ft.)	Bottom Depth (Ft.)
Schedule 40 PVC casing	2"	8.52	3.34
Schedule 40 0.010" screen	2"	3.34	-6.66

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Well Installation Detail	Elevation (Ft. MSL) 5.34
1	S-1	0	3 4		0.0			
2		0.0%	3 6	84-	0.0		2.0 sand	3.34
3	S-2	0.6	4 4	MW23 -01	0.0	Fine sand, trace silt, moist, loose, dark gray		
4		30.0%	5 5		0.0		4.0	1.34
5	S-3	1.3	4 3		3.5	Fine sand, trace silt, wet, loose dark gray, petroleum odor	sand	
6		65.0%	3 6		0.0		6.0	-0.66
7	MN						screen	
8								
9							sand	
10	MN						screen	

DRILLING CO.: Parratt Wolff Inc. BAKER REP.: David D. Schilling
DRILLER: Louie Lefever BORING NO.: MW23 SHEET 1 OF 2

Baker Environmental

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Site 84 field investigation
CTO NO.: CTO-0219 BORING NO.: MW23

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
ps/bg = point source/background

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Well Installation Detail	Elevation (Ft. MSL) -5.16
11	MN						sand	
12						12.0		-6.66
13						End of Macro Core = 12.0'		
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30						Match to Sheet 3		

DRILLING CO.: Parratt Wolff Inc. BAKER REP.: David D. Schilling
DRILLER: Louie Lefever BORING NO.: MW23 SHEET 2 OF 2

Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: SB01
COORDINATES: EAST: 2495403.418 NORTH: 361254.0209
ELEVATION: SURFACE: 21.31

Rig:	Split Spoon	Casing	Augers	Macro Tube	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)	2"			2"	8/2/01	6'	Cloudy high 80s	NA
Length	24"			48"				
Type	SS			Acetate				
Hammer Wt.								
Fall								

Remarks:

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)		Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 21.31
1		S-1	1.4 70%			0.0 / 0.0	Fine sand, trace silt, moist, dark brown, wood fragments	
2	2.0						2.0	19.31
3							Fine sand, trace silt, moist, brown	
4		M-1	3.4 85%		IR84-SB01-02	0.0 / 0.0		
5								
6	6.0						6.0	15.31
7							End of Boring = 6.0'	
8								
9								
10								

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: David D. Schilling
DRILLER: Louie LeFever BORING NO.: SB01 SHEET 1 OF 1

Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: SB02
COORDINATES: EAST: 2495404.290 NORTH: 361260.3094
ELEVATION: SURFACE: 21.44

Rig:	Split Spoon	Casing	Augers	Macro Tube	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)	2"			2"	8/2/01	6'	Cloudy high 80s	NA
Length	24"			48"				
Type	SS			Acetate				
Hammer Wt.								
Fall								

Remarks:

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)		Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 21.44
1		S-1	1.6 80%			0.0 0.0	Fine sand, trace silt, concrete fragments, damp,dark brown 1.0	20.44
2	2.0						Fine sand, trace silt, moist, brown 2.0	19.44
3		M-1	4.0 100%		IR84-SB02-02	0.0 0.0	Fine sand, trace silt, moist, brown	
4								
5								
6	6.0						6.0	15.44
7							End of Boring = 6.0'	
8								
9								
10								

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: David D. Schilling
DRILLER: Louie LeFever BORING NO.: SB02 SHEET 1 OF 1

Baker
Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: SB03
COORDINATES: EAST: 2495409.313 NORTH: 361261.1316
ELEVATION: SURFACE: 21.55

Rig:	Split Spoon	Casing	Augers	Macro Tube	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)	2"			2"	8/2/01	6'	Cloudy high 80s	NA
Length	24"			48"				
Type	SS			Acetate				
Hammer Wt.								
Fall								

Remarks:

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)		Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 21.55
1		S-1	1.7 85%			0.0 0.0	Fine sand,trace silt, trace fine gravel,damp, gray	
2	2.0						concrete 2.0	19.55
3		M-1	1.1 28%		IR84-SB03-02	0.0 0.0	Fine sand, trace silt, damp, gray 3.0	18.55
4							concrete 3.1	18.45
5								
6	6.0						6.0	15.55
7							Macro Tube Refusal @ 3.1'	
8								
9								
10								

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: David D. Schilling
DRILLER: Louie LeFever BORING NO.: SB03 SHEET 1 OF 1

Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: SB04
COORDINATES: EAST: 2495409.094 NORTH: 361256.1613
ELEVATION: SURFACE: 21.46

Rig:	Split Spoon	Casing	Augers	Macro Tube	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)	2"			2"	8/2/01	6'	Cloudy high 80s	NA
Length	24"			48"				
Type	SS			Acetate				
Hammer Wt.								
Fall								

Remarks:

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)		Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 21.46
1		S-1	2.0 100%			0.0 0.0	Fine sand, trace silt, moist, dark brown, red brick	
							1.3	20.16
2	2.0						Fine sand, trace silt, moist, brown 2.0	19.46
3		M-1	3.1 78%		IR84-SB04-02	0.0 0.0	Fine sand, trace silt, moist, brown	
4								
5								
6	6.0						6.0	15.46
7							End of Boring = 6.0'	
8								
9								
10								

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: David D. Schilling
DRILLER: Louie LeFever BORING NO.: SB04 SHEET 1 OF 1

Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: SB05
COORDINATES: EAST: 2495377.042 NORTH: 361411.3618
ELEVATION: SURFACE: 19.91

Rig:	Split Spoon	Casing	Augers	Macro Tube	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)			3"		8/3/01	2.5'	sunny, high 80s	NA
Length			12"					
Type			SS					
Hammer Wt.								
Fall								

Remarks:

SAMPLE TYPE
S = Split Spoon HA = Hand Auger
T = Shelby Tube W = Wash
R = Air Rotary C = Core
D = Denison M = Macro Tube
N = No Sample

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 19.91
1–2	HA - 1	2.5 100%		IR84-SB05-01 MS MSD	0.0 / 0.0	Fine sand, trace silt, moist, brown	
						2.5	17.41
3–10						End of Boring = 2.5'	

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: David D. Schilling
DRILLER: Louie LeFever BORING NO.: SB05 SHEET 1 OF 1

Baker
Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: SB06
COORDINATES: EAST: 2495370.618 NORTH: 361411.4487
ELEVATION: SURFACE: 19.94

Rig:	Split Spoon	Casing	Augers	Macro Tube	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)	2"			2"	8/2/01	4'	sunny, high 80s	NA
Length	24"			48"				
Type	SS			Acetate				
Hammer Wt.								
Fall								

Remarks:

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 19.94
1 2 3 4 4.0	M-1	3.1 78%		IR84-SB06-01 & IR84-SB06-01D	0.0 0.0	Fine sand, trace silt, moist, brown 4.0	15.94
5 6 7 8 9 10						End of Boring = 4.0'	

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: David D. Schilling
DRILLER: Louie LeFever BORING NO.: SB06 SHEET 1 OF 1

Baker
Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: SB07
COORDINATES: EAST: 2495370.348 NORTH: 361416.33
ELEVATION: SURFACE: 19.78

Rig:	Split Spoon	Casing	Augers	Macro Tube	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)	2"			2"	8/2/01	4'	sunny, high 80s	NA
Length	24"			48"				
Type	SS			Acetate				
Hammer Wt.								
Fall								

Remarks:

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

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)		Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 19.78
1							Fine sand, trace silt, moist, brown	
2		M-1	2.9 73%		IR84-SB07-01	0.0 / 0.0		
3								
4	4.0						4.0	15.78
5							End of Boring = 4.0'	
6								
7								
8								
9								
10								

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: David D. Schilling
DRILLER: Louie LeFever BORING NO.: SB07 SHEET 1 OF 1

Baker Environmental

TEST BORING RECORD

PROJECT: Site 84 field investigation
PROJ. NO.: CTO-0219 BORING NO.: SB08
COORDINATES: EAST: 2495375.097 NORTH: 361416.6665
ELEVATION: SURFACE: 19.77

Rig:	Split Spoon	Casing	Augers	Macro Tube	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)	2"			2"	8/2/01	4'	sunny, high 80s	NA
Length	24"			48"				
Type	SS			Acetate				
Hammer Wt.								
Fall								

Remarks:

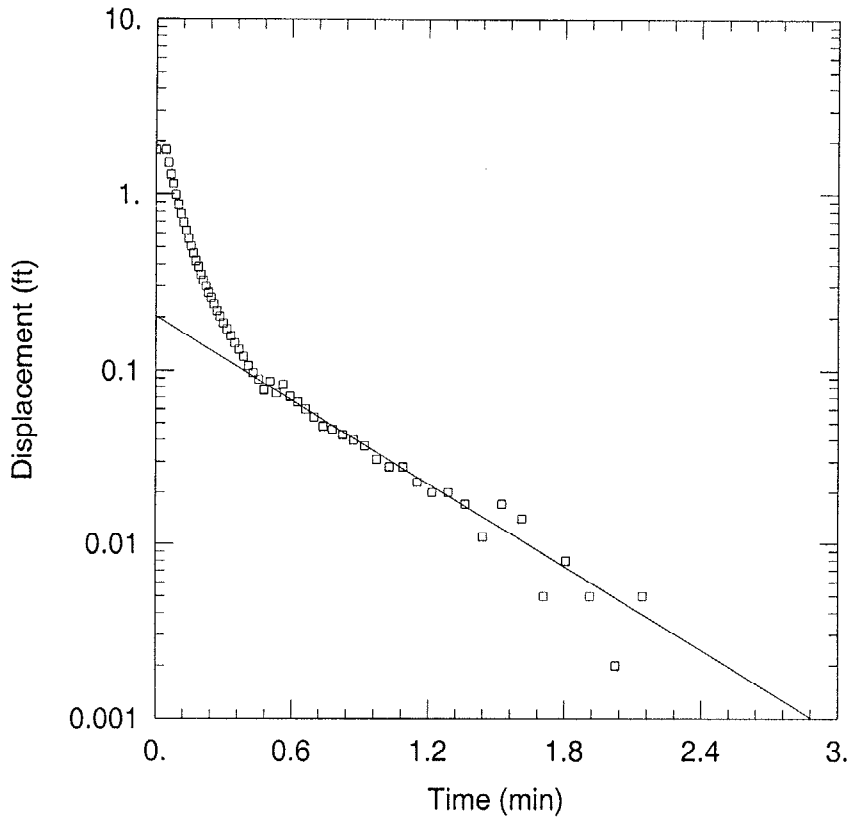
SAMPLE TYPE
S = Split Spoon A = Auger
T = Shelby Tube W = Wash
R = Air Rotary C = Core
D = Denison M = Macro Tube
N = No Sample

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL) 19.77
1						Fine sand, trace silt, moist, brown	
2		M-1	3.2 80%	IR84-SB08-01	0.0 / 0.0		
3							
4	4.0					4.0	19.77
5						End of Boring = 4.0'	
6							
7							
8							
9							
10							

DRILLING COMPANY: Parratt Wolff Inc. BAKER REP.: David D. Schilling
DRILLER: Louie LeFever BORING NO.: SB08 SHEET 1 OF 1

APPENDIX C
SLUG TEST DATA AND GROUNDWATER VELOCITY CALCULATIONS



WELL TEST ANALYSIS

Data Set: C:\SITE84~1\MW07R.AQT
Date: 12/11/01 Time: 13:02:25

PROJECT INFORMATION

Company: Baker Environmental, Inc.
Client: LANTDIV
Project: 26007-219-0000-184ZZ
Test Location: Camp Lejeune - Site 84
Test Well: MW07 (Rising Head Test)
Test Date: August 7, 2001

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 11.2 ft/day
y0 = 0.204 ft

AQUIFER DATA

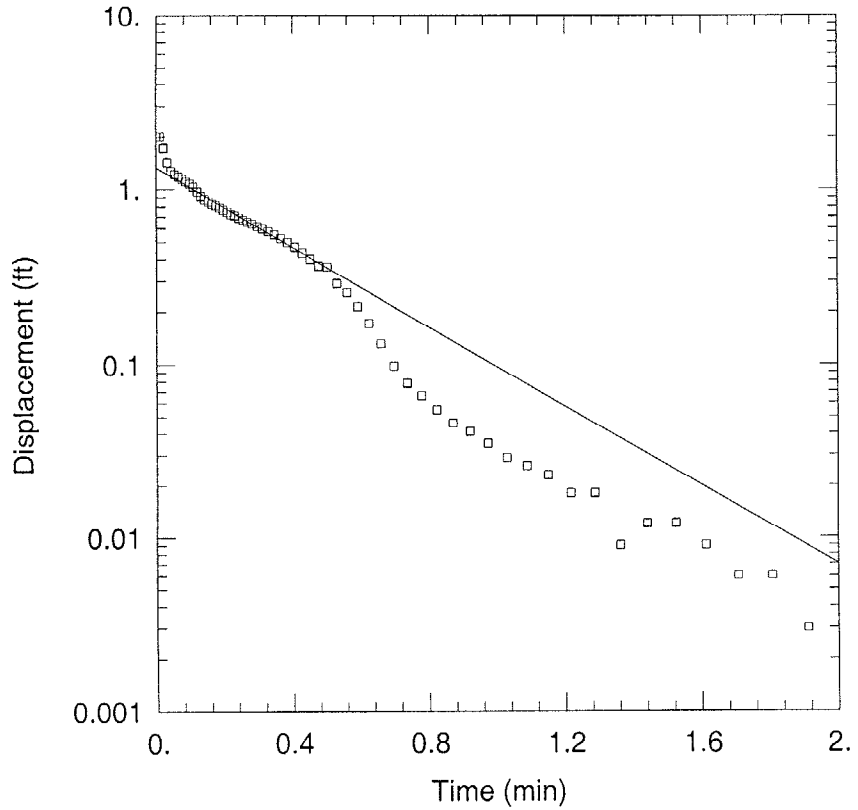
Saturated Thickness: 40. ft

Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Initial Displacement: 1.792 ft
Casing Radius: 0.083 ft
Screen Length: 10. ft

Water Column Height: 10. ft
Wellbore Radius: 0.34 ft
Gravel Pack Porosity: 0.3



WELL TEST ANALYSIS

Data Set: C:\SITE84~1\MW09R.AQT
Date: 12/11/01 Time: 13:01:36

PROJECT INFORMATION

Company: Baker Environmental, Inc.
Client: LANTDIV
Project: 26007-219-0000-184ZZ
Test Location: Camp Lejeune - Site 84
Test Well: MW09 (Rising Head Test)
Test Date: August 7, 2001

SOLUTION

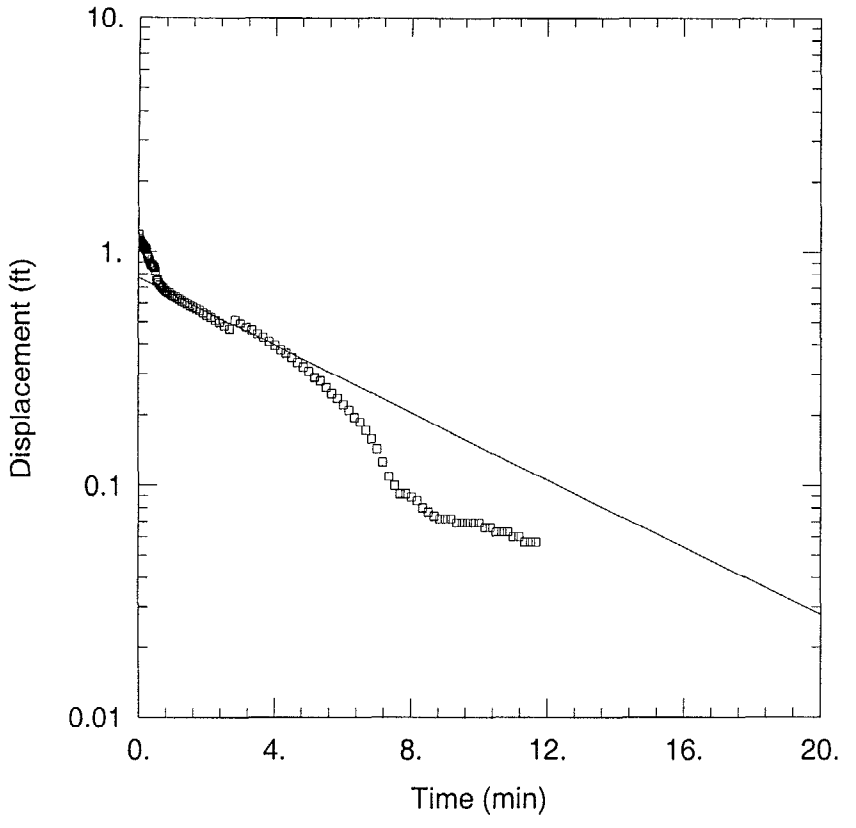
Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 15.96 ft/day
y0 = 1.339 ft

AQUIFER DATA

Saturated Thickness: 40. ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Initial Displacement: 2.009 ft
Casing Radius: 0.083 ft
Screen Length: 10. ft
Water Column Height: 10. ft
Wellbore Radius: 0.34 ft
Gravel Pack Porosity: 0.3



WELL TEST ANALYSIS

Data Set: C:\SITE84~1\MW16R.AQT
Date: 12/11/01 Time: 13:03:54

PROJECT INFORMATION

Company: Baker Environmental Inc.
Client: LANTDIV
Project: 26007-219-0000-184ZZ
Test Location: Camp Lejeune - Site 84
Test Well: MW16 (Rising head test)
Test Date: August 7, 2001

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 1.01 ft/day
y0 = 0.7725 ft

AQUIFER DATA

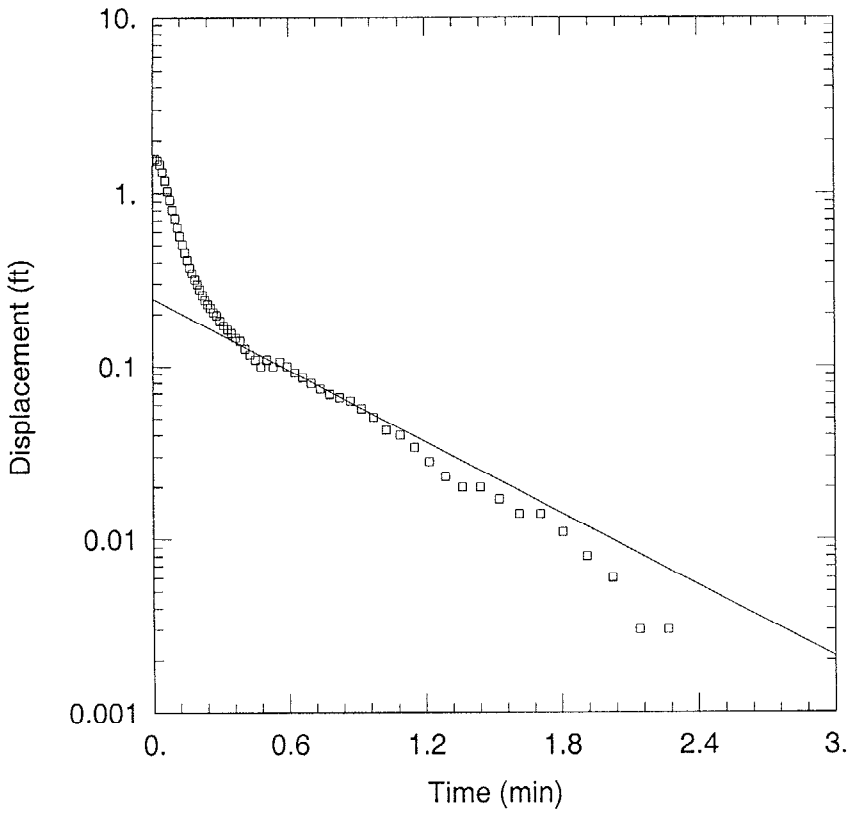
Saturated Thickness: 40. ft

Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Initial Displacement: 1.177 ft
Casing Radius: 0.083 ft
Screen Length: 10. ft

Water Column Height: 10. ft
Wellbore Radius: 0.34 ft
Gravel Pack Porosity: 0.3



WELL TEST ANALYSIS

Data Set: C:\SITE84~1\MW17R.AQT
Date: 12/11/01 Time: 13:05:04

PROJECT INFORMATION

Company: Baker Environmental, Inc.
Client: LANTDIV
Project: 26007-219-0000-184ZZ
Test Location: Camp Lejeune - Site 84
Test Well: MW17 (Rising Head Test)
Test Date: August 7, 2001

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 9.649 ft/day
y0 = 0.2464 ft

AQUIFER DATA

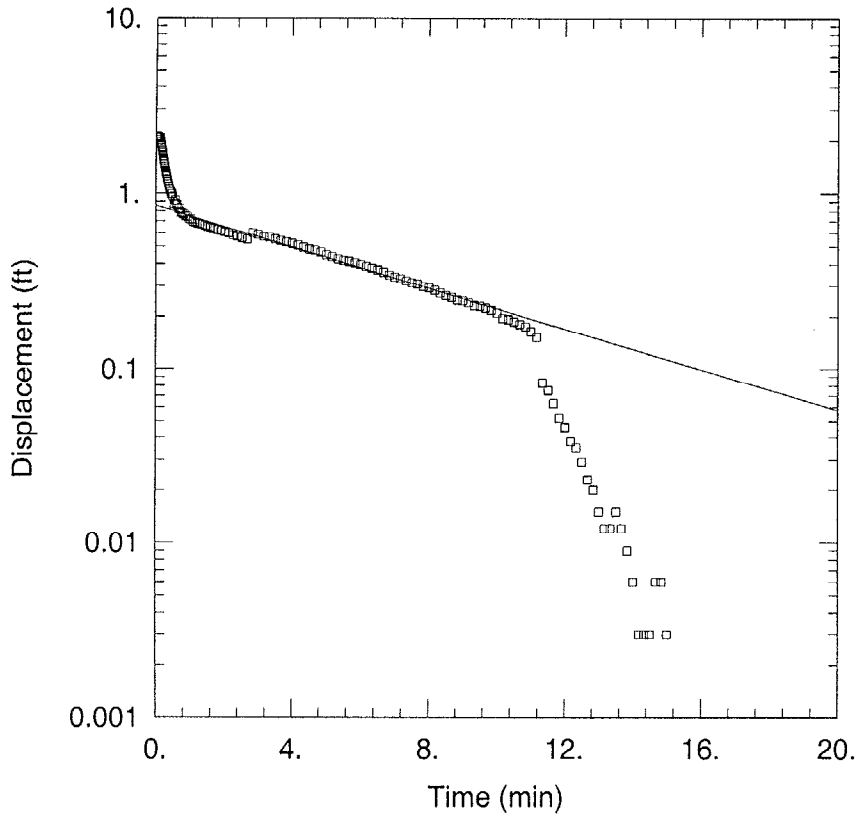
Saturated Thickness: 40. ft

Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Initial Displacement: 1.572 ft
Casing Radius: 0.083 ft
Screen Length: 10. ft

Water Column Height: 10. ft
Wellbore Radius: 0.34 ft
Gravel Pack Porosity: 0.3



WELL TEST ANALYSIS

Data Set: C:\SITE84~1\MW18R.AQT
Date: 12/11/01 Time: 13:06:05

PROJECT INFORMATION

Company: Baker Environmental, Inc.
Client: LANTDIV
Project: 26007-219-0000-184ZZ
Test Location: Camp Lejeune - Site 84
Test Well: MW18 (Rising Head Test)
Test Date: August 7, 2001

SOLUTION

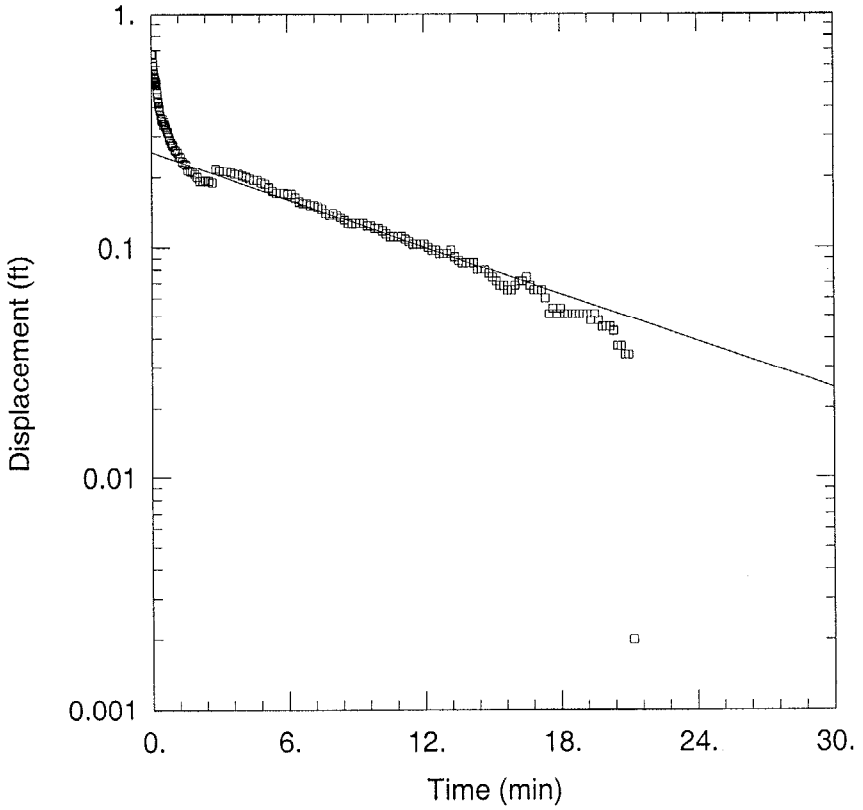
Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 0.8202 ft/day
y0 = 0.857 ft

AQUIFER DATA

Saturated Thickness: 40. ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Initial Displacement: 2.118 ft
Casing Radius: 0.083 ft
Screen Length: 10. ft
Water Column Height: 10. ft
Wellbore Radius: 0.34 ft
Gravel Pack Porosity: 0.3



WELL TEST ANALYSIS

Data Set: C:\SITE84~1\MW19R.AQT
Date: 12/11/01 Time: 13:08:58

PROJECT INFORMATION

Company: Baker Environmental, Inc.
Client: LANTDIV
Project: 26007-219-0000-184ZZ
Test Location: Camp Lejeune - Site 84
Test Well: MW19 (Rising Head Test)
Test Date: August 7, 2001

SOLUTION

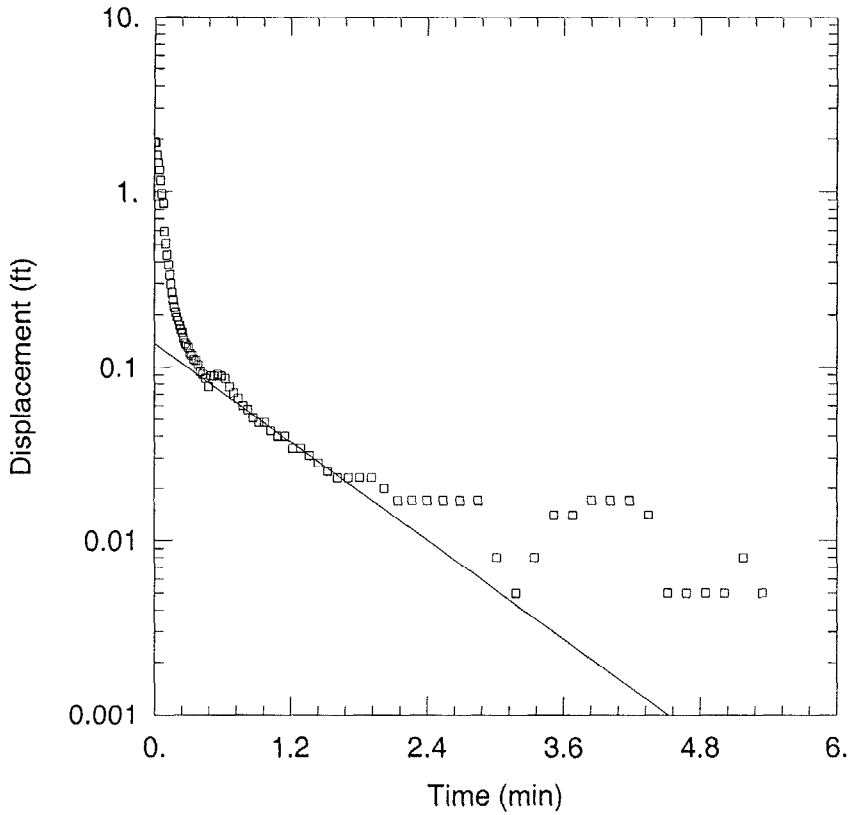
Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 0.4757 ft/day
y0 = 0.2563 ft

AQUIFER DATA

Saturated Thickness: 40. ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Initial Displacement: 0.67 ft
Casing Radius: 0.083 ft
Screen Length: 10. ft
Water Column Height: 10. ft
Wellbore Radius: 0.34 ft
Gravel Pack Porosity: 0.3



WELL TEST ANALYSIS

Data Set: C:\SITE84~1\MW20R.AQT
Date: 12/11/01 Time: 13:10:11

PROJECT INFORMATION

Company: Baker Environmental, Inc.
Client: LANTDIV
Project: 26007-219-0000-184ZZ
Test Location: Camp Lejeune - Site 84
Test Well: MW20 (Rising Head Test)
Test Date: August 7, 2001

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

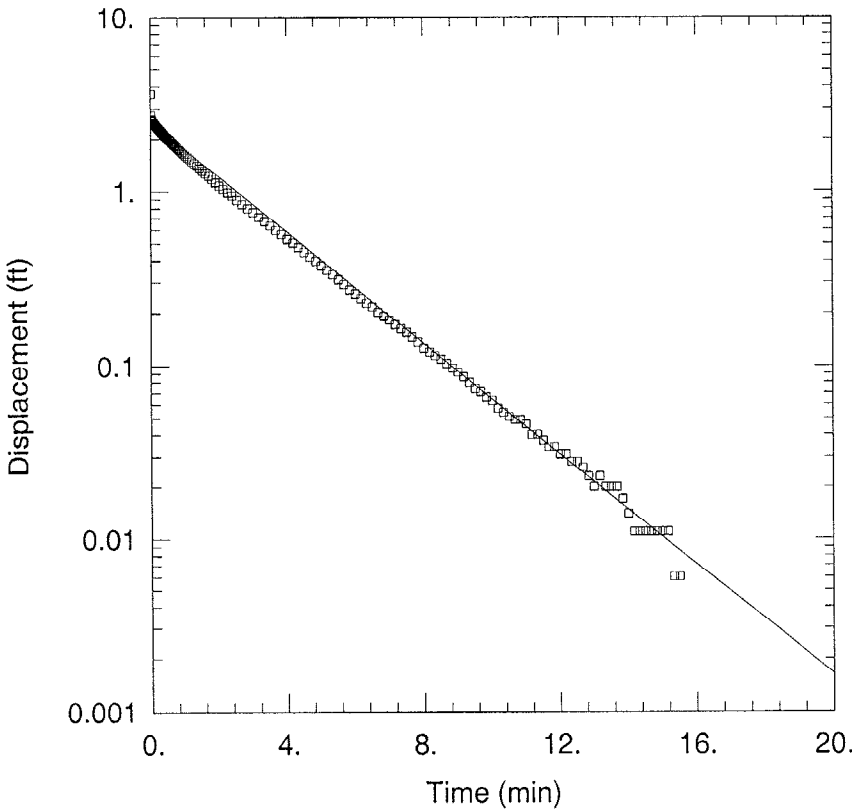
K = 6.614 ft/day
y0 = 0.137 ft

AQUIFER DATA

Saturated Thickness: 40. ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Initial Displacement: 1.914 ft
Casing Radius: 0.083 ft
Screen Length: 10. ft
Water Column Height: 10. ft
Wellbore Radius: 0.34 ft
Gravel Pack Porosity: 0.3



WELL TEST ANALYSIS

Data Set: C:\SITE84~1\MW23R.AQT
Date: 12/11/01 Time: 13:11:14

PROJECT INFORMATION

Company: Baker Environmental, Inc.
Client: LANTDIV
Project: 26007-219-0000-184ZZ
Test Location: Camp Lejeune - Site 84
Test Well: MW23 (Rising Head Test)
Test Date: August 7, 2001

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 2.234 ft/day
y0 = 2.552 ft

AQUIFER DATA

Saturated Thickness: 40. ft

Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Initial Displacement: 3.633 ft
Casing Radius: 0.083 ft
Screen Length: 10. ft

Water Column Height: 10. ft
Wellbore Radius: 0.34 ft
Gravel Pack Porosity: 0.3

S.O. No. 26007-219

Subject: Site 84 Velocity Calculations

Baker

Sheet No. ____ of ____

Drawing No. ____

Computed by DMG Checked By ____ Date 12/7/01

Building 45 Vicinity

Gradient between Wells, MW-18 + MW-22 = 0.034

Average Hydraulic Cond. between Wells, MW18, MW19, MW16

MW18 - 0.8202
MW19 - 0.4757
MW16 - 1.01
Avg. - 0.769

$$V = \frac{0.034 \times 0.769}{0.20 \text{ (effective porosity)}} = 0.131 \text{ ft./day}$$

Area West of Building 45

Gradient between Wells MW22 + MW20 = 0.005

Average Hydraulic Cond. between Wells MW17 + MW20

MW17 - 9.649
MW20 - 6.614
Avg. - 8.13

$$V = \frac{0.005 \times 8.13}{0.20} = 0.2 \text{ ft./day}$$

26007-219-01

Chain of Custody Record

SEVERN TRENT SERVICES — Severn Trent Laboratories,

STL-4124 (1200)

Client: BAKER ENVIRONMENTAL	Project Manager: JEFF TEPSIC (FOR MICHELLE JOY)	Date: 7/20/01	Chain of Custody Number: 075733
Address: 420 ROUSER RD AOP 3	Telephone Number (Area Code)/Fax Number: (710) 887-5209 (412) 269-6000	Lab Number:	Page 1 of 1
City: CORAOPOLIS; State: PA; Zip Code: 15108	Site Contact: HEATHER GOVERNOR	Lab Contact: DAVE HEARN	
Project Name and Location (State): SITE 84 CAMP LEJEUNE N.C.	Carrier/Waybill Number:		
Contract/Purchase Order/Quote No.: 26007-219-0000			

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Aqueous	Sed.	Soil	Containers & Preservatives: Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Analysis: FC Bs	Special Instructions/ Conditions of Receipt
✓ IR84-ER01 (Split Spoon rinsate)	7/17/01	0836		X			X						X	extract + hold (FB)
✓ IR84-FB01 (FB from DI water)	7/17/01	0830		X			X						X	extract + hold
✓ IR84-FB02 (FB Drillers Water)	7/16/01	0843		X			X						X	extract + hold
✓ IR84-ER02 (Acetate Sleeve rinsate)	7/18/01	0720		X			X						X	extract + hold. (HC) and
✓ IR84-ER03 (Metal spoons rinsate)	7/19/01	0705		X			X						X	extract + analyze

Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☒ Unknown

Sample Disposal: ☐ Return To Client ☐ Disposal By Lab ☒ Archive For 1 Months (A fee may be assessed if samples are retained longer than 3 months)

Turn Around Time Required: ☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☐ 14 Days ☐ 21 Days ☐ Other Standard

QC Requirements (Specify):

	Date	Time		Date	Time
1. Relinquished By: Heather Governor	7-19-01	1600 h	1. Received By		
2. Relinquished By			2. Received By		
3. Relinquished By			3. Received By		

Comments:

DISTRIBUTION: WHITE - Stays with the Sample; CANARY - Returned to Client with Report; PINK - Field Copy

[redacted] 260007-219-002a

Chain of Custody Record

SEVERN TRENT SERVICES — Severn Trent Laboratories, Inc.

STL-4124 (1200)

Client	Project Manager (MAIL TO: Michelle Joy)	Date	Chain of Custody Number
BAKER Environmental	JEFF TEPSIC	7-23-01	075736
Address	**Telephone Number (Area Code)/Fax Number**	**Lab Number**	**Page 1 of 1**
420 Rouser Rd AOP #3	(910) 389-3209 (412) 269-6000		
City / State / Zip Code	**Site Contact / Lab Contact**		
CORAOPOLIS PA 15108	HEATHER GOVENDER / Dave Henkin		
Project Name and Location (State)	**Carrier/Waybill Number**		
SITE 84 CAMP LEJEUNE, NC			
Contract/Purchase Order/Quote No.			
260007-219-0000			

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Aqueous	Sed.	Soil	Containers & Preservatives: Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Analysis: PCBs	BNA	PCBs/Pest	HERB	METALS	VOC	Special Instructions/ Conditions of Receipt
✓IR84-ER04 (split spoon rinsate)	7-20-01	0910		X			X						X (3)						extract + hold
✓IR84-FB03 (DI water)	7-21-01	0745		X			X							X	X	X			
✓IR84-FB04 (Drillers Down Water)	7-21-01	0730		X			X							X	X	X			
✓IR84-ER05 (split spoon rinsate)	7-21-01	0730		X			X							X	X (3)	X (3)			
✓IR84-FB03	7-21-01	0745		X						X								X	
✓IR84-FB04	7-21-01	0730		X						X								X	
✓IR84-ER05	7-21-01	0730		X						X								X	
✓IR84-FB03	7-21-01	0745		X					X								X		
✓IR84-FB04	7-21-01	0730		X					X								X		
✓IR84-ER05	7-21-01	0730		X					X								X		
✓Trip Blanks				X						X								X	

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months (A fee may be assessed if samples are retained longer than 3 months)

Turn Around Time Required
☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☐ 14 Days ☐ 21 Days ☐ Other_____

QC Requirements (Specify)

1. Relinquished By	Date	Time	1. Received By	Date	Time
[redacted]	7/23/01				
2. Relinquished By	Date	Time	2. Received By	Date	Time
3. Relinquished By	Date	Time	3. Received By	Date	Time

Comments

DISTRIBUTION: WHITE - Stays with the Sample; CANARY - Returned to Client with Report; PINK - Field Copy

Chain of Custody Record

26KV7-219-03a

SEVERN TRENT SERVICES — Severn Trent Laboratories, Inc.

STL-4124 (1200)

Client	Project Manager	Date	Chain of Custody Number
Baker Environmental	Jeff Tepsic (Mail results to Attn of Michelle Joy)	7-24-01	076047
Address	**Telephone Number (Area Code)/Fax Number**	**Lab Number**	**Page** 1 of 2
420 Rouser Rd AOP 3	(910) 389-3209 (412) 269-6000		
City / State / Zip Code	**Site Contact**	**Lab Contact**	
Coraopolis PA 15108	Heather Governor	Dave Hoakin	
Project Name and Location (State)	**Carrier/Waybill Number**		
Baker Site 84, Camp Lejeune, N. C.	FedEx / 8185-4453-5118		
Contract/Purchase Order/Quote No.			
26007-219-0000			

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Aqueous	Sed.	Soil	Containers & Preservatives: Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Analysis: PCBs	BNA	PCB/PEST	HERB	METALS	VOC	VOC/GRO	BNA, PEST, PCB, DRO, (N), METALS	Special Instructions/ Conditions of Receipt
✓IR84-ER06 (Acetate Sleeve)	7.22.01	1000		X			X						X								extract + analyze
✓IR84-DP45-00	7.21.01	0845				X	X												X	X	
✓IR84-DP45-03		0850				X	X												X	X	
✓IR84-DP46-00		0730				X	X												X	X	
✓IR84-DP46-02		0730				X	X												X	X	
✓IR84-DP47-00		0735				X	X												X	X	
✓IR84-DP47-01		0740				X	X												X	X	
✓IR84-DP48-00		0955				X	X												X	X	
✓IR84-DP49-00		1010				X	X												X	X	
✓IR84-DP49-01		1012				X	X												X	X	
✓IR84-DP50-00		1028				X	X												X	X	
✓IR84-DP50-01		1030				X	X												X	X	

Possible Hazard Identification

☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal

☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months (A fee may be assessed if samples are retained longer than 3 months)

Turn Around Time Required

☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☐ 14 Days ☐ 21 Days ☐ Other _____

QC Requirements (Specify)

1. Relinquished By	Date	Time	1. Received By	Date	Time
Heather Governor	7/24/01				
2. Relinquished By	Date	Time	2. Received By	Date	Time
3. Relinquished By	Date	Time	3. Received By	Date	Time

Comments

DISTRIBUTION: WHITE - Stays with the Sample; CANARY - Returned to Client with Report; PINK - Field Copy

[redacted] 26007-219-0300

Chain of Custody Record

SEVERN TRENT SERVICES

Severn Trent Laboratories, Inc.

STL-4124 (1200)

Client: Baker Environmental	Project Manager: Jeff Tepsic (mail data to Michelle Joy)	Date: 7-24-01	Chain of Custody Number: 076052
Address: 420 Rouser Rd AOP 3	Telephone Number (Area Code)/Fax Number: (910) 389-3207, (412) 269-6000	Lab Number:	Page 2 of 2
City: Coraopolis; State: PA; Zip Code: 15108	Site Contact: Heather Governor; Lab Contact: Dave Heakin		
Project Name and Location (State): Baker Site 84, Camp Lejeune, N.C.	Carrier/Waybill Number: Fed Ex / 8185-4453-8118		
Contract/Purchase Order/Quote No.: 26007-219-0000			

Matrix / Containers & Preservatives

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Air	Aqueous	Sed.	Soil	Unpres.	H2SO4	HNOS	HCl	NaOH	ZnAc/NaOH	VOC, GRO	BNA, PEST, PCB, DRO, CN, METALS	Herb	PCB, Pest	PCB	VOCs	Special Instructions/ Conditions of Receipt
✓ IR84-DP51-00	7.21.01	1043				X	X						X	X					
✓ IR84-DP51-01	↓	1045				X	X						X	X					
✓ IR84-DP52-00	↓	1055				X	X						X	X					
✓ IR84-DP52-01	↓	1100				X	X						X	X					
✓ IR84-DP53-00	↓	1130				X	X						X	X					
✓ IR84-DP54-00	↓	1140				X	X						X	X					
✓ IR84-DP55-00	7.21.01	1150				X	X						X	X					
✓ IR84-ER05	7.21.01	0730		X			X								X	X			These were missing from the 7-23-01 delivery
✓ IR84-ER04 (split spoon ringsate)	7.20.01	0910		X			X										X		extract and hold (ER04)
✓ IR84-TB02	7.16.01	0600		X						X								X	

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

Sample Disposal: ☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months (A fee may be assessed if samples are retained longer than 3 months)

Turn Around Time Required: ☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☐ 14 Days ☐ 21 Days ☐ Other _____

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished By: Heather Governor 7/24/01			1. Received By		
2. Relinquished By			2. Received By		
3. Relinquished By			3. Received By		

Comments

DISTRIBUTION: WHITE - Stays with the Sample; CANARY - Returned to Client with Report; PINK - Field Copy

[redacted] [redacted] 26007-219-0404

Chain of Custody Record

SEVERN TRENT SERVICES — Severn Trent Laboratories, Inc.

STL-4124 (1200)

Client: Baker Environmental	Project Manager: Jeff Tepsic (To: Michelle Jay)	Date: 7-24-01	Chain of Custody Number: 076050
Address: 420 Rouser Rd. AOP #3	Telephone Number (Area Code)/Fax Number: (412) 399-3209 ↓ (412) 269-6000	Lab Number:	Page 1 of 3
City: Coraopolis / State: PA / Zip Code: 15108	Site Contact: Heather Governo	Lab Contact: Dave Heakin	
Project Name and Location (State): Site 84 Camp Lejeune NC	Carrier/Waybill Number: FedEx		
Contract/Purchase Order/Quote No.: 26007-219-0000			

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Aqueous	Sed.	Soil	Containers & Preservatives: Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Analysis: PCBs	Grain Size	TOC	Special Instructions/ Conditions of Receipt
✓IR84-ER07	7-23-01	0715		X			X						X			
✓IR84-TP01A	7-23-01	1145				X	X						X			
✓IR84-TP01B	7-23-01	1145				X	X						X			
✓IR84-TP02A	7-23-01	1145				X	X						X			
✓IR84-TP02B	7-23-01	1145				X	X						X			
✓IR84-TP03A	7-23-01	1200				X	X						X			
✓IR84-TP03B	7-23-01	1200				X	X						X			
✓IR84-DP06-00 (*)	7-17-01	1611				X	X						X			
✓IR84-DP18-00	7-19-01	0702				X	X						X			
✓IR84-DP18-02	7-19-01	0756				X	X						X			
✓IR84-DP20-00	7-19-01	0831				X	X						X			
✓IR84-DP36-00	7-20-01	1112				X	X						X	X	X	

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☒ Unknown

Sample Disposal
☐ Return To Client ☐ Disposal By Lab ☒ Archive For 1 Months (A fee may be assessed if samples are retained longer than 3 months)

Turn Around Time Required
☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☐ 14 Days ☐ 21 Days ☐ Other standard

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished By: Heather Governo	7-24-01	1630	1. Received By		
2. Relinquished By			2. Received By		
3. Relinquished By			3. Received By		

Comments: * Please do 7 day Turn Around on these samples

DISTRIBUTION: WHITE - Stays with the Sample; CANARY - Returned to Client with Report; PINK - Field Copy

26007-219-0116

Chain of Custody Record

SEVERN TRENT SERVICES

Severn Trent Laboratories, Inc.

STL-4124 (1200)

Client	Project Manager	Date	Chain of Custody Number
Baker Environmental	Jeff Tepsic / Michelle Toyr	7.24.01	076051
Address	**Telephone Number (Area Code)/Fax Number**	**Lab Number**	**Page** 2 **of** 3
420 Rouser Rd Ave #3	(412) 261-3201 (412) 261-6000		

City	State	Zip Code	Site Contact	Lab Contact
Coraopolis	PA	15108	Heather Governor	Dave Heakin

Project Name and Location (State)	Carrier/Waybill Number
Site 84 Camp Lejeune N.C.	FedEx /

Contract/Purchase Order/Quote No.: 26007-219-0000

Analysis (Attach list if more space is needed)

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Aqueous	Sed.	Soil	Containers & Preservatives: Unpres.	H2SO4	HNOS	HCl	NaOH	ZnAc/NaOH	PCBs	VOC, GRO	BNA, PEST, PCB, DRU, CH, Metals	Special Instructions/ Conditions of Receipt
✓1R84-DP37-00 (*)	7.20.01	1335				X	X						X			*
✓1R84-DP22-00	7.19.01	1000				X	X						X			
✓1R84-DP22-00D	7.19.01	1036				X	X						X			
✓1R84-DP33-00	7.20.01	1000				X	X						X			
✓1R84-DP27-00	7.19.01	1254				X	X						X			
✓1R84-DP29-00	7.19.01	1315				X	X						X			
✓1R84-DP15-03	7.18.01	1429				X	X							X	X	
✓1R84-DP65-00	7.22.01	1224				X	X						X			
✓1R84-DP63-00	7.22.01	1200				X	X						X			
✓1R84-DP65-02	7.22.01	1228				X	X						X			
✓1R84-DP63-01	7.22.01	1205				X	X						X			
✓1R84-DP41-00	7.20.01	1545				X	X						X			

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

Sample Disposal: ☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months (A fee may be assessed if samples are retained longer than 3 months)

Turn Around Time Required: ☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☐ 14 Days ☐ 21 Days ☐ Other_____

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished By: Heather Governor 7.24.01		1630	1. Received By		
2. Relinquished By			2. Received By		
3. Relinquished By			3. Received By		

Comments: * Please do 7 day turn around on these samples

DISTRIBUTION: WHITE - Stays with the Sample; CANARY - Returned to Client with Report; PINK - Field Copy

[redacted] 26007-219-04 c

Chain of Custody Record

SEVERN TRENT SERVICES

Severn Trent Laboratories, Inc.

STL-4124 (1200)

Client: Baker Environmental	Project Manager: [illegible]	Date: 7.24.01	Chain of Custody Number: 076048
Address: 420 Rouser Rd ACP3	Telephone Number (Area Code)/Fax Number: [illegible]	Lab Number:	Page 3 of 3
City: Coraopolis; State: PA; Zip Code: 15108	Site Contact: Heather [illegible]; Lab Contact: [illegible]		
Project Name and Location (State): Site 54, Camp Lejeune, N.C.	Carrier/Waybill Number: [illegible]		
Contract/Purchase Order/Quote No.:			

Analysis (Attach list if more space is needed)

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Aqueous	Sed.	Soil	Containers & Preservatives: Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	PCBs	Special Instructions/ Conditions of Receipt
✓IR84-DP41-00 MS	7.20.01	1514				X	X						X	
✓IR84-DP41-00MSD	7.20.01	1514				X	X						X	
✓IR84-DP42-00	7.20.01	1610				X	X						X	
✓IR84-DP42-00D	7.20.01	1610				X	X						X	
✓IR84-DP71-00 (*)	7.22.01	1525				X	X						X	*
✓IR84-DP71-00MS	7.22.01	1525				X	X						X	
✓IR84-DP71-00MSD	7.22.01	1525				X	X						X	
✓IR84-DP69-00 (*)	7.22.01	1505				X	X						X	*
~~IR84-DP65-02~~	~~7.22.01~~	~~1228~~												
✓IR84-DP69-00D	7.22.01	1505				X	X						X	

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

Sample Disposal: ☐ Return To Client ☐ Disposal By Lab ☐ Archive For ____ Months (A fee may be assessed if samples are retained longer than 3 months)

Turn Around Time Required: ☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☐ 14 Days ☐ 21 Days ☐ Other ____

QC Requirements (Specify):

	Date	Time		Date	Time
1. Relinquished By: [signature]	7.24.01	1630	1. Received By		
2. Relinquished By			2. Received By		
3. Relinquished By			3. Received By		

Comments: * Please do 7 day turn around on these samples

DISTRIBUTION: WHITE - Stays with the Sample; CANARY - Returned to Client with Report; PINK - Field Copy

Serial Number 015564

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

26007-219-01A

Savannah Laboratories
a division of Severn Trent Laboratories, Inc.

5102 LaRoche Avenue, Savannah, GA 31404 — Phone: (912) 354-7858 — Fax: (912) 352-0165
2846 Industrial Plaza Drive, Tallahassee, FL 32301 — Phone: (850) 878-3994 — Fax: (850) 878-9504
900 Lakeside Drive, Mobile, AL 36693 — Phone: (334) 666-6633 — Fax: (334) 666-6696
6712 Benjamin Rd., Suite 100, Tampa, FL 33634 — Phone: (813) 885-7427 — Fax: (813) 885-7049

PROJECT REFERENCE	PROJECT NO.	PROJECT LOCATION (STATE)
Site 84	26007-219-0000	N. C.
STL (LAB) PROJECT MANAGER	P.O. NUMBER	CONTRACT NO.
CLIENT (SITE) PM	CLIENT PHONE	CLIENT FAX
~~D. Schaffner~~ Jeff Tepsic	412 269-6000	412-269-2002
CLIENT NAME	CLIENT EMAIL	
Baker Env. Inc.		
CLIENT ADDRESS		
420 Rouser Rd Coraopolis PA 15108		
COMPANY CONTRACTING THIS WORK (if applicable):		
MCB Camp Lejeune		

PAGE 1 OF 1

STANDARD REPORT DELIVERY ○ DATE DUE _____

EXPEDITED REPORT DELIVERY (SURCHARGE) ○ DATE DUE _____

NUMBER OF COOLERS SUBMITTED PER SHIPMENT:

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	COMPOSITE (C) OR GRAB (G) INDICATE	MATRIX TYPE: AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID (OIL, SOLVENT, ETC)	PCBs	VPH	VOCs	SVOCs	Pesticides	Herbicides	TAL metals	EPH	REMARKS
7/31/01	0730	84-MW15-00	6					X	X	X	X	X	X	X	X	
	0810	84-MW15-04	6					X	X	X	X	X	X	X	X	
	0930	84-MW16-00	G					X								
	1000	84-MW16-07	G					X								
	1325	84-MW17-00	6					X	X	X	X	X	X	X	X	
	1435	84-MW17-07	6					X	X	X	X	X	X	X	X	
	1700	84-TB03		X						X						2-40ml VOAs
	~~1655~~ 1655	84-ER08		X				X	X	X	X	X	X	X	X	2-40ml, 2-1L Amber, 1-500 ml plast
		Temp. Blank														

NUMBER OF CONTAINERS SUBMITTED

PRESERVATIVE

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
EMPTY CONTAINERS				7/31/01	1800			
RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
EMPTY CONTAINERS								

LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT	CUSTODY SEAL NO.	STL-SL LOG NO.	LABORATORY REMARKS:
			YES NO			

Serial Number 015558

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

26007-219-02A

Savannah Laboratories
a division of Severn Trent Laboratories, Inc.

5102 LaRoche Avenue, Savannah, GA 31404 Phone: (912) 354-7858 Fax: (912) 352-0165
2846 Industrial Plaza Drive, Tallahassee, FL 32301 Phone: (850) 878-3994 Fax: (850) 878-9504
900 Lakeside Drive, Mobile, AL 36693 Phone: (334) 666-6633 Fax: (334) 666-6696
6712 Benjamin Rd., Suite 100, Tampa, FL 33634 Phone: (813) 885-7427 Fax: (813) 885-7049

PROJECT REFERENCE: Site 84
PROJECT NO.: 26007-219-0000
PROJECT LOCATION (STATE): N.C.
PAGE 1 OF 1
STL (LAB) PROJECT MANAGER:
P.O. NUMBER:
CONTRACT NO.:
CLIENT (SITE) PM: Jeff Tepsic
CLIENT PHONE: 412 269-6000
CLIENT FAX: 412-269-2002
CLIENT NAME: Baker Env. Inc.
CLIENT EMAIL:
CLIENT ADDRESS: 420 Rouser Rd Coraopolis PA 15108
COMPANY CONTRACTING THIS WORK (if applicable): MCB Camp Lejeune

STANDARD REPORT DELIVERY ○ DATE DUE_____
EXPEDITED REPORT DELIVERY (SURCHARGE) ○ DATE DUE_____
NUMBER OF COOLERS SUBMITTED PER SHIPMENT:

MATRIX TYPE: COMPOSITE (C) OR GRAB (G) INDICATE; AQUEOUS (WATER); SOLID OR SEMISOLID; AIR; NONAQUEOUS LIQUID (OIL, SOLVENT, ETC)

REQUIRED ANALYSES / NUMBER OF CONTAINERS SUBMITTED

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	COMPOSITE (C) OR GRAB (G) INDICATE	AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID (OIL, SOLVENT, ETC)	PCBs	VPH	VOCs	SVOCs	Pesticides	Herbicides	TAL metals	EPH			REMARKS
8/1/01	—	IR84-TB04		2						X								2 40ml Voa vials (HCL)
	1400	IR84-FB05		9				X	X	X	X	X	X	X	X			3 1L Amber, 1 1L Amber (HCL) 1 500ml plastic (Nitric) 4 40ml Vials
	1300	IR84-MW20-00		5				X	X	X	X	X	X	X	X			3 ENCORE 2 8oz Glass
	1300	IR84-MW20-00D		5				X	X	X	X	X	X	X	X			" "
	1010	IR84-MW19-06		1				X										1 8oz Glass
	0938	IR84-MW19-00		1				X										" "
	0736	IR84-MW18-04		1				X										" "
	0710	IR84-MW18-00		1				X										" "
	1530	IR84-ER09		9				X	X	X	X	X	X	X	X			

PRESERVATIVE

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
EMPTY CONTAINERS								
RECEIVED BY: (SIGNATURE)	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**
EMPTY CONTAINERS								

LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT YES NO	CUSTODY SEAL NO.	STL-SL LOG NO.	LABORATORY REMARKS:

CLIENTS FIELD COPY

Serial Number 010000

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

STL Savannah Laboratories
a division of Severn Trent Laboratories, Inc.

○ 5102 LaRoche Avenue, Savannah, GA 31404 Phone: (912) 354-7858 Fax: (912) 352-0165
○ 2846 Industrial Plaza Drive, Tallahassee, FL 32301 Phone: (850) 878-3994 Fax: (850) 878-9504
○ 900 Lakeside Drive, Mobile, AL 36693 Phone: (334) 666-6633 Fax: (334) 666-6696
○ 6712 Benjamin Rd., Suite 100, Tampa, FL 33634 Phone: (813) 885-7427 Fax: (813) 885-7049

PROJECT REFERENCE	PROJECT NO.	PROJECT LOCATION (STATE)
Site 84	26007-219-0000	N.C.
STL (LAB) PROJECT MANAGER	P.O. NUMBER	CONTRACT NO.
CLIENT (SITE) PM	CLIENT PHONE	CLIENT FAX
Jeff Tepsic	412 269-6000	412 269-2002
CLIENT NAME	CLIENT EMAIL	
Baker Env. Inc.		
CLIENT ADDRESS		
420 Rouser Rd. Coraopolis PA 15108		
COMPANY CONTRACTING THIS WORK (if applicable):		
MCB Camp Lejeune		

PAGE 1 OF 2

STANDARD REPORT DELIVERY ○
DATE DUE_____
EXPEDITED REPORT DELIVERY (SURCHARGE) ○
DATE DUE_____
NUMBER OF COOLERS SUBMITTED PER SHIPMENT:

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	MATRIX: COMPOSITE (C) OR GRAB (G) INDICATE	MATRIX: AQUEOUS (WATER)	MATRIX: SOLID OR SEMISOLID	MATRIX: AIR	MATRIX: NONAQUEOUS LIQUID (OIL, SOLVENT, ETC)	REQUIRED ANALYSES: PCBs	VPH	VOC's	SVOC's	Pesticides	Herbicides	TAL metals	EPH			REMARKS
					NUMBER OF CONTAINERS SUBMITTED													
8/2/01	1525	IR84-SB06-01			7			X	X	X	X	X	X	X	X			
	1630	IR84-ER10		9				X	X	X	X	X	X	X	X			1-LAmber, Neat-5 preserved with HCl
	—	IR84-TB05		2						X								
	1555	IR84-SB08-01			7			X	X	X	X	X	X	X	X			
	1545	IR84-SB07-01			7			X	X	X	X	X	X	X	X			
	1525	IR84-SB06-01D			7			X	X	X	X	X	X	X	X			
	1500	IR84-SB04-02			7			X	X	X	X	X	X	X	X			
	1450	IR84-SB01-02			7			X	X	X	X	X	X	X	X			
	1435	IR84-SB02-02			7			X	X	X	X	X	X	X	X			
	1030	IR84-DP74-00			7			X	X	X	X	X	X	X	X			
	1230	IR84-SB03-02			7			X	X	X	X	X	X	X	X			
	1155	IR84-DP76-00			7			X	X	X	X	X	X	X	X			

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
EMPTY CONTAINERS				8/2/01	1730			
RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
EMPTY CONTAINERS								

LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT	CUSTODY SEAL NO.	STL-SL LOG NO.	LABORATORY REMARKS:
			YES NO			

CLIENTS FIELD COPY

Serial Number 013504

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

Savannah Laboratories
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5102 LaRoche Avenue, Savannah, GA 31404 — Phone: (912) 354-7858 — Fax: (912) 352-0165
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900 Lakeside Drive, Mobile, AL 36693 — Phone: (334) 666-6633 — Fax: (334) 666-6696
6712 Benjamin Rd., Suite 100, Tampa, FL 33634 — Phone: (813) 885-7427 — Fax: (813) 885-7049

PROJECT REFERENCE	PROJECT NO.	PROJECT LOCATION (STATE)
Site 84	26007-29-0000	N.C.
STL (LAB) PROJECT MANAGER	P.O. NUMBER	CONTRACT NO.
CLIENT (SITE) PM	CLIENT PHONE	CLIENT FAX
Jeff Tepsic	412 269-6000	412 269-2002
CLIENT NAME	CLIENT EMAIL	
Baker Env. Inc.		
CLIENT ADDRESS		
420 Rouser Rd. Coraopolis PA 15108		
COMPANY CONTRACTING THIS WORK (if applicable):		
MCB, Camp Lejeune		

PAGE 2 OF 2

STANDARD REPORT DELIVERY ○
DATE DUE_____
EXPEDITED REPORT DELIVERY (SURCHARGE) ○
DATE DUE_____
NUMBER OF COOLERS SUBMITTED PER SHIPMENT:

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	COMPOSITE (C) OR GRAB (G) INDICATE	AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID (OIL, SOLVENT, ETC)	PCB's	VPH	VOC's	SVOC's	Pesticides	Herbicides	TAL metals	EPH			REMARKS
			PRESERVATIVE															
			NUMBER OF CONTAINERS SUBMITTED															
8/2/01	1105	IR84-DP75-00			G			X	X	X	X	X	X	X	X			
	1205	IR84-DP76-04			G			X	X	X	X	X	X	X	X			
	1140	IR84-DP75-05			G			X	X	X	X	X	X	X	X			
	0815	IR84-MW21-04			G			X	X	X	X	X	X	X	X			
	1050	IR84-DP74-04			G			X	X	X	X	X	X	X	X			

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
EMPTY CONTAINERS				8/2/01	1730			
RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
EMPTY CONTAINERS								

LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT	CUSTODY SEAL NO.	STL-SL LOG NO.	LABORATORY REMARKS:
			YES			

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Serial Number 010000

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

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PROJECT REFERENCE	PROJECT NO.	PROJECT LOCATION (STATE)	PAGE	OF
Site 84	Z6007-219-0000	N.C.	1	1

STL (LAB) PROJECT MANAGER	P.O. NUMBER	CONTRACT NO.

CLIENT (SITE) PM	CLIENT PHONE	CLIENT FAX
Jeff Tepsic	412-269-6000	412-269-2002

CLIENT NAME	CLIENT EMAIL
Baker Env. Inc.	

CLIENT ADDRESS: 420 Rouser Rd. Coraopolis PA 15108

COMPANY CONTRACTING THIS WORK (if applicable): MCB Camp Lejeune

STANDARD REPORT DELIVERY ○ — DATE DUE _____

EXPEDITED REPORT DELIVERY (SURCHARGE) ○ — DATE DUE _____

NUMBER OF COOLERS SUBMITTED PER SHIPMENT:

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	MATRIX TYPE: COMPOSITE (C) OR GRAB (G) INDICATE	AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID (OIL, SOLVENT, ETC)	REQUIRED ANALYSES: PCBs	VPH	VOCs	SVOCs	Pesticides	Herbicides	TAL metals	EPH	NUMBER OF CONTAINERS SUBMITTED: PRESERVATIVE	REMARKS
8-3-01	—	IR84-TB06		2					X	X							
	1430	IR84-ER11		12				X	X	X	X	X	X	X	X		1-L Amber Needs preserved with HCl
	0925	IR84-MW23-01			7			X	X	X	X	X	X	X	X		
	1200	IR84-MW22-02			7			X	X	X	X	X	X	X	X		
	1240	IR84-SB05-01			7			X	X	X	X	X	X	X	X		
	1240	IR84-SB05-01			12			X	X	X	X	X	X	X	X		MS/MSD
	1015	IR84-DP84-00			7			X	X	X	X	X	X	X	X		
✓	1500	IR84-FB06		12				X	X	X	X	X	X	X	X		1-L Amber Needs preserved with HCl

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
EMPTY CONTAINERS				8/3/01	1700			
RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
EMPTY CONTAINERS								

LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT	CUSTODY SEAL NO.	STL-SL LOG NO.	LABORATORY REMARKS:
			YES / NO			

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Serial Number 015561

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

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○ 900 Lakeside Drive, Mobile, AL 36693 Phone: (334) 666-6633 Fax: (334) 666-6696
○ 6712 Benjamin Rd., Suite 100, Tampa, FL 33634 Phone: (813) 885-7427 Fax: (813) 885-7049

PROJECT REFERENCE	PROJECT NO.	PROJECT LOCATION (STATE)	PAGE	OF
Site 84	26007-219-0000	NC.	1	3

STL (LAB) PROJECT MANAGER	P.O. NUMBER	CONTRACT NO.

CLIENT (SITE) PM	CLIENT PHONE	CLIENT FAX
Jeff Tepsic	412-269-6000	412-269-2002

CLIENT NAME	CLIENT EMAIL
Baker Env. Inc	

CLIENT ADDRESS: 420 Rouser Rd Coraopolis PA 15108

COMPANY CONTRACTING THIS WORK (if applicable): MCB Camp Lejeune

STANDARD REPORT DELIVERY ○ DATE DUE _____

EXPEDITED REPORT DELIVERY (SURCHARGE) ○ DATE DUE _____

NUMBER OF COOLERS SUBMITTED PER SHIPMENT:

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	MATRIX TYPE: COMPOSITE (C) OR GRAB (G) INDICATE	AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID (OIL, SOLVENT, ETC)	REQUIRED ANALYSES: PCB's	VPH	VOCs	SVOCs	Pesticides	Herbicide	TAL metal	EPH			NUMBER OF CONTAINERS SUBMITTED	REMARKS
											PRESERVATIVE								
8/4/01	0935	IR84-MW16-01C		12				X	X	X	X	X	X	X	X				1-Liter Amber Needs preservative w/HCl
8/4/01	1115	IR84-MW18-01C		12				X	X	X	X	X	X	X	X				" " "
8/4/01	1310	IR84-MW19-01C		12				X	X	X	X	X	X	X	X				" " "
8/5/01	1000	IR84-MW21-01C		12				X	X	X	X	X	X	X	X				
8/5/01	1145	IR84-MW09-01C		12				X	X	X	X	X	X	X	X				
8/5/01	1135	IR84-MW10-01C		12				X	X	X	X	X	X	X	X				
8/5/01	1410	IR84-MW22-01C		12				X	X	X	X	X	X	X	X				
8/5/01	1455	IR84-DP81-00		[illegible]	7			X	X	X	X	X	X	X	X				
8/5/01	1515	IR84-DP81-04		[illegible]	7			X	X	X	X	X	X	X	X				
8/5/01	1530	IR84-DP82-00		[illegible]	7			X	X	X	X	X	X	X	X				
8/5/01	1545	IR84-DP82-04		[illegible]	7			X	X	X	X	X	X	X	X				
8/5/01	1600	IR84-DP83-00		[illegible]	7			X	X	X	X	X	X	X	X				

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
EMPTY CONTAINERS			[signature]	8/6/01	1630			
RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
EMPTY CONTAINERS								

LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT YES NO	CUSTODY SEAL NO.	STL-SL LOG NO.	LABORATORY REMARKS:

CLIENTS FIELD COPY

Serial Number 015302

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

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6712 Benjamin Rd., Suite 100, Tampa, FL 33634 — Phone: (813) 885-7427 — Fax: (813) 885-7049

PROJECT REFERENCE	PROJECT NO.	PROJECT LOCATION (STATE)
Site 84	26007-219-0000	N.C.

STL (LAB) PROJECT MANAGER	P.O. NUMBER	CONTRACT NO.

CLIENT (SITE) PM	CLIENT PHONE	CLIENT FAX
Jeff Tepsic	412-269-6000	412-269-2002

CLIENT NAME	CLIENT EMAIL
Baker Env. Inc.	

CLIENT ADDRESS: 420 Rouser Rd. Coraopolis PA 15108

COMPANY CONTRACTING THIS WORK (if applicable): MCB Camp Lejeune

PAGE 2 OF 3

STANDARD REPORT DELIVERY ○ — DATE DUE _____

EXPEDITED REPORT DELIVERY (SURCHARGE) ○ — DATE DUE _____

NUMBER OF COOLERS SUBMITTED PER SHIPMENT:

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	MATRIX TYPE: COMPOSITE (C) OR GRAB (G) INDICATE	AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID (OIL, SOLVENT, ETC)	REQUIRED ANALYSES: PCB's	VPH	VOCs	SVOCs	Pesticides	Herbicides	TAL metals	EPH	NUMBER OF CONTAINERS SUBMITTED	REMARKS
										PRESERVATIVE							
8/5/01	1610	IR84-DP83-03			7			X	X	X	X	X	X	X	X		
8/5/01	1630	IR84-DP80-00			7			X	X	X	X	X	X	X	X		
8/5/01	1640	IR84-DP80-02			7			X	X	X	X	X	X	X	X		
8/5/01	1650	IR84-DP79-00			7			X	X	X	X	X	X	X	X		
8/5/01	1705	IR84-DP79-02			7			X	X	X	X	X	X	X	X		
8/5/01	1705	IR84-DP79-02D			7			X	X	X	X	X	X	X	X		
8/5/01	1720	IR84-DP78-00			7			X	X	X	X	X	X	X	X		
8/5/01	1735	IR84-DP78-03			7			X	X	X	X	X	X	X	X		
8/5/01	1750	IR84-DP77-00			7			X	X	X	X	X	X	X	X		
8/5/01	1755	IR84-DP77-03			7			X	X	X	X	X	X	X	X		
8/5/01	1910	IR84-MW20-01C		W	2			X	X	X	X	X	X	X	X		
8/5/01	1915	IR84-MW20-01CD		W	2			X	X	X	X	X	X	X	X		

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
EMPTY CONTAINERS				8/6/01	1630			
RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
EMPTY CONTAINERS								

LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT	CUSTODY SEAL NO.	STL-SL LOG NO.	LABORATORY REMARKS:
			YES NO			

CLIENTS FIELD COPY

Serial Number 015363

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6712 Benjamin Rd., Suite 100, Tampa, FL 33634 — Phone: (813) 885-7427 — Fax: (813) 885-7049

PROJECT REFERENCE	PROJECT NO.	PROJECT LOCATION (STATE)
Site 84	26007-219-0000	NC.
STL (LAB) PROJECT MANAGER	P.O. NUMBER	CONTRACT NO.
CLIENT (SITE) PM	CLIENT PHONE	CLIENT FAX
Jeff Tepsic	412-269-6000	412-269-2002
CLIENT NAME	CLIENT EMAIL	
Baker Env. Inc		
CLIENT ADDRESS		
420 Rouser Rd. Coraopolis PA 15108		
COMPANY CONTRACTING THIS WORK (if applicable)		
MCB Camp Lejeune		

PAGE 3 OF 3

STANDARD REPORT DELIVERY ○
DATE DUE _____
EXPEDITED REPORT DELIVERY (SURCHARGE) ○
DATE DUE _____

NUMBER OF COOLERS SUBMITTED PER SHIPMENT:

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	MATRIX: COMPOSITE (C) OR GRAB (G) INDICATE	AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID (OIL, SOLVENT, ETC)	PCB's	VPH	VOCs	SVOCs	Pesticides	Herbicides	TAL metals	EPH	REMARKS
8/6/01	1630	IR84-ER12		12				X	X	X	X	X	X	X	X	
8/6/01	—	IR84-TB07		2						X						
8/6/01	0925	IR84-MW17-01C		12				X	X	X	X	X	X	X	X	
8/6/01	1200	IR84-MW07-01C		12				X	X	X	X	X	X	X	X	
8/6/01	1200	IR84-MW07-01C						X	X	X	X	X	X	X	X	MS/MSD
8/6/01	1140	IR84-MW08-01C		12				X	X	X	X	X	X	X	X	
8/6/01	1445	IR84-MW23-01C		12				X	X	X	X	X	X	X	X	

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
EMPTY CONTAINERS				8/6/01	1700			
RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
EMPTY CONTAINERS								

LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT	CUSTODY SEAL NO.	STL-SL LOG NO.	LABORATORY REMARKS:
			YES / NO			

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Baker

Baker Environmental, Inc.
Airport Office Park, Bldg. 3
420 Rouser Road
Coraopolis, PA 15108
412-269-6000
412-269-6097 (fax)

CHAIN-OF-CUSTODY RECORD

Lab and BOA #:
Delivery Order #
Project Number: 26007-217-0000-1B422
Project Name: Site 84
Field Team: David Schilling
SEND RESULTS TO: Jeff Tepsic

Sample Number	Date	Time	Sample Location	Matrix Type (1) GB (2)	Matrix Type (1) COM (2)	Analytical Methods: VPH	EPH	VOC	SVOC	PCB	Pesticides	Herbicides	TAL metals	TSS/TDS	RCRA Characteristics			Remarks
						Type of Container(s) (3)												
						Number of Container(s)												
IR84-ER13	8/7/01	0920		LAB	~~LAB~~	X	X	X	X	X	X	X	X					
IR84-TB08	8/7/01	1430		LAB				X										
IR84-IDW	8/7/01	0900			GW			X	X	X	X	X	X	X	X			

General Comments

Relinquished By: [signature] Date: 8/7/01 Time: 1700
Received By: Date: Time:
Shipped by (check one): Hand ☐ Overnight ☐ Other ☐

Relinquished By: Date: Time:
Received By: Date: Time:
Shipped by (check one): Hand ☐ Overnight ☐ Other ☐

Relinquished By: Date: Time:
Received By: Date: Time:
Shipped by (check one): Hand ☐ Overnight ☐ Other ☐

Sample Stored at 4 Degrees C: Yes ☒ No ☐
Chain-of-custody seal on cooler: Yes ☒ Number: No ☐
Analysis turnaround: Priority ☐ hrs. Regular ☒
See Work Order ☐
See Analysis Request Form ☐

Sample Disposal Return to Baker ☐ Lab Disposal ☒
Archive until: (date)

NOTES:
(1) A - Air; GW - Groundwater; L - Leachate; S - Spring; SS - Surface Soil; SB - SubSurface Soil; SW - Surface Water; W - Waste; WP - Wipe; WW - Wastewater
(2) GB - Grab; COM - Composite
(3) P - Plastic; G - Glass

White - Return with analytical results; Yellow - Laboratory Copy; Pink - Field Copy

Courier Name:
Courier Pickup Number:
File Name:

APPENDIX E
TECHNICAL MEMORANDUM
SUMMARY OF GROUNDWATER DATA AND AQUIFER CHARACTERISTICS

SUMMARY OF GROUNDWATER DATA AND AQUIFER CHARACTERISTICS
MARINE CORPS BASE, CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

SUMMARY

This study examines the utility of exploratory aquifer tests (pump tests) at investigation sites across Marine Corps Base, Camp Lejeune (MCB-CL). The study reviews the available information on the relevant water-bearing layers, considers the general characteristics and applicability of aquifer tests, and concludes:

- That available information is satisfactorily complete to allow appropriate designs of groundwater systems in the main operating areas of MCB-CL;
- That quantified characterization of the water-bearing layers in explored areas of MCB-CL can be extended to other areas having similar geologic terrane;
- That exploratory tests are no longer routinely required or advisable;
- That reconnaissance testing (well-head tests or slug tests) of each newly installed or otherwise uncharacterized data station is highly advisable; and,
- That performance testing of groundwater extraction systems should be the recommended form of evaluating and adjusting withdrawal systems.

BACKGROUND

This study considers the aquifer characteristics (especially, the Coefficient of Transmissivity) and the production capacities (available discharge rates) of the two water-bearing layers relevant to the studies at MCB-CL. These water-bearing layers are the (shallow or surficial) water table and the Upper Castle Hayne Aquifer.

The water table at MCB-CL occupies the water-bearing zone within 25 to 35 feet of the surface; the Castle Hayne, immediately below this. However, the separation of the water table and the Castle Hayne is not always obvious. Usually, this separation is effected only by the low permeability material of the water table transiting to the significantly more permeable material of the Upper Castle Hayne; there is rarely an aquiclude or aquitard of vertically extensive clay separating the water table from the Castle Hayne.

The data available for this summary derive from three main sources:

- Assessment of Hydrologic and Hydrogeologic Data at Camp Lejeune Marine Corps Base, North Carolina; U.S. Geological Survey, Water-Resources Investigation Report 89-4096; 1989
- Wellhead Management Program Engineering Study 91-36; Geophex, Ltd.; 22Jan91
- Various site investigations by Baker Environmental, Inc., and reported to LANTDIV and MCB-CL

DISTRIBUTION OF DATA

The data available from the various sources have been compiled on Tables 1, 2 and 3, with Table 3 summarizing the relevant flow information. The accompanying map indicates the distribution of stations from which data are available.

The tabulated data indicate the main characteristics of each water-bearing layer:

- There is low available production from the water table.
- There is an excessive availability of production from the Castle Hayne compared to the probably acceptable levels of treatment volumes foreseeable in groundwater remediation systems.

The water table had production capacities of less than 5 gallons per minute (gpm) in all cases tested. The specific capacities of the discharge wells were always less than 1 gallon per minute per foot of drawdown (gpm/ft). The transmissivities calculated were generally near or below 1000 gallons per day per foot of drawdown (gpd/ft); only the deeper wells, which intercepted at least part of the Castle Hayne, had transmissivities in a range indicative of an acceptably producing zone. The hydraulic conductivity values were commonly in the range of tenths of feet per day (ft/d). The low production rates, low transmissivities and low hydraulic conductivities indicate that the water table is only marginally, at best, under Darcian conditions. Calculations based on these data would, therefore, be highly unreliable. However, the available information all indicate an expectably low rate of groundwater discharge, which in turn would produce only a narrow radius of effect around an individual production well:

> The standard equation for calculation of the radius of capture around an individual well is $r_c=720Q/\pi Ti$. With a discharge rate (Q) of 3 gpm, a transmissivity (T) of 500 gpd/ft and a representative gradient of 0.005, the radius of capture would be 275 ft. However, this calculation applies only to Darcian conditions in a homogeneous medium; the water table at MCB-CL is marginally Darcian and is highly non-homogeneous. The calculation of radius must, therefore, be in some degree of error, with no more usable data or calculation possible.

The Castle Hayne has production capacities generally ranging above 200 gpm. The estimated transmissivities are at least in the range of several tens of thousands gpd/ft, with specific capacities usually about 5 to 10 gpm/ft. The calculated hydraulic conductivities are usually in the scores of feet per day. The available discharge from the Castle Hayne is, therefore, much greater than that from the water table. The limiting factor in remediation schemes for the Castle Hayne then becomes the amount of water that can be treated by an affordable system, usually less than 500 gpm; this value of 500 gpm would be available from one or two wells in the Castle Hayne. The high values of aquifer parameters, the relatively low total discharge and the low number of production wells would conspire to limit the radius of effect available to a remediation scheme:

> The standard equation for calculation of the radius of capture around an individual well is $r_c=720Q/\pi Ti$. With a Q of 500 gpm, a T of 50000 gpd/ft and a representative gradient of 0.005, the radius of capture would be only 460 ft.

COMPARABILITY OF DATA ACROSS MCB-CL

The stratigraphic sequences of MCB-CL containing the water table and the Upper Castle Hayne have been well characterized. The available information indicates that the lithology and the hydrologic conditions can be correlated stratigraphically across the base (Tables 1 and 2). From these correlations, aquifer performance can be predicted sufficiently for an engineering design whose final criteria for suitability are performance-based.

The upper water-bearing zone is a highly variable layering and intercalation of clay, silt and sand. This variability, however, is found within recognizable limits. These limits correspond to the range of hydrologic characteristics described previously. Similar correlation is available for the lithology and hydrology of the Upper Castle Hayne.

In areas not near stations catalogued in Tables 1, 2 and 3, a reconnaissance comparison of well-head tests (slug tests) and an examination of lithologic descriptions will likely be sufficient to support the engineering evaluation of the site. There is ample demonstration that lithology has a significant influence on the hydrology of a site, and that, for a given geologic terrane, the influence is fairly consistent. The geologic terrane of MCB-CL has been broadly characterized and correlated between lithologic (stratigraphic descriptions) and hydrologic (aquifer tests and well-head tests) sequences. Lithologic descriptions can now provide a good indication of hydrologic conditions at MCB-CL in areas of similar terrane.

GENERAL APPLICABILITY OF AQUIFER TESTS

Aquifer (pump) tests are an extremely dangerous activity at contamination sites. While the information available from aquifer tests is required for engineering design of withdrawal systems, aquifer tests should not be a reconnaissance or an initial step in the investigation. Full consideration must be made of the redistribution of contaminants expectable from the test, of the change in structural support of disposal features by relaxation or increase of hydrostatic loading, and so forth.

Consideration must also be made of alternative sources of acceptable data on the aquifer. In the case of MCB-CL, alternatives to exploratory aquifer tests are available from the tabulation and correlation of aquifer characteristics, production performance and geologic terrane presently available.

From the available information and in light of the relative consistency of the geologic terrane of MCB-CL, exploratory tests at MCB-CL are not generally required. Therefore, exploratory tests are not advisable and should not form part of the initial investigation of a site. While they may be useful in certain circumstances after the initial investigation of a site, they should not, in the general case, be part of the investigation. Sufficiently satisfactory information is presently available to allow the initial engineering design of a groundwater response.

While exploratory aquifer tests are not advisable, performance tests of a newly installed system are highly recommended. These tests, to some extent, are a normal part of the initial operation of a system. Only minor additional monitoring and modification of the system during operation would provide data directly relevant to the long-term operation of that system.

In the Coastal Plain of MCB-CL, the information from an exploratory data station not coincident with the long-term extraction system is not fully transferable. That is, if the test station and the

recovery station are not the same, the aquifer parameters and calculations based on those parameters will differ. This means that data from an exploratory station are no more reliably usable that the data presently available, unless the exploratory station is collocated with the recovery system. However, if the exploratory and recovery stations are identical, and considering that alternative sources of acceptable data on the aquifer are available and that a performance test must be run as part of the initial operation of a recovery system, the exploratory test represents a superfluous duplication of effort.

TABLE 1
CAMP LEJEUNE PUMP TEST DATA

Well Number	Well Depth (ft,BGS)	Well Diameter (in)	Total Aquifer Thickness (ft)	Screened Length (ft)	Screened Interval (ft,BGS)	Water-level Drawdown During Pumping (ft,BGS)	Pumping Rate (Recovery wells) GPM	Duration of Pumping (min)	Specific Capacity (pumping rate/ drawdown)	T (square ft/ day)	K (ft/day)	S	Soils (ft,BGS)
013RW-01*	23	2	15	20	3-23	8.773	1	480	0.11	7.17	0.48	NA	0-10 silt/clay, 10-23 sand.
013MW-18	13	2	15	10	3-13	0.297	NA	480	NA	105.98	7.06	1.40E-02	0-7 silt/clay, 7-13 sand.
013MW-21	14	2	15	10	4-14	0.31	NA	480	NA	82.27	5.48	2.77E-02	0-4 silt/sand, 0-14 clay/silt
108RW-01*	15	2	9	9.1	2.45-11.55	6.38	0.5	485	0.08	5.30	0.59	NA	very fine sand
108MW-04		2	9				NA	485	NA	118.63	13.18	1.33E-02	
108MW-15	12.5	2	9	9.03	2.79-11.82		NA	485	NA	56.78	6.31	7.33E-03	0-8 sand/silt, 8-10 silt/clay
109MW-15		2	15			0.939	NA	460	NA	76.26	5.08	1.11E-02	
109MW-17	14.5	2	15	10	4.5-14.5	0.545	NA	460	NA	163.10	10.87	7.30E-03	0-15 fine sand
109RW-01*	15	2	15	9.5	2-11.5	6.265	3	460	0.48	7.80	0.52	NA	0-4 sand, 4-8 silt, 8-15 sand
0RW-01* (Drawdown,Theis)	21.8	2	50	19.2	2-21.2	9.53	3	475	0.31	200.02	4.00	NA	0-10.5 sand/silt, 10.5-15 sand/clay, 15-21.5 sand/clay, 21.5- sand
0RW-01* (Drawdown,Cooper)										161.86	3.24	NA	
0RW-01* Recovery(Theis)										106.06	2.12	NA	
10DW-01 (Drawdown,Theis)	30.3	2	50	4.8	24.9-29.7	0.02	3	475	NA	7080.48	142.00	4.52E-03	0-4 sand/silt, 4-10.5 clay, 10.5-15.5 sand/silt,15.5-20.5 clay, 20.5-on sand
10DW-01 (Drawdown,Cooper)									NA	7099.20	142	4.51E-03	
10DW-02 (Drawdown,Theis)	30	2	50	4.7	24.7-29.4	0.52	NA	475	NA	5398.56	108.00	1.51E-03	0-3 sand and silt with clay layers, 3-11 sand and silt, 11-30 sand with some limited clay layers
10DW-02 (Drawdown,Cooper)									NA	5400.00	108	1.51E-03	
10DW-03 (Drawdown,Theis)	30	2	50	4.9	24.5-29.4	0.47	NA	475	NA	2952.00	59.00	7.48E-02	0-6 sand and silt , 6-12 sand, 12-23 sand/clay, 23-30 sand
10DW-03 (Drawdown,Cooper)									NA	3225.60	64	5.85E-02	

- Transmissivity
- Hydraulic Conductivity
- Storativity
- Pumping well
- Not applicable

TABLE 2
HYDRAULIC CONDUCTIVITY TEST RESULTS (SLUG TEST)

Well Number	Well Depth (ft,BGS)	Well Diameter (in)	Saturated Aquifer Thickness* (ft)	Screened Length (ft)	Screened Interval (ft,BGS)	K Rising (ft/day)	Soils (ft,BGS)
013MW-03	14	2	1	9.8	4-13.8	0.75	0-6 clay, 6-14 silt
013MW-04	14	2	8.13	9.8	4-13.8	0.27	0-8 clay, 8-14 silt
013MW-11	16	2	9.14	10	6-16	0.37	0-4 sand/silt, 4-14 clay, 14-16 sand
013MW-21	14	2	9.2	10	4-14	0.46	0-4 silt/sand, 4-14 clay
108MW-08	12.8	2	8.83	9.7	2.7-12.4	0.59	0-8 very fine sand, 8-12 clayey peat, 12-13 sandy clay
108MW-09	12.8	2	7.81	9.7	2.8-12.5	0.53	0-13 silt/sand
108MW-13	10.8	2	NA	9.02	0.69-9.71	0.061	0-2 very fine sand, 8-9.5 sandy clay
108MW-17	13.1	2	NA	9.03	3.39-12.42	0.59	0-8 fine grained sand, 8-9 clayey peat, 9-12.5 sandy clay
109MW-17	14.5	2	9.04	10	4.5-14.5	9.00	0-15 fine sand
109MW-18	14	2	10.19	10	4.5-14.5	5.70	0-3 sand, 3-10 silt, 10-14 sand
110MW-07	11.96	2	9	9.8	1.5-11.3	0.0115	0-2 clay/silt, 2-4 clay/sand, 4-6 sand, 6-10 silt/clay, 10-14 silt /sand
110MW-09	14.2	2	9.47	9.8	3.8-13.6	0.16	0-6 sand/silt, 6-9 clay/silt, 9-12 sand/silt, 12-14 clay
110DW-03	30	6	22.04	4.9	24.5-29.4	1.07	0-3 sand, 3-4 clay, 4-10 sand/silt, 10-12 sand, 12-13 clay,13-22 silt/clay, 22-30 sand
41GW-07	20.5	2	12.03	10	10.5-20.5	1.15	1-5 silty sand, 5-9 clay, 9-10 silty sand, 10-12 fill, 12-16 silty sand with 1 ft clay layer,16-21 sand
41GW-08	15	2	9.48	10	5-15	0.14	0-1 silty sand, 1-6 sand, 6-14 clay with sand and silt, 14-16 silty sand
41GW-09	21	2	11.89	10	11-21	3.67	0-5 clay and sand, 5-21 silty sand
41GW-10	13	2	8.59	10	3-13	0.94	0-2 silty sand, 2-7 sand, 7-9 silty sand and clay, 9-12 lithified sandstone, 12-13 sand. 13-14 lithified sandstone
41GW-12	16	2	12.45	10	6-16	4.57	0-4 silty sand, 4-14 sand, 14-17 lithified sandstone
69GW-09	20.5	2	14.22	10	10.5-20.5	1.7	1-4 Sand/silt, 4-10 clay some sand, 10-21 sand/silt
69GW-10	16	2	10.5	10	6-16	0.17	1-17 sand/silt
69GW-12	12.5	2	11.27	10.5	2-12.5	0.12	0-13.5 sand/silt
69GW-02D	125	2	22.1	10	40-50	0.29	0-125 silty sand **
69GW-12D	58	2	53.83	10	48-58	6.66	0-58 silty sand **
74GW-03A	18	2	13.58	10	8-18	0.59	0-17 silty sand, 17-18.5 sandy clay
74GW-06	16.5	2	8.18	9.74	15.5-26	6.33	1-26 sand/silt
74GW-08	23	2	10.51	10	13-23	3.55	0-1 silty sand, 1-24 sand

* Values taken from AQTESOL results. (Bottom of screened interval- water level)

** Due to depth, soils were very generally described.

K = Hydraulic Conductivity

TABLE 3

BARONE:8SEP94:CL5-1A1:1/5

1-CL5 CTO-232 CL5-1B1.wks 8SEP94 MCB-CAMP LEJEUNE

STATION	b ft	Q gpm	Sc gpm/ft	T ft-sq/d	T gpd/ft	K ft/d
013RW-01	15	1.0	0.11	7.2	54	0.5
013MW-1	15			106.0	793	7.1
013MW-2	15			82.3	615	5.5
013MW-03	1					0.8
013MW-04	8					0.3
013MW-11	9					0.4
013MW-21	8					0.5
41GW-07						1.2
41GW-08						0.1
41GW-09						3.7
41GW-10						0.9
41GW-12						4.6
69GW-09						1.7
69GW-10						0.2
69GW-12						0.1
69GW-02DW						0.3
69GW-12DW						6.7
74GW-03A						0.6
74GW-06						6.3
74GW-08						3.6
108RW-01	9	0.5	0.08	5.3	40	0.6
108MW-0	9			118.6	887	13.2
108MW-1	9			56.8	425	6.3
108MW-08	9					0.6
108MW-09	8					0.5
108MW-13	8					0.1
108MW-17	8					0.6
109MW-1	15			76.3	570	5.1
109MW-1	15			163.1	1220	10.9
109RW-01	15	3.0	0.48	7.8	58	0.5
109MW-17	15					9.0
109MW-18	15					5.7
110RW-01	50	3.0	0.31	200.0	1496	4.0
110RW-01	50	3.0	0.31	161.9	1211	3.2
110RW-01	50	3.0		106.1	793	2.1
110DW-01	50			7080	52962	142.0
110DW-01	50			7099	53102	142.0
110DW-02	50			5399	40381	108.0
110DW-02	50			5400	40392	108.0
110DW-03	50			2952	22081	59.0
110DW-03	50			3226	24127	64.0
110MW-07	9					0.1
110MW-09	9					0.2
110DW-03	22					5.8

STATION	b ft	Q gpm	Sc gpm/ft	T ft-sq/d	T gpd/ft	K ft/d
BB-43	275	170	5.0	8900	66572	32.4
BB-44	275	450	10.0	17900	133892	65.1
BB-222	275	329	9.4	10600	79288	38.5
HP-612	285	275	5.4	7900	59092	27.7
HP-614	285	323	4.9	6600	49368	23.2
HP-621	300	200	9.1	24500	183260	81.7
HP-628	320	160	3.4	6400	47872	20.0
HP-629	300	210	5.7	7900	59092	26.3
HP-634	300	163	4.5	4300	32164	14.3
HP-636	300	211	6.8	6900	51612	23.0
HP-643	295	278	5.3	9700	72556	32.9
HP-644	300	246	4.3	8100	60588	27.0
HP-646	305	304	10.6	20200	151096	66.2
HP-647	305	500	9.8	18700	139876	61.3
HP-648	310	250	2.9	5600	41888	18.1
HP-649	310	257	2.6	5000	37400	16.1
HP-651	305	270	3.8	7300	54604	23.9
HP-652	320	218	2.2	4400	32912	13.8
HP-663	325	350	4.8	6400	47872	19.7
HP-699	275	250	5.7	7700	57596	28.0
HP-700	270	250	6.8	11500	86020	42.6
HP-701	275	250	7.2	12400	92752	45.1
HP-705	295	250	9.0	13100	97988	44.4
HP-706	300	250	3.8	4700	35156	15.7
HP-709	310	200	4.4	8500	63580	27.4
HP-710	310	200	5.1	9900	74052	31.9
HP-711	320	200	6.8	10700	80036	33.4
LCH-4006	295	540	10.0	14500	108460	49.2
LCH-4007	295	275	11.8	13700	102476	46.4
M-267	260	170	7.7	10300	77044	39.6
M-628	260	70	3.0	6100	45628	23.5
RR-229	290	429	12.2	19400	145112	66.9
TT-25	280	150	5.0	7200	53856	25.7

STATION	PUMPING LEVEL	Q gpm	Sc gpm/ft
HP-602	44	154	3.5
HP-603	30	129	4.3
HP-606	38	267	7.0
HP-607	46	246	5.3
HP-608	21	208	9.9
HP-609	45	199	4.4
HP-610	14	214	15.3
HP-613	17	157	9.2
HP-616	15	178	11.9
HP-620	9	224	24.9
HP-622	55	330	6.0
HP-623	30	210	7.0
HP-628	45	172	3.8
HP-629	45	216	4.8
HP-632	21	224	10.7
HP-633	18	205	11.4
HP-634	36	219	6.1
HP-635	33	151	4.6
HP-636	35	149	4.3
HP-637	40	130	3.3
HP-638	84	201	2.4
HP-639	52	[--]	0.0
HP-640	28	210	7.5
-641	44	351	8.0
-642	32	[--]	0.0
HP-643	35	269	7.7
HP-644	52	230	4.4
HP-645	40	192	4.8
HP-646	11	154	14.0
HP-647	26	302	11.6
HP-648	84	263	3.1
HP-649	80	100	1.3
HP-650	75	480	6.4
HP-651	69	242	3.5
HP-652	82	216	2.6
HP-653	29	197	6.8
HP-654	30	175	5.8
HP-655		[--]	ERR
HP-660		150	ERR
HP-661	37	275	7.4
HP-662	53	148	2.8
HP-663	23	100	4.3
HP-698	33	216	6.5
HP-699	21	140	6.7

STATION	PUMPING LEVEL	Q gpm	Sc gpm/ft
HP-700	39	192	4.9
HP-701	36	236	6.6
HP-703	33	293	8.9
HP-704	38	159	4.2
HP-705	25	214	8.6
HP-706	33	214	6.5
HP-707	51	50	1.0
HP-708	42	219	5.2
HP-709	52	239	4.6
HP-710	29	115	4.0
HP-711	56	235	4.2
HP-5186	38	336	8.8
LCH-4007	34	150	4.4
LCH-4009	22	349	15.9
TT-23	36	160	4.4
TT-25	22	130	5.9
TT-26	32	127	4.0
TT-31	28	111	4.0
TT-52	18	236	13.1
TT-54	20	119	6.0
TT-67	29	119	4.1
RR-45	11	192	17.5
RR-47	5	140	28.0
RR-97	14	170	12.1
RR-229	35	[--]	0.0
BB-44	11	125	11.4
BB-47	6	341	56.8
BB-218	17	192	11.3
BB-220	13	119	9.2
BB-221	19	230	12.1
TC-325	8	100	12.5
TC-502	1	180	180.0
TC-504	35	203	5.8
TC-600	32	172	5.4
TC-604	16	137	8.6
TC-700	28	125	4.5
TC-901	37	[--]	0.0
TC-1000	25	110	4.4
TC-1001	16	160	10.0
TC-1251	6	150	25.0
TC-1253	5	128	25.6
TC-1254	3	122	40.7
TC-1255	36	104	2.9
TC-1256	48	108	2.3

STATION	PUMPING LEVEL	Q gpm	Sc gpm/ft
AS-108	8	226	28.3
AS-131	11	310	28.2
AS-190	60	220	3.7
AS-191	16	220	13.8
AS-203	19	220	11.6
AS-4140	6	110	18.3
AS-4150	10	128	12.8
AS-5001	27	185	6.9
AS-5009	53	111	2.1
BA-164	21	214	10.2
BA-190	17	303	17.8

APPENDIX F
ANALYTICAL DATA

APPENDIX F
EQUIPMENT RINSATE ANALYTICAL RESULTS
REMEDIAL INVESTIGATION, CTO-219, SITE 84
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	1R84-ER01	1R84-ER02	1R84-ER03	1R84-ER04	1R84-ER05	1R84-ER06	1R84-ER07
SAMPLE DATE	07-17-2001	07-18-2001	07-19-2001	07-20-2001	07-21-2001	7-22-2001	07-23-2001
VOLATILES (ug/L)							
1,1,1-Trichloroethane	NA	NA	NA	NA	0.15 U	NA	NA
1,1,2,2-Tetrachloroethane	NA	NA	NA	NA	0.25 U	NA	NA
1,1,2-Trichloroethane	NA	NA	NA	NA	0.3 U	NA	NA
1,1-Dichloroethane	NA	NA	NA	NA	0.16 U	NA	NA
1,1-Dichloroethene	NA	NA	NA	NA	0.24 U	NA	NA
1,2-Dibromoethane (EDB)	NA	NA	NA	NA	0.22 U	NA	NA
1,2-Dichloroethane	NA	NA	NA	NA	0.21 U	NA	NA
1,2-Dichloroethene (total)	NA	NA	NA	NA	0.28 U	NA	NA
1,2-Dichloropropane	NA	NA	NA	NA	0.17 U	NA	NA
2-Butanone	NA	NA	NA	NA	0.41 U	NA	NA
2-Hexanone	NA	NA	NA	NA	0.46 U	NA	NA
4-Methyl-2-pentanone	NA	NA	NA	NA	0.23 U	NA	NA
Acetone	NA	NA	NA	NA	10 U	NA	NA
Benzene	NA	NA	NA	NA	0.16 U	NA	NA
Bromodichloromethane	NA	NA	NA	NA	0.17 U	NA	NA
Bromoform	NA	NA	NA	NA	0.18 U	NA	NA
Bromomethane	NA	NA	NA	NA	0.2 U	NA	NA
Carbon disulfide	NA	NA	NA	NA	0.2 U	NA	NA
Carbon tetrachloride	NA	NA	NA	NA	0.12 U	NA	NA
Chlorobenzene	NA	NA	NA	NA	0.14 U	NA	NA
Chloroethane	NA	NA	NA	NA	0.26 U	NA	NA
Chloroform	NA	NA	NA	NA	6.9	NA	NA
Chloromethane	NA	NA	NA	NA	0.13 U	NA	NA
Dibromochloromethane	NA	NA	NA	NA	0.26 U	NA	NA
Ethylbenzene	NA	NA	NA	NA	0.12 U	NA	NA
Isopropyl ether	NA	NA	NA	NA	0.69 U	NA	NA
Methyl tert-butyl ether	NA	NA	NA	NA	0.13 U	NA	NA
Methylene chloride	NA	NA	NA	NA	2.5	NA	NA
Styrene	NA	NA	NA	NA	0.15 U	NA	NA
Tetrachloroethene	NA	NA	NA	NA	0.23 U	NA	NA
Toluene	NA	NA	NA	NA	0.25 J	NA	NA
Trichloroethene	NA	NA	NA	NA	0.14 U	NA	NA
Vinyl chloride	NA	NA	NA	NA	0.15 U	NA	NA
Xylenes (total)	NA	NA	NA	NA	0.33 U	NA	NA
cis-1,3-Dichloropropene	NA	NA	NA	NA	0.12 U	NA	NA
trans-1,3-Dichloropropene	NA	NA	NA	NA	0.27 U	NA	NA
SEMIVOLATILES (ug/L)							
1,2,4-Trichlorobenzene	NA	NA	NA	NA	0.65 U	NA	NA
1,2-Dichlorobenzene	NA	NA	NA	NA	0.81 U	NA	NA
1,3-Dichlorobenzene	NA	NA	NA	NA	0.83 U	NA	NA
1,4-Dichlorobenzene	NA	NA	NA	NA	0.77 U	NA	NA
2,2'-Oxybis(1-Chloropropane)	NA	NA	NA	NA	0.78 U	NA	NA
2,4,5-Trichlorophenol	NA	NA	NA	NA	1.2 U	NA	NA
2,4,6-Trichlorophenol	NA	NA	NA	NA	1.7 U	NA	NA
2,4-Dichlorophenol	NA	NA	NA	NA	0.85 U	NA	NA

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REMEDIAL INVESTIGATION, CTO-219, SITE 84
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	1R84-ER01	1R84-ER02	1R84-ER03	1R84-ER04	1R84-ER05	1R84-ER06	IR84-ER07
SAMPLE DATE	07-17-2001	07-18-2001	07-19-2001	07-20-2001	07-21-2001	7-22-2001	07-23-2001
2,4-Dimethylphenol	NA	NA	NA	NA	0.85 U	NA	NA
2,4-Dinitrophenol	NA	NA	NA	NA	3 U	NA	NA
2,4-Dinitrotoluene	NA	NA	NA	NA	0.79 U	NA	NA
2,6-Dinitrotoluene	NA	NA	NA	NA	0.57 U	NA	NA
2-Chloronaphthalene	NA	NA	NA	NA	0.85 U	NA	NA
2-Chlorophenol	NA	NA	NA	NA	1 U	NA	NA
2-Methylnaphthalene	NA	NA	NA	NA	0.64 U	NA	NA
2-Methylphenol	NA	NA	NA	NA	1.1 U	NA	NA
2-Nitroaniline	NA	NA	NA	NA	0.7 U	NA	NA
2-Nitrophenol	NA	NA	NA	NA	2.1 U	NA	NA
3,3'-Dichlorobenzidine	NA	NA	NA	NA	0.93 U	NA	NA
3-Nitroaniline	NA	NA	NA	NA	0.71 U	NA	NA
4,6-Dinitro-2-methylphenol	NA	NA	NA	NA	1.3 U	NA	NA
4-Bromophenyl phenyl ether	NA	NA	NA	NA	0.88 U	NA	NA
4-Chloro-3-methylphenol	NA	NA	NA	NA	0.99 U	NA	NA
4-Chloroaniline	NA	NA	NA	NA	0.61 U	NA	NA
4-Chlorophenyl phenyl ether	NA	NA	NA	NA	0.79 U	NA	NA
4-Methylphenol	NA	NA	NA	NA	1.3 U	NA	NA
4-Nitroaniline	NA	NA	NA	NA	1.3 U	NA	NA
4-Nitrophenol	NA	NA	NA	NA	1.9 U	NA	NA
Acenaphthene	NA	NA	NA	NA	0.8 U	NA	NA
Acenaphthylene	NA	NA	NA	NA	0.71 U	NA	NA
Anthracene	NA	NA	NA	NA	0.68 U	NA	NA
Benzo(a)anthracene	NA	NA	NA	NA	0.7 U	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	0.73 U	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	0.94 U	NA	NA
Benzo(ghi)perylene	NA	NA	NA	NA	0.85 U	NA	NA
Benzo(k)fluoranthene	NA	NA	NA	NA	0.84 U	NA	NA
SEMIVOLATILES (ug/L)							
Butyl benzyl phthalate	NA	NA	NA	NA	0.88 U	NA	NA
Carbazole	NA	NA	NA	NA	0.82 U	NA	NA
Chrysene	NA	NA	NA	NA	0.75 U	NA	NA
Di-n-butyl phthalate	NA	NA	NA	NA	0.67 U	NA	NA
Di-n-octyl phthalate	NA	NA	NA	NA	1.1 U	NA	NA
Dibenz(a,h)anthracene	NA	NA	NA	NA	0.79 U	NA	NA
Dibenzofuran	NA	NA	NA	NA	1.1 U	NA	NA
Diethyl phthalate	NA	NA	NA	NA	0.65 U	NA	NA
Dimethyl phthalate	NA	NA	NA	NA	0.76 U	NA	NA
Fluoranthene	NA	NA	NA	NA	0.81 U	NA	NA
Fluorene	NA	NA	NA	NA	1 U	NA	NA
Hexachlorobenzene	NA	NA	NA	NA	0.74 U	NA	NA
Hexachlorobutadiene	NA	NA	NA	NA	0.73 U	NA	NA
Hexachlorocyclopentadiene	NA	NA	NA	NA	1.1 U	NA	NA
Hexachloroethane	NA	NA	NA	NA	0.74 U	NA	NA
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	0.63 U	NA	NA
Isophorone	NA	NA	NA	NA	0.63 U	NA	NA

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EQUIPMENT RINSATE ANALYTICAL RESULTS
REMEDIAL INVESTIGATION, CTO-219, SITE 84
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	1R84-ER01	1R84-ER02	1R84-ER03	1R84-ER04	1R84-ER05	1R84-ER06	1R84-ER07
SAMPLE DATE	07-17-2001	07-18-2001	07-19-2001	07-20-2001	07-21-2001	7-22-2001	07-23-2001
N-Nitrosodi-n-propylamine	NA	NA	NA	NA	0.67 U	NA	NA
N-Nitrosodiphenylamine	NA	NA	NA	NA	1.4 U	NA	NA
Naphthalene	NA	NA	NA	NA	0.75 U	NA	NA
Nitrobenzene	NA	NA	NA	NA	0.81 U	NA	NA
Pentachlorophenol	NA	NA	NA	NA	2.4 U	NA	NA
Phenanthrene	NA	NA	NA	NA	0.82 U	NA	NA
Phenol	NA	NA	NA	NA	2.6 U	NA	NA
Pyrene	NA	NA	NA	NA	1.1 U	NA	NA
bis(2-Chloroethoxy)methane	NA	NA	NA	NA	0.87 U	NA	NA
bis(2-Chloroethyl) ether	NA	NA	NA	NA	0.97 U	NA	NA
bis(2-Ethylhexyl) phthalate	NA	NA	NA	NA	2.7 U	NA	NA

APPENDIX F
EQUIPMENT RINSATE ANALYTICAL RESULTS
REMEDIAL INVESTIGATION, CTO-219, SITE 84
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	1R84-ER01	1R84-ER02	1R84-ER03	1R84-ER04	1R84-ER05	1R84-ER06	1R84-ER07
SAMPLE DATE	07-17-2001	07-18-2001	07-19-2001	07-20-2001	07-21-2001	7-22-2001	07-23-2001
PESTICIDES/PCBs (ug/L)							
4,4'-DDD	NA	NA	NA	NA	0.0064 U	NA	NA
4,4'-DDE	NA	NA	NA	NA	0.0074 U	NA	NA
4,4'-DDT	NA	NA	NA	NA	0.0072 U	NA	NA
Aldrin	NA	NA	NA	NA	0.0064 U	NA	NA
Dieldrin	NA	NA	NA	NA	0.0069 U	NA	NA
Endosulfan I	NA	NA	NA	NA	0.0069 U	NA	NA
Endosulfan II	NA	NA	NA	NA	0.0066 U	NA	NA
Endosulfan sulfate	NA	NA	NA	NA	0.007 U	NA	NA
Endrin	NA	NA	NA	NA	0.0087 U	NA	NA
Endrin aldehyde	NA	NA	NA	NA	0.0064 U	NA	NA
Endrin ketone	NA	NA	NA	NA	0.0066 U	NA	NA
Heptachlor	NA	NA	NA	NA	0.0071 U	NA	NA
Heptachlor epoxide	NA	NA	NA	NA	0.0068 U	NA	NA
Methoxychlor	NA	NA	NA	NA	0.0084 U	NA	NA
PCB-1016	0.018 U	0.018 U	1.8 U	0.018 U	0.018 U	0.018 U	0.018 U
PCB-1221	0.094 U	0.094 U	9.4 U	0.094 U	0.094 U	0.094 U	0.094 U
PCB-1232	0.16 U	0.16 U	16 U	0.16 U	0.16 U	0.16 U	0.16 U
PCB-1242	0.3 U	0.3 U	30 U	0.3 U	0.3 U	0.3 U	0.3 U
PCB-1248	0.22 U	0.22 U	22 U	0.22 U	0.22 U	0.22 U	0.22 U
PCB-1254	0.096 U	0.096 U	9.6 U	0.096 U	0.096 U	0.096 U	0.096 U
PCB-1260	0.065 U	0.065 U	6.5 U	0.065 U	0.065 U	0.065 U	0.065 U
Toxaphene	NA	NA	NA	NA	0.23 U	NA	NA
alpha-BHC	NA	NA	NA	NA	0.0059 U	NA	NA
alpha-Chlordane	NA	NA	NA	NA	0.0067 U	NA	NA
beta-BHC	NA	NA	NA	NA	0.0062 U	NA	NA
delta-BHC	NA	NA	NA	NA	0.006 U	NA	NA
gamma-BHC (Lindane)	NA	NA	NA	NA	0.0062 U	NA	NA
gamma-Chlordane	NA	NA	NA	NA	0.0065 U	NA	NA

APPENDIX F
EQUIPMENT RINSATE ANALYTICAL RESULTS
REMEDIAL INVESTIGATION, CTO-219, SITE 84
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	1R84-ER01	1R84-ER02	1R84-ER03	1R84-ER04	1R84-ER05	1R84-ER06	1R84-ER07
SAMPLE DATE	07-17-2001	07-18-2001	07-19-2001	07-20-2001	07-21-2001	7-22-2001	07-23-2001
N-Nitrosodi-n-propylamine	NA	NA	NA	NA	0.67 U	NA	NA
N-Nitrosodiphenylamine	NA	NA	NA	NA	1.4 U	NA	NA
Naphthalene	NA	NA	NA	NA	0.75 U	NA	NA
Nitrobenzene	NA	NA	NA	NA	0.81 U	NA	NA
Pentachlorophenol	NA	NA	NA	NA	2.4 U	NA	NA
Phenanthrene	NA	NA	NA	NA	0.82 U	NA	NA
Phenol	NA	NA	NA	NA	2.6 U	NA	NA
Pyrene	NA	NA	NA	NA	1.1 U	NA	NA
bis(2-Chloroethoxy)methane	NA	NA	NA	NA	0.87 U	NA	NA
bis(2-Chloroethyl) ether	NA	NA	NA	NA	0.97 U	NA	NA
bis(2-Ethylhexyl) phthalate	NA	NA	NA	NA	2.7 U	NA	NA

APPENDIX F
EQUIPMENT RINSATE ANALYTICAL RESULTS
REMEDIAL INVESTIGATION, CTO-219, SITE 84
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	1R84-ER01	1R84-ER02	1R84-ER03	1R84-ER04	1R84-ER05	1R84-ER06	1R84-ER07
SAMPLE DATE	07-17-2001	07-18-2001	07-19-2001	07-20-2001	07-21-2001	7-22-2001	07-23-2001
PESTICIDES/PCBs (ug/L)							
4,4'-DDD	NA	NA	NA	NA	0.0064 U	NA	NA
4,4'-DDE	NA	NA	NA	NA	0.0074 U	NA	NA
4,4'-DDT	NA	NA	NA	NA	0.0072 U	NA	NA
Aldrin	NA	NA	NA	NA	0.0064 U	NA	NA
Dieldrin	NA	NA	NA	NA	0.0069 U	NA	NA
Endosulfan I	NA	NA	NA	NA	0.0069 U	NA	NA
Endosulfan II	NA	NA	NA	NA	0.0066 U	NA	NA
Endosulfan sulfate	NA	NA	NA	NA	0.007 U	NA	NA
Endrin	NA	NA	NA	NA	0.0087 U	NA	NA
Endrin aldehyde	NA	NA	NA	NA	0.0064 U	NA	NA
Endrin ketone	NA	NA	NA	NA	0.0066 U	NA	NA
Heptachlor	NA	NA	NA	NA	0.0071 U	NA	NA
Heptachlor epoxide	NA	NA	NA	NA	0.0068 U	NA	NA
Methoxychlor	NA	NA	NA	NA	0.0084 U	NA	NA
PCB-1016	0.018 U	0.018 U	1.8 U	0.018 U	0.018 U	0.018 U	0.018 U
PCB-1221	0.094 U	0.094 U	9.4 U	0.094 U	0.094 U	0.094 U	0.094 U
PCB-1232	0.16 U	0.16 U	16 U	0.16 U	0.16 U	0.16 U	0.16 U
PCB-1242	0.3 U	0.3 U	30 U	0.3 U	0.3 U	0.3 U	0.3 U
PCB-1248	0.22 U	0.22 U	22 U	0.22 U	0.22 U	0.22 U	0.22 U
PCB-1254	0.096 U	0.096 U	9.6 U	0.096 U	0.096 U	0.096 U	0.096 U
PCB-1260	0.065 U	0.065 U	6.5 U	0.065 U	0.065 U	0.065 U	0.065 U
Toxaphene	NA	NA	NA	NA	0.23 U	NA	NA
alpha-BHC	NA	NA	NA	NA	0.0059 U	NA	NA
alpha-Chlordane	NA	NA	NA	NA	0.0067 U	NA	NA
beta-BHC	NA	NA	NA	NA	0.0062 U	NA	NA
delta-BHC	NA	NA	NA	NA	0.006 U	NA	NA
gamma-BHC (Lindane)	NA	NA	NA	NA	0.0062 U	NA	NA
gamma-Chlordane	NA	NA	NA	NA	0.0065 U	NA	NA

APPENDIX F
EQUIPMENT RINSATE ANALYTICAL RESULTS
REMEDIAL INVESTIGATION, CTO-219, SITE 84
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	1R84-ER01	1R84-ER02	1R84-ER03	1R84-ER04	1R84-ER05	1R84-ER06	1R84-ER07
SAMPLE DATE	07-17-2001	07-18-2001	07-19-2001	07-20-2001	07-21-2001	7-22-2001	07-23-2001
HERBICIDES (ug/L)							
2,4,5-T	NA	NA	NA	NA	0.043 U	NA	NA
2,4-D	NA	NA	NA	NA	0.077 U	NA	NA
2,4-DB	NA	NA	NA	NA	0.33 U	NA	NA
Dalapon	NA	NA	NA	NA	0.39 UJ	NA	NA
Dicamba	NA	NA	NA	NA	0.059 U	NA	NA
Dichlorprop	NA	NA	NA	NA	0.089 U	NA	NA
Dinoseb	NA	NA	NA	NA	0.013 U	NA	NA
MCPA	NA	NA	NA	NA	8 U	NA	NA
MCPP	NA	NA	NA	NA	25 U	NA	NA
Pentachlorophenol	NA	NA	NA	NA	0.025 U	NA	NA
Silvex	NA	NA	NA	NA	0.036 U	NA	NA
METALS (mg/L)							
Aluminum	NA	NA	NA	NA	0.047 J	NA	NA
Antimony	NA	NA	NA	NA	0.0022 U	NA	NA
Arsenic	NA	NA	NA	NA	0.0039 U	NA	NA
Barium	NA	NA	NA	NA	0.003 U	NA	NA
Beryllium	NA	NA	NA	NA	0.00054 U	NA	NA
Cadmium	NA	NA	NA	NA	0.00028 U	NA	NA
Calcium	NA	NA	NA	NA	0.41 J	NA	NA
Chromium	NA	NA	NA	NA	0.0014 U	NA	NA
Cobalt	NA	NA	NA	NA	0.0013 U	NA	NA
Copper	NA	NA	NA	NA	0.0042 U	NA	NA
Iron	NA	NA	NA	NA	2.9	NA	NA
Lead	NA	NA	NA	NA	0.0025 U	NA	NA
Magnesium	NA	NA	NA	NA	0.03 U	NA	NA
Manganese	NA	NA	NA	NA	0.046	NA	NA
Mercury	NA	NA	NA	NA	0.000069 U	NA	NA
Nickel	NA	NA	NA	NA	0.0032 J	NA	NA
Potassium	NA	NA	NA	NA	0.16 U	NA	NA
Selenium	NA	NA	NA	NA	0.0045 U	NA	NA
Silver	NA	NA	NA	NA	0.0015 U	NA	NA
Sodium	NA	NA	NA	NA	0.63 U	NA	NA
Thallium	NA	NA	NA	NA	0.005 U	NA	NA
Vanadium	NA	NA	NA	NA	0.00082 U	NA	NA
Zinc	NA	NA	NA	NA	0.012 U	NA	NA

APPENDIX F
EQUIPMENT RINSATE ANALYTICAL RESULTS
REMEDIAL INVESTIGATION, CTO-219, SITE 84
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	EQIR84-ER08	IR84-ER09	IR84-ER10	IR84-ER11	IR84-ER12	IR84-ER13
SAMPLE DATE	07-31-2001	08-01-2001	08-02-2001	08-03-2001	08-06-2001	08-07-2001
VOLATILES (ug/L)						
1,1,1-Trichloroethane	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U
1,1,2,2-Tetrachloroethane	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
1,1,2-Trichloroethane	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
1,1-Dichloroethane	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U
1,1-Dichloroethene	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U
1,2-Dibromoethane (EDB)	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U
1,2-Dichloroethane	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U
1,2-Dichloroethene (total)	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U
1,2-Dichloropropane	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U
2-Butanone	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U
2-Hexanone	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U
4-Methyl-2-pentanone	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U
Acetone	0.51 U	1.8 J	1.3 J	0.91 J	2.6 J	1.5 J B
Benzene	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U
Bromodichloromethane	0.17 U	0.17 U	0.17 U	0.17 U	0.28 J	0.18 J
Bromoform	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U
Bromomethane	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Carbon disulfide	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Carbon tetrachloride	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U
Chlorobenzene	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U
Chloroethane	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U
Chloroform	0.18 J	0.25 J	0.21 J	0.14 U	28	21
Chloromethane	0.13 U	0.44 J	0.13 U	0.13 U	0.13 U	0.13 U
Dibromochloromethane	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U
Ethylbenzene	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U
Isopropyl ether	0.69 U	0.69 U	0.69 U	0.69 U	0.69 U	0.69 U
Methyl tert-butyl ether	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U
Methylene chloride	0.34 U	0.34 U	0.34 U	0.34 U	4.7 U	2.8
Styrene	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U
Tetrachloroethene	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U
Toluene	0.23 J	0.25 J	0.35 J	0.18 U	0.31 J	0.35 J
Trichloroethene	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U
Vinyl chloride	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U
Xylenes (total)	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U
cis-1,3-Dichloropropene	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U
trans-1,3-Dichloropropene	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U
SEMIVOLATILES (ug/L)						
1,2,4-Trichlorobenzene	0.65 U	0.65 U	0.65 U	0.65 U	0.65 U	0.65 U
1,2-Dichlorobenzene	0.81 U	0.81 U	0.81 U	0.81 U	0.81 U	0.81 U
1,3-Dichlorobenzene	0.83 U	0.83 U	0.83 U	0.83 U	0.83 U	0.83 U
1,4-Dichlorobenzene	0.77 U	0.77 U	0.77 U	0.77 U	0.77 U	0.77 U
2,2'-Oxybis(1-Chloropropane)	0.78 U	0.78 U	0.78 U	0.78 U	0.78 U	0.78 U
2,4,5-Trichlorophenol	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
2,4,6-Trichlorophenol	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
2,4-Dichlorophenol	0.85 U	0.85 U	0.85 U	0.85 U	0.85 U	0.85 U

APPENDIX F
EQUIPMENT RINSATE ANALYTICAL RESULTS
REMEDIAL INVESTIGATION, CTO-219, SITE 84
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	EQIR84-ER08	IR84-ER09	IR84-ER10	IR84-ER11	IR84-ER12	IR84-ER13
SAMPLE DATE	07-31-2001	08-01-2001	08-02-2001	08-03-2001	08-06-2001	08-07-2001
2,4-Dimethylphenol	0.85 U	0.85 U	0.85 U	0.85 U	0.85 U	0.85 U
2,4-Dinitrophenol	3 U	3 U	3 U	3 U	3 U	3 U
2,4-Dinitrotoluene	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U
2,6-Dinitrotoluene	0.57 U	0.57 U	0.57 U	0.57 U	0.57 U	0.57 U
2-Chloronaphthalene	0.85 U	0.85 U	0.85 U	0.85 U	0.85 U	0.85 U
2-Chlorophenol	1 U	1 U	1 U	1 U	1 U	1 U
2-Methylnaphthalene	0.64 U	0.64 U	0.64 U	0.64 U	0.64 U	0.64 U
2-Methylphenol	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U
2-Nitroaniline	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U
2-Nitrophenol	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U
3,3'-Dichlorobenzidine	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U
3-Nitroaniline	0.71 U	0.71 U	0.71 U	0.71 U	0.71 U	0.71 U
4,6-Dinitro-2-methylphenol	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U
4-Bromophenyl phenyl ether	0.88 U	0.88 U	0.88 U	0.88 U	0.88 U	0.88 U
4-Chloro-3-methylphenol	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U
4-Chloroaniline	0.61 U	0.61 U	0.61 U	0.61 U	0.61 U	0.61 U
4-Chlorophenyl phenyl ether	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U
4-Methylphenol	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U
4-Nitroaniline	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U
4-Nitrophenol	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
Acenaphthene	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U
Acenaphthylene	0.71 U	0.71 U	0.71 U	0.71 U	0.71 U	0.71 U
Anthracene	0.68 U	0.68 U	0.68 U	0.68 U	0.68 U	0.68 U
Benzo(a)anthracene	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U
Benzo(a)pyrene	0.73 U	0.73 U	0.73 U	0.73 U	0.73 U	0.73 U
Benzo(b)fluoranthene	0.94 U	0.94 U	0.94 U	0.94 U	0.94 U	0.94 U
Benzo(ghi)perylene	0.85 U	0.85 U	0.85 U	0.85 U	0.85 U	0.85 U
Benzo(k)fluoranthene	0.84 U	0.84 U	0.84 U	0.84 U	0.84 U	0.84 U
SEMIVOLATILES (ug/L)						
Butyl benzyl phthalate	0.88 U	0.88 U	0.88 U	0.88 U	0.88 U	0.88 U
Carbazole	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U
Chrysene	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Di-n-butyl phthalate	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U
Di-n-octyl phthalate	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U
Dibenz(a,h)anthracene	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U
Dibenzofuran	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U
Diethyl phthalate	0.65 U	0.65 U	0.65 U	0.65 U	0.65 U	0.65 U
Dimethyl phthalate	0.76 U	0.76 U	0.76 U	0.76 U	0.76 U	0.76 U
Fluoranthene	0.81 U	0.81 U	0.81 U	0.81 U	0.81 U	0.81 U
Fluorene	1 U	1 U	1 U	1 U	1 U	1 U
Hexachlorobenzene	0.74 U	0.74 U	0.74 U	0.74 U	0.74 U	0.74 U
Hexachlorobutadiene	0.73 U	0.73 U	0.73 U	0.73 U	0.73 U	0.73 U
Hexachlorocyclopentadiene	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U
Hexachloroethane	0.74 U	0.74 U	0.74 U	0.74 U	0.74 U	0.74 U
Indeno(1,2,3-cd)pyrene	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U
Isophorone	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U

APPENDIX F
EQUIPMENT RINSATE ANALYTICAL RESULTS
REMEDIAL INVESTIGATION, CTO-219, SITE 84
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	EQIR84-ER08	IR84-ER09	IR84-ER10	IR84-ER11	IR84-ER12	IR84-ER13
SAMPLE DATE	07-31-2001	08-01-2001	08-02-2001	08-03-2001	08-06-2001	08-07-2001
N-Nitrosodi-n-propylamine	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U
N-Nitrosodiphenylamine	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U
Naphthalene	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Nitrobenzene	0.81 U	0.81 U	0.81 U	0.81 U	0.81 U	0.81 U
Pentachlorophenol	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U
Phenanthrene	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U
Phenol	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U
Pyrene	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U
bis(2-Chloroethoxy)methane	0.87 U	0.87 U	0.87 U	0.87 U	0.87 U	0.87 U
bis(2-Chloroethyl) ether	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U
bis(2-Ethylhexyl) phthalate	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U

APPENDIX F
EQUIPMENT RINSATE ANALYTICAL RESULTS
REMEDIAL INVESTIGATION, CTO-219, SITE 84
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	EQIR84-ER08	IR84-ER09	IR84-ER10	IR84-ER11	IR84-ER12	IR84-ER13
SAMPLE DATE	07-31-2001	08-01-2001	08-02-2001	08-03-2001	08-06-2001	08-07-2001
PESTICIDES/PCBs (ug/L)						
4,4'-DDD	0.0064 U	0.0064 U	0.0064 U	0.0064 U	0.0064 U	0.0064 U
4,4'-DDE	0.0074 U	0.0074 U	0.0074 U	0.0074 U	0.0074 U	0.0074 U
4,4'-DDT	0.0072 U	0.0072 U	0.0072 U	0.0072 U	0.0072 U	0.0072 U
Aldrin	0.0064 U	0.0064 U	0.0064 U	0.0064 U	0.0064 U	0.0064 U
Dieldrin	0.0069 U	0.0069 U	0.0069 U	0.0069 U	0.0069 U	0.0069 U
Endosulfan I	0.0069 U	0.0069 U	0.0069 U	0.0069 U	0.0069 U	0.0069 U
Endosulfan II	0.0066 U	0.0066 U	0.0066 U	0.0066 U	0.0066 U	0.0066 U
Endosulfan sulfate	0.007 U	0.007 U	0.007 U	0.007 U	0.007 U	0.007 U
Endrin	0.0087 U	0.0087 U	0.0087 U	0.0087 U	0.0087 U	0.0087 U
Endrin aldehyde	0.0064 U	0.0064 U	0.0064 U	0.0064 U	0.0064 U	0.0064 U
Endrin ketone	0.0066 U	0.0066 U	0.0066 U	0.0066 U	0.0066 U	0.0066 U
Heptachlor	0.0071 U	0.0071 U	0.0071 U	0.0071 U	0.0071 U	0.0071 U
Heptachlor epoxide	0.0068 U	0.0068 U	0.0068 U	0.0068 U	0.0068 U	0.0068 U
Methoxychlor	0.0084 U	0.0084 U	0.0084 U	0.0084 U	0.0084 U	0.0084 U
PCB-1016	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U
PCB-1221	0.094 U	0.094 U	0.094 U	0.094 U	0.094 U	0.094 U
PCB-1232	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U
PCB-1242	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
PCB-1248	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U
PCB-1254	0.096 U	0.096 U	0.096 U	0.096 U	0.096 U	0.096 U
PCB-1260	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U
Toxaphene	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U
alpha-BHC	0.0059 U	0.0059 U	0.0059 U	0.0059 U	0.0059 U	0.0059 U
alpha-Chlordane	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U
beta-BHC	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U
delta-BHC	0.006 U	0.006 U	0.006 U	0.006 U	0.006 U	0.006 U
gamma-BHC (Lindane)	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U
gamma-Chlordane	0.0065 U	0.0065 U	0.0065 U	0.0065 U	0.0065 U	0.0065 U

APPENDIX F
EQUIPMENT RINSATE ANALYTICAL RESULTS
REMEDIAL INVESTIGATION, CTO-219, SITE 84
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	EQIR84-ER08	IR84-ER09	IR84-ER10	IR84-ER11	IR84-ER12	IR84-ER13
SAMPLE DATE	07-31-2001	08-01-2001	08-02-2001	08-03-2001	08-06-2001	08-07-2001
HERBICIDES (ug/L)						
2,4,5-T	0.043 U	0.043 U	0.043 U	0.043 U	0.043 U	0.043 U
2,4-D	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U
2,4-DB	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U
Dalapon	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U
Dicamba	0.059 U	0.059 U	0.059 U	0.059 U	0.059 U	0.059 U
Dichlorprop	0.089 U	0.089 U	0.089 U	0.089 U	0.089 U	0.089 U
Dinoseb	0.013 U	0.013 U	0.013 U	0.013 U	0.013 UJ	0.013 U
MCPA	8 U	8 U	8 U	8 U	8 U	8 U
MCPP	25 U	25 U	25 U	25 U	25 U	25 U
Pentachlorophenol	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U
Silvex	0.036 U	0.036 U	0.036 U	0.036 U	0.036 U	0.036 U
METALS (mg/L)						
Aluminum	0.044 J	0.045 J	0.028 U	0.028 U	0.094 U	0.028 U
Antimony	0.0022 U	0.0023 J	0.0022 U	0.0022 U	0.0022 U	0.0022 U
Arsenic	0.0039 U	0.0039 U	0.0039 U	0.0039 U	0.0039 U	0.0039 U
Barium	0.0035 J	0.0034 J	0.0036 J	0.0039 J	0.003 U	0.003 U
Beryllium	0.00054 U	0.00054 U	0.00054 U	0.00054 U	0.00061 J	0.00054 U
Cadmium	0.00028 U	0.00028 U	0.00028 U	0.00028 U	0.00028 U	0.00028 U
Calcium	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Chromium	0.0014 U	0.0014 U	0.0014 U	0.0014 U	0.0014 U	0.0014 U
Cobalt	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U
Copper	0.0042 U	0.0042 U	0.0042 U	0.0042 U	0.0042 U	0.0042 U
Iron	0.088 U	0.088 U	0.088 U	0.088 U	0.088 U	0.088 U
Lead	0.0025 U	0.0025 U	0.0025 U	0.0025 U	0.0025 U	0.0025 U
Magnesium	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U
Manganese	0.0009 U	0.0011 U	0.00094 B	0.0009 U	0.0009 U	0.0009 U
Mercury	0.000069 U	0.000069 U	0.000069 U	0.000069 U	0.000069 U	0.000069 U
Nickel	0.0022 U	0.0022 U	0.0022 U	0.0022 U	0.0022 U	0.0022 U
Potassium	0.19 U	0.17 U	0.18 U	0.16 U	0.17 U	0.041 U
Selenium	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U
Silver	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U
Sodium	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U
Thallium	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Vanadium	0.00082 U	0.00082 U	0.00098 J	0.00082 U	0.00082 U	0.00082 U
Zinc	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U

APPENDIX F
FIELD BLANK ANALYTICAL RESULTS
REMEDIAL INVESTIGATION, CTO-219, SITE 84
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-FB01	IR84-FB02	IR84-FB03	IR84-FB04	IR84-FB05	IR84-FB06
SAMPLE DATE	07-17-2001	07-17-2001	07-21-2001	07-21-2001	08-01-2001	08-03-2001
VOLATILES (ug/L)						
1,1,1-Trichloroethane	NA	NA	0.15 U	0.15 U	0.15 U	0.15 U
1,1,2,2-Tetrachloroethane	NA	NA	0.25 U	0.25 U	0.25 U	0.25 U
1,1,2-Trichloroethane	NA	NA	0.3 U	0.3 U	0.3 U	0.3 U
1,1-Dichloroethane	NA	NA	0.16 U	0.16 U	0.16 U	0.16 U
1,1-Dichloroethene	NA	NA	0.24 U	0.24 U	0.24 U	0.44 J
1,2-Dibromoethane (EDB)	NA	NA	0.22 U	0.22 U	0.22 U	0.22 U
1,2-Dichloroethane	NA	NA	0.21 U	0.21 U	0.21 U	0.21 U
1,2-Dichloroethene (total)	NA	NA	0.28 U	0.28 U	0.28 U	0.28 U
1,2-Dichloropropane	NA	NA	0.17 U	0.17 U	0.17 U	0.17 U
2-Butanone	NA	NA	0.41 U	0.41 U	0.41 U	4.6 J
2-Hexanone	NA	NA	0.46 U	0.46 U	0.46 U	0.46 U
4-Methyl-2-pentanone	NA	NA	0.23 U	0.23 U	0.23 U	0.23 U
Acetone	NA	NA	10 U	0.51 U	1.1 J	30 J
Benzene	NA	NA	0.16 U	0.16 U	0.16 U	0.35 J
Bromodichloromethane	NA	NA	0.17 U	0.17 U	3.4	0.17 U
Bromoform	NA	NA	0.18 U	0.18 U	0.18 U	0.18 U
Bromomethane	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U
Carbon disulfide	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U
Carbon tetrachloride	NA	NA	0.12 U	0.12 U	0.12 U	0.12 U
Chlorobenzene	NA	NA	0.14 U	0.14 U	0.14 U	0.14 U
Chloroethane	NA	NA	0.26 U	0.26 U	0.26 U	0.26 U
Chloroform	NA	NA	8.6	0.14 U	16	0.14 U
Chloromethane	NA	NA	0.13 U	0.13 U	0.13 U	0.13 U
Dibromochloromethane	NA	NA	0.26 U	0.26 U	0.62 J	0.26 U
Ethylbenzene	NA	NA	0.12 U	0.12 U	0.12 U	0.12 U
Isopropyl ether	NA	NA	0.69 U	0.69 U	0.69 U	0.69 U
Methyl tert-butyl ether	NA	NA	0.13 U	0.13 U	0.13 U	2.1 J
Methylene chloride	NA	NA	3.2	0.34 U	0.34 U	0.34 U
Styrene	NA	NA	0.15 U	0.15 U	0.15 U	0.15 U
Tetrachloroethene	NA	NA	0.23 U	0.23 U	0.23 U	0.23 U
Toluene	NA	NA	0.54 J	0.2 J	0.18 U	1.3
Trichloroethene	NA	NA	0.14 U	0.14 U	0.14 U	0.14 U
Vinyl chloride	NA	NA	0.15 U	0.15 U	0.15 U	0.15 U
Xylenes (total)	NA	NA	0.33 U	0.33 U	0.33 U	0.51 J
cis-1,3-Dichloropropene	NA	NA	0.12 U	0.12 U	0.12 U	0.12 U
trans-1,3-Dichloropropene	NA	NA	0.27 U	0.27 U	0.27 U	0.27 U
SEMIVOLATILES (ug/L)						
1,2,4-Trichlorobenzene	NA	NA	0.65 U	0.65 U	0.65 U	0.65 U
1,2-Dichlorobenzene	NA	NA	0.81 U	0.81 U	0.81 U	0.81 U
1,3-Dichlorobenzene	NA	NA	0.83 U	0.83 U	0.83 U	0.83 U
1,4-Dichlorobenzene	NA	NA	0.77 U	0.77 U	0.77 U	0.77 U
2,2'-Oxybis(1-Chloropropane)	NA	NA	0.78 U	0.78 U	0.78 U	0.78 U
2,4,5-Trichlorophenol	NA	NA	1.2 U	1.2 U	1.2 U	1.2 U
2,4,6-Trichlorophenol	NA	NA	1.7 U	1.7 U	1.7 U	1.7 U
2,4-Dichlorophenol	NA	NA	0.85 U	0.85 U	0.85 U	0.85 U

APPENDIX F
FIELD BLANK ANALYTICAL RESULTS
REMEDIAL INVESTIGATION, CTO-219, SITE 84
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-FB01	IR84-FB02	IR84-FB03	IR84-FB04	IR84-FB05	IR84-FB06
SAMPLE DATE	07-17-2001	07-17-2001	07-21-2001	07-21-2001	08-01-2001	08-03-2001
2,4-Dimethylphenol	NA	NA	0.85 U	0.85 U	0.85 U	0.85 U
2,4-Dinitrophenol	NA	NA	3 U	3 U	3 U	3 U
2,4-Dinitrotoluene	NA	NA	0.79 U	0.79 U	0.79 U	0.79 U
2,6-Dinitrotoluene	NA	NA	0.57 U	0.57 U	0.57 U	0.57 U
2-Chloronaphthalene	NA	NA	0.85 U	0.85 U	0.85 U	0.85 U
2-Chlorophenol	NA	NA	1 U	1 U	1 U	1 U
2-Methylnaphthalene	NA	NA	0.64 U	0.64 U	0.64 U	0.64 U
2-Methylphenol	NA	NA	1.1 U	1.1 U	1.1 U	1.1 U
2-Nitroaniline	NA	NA	0.7 U	0.7 U	0.7 U	0.7 U
2-Nitrophenol	NA	NA	2.1 U	2.1 U	2.1 U	2.1 U
3,3'-Dichlorobenzidine	NA	NA	0.93 U	0.93 U	0.93 U	0.93 U
3-Nitroaniline	NA	NA	0.71 U	0.71 U	0.71 U	0.71 U
4,6-Dinitro-2-methylphenol	NA	NA	1.3 U	1.3 U	1.3 U	1.3 U
4-Bromophenyl phenyl ether	NA	NA	0.88 U	0.88 U	0.88 U	0.88 U
4-Chloro-3-methylphenol	NA	NA	0.99 U	0.99 U	0.99 U	0.99 U
4-Chloroaniline	NA	NA	0.61 U	0.61 U	0.61 U	0.61 U
4-Chlorophenyl phenyl ether	NA	NA	0.79 U	0.79 U	0.79 U	0.79 U
4-Methylphenol	NA	NA	1.3 U	1.3 U	1.3 U	1.4 J
4-Nitroaniline	NA	NA	1.3 U	1.3 U	1.3 U	1.3 U
4-Nitrophenol	NA	NA	1.9 U	1.9 U	1.9 U	1.9 U
Acenaphthene	NA	NA	0.8 U	0.8 U	0.8 U	0.8 U
Acenaphthylene	NA	NA	0.71 U	0.71 U	0.71 U	0.71 U
Anthracene	NA	NA	0.68 U	0.68 U	0.68 U	0.68 U
Benzo(a)anthracene	NA	NA	0.7 U	0.7 U	0.7 U	0.7 U
Benzo(a)pyrene	NA	NA	0.73 U	0.73 U	0.73 U	0.73 U
Benzo(b)fluoranthene	NA	NA	0.94 U	0.94 U	0.94 U	0.94 U
Benzo(ghi)perylene	NA	NA	0.85 U	0.85 U	0.85 U	0.85 U
Benzo(k)fluoranthene	NA	NA	0.84 U	0.84 U	0.84 U	0.84 U
SEMIVOLATILES (ug/L)						
Benzothiazole	NA	NA	NA	NA	NA	7.1 NJ
Butyl benzyl phthalate	NA	NA	0.88 U	0.88 U	0.88 U	0.88 U
Carbazole	NA	NA	0.82 U	0.82 U	0.82 U	0.82 U
Chrysene	NA	NA	0.75 U	0.75 U	0.75 U	0.75 U
Di-n-butyl phthalate	NA	NA	0.67 U	0.67 U	0.67 U	0.67 U
Di-n-octyl phthalate	NA	NA	1.1 U	1.1 U	1.1 U	1.1 U
Dibenz(a,h)anthracene	NA	NA	0.79 U	0.79 U	0.79 U	0.79 U
Dibenzofuran	NA	NA	1.1 U	1.1 U	1.1 U	1.1 U
Diethyl phthalate	NA	NA	0.65 U	0.65 U	0.65 U	0.65 U
Dimethyl phthalate	NA	NA	0.76 U	0.76 U	0.76 U	6.9 J
Fluoranthene	NA	NA	0.81 U	0.81 U	0.81 U	0.81 U
Fluorene	NA	NA	1 U	1 U	1 U	1 U
Hexachlorobenzene	NA	NA	0.74 U	0.74 U	0.74 U	0.74 U
Hexachlorobutadiene	NA	NA	0.73 U	0.73 U	0.73 U	0.73 U
Hexachlorocyclopentadiene	NA	NA	1.1 U	1.1 U	1.1 U	1.1 U
Hexachloroethane	NA	NA	0.74 U	0.74 U	0.74 U	0.74 U
Indeno(1,2,3-cd)pyrene	NA	NA	0.63 U	0.63 U	0.63 U	0.63 U

APPENDIX F
FIELD BLANK ANALYTICAL RESULTS
REMEDIAL INVESTIGATION, CTO-219, SITE 84
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	1R84-FB01	1R84-FB02	1R84-FB03	1R84-FB04	IR84-FB05	IR84-FB06
SAMPLE DATE	07-17-2001	07-17-2001	07-21-2001	07-21-2001	08-01-2001	08-03-2001
Isophorone	NA	NA	0.63 U	0.63 U	0.63 U	0.63 U
N-Nitrosodi-n-propylamine	NA	NA	0.67 U	0.67 U	0.67 U	0.67 U
N-Nitrosodiphenylamine	NA	NA	1.4 U	1.4 U	1.4 U	1.4 U
Naphthalene	NA	NA	0.75 U	0.75 U	0.75 U	0.75 U
Nitrobenzene	NA	NA	0.81 U	0.81 U	0.81 U	0.81 U
Pentachlorophenol	NA	NA	2.4 U	2.4 U	2.4 U	2.4 U
Phenanthrene	NA	NA	0.82 U	0.82 U	0.82 U	0.82 U
Phenol	NA	NA	2.6 U	2.6 U	2.6 U	28
Pyrene	NA	NA	1.1 U	1.1 U	1.1 U	1.1 U
bis(2-Chloroethoxy)methane	NA	NA	0.87 U	0.87 U	0.87 U	0.87 U
bis(2-Chloroethyl) ether	NA	NA	0.97 U	0.97 U	0.97 U	0.97 U
bis(2-Ethylhexyl) phthalate	NA	NA	2.7 U	2.7 U	2.7 U	2.7 U

APPENDIX F
FIELD BLANK ANALYTICAL RESULTS
REMEDIAL INVESTIGATION, CTO-219, SITE 84
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	1R84-FB01	1R84-FB02	1R84-FB03	1R84-FB04	IR84-FB05	IR84-FB06
SAMPLE DATE	07-17-2001	07-17-2001	07-21-2001	07-21-2001	08-01-2001	08-03-2001
PESTICIDES/PCBs (ug/L)						
4,4'-DDD	NA	NA	0.0064 U	0.0064 U	0.0064 U	0.0064 U
4,4'-DDE	NA	NA	0.0074 U	0.0074 U	0.0074 U	0.0074 U
4,4'-DDT	NA	NA	0.0072 U	0.0072 U	0.0072 U	0.0072 U
Aldrin	NA	NA	0.0064 U	0.0064 U	0.0064 U	0.0064 U
Dieldrin	NA	NA	0.0069 U	0.0069 U	0.0069 U	0.0069 U
Endosulfan I	NA	NA	0.0069 U	0.0069 U	0.0069 U	0.0069 U
Endosulfan II	NA	NA	0.0066 U	0.0066 U	0.0066 U	0.0066 U
Endosulfan sulfate	NA	NA	0.007 U	0.007 U	0.007 U	0.007 U
Endrin	NA	NA	0.0087 U	0.0087 U	0.0087 U	0.0087 U
Endrin aldehyde	NA	NA	0.0064 U	0.0064 U	0.0064 U	0.0064 U
Endrin ketone	NA	NA	0.0066 U	0.0066 U	0.0066 U	0.0066 U
Heptachlor	NA	NA	0.0071 U	0.0071 U	0.0071 U	0.0071 U
Heptachlor epoxide	NA	NA	0.0068 U	0.0068 U	0.0068 U	0.0068 U
Methoxychlor	NA	NA	0.0084 U	0.0084 U	0.0084 U	0.0084 U
PCB-1016	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U
PCB-1221	0.094 U	0.094 U	0.094 U	0.094 U	0.094 U	0.094 U
PCB-1232	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U
PCB-1242	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
PCB-1248	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U
PCB-1254	0.096 U	0.096 U	0.096 U	0.096 U	0.096 U	0.096 U
PCB-1260	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U
Toxaphene	NA	NA	0.23 U	0.23 U	0.23 U	0.23 U
alpha-BHC	NA	NA	0.079	0.0059 U	0.0059 U	0.0059 U
alpha-Chlordane	NA	NA	0.0067 U	0.0067 U	0.0067 U	0.0067 U
beta-BHC	NA	NA	0.0062 U	0.0062 U	0.0062 U	0.0062 U
delta-BHC	NA	NA	0.006 U	0.006 U	0.006 U	0.006 U
gamma-BHC (Lindane)	NA	NA	0.029 J	0.0062 U	0.0062 U	0.0062 U
gamma-Chlordane	NA	NA	0.0065 U	0.0065 U	0.0065 U	0.0065 U

APPENDIX F
FIELD BLANK ANALYTICAL RESULTS
REMEDIAL INVESTIGATION, CTO-219, SITE 84
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-FB01	IR84-FB02	IR84-FB03	IR84-FB04	IR84-FB05	IR84-FB06
SAMPLE DATE	07-17-2001	07-17-2001	07-21-2001	07-21-2001	08-01-2001	08-03-2001
HERBICIDES (ug/L)						
2,4,5-T	NA	NA	0.043 U	0.043 U	0.043 U	0.043 U
2,4-D	NA	NA	0.077 U	0.077 U	0.077 U	0.077 U
2,4-DB	NA	NA	0.33 U	0.33 U	0.33 U	0.33 U
Dalapon	NA	NA	0.39 UJ	0.39 UJ	0.39 U	0.39 U
Dicamba	NA	NA	0.059 U	0.059 U	0.059 U	0.059 U
Dichlorprop	NA	NA	0.089 U	0.089 U	0.089 U	0.089 U
Dinoseb	NA	NA	0.013 U	0.013 U	0.013 U	0.013 U
MCPA	NA	NA	8 U	8 U	8 U	8 U
MCPP	NA	NA	25 U	25 U	25 U	25 U
Pentachlorophenol	NA	NA	0.025 U	0.025 U	0.025 U	0.025 U
Silvex	NA	NA	0.036 U	0.036 U	0.036 U	0.095 J
METALS (ug/L)						
Aluminum	NA	NA	0.05 J	0.055 J	0.085 J	0.028 U
Antimony	NA	NA	0.0022 U	0.0022 U	0.0022 U	0.0022 U
Arsenic	NA	NA	0.0039 U	0.0039 U	0.0039 U	0.0039 U
Barium	NA	NA	0.0044 J	0.066 J	0.021 J	0.003 U
Beryllium	NA	NA	0.00054 U	0.00054 U	0.00054 U	0.00054 U
Cadmium	NA	NA	0.00028 U	0.00028 U	0.00028 U	0.00028 U
Calcium	NA	NA	0.25 U	50 J	14.8	0.25 U
Chromium	NA	NA	0.0014 U	0.0014 U	0.0014 U	0.0014 U
Cobalt	NA	NA	0.0013 U	0.0013 U	0.0013 U	0.0013 U
Copper	NA	NA	0.0042 U	0.0042 U	0.031	0.0042 U
Iron	NA	NA	0.088 U	1.4	0.088 U	0.088 U
Lead	NA	NA	0.0025 U	0.0025 U	0.0025 U	0.0025 U
Magnesium	NA	NA	0.03 U	2.6 J	3.4 J	0.03 U
Manganese	NA	NA	0.0009 U	0.054	0.055	0.0009 U
Mercury	NA	NA	0.000069 U	0.000069 U	0.000069 U	0.000069 U
Nickel	NA	NA	0.0022 U	0.0022 U	0.0022 U	0.0022 U
Potassium	NA	NA	0.18 U	1.7 J	1.8 J	0.16 U
Selenium	NA	NA	0.0045 U	0.0045 U	0.0045 U	0.0045 U
Silver	NA	NA	0.0015 U	0.0015 U	0.0015 U	0.0015 U
Sodium	NA	NA	0.63 U	7.9	14.2	0.63 U
Thallium	NA	NA	0.005 U	0.005 U	0.005 U	0.005 U
Vanadium	NA	NA	0.00082 U	0.00082 U	0.00082 U	0.00082 U
Zinc	NA	NA	0.012 U	0.024	0.061	0.012 U

APPENDIX F
GROUNDWATER ANALYTICAL DATA
REMEDIAL INVESTIGATION, CTO-0219
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	AST781-GW03-98B	AST781-GW04-98B	AST781-GW07-98B	AST781-GW08-98B	AST781-GW11-98B	AST781-GW12-98B
SAMPLE DATE	04/23/1998	04/23/1998	04/22/1998	04/22/1998	04/23/1998	04/23/1998
VOLATILES (ug/L)						
1,1,1-Trichloroethane	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
1,1,2-Trichloroethane	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
1,1-Dichloroethene	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dibromoethane (EDB)	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
1,2-Dichloroethene (total)	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
2-Butanone	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
4-Methyl-2-pentanone	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
Benzene	3.4 J	1.5 J	10 U	10 U	10 U	10 U
Bromodichloromethane	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
Bromomethane	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
Carbon tetrachloride	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
Chloroethane	10 U	10 U	10 U	10 U	10 U	10 U
Chloroform	10 U	10 U	10 U	10 U	16	16
Chloromethane	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
Ethylbenzene	3.6 J	6.7 J	10 U	10 U	10 U	10 U
Isopropyl ether	10 U	10 U	10 U	10 U	10 U	10 U
Methyl tert-butyl ether	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
Styrene	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
Toluene	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
Vinyl chloride	10 U	10 U	10 U	10 U	10 U	10 U
Xylenes (total)	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
trans-1,3-Dichloropropene	10 U	10 U	10 U	10 U	10 U	10 U

APPENDIX F
GROUNDWATER ANALYTICAL DATA
REMEDIAL INVESTIGATION, CTO-0219
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	AST781-GW03-98B	AST781-GW04-98B	ASI781-GW07-98B	AST781-GW08-98B	AST781-GW11-98B	AST781-GW12-98B
SAMPLE DATE	04/23/1998	04/23/1998	04/22/1998	04/22/1998	04/23/1998	04/23/1998
SEMIVOLATILES (ug/L)						
1.2.4-Trichlorobenzene	NA	NA	NA	NA	NA	NA
1.2-Dichlorobenzene	NA	NA	NA	NA	NA	NA
1.3-Dichlorobenzene	NA	NA	NA	NA	NA	NA
1.4-Dichlorobenzene	NA	NA	NA	NA	NA	NA
2.2'-Oxybis(1-Chloropropane)	NA	NA	NA	NA	NA	NA
2.4.5-Trichlorophenol	NA	NA	NA	NA	NA	NA
2.4.6-Trichlorophenol	NA	NA	NA	NA	NA	NA
2.4-Dichlorophenol	NA	NA	NA	NA	NA	NA
2.4-Dimethylphenol	NA	NA	NA	NA	NA	NA
2.4-Dinitrophenol	NA	NA	NA	NA	NA	NA
2.4-Dinitrotoluene	NA	NA	NA	NA	NA	NA
2.6-Dinitrotoluene	NA	NA	NA	NA	NA	NA
2-Chloronaphthalene	NA	NA	NA	NA	NA	NA
2-Chlorophenol	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	NA	NA	NA	NA	NA	NA
2-Methylphenol	NA	NA	NA	NA	NA	NA
2-Nitroaniline	NA	NA	NA	NA	NA	NA
2-Nitrophenol	NA	NA	NA	NA	NA	NA
3.3'-Dichlorobenzidine	NA	NA	NA	NA	NA	NA
3-Nitroaniline	NA	NA	NA	NA	NA	NA
4.6-Dinitro-2-methylphenol	NA	NA	NA	NA	NA	NA
4-Bromophenyl phenyl ether	NA	NA	NA	NA	NA	NA
4-Chloro-3-methylphenol	NA	NA	NA	NA	NA	NA
4-Chloroaniline	NA	NA	NA	NA	NA	NA
4-Chlorophenyl phenyl ether	NA	NA	NA	NA	NA	NA
4-Methylphenol	NA	NA	NA	NA	NA	NA
4-Nitroaniline	NA	NA	NA	NA	NA	NA
4-Nitrophenol	NA	NA	NA	NA	NA	NA
Acenaphthene	NA	NA	NA	NA	NA	NA
Acenaphthylene	NA	NA	NA	NA	NA	NA
Anthracene	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA
Benzo(ghi)perylene	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	NA
Butyl benzyl phthalate	NA	NA	NA	NA	NA	NA

APPENDIX F
GROUNDWATER ANALYTICAL DATA
REMEDIAL INVESTIGATION, CTO-0219
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	AST781-GW03-98B	AST781-GW04-98B	ASI781-GW07-98B	AST781-GW08-98B	AST781-GW11-98B	AST781-GW12-98B
SAMPLE DATE	04/23/1998	04/23/1998	04/22/1998	04/22/1998	04/23/1998	04/23/1998
SEMIVOLATILES (ug/L)						
Carbazole	NA	NA	NA	NA	NA	NA
Chrysene	NA	NA	NA	NA	NA	NA
Di-n-butyl phthalate	NA	NA	NA	NA	NA	NA
Di-n-octyl phthalate	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	NA	NA	NA	NA	NA	NA
Dibenzofuran	NA	NA	NA	NA	NA	NA
Diethyl phthalate	NA	NA	NA	NA	NA	NA
Dimethyl phthalate	NA	NA	NA	NA	NA	NA
Fluoranthene	NA	NA	NA	NA	NA	NA
Fluorene	NA	NA	NA	NA	NA	NA
Hexachlorobenzene	NA	NA	NA	NA	NA	NA
Hexachlorobutadiene	NA	NA	NA	NA	NA	NA
Hexachlorocyclopentadiene	NA	NA	NA	NA	NA	NA
Hexachloroethane	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	NA
Isophorone	NA	NA	NA	NA	NA	NA
N-Nitrosodi-n-propylamine	NA	NA	NA	NA	NA	NA
N-Nitrosodiphenylamine	NA	NA	NA	NA	NA	NA
Naphthalene	NA	NA	NA	NA	NA	NA
Nitrobenzene	NA	NA	NA	NA	NA	NA
Pentachlorophenol	NA	NA	NA	NA	NA	NA
Phenanthrene	NA	NA	NA	NA	NA	NA
Phenol	NA	NA	NA	NA	NA	NA
Pyrene	NA	NA	NA	NA	NA	NA
bis(2-Chloroethoxy)methane	NA	NA	NA	NA	NA	NA
bis(2-Chloroethyl) ether	NA	NA	NA	NA	NA	NA
bis(2-Ethylhexyl) phthalate	NA	NA	NA	NA	NA	NA

APPENDIX F
GROUNDWATER ANALYTICAL DATA
REMEDIAL INVESTIGATION, CTO-0219
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	AST781-GW03-98B	AST781-GW04-98B	ASI781-GW07-98B	AST781-GW08-98B	AST781-GW11-98B	AST781-GW12-98B
SAMPLE DATE	04/23/1998	04/23/1998	04/22/1998	04/22/1998	04/23/1998	04/23/1998
PESTICIDES/PCBs (ug/L)						
4,4'-DDD	NA	NA	NA	NA	NA	NA
4,4'-DDE	NA	NA	NA	NA	NA	NA
4,4'-DDT	NA	NA	NA	NA	NA	NA
Aldrin	NA	NA	NA	NA	NA	NA
Dieldrin	NA	NA	NA	NA	NA	NA
Endosulfan I	NA	NA	NA	NA	NA	NA
Endosulfan II	NA	NA	NA	NA	NA	NA
Endosulfan sulfate	NA	NA	NA	NA	NA	NA
Endrin	NA	NA	NA	NA	NA	NA
Endrin aldehyde	NA	NA	NA	NA	NA	NA
Endrin ketone	NA	NA	NA	NA	NA	NA
Heptachlor	NA	NA	NA	NA	NA	NA
Heptachlor epoxide	NA	NA	NA	NA	NA	NA
Methoxychlor	NA	NA	NA	NA	NA	NA
PCB-1016	NA	NA	NA	NA	NA	NA
PCB-1221	NA	NA	NA	NA	NA	NA
PCB-1232	NA	NA	NA	NA	NA	NA
PCB-1242	NA	NA	NA	NA	NA	NA
PCB-1248	NA	NA	NA	NA	NA	NA
PCB-1254	NA	NA	NA	NA	NA	NA
PCB-1260	NA	NA	NA	NA	NA	NA
Toxaphene	NA	NA	NA	NA	NA	NA
alpha-BHC	NA	NA	NA	NA	NA	NA
alpha-Chlordane	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
gamma-Chlordane	NA	NA	NA	NA	NA	NA
HERBICIDES (ug/L)						
2,4,5-T	NA	NA	NA	NA	NA	NA
2,4-D	NA	NA	NA	NA	NA	NA
2,4-DB	NA	NA	NA	NA	NA	NA
Dalapon	NA	NA	NA	NA	NA	NA
Dicamba	NA	NA	NA	NA	NA	NA
Dichlorprop	NA	NA	NA	NA	NA	NA
Dinoseb	NA	NA	NA	NA	NA	NA
MCPA	NA	NA	NA	NA	NA	NA
MCPP	NA	NA	NA	NA	NA	NA
Pentachlorophenol	NA	NA	NA	NA	NA	NA
Silvex	NA	NA	NA	NA	NA	NA

APPENDIX F
GROUNDWATER ANALYTICAL DATA
REMEDIAL INVESTIGATION, CTO-0219
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	AST781-GW03-98B	AST781-GW04-98B	ASI781-GW07-98B	AST781-GW08-98B	AST781-GW11-98B	AST781-GW12-98B
SAMPLE DATE	04/23/1998	04/23/1998	04/22/1998	04/22/1998	04/23/1998	04/23/1998
METALS (mg/L)						
Aluminum	NA	NA	NA	NA	NA	NA
Antimony	NA	NA	NA	NA	NA	NA
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
Calcium	NA	NA	NA	NA	NA	NA
Chromium	NA	NA	NA	NA	NA	NA
Cobalt	NA	NA	NA	NA	NA	NA
Copper	NA	NA	NA	NA	NA	NA
Iron	NA	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA	NA
Magnesium	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
Potassium	NA	NA	NA	NA	NA	NA
Selenium	NA	NA	NA	NA	NA	NA
Silver	NA	NA	NA	NA	NA	NA
Sodium	NA	NA	NA	NA	NA	NA
Thallium	NA	NA	NA	NA	NA	NA
Vanadium	NA	NA	NA	NA	NA	NA
Zinc	NA	NA	NA	NA	NA	NA

NOTES:

U = not detected at detection limit
J = value is estimated
ug/L = micrograms per liter
mg/L = micrograms per liter
NA = Not analyzed

APPENDIX F
GROUNDWATER ANALYTICAL DATA
REMEDIAL INVESTIGATION, CTO-0219
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	84-GW01-01	84-GW07-01	84-GW13-01	IR84-MW10-01C	IR84-MW07-01C	IR84-MW08-01C	IR84-MW09-01C
SAMPLE DATE	11/07/1995	11/26/1995	10/26/1995	08-05-2001	08-06-2001	08-06-2001	08-05-2001
VOLATILES (ug/L)							
1,1,1-Trichloroethane	NA	NA	NA	0.15 U	0.15 U	0.15 U	0.15 U
1,1,2,2-Tetrachloroethane	NA	NA	NA	0.25 U	0.25 U	0.25 U	0.25 U
1,1,2-Trichloroethane	NA	NA	NA	0.3 U	0.3 U	0.3 U	0.3 U
1,1-Dichloroethane	NA	NA	NA	0.16 U	0.16 U	0.16 U	0.16 U
1,1-Dichloroethene	NA	NA	NA	0.24 U	0.24 U	0.24 U	0.24 U
1,2-Dibromoethane (EDB)	NA	NA	NA	0.22 U	0.22 U	0.22 U	0.22 U
1,2-Dichloroethane	NA	NA	NA	0.21 U	0.21 U	0.21 U	0.21 U
1,2-Dichloroethene (total)	NA	NA	NA	0.28 U	0.28 U	0.28 U	0.28 U
1,2-Dichloropropane	NA	NA	NA	0.17 U	0.17 U	0.17 U	0.17 U
2-Butanone	NA	NA	NA	0.41 U	0.41 U	0.41 U	0.41 U
2-Hexanone	NA	NA	NA	0.46 U	0.46 U	0.46 U	0.46 U
4-Methyl-2-pentanone	NA	NA	NA	0.23 U	0.23 U	0.23 U	0.23 U
Acetone	NA	NA	NA	10 U	10 U	10 U	10 U
Benzene	NA	NA	NA	0.16 U	0.16 U	0.16 U	0.16 U
Bromodichloromethane	NA	NA	NA	0.17 U	0.17 U	0.17 U	0.17 U
Bromoform	NA	NA	NA	0.18 U	0.18 U	0.18 U	0.18 U
Bromomethane	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U
Carbon disulfide	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U
Carbon tetrachloride	NA	NA	NA	0.12 U	0.12 U	0.12 U	0.12 U
Chlorobenzene	NA	NA	NA	0.14 U	0.14 U	0.14 U	0.14 U
Chloroethane	NA	NA	NA	0.26 U	0.26 U	0.26 U	0.26 U
Chloroform	NA	NA	NA	0.14 U	0.14 U	0.14 U	0.14 U
Chloromethane	NA	NA	NA	0.13 U	0.13 U	0.13 U	0.13 U
Dibromochloromethane	NA	NA	NA	0.26 U	0.26 U	0.26 U	0.26 U
Ethylbenzene	NA	NA	NA	0.12 U	0.12 U	0.12 U	0.12 U
Isopropyl ether	NA	NA	NA	0.69 U	0.69 U	0.69 U	0.69 U
Methyl tert-butyl ether	NA	NA	NA	0.13 U	0.13 U	0.13 U	0.13 U
Methylene chloride	NA	NA	NA	0.34 U	0.34 U	0.34 U	0.57 J
Styrene	NA	NA	NA	0.15 U	0.15 U	0.15 U	0.15 U
Tetrachloroethene	NA	NA	NA	0.23 U	0.23 U	0.23 U	0.23 U
Toluene	NA	NA	NA	0.18 U	0.18 U	0.18 U	0.18 U
Trichloroethene	NA	NA	NA	0.14 U	0.14 U	0.14 U	0.14 U
Vinyl chloride	NA	NA	NA	0.15 U	0.15 U	0.15 U	0.15 U
Xylenes (total)	NA	NA	NA	0.33 U	0.33 U	0.33 U	0.33 U
cis-1,3-Dichloropropene	NA	NA	NA	0.12 U	0.12 U	0.12 U	0.12 U
trans-1,3-Dichloropropene	NA	NA	NA	0.27 U	0.27 U	0.27 U	0.27 U

APPENDIX F
GROUNDWATER ANALYTICAL DATA
REMEDIAL INVESTIGATION, CTO-0219
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	84-GW01-01	84-GW07-01	84-GW13-01	IR84-MW10-01C	IR84-MW07-01C	IR84-MW08-01C	IR84-MW09-01C
SAMPLE DATE	11/07/1995	11/26/1995	10/26/1995	08-05-2001	08-06-2001	08-06-2001	08-05-2001
SEMIVOLATILES (ug/L)							
1,2,4-Trichlorobenzene	NA	NA	NA	0.65 U	0.65 U	0.65 U	0.65 U
1,2-Dichlorobenzene	NA	NA	NA	0.81 U	0.81 U	0.81 U	0.81 U
1,3-Dichlorobenzene	NA	NA	NA	0.83 U	0.83 U	0.83 U	0.83 U
1,4-Dichlorobenzene	NA	NA	NA	0.77 U	0.77 U	0.77 U	0.77 U
2,2'-Oxybis(1-Chloropropane)	NA	NA	NA	0.78 U	0.78 U	0.78 U	0.78 U
2,4,5-Trichlorophenol	NA	NA	NA	1.2 U	1.2 U	1.2 U	1.2 U
2,4,6-Trichlorophenol	NA	NA	NA	1.7 U	1.7 U	1.7 U	1.7 U
2,4-Dichlorophenol	NA	NA	NA	0.85 U	0.85 U	0.85 U	0.85 U
2,4-Dimethylphenol	NA	NA	NA	0.85 U	0.85 U	0.85 U	0.85 U
2,4-Dinitrophenol	NA	NA	NA	3 U	3 U	3 U	3 U
2,4-Dinitrotoluene	NA	NA	NA	0.79 U	0.79 U	0.79 U	0.79 U
2,6-Dinitrotoluene	NA	NA	NA	0.57 U	0.57 U	0.57 U	0.57 U
2-Chloronaphthalene	NA	NA	NA	0.85 U	0.85 U	0.85 U	0.85 U
2-Chlorophenol	NA	NA	NA	1 U	1 U	1 U	1 U
2-Methylnaphthalene	NA	NA	NA	0.64 U	0.64 U	0.64 U	0.64 U
2-Methylphenol	NA	NA	NA	1.1 U	1.1 U	1.1 U	1.1 U
2-Nitroaniline	NA	NA	NA	0.7 U	0.7 U	0.7 U	0.7 U
2-Nitrophenol	NA	NA	NA	2.1 U	2.1 U	2.1 U	2.1 U
3,3'-Dichlorobenzidine	NA	NA	NA	0.93 U	0.93 U	0.93 U	0.93 U
3-Nitroaniline	NA	NA	NA	0.71 U	0.71 U	0.71 U	0.71 U
4,6-Dinitro-2-methylphenol	NA	NA	NA	1.3 U	1.3 U	1.3 U	1.3 U
4-Bromophenyl phenyl ether	NA	NA	NA	0.88 U	0.88 U	0.88 U	0.88 U
4-Chloro-3-methylphenol	NA	NA	NA	0.99 U	0.99 U	0.99 U	0.99 U
4-Chloroaniline	NA	NA	NA	0.61 U	0.61 U	0.61 U	0.61 U
4-Chlorophenyl phenyl ether	NA	NA	NA	0.79 U	0.79 U	0.79 U	0.79 U
4-Methylphenol	NA	NA	NA	1.3 U	1.3 U	1.3 U	1.3 U
4-Nitroaniline	NA	NA	NA	1.3 U	1.3 U	1.3 U	1.3 U
4-Nitrophenol	NA	NA	NA	1.9 U	1.9 U	1.9 U	1.9 U
Acenaphthene	NA	NA	NA	0.8 U	0.8 U	0.8 U	0.8 U
Acenaphthylene	NA	NA	NA	0.71 U	0.71 U	0.71 U	0.71 U
Anthracene	NA	NA	NA	0.68 U	0.68 U	0.68 U	0.68 U
Benzo(a)anthracene	NA	NA	NA	0.7 U	0.7 U	0.7 U	0.7 U
Benzo(a)pyrene	NA	NA	NA	0.73 U	0.73 U	0.73 U	0.73 U
Benzo(b)fluoranthene	NA	NA	NA	0.94 U	0.94 U	0.94 U	0.94 U
Benzo(ghi)perylene	NA	NA	NA	0.85 U	0.85 U	0.85 U	0.85 U
Benzo(k)fluoranthene	NA	NA	NA	0.84 U	0.84 U	0.84 U	0.84 U
Butyl benzyl phthalate	NA	NA	NA	0.88 U	0.88 U	0.88 U	0.88 U

APPENDIX F
GROUNDWATER ANALYTICAL DATA
REMEDIAL INVESTIGATION, CTO-0219
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	84-GW01-01	84-GW07-01	84-GW13-01	IR84-MW10-01C	IR84-MW07-01C	IR84-MW08-01C	IR84-MW09-01C
SAMPLE DATE	11/07/1995	11/26/1995	10/26/1995	08-05-2001	08-06-2001	08-06-2001	08-05-2001
SEMIVOLATILES (ug/L)							
Carbazole	NA	NA	NA	0.82 U	0.82 U	0.82 U	0.82 U
Chrysene	NA	NA	NA	0.75 U	0.75 U	0.75 U	0.75 U
Di-n-butyl phthalate	NA	NA	NA	0.67 U	0.67 U	0.67 U	0.67 U
Di-n-octyl phthalate	NA	NA	NA	1.1 U	1.1 U	1.1 U	1.1 U
Dibenz(a,h)anthracene	NA	NA	NA	0.79 U	0.79 U	0.79 U	0.79 U
Dibenzofuran	NA	NA	NA	1.1 U	1.1 U	1.1 U	1.1 U
Diethyl phthalate	NA	NA	NA	0.65 U	0.65 U	0.65 U	0.65 U
Dimethyl phthalate	NA	NA	NA	0.76 U	0.76 U	0.76 U	0.76 U
Fluoranthene	NA	NA	NA	0.81 U	0.81 U	0.81 U	0.81 U
Fluorene	NA	NA	NA	1 U	1 U	1 U	1 U
Hexachlorobenzene	NA	NA	NA	0.74 U	0.74 U	0.74 U	0.74 U
Hexachlorobutadiene	NA	NA	NA	0.73 U	0.73 U	0.73 U	0.73 U
Hexachlorocyclopentadiene	NA	NA	NA	1.1 U	1.1 U	1.1 U	1.1 U
Hexachloroethane	NA	NA	NA	0.74 U	0.74 U	0.74 U	0.74 U
Indeno(1,2,3-cd)pyrene	NA	NA	NA	0.63 U	0.63 U	0.63 U	0.63 U
Isophorone	NA	NA	NA	0.63 U	0.63 U	0.63 U	0.63 U
N-Nitrosodi-n-propylamine	NA	NA	NA	0.67 U	0.67 U	0.67 U	0.67 U
N-Nitrosodiphenylamine	NA	NA	NA	1.4 U	1.4 U	1.4 U	1.4 U
Naphthalene	NA	NA	NA	0.75 U	0.75 U	0.75 U	0.75 U
Nitrobenzene	NA	NA	NA	0.81 U	0.81 U	0.81 U	0.81 U
Pentachlorophenol	NA	NA	NA	2.4 U	2.4 U	2.4 U	2.4 U
Phenanthrene	NA	NA	NA	0.82 U	0.82 U	0.82 U	0.82 U
Phenol	NA	NA	NA	2.6 U	2.6 U	2.6 U	2.6 U
Pyrene	NA	NA	NA	1.1 U	1.1 U	1.1 U	1.1 U
bis(2-Chloroethoxy)methane	NA	NA	NA	0.87 U	0.87 U	0.87 U	0.87 U
bis(2-Chloroethyl) ether	NA	NA	NA	0.97 U	0.97 U	0.97 U	0.97 U
bis(2-Ethylhexyl) phthalate	NA	NA	NA	2.7 U	2.7 U	2.7 U	2.7 U

APPENDIX F
GROUNDWATER ANALYTICAL DATA
REMEDIAL INVESTIGATION, CTO-0219
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	84-GW01-01	84-GW07-01	84-GW13-01	IR84-MW10-01C	IR84-MW07-01C	IR84-MW08-01C	IR84-MW09-01C
SAMPLE DATE	11/07/1995	11/26/1995	10/26/1995	08-05-2001	08-06-2001	08-06-2001	08-05-2001
PESTICIDES/PCBs (ug/L)							
4,4'-DDD	NA	NA	NA	0.0064 U	0.0064 U	0.0064 U	0.0064 U
4,4'-DDE	NA	NA	NA	0.0074 U	0.0074 U	0.0074 U	0.0074 U
4,4'-DDT	NA	NA	NA	0.0072 U	0.0072 U	0.0072 U	0.0072 U
Aldrin	NA	NA	NA	0.0064 U	0.0064 U	0.0064 U	0.0064 U
Dieldrin	NA	NA	NA	0.0069 U	0.0069 U	0.0069 U	0.0069 U
Endosulfan I	NA	NA	NA	0.0069 U	0.0069 U	0.0069 U	0.0069 U
Endosulfan II	NA	NA	NA	0.0066 U	0.0066 U	0.0066 U	0.0066 U
Endosulfan sulfate	NA	NA	NA	0.007 U	0.007 U	0.007 U	0.007 U
Endrin	NA	NA	NA	0.0087 U	0.0087 U	0.0087 U	0.0087 U
Endrin aldehyde	NA	NA	NA	0.0064 U	0.0064 U	0.0064 U	0.0064 U
Endrin ketone	NA	NA	NA	0.0066 U	0.0066 U	0.0066 U	0.0066 U
Heptachlor	NA	NA	NA	0.0071 U	0.0071 U	0.0071 U	0.0071 U
Heptachlor epoxide	NA	NA	NA	0.0068 U	0.0068 U	0.0068 U	0.0068 U
Methoxychlor	NA	NA	NA	0.0084 U	0.0084 U	0.0084 U	0.0084 U
PCB-1016	1.1 U	1.2 UJ	1.2 UJ	0.018 U	0.018 U	0.018 U	0.018 U
PCB-1221	2.2 U	2.3 UJ	2.4 UJ	0.094 U	0.094 U	0.094 U	0.094 U
PCB-1232	1.1 U	1.2 UJ	1.2 UJ	0.16 U	0.16 U	0.16 U	0.16 U
PCB-1242	1.1 U	1.2 UJ	1.2 UJ	0.3 U	0.3 U	0.3 U	0.3 U
PCB-1248	1.1 U	1.2 UJ	1.2 UJ	0.22 U	0.22 U	0.22 U	0.22 U
PCB-1254	1.1 U	1.2 UJ	1.2 UJ	0.096 U	0.096 U	0.096 U	0.096 U
PCB-1260	1.1 U	1.2 UJ	1.2 UJ	0.065 U	0.065 U	0.065 U	0.065 U
Toxaphene	NA	NA	NA	0.23 U	0.23 U	0.23 U	0.23 U
alpha-BHC	NA	NA	NA	0.0059 U	0.0059 U	0.0059 U	0.0059 U
alpha-Chlordane	NA	NA	NA	0.0067 U	0.0067 U	0.0067 U	0.0067 U
beta-BHC	NA	NA	NA	0.0062 U	0.0062 U	0.0062 U	0.0062 U
delta-BHC	NA	NA	NA	0.006 U	0.006 U	0.006 U	0.006 U
gamma-BHC (Lindane)	NA	NA	NA	0.0062 U	0.0062 U	0.0062 U	0.0062 U
gamma-Chlordane	NA	NA	NA	0.0065 U	0.0065 U	0.0065 U	0.0065 U
HERBICIDES (ug/L)							
2,4,5-T	NA	NA	NA	0.043 U	0.043 U	0.043 U	0.043 U
2,4-D	NA	NA	NA	0.077 U	0.077 U	0.077 U	0.077 U
2,4-DB	NA	NA	NA	0.33 U	0.33 U	0.33 U	0.33 U
Dalapon	NA	NA	NA	0.39 UJ	0.39 UJ	0.39 UJ	0.39 UJ
Dicamba	NA	NA	NA	0.059 U	0.059 U	0.059 U	0.059 U
Dichlorprop	NA	NA	NA	0.089 U	0.089 U	0.089 U	0.089 U
Dinoseb	NA	NA	NA	0.013 U	0.015 J	0.013 U	0.013 U
MCPA	NA	NA	NA	8 U	8 U	8 U	8 U
MCPP	NA	NA	NA	25 U	25 U	25 U	25 U
Pentachlorophenol	NA	NA	NA	0.025 U	0.025 U	0.025 U	0.025 U
Silvex	NA	NA	NA	0.036 U	0.036 U	0.036 U	0.036 U

APPENDIX F
GROUNDWATER ANALYTICAL DATA
REMEDIAL INVESTIGATION, CTO-0219
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	84-GW01-01	84-GW07-01	84-GW13-01	IR84-MW10-01C	IR84-MW07-01C	IR84-MW08-01C	IR84-MW09-01C
SAMPLE DATE	11/07/1995	11/26/1995	10/26/1995	08-05-2001	08-06-2001	08-06-2001	08-05-2001
METALS (mg/L)							
Aluminum	NA	NA	NA	0.55	0.11 U	0.11 U	0.44
Antimony	NA	NA	NA	0.0022 U	0.0022 U	0.0022 U	0.0022 U
Arsenic	NA	NA	NA	0.0039 U	0.013	0.03	0.0039 U
Barium	NA	NA	NA	0.049 J	0.028 J	0.0036 J	0.014 J
Beryllium	NA	NA	NA	0.0011 J	0.00067 J	0.00067 J	0.00061 J
Cadmium	NA	NA	NA	0.00028 U	0.00028 U	0.00028 U	0.00028 U
Calcium	NA	NA	NA	10	106	49.1	1.4 J
Chromium	NA	NA	NA	0.0014 U	0.0014 U	0.0014 U	0.0014 U
Cobalt	NA	NA	NA	0.0022 J	0.0013 U	0.0013 U	0.0013 U
Copper	NA	NA	NA	0.0042 U	0.0042 U	0.0042 U	0.0042 U
Iron	NA	NA	NA	0.088 U	51.1	67.7	0.74
Lead	NA	NA	NA	0.0025 U	0.0025 U	0.0025 U	0.0025 U
Magnesium	NA	NA	NA	10	5.8	4.4 J	0.34 J
Manganese	NA	NA	NA	0.04	0.45	0.18	0.004 J
Mercury	NA	NA	NA	0.000069 U	0.000069 U	0.000069 U	0.000069 U
Nickel	NA	NA	NA	0.0022 U	0.0022 U	0.0022 U	0.0022 U
Potassium	NA	NA	NA	0.86 J	0.69 U	1.3 J	0.26 U
Selenium	NA	NA	NA	0.0045 U	0.0045 U	0.0045 U	0.0045 U
Silver	NA	NA	NA	0.0015 U	0.0015 U	0.0015 U	0.0015 U
Sodium	NA	NA	NA	2.1 J	9.7	4.2 J	3.9 J
Thallium	NA	NA	NA	0.005 U	0.005 U	0.0057 J	0.005 U
Vanadium	NA	NA	NA	0.00082 U	0.0018 J	0.0016 J	0.0018 J
Zinc	NA	NA	NA	0.012 U	0.012 U	0.012 U	0.012 U

NOTES:

U = not detected at detection limit
J = value is estimated
ug/L = micrograms per liter
mg/L = micrograms per liter
NA = Not analyzed

APPENDIX F
GROUNDWATER ANALYTICAL DATA
REMEDIAL INVESTIGATION, CTO-0219
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-MW10-01C	IR84-MW16-01C	IR84-MW17-01C	IR84-MW18-01C	IR84-MW19-01C	IR84-MW20-01C	IR84-MW20-01CD
SAMPLE DATE	08-05-2001	08-04-2001	08-06-2001	08-04-2001	08-04-2001	08-05-2001	08-05-2001
VOLATILES (ug/L)							
1,1,1-Trichloroethane	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U
1,1,2,2-Tetrachloroethane	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
1,1,2-Trichloroethane	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
1,1-Dichloroethane	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U
1,1-Dichloroethene	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U
1,2-Dibromoethane (EDB)	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U
1,2-Dichloroethane	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U
1,2-Dichloroethene (total)	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U
1,2-Dichloropropane	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U
2-Butanone	0.41 U	0.41 U	0.41 U	0.53 J	0.41 U	0.41 U	0.41 U
2-Hexanone	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U
4-Methyl-2-pentanone	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U
Acetone	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzene	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U
Bromodichloromethane	0.17 U	0.17 U	1 U	0.17 U	0.17 U	0.17 U	0.17 U
Bromoform	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U
Bromomethane	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Carbon disulfide	0.2 U	0.2 U	0.2 U	0.49 J	0.2 U	0.2 U	0.2 U
Carbon tetrachloride	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U
Chlorobenzene	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U
Chloroethane	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U
Chloroform	0.14 U	0.14 U	6.5 U	1 U	0.14 U	0.14 U	0.14 U
Chloromethane	0.13 U	0.17 J	0.13 U	0.62 J	0.13 U	0.13 U	0.13 U
Dibromochloromethane	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U
Ethylbenzene	0.12 U	0.12 U	0.6 J	0.12 U	0.12 U	0.12 U	0.12 U
Isopropyl ether	0.69 U	0.69 U	0.69 U	0.69 U	0.69 U	0.69 U	0.69 U
Methyl tert-butyl ether	0.13 U	0.52 J	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U
Methylene chloride	0.34 U	0.34 U	1 U	0.34 U	0.34 U	0.34 U	1 U
Styrene	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U
Tetrachloroethene	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U
Toluene	0.18 U	0.18 U	1 U	0.18 U	10 U	0.18 U	0.18 U
Trichloroethene	0.14 U	0.14 U	0.19 J	0.14 U	0.14 U	0.14 U	0.14 U
Vinyl chloride	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U
Xylenes (total)	0.33 U	0.33 U	1.8	0.33 U	0.33 U	0.33 U	0.33 U
cis-1,3-Dichloropropene	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U
trans-1,3-Dichloropropene	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U

APPENDIX F
GROUNDWATER ANALYTICAL DATA
REMEDIAL INVESTIGATION, CTO-0219
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-MW10-01C	IR84-MW16-01C	IR84-MW17-01C	IR84-MW18-01C	IR84-MW19-01C	IR84-MW20-01C	IR84-MW20-01CD
SAMPLE DATE	08-05-2001	08-04-2001	08-06-2001	08-04-2001	08-04-2001	08-05-2001	08-05-2001
SEMIVOLATILES (ug/L)							
1,2,4-Trichlorobenzene	0.65 U	0.65 U	0.65 U	0.65 U	0.65 U	0.65 U	0.65 U
1,2-Dichlorobenzene	0.81 U	0.81 U	0.81 U	0.81 U	0.81 U	0.81 U	0.81 U
1,3-Dichlorobenzene	0.83 U	0.83 U	0.83 U	0.83 U	0.83 U	0.83 U	0.83 U
1,4-Dichlorobenzene	0.77 U	0.77 U	0.77 U	0.77 U	0.77 U	0.77 U	0.77 U
2,2'-Oxybis(1-Chloropropane)	0.78 U	0.78 U	0.78 U	0.78 U	0.78 U	0.78 U	0.78 U
2,4,5-Trichlorophenol	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
2,4,6-Trichlorophenol	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
2,4-Dichlorophenol	0.85 U	0.85 U	0.85 U	0.85 U	0.85 U	0.85 U	0.85 U
2,4-Dimethylphenol	0.85 U	0.85 U	0.85 U	0.85 U	0.85 U	0.85 U	0.85 U
2,4-Dinitrophenol	3 U	3 U	3 U	3 U	3 U	3 U	3 U
2,4-Dinitrotoluene	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U
2,6-Dinitrotoluene	0.57 U	0.57 U	0.57 U	0.57 U	0.57 U	0.57 U	0.57 U
2-Chloronaphthalene	0.85 U	0.85 U	0.85 U	0.85 U	0.85 U	0.85 U	0.85 U
2-Chlorophenol	1 U	1 U	1 U	1 U	1 U	1 U	1 U
2-Methylnaphthalene	0.64 U	0.64 U	0.64 U	0.64 U	0.64 U	1 J	1.1 J
2-Methylphenol	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U
2-Nitroaniline	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U
2-Nitrophenol	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U
3,3'-Dichlorobenzidine	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U
3-Nitroaniline	0.71 U	0.71 U	0.71 U	0.71 U	0.71 U	0.71 U	0.71 U
4,6-Dinitro-2-methylphenol	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U
4-Bromophenyl phenyl ether	0.88 U	0.88 U	0.88 U	0.88 U	0.88 U	0.88 U	0.88 U
4-Chloro-3-methylphenol	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U
4-Chloroaniline	0.61 U	0.61 U	0.61 U	0.61 U	0.61 U	0.61 U	0.61 U
4-Chlorophenyl phenyl ether	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U
4-Methylphenol	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U
4-Nitroaniline	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U
4-Nitrophenol	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
Acenaphthene	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U
Acenaphthylene	0.71 U	0.71 U	0.71 U	0.71 U	0.71 U	0.71 U	0.71 U
Anthracene	0.68 U	0.68 U	0.68 U	0.68 U	0.68 U	0.68 U	0.68 U
Benzo(a)anthracene	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U
Benzo(a)pyrene	0.73 U	0.73 U	0.73 U	0.73 U	0.73 U	0.73 U	0.73 U
Benzo(b)fluoranthene	0.94 U	0.94 U	0.94 U	0.94 U	0.94 U	0.94 U	0.94 U
Benzo(ghi)perylene	0.85 U	0.85 U	0.85 U	0.85 U	0.85 U	0.85 U	0.85 U
Benzo(k)fluoranthene	0.84 U	0.84 U	0.84 U	0.84 U	0.84 U	0.84 U	0.84 U
Butyl benzyl phthalate	0.88 U	0.88 U	0.88 U	0.88 U	0.88 U	0.88 U	0.88 U

APPENDIX F
GROUNDWATER ANALYTICAL DATA
REMEDIAL INVESTIGATION, CTO-0219
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-MW10-01C	IR84-MW16-01C	IR84-MW17-01C	IR84-MW18-01C	IR84-MW19-01C	IR84-MW20-01C	IR84-MW20-01CD
SAMPLE DATE	08-05-2001	08-04-2001	08-06-2001	08-04-2001	08-04-2001	08-05-2001	08-05-2001
SEMIVOLATILES (ug/L)							
Carbazole	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U
Chrysene	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Di-n-butyl phthalate	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U
Di-n-octyl phthalate	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U
Dibenz(a,h)anthracene	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U
Dibenzofuran	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U
Diethyl phthalate	0.65 U	0.65 U	0.65 U	0.65 U	0.65 U	0.65 U	0.65 U
Dimethyl phthalate	0.76 U	0.76 U	0.76 U	0.76 U	0.76 U	0.76 U	0.76 U
Fluoranthene	0.81 U	0.81 U	0.81 U	0.81 U	0.81 U	0.81 U	0.81 U
Fluorene	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Hexachlorobenzene	0.74 U	0.74 U	0.74 U	0.74 U	0.74 U	0.74 U	0.74 U
Hexachlorobutadiene	0.73 U	0.73 U	0.73 U	0.73 U	0.73 U	0.73 U	0.73 U
Hexachlorocyclopentadiene	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U
Hexachloroethane	0.74 U	0.74 U	0.74 U	0.74 U	0.74 U	0.74 U	0.74 U
Indeno(1,2,3-cd)pyrene	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U
Isophorone	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U
N-Nitrosodi-n-propylamine	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U
N-Nitrosodiphenylamine	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U
Naphthalene	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Nitrobenzene	0.81 U	0.81 U	0.81 U	0.81 U	0.81 U	0.81 U	0.81 U
Pentachlorophenol	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U
Phenanthrene	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U
Phenol	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U
Pyrene	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U
bis(2-Chloroethoxy)methane	0.87 U	0.87 U	0.87 U	0.87 U	0.87 U	0.87 U	0.87 U
bis(2-Chloroethyl) ether	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U
bis(2-Ethylhexyl) phthalate	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U

APPENDIX F
GROUNDWATER ANALYTICAL DATA
REMEDIAL INVESTIGATION, CTO-0219
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-MW10-01C	IR84-MW16-01C	IR84-MW17-01C	IR84-MW18-01C	IR84-MW19-01C	IR84-MW20-01C	IR84-MW20-01CD
SAMPLE DATE	08-05-2001	08-04-2001	08-06-2001	08-04-2001	08-04-2001	08-05-2001	08-05-2001
PESTICIDES/PCBs (ug/L)							
4,4'-DDD	0.0064 U	0.0064 U	0.0064 UJ	0.044 J	0.0064 U	0.028 J	0.029 J
4,4'-DDE	0.0074 U	0.0074 U	0.0074 UJ	0.0074 U	0.0074 U	0.024 J	0.026 J
4,4'-DDT	0.0072 U	0.029 J	0.0072 UJ	0.0072 U	0.0072 U	0.042 J	0.047 J
Aldrin	0.0064 U	0.0064 U	0.0064 UJ	0.0064 U	0.0064 U	0.0064 U	0.0064 U
Dieldrin	0.0069 U	0.0069 U	0.0069 UJ	0.0069 U	0.0069 U	0.0069 U	0.0069 U
Endosulfan I	0.0069 U	0.0069 U	0.0069 UJ	0.023 J	0.0069 U	0.0069 U	0.0069 U
Endosulfan II	0.0066 U	0.0066 U	0.0066 UJ	0.0066 U	0.0066 U	0.0066 U	0.0066 U
Endosulfan sulfate	0.007 U	0.007 U	0.007 UJ	0.007 U	0.007 U	0.007 U	0.007 U
Endrin	0.0087 U	0.0087 U	0.0087 UJ	0.0087 U	0.0087 U	0.0087 U	0.0087 U
Endrin aldehyde	0.0064 U	0.0064 U	0.0064 UJ	0.0064 U	0.0064 U	0.0064 U	0.0064 U
Endrin ketone	0.0066 U	0.0066 U	0.0066 UJ	0.0066 U	0.0066 U	0.0066 U	0.0066 U
Heptachlor	0.0071 U	0.0071 U	0.0071 UJ	0.0071 U	0.0071 U	0.0071 U	0.0071 U
Heptachlor epoxide	0.0068 U	0.0068 U	0.0068 UJ	0.0068 U	0.0068 U	0.03 J	0.0068 U
Methoxychlor	0.0084 U	0.0084 U	0.0084 UJ	0.0084 U	0.0084 U	0.0084 U	0.0084 U
PCB-1016	0.018 U	0.018 U	0.018 UJ	0.018 U	0.018 U	0.018 U	0.018 U
PCB-1221	0.094 U	0.094 U	0.094 UJ	0.094 U	0.094 U	0.094 U	0.094 U
PCB-1232	0.16 U	0.16 U	0.16 UJ	0.16 U	0.16 U	0.16 U	0.16 U
PCB-1242	0.3 U	0.3 U	0.3 UJ	0.3 U	0.3 U	0.3 U	0.3 U
PCB-1248	0.22 U	0.22 U	0.22 UJ	0.22 U	0.22 U	0.22 U	0.22 U
PCB-1254	0.096 U	0.096 U	0.096 UJ	0.096 U	0.096 U	0.096 U	0.096 U
PCB-1260	0.065 U	0.065 U	0.065 UJ	0.065 U	0.065 U	0.065 U	0.065 U
Toxaphene	0.23 U	0.23 U	0.23 UJ	0.23 U	0.23 U	0.23 U	0.23 U
alpha-BHC	0.0059 U	0.0059 U	0.0059 UJ	0.0059 U	0.0059 U	0.0059 U	0.0059 U
alpha-Chlordane	0.0067 U	0.0067 U	0.0067 UJ	0.0067 U	0.0067 U	0.0067 U	0.0067 U
beta-BHC	0.0062 U	0.0062 U	0.021 J	0.026 J	0.0062 U	0.025 J	0.0062 U
delta-BHC	0.006 U	0.006 U	0.006 UJ	0.006 U	0.006 U	0.006 U	0.006 U
gamma-BHC (Lindane)	0.0062 U	0.0062 U	0.0062 UJ	0.0062 U	0.0062 U	0.0062 U	0.0062 U
gamma-Chlordane	0.0065 U	0.0065 U	0.0065 UJ	0.04 J	0.0065 U	0.0065 U	0.0065 U
HERBICIDES (ug/L)							
2,4,5-T	0.043 U	0.43 U	0.086 U	0.043 U	0.043 U	0.043 U	0.043 U
2,4-D	0.077 U	0.77 U	0.15 U	0.077 U	0.077 U	0.077 U	0.077 U
2,4-DB	0.33 U	3.3 U	0.66 U	0.33 U	0.33 U	0.33 U	0.33 U
Dalapon	0.39 UJ	3.9 U	0.78 U	0.39 UJ	0.39 UJ	0.39 UJ	0.39 UJ
Dicamba	0.059 U	0.59 U	0.12 U	0.059 U	0.059 U	0.059 U	0.059 U
Dichlorprop	0.089 U	0.89 U	0.18 U	0.089 U	0.089 U	0.089 U	0.089 U
Dinoseb	0.013 U	0.13 U	1.5 J	0.013 U	0.057 J	0.013 U	0.013 U
MCPA	8 U	80 U	16 U	44 J	8 U	8 U	8 U
MCPP	25 U	250 U	50 U	25 U	25 U	25 U	25 U
Pentachlorophenol	0.025 U	0.25 U	0.05 U	0.025 U	0.025 U	0.025 U	0.025 U
Silvex	0.036 U	0.36 U	0.072 U	0.036 U	0.036 U	0.036 U	0.036 U

APPENDIX F
GROUNDWATER ANALYTICAL DATA
REMEDIAL INVESTIGATION, CTO-0219
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-MW10-01C	IR84-MW16-01C	IR84-MW17-01C	IR84-MW18-01C	IR84-MW19-01C	IR84-MW20-01C	IR84-MW20-01CD
SAMPLE DATE	08-05-2001	08-04-2001	08-06-2001	08-04-2001	08-04-2001	08-05-2001	08-05-2001
METALS (mg/L)							
Aluminum	0.55	0.17 U	0.73	0.54	0.58	0.23 U	0.22 U
Antimony	0.0022 U	0.0024 J	0.011 J	0.0022 U	0.0022 U	0.0022 UJ	0.0022 U
Arsenic	0.0039 U	0.0039 U	0.0039 U	0.0039 U	0.0039 U	0.0077 J	0.0071 J
Barium	0.049 J	0.02 J	0.012 J	0.12 J	0.04 J	0.038 J	0.037 J
Beryllium	0.0011 J	0.00057 J	0.00067 J	0.00068 J	0.00057 J	0.00076 J	0.00068 J
Cadmium	0.00028 U	0.00028 U	0.00028 U	0.00056 J	0.00028 U	0.00028 U	0.00028 U
Calcium	10	32.8	34.5	63.8	44.7	72.5	70.3
Chromium	0.0014 U	0.0014 U	0.0014 U	0.0015 J	0.0022 J	0.0015 J	0.0014 U
Cobalt	0.0022 J	0.0013 U	0.0013 U	0.0057 J	0.0013 U	0.0013 U	0.0013 U
Copper	0.0042 U	0.0042 U	0.0042 U	0.0042 U	0.0042 U	0.0042 U	0.0042 U
Iron	0.088 U	0.18	1	0.53	0.39	24.9	24.1
Lead	0.0025 U	0.0025 U	0.0025 U	0.0025 U	0.0025 U	0.0025 U	0.0025 U
Magnesium	10	3.4 J	0.89 J	11.3	2.2 J	3.1 J	3 J
Manganese	0.04	0.008 J	0.0047 J	0.24	0.012 J	0.16	0.16
Mercury	0.000069 U	0.000069 U	0.000072 J	0.000069 U	0.000069 U	0.000069 U	0.000069 U
Nickel	0.0022 U	0.0022 U	0.0022 U	0.011 J	0.0022 U	0.0022 U	0.0022 U
Potassium	0.86 J	1.8 J	1.1 J	2.4 J	5.2	2 J	1.9 J
Selenium	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U
Silver	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U
Sodium	2.1 J	5.9	9	8	22	8.7	8.4
Thallium	0.005 U	0.005 U	0.0054 J	0.005 U	0.005 U	0.005 U	0.005 U
Vanadium	0.00082 U	0.00082 U	0.0027 J	0.0011 J	0.00084 J	0.0029 J	0.0026 J
Zinc	0.012 U	0.027 J	0.012 U	0.31	0.012 U	0.012 U	0.012 U

NOTES:

U = not detected at detection limit
J = value is estimated
ug/L = micrograms per liter
mg/L = micrograms per liter
NA = Not analyzed

APPENDIX F
GROUNDWATER ANALYTICAL DATA
REMEDIAL INVESTIGATION, CTO-0219
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-MW21-01C	IR84-MW22-01C	IR84-MW23-01C
SAMPLE DATE	08-05-2001	08-05-2001	08-06-2001
VOLATILES (ug/L)			
1,1,1-Trichloroethane	0.15 U	0.15 U	0.15 U
1,1,2,2-Tetrachloroethane	0.25 U	0.25 U	0.25 U
1,1,2-Trichloroethane	0.3 U	0.3 U	0.3 U
1,1-Dichloroethane	0.16 U	0.16 U	0.16 U
1,1-Dichloroethene	0.24 U	0.24 U	0.24 U
1,2-Dibromoethane (EDB)	0.22 U	0.22 U	0.22 U
1,2-Dichloroethane	0.21 U	0.21 U	0.21 U
1,2-Dichloroethene (total)	0.28 U	0.28 U	0.28 U
1,2-Dichloropropane	0.17 U	0.17 U	0.17 U
2-Butanone	0.41 U	0.69 J	0.41 U
2-Hexanone	0.46 U	0.46 U	0.46 U
4-Methyl-2-pentanone	0.23 U	0.23 U	0.23 U
Acetone	10 U	10 U	10 U
Benzene	0.16 U	0.16 U	0.16 U
Bromodichloromethane	0.17 U	1 U	0.17 U
Bromoform	0.18 U	0.18 U	0.18 U
Bromomethane	0.2 U	0.2 U	0.2 U
Carbon disulfide	0.2 U	0.2 U	0.2 U
Carbon tetrachloride	0.12 U	0.12 U	0.12 U
Chlorobenzene	0.14 U	0.14 U	0.14 U
Chloroethane	0.26 U	0.26 U	0.26 U
Chloroform	1 U	8.8 U	0.14 U
Chloromethane	0.13 U	0.13 U	0.13 U
Dibromochloromethane	0.26 U	0.26 U	0.26 U
Ethylbenzene	0.12 U	3.6	0.12 U
Isopropyl ether	0.69 U	0.69 U	0.69 U
Methyl tert-butyl ether	0.13 U	0.13 U	0.13 U
Methylene chloride	0.37 J	0.7 J	0.34 U
Styrene	0.15 U	0.15 U	0.15 U
Tetrachloroethene	0.23 U	0.23 U	0.23 U
Toluene	0.18 U	1 U	0.18 U
Trichloroethene	0.14 U	0.14 U	0.14 U
Vinyl chloride	0.15 U	0.15 U	0.15 U
Xylenes (total)	0.33 U	0.33 U	0.33 U
cis-1,3-Dichloropropene	0.12 U	0.12 U	0.12 U
trans-1,3-Dichloropropene	0.27 U	0.27 U	0.27 U

APPENDIX F
GROUNDWATER ANALYTICAL DATA
REMEDIAL INVESTIGATION, CTO-0219
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-MW21-01C	IR84-MW22-01C	IR84-MW23-01C
SAMPLE DATE	08-05-2001	08-05-2001	08-06-2001
SEMIVOLATILES (ug/L)			
1,2,4-Trichlorobenzene	0.65 U	0.65 U	0.65 U
1,2-Dichlorobenzene	0.81 U	0.81 U	0.81 U
1,3-Dichlorobenzene	0.83 U	0.83 U	0.83 U
1,4-Dichlorobenzene	0.77 U	0.77 U	0.77 U
2,2'-Oxybis(1-Chloropropane)	0.78 U	0.78 U	0.78 U
2,4,5-Trichlorophenol	1.2 U	1.2 U	1.2 U
2,4,6-Trichlorophenol	1.7 U	1.7 U	1.7 U
2,4-Dichlorophenol	0.85 U	0.85 U	0.85 U
2,4-Dimethylphenol	0.85 U	0.85 U	0.85 U
2,4-Dinitrophenol	3 U	3 U	3 U
2,4-Dinitrotoluene	0.79 U	0.79 U	0.79 U
2,6-Dinitrotoluene	0.57 U	0.57 U	0.57 U
2-Chloronaphthalene	0.85 U	0.85 U	0.85 U
2-Chlorophenol	1 U	1 U	1 U
2-Methylnaphthalene	0.64 U	0.64 U	0.64 U
2-Methylphenol	1.1 U	1.1 U	1.1 U
2-Nitroaniline	0.7 U	0.7 U	0.7 U
2-Nitrophenol	2.1 U	2.1 U	2.1 U
3,3'-Dichlorobenzidine	0.93 U	0.93 U	0.93 U
3-Nitroaniline	0.71 U	0.71 U	0.71 U
4,6-Dinitro-2-methylphenol	1.3 U	1.3 U	1.3 U
4-Bromophenyl phenyl ether	0.88 U	0.88 U	0.88 U
4-Chloro-3-methylphenol	0.99 U	0.99 U	0.99 U
4-Chloroaniline	0.61 U	0.61 U	0.61 U
4-Chlorophenyl phenyl ether	0.79 U	0.79 U	0.79 U
4-Methylphenol	1.3 U	1.3 U	1.3 U
4-Nitroaniline	1.3 U	1.3 U	1.3 U
4-Nitrophenol	1.9 U	1.9 U	1.9 U
Acenaphthene	0.8 U	0.8 U	0.8 U
Acenaphthylene	0.71 U	0.71 U	0.71 U
Anthracene	0.68 U	0.68 U	0.68 U
Benzo(a)anthracene	0.7 U	0.7 U	0.7 U
Benzo(a)pyrene	0.73 U	0.73 U	0.73 U
Benzo(b)fluoranthene	0.94 U	0.94 U	0.94 U
Benzo(ghi)perylene	0.85 U	0.85 U	0.85 U
Benzo(k)fluoranthene	0.84 U	0.84 U	0.84 U
Butyl benzyl phthalate	0.88 U	0.88 U	0.88 U

APPENDIX F
GROUNDWATER ANALYTICAL DATA
REMEDIAL INVESTIGATION, CTO-0219
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-MW21-01C	IR84-MW22-01C	IR84-MW23-01C
SAMPLE DATE	08-05-2001	08-05-2001	08-06-2001
SEMIVOLATILES (ug/L)			
Carbazole	0.82 U	0.82 U	0.82 U
Chrysene	0.75 U	0.75 U	0.75 U
Di-n-butyl phthalate	0.67 U	0.67 U	0.67 U
Di-n-octyl phthalate	1.1 U	1.1 U	1.1 U
Dibenz(a,h)anthracene	0.79 U	0.79 U	0.79 U
Dibenzofuran	1.1 U	1.1 U	1.1 U
Diethyl phthalate	0.65 U	0.65 U	0.65 U
Dimethyl phthalate	0.76 U	0.76 U	0.76 U
Fluoranthene	0.81 U	0.81 U	0.81 U
Fluorene	1 U	1 U	1 U
Hexachlorobenzene	0.74 U	0.74 U	0.74 U
Hexachlorobutadiene	0.73 U	0.73 U	0.73 U
Hexachlorocyclopentadiene	1.1 U	1.1 U	1.1 U
Hexachloroethane	0.74 U	0.74 U	0.74 U
Indeno(1,2,3-cd)pyrene	0.63 U	0.63 U	0.63 U
Isophorone	0.63 U	0.63 U	0.63 U
N-Nitrosodi-n-propylamine	0.67 U	0.67 U	0.67 U
N-Nitrosodiphenylamine	1.4 U	1.4 U	1.4 U
Naphthalene	0.75 U	2.2 J	0.75 U
Nitrobenzene	0.81 U	0.81 U	0.81 U
Pentachlorophenol	2.4 U	2.4 U	2.4 U
Phenanthrene	0.82 U	0.82 U	0.82 U
Phenol	2.6 U	2.6 U	2.6 U
Pyrene	1.1 U	1.1 U	1.1 U
bis(2-Chloroethoxy)methane	0.87 U	0.87 U	0.87 U
bis(2-Chloroethyl) ether	0.97 U	0.97 U	0.97 U
bis(2-Ethylhexyl) phthalate	2.7 U	2.7 U	2.7 U

APPENDIX F
GROUNDWATER ANALYTICAL DATA
REMEDIAL INVESTIGATION, CTO-0219
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-MW21-01C	IR84-MW22-01C	IR84-MW23-01C
SAMPLE DATE	08-05-2001	08-05-2001	08-06-2001
PESTICIDES/PCBs (ug/L)			
4,4'-DDD	0.036 J	0.13 U	0.0064 U
4,4'-DDE	0.0074 U	0.15 U	0.0074 U
4,4'-DDT	0.046 J	0.14 U	0.0072 U
Aldrin	0.0064 U	0.13 U	0.0064 U
Dieldrin	0.0069 U	0.14 U	0.0069 U
Endosulfan I	0.0069 U	0.14 U	0.0069 U
Endosulfan II	0.0066 U	0.13 U	0.0066 U
Endosulfan sulfate	0.007 U	0.14 U	0.007 U
Endrin	0.0087 U	0.17 U	0.0087 U
Endrin aldehyde	0.0064 U	0.13 U	0.0064 U
Endrin ketone	0.0066 U	0.13 U	0.0066 U
Heptachlor	0.0071 U	0.14 U	0.0071 U
Heptachlor epoxide	0.0068 U	0.14 U	0.0068 U
Methoxychlor	0.0084 U	0.17 U	0.0084 U
PCB-1016	0.018 U	0.018 U	0.018 U
PCB-1221	0.094 U	0.094 U	0.094 U
PCB-1232	0.16 U	0.16 U	0.16 U
PCB-1242	0.3 U	0.3 U	0.3 U
PCB-1248	0.22 U	0.22 U	0.22 U
PCB-1254	0.096 U	0.096 U	0.096 U
PCB-1260	0.065 U	0.065 U	0.065 U
Toxaphene	0.23 U	4.6 U	0.23 U
alpha-BHC	0.0059 U	0.12 U	0.0059 U
alpha-Chlordane	0.0067 U	0.13 U	0.0067 U
beta-BHC	0.029 J	0.12 U	0.0062 U
delta-BHC	0.006 U	0.12 U	0.006 U
gamma-BHC (Lindane)	0.0062 U	0.12 U	0.0062 U
gamma-Chlordane	0.0065 U	0.13 U	0.0065 U
HERBICIDES (ug/L)			
2,4,5-T	0.043 U	0.086 U	0.043 U
2,4-D	0.077 U	0.15 U	0.077 U
2,4-DB	0.33 U	0.66 U	0.33 U
Dalapon	0.39 UJ	0.78 U	0.39 UJ
Dicamba	0.059 U	0.12 U	0.059 U
Dichlorprop	0.089 U	0.18 U	0.089 U
Dinoseb	0.16 J	0.026 UJ	0.013 U
MCPA	8 U	16 U	8 U
MCPP	25 U	50 U	25 U
Pentachlorophenol	0.025 U	0.05 U	0.025 U
Silvex	0.036 U	0.072 U	0.036 U

APPENDIX F
GROUNDWATER ANALYTICAL DATA
REMEDIAL INVESTIGATION, CTO-0219
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-MW21-01C	IR84-MW22-01C	IR84-MW23-01C
SAMPLE DATE	08-05-2001	08-05-2001	08-06-2001
METALS (mg/L)			
Aluminum	0.56	0.52	0.52
Antimony	0.0022 J	0.0022 U	0.0022 U
Arsenic	0.0039 U	0.0039 U	0.0039 U
Barium	0.11 J	0.033 J	0.0073 J
Beryllium	0.0006 J	0.00089 J	0.00063 J
Cadmium	0.00028 U	0.00028 U	0.00061 J
Calcium	87.8	49.7	34.6
Chromium	0.0014 U	0.0014 U	0.0014 U
Cobalt	0.0013 U	0.0013 U	0.0013 U
Copper	0.0042 U	0.0042 U	0.0042 U
Iron	0.33	0.37	25.8
Lead	0.0025 U	0.0025 U	0.0025 U
Magnesium	7.6	3.3 J	1.7 J
Manganese	0.069	0.022	0.066
Mercury	0.000069 U	0.000069 U	0.000069 U
Nickel	0.0027 J	0.0022 U	0.0022 U
Potassium	11	9.1	0.69 U
Selenium	0.0045 U	0.0045 U	0.0045 U
Silver	0.0015 U	0.0015 U	0.0015 U
Sodium	13.9	17.6	3.2 J
Thallium	0.005 U	0.005 U	0.005 U
Vanadium	0.0037 J	0.0012 J	0.00082 U
Zinc	0.013 J	0.012 U	0.012 U

NOTES:

U = not detected at detection limit
J = value is estimated
ug/L = micrograms per liter
mg/L = micrograms per liter
NA = Not analyzed

APPENDIX F
SUBSURFACE SOIL ANALYTICAL DATA
REMEDIAL INVESTIGATION, CTO-0219
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	84-MW15-04	84-MW16-07	84-MW17-07	IR84-MW18-04	IR84-MW19-06	IR84-MW21-04	IR84-MW22-02
DEPTH	7 - 9	13 - 15	13 - 15	7 - 9	11 - 13	7 - 9	3 - 5
SAMPLE DATE	07-31-2001	07-31-2001	07-31-2001	08-01-2001	08-01-2001	08-02-2001	08-03-2001
VOLATILES (ug/kg)							
1,1,1-Trichloroethane	12 U	NA	11 U	NA	NA	1 U	0.87 U
1,1,2,2-Tetrachloroethane	14 U	NA	12 U	NA	NA	2 U	1.7 U
1,1,2-Trichloroethane	20 U	NA	17 U	NA	NA	1.3 U	1.1 U
1,1-Dichloroethane	17 U	NA	15 U	NA	NA	0.65 U	0.55 U
1,1-Dichloroethene	21 U	NA	19 U	NA	NA	1.3 U	1.1 U
1,2-Dichloroethane	14 U	NA	12 U	NA	NA	0.81 U	0.69 U
1,2-Dichloroethene (total)	36 U	NA	32 U	NA	NA	1.6 U	1.3 U
1,2-Dichloropropane	12 U	NA	10 U	NA	NA	0.84 U	0.71 U
2-Butanone	100 U	NA	88 U	NA	NA	3.8 J	2.6 U
2-Hexanone	37 U	NA	33 U	NA	NA	1.9 U	1.6 U
4-Methyl-2-pentanone	36 U	NA	32 U	NA	NA	2.1 U	1.8 U
Acetone	93 U	NA	82 U	NA	NA	18 J	2 U
Benzene	160 J	NA	19 U	NA	NA	0.72 U	0.62 U
Bromodichloromethane	12 U	NA	11 U	NA	NA	1.3 U	1.1 U
Bromoform	20 U	NA	17 U	NA	NA	1.8 U	1.5 U
Bromomethane	32 U	NA	28 U	NA	NA	2 U	1.7 U
Carbon disulfide	43 U	NA	38 U	NA	NA	0.87 U	0.74 U
Carbon tetrachloride	12 U	NA	11 U	NA	NA	1.1 U	0.95 U
Chlorobenzene	10 U	NA	8.8 U	NA	NA	0.58 U	0.49 U
Chloroethane	46 U	NA	40 U	NA	NA	2.5 U	2.1 U
Chloroform	12 U	NA	11 U	NA	NA	0.91 U	0.98 J
Chloromethane	19 U	NA	16 U	NA	NA	1.4 U	1.2 U
Dibromochloromethane	16 U	NA	14 U	NA	NA	1.2 U	1 U
Ethylbenzene	1000	NA	15 U	NA	NA	0.66 U	0.56 U
Isopropyl ether	57 U	NA	50 U	NA	NA	0.98 U	0.83 U
Methyl tert-butyl ether	14 U	NA	12 U	NA	NA	0.94 U	0.8 U
Methylene chloride	51 U	NA	270 U	NA	NA	1.4 U	1.2 U
Styrene	21 U	NA	19 U	NA	NA	0.56 U	0.47 U
Tetrachloroethene	19 U	NA	16 U	NA	NA	1.3 U	1.1 U
Toluene	310 U	NA	11 U	NA	NA	0.59 U	0.5 U
Trichloroethene	21 U	NA	19 U	NA	NA	0.85 U	0.72 U
Vinyl chloride	14 U	NA	12 U	NA	NA	1.6 U	1.3 U
Xylenes (total)	2800	NA	21 U	NA	NA	2.1 U	1.8 U
cis-1,3-Dichloropropene	15 U	NA	13 U	NA	NA	0.71 U	0.61 U
trans-1,3-Dichloropropene	14 U	NA	12 U	NA	NA	0.96 U	0.81 U

APPENDIX F
SUBSURFACE SOIL ANALYTICAL DATA
REMEDIAL INVESTIGATION, CTO-0219
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	84-MW15-04	84-MW16-07	84-MW17-07	IR84-MW18-04	IR84-MW19-06	IR84-MW21-04	IR84-MW22-02
DEPTH	7 - 9	13 - 15	13 - 15	7 - 9	11 - 13	7 - 9	3 - 5
SAMPLE DATE	07-31-2001	07-31-2001	07-31-2001	08-01-2001	08-01-2001	08-02-2001	08-03-2001
SEMIVOLATILES (ug/kg)							
1,2,4-Trichlorobenzene	610 U	NA	58 U	NA	NA	59 U	58 U
1,2-Dichlorobenzene	590 U	NA	56 U	NA	NA	57 U	56 U
1,3-Dichlorobenzene	620 U	NA	59 U	NA	NA	61 U	59 U
1,4-Dichlorobenzene	620 U	NA	59 U	NA	NA	61 U	59 U
2,2'-Oxybis(1-Chloropropane)	650 U	NA	62 U	NA	NA	63 U	62 U
2,4,5-Trichlorophenol	690 U	NA	65 U	NA	NA	67 U	65 U
2,4,6-Trichlorophenol	790 U	NA	75 U	NA	NA	76 U	75 U
2,4-Dichlorophenol	620 U	NA	59 U	NA	NA	61 U	59 U
2,4-Dimethylphenol	1000 U	NA	95 U	NA	NA	97 U	95 U
2,4-Dinitrophenol	1400 U	NA	130 U	NA	NA	130 U	130 U
2,4-Dinitrotoluene	570 U	NA	54 U	NA	NA	56 U	54 U
2,6-Dinitrotoluene	600 U	NA	57 U	NA	NA	58 U	57 U
2-Chloronaphthalene	600 U	NA	57 U	NA	NA	58 U	57 U
2-Chlorophenol	650 U	NA	62 U	NA	NA	63 U	62 U
2-Methylnaphthalene	27000	NA	57 U	NA	NA	58 U	57 U
2-Methylphenol	570 U	NA	54 U	NA	NA	56 U	54 U
2-Nitroaniline	570 U	NA	54 U	NA	NA	56 U	54 U
2-Nitrophenol	570 U	NA	54 U	NA	NA	56 U	54 U
3,3'-Dichlorobenzidine	490 U	NA	46 U	NA	NA	47 U	46 U
3-Nitroaniline	1700 U	NA	170 U	NA	NA	170 U	170 U
4,6-Dinitro-2-methylphenol	2000 U	NA	190 U	NA	NA	190 U	190 U
4-Bromophenyl phenyl ether	760 U	NA	72 U	NA	NA	74 U	72 U
4-Chloro-3-methylphenol	640 U	NA	60 U	NA	NA	62 U	60 U
4-Chloroaniline	640 U	NA	60 U	NA	NA	62 U	60 U
4-Chlorophenyl phenyl ether	650 U	NA	62 U	NA	NA	63 U	62 U
4-Methylphenol	590 U	NA	56 U	NA	NA	57 U	56 U
4-Nitroaniline	850 U	NA	80 U	NA	NA	82 U	80 U
4-Nitrophenol	2400 U	NA	220 U	NA	NA	230 U	220 U
Acenaphthene	640 U	NA	60 U	NA	NA	62 U	60 U
Acenaphthylene	590 U	NA	56 U	NA	NA	57 U	56 U
Anthracene	610 U	NA	58 U	NA	NA	59 U	58 U
Benzo(a)anthracene	690 U	NA	65 U	NA	NA	67 U	65 U
Benzo(a)pyrene	750 U	NA	71 U	NA	NA	73 U	71 U
Benzo(b)fluoranthene	720 U	NA	69 U	NA	NA	70 U	69 U
Benzo(ghi)perylene	690 U	NA	65 U	NA	NA	67 U	65 U

APPENDIX F
SUBSURFACE SOIL ANALYTICAL DATA
REMEDIAL INVESTIGATION, CTO-0219
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	84-MW15-04	84-MW16-07	84-MW17-07	IR84-MW18-04	IR84-MW19-06	IR84-MW21-04	IR84-MW22-02
DEPTH	7 - 9	13 - 15	13 - 15	7 - 9	11 - 13	7 - 9	3 - 5
SAMPLE DATE	07-31-2001	07-31-2001	07-31-2001	08-01-2001	08-01-2001	08-02-2001	08-03-2001
SEMIVOLATILES (ug/kg)							
Benzo(k)fluoranthene	660 U	NA	63 U	NA	NA	64 U	63 U
Butyl benzyl phthalate	640 U	NA	60 U	NA	NA	62 U	60 U
Carbazole	650 U	NA	62 U	NA	NA	63 U	62 U
Chrysene	570 U	NA	54 U	NA	NA	56 U	54 U
Di-n-butyl phthalate	1900 U	NA	180 U	NA	NA	180 U	180 U
Di-n-octyl phthalate	670 U	NA	64 U	NA	NA	65 U	64 U
Dibenz(a,h)anthracene	640 U	NA	60 U	NA	NA	62 U	60 U
Dibenzofuran	620 U	NA	59 U	NA	NA	61 U	59 U
Diethyl phthalate	1900 U	NA	180 U	NA	NA	180 U	180 U
Dimethyl phthalate	2000 U	NA	190 U	NA	NA	190 U	190 U
Fluoranthene	700 U	NA	66 U	NA	NA	68 U	66 U
Fluorene	600 U	NA	57 U	NA	NA	58 U	57 U
Hexachlorobenzene	700 U	NA	66 U	NA	NA	68 U	66 U
Hexachlorobutadiene	560 U	NA	53 U	NA	NA	55 U	53 U
Hexachlorocyclopentadiene	750 U	NA	71 U	NA	NA	73 U	71 U
Hexachloroethane	600 U	NA	57 U	NA	NA	58 U	57 U
Indeno(1,2,3-cd)pyrene	870 U	NA	83 U	NA	NA	85 U	83 U
Isophorone	550 U	NA	52 U	NA	NA	53 U	52 U
N-Nitrosodi-n-propylamine	550 U	NA	52 U	NA	NA	53 U	52 U
N-Nitrosodiphenylamine	610 U	NA	58 U	NA	NA	59 U	58 U
Naphthalene	8500	NA	58 U	NA	NA	59 U	58 U
Nitrobenzene	570 U	NA	54 U	NA	NA	56 U	54 U
Pentachlorophenol	1500 U	NA	140 U	NA	NA	150 U	140 U
Phenanthrene	3400 J	NA	62 U	NA	NA	63 U	62 U
Phenol	610 U	NA	58 U	NA	NA	59 U	58 U
Phthalic anhydride	NA	NA	NA	NA	NA	NA	NA
Pyrene	640 U	NA	60 U	NA	NA	62 U	60 U
bis(2-Chloroethoxy)methane	590 U	NA	56 U	NA	NA	57 U	56 U
bis(2-Chloroethyl) ether	640 U	NA	60 U	NA	NA	62 U	60 U
bis(2-Ethylhexyl) phthalate	670 U	NA	91 J	NA	NA	150 J	1800

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SUBSURFACE SOIL ANALYTICAL DATA
REMEDIAL INVESTIGATION, CTO-0219
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	84-MW15-04	84-MW16-07	84-MW17-07	IR84-MW18-04	IR84-MW19-06	IR84-MW21-04	IR84-MW22-02
DEPTH	7 - 9	13 - 15	13 - 15	7 - 9	11 - 13	7 - 9	3 - 5
SAMPLE DATE	07-31-2001	07-31-2001	07-31-2001	08-01-2001	08-01-2001	08-02-2001	08-03-2001
PESTICIDES/PCBs (ug/kg)							
4,4'-DDD	2 U	NA	0.93 U	NA	NA	0.96 U	0.93 U
4,4'-DDE	1.4 U	NA	0.67 U	NA	NA	0.69 U	0.67 U
4,4'-DDT	3.2 U	NA	1.5 U	NA	NA	1.6 U	1.5 U
Aldrin	1.4 U	NA	0.65 U	NA	NA	0.67 U	0.65 U
Dieldrin	3.7 U	NA	1.8 U	NA	NA	1.8 U	1.8 U
Endosulfan I	1.7 U	NA	0.79 U	NA	NA	0.81 U	0.79 U
Endosulfan II	0.95 U	NA	0.45 U	NA	NA	0.46 U	0.45 U
Endosulfan sulfate	0.7 U	NA	0.33 U	NA	NA	0.34 U	0.33 U
Endrin	1.5 U	NA	0.72 U	NA	NA	0.74 U	0.72 U
Endrin aldehyde	3.7 U	NA	1.8 U	NA	NA	1.8 U	1.8 U
Endrin ketone	0.65 U	NA	0.31 U	NA	NA	0.32 U	0.31 U
Heptachlor	1.5 U	NA	0.72 U	NA	NA	0.74 U	0.72 U
Heptachlor epoxide	1.6 U	NA	0.78 U	NA	NA	0.8 U	0.78 U
Methoxychlor	2 U	NA	0.97 U	NA	NA	2.9 J	0.97 U
PCB-1016	6.6 U	6.6 U	6.3 U	6.4 U	6.6 U	6.4 U	6.3 U
PCB-1221	24 U	24 U	22 U	23 U	24 U	23 U	22 U
PCB-1232	14 U	14 U	13 U	13 U	14 U	13 U	13 U
PCB-1242	22 U	22 U	21 U	22 U	22 U	22 U	21 U
PCB-1248	5.7 U	5.7 U	5.4 U	5.6 U	5.7 U	5.6 U	5.4 U
PCB-1254	25 U	25 U	24 U	24 U	25 U	24 U	24 U
PCB-1260	54	9.2 U	8.8 U	8.9 U	9.2 U	9 U	8.8 U
Toxaphene	17 U	NA	8.2 U	NA	NA	8.4 U	8.2 U
alpha-BHC	1.1 U	NA	0.54 U	NA	NA	0.56 U	0.54 U
alpha-Chlordane	1.5 U	NA	0.7 U	NA	NA	0.71 U	0.7 U
beta-BHC	1.1 U	NA	1.7 J	NA	NA	0.56 U	0.54 U
delta-BHC	1.2 U	NA	0.57 U	NA	NA	0.58 U	0.57 U
gamma-BHC (Lindane)	1.4 U	NA	0.67 U	NA	NA	0.69 U	0.67 U
gamma-Chlordane	1.4 U	NA	0.67 U	NA	NA	0.69 U	0.67 U
HERBICIDES (ug/kg)							
2,4,5-T	3.9 U	NA	3.7 U	NA	NA	3.8 U	3.7 U
2,4-D	66 U	NA	63 U	NA	NA	64 U	63 U
2,4-DB	49 U	NA	46 U	NA	NA	47 U	46 U
Dalapon	46 U	NA	44 U	NA	NA	45 U	44 U
Dicamba	19 U	NA	18 U	NA	NA	18 U	18 U
Dichlorprop	12 U	NA	12 U	NA	NA	12 U	12 U
Dinoseb	15 U	NA	14 U	NA	NA	15 U	14 U
MCPA	2900 U	NA	2700 U	NA	NA	2800 U	2700 U
MCPP	3400 U	NA	3200 U	NA	NA	3300 U	3200 U
Pentachlorophenol	12 U	NA	11 U	NA	NA	12 U	11 U
Silvex	4.9 U	NA	4.6 U	NA	NA	4.7 U	4.6 U

APPENDIX F
SUBSURFACE SOIL ANALYTICAL DATA
REMEDIAL INVESTIGATION, CTO-0219
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	84-MW15-04	84-MW16-07	84-MW17-07	IR84-MW18-04	IR84-MW19-06	IR84-MW21-04	IR84-MW22-02
DEPTH	7 - 9	13 - 15	13 - 15	7 - 9	11 - 13	7 - 9	3 - 5
SAMPLE DATE	07-31-2001	07-31-2001	07-31-2001	08-01-2001	08-01-2001	08-02-2001	08-03-2001
METALS (mg/kg)							
Aluminum	2360	NA	630	NA	NA	4610	3470
Antimony	0.61 UJ	NA	0.58 UJ	NA	NA	0.59 UJ	0.58 U
Arsenic	0.62 J	NA	0.35 U	NA	NA	0.38 J	0.58 J
Barium	12.8 J	NA	0.92 J	NA	NA	8.8 U	6 J
Beryllium	0.057 U	NA	0.054 U	NA	NA	0.056 U	0.054 U
Cadmium	0.054 U	NA	0.051 U	NA	NA	0.052 U	0.051 U
Calcium	390 J	NA	71.4 J	NA	NA	971 J	385 J
Chromium	3.6	NA	1.2	NA	NA	4.1	5.7
Cobalt	0.29 J	NA	0.18 U	NA	NA	0.18 U	0.29 J
Copper	0.63 J	NA	0.32 U	NA	NA	0.34 J	1.8 J
Iron	1140	NA	549	NA	NA	801	2670
Lead	3	NA	0.87	NA	NA	3.5 J	3.7
Magnesium	117 J	NA	16.4 J	NA	NA	117 J	111 J
Manganese	6.5	NA	1.5 J	NA	NA	5.2	6.2
Mercury	0.014 J	NA	0.0099 U	NA	NA	0.037 J	0.018 J
Nickel	0.51 J	NA	0.32 U	NA	NA	0.65 J	1.3 J
Potassium	96.7 J	NA	21.3 J	NA	NA	81.6 J	92.5 J
Selenium	0.39 U	NA	0.37 U	NA	NA	0.38 U	0.37 U
Silver	0.19 U	NA	0.18 U	NA	NA	0.18 U	0.18 U
Sodium	62.4 U	NA	59.2 U	NA	NA	60.6 U	59.2 U
Thallium	0.62 U	NA	0.59 U	NA	NA	0.61 U	0.59 U
Vanadium	4.2 J	NA	1.2 J	NA	NA	2.3 J	5.8 J
Zinc	2.1 J	NA	2.7	NA	NA	1.5 U	4
TOTAL PETROLEUM HYDROCARBONS							
TPH (as Diesel) (mg/kg)	NA	NA	NA	NA	NA	NA	NA
TPH (as Gasoline) (ug/kg)	NA	NA	NA	NA	NA	NA	NA
CONVENTIONAL							
Cyanide, Total (mg/kg)	NA	NA	NA	NA	NA	NA	NA
Percent Solids (%)	80.1	80.5	84.5	82.9	80.4	82.5	84.5

APPENDIX F
SUBSURFACE SOIL ANALYTICAL DATA
REMEDIAL INVESTIGATION, CTO-0219
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-MW23-01	IR84-DP15-03	IR84-DP18-02	IR84-DP45-03	IR84-DP46-02	IR84-DP47-01	IR84-DP49-01
DEPTH	1 - 3	5 - 7	3 - 5	5 - 7	3 - 5	1 - 3	1 - 3
SAMPLE DATE	08-03-2001	07-18-2001	07-19-2001	07-21-2001	07-21-2001	07-21-2001	07-21-2001
VOLATILES (ug/kg)							
1,1,1-Trichloroethane	1.3 U	32 U	NA	1 U	1 U	1 U	1 U
1,1,2,2-Tetrachloroethane	2.6 U	34 U	NA	2 U	2 U	2 U	2 U
1,1,2-Trichloroethane	1.7 U	52 U	NA	1.3 U	1.3 U	1.3 U	1.3 U
1,1-Dichloroethane	0.82 U	43 U	NA	0.64 U	0.64 U	0.64 U	0.63 U
1,1-Dichloroethene	1.7 U	52 U	NA	1.3 U	1.3 U	1.3 U	1.3 U
1,2-Dichloroethane	1 U	34 U	NA	0.81 U	0.81 U	0.81 U	0.79 U
1,2-Dichloroethene (total)	2 U	93 U	NA	1.5 U	1.6 U	1.6 U	1.5 U
1,2-Dichloropropane	1.1 U	29 U	NA	0.83 U	0.83 U	0.83 U	0.81 U
2-Butanone	3.8 U	260 U	NA	3 U	3 U	3 U	2.9 U
2-Hexanone	2.4 U	97 U	NA	1.9 U	1.9 U	1.9 U	1.8 U
4-Methyl-2-pentanone	2.7 U	93 U	NA	2.1 U	2.1 U	2.1 U	2.1 U
Acetone	14 J	240 U	NA	2.3 U	2.3 U	2.3 U	2.3 U
Benzene	0.92 U	54 U	NA	0.72 U	0.72 U	0.72 U	0.7 U
Bromodichloromethane	1.7 U	32 U	NA	1.3 U	1.3 U	1.3 U	1.3 U
Bromoform	2.3 U	52 U	NA	1.8 U	1.8 U	1.8 U	1.7 U
Bromomethane	2.6 U	82 R	NA	2 U	2 U	2 U	2 U
Carbon disulfide	1.1 U	110 U	NA	0.86 U	0.87 U	0.86 U	0.85 U
Carbon tetrachloride	1.4 U	32 U	NA	1.1 U	1.1 U	1.1 U	1.1 U
Chlorobenzene	0.74 U	26 U	NA	0.58 U	0.58 U	0.58 U	0.56 U
Chloroethane	3.1 U	120 U	NA	2.4 U	2.4 U	2.4 U	2.4 U
Chloroform	1.2 U	32 U	NA	0.91 U	0.91 U	0.91 U	0.89 U
Chloromethane	1.8 U	49 U	NA	1.4 U	1.4 U	1.4 U	1.4 U
Dibromochloromethane	1.6 U	40 U	NA	1.2 U	1.2 U	1.2 U	1.2 U
Ethylbenzene	0.89 J	140 J	NA	0.65 U	0.65 U	0.65 U	0.64 U
Isopropyl ether	1.2 U	790 U	NA	11 U	11 U	11 U	11 U
Methyl tert-butyl ether	1.2 U	3200 U	NA	22 U	22 U	22 U	22 U
Methylene chloride	1.8 U	130 U	NA	1.4 U	1.4 U	1.4 U	1.4 U
Styrene	2.1 J	54 U	NA	0.55 U	0.55 U	0.55 U	0.54 U
Tetrachloroethene	1.7 U	47 U	NA	1.3 U	1.3 U	1.3 U	1.3 U
Toluene	0.75 U	32 U	NA	0.59 U	0.59 U	0.59 U	0.57 U
Trichloroethene	1.1 U	55 U	NA	0.84 U	0.84 U	0.84 U	0.82 U
Vinyl chloride	2 U	34 U	NA	1.5 U	1.6 U	1.6 U	1.5 U
Xylenes (total)	4.1 J	63 U	NA	2.1 U	2.1 U	2.1 U	2.1 U
cis-1,3-Dichloropropene	0.91 U	37 U	NA	0.71 U	0.71 U	0.71 U	0.69 U
trans-1,3-Dichloropropene	1.2 U	36 U	NA	0.95 U	0.95 U	0.95 U	0.93 U

APPENDIX F
SUBSURFACE SOIL ANALYTICAL DATA
REMEDIAL INVESTIGATION, CTO-0219
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-MW23-01	IR84-DP15-03	IR84-DP18-02	IR84-DP45-03	IR84-DP46-02	IR84-DP47-01	IR84-DP49-01
DEPTH	1 - 3	5 - 7	3 - 5	5 - 7	3 - 5	1 - 3	1 - 3
SAMPLE DATE	08-03-2001	07-18-2001	07-19-2001	07-21-2001	07-21-2001	07-21-2001	07-21-2001
SEMIVOLATILES (ug/kg)							
1,2,4-Trichlorobenzene	74 U	630 U	NA	54 U	140 U	54 U	53 U
1,2-Dichlorobenzene	71 U	600 U	NA	52 U	130 U	52 U	51 U
1,3-Dichlorobenzene	75 U	640 U	NA	55 U	140 U	55 U	54 U
1,4-Dichlorobenzene	75 U	640 U	NA	55 U	140 U	55 U	54 U
2,2'-Oxybis(1-Chloropropane)	78 U	660 U	NA	58 U	140 U	58 U	56 U
2,4,5-Trichlorophenol	83 U	700 U	NA	61 U	150 U	61 U	60 U
2,4,6-Trichlorophenol	95 U	800 U	NA	70 U	170 U	70 U	68 U
2,4-Dichlorophenol	75 U	640 U	NA	55 U	140 U	55 U	54 U
2,4-Dimethylphenol	120 U	1000 U	NA	88 U	220 U	89 U	87 U
2,4-Dinitrophenol	170 U	1400 U	NA	120 U	300 U	120 U	120 U
2,4-Dinitrotoluene	69 U	590 U	NA	51 U	130 U	51 U	50 U
2,6-Dinitrotoluene	72 U	610 U	NA	53 U	130 U	53 U	52 U
2-Chloronaphthalene	72 U	610 U	NA	53 U	130 U	53 U	52 U
2-Chlorophenol	78 U	660 U	NA	58 U	140 U	58 U	56 U
2-Methylnaphthalene	72 U	9100	NA	53 U	130 U	53 U	52 U
2-Methylphenol	69 U	590 U	NA	51 U	130 U	51 U	50 U
2-Nitroaniline	69 U	590 U	NA	51 U	130 U	51 U	50 U
2-Nitrophenol	69 U	590 U	NA	51 U	130 U	51 U	50 U
3,3'-Dichlorobenzidine	59 U	500 U	NA	43 U	110 U	43 U	42 U
3-Nitroaniline	210 U	1800 U	NA	150 U	390 U	160 U	150 U
4,6-Dinitro-2-methylphenol	240 U	2000 U	NA	180 U	440 U	180 U	170 U
4-Bromophenyl phenyl ether	92 U	780 U	NA	67 U	170 U	68 U	66 U
4-Chloro-3-methylphenol	77 U	650 U	NA	56 U	140 U	57 U	55 U
4-Chloroaniline	77 U	650 U	NA	56 U	140 U	57 U	55 U
4-Chlorophenyl phenyl ether	78 U	660 U	NA	58 U	140 U	58 U	56 U
4-Methylphenol	71 U	600 U	NA	52 U	130 U	52 U	51 U
4-Nitroaniline	100 U	870 U	NA	75 U	190 U	75 U	74 U
4-Nitrophenol	290 U	2400 U	NA	210 U	530 U	210 U	210 U
Acenaphthene	77 U	950 J	NA	61 J	370 J	230 J	55 U
Acenaphthylene	71 U	600 U	NA	52 U	130 U	52 U	51 U
Anthracene	74 U	630 U	NA	190 J	830 J	320 J	53 U
Benzo(a)anthracene	83 U	700 U	NA	780	3000	640	60 U
Benzo(a)pyrene	90 U	770 U	NA	660	2600	590	65 U
Benzo(b)fluoranthene	87 U	740 U	NA	880	2800	720	63 U
Benzo(ghi)perylene	83 U	700 U	NA	350 J	1200	340 J	60 U

APPENDIX F
SUBSURFACE SOIL ANALYTICAL DATA
REMEDIAL INVESTIGATION, CTO-0219
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-MW23-01	IR84-DP15-03	IR84-DP18-02	IR84-DP45-03	IR84-DP46-02	IR84-DP47-01	IR84-DP49-01
DEPTH	1 - 3	5 - 7	3 - 5	5 - 7	3 - 5	1 - 3	1 - 3
SAMPLE DATE	08-03-2001	07-18-2001	07-19-2001	07-21-2001	07-21-2001	07-21-2001	07-21-2001
SEMIVOLATILES (ug/kg)							
Benzo(k)fluoranthene	80 U	680 U	NA	280 J	1700	350 J	57 U
Butyl benzyl phthalate	77 U	650 U	NA	56 U	140 U	57 U	55 U
Carbazole	78 U	660 U	NA	110 J	480 J	180 J	56 U
Chrysene	69 U	590 U	NA	750	3100	710	50 U
Di-n-butyl phthalate	230 U	1900 U	NA	170 U	420 U	170 U	160 U
Di-n-octyl phthalate	81 U	690 U	NA	60 U	150 U	60 U	59 U
Dibenz(a,h)anthracene	77 U	650 U	NA	98 J	430 J	100 J	55 U
Dibenzofuran	75 U	1300 J	NA	55 U	200 J	160 J	54 U
Diethyl phthalate	230 U	1900 U	NA	170 U	420 U	170 U	160 U
Dimethyl phthalate	240 U	2000 U	NA	180 U	440 U	180 U	170 U
Fluoranthene	84 U	720 U	NA	1200	4800	1500	61 U
Fluorene	72 U	1500 J	NA	61 J	310 J	230 J	52 U
Hexachlorobenzene	84 U	720 U	NA	62 U	160 U	62 U	61 U
Hexachlorobutadiene	68 U	570 U	NA	50 U	120 U	50 U	49 U
Hexachlorocyclopentadiene	90 U	770 U	NA	66 U	170 U	94 J	65 U
Hexachloroethane	72 U	610 U	NA	53 U	130 U	53 U	52 U
Indeno(1,2,3-cd)pyrene	110 U	890 U	NA	340 J	1200	350 J	76 U
Isophorone	66 U	560 U	NA	49 U	120 U	49 U	48 U
N-Nitrosodi-n-propylamine	66 U	560 U	NA	49 U	120 U	49 U	48 U
N-Nitrosodiphenylamine	74 U	630 U	NA	54 U	140 U	54 U	53 U
Naphthalene	74 U	2000 J	NA	54 U	140 U	55 J	53 U
Nitrobenzene	69 U	590 U	NA	51 U	130 U	51 U	50 U
Pentachlorophenol	180 U	1500 U	NA	130 U	330 U	130 U	130 U
Phenanthrene	78 U	3400 J	NA	610	3100	1400	56 U
Phenol	74 U	630 U	NA	54 U	140 U	54 U	53 U
Phthalic anhydride		NA	NA	NA	NA	NA	NA
Pyrene	77 U	650 U	NA	900	4100	1100	55 U
bis(2-Chloroethoxy)methane	71 U	600 U	NA	52 U	130 U	52 U	51 U
bis(2-Chloroethyl) ether	77 U	650 U	NA	56 U	140 U	57 U	55 U
bis(2-Ethylhexyl) phthalate	81 U	690 U	NA	300 J	150 J	60 U	59 U

APPENDIX F
SUBSURFACE SOIL ANALYTICAL DATA
REMEDIAL INVESTIGATION, CTO-0219
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-MW23-01	IR84-DP15-03	IR84-DP18-02	IR84-DP45-03	IR84-DP46-02	IR84-DP47-01	IR84-DP49-01
DEPTH	1 - 3	5 - 7	3 - 5	5 - 7	3 - 5	1 - 3	1 - 3
SAMPLE DATE	08-03-2001	07-18-2001	07-19-2001	07-21-2001	07-21-2001	07-21-2001	07-21-2001
PESTICIDES/PCBs (ug/kg)							
4,4'-DDD	5.3	9.1 J	NA	46 J	88 U	880 U	0.86 U
4,4'-DDE	1.7 U	3.6 U	NA	13 U	63 U	630 U	0.62 U
4,4'-DDT	3.9 U	8.3 U	NA	29 U	140 U	1400 U	1.4 U
Aldrin	1.7 U	3.5 U	NA	12 U	61 U	610 U	0.6 U
Dieldrin	4.5 U	9.6 U	NA	33 U	170 U	1700 U	1.8
Endosulfan I	2 U	4.3 U	NA	15 U	74 U	740 U	0.73 U
Endosulfan II	1.1 U	2.4 U	NA	8.4 U	42 U	420 U	0.41 U
Endosulfan sulfate	0.84 U	1.8 U	NA	6.2 U	31 U	310 U	0.3 U
Endrin	1.8 U	3.9 U	NA	13 U	68 U	680 U	0.66 U
Endrin aldehyde	4.5 U	10 J	NA	33 U	170 U	1700 U	1.6 U
Endrin ketone	0.78 U	1.7 U	NA	5.8 U	29 U	290 U	0.28 U
Heptachlor	1.8 U	3.9 U	NA	200 J	790	6900	1.6 J
Heptachlor epoxide	2 U	4.2 U	NA	63 J	200 J	730 U	0.72 U
Methoxychlor	2.5 U	24 J	NA	18 U	91 U	910 U	0.89 U
PCB-1016	8 U	68 U	600 U	590 U	590 U	590 U	5.7 U
PCB-1221	29 U	240 U	2100 U	2100 U	2100 U	2100 U	21 U
PCB-1232	17 U	140 U	1200 U	1200 U	1200 U	1200 U	12 U
PCB-1242	27 U	230 U	2000 U	2000 U	2000 U	2000 U	20 U
PCB-1248	6.9 U	59 U	520 U	510 U	510 U	47000	5 U
PCB-1254	30 U	260 U	2300 U	2200 U	5000	2200 U	22 U
PCB-1260	11 U	1100	45000	820 U	820 U	820 U	8 U
Toxaphene	21 U	44 U	NA	150 U	770 U	7600 U	7.5 U
alpha-BHC	1.4 U	2.9 U	NA	10 U	51 U	510 U	0.5 U
alpha-Chlordane	1.8 U	3.8 U	NA	620 J	2200 J	14000 J	0.64 U
beta-BHC	1.4 U	2.9 U	NA	10 U	51 U	510 U	0.5 U
delta-BHC	1.4 U	3.1 U	NA	11 U	53 U	530 U	0.52 U
gamma-BHC (Lindane)	1.7 U	3.6 U	NA	13 U	63 U	630 U	0.62 U
gamma-Chlordane	1.7 U	3.6 U	NA	730	2600	18000	0.62 U
HERBICIDES (ug/kg)							
2,4,5-T	4.7 U	NA	NA	NA	NA	NA	NA
2,4-D	80 U	NA	NA	NA	NA	NA	NA
2,4-DB	59 U	NA	NA	NA	NA	NA	NA
Dalapon	56 U	NA	NA	NA	NA	NA	NA
Dicamba	23 U	NA	NA	NA	NA	NA	NA
Dichlorprop	15 U	NA	NA	NA	NA	NA	NA
Dinoseb	18 U	NA	NA	NA	NA	NA	NA
MCPA	3500 U	NA	NA	NA	NA	NA	NA
MCPP	4100 U	NA	NA	NA	NA	NA	NA
Pentachlorophenol	15 U	NA	NA	NA	NA	NA	NA
Silvex	5.9 U	NA	NA	NA	NA	NA	NA

APPENDIX F
SUBSURFACE SOIL ANALYTICAL DATA
REMEDIAL INVESTIGATION, CTO-0219
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-MW23-01	IR84-DP15-03	IR84-DP18-02	IR84-DP45-03	IR84-DP46-02	IR84-DP47-01	IR84-DP49-01
DEPTH	1 - 3	5 - 7	3 - 5	5 - 7	3 - 5	1 - 3	1 - 3
SAMPLE DATE	08-03-2001	07-18-2001	07-19-2001	07-21-2001	07-21-2001	07-21-2001	07-21-2001
METALS (mg/kg)							
Aluminum	4900	6500	NA	3140	2770	2740	2860
Antimony	0.74 U	1.3 B	NA	0.54 U	0.54 U	0.6 J	1.2 J
Arsenic	0.94 B	2	NA	0.37 J	0.63 J	0.7 J	1.2
Barium	21.6 B	15.1 J	NA	6.2 J	7.1 J	11.8 J	24.3
Beryllium	0.1 B	0.13 B	NA	0.051 U	0.051 U	0.064 J	0.058 J
Cadmium	0.065 U	0.097 J	NA	0.048 U	0.048 U	0.048 U	0.18 J
Calcium	1400	21500	NA	3260 J	3220 J	1640 J	2270 J
Chromium	4.8	9.7	NA	9.9	3.5	2.8	4.1
Cobalt	0.38 B	0.68 J	NA	0.37 J	0.17 U	0.21 J	0.36 J
Copper	4.2	5.1	NA	3.4	3	1.8 J	22.2
Iron	1700	6140	NA	2320	1710	1680	2190
Lead	9.1	11.4	NA	5	8.9	5.7	52.7
Magnesium	168 B	648	NA	147 J	124 J	101 J	178 J
Manganese	7.8	35	NA	9.7	6.4	10	18.8
Mercury	0.028 B	0.02 J	NA	0.013 J	0.055 J	0.023 J	0.038 J
Nickel	1.1 B	2.3 J	NA	1.1 J	0.91 J	0.91 J	1.8 J
Potassium	111 B	134 J	NA	102 J	137 J	102 J	104 J
Selenium	0.47 U	0.82 U	NA	0.34 U	0.34 U	0.39 U	0.34 U
Silver	0.23 U	0.19 U	NA	0.17 U	0.17 U	0.17 U	0.16 U
Sodium	75.4 U	63.8 U	NA	55.3 U	55.5 U	55.4 U	54.2 U
Thallium	0.75 U	0.64 U	NA	0.55 U	0.55 U	0.55 U	0.54 U
Vanadium	7.2 B	11.2	NA	5 J	4.5 J	4.4 J	4.8 J
Zinc	13.7	19.4 J	NA	16.2 J	23 J	6.8 J	42.6 J
TOTAL PETROLEUM HYDROCARBONS							
TPH (as Diesel) (mg/kg)	NA	5500	NA	27	61	67	19
TPH (as Gasoline) (ug/kg)	NA	580000	NA	19 U	220	19 U	18 U
CONVENTIONAL							
Cyanide, Total (mg/kg)	NA	0.22 U	NA	0.19 U	0.19 U	0.19 U	0.18 U
Percent Solids (%)	66.3	78.3	88.9	90.4	90.2	90.2	92.2

APPENDIX F
SUBSURFACE SOIL ANALYTICAL DATA
REMEDIAL INVESTIGATION, CTO-0219
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-DP50-01	IR84-DP51-01	IR84-DP52-01	IR84-DP63-01	IR84-DP65-02	IR84-DP74-04	IR84-DP75-05
DEPTH	1 - 3	1 - 3	1 - 3	1 - 3	3 - 5	7 - 9	9 - 11
SAMPLE DATE	07-21-2001	07-21-2001	07-21-2001	07-22-2001	07-22-2001	08-02-2001	08-02-2001
VOLATILES (ug/kg)							
1,1,1-Trichloroethane	0.98 U	1 U	1 U	NA	NA	0.98 U	13 U
1,1,2,2-Tetrachloroethane	1.9 U	2 U	2 U	NA	NA	1.9 U	14 U
1,1,2-Trichloroethane	1.3 U	1.3 U	1.3 U	NA	NA	1.3 U	20 U
1,1-Dichloroethane	0.62 U	0.64 U	0.64 U	NA	NA	0.62 U	18 U
1,1-Dichloroethene	1.3 U	1.3 U	1.3 U	NA	NA	1.3 U	21 U
1,2-Dichloroethane	0.78 U	0.81 U	0.81 U	NA	NA	0.78 U	14 U
1,2-Dichloroethene (total)	1.5 U	1.5 U	1.5 U	NA	NA	1.5 U	37 U
1,2-Dichloropropane	0.8 U	0.83 U	0.83 U	NA	NA	0.8 U	12 U
2-Butanone	2.9 U	3 U	3 U	NA	NA	2.9 U	100 U
2-Hexanone	1.8 U	1.9 U	1.9 U	NA	NA	1.8 U	38 U
4-Methyl-2-pentanone	2 U	2.1 U	2.1 U	NA	NA	2 U	37 U
Acetone	2.3 U	2.3 U	2.3 U	NA	NA	2.2 U	95 U
Benzene	0.69 U	0.72 U	0.72 U	NA	NA	0.69 U	120 J
Bromodichloromethane	1.3 U	1.3 U	1.3 U	NA	NA	1.3 U	13 U
Bromoform	1.7 U	1.8 U	1.8 U	NA	NA	1.7 U	20 U
Bromomethane	1.9 U	2 U	2 U	NA	NA	1.9 U	33 U
Carbon disulfide	0.83 U	0.86 U	0.86 U	NA	NA	0.83 U	44 U
Carbon tetrachloride	1.1 U	1.1 U	1.1 U	NA	NA	1.1 U	13 U
Chlorobenzene	0.55 U	0.57 U	0.58 U	NA	NA	0.55 U	10 U
Chloroethane	2.3 U	2.4 U	2.4 U	NA	NA	2.3 U	47 U
Chloroform	0.87 U	0.91 U	0.91 U	NA	NA	0.87 U	13 U
Chloromethane	1.4 U	1.4 U	1.4 U	NA	NA	1.4 U	19 U
Dibromochloromethane	1.2 U	1.2 U	1.2 U	NA	NA	1.2 U	16 U
Ethylbenzene	0.63 U	0.65 U	0.65 U	NA	NA	0.63 U	1300
Isopropyl ether	11 U	11 U	11 U	NA	NA	0.93 U	58 U
Methyl tert-butyl ether	21 U	22 U	22 U	NA	NA	0.89 U	14 U
Methylene chloride	1.4 U	1.4 U	1.4 U	NA	NA	1.4 U	52 U
Styrene	0.53 U	0.55 U	0.55 U	NA	NA	0.53 U	21 U
Tetrachloroethene	1.3 U	1.3 U	1.3 U	NA	NA	1.3 U	19 U
Toluene	0.56 U	0.59 U	0.59 U	NA	NA	0.56 U	75 J
Trichloroethene	0.81 U	0.84 U	0.84 U	NA	NA	0.81 U	21 U
Vinyl chloride	1.5 U	1.5 U	1.5 U	NA	NA	1.5 U	14 U
Xylenes (total)	2 U	2.1 U	2.1 U	NA	NA	2 U	3100
cis-1,3-Dichloropropene	0.68 U	0.71 U	0.71 U	NA	NA	0.68 U	15 U
trans-1,3-Dichloropropene	0.91 U	0.95 U	0.95 U	NA	NA	0.91 U	14 U

APPENDIX F
SUBSURFACE SOIL ANALYTICAL DATA
REMEDIAL INVESTIGATION, CTO-0219
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-DP50-01	IR84-DP51-01	IR84-DP52-01	IR84-DP63-01	IR84-DP65-02	IR84-DP74-04	IR84-DP75-05
DEPTH	1 - 3	1 - 3	1 - 3	1 - 3	3 - 5	7 - 9	9 - 11
SAMPLE DATE	07-21-2001	07-21-2001	07-21-2001	07-22-2001	07-22-2001	08-02-2001	08-02-2001
SEMIVOLATILES (ug/kg)							
1,2,4-Trichlorobenzene	52 U	54 U	54 U	NA	NA	60 U	63 U
1,2-Dichlorobenzene	50 U	52 U	52 U	NA	NA	57 U	61 U
1,3-Dichlorobenzene	53 U	55 U	55 U	NA	NA	61 U	64 U
1,4-Dichlorobenzene	53 U	55 U	55 U	NA	NA	61 U	64 U
2,2'-Oxybis(1-Chloropropane)	55 U	57 U	58 U	NA	NA	63 U	67 U
2,4,5-Trichlorophenol	58 U	61 U	61 U	NA	NA	67 U	71 U
2,4,6-Trichlorophenol	67 U	70 U	70 U	NA	NA	77 U	81 U
2,4-Dichlorophenol	53 U	55 U	55 U	NA	NA	61 U	64 U
2,4-Dimethylphenol	85 U	88 U	89 U	NA	NA	98 U	100 U
2,4-Dinitrophenol	120 U	120 U	120 U	NA	NA	130 U	140 U
2,4-Dinitrotoluene	49 U	51 U	51 U	NA	NA	56 U	59 U
2,6-Dinitrotoluene	51 U	53 U	53 U	NA	NA	59 U	62 U
2-Chloronaphthalene	51 U	53 U	53 U	NA	NA	59 U	62 U
2-Chlorophenol	55 U	57 U	58 U	NA	NA	63 U	67 U
2-Methylnaphthalene	51 U	53 U	53 U	NA	NA	59 U	1000
2-Methylphenol	49 U	51 U	51 U	NA	NA	56 U	59 U
2-Nitroaniline	49 U	51 U	51 U	NA	NA	56 U	59 U
2-Nitrophenol	49 U	51 U	51 U	NA	NA	56 U	59 U
3,3'-Dichlorobenzidine	41 U	43 U	43 U	NA	NA	48 U	50 U
3-Nitroaniline	150 U	150 U	150 U	NA	NA	170 U	180 U
4,6-Dinitro-2-methylphenol	170 U	180 U	180 U	NA	NA	200 U	210 U
4-Bromophenyl phenyl ether	65 U	67 U	68 U	NA	NA	74 U	79 U
4-Chloro-3-methylphenol	54 U	56 U	56 U	NA	NA	62 U	66 U
4-Chloroaniline	54 U	56 U	56 U	NA	NA	62 U	66 U
4-Chlorophenyl phenyl ether	55 U	57 U	58 U	NA	NA	63 U	67 U
4-Methylphenol	50 U	52 U	52 U	NA	NA	57 U	61 U
4-Nitroaniline	72 U	75 U	75 U	NA	NA	83 U	88 U
4-Nitrophenol	200 U	210 U	210 U	NA	NA	230 U	240 U
Acenaphthene	54 U	56 U	56 U	NA	NA	62 U	66 U
Acenaphthylene	50 U	52 U	52 U	NA	NA	57 U	61 U
Anthracene	52 U	54 U	54 U	NA	NA	60 U	63 U
Benzo(a)anthracene	58 U	61 U	61 U	NA	NA	67 U	71 U
Benzo(a)pyrene	64 U	66 U	66 U	NA	NA	73 U	77 U
Benzo(b)fluoranthene	62 U	64 U	77 J	NA	NA	71 U	75 U
Benzo(ghi)perylene	58 U	65 J	83 J	NA	NA	67 U	71 U

APPENDIX F
SUBSURFACE SOIL ANALYTICAL DATA
REMEDIAL INVESTIGATION, CTO-0219
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-DP50-01	IR84-DP51-01	IR84-DP52-01	IR84-DP63-01	IR84-DP65-02	IR84-DP74-04	IR84-DP75-05
DEPTH	1 - 3	1 - 3	1 - 3	1 - 3	3 - 5	7 - 9	9 - 11
SAMPLE DATE	07-21-2001	07-21-2001	07-21-2001	07-22-2001	07-22-2001	08-02-2001	08-02-2001
SEMIVOLATILES (ug/kg)							
Benzo(k)fluoranthene	56 U	59 U	59 U	NA	NA	65 U	68 U
Butyl benzyl phthalate	54 U	56 U	56 U	NA	NA	62 U	66 U
Carbazole	55 U	57 U	58 U	NA	NA	63 U	67 U
Chrysene	49 U	51 U	57 J	NA	NA	56 U	59 U
Di-n-butyl phthalate	160 U	170 U	170 U	NA	NA	180 U	190 U
Di-n-octyl phthalate	57 U	60 U	60 U	NA	NA	66 U	70 U
Dibenz(a,h)anthracene	54 U	56 U	56 U	NA	NA	62 U	66 U
Dibenzofuran	53 U	55 U	55 U	NA	NA	61 U	64 U
Diethyl phthalate	160 U	170 U	170 U	NA	NA	180 U	190 U
Dimethyl phthalate	170 U	180 U	180 U	NA	NA	200 U	210 U
Fluoranthene	60 U	62 U	74 J	NA	NA	68 U	72 U
Fluorene	51 U	53 U	53 U	NA	NA	59 U	80 J
Hexachlorobenzene	60 U	62 U	62 U	NA	NA	68 U	72 U
Hexachlorobutadiene	48 U	50 U	50 U	NA	NA	55 U	58 U
Hexachlorocyclopentadiene	64 U	66 U	66 U	NA	NA	73 U	77 U
Hexachloroethane	51 U	53 U	53 U	NA	NA	59 U	62 U
Indeno(1,2,3-cd)pyrene	74 U	77 U	77 U	NA	NA	85 U	90 U
Isophorone	47 U	49 U	49 U	NA	NA	54 U	57 U
N-Nitrosodi-n-propylamine	47 U	49 U	49 U	NA	NA	54 U	57 U
N-Nitrosodiphenylamine	52 U	54 U	54 U	NA	NA	60 U	63 U
Naphthalene	52 U	54 U	54 U	NA	NA	60 U	400 J
Nitrobenzene	49 U	51 U	51 U	NA	NA	56 U	59 U
Pentachlorophenol	130 U	130 U	130 U	NA	NA	150 U	150 U
Phenanthrene	55 U	57 U	58 U	NA	NA	63 U	150 J
Phenol	52 U	54 U	54 U	NA	NA	60 U	63 U
Phthalic anhydride	NA	NA	NA	NA	NA	NA	NA
Pyrene	54 U	56 U	69 J	NA	NA	62 U	66 U
bis(2-Chloroethoxy)methane	50 U	52 U	52 U	NA	NA	57 U	61 U
bis(2-Chloroethyl) ether	54 U	56 U	56 U	NA	NA	62 U	66 U
bis(2-Ethylhexyl) phthalate	57 U	60 U	60 U	NA	NA	66 U	70 U

APPENDIX F
SUBSURFACE SOIL ANALYTICAL DATA
REMEDIAL INVESTIGATION, CTO-0219
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-DP50-01	IR84-DP51-01	IR84-DP52-01	IR84-DP63-01	IR84-DP65-02	IR84-DP74-04	IR84-DP75-05
DEPTH	1 - 3	1 - 3	1 - 3	1 - 3	3 - 5	7 - 9	9 - 11
SAMPLE DATE	07-21-2001	07-21-2001	07-21-2001	07-22-2001	07-22-2001	08-02-2001	08-02-2001
PESTICIDES/PCBs (ug/kg)							
4,4'-DDD	0.84 U	5.5	4.4 U	NA	NA	0.96 U	1 U
4,4'-DDE	0.61 U	9.4	16	NA	NA	0.7 U	0.73 U
4,4'-DDT	1.4 U	30	120 J	NA	NA	1.6 U	1.7 U
Aldrin	0.58 U	1.2 U	3 U	NA	NA	0.67 U	0.71 U
Dieldrin	1.6 U	3.3 U	8.3 U	NA	NA	1.8 U	1.9 U
Endosulfan I	0.71 U	1.5 U	3.7 U	NA	NA	0.82 U	0.86 U
Endosulfan II	0.4 U	0.84 U	2.1 U	NA	NA	0.46 U	0.49 U
Endosulfan sulfate	0.3 U	0.62 U	1.5 U	NA	NA	0.34 U	0.36 U
Endrin	0.65 U	1.3 U	3.4 U	NA	NA	0.74 U	0.79 U
Endrin aldehyde	1.6 U	3.3 U	8.3 U	NA	NA	1.8 U	1.9 U
Endrin ketone	0.28 U	0.57 U	1.4 U	NA	NA	0.32 U	0.34 U
Heptachlor	2.4	1.3 U	3.4 U	NA	NA	0.74 U	0.79 U
Heptachlor epoxide	0.7 U	1.5 U	3.7 U	NA	NA	0.81 U	0.85 U
Methoxychlor	0.87 U	1.8 U	14 J	NA	NA	1 U	1.1 U
PCB-1016	5.6 U	5.9 U	59 U	60 U	610 U	6.5 U	6.8 U
PCB-1221	20 U	21 U	210 U	210 U	2200 U	23 U	24 U
PCB-1232	12 U	12 U	120 U	120 U	1300 U	13 U	14 U
PCB-1242	19 U	20 U	200 U	200 U	2100 U	22 U	23 U
PCB-1248	4.9 U	5.1 U	51 U	52 U	530 U	5.6 U	5.9 U
PCB-1254	21 U	22 U	220 U	230 U	2300 U	24 U	26 U
PCB-1260	7.9 U	23 J	1300	2500	8900	9 U	9.5 U
Toxaphene	7.3 U	15 U	38 U	NA	NA	8.4 U	8.9 U
alpha-BHC	0.49 U	1 U	2.5 U	NA	NA	0.56 U	0.59 U
alpha-Chlordane	0.63 U	1.3 U	9.4	NA	NA	0.72 U	0.76 U
beta-BHC	0.49 U	1 U	2.5 U	NA	NA	0.56 U	0.59 U
delta-BHC	0.51 U	1.1 U	2.7 U	NA	NA	0.59 U	0.62 U
gamma-BHC (Lindane)	0.61 U	1.3 U	3.2 U	NA	NA	0.7 U	0.73 U
gamma-Chlordane	0.61 U	1.3 U	10	NA	NA	0.7 U	0.73 U
HERBICIDES (ug/kg)							
2,4,5-T	NA	NA	NA	NA	NA	3.8 U	4 U
2,4-D	NA	NA	NA	NA	NA	65 U	68 U
2,4-DB	NA	NA	NA	NA	NA	48 U	50 U
Dalapon	NA	NA	NA	NA	NA	45 U	48 U
Dicamba	NA	NA	NA	NA	NA	18 U	19 U
Dichlorprop	NA	NA	NA	NA	NA	12 U	13 U
Dinoseb	NA	NA	NA	NA	NA	15 U	15 U
MCPA	NA	NA	NA	NA	NA	2800 U	3000 U
MCPP	NA	NA	NA	NA	NA	3300 U	3500 U
Pentachlorophenol	NA	NA	NA	NA	NA	12 U	12 U
Silvex	NA	NA	NA	NA	NA	4.8 U	5 U

APPENDIX F
SUBSURFACE SOIL ANALYTICAL DATA
REMEDIAL INVESTIGATION, CTO-0219
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-DP50-01	IR84-DP51-01	IR84-DP52-01	IR84-DP63-01	IR84-DP65-02	IR84-DP74-04	IR84-DP75-05
DEPTH	1 - 3	1 - 3	1 - 3	1 - 3	3 - 5	7 - 9	9 - 11
SAMPLE DATE	07-21-2001	07-21-2001	07-21-2001	07-22-2001	07-22-2001	08-02-2001	08-02-2001
METALS (mg/kg)							
Aluminum	3050	2000	1680	NA	NA	2990	2550
Antimony	1.2 J	0.54 U	0.54 U	NA	NA	0.6 UJ	0.63 UJ
Arsenic	1.5	0.36 J	0.57 J	NA	NA	0.4 J	0.39 U
Barium	23.5	14 J	11.7 J	NA	NA	4 U	2.9 U
Beryllium	0.051 J	0.051 U	0.051 U	NA	NA	0.056 U	0.059 U
Cadmium	0.15 J	0.061 J	0.087 J	NA	NA	0.052 U	0.055 U
Calcium	8790 J	16400 J	12100 J	NA	NA	253 J	164 J
Chromium	4.8	2.6	2.7	NA	NA	3.3	2.2
Cobalt	0.51 J	0.25 J	0.69 J	NA	NA	0.31 J	0.19 U
Copper	25.5	2.7 J	3.3	NA	NA	0.33 U	0.37 J
Iron	5400	1110	1050	NA	NA	1250	155
Lead	40.9	10.2	12.2	NA	NA	2.7 J	3.8 J
Magnesium	200 J	255 J	209 J	NA	NA	105 J	40.2 J
Manganese	40	19	10.7	NA	NA	2.4	1.5 J
Mercury	0.026 J	0.02 J	0.01 J	NA	NA	0.013 J	0.021 J
Nickel	3.5 J	1.1 J	1.5 J	NA	NA	1 J	0.48 J
Potassium	109 J	84.3 J	76.3 J	NA	NA	86.7 J	41.5 J
Selenium	0.33 U	0.34 U	0.34 U	NA	NA	0.39 J	0.69
Silver	0.16 U	0.17 U	0.17 U	NA	NA	0.18 U	0.19 U
Sodium	53.2 U	55.3 U	55.4 U	NA	NA	61 U	64.4 U
Thallium	0.53 U	0.55 U	0.55 U	NA	NA	0.65 J	0.64 U
Vanadium	5.6	3.1 J	3.5 J	NA	NA	3.4 J	2.3 J
Zinc	32.7 J	11.9 J	13.5 J	NA	NA	1.5 U	1.5 U
TOTAL PETROLEUM HYDROCARBONS							
TPH (as Diesel) (mg/kg)	15	27	100	NA	NA	NA	NA
TPH (as Gasoline) (ug/kg)	18 U	19 U	19 U	NA	NA	NA	NA
CONVENTIONAL							
Cyanide, Total (mg/kg)	0.18 U	0.19 U	0.19 U	NA	NA	NA	NA
Percent Solids (%)	94.1	90.5	90.3	88.6	86.9	81.9	77.6

APPENDIX F
SUBSURFACE SOIL ANALYTICAL DATA
REMEDIAL INVESTIGATION, CTO-0219
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-DP76-04	IR84-DP77-03	IR84-DP78-03	IR84-DP79-02	IR84-DP79-02D	IR84-DP80-02	IR84-DP81-04
DEPTH	7 - 9	5 - 7	5 - 7	3 - 5	3 - 5	3 - 5	7 - 9
SAMPLE DATE	08-02-2001	08-05-2001	08-05-2001	08-05-2001	08-05-2001	08-05-2001	08-05-2001
VOLATILES (ug/kg)							
1,1,1-Trichloroethane	1.1 U	1 U	0.92 U	0.96 U	1 U	0.9 U	0.98 U
1,1,2,2-Tetrachloroethane	2.1 U	2.1 U	1.8 U	1.9 U	2.1 U	1.8 U	1.9 U
1,1,2-Trichloroethane	1.4 U	1.4 U	1.2 U	1.3 U	1.4 U	1.2 U	1.3 U
1,1-Dichloroethane	0.68 U	0.66 U	0.58 U	0.61 U	0.66 U	0.57 U	0.62 U
1,1-Dichloroethene	1.4 U	1.4 U	1.2 U	1.3 U	1.4 U	1.2 U	1.3 U
1,2-Dichloroethane	0.86 U	0.83 U	0.73 U	0.76 U	0.83 U	0.72 U	0.78 U
1,2-Dichloroethene (total)	1.6 U	1.6 U	1.4 U	1.5 U	1.6 U	1.4 U	1.5 U
1,2-Dichloropropane	0.88 U	0.85 U	0.75 U	0.79 U	0.85 U	0.74 U	0.8 U
2-Butanone	3.2 U	3.1 U	2.7 U	2.8 U	3.1 U	2.7 U	2.9 U
2-Hexanone	2 U	1.9 U	1.7 U	1.8 U	1.9 U	1.7 U	1.8 U
4-Methyl-2-pentanone	2.2 U	2.2 U	1.9 U	2 U	2.2 U	1.9 U	2 U
Acetone	2.5 U	2.4 U	2.1 U	2.2 U	2.4 U	2.1 U	2.2 U
Benzene	0.76 U	0.74 U	0.65 U	0.68 U	0.74 U	0.64 U	0.7 U
Bromodichloromethane	1.4 U	1.4 U	1.2 U	1.3 U	1.4 U	1.2 U	1.3 U
Bromoform	1.9 U	1.8 U	1.6 U	1.7 U	1.8 U	1.6 U	1.7 U
Bromomethane	2.1 U	2.1 U	1.8 U	1.9 U	2.1 U	1.8 U	1.9 U
Carbon disulfide	0.91 U	0.89 U	0.78 U	0.82 U	0.89 U	0.77 U	0.83 U
Carbon tetrachloride	1.2 U	1.1 U	1 U	1 U	1.1 U	0.98 U	1.1 U
Chlorobenzene	0.61 U	0.59 U	0.52 U	0.54 U	0.59 U	0.51 U	0.56 U
Chloroethane	2.6 U	2.5 U	2.2 U	2.3 U	2.5 U	2.2 U	2.4 U
Chloroform	0.96 U	0.93 U	0.82 U	0.86 U	0.93 U	0.81 U	0.88 U
Chloromethane	1.5 U	1.5 U	1.3 U	1.4 U	1.5 U	1.3 U	1.4 U
Dibromochloromethane	1.3 U	1.3 U	1.1 U	1.2 U	1.3 U	1.1 U	1.2 U
Ethylbenzene	0.69 U	0.67 U	0.59 U	0.62 U	0.67 U	0.58 U	0.63 U
Isopropyl ether	1 U	1 U	0.88 U	0.92 U	1 U	0.86 U	0.94 U
Methyl tert-butyl ether	0.98 U	0.96 U	0.84 U	0.88 U	0.96 U	0.83 U	0.9 U
Methylene chloride	1.5 U	1.5 U	1.3 J	1.4 U	1.5 U	1.3 U	1.4 U
Styrene	0.59 U	0.57 U	0.5 U	0.52 U	0.57 U	0.49 U	0.53 U
Tetrachloroethene	1.4 U	1.4 U	1.2 U	1.3 U	1.4 U	1.2 U	1.3 U
Toluene	0.62 U	0.6 U	0.53 U	0.56 U	0.6 U	0.52 U	0.57 U
Trichloroethene	0.89 U	0.87 U	0.76 U	0.8 U	0.87 U	0.75 U	0.81 U
Vinyl chloride	1.6 U	1.6 U	1.4 U	1.5 U	1.6 U	1.4 U	1.5 U
Xylenes (total)	2.2 U	2.2 U	1.9 U	2 U	2.2 U	1.9 U	2 U
cis-1,3-Dichloropropene	0.75 U	0.73 U	0.64 U	0.67 U	0.73 U	0.63 U	0.68 U
trans-1,3-Dichloropropene	1 U	0.98 U	0.86 U	0.9 U	0.98 U	0.85 U	0.92 U

APPENDIX F
SUBSURFACE SOIL ANALYTICAL DATA
REMEDIAL INVESTIGATION, CTO-0219
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-DP76-04	IR84-DP77-03	IR84-DP78-03	IR84-DP79-02	IR84-DP79-02D	IR84-DP80-02	IR84-DP81-04
DEPTH	7 - 9	5 - 7	5 - 7	3 - 5	3 - 5	3 - 5	7 - 9
SAMPLE DATE	08-02-2001	08-05-2001	08-05-2001	08-05-2001	08-05-2001	08-05-2001	08-05-2001
SEMIVOLATILES (ug/kg)							
1,2,4-Trichlorobenzene	59 U	58 U	59 U	53 U	58 U	53 U	56 U
1,2-Dichlorobenzene	57 U	55 U	56 U	51 U	55 U	51 U	54 U
1,3-Dichlorobenzene	60 U	59 U	60 U	55 U	59 U	54 U	58 U
1,4-Dichlorobenzene	60 U	59 U	60 U	55 U	59 U	54 U	58 U
2,2'-Oxybis(1-Chloropropane)	63 U	61 U	62 U	57 U	61 U	56 U	60 U
2,4,5-Trichlorophenol	66 U	65 U	66 U	60 U	65 U	59 U	63 U
2,4,6-Trichlorophenol	76 U	74 U	75 U	69 U	74 U	68 U	72 U
2,4-Dichlorophenol	60 U	59 U	60 U	55 U	59 U	54 U	58 U
2,4-Dimethylphenol	97 U	94 U	96 U	87 U	94 U	86 U	92 U
2,4-Dinitrophenol	130 U	130 U	130 U	120 U	130 U	120 U	130 U
2,4-Dinitrotoluene	56 U	54 U	55 U	50 U	54 U	50 U	53 U
2,6-Dinitrotoluene	58 U	56 U	57 U	52 U	56 U	52 U	55 U
2-Chloronaphthalene	58 U	56 U	57 U	52 U	56 U	52 U	55 U
2-Chlorophenol	63 U	61 U	62 U	57 U	61 U	56 U	60 U
2-Methylnaphthalene	58 U	56 U	57 U	52 U	56 U	52 U	55 U
2-Methylphenol	56 U	54 U	55 U	50 U	54 U	50 U	53 U
2-Nitroaniline	56 U	54 U	55 U	50 U	54 U	50 U	53 U
2-Nitrophenol	56 U	54 U	55 U	50 U	54 U	50 U	53 U
3,3'-Dichlorobenzidine	47 U	46 U	47 U	43 U	46 U	42 U	45 U
3-Nitroaniline	170 U	160 U	170 U	150 U	160 U	150 U	160 U
4,6-Dinitro-2-methylphenol	190 U	190 U	190 U	170 U	190 U	170 U	180 U
4-Bromophenyl phenyl ether	74 U	72 U	73 U	67 U	72 U	66 U	70 U
4-Chloro-3-methylphenol	62 U	60 U	61 U	56 U	60 U	55 U	59 U
4-Chloroaniline	62 U	60 U	61 U	56 U	60 U	55 U	59 U
4-Chlorophenyl phenyl ether	63 U	61 U	62 U	57 U	61 U	56 U	60 U
4-Methylphenol	57 U	55 U	56 U	51 U	55 U	51 U	54 U
4-Nitroaniline	82 U	80 U	81 U	74 U	80 U	73 U	78 U
4-Nitrophenol	230 U	220 U	230 U	210 U	220 U	210 R	220 U
Acenaphthene	62 U	60 U	61 U	56 U	60 U	55 U	59 U
Acenaphthylene	57 U	55 U	56 U	51 U	55 U	51 U	54 U
Anthracene	59 U	58 U	59 U	53 U	58 U	53 U	56 U
Benzo(a)anthracene	66 U	65 U	66 U	60 U	65 U	59 U	63 U
Benzo(a)pyrene	73 U	71 U	72 U	65 U	70 U	65 U	69 U
Benzo(b)fluoranthene	70 U	68 U	69 U	63 U	68 U	63 U	67 U
Benzo(ghi)perylene	66 U	65 U	66 U	60 U	65 U	59 U	63 U

APPENDIX F
SUBSURFACE SOIL ANALYTICAL DATA
REMEDIAL INVESTIGATION, CTO-0219
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-DP76-04	IR84-DP77-03	IR84-DP78-03	IR84-DP79-02	IR84-DP79-02D	IR84-DP80-02	IR84-DP81-04
DEPTH	7 - 9	5 - 7	5 - 7	3 - 5	3 - 5	3 - 5	7 - 9
SAMPLE DATE	08-02-2001	08-05-2001	08-05-2001	08-05-2001	08-05-2001	08-05-2001	08-05-2001
SEMIVOLATILES (ug/kg)							
Benzo(k)fluoranthene	64 U	62 U	63 U	58 U	62 U	57 U	61 U
Butyl benzyl phthalate	62 U	60 U	61 U	56 U	60 U	55 U	59 U
Carbazole	63 U	61 U	62 U	57 U	61 U	56 U	60 U
Chrysene	56 U	54 U	55 U	50 U	54 U	50 U	53 U
Di-n-butyl phthalate	180 U	180 U	180 U	160 U	180 U	160 U	170 U
Di-n-octyl phthalate	65 U	63 U	65 U	59 U	63 U	58 U	62 U
Dibenz(a.h)anthracene	62 U	60 U	61 U	56 U	60 U	55 U	59 U
Dibenzofuran	60 U	59 U	60 U	55 U	59 U	54 U	58 U
Diethyl phthalate	180 U	180 U	180 U	160 U	180 U	160 U	170 U
Dimethyl phthalate	190 U	190 U	190 U	170 U	190 U	170 U	180 U
Fluoranthene	68 U	66 U	67 U	61 U	66 U	60 U	64 U
Fluorene	58 U	56 U	57 U	52 U	56 U	52 U	55 U
Hexachlorobenzene	68 U	66 U	67 U	61 U	66 U	60 U	64 U
Hexachlorobutadiene	54 U	53 U	54 U	49 U	53 U	49 U	52 U
Hexachlorocyclopentadiene	73 U	71 U	72 U	65 U	70 U	65 U	69 U
Hexachloroethane	58 U	56 U	57 U	52 U	56 U	52 U	55 U
Indeno(1.2.3-cd)pyrene	85 U	82 U	84 U	76 U	82 U	76 U	81 U
Isophorone	53 U	52 U	53 U	48 U	52 U	48 U	51 U
N-Nitrosodi-n-propylamine	53 U	52 U	53 U	48 U	52 U	48 U	51 U
N-Nitrosodiphenylamine	59 U	58 U	59 U	53 U	58 U	53 U	56 U
Naphthalene	59 U	58 U	59 U	53 U	58 U	53 U	56 U
Nitrobenzene	56 U	54 U	55 U	50 U	54 U	50 U	53 U
Pentachlorophenol	150 U	140 U	140 U	130 U	140 U	130 U	140 U
Phenanthrene	63 U	61 U	62 U	57 U	61 U	56 U	60 U
Phenol	59 U	58 U	59 U	53 U	58 U	53 U	56 U
Phthalic anhydride	NA	NA	NA	NA	NA	NA	NA
Pyrene	62 U	60 U	61 U	56 U	60 U	55 U	59 U
bis(2-Chloroethoxy)methane	57 U	55 U	56 U	51 U	55 U	51 U	54
bis(2-Chloroethyl) ether	62 U	60 U	61 U	56 U	60 U	55 U	59 U
bis(2-Ethylhexyl) phthalate	65 U	63 U	65 U	730 J	63 U	160 J	62 U

APPENDIX F
SUBSURFACE SOIL ANALYTICAL DATA
REMEDIAL INVESTIGATION, CTO-0219
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-DP76-04	IR84-DP77-03	IR84-DP78-03	IR84-DP79-02	IR84-DP79-02D	IR84-DP80-02	IR84-DP81-04
DEPTH	7 - 9	5 - 7	5 - 7	3 - 5	3 - 5	3 - 5	7 - 9
SAMPLE DATE	08-02-2001	08-05-2001	08-05-2001	08-05-2001	08-05-2001	08-05-2001	08-05-2001
PESTICIDES/PCBs (ug/kg)							
4,4'-DDD	0.95 U	0.93 U	0.94 U	0.86 U	0.93 U	0.85 U	0.91 U
4,4'-DDE	0.69 U	0.67 U	0.68 U	0.62 U	0.67 U	0.62 U	0.66 U
4,4'-DDT	1.6 U	1.5 U	1.6 U	1.4 U	1.5 U	1.4 U	1.5 U
Aldrin	0.66 U	0.65 U	0.66 U	0.6 U	0.65 U	0.59 U	0.63 U
Dieldrin	1.8 U	1.8 U	1.8 U	1.6 U	1.8 U	1.6 U	1.7 U
Endosulfan I	0.81 U	0.79 U	0.8 U	0.73 U	0.79 U	0.72 U	0.77 U
Endosulfan II	0.46 U	0.45 U	0.45 U	0.41 U	0.45 U	0.41 U	0.44 U
Endosulfan sulfate	0.34 U	0.33 U	0.33 U	0.31 U	0.33 U	0.3 U	0.32 U
Endrin	0.74 U	0.72 U	0.73 U	0.67 U	0.72 U	0.66 U	0.7 U
Endrin aldehyde	1.8 U	1.8 U	1.8 U	1.6 U	1.8 U	1.6 U	1.7 U
Endrin ketone	0.31 U	0.31 U	0.31 U	0.28 U	0.31 U	0.28 U	0.3 U
Heptachlor	0.74 U	0.72 U	0.73 U	0.67 U	0.72 U	0.66 U	0.7 U
Heptachlor epoxide	0.8 U	0.78 U	0.79 U	0.72 U	0.78 U	0.71 U	0.76 U
Methoxychlor	0.99 U	0.96 U	0.98 U	0.89 U	0.96 U	0.89 U	0.94 U
PCB-1016	6.4 U	6.2 U	6.3 U	5.8 U	6.2 U	5.7 U	6.1 U
PCB-1221	23 U	22 U	23 U	21 U	22 U	21 U	22 U
PCB-1232	13 U	13 U	13 U	12 U	13 U	12 U	13 U
PCB-1242	22 U	21 U	22 U	20 U	21 U	19 U	21 U
PCB-1248	5.6 U	5.4 U	5.5 U	5 U	5.4 U	5 U	5.3 U
PCB-1254	24 U	24 U	24 U	22 U	23 U	22 U	23 U
PCB-1260	8.9 U	8.7 U	8.9 U	8.1 U	8.7 U	8 U	8.5 U
Toxaphene	8.3 U	8.1 U	8.3 U	7.5 U	8.1 U	7.5 U	7.9 U
alpha-BHC	0.56 U	0.54 U	0.55 U	0.5 U	0.54 U	0.5 U	0.53 U
alpha-Chlordane	0.71 U	0.69 U	0.71 U	0.64 U	0.69 U	0.64 U	0.68 U
beta-BHC	0.56 U	0.54 U	0.55 U	0.5 U	0.54 U	0.5 U	0.53 U
delta-BHC	0.58 U	0.56 U	0.57 U	0.52 U	0.56 U	0.52 U	0.55 U
gamma-BHC (Lindane)	0.69 U	0.67 U	0.68 U	0.62 U	0.67 U	0.62 U	0.66 U
gamma-Chlordane	0.69 U	0.67 U	0.68 U	0.62 U	0.67 U	0.62 U	0.66 U
HERBICIDES (ug/kg)							
2,4,5-T	3.7 U	3.6 U	3.7 U	3.4 U	3.6 U	3.3 U	3.6 U
2,4-D	64 U	62 U	63 U	58 U	62 U	57 U	61 U
2,4-DB	47 U	46 U	47 U	43 U	46 U	42 U	45 U
Dalapon	45 U	43 U	44 U	40 U	43 U	40 U	43 U
Dicamba	18 U	18 U	18 U	16 U	18 U	16 U	17 U
Dichlorprop	12 U	12 U	12 U	11 U	12 U	11 U	12 U
Dinoseb	15 U	14 U	14 U	13 U	14 U	13 U	14 U
MCPA	2800 U	2700 U	2800 U	2500 U	2700 U	2500 U	2600 U
MCPP	3300 U	3200 U	3200 U	2900 U	3200 U	2900 U	3100 U
Pentachlorophenol	12 U	11 U	12 U	11 U	11 U	10 U	11 U
Silvex	4.7 U	4.6 U	4.7 U	4.3 U	4.6 U	4.2 U	4.5 U

APPENDIX F
SUBSURFACE SOIL ANALYTICAL DATA
REMEDIAL INVESTIGATION, CTO-0219
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-DP76-04	IR84-DP77-03	IR84-DP78-03	IR84-DP79-02	IR84-DP79-02D	IR84-DP80-02	IR84-DP81-04
DEPTH	7 - 9	5 - 7	5 - 7	3 - 5	3 - 5	3 - 5	7 - 9
SAMPLE DATE	08-02-2001	08-05-2001	08-05-2001	08-05-2001	08-05-2001	08-05-2001	08-05-2001
METALS (mg/kg)							
Aluminum	3110	7210	5540	2090	5390	2090	2700
Antimony	0.59 UJ	0.58 UJ	0.59 UJ	0.53 UJ	0.58 UJ	0.53 UJ	0.56 UJ
Arsenic	0.53 J	0.78 J	1.4	0.48 J	2	1.1	0.35 U
Barium	4.8 U	11.2 J	11 J	6.5 J	13.3 J	4.2 J	2.6 J
Beryllium	0.056 U	0.12 U	0.099 U	0.085 U	0.13 U	0.078 U	0.12 U
Cadmium	0.052 U	0.051 U	0.051 U	0.047 U	0.051 U	0.046 U	0.049 U
Calcium	231 J	931	846	341 J	498 J	194 J	854
Chromium	3.6	9.3	7.9	8.3	6.7	4.7	2
Cobalt	0.27 J	0.51 J	0.3 J	0.18 J	0.55 J	0.27 J	0.17 U
Copper	0.33 U	1.4 J	1.1 J	1.2 J	1.6 J	0.52 J	0.4 J
Iron	1120	1850	3320	2080	5220	1740	503
Lead	3.1 J	5.5	5.4	3	4.2	2.3	1.6
Magnesium	88.6 J	229 J	149 J	56.4 J	169 J	78.7 J	33.9 J
Manganese	4.4	4.2	3.2	11.4	7.6	3.5	0.48 J
Mercury	0.019 J	0.0099 U	0.01 U	0.0092 J	0.014 J	0.0091 U	0.0097 U
Nickel	0.88 J	1.3 J	1 J	0.96 J	1.6 J	0.66 J	0.44 J
Potassium	65.9 J	195 J	161 J	44.6 U	138 J	73.2 U	32.9 U
Selenium	0.45 J	0.36 U	0.37 U	0.34 U	0.36 U	0.33 U	0.36 U
Silver	0.18 U	0.18 U	0.18 U	0.16 U	0.18 U	0.16 U	0.17 U
Sodium	60.4 U	58.8 U	59.8 U	54.6 U	58.7 U	54 U	57.5 U
Thallium	0.6 U	0.59 U	0.6 U	0.55 U	0.59 U	0.54 U	0.67 J
Vanadium	4 J	8.1	9.7	4.5 J	11.4	5.1 J	1.4 J
Zinc	2 J	2.7 J	2.9 J	2.6 J	4.8 J	1.4 J	1.8 J
TOTAL PETROLEUM HYDROCARBONS							
TPH (as Diesel) (mg/kg)	NA	NA	NA	NA	NA	NA	NA
TPH (as Gasoline) (ug/kg)	NA	NA	NA	NA	NA	NA	NA
CONVENTIONAL							
Cyanide, Total (mg/kg)	NA	NA	NA	NA	NA	NA	NA
Percent Solids (%)	82.8	85.1	83.6	91.6	85.1	92.6	86.9

APPENDIX F
SUBSURFACE SOIL ANALYTICAL DATA
REMEDIAL INVESTIGATION, CTO-0219
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-DP82-04	IR84-DP83-03	IR84-SB01-02	IR84-SB02-02	IR84-SB03-02	IR84-SB04-02	IR84-SB05-01
DEPTH	7 - 9	5 - 7	3 - 5	3 - 5	3 - 5	3 - 5	1 - 3
SAMPLE DATE	08-05-2001	08-05-2001	08-02-2001	08-02-2001	08-02-2001	08-02-2001	08-03-2001
VOLATILES (ug/kg)							
1,1,1-Trichloroethane	9.3 U	0.96 U	0.92 U	0.88 U	1.1 U	0.88 U	1.1 U
1,1,2,2-Tetrachloroethane	10 U	1.9 U	1.8 U	1.7 U	2.1 U	1.7 U	2.2 U
1,1,2-Trichloroethane	15 U	1.3 U	1.2 U	1.1 U	1.4 U	1.1 U	1.5 U
1,1-Dichloroethane	13 U	0.61 U	0.58 U	0.55 U	0.68 U	0.55 U	0.72 U
1,1-Dichloroethene	16 U	1.3 U	1.2 U	1.1 U	1.4 U	1.1 U	1.5 U
1,2-Dichloroethane	10 U	0.76 U	0.73 U	0.70 U	0.85 U	0.69 U	0.91 U
1,2-Dichloroethene (total)	91 J	1.5 U	1.4 U	1.3 U	1.6 U	1.3 U	1.7 U
1,2-Dichloropropane	8.8 U	0.78 U	0.75 U	0.71 U	0.88 U	0.71 U	0.93 U
2-Butanone	76 U	2.8 U	2.7 U	2.6 U	3.2 U	2.6 U	3.4 U
2-Hexanone	28 U	1.8 U	1.7 U	1.6 U	2.0 U	1.6 U	2.1 U
4-Methyl-2-pentanone	27 U	2 U	1.9 U	1.8 U	2.2 U	1.8 U	2.4 U
Acetone	940 U	2.2 U	2.1 U	2.0 U	23 U	2.0 U	2.6 U
Benzene	16 U	0.68 U	0.65 U	0.62 U	0.76 U	0.62 U	0.81 U
Bromodichloromethane	9.4 U	1.3 U	1.2 U	1.1 U	1.4 U	1.1 U	1.5 U
Bromoform	15 U	1.7 U	1.6 U	1.5 U	1.9 U	1.5 U	2.0 U
Bromomethane	24 U	1.9 U	1.8 U	1.7 U	2.1 U	1.7 U	2.2 U
Carbon disulfide	33 U	0.81 U	0.78 U	0.74 U	0.91 U	0.74 U	0.97 U
Carbon tetrachloride	9.4 U	1 U	1.0 U	0.95 U	1.2 U	0.95 U	1.2 U
Chlorobenzene	7.6 U	0.54 U	0.52 U	0.50 U	0.61 U	0.49 U	0.65 U
Chloroethane	35 U	2.3 U	2.2 U	2.1 U	2.6 U	2.1 U	2.7 U
Chloroform	9.4 U	0.86 U	0.82 U	0.78 U	0.96 U	0.78 U	2.3 J
Chloromethane	14 U	1.4 U	1.3 U	1.2 U	1.5 U	1.2 U	1.6 U
Dibromochloromethane	12 U	1.1 U	1.1 U	1.0 U	1.3 U	1.0 U	1.4 U
Ethylbenzene	250	0.62 U	0.59 U	0.56 U	0.69 U	0.56 U	0.73 U
Isopropyl ether	43 U	0.92 U	0.88 U	0.84 U	1.0 U	0.84 U	1.1 U
Methyl tert-butyl ether	10 U	0.88 U	0.84 U	0.80 U	0.98 U	0.80 U	1.0 U
Methylene chloride	38 U	1.4 U	1.3 U	1.2 U	1.5 U	1.2 U	1.6 U
Styrene	16 U	0.52 U	0.50 U	0.48 U	0.58 U	0.48 U	0.62 U
Tetrachloroethene	14 U	1.3 U	1.2 U	1.1 U	1.4 U	1.1 U	1.5 U
Toluene	9.4 U	0.55 U	0.53 U	0.50 U	0.62 U	0.50 U	0.66 U
Trichloroethene	230 U	0.79 U	0.76 U	0.72 U	0.89 U	0.72 U	0.95 U
Vinyl chloride	10 U	1.5 U	1.4 U	1.3 U	1.6 U	1.3 U	1.7 U
Xylenes (total)	95 J	2 U	1.9 U	1.8 U	2.2 U	1.8 U	2.4 U
cis-1,3-Dichloropropene	11 U	0.67 U	0.64 U	0.61 U	0.75 U	0.61 U	0.80 U
trans-1,3-Dichloropropene	10 U	0.9 U	0.86 U	0.82 U	1.0 U	0.82 U	1.1 U

APPENDIX F
SUBSURFACE SOIL ANALYTICAL DATA
REMEDIAL INVESTIGATION, CTO-0219
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-DP76-04	IR84-DP77-03	IR84-DP78-03	IR84-DP79-02	IR84-DP79-02D	IR84-DP80-02	IR84-DP81-04
DEPTH	7 - 9	5 - 7	5 - 7	3 - 5	3 - 5	3 - 5	7 - 9
SAMPLE DATE	08-02-2001	08-05-2001	08-05-2001	08-05-2001	08-05-2001	08-05-2001	08-05-2001
METALS (mg/kg)							
Aluminum	3110	7210	5540	2090	5390	2090	2700
Antimony	0.59 UJ	0.58 UJ	0.59 UJ	0.53 UJ	0.58 UJ	0.53 UJ	0.56 UJ
Arsenic	0.53 J	0.78 J	1.4	0.48 J	2	1.1	0.35 U
Barium	4.8 U	11.2 J	11 J	6.5 J	13.3 J	4.2 J	2.6 J
Beryllium	0.056 U	0.12 U	0.099 U	0.085 U	0.13 U	0.078 U	0.12 U
Cadmium	0.052 U	0.051 U	0.051 U	0.047 U	0.051 U	0.046 U	0.049 U
Calcium	231 J	931	846	341 J	498 J	194 J	854
Chromium	3.6	9.3	7.9	8.3	6.7	4.7	2
Cobalt	0.27 J	0.51 J	0.3 J	0.18 J	0.55 J	0.27 J	0.17 U
Copper	0.33 U	1.4 J	1.1 J	1.2 J	1.6 J	0.52 J	0.4 J
Iron	1120	1850	3320	2080	5220	1740	503
Lead	3.1 J	5.5	5.4	3	4.2	2.3	1.6
Magnesium	88.6 J	229 J	149 J	56.4 J	169 J	78.7 J	33.9 J
Manganese	4.4	4.2	3.2	11.4	7.6	3.5	0.48 J
Mercury	0.019 J	0.0099 U	0.01 U	0.0092 J	0.014 J	0.0091 U	0.0097 U
Nickel	0.88 J	1.3 J	1 J	0.96 J	1.6 J	0.66 J	0.44 J
Potassium	65.9 J	195 J	161 J	44.6 U	138 J	73.2 U	32.9 U
Selenium	0.45 J	0.36 U	0.37 U	0.34 U	0.36 U	0.33 U	0.36 U
Silver	0.18 U	0.18 U	0.18 U	0.16 U	0.18 U	0.16 U	0.17 U
Sodium	60.4 U	58.8 U	59.8 U	54.6 U	58.7 U	54 U	57.5 U
Thallium	0.6 U	0.59 U	0.6 U	0.55 U	0.59 U	0.54 U	0.67 J
Vanadium	4 J	8.1	9.7	4.5 J	11.4	5.1 J	1.4 J
Zinc	2 J	2.7 J	2.9 J	2.6 J	4.8 J	1.4 J	1.8 J
TOTAL PETROLEUM HYDROCARBONS							
TPH (as Diesel) (mg/kg)	NA	NA	NA	NA	NA	NA	NA
TPH (as Gasoline) (ug/kg)	NA	NA	NA	NA	NA	NA	NA
CONVENTIONAL							
Cyanide, Total (mg/kg)	NA	NA	NA	NA	NA	NA	NA
Percent Solids (%)	82.8	85.1	83.6	91.6	85.1	92.6	86.9

APPENDIX F
SUBSURFACE SOIL ANALYTICAL DATA
REMEDIAL INVESTIGATION, CTO-0219
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-DP82-04	IR84-DP83-03	IR84-SB01-02	IR84-SB02-02	IR84-SB03-02	IR84-SB04-02	IR84-SB05-01
DEPTH	7 - 9	5 - 7	3 - 5	3 - 5	3 - 5	3 - 5	1 - 3
SAMPLE DATE	08-05-2001	08-05-2001	08-02-2001	08-02-2001	08-02-2001	08-02-2001	08-03-2001
VOLATILES (ug/kg)							
1,1,1-Trichloroethane	9.3 U	0.96 U	0.92 U	0.88 U	1.1 U	0.88 U	1.1 U
1,1,2,2-Tetrachloroethane	10 U	1.9 U	1.8 U	1.7 U	2.1 U	1.7 U	2.2 U
1,1,2-Trichloroethane	15 U	1.3 U	1.2 U	1.1 U	1.4 U	1.1 U	1.5 U
1,1-Dichloroethane	13 U	0.61 U	0.58 U	0.55 U	0.68 U	0.55 U	0.72 U
1,1-Dichloroethene	16 U	1.3 U	1.2 U	1.1 U	1.4 U	1.1 U	1.5 U
1,2-Dichloroethane	10 U	0.76 U	0.73 U	0.70 U	0.85 U	0.69 U	0.91 U
1,2-Dichloroethene (total)	91 J	1.5 U	1.4 U	1.3 U	1.6 U	1.3 U	1.7 U
1,2-Dichloropropane	8.8 U	0.78 U	0.75 U	0.71 U	0.88 U	0.71 U	0.93 U
2-Butanone	76 U	2.8 U	2.7 U	2.6 U	3.2 U	2.6 U	3.4 U
2-Hexanone	28 U	1.8 U	1.7 U	1.6 U	2.0 U	1.6 U	2.1 U
4-Methyl-2-pentanone	27 U	2 U	1.9 U	1.8 U	2.2 U	1.8 U	2.4 U
Acetone	940 U	2.2 U	2.1 U	2.0 U	23 U	2.0 U	2.6 U
Benzene	16 U	0.68 U	0.65 U	0.62 U	0.76 U	0.62 U	0.81 U
Bromodichloromethane	9.4 U	1.3 U	1.2 U	1.1 U	1.4 U	1.1 U	1.5 U
Bromoform	15 U	1.7 U	1.6 U	1.5 U	1.9 U	1.5 U	2.0 U
Bromomethane	24 U	1.9 U	1.8 U	1.7 U	2.1 U	1.7 U	2.2 U
Carbon disulfide	33 U	0.81 U	0.78 U	0.74 U	0.91 U	0.74 U	0.97 U
Carbon tetrachloride	9.4 U	1 U	1.0 U	0.95 U	1.2 U	0.95 U	1.2 U
Chlorobenzene	7.6 U	0.54 U	0.52 U	0.50 U	0.61 U	0.49 U	0.65 U
Chloroethane	35 U	2.3 U	2.2 U	2.1 U	2.6 U	2.1 U	2.7 U
Chloroform	9.4 U	0.86 U	0.82 U	0.78 U	0.96 U	0.78 U	2.3 J
Chloromethane	14 U	1.4 U	1.3 U	1.2 U	1.5 U	1.2 U	1.6 U
Dibromochloromethane	12 U	1.1 U	1.1 U	1.0 U	1.3 U	1.0 U	1.4 U
Ethylbenzene	250	0.62 U	0.59 U	0.56 U	0.69 U	0.56 U	0.73 U
Isopropyl ether	43 U	0.92 U	0.88 U	0.84 U	1.0 U	0.84 U	1.1 U
Methyl tert-butyl ether	10 U	0.88 U	0.84 U	0.80 U	0.98 U	0.80 U	1.0 U
Methylene chloride	38 U	1.4 U	1.3 U	1.2 U	1.5 U	1.2 U	1.6 U
Styrene	16 U	0.52 U	0.50 U	0.48 U	0.58 U	0.48 U	0.62 U
Tetrachloroethene	14 U	1.3 U	1.2 U	1.1 U	1.4 U	1.1 U	1.5 U
Toluene	9.4 U	0.55 U	0.53 U	0.50 U	0.62 U	0.50 U	0.66 U
Trichloroethene	230 U	0.79 U	0.76 U	0.72 U	0.89 U	0.72 U	0.95 U
Vinyl chloride	10 U	1.5 U	1.4 U	1.3 U	1.6 U	1.3 U	1.7 U
Xylenes (total)	95 J	2 U	1.9 U	1.8 U	2.2 U	1.8 U	2.4 U
cis-1,3-Dichloropropene	11 U	0.67 U	0.64 U	0.61 U	0.75 U	0.61 U	0.80 U
trans-1,3-Dichloropropene	10 U	0.9 U	0.86 U	0.82 U	1.0 U	0.82 U	1.1 U

APPENDIX F
SUBSURFACE SOIL ANALYTICAL DATA
REMEDIAL INVESTIGATION, CTO-0219
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-DP82-04	IR84-DP83-03	IR84-SB01-02	IR84-SB02-02	IR84-SB03-02	IR84-SB04-02	IR84-SB05-01
DEPTH	7 - 9	5 - 7	3 - 5	3 - 5	3 - 5	3 - 5	1 - 3
SAMPLE DATE	08-05-2001	08-05-2001	08-02-2001	08-02-2001	08-02-2001	08-02-2001	08-03-2001
SEMIVOLATILES (ug/kg)							
1,2,4-Trichlorobenzene	51 U	52 U	56 U	54 U	62 U	54 U	61 U
1,2-Dichlorobenzene	49 U	50 U	53 U	51 U	60 U	52 U	58 U
1,3-Dichlorobenzene	52 U	53 U	57 U	55 U	63 U	55 U	62 U
1,4-Dichlorobenzene	52 U	53 U	57 U	55 U	63 U	55 U	62 U
2,2'-Oxybis(1-Chloropropane)	54 U	55 U	59 U	57 U	66 U	58 U	65 U
2,4,5-Trichlorophenol	57 U	58 U	62 U	60 U	70 U	61 U	68 U
2,4,6-Trichlorophenol	66 U	66 U	71 U	69 U	80 U	70 U	78 U
2,4-Dichlorophenol	52 U	53 U	57 U	55 U	63 U	55 U	62 U
2,4-Dimethylphenol	83 U	84 U	91 U	88 U	100 U	89 U	100 U
2,4-Dinitrophenol	110 U	120 U	120 U	120 U	140 U	120 U	140 U
2,4-Dinitrotoluene	48 U	49 U	52 U	50 U	58 U	51 U	57 U
2,6-Dinitrotoluene	50 U	51 U	54 U	53 U	61 U	53 U	60 U
2-Chloronaphthalene	50 U	51 U	54 U	53 U	61 U	53 U	60 U
2-Chlorophenol	54 U	55 U	59 U	57 U	66 U	58 U	65 U
2-Methylnaphthalene	50 U	51 U	54 U	53 U	61 U	53 U	60 U
2-Methylphenol	48 U	49 U	52 U	50 U	58 U	51 U	57 U
2-Nitroaniline	48 U	49 U	52 U	50 U	58 U	51 U	57 U
2-Nitrophenol	48 U	49 U	52 U	50 U	58 U	51 U	57 U
3,3'-Dichlorobenzidine	41 U	41 U	44 U	43 U	49 U	43 U	49 U
3-Nitroaniline	150 U	150 U	160 U	150 U	180 U	150 U	170 U
4,6-Dinitro-2-methylphenol	170 U	170 U	180 U	180 U	200 U	180 U	200 U
4-Bromophenyl phenyl ether	64 U	64 U	69 U	67 U	77 U	68 U	76 U
4-Chloro-3-methylphenol	53 U	54 U	58 U	56 U	65 U	56 U	63 U
4-Chloroaniline	53 U	54 U	58 U	56 U	65 U	56 U	63 U
4-Chlorophenyl phenyl ether	54 U	55 U	59 U	57 U	66 U	58 U	65 U
4-Methylphenol	49 U	50 U	53 U	51 U	60 U	52 U	58 U
4-Nitroaniline	71 U	72 U	77 U	74 U	86 U	75 U	85 U
4-Nitrophenol	200 U	200 U	220 U	210 U	240 U	210 U	240 U
Acenaphthene	53 U	54 U	58 U	56 U	65 U	56 U	63 U
Acenaphthylene	49 U	50 U	53 U	51 U	60 U	52 U	58 U
Anthracene	51 U	52 U	56 U	54 U	62 U	54 U	61 U
Benzo(a)anthracene	57 U	58 U	62 U	60 U	70 U	61 U	68 U
Benzo(a)pyrene	63 U	63 U	68 U	66 U	76 U	66 U	75 U
Benzo(b)fluoranthene	60 U	61 U	68 J	63 U	74 U	64 U	72 U
Benzo(ghi)perylene	57 U	58 U	62 U	60 U	70 U	61 U	68 U

APPENDIX F
SUBSURFACE SOIL ANALYTICAL DATA
REMEDIAL INVESTIGATION, CTO-0219
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-DP82-04	IR84-DP83-03	IR84-SB01-02	IR84-SB02-02	IR84-SB03-02	IR84-SB04-02	IR84-SB05-01
DEPTH	7 - 9	5 - 7	3 - 5	3 - 5	3 - 5	3 - 5	1 - 3
SAMPLE DATE	08-05-2001	08-05-2001	08-02-2001	08-02-2001	08-02-2001	08-02-2001	08-03-2001
SEMIVOLATILES (ug/kg)							
Benzo(k)fluoranthene	55 U	56 U	60 U	58 U	67 U	59 U	66 U
Butyl benzyl phthalate	53 U	54 U	58 U	56 U	65 U	56 U	63 U
Carbazole	54 U	55 U	59 U	57 U	66 U	58 U	65 U
Chrysene	48 U	49 U	52 U	50 U	59 J	51 U	57 U
Di-n-butyl phthalate	160 U	160 U	170 U	160 U	190 U	170 U	190 U
Di-n-octyl phthalate	56 U	57 U	61 U	59 U	69 U	60 U	67 U
Dibenz(a,h)anthracene	53 U	54 U	58 U	56 U	65 U	56 U	63 U
Dibenzofuran	52 U	53 U	57 U	55 U	63 U	55 U	62 U
Diethyl phthalate	160 U	160 U	170 U	160 U	190 U	170 U	190 U
Dimethyl phthalate	170 U	170 U	180 U	180 U	200 U	180 U	200 U
Fluoranthene	58 U	59 U	63 U	61 U	82 J	62 U	70 U
Fluorene	50 U	51 U	54 U	53 U	61 U	53 U	60 U
Hexachlorobenzene	58 U	59 U	63 U	61 U	71 U	62 U	70 U
Hexachlorobutadiene	47 U	47 U	51 U	49 U	57 U	50 U	56 U
Hexachlorocyclopentadiene	63 U	63 U	68 U	66 U	76 U	66 U	75 U
Hexachloroethane	50 U	51 U	54 U	53 U	61 U	53 U	60 U
Indeno(1,2,3-cd)pyrene	73 U	74 U	79 U	77 U	89 U	77 U	87 U
Isophorone	46 U	46 U	50 U	48 U	56 U	49 U	55 U
N-Nitrosodi-n-propylamine	46 U	46 U	50 U	48 U	56 U	49 U	55 U
N-Nitrosodiphenylamine	51 U	52 U	56 U	54 U	62 U	54 U	61 U
Naphthalene	51 U	52 U	56 U	54 U	62 U	54 U	61 U
Nitrobenzene	48 U	49 U	52 U	50 U	58 U	51 U	57 U
Pentachlorophenol	130 U	130 U	140 U	130 U	150 U	130 U	150 U
Phenanthrene	54 U	55 U	59 U	57 U	66 U	58 U	65 U
Phenol	51 U	52 U	56 U	54 U	62 U	54 U	61 U
Phthalic anhydride	NA	NA	NA	NA	120 NJ	170 NJ	NA
Pyrene	53 U	54 U	58 U	56 U	91 J	56 U	63 U
bis(2-Chloroethoxy)methane	49 U	50 U	53 U	51 U	60 U	52 U	58 U
bis(2-Chloroethyl) ether	53 U	54 U	58 U	56 U	65 U	56 U	63 U
bis(2-Ethylhexyl) phthalate	56 U	57 U	61 U	59 U	69 U	60 U	67 U

APPENDIX F
SUBSURFACE SOIL ANALYTICAL DATA
REMEDIAL INVESTIGATION, CTO-0219
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-DP82-04	IR84-DP83-03	IR84-SB01-02	IR84-SB02-02	IR84-SB03-02	IR84-SB04-02	IR84-SB05-01
DEPTH	7 - 9	5 - 7	3 - 5	3 - 5	3 - 5	3 - 5	1 - 3
SAMPLE DATE	08-05-2001	08-05-2001	08-02-2001	08-02-2001	08-02-2001	08-02-2001	08-03-2001
PESTICIDES/PCBs (ug/kg)							
4,4'-DDD	0.82 U	0.83 U	0.9 U	0.86 U	2.4	0.87 U	1.7 J
4,4'-DDE	0.59 U	0.6 U	0.65 U	2.2	4.4	0.63 U	0.71 U
4,4'-DDT	1.4 U	1.4 U	1.5 U	2.5	8.7	1.4 U	1.6 U
Aldrin	0.57 U	0.58 U	0.62 U	0.6 U	0.7 U	0.61 U	0.68 U
Dieldrin	1.6 U	1.6 U	2.4	1.6 U	1.9 U	1.7 U	1.9 U
Endosulfan I	0.7 U	0.71 U	0.76 U	0.73 U	0.85 U	0.74 U	0.83 U
Endosulfan II	0.4 U	0.4 U	0.43 U	0.42 U	0.48 U	0.42 U	0.47 U
Endosulfan sulfate	0.29 U	0.3 U	0.32 U	0.31 U	0.36 U	0.31 U	0.35 U
Endrin	0.64 U	0.64 U	0.69 U	0.67 U	0.77 U	0.68 U	0.76 U
Endrin aldehyde	1.6 U	1.6 U	1.7 U	1.6 U	1.9 U	1.7 U	1.9 U
Endrin ketone	0.27 U	0.27 U	0.29 U	0.28 U	0.33 U	0.29 U	0.32 U
Heptachlor	0.64 U	0.64 U	0.69 U	0.67 U	0.77 U	0.68 U	3.1
Heptachlor epoxide	0.69 U	0.7 U	0.75 U	0.72 U	0.84 U	0.73 U	0.82 U
Methoxychlor	0.85 U	0.86 U	0.93 U	0.9 U	1 U	0.91 U	1 U
PCB-1016	5.5 U	5.6 U	6 U	5.8 U	6.7 U	5.9 U	6.6 U
PCB-1221	20 U	20 U	22 U	21 U	24 U	21 U	24 U
PCB-1232	11 U	12 U	12 U	12 U	14 U	12 U	14 U
PCB-1242	19 U	19 U	20 U	20 U	23 U	20 U	22 U
PCB-1248	4.8 U	4.9 U	5.2 U	5 U	5.8 U	5.1 U	5.7 U
PCB-1254	21 U	21 U	23 U	22 U	25 U	22 U	25 U
PCB-1260	13 J	7.8 U	77	8.1 U	40 J	8.2 U	9.2 U
Toxaphene	7.2 U	7.3 U	7.8 U	7.6 U	8.8 U	7.6 U	8.6 U
alpha-BHC	0.48 U	0.49 U	0.52 U	0.5 U	0.58 U	0.51 U	0.57 U
alpha-Chlordane	0.61 U	0.62 U	0.67 U	0.65 U	5.9 J	0.65 U	28 J
beta-BHC	0.48 U	0.49 U	0.52 U	0.5 U	0.58 U	0.51 U	0.57 U
delta-BHC	0.5 U	0.51 U	0.54 U	0.53 U	0.61 U	0.53 U	0.6 U
gamma-BHC (Lindane)	0.59 U	0.6 U	0.65 U	0.62 U	0.72 U	0.63 U	0.71 U
gamma-Chlordane	0.59 U	0.6 U	0.65 U	0.62 U	6.3	0.63 U	33
HERBICIDES (ug/kg)							
2,4,5-T	3.2 U	3.3 U	3.5 U	3.4 U	3.9 U	3.4 U	3.9 U
2,4-D	55 U	56 U	60 U	58 U	67 U	59 U	66 U
2,4-DB	41 U	41 U	44 U	43 U	49 U	43 U	49 U
Dalapon	39 U	39 U	42 U	40 U	47 U	41 U	46 U
Dicamba	16 U	16 U	17 U	16 U	19 U	17 U	19 U
Dichlorprop	10 U	11 U	11 U	11 U	13 U	11 U	12 U
Dinoseb	13 U	13 U	14 U	13 U	15 U	13 U	15 U
MCPA	2400 U	2400 U	2600 U	2500 U	2900 U	2500 U	2900 U
MCPP	2800 U	2800 U	3100 U	3000 U	3400 U	3000 U	3400 U
Pentachlorophenol	10 U	10 U	11 U	11 U	12 U	11 U	12 U
Silvex	4.1 U	4.1 U	4.4 U	4.3 U	4.9 U	4.3 U	4.9 U

APPENDIX F
SUBSURFACE SOIL ANALYTICAL DATA
REMEDIAL INVESTIGATION, CTO-0219
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-DP82-04	IR84-DP83-03	IR84-SB01-02	IR84-SB02-02	IR84-SB03-02	IR84-SB04-02	IR84-SB05-01
DEPTH	7 - 9	5 - 7	3 - 5	3 - 5	3 - 5	3 - 5	1 - 3
SAMPLE DATE	08-05-2001	08-05-2001	08-02-2001	08-02-2001	08-02-2001	08-02-2001	08-03-2001
METALS (mg/kg)							
Aluminum	589	1110	3930	7100	1660	2610	2810
Antimony	0.51 UJ	0.52 UJ	0.56 U	0.54 UJ	0.62 UJ	0.54 UJ	0.61 U
Arsenic	0.31 U	0.33 J	1.6	1.6	1.1 J	0.89 J	0.59 J
Barium	1.5 J	1.2 J	8.4 U	56.6 U	9.4 U	5.8 U	10.7 J
Beryllium	0.063 U	0.066 U	0.052 U	0.05 U	0.058 U	0.051 U	0.057 U
Cadmium	0.045 U	0.045 U	0.049 U	0.047 U	0.12 J	0.048 U	0.053 U
Calcium	3870	167 J	23900 J	377 J	66800 J	795	1150
Chromium	1.4	1.6	5.5	6.2	3.8	2.8	3.2
Cobalt	0.16 J	0.16 U	0.31 J	0.4 J	0.46 J	0.27 J	0.26 J
Copper	0.46 J	0.28 U	1.3 J	1.8 J	1.6 J	1.6 J	2.1 J
Iron	475	1340	1970	4430	1490	1780	1800
Lead	3.5	1.4	5.4 J	3.3 J	10 J	5 J	4
Magnesium	79 J	25.8 J	406 J	118 J	943	83.7 J	137 J
Manganese	3	1.1 J	12.8	8.2	50.5	8.1	7.6
Mercury	0.0088 U	0.0089 U	0.0095 U	0.015 J	0.017 J	0.02 J	0.01 U
Nickel	0.51 J	0.42 J	1.1 J	1.9 J	2 J	0.91 J	0.88 J
Potassium	42.3 U	59.7 U	187 J	79.5 J	182 J	67.3 J	79.8 U
Selenium	0.32 U	0.33 U	0.44 J	0.34 U	0.73	0.46 J	0.39 U
Silver	0.16 U	0.16 U	0.17 U	0.16 U	0.19 U	0.17 U	0.19 U
Sodium	52.1 U	52.7 U	56.7 U	54.7 U	89.7 J	55.3 U	62.2 U
Thallium	0.52 U	0.53 U	0.57 U	0.86 J	0.9 J	0.55 U	0.62 U
Vanadium	1.1 J	2.2 J	7.1	9.6	3.8 J	4.1 J	4.5 J
Zinc	3.9 J	1.3 U	4.2	2.6	33.2	3.2	5.7
TOTAL PETROLEUM HYDROCARBONS							
TPH (as Diesel) (mg/kg)	NA	NA	NA	NA	NA	NA	NA
TPH (as Gasoline) (ug/kg)	NA	NA	NA	NA	NA	NA	NA
CONVENTIONAL							
Cyanide, Total (mg/kg)	NA	NA	NA	NA	NA	NA	NA
Percent Solids (%)	96	94.8	88.2	91.4	78.8	90.4	80.4

APPENDIX F
SUBSURFACE SOIL ANALYTICAL DATA
REMEDIAL INVESTIGATION, CTO-0219
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-SB06-01	IR84-SB06-01D	IR84-SB07-01	IR84-SB08-01
DEPTH	1 - 3	1 - 3	1 - 3	1 - 3
SAMPLE DATE	08-02-2001	08-02-2001	08-02-2001	08-02-2001
VOLATILES (ug/kg)				
1,1,1-Trichloroethane	1.0 U	0.98 U	1.1 U	0.95 U
1,1,2,2-Tetrachloroethane	2.0 U	1.9 U	2.1 U	1.9 U
1,1,2-Trichloroethane	1.4 U	1.3 U	1.4 U	1.2 U
1,1-Dichloroethane	0.66 U	0.62 U	0.67 U	0.60 U
1,1-Dichloroethene	1.4 U	1.3 U	1.4 U	1.2 U
1,2-Dichloroethane	0.83 U	0.78 U	0.84 U	0.75 U
1,2-Dichloroethene (total)	1.6 U	1.5 U	1.6 U	1.4 U
1,2-Dichloropropane	0.85 U	0.80 U	0.86 U	0.77 U
2-Butanone	3.1 U	2.9 U	3.1 U	2.8 U
2-Hexanone	1.9 U	1.8 U	2.0 U	1.8 U
4-Methyl-2-pentanone	2.2 U	2.0 U	2.2 U	2.0 U
Acetone	2.4 U	2.2 U	2.4 U	2.2 U
Benzene	0.74 U	0.69 U	0.75 U	0.67 U
Bromodichloromethane	1.4 U	1.3 U	1.4 U	1.2 U
Bromoform	1.8 U	1.7 U	1.8 U	1.7 U
Bromomethane	2.0 U	1.9 U	2.1 U	1.9 U
Carbon disulfide	0.88 U	0.83 U	0.90 U	0.80 U
Carbon tetrachloride	1.1 U	1.1 U	1.1 U	1.0 U
Chlorobenzene	0.59 U	0.55 U	0.60 U	0.54 U
Chloroethane	2.5 U	2.3 U	2.5 U	2.3 U
Chloroform	5.7 U	1.5 J	0.94 U	0.85 U
Chloromethane	1.5 U	1.4 U	1.5 U	1.3 U
Dibromochloromethane	1.2 U	1.2 U	1.3 U	1.1 U
Ethylbenzene	0.67 U	0.63 U	0.68 U	0.61 U
Isopropyl ether	1.0 U	0.93 U	1.0 U	0.91 U
Methyl tert-butyl ether	0.95 U	0.89 U	0.97 U	0.87 U
Methylene chloride	1.5 U	1.4 U	1.5 U	1.3 U
Styrene	0.57 U	0.53 U	0.57 U	0.52 U
Tetrachloroethene	1.4 U	1.3 U	1.4 U	1.2 U
Toluene	0.60 U	0.56 U	0.61 U	0.55 U
Trichloroethene	0.86 U	0.81 U	0.87 U	0.78 U
Vinyl chloride	1.6 U	1.5 U	1.6 U	1.4 U
Xylenes (total)	2.2 U	2.0 U	2.2 U	2.0 U
cis-1,3-Dichloropropene	0.72 U	0.68 U	0.74 U	0.66 U
trans-1,3-Dichloropropene	0.97 U	0.91 U	0.99 U	0.89 U

APPENDIX F
SUBSURFACE SOIL ANALYTICAL DATA
REMEDIAL INVESTIGATION, CTO-0219
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-SB06-01	IR84-SB06-01D	IR84-SB07-01	IR84-SB08-01
DEPTH	1 - 3	1 - 3	1 - 3	1 - 3
SAMPLE DATE	08-02-2001	08-02-2001	08-02-2001	08-02-2001
SEMIVOLATILES (ug/kg)				
1,2,4-Trichlorobenzene	54 U	54 U	55 U	54 U
1,2-Dichlorobenzene	52 U	51 U	53 U	52 U
1,3-Dichlorobenzene	56 U	55 U	56 U	55 U
1,4-Dichlorobenzene	56 U	55 U	56 U	55 U
2,2'-Oxybis(1-Chloropropane)	58 U	57 U	59 U	58 U
2,4,5-Trichlorophenol	61 U	60 U	62 U	61 U
2,4,6-Trichlorophenol	70 U	69 U	71 U	70 U
2,4-Dichlorophenol	56 U	55 U	56 U	55 U
2,4-Dimethylphenol	89 U	88 U	90 U	89 U
2,4-Dinitrophenol	120 U	120 U	120 U	120 U
2,4-Dinitrotoluene	51 U	50 U	52 U	51 U
2,6-Dinitrotoluene	53 U	53 U	54 U	53 U
2-Chloronaphthalene	53 U	53 U	54 U	53 U
2-Chlorophenol	58 U	57 U	59 U	58 U
2-Methylnaphthalene	53 U	53 U	54 U	53 U
2-Methylphenol	51 U	50 U	52 U	51 U
2-Nitroaniline	51 U	50 U	52 U	51 U
2-Nitrophenol	51 U	50 U	52 U	51 U
3,3'-Dichlorobenzidine	43 U	43 U	44 U	43 U
3-Nitroaniline	160 U	150 U	160 U	160 U
4,6-Dinitro-2-methylphenol	180 U	180 U	180 U	180 U
4-Bromophenyl phenyl ether	68 U	67 U	69 U	68 U
4-Chloro-3-methylphenol	57 U	56 U	57 U	57 U
4-Chloroaniline	57 U	56 U	57 U	57 U
4-Chlorophenyl phenyl ether	58 U	57 U	59 U	58 U
4-Methylphenol	52 U	51 U	53 U	52 U
4-Nitroaniline	75 U	74 U	77 U	75 U
4-Nitrophenol	210 U	210 U	210 U	210 U
Acenaphthene	57 U	56 U	57 U	57 U
Acenaphthylene	52 U	51 U	53 U	52 U
Anthracene	54 U	54 U	55 U	54 U
Benzo(a)anthracene	61 U	60 U	62 U	61 U
Benzo(a)pyrene	67 U	66 U	68 U	67 U
Benzo(b)fluoranthene	64 U	64 U	65 U	64 U
Benzo(ghi)perylene	61 U	60 U	62 U	61 U

APPENDIX F
SUBSURFACE SOIL ANALYTICAL DATA
REMEDIAL INVESTIGATION, CTO-0219
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-SB06-01	IR84-SB06-01D	IR84-SB07-01	IR84-SB08-01
DEPTH	1 - 3	1 - 3	1 - 3	1 - 3
SAMPLE DATE	08-02-2001	08-02-2001	08-02-2001	08-02-2001
SEMIVOLATILES (ug/kg)				
Benzo(k)fluoranthene	59 U	58 U	60 U	59 U
Butyl benzyl phthalate	57 U	56 U	57 U	57 U
Carbazole	58 U	57 U	59 U	58 U
Chrysene	51 U	50 U	52 U	51 U
Di-n-butyl phthalate	170 U	160 U	170 U	170 U
Di-n-octyl phthalate	60 U	59 U	61 U	60 U
Dibenz(a.h)anthracene	57 U	56 U	57 U	57 U
Dibenzofuran	56 U	55 U	56 U	55 U
Diethyl phthalate	170 U	160 U	170 U	170 U
Dimethyl phthalate	180 U	180 U	180 U	180 U
Fluoranthene	62 U	61 U	63 U	62 U
Fluorene	53 U	53 U	54 U	53 U
Hexachlorobenzene	62 U	61 U	63 U	62 U
Hexachlorobutadiene	50 U	49 U	51 U	50 U
Hexachlorocyclopentadiene	67 U	66 U	68 U	67 U
Hexachloroethane	53 U	53 U	54 U	53 U
Indeno(1,2,3-cd)pyrene	78 U	77 U	79 U	78 U
Isophorone	49 U	48 U	50 U	49 U
N-Nitrosodi-n-propylamine	49 U	48 U	50 U	49 U
N-Nitrosodiphenylamine	54 U	54 U	55 U	54 U
Naphthalene	54 U	54 U	55 U	54 U
Nitrobenzene	51 U	50 U	52 U	51 U
Pentachlorophenol	130 U	130 U	140 U	130 U
Phenanthrene	58 U	57 U	59 U	58 U
Phenol	54 U	54 U	55 U	54 U
Phthalic anhydride	NA	NA	NA	NA
Pyrene	57 U	56 U	57 U	57 U
bis(2-Chloroethoxy)methane	52 U	51 U	53 U	52 U
bis(2-Chloroethyl) ether	57 U	56 U	57 U	57 U
bis(2-Ethylhexyl) phthalate	60 U	59 U	61 U	60 U

APPENDIX F
SUBSURFACE SOIL ANALYTICAL DATA
REMEDIAL INVESTIGATION, CTO-0219
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-SB06-01	IR84-SB06-01D	IR84-SB07-01	IR84-SB08-01
DEPTH	1 - 3	1 - 3	1 - 3	1 - 3
SAMPLE DATE	08-02-2001	08-02-2001	08-02-2001	08-02-2001
PESTICIDES/PCBs (ug/kg)				
4,4'-DDD	1.9 J	0.87 UJ	0.89 U	0.88 U
4,4'-DDE	2 J	0.62 UJ	0.64 U	0.63 U
4,4'-DDT	4.3	1.4 UJ	1.5 U	1.4 U
Aldrin	0.61 U	0.6 U	0.62 U	0.61 U
Dieldrin	2 J	1.6 UJ	1.7 U	1.7 U
Endosulfan I	0.74 U	0.73 U	0.75 U	0.74 U
Endosulfan II	0.42 U	0.42 U	0.43 U	0.42 U
Endosulfan sulfate	0.31 U	0.31 U	0.32 U	0.31 U
Endrin	0.68 U	0.67 U	0.69 U	0.68 U
Endrin aldehyde	1.7 U	1.6 U	1.7 U	1.7 U
Endrin ketone	0.29 U	0.28 U	0.29 U	0.29 U
Heptachlor	0.68 U	0.67 U	0.69 U	0.68 U
Heptachlor epoxide	0.73 U	0.72 U	0.74 U	0.73 U
Methoxychlor	0.91 U	0.9 U	0.92 U	0.91 U
PCB-1016	5.9 U	5.8 U	6 U	5.9 U
PCB-1221	21 U	21 U	21 U	21 U
PCB-1232	12 U	12 U	12 U	12 U
PCB-1242	20 U	20 U	20 U	20 U
PCB-1248	5.1 U	5 U	5.2 U	5.1 U
PCB-1254	22 U	22 U	23 U	22 U
PCB-1260	29 J	8.1 U	8.3 U	8.2 U
Toxaphene	7.7 U	7.6 U	7.8 U	7.7 U
alpha-BHC	0.51 U	0.5 U	0.52 U	0.51 U
alpha-Chlordane	22 J	3.3 J	0.66 U	0.65 U
beta-BHC	0.51 U	0.5 U	0.52 U	0.51 U
delta-BHC	0.53 U	0.53 U	0.54 U	0.53 U
gamma-BHC (Lindane)	0.63 U	0.62 U	0.64 U	0.63 U
gamma-Chlordane	26	3.3 J	0.64 U	0.63 U
HERBICIDES (ug/kg)				
2,4,5-T	3.4 U	3.4 U	3.5 U	3.4 U
2,4-D	59 U	58 U	60 U	59 U
2,4-DB	43 U	43 U	44 U	43 U
Dalapon	41 U	41 U	42 U	41 U
Dicamba	17 U	16 U	17 U	17 U
Dichlorprop	11 U	11 U	11 U	11 U
Dinoseb	13 U	13 U	14 U	13 U
MCPA	2600 U	2500 U	2600 U	2600 U
MCPP	3000 U	3000 U	3000 U	3000 U
Pentachlorophenol	11 U	11 U	11 U	11 U
Silvex	4.3 U	4.3 U	4.4 U	4.3 U

APPENDIX F
SUBSURFACE SOIL ANALYTICAL DATA
REMEDIAL INVESTIGATION, CTO-0219
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-SB06-01	IR84-SB06-01D	IR84-SB07-01	IR84-SB08-01
DEPTH	1 - 3	1 - 3	1 - 3	1 - 3
SAMPLE DATE	08-02-2001	08-02-2001	08-02-2001	08-02-2001
METALS (mg/kg)				
Aluminum	2590	2830	2750	2570
Antimony	0.91 J	0.65 J	0.6 J	0.69 J
Arsenic	1.4	0.86 J	0.87 J	0.8 J
Barium	5.5 U	29.1 U	6.3 U	6.3 U
Beryllium	0.051 U	0.05 U	0.052 U	0.051 U
Cadmium	0.05 J	0.047 U	0.048 U	0.048 U
Calcium	1820 J	741 J	699 J	447 J
Chromium	3	3	3.2	3.1
Cobalt	0.22 J	0.24 J	0.21 J	0.22 J
Copper	4.1	2 J	0.67 J	0.8 J
Iron	1830	1670	1840	1560
Lead	10.5 J	4.6 J	3.9 J	3.7 J
Magnesium	111 J	123 J	105 J	92.3 J
Manganese	8.3	7.6	6.2	7.3
Mercury	0.029 J	0.0092 U	0.017 J	0.013 J
Nickel	1 J	1 J	0.85 J	0.83 J
Potassium	78.2 J	88.1 J	81.7 J	93.1 J
Selenium	0.34 U	0.42 J	0.48 J	0.34 U
Silver	0.17 U	0.16 U	0.17 U	0.17 U
Sodium	55.5 U	54.8 U	56.3 U	55.5 U
Thallium	0.56 U	0.55 U	0.56 U	0.64 J
Vanadium	4.1 J	4.2 J	5.4 J	4.2 J
Zinc	11.4	6.8	3.5	4.4
TOTAL PETROLEUM HYDROCARBONS				
TPH (as Diesel) (mg/kg)	NA	NA	NA	NA
TPH (as Gasoline) (ug/kg)	NA	NA	NA	NA
CONVENTIONAL				
Cyanide, Total (mg/kg)	NA	NA	NA	NA
Percent Solids (%)	90.1	91.3	88.8	90.1

APPENDIX F
SEDIMENT ANALYTICAL RESULTS - LAGOON
REMEDIAL INVESTIGATION, CTO-0219
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	84-SD05-01	84-SD06-01	84-SD07-01	84-SD08-01	IR84-SD01-98B	IR84-SD01-98BD	IR84-SD05-98B
DEPTH (inches bgs)	0 - 6 "	0 - 6 "	0 - 6 "	0 - 6 "	0 - 6 "	0 - 6 "	0 - 6 "
SAMPLE DATE	10-26-1995	10-26-1995	10-26-1995	10-26-1995	04/19/1998	04/19/1998	04/19/1998
VOLATILES (ug/kg)							
1,1,1-Trichloroethane	NA	NA	NA	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethane	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethene	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethene (total)	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	NA	NA	NA	NA	NA	NA	NA
2-Butanone	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	NA	NA	NA	NA	NA	NA	NA
4-Methyl-2-pentanone	NA	NA	NA	NA	NA	NA	NA
Acetone	NA	NA	NA	NA	NA	NA	NA
Benzene	NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane	NA	NA	NA	NA	NA	NA	NA
Bromoform	NA	NA	NA	NA	NA	NA	NA
Bromomethane	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	NA	NA	NA	NA	NA	NA	NA
Carbon tetrachloride	NA	NA	NA	NA	NA	NA	NA
Chlorobenzene	NA	NA	NA	NA	NA	NA	NA
Chloroethane	NA	NA	NA	NA	NA	NA	NA
Chloroform	NA	NA	NA	NA	NA	NA	NA
Chloromethane	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	NA	NA	NA	NA	NA	NA	NA
Styrene	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	NA	NA	NA	NA	NA	NA	NA
Toluene	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	NA	NA	NA	NA	NA	NA	NA
Xylenes (total)	NA	NA	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene	NA	NA	NA	NA	NA	NA	NA
trans-1,3-Dichloropropene	NA	NA	NA	NA	NA	NA	NA

APPENDIX F
SEDIMENT ANALYTICAL RESULTS - LAGOON
REMEDIAL INVESTIGATION, CTO-0219
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	84-SD05-01	84-SD06-01	84-SD07-01	84-SD08-01	IR84-SD01-98B	IR84-SD01-98BD	IR84-SD05-98B
DEPTH (inches bgs)	0 - 6 "	0 - 6 "	0 - 6 "	0 - 6 "	0 - 6 "	0 - 6 "	0 - 6 "
SAMPLE DATE	10-26-1995	10-26-1995	10-26-1995	10-26-1995	04/19/1998	04/19/1998	04/19/1998
SEMIVOLATILES (ug/kg)							
1,2,4-Trichlorobenzene	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	NA	NA	NA	NA	NA	NA	NA
1,3-Dichlorobenzene	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	NA	NA	NA	NA	NA	NA	NA
2,2'-Oxybis(1-Chloropropane)	NA	NA	NA	NA	NA	NA	NA
2,4,5-Trichlorophenol	NA	NA	NA	NA	NA	NA	NA
2,4,6-Trichlorophenol	NA	NA	NA	NA	NA	NA	NA
2,4-Dichlorophenol	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrophenol	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	NA	NA	NA	NA	NA	NA	NA
2,6-Dinitrotoluene	NA	NA	NA	NA	NA	NA	NA
2-Chloronaphthalene	NA	NA	NA	NA	NA	NA	NA
2-Chlorophenol	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	NA	NA	NA	NA	NA	NA	NA
2-Methylphenol	NA	NA	NA	NA	NA	NA	NA
2-Nitroaniline	NA	NA	NA	NA	NA	NA	NA
2-Nitrophenol	NA	NA	NA	NA	NA	NA	NA
3,3'-Dichlorobenzidine	NA	NA	NA	NA	NA	NA	NA
3-Nitroaniline	NA	NA	NA	NA	NA	NA	NA
4,6-Dinitro-2-methylphenol	NA	NA	NA	NA	NA	NA	NA
4-Bromophenyl phenyl ether	NA	NA	NA	NA	NA	NA	NA
4-Chloro-3-methylphenol	NA	NA	NA	NA	NA	NA	NA
4-Chloroaniline	NA	NA	NA	NA	NA	NA	NA
4-Chlorophenyl phenyl ether	NA	NA	NA	NA	NA	NA	NA
4-Methylphenol	NA	NA	NA	NA	NA	NA	NA
4-Nitroaniline	NA	NA	NA	NA	NA	NA	NA
4-Nitrophenol	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	NA	NA	NA	NA	NA	NA	NA
Anthracene	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA
Benzo(ghi)perylene	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	NA	NA
Butyl benzyl phthalate	NA	NA	NA	NA	NA	NA	NA
Carbazole	NA	NA	NA	NA	NA	NA	NA

APPENDIX F
SEDIMENT ANALYTICAL RESULTS - LAGOON
REMEDIAL INVESTIGATION, CTO-0219
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	84-SD05-01	84-SD06-01	84-SD07-01	84-SD08-01	IR84-SD01-98B	IR84-SD01-98BD	IR84-SD05-98B
DEPTH (inches bgs)	0 - 6 "	0 - 6 "	0 - 6 "	0 - 6 "	0 - 6 "	0 - 6 "	0 - 6 "
SAMPLE DATE	10-26-1995	10-26-1995	10-26-1995	10-26-1995	04/19/1998	04/19/1998	04/19/1998
SEMIVOLATILES (ug/kg)							
Chrysene	NA	NA	NA	NA	NA	NA	NA
Di-n-butyl phthalate	NA	NA	NA	NA	NA	NA	NA
Di-n-octyl phthalate	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	NA	NA	NA	NA	NA	NA	NA
Dibenzofuran	NA	NA	NA	NA	NA	NA	NA
Diethyl phthalate	NA	NA	NA	NA	NA	NA	NA
Dimethyl phthalate	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	NA	NA	NA	NA	NA	NA	NA
Fluorene	NA	NA	NA	NA	NA	NA	NA
Hexachlorobenzene	NA	NA	NA	NA	NA	NA	NA
Hexachlorobutadiene	NA	NA	NA	NA	NA	NA	NA
Hexachlorocyclopentadiene	NA	NA	NA	NA	NA	NA	NA
Hexachloroethane	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	NA	NA
Isophorone	NA	NA	NA	NA	NA	NA	NA
N-Nitrosodi-n-propylamine	NA	NA	NA	NA	NA	NA	NA
N-Nitrosodiphenylamine	NA	NA	NA	NA	NA	NA	NA
Naphthalene	NA	NA	NA	NA	NA	NA	NA
Nitrobenzene	NA	NA	NA	NA	NA	NA	NA
Pentachlorophenol	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	NA	NA	NA	NA	NA	NA	NA
Phenol	NA	NA	NA	NA	NA	NA	NA
Pyrene	NA	NA	NA	NA	NA	NA	NA
bis(2-Chloroethoxy)methane	NA	NA	NA	NA	NA	NA	NA
bis(2-Chloroethyl) ether	NA	NA	NA	NA	NA	NA	NA
bis(2-Ethylhexyl) phthalate	NA	NA	NA	NA	NA	NA	NA
PCBs (ug/kg)							
AROCLOR-1016	680 U	3300 U	4700 U	450 U	810 U	NA	180 U
AROCLOR-1221	1400 U	6500 U	9500 U	890 U	1600 U	NA	370 U
AROCLOR-1232	680 U	3300 U	4700 U	450 U	810 U	NA	180 U
AROCLOR-1242	680 U	3300 U	4700 U	450 U	810 U	NA	180 U
AROCLOR-1248	2800	3300 U	4700 U	450 U	810 U	NA	180 U
AROCLOR-1254	680 U	3300 U	4700 U	450 U	810 U	NA	180 U
AROCLOR-1260	20000	8100	17000	3700	40000	NA	5900
DIESEL RANGE ORGANICS (mg/kg	NA	NA	NA	NA	9200	14000	4300
CONVENTIONAL							
pH (solid)	NA	NA	NA	NA	6.6	6.6	6.9
Percent moisture (%)	NA	NA	NA	NA	59.2	56.3	28

NOTES:
J = value is estimated
U = not detected at detection limit

APPENDIX F
SEDIMENT ANALYTICAL RESULTS - LAGOON
REMEDIAL INVESTIGATION, CTO-0219
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-SD06-98B	IR84-SD07-98B
DEPTH (inches bgs)	0 - 6 "	0 - 6 "
SAMPLE DATE	04/19/1998	04/23/1998
VOLATILES (ug/kg)		
1,1,1-Trichloroethane	NA	2200 U
1,1,2,2-Tetrachloroethane	NA	2200 U
1,1,2-Trichloroethane	NA	2200 U
1,1-Dichloroethane	NA	2200 U
1,1-Dichloroethene	NA	2200 U
1,2-Dichloroethane	NA	2200 U
1,2-Dichloroethene (total)	NA	2200 U
1,2-Dichloropropane	NA	2200 U
2-Butanone	NA	2200 U
2-Hexanone	NA	2200 U
4-Methyl-2-pentanone	NA	2200 U
Acetone	NA	2200 U
Benzene	NA	2200 U
Bromodichloromethane	NA	2200 U
Bromoform	NA	2200 U
Bromomethane	NA	2200 U
Carbon disulfide	NA	2200 U
Carbon tetrachloride	NA	2200 U
Chlorobenzene	NA	2200 U
Chloroethane	NA	2200 U
Chloroform	NA	2200 U
Chloromethane	NA	2200 U
Dibromochloromethane	NA	2200 U
Ethylbenzene	NA	2200 U
Methylene chloride	NA	2200 U
Styrene	NA	2200 U
Tetrachloroethene	NA	2200 U
Toluene	NA	2200 U
Trichloroethene	NA	2200 U
Vinyl chloride	NA	2200 U
Xylenes (total)	NA	910 J
cis-1,3-Dichloropropene	NA	2200 U
trans-1,3-Dichloropropene	NA	2200 U

APPENDIX F
SEDIMENT ANALYTICAL RESULTS - LAGOON
REMEDIAL INVESTIGATION, CTO-0219
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-SD06-98B	IR84-SD07-98B
DEPTH (inches bgs)	0 - 6 "	0 - 6 "
SAMPLE DATE	04/19/1998	04/23/1998
SEMIVOLATILES (ug/kg)		
1,2,4-Trichlorobenzene	NA	590 U
1,2-Dichlorobenzene	NA	590 U
1,3-Dichlorobenzene	NA	590 U
1,4-Dichlorobenzene	NA	590 U
2,2'-Oxybis(1-Chloropropane)	NA	590 U
2,4,5-Trichlorophenol	NA	1500 U
2,4,6-Trichlorophenol	NA	590 U
2,4-Dichlorophenol	NA	590 U
2,4-Dimethylphenol	NA	590 U
2,4-Dinitrophenol	NA	1500 U
2,4-Dinitrotoluene	NA	590 U
2,6-Dinitrotoluene	NA	590 U
2-Chloronaphthalene	NA	590 U
2-Chlorophenol	NA	590 U
2-Methylnaphthalene	NA	10000
2-Methylphenol	NA	590 U
2-Nitroaniline	NA	1500 U
2-Nitrophenol	NA	590 U
3,3'-Dichlorobenzidine	NA	590 UJ
3-Nitroaniline	NA	1500 U
4,6-Dinitro-2-methylphenol	NA	1500 U
4-Bromophenyl phenyl ether	NA	590 U
4-Chloro-3-methylphenol	NA	590 U
4-Chloroaniline	NA	590 U
4-Chlorophenyl phenyl ether	NA	590 U
4-Methylphenol	NA	590 U
4-Nitroaniline	NA	1500 U
4-Nitrophenol	NA	1500 U
Acenaphthene	NA	590 U
Acenaphthylene	NA	590 U
Anthracene	NA	590 U
Benzo(a)anthracene	NA	590 UJ
Benzo(a)pyrene	NA	590 UJ
Benzo(b)fluoranthene	NA	590 UJ
Benzo(ghi)perylene	NA	590 UJ
Benzo(k)fluoranthene	NA	590 UJ
Butyl benzyl phthalate	NA	590 UJ
Carbazole	NA	590 U

APPENDIX F
SEDIMENT ANALYTICAL RESULTS - LAGOON
REMEDIAL INVESTIGATION, CTO-0219
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-SD06-98B	IR84-SD07-98B
DEPTH (inches bgs)	0 - 6 "	0 - 6 "
SAMPLE DATE	04/19/1998	04/23/1998
SEMIVOLATILES (ug/kg)		
Chrysene	NA	590 UJ
Di-n-butyl phthalate	NA	590 U
Di-n-octyl phthalate	NA	590 UJ
Dibenz(a,h)anthracene	NA	590 UJ
Dibenzofuran	NA	590 U
Diethyl phthalate	NA	590 U
Dimethyl phthalate	NA	590 U
Fluoranthene	NA	590 U
Fluorene	NA	590 U
Hexachlorobenzene	NA	590 U
Hexachlorobutadiene	NA	590 U
Hexachlorocyclopentadiene	NA	590 U
Hexachloroethane	NA	590 U
Indeno(1,2,3-cd)pyrene	NA	590 UJ
Isophorone	NA	590 U
N-Nitrosodi-n-propylamine	NA	590 U
N-Nitrosodiphenylamine	NA	590 U
Naphthalene	NA	2000
Nitrobenzene	NA	590 U
Pentachlorophenol	NA	1500 U
Phenanthrene	NA	2500
Phenol	NA	590 U
Pyrene	NA	590 UJ
bis(2-Chloroethoxy)methane	NA	590 U
bis(2-Chloroethyl) ether	NA	590 U
bis(2-Ethylhexyl) phthalate	NA	2400 J
PCBs (ug/kg)		
AROCLOR-1016	160 U	NA
AROCLOR-1221	330 U	NA
AROCLOR-1232	160 U	NA
AROCLOR-1242	160 U	NA
AROCLOR-1248	160 U	NA
AROCLOR-1254	160 U	NA
AROCLOR-1260	4300	NA
DIESEL RANGE ORGANICS (mg/kg	3500	NA
CONVENTIONAL		
pH (solid)	6.3	6.6
Percent moisture (%)	19.6	43.9

NOTES:
J = value is estimated
U = not detected at detection limit

APPENDIX F
SEDIMENT ANALYTICAL RESULTS -NORTHEAST CREEK
REMEDIAL INVESTIGATION, CTO-0219
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	84-SD01-01	84-SD02-01	84-SD04-01
DEPTH (inches bgs)	0 - 6 "	0 - 6 "	0 - 6 "
SAMPLE DATE	10-26-1995	10-26-1995	10-26-1995
PCBs (ug/kg)			
AROCLOR-1016	42 U	59 U	58 U
AROCLOR-1221	84 U	120 U	120 U
AROCLOR-1232	42 U	59 U	58 U
AROCLOR-1242	42 U	59 U	58 U
AROCLOR-1248	42 U	59 U	58 U
AROCLOR-1254	42 U	59 U	58 U
AROCLOR-1260	42 U	59 U	58 U

NOTES:
U = not detected at detection limit

APPENDIX F
SURFACE SOIL ANALYTICAL RESUTLS
REMEDIAL INVESTIGATION, CTO-120
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	84-MW15-00	84-MW16-00	84-MW17-00	IR84-MW18-00	IR84-MW19-00	IR84-MW20-00	IR84-MW20-00D	IR84-DP06-00	IR84-DP18-00
DEPTH (feet bgs)	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
SAMPLE DATE	07-31-2001	07-31-2001	07-31-2001	08-01-2001	08-01-2001	08-01-2001	08-01-2001	07-17-2001	07-19-2001
VOLATILES (ug/kg)									
1,1,1-Trichloroethane	1 U	NA	0.97 U	NA	NA	1.1 UJ	1 U	NA	NA
1,1,2,2-Tetrachloroethane	2 U	NA	1.9 U	NA	NA	2.1 UJ	2 U	NA	NA
1,1,2-Trichloroethane	1.4 U	NA	1.3 U	NA	NA	1.4 UJ	1.4 U	NA	NA
1,1-Dichloroethane	0.66 U	NA	0.61 U	NA	NA	0.68 UJ	0.66 U	NA	NA
1,1-Dichloroethene	1.4 U	NA	1.3 U	NA	NA	1.4 UJ	1.4 U	NA	NA
1,2-Dichloroethane	0.83 U	NA	0.77 U	NA	NA	0.86 UJ	0.83 U	NA	NA
1,2-Dichloroethene (total)	1.6 U	NA	1.5 U	NA	NA	1.6 UJ	1.6 U	NA	NA
1,2-Dichloropropane	0.85 U	NA	0.79 U	NA	NA	0.88 UJ	0.85 U	NA	NA
2-Butanone	3.1 U	NA	2.9 U	NA	NA	9 J	4.8 J	NA	NA
2-Hexanone	1.9 U	NA	1.8 U	NA	NA	2 UJ	1.9 U	NA	NA
4-Methyl-2-pentanone	2.2 U	NA	2 U	NA	NA	2.2 UJ	2.2 U	NA	NA
Acetone	40 J	NA	2.2 U	NA	NA	46 UJ	23 U	NA	NA
Benzene	0.74 U	NA	0.69 U	NA	NA	0.76 UJ	0.74 U	NA	NA
Bromodichloromethane	1.4 U	NA	1.3 U	NA	NA	1.4 UJ	1.4 U	NA	NA
Bromoform	1.8 U	NA	1.7 U	NA	NA	1.9 UJ	1.8 U	NA	NA
Bromomethane	2 U	NA	1.9 U	NA	NA	2.1 UJ	2 U	NA	NA
Carbon disulfide	0.88 U	NA	0.82 U	NA	NA	0.92 UJ	0.89 U	NA	NA
Carbon tetrachloride	1.1 U	NA	1.1 U	NA	NA	1.2 UJ	1.1 U	NA	NA
Chlorobenzene	0.59 U	NA	0.55 U	NA	NA	0.61 UJ	0.59 U	NA	NA
Chloroethane	2.5 U	NA	2.3 U	NA	NA	2.6 UJ	2.5 U	NA	NA
Chloroform	0.93 U	NA	0.87 U	NA	NA	0.96 UJ	0.93 U	NA	NA
Chloromethane	1.5 U	NA	1.4 U	NA	NA	1.5 UJ	1.5 U	NA	NA
Dibromochloromethane	1.2 U	NA	1.2 U	NA	NA	1.3 UJ	1.3 U	NA	NA
Ethylbenzene	0.67 U	NA	0.62 U	NA	NA	0.69 UJ	0.67 U	NA	NA
Isopropyl ether	0.77 U	NA	0.72 U	NA	NA	0.8 UJ	0.77 U	NA	NA
Methyl tert-butyl ether	0.95 U	NA	0.89 U	NA	NA	0.99 UJ	0.95 U	NA	NA
Methylene chloride	1.5 U	NA	1.4 U	NA	NA	1.5 UJ	1.5 U	NA	NA
Styrene	0.57 U	NA	0.53 U	NA	NA	0.59 UJ	0.57 U	NA	NA
Tetrachloroethene	1.4 U	NA	1.3 U	NA	NA	1.4 UJ	1.4 U	NA	NA
Toluene	0.6 U	NA	0.56 U	NA	NA	0.62 UJ	0.6 U	NA	NA
Trichloroethene	0.86 U	NA	0.8 U	NA	NA	0.89 UJ	0.86 U	NA	NA
Vinyl chloride	1.6 U	NA	1.5 U	NA	NA	1.6 UJ	1.6 U	NA	NA
Xylenes (total)	2.2 U	NA	2 U	NA	NA	2.2 UJ	2.2 U	NA	NA
cis-1,3-Dichloropropene	0.73 U	NA	0.68 U	NA	NA	0.75 UJ	0.73 U	NA	NA
trans-1,3-Dichloropropene	0.97 U	NA	0.91 U	NA	NA	1 UJ	0.98 U	NA	NA

APPENDIX F
SURFACE SOIL ANALYTICAL RESUTLS
REMEDIAL INVESTIGATION, CTO-120
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	84-MW15-00	84-MW16-00	84-MW17-00	IR84-MW18-00	IR84-MW19-00	IR84-MW20-00	IR84-MW20-00D	IR84-DP06-00	IR84-DP18-00
DEPTH (feet bgs)	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
SAMPLE DATE	07-31-2001	07-31-2001	07-31-2001	08-01-2001	08-01-2001	08-01-2001	08-01-2001	07-17-2001	07-19-2001
SEMIVOLATILES (ug/kg)									
1,2,4-Trichlorobenzene	56 U	NA	280 U	NA	NA	64 U	56 U	NA	NA
1,2-Dichlorobenzene	53 U	NA	270 U	NA	NA	61 U	53 U	NA	NA
1,3-Dichlorobenzene	57 U	NA	280 U	NA	NA	65 U	57 U	NA	NA
1,4-Dichlorobenzene	57 U	NA	280 U	NA	NA	65 U	57 U	NA	NA
2,2'-Oxybis(1-Chloropropane)	59 U	NA	300 U	NA	NA	68 U	59 U	NA	NA
2,4,5-Trichlorophenol	62 U	NA	310 U	NA	NA	72 U	63 U	NA	NA
2,4,6-Trichlorophenol	71 U	NA	360 U	NA	NA	82 U	72 U	NA	NA
2,4-Dichlorophenol	57 U	NA	280 U	NA	NA	65 U	57 U	NA	NA
2,4-Dimethylphenol	91 U	NA	450 U	NA	NA	100 U	91 U	NA	NA
2,4-Dinitrophenol	120 U	NA	620 U	NA	NA	140 U	130 U	NA	NA
2,4-Dinitrotoluene	52 U	NA	260 U	NA	NA	60 U	52 U	NA	NA
2,6-Dinitrotoluene	54 U	NA	270 U	NA	NA	63 U	55 U	NA	NA
2-Chloronaphthalene	54 U	NA	270 U	NA	NA	63 U	55 U	NA	NA
2-Chlorophenol	59 U	NA	300 U	NA	NA	68 U	59 U	NA	NA
2-Methylnaphthalene	54 U	NA	350 J	NA	NA	63 U	55 U	NA	NA
2-Methylphenol	52 U	NA	260 U	NA	NA	60 U	52 U	NA	NA
2-Nitroaniline	52 U	NA	260 U	NA	NA	60 U	52 U	NA	NA
2-Nitrophenol	52 U	NA	260 U	NA	NA	60 U	52 U	NA	NA
3,3'-Dichlorobenzidine	44 U	NA	220 U	NA	NA	51 U	44 U	NA	NA
3-Nitroaniline	160 U	NA	800 U	NA	NA	180 U	160 U	NA	NA
4,6-Dinitro-2-methylphenol	180 U	NA	910 U	NA	NA	210 U	180 U	NA	NA
4-Bromophenyl phenyl ether	69 U	NA	350 U	NA	NA	80 U	69 U	NA	NA
4-Chloro-3-methylphenol	58 U	NA	290 U	NA	NA	67 U	58 U	NA	NA
4-Chloroaniline	58 U	NA	290 U	NA	NA	67 U	58 U	NA	NA
4-Chlorophenyl phenyl ether	59 U	NA	300 U	NA	NA	68 U	59 U	NA	NA
4-Methylphenol	53 U	NA	270 U	NA	NA	61 U	53 U	NA	NA
4-Nitroaniline	77 U	NA	390 U	NA	NA	89 U	77 U	NA	NA
4-Nitrophenol	220 U	NA	1100 U	NA	NA	250 U	220 U	NA	NA
Acenaphthene	58 U	NA	2300	NA	NA	67 U	58 U	NA	NA
Acenaphthylene	53 U	NA	270 U	NA	NA	61 U	53 U	NA	NA
Anthracene	56 U	NA	3500	NA	NA	64 U	56 U	NA	NA
Benzo(a)anthracene	62 U	NA	5900	NA	NA	72 U	63 U	NA	NA
Benzo(a)pyrene	68 U	NA	5800	NA	NA	78 U	68 U	NA	NA
Benzo(b)fluoranthene	66 U	NA	7100	NA	NA	76 U	66 U	NA	NA
Benzo(ghi)perylene	62 U	NA	3200	NA	NA	72 U	63 U	NA	NA
Benzo(k)fluoranthene	60 U	NA	3800	NA	NA	69 U	60 U	NA	NA
Butyl benzyl phthalate	58 U	NA	290 U	NA	NA	67 U	58 U	NA	NA
Carbazole	59 U	NA	2100	NA	NA	68 U	59 U	NA	NA
Chrysene	52 U	NA	6700	NA	NA	60 U	52 U	NA	NA
Di-n-butyl phthalate	170 U	NA	850 U	NA	NA	200 U	170 U	NA	NA
Di-n-octyl phthalate	61 U	NA	310 U	NA	NA	70 U	61 U	NA	NA
Dibenz(a,h)anthracene	58 U	NA	1200 J	NA	NA	67 U	58 U	NA	NA
Dibenzofuran	57 U	NA	1800 J	NA	NA	65 U	57 U	NA	NA

APPENDIX F
SURFACE SOIL ANALYTICAL RESUTLS
REMEDIAL INVESTIGATION, CTO-120
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	84-MW15-00	84-MW16-00	84-MW17-00	IR84-MW18-00	IR84-MW19-00	IR84-MW20-00	IR84-MW20-00D	IR84-DP06-00	IR84-DP18-00
DEPTH (feet bgs)	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
SAMPLE DATE	07-31-2001	07-31-2001	07-31-2001	08-01-2001	08-01-2001	08-01-2001	08-01-2001	07-17-2001	07-19-2001
SEMIVOLATILES (ug/kg)									
Dibenzothiophene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Diethyl phthalate	170 U	NA	850 U	NA	NA	200 U	170 U	NA	NA
Dimethyl phthalate	180 U	NA	910 U	NA	NA	210 U	180 U	NA	NA
Fluoranthene	63 U	NA	16000	NA	NA	73 U	64 U	NA	NA
Fluorene	54 U	NA	2600	NA	NA	63 U	55 U	NA	NA
Hexachlorobenzene	63 U	NA	320 U	NA	NA	73 U	64 U	NA	NA
Hexachlorobutadiene	51 U	NA	260 U	NA	NA	59 U	51 U	NA	NA
Hexachlorocyclopentadiene	68 U	NA	340 U	NA	NA	78 U	68 U	NA	NA
Hexachloroethane	54 U	NA	270 U	NA	NA	63 U	55 U	NA	NA
Indeno(1,2,3-cd)pyrene	79 U	NA	3200	NA	NA	91 U	80 U	NA	NA
Isophorone	50 U	NA	250 U	NA	NA	57 U	50 U	NA	NA
N-Nitrosodi-n-propylamine	50 U	NA	250 U	NA	NA	57 U	50 U	NA	NA
N-Nitrosodiphenylamine	56 U	NA	280 U	NA	NA	64 U	56 U	NA	NA
Naphthalene	56 U	NA	640 J	NA	NA	64 U	56 U	NA	NA
Nitrobenzene	52 U	NA	260 U	NA	NA	60 U	52 U	NA	NA
Pentachlorophenol	140 U	NA	680 U	NA	NA	160 U	140 U	NA	NA
Phenanthrene	59 U	NA	15000	NA	NA	68 U	59 U	NA	NA
Phenol	56 U	NA	280 U	NA	NA	64 U	56 U	NA	NA
Pyrene	58 U	NA	10000	NA	NA	67 U	58 U	NA	NA
bis(2-Chloroethoxy)methane	53 U	NA	270 U	NA	NA	61 U	53 U	NA	NA
bis(2-Chloroethyl) ether	58 U	NA	290 U	NA	NA	67 U	58 U	NA	NA
bis(2-Ethylhexyl) phthalate	61 U	NA	310 U	NA	NA	140 J	620	NA	NA

APPENDIX F
SURFACE SOIL ANALYTICAL RESUTLS
REMEDIAL INVESTIGATION, CTO-120
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	84-MW15-00	84-MW16-00	84-MW17-00	IR84-MW18-00	IR84-MW19-00	IR84-MW20-00	IR84-MW20-00D	IR84-DP06-00	IR84-DP18-00
DEPTH (feet bgs)	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
SAMPLE DATE	07-31-2001	07-31-2001	07-31-2001	08-01-2001	08-01-2001	08-01-2001	08-01-2001	07-17-2001	07-19-2001
PESTICIDES/PCBs (ug/kg)									
4,4'-DDD	0.9 U	NA	9.4 J	NA	NA	8.1 J	0.9 UJ	NA	NA
4,4'-DDE	0.65 U	NA	3.2 U	NA	NA	5.6 J	0.65 UJ	NA	NA
4,4'-DDT	1.5 U	NA	7.4 U	NA	NA	3.4 U	1.5 U	NA	NA
Aldrin	0.62 U	NA	3.1 U	NA	NA	1.4 U	0.63 U	NA	NA
Dieldrin	1.7 U	NA	14 J	NA	NA	50 J	1.7 UJ	NA	NA
Endosulfan I	0.76 U	NA	3.8 U	NA	NA	1.7 U	0.76 U	NA	NA
Endosulfan II	0.43 U	NA	2.2 U	NA	NA	0.99 U	0.43 U	NA	NA
Endosulfan sulfate	0.32 U	NA	28 J	NA	NA	54 J	2.1 J	NA	NA
Endrin	0.69 U	NA	3.5 U	NA	NA	6.9 J	0.69 UJ	NA	NA
Endrin aldehyde	1.7 U	NA	46 J	NA	NA	74 J	22 J	NA	NA
Endrin ketone	0.29 U	NA	8.3 J	NA	NA	0.68 U	0.3 U	NA	NA
Heptachlor	0.69 U	NA	3.5 U	NA	NA	1.6 U	0.69 U	NA	NA
Heptachlor epoxide	0.75 U	NA	3.7 U	NA	NA	1.7 U	0.75 U	NA	NA
Methoxychlor	0.93 U	NA	4.7 U	NA	NA	98 J	0.93 UJ	NA	NA
PCB-1016	6 U	5.9 U	60 U	6.3 U	56 U	350 U	12 U	5.6 U	300 U
PCB-1221	22 U	21 U	220 U	23 U	200 U	1200 U	43 U	20 U	1100 U
PCB-1232	12 U	12 U	120 U	13 U	120 U	720 U	25 U	12 U	620 U
PCB-1242	20 U	20 U	200 U	22 U	190 U	1200 U	41 U	19 U	1000 U
PCB-1248	5.2 U	5.1 U	52 U	5.5 U	48 U	300 U	10 U	4.8 U	260 U
PCB-1254	23 U	22 U	230 U	24 U	210 U	1300 U	45 U	21 U	1100 U
PCB-1260	8.4 U	30 J	3500	41	3600	11000 J	410 J	56	25000
Toxaphene	7.8 U	NA	39 U	NA	NA	18 U	7.8 U	NA	NA
alpha-BHC	0.52 U	NA	2.6 U	NA	NA	1.2 U	0.52 U	NA	NA
alpha-Chlordane	0.67 U	NA	40 J	NA	NA	4.5 J	0.67 UJ	NA	NA
beta-BHC	0.52 U	NA	2.6 U	NA	NA	1.2 U	0.52 U	NA	NA
delta-BHC	0.54 U	NA	2.7 U	NA	NA	1.3 U	0.55 U	NA	NA
gamma-BHC (Lindane)	0.65 U	NA	3.2 U	NA	NA	1.5 U	0.65 U	NA	NA
gamma-Chlordane	0.65 U	NA	43	NA	NA	6.7 J	0.65 UJ	NA	NA
HERBICIDES (ug/kg)									
2,4,5-T	3.5 U	NA	3.5 U	NA	NA	4 U	3.5 U	NA	NA
2,4-D	60 U	NA	60 U	NA	NA	69 U	60 U	NA	NA
2,4-DB	44 U	NA	44 U	NA	NA	51 U	44 U	NA	NA
Dalapon	42 U	NA	42 U	NA	NA	48 U	42 U	NA	NA
Dicamba	17 U	NA	17 U	NA	NA	20 U	17 U	NA	NA
Dichlorprop	11 U	NA	11 U	NA	NA	13 U	11 U	NA	NA
Dinoseb	14 U	NA	14 U	NA	NA	16 U	14 U	NA	NA
MCPA	2600 U	NA	2600 U	NA	NA	3000 U	2600 U	NA	NA
MCPP	3100 U	NA	3100 U	NA	NA	3500 U	3100 U	NA	NA
Pentachlorophenol	11 U	NA	11 U	NA	NA	13 U	11 U	NA	NA
Silvex	4.4 U	NA	4.4 U	NA	NA	5.1 U	4.4 U	NA	NA

APPENDIX F
SURFACE SOIL ANALYTICAL RESUTLS
REMEDIAL INVESTIGATION, CTO-120
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	84-MW15-00	84-MW16-00	84-MW17-00	IR84-MW18-00	IR84-MW19-00	IR84-MW20-00	IR84-MW20-00D	IR84-DP06-00	IR84-DP18-00
DEPTH (feet bgs)	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
SAMPLE DATE	07-31-2001	07-31-2001	07-31-2001	08-01-2001	08-01-2001	08-01-2001	08-01-2001	07-17-2001	07-19-2001
METALS (mg/kg)									
Aluminum	2990	NA	2750	NA	NA	8940	2880	NA	NA
Antimony	0.56 UJ	NA	1.1 J	NA	NA	0.64 UJ	0.56 UJ	NA	NA
Arsenic	0.64 J	NA	6.7	NA	NA	1.5	1.1	NA	NA
Barium	5.3 J	NA	8.9 J	NA	NA	13.4 J	10.4 J	NA	NA
Beryllium	0.052 U	NA	0.052 U	NA	NA	0.06 U	0.052 U	NA	NA
Cadmium	0.049 U	NA	0.14 J	NA	NA	0.071 J	0.16 J	NA	NA
Calcium	636	NA	7200	NA	NA	1350	10500	NA	NA
Chromium	3.2	NA	4.4	NA	NA	6.4	4.5	NA	NA
Cobalt	0.17 U	NA	0.3 J	NA	NA	0.42 J	0.34 J	NA	NA
Copper	1.1 J	NA	5.8	NA	NA	1.7 J	4	NA	NA
Iron	1550	NA	2060	NA	NA	5000	1960	NA	NA
Lead	2.8	NA	31.5	NA	NA	5.7	22.4	NA	NA
Magnesium	91 J	NA	239 J	NA	NA	188 J	234 J	NA	NA
Manganese	5.5	NA	13.4	NA	NA	11.5	9.1	NA	NA
Mercury	0.02 J	NA	0.0095 U	NA	NA	0.028 J	0.0095 U	NA	NA
Nickel	0.91 J	NA	1.1 J	NA	NA	1.9 J	1.3 J	NA	NA
Potassium	70.2 J	NA	106 J	NA	NA	107 J	71.3 J	NA	NA
Selenium	0.35 U	NA	0.35 U	NA	NA	0.4 U	0.53 J	NA	NA
Silver	0.17 U	NA	0.17 U	NA	NA	0.2 U	0.17 U	NA	NA
Sodium	56.7 U	NA	56.8 U	NA	NA	65.2 U	56.8 U	NA	NA
Thallium	0.57 U	NA	0.57 U	NA	NA	0.65 U	0.57 U	NA	NA
Vanadium	4.1 J	NA	4.9 J	NA	NA	11.2	4.6 J	NA	NA
Zinc	3.2	NA	22.5	NA	NA	4.7	13.8	NA	NA
TOTAL PETROLEUM HYDROCARBONS									
TPH (as Diesel) (mg/kg)	NA	NA	NA	NA	NA	NA	NA	NA	NA
TPH (as Gasoline) (ug/kg)	NA	NA	NA	NA	NA	NA	NA	NA	NA
CONVENTIONAL									
Cyanide, Total (mg/kg)	NA	NA	NA	NA	NA	NA	NA	NA	NA
Percent Solids (%)	88.3	90	88	83.5	95.1	76.7	88	95	88.1
Total Organic Carbon (mg/kg)	NA	NA	NA	NA	NA	NA	NA	NA	NA

NOTES:
J = Value is estimated
U = Not detected at detection limit
ug/kg = microgram per kilogram
mg/kg = milligram per kilogram
BG = sample was diluted due to matrix interference and blar

APPENDIX F
SURFACE SOIL ANALYTICAL RESUTLS
REMEDIAL INVESTIGATION, CTO-120
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-DP20-00	IR84-DP22-00	IR84-DP22-00D	IR84-DP27-00	IR84-DP29-00	IR84-DP33-00	IR84-DP36-00	IR84-DP37-00	IR84-DP41-00
DEPTH (feet bgs)	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
SAMPLE DATE	07-19-2001	07-19-2001	07-19-2001	07-19-2001	07-19-2001	07-20-2001	07-20-2001	07-20-2001	07-20-2001
VOLATILES (ug/kg)									
1,1,1-Trichloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethene (total)	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Methyl-2-pentanone	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromoform	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromomethane	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon tetrachloride	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroform	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloromethane	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isopropyl ether	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl tert-butyl ether	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	NA	NA	NA	NA	NA	NA	NA	NA	NA
Xylenes (total)	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,3-Dichloropropene	NA	NA	NA	NA	NA	NA	NA	NA	NA

APPENDIX F
SURFACE SOIL ANALYTICAL RESUTLS
REMEDIAL INVESTIGATION, CTO-120
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-DP20-00	IR84-DP22-00	IR84-DP22-00D	IR84-DP27-00	IR84-DP29-00	IR84-DP33-00	IR84-DP36-00	IR84-DP37-00	IR84-DP41-00
DEPTH (feet bgs)	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
SAMPLE DATE	07-19-2001	07-19-2001	07-19-2001	07-19-2001	07-19-2001	07-20-2001	07-20-2001	07-20-2001	07-20-2001
SEMIVOLATILES (ug/kg)									
1,2,4-Trichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3-Dichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,2'-Oxybis(1-Chloropropane)	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4,5-Trichlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4,6-Trichlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dichlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,6-Dinitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Chloronaphthalene	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Chlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylphenol	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Nitroaniline	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Nitrophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,3'-Dichlorobenzidine	NA	NA	NA	NA	NA	NA	NA	NA	NA
3-Nitroaniline	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,6-Dinitro-2-methylphenol	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Bromophenyl phenyl ether	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Chloro-3-methylphenol	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Chloroaniline	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Chlorophenyl phenyl ether	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Methylphenol	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Nitroaniline	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Nitrophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(ghi)perylene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Butyl benzyl phthalate	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-butyl phthalate	NA	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-octyl phthalate	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA

APPENDIX F
SURFACE SOIL ANALYTICAL RESUTLS
REMEDIAL INVESTIGATION, CTO-120
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-DP20-00	IR84-DP22-00	IR84-DP22-00D	IR84-DP27-00	IR84-DP29-00	IR84-DP33-00	IR84-DP36-00	IR84-DP37-00	IR84-DP41-00
DEPTH (feet bgs)	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
SAMPLE DATE	07-19-2001	07-19-2001	07-19-2001	07-19-2001	07-19-2001	07-20-2001	07-20-2001	07-20-2001	07-20-2001
SEMIVOLATILES (ug/kg)									
Dibenzothiophene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Diethyl phthalate	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dimethyl phthalate	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorobutadiene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorocyclopentadiene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isophorone	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-Nitrosodi-n-propylamine	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-Nitrosodiphenylamine	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pentachlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenol	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA
bis(2-Chloroethoxy)methane	NA	NA	NA	NA	NA	NA	NA	NA	NA
bis(2-Chloroethyl) ether	NA	NA	NA	NA	NA	NA	NA	NA	NA
bis(2-Ethylhexyl) phthalate	NA	NA	NA	NA	NA	NA	NA	NA	NA

APPENDIX F
SURFACE SOIL ANALYTICAL RESUTLS
REMEDIAL INVESTIGATION, CTO-120
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-DP20-00	IR84-DP22-00	IR84-DP22-00D	IR84-DP27-00	IR84-DP29-00	IR84-DP33-00	IR84-DP36-00	IR84-DP37-00	IR84-DP41-00
DEPTH (feet bgs)	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
SAMPLE DATE	07-19-2001	07-19-2001	07-19-2001	07-19-2001	07-19-2001	07-20-2001	07-20-2001	07-20-2001	07-20-2001
PESTICIDES/PCBs (ug/kg)									
4,4'-DDD	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDE	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDT	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aldrin	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dieldrin	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endosulfan I	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endosulfan II	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endosulfan sulfate	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endrin	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endrin aldehyde	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endrin ketone	NA	NA	NA	NA	NA	NA	NA	NA	NA
Heptachlor	NA	NA	NA	NA	NA	NA	NA	NA	NA
Heptachlor epoxide	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methoxychlor	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-1016	5.6 U	6.1 U	6.1 U	6.7 U	65 U	63 U	55 U	5.6 U	89 U
PCB-1221	20 U	22 U	22 U	24 U	230 U	220 U	200 U	20 U	320 U
PCB-1232	12 U	13 U	13 U	14 U	140 U	130 U	110 U	12 U	180 U
PCB-1242	19 U	21 U	21 U	23 U	220 U	210 U	190 U	19 U	300 U
PCB-1248	56	5.3 U	5.3 U	5.8 U	57 U	54 U	48 U	4.9 U	77 U
PCB-1254	21 U	23 U	23 U	25 U	250 U	240 U	210 U	21 U	340 U
PCB-1260	18 J	340	420	270	3800	1400	940	84	1600
Toxaphene	NA	NA	NA	NA	NA	NA	NA	NA	NA
alpha-BHC	NA	NA	NA	NA	NA	NA	NA	NA	NA
alpha-Chlordane	NA	NA	NA	NA	NA	NA	NA	NA	NA
beta-BHC	NA	NA	NA	NA	NA	NA	NA	NA	NA
delta-BHC	NA	NA	NA	NA	NA	NA	NA	NA	NA
gamma-BHC (Lindane)	NA	NA	NA	NA	NA	NA	NA	NA	NA
gamma-Chlordane	NA	NA	NA	NA	NA	NA	NA	NA	NA
HERBICIDES (ug/kg)									
2,4,5-T	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-D	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-DB	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dalapon	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dicamba	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dichlorprop	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dinoseb	NA	NA	NA	NA	NA	NA	NA	NA	NA
MCPA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MCPP	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pentachlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silvex	NA	NA	NA	NA	NA	NA	NA	NA	NA

APPENDIX F
SURFACE SOIL ANALYTICAL RESUTLS
REMEDIAL INVESTIGATION, CTO-120
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-DP20-00	IR84-DP22-00	IR84-DP22-00D	IR84-DP27-00	IR84-DP29-00	IR84-DP33-00	IR84-DP36-00	IR84-DP37-00	IR84-DP41-00
DEPTH (feet bgs)	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
SAMPLE DATE	07-19-2001	07-19-2001	07-19-2001	07-19-2001	07-19-2001	07-20-2001	07-20-2001	07-20-2001	07-20-2001
METALS (mg/kg)									
Aluminum	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL PETROLEUM HYDROCARBON									
TPH (as Diesel) (mg/kg)	NA	NA	NA	NA	NA	NA	NA	NA	NA
TPH (as Gasoline) (ug/kg)	NA	NA	NA	NA	NA	NA	NA	NA	NA
CONVENTIONAL									
Cyanide, Total (mg/kg)	NA	NA	NA	NA	NA	NA	NA	NA	NA
Percent Solids (%)	94.8	86.3	86.3	79.2	81.4	84.5	96	93.9	59.6
Total Organic Carbon (mg/kg)	NA	NA	NA	13 BG	NA	NA	3 BG	NA	NA

NOTES:
J = Value is estimated
U = Not detected at detection limit
ug/kg = microgram per kilogram
mg/kg = milligram per kilogram
BG = sample was diluted due to matrix interfe

APPENDIX F
SURFACE SOIL ANALYTICAL RESUTLS
REMEDIAL INVESTIGATION, CTO-120
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-DP42-00	IR84-DP42-00D	IR84-DP45-00	IR84-DP46-00	IR84-DP47-00	IR84-DP48-00	IR84-DP49-00	IR84-DP50-00	IR84-DP51-00
DEPTH (feet bgs)	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
SAMPLE DATE	07-20-2001	07-20-2001	07-21-2001	07-21-2001	07-21-2001	07-21-2001	07-21-2001	07-21-2001	07-21-2001
VOLATILES (ug/kg)									
1,1,1-Trichloroethane	NA	NA	0.96 U	0.97 U	0.96 U	1 U	0.99 U	0.96 U	1 U
1,1,2,2-Tetrachloroethane	NA	NA	1.9 U	1.9 U	1.9 U	2 U	1.9 U	1.9 U	2 U
1,1,2-Trichloroethane	NA	NA	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U
1,1-Dichloroethane	NA	NA	0.61 U	0.61 U	0.61 U	0.63 U	0.62 U	0.61 U	0.63 U
1,1-Dichloroethene	NA	NA	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U
1,2-Dichloroethane	NA	NA	0.76 U	0.77 U	0.76 U	0.8 U	0.79 U	0.77 U	0.8 U
1,2-Dichloroethene (total)	NA	NA	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U
1,2-Dichloropropane	NA	NA	0.78 U	0.79 U	0.78 U	0.82 U	0.81 U	0.79 U	0.82 U
2-Butanone	NA	NA	2.8 U	2.8 U	2.8 U	2.9 U	2.9 U	2.8 U	2.9 U
2-Hexanone	NA	NA	1.8 U	1.8 U	1.8 U	1.9 U	1.8 U	1.8 U	1.9 U
4-Methyl-2-pentanone	NA	NA	2 U	2 U	2 U	2.1 U	2 U	2 U	2.1 U
Acetone	NA	NA	2.2 U	2.2 U	2.2 U	2.3 U	2.3 U	2.2 U	2.3 U
Benzene	NA	NA	0.68 U	0.68 U	0.68 U	0.71 U	0.7 U	0.68 U	0.71 U
Bromodichloromethane	NA	NA	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U
Bromoform	NA	NA	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
Bromomethane	NA	NA	1.9 U	1.9 U	1.9 U	2 U	1.9 U	1.9 U	2 U
Carbon disulfide	NA	NA	0.81 U	0.82 U	0.81 U	0.85 U	0.84 U	0.82 U	0.85 U
Carbon tetrachloride	NA	NA	1 U	1.1 U	1 U	1.1 U	1.1 U	1 U	1.1 U
Chlorobenzene	NA	NA	0.54 U	0.55 U	0.54 U	0.57 U	0.56 U	0.55 U	0.57 U
Chloroethane	NA	NA	2.3 U	2.3 U	2.3 U	2.4 U	2.4 U	2.3 U	2.4 U
Chloroform	NA	NA	0.86 U	0.86 U	0.86 U	0.89 U	0.88 U	0.86 U	0.9 U
Chloromethane	NA	NA	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U
Dibromochloromethane	NA	NA	1.1 U	1.2 U	1.1 U	1.2 U	1.2 U	1.2 U	1.2 U
Ethylbenzene	NA	NA	0.62 U	0.62 U	0.62 U	0.64 U	0.63 U	0.62 U	0.64 U
Isopropyl ether	NA	NA	21 U	21 U	21 U	22 U	22 U	21 U	22 U
Methyl tert-butyl ether	NA	NA	10 U	11 U	10 U	11 U	11 U	10 U	11 U
Methylene chloride	NA	NA	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U
Styrene	NA	NA	0.52 U	0.53 U	0.52 U	0.55 U	0.54 U	0.52 U	0.55 U
Tetrachloroethene	NA	NA	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U
Toluene	NA	NA	0.55 U	0.56 U	0.55 U	0.58 U	0.57 U	0.56 U	0.58 U
Trichloroethene	NA	NA	0.79 U	0.8 U	0.79 U	0.83 U	0.82 U	0.8 U	0.83 U
Vinyl chloride	NA	NA	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U
Xylenes (total)	NA	NA	2 U	2 U	2 U	2.1 U	2 U	2 U	2.1 U
cis-1,3-Dichloropropene	NA	NA	0.67 U	0.67 U	0.67 U	0.7 U	0.69 U	0.67 U	0.7 U
trans-1,3-Dichloropropene	NA	NA	0.9 U	0.9 U	0.9 U	0.94 U	0.92 U	0.9 U	0.94 U

APPENDIX F
SURFACE SOIL ANALYTICAL RESUTLS
REMEDIAL INVESTIGATION, CTO-120
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-DP42-00	IR84-DP42-00D	IR84-DP45-00	IR84-DP46-00	IR84-DP47-00	IR84-DP48-00	IR84-DP49-00	IR84-DP50-00	IR84-DP51-00
DEPTH (feet bgs)	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
SAMPLE DATE	07-20-2001	07-20-2001	07-21-2001	07-21-2001	07-21-2001	07-21-2001	07-21-2001	07-21-2001	07-21-2001
SEMIVOLATILES (ug/kg)									
1,2,4-Trichlorobenzene	NA	NA	200 U	6900 U	130 U	53 U	130 U	51 U	54 U
1,2-Dichlorobenzene	NA	NA	200 U	6600 U	120 U	51 U	130 U	49 U	51 U
1,3-Dichlorobenzene	NA	NA	210 U	7000 U	130 U	55 U	130 U	52 U	55 U
1,4-Dichlorobenzene	NA	NA	210 U	7000 U	130 U	55 U	130 U	52 U	55 U
2,2'-Oxybis(1-Chloropropane)	NA	NA	220 U	7300 U	140 U	57 U	140 U	55 U	57 U
2,4,5-Trichlorophenol	NA	NA	230 U	7700 U	140 U	60 U	150 U	58 U	60 U
2,4,6-Trichlorophenol	NA	NA	260 U	8800 U	160 U	69 U	170 U	66 U	69 U
2,4-Dichlorophenol	NA	NA	210 U	7000 U	130 U	55 U	130 U	52 U	55 U
2,4-Dimethylphenol	NA	NA	330 U	11000 U	210 U	87 U	220 U	84 U	87 U
2,4-Dinitrophenol	NA	NA	460 U	15000 U	290 U	120 U	300 U	120 U	120 U
2,4-Dinitrotoluene	NA	NA	190 U	6400 U	120 U	50 U	120 U	48 U	50 U
2,6-Dinitrotoluene	NA	NA	200 U	6700 U	130 U	52 U	130 U	50 U	52 U
2-Chloronaphthalene	NA	NA	200 U	6700 U	130 U	52 U	130 U	50 U	52 U
2-Chlorophenol	NA	NA	220 U	7300 U	140 U	57 U	140 U	55 U	57 U
2-Methylnaphthalene	NA	NA	200 U	6700 U	120 J	52 U	130 U	50 U	52 U
2-Methylphenol	NA	NA	190 U	6400 U	120 U	50 U	120 U	48 U	50 U
2-Nitroaniline	NA	NA	190 U	6400 U	120 U	50 U	120 U	48 U	50 U
2-Nitrophenol	NA	NA	190 U	6400 U	120 U	50 U	120 U	48 U	50 U
3,3'-Dichlorobenzidine	NA	NA	160 U	5500 U	100 U	43 U	100 U	41 U	43 U
3-Nitroaniline	NA	NA	580 U	20000 U	370 U	150 U	380 U	150 U	150 U
4,6-Dinitro-2-methylphenol	NA	NA	670 U	22000 U	420 U	170 U	430 U	170 U	170 U
4-Bromophenyl phenyl ether	NA	NA	250 U	8500 U	160 U	66 U	160 U	64 U	67 U
4-Chloro-3-methylphenol	NA	NA	210 U	7100 U	130 U	56 U	140 U	53 U	56 U
4-Chloroaniline	NA	NA	210 U	7100 U	130 U	56 U	140 U	53 U	56 U
4-Chlorophenyl phenyl ether	NA	NA	220 U	7300 U	140 U	57 U	140 U	55 U	57 U
4-Methylphenol	NA	NA	200 U	6600 U	120 U	51 U	130 U	49 U	51 U
4-Nitroaniline	NA	NA	280 U	9500 U	180 U	74 U	180 U	71 U	74 U
4-Nitrophenol	NA	NA	790 U	27000 U	500 U	210 U	510 U	200 U	210 U
Acenaphthene	NA	NA	460 J	20000 J	910	140 J	890	53 U	56 U
Acenaphthylene	NA	NA	200 U	6600 U	120 U	51 U	130 U	49 U	51 U
Anthracene	NA	NA	910 J	56000	1100	210 J	1100	51 U	54 U
Benzo(a)anthracene	NA	NA	3800	190000	2500	520	3100	58 U	60 U
Benzo(a)pyrene	NA	NA	3300	150000	2300	470	3000	63 U	66 U
Benzo(b)fluoranthene	NA	NA	4300	170000	2200	540	3600	61 U	63 U
Benzo(ghi)perylene	NA	NA	1600	55000	1200	260 J	1500	58 U	74 J
Benzo(k)fluoranthene	NA	NA	1800	120000	2000	340 J	2100	56 U	58 U
Butyl benzyl phthalate	NA	NA	210 U	7100 U	130 U	56 U	140 U	53 U	56 U
Carbazole	NA	NA	570 J	38000 J	700 J	130 J	650 J	55 U	57 U
Chrysene	NA	NA	3900	180000	2700	560	3300	48 U	50 U
Di-n-butyl phthalate	NA	NA	630 U	21000 U	390 U	160 U	400 U	160 U	160 U
Di-n-octyl phthalate	NA	NA	230 U	7600 U	140 U	59 U	150 U	57 U	59 U
Dibenz(a,h)anthracene	NA	NA	530 J	17000 J	400 J	70 J	460 J	53 U	56 U
Dibenzofuran	NA	NA	250 J	8900 J	560 J	84 J	400 J	52 U	55 U

APPENDIX F
SURFACE SOIL ANALYTICAL RESUTLS
REMEDIAL INVESTIGATION, CTO-120
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-DP42-00	IR84-DP42-00D	IR84-DP45-00	IR84-DP46-00	IR84-DP47-00	IR84-DP48-00	IR84-DP49-00	IR84-DP50-00	IR84-DP51-00
DEPTH (feet bgs)	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
SAMPLE DATE	07-20-2001	07-20-2001	07-21-2001	07-21-2001	07-21-2001	07-21-2001	07-21-2001	07-21-2001	07-21-2001
SEMIVOLATILES (ug/kg)									
Dibenzothiophene	NA	NA	NA	NA	NA	89 NJ	760 NJ	NA	NA
Diethyl phthalate	NA	NA	630 U	21000 U	390 U	160 U	400 U	160 U	160 U
Dimethyl phthalate	NA	NA	670 U	22000 U	420 U	170 U	430 U	170 U	170 U
Fluoranthene	NA	NA	5900	300000	5600	1200	7200	59 U	61 U
Fluorene	NA	NA	410 J	19000 J	880	130 J	680 J	50 U	52 U
Hexachlorobenzene	NA	NA	230 U	7800 U	150 U	61 U	150 U	59 U	61 U
Hexachlorobutadiene	NA	NA	190 U	6300 U	120 U	49 U	120 U	47 U	49 U
Hexachlorocyclopentadiene	NA	NA	250 U	8400 U	410 J	65 U	160 U	63 U	66 U
Hexachloroethane	NA	NA	200 U	6700 U	130 U	52 U	130 U	50 U	52 U
Indeno(1,2,3-cd)pyrene	NA	NA	1500	59000	1200	250 J	1500	73 U	76 U
Isophorone	NA	NA	180 U	6200 U	110 U	48 U	120 U	46 U	48 U
N-Nitrosodi-n-propylamine	NA	NA	180 U	6200 U	110 U	48 U	120 U	46 U	48 U
N-Nitrosodiphenylamine	NA	NA	200 U	6900 U	130 U	53 U	130 U	51 U	54 U
Naphthalene	NA	NA	200 U	7500 J	240 J	53 U	140 J	51 U	54 U
Nitrobenzene	NA	NA	190 U	6400 U	120 U	50 U	120 U	48 U	50 U
Pentachlorophenol	NA	NA	500 U	17000 U	310 U	130 U	320 U	130 U	130 U
Phenanthrene	NA	NA	3500	180000	5300	950	6000	55 U	57 U
Phenol	NA	NA	200 U	6900 U	130 U	53 U	130 U	51 U	54 U
Pyrene	NA	NA	5400	250000	3200	760	6100	53 U	56 U
bis(2-Chloroethoxy)methane	NA	NA	200 U	6600 U	120 U	51 U	130 U	49 U	51 U
bis(2-Chloroethyl) ether	NA	NA	210 U	7100 U	130 U	56 U	140 U	53 U	56 U
bis(2-Ethylhexyl) phthalate	NA	NA	230 U	7600 U	140 U	59 U	150 U	57 U	59 U

APPENDIX F
SURFACE SOIL ANALYTICAL RESUTLS
REMEDIAL INVESTIGATION, CTO-120
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-DP42-00	IR84-DP42-00D	IR84-DP45-00	IR84-DP46-00	IR84-DP47-00	IR84-DP48-00	IR84-DP49-00	IR84-DP50-00	IR84-DP51-00
DEPTH (feet bgs)	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
SAMPLE DATE	07-20-2001	07-20-2001	07-21-2001	07-21-2001	07-21-2001	07-21-2001	07-21-2001	07-21-2001	07-21-2001
PESTICIDES/PCBs (ug/kg)									
4,4'-DDD	NA	NA	820 U	830 U	3000 J	6.2 J	8.5 U	1.7 U	3.2 J
4,4'-DDE	NA	NA	600 U	600 U	590 U	1.2 U	58	6.6	17
4,4'-DDT	NA	NA	1400 U	1400 U	1400 U	2.8 U	190	25 J	43
Aldrin	NA	NA	570 U	580 U	570 U	1.2 U	5.9 U	1.2 U	1.2 U
Dieldrin	NA	NA	1600 U	1600 U	1600 U	9.2 J	320	21	3.3 U
Endosulfan I	NA	NA	700 U	700 U	700 U	1.5 U	7.2 U	1.4 U	1.5 U
Endosulfan II	NA	NA	400 U	400 U	400 U	0.83 U	4.1 U	0.8 U	0.83 U
Endosulfan sulfate	NA	NA	290 U	290 U	290 U	0.61 U	3 U	0.59 U	0.61 U
Endrin	NA	NA	640 U	640 U	640 U	1.3 U	6.6 U	1.3 U	1.3 U
Endrin aldehyde	NA	NA	1600 U	1600 U	1600 U	3.3 U	16 U	5.6 J	3.3 U
Endrin ketone	NA	NA	270 U	270 U	270 U	4.4 J	2.8 U	0.55 U	0.57 U
Heptachlor	NA	NA	10000	7400	22000	9.5 J	6.6 U	4.2	1.3 U
Heptachlor epoxide	NA	NA	2000 J	1600 J	4500 J	4.2 J	7.1 U	1.4 U	1.4 U
Methoxychlor	NA	NA	860 U	860 U	860 U	1.8 U	8.8 U	8.1 J	1.8 U
PCB-1016	6.9 U	6.9 U	550 U	1100 U	2800 U	580 U	28 U	5.6 U	5.8 U
PCB-1221	25 U	25 U	2000 U	4000 U	9900 U	2100 U	100 U	20 U	21 U
PCB-1232	14 U	14 U	1100 U	2300 U	5700 U	1200 U	59 U	12 U	12 U
PCB-1242	23 U	24 U	1900 U	3800 U	9400 U	2000 U	97 U	19 U	20 U
PCB-1248	5.9 U	6 U	480 U	19000	160000	500 U	25 U	4.8 U	5 U
PCB-1254	26 U	26 U	2100 U	4200 U	10000 U	2200 U	110 U	21 U	22 U
PCB-1260	660	860	770 U	1600 U	3900 U	810 U	820 J	470	50
Toxaphene	NA	NA	7200 U	7300 U	7200 U	15 U	74 U	14 U	15 U
alpha-BHC	NA	NA	480 U	480 U	480 U	1 U	4.9 U	0.96 U	1 U
alpha-Chlordane	NA	NA	19000 J	17000 J	48000 J	65 J	6.3 U	5.8 J	1.3 U
beta-BHC	NA	NA	480 U	480 U	480 U	1 U	4.9 U	0.96 U	1 U
delta-BHC	NA	NA	500 U	500 U	500 U	1 U	5.2 U	1 U	1 U
gamma-BHC (Lindane)	NA	NA	600 U	600 U	590 U	1.2 U	6.1 U	1.2 U	1.2 U
gamma-Chlordane	NA	NA	23000	20000	58000	75 J	6.1 U	9.8	1.2 U
HERBICIDES (ug/kg)									
2,4,5-T	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-D	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-DB	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dalapon	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dicamba	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dichlorprop	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dinoseb	NA	NA	NA	NA	NA	NA	NA	NA	NA
MCPA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MCPP	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pentachlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silvex	NA	NA	NA	NA	NA	NA	NA	NA	NA

APPENDIX F
SURFACE SOIL ANALYTICAL RESUTLS
REMEDIAL INVESTIGATION, CTO-120
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-DP42-00	IR84-DP42-00D	IR84-DP45-00	IR84-DP46-00	IR84-DP47-00	IR84-DP48-00	IR84-DP49-00	IR84-DP50-00	IR84-DP51-00
DEPTH (feet bgs)	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
SAMPLE DATE	07-20-2001	07-20-2001	07-21-2001	07-21-2001	07-21-2001	07-21-2001	07-21-2001	07-21-2001	07-21-2001
METALS (mg/kg)									
Aluminum	NA	NA	2810	3090	2760	2970	2070	2310	1420
Antimony	NA	NA	1.1 J	0.74 J	1 J	1.3 J	3.3 J	0.76 J	0.54 U
Arsenic	NA	NA	1.3	1.3	1.4	1.1	9.1	8.2	0.42 J
Barium	NA	NA	16.9 J	24.7	23.1	13.5 J	65.7	18.5 J	7.6 J
Beryllium	NA	NA	0.06 J	0.075 J	0.072 J	0.05 U	0.073 J	0.065 J	0.05 U
Cadmium	NA	NA	0.33 J	0.13 J	0.38 J	0.067 J	0.53 J	0.37 J	0.08 J
Calcium	NA	NA	14200 J	12000	56300 J	3580 J	98000 J	100000 J	17200 J
Chromium	NA	NA	6.1	5.6	6.9	3.8	20.2	11.8	2.2
Cobalt	NA	NA	0.33 J	0.45 J	0.39 J	0.25 J	0.76 J	0.3 J	0.22 J
Copper	NA	NA	19.3	6	8.1	8.6	146	11.3	1.4 J
Iron	NA	NA	2440	2460	2700	2290	2660	2510	684
Lead	NA	NA	20.6	27.1	28.9	20.2	97.3	27.9	9.1
Magnesium	NA	NA	329 J	371 J	1070	178 J	1480	1460	282 J
Manganese	NA	NA	17.4	22.4	25.6	10.9	32.8	27.4	17.4
Mercury	NA	NA	0.052 J	0.068 J	0.053 J	0.015 J	0.045 J	0.015 J	0.022 J
Nickel	NA	NA	1.6 J	1.8 J	1.5 J	1.4 J	2.9 J	2.1 J	0.98 J
Potassium	NA	NA	114 J	181 J	226 J	99.1 J	179 J	185 J	72.4 J
Selenium	NA	NA	0.56 U	0.33 U	0.32 U	0.34 U	0.33 U	0.32 U	0.34 U
Silver	NA	NA	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U
Sodium	NA	NA	52.2 U	52.5 U	165 J	54.5 U	187 J	235 J	54.6 U
Thallium	NA	NA	0.6 J	0.53 U	0.52 U	0.55 U	0.54 U	0.52 U	0.55 U
Vanadium	NA	NA	4.9 J	5.4	5.7	5.8	5.7	5.7	2.3 J
Zinc	NA	NA	64.9 J	60.3 J	46.3 J	17.3 J	154 J	27.3 J	9.8 J
TOTAL PETROLEUM HYDROCARBON									
TPH (as Diesel) (mg/kg)	NA	NA	340	470	370	130	270	170	34
TPH (as Gasoline) (ug/kg)	NA	NA	18 U	880	18 U	19 U	18 U	18 U	19 U
CONVENTIONAL									
Cyanide, Total (mg/kg)	NA	NA	0.18 U	0.18 U	0.18 U	0.19 U	0.18 U	0.18 U	0.19 U
Percent Solids (%)	77.4	76.5	95.8	95.2	95.8	91.7	93	95.4	91.5
Total Organic Carbon (mg/kg)	NA	NA	NA	NA	NA	NA	NA	NA	NA

NOTES:
J = Value is estimated
U = Not detected at detection limit
ug/kg = microgram per kilogram
mg/kg = milligram per kilogram
BG = sample was diluted due to matrix interfe

APPENDIX F
SURFACE SOIL ANALYTICAL RESUTLS
REMEDIAL INVESTIGATION, CTO-120
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-DP52-00	IR84-DP53-00	IR84-DP54-00	IR84-DP55-00	IR84-DP63-00	IR84-DP65-00	IR84-DP69-00	IR84-DP69-00D	IR84-DP71-00
DEPTH (feet bgs)	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
SAMPLE DATE	07-21-2001	07-21-2001	07-21-2001	07-21-2001	07-22-2001	07-22-2001	07-22-2001	07-22-2001	07-22-2001
VOLATILES (ug/kg)									
1,1,1-Trichloroethane	0.99 U	1 U	1 U	0.96 U	NA	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	1.9 U	2 U	2 U	1.9 U	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	1.3 U	1.4 U	1.3 U	1.3 U	NA	NA	NA	NA	NA
1,1-Dichloroethane	0.62 U	0.65 U	0.63 U	0.61 U	NA	NA	NA	NA	NA
1,1-Dichloroethene	1.3 U	1.4 U	1.3 U	1.3 U	NA	NA	NA	NA	NA
1,2-Dichloroethane	0.78 U	0.82 U	0.79 U	0.76 U	NA	NA	NA	NA	NA
1,2-Dichloroethene (total)	1.5 U	1.6 U	1.5 U	1.5 U	NA	NA	NA	NA	NA
1,2-Dichloropropane	0.81 U	0.85 U	0.81 U	0.78 U	NA	NA	NA	NA	NA
2-Butanone	2.9 U	3 U	2.9 U	2.8 U	NA	NA	NA	NA	NA
2-Hexanone	1.8 U	1.9 U	1.8 U	1.8 U	NA	NA	NA	NA	NA
4-Methyl-2-pentanone	2 U	2.1 U	2.1 U	2 U	NA	NA	NA	NA	NA
Acetone	2.3 U	2.4 U	2.3 U	2.2 U	NA	NA	NA	NA	NA
Benzene	0.7 U	0.73 U	0.71 U	0.68 U	NA	NA	NA	NA	NA
Bromodichloromethane	1.3 U	1.4 U	1.3 U	1.3 U	NA	NA	NA	NA	NA
Bromoform	1.7 U	1.8 U	1.7 U	1.7 U	NA	NA	NA	NA	NA
Bromomethane	1.9 U	2 U	2 U	1.9 U	NA	NA	NA	NA	NA
Carbon disulfide	0.84 U	0.88 U	0.85 U	0.82 U	NA	NA	NA	NA	NA
Carbon tetrachloride	1.1 U	1.1 U	1.1 U	1 U	NA	NA	NA	NA	NA
Chlorobenzene	0.56 U	0.59 U	0.56 U	0.54 U	NA	NA	NA	NA	NA
Chloroethane	2.4 U	2.5 U	2.4 U	2.3 U	NA	NA	NA	NA	NA
Chloroform	0.88 U	0.92 U	0.89 U	0.86 U	NA	NA	NA	NA	NA
Chloromethane	1.4 U	1.5 U	1.4 U	1.4 U	NA	NA	NA	NA	NA
Dibromochloromethane	1.2 U	1.2 U	1.2 U	1.1 U	NA	NA	NA	NA	NA
Ethylbenzene	0.63 U	0.67 U	0.64 U	0.62 U	NA	NA	NA	NA	NA
Isopropyl ether	21 U	23 U	22 U	21 U	NA	NA	NA	NA	NA
Methyl tert-butyl ether	11 U	11 U	11 U	10 U	NA	NA	NA	NA	NA
Methylene chloride	1.4 U	1.5 U	1.4 U	1.4 U	NA	NA	NA	NA	NA
Styrene	0.54 U	0.56 U	0.54 U	0.52 U	NA	NA	NA	NA	NA
Tetrachloroethene	1.3 U	1.4 U	1.3 U	1.3 U	NA	NA	NA	NA	NA
Toluene	0.57 U	0.6 U	0.58 U	0.55 U	NA	NA	NA	NA	NA
Trichloroethene	0.82 U	0.86 U	0.83 U	0.79 U	NA	NA	NA	NA	NA
Vinyl chloride	1.5 U	1.6 U	1.5 U	1.5 U	NA	NA	NA	NA	NA
Xylenes (total)	2 U	2.1 U	2.1 U	2 U	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene	0.69 U	0.72 U	0.7 U	0.67 U	NA	NA	NA	NA	NA
trans-1,3-Dichloropropene	0.92 U	0.97 U	0.93 U	0.9 U	NA	NA	NA	NA	NA

APPENDIX F
SURFACE SOIL ANALYTICAL RESUTLS
REMEDIAL INVESTIGATION, CTO-120
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-DP52-00	IR84-DP53-00	IR84-DP54-00	IR84-DP55-00	IR84-DP63-00	IR84-DP65-00	IR84-DP69-00	IR84-DP69-00D	IR84-DP71-00
DEPTH (feet bgs)	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
SAMPLE DATE	07-21-2001	07-21-2001	07-21-2001	07-21-2001	07-22-2001	07-22-2001	07-22-2001	07-22-2001	07-22-2001
SEMIVOLATILES (ug/kg)									
1,2,4-Trichlorobenzene	53 U	220 U	53 U	51 U	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	51 U	210 U	51 U	49 U	NA	NA	NA	NA	NA
1,3-Dichlorobenzene	54 U	230 U	54 U	52 U	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	54 U	230 U	54 U	52 U	NA	NA	NA	NA	NA
2,2'-Oxybis(1-Chloropropane)	56 U	230 U	56 U	54 U	NA	NA	NA	NA	NA
2,4,5-Trichlorophenol	59 U	250 U	60 U	57 U	NA	NA	NA	NA	NA
2,4,6-Trichlorophenol	68 U	280 U	68 U	66 U	NA	NA	NA	NA	NA
2,4-Dichlorophenol	54 U	230 U	54 U	52 U	NA	NA	NA	NA	NA
2,4-Dimethylphenol	86 U	360 U	87 U	84 U	NA	NA	NA	NA	NA
2,4-Dinitrophenol	120 U	500 U	120 U	110 U	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	49 U	210 U	50 U	48 U	NA	NA	NA	NA	NA
2,6-Dinitrotoluene	52 U	220 U	52 U	50 U	NA	NA	NA	NA	NA
2-Chloronaphthalene	52 U	220 U	52 U	50 U	NA	NA	NA	NA	NA
2-Chlorophenol	56 U	230 U	56 U	54 U	NA	NA	NA	NA	NA
2-Methylnaphthalene	52 U	220 U	52 U	50 U	NA	NA	NA	NA	NA
2-Methylphenol	49 U	210 U	50 U	48 U	NA	NA	NA	NA	NA
2-Nitroaniline	49 U	210 U	50 U	48 U	NA	NA	NA	NA	NA
2-Nitrophenol	49 U	210 U	50 U	48 U	NA	NA	NA	NA	NA
3,3'-Dichlorobenzidine	42 U	180 U	42 U	41 U	NA	NA	NA	NA	NA
3-Nitroaniline	150 U	630 U	150 U	150 U	NA	NA	NA	NA	NA
4,6-Dinitro-2-methylphenol	170 U	720 U	170 U	170 U	NA	NA	NA	NA	NA
4-Bromophenyl phenyl ether	66 U	280 U	66 U	64 U	NA	NA	NA	NA	NA
4-Chloro-3-methylphenol	55 U	230 U	55 U	53 U	NA	NA	NA	NA	NA
4-Chloroaniline	55 U	230 U	55 U	53 U	NA	NA	NA	NA	NA
4-Chlorophenyl phenyl ether	56 U	230 U	56 U	54 U	NA	NA	NA	NA	NA
4-Methylphenol	51 U	210 U	51 U	49 U	NA	NA	NA	NA	NA
4-Nitroaniline	73 U	310 U	74 U	71 U	NA	NA	NA	NA	NA
4-Nitrophenol	200 U	860 U	210 U	200 U	NA	NA	NA	NA	NA
Acenaphthene	55 U	1100 J	55 U	53 U	NA	NA	NA	NA	NA
Acenaphthylene	51 U	210 U	51 U	49 U	NA	NA	NA	NA	NA
Anthracene	53 U	1500	53 U	51 U	NA	NA	NA	NA	NA
Benzo(a)anthracene	59 U	3600	60 U	57 U	NA	NA	NA	NA	NA
Benzo(a)pyrene	64 U	3300	65 U	63 U	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	62 U	4400	63 U	61 U	NA	NA	NA	NA	NA
Benzo(ghi)perylene	59 U	1600	60 U	57 U	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	57 U	2000	58 U	55 U	NA	NA	NA	NA	NA
Butyl benzyl phthalate	55 U	230 U	55 U	53 U	NA	NA	NA	NA	NA
Carbazole	56 U	930 J	56 U	54 U	NA	NA	NA	NA	NA
Chrysene	49 U	3900	50 U	48 U	NA	NA	NA	NA	NA
Di-n-butyl phthalate	160 U	680 U	160 U	160 U	NA	NA	NA	NA	NA
Di-n-octyl phthalate	58 U	240 U	59 U	56 U	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	55 U	570 J	55 U	53 U	NA	NA	NA	NA	NA
Dibenzofuran	54 U	710 J	54 U	52 U	NA	NA	NA	NA	NA

APPENDIX F
SURFACE SOIL ANALYTICAL RESUTLS
REMEDIAL INVESTIGATION, CTO-120
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-DP52-00	IR84-DP53-00	IR84-DP54-00	IR84-DP55-00	IR84-DP63-00	IR84-DP65-00	IR84-DP69-00	IR84-DP69-00D	IR84-DP71-00
DEPTH (feet bgs)	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
SAMPLE DATE	07-21-2001	07-21-2001	07-21-2001	07-21-2001	07-22-2001	07-22-2001	07-22-2001	07-22-2001	07-22-2001
SEMIVOLATILES (ug/kg)									
Dibenzothiophene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Diethyl phthalate	160 U	680 U	160 U	160 U	NA	NA	NA	NA	NA
Dimethyl phthalate	170 U	720 U	170 U	170 U	NA	NA	NA	NA	NA
Fluoranthene	60 U	8400	61 U	59 U	NA	NA	NA	NA	NA
Fluorene	52 U	960 J	52 U	50 U	NA	NA	NA	NA	NA
Hexachlorobenzene	60 U	250 U	61 U	59 U	NA	NA	NA	NA	NA
Hexachlorobutadiene	48 U	200 U	49 U	47 U	NA	NA	NA	NA	NA
Hexachlorocyclopentadiene	64 U	270 U	65 U	63 U	NA	NA	NA	NA	NA
Hexachloroethane	52 U	220 U	52 U	50 U	NA	NA	NA	NA	NA
Indeno(1.2.3-cd)pyrene	75 U	1600	76 U	73 U	NA	NA	NA	NA	NA
Isophorone	47 U	200 U	48 U	46 U	NA	NA	NA	NA	NA
N-Nitrosodi-n-propylamine	47 U	200 U	48 U	46 U	NA	NA	NA	NA	NA
N-Nitrosodiphenylamine	53 U	220 U	53 U	51 U	NA	NA	NA	NA	NA
Naphthalene	53 U	300 J	53 U	51 U	NA	NA	NA	NA	NA
Nitrobenzene	49 U	210 U	50 U	48 U	NA	NA	NA	NA	NA
Pentachlorophenol	130 U	540 U	130 U	130 U	NA	NA	NA	NA	NA
Phenanthrene	56 U	7100	56 U	54 U	NA	NA	NA	NA	NA
Phenol	53 U	220 U	53 U	51 U	NA	NA	NA	NA	NA
Pyrene	55 U	8100 J	55 U	53 U	NA	NA	NA	NA	NA
bis(2-Chloroethoxy)methane	51 U	210 U	51 U	49 U	NA	NA	NA	NA	NA
bis(2-Chloroethyl) ether	55 U	230 U	55 U	53 U	NA	NA	NA	NA	NA
bis(2-Ethylhexyl) phthalate	58 U	240 U	59 U	56 U	NA	NA	NA	NA	NA

APPENDIX F
SURFACE SOIL ANALYTICAL RESUTLS
REMEDIAL INVESTIGATION, CTO-120
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-DP52-00	IR84-DP53-00	IR84-DP54-00	IR84-DP55-00	IR84-DP63-00	IR84-DP65-00	IR84-DP69-00	IR84-DP69-00D	IR84-DP71-00
DEPTH (feet bgs)	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
SAMPLE DATE	07-21-2001	07-21-2001	07-21-2001	07-21-2001	07-22-2001	07-22-2001	07-22-2001	07-22-2001	07-22-2001
PESTICIDES/PCBs (ug/kg)									
4,4'-DDD	4.2 U	890 U	0.86 U	0.83 U	NA	NA	NA	NA	NA
4,4'-DDE	9.7	640 U	5.8	3.1	NA	NA	NA	NA	NA
4,4'-DDT	54 J	1500 U	7.8	1.9	NA	NA	NA	NA	NA
Aldrin	3 U	620 U	0.6 U	0.57 U	NA	NA	NA	NA	NA
Dieldrin	8.1 U	1700 U	3.5 J	4.2	NA	NA	NA	NA	NA
Endosulfan I	3.6 U	760 U	0.73 U	0.7 U	NA	NA	NA	NA	NA
Endosulfan II	2 U	430 U	0.41 U	0.4 U	NA	NA	NA	NA	NA
Endosulfan sulfate	1.5 U	320 U	0.3 U	0.29 U	NA	NA	NA	NA	NA
Endrin	3.3 U	690 U	0.66 U	0.64 U	NA	NA	NA	NA	NA
Endrin aldehyde	8.3 J	1700 U	1.6 U	1.6 U	NA	NA	NA	NA	NA
Endrin ketone	1.4 U	290 U	0.28 U	0.27 U	NA	NA	NA	NA	NA
Heptachlor	3.3 U	4400	1.7 J	1.5 J	NA	NA	NA	NA	NA
Heptachlor epoxide	3.5 U	1500 J	0.72 U	0.69 U	NA	NA	NA	NA	NA
Methoxychlor	16 J	920 U	1.9 J	0.86 U	NA	NA	NA	NA	NA
PCB-1016	57 U	3000 U	5.8 U	550 U	620 U	590 U	17 U	17 U	210 U
PCB-1221	200 U	11000 U	21 U	2000 U	2200 U	2100 U	63 U	61 U	740 U
PCB-1232	120 U	6200 U	12 U	1100 U	1300 U	1200 U	36 U	36 U	430 U
PCB-1242	190 U	10000 U	20 U	1900 U	2100 U	2000 U	59 U	58 U	700 U
PCB-1248	49 U	2600 U	5 U	480 U	540 U	520 U	15 U	15 U	180 U
PCB-1254	210 U	51000	22 U	2100 U	2300 U	2200 U	66 U	65 U	770 U
PCB-1260	980	4200 U	20 J	770 U	18000	13000	99 J	190	7800
Toxaphene	37 U	7800 U	7.5 U	7.2 U	NA	NA	NA	NA	NA
alpha-BHC	2.5 U	520 U	0.5 U	0.48 U	NA	NA	NA	NA	NA
alpha-Chlordane	3.2 U	18000 J	6.9 J	0.62 U	NA	NA	NA	NA	NA
beta-BHC	2.5 U	520 U	0.5 U	0.48 U	NA	NA	NA	NA	NA
delta-BHC	2.6 U	540 U	0.52 U	0.5 U	NA	NA	NA	NA	NA
gamma-BHC (Lindane)	3.1 U	640 U	0.62 U	0.6 U	NA	NA	NA	NA	NA
gamma-Chlordane	3.1 U	22000	7.6	0.6 U	NA	NA	NA	NA	NA
HERBICIDES (ug/kg)									
2,4,5-T	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-D	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-DB	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dalapon	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dicamba	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dichlorprop	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dinoseb	NA	NA	NA	NA	NA	NA	NA	NA	NA
MCPA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MCPP	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pentachlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silvex	NA	NA	NA	NA	NA	NA	NA	NA	NA

APPENDIX F
SURFACE SOIL ANALYTICAL RESUTLS
REMEDIAL INVESTIGATION, CTO-120
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-DP52-00	IR84-DP53-00	IR84-DP54-00	IR84-DP55-00	IR84-DP63-00	IR84-DP65-00	IR84-DP69-00	IR84-DP69-00D	IR84-DP71-00
DEPTH (feet bgs)	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
SAMPLE DATE	07-21-2001	07-21-2001	07-21-2001	07-21-2001	07-22-2001	07-22-2001	07-22-2001	07-22-2001	07-22-2001
METALS (mg/kg)									
Aluminum	1270	1770	4340	3340	NA	NA	NA	NA	NA
Antimony	0.53 U	1.7 J	0.53 U	0.76 J	NA	NA	NA	NA	NA
Arsenic	0.33 J	0.97 J	0.47 J	0.89 J	NA	NA	NA	NA	NA
Barium	8.4 J	15.2 J	6.5 J	11.4 J	NA	NA	NA	NA	NA
Beryllium	0.049 U	0.052 U	0.05 U	0.048 U	NA	NA	NA	NA	NA
Cadmium	0.078 J	0.57	0.047 U	0.045 U	NA	NA	NA	NA	NA
Calcium	15200 J	6080 J	291 J	1040 J	NA	NA	NA	NA	NA
Chromium	2.1	5.2	4.4	4	NA	NA	NA	NA	NA
Cobalt	0.22 J	0.38 J	0.2 J	0.26 J	NA	NA	NA	NA	NA
Copper	2.2 J	13.5	1.1 J	3	NA	NA	NA	NA	NA
Iron	992	1740	1630	2000	NA	NA	NA	NA	NA
Lead	11.9	29.5	4.7	11.8	NA	NA	NA	NA	NA
Magnesium	236 J	211 J	116 J	100 J	NA	NA	NA	NA	NA
Manganese	15.8	13.8	4.2	11.3	NA	NA	NA	NA	NA
Mercury	0.016 J	0.039 J	0.01 J	0.013 J	NA	NA	NA	NA	NA
Nickel	1.2 J	1.4 J	1 J	1.1 J	NA	NA	NA	NA	NA
Potassium	76.5 J	73.9 U	97.6 U	89 U	NA	NA	NA	NA	NA
Selenium	0.33 U	0.35 U	0.34 U	0.32 U	NA	NA	NA	NA	NA
Silver	0.16 U	0.17 U	0.16 U	0.16 U	NA	NA	NA	NA	NA
Sodium	53.7 U	56.4 U	54.3 U	52.3 U	NA	NA	NA	NA	NA
Thallium	0.54 U	0.56 U	0.54 U	0.52 U	NA	NA	NA	NA	NA
Vanadium	2.4 J	3.4 J	5.5	5.2	NA	NA	NA	NA	NA
Zinc	13.5 J	72 J	3.4 J	8.5 J	NA	NA	NA	NA	NA
TOTAL PETROLEUM HYDROCARBON									
TPH (as Diesel) (mg/kg)	49	220	7 J	12	NA	NA	NA	NA	NA
TPH (as Gasoline) (ug/kg)	18 U	19 U	18 U	18 U	NA	NA	NA	NA	NA
CONVENTIONAL									
Cyanide, Total (mg/kg)	0.18 U	0.19 U	0.18 U	0.18 U	NA	NA	NA	NA	NA
Percent Solids (%)	93.1	88.7	92.1	95.7	85.8	89.3	30.3	30.9	51.7
Total Organic Carbon (mg/kg)	NA	NA	NA	NA	NA	NA	NA	NA	NA

NOTES:
J = Value is estimated
U = Not detected at detection limit
ug/kg = microgram per kilogram
mg/kg = milligram per kilogram
BG = sample was diluted due to matrix interfe

APPENDIX F
SURFACE SOIL ANALYTICAL RESUTLS
REMEDIAL INVESTIGATION, CTO-120
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-DP74-00	IR84-DP75-00	IR84-DP76-00	IR84-DP77-00	IR84-DP78-00	IR84-DP79-00	IR84-DP80-00	IR84-DP81-00	IR84-DP82-00
DEPTH (feet bgs)	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
SAMPLE DATE	08-02-2001	08-02-2001	08-02-2001	08-05-2001	08-05-2001	08-05-2001	08-05-2001	08-05-2001	08-05-2001
VOLATILES (ug/kg)									
1,1,1-Trichloroethane	1 U	0.97 U	1 U	1 U	0.9 U	1 U	1 U	1.1 U	14 U
1,1,2,2-Tetrachloroethane	2 U	1.9 U	2 U	2 U	1.8 U	2 U	1.9 U	2.1 U	15 U
1,1,2-Trichloroethane	1.3 U	1.3 U	1.3 U	1.3 U	1.2 U	1.4 U	1.3 U	1.4 U	22 U
1,1-Dichloroethane	0.65 U	0.61 U	0.64 U	0.65 U	0.57 U	0.66 U	0.63 U	0.67 U	19 U
1,1-Dichloroethene	1.3 U	1.3 U	1.3 U	1.3 U	1.2 U	1.4 U	1.3 U	1.4 U	24 U
1,2-Dichloroethane	0.82 U	0.77 U	0.8 U	0.82 U	0.72 U	0.83 U	0.79 U	0.84 U	15 U
1,2-Dichloroethene (total)	1.6 U	1.5 U	1.5 U	1.6 U	1.4 U	1.6 U	1.5 U	1.6 U	40 U
1,2-Dichloropropane	0.84 U	0.79 U	0.82 U	0.84 U	0.74 U	0.85 U	0.81 U	0.86 U	13 U
2-Butanone	3 U	2.9 U	3 U	3 U	2.7 U	3.1 U	2.9 U	3.1 U	110 U
2-Hexanone	1.9 U	1.8 U	1.9 U	1.9 U	1.7 U	1.9 U	1.8 U	2 U	42 U
4-Methyl-2-pentanone	2.1 U	2 U	2.1 U	2.1 U	1.9 U	2.2 U	2.1 U	2.2 U	40 U
Acetone	2.4 U	2.2 U	2.3 U	2.4 U	2.1 U	2.4 U	2.3 U	2.4 U	1400 U
Benzene	0.73 U	0.69 U	0.71 U	0.73 U	0.64 U	0.74 U	0.7 U	0.75 U	24 U
Bromodichloromethane	1.3 U	1.3 U	1.3 U	1.3 U	1.2 U	1.4 U	1.3 U	1.4 U	14 U
Bromoform	1.8 U	1.7 U	1.8 U	1.8 U	1.6 U	1.8 U	1.7 U	1.8 U	22 U
Bromomethane	2 U	1.9 U	2 U	2 U	1.8 U	2 U	1.9 U	2.1 U	36 U
Carbon disulfide	0.88 U	0.83 U	0.86 U	0.88 U	0.77 U	0.89 U	0.84 U	0.9 U	49 U
Carbon tetrachloride	1.1 U	1.1 U	1.1 U	1.1 U	0.98 U	1.1 U	1.1 U	1.1 U	14 U
Chlorobenzene	0.58 U	0.55 U	0.57 U	0.58 U	0.51 U	0.59 U	0.56 U	0.6 U	11 U
Chloroethane	2.5 U	2.3 U	2.4 U	2.5 U	2.2 U	2.5 U	2.4 U	2.5 U	51 U
Chloroform	0.92 U	0.87 U	0.9 U	0.92 U	0.81 U	0.93 U	0.89 U	0.94 U	14 U
Chloromethane	1.5 U	1.4 U	1.4 U	1.5 U	1.3 U	1.5 U	1.4 U	1.5 U	21 U
Dibromochloromethane	1.2 U	1.2 U	1.2 U	1.2 U	1.1 U	1.2 U	1.2 U	1.3 U	18 U
Ethylbenzene	0.66 U	0.63 U	0.65 U	0.66 U	0.58 U	0.67 U	0.64 U	0.68 U	330 J
Isopropyl ether	0.99 U	0.93 U	0.96 U	0.99 U	0.87 U	1 U	0.95 U	1 U	64 U
Methyl tert-butyl ether	0.94 U	0.89 U	0.92 U	0.94 U	0.83 U	0.95 U	0.91 U	0.97 U	15 U
Methylene chloride	1.5 U	1.4 U	1.4 U	1.5 U	1.3 U	1.5 U	1.4 U	1.5 U	57 U
Styrene	0.56 U	0.53 U	0.55 U	0.56 U	0.49 U	0.57 U	0.54 U	0.57 U	24 U
Tetrachloroethene	1.3 U	1.3 U	1.3 U	1.3 U	1.2 U	1.4 U	1.3 U	1.4 U	21 U
Toluene	0.59 U	0.56 U	0.58 U	0.6 U	0.52 U	0.6 U	0.57 U	0.61 U	14 U
Trichloroethene	0.85 U	0.81 U	0.83 U	0.85 U	0.75 U	0.86 U	0.82 U	0.87 U	24 U
Vinyl chloride	1.6 U	1.5 U	1.5 U	1.6 U	1.4 U	1.6 U	1.5 U	1.6 U	15 U
Xylenes (total)	2.1 U	2 U	2.1 U	2.1 U	1.9 U	2.2 U	2.1 U	2.2 U	120 J
cis-1,3-Dichloropropene	0.72 U	0.68 U	0.7 U	0.72 U	0.63 U	0.73 U	0.69 U	0.74 U	17 U
trans-1,3-Dichloropropene	0.97 U	0.91 U	0.94 U	0.97 U	0.85 U	0.98 U	0.93 U	0.99 U	15 U

APPENDIX F
SURFACE SOIL ANALYTICAL RESUTLS
REMEDIAL INVESTIGATION, CTO-120
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-DP74-00	IR84-DP75-00	IR84-DP76-00	IR84-DP77-00	IR84-DP78-00	IR84-DP79-00	IR84-DP80-00	IR84-DP81-00	IR84-DP82-00
DEPTH (feet bgs)	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
SAMPLE DATE	08-02-2001	08-02-2001	08-02-2001	08-05-2001	08-05-2001	08-05-2001	08-05-2001	08-05-2001	08-05-2001
SEMIVOLATILES (ug/kg)									
1,2,4-Trichlorobenzene	54 U	55 U	55 U	53 U	52 U	52 U	52 U	54 U	560 U
1,2-Dichlorobenzene	52 U	52 U	53 U	51 U	50 U	50 U	50 U	52 U	540 U
1,3-Dichlorobenzene	55 U	56 U	57 U	54 U	53 U	53 U	53 U	55 U	570 U
1,4-Dichlorobenzene	55 U	56 U	57 U	54 U	53 U	53 U	53 U	55 U	570 U
2,2'-Oxybis(1-Chloropropane)	57 U	58 U	59 U	56 U	56 U	55 U	55 U	57 U	600 U
2,4,5-Trichlorophenol	61 U	61 U	62 U	59 U	59 U	58 U	58 U	61 U	630 U
2,4,6-Trichlorophenol	69 U	70 U	71 U	68 U	67 U	67 U	67 U	70 U	720 U
2,4-Dichlorophenol	55 U	56 U	57 U	54 U	53 U	53 U	53 U	55 U	570 U
2,4-Dimethylphenol	88 U	89 U	90 U	86 U	86 U	85 U	85 U	88 U	920 U
2,4-Dinitrophenol	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	1300 U
2,4-Dinitrotoluene	51 U	51 U	52 U	50 U	49 U	49 U	49 U	51 U	530 U
2,6-Dinitrotoluene	53 U	54 U	54 U	52 U	51 U	51 U	51 U	53 U	550 U
2-Chloronaphthalene	53 U	54 U	54 U	52 U	51 U	51 U	51 U	53 U	550 U
2-Chlorophenol	57 U	58 U	59 U	56 U	56 U	55 U	55 U	57 U	600 U
2-Methylnaphthalene	53 U	54 U	54 U	52 U	51 U	51 U	51 U	53 U	550 U
2-Methylphenol	51 U	51 U	52 U	50 U	49 U	49 U	49 U	51 U	530 U
2-Nitroaniline	51 U	51 U	52 U	50 U	49 U	49 U	49 U	51 U	530 U
2-Nitrophenol	51 U	51 U	52 U	50 U	49 U	49 U	49 U	51 U	530 U
3,3'-Dichlorobenzidine	43 U	43 U	44 U	42 U	42 U	41 U	41 U	43 U	450 U
3-Nitroaniline	150 U	160 U	160 U	150 U	150 U	150 U	150 U	150 U	1600 U
4,6-Dinitro-2-methylphenol	180 U	180 U	180 U	170 U	170 U	170 U	170 U	180 U	1800 U
4-Bromophenyl phenyl ether	67 U	68 U	69 U	66 U	65 U	65 U	65 U	67 U	700 U
4-Chloro-3-methylphenol	56 U	57 U	58 U	55 U	55 U	54 U	54 U	56 U	590 U
4-Chloroaniline	56 U	57 U	58 U	55 U	55 U	54 U	54 U	56 U	590 U
4-Chlorophenyl phenyl ether	57 U	58 U	59 U	56 U	56 U	55 U	55 U	57 U	600 U
4-Methylphenol	52 U	52 U	53 U	51 U	50 U	50 U	50 U	52 U	540 U
4-Nitroaniline	75 U	76 U	77 U	73 U	73 U	72 U	72 U	75 U	780 U
4-Nitrophenol	210 U	210 U	210 U	210 U	200 U	200 U	200 U	210 U	2200 U
Acenaphthene	56 U	57 U	58 U	55 U	55 U	54 U	54 U	56 U	590 U
Acenaphthylene	52 U	52 U	53 U	51 U	50 U	50 U	50 U	52 U	540 U
Anthracene	54 U	55 U	55 U	53 U	52 U	52 U	52 U	54 U	560 U
Benzo(a)anthracene	61 U	61 U	62 U	59 U	59 U	58 U	58 U	61 U	630 U
Benzo(a)pyrene	66 U	67 U	68 U	65 U	64 U	64 U	64 U	66 U	690 U
Benzo(b)fluoranthene	64 U	65 U	66 U	63 U	62 U	62 U	61 U	64 U	670 U
Benzo(ghi)perylene	61 U	61 U	62 U	59 U	59 U	58 U	58 U	61 U	630 U
Benzo(k)fluoranthene	58 U	59 U	60 U	57 U	57 U	56 U	56 U	59 U	610 U
Butyl benzyl phthalate	56 U	57 U	58 U	55 U	55 U	54 U	54 U	56 U	590 U
Carbazole	57 U	58 U	59 U	56 U	56 U	55 U	55 U	57 U	600 U
Chrysene	51 U	51 U	52 U	50 U	49 U	49 U	49 U	51 U	530 U
Di-n-butyl phthalate	170 U	170 U	170 U	160 U	160 U	160 U	160 U	170 U	1700 U
Di-n-octyl phthalate	59 U	60 U	61 U	58 U	58 U	57 U	57 U	60 U	620 U
Dibenz(a,h)anthracene	56 U	57 U	58 U	55 U	55 U	54 U	54 U	56 U	590 U
Dibenzofuran	55 U	56 U	57 U	54 U	53 U	53 U	53 U	55 U	570 U

APPENDIX F
SURFACE SOIL ANALYTICAL RESUTLS
REMEDIAL INVESTIGATION, CTO-120
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-DP74-00	IR84-DP75-00	IR84-DP76-00	IR84-DP77-00	IR84-DP78-00	IR84-DP79-00	IR84-DP80-00	IR84-DP81-00	IR84-DP82-00
DEPTH (feet bgs)	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
SAMPLE DATE	08-02-2001	08-02-2001	08-02-2001	08-05-2001	08-05-2001	08-05-2001	08-05-2001	08-05-2001	08-05-2001
SEMIVOLATILES (ug/kg)									
Dibenzothiophene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Diethyl phthalate	170 U	170 U	170 U	160 U	160 U	160 U	160 U	170 U	1700 U
Dimethyl phthalate	180 U	180 U	180 U	170 U	170 U	170 U	170 U	180 U	1800 U
Fluoranthene	62 U	62 U	63 U	60 U	60 U	59 U	59 U	62 U	640 U
Fluorene	53 U	54 U	54 U	52 U	51 U	51 U	51 U	53 U	580 J
Hexachlorobenzene	62 U	62 U	63 U	60 U	60 U	59 U	59 U	62 U	640 U
Hexachlorobutadiene	50 U	50 U	51 U	49 U	48 U	48 U	48 U	50 U	520 U
Hexachlorocyclopentadiene	66 U	67 U	68 U	65 U	64 U	64 U	64 U	66 U	690 U
Hexachloroethane	53 U	54 U	54 U	52 U	51 U	51 U	51 U	53 U	550 U
Indeno(1,2,3-cd)pyrene	77 U	78 U	79 U	76 U	75 U	74 U	74 U	77 U	800 U
Isophorone	48 U	49 U	50 U	48 U	47 U	47 U	47 U	49 U	510 U
N-Nitrosodi-n-propylamine	48 U	49 U	50 U	48 U	47 U	47 U	47 U	49 U	510 U
N-Nitrosodiphenylamine	54 U	55 U	55 U	53 U	52 U	52 U	52 U	54 U	560 U
Naphthalene	54 U	55 U	55 U	53 U	52 U	52 U	52 U	54 U	560 U
Nitrobenzene	51 U	51 U	52 U	50 U	49 U	49 U	49 U	51 U	530 U
Pentachlorophenol	130 U	130 U	140 U	130 U	130 U	130 U	130 U	130 U	1400 U
Phenanthrene	57 U	58 U	59 U	56 U	56 U	55 U	55 U	57 U	910 J
Phenol	54 U	55 U	55 U	53 U	52 U	52 U	52 U	54 U	560 U
Pyrene	56 U	57 U	58 U	55 U	55 U	54 U	54 U	56 U	590 U
bis(2-Chloroethoxy)methane	52 U	52 U	53 U	51 U	50 U	50 U	50 U	52 U	540 U
bis(2-Chloroethyl) ether	56 U	57 U	58 U	55 U	55 U	54 U	54 U	56 U	590 U
bis(2-Ethylhexyl) phthalate	59 U	60 U	61 U	58 U	58 U	57 U	57 U	60 U	620 U

APPENDIX F
SURFACE SOIL ANALYTICAL RESUTLS
REMEDIAL INVESTIGATION, CTO-120
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-DP74-00	IR84-DP75-00	IR84-DP76-00	IR84-DP77-00	IR84-DP78-00	IR84-DP79-00	IR84-DP80-00	IR84-DP81-00	IR84-DP82-00
DEPTH (feet bgs)	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
SAMPLE DATE	08-02-2001	08-02-2001	08-02-2001	08-05-2001	08-05-2001	08-05-2001	08-05-2001	08-05-2001	08-05-2001
PESTICIDES/PCBs (ug/kg)									
4,4'-DDD	0.87 U	0.88 U	0.89 U	4.3 R	0.84 U	0.84 U	0.84 U	3.6 J	32 J
4,4'-DDE	0.63 U	0.64 U	0.64 U	3.1 R	0.61 U	0.61 U	0.6 U	0.63 U	6.5 U
4,4'-DDT	1.4 U	1.4 U	1.5 U	7 R	1.4 U	1.4 U	1.4 U	1.4 U	15 U
Aldrin	0.61 U	0.61 U	0.62 U	3 R	0.59 U	0.58 U	0.58 U	0.61 U	6.3 U
Dieldrin	1.7 U	1.7 U	1.7 U	8.1 R	1.6 U	1.6 U	1.6 U	1.7 U	52
Endosulfan I	0.74 U	0.75 U	0.76 U	3.6 R	0.72 U	0.71 U	0.71 U	0.74 U	7.7 U
Endosulfan II	0.42 U	0.42 U	0.43 U	2.1 R	0.41 U	0.4 U	0.4 U	0.42 U	4.4 U
Endosulfan sulfate	0.31 U	0.31 U	0.32 U	8.4 J	0.3 U	0.3 U	0.3 U	3.2	40 J
Endrin	0.67 U	0.68 U	0.69 U	3.3 R	0.65 U	0.65 U	0.65 U	0.67 U	7 U
Endrin aldehyde	1.7 U	1.7 U	1.7 U	14 J	1.6 U	1.6 U	1.6 U	4.5 J	61 J
Endrin ketone	0.29 U	0.29 U	0.29 U	17 J	0.28 U	1.7 J	0.28 U	26 J	3 U
Heptachlor	0.67 U	0.68 U	0.69 U	3.3 R	0.65 U	0.65 U	0.65 U	0.67 U	7 U
Heptachlor epoxide	0.73 U	4.3	0.75 U	3.6 R	0.71 U	0.7 U	0.7 U	0.73 U	7.6 U
Methoxychlor	0.9 U	0.91 U	0.93 U	22 J	0.88 U	0.87 U	0.87 U	8.7 J	79 J
PCB-1016	5.8 U	5.9 U	6 U	29 U	5.7 U	5.6 U	5.6 U	5.9 U	300 U
PCB-1221	21 U	21 U	21 U	100 U	20 U	20 U	20 U	21 U	1100 U
PCB-1232	12 U	12 U	12 U	59 U	12 U	12 U	12 U	12 U	630 U
PCB-1242	20 U	20 U	20 U	97 U	19 U	19 U	19 U	20 U	1000 U
PCB-1248	5.1 U	130	5.2 U	25 U	4.9 U	4.9 U	4.9 U	5.1 U	260 U
PCB-1254	22 U	22 U	23 U	110 U	21 U	21 U	21 U	22 U	1100 U
PCB-1260	8.1 U	8.3 U	8.4 U	1700	7.9 U	42	7.8 U	530	11000
Toxaphene	7.6 U	7.7 U	7.8 U	37 R	7.4 U	7.3 U	7.3 U	7.6 U	79 U
alpha-BHC	0.51 U	0.51 U	0.52 U	2.5 R	0.49 U	0.49 U	0.49 U	0.51 U	21
alpha-Chlordane	0.65 U	2 J	0.67 U	3.2 R	0.63 U	0.63 U	0.63 U	0.65 U	6.8 U
beta-BHC	0.51 U	0.51 U	0.52 U	2.5 R	0.49 U	0.49 U	0.49 U	0.51 U	5.3 U
delta-BHC	0.53 U	0.54 U	0.54 U	2.6 R	0.51 U	0.51 U	0.51 U	0.53 U	5.5 U
gamma-BHC (Lindane)	0.63 U	0.64 U	0.64 U	3.1 R	0.61 U	0.61 U	0.6 U	0.63 U	6.5 U
gamma-Chlordane	0.63 U	3.9	0.64 U	3.1 R	0.61 U	0.61 U	0.6 U	0.63 U	6.5 U
HERBICIDES (ug/kg)									
2,4,5-T	3.4 U	3.5 U	3.5 U	3.3 U	3.3 U	3.3 U	3.3 U	3.4 U	3.6 U
2,4-D	58 U	59 U	60 U	57 U	57 U	56 U	56 U	59 U	61 U
2,4-DB	43 U	43 U	44 U	42 U	42 U	41 U	41 U	43 U	45 U
Dalapon	41 U	41 U	42 U	40 U	40 U	39 U	39 U	41 U	43 U
Dicamba	17 U	17 U	17 U	16 U	16 U	16 U	16 U	17 U	17 U
Dichlorprop	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
Dinoseb	13 U	13 U	14 U	13 U	13 U	13 U	13 U	13 U	14 U
MCPA	2500 U	2600 U	2600 U	2500 U	2500 U	2400 U	2400 U	2500 U	2600 U
MCPP	3000 U	3000 U	3100 U	2900 U	2900 U	2900 U	2900 U	3000 U	3100 U
Pentachlorophenol	11 U	11 U	11 U	10 U	10 U	10 U	10 U	11 U	11 U
Silvex	4.3 U	4.3 U	4.4 U	4.2 U	4.2 U	4.1 U	4.1 U	4.3 U	4.5 U

APPENDIX F
SURFACE SOIL ANALYTICAL RESUTLS
REMEDIAL INVESTIGATION, CTO-120
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-DP74-00	IR84-DP75-00	IR84-DP76-00	IR84-DP77-00	IR84-DP78-00	IR84-DP79-00	IR84-DP80-00	IR84-DP81-00	IR84-DP82-00
DEPTH (feet bgs)	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
SAMPLE DATE	08-02-2001	08-02-2001	08-02-2001	08-05-2001	08-05-2001	08-05-2001	08-05-2001	08-05-2001	08-05-2001
METALS (mg/kg)									
Aluminum	3540	1700	4820	2150	1650	1780	1390	2440	2380
Antimony	0.66 J	0.55 UJ	0.55 UJ	0.53 UJ	0.52 UJ	0.52 UJ	0.52 UJ	1.6 J	1.2 J
Arsenic	1.5	0.79 J	2.5	3.1	0.32 U	0.32 U	0.79 J	2.6	0.98 J
Barium	9.8 U	3.7 U	6.3 U	5.7 J	5.5 J	6.7 J	3 J	9.7 J	16.4 J
Beryllium	0.051 U	0.051 U	0.052 U	0.081 U	0.078 U	0.094 U	0.073 U	0.11 U	0.11 U
Cadmium	0.047 U	0.048 U	0.049 U	0.046 U	0.046 U	0.046 U	0.046 U	0.048 U	0.23 J
Calcium	3160 J	358 J	628 J	3920	634	204 J	109 J	461 J	17900
Chromium	4.8	2.6	7.5	2.8	1.7	1.8	2.5	3.2	4.6
Cobalt	0.41 J	0.17 U	0.33 J	0.2 J	0.18 J	0.16 U	0.24 J	0.22 J	0.36 J
Copper	6.8	1 J	0.65 J	1.6 J	0.35 J	0.41 J	0.35 J	1.9 J	8.4
Iron	2170	1270	2620	1710	950	1160	1490	1910	2270
Lead	13.7 J	5 J	4.3 J	7	1.8	2	2.1	61.4	65.4
Magnesium	232 J	56.6 J	174 J	114 J	52.9 J	47.3 J	53.5 J	71.7 J	347 J
Manganese	10.4	3.3	3.8	8	7.7	6.6	2.7	13.2	11.1
Mercury	0.2	0.0094 U	0.015 J	0.019 J	0.009 U	0.0089 U	0.0089 U	0.0093 U	0.17
Nickel	2.4 J	0.63 J	0.72 J	0.76 J	0.54 J	0.46 J	0.52 J	0.73 J	1.7 J
Potassium	72.5 J	76.8 J	258 J	62 U	38.5 U	34.8 U	51.1 U	53.3 U	86 J
Selenium	0.61	0.35 U	0.35 U	0.33 U	0.33 U	0.33 U	0.33 U	0.34 U	0.36 U
Silver	0.17 U	0.17 U	0.17 U	0.16 U	0.16 U	0.16 U	0.16 U	0.17 U	0.17 U
Sodium	55 U	55.8 U	56.5 U	54 U	53.5 U	53.1 U	53 U	55.2 U	57.5 U
Thallium	0.55 U	0.56 U	0.57 U	0.54 U	0.53 U	0.53 U	0.53 U	0.55 U	0.57 U
Vanadium	5.1 J	4.2 J	10.4	4.6 J	2.5 J	2.8 J	4 J	4.4 J	5.2 J
Zinc	9	2.5	1.9 J	6.2 J	1.5 J	1.8 J	1.3 J	19.4 J	40.7 J
TOTAL PETROLEUM HYDROCARBON									
TPH (as Diesel) (mg/kg)	NA	NA	NA	NA	NA	NA	NA	NA	NA
TPH (as Gasoline) (ug/kg)	NA	NA	NA	NA	NA	NA	NA	NA	NA
CONVENTIONAL									
Cyanide, Total (mg/kg)	NA	NA	NA	NA	NA	NA	NA	NA	NA
Percent Solids (%)	90.9	89.7	88.5	92.6	93.5	94.2	94.3	90.5	87
Total Organic Carbon (mg/kg)	NA	NA	NA	NA	NA	NA	NA	NA	NA

NOTES:
J = Value is estimated
U = Not detected at detection limit
ug/kg = microgram per kilogram
mg/kg = milligram per kilogram
BG = sample was diluted due to matrix interfe

APPENDIX F
SURFACE SOIL ANALYTICAL RESUTLS
REMEDIAL INVESTIGATION, CTO-120
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-DP83-00	IR84-DP84-00	84-SB01A	84-SB02A	84-SB03A	84-SB04A	84-SB05A	84-SB06A	84-SB07A	84-SB08A	84-SB09A
DEPTH (feet bgs)	0 - 1	0 - 1	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5
SAMPLE DATE	08-05-2001	08-03-2001	10-26-1995	10-26-1995	10-26-1995	10-26-1995	10-26-1995	10-26-1995	10-26-1995	10-26-1995	10-26-1995
VOLATILES (ug/kg)											
1,1,1-Trichloroethane	0.95 U	2.3 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	1.9 U	4.5 UJ	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	1.2 U	3 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethane	0.6 U	1.4 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethene	1.2 U	3 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	0.75 U	1.8 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethene (total)	1.4 U	3.5 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	0.78 U	1.9 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone	2.8 U	50 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	1.8 U	4.2 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Methyl-2-pentanone	2 U	4.7 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	2.2 U	87 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	0.67 U	1.6 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane	1.2 U	3 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromoform	1.7 U	4 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromomethane	1.9 U	4.5 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	0.81 U	1.9 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon tetrachloride	1 U	2.5 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chlorobenzene	0.54 U	1.3 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroethane	2.3 U	5.5 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroform	0.85 U	2 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloromethane	1.3 U	3.2 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	1.1 U	2.7 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	0.61 U	1.5 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isopropyl ether	0.91 U	2.2 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl tert-butyl ether	0.87 U	2.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	1.3 U	3.2 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	0.52 U	1.2 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	1.2 U	3 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	0.55 U	12 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	0.79 U	1.9 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	1.4 U	3.5 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Xylenes (total)	2 U	8.7 J	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene	0.66 U	1.6 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,3-Dichloropropene	0.89 U	2.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA

APPENDIX F
SURFACE SOIL ANALYTICAL RESUTLS
REMEDIAL INVESTIGATION, CTO-120
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-DP83-00	IR84-DP84-00	84-SB01A	84-SB02A	84-SB03A	84-SB04A	84-SB05A	84-SB06A	84-SB07A	84-SB08A	84-SB09A
DEPTH (feet bgs)	0 - 1	0 - 1	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5
SAMPLE DATE	08-05-2001	08-03-2001	10-26-1995	10-26-1995	10-26-1995	10-26-1995	10-26-1995	10-26-1995	10-26-1995	10-26-1995	10-26-1995
SEMIVOLATILES (ug/kg)											
1,2,4-Trichlorobenzene	53 U	1400 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	51 U	1300 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3-Dichlorobenzene	54 U	1400 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	54 U	1400 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,2'-Oxybis(1-Chloropropane)	57 U	1400 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4,5-Trichlorophenol	60 U	1500 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4,6-Trichlorophenol	69 U	1800 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dichlorophenol	54 U	1400 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	87 U	2200 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrophenol	120 U	3100 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	50 U	1300 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,6-Dinitrotoluene	52 U	1300 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Chloronaphthalene	52 U	1300 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Chlorophenol	57 U	1400 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	52 U	92000	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylphenol	50 U	1300 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Nitroaniline	50 U	1300 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Nitrophenol	50 U	1300 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,3'-Dichlorobenzidine	42 U	1100 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
3-Nitroaniline	150 U	3900 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,6-Dinitro-2-methylphenol	170 U	4500 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Bromophenyl phenyl ether	66 U	1700 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Chloro-3-methylphenol	56 U	1400 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Chloroaniline	56 U	1400 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Chlorophenyl phenyl ether	57 U	1400 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Methylphenol	51 U	1300 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Nitroaniline	74 U	1900 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Nitrophenol	210 U	5300 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	56 U	2800 J	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	51 U	1300 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	53 U	4100 J	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	60 U	1800 J	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	65 U	1700 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	63 U	1600 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(ghi)perylene	60 U	1500 J	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	58 U	1500 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Butyl benzyl phthalate	56 U	1400 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	57 U	1400 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	50 U	2800 J	NA	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-butyl phthalate	160 U	4200 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-octyl phthalate	59 U	1500 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	56 U	1400 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzofuran	54 U	1400 U	NA	NA	NA	NA	NA	NA	NA	NA	NA

APPENDIX F
SURFACE SOIL ANALYTICAL RESUTLS
REMEDIAL INVESTIGATION, CTO-120
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-DP83-00	IR84-DP84-00	84-SB01A	84-SB02A	84-SB03A	84-SB04A	84-SB05A	84-SB06A	84-SB07A	84-SB08A	84-SB09A
DEPTH (feet bgs)	0 - 1	0 - 1	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5
SAMPLE DATE	08-05-2001	08-03-2001	10-26-1995	10-26-1995	10-26-1995	10-26-1995	10-26-1995	10-26-1995	10-26-1995	10-26-1995	10-26-1995
SEMIVOLATILES (ug/kg)											
Dibenzothiophene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Diethyl phthalate	160 U	4200 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dimethyl phthalate	170 U	4500 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	61 U	1700 J	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	52 U	9000 J	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorobenzene	61 U	1600 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorobutadiene	49 U	1300 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorocyclopentadiene	65 U	1700 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachloroethane	52 U	1300 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1.2.3-cd)pyrene	76 U	1900 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isophorone	48 U	1200 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-Nitrosodi-n-propylamine	48 U	1200 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-Nitrosodiphenylamine	53 U	1400 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	53 U	1400 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrobenzene	50 U	1300 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pentachlorophenol	130 U	3300 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	57 U	24000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenol	53 U	1400 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	56 U	16000	NA	NA	NA	NA	NA	NA	NA	NA	NA
bis(2-Chloroethoxy)methane	51 U	1300 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
bis(2-Chloroethyl) ether	56 U	1400 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
bis(2-Ethylhexyl) phthalate	59 U	1500 U	NA	NA	NA	NA	NA	NA	NA	NA	NA

APPENDIX F
SURFACE SOIL ANALYTICAL RESUTLS
REMEDIAL INVESTIGATION, CTO-120
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-DP83-00	IR84-DP84-00	84-SB01A	84-SB02A	84-SB03A	84-SB04A	84-SB05A	84-SB06A	84-SB07A	84-SB08A	84-SB09A
DEPTH (feet bgs)	0 - 1	0 - 1	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5
SAMPLE DATE	08-05-2001	08-03-2001	10-26-1995	10-26-1995	10-26-1995	10-26-1995	10-26-1995	10-26-1995	10-26-1995	10-26-1995	10-26-1995
PESTICIDES/PCBs (ug/kg)											
4,4'-DDD	1.7 U	5.5 R	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDE	1.2 U	4 R	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDT	8.2 J	9.1 R	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aldrin	1.2 U	3.8 R	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dieldrin	3.3 U	10 R	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endosulfan I	1.5 U	4.7 R	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endosulfan II	0.83 U	2.6 R	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endosulfan sulfate	0.61 U	1.9 R	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endrin	1.3 U	4.2 R	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endrin aldehyde	3.3 U	10 R	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endrin ketone	0.57 U	1.8 R	NA	NA	NA	NA	NA	NA	NA	NA	NA
Heptachlor	1.3 U	4.2 R	NA	NA	NA	NA	NA	NA	NA	NA	NA
Heptachlor epoxide	1.4 U	4.6 R	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methoxychlor	1.8 U	5.7 R	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-1016	5.8 U	7.4 U	1900 U	380 U	730 U	1800 U	400 U	170 U	150 U	390 U	1900 U
PCB-1221	21 U	26 U	3800 U	750 U	1500 U	3700 U	800 U	330 U	300 U	790 U	3700 U
PCB-1232	12 U	15 U	1900 U	380 U	730 U	1800 U	400 U	170 U	150 U	390 U	1900 U
PCB-1242	20 U	25 U	1900 U	380 U	730 U	1800 U	400 U	170 U	150 U	390 U	1900 U
PCB-1248	5 U	6.4 U	1900 U	380 U	730 U	1800 U	400 U	170 U	150 U	390 U	1900 U
PCB-1254	22 U	28 U	1900 U	380 U	730 U	1800 U	400 U	170 U	150 U	390 U	1900 U
PCB-1260	58	10 U	12000	4400	5300	6200	5000	1300 J	360	2500	12000
Toxaphene	15 U	48 R	NA	NA	NA	NA	NA	NA	NA	NA	NA
alpha-BHC	1 U	3.2 R	NA	NA	NA	NA	NA	NA	NA	NA	NA
alpha-Chlordane	1.3 U	4.1 R	NA	NA	NA	NA	NA	NA	NA	NA	NA
beta-BHC	1 U	3.2 R	NA	NA	NA	NA	NA	NA	NA	NA	NA
delta-BHC	1 U	3.3 R	NA	NA	NA	NA	NA	NA	NA	NA	NA
gamma-BHC (Lindane)	1.2 U	4 R	NA	NA	NA	NA	NA	NA	NA	NA	NA
gamma-Chlordane	1.2 U	4 R	NA	NA	NA	NA	NA	NA	NA	NA	NA
HERBICIDES (ug/kg)											
2,4,5-T	3.4 U	4.3 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-D	58 U	74 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-DB	42 U	54 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dalapon	40 U	52 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dicamba	16 U	21 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dichlorprop	11 U	14 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dinoseb	13 U	17 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
MCPA	2500 U	3200 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
MCPP	2900 U	3800 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pentachlorophenol	11 U	14 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silvex	4.2 U	5.4 U	NA	NA	NA	NA	NA	NA	NA	NA	NA

APPENDIX F
SURFACE SOIL ANALYTICAL RESUTLS
REMEDIAL INVESTIGATION, CTO-120
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-DP83-00	IR84-DP84-00	84-SB01A	84-SB02A	84-SB03A	84-SB04A	84-SB05A	84-SB06A	84-SB07A	84-SB08A	84-SB09A
DEPTH (feet bgs)	0 - 1	0 - 1	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5
SAMPLE DATE	08-05-2001	08-03-2001	10-26-1995	10-26-1995	10-26-1995	10-26-1995	10-26-1995	10-26-1995	10-26-1995	10-26-1995	10-26-1995
METALS (mg/kg)											
Aluminum	2080	2140	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	0.53 UJ	2 J	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	0.68 J	0.78 J	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	6.5 J	24.6 J	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	0.11 U	0.064 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	0.047 U	0.16 J	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	14500	1510	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	3.2	2.6	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	0.22 J	0.28 J	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	1.3 J	28.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	1620	1990	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	5.7	54.7	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	283 J	156 J	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	15.9	6.6	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	0.0091 U	0.041 J	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	0.94 J	2.6 J	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	86.8 J	75.9 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	0.34 U	0.43 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	0.16 U	0.21 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	54.4 U	69.6 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	0.54 U	0.7 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	3.8 J	4.2 J	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	7.7 J	38.2	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL PETROLEUM HYDROCARBON											
TPH (as Diesel) (mg/kg)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TPH (as Gasoline) (ug/kg)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CONVENTIONAL											
Cyanide, Total (mg/kg)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Percent Solids (%)	91.9	71.8	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon (mg/kg)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

NOTES:
J = Value is estimated
U = Not detected at detection limit
ug/kg = microgram per kilogram
mg/kg = milligram per kilogram
BG = sample was diluted due to matrix interfe

APPENDIX F
SURFACE SOIL ANALYTICAL RESUTLS
REMEDIAL INVESTIGATION, CTO-120
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	84-SB10A	IR84-SB02-00	IR84-SB04-00	IR84-SB08-00	IR84-SB10-00	IR84-SB15-00	IR84-SB21-00	IR84-SB23-00	IR84-SB25-00	IR84-SB26-00
DEPTH (feet bgs)	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5
SAMPLE DATE	10-26-1995	04-16-1998	04-16-1998	04-16-1998	04-16-1998	04-16-1998	04-16-1998	04-16-1998	04-16-1998	04-23-1998
VOLATILES (ug/kg)										
1,1,1-Trichloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethene (total)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Methyl-2-pentanone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromoform	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromomethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon tetrachloride	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroform	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloromethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isopropyl ether	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl tert-butyl ether	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Xylenes (total)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,3-Dichloropropene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

APPENDIX F
SURFACE SOIL ANALYTICAL RESUTLS
REMEDIAL INVESTIGATION, CTO-120
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	84-SB10A	IR84-SB02-00	IR84-SB04-00	IR84-SB08-00	IR84-SB10-00	IR84-SB15-00	IR84-SB21-00	IR84-SB23-00	IR84-SB25-00	IR84-SB26-00
DEPTH (feet bgs)	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5
SAMPLE DATE	10-26-1995	04-16-1998	04-16-1998	04-16-1998	04-16-1998	04-16-1998	04-16-1998	04-16-1998	04-16-1998	04-23-1998
SEMIVOLATILES (ug/kg)										
1,2,4-Trichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3-Dichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,2'-Oxybis(1-Chloropropane)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4,5-Trichlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4,6-Trichlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dichlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,6-Dinitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Chloronaphthalene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Chlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylphenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Nitroaniline	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Nitrophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,3'-Dichlorobenzidine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3-Nitroaniline	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,6-Dinitro-2-methylphenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Bromophenyl phenyl ether	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Chloro-3-methylphenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Chloroaniline	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Chlorophenyl phenyl ether	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Methylphenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Nitroaniline	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Nitrophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(ghi)perylene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Butyl benzyl phthalate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-butyl phthalate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-octyl phthalate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

APPENDIX F
SURFACE SOIL ANALYTICAL RESUTLS
REMEDIAL INVESTIGATION, CTO-120
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	84-SB10A	IR84-SB02-00	IR84-SB04-00	IR84-SB08-00	IR84-SB10-00	IR84-SB15-00	IR84-SB21-00	IR84-SB23-00	IR84-SB25-00	IR84-SB26-00
DEPTH (feet bgs)	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5
SAMPLE DATE	10-26-1995	04-16-1998	04-16-1998	04-16-1998	04-16-1998	04-16-1998	04-16-1998	04-16-1998	04-16-1998	04-23-1998
SEMIVOLATILES (ug/kg)										
Dibenzothiophene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Diethyl phthalate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dimethyl phthalate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorobutadiene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorocyclopentadiene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isophorone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-Nitrosodi-n-propylamine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-Nitrosodiphenylamine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pentachlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
bis(2-Chloroethoxy)methane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
bis(2-Chloroethyl) ether	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
bis(2-Ethylhexyl) phthalate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

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SURFACE SOIL ANALYTICAL RESUTLS
REMEDIAL INVESTIGATION, CTO-120
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	84-SB10A	IR84-SB02-00	IR84-SB04-00	IR84-SB08-00	IR84-SB10-00	IR84-SB15-00	IR84-SB21-00	IR84-SB23-00	IR84-SB25-00	IR84-SB26-00
DEPTH (feet bgs)	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5
SAMPLE DATE	10-26-1995	04-16-1998	04-16-1998	04-16-1998	04-16-1998	04-16-1998	04-16-1998	04-16-1998	04-16-1998	04-23-1998
PESTICIDES/PCBs (ug/kg)										
4,4'-DDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aldrin	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dieldrin	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endosulfan I	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endosulfan II	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endosulfan sulfate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endrin	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endrin aldehyde	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endrin ketone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Heptachlor	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Heptachlor epoxide	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methoxychlor	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-1016	140 U	74 U	390 U	350 U	710 U	390 U	36 U	42 U	44 U	130 U
PCB-1221	280 U	74 U	390 U	350 U	710 U	390 U	36 U	42 U	44 U	130 U
PCB-1232	140 U	74 U	390 U	350 U	710 U	390 U	36 U	42 U	44 U	130 U
PCB-1242	140 U	74 U	390 U	350 U	710 U	390 U	36 U	42 U	44 U	130 U
PCB-1248	140 U	74 U	390 U	350 U	710 U	390 U	36 U	42 U	44 U	130 U
PCB-1254	140 U	74 U	390 U	350 U	710 U	390 U	36 U	42 U	44 U	130 U
PCB-1260	1100	1000	3900	4300	8100	6800	36 U	42 U	110 J	1500 J
Toxaphene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
alpha-BHC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
alpha-Chlordane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
beta-BHC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
delta-BHC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
gamma-BHC (Lindane)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
gamma-Chlordane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HERBICIDES (ug/kg)										
2,4,5-T	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-D	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-DB	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dalapon	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dicamba	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dichlorprop	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dinoseb	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MCPA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MCPP	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pentachlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silvex	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

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SURFACE SOIL ANALYTICAL RESUTLS
REMEDIAL INVESTIGATION, CTO-120
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	84-SB10A	IR84-SB02-00	IR84-SB04-00	IR84-SB08-00	IR84-SB10-00	IR84-SB15-00	IR84-SB21-00	IR84-SB23-00	IR84-SB25-00	IR84-SB26-00
DEPTH (feet bgs)	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5
SAMPLE DATE	10-26-1995	04-16-1998	04-16-1998	04-16-1998	04-16-1998	04-16-1998	04-16-1998	04-16-1998	04-16-1998	04-23-1998
METALS (mg/kg)										
Aluminum	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL PETROLEUM HYDROCARBON										
TPH (as Diesel) (mg/kg)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TPH (as Gasoline) (ug/kg)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CONVENTIONAL										
Cyanide, Total (mg/kg)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Percent Solids (%)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon (mg/kg)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

NOTES:
J = Value is estimated
U = Not detected at detection limit
ug/kg = microgram per kilogram
mg/kg = milligram per kilogram
BG = sample was diluted due to matrix interfe

APPENDIX F
SURFACE SOIL ANALYTICAL RESUTLS
REMEDIAL INVESTIGATION, CTO-120
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-SB27-00	IR84-SB28-00	IR84-SB29-00	IR84-SB30-00	IR84-SB31-00	84-SB01B	84-SB02B	84-SB03B	84-SB04B	84-SB05B	84-SB06B
DEPTH (feet bgs)	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0
SAMPLE DATE	04-23-1998	04-23-1998	04-23-1998	04-23-1998	04-23-1998	10-26-1995	10-26-1995	10-26-1995	10-26-1995	10-26-1995	10-26-1995
VOLATILES (ug/kg)											
1,1,1-Trichloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethene (total)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Methyl-2-pentanone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromoform	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromomethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon tetrachloride	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroform	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloromethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isopropyl ether	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl tert-butyl ether	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Xylenes (total)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,3-Dichloropropene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

APPENDIX F
SURFACE SOIL ANALYTICAL RESUTLS
REMEDIAL INVESTIGATION, CTO-120
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-SB27-00	IR84-SB28-00	IR84-SB29-00	IR84-SB30-00	IR84-SB31-00	84-SB01B	84-SB02B	84-SB03B	84-SB04B	84-SB05B	84-SB06B
DEPTH (feet bgs)	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0
SAMPLE DATE	04-23-1998	04-23-1998	04-23-1998	04-23-1998	04-23-1998	10-26-1995	10-26-1995	10-26-1995	10-26-1995	10-26-1995	10-26-1995
SEMIVOLATILES (ug/kg)											
1,2,4-Trichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3-Dichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,2'-Oxybis(1-Chloropropane)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4,5-Trichlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4,6-Trichlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dichlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,6-Dinitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Chloronaphthalene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Chlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylphenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Nitroaniline	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Nitrophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,3'-Dichlorobenzidine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3-Nitroaniline	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,6-Dinitro-2-methylphenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Bromophenyl phenyl ether	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Chloro-3-methylphenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Chloroaniline	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Chlorophenyl phenyl ether	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Methylphenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Nitroaniline	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Nitrophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(ghi)perylene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Butyl benzyl phthalate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-butyl phthalate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-octyl phthalate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

APPENDIX F
SURFACE SOIL ANALYTICAL RESUTLS
REMEDIAL INVESTIGATION, CTO-120
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-SB27-00	IR84-SB28-00	IR84-SB29-00	IR84-SB30-00	IR84-SB31-00	84-SB01B	84-SB02B	84-SB03B	84-SB04B	84-SB05B	84-SB06B
DEPTH (feet bgs)	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0
SAMPLE DATE	04-23-1998	04-23-1998	04-23-1998	04-23-1998	04-23-1998	10-26-1995	10-26-1995	10-26-1995	10-26-1995	10-26-1995	10-26-1995
SEMIVOLATILES (ug/kg)											
Dibenzothiophene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Diethyl phthalate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dimethyl phthalate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorobutadiene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorocyclopentadiene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isophorone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-Nitrosodi-n-propylamine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-Nitrosodiphenylamine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pentachlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
bis(2-Chloroethoxy)methane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
bis(2-Chloroethyl) ether	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
bis(2-Ethylhexyl) phthalate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

APPENDIX F
SURFACE SOIL ANALYTICAL RESUTLS
REMEDIAL INVESTIGATION, CTO-120
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-SB27-00	IR84-SB28-00	IR84-SB29-00	IR84-SB30-00	IR84-SB31-00	84-SB01B	84-SB02B	84-SB03B	84-SB04B	84-SB05B	84-SB06B
DEPTH (feet bgs)	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0
SAMPLE DATE	04-23-1998	04-23-1998	04-23-1998	04-23-1998	04-23-1998	10-26-1995	10-26-1995	10-26-1995	10-26-1995	10-26-1995	10-26-1995
PESTICIDES/PCBs (ug/kg)											
4,4'-DDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aldrin	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dieldrin	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endosulfan I	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endosulfan II	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endosulfan sulfate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endrin	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endrin aldehyde	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endrin ketone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Heptachlor	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Heptachlor epoxide	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methoxychlor	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-1016	1800 U	35 U	460 U	55 U	37 U	370 U	1900 U	720 U	180 U	370 U	810 U
PCB-1221	1800 U	35 U	460 U	55 U	37 U	750 U	3700 U	1400 U	370 U	750 U	1600 U
PCB-1232	1800 U	35 U	460 U	55 U	37 U	370 U	1900 U	720 U	180 U	370 U	810 U
PCB-1242	1800 U	35 U	460 U	55 U	37 U	370 U	1900 U	720 U	180 U	370 U	810 U
PCB-1248	1800 U	35 U	460 U	55 U	37 U	370 U	1900 U	720 U	180 U	370 U	810 U
PCB-1254	1800 U	35 U	460 U	55 U	37 U	370 U	1900 U	720 U	180 U	370 U	810 U
PCB-1260	26000	35 U	5800	55 U	37 U	1700	12000	5700	2300	4300 J	2800
Toxaphene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
alpha-BHC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
alpha-Chlordane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
beta-BHC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
delta-BHC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
gamma-BHC (Lindane)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
gamma-Chlordane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HERBICIDES (ug/kg)											
2,4,5-T	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-D	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-DB	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dalapon	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dicamba	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dichlorprop	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dinoseb	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MCPA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MCPP	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pentachlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silvex	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

APPENDIX F
SURFACE SOIL ANALYTICAL RESUTLS
REMEDIAL INVESTIGATION, CTO-120
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-SB27-00	IR84-SB28-00	IR84-SB29-00	IR84-SB30-00	IR84-SB31-00	84-SB01B	84-SB02B	84-SB03B	84-SB04B	84-SB05B	84-SB06B
DEPTH (feet bgs)	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0
SAMPLE DATE	04-23-1998	04-23-1998	04-23-1998	04-23-1998	04-23-1998	10-26-1995	10-26-1995	10-26-1995	10-26-1995	10-26-1995	10-26-1995
METALS (mg/kg)											
Aluminum	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL PETROLEUM HYDROCARBON											
TPH (as Diesel) (mg/kg)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TPH (as Gasoline) (ug/kg)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CONVENTIONAL											
Cyanide, Total (mg/kg)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Percent Solids (%)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon (mg/kg)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

NOTES:
J = Value is estimated
U = Not detected at detection limit
ug/kg = microgram per kilogram
mg/kg = milligram per kilogram
BG = sample was diluted due to matrix interfe

APPENDIX F
SURFACE SOIL ANALYTICAL RESUTLS
REMEDIAL INVESTIGATION, CTO-120
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	84-SB07B	84-SB08B	84-SB09B	84-SB10B	IR84-SB02-01	IR84-SB04-01	IR84-SB08-01	IR84-SB10-01	IR84-SB15-01	IR84-SB21-01
DEPTH (feet bgs)	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0
SAMPLE DATE	10-26-1995	10-26-1995	10-26-1995	10-26-1995	04-16-1998	04-16-1998	04-16-1998	04-16-1998	04-16-1998	04-16-1998
VOLATILES (ug/kg)										
1,1,1-Trichloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethene (total)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Methyl-2-pentanone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromoform	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromomethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon tetrachloride	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroform	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloromethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isopropyl ether	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl tert-butyl ether	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Xylenes (total)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,3-Dichloropropene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

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SURFACE SOIL ANALYTICAL RESUTLS
REMEDIAL INVESTIGATION, CTO-120
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	84-SB07B	84-SB08B	84-SB09B	84-SB10B	IR84-SB02-01	IR84-SB04-01	IR84-SB08-01	IR84-SB10-01	IR84-SB15-01	IR84-SB21-01
DEPTH (feet bgs)	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0
SAMPLE DATE	10-26-1995	10-26-1995	10-26-1995	10-26-1995	04-16-1998	04-16-1998	04-16-1998	04-16-1998	04-16-1998	04-16-1998
SEMIVOLATILES (ug/kg)										
1,2,4-Trichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3-Dichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,2'-Oxybis(1-Chloropropane)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4,5-Trichlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4,6-Trichlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dichlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,6-Dinitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Chloronaphthalene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Chlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylphenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Nitroaniline	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Nitrophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,3'-Dichlorobenzidine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3-Nitroaniline	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,6-Dinitro-2-methylphenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Bromophenyl phenyl ether	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Chloro-3-methylphenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Chloroaniline	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Chlorophenyl phenyl ether	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Methylphenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Nitroaniline	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Nitrophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(ghi)perylene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Butyl benzyl phthalate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-butyl phthalate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-octyl phthalate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

APPENDIX F
SURFACE SOIL ANALYTICAL RESUTLS
REMEDIAL INVESTIGATION, CTO-120
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	84-SB07B	84-SB08B	84-SB09B	84-SB10B	IR84-SB02-01	IR84-SB04-01	IR84-SB08-01	IR84-SB10-01	IR84-SB15-01	IR84-SB21-01
DEPTH (feet bgs)	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0
SAMPLE DATE	10-26-1995	10-26-1995	10-26-1995	10-26-1995	04-16-1998	04-16-1998	04-16-1998	04-16-1998	04-16-1998	04-16-1998
SEMIVOLATILES (ug/kg)										
Dibenzothiophene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Diethyl phthalate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dimethyl phthalate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorobutadiene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorocyclopentadiene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isophorone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-Nitrosodi-n-propylamine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-Nitrosodiphenylamine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pentachlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
bis(2-Chloroethoxy)methane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
bis(2-Chloroethyl) ether	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
bis(2-Ethylhexyl) phthalate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

APPENDIX F
SURFACE SOIL ANALYTICAL RESUTLS
REMEDIAL INVESTIGATION, CTO-120
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	84-SB07B	84-SB08B	84-SB09B	84-SB10B	IR84-SB02-01	IR84-SB04-01	IR84-SB08-01	IR84-SB10-01	IR84-SB15-01	IR84-SB21-01
DEPTH (feet bgs)	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0
SAMPLE DATE	10-26-1995	10-26-1995	10-26-1995	10-26-1995	04-16-1998	04-16-1998	04-16-1998	04-16-1998	04-16-1998	04-16-1998
PESTICIDES/PCBs (ug/kg)										
4,4'-DDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aldrin	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dieldrin	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endosulfan I	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endosulfan II	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endosulfan sulfate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endrin	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endrin aldehyde	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endrin ketone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Heptachlor	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Heptachlor epoxide	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methoxychlor	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-1016	190 U	1800 U	1800 U	730 U	41 U	39 U	36 U	360 U	39 U	36 U
PCB-1221	380 U	3600 U	3600 U	1500 U	41 U	39 U	36 U	360 U	39 U	36 U
PCB-1232	190 U	1800 U	1800 U	730 U	41 U	39 U	36 U	360 U	39 U	36 U
PCB-1242	190 U	1800 U	1800 U	730 U	41 U	39 U	36 U	360 U	39 U	36 U
PCB-1248	190 U	1800 U	1800 U	730 U	41 U	39 U	36 U	360 U	39 U	36 U
PCB-1254	190 U	1800 U	1800 U	730 U	41 U	39 U	36 U	360 U	39 U	36 U
PCB-1260	880	6100	10000	7500	110 U	140 U	120 U	2900	530 J	62 J
Toxaphene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
alpha-BHC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
alpha-Chlordane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
beta-BHC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
delta-BHC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
gamma-BHC (Lindane)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
gamma-Chlordane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HERBICIDES (ug/kg)										
2,4,5-T	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-D	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-DB	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dalapon	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dicamba	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dichlorprop	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dinoseb	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MCPA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MCPP	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pentachlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silvex	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

APPENDIX F
SURFACE SOIL ANALYTICAL RESUTLS
REMEDIAL INVESTIGATION, CTO-120
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	84-SB07B	84-SB08B	84-SB09B	84-SB10B	IR84-SB02-01	IR84-SB04-01	IR84-SB08-01	IR84-SB10-01	IR84-SB15-01	IR84-SB21-01
DEPTH (feet bgs)	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0
SAMPLE DATE	10-26-1995	10-26-1995	10-26-1995	10-26-1995	04-16-1998	04-16-1998	04-16-1998	04-16-1998	04-16-1998	04-16-1998
METALS (mg/kg)										
Aluminum	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL PETROLEUM HYDROCARBON										
TPH (as Diesel) (mg/kg)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TPH (as Gasoline) (ug/kg)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CONVENTIONAL										
Cyanide, Total (mg/kg)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Percent Solids (%)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon (mg/kg)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

NOTES:
J = Value is estimated
U = Not detected at detection limit
ug/kg = microgram per kilogram
mg/kg = milligram per kilogram
BG = sample was diluted due to matrix interfe

APPENDIX F
SURFACE SOIL ANALYTICAL RESUTLS
REMEDIAL INVESTIGATION, CTO-120
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-SB23-01	IR84-SB25-01	IR84-SB26-01	IR84-SB27-01	IR84-SB28-01	IR84-SB29-01	IR84-SB30-01	IR84-SB31-01
DEPTH (feet bgs)	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0
SAMPLE DATE	04-16-1998	04-16-1998	04-23-1998	04-23-1998	04-23-1998	04-23-1998	04-23-1998	04-23-1998
VOLATILES (ug/kg)								
1,1,1-Trichloroethane	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethane	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethene (total)	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone	NA	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	NA	NA	NA	NA	NA	NA	NA	NA
4-Methyl-2-pentanone	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	NA	NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane	NA	NA	NA	NA	NA	NA	NA	NA
Bromoform	NA	NA	NA	NA	NA	NA	NA	NA
Bromomethane	NA	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	NA	NA	NA	NA	NA	NA	NA	NA
Carbon tetrachloride	NA	NA	NA	NA	NA	NA	NA	NA
Chlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA
Chloroethane	NA	NA	NA	NA	NA	NA	NA	NA
Chloroform	NA	NA	NA	NA	NA	NA	NA	NA
Chloromethane	NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	NA	NA	NA	NA	NA	NA	NA	NA
Isopropyl ether	NA	NA	NA	NA	NA	NA	NA	NA
Methyl tert-butyl ether	NA	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	NA	NA	NA	NA	NA	NA	NA	NA
Xylenes (total)	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,3-Dichloropropene	NA	NA	NA	NA	NA	NA	NA	NA

APPENDIX F
SURFACE SOIL ANALYTICAL RESUTLS
REMEDIAL INVESTIGATION, CTO-120
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-SB23-01	IR84-SB25-01	IR84-SB26-01	IR84-SB27-01	IR84-SB28-01	IR84-SB29-01	IR84-SB30-01	IR84-SB31-01
DEPTH (feet bgs)	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0
SAMPLE DATE	04-16-1998	04-16-1998	04-23-1998	04-23-1998	04-23-1998	04-23-1998	04-23-1998	04-23-1998
SEMIVOLATILES (ug/kg)								
1,2,4-Trichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA
1,3-Dichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA
2,2'-Oxybis(1-Chloropropane)	NA	NA	NA	NA	NA	NA	NA	NA
2,4,5-Trichlorophenol	NA	NA	NA	NA	NA	NA	NA	NA
2,4,6-Trichlorophenol	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dichlorophenol	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrophenol	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA
2,6-Dinitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA
2-Chloronaphthalene	NA	NA	NA	NA	NA	NA	NA	NA
2-Chlorophenol	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylphenol	NA	NA	NA	NA	NA	NA	NA	NA
2-Nitroaniline	NA	NA	NA	NA	NA	NA	NA	NA
2-Nitrophenol	NA	NA	NA	NA	NA	NA	NA	NA
3,3'-Dichlorobenzidine	NA	NA	NA	NA	NA	NA	NA	NA
3-Nitroaniline	NA	NA	NA	NA	NA	NA	NA	NA
4,6-Dinitro-2-methylphenol	NA	NA	NA	NA	NA	NA	NA	NA
4-Bromophenyl phenyl ether	NA	NA	NA	NA	NA	NA	NA	NA
4-Chloro-3-methylphenol	NA	NA	NA	NA	NA	NA	NA	NA
4-Chloroaniline	NA	NA	NA	NA	NA	NA	NA	NA
4-Chlorophenyl phenyl ether	NA	NA	NA	NA	NA	NA	NA	NA
4-Methylphenol	NA	NA	NA	NA	NA	NA	NA	NA
4-Nitroaniline	NA	NA	NA	NA	NA	NA	NA	NA
4-Nitrophenol	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(ghi)perylene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA
Butyl benzyl phthalate	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-butyl phthalate	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-octyl phthalate	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA

APPENDIX F
SURFACE SOIL ANALYTICAL RESUTLS
REMEDIAL INVESTIGATION, CTO-120
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-SB23-01	IR84-SB25-01	IR84-SB26-01	IR84-SB27-01	IR84-SB28-01	IR84-SB29-01	IR84-SB30-01	IR84-SB31-01
DEPTH (feet bgs)	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0
SAMPLE DATE	04-16-1998	04-16-1998	04-23-1998	04-23-1998	04-23-1998	04-23-1998	04-23-1998	04-23-1998
SEMIVOLATILES (ug/kg)								
Dibenzothiophene	NA	NA	NA	NA	NA	NA	NA	NA
Diethyl phthalate	NA	NA	NA	NA	NA	NA	NA	NA
Dimethyl phthalate	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorobutadiene	NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorocyclopentadiene	NA	NA	NA	NA	NA	NA	NA	NA
Hexachloroethane	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	NA	NA	NA
Isophorone	NA	NA	NA	NA	NA	NA	NA	NA
N-Nitrosodi-n-propylamine	NA	NA	NA	NA	NA	NA	NA	NA
N-Nitrosodiphenylamine	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	NA	NA	NA	NA	NA	NA	NA	NA
Nitrobenzene	NA	NA	NA	NA	NA	NA	NA	NA
Pentachlorophenol	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	NA	NA	NA	NA	NA	NA	NA	NA
Phenol	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	NA	NA	NA	NA	NA	NA	NA	NA
bis(2-Chloroethoxy)methane	NA	NA	NA	NA	NA	NA	NA	NA
bis(2-Chloroethyl) ether	NA	NA	NA	NA	NA	NA	NA	NA
bis(2-Ethylhexyl) phthalate	NA	NA	NA	NA	NA	NA	NA	NA

APPENDIX F
SURFACE SOIL ANALYTICAL RESUTLS
REMEDIAL INVESTIGATION, CTO-120
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-SB23-01	IR84-SB25-01	IR84-SB26-01	IR84-SB27-01	IR84-SB28-01	IR84-SB29-01	IR84-SB30-01	IR84-SB31-01
DEPTH (feet bgs)	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0
SAMPLE DATE	04-16-1998	04-16-1998	04-23-1998	04-23-1998	04-23-1998	04-23-1998	04-23-1998	04-23-1998
PESTICIDES/PCBs (ug/kg)								
4,4'-DDD	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDE	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDT	NA	NA	NA	NA	NA	NA	NA	NA
Aldrin	NA	NA	NA	NA	NA	NA	NA	NA
Dieldrin	NA	NA	NA	NA	NA	NA	NA	NA
Endosulfan I	NA	NA	NA	NA	NA	NA	NA	NA
Endosulfan II	NA	NA	NA	NA	NA	NA	NA	NA
Endosulfan sulfate	NA	NA	NA	NA	NA	NA	NA	NA
Endrin	NA	NA	NA	NA	NA	NA	NA	NA
Endrin aldehyde	NA	NA	NA	NA	NA	NA	NA	NA
Endrin ketone	NA	NA	NA	NA	NA	NA	NA	NA
Heptachlor	NA	NA	NA	NA	NA	NA	NA	NA
Heptachlor epoxide	NA	NA	NA	NA	NA	NA	NA	NA
Methoxychlor	NA	NA	NA	NA	NA	NA	NA	NA
PCB-1016	36 U	40 U	40 U	18000 U	35 U	40 U	44 U	36 U
PCB-1221	36 U	40 U	40 U	18000 U	35 U	40 U	44 U	36 U
PCB-1232	36 U	40 U	40 U	18000 U	35 U	40 U	44 U	36 U
PCB-1242	36 U	40 U	40 U	18000 U	35 U	40 U	44 U	36 U
PCB-1248	36 U	40 U	40 U	18000 U	35 U	40 U	44 U	36 U
PCB-1254	36 U	40 U	40 U	18000 U	35 U	40 U	44 U	36 U
PCB-1260	36 U	40 U	40 U	200000	35 U	520	44 U	36 U
Toxaphene	NA	NA	NA	NA	NA	NA	NA	NA
alpha-BHC	NA	NA	NA	NA	NA	NA	NA	NA
alpha-Chlordane	NA	NA	NA	NA	NA	NA	NA	NA
beta-BHC	NA	NA	NA	NA	NA	NA	NA	NA
delta-BHC	NA	NA	NA	NA	NA	NA	NA	NA
gamma-BHC (Lindane)	NA	NA	NA	NA	NA	NA	NA	NA
gamma-Chlordane	NA	NA	NA	NA	NA	NA	NA	NA
HERBICIDES (ug/kg)								
2,4,5-T	NA	NA	NA	NA	NA	NA	NA	NA
2,4-D	NA	NA	NA	NA	NA	NA	NA	NA
2,4-DB	NA	NA	NA	NA	NA	NA	NA	NA
Dalapon	NA	NA	NA	NA	NA	NA	NA	NA
Dicamba	NA	NA	NA	NA	NA	NA	NA	NA
Dichlorprop	NA	NA	NA	NA	NA	NA	NA	NA
Dinoseb	NA	NA	NA	NA	NA	NA	NA	NA
MCPA	NA	NA	NA	NA	NA	NA	NA	NA
MCPP	NA	NA	NA	NA	NA	NA	NA	NA
Pentachlorophenol	NA	NA	NA	NA	NA	NA	NA	NA
Silvex	NA	NA	NA	NA	NA	NA	NA	NA

APPENDIX F
SURFACE SOIL ANALYTICAL RESUTLS
REMEDIAL INVESTIGATION, CTO-120
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-SB23-01	IR84-SB25-01	IR84-SB26-01	IR84-SB27-01	IR84-SB28-01	IR84-SB29-01	IR84-SB30-01	IR84-SB31-01
DEPTH (feet bgs)	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0
SAMPLE DATE	04-16-1998	04-16-1998	04-23-1998	04-23-1998	04-23-1998	04-23-1998	04-23-1998	04-23-1998
METALS (mg/kg)								
Aluminum	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	NA	NA	NA	NA	NA	NA	NA	NA
Barium	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	NA	NA	NA	NA	NA	NA	NA	NA
Copper	NA	NA	NA	NA	NA	NA	NA	NA
Iron	NA	NA	NA	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	NA	NA	NA	NA	NA	NA	NA	NA
Silver	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL PETROLEUM HYDROCARBON								
TPH (as Diesel) (mg/kg)	NA	NA	NA	NA	NA	NA	NA	NA
TPH (as Gasoline) (ug/kg)	NA	NA	NA	NA	NA	NA	NA	NA
CONVENTIONAL								
Cyanide, Total (mg/kg)	NA	NA	NA	NA	NA	NA	NA	NA
Percent Solids (%)	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon (mg/kg)	NA	NA	NA	NA	NA	NA	NA	NA

NOTES:
J = Value is estimated
U = Not detected at detection limit
ug/kg = microgram per kilogram
mg/kg = milligram per kilogram
BG = sample was diluted due to matrix interfe

APPENDIX F
SURFACE WATER ANALYTICAL RESULTS - LAGOON
REMEDIAL INVESTIGATION, CTO-0219
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	84-SW05-01	84-SW06-01	84-SW07-01	84-SW08-01	IR84-SW01-98B	IR84-SW02-98B	IR84-SW03-98B
SAMPLE DATE	10/26/1995	10/26/1995	10/26/1995	10/26/1995	04-19-1998	04-19-1998	04-19-1998
VOLATILES (ug/L)							
1,1,1-Trichloroethane	NA	NA	NA	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethane	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethene	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethene (total)	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	NA	NA	NA	NA	NA	NA	NA
2-Butanone	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	NA	NA	NA	NA	NA	NA	NA
4-Methyl-2-pentanone	NA	NA	NA	NA	NA	NA	NA
Acetone	NA	NA	NA	NA	NA	NA	NA
Benzene	NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane	NA	NA	NA	NA	NA	NA	NA
Bromoform	NA	NA	NA	NA	NA	NA	NA
Bromomethane	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	NA	NA	NA	NA	NA	NA	NA
Carbon tetrachloride	NA	NA	NA	NA	NA	NA	NA
Chlorobenzene	NA	NA	NA	NA	NA	NA	NA
Chloroethane	NA	NA	NA	NA	NA	NA	NA
Chloroform	NA	NA	NA	NA	NA	NA	NA
Chloromethane	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	NA	NA	NA	NA	NA	NA	NA
Styrene	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	NA	NA	NA	NA	NA	NA	NA
Toluene	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	NA	NA	NA	NA	NA	NA	NA
Xylenes (total)	NA	NA	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene	NA	NA	NA	NA	NA	NA	NA
trans-1,3-Dichloropropene	NA	NA	NA	NA	NA	NA	NA

APPENDIX F
SURFACE WATER ANALYTICAL RESULTS - LAGOON
REMEDIAL INVESTIGATION, CTO-0219
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	84-SW05-01	84-SW06-01	84-SW07-01	84-SW08-01	IR84-SW01-98B	IR84-SW02-98B	IR84-SW03-98B
SAMPLE DATE	10/26/1995	10/26/1995	10/26/1995	10/26/1995	04-19-1998	04-19-1998	04-19-1998
SEMIVOLATILES (ug/L)							
1,2,4-Trichlorobenzene	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	NA	NA	NA	NA	NA	NA	NA
1,3-Dichlorobenzene	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	NA	NA	NA	NA	NA	NA	NA
2,2'-Oxybis(1-Chloropropane)	NA	NA	NA	NA	NA	NA	NA
2,4,5-Trichlorophenol	NA	NA	NA	NA	NA	NA	NA
2,4,6-Trichlorophenol	NA	NA	NA	NA	NA	NA	NA
2,4-Dichlorophenol	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrophenol	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	NA	NA	NA	NA	NA	NA	NA
2,6-Dinitrotoluene	NA	NA	NA	NA	NA	NA	NA
2-Chloronaphthalene	NA	NA	NA	NA	NA	NA	NA
2-Chlorophenol	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	NA	NA	NA	NA	NA	NA	NA
2-Methylphenol	NA	NA	NA	NA	NA	NA	NA
SEMIVOLATILES (ug/L)							
2-Nitroaniline	NA	NA	NA	NA	NA	NA	NA
2-Nitrophenol	NA	NA	NA	NA	NA	NA	NA
3,3'-Dichlorobenzidine	NA	NA	NA	NA	NA	NA	NA
3-Nitroaniline	NA	NA	NA	NA	NA	NA	NA
4,6-Dinitro-2-methylphenol	NA	NA	NA	NA	NA	NA	NA
4-Bromophenyl phenyl ether	NA	NA	NA	NA	NA	NA	NA
4-Chloro-3-methylphenol	NA	NA	NA	NA	NA	NA	NA
4-Chloroaniline	NA	NA	NA	NA	NA	NA	NA
4-Chlorophenyl phenyl ether	NA	NA	NA	NA	NA	NA	NA
4-Methylphenol	NA	NA	NA	NA	NA	NA	NA
4-Nitroaniline	NA	NA	NA	NA	NA	NA	NA
4-Nitrophenol	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	NA	NA	NA	NA	NA	NA	NA
Anthracene	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA
Benzo(ghi)perylene	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	NA	NA
Butyl benzyl phthalate	NA	NA	NA	NA	NA	NA	NA
Carbazole	NA	NA	NA	NA	NA	NA	NA
Chrysene	NA	NA	NA	NA	NA	NA	NA
Di-n-butyl phthalate	NA	NA	NA	NA	NA	NA	NA

APPENDIX F
SURFACE WATER ANALYTICAL RESULTS - LAGOON
REMEDIAL INVESTIGATION, CTO-0219
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	84-SW05-01	84-SW06-01	84-SW07-01	84-SW08-01	IR84-SW01-98B	IR84-SW02-98B	IR84-SW03-98B
SAMPLE DATE	10/26/1995	10/26/1995	10/26/1995	10/26/1995	04-19-1998	04-19-1998	04-19-1998
Di-n-octyl phthalate	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	NA	NA	NA	NA	NA	NA	NA
Dibenzofuran	NA	NA	NA	NA	NA	NA	NA
Diethyl phthalate	NA	NA	NA	NA	NA	NA	NA
Dimethyl phthalate	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	NA	NA	NA	NA	NA	NA	NA
Fluorene	NA	NA	NA	NA	NA	NA	NA
Hexachlorobenzene	NA	NA	NA	NA	NA	NA	NA
Hexachlorobutadiene	NA	NA	NA	NA	NA	NA	NA
Hexachlorocyclopentadiene	NA	NA	NA	NA	NA	NA	NA
Hexachloroethane	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	NA	NA
Isophorone	NA	NA	NA	NA	NA	NA	NA
N-Nitrosodi-n-propylamine	NA	NA	NA	NA	NA	NA	NA
N-Nitrosodiphenylamine	NA	NA	NA	NA	NA	NA	NA
Naphthalene	NA	NA	NA	NA	NA	NA	NA
Nitrobenzene	NA	NA	NA	NA	NA	NA	NA
Pentachlorophenol	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	NA	NA	NA	NA	NA	NA	NA
Phenol	NA	NA	NA	NA	NA	NA	NA
Pyrene	NA	NA	NA	NA	NA	NA	NA
bis(2-Chloroethoxy)methane	NA	NA	NA	NA	NA	NA	NA
bis(2-Chloroethyl) ether	NA	NA	NA	NA	NA	NA	NA
bis(2-Ethylhexyl) phthalate	NA	NA	NA	NA	NA	NA	NA
PCBs (ug/L)							
PCB-1016	1.1 UJ	1.1 UJ	1.1 UJ	1.1 UJ	1 UJ	1 UJ	1 UJ
PCB-1221	2.2 UJ	2.2 UJ	2.3 UJ	2.3 UJ	2 UJ	2 UJ	2 UJ
PCB-1232	1.1 UJ	1.1 UJ	1.1 UJ	1.1 UJ	1 UJ	1 UJ	1 UJ
PCB-1242	1.1 UJ	1.1 UJ	1.1 UJ	1.1 UJ	1 UJ	1 UJ	1 UJ
PCB-1248	1.1 UJ	1.1 UJ	1.1 UJ	1.1 UJ	1 UJ	1 UJ	1 UJ
PCB-1254	1.1 UJ	1.1 UJ	1.1 UJ	1.1 UJ	1 UJ	1 UJ	1 UJ
PCB-1260	1.1 UJ	1.1 UJ	1.1 UJ	1.1 UJ	1 UJ	1 UJ	1 UJ

NOTES:
J = value is estimated
U = not detected at detection limit
R = value was rejected by validator
NA = not analyzed

APPENDIX F
SURFACE WATER ANALYTICAL RESULTS - LAGOON
REMEDIAL INVESTIGATION, CTO-0219
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-SW04-98B	IR84-SW05-98B	IR84-SW06-98B	IR84-SW07-98B
SAMPLE DATE	04-19-1998	04-19-1998	04-19-1998	04-23-1998
VOLATILES (ug/L)				
1,1,1-Trichloroethane	NA	NA	NA	10 U
1,1,2,2-Tetrachloroethane	NA	NA	NA	10 U
1,1,2-Trichloroethane	NA	NA	NA	10 U
1,1-Dichloroethane	NA	NA	NA	10 U
1,1-Dichloroethene	NA	NA	NA	10 U
1,2-Dichloroethane	NA	NA	NA	10 U
1,2-Dichloroethene (total)	NA	NA	NA	10 U
1,2-Dichloropropane	NA	NA	NA	10 U
2-Butanone	NA	NA	NA	10 U
2-Hexanone	NA	NA	NA	10 U
4-Methyl-2-pentanone	NA	NA	NA	10 U
Acetone	NA	NA	NA	5.6 J
Benzene	NA	NA	NA	1.2 J
Bromodichloromethane	NA	NA	NA	10 U
Bromoform	NA	NA	NA	10 U
Bromomethane	NA	NA	NA	10 U
Carbon disulfide	NA	NA	NA	10 U
Carbon tetrachloride	NA	NA	NA	10 U
Chlorobenzene	NA	NA	NA	10 U
Chloroethane	NA	NA	NA	10 U
Chloroform	NA	NA	NA	10 U
Chloromethane	NA	NA	NA	10 U
Dibromochloromethane	NA	NA	NA	10 U
Ethylbenzene	NA	NA	NA	10 U
Methylene chloride	NA	NA	NA	10 U
Styrene	NA	NA	NA	10 U
Tetrachloroethene	NA	NA	NA	10 U
Toluene	NA	NA	NA	2.7 J
Trichloroethene	NA	NA	NA	10 U
Vinyl chloride	NA	NA	NA	10 U
Xylenes (total)	NA	NA	NA	3.5 J
cis-1,3-Dichloropropene	NA	NA	NA	10 U
trans-1,3-Dichloropropene	NA	NA	NA	10 U

APPENDIX F
SURFACE WATER ANALYTICAL RESULTS - LAGOON
REMEDIAL INVESTIGATION, CTO-0219
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-SW04-98B	IR84-SW05-98B	IR84-SW06-98B	IR84-SW07-98B
SAMPLE DATE	04-19-1998	04-19-1998	04-19-1998	04-23-1998
SEMIVOLATILES (ug/L)				
1,2,4-Trichlorobenzene	NA	NA	NA	10 U
1,2-Dichlorobenzene	NA	NA	NA	10 U
1,3-Dichlorobenzene	NA	NA	NA	10 U
1,4-Dichlorobenzene	NA	NA	NA	10 U
2,2'-Oxybis(1-Chloropropane)	NA	NA	NA	10 U
2,4,5-Trichlorophenol	NA	NA	NA	25 U
2,4,6-Trichlorophenol	NA	NA	NA	10 U
2,4-Dichlorophenol	NA	NA	NA	10 U
2,4-Dimethylphenol	NA	NA	NA	10 U
2,4-Dinitrophenol	NA	NA	NA	25 U
2,4-Dinitrotoluene	NA	NA	NA	10 U
2,6-Dinitrotoluene	NA	NA	NA	10 U
2-Chloronaphthalene	NA	NA	NA	10 U
2-Chlorophenol	NA	NA	NA	10 U
2-Methylnaphthalene	NA	NA	NA	10 U
2-Methylphenol	NA	NA	NA	10 U
SEMIVOLATILES (ug/L)				
2-Nitroaniline	NA	NA	NA	25 U
2-Nitrophenol	NA	NA	NA	10 U
3,3'-Dichlorobenzidine	NA	NA	NA	10 U
3-Nitroaniline	NA	NA	NA	25 U
4,6-Dinitro-2-methylphenol	NA	NA	NA	25 U
4-Bromophenyl phenyl ether	NA	NA	NA	10 U
4-Chloro-3-methylphenol	NA	NA	NA	10 U
4-Chloroaniline	NA	NA	NA	10 U
4-Chlorophenyl phenyl ether	NA	NA	NA	10 U
4-Methylphenol	NA	NA	NA	10 U
4-Nitroaniline	NA	NA	NA	25 U
4-Nitrophenol	NA	NA	NA	25 U
Acenaphthene	NA	NA	NA	10 U
Acenaphthylene	NA	NA	NA	10 U
Anthracene	NA	NA	NA	10 U
Benzo(a)anthracene	NA	NA	NA	10 U
Benzo(a)pyrene	NA	NA	NA	10 U
Benzo(b)fluoranthene	NA	NA	NA	10 U
Benzo(ghi)perylene	NA	NA	NA	10 U
Benzo(k)fluoranthene	NA	NA	NA	10 U
Butyl benzyl phthalate	NA	NA	NA	10 U
Carbazole	NA	NA	NA	10 U
Chrysene	NA	NA	NA	10 U
Di-n-butyl phthalate	NA	NA	NA	10 U

APPENDIX F
SURFACE WATER ANALYTICAL RESULTS - LAGOON
REMEDIAL INVESTIGATION, CTO-0219
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-SW04-98B	IR84-SW05-98B	IR84-SW06-98B	IR84-SW07-98B
SAMPLE DATE	04-19-1998	04-19-1998	04-19-1998	04-23-1998
Di-n-octyl phthalate	NA	NA	NA	10 U
Dibenz(a,h)anthracene	NA	NA	NA	10 U
Dibenzofuran	NA	NA	NA	10 U
Diethyl phthalate	NA	NA	NA	10 U
Dimethyl phthalate	NA	NA	NA	10 U
Fluoranthene	NA	NA	NA	10 U
Fluorene	NA	NA	NA	10 U
Hexachlorobenzene	NA	NA	NA	10 U
Hexachlorobutadiene	NA	NA	NA	10 U
Hexachlorocyclopentadiene	NA	NA	NA	10 U
Hexachloroethane	NA	NA	NA	10 U
Indeno(1,2,3-cd)pyrene	NA	NA	NA	10 U
Isophorone	NA	NA	NA	10 U
N-Nitrosodi-n-propylamine	NA	NA	NA	10 U
N-Nitrosodiphenylamine	NA	NA	NA	10 U
Naphthalene	NA	NA	NA	10 U
Nitrobenzene	NA	NA	NA	10 U
Pentachlorophenol	NA	NA	NA	25 U
Phenanthrene	NA	NA	NA	10 U
Phenol	NA	NA	NA	10 U
Pyrene	NA	NA	NA	10 U
bis(2-Chloroethoxy)methane	NA	NA	NA	10 U
bis(2-Chloroethyl) ether	NA	NA	NA	10 U
bis(2-Ethylhexyl) phthalate	NA	NA	NA	10 U
PCBs (ug/L)				
PCB-1016	1 UJ	1 UJ	1 R	NA
PCB-1221	2 UJ	2 UJ	2 R	NA
PCB-1232	1 UJ	1 UJ	1 R	NA
PCB-1242	1 UJ	1 UJ	1 R	NA
PCB-1248	1 UJ	1 UJ	1 R	NA
PCB-1254	1 UJ	1 UJ	1 R	NA
PCB-1260	1 UJ	1 UJ	1 R	NA

NOTES:
J = value is estimated
U = not detected at detection limit
R = value was rejected by validator
NA = not analyzed

APPENDIX - F
SURFACE WATER ANALYTICAL RESULTS - NORTHEAST CREEK
REMEDIAL INVESTIGATION, CTO-0219
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	84-SW01-01	84-SW02-01	84-SW04-01
SAMPLE DATE	10/26/1995	10/26/1995	10/26/1995
PCBs (ug/L)			
PCB-1016	1.2 UJ	1.2 UJ	1.2 UJ
PCB-1221	2.3 UJ	2.3 UJ	2.3 UJ
PCB-1232	1.2 UJ	1.2 UJ	1.2 UJ
PCB-1242	1.2 UJ	1.2 UJ	1.2 UJ
PCB-1248	1.2 UJ	1.2 UJ	1.2 UJ
PCB-1254	1.2 UJ	1.2 UJ	1.2 UJ
PCB-1260	1.2 UJ	1.2 UJ	1.2 UJ

APPENDIX F
TRIP BLANK ANALYTICAL RESULTS
REMEDIAL INVESTIGATION, CTO-219, SITE 84
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-TB02	IR84-TB03	IR84-TB04	IR84-TB05	IR84-TB07	IR84-TB08	IR84-TBO6	TBIR84-TB03	TRIP BLANKS
SAMPLE DATE	07-16-2001	07-23-2001	08-01-2001	08-02-2001	08-06-2001	08-07-2001	08-03-2001	07-31-2001	07-21-2001
VOLATILES (ug/L)									
1,1,1-Trichloroethane	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U
1,1,2,2-Tetrachloroethane	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
1,1,2-Trichloroethane	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
1,1-Dichloroethane	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U
1,1-Dichloroethene	0.24 U	0.24 U	0.24 U	0.55 J	0.24 U	0.34 J	0.24 U	0.24 U	0.24 U
1,2-Dibromoethane (EDB)	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U
1,2-Dichloroethane	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U
1,2-Dichloroethene (total)	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U
1,2-Dichloropropane	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U
2-Butanone	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	0.62 J	0.41 U	0.41 U
2-Hexanone	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U
4-Methyl-2-pentanone	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U
Acetone	2.4 J	2.6 J	3 J	0.51 U	2.3 J	1.4 J B	2.7 J	0.51 U	0.51 U
Benzene	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U
Bromodichloromethane	0.17 U	0.17 U	0.17 U	0.17 U	0.26 J	0.17 U	0.17 U	0.17 U	0.17 U
Bromoform	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U
Bromomethane	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Carbon disulfide	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Carbon tetrachloride	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U
Chlorobenzene	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U
Chloroethane	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U
Chloroform	0.14 U	0.14 U	0.14 U	0.14 U	28	0.14 U	0.14 U	0.22 J	0.14 U
Chloromethane	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.27 J	0.13 U
Dibromochloromethane	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U
Ethylbenzene	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U
Isopropyl ether	0.69 U	0.69 U	0.69 U	0.69 U	0.69 U	0.69 U	0.69 U	0.69 U	0.69 U
Methyl tert-butyl ether	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U
Methylene chloride	0.45 J	0.53 J	0.48 J	0.34 U	4.1 U	0.34 U	0.44 J	0.34 U	0.34 U
Styrene	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U
Tetrachloroethene	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U
Toluene	0.18 U	0.18 U	0.18 U	0.23 J	0.26 J	0.18 U	0.18 U	0.26 J	0.18 U
Trichloroethene	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U
Vinyl chloride	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U
Xylenes (total)	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.44 J	0.33 U
cis-1,3-Dichloropropene	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U
trans-1,3-Dichloropropene	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U

APPENDIX F
SURFACE SOIL ANALYTICAL RESUTLS
REMEDIAL INVESTIGATION, CTO-120, SITE 84
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR84-TP01A	IR84-TP01B	IR84-TP02A	IR84-TP02B	IR84-TP03A	IR84-TP03B
B_DEPTH	0	0	0	0	0	0
SAMPLE DATE	07-23-2001	07-23-2001	07-23-2001	07-23-2001	07-23-2001	07-23-2001
PCBs (ug/kg)						
PCB-1016	59 U	6 U	5.7 U	5.6 U	13 U	6.4 U
PCB-1221	210 U	21 U	20 U	20 U	47 U	23 U
PCB-1232	120 U	12 U	12 U	12 U	27 U	13 U
PCB-1242	200 U	20 U	19 U	19 U	44 U	22 U
PCB-1248	51 U	5.2 U	4.9 U	4.9 U	11 U	5.6 U
PCB-1254	220 U	23 U	21 U	21 U	49 U	24 U
PCB-1260	500	130	110 J	56	990	580
CONVENTIONAL						
Percent Solids (%)	90	88.7	93.4	94.5	81.3	82.5

DATA ASSESSMENT NARRATIVES

Data Validation Report

Baker Environmental, Inc.
Camp Lejeune
SDG#: A1G250214

HEARTLAND
ENVIRONMENTAL SERVICES, INC.

Data Validation Report

SDG#:	A1G250214
Date:	October 9, 2001
Client Name:	Baker Environmental, Inc.
Project/Site Name:	Camp Lejeune
Date Sampled:	July 17 - 23, 2001
Number of Samples:	42 Non-Aqueous Sample(s) with 3 MS/MD(s) 4 Aqueous Sample(s) with 0 MS/MD(s)
Laboratory:	STL North Canton
Validation Guidance:	National Functional Guidelines for Organic and Inorganic Data
QA/QC Level:	NEESA Level C
Method(s) Utilized:	SW846 Third Edition
Analytical Fractions:	Volatiles, Semivolatiles, Pesticides, PCBs and Metals

Analytical data in this report were screened to determine usability of results and also to determine contractual compliance relative to these requirements and deliverables. This screening assumes analytical results are correct as reported and merely provides an interpretation of the reported quality control results. A minimum of 10% of all laboratory calculations have been verified as part of this validation. All instrument output, i.e. spectra, chromatograms, etc., for each sample have been carefully reviewed. The end-user is urged to review the Specific Findings and associated Data Qualifications presented in this report. Annotated Form 1s or spreadsheets for all samples reviewed are included after the Data Assessment Narratives. Form 1s for MS/MSD samples or spreadsheets are not annotated.

The release of this Data Validation Report is authorized by the following signature:

Craig G. Scanlon

Paul B. Humburg, President

10-10-01

Date

4127 Plaza 94 South • St. Charles, MO 63304
(636) 936-1332 • Fax (636) 936-1335

SDG# A1G250214

Samples and Fractions Reviewed

Sample Identifications — Analytical Fractions

CH2M HILL ID	MATRIX	VOA		SVOA		PEST		PCB		MET	
IR84-DP15-03	SOIL		X		X		X		X		X
IR84-DP15-03 MS	SOIL				X						X
IR84-DP15-03 MSD	SOIL				X						X
IR84-DP45-00	SOIL		X		X		X		X		X
IR84-DP45-03	SOIL		X		X		X		X		X
IR84-DP46-00	SOIL		X		X		X		X		X
IR84-DP46-02	SOIL		X		X		X		X		X
IR84-DP47-00	SOIL		X		X		X		X		X
IR84-DP47-01	SOIL		X		X		X		X		X
IR84-DP48-00	SOIL		X		X		X		X		X
IR84-DP49-00	SOIL		X		X		X		X		X
IR84-DP49-01	SOIL		X		X		X		X		X
IR84-DP50-00	SOIL		X		X		X		X		X
IR84-DP50-01	SOIL		X		X		X		X		X
IR84-DP51-00	SOIL		X		X		X		X		X
IR84-DP51-01	SOIL		X		X		X		X		X
IR84-DP52-00	SOIL		X		X		X		X		X
IR84-DP52-01	SOIL		X		X		X		X		X
IR84-DP52-01 MS	SOIL		X								
IR84-DP52-01 MSD	SOIL		X								
IR84-DP53-00	SOIL		X		X		X		X		X
IR84-DP54-00	SOIL		X		X		X		X		X
IR84-DP55-00	SOIL		X		X		X		X		X
IR84-TP01A	SOIL								X		
IR84-TP01B	SOIL								X		
IR84-TP02A	SOIL								X		
IR84-TP02B	SOIL								X		
IR84-TP03A	SOIL								X		
IR84-TP03B	SOIL								X		
IR84-DP18-00	SOIL								X		
IR84-DP18-02	SOIL								X		
IR84-DP20-00	SOIL								X		
IR84-DP36-00	SOIL								X		
IR84-DP22-00	SOIL								X		
IR84-DP22-00D	SOIL								X		
IR84-DP33-00	SOIL								X		
IR84-DP27-00	SOIL								X		
IR84-DP29-00	SOIL								X		
IR84-DP65-00	SOIL								X		
IR84-DP63-00	SOIL								X		
IR84-DP65-02	SOIL								X		
IR84-DP63-01	SOIL								X		
IR84-DP41-00	SOIL								X		
IR84-DP41-00MS	SOIL								X		
IR84-DP41-00MSD	SOIL								X		
IR84-DP42-00	SOIL								X		
IR84-DP42-00D	SOIL								X		
IR84-DP69-00D	SOIL								X		
IR84-ER07	WATER							X			
IR84-ER06	WATER							X			
IR84-TB03	WATER	X									
IR84-TB02	WATER	X									
Total Billable Samples (Water/Soil)		2	21	0	21	0	19	2	44	0	21

VOA= Volatiles
SVOA= Semivolatiles
PEST= Pesticides
PCB= PCBs
MET= Metals

DATA ASSESSMENT NARRATIVE

VOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW-846 Method 8260B for GC/MS Volatiles; the National Functional Guidelines for Organic Data Validation, 10/99, as applicable; and NEESA Level C requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # A1G250214

A validation was performed on the Volatile Data from SDG A1G250214. The data was evaluated based on the following parameters:

*	• Data Completeness
*	• Holding Times
*	• GC/MS Tuning
	• Calibration
*	• Blanks
*	• Internal Standard Performance
*	• Surrogate Recoveries
*	• Matrix Spike/Matrix Spike Duplicates
*	• Field Duplicates
*	• Compound Identification
*	• Compound Quantitation

* - All criteria were met for this parameter.

Calibrations

The continuing calibration standard VSTD050 analyzed 7/27/01 at 1824 exhibited a non-compliant RRF below 0.05 for one compound. For the following sample and non-compliant compound, the reported non-detect result is rejected, R.

IR84-DP15-03	bromomethane

Calibrations (continued)

The continuing calibration standard VSTD010 analyzed 7/28/01 at 1053 exhibited a non-compliant %D for one compound for which qualifications were required. For the following samples and non-compliant compound, the reported positive results are qualified as estimated, J.

IR84-TB03	acetone
IR84-TB02	

System Performance and Overall Assessment

The data, as reported, did require qualifications. According to the laboratory, one of the samples exhibited elevated detection limits due to matrix interferences. No qualifications were required.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported Quantitation limit is qualified as estimated

L = Result is estimated and biased low.

K = Result is estimated and biased high.

R = Result is rejected and unusable

D = Result value is based on dilution analysis

BLANK QUALIFICATION CODES

CRQL =	The sample result for the blank contaminant is less than the sample CRQL and is less than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.
U =	The sample result for the blank contaminant is greater than the sample CRQL and is less than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.
No Action =	The sample result for the blank contaminant is greater than the sample CRQL and is greater than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL
IR84-DP15-03	bromomethane	-	R
IR84-TB03 IR84-TB02	acetone	+	J

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW-846 Method 8270C for GC/MS Semivolatiles; the National Functional Guidelines for Organic Data Validation, 10/99, as applicable; and NEESA Level C requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # A1G250214

A validation was performed on the Semivolatile Data from SDG A1G250214. The data was evaluated based on the following parameters:

*	•	Data Completeness
*	•	Holding Times
*	•	GC/MS Tuning
	•	Calibration
	•	Blanks
*	•	Internal Standard Performance
*	•	Surrogate Recoveries
*	•	Matrix Spike/Matrix Spike Duplicates
*	•	Field Duplicates
*	•	Compound Identification
	•	Compound Quantitation

* - All criteria were met for this parameter.

Calibration

The continuing calibration standard SSTD008 analyzed 8/09/01 at 0958 exhibited a non-compliant %D for one compound for which qualifications were required. For the following sample and non-compliant compound, the reported positive result is qualified as estimated, J.

IR84-DP53-00 pyrene

Blanks

All TIC compounds also reported in the associated method blanks are rejected, R, up to 10X the blank contamination concentration.

Compound Quantitation

The following sample is rejected in favor of the results reported from the RE analysis of the sample. The original extraction was performed without the addition of surrogate compounds. Although the RE was extracted slightly outside of holding time all surrogate recoveries were acceptable. Further, according to the case narrative, the original analysis exhibited positive results for several samples that were not noted in the RE analysis. The laboratory extracted the sample a third time to verify the results. The third analysis agreed with the result from the RE analysis.

IR84-DP52-00

System Performance and Overall Assessment

The data, as reported, did require qualifications. The submitted case narrative contains an error in the third paragraph. The narrative notes that sample IR84-DP15-03 was re-extracted past holding time. Based on the submitted data package, the sample that this paragraph is referring to is IR84-DP52-00. The rest of the paragraph appears to be correct based on sample IR84-DP52-00. Two samples exhibited raised reporting limits due to matrix interferences or TIC presence. No qualifications were required.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported Quantitation limit is qualified as estimated

L = Result is estimated and biased low.

K = Result is estimated and biased high.

R = Result is rejected and unusable

D = Result value is based on dilution analysis

BLANK QUALIFICATION CODES

CRQL =	The sample result for the blank contaminant is less than the sample CRQL and is less than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.
U =	The sample result for the blank contaminant is greater than the sample CRQL and is less than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.
No Action =	The sample result for the blank contaminant is greater than the sample CRQL and is greater than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL
IR84-DP53-00	pyrene	+	J
All Samples	All TICs noted in blanks up to 10X	+	R
IR84-DP52-00	All compounds	+/-	R

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE

PESTICIDES

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC performance, and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW-846 Methods 8081A; the National Functional Guidelines for Organic Data Review, October 1999, as applicable; and NEESA Level C requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # A1G250214

A validation was performed on the Pesticide Data from SDG A1G250214. The data was evaluated based on the following parameters:

*	• Data Completeness
*	• Holding Times
*	• GC Performance
	• Calibration
*	• Blanks
	• Surrogate Recoveries
*	• Matrix Spike/Matrix Spike Duplicates
*	• Field Duplicates
*	• Compound Identification
	• Compound Quantitation

* - All criteria were met for this parameter.

Method Deviations

It is recommended by the method that the calibration standards for the single component pesticides be prepared as two calibration mixtures "to minimize potential resolution and quantitation problems on confirmation columns..." (SW-846, Method 8081A, Revision 1, December 1996, page 8081A - 8, section 5.6.1). The initial and continuing calibration standards used by the laboratory contain all single component target compounds. There were no qualifications required because of this method deviation.

Continuing Calibrations

The continuing calibration 049F4901.D analyzed on 08/09/01 at 09:07 exhibited one (1) compound with a %D greater than 15% and less than 50%. For the following sample and non-compliant compound, the positive results are qualified as estimated, J.

IR84-DP51-00	4,4'-DDD

The continuing calibration 067F6701.D analyzed on 08/16/01 at 20:58 exhibited two (2) compounds with %Ds greater than 15% and less than 50%. For the following sample and non-compliant compounds, the positive results are qualified as estimated, J.

IR84-DP45-03	Heptachlor
	4,4'-DDD

Surrogate Recoveries

The sample listed below exhibited a high DCB recovery. The positive results are qualified as estimated, J.

IR84-DP48-00

Compound Quantitation

The positive results exhibiting column quantitation %Ds greater than 40%, flagged PG by the laboratory, are qualified as estimated, J.

System Performance and Overall Assessment

The data required qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

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J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

D = Result value is based on dilution analysis

BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 5X the blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 5X the blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 5X the blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL
IR84-DP51-00	4,4'-DDD	+	J
IR84-DP45-03	Heptachlor 4,4'-DDD	+	J
IR84-DP48-00	ALL	+	J
All Samples	All %Ds>40%	+PG	J

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QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non-detect result

DATA ASSESSMENT NARRATIVE

PCBs

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC performance, and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW-846 Methods 8082; the National Functional Guidelines for Organic Data Review, October 1999, as applicable; and NEESA Level C requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # A1G250214

A validation was performed on the PCB Data from SDG A1G250214. The data was evaluated based on the following parameters:

*	• Data Completeness
*	• Holding Times
*	• GC Performance
*	• Calibration
*	• Blanks
	• Surrogate Recoveries
*	• Matrix Spike/Matrix Spike Duplicates
*	• Field Duplicates
*	• Compound Identification
*	• Compound Quantitation

* - All criteria were met for this parameter.

Surrogate Recoveries

The samples listed below exhibited high DCB recoveries. The positive results are qualified as estimated, J.

IR84-TP02A
IR84-DP49-00

System Performance and Overall Assessment

The data required qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

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UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

D = Result value is based on dilution analysis

BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 5X the blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 5X the blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 5X the blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL
IR84-TP02A IR84-DP49-00	ALL	+	J

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\- in the DL column denotes a non-detect result

DATA ASSESSMENT NARRATIVE
METALS

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, matrix spike and LCS recoveries, matrix duplicates and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW 846 methods for Metals and the Functional Guidelines for Inorganic Data Validation, February 1994 requirements and NEESA C requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDGs # A1G250214

A validation was performed on the Metals Data from SDG A1G250214. The data was evaluated based on the following parameters.

*	●	Data Completeness
*	●	Holding Times
*	●	Calibrations
	●	Blanks
*	●	Interferences
*	●	Matrix Spike Recovery
*	●	Matrix Duplicates
*	●	Field Duplicates
*	●	Laboratory Control Samples
	●	Serial Dilutions

* - All criteria were met for this parameter.

Preparation Blank results

1. The preparation blank for soils exhibited contamination for Aluminum (6.0 mg/kg), Selenium (0.37 mg/kg), Calcium (42.1 mg/kg) and Potassium (16.5 mg/kg) required that all values below five times the blank contamination be qualified as non-detect, "U".

Serial Dilution results

2. The serial dilution results for soils for Calcium, Potassium and Zinc were outside the control limits (10%). All positive results are qualified as estimated, "J".

3. All results with "B" qualifier are changed to "J" qualifier.

SUMMARY OF DATA QUALIFICATIONS

Sample ID	Analyte	DL	QL
1.all soil samples below 1.85 mg/kg	Se.	+	U
all soil samples below 82.5 mg/kg	K.		
2.all soil samples	Ca, K and Zn.	+	J
3.all "B" results	all analytes	B	J

Data Validation Report

Baker Environmental, Inc.
Camp Lejeune
SDG#: A1H010202

HEARTLAND
ENVIRONMENTAL SERVICES, INC.

Data Validation Report

SDG#:	A1H010202
Date:	October 9, 2001
Client Name:	Baker Environmental, Inc.
Project/Site Name:	Camp Lejeune
Date Sampled:	July 31, 2001
Number of Samples:	8 Aqueous Sample(s) with 1 MS/MD(s)
Laboratory:	STL North Canton
Validation Guidance:	National Functional Guidelines for Organic and Inorganic Data
QA/QC Level:	NEESA Level C
Method(s) Utilized:	SW846 Third Edition
Analytical Fractions:	Volatiles, Semivolatiles, Pesticides, PCBs, Herbicides and Metals

Analytical data in this report were screened to determine usability of results and also to determine contractual compliance relative to these requirements and deliverables. This screening assumes analytical results are correct as reported and merely provides an interpretation of the reported quality control results. A minimum of 10% of all laboratory calculations have been verified as part of this validation. All instrument output, i.e. spectra, chromatograms, etc., for each sample have been carefully reviewed. The end-user is urged to review the Specific Findings and associated Data Qualifications presented in this report. Annotated Form 1s or spreadsheets for all samples reviewed are included after the Data Assessment Narratives. Form 1s for MS/MSD samples or spreadsheets are not annotated.

The release of this Data Validation Report is authorized by the following signature:

Craig G. Sayan
for Paul B. Humburg, President

10.9.01
Date

4127 Plaza 94 South • St. Charles, MO 63304
(636) 936-1332 • Fax (636) 936-1335

SDG# A1H010202

Samples and Fractions Reviewed

Sample Identifications — Analytical Fractions

CH2M HILL ID	MATRIX	VOA		SVOA		PEST		PCB		HERB		MET	
84-MW15-00	SOIL		X		X		X		X		X		X
84-MW15-04	SOIL		X		X		X		X		X		X
84-MW16-00	SOIL								X				
84-MW16-07	SOIL								X				
84-MW17-00	SOIL		X		X		X		X		X		X
84-MW17-07	SOIL		X		X		X		X		X		X
TBIR84-TB03	WATER	X											
EQIR84-ER08	WATER	X		X		X		X		X		X	
EQIR84-ER08 MS	WATER											X	
EQIR84-ER08 MSD	WATER											X	
Total Billable Samples (Water/Soil)		2	4	1	4	1	4	1	6	1	4	3	4

VOA= Volatiles
SVOA= Semivolatiles
PEST= Pesticides
PCB= PCBs
HERB= Herbicides
MET= Metals

DATA ASSESSMENT NARRATIVE

VOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW-846 Method 8260B for GC/MS Volatiles; the National Functional Guidelines for Organic Data Validation, 10/99, as applicable; and NEESA Level C requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # A1H010202

A validation was performed on the Volatile Data from SDG A1H010202. The data was evaluated based on the following parameters:

*	•	Data Completeness
*	•	Holding Times
*	•	GC/MS Tuning
	•	Calibration
	•	Blanks
*	•	Internal Standard Performance
*	•	Surrogate Recoveries
*	•	Matrix Spike/Matrix Spike Duplicates
*	•	Field Duplicates
*	•	Compound Identification
*	•	Compound Quantitation

* - All criteria were met for this parameter.

Calibrations

The continuing calibration standard VSTD050 analyzed 8/6/01 at 2000 exhibited a non-compliant %D greater than 20% but less than 50% for which qualifications were required. For the following sample and non-compliant compound, the reported non-detect result is estimated, J.

84-MW15-00	acetone

Blanks

The method and trip blanks associated with the field samples in this SDG exhibited contamination for which qualifications were required. The end user should note that the action levels indicated for the blank analysis may not involve the same weights, volumes, dilution factors, or percent moisture as associated samples. These factors must be taken into considerations when applying the 5X and 10X criteria to field samples.

Associated blank	Compound	Concentration	Action Level
EHTQE1AA	methylene chloride	59J ug/Kg	590 ug/Kg
TBIR84-TB03	toluene	0.26J ug/L	1.3 ug/L

Samples	Compound	Qualifications
84-MW17-07	methylene chloride	CRQL
84-MW15-04	toluene	CRQL

System Performance and Overall Assessment

The data, as reported, did require qualifications. According to the laboratory, samples were preserved by freezing them in water. This was due to effervescing when preserved with sodium bisulfate. According to the laboratory, some of the field samples exhibited elevated detection limits due to matrix interferences. No qualifications were required.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported Quantitation limit is qualified as estimated

L = Result is estimated and biased low.

K = Result is estimated and biased high.

R = Result is rejected and unusable

D = Result value is based on dilution analysis

BLANK QUALIFICATION CODES

CRQL =	The sample result for the blank contaminant is less than the sample CRQL and is less than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.
U =	The sample result for the blank contaminant is greater than the sample CRQL and is less than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.
No Action =	The sample result for the blank contaminant is greater than the sample CRQL and is greater than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL
84-MW15-00	acetone	+	J
84-MW17-07	methylene chloride	+B	CRQL
84-MW15-04	toluene	+	CRQL

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW-846 Method 8270C for GC/MS Semivolatiles; the National Functional Guidelines for Organic Data Validation, 10/99, as applicable; and NEESA Level C requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # A1H010202

A validation was performed on the Semivolatile Data from SDG A1H010202. The data was evaluated based on the following parameters:

*	• Data Completeness
*	• Holding Times
*	• GC/MS Tuning
*	• Calibration
	• Blanks
*	• Internal Standard Performance
*	• Surrogate Recoveries
*	• Matrix Spike/Matrix Spike Duplicates
*	• Field Duplicates
*	• Compound Identification
*	• Compound Quantitation

* - All criteria were met for this parameter.

Blanks

All TIC compounds also reported in the associated method blanks are rejected, R, up to 10X the blank contamination concentration.

System Performance and Overall Assessment

The data, as reported, did require qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported Quantitation limit is qualified as estimated

L = Result is estimated and biased low.

K = Result is estimated and biased high.

R = Result is rejected and unusable

D = Result value is based on dilution analysis

BLANK QUALIFICATION CODES

CRQL =	The sample result for the blank contaminant is less than the sample CRQL and is less than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.
U =	The sample result for the blank contaminant is greater than the sample CRQL and is less than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.
No Action =	The sample result for the blank contaminant is greater than the sample CRQL and is greater than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL
All Samples	All TICs noted in blanks up to 10X	+	R

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE

PESTICIDES

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC performance, and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW-846 Methods 8081A; the National Functional Guidelines for Organic Data Review, October 1999, as applicable; and NEESA Level C requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # A1H010202

A validation was performed on the Pesticide Data from SDG A1H010202. The data was evaluated based on the following parameters:

*	• Data Completeness
*	• Holding Times
*	• GC Performance
*	• Calibration
*	• Blanks
	• Surrogate Recoveries
*	• Matrix Spike/Matrix Spike Duplicates
*	• Field Duplicates
*	• Compound Identification
	• Compound Quantitation

* - All criteria were met for this parameter.

Method Deviations

It is recommended by the method that the calibration standards for the single component pesticides be prepared as two calibration mixtures "to minimize potential resolution and quantitation problems on confirmation columns..." (SW-846, Method 8081A, Revision 1, December 1996, page 8081A - 8, section 5.6.1). The initial and continuing calibration standards used by the laboratory contain all single component target compounds. There were no qualifications required because of this method deviation.

Surrogate Recoveries

The sample listed below exhibited a high DCB recovery. The positive results are qualified as estimated, J.

84-MW17-00

Compound Quantitation

The positive results exhibiting column quantitation %Ds greater than 40%, flagged PG by the laboratory, are qualified as estimated, J.

System Performance and Overall Assessment

The data required qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

D = Result value is based on dilution analysis

BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 5X the blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 5X the blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 5X the blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL
84-MW17-00	ALL	+	J
All Samples	All %Ds>40%	+PG	J

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non-detect result

DATA ASSESSMENT NARRATIVE

PCBs

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC performance, and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW-846 Methods 8082; the National Functional Guidelines for Organic Data Review, October 1999, as applicable; and NEESA Level C requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # A1H010202

A validation was performed on the PCB Data from SDG A1H010202. The data was evaluated based on the following parameters:

*	•	Data Completeness
*	•	Holding Times
*	•	GC Performance
*	•	Calibration
*	•	Blanks
*	•	Surrogate Recoveries
*	•	Matrix Spike/Matrix Spike Duplicates
*	•	Field Duplicates
*	•	Compound Identification
*	•	Compound Quantitation

* - All criteria were met for this parameter.

System Performance and Overall Assessment

The data did not require qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

D = Result value is based on dilution analysis

BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 5X the blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 5X the blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 5X the blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL

NO QUALIFICATIONS WERE REQUIRED.

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non-detect result

DATA ASSESSMENT NARRATIVE

HERBICIDES

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC performance, and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW-846 Methods 8151A; the National Functional Guidelines for Organic Data Review, October 1999, as applicable; and NEESA Level C requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # A1H010202

A validation was performed on the Herbicide Data from SDG A1H010202. The data was evaluated based on the following parameters:

*	•	Data Completeness
*	•	Holding Times
*	•	GC Performance
*	•	Calibration
*	•	Blanks
*	•	Surrogate Recoveries
*	•	Matrix Spike/Matrix Spike Duplicates
*	•	Field Duplicates
*	•	Compound Identification
*	•	Compound Quantitation

* - All criteria were met for this parameter.

System Performance and Overall Assessment

The data did not require qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

D = Result value is based on dilution analysis

BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 5X the blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 5X the blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 5X the blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL

NO QUALIFICATIONS WERE REQUIRED.

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non-detect result

DATA ASSESSMENT NARRATIVE
METALS

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, matrix spike and LCS recoveries, matrix duplicates and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW 846 methods for Metals and the Functional Guidelines for Inorganic Data Validation, February 1994 requirements and NEESA C requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDGs # A1H010202

A validation was performed on the Metals Data from SDG A1H010202. The data was evaluated based on the following parameters.

*	●	Data Completeness
*	●	Holding Times
*	●	Calibrations
	●	Blanks
*	●	Interferences
	●	Matrix Spike Recovery
*	●	Matrix Duplicates
*	●	Field Duplicates
*	●	Laboratory Control Samples
*	●	Serial Dilutions

* - All criteria were met for this parameter.

Preparation Blank results

1. The preparation blank for waters exhibited contamination for Potassium (140 ug/l) required that all values below five times the blank contamination be qualified as non-detect, "U".

Matrix Spike Recovery results

2. The matrix spike recovery results for soils for Antimony (32%) was below the lower control limits (>30% but <75%). All positive and non-detect results are qualified as estimated, "J" or "UJ".

3. All results with "B" qualifier are changed to "J" qualifier.

SUMMARY OF DATA QUALIFICATIONS

Sample ID	Analyte	DL	QL
1.all water samples below 700 ug/l	K.	+	U
2.all soil samples	Sb.	+/U	J/UJ
3.all "B" results	all analytes	B	J

Data Validation Report

Baker Environmental, Inc.
Camp Lejeune
SDG#: A1G240102 and A1G240160

PCBs only

HEARTLAND
ENVIRONMENTAL SERVICES, INC.

Data Validation Report

SDG#:	A1G240102
Date:	October 2, 2001
Client Name:	Baker Environmental, Inc.
Project/Site Name:	Camp Lejeune
Date Sampled:	July 17 - 19, 2001
Number of Samples:	5 Aqueous Sample(s) with 0 MS/MD(s)
Laboratory:	STL North Canton
Validation Guidance:	National Functional Guidelines for Organic and Inorganic Data
QA/QC Level:	NEESA Level C
Method(s) Utilized:	SW846 Third Edition
Analytical Fractions:	PCBs

Analytical data in this report were screened to determine usability of results and also to determine contractual compliance relative to these requirements and deliverables. This screening assumes analytical results are correct as reported and merely provides an interpretation of the reported quality control results. A minimum of 10% of all laboratory calculations have been verified as part of this validation. All instrument output, i.e. spectra, chromatograms, etc., for each sample have been carefully reviewed. The end-user is urged to review the Specific Findings and associated Data Qualifications presented in this report. Annotated Form 1s or spreadsheets for all samples reviewed are included after the Data Assessment Narratives. Form 1s for MS/MSD samples or spreadsheets are not annotated.

The release of this Data Validation Report is authorized by the following signature:

Craig G. Seaman — 10-2-01.

Paul B. Humburg, President — Date

4127 Plaza 94 South • St. Charles, MO 63304
(636) 936-1332 • Fax (636) 936-1335

SDG# A1G240102

Samples and Fractions Reviewed

Sample Identifications Analytical Fraction

CH2M HILL ID	MATRIX	PCB	
IR84-ER01	WATER	X	
IR84-FB01	WATER	X	
IR84-FB02	WATER	X	
IR84-ER02	WATER	X	
IR84-ER03	WATER	X	
Total Billable Samples (Water/Soil)		5	0

PCB= PCBs

DATA ASSESSMENT NARRATIVE

POLYCHLORINATED BIPHENYLS (PCBs)

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC performance and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW-846 Method 8082; the National Functional Guidelines for Organic Data Validation, 10/99, as applicable; and NEESA C requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # A1G240102

A validation was performed on the Pesticides Data from SDG A1G240102. The data was evaluated based on the following parameters:

*	•	Data Completeness
*	•	Holding Times
*	•	GC Performance
*	•	Calibration
*	•	Blanks
*	•	Surrogate Recoveries
*	•	Matrix Spike/Matrix Spike Duplicates
*	•	Laboratory Control Samples
*	•	Field Duplicates
*	•	Compound Identification
*	•	Compound Quantitation

* - All criteria were met for this parameter.

System Performance and Overall Assessment

The data, as reported, did not require qualifications. This SDG contained field QC blanks only.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported Quantitation limit is qualified as estimated

L = Result is estimated and biased low.

K = Result is estimated and biased high.

R = Result is rejected and unusable

D = Result value is based on dilution analysis

BLANK QUALIFICATION CODES

CRQL =	The sample result for the blank contaminant is less than the sample CRQL and is less than 5X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.
U =	The sample result for the blank contaminant is greater than the sample CRQL and is less than 5X the method blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.
No Action =	The sample result for the blank contaminant is greater than the sample CRQL and is greater than 5X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL

NO QUALIFICATIONS WERE REQUIRED

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non detect result

HEARTLAND
ENVIRONMENTAL SERVICES, INC.

Data Validation Report

SDG#:	A1G240160
Date:	October 2, 2001
Client Name:	Baker Environmental, Inc.
Project/Site Name:	Camp Lejeune
Date Sampled:	July 20 - 21, 2001
Number of Samples:	5 Aqueous Sample(s) with 0 MS/MD(s)
Laboratory:	STL North Canton
Validation Guidance:	National Functional Guidelines for Organic and Inorganic Data
QA/QC Level:	NEESA Level C
Method(s) Utilized:	SW846 Third Edition
Analytical Fractions:	Volatiles, Semivolatiles, Pesticides, PCBs, Herbicides and Metals

Analytical data in this report were screened to determine usability of results and also to determine contractual compliance relative to these requirements and deliverables. This screening assumes analytical results are correct as reported and merely provides an interpretation of the reported quality control results. A minimum of 10% of all laboratory calculations have been verified as part of this validation. All instrument output, i.e. spectra, chromatograms, etc., for each sample have been carefully reviewed. The end-user is urged to review the Specific Findings and associated Data Qualifications presented in this report. Annotated Form 1s or spreadsheets for all samples reviewed are included after the Data Assessment Narratives. Form 1s for MS/MSD samples or spreadsheets are not annotated.

The release of this Data Validation Report is authorized by the following signature:

Craig G. Swafford

Paul B. Humburg, President

10-2-01.

Date

4127 Plaza 94 South • St. Charles, MO 63304
(636) 936-1332 • Fax (636) 936-1335

SDG# A1G240160

Samples and Fractions Reviewed

Sample Identifications | Analytical Fractions

CH2M HILL ID	MATRIX	VOA		SVOA		PEST		PCB		HERB		MET	
IR84-ER04	WATER							X					
IR84-FB03	WATER	X		X		X		X		X		X	
IR84-FB04	WATER	X		X		X		X		X		X	
IR84-ER05	WATER	X		X		X		X		X		X	
TRIP BLANKS	WATER	X											
Total Billable Samples (Water/Soil)		4	0	3	0	3	0	4	0	3	0	3	0

VOA= Volatiles
SVOA= Semivolatiles
PEST= Pesticides
PCB= PCBs
HERB= Herbicides
MET= Metals

DATA ASSESSMENT NARRATIVE

VOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW-846 Method 8260B for GC/MS Volatiles; the National Functional Guidelines for Organic Data Validation, 10/99, as applicable; and NEESA Level C requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # A1G240160

A validation was performed on the Volatile Data from SDG A1G240160. The data was evaluated based on the following parameters:

*	• Data Completeness
*	• Holding Times
*	• GC/MS Tuning
*	• Calibration
	• Blanks
*	• Internal Standard Performance
*	• Surrogate Recoveries
*	• Matrix Spike/Matrix Spike Duplicates
*	• Field Duplicates
*	• Compound Identification
*	• Compound Quantitation

* - All criteria were met for this parameter.

Blanks

The method blank associated with the field QC blanks in this SDG exhibited contamination for which qualifications were required. The end user should note that the action levels indicated for the blank analysis may not involve the same weights, volumes, dilution factors, or percent moisture as associated samples. These factors must be taken into considerations when applying the 5X and 10X criteria to field samples.

Associated blank	Compound	Concentration	Action Level
EG0CT1AA	acetone	0.76J ug/L	7.6 ug/L

Blanks (continued)

Samples	Compound	Qualifications
1R84-FB03 IR84-ER05	acetone	CRQL

System Performance and Overall Assessment

The data, as reported, did require qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

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L = Result is estimated and biased low.

K = Result is estimated and biased high.

R = Result is rejected and unusable

D = Result value is based on dilution analysis

BLANK QUALIFICATION CODES

CRQL =	The sample result for the blank contaminant is less than the sample CRQL and is less than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.
U =	The sample result for the blank contaminant is greater than the sample CRQL and is less than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.
No Action =	The sample result for the blank contaminant is greater than the sample CRQL and is greater than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL
1R84-FB03 IR84-ER05	acetone	+B	CRQL

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW-846 Method 8270C for GC/MS Semivolatiles; the National Functional Guidelines for Organic Data Validation, 10/99, as applicable; and NEESA Level C requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # A1G240160

A validation was performed on the Semivolatile Data from SDG A1G240160. The data was evaluated based on the following parameters:

*	•	Data Completeness
*	•	Holding Times
*	•	GC/MS Tuning
*	•	Calibration
*	•	Blanks
*	•	Internal Standard Performance
*	•	Surrogate Recoveries
*	•	Matrix Spike/Matrix Spike Duplicates
*	•	Field Duplicates
*	•	Compound Identification
*	•	Compound Quantitation

* - All criteria were met for this parameter.

System Performance and Overall Assessment

The data, as reported, did not require qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported Quantitation limit is qualified as estimated

L = Result is estimated and biased low.

K = Result is estimated and biased high.

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D = Result value is based on dilution analysis

BLANK QUALIFICATION CODES

CRQL =	The sample result for the blank contaminant is less than the sample CRQL and is less than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.
U =	The sample result for the blank contaminant is greater than the sample CRQL and is less than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.
No Action =	The sample result for the blank contaminant is greater than the sample CRQL and is greater than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL

NO QUALIFICATIONS WERE REQUIRED

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE

PESTICIDES

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC performance and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW-846 Method 8081A, the National Functional Guidelines for Organic Data Validation, 10/99, as applicable; and NEESA C requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # A1G240160

A validation was performed on the Pesticides Data from SDG A1G240160. The data was evaluated based on the following parameters:

*	•	Data Completeness
*	•	Holding Times
*	•	GC Performance
*	•	Calibration
*	•	Blanks
*	•	Surrogate Recoveries
*	•	Matrix Spike/Matrix Spike Duplicates
*	•	Laboratory Control Samples
*	•	Field Duplicates
*	•	Compound Identification
*	•	Compound Quantitation

* - All criteria were met for this parameter.

System Performance and Overall Assessment

The data, as reported, did not require qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

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BLANK QUALIFICATION CODES

CRQL =	The sample result for the blank contaminant is less than the sample CRQL and is less than 5X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.
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SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL

NO QUALIFICATIONS WERE REQUIRED

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE

POLYCHLORINATED BIPHENYLS (PCBs)

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC performance and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW-846 Method 8082; the National Functional Guidelines for Organic Data Validation, 10/99, as applicable; and NEESA C requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # A1G240160

A validation was performed on the Pesticides Data from SDG A1G240160. The data was evaluated based on the following parameters:

*	•	Data Completeness
*	•	Holding Times
*	•	GC Performance
*	•	Calibration
*	•	Blanks
*	•	Surrogate Recoveries
*	•	Matrix Spike/Matrix Spike Duplicates
*	•	Laboratory Control Samples
*	•	Field Duplicates
*	•	Compound Identification
*	•	Compound Quantitation

* - All criteria were met for this parameter.

System Performance and Overall Assessment

The data, as reported, did not require qualifications. This SDG contained field QC blanks only.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported Quantitation limit is qualified as estimated

L = Result is estimated and biased low.

K = Result is estimated and biased high.

R = Result is rejected and unusable

D = Result value is based on dilution analysis

BLANK QUALIFICATION CODES

CRQL =	The sample result for the blank contaminant is less than the sample CRQL and is less than 5X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.
U =	The sample result for the blank contaminant is greater than the sample CRQL and is less than 5X the method blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.
No Action =	The sample result for the blank contaminant is greater than the sample CRQL and is greater than 5X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL

NO QUALIFICATIONS WERE REQUIRED

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE

HERBICIDES

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC performance and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW-846 Method 8151A, the National Functional Guidelines for Organic Data Validation, 10/99, as applicable; and NEESA C requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # A1G240160

A validation was performed on the Herbicides Data from SDG A1G240160. The data was evaluated based on the following parameters:

*	•	Data Completeness
*	•	Holding Times
*	•	GC Performance
	•	Calibration
*	•	Blanks
*	•	Surrogate Recoveries
*	•	Matrix Spike/Matrix Spike Duplicates
*	•	Laboratory Control Samples
*	•	Field Duplicates
*	•	Compound Identification
*	•	Compound Quantitation

* - All criteria were met for this parameter.

Calibrations

The continuing calibration standard 679 analyzed 8/3/01 at 1721 exhibited one compound with a %D greater than 50% but less than 90%. For the following sample and non-compliant compound, the reported positive and non-detect results are qualified as estimated, J/UJ.

All Samples dalapon

System Performance and Overall Assessment

The data, as reported, did require qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported Quantitation limit is qualified as estimated

L = Result is estimated and biased low.

K = Result is estimated and biased high.

R = Result is rejected and unusable

D = Result value is based on dilution analysis

BLANK QUALIFICATION CODES

CRQL =	The sample result for the blank contaminant is less than the sample CRQL and is less than 5X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.
U =	The sample result for the blank contaminant is greater than the sample CRQL and is less than 5X the method blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.
No Action =	The sample result for the blank contaminant is greater than the sample CRQL and is greater than 5X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL
All Samples	dalapon	+/-	J/UJ

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE
METALS

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, matrix spike and LCS recoveries, matrix duplicates and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW 846 methods for Metals and the Functional Guidelines for Inorganic Data Validation, February 1994 requirements and NEESA C requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDGs # A1G24160

A validation was performed on the Metals Data from SDG A1G240160. The data was evaluated based on the following parameters.

*	●	Data Completeness
*	●	Holding Times
*	●	Calibrations
	●	Blanks
*	●	Interferences
*	●	Matrix Spike Recovery
*	●	Matrix Duplicates
*	●	Field Duplicates
*	●	Laboratory Control Samples
*	●	Serial Dilutions

* - All criteria were met for this parameter.

Preparation Blank results

1. The preparation blank for waters exhibited contamination for Potassium (150 ug/l) required that all values below five times the blank contamination (750 ug/l respectfully) be qualified as non-detect, "U".

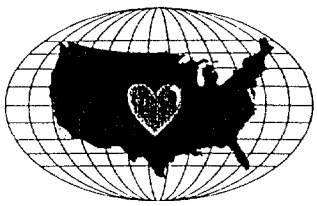
2. All results with "B" qualifier are changed to "J" qualifier.

SUMMARY OF DATA QUALIFICATIONS

Sample ID	Analyte	DL	QL
1.all water samples below 750 ug/l	K.	+	U
2.all "B" results	all analytes	B	J

Data Validation Report

Baker Environmental, Inc.
Camp Lejeune
SDG#: A1H030154



HEARTLAND
ENVIRONMENTAL SERVICES, INC.

Data Validation Report

SDG#:	A1H030154
Date:	October 9, 2001
Client Name:	Baker Environmental, Inc.
Project/Site Name:	Camp Lejeune
Date Sampled:	August 2, 2001
Number of Samples:	15 Non-Aqueous Sample(s) with 0 MS/MD(s) 2 Aqueous Sample(s) with 0 MS/MD(s)
Laboratory:	STL North Canton
Validation Guidance:	National Functional Guidelines for Organic and Inorganic Data
QA/QC Level:	NEESA Level C
Method(s) Utilized:	SW846 Third Edition
Analytical Fractions:	Volatiles, Semivolatiles, Pesticides, PCBs, Herbicides and Metals

Analytical data in this report were screened to determine usability of results and also to determine contractual compliance relative to these requirements and deliverables. This screening assumes analytical results are correct as reported and merely provides an interpretation of the reported quality control results. A minimum of 10% of all laboratory calculations have been verified as part of this validation. All instrument output, i.e. spectra, chromatograms, etc., for each sample have been carefully reviewed. The end-user is urged to review the Specific Findings and associated Data Qualifications presented in this report. Annotated Form 1s or spreadsheets for all samples reviewed are included after the Data Assessment Narratives. Form 1s for MS/MSD samples or spreadsheets are not annotated.

The release of this Data Validation Report is authorized by the following signature:

Craig G. Simpson
Paul B. Humburg, President

10-9-01.
Date

4127 Plaza 94 South • St. Charles, MO 63304
(636) 936-1332 • Fax (636) 936-1335

SDG# A1H030154

Samples and Fractions Reviewed

Sample Identifications | Analytical Fractions

CH2M HILL ID	MATRIX	VOA		SVOA		PEST		PCB		HERB		MET	
IR84-SB06-01	SOIL		X		X		X		X		X		X
IR84-SB08-01	SOIL		X		X		X		X		X		X
IR84-SB07-01	SOIL		X		X		X		X		X		X
IR84-SB06-01D	SOIL		X		X		X		X		X		X
IR84-SB04-02	SOIL		X		X		X		X		X		X
IR84-SB01-02	SOIL		X		X		X		X		X		X
IR84-SB02-02	SOIL		X		X		X		X		X		X
IR84-DP74-00	SOIL		X		X		X		X		X		X
IR84-SB03-02	SOIL		X		X		X		X		X		X
IR84-DP76-00	SOIL		X		X		X		X		X		X
IR84-DP75-00	SOIL		X		X		X		X		X		X
IR84-DP76-04	SOIL		X		X		X		X		X		X
IR84-DP75-05	SOIL		X		X		X		X		X		X
IR84-MW21-04	SOIL		X		X		X		X		X		X
IR84-DP74-04	SOIL		X		X		X		X		X		X
IR84-ER10	WATER	X		X		X		X		X		X	
IR84-TB05	WATER	X											
Total Billable Samples (Water/Soil)		2	15	1	15	1	15	1	15	1	15	1	15

VOA= Volatiles
SVOA= Semivolatiles
PEST= Pesticides
PCB= PCBs
HERB= Herbicides
MET= Metals

DATA ASSESSMENT NARRATIVE

VOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW-846 Method 8260B for GC/MS Volatiles; the National Functional Guidelines for Organic Data Validation, 10/99, as applicable; and NEESA Level C requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # A1H030154

A validation was performed on the Volatile Data from SDG A1H030154. The data was evaluated based on the following parameters:

*	• Data Completeness
*	• Holding Times
*	• GC/MS Tuning
	• Calibration
	• Blanks
*	• Internal Standard Performance
*	• Surrogate Recoveries
*	• Matrix Spike/Matrix Spike Duplicates
*	• Field Duplicates
*	• Compound Identification
*	• Compound Quantitation

* - All criteria were met for this parameter.

Calibrations

The continuing calibration standard VSTD050 analyzed 8/13/01 at 2037 exhibited a non-compliant %D for one compound for which qualifications were required. For the following sample and non-compliant compound, the reported positive result is qualified as estimated, J.

IR84-MW21-04	acetone

Calibrations (continued)

The continuing calibration standard VSTD050 analyzed 8/09/01 at 0557 exhibited a non-compliant %D for one compound for which qualifications were required. For the following sample and non-compliant compound, the reported positive result is qualified as estimated, J.

IR84-ER10 acetone

Blanks

The rinse blank associated with the field samples in this SDG exhibited contamination for which qualifications were required. The end user should note that the action levels indicated for the blank analysis may not involve the same weights, volumes, dilution factors, or percent moisture as associated samples. These factors must be taken into considerations when applying the 5X and 10X criteria to field samples.

Associated blank	Compound	Concentration	Action Level
IR84-ER10	acetone	1.3J ug/L	13 ug/L
	chloroform	0.21J ug/L	1.05 ug/L

Samples	Compound	Qualifications
IR84-SB06-01	chloroform	CRQL
IR84-SB03-02	acetone	CRQL

System Performance and Overall Assessment

The data, as reported, did require qualifications. According to the laboratory, samples were preserved by freezing them in water. This was due to effervescing when preserved with sodium bisulfate. No qualifications were required. Also, according to the STL Cooler Receipt Form, one cooler (J293) was received at a temperature of 8.8 ° C. The laboratory did not maintain information on specific samples contained in this cooler. (Called David Heakin at STL, 10/8/01 at 11:24am). This information was also not available on the COC. Therefore, none of the sample data was qualified due to temperature outside the QC limits of 4 °C +/-2 ° C.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported Quantitation limit is qualified as estimated

L = Result is estimated and biased low.

K = Result is estimated and biased high.

R = Result is rejected and unusable

D = Result value is based on dilution analysis

BLANK QUALIFICATION CODES

CRQL =	The sample result for the blank contaminant is less than the sample CRQL and is less than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.
U =	The sample result for the blank contaminant is greater than the sample CRQL and is less than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.
No Action =	The sample result for the blank contaminant is greater than the sample CRQL and is greater than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL
IR84-MW21-04	acetone	+	J
IR84-ER10	acetone	+	J
IR84-SB06-01	chloroform	+	CRQL
IR84-SB03-02	acetone	+	CRQL

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW-846 Method 8270C for GC/MS Semivolatiles; the National Functional Guidelines for Organic Data Validation, 10/99, as applicable; and NEESA Level C requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # A1H030154

A validation was performed on the Semivolatile Data from SDG A1H030154. The data was evaluated based on the following parameters:

*	• Data Completeness
*	• Holding Times
*	• GC/MS Tuning
*	• Calibration
	• Blanks
*	• Internal Standard Performance
*	• Surrogate Recoveries
*	• Matrix Spike/Matrix Spike Duplicates
*	• Field Duplicates
*	• Compound Identification
*	• Compound Quantitation

* - All criteria were met for this parameter.

Blanks

All TIC compounds also reported in the associated method blanks are rejected, R, up to 10X the blank contamination concentration.

System Performance and Overall Assessment

The data, as reported, did require qualifications. According to the STL Cooler Receipt Form, one cooler (J293) was received at a temperature of 8.8 ° C. The laboratory did not maintain information on specific samples contained in this cooler. (Called David Heakin at STL, 10/8/01 at 11:24am). This information was also not available on the COC. Therefore, none of the sample data was qualified due to temperature outside the QC limits of 4 °C +/-2 ° C.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported Quantitation limit is qualified as estimated

L = Result is estimated and biased low.

K = Result is estimated and biased high.

R = Result is rejected and unusable

D = Result value is based on dilution analysis

BLANK QUALIFICATION CODES

CRQL =	The sample result for the blank contaminant is less than the sample CRQL and is less than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.
U =	The sample result for the blank contaminant is greater than the sample CRQL and is less than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.
No Action =	The sample result for the blank contaminant is greater than the sample CRQL and is greater than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL
All Samples	All TICs noted in blanks up to 10X	+	R

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE

PESTICIDES

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC performance, and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW-846 Methods 8081A; the National Functional Guidelines for Organic Data Review, October 1999, as applicable; and NEESA Level C requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # A1H030154

A validation was performed on the Pesticide Data from SDG A1H030154. The data was evaluated based on the following parameters:

*	• Data Completeness
*	• Holding Times
*	• GC Performance
	• Calibration
*	• Blanks
*	• Surrogate Recoveries
*	• Matrix Spike/Matrix Spike Duplicates
	• Field Duplicates
*	• Compound Identification
	• Compound Quantitation

* - All criteria were met for this parameter.

Method Deviations

It is recommended by the method that the calibration standards for the single component pesticides be prepared as two calibration mixtures "to minimize potential resolution and quantitation problems on confirmation columns..." (SW-846, Method 8081A, Revision 1, December 1996, page 8081A - 8, section 5.6.1). The initial and continuing calibration standards used by the laboratory contain all single component target compounds. There were no qualifications required because of this method deviation.

Continuing Calibrations

The continuing calibration 029F2901.D analyzed on 08/18/01 at 06:47 exhibited one (1) compound with a %D greater than 15% and less than 50%. For the following sample and non-compliant compound, the positive results are qualified as estimated, J.

IR84-MW21-04	Methoxychlor

Field Duplicates

The field duplicate pair of samples IR84-SB06-01 and IR84-SB06-01D exhibited high RPDs for six (6) compounds and required qualifications. For the following samples and compounds, the positive results are qualified as estimated, J, and the non-detect results are qualified as estimated, UJ.

IR84-SB06-01	Dieldrin
IR84-SB06-01D	4,4'-DDE
	4,4'-DDD
	4,4'-DDT
	Alpha-Chlordane
	Gamma-Chlordane

Compound Quantitation

The positive results exhibiting column quantitation %Ds greater than 40%, flagged PG by the laboratory, are qualified as estimated, J.

System Performance and Overall Assessment

The data required qualifications/rejections.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

D = Result value is based on dilution analysis

BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 5X the blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 5X the blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 5X the blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL
IR84-MW21-04	Methoxychlor	+	J
IR84-SB06-01 IR84-SB06-01D	Dieldrin 4,4'-DDE 4,4'-DDD 4,4'-DDT Alpha-Chlordane Gamma-Chlordane	+/-	J/UJ
All Samples	All %Ds>40%	+PG	J

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non-detect result

DATA ASSESSMENT NARRATIVE

PCBs

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC performance, and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW-846 Methods 8082; the National Functional Guidelines for Organic Data Review, October 1999, as applicable; and NEESA Level C requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # A1H030154

A validation was performed on the PCB Data from SDG A1H030154. The data was evaluated based on the following parameters:

*	•	Data Completeness
*	•	Holding Times
*	•	GC Performance
*	•	Calibration
*	•	Blanks
*	•	Surrogate Recoveries
*	•	Matrix Spike/Matrix Spike Duplicates
*	•	Field Duplicates
*	•	Compound Identification
*	•	Compound Quantitation

* - All criteria were met for this parameter.

System Performance and Overall Assessment

The data did not require qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

D = Result value is based on dilution analysis

BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 5X the blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 5X the blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 5X the blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL

NO QUALIFICATIONS WERE REQUIRED.

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non-detect result

DATA ASSESSMENT NARRATIVE

HERBICIDES

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC performance, and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW-846 Methods 8151A; the National Functional Guidelines for Organic Data Review, October 1999, as applicable; and NEESA Level C requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # A1H030154

A validation was performed on the Herbicide Data from SDG A1H030154. The data was evaluated based on the following parameters:

*	•	Data Completeness
*	•	Holding Times
*	•	GC Performance
*	•	Calibration
*	•	Blanks
*	•	Surrogate Recoveries
*	•	Matrix Spike/Matrix Spike Duplicates
*	•	Field Duplicates
*	•	Compound Identification
*	•	Compound Quantitation

* - All criteria were met for this parameter.

System Performance and Overall Assessment

The data did not require qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

D = Result value is based on dilution analysis

BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 5X the blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 5X the blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 5X the blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL

NO QUALIFICATIONS WERE REQUIRED.

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non-detect result

DATA ASSESSMENT NARRATIVE
METALS

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, matrix spike and LCS recoveries, matrix duplicates and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW 846 methods for Metals and the Functional Guidelines for Inorganic Data Validation, February 1994 requirements and NEESA C requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDGs # A1H030154

A validation was performed on the Metals Data from SDG A1H030154. The data was evaluated based on the following parameters.

*	●	Data Completeness
*	●	Holding Times
*	●	Calibrations
	●	Blanks
*	●	Interferences
	●	Matrix Spike Recovery
*	●	Matrix Duplicates
*	●	Field Duplicates
*	●	Laboratory Control Samples
*	●	Serial Dilutions

* - All criteria were met for this parameter.

Preparation Blank results

1. The preparation blank for waters exhibited contamination for Antimony (3.4 ug/l) and Potassium (140 ug/l) and for soils for Barium (12.1 mg/kg), Iron (7.8 mg/kg) and Manganese (0.26 mg/kg) required that all values below five times the blank contamination be qualified as non-detect, "U".

Matrix Spike Recovery results

2. The matrix spike recovery results for soils for Antimony (54%) and Calcium (70%) were below the lower control limits (>30% but <75%). All positive and non-detect results are qualified as estimated, "J" or "UJ".

3. The matrix spike recovery results for soils for Lead (126%) and for waters for Aluminum (164%) and Iron (241%) were above the upper control limits (> 125%). All positive results are qualified as estimated, "J".

4. All results with "B" qualifier are changed to "J" qualifier.

SUMMARY OF DATA QUALIFICATIONS

Sample ID	Analyte	DL	QL
1.all water samples below 700 ug/l	K.	+	U
all soil samples below 50.5 mg/kg	Ba.		
2.all soil samples	Sb and Ca.	+/U	J/UJ
3.all soil samples	Pb.	+	J
all water samples	Al and Fe.		
4.all "B" results	all analytes	B	J

Data Validation Report

Baker Environmental, Inc.
Camp Lejeune
SDG#: A1H020175 and A1G250211

↑PCBs only

HEARTLAND
ENVIRONMENTAL SERVICES, INC.

Data Validation Report

SDG#:	A1H020175
Date:	October 2, 2001
Client Name:	Baker Environmental, Inc.
Project/Site Name:	Camp Lejeune
Date Sampled:	August 1, 2001
Number of Samples:	9 Aqueous Sample(s) with 1 MS/MD(s)
Laboratory:	STL North Canton
Validation Guidance:	National Functional Guidelines for Organic and Inorganic Data
QA/QC Level:	NEESA Level C
Method(s) Utilized:	SW846 Third Edition
Analytical Fractions:	Volatiles, Semivolatiles, Pesticides, PCBs, Herbicides and Metals

Analytical data in this report were screened to determine usability of results and also to determine contractual compliance relative to these requirements and deliverables. This screening assumes analytical results are correct as reported and merely provides an interpretation of the reported quality control results. A minimum of 10% of all laboratory calculations have been verified as part of this validation. All instrument output, i.e. spectra, chromatograms, etc., for each sample have been carefully reviewed. The end-user is urged to review the Specific Findings and associated Data Qualifications presented in this report. Annotated Form 1s or spreadsheets for all samples reviewed are included after the Data Assessment Narratives. Form 1s for MS/MSD samples or spreadsheets are not annotated.

The release of this Data Validation Report is authorized by the following signature:

Craig G. Seurfoss
Paul B. Humburg, President

10-2-01.
Date

4127 Plaza 94 South • St. Charles, MO 63304
(636) 936-1332 • Fax (636) 936-1335

SDG# A1H020175

Samples and Fractions Reviewed

Sample Identifications | Analytical Fractions

CH2M HILL ID	MATRIX	VOA		SVOA		PEST		PCB		HERB		MET	
IR84-TB04	WATER	X											
IR84-FB05	WATER	X		X		X		X		X		X	
IR84-MW20-00	WATER	X		X		X		X		X		X	
IR84-MW20-00 MS	WATER											X	
IR84-MW20-00 MSD	WATER											X	
IR84-MW20-00D	WATER	X		X		X		X		X		X	
IR84-MW19-06	WATER							X					
IR84-MW19-00	WATER							X					
IR84-MW18-04	WATER							X					
IR84-MW18-00	WATER							X					
IR84-ER09	WATER	X		X		X		X		X		X	
Total Billable Samples (Water/Soil)		5	0	4	0	4	0	8	0	4	0	6	0

VOA= Volatiles
SVOA= Semivolatiles
PEST= Pesticides
PCB= PCBs
HERB= Herbicides
MET= Metals

DATA ASSESSMENT NARRATIVE

VOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW-846 Method 8260B for GC/MS Volatiles; the National Functional Guidelines for Organic Data Validation, 10/99, as applicable; and NEESA Level C requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # A1H020175

A validation was performed on the Volatile Data from SDG A1H020175. The data was evaluated based on the following parameters:

*	• Data Completeness
*	• Holding Times
*	• GC/MS Tuning
*	• Calibration
	• Blanks
	• Internal Standard Performance
*	• Surrogate Recoveries
*	• Matrix Spike/Matrix Spike Duplicates
*	• Field Duplicates
*	• Compound Identification
*	• Compound Quantitation

* - All criteria were met for this parameter.

Blanks

The trip blank associated with the field QC blanks in this SDG exhibited contamination for which qualifications were required. The end user should note that the action levels indicated for the blank analysis may not involve the same weights, volumes, dilution factors, or percent moisture as associated samples. These factors must be taken into considerations when applying the 5X and 10X criteria to field samples.

Associated blank	Compound	Concentration	Action Level
IR84-TB04	acetone	3.0J ug/L	30 ug/L

Blanks (continued)

Samples	Compound	Qualifications
1R84-MW20-00	acetone	U
IR84-MW20-00D	acetone	CRQL

Internal Standards

The following sample exhibited internal standards below the QC limits for all internal standards. All reported positive and non-detect results are qualified as estimated, J/UJ.

IR84-MW20-00	All internal standards

System Performance and Overall Assessment

The data, as reported, did require qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported Quantitation limit is qualified as estimated

L = Result is estimated and biased low.

K = Result is estimated and biased high.

R = Result is rejected and unusable

D = Result value is based on dilution analysis

BLANK QUALIFICATION CODES

CRQL =	The sample result for the blank contaminant is less than the sample CRQL and is less than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.
U =	The sample result for the blank contaminant is greater than the sample CRQL and is less than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.
No Action =	The sample result for the blank contaminant is greater than the sample CRQL and is greater than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL
1R84-MW20-00	acetone	+	U
IR84-MW20-00D	acetone	+	CRQL
IR84-MW20-00	*All associated with* All internal standards	+/-	J/UJ

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW-846 Method 8270C for GC/MS Semivolatiles; the National Functional Guidelines for Organic Data Validation, 10/99, as applicable; and NEESA Level C requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # A1H020175

A validation was performed on the Semivolatile Data from SDG A1H020175. The data was evaluated based on the following parameters:

*	•	Data Completeness
*	•	Holding Times
*	•	GC/MS Tuning
*	•	Calibration
*	•	Blanks
*	•	Internal Standard Performance
*	•	Surrogate Recoveries
*	•	Matrix Spike/Matrix Spike Duplicates
*	•	Field Duplicates
*	•	Compound Identification
*	•	Compound Quantitation

* - All criteria were met for this parameter.

System Performance and Overall Assessment

The data, as reported, did not require qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported Quantitation limit is qualified as estimated

L = Result is estimated and biased low.

K = Result is estimated and biased high.

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BLANK QUALIFICATION CODES

CRQL =	The sample result for the blank contaminant is less than the sample CRQL and is less than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.
U =	The sample result for the blank contaminant is greater than the sample CRQL and is less than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.
No Action =	The sample result for the blank contaminant is greater than the sample CRQL and is greater than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL

NO QUALIFICATIONS WERE REQUIRED

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE

PESTICIDES

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC performance and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW-846 Method 8081A, the National Functional Guidelines for Organic Data Validation, 10/99, as applicable; and NEESA C requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # A1H020175

A validation was performed on the Pesticides Data from SDG A1H020175. The data was evaluated based on the following parameters:

*	• Data Completeness
*	• Holding Times
*	• GC Performance
	• Calibration
*	• Blanks
*	• Surrogate Recoveries
*	• Matrix Spike/Matrix Spike Duplicates
*	• Laboratory Control Samples
	• Field Duplicates
*	• Compound Identification
	• Compound Quantitation

* - All criteria were met for this parameter.

Calibrations

The continuing calibration standard AB3 analyzed 8/16/01 at 2058 exhibited one compound with a %D greater than 15% but less than 50% for which qualifications were required. For the following sample and non-compliant compound, the reported positive result is qualified as estimated, J.

IR84-MW20-00D	endrin aldehyde

Field Duplicates

The field duplicate pair of the following samples exhibited non-compliant precision results for the noted compound. The reported positive and non-detect results are qualified as estimated, J/UJ.

IR84-MW20-00	dieldrin
IR84-MW20-00D	4,4'-DDE
	endrin
	4,4,'-DDD
	endosulfan sulfate
	methoxychlor
	endrin aldehyde
	alpha-chlordane
	gamma-chlordane

Compound Quantitation

Several results were reported by the laboratory flagged PG. This flag indicates that the column quantitation %Ds were greater than 40%. All results flagged PG are qualified as estimated, J, due to column quantitation %Ds greater than 40%.

System Performance and Overall Assessment

The data, as reported, did require qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported Quantitation limit is qualified as estimated

L = Result is estimated and biased low.

K = Result is estimated and biased high.

R = Result is rejected and unusable

D = Result value is based on dilution analysis

BLANK QUALIFICATION CODES

CRQL =	The sample result for the blank contaminant is less than the sample CRQL and is less than 5X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.
U =	The sample result for the blank contaminant is greater than the sample CRQL and is less than 5X the method blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.
No Action =	The sample result for the blank contaminant is greater than the sample CRQL and is greater than 5X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL
IR84-MW20-00D	endrin aldehyde	+	J
IR84-MW20-00 IR84-MW20-00D	dieldrin 4,4'-DDE endrin 4,4,'-DDD endosulfan sulfate methoxychlor endrin aldehyde alpha-chlordane gamma-chlordane	+/-	J/UJ
All Samples	All Compounds	+PG	J

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non detect result

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL
IR84-MW20-00 IR84-MW20-00D	AR1260	+	J

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE

HERBICIDES

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC performance and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW-846 Method 8151A, the National Functional Guidelines for Organic Data Validation, 10/99, as applicable; and NEESA C requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # A1H020175

A validation was performed on the Herbicides Data from SDG A1H020175. The data was evaluated based on the following parameters:

*	• Data Completeness
*	• Holding Times
*	• GC Performance
*	• Calibration
*	• Blanks
*	• Surrogate Recoveries
*	• Matrix Spike/Matrix Spike Duplicates
*	• Laboratory Control Samples
*	• Field Duplicates
*	• Compound Identification
*	• Compound Quantitation

* - All criteria were met for this parameter.

System Performance and Overall Assessment

The data, as reported, did not require qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported Quantitation limit is qualified as estimated

L = Result is estimated and biased low.

K = Result is estimated and biased high.

R = Result is rejected and unusable

D = Result value is based on dilution analysis

BLANK QUALIFICATION CODES

CRQL =	The sample result for the blank contaminant is less than the sample CRQL and is less than 5X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.
U =	The sample result for the blank contaminant is greater than the sample CRQL and is less than 5X the method blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.
No Action =	The sample result for the blank contaminant is greater than the sample CRQL and is greater than 5X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL

NO QUALIFICATIONS WERE REQUIRED

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE
METALS

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, matrix spike and LCS recoveries, matrix duplicates and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW 846 methods for Metals and the Functional Guidelines for Inorganic Data Validation, February 1994 requirements and NEESA C requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDGs # A1H020175

A validation was performed on the Metals Data from SDG A1H020175. The data was evaluated based on the following parameters.

*	●	Data Completeness
*	●	Holding Times
*	●	Calibrations
	●	Blanks
*	●	Interferences
	●	Matrix Spike Recovery
*	●	Matrix Duplicates
*	●	Field Duplicates
*	●	Laboratory Control Samples
*	●	Serial Dilutions

* - All criteria were met for this parameter.

Preparation Blank results

1. The preparation blank for waters exhibited contamination for Manganese (6.7 ug/l) and Potassium (160 ug/l) required that all values below five times the blank contamination (33.5 ug/l and 800 ug/l respectfully) be qualified as non-detect, "U".

Matrix Spike Recovery results

2. The matrix spike recovery results for soils for Antimony (52%) was below the lower control limits (>30% but <75%). All positive and non-detect results are qualified as estimated, "J" or "UJ".

3. All results with "B" qualifier are changed to "J" qualifier.

SUMMARY OF DATA QUALIFICATIONS

Sample ID	Analyte	DL	QL
1.all water samples below 33.5 ug/l	Mn.	+	U
all water samples below 800 ug/l	K.		
2.all soil samples	Sb.	+/U	J/UJ
3.all "B" results	all analytes	B	J

Data Validation Report

Baker Environmental, Inc.
Camp Lejeune
SDG#: A1H040142

HEARTLAND
ENVIRONMENTAL SERVICES, INC.

Data Validation Report

SDG#:	A1H040142
Date:	October 9, 2001
Client Name:	Baker Environmental, Inc.
Project/Site Name:	Camp Lejeune
Date Sampled:	August 3, 2001
Number of Samples:	3 Aqueous Sample(s) with 0 MS/MD(s) 4 Non-Aqueous Sample(s) with 1 MS/MD(s)
Laboratory:	STL North Canton
Validation Guidance:	National Functional Guidelines for Organic and Inorganic Data
QA/QC Level:	NEESA Level C
Method(s) Utilized:	SW846 Third Edition
Analytical Fractions:	Volatiles, Semivolatiles, Pesticides, PCBs, Herbicides and Metals

Analytical data in this report were screened to determine usability of results and also to determine contractual compliance relative to these requirements and deliverables. This screening assumes analytical results are correct as reported and merely provides an interpretation of the reported quality control results. A minimum of 10% of all laboratory calculations have been verified as part of this validation. All instrument output, i.e. spectra, chromatograms, etc., for each sample have been carefully reviewed. The end-user is urged to review the Specific Findings and associated Data Qualifications presented in this report. Annotated Form 1s or spreadsheets for all samples reviewed are included after the Data Assessment Narratives. Form 1s for MS/MSD samples or spreadsheets are not annotated.

The release of this Data Validation Report is authorized by the following signature:

Craig G. Swanson

Paul B. Humburg, President

10-9-01

Date

4127 Plaza 94 South • St. Charles, MO 63304
(636) 936-1332 • Fax (636) 936-1335

SDG# A1H040142

Samples and Fractions Reviewed

Sample Identifications — Analytical Fractions

CH2M HILL ID	MATRIX	VOA		SVOA		PEST		PCB		HERB		MET	
IR84-MW23-01	SOIL		X		X		X		X		X		X
IR84-MW22-02	SOIL		X		X		X		X		X		X
IR84-SB05-01	SOIL		X		X		X		X		X		X
IR84-SB05-01 MS	SOIL		X		X		X		X		X		X
IR84-SB05-01 MSD	SOIL		X		X		X		X		X		X
IR84-DP84-00	SOIL		X		X		X		X		X		X
IR84-TB06	WATER	X											
IR84-ER11	WATER	X		X		X		X		X		X	
IR84-FB06	WATER	X		X		X		X		X		X	
Total Billable Samples (Water/Soil)		3	6	2	6	2	6	2	6	2	6	2	6

VOA= Volatiles
SVOA= Semivolatiles
PEST= Pesticides
PCB= PCBs
HERB= Herbicides
MET= Metals

DATA ASSESSMENT NARRATIVE

VOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW-846 Method 8260B for GC/MS Volatiles; the National Functional Guidelines for Organic Data Validation, 10/99, as applicable; and NEESA Level C requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # A1H040142

A validation was performed on the Volatile Data from SDG A1H040142. The data was evaluated based on the following parameters:

*	• Data Completeness
*	• Holding Times
*	• GC/MS Tuning
	• Calibration
	• Blanks
*	• Internal Standard Performance
*	• Surrogate Recoveries
*	• Matrix Spike/Matrix Spike Duplicates
*	• Field Duplicates
*	• Compound Identification
*	• Compound Quantitation

* - All criteria were met for this parameter.

Calibrations

The continuing calibration standard VSTD050 analyzed 8/13/01 at 2037 exhibited a non-compliant %D for one compound for which qualifications were required. For the following sample and non-compliant compound, the reported positive result is qualified as estimated, J.

IR84-MW21-04	acetone

Calibrations (continued)

The continuing calibration standard VSTD010 analyzed 8/10/01 at 0904 exhibited non-compliant %Ds for two compounds for which qualifications were required. For the following samples and non-compliant compounds, the reported positive results are qualified as estimated, J. (continued)

IR84-TB06	2-butanone
IR84-FB06	

Internal Standards

The following sample exhibited a non-compliant internal standard recovery for the noted internal standard compound. For the following sample and associated compounds, the reported positive and non-detect results are qualified as estimated, J/UJ.

IR84-DP84-00	1,4-dichlorobenzene-d4

Blanks

The trip and rinse blanks associated with the field samples in this SDG exhibited contamination for which qualifications were required. The end user should note that the action levels indicated for the blank analysis may not involve the same weights, volumes, dilution factors, or percent moisture as associated samples. These factors must be taken into considerations when applying the 5X and 10X criteria to field samples.

Associated blank	Compound	Concentration	Action Level
IR84-TB06	acetone	2.7J ug/L	27 ug/L
IR84-FB06	acetone	30 ug/L	300 ug/L
	2-butanone	4.6J ug/L	23 ug/L
	toluene	1.3 ug/L	6.5 ug/L
	xylenes (total)	0.51J ug/L	2.5 ug/L

Samples	Compound	Qualifications
IR84-MW23-01	acetone	CRQL
IR84-DP84-00	acetone	U

Blanks (continued)

Samples	Compound	Qualifications
IR84-DP84-00	2-butanone	CRQL
IR84-DP84-00	toluene	CRQL
IR84-MW23-01	xylenes (total)	CRQL

System Performance and Overall Assessment

The data, as reported, did require qualifications. According to the laboratory, samples were preserved by freezing them in water. This was due to effervescing when preserved with sodium bisulfate. No qualifications were required.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported Quantitation limit is qualified as estimated

L = Result is estimated and biased low.

K = Result is estimated and biased high.

R = Result is rejected and unusable

D = Result value is based on dilution analysis

BLANK QUALIFICATION CODES

CRQL =	The sample result for the blank contaminant is less than the sample CRQL and is less than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.
U =	The sample result for the blank contaminant is greater than the sample CRQL and is less than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.
No Action =	The sample result for the blank contaminant is greater than the sample CRQL and is greater than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL
IR84-TB06 IR84-ER11 IR84-FB06	acetone	+	J
IR84-TB06 IR84-FB06	2-butanone	+	J
IR84-DP84-00	*All associated with* 1,4-dichlorobenzene-d4	+/-	J/UJ
IR84-MW23-01	acetone	+	CRQL
IR84-DP84-00	acetone	+	U
IR84-DP84-00	2-butanone	+	CRQL
IR84-DP84-00	toluene	+	CRQL
IR84-MW23-01	xylenes (total)	+	CRQL

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non detect result

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL
IR84-TB06 IR84-ER11 IR84-FB06	acetone	+	J
IR84-TB06 IR84-FB06	2-butanone	+	J
IR84-DP84-00	*All associated with* 1,4-dichlorobenzene-d4	+/-	J/UJ
IR84-MW23-01	acetone	+	CRQL
IR84-DP84-00	acetone	+	U
IR84-DP84-00	2-butanone	+	CRQL
IR84-DP84-00	toluene	+	CRQL
IR84-MW23-01	xylenes (total)	+	CRQL

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW-846 Method 8270C for GC/MS Semivolatiles; the National Functional Guidelines for Organic Data Validation, 10/99, as applicable; and NEESA Level C requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # A1H040142

A validation was performed on the Semivolatile Data from SDG A1H040142. The data was evaluated based on the following parameters:

*	• Data Completeness
*	• Holding Times
*	• GC/MS Tuning
*	• Calibration
	• Blanks
*	• Internal Standard Performance
*	• Surrogate Recoveries
*	• Matrix Spike/Matrix Spike Duplicates
*	• Field Duplicates
*	• Compound Identification
*	• Compound Quantitation

* - All criteria were met for this parameter.

Blanks

All TIC compounds also reported in the associated method blanks are rejected, R, up to 10X the blank contamination concentration.

System Performance and Overall Assessment

The data, as reported, did require qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported Quantitation limit is qualified as estimated

L = Result is estimated and biased low.

K = Result is estimated and biased high.

R = Result is rejected and unusable

D = Result value is based on dilution analysis

BLANK QUALIFICATION CODES

CRQL =	The sample result for the blank contaminant is less than the sample CRQL and is less than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.
U =	The sample result for the blank contaminant is greater than the sample CRQL and is less than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.
No Action =	The sample result for the blank contaminant is greater than the sample CRQL and is greater than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL
All Samples	All TICs noted in blanks up to 10X	+	R

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE

PESTICIDES

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC performance, and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW-846 Methods 8081A; the National Functional Guidelines for Organic Data Review, October 1999, as applicable; and NEESA Level C requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # A1H040142

A validation was performed on the Pesticide Data from SDG A1H040142. The data was evaluated based on the following parameters:

*	• Data Completeness
*	• Holding Times
*	• GC Performance
*	• Calibration
*	• Blanks
	• Surrogate Recoveries
*	• Matrix Spike/Matrix Spike Duplicates
*	• Field Duplicates
*	• Compound Identification
	• Compound Quantitation

* - All criteria were met for this parameter.

Method Deviations

It is recommended by the method that the calibration standards for the single component pesticides be prepared as two calibration mixtures "to minimize potential resolution and quantitation problems on confirmation columns..." (SW-846, Method 8081A, Revision 1, December 1996, page 8081A - 8, section 5.6.1). The initial and continuing calibration standards used by the laboratory contain all single component target compounds. There were no qualifications required because of this method deviation.

Surrogate Recoveries

The sample listed below exhibited TCX and DCB recoveries less than 10%. The positive results are qualified as estimated, J, and the non-detect results are rejected, R.

IR84-DP84-00

Compound Quantitation

The positive results exhibiting column quantitation %Ds greater than 40%, flagged PG by the laboratory, are qualified as estimated, J.

System Performance and Overall Assessment

The data required qualifications/rejections.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

D = Result value is based on dilution analysis

BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 5X the blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 5X the blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 5X the blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL
IR84-DP84-00	ALL	+/-	J/R
All Samples	All %Ds>40%	+PG	J

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non-detect result

DATA ASSESSMENT NARRATIVE

PCBs

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC performance, and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW-846 Methods 8082; the National Functional Guidelines for Organic Data Review, October 1999, as applicable; and NEESA Level C requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # A1H040142

A validation was performed on the PCB Data from SDG A1H040142. The data was evaluated based on the following parameters:

*	•	Data Completeness
*	•	Holding Times
*	•	GC Performance
*	•	Calibration
*	•	Blanks
*	•	Surrogate Recoveries
*	•	Matrix Spike/Matrix Spike Duplicates
*	•	Field Duplicates
*	•	Compound Identification
*	•	Compound Quantitation

* - All criteria were met for this parameter.

System Performance and Overall Assessment

The data did not require qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

D = Result value is based on dilution analysis

BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 5X the blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 5X the blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 5X the blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL

NO QUALIFICATIONS WERE REQUIRED.

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non-detect result

DATA ASSESSMENT NARRATIVE

HERBICIDES

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC performance, and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW-846 Methods 8151A; the National Functional Guidelines for Organic Data Review, October 1999, as applicable; and NEESA Level C requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # A1H040142

A validation was performed on the Herbicide Data from SDG A1H040142. The data was evaluated based on the following parameters:

*	•	Data Completeness
*	•	Holding Times
*	•	GC Performance
	•	Calibration
*	•	Blanks
*	•	Surrogate Recoveries
*	•	Matrix Spike/Matrix Spike Duplicates
*	•	Field Duplicates
*	•	Compound Identification
*	•	Compound Quantitation

* - All criteria were met for this parameter.

Continuing Calibrations

The continuing calibration 043F4301.D analyzed on 08/08/01 at 01:11 exhibited one (1) compound with a %D greater than 15% and less than 50%. For the following sample and non-compliant compound, the positive results are qualified as estimated, J.

IR84-FB06	Silvex

System Performance and Overall Assessment

The data required qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

D = Result value is based on dilution analysis

BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 5X the blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 5X the blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 5X the blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL
IR84-FB06	Silvex	+	J

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non-detect result

DATA ASSESSMENT NARRATIVE
METALS

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, matrix spike and LCS recoveries, matrix duplicates and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW 846 methods for Metals and the Functional Guidelines for Inorganic Data Validation, February 1994 requirements and NEESA C requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDGs # A1H040142

A validation was performed on the Metals Data from SDG A1H040142. The data was evaluated based on the following parameters.

*	●	Data Completeness
*	●	Holding Times
*	●	Calibrations
	●	Blanks
*	●	Interferences
	●	Matrix Spike Recovery
*	●	Matrix Duplicates
*	●	Field Duplicates
*	●	Laboratory Control Samples
*	●	Serial Dilutions

* - All criteria were met for this parameter.

Preparation Blank results

1. The preparation blank for waters exhibited contamination for Antimony (3.4 ug/l) and Potassium (140 ug/l) and for soils for Aluminum (5.1 mg/kg), Barium (0.21 mg/kg) and Potassium (16.2 mg/kg) required that all values below five times the blank contamination be qualified as non-detect, "U".

Matrix Spike Recovery results

2. The matrix spike recovery results for soils for Copper (67%) was below the lower control limits (>30% but <75%). All positive and non-detect results are qualified as estimated, "J" or "UJ".

3. The matrix spike recovery results for waters for Aluminum (164%) and Iron (241%) were above the upper control limits (> 125%). All positive results are qualified as estimated, "J".

4. All results with "B" qualifier are changed to "J" qualifier.

SUMMARY OF DATA QUALIFICATIONS

Sample ID	Analyte	DL	QL
1.all water samples below 700 ug/l	K.	+	U
all soil samples below 90.0 mg/kg	K.		
2.all soil samples	Cu.	+/U	J/UJ
3.all water samples	Al and Fe.	+	J
4.all "B" results	all analytes	B	J

Data Validation Report

Baker Environmental, Inc.
Camp Lejeune
SDG#: A1H070159

HEARTLAND
ENVIRONMENTAL SERVICES, INC.

Data Validation Report

SDG#:	A1H070159
Date:	October 9, 2001
Client Name:	Baker Environmental, Inc.
Project/Site Name:	Camp Lejeune
Date Sampled:	August 4 - 6, 2001
Number of Samples:	15 Non-Aqueous Sample(s) with 2 MS/MD(s) 15 Aqueous Sample(s) with 1 MS/MD(s)
Laboratory:	STL North Canton
Validation Guidance:	National Functional Guidelines for Organic and Inorganic Data
QA/QC Level:	NEESA Level C
Method(s) Utilized:	SW846 Third Edition
Analytical Fractions:	Volatiles, Semivolatiles, Pesticides, PCBs, Herbicides and Metals

Analytical data in this report were screened to determine usability of results and also to determine contractual compliance relative to these requirements and deliverables. This screening assumes analytical results are correct as reported and merely provides an interpretation of the reported quality control results. A minimum of 10% of all laboratory calculations have been verified as part of this validation. All instrument output, i.e. spectra, chromatograms, etc., for each sample have been carefully reviewed. The end-user is urged to review the Specific Findings and associated Data Qualifications presented in this report. Annotated Form 1s or spreadsheets for all samples reviewed are included after the Data Assessment Narratives. Form 1s for MS/MSD samples or spreadsheets are not annotated.

The release of this Data Validation Report is authorized by the following signature:

Craig G. Scanlon
Paul B. Humburg, President

10-9-01.
Date

4127 Plaza 94 South • St. Charles, MO 63304
(636) 936-1332 • Fax (636) 936-1335

SDG# A1H070159

Samples and Fractions Reviewed

Sample Identifications | Analytical Fractions

CH2M HILL ID	MATRIX	VOA		SVOA		PEST		PCB		HERB		MET	
IR84-DP77-00	SOIL		X		X		X		X		X		X
IR84-DP77-03	SOIL		X		X		X		X		X		X
IR84-DP78-00	SOIL		X		X		X		X		X		X
IR84-DP78-03	SOIL		X		X		X		X		X		X
IR84-DP79-00	SOIL		X		X		X		X		X		X
IR84-DP79-02	SOIL		X		X		X		X		X		X
IR84-DP79-02D	SOIL		X		X		X		X		X		X
IR84-DP80-00	SOIL		X		X		X		X		X		X
IR84-DP80-02	SOIL		X		X		X		X		X		X
IR84-DP80-02 MS	SOIL				X								
IR84-DP80-02 MSD	SOIL				X								
IR84-DP81-00	SOIL		X		X		X		X		X		X
IR84-DP81-00 MS	SOIL												X
IR84-DP81-00 MSD	SOIL												X
IR84-DP81-04	SOIL		X		X		X		X		X		X
IR84-DP82-00	SOIL		X		X		X		X		X		X
IR84-DP82-04	SOIL		X		X		X		X		X		X
IR84-DP83-00	SOIL		X		X		X		X		X		X
IR84-DP83-03	SOIL		X		X		X		X		X		X
IR84-ER12	WATER	X		X		X		X		X		X	
IR84-MW07-01C	WATER	X		X		X		X		X		X	
IR84-MW07-01C MS	WATER	X		X		X		X		X		X	
IR84-MW07-01C MSD	WATER	X		X		X		X		X		X	
IR84-MW08-01C	WATER	X		X		X		X		X		X	
IR84-MW09-01C	WATER	X		X		X		X		X		X	
IR84-MW10-01C	WATER	X		X		X		X		X		X	
IR84-MW16-01C	WATER	X		X		X		X		X		X	
IR84-MW17-01C	WATER	X		X		X		X		X		X	
IR84-MW18-01C	WATER	X		X		X		X		X		X	
IR84-MW19-01C	WATER	X		X		X		X		X		X	
IR84-MW20-01C	WATER	X		X		X		X		X		X	
IR84-MW20-01CD	WATER	X		X		X		X		X		X	
IR84-MW21-01C	WATER	X		X		X		X		X		X	
IR84-MW22-01C	WATER	X		X		X		X		X		X	
IR84-MW23-01C	WATER	X		X		X		X		X		X	
IR84-TB07	WATER	X											
Total Billable Samples (Water/Soil)		17	15	16	17	16	15	16	15	16	15	16	17

VOA= Volatiles
SVOA= Semivolatiles
PEST= Pesticides
PCB= PCBs
HERB= Herbicides
MET= Metals

DATA ASSESSMENT NARRATIVE

VOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW-846 Method 8260B for GC/MS Volatiles; the National Functional Guidelines for Organic Data Validation, 10/99, as applicable; and NEESA Level C requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # A1H070159

A validation was performed on the Volatile Data from SDG A1H070159. The data was evaluated based on the following parameters:

*	• Data Completeness
*	• Holding Times
*	• GC/MS Tuning
*	• Calibration
	• Blanks
*	• Internal Standard Performance
*	• Surrogate Recoveries
*	• Matrix Spike/Matrix Spike Duplicates
*	• Field Duplicates
*	• Compound Identification
*	• Compound Quantitation

* - All criteria were met for this parameter.

Blanks

The method blanks associated with the field samples in this SDG exhibited contamination for which qualifications were required. The end user should note that the action levels indicated for the blank analysis may not involve the same weights, volumes, dilution factors, or percent moisture as associated samples. These factors must be taken into considerations when applying the 5X and 10X criteria to field samples.

Associated blank	Compound	Concentration	Action Level
EH1R31AA	methylene chloride	0.86J ug/L	8.6 ug/L
EH5GE1AA	acetone	180 J ug/Kg	1800 ug/Kg
	trichloroethene	36J ug/Kg	180 ug/Kg
IR84-ER12	acetone	2.6J ug/L	26 ug/L
	chloroform	28 ug/L	140 ug/L
	bromodichloromethane	0.28J ug/L	1.4 ug/L
	toluene	0.31J ug/L	1.55 ug/L
IR84-TB07	acetone	2.3J ug/L	23 ug/L
	chloroform	28 ug/L	140 ug/L
	bromodichloromethane	0.26J ug/L	1.3 ug/L
	toluene	0.26J ug/L	1.3 ug/L

Samples	Compound	Qualifications
IR84-MW20-01CD	methylene chloride	CRQL
IR84-ER12 IR-TB07 IR84-MW17-01C	methylene chloride	U
IR84-DP82-00 IR84-DP82-04 IR84-MW16-01C IR84-MW18-01C IR84-MW19-01C IR84-MW21-01C IR84-MW09-01C IR84-MW10-01C	acetone	CRQL

Blanks (continued)

Samples	Compound	Qualifications
IR84-MW22-01C IR84-MW20-01C IR84-MW20-01CD IR84-MW17-01C IR84-MW07-01C IR84-MW08-01C IR84-MW23-01C	acetone	CRQL
IR84-MW18-01C IR84-MW21-01C	chloroform	CRQL
IR84-MW22-01C IR84-MW17-01C	chloroform	U
IR84-MW22-01C IR84-MW17-01C	bromodichloromethane	CRQL
IR84-MW19-01C IR84-MW22-01C IR84-MW17-01C	toluene	CRQL
IR84-DP82-04	trichloroethene	U

System Performance and Overall Assessment

The data, as reported, did require qualifications. According to the laboratory, samples were preserved by freezing them in water. This was due to effervescing when preserved with sodium bisulfate. No qualifications were required. Also, according to the STL Cooler Receipt Form, one cooler (H73) was received at a temperature of 11.4 ° C. The laboratory did not maintain information on specific samples contained in this cooler. (Called David Heakin at STL, 10/8/01 at 11:24am). This information was also not available on the COC. Therefore, none of the sample data was qualified due to temperature outside the QC limits of 4 °C +/-2 ° C. According to the laboratory, some of the field samples exhibited elevated detection limits due to matrix interferences.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported Quantitation limit is qualified as estimated

L = Result is estimated and biased low.

K = Result is estimated and biased high.

R = Result is rejected and unusable

D = Result value is based on dilution analysis

BLANK QUALIFICATION CODES

CRQL =	The sample result for the blank contaminant is less than the sample CRQL and is less than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.
U =	The sample result for the blank contaminant is greater than the sample CRQL and is less than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.
No Action =	The sample result for the blank contaminant is greater than the sample CRQL and is greater than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL
IR84-MW20-01CD	methylene chloride	+B	CRQL
IR84-ER12 IR-TB07 IR84-MW17-01C	methylene chloride	+B	U
IR84-DP82-00 IR84-DP82-04 IR84-MW16-01C IR84-MW18-01C IR84-MW19-01C IR84-MW21-01C IR84-MW09-01C IR84-MW10-01C IR84-MW22-01C IR84-MW20-01C IR84-MW20-01CD IR84-MW17-01C IR84-MW07-01C IR84-MW08-01C IR84-MW23-01C	acetone	+/+B	CRQL
IR84-MW18-01C IR84-MW21-01C	chloroform	+	CRQL
IR84-MW22-01C IR84-MW17-01C	chloroform	+	U
IR84-MW22-01C IR84-MW17-01C	bromodichloromethane	+	CRQL
IR84-MW19-01C IR84-MW22-01C IR84-MW17-01C	toluene	+	CRQL
IR84-DP82-04	trichloroethene	+	U

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW-846 Method 8270C for GC/MS Semivolatiles; the National Functional Guidelines for Organic Data Validation, 10/99, as applicable; and NEESA Level C requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # A1H070159

A validation was performed on the Semivolatile Data from SDG A1H070159. The data was evaluated based on the following parameters:

*	• Data Completeness
	• Holding Times
*	• GC/MS Tuning
*	• Calibration
	• Blanks
*	• Internal Standard Performance
*	• Surrogate Recoveries
	• Matrix Spike/Matrix Spike Duplicates
*	• Field Duplicates
*	• Compound Identification
	• Compound Quantitation

* - All criteria were met for this parameter.

Holding Times

The following samples were extracted two days outside the extraction holding time for soil samples. All reported positive results are qualified as estimated, J.

IR84-DP80-02RE
IR84-DP79-02RE

Blanks

All TIC compounds also reported in the associated method blanks are rejected, R, up to 10X the blank contamination concentration.

Matrix Spike/Matrix Spike Duplicates

The MS/MSD pair of the following sample exhibited 0% recovery for the noted compound. The non-detect result reported in the unspiked sample is rejected, R.

IR84-DP80-02RE	4-nitrophenol

Compound Quantitation

The following samples are rejected in favor of the results reported from the RE analyses. The original extraction exhibited no recoveries in the associated spike blank. Although the REs were extracted slightly outside of holding time all associated QC spike recoveries were improved

IR84-DP84-02
IR84-DP79-00
IR84-DP79-02

System Performance and Overall Assessment

The data, as reported, did require qualifications. One sample exhibited raised reporting limits due to matrix interferences or TIC presence. According to the STL Cooler Receipt Form, one cooler (J293) was received at a temperature of 8.8 ° C. The laboratory did not maintain information on specific samples contained in this cooler. (Called David Heakin at STL, 10/8/01 at 11:24am). This information was also not available on the COC. Therefore, none of the sample data was qualified due to temperature outside the QC limits of 4 °C +/-2 ° C.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported Quantitation limit is qualified as estimated

L = Result is estimated and biased low.

K = Result is estimated and biased high.

R = Result is rejected and unusable

D = Result value is based on dilution analysis

BLANK QUALIFICATION CODES

CRQL =	The sample result for the blank contaminant is less than the sample CRQL and is less than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.
U =	The sample result for the blank contaminant is greater than the sample CRQL and is less than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.
No Action =	The sample result for the blank contaminant is greater than the sample CRQL and is greater than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL
IR84-DP80-02RE IR84-DP79-02RE	All compounds	+	J
All Samples	All TICs noted in blanks up to 10X	+	R
IR84-DP80-02RE	4-nitrophenol	-	R
IR84-DP84-02 IR84-DP79-00 IR84-DP79-02	All compounds	+/-	R

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE

PESTICIDES

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC performance, and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW-846 Methods 8081A; the National Functional Guidelines for Organic Data Review, October 1999, as applicable; and NEESA Level C requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # A1H070159

A validation was performed on the Pesticide Data from SDG A1H070159. The data was evaluated based on the following parameters:

*	• Data Completeness
*	• Holding Times
*	• GC Performance
*	• Calibration
*	• Blanks
	• Surrogate Recoveries
*	• Matrix Spike/Matrix Spike Duplicates
*	• Field Duplicates
*	• Compound Identification
	• Compound Quantitation

* - All criteria were met for this parameter.

Method Deviations

It is recommended by the method that the calibration standards for the single component pesticides be prepared as two calibration mixtures "to minimize potential resolution and quantitation problems on confirmation columns..." (SW-846, Method 8081A, Revision 1, December 1996, page 8081A - 8, section 5.6.1). The initial and continuing calibration standards used by the laboratory contain all single component target compounds. There were no qualifications required because of this method deviation.

Surrogate Recoveries

The sample listed below exhibited a low TCX recovery. The positive results are qualified as estimated, J, and the non-detect results are qualified as estimated, UJ.

IR84-MW17-01C

The sample listed below exhibited TCX and DCB recoveries less than 10%. The positive results are qualified as estimated, J, and the non-detect results are rejected, R.

IR84-DP77-00

Compound Quantitation

The positive results exhibiting column quantitation %Ds greater than 40%, flagged PG by the laboratory, are qualified as estimated, J.

System Performance and Overall Assessment

The data required qualifications/rejections.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

D = Result value is based on dilution analysis

BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 5X the blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 5X the blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 5X the blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL
IR84-MW17-01C	ALL	+/-	J/UJ
IR84-DP77-00	ALL	+/-	J/R
All Samples	All %Ds > 40%	+PG	J

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non-detect result

DATA ASSESSMENT NARRATIVE

PCBs

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC performance, and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW-846 Methods 8082; the National Functional Guidelines for Organic Data Review, October 1999, as applicable; and NEESA Level C requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # A1H070159

A validation was performed on the PCB Data from SDG A1H070159. The data was evaluated based on the following parameters:

*	•	Data Completeness
*	•	Holding Times
*	•	GC Performance
*	•	Calibration
*	•	Blanks
	•	Surrogate Recoveries
*	•	Matrix Spike/Matrix Spike Duplicates
*	•	Field Duplicates
*	•	Compound Identification
*	•	Compound Quantitation

* - All criteria were met for this parameter.

Surrogate Recoveries

The sample listed below exhibited a low TCX recovery. The positive results are qualified as estimated, J, and the non-detect results are qualified as estimated, UJ.

IR84-MW17-01C

System Performance and Overall Assessment

The data required qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

D = Result value is based on dilution analysis

BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 5X the blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 5X the blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 5X the blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL
IR84-MW17-01C	ALL	+/-	J/UJ

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non-detect result

DATA ASSESSMENT NARRATIVE

HERBICIDES

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC performance, and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW-846 Methods 8151A; the National Functional Guidelines for Organic Data Review, October 1999, as applicable; and NEESA Level C requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # A1H070159

A validation was performed on the Herbicide Data from SDG A1H070159. The data was evaluated based on the following parameters:

*	• Data Completeness
*	• Holding Times
*	• GC Performance
	• Calibration
*	• Blanks
*	• Surrogate Recoveries
*	• Matrix Spike/Matrix Spike Duplicates
*	• Field Duplicates
*	• Compound Identification
	• Compound Quantitation

* - All criteria were met for this parameter.

Continuing Calibrations

The continuing calibration 047F3901.D analyzed on 08/11/01 at 04:32 exhibited one (1) compound with a %D greater than 50% and less than 90%. For the following samples and non-compliant compound, the positive results are qualified as estimated, J, and the non-detect results are qualified as estimated, UJ.

IR84-MW20-01C	Dalapon
IR84-MW20-01CD	
IR84-MW07-01C	
IR84-MW23-01C	
IR84-MW08-01C	

The continuing calibration 060F5201.D analyzed on 08/11/01 at 09:34 exhibited one (1) compound with a %D greater than 15% and less than 50%. For the following sample and non-compliant compound, the positive results are qualified as estimated, J.

IR84-MW07-01C	Dinoseb

The continuing calibration 035F2701.D analyzed on 08/10/01 at 23:53 exhibited one (1) compound with a %D greater than 50% and less than 90%. For the following samples and non-compliant compound, the positive results are qualified as estimated, J, and the non-detect results are qualified as estimated, UJ.

IR84-MW18-01C	Dalapon
IR84-MW19-01C	
IR84-MW21-01C	
IR84-MW09-01C	
IR84-MW10-01C	

The continuing calibration 046F4601.D analyzed on 08/17/01 at 06:04 exhibited one (1) compound with a %D greater than 50% and less than 90%. For the following samples and non-compliant compound, the positive results are qualified as estimated, J, and the non-detect results are qualified as estimated, UJ.

IR84-MW22-01C	Dinoseb
IR84-MW17-01C	

Continuing Calibrations

The continuing calibration 060F0401.D analyzed on 08/17/01 at 12:06 exhibited one (1) compound with a %D greater than 50% and less than 90%. For the following samples and non-compliant compound, the positive results are qualified as estimated, J, and the non-detect results are qualified as estimated, UJ.

IR84-ER12 -RE 1 Dinoseb

Compound Quantitation

One (1) sample was re-extracted due to a low surrogate recovery. For the following sample, the results reported from the original analysis are rejected, R, in favor of the results reported from the RE analysis due to an improved surrogate recovery in the RE.

IR84-ER12

System Performance and Overall Assessment

The data required qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

D = Result value is based on dilution analysis

BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 5X the blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 5X the blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 5X the blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL
IR84-MW20-01C IR84-MW20-01CD IR84-MW07-01C IR84-MW23-01C IR84-MW08-01C	Dalapon	+/-	J/UJ
IR84-MW07-01C	Dinoseb	+	J
IR84-MW18-01C IR84-MW19-01C IR84-MW21-01C IR84-MW09-01C IR84-MW10-01C	Dalapon	+/-	J/UJ
IR84-MW22-01C IR84-MW17-01C	Dinoseb	+/-	J/UJ
IR84-ER12 -RE 1	Dinoseb	+/-	J/UJ
IR84-ER12	ALL	+/-	R

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non-detect result

DATA ASSESSMENT NARRATIVE
METALS

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, matrix spike and LCS recoveries, matrix duplicates and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW 846 methods for Metals and the Functional Guidelines for Inorganic Data Validation, February 1994 requirements and NEESA C requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDGs # A1H070159

A validation was performed on the Metals Data from SDG A1H070159. The data was evaluated based on the following parameters.

*	●	Data Completeness
*	●	Holding Times
*	●	Calibrations
	●	Blanks
*	●	Interferences
	●	Matrix Spike Recovery
*	●	Matrix Duplicates
*	●	Field Duplicates
*	●	Laboratory Control Samples
	●	Serial Dilutions

* - All criteria were met for this parameter.

Preparation Blank results

1. The preparation blank for waters exhibited contamination for Aluminum (55 ug/l) and Potassium (150 ug/l) and for soils for Aluminum (5.8 mg/kg), Barium (0.24 mg/kg). Beryllium (0.06 mg/kg), Potassium (16.3 mg/kg) and Vanadium (0.16 mg/kg) required that all values below five times the blank contamination be qualified as non-detect, "U".

Matrix Spike Recovery results

2. The matrix spike recovery results for soils for Antimony (67%) was below the lower control limits (>30% but <75%). All positive and non-detect results

are qualified as estimated, "J" or "UJ".

Serial Dilution results

3. The serial dilution results for soils for Potassium and Zinc were outside the control limits (10%). All positive results are qualified as estimated, "J".

4. All results with "B" qualifier are changed to "J" qualifier.

SUMMARY OF DATA QUALIFICATIONS

Sample ID	Analyte	DL	QL
1.all water samples below 750 ug/l	K.	+	U
all water samples below 275 ug/l	Al.		
all soil samples below 0.3 mg/kg	Be.		
all soil samples below 81.5 mg/kg	V.		
2.all soil samples	Sb.	+/U	J/UJ
3.all soil samples	K and Zn.	+	J
4.all "B" results	all analytes	B	J

HEARTLAND
ENVIRONMENTAL SERVICES, INC.

Data Validation Report

SDG#:	A1G250211
Date:	October 2, 2001
Client Name:	Baker Environmental, Inc.
Project/Site Name:	Camp Lejeune
Date Sampled:	July 17 - 22, 2001
Number of Samples:	4 Non-Aqueous Sample(s) with 1 MS/MD(s)
Laboratory:	STL North Canton
Validation Guidance:	National Functional Guidelines for Organic and Inorganic Data
QA/QC Level:	NEESA Level C
Method(s) Utilized:	SW846 Third Edition
Analytical Fractions:	PCBs

Analytical data in this report were screened to determine usability of results and also to determine contractual compliance relative to these requirements and deliverables. This screening assumes analytical results are correct as reported and merely provides an interpretation of the reported quality control results. A minimum of 10% of all laboratory calculations have been verified as part of this validation. All instrument output, i.e. spectra, chromatograms, etc., for each sample have been carefully reviewed. The end-user is urged to review the Specific Findings and associated Data Qualifications presented in this report. Annotated Form 1s or spreadsheets for all samples reviewed are included after the Data Assessment Narratives. Form 1s for MS/MSD samples or spreadsheets are not annotated.

The release of this Data Validation Report is authorized by the following signature:

Craig G. Sewfoss
Paul B. Humburg, President

10.2.01.
Date

4127 Plaza 94 South • St. Charles, MO 63304
(636) 936-1332 • Fax (636) 936-1335

SDG# A1G250211

Samples and Fractions Reviewed

Sample Identifications Analytical Fraction

CH2M HILL ID	MATRIX	PCB	
IR84-DP06-00	SOIL		X
IR84-DP37-00	SOIL		X
IR84-DP71-00	SOIL		X
IR84-DP71-00 MS	SOIL		X
IR84-DP71-00 MSD	SOIL		X
IR84-DP69-00	SOIL		X
Total Billable Samples (Water/Soil)		0	6

PCB= PCBs

DATA ASSESSMENT NARRATIVE

POLYCHLORINATED BIPHENYLS (PCBs)

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC performance and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW-846 Method 8082; the National Functional Guidelines for Organic Data Validation, 10/99, as applicable; and NEESA C requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # A1G250211

A validation was performed on the Pesticides Data from SDG A1G250211. The data was evaluated based on the following parameters:

*	•	Data Completeness
*	•	Holding Times
*	•	GC Performance
*	•	Calibration
*	•	Blanks
*	•	Surrogate Recoveries
*	•	Matrix Spike/Matrix Spike Duplicates
*	•	Laboratory Control Samples
*	•	Field Duplicates
*	•	Compound Identification
*	•	Compound Quantitation

* - All criteria were met for this parameter.

System Performance and Overall Assessment

The data, as reported, did not require qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported Quantitation limit is qualified as estimated

L = Result is estimated and biased low.

K = Result is estimated and biased high.

R = Result is rejected and unusable

D = Result value is based on dilution analysis

BLANK QUALIFICATION CODES

CRQL =	The sample result for the blank contaminant is less than the sample CRQL and is less than 5X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.
U =	The sample result for the blank contaminant is greater than the sample CRQL and is less than 5X the method blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.
No Action =	The sample result for the blank contaminant is greater than the sample CRQL and is greater than 5X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL

NO QUALIFICATIONS WERE REQUIRED

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

APPENDIX G
STATISTICAL SUMMARIES

STATISTICAL SUMMARY
SURFACE SOIL ORGANICS (BEFORE NON-TCRA)
SITE 84 - BUILDING 45 AREA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

	Arithmatic Mean Half Non-Detects	Standard Deviation	Upper 95% Confidence Level	Log Arithmatic Mean Half Non-Detects	Log Standard Deviation	Log Upper 95% Confidence Level	Lognormally Distributed	Normally Distributed
VOLATILES (ug/kg)								
2-Butanone (MEK)	4.756	11.5086	8.694	0.6954	0.9391	5.026	NO	NO
Acetone	32.986	139.4356	80.6976	0.7825	1.6322	27.302	NO	NO
Ethylbenzene	13.524	65.9326	36.0846	-0.8298	1.392	2.8487	NO	NO
Xylenes, total	6.098	23.779	14.2346	0.3068	1.0268	4.1666	NO	NO
SEMIVOLATILES (ug/kg)								
2-Methylnaphthalene	3872.64	18371.7849	10159.0324	4.1927	1.9145	1957.7469	NO	NO
Acenaphthene	1173.67	3988.8041	2538.5449	4.6483	1.9799	3698.151	NO	NO
Anthracene	2765.16	11142.1485	6577.741	4.7655	2.2261	12398.0323	NO	NO
Benzo(a)anthracene	8480.65	37850.3955	21432.1645	5.0833	2.5139	69003.872	NO	NO
Benzo(a)pyrene	6795.62	29872.1431	17017.1643	5.0853	2.4018	30451.0555	NO	NO
Benzo(b)fluoranthene	7751.34	33853.2607	19335.129	5.1069	2.4814	40857.7396	NO	NO
Benzo(g,h,i)perylene	2668.01	10932.6136	6408.8931	4.8849	2.1419	10702.8685	NO	NO
Benzo(k)fluoranthene	5342.37	23907.2441	13522.8662	4.8932	2.3125	18652.7751	NO	NO
Bis(2-ethylhexyl)phthalate	249.76	757.1721	508.8465	4.149	1.2865	335.4814	NO	NO
Carbazole	1781.41	7560.2762	4368.3586	4.6035	1.939	3157.2101	NO	NO
Chrysene	8181.1	35840.1916	20444.77	4.9955	2.6262	96011.8922	NO	NO
Dibenz(a,h)anthracene	866.87	3374.0754	2021.3992	4.4527	1.7466	1413.752	NO	NO
Dibenzofuran	565.06	1780.6617	1174.3605	4.4221	1.6969	1213.8138	NO	NO
Dibenzothiophene	424.5	474.4687	2542.7629	5.561	1.5165	53170.6124	NO	NO
Fluoranthene	13872.39	59734.8088	34312.2356	5.302	2.7876	243222.2476	NO	NO
Fluorene	1386.4	4099.7877	2789.2509	4.6603	2.0983	7468.8312	NO	NO
Hexachlorocyclopentadiene	274.92	837.8442	561.6106	4.2215	1.2911	363.9421	NO	NO
Indeno(1,2,3-cd)pyrene	2808.47	11732.6127	6823.0939	4.9923	2.0429	8790.9605	NO	NO
Naphthalene	414.22	1487.8391	923.3235	4.1675	1.4969	525.3675	NO	NO
Phenanthrene	9728.61	35918.5115	22019.0792	5.3335	2.8627	338404.524	NO	NO
Pyrene	12012.07	49745.8757	29033.9378	5.2512	2.8377	281986.6034	NO	NO
PESTICIDES / PCBs (ug/kg)								
4,4'-DDD	188.7217	629.5887	414.1455	1.3849	2.7326	4806.2789	NO	NO
4,4'-DDE	57.6834	116.1411	99.2676	1.2707	2.5696	2277.8123	NO	NO
4,4'-DDT	139.1054	272.1248	236.5395	2.1059	2.6495	7135.9174	NO	NO
BHC, alpha-	43.953	94.4888	77.7847	0.3889	2.6074	1089.5109	NO	NO
Chlordane, alpha-	4440.6149	11330.7056	8497.5663	2.009	4.0683	44122769.18	NO	NO
Chlordane, gamma-	5354.5368	13680.7316	10252.9134	2.0989	4.1437	75346385.18	NO	NO
Dieldrin	161.4489	312.5785	273.3674	2.2288	2.63	7482.7026	NO	NO
Endosulfan Sulfate	29.4785	55.5895	48.9261	0.503	2.7462	1949.9272	NO	NO
Endrin	57.5977	126.1254	102.7568	0.6611	2.5407	1109.8717	NO	NO
Endrin Aldehyde	144.0729	305.946	251.1057	2.017	2.5585	4298.5396	NO	NO
Endrin Ketone	25.551	51.5384	43.5813	0.3944	2.6089	1026.8434	NO	NO
Heptachlor	1905.7238	5110.5467	3735.5515	1.4979	3.7196	1785114.862	NO	NO
Heptachlor Epoxide	418.4958	1066.6831	800.421	1.1572	3.1905	47553.3347	NO	NO
Methoxychlor	81.1649	163.8893	138.5003	1.6218	2.587	3224.133	NO	NO
Aroclor-1248	2225.8288	16865.5781	5164.1635	3.8998	2.2265	1507.0811	NA	NO
Aroclor-1254	952.7253	5418.892	1896.809	4.446	1.8817	975.2076	NA	NO
Aroclor-1260	5200.1973	21242.6787	8901.114	6.1559	2.6293	54561.7753	NA	NO
TOTAL PETROLEUM HYDROCARBONS								
Gasoline Range Organics (ug/kg)	88.3182	262.5713	231.8076	2.6286	1.3771	207.0752	NO	NO
Diesel Range Organics (mg/kg)	188.3636	159.3614	275.4511	4.6127	1.4423	1794.0789	YES	YES

STATISTICAL SUMMARY
SURFACE SOIL ORGANICS (AFTER NON-TCRA)
SITE 84 - BUILDING 45 AREA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

	Arithmatic Mean Half Non-Detects	Standard Deviation	Upper 95% Confidence Level	Log Arithmatic Mean Half Non-Detects	Log Standard Deviation	Log Upper 95% Confidence Level	Lognormally Distributed	Normally Distributed
VOLATILES (ug/kg)								
2-Butanone	7.8231	15.6097	15.5392	1.0053	1.2437	19.3652	NO	NO
Acetone	62.3923	192.1795	157.39	1.393	2.1181	1370.4539	NO	NO
Ethylbenzene	25.7162	91.426	70.9097	-0.5316	1.9169	52.6968	NO	NO
Xylenes (total)	10.7885	32.8821	27.0427	0.5751	1.3949	21.5783	NO	NO
SEMIVOLATILES (ug/kg)								
2-Methylnaphthalene	7145.3846	25495.8663	19748.435	4.2821	2.336	57887.4821	NO	NO
Acenaphthene	436.7115	946.2948	904.4815	4.2122	1.7354	2607.5134	NO	NO
Anthracene	626.9615	1415.2644	1326.5513	4.2371	1.89	5680.1834	NO	NO
Benzo(a)anthracene	639.9038	1654.1682	1457.5879	4.3121	1.8124	4762.1187	NO	NO
Benzo(a)pyrene	563.5769	1590.6887	1349.882	4.3275	1.6788	2476.9142	NO	NO
Benzo(b)fluoranthene	658.1538	1948.1056	1621.1363	4.3113	1.7268	2806.5731	NO	NO
Benzo(ghi)perylene	409.1346	931.9507	869.8141	4.2511	1.6651	2205.0483	NO	NO
Benzo(k)fluoranthene	395.9808	1043.4598	911.7811	4.1802	1.6154	1780.3472	NO	NO
Carbazole	260.5577	585.6401	550.0498	4.1134	1.4921	950.0093	NO	NO
Chrysene	770.7308	1938.3063	1728.8693	4.2067	1.967	7112.7112	NO	NO
Dibenz(a,h)anthracene	190.5577	359.7391	368.383	4.0555	1.3918	695.3267	NO	NO
Dibenzofuran	235.4615	508.11	486.6291	4.0668	1.4743	866.1231	NO	NO
Fluoranthene	1409.9038	4407.949	3588.8297	4.3983	2.009	18367.1219	NO	NO
Fluorene	957.3077	2519.751	2202.8645	4.3149	2.0521	19839.2658	NO	NO
Indeno(1,2,3-cd)pyrene	379.7115	887.0876	818.2143	4.4192	1.5175	1718.185	NO	NO
Naphthalene	145.4231	243.3119	265.6964	3.9704	1.2971	507.0031	NO	NO
Phenanthrene	3092.0962	7514.1123	6806.4527	4.6219	2.5102	364569.603	NO	NO
Pyrene	2044.4038	5014.6483	4523.2317	4.4593	2.3076	61662.1556	NO	NO
bis(2-Ethylhexyl) phthalate	143.0769	217.6981	250.6889	4.1369	1.2224	423.4872	NO	NO
PESTICIDES/PCBs (ug/kg)								
4,4'-DDD	4.7923	9.4489	9.9559	0.294	1.5525	42.5673	NO	NO
4,4'-DDE	0.9634	1.1283	1.58	-0.539	0.9672	2.3296	NO	NO
4,4'-DDT	2.3295	2.8733	3.8997	0.2974	1.0034	6.7623	NO	NO
Dieldrin	8.9886	16.3255	17.9101	0.8188	1.6179	87.744	NO	NO
Endosulfan sulfate	9.0733	14.3462	16.5108	0.1032	2.4117	1674.0436	NO	NO
Endrin	1.078	1.2983	1.7875	-0.4562	0.9941	2.6655	NO	NO
Endrin aldehyde	15.0083	22.6857	26.7692	1.2748	1.8278	292.8899	NO	NO
Endrin ketone	4.6454	8.4225	9.0119	-0.2703	2.0262	241.993	NO	NO
Methoxychlor	13.7394	25.1664	26.7863	0.7878	2.0377	728.8098	NO	NO
PCB-1248	274.7146	1041.3204	472.3172	3.7408	1.9609	619.4323	NA	NO
PCB-1260	5980.374	23024.5561	10349.5489	6.2315	2.7379	95624.6868	NA	NO
alpha-BHC	2.2723	6.2191	5.6709	-0.7161	1.3487	6.7765	NO	NO
alpha-Chlordane	4.4302	11.8434	10.9024	-0.2306	1.5623	25.9446	NO	NO
gamma-Chlordane	4.777	12.7355	11.7367	-0.2243	1.6224	31.3477	NO	NO

STATISTICAL SUMMARY
SURFACE SOIL INORGANICS (BEFORE NON-TCRA)
SITE 84 - BUILDING 45 AREA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

	Arithmatic Mean Half Non-Detects	Standard Deviation	Upper 95% Confidence Level	Log Arithmatic Mean Half Non-Detects	Log Standard Deviation	Log Upper 95% Confidence Level	Lognormally Distributed	Normally Distributed
METALS (mg/kg)								
Aluminum	2634.8	1113.4972	3015.8125	7.8014	0.3879	3058.165	YES	NO
Antimony	0.8184	0.7405	1.0718	-0.5386	0.8243	1.2215	NO	NO
Arsenic	1.9264	2.426	2.7565	0.1091	1.0399	3.4921	YES	NO
Barium	13.024	12.8689	17.4274	2.2534	0.7877	18.6569	YES	NO
Beryllium	0.0405	0.0179	0.0466	-3.2946	0.4177	0.0478	NO	NO
Cadmium	0.1385	0.1669	0.1956	-2.6611	1.1918	0.283	NO	NO
Calcium	15241.44	27791.2265	24750.9436	8.1506	1.943	110808.1108	YES	NO
Chromium VI	4.906	3.8827	6.2346	1.4028	0.578	6.1195	YES	NO
Cobalt	0.2852	0.1408	0.3334	-1.3747	0.526	0.3619	NO	NO
Copper	11.2564	28.8671	21.134	1.1828	1.4851	25.8965	YES	NO
Iron	1934.24	653.1912	2157.7467	7.5044	0.3807	2259.8164	YES	YES
Lead	22.418	24.0664	30.653	2.5401	1.1587	48.4601	YES	NO
Magnesium	318.48	401.0414	455.7069	5.2644	0.9583	498.5091	YES	NO
Manganese	12.7	7.849	15.3857	2.3457	0.6679	17.487	YES	YES
Mercury	0.0345	0.0489	0.0512	-4.0278	1.1323	0.065	NO	NO
Nickel	1.3036	0.6648	1.5311	0.1418	0.512	1.6273	YES	YES
Potassium	90.66	66.2879	113.3422	4.2472	0.7593	132.287	YES	NO
Selenium	0.2004	0.0965	0.2334	-1.6685	0.308	0.2225	NO	NO
Sodium	47.932	56.6574	67.3188	3.5557	0.6491	57.4455	NO	NO
Thallium	0.2898	0.0672	0.3128	-1.2552	0.1668	0.3068	NO	NO
Vanadium	4.804	1.7319	5.3966	1.5109	0.3507	5.5127	YES	NO
Zinc	25.698	34.2045	37.402	2.4608	1.3582	71.4459	YES	NO

STATISTICAL SUMMARY
SURFACE SOIL INORGANICS(AFTER NON-TCRA)
SITE 84 - BUILDING 45 AREA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

	Arithmatic Mean Half Non-Detects	Standard Deviation	Upper 95% Confidence Level	Log Arithmatic Mean Half Non-Detects	Log Standard Deviation	Log Upper 95% Confidence Level	Lognormally Distributed	Normally Distributed
METALS (mg/kg)								
Aluminum	2770.7692	1302.5965	3414.6653	7.842	0.4129	3565.2193	YES	NO
Antimony	0.6712	0.6039	0.9697	-0.7261	0.8046	1.2459	NO	NO
Arsenic	1.6838	1.7726	2.56	0.044	1.0817	5.2567	YES	NO
Barium	8.6346	6.0601	11.6302	1.9736	0.6061	13.0936	YES	NO
Cadmium	0.066	0.0706	0.1009	-3.1666	0.9207	0.1373	NO	NO
Calcium	4368.2308	5763.7217	7217.3387	7.3914	1.6208	44854.7932	YES	NO
Chromium	3.6731	1.6285	4.4781	1.2151	0.4305	4.8078	YES	YES
Cobalt	0.2527	0.104	0.3041	-1.4798	0.5178	0.3636	YES	YES
Copper	4.6085	7.6318	8.381	0.6342	1.3619	21.0996	YES	NO
Iron	1921.5385	652.4038	2244.0331	7.509	0.3375	2347.4881	YES	YES
Lead	20.4962	24.281	32.4987	2.2467	1.3522	103.3368	YES	NO
Magnesium	159.4154	97.6897	207.7051	4.8695	0.6919	265.7173	YES	YES
Manganese	8.8615	3.9329	10.8056	2.0731	0.5146	12.6483	YES	YES
Mercury	0.0391	0.0659	0.0717	-4.2392	1.362	0.1614	NO	NO
Nickel	1.1523	0.709	1.5028	-0.0149	0.5696	1.6733	YES	NO
Potassium	71.2654	64.0807	102.9416	3.9667	0.7948	129.1197	YES	NO
Selenium	0.2227	0.1284	0.2862	-1.5949	0.3951	0.2757	NO	NO
Vanadium	4.9154	2.1023	5.9546	1.5228	0.3747	6.1084	YES	NO
Zinc	12.5115	13.689	19.2782	1.9059	1.221	45.3531	YES	NO

STATISTICAL SUMMARY
SUBSURFACE SOIL ORGANICS (BEFORE NON-TCRA)
SITE 84 - BUILDING 45 AREA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

	Arithmatic Mean Half Non-Detects	Standard Deviation	Upper 95% Confidence Level	Log Arithmatic Mean Half Non-Detects	Log Standard Deviation	Log Upper 95% Confidence Level	Lognormally Distributed	Normally Distributed
VOLATILES (ug/kg)								
1,2-Dichloroethene (total)	8.862	20.8566	16.3297	0.5267	1.5765	19.962	NO	NO
2-Butanone (MEK)	14.8272	30.3582	25.6969	1.2217	1.5377	36.5352	NO	NO
Acetone	33.6978	99.046	69.1612	1.2952	1.9214	121.6278	NO	NO
Benzene	14.3874	40.5219	28.8962	-0.0503	2.0034	57.3155	NO	NO
Chloroform	2.061	3.6518	3.3685	-0.1655	1.1651	3.4106	NO	NO
Ethylbenzene	117.556	334.0055	237.1464	0.3006	2.8484	2588.6016	NO	NO
Methylene Chloride	12.3424	30.6326	23.3104	0.5616	1.7347	30.3719	NO	NO
Styrene	3.1375	6.3352	5.4058	-0.405	1.6183	8.683	NO	NO
Toluene	11.3663	35.0249	23.9069	-0.3018	1.9399	25.9369	NO	NO
Xylenes, total	263.413	849.1781	567.4606	1.2224	2.4631	923.2873	NO	NO
SEMIVOLATILES (ug/kg)								
2-Methylnaphthalene	1222.9355	5054.6093	2763.7672	3.8689	1.687	572.7731	NO	NO
Acenaphthene	87.1048	181.3039	142.3729	3.7443	0.9133	96.0993	NO	NO
Anthracene	87.0726	163.8882	137.0318	3.7472	0.9569	102.344	NO	NO
Benzo(a)anthracene	191.7581	552.1553	360.0754	3.9605	1.2074	198.89	NO	NO
Benzo(a)pyrene	177.9355	478.9863	323.9482	4.0278	1.1514	193.6441	NO	NO
Benzo(b)fluoranthene	196.2823	524.1832	356.0727	4.0654	1.1962	216.7176	NO	NO
Benzo(g,h,i)perylene	112.9516	228.0369	182.4657	3.9414	1.0062	141.2347	NO	NO
Benzo(k)fluoranthene	122.5726	309.5384	216.9313	3.8568	1.0441	137.4988	NO	NO
Bis(2-chloroethoxy)methane	46.7177	67.4809	67.2884	3.5049	0.6212	51.2258	NO	NO
Bis(2-ethylhexyl)phthalate	141.9516	325.6875	241.2332	4.0675	1.0946	183.7456	NO	NO
Carbazole	71.2984	108.8899	104.4921	3.7476	0.8256	84.4873	NO	NO
Chrysene	190.1694	570.0182	363.932	3.8512	1.2552	209.3716	NO	NO
Dibenz(a,h)anthracene	65.879	100.1506	96.4086	3.703	0.7866	75.8384	NO	NO
Dibenzofuran	88.75	233.1149	159.812	3.6793	0.8918	85.89	NO	NO
Fluoranthene	294.9516	900.4216	569.4334	4.0881	1.346	314.2268	NO	NO
Fluorene	102.3871	270.3996	184.8149	3.7311	0.9765	103.5296	NO	NO
Hexachlorocyclopentadiene	60.5806	86.4112	86.9219	3.7616	0.6318	66.9303	NO	NO
Indeno(1,2,3-cd)pyrene	123.5081	233.5187	194.6932	4.1042	0.952	145.2556	NO	NO
Naphthalene	379.3468	1548.9545	851.5254	3.7967	1.3256	225.8801	NO	NO
Phenanthrene	413.2823	996.8698	717.1651	4.1285	1.5962	604.2903	NO	NO
Phthalic anhydride	145	35.3553	302.8435	4.9616	0.2463	289.8191	NA	NA
Pyrene	245.6048	757.2355	476.4382	3.9869	1.3096	265.1072	NO	NO
PESTICIDES / PCBs (ug/kg)								
4,4'-DDD	18.3023	79.042	42.3972	0.1818	1.7331	15.977	NO	NO
4,4'-DDE	12.776	56.4435	29.9821	-0.1219	1.7236	11.5314	NO	NO
4,4'-DDT	31.3185	126.5078	69.8828	0.7225	1.8004	36.4612	NO	NO
BHC, beta-	9.5956	45.773	23.5489	-0.6275	1.5509	4.7037	NO	NO
Chlordane, alpha-	544.7381	2529.997	1315.9747	0.3732	2.8145	1215.069	NO	NO
Chlordane, gamma-	690.4664	3248.1548	1680.624	0.3784	2.8926	1648.2116	NO	NO
Dieldrin	31.9097	152.5898	78.4247	0.5771	1.5301	14.997	NO	NO
Endrin Aldehyde	31.9766	152.5828	78.4895	0.5241	1.5682	15.4527	NO	NO
Heptachlor	255.1644	1241.7159	633.6853	0.0891	2.4197	155.0018	NO	NO
Heptachlor Epoxide	20.7496	73.9054	43.2787	-0.1972	1.8404	16.074	NO	NO
Methoxychlor	18.1898	81.59	43.0614	0.0798	1.709	13.6338	NO	NO
Aroclor-1248	1302.5453	7721.714	3445.7407	1.9335	2.121	317.5042	NO	NO
Aroclor-1254	275.5608	870.8505	517.2692	3.3054	1.7466	332.735	NO	NO
Aroclor-1260	1631.1831	7482.2533	3707.9152	3.0858	2.5705	5607.5431	NO	NO
TOTAL PETROLEUM HYDROCARBONS								
Gasoline Range Organics (ug/kg)	72534.5	205047.0397	209882.0407	4.008	3.9028	4.83717E+12	YES	NO
Diesel Range Organics (mg/kg)	727	1928.805	2018.9798	4.2222	1.8927	32931.0808	YES	NO

STATISTICAL SUMMARY
SUBSURFACE SOIL ORGANICS (AFTER NON-TCRA)
SITE 84 - BUILDING 45 AREA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

VOLATILES (ug/kg)								
1,2-Dichloroethene (total)	12.8089	25.9177	25.0758	0.8223	1.8056	120.7301	NO	NO
2-Butanone	19.9518	36.4185	37.1887	1.5111	1.7077	140.7664	NO	NO
Acetone	51.3214	124.8996	110.4366	1.7822	2.1536	1816.4123	NO	NO
Benzene	14.8646	42.4184	34.9413	0.175	2.079	276.3447	NO	NO
Ethylbenzene	100.0891	269.1737	227.4894	0.6379	2.947	36015.3507	NO	NO
Methylene chloride	18.0268	38.1478	36.0822	0.9047	1.9657	218.2056	NO	NO
Styrene	4.2513	7.5729	7.8356	-0.0804	1.7945	47.2988	NO	NO
Xylenes (total)	210.7357	745.6757	563.6651	1.4207	2.4009	3284.9305	NO	NO
SEMIVOLATILES (ug/kg)								
2-Methylnaphthalene	2030.5556	6587.0012	4731.4182	4.036	2.0561	6379.5254	NO	NO
Acenaphthene	97.1667	223.5298	188.8204	3.7194	0.9652	121.8449	NO	NO
Benzo(b)fluoranthene	72.7083	106.6905	116.4545	3.8265	0.7762	96.7765	NO	NO
Chrysene	57.8611	84.8375	92.6469	3.5948	0.7814	77.303	NO	NO
Dibenzofuran	115.5278	302.9021	239.7265	3.7175	1.0284	148.3853	NO	NO
Fluoranthene	71.1528	103.9667	113.7822	3.7972	0.7897	95.7181	NO	NO
Fluorene	125	349.075	268.1309	3.6858	1.0664	153.8158	NO	NO
Naphthalene	608.9028	2023.2417	1438.4909	3.9075	1.628	862.2707	NO	NO
Phenanthrene	404.8889	1089.6349	851.671	3.9382	1.5277	690.8626	NO	NO
Phthalic anhydride	145	35.3553	302.8435	4.9616	0.2463	289.8191	N/A	N/A
Pyrene	65.6944	94.5657	104.4691	3.717	0.7981	89.3614	NO	NO
bis(2-Chloroethoxy)methane	59.0556	87.0066	94.7308	3.6159	0.7774	78.5255	NO	NO
bis(2-Ethylhexyl) phthalate	102.4306	122.7209	152.7497	4.0926	0.9824	181.9448	NO	NO
PESTICIDES/PCBs (ug/kg)								
4,4'-DDD	1.339	2.2782	2.2731	-0.3578	0.9426	1.9928	NO	NO
4,4'-DDE	0.7888	1.0529	1.2205	-0.6789	0.8175	1.162	NO	NO
4,4'-DDT	1.5903	1.9897	2.4061	0.1027	0.7342	2.2096	NO	NO
Dieldrin	1.3	1.0104	1.7143	0.1004	0.5104	1.6382	NO	NO
Endrin aldehyde	1.5028	2.1563	2.3869	0.0835	0.6225	1.8499	NO	NO
Methoxychlor	1.9835	5.5266	4.2496	-0.3434	1.0087	2.4705	NO	NO
PCB-1260	2406.4292	9261.1843	5646.3828	3.0357	2.7706	27035.0174	NO	NO
alpha-Chlordane	0.7868	1.3337	1.3337	-0.7355	0.7894	1.0287	NO	NO
beta-BHC	0.45	0.4285	0.6257	-1.0391	0.6117	0.5945	NO	NO
gamma-Chlordane	0.7893	1.4228	1.3727	-0.7679	0.8039	1.0428	NO	NO
TOTAL PETROLEUM HYDROCARBONS								
Gasoline Range Organics (ug/kg)	580000	ND	ND	13.2708	ND	ND	NO	NO
Diesel Range Organics (mg/kg)	5500	ND	ND	8.6125	ND	ND	NO	NO

STATISTICAL SUMMARY
SUBSURFACE SOIL INORGANICS (BEFORE NON-TCRA)
SITE 84 - BUILDING 45 AREA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

	Arithmatic Mean Half Non-Detects	Standard Deviation	Upper 95% Confidence Level	Log Arithmatic Mean Half Non-Detects	Log Standard Deviation	Log Upper 95% Confidence Level	Lognormally Distributed	Normally Distributed
METALS (mg/kg)								
Aluminum	3176.7419	1651.9388	3680.3139	7.9219	0.5793	4033.0668	NO	NO
Antimony	0.428	0.2996	0.5193	-1.0005	0.4992	0.4965	NO	NO
Arsenic	0.8035	0.4842	0.9511	-0.4279	0.705	1.1096	YES	YES
Barium	8.7942	7.4464	11.0641	1.7891	0.9483	14.2712	YES	NO
Beryllium	0.04	0.024	0.0473	-3.3353	0.4442	0.0459	NO	NO
Cadmium	0.043	0.0405	0.0553	-3.3907	0.6134	0.0514	NO	NO
Calcium	5670.1742	12968.941	9623.5867	7.1456	1.6774	14839.034	YES	NO
Chromium VI	4.3161	2.3794	5.0414	1.3236	0.5391	5.2949	YES	NO
Cobalt	0.2935	0.1595	0.3421	-1.3882	0.6156	0.3819	NO	YES
Copper	3.0055	5.7251	4.7507	0.2128	1.2944	5.9163	YES	NO
Iron	1951.0645	1369.9225	2368.6675	7.3432	0.7455	2753.9658	YES	NO
Lead	7.8361	10.9199	11.1649	1.6158	0.85	10.335	YES	NO
Magnesium	172.1065	186.7738	229.0421	4.8012	0.8235	241.6727	YES	NO
Manganese	10.2816	11.5622	13.8062	1.8592	1.0189	17.9471	YES	NO
Mercury	0.0164	0.0116	0.0199	-4.3537	0.7342	0.0226	NO	YES
Nickel	1.1058	0.6593	1.3068	-0.0571	0.5919	1.3983	YES	NO
Potassium	90.3113	47.3814	104.7549	4.3377	0.6389	119.9395	NO	YES
Selenium	0.2674	0.1582	0.3156	-1.4439	0.4707	0.3112	NO	NO
Sodium	30.9274	11.1467	34.3253	3.3999	0.2168	32.9296	NO	NO
Thallium	0.363	0.1773	0.417	-1.0912	0.3622	0.4054	NO	NO
Vanadium	4.8677	2.5132	5.6338	1.4392	0.5772	6.157	YES	YES
Zinc	8.8968	10.8371	12.2003	1.5371	1.1774	16.7532	YES	NO

STATISTICAL SUMMARY
SUBSURFACE SOIL INORGANICS (AFTER NON-TCRA)
SITE 84 - BUILDING 45 AREA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

METALS (mg/kg)								
Aluminum	3521.0556	2089.9316	4377.9885	7.9479	0.7521	5776.6666	YES	YES
Antimony	0.3449	0.2397	0.4432	-1.1623	0.3652	0.3967	NO	NO
Arsenic	0.8564	0.5575	1.085	-0.4171	0.813	1.5001	YES	YES
Barium	7.8289	7.6953	10.9842	1.5988	1.0153	17.4289	YES	NO
Beryllium	0.0445	0.0287	0.0563	-3.2476	0.4931	0.0559	NO	NO
Cadmium	0.0344	0.0273	0.0456	-3.5231	0.4802	0.0419	NO	NO
Calcium	6887.2167	16562.4916	13678.3214	6.8957	1.8579	38774.362	NO	NO
Chromium	4.6111	2.6144	5.6831	1.3579	0.6303	6.677	YES	YES
Cobalt	0.2956	0.1608	0.3615	-1.3933	0.6568	0.4399	NO	YES
Copper	1.2489	1.3722	1.8115	-0.3148	1.1111	3.0544	YES	NO
Iron	1958.2222	1506.6367	2575.9872	7.3332	0.723	3007.1525	YES	NO
Lead	4.4817	2.9667	5.6981	1.2964	0.6756	6.6282	YES	NO
Magnesium	195.4889	240.5106	294.1053	4.7657	1.0195	416.7047	YES	NO
Manganese	9.2989	12.8654	14.5741	1.6179	1.1267	21.7184	YES	NO
Mercury	0.0129	0.0094	0.0168	-4.6016	0.7393	0.0201	NO	YES
Nickel	1.0067	0.5833	1.2459	-0.1705	0.6547	1.4906	YES	YES
Potassium	91.8444	58.9235	116.0048	4.272	0.7878	153.4877	YES	YES
Selenium	0.2814	0.1605	0.3472	-1.3913	0.4842	0.3546	NO	NO
Sodium	32.7903	14.4441	38.7128	3.4408	0.2767	36.7242	NO	NO
Thallium	0.4011	0.2114	0.4878	-1.0112	0.4205	0.4884	NO	NO
Vanadium	5.2028	3.1874	6.5097	1.428	0.7355	8.3297	YES	YES
Zinc	5.6472	8.3804	9.0834	1.0951	1.0616	11.4322	YES	NO

STATISTICAL SUMMARY
GROUNDWATER ORGANICS
SITE 84 - BUILDING 45 AREA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

	Arithmatic Mean Half Non-Detects	Standard Deviation	Upper 95% Confidence Level	Log Arithmatic Mean Half Non-Detects	Log Standard Deviation	Log Upper 95% Confidence Level	Lognormally Distributed	Normally Distributed
VOLATILES (ug/L)								
2-Butanone (MEK)	1.7618	2.2637	2.6623	-0.4622	1.4842	6.1994	NO	NO
Benzene	1.3653	2.088	2.196	-1.3036	1.8659	10.0419	NO	NO
Carbon Disulfide	1.6679	2.3274	2.5938	-0.9836	1.8453	13.0384	NO	NO
Chloroform	3.2253	4.9712	5.2029	-0.5619	2.2102	96.0667	NO	NO
Chloromethane	1.6582	2.3359	2.5875	-1.1927	2.0285	27.8956	NO	NO
Ethylbenzene	1.8505	2.4284	2.8166	-1.0819	2.1389	44.8534	NO	NO
Methyl Tert-Butyl Ether (MTBE)	1.6474	2.3423	2.5792	-1.2525	2.0523	28.3928	NO	NO
Methylene Chloride	1.7808	2.2521	2.6767	-0.4326	1.4947	6.5409	NO	NO
Trichloroethene (TCE)	1.6332	2.3502	2.5682	-1.2587	2.0146	24.9653	NO	NO
Xylenes, total	1.7779	2.2792	2.6846	-0.5988	1.6335	9.0526	NO	NO
SEMIVOLATILES (ug/L)								
2-Methylnaphthalene	0.3762	0.2025	0.4763	-1.048	0.3296	0.4479	NO	NO
Naphthalene	0.5154	0.5062	0.7656	-0.8447	0.4907	0.6537	NO	NO
PESTICIDES / PCBs (ug/L)								
4,4'-DDD	0.0156	0.0208	0.0259	-4.957	1.2421	0.0497	NO	YES
4,4'-DDE	0.0108	0.0202	0.0208	-5.221	0.9506	0.0185	NO	YES
4,4'-DDT	0.0171	0.0227	0.0283	-4.8487	1.2282	0.0537	NO	YES
BHC, beta-	0.0135	0.017	0.0219	-4.9494	1.1312	0.0395	NO	YES
Chlordane, gamma-	0.0108	0.0192	0.0203	-5.3056	1.0386	0.0229	NO	YES
Endosulfan I	0.0101	0.0188	0.0194	-5.2919	0.949	0.0172	NO	YES
Heptachlor Epoxide	0.0095	0.0185	0.0186	-5.3289	0.9148	0.0156	NO	YES
HERBICIDES (ug/L)								
Dinoseb	0.1427	0.4102	0.3455	-3.9092	1.6971	0.6918	NO	NO
MCPA	10.4615	14.0986	17.4307	1.8545	0.8738	18.394	NO	NO

STATISTICAL SUMMARY
GROUNDWATER INORGANICS
SITE 84 - BUILDING 45 AREA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

	Arithmatic Mean Half Non-Detects	Standard Deviation	Upper 95% Confidence Level	Log Arithmatic Mean Half Non-Detects	Log Standard Deviation	Log Upper 95% Confidence Level	Lognormally Distributed	Normally Distributed
METALS (mg/L)								
Aluminum	0.4075	0.2382	0.5252	-1.2177	0.9897	1.0895	NO	YES
Antimony	0.002	0.0027	0.0033	-6.522	0.6642	0.0029	NO	YES
Arsenic	0.0054	0.0081	0.0094	-5.7811	0.918	0.01	NO	YES
Barium	0.0403	0.0364	0.0583	-3.6153	1.0067	0.1165	YES	YES
Beryllium	0.0007	0.0002	0.0008	-7.2487	0.2252	0.0008	YES	YES
Cadmium	0.0002	0.0002	0.0003	-8.654	0.5369	0.0003	NO	YES
Calcium	45.8308	30.7564	61.0342	3.4369	1.1748	189.8292	YES	YES
Chromium VI	0.0009	0.0005	0.0011	-7.0829	0.3729	0.0011	NO	YES
Cobalt	0.0013	0.0014	0.002	-6.9839	0.7102	0.002	NO	YES
Iron	13.2868	22.6709	24.4934	0.2043	2.5747	5897.0693	YES	NO
Magnesium	4.9215	3.6964	6.7487	1.2272	1.0226	15.2444	YES	YES
Manganese	0.0997	0.1297	0.1638	-3.1963	1.5297	0.8757	YES	YES
Mercury	0	0	0	-10.218	0.204	0	NO	YES
Nickel	0.002	0.0027	0.0033	-6.5663	0.6658	0.0028	NO	YES
Potassium	2.7992	3.4931	4.5259	0.3287	1.2926	13.1454	YES	NO
Sodium	8.4731	6.1412	11.5088	1.8849	0.7613	15.31	YES	YES
Thallium	0.003	0.0011	0.0035	-5.8688	0.2996	0.0035	NO	YES
Vanadium	0.0015	0.0011	0.002	-6.7927	0.8018	0.0029	YES	YES
Zinc	0.0315	0.0839	0.073	-4.6374	1.1344	0.0543	NO	YES

STATISTICAL SUMMARY
LAGOON SURFACE WATER ORGANICS
SITE 84 - BUILDING 45 AREA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

	Arithmatic Mean Half Non-Detects	Standard Deviation	Upper 95% Confidence Level	Log Arithmatic Mean Half Non-Detects	Log Standard Deviation	Log Upper 95% Confidence Level	Lognormally Distributed	Normally Distributed
VOLATILES (ug/L)								
Acetone	5.6	ND	ND	1.7228	ND	ND	NA	NA
Benzene	1.2	ND	ND	0.1823	ND	ND	NA	NA
Toluene	2.7	ND	ND	0.9933	ND	ND	NA	NA
Xylenes, total	3.5	ND	ND	1.2528	ND	ND	NA	NA

STATISTICAL SUMMARY
LAGOON SEDIMENT ORGANICS
SITE 84 - BUILDING 45 AREA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

	Arithmatic Mean Half Non-Detects	Standard Deviation	Upper 95% Confidence Level	Log Arithmatic Mean Half Non-Detects	Log Standard Deviation	Log Upper 95% Confidence Level	Lognormally Distributed	Normally Distributed
VOLATILES (ug/kg)								
Xylenes, total	910	ND	ND	6.8134	ND	ND	NA	NA
SEMIVOLATILES (ug/kg)								
2-Methylnaphthalene	10000	ND	ND	9.2103	ND	ND	NA	NA
Bis(2-ethylhexyl)phthalate	2400	ND	ND	7.7832	ND	ND	NA	NA
Naphthalene	2000	ND	ND	7.6009	ND	ND	NA	NA
Phenanthrene	2500	ND	ND	7.824	ND	ND	NA	NA
PCBs (ug/kg)								
Aroclor-1248	1085.7143	1159.2182	1937.106	6.2014	1.5148	61973.3667	YES	YES
Aroclor-1260	14142.8571	13047.7146	23725.7948	9.2151	0.8857	51223.5513	YES	YES
TOTAL PETROLEUM HYDROCARBONS								
Diesel Range Organics (mg/kg)	6466.6667	4463.5561	13991.5771	8.6285	0.6407	427411.8192	YES	YES

APPENDIX H
HUMAN HEALTH RISK CALCULATION SPREADSHEETS

RISK CALCULATION SPREADSHEETS

ADULT AND YOUNG CHILD RESIDENTS - FUTURE SCENARIOS
ACCIDENTAL INGESTION OF SURFACE SOIL - SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (C*IR*CF*FI*EF*ED)/(BW*AT)
ILCR = CDI*CSFo
HQ = CDI/RfDo

Parameter	Units	Description	Adult	Young Child	
CDI	mg/kg/d	Chronic daily intake	CS	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	CS	
CSFo	1/(mg/kg/d)	Oral cancer slope factor	CS	CS	
HQ	NA	Hazard quotient	CS	CS	
RfDo	mg/kg/d	Oral reference dose	CS	CS	
C	mg/kg	Concentration of chemical in soil	CS	CS	
IR-S	mg/day	Ingestion rate of soil	100	200	
CF	kg/mg	Conversion factor	1.00E-06	1.00E-06	
FI	NA	Fraction of soil ingested from site	1	1	
EF	days/year	Exposure frequency	350	350	
ED	years	Exposure duration	24	6	
BW	kg	Body weight	70	15	
AT-C	days	Averaging time, carcinogens	25,550	25,550	
AT-N	days	Averaging time, noncarcinogens	8,760	2,190	

				Adult						Young Child					
				Carcinogens			Noncarcinogens			Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	CSFo 1/(mg/kg/d)	RfDo (mg/kg/d)	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	57.9	NA	NA	2.7E-05	--	--	7.9E-05	--	--	6.3E-05	--	--	7.4E-04	--	--
Benzo(a)anthracene	4.76	7.3E-01	NA	2.2E-06	1.6E-06	1.5%	6.5E-06	--	--	5.2E-06	3.8E-06	1.5%	6.1E-05	--	--
Benzo(a)pyrene	2.48	7.3E+00	NA	1.2E-06	8.5E-06	7.9%	3.4E-06	--	--	2.7E-06	2.0E-05	7.9%	3.2E-05	--	--
Benzo(b)fluoranthene	2.81	7.3E-01	NA	1.3E-06	9.6E-07	0.9%	3.8E-06	--	--	3.1E-06	2.2E-06	0.9%	3.6E-05	--	--
Benzo(k)fluoranthene	1.78	7.3E-02	NA	8.4E-07	6.1E-08	0.1%	2.4E-06	--	--	2.0E-06	1.4E-07	0.1%	2.3E-05	--	--
Carbazole	0.95	2.0E-02	NA	4.5E-07	8.9E-09	0.0%	1.3E-06	--	--	1.0E-06	2.1E-08	0.0%	1.2E-05	--	--
Chrysene	6.7	7.3E-03	NA	3.1E-06	2.3E-08	0.0%	9.2E-06	--	--	7.3E-06	5.4E-08	0.0%	8.6E-05	--	--
Dibenz(a,h)anthracene	0.695	7.3E+00	NA	3.3E-07	2.4E-06	2.2%	9.5E-07	--	--	7.6E-07	5.6E-06	2.2%	8.9E-06	--	--
Indeno(1,2,3-cd)pyrene	1.72	7.3E-01	NA	8.1E-07	5.9E-07	0.5%	2.4E-06	--	--	1.9E-06	1.4E-06	0.5%	2.2E-05	--	--
Dieldrin	0.052	1.6E+01	5.0E-05	2.4E-08	3.9E-07	0.4%	7.1E-08	1.4E-03	3.9%	5.7E-08	9.1E-07	0.4%	6.6E-07	1.3E-02	3.9%
Aroclor-1260	95.6	2.0E+00	NA	4.5E-05	9.0E-05	83.1%	1.3E-04	--	--	1.0E-04	2.1E-04	83.1%	1.2E-03	--	--
Arsenic	5.26	1.5E+00	3.0E-04	2.5E-06	3.7E-06	3.4%	7.2E-06	2.4E-02	66.4%	5.8E-06	8.6E-06	3.4%	6.7E-05	2.2E-01	66.4%
Iron	2,347	NA	3.0E-01	1.1E-03	--	--	3.2E-03	1.1E-02	29.7%	2.6E-03	--	--	3.0E-02	1.0E-01	29.7%
				Total ILCR:	1.1E-04	100.0%	Total HI:	3.6E-02	100.0%	Total ILCR:	2.5E-04	100.0%	Total HI:	3.4E-01	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT AND YOUNG CHILD RESIDENTS - FUTURE SCENARIOS
DERMAL CONTACT WITH SURFACE SOIL - SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

DAD (mg/kg/d) = (C*CF*AF*ABS*SA*EF*ED)/(BW*AT)
ILCR = CDI*CSFd
HQ = CDI/RfDd

Parameter	Units	Description	Adult	Young Child	
DAD	mg/kg/d	Dermally absorbed dose	CS	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	CS	
CSFd	1/(mg/kg/d)	Dermal cancer slope factor	CS	CS	
HQ	NA	Hazard quotient	CS	CS	
RfDd	mg/kg/d	Dermal reference dose	CS	CS	
C	mg/kg	Concentration of chemical in soil	CS	CS	
CF	kg/mg	Conversion factor	1.00E-06	1.00E-06	
AF	mg/cm2	Soil to skin adherence factor	0.07	0.2	
ABS	NA	Absorption fraction	CS	CS	
SA	cm2/day	Skin surface area available for contact	5,700	2,800	
EF	days/year	Exposure frequency	350	350	
ED	years	Exposure duration	24	6	
BW	kg	Body weight	70	15	
AT-C	days	Averaging time, carcinogens	25,550	25,550	
AT-N	days	Averaging time, noncarcinogens	8,760	2,190	

					Adult						Young Child					
					Carcinogens			Noncarcinogens			Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	ABS	CSFd 1/(mg/kg/d)	RfDd (mg/kg/d)	DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI	DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	57.9	0.01	NA	NA	1.1E-06	--	--	3.2E-06	--	--	1.8E-06	--	--	2.1E-05	--	--
Benzo(a)anthracene	4.76	0.13	2.4E+00	NA	1.2E-06	2.7E-06	3.7%	3.4E-06	--	--	1.9E-06	4.5E-06	3.7%	2.2E-05	--	--
Benzo(a)pyrene	2.48	0.13	1.5E+01	NA	6.0E-07	8.8E-06	11.8%	1.8E-06	--	--	9.9E-07	1.4E-05	11.8%	1.2E-05	--	--
Benzo(b)fluoranthene	2.81	0.13	1.5E+00	NA	6.8E-07	1.0E-06	1.3%	2.0E-06	--	--	1.1E-06	1.6E-06	1.3%	1.3E-05	--	--
Benzo(k)fluoranthene	1.78	0.13	1.5E-01	NA	4.3E-07	6.3E-08	0.1%	1.3E-06	--	--	7.1E-07	1.0E-07	0.1%	8.3E-06	--	--
Carbazole	0.95	0.13	4.0E-02	NA	2.3E-07	9.3E-09	0.0%	6.8E-07	--	--	3.8E-07	1.5E-08	0.0%	4.4E-06	--	--
Chrysene	6.7	0.13	2.4E-02	NA	1.6E-06	3.8E-08	0.1%	4.8E-06	--	--	2.7E-06	6.3E-08	0.1%	3.1E-05	--	--
Dibenz(a,h)anthracene	0.695	0.13	2.4E+01	NA	1.7E-07	4.0E-06	5.4%	4.9E-07	--	--	2.8E-07	6.5E-06	5.4%	3.2E-06	--	--
Indeno(1,2,3-cd)pyrene	1.72	0.13	2.4E+00	NA	4.2E-07	9.9E-07	1.3%	1.2E-06	--	--	6.9E-07	1.6E-06	1.3%	8.0E-06	--	--
Dieldrin	0.052	0.01	3.2E+01	2.5E-05	9.7E-10	3.1E-08	0.0%	2.8E-09	1.1E-04	1.5%	1.6E-09	5.1E-08	0.0%	1.9E-08	7.4E-04	1.5%
Aroclor-1260	95.6	0.14	2.2E+00	NA	2.5E-05	5.6E-05	74.8%	7.3E-05	--	--	4.1E-05	9.1E-05	74.8%	4.8E-04	--	--
Arsenic	5.26	0.03	3.7E+00	1.2E-04	3.0E-07	1.1E-06	1.5%	8.6E-07	7.0E-03	94.6%	4.8E-07	1.8E-06	1.5%	5.6E-06	4.6E-02	94.6%
Iron	2,347	0.001	NA	4.5E-02	4.4E-06	--	--	1.3E-05	2.9E-04	3.8%	7.2E-06	--	--	8.4E-05	1.9E-03	3.8%
					Total ILCR:	7.4E-05	100.0%	Total HI:	7.4E-03	100.0%	Total ILCR:	1.2E-04	100.0%	Total HI:	4.9E-02	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT MILITARY BASE PERSONNEL - CURRENT SCENARIO
INHALATION OF FUGITIVE DUSTS EMANATING FROM SURFACE SOIL - SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (Ca*RR*ET*EF*ED)/(BW*AT)
Where: Ca = C * (1/PEF)

ILCR = CDI*CSFi
HQ = CDI/RfDi

Parameter	Units	Description	Military Personnel	
CDI	mg/kg/d	Chronic daily intake	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	
CSFi	1/(mg/kg/d)	Inhalation cancer slope factor	CS	
HQ	NA	Hazard quotient	CS	
RfDi	mg/kg/d	Inhalation reference dose	CS	
Ca	mg/m3	Concentration of chemical in air as fugitive dusts	CS	
C	mg/kg	Concentration of chemical in soil	CS	
PEF	m3/kg	Particulate emission factor	1.32E+09	
RR	m3/hour	Respiration rate	0.83	
ET	hours/day	Exposure time	8	
EF	days/year	Exposure frequency	250	
ED	years	Exposure duration	4	
BW	kg	Body weight	70	
AT-C	days	Averaging time, carcinogens	25,550	
AT-N	days	Averaging time, noncarcinogens	1,460	

					Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	Ca (mg/m3)	CSFi 1/(mg/kg/d)	RfDi (mg/kg/d)	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	1.96	1.48E-09	NA	NA	5.5E-12	--	--	9.6E-11	--	--
Benzo(a)anthracene	69.0	5.23E-08	3.1E-01	NA	1.9E-10	6.0E-11	4.4%	3.4E-09	--	--
Benzo(a)pyrene	30.5	2.31E-08	3.1E+00	NA	8.6E-11	2.7E-10	19.4%	1.5E-09	--	--
Benzo(b)fluoranthene	40.9	3.10E-08	3.1E-01	NA	1.1E-10	3.6E-11	2.6%	2.0E-09	--	--
Benzo(k)fluoranthene	18.7	1.41E-08	3.1E-02	NA	5.2E-11	1.6E-12	0.1%	9.2E-10	--	--
Carbazole	3.16	2.39E-09	2.0E-02	NA	8.9E-12	1.8E-13	0.0%	1.6E-10	--	--
Chrysene	96.0	7.27E-08	3.1E-03	NA	2.7E-10	8.4E-13	0.1%	4.7E-09	--	--
Dibenz(a,h)anthracene	1.41	1.07E-09	3.1E+00	NA	4.0E-12	1.2E-11	0.9%	7.0E-11	--	--
Fluoranthene	243	1.84E-07	NA	4.0E-02	6.8E-10	--	--	1.2E-08	3.0E-07	0.6%
Indeno(1,2,3-cd)pyrene	8.79	6.66E-09	3.1E-01	NA	2.5E-11	7.7E-12	0.6%	4.3E-10	--	--
Naphthalene	0.525	3.98E-10	NA	8.6E-04	1.5E-12	--	--	2.6E-11	3.0E-08	0.1%
Pyrene	250	1.89E-07	NA	3.0E-02	7.0E-10	--	--	1.2E-08	4.1E-07	0.8%
4,4'-DDD	3	2.27E-09	2.4E-01	NA	8.4E-12	2.0E-12	0.1%	1.5E-10	--	--
Chlordane, alpha-	48	3.64E-08	3.5E-01 (1)	2.0E-04 (1)	1.4E-10	4.7E-11	3.4%	2.4E-09	1.2E-05	24.2%
Chlordane, gamma-	58	4.39E-08	3.5E-01 (1)	2.0E-04 (1)	1.6E-10	5.7E-11	4.2%	2.9E-09	1.4E-05	29.3%
Dieldrin	0.32	2.42E-10	1.6E+01	5.0E-05	9.0E-13	1.4E-11	1.1%	1.6E-11	3.2E-07	0.6%
Heptachlor	22	1.67E-08	4.6E+00	5.0E-04	6.2E-11	2.8E-10	20.5%	1.1E-09	2.2E-06	4.4%
Heptachlor Epoxide	4.5	3.41E-09	9.1E+00	1.3E-05	1.3E-11	1.2E-10	8.4%	2.2E-10	1.7E-05	35.0%
Aroclor-1248	1.51	1.14E-09	2.0E+00	NA	4.2E-12	8.5E-12	0.6%	7.4E-11	--	--
Aroclor-1254	0.975	7.39E-10	2.0E+00	2.0E-05	2.7E-12	5.5E-12	0.4%	4.8E-11	2.4E-06	4.9%
Aroclor-1260	54.6	4.13E-08	2.0E+00	NA	1.5E-10	3.1E-10	22.4%	2.7E-09	--	--
Gasoline Range Organics	0.207	1.57E-10	NA	NA	5.8E-13	--	--	1.0E-11	--	--
Diesel Range Organics	470	3.56E-07	NA	NA	1.3E-09	--	--	2.3E-08	--	--
Antimony	1.22	9.25E-10	NA	NA	3.4E-12	--	--	6.0E-11	--	--
Arsenic	3.49	2.65E-09	1.5E+01	NA	9.8E-12	1.5E-10	10.8%	1.7E-10	--	--
Iron	2,260	1.71E-06	NA	NA	6.4E-09	--	--	1.1E-07	--	--
Thallium	0.31	2.32E-10	NA	NA	8.6E-13	--	--	1.5E-11	--	--
					Total ILCR:	1.4E-09	100.0%	Total HI:	4.9E-05	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT MILITARY BASE PERSONNEL - CURRENT SCENARIO
ACCIDENTAL INGESTION OF SURFACE SOIL - SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (C*IR*CF*FI*EF*ED)/(BW*AT)
ILCR = CDI*CSFo
HQ = CDI/RfDo

Parameter	Units	Description	Military Personnel	
CDI	mg/kg/d	Chronic daily intake	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	
CSFo	1/(mg/kg/d)	Oral cancer slope factor	CS	
HQ	NA	Hazard quotient	CS	
RfDo	mg/kg/d	Oral reference dose	CS	
C	mg/kg	Concentration of chemical in soil	CS	
IR-S	mg/day	Ingestion rate of soil	100	
CF	kg/mg	Conversion factor	1.00E-06	
FI	NA	Fraction of soil ingested from site	1	
EF	days/year	Exposure frequency	250	
ED	years	Exposure duration	4	
BW	kg	Body weight	70	
AT-C	days	Averaging time, carcinogens	25,550	
AT-N	days	Averaging time, noncarcinogens	1,460	

				Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	CSFo 1/(mg/kg/d)	RfDo (mg/kg/d)	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	57.9	NA	NA	3.2E-06	--	--	5.7E-05	--	--
Benzo(a)anthracene	4.76	7.3E-01	NA	2.7E-07	1.9E-07	1.5%	4.7E-06	--	--
Benzo(a)pyrene	2.48	7.3E+00	NA	1.4E-07	1.0E-06	7.9%	2.4E-06	--	--
Benzo(b)fluoranthene	2.81	7.3E-01	NA	1.6E-07	1.1E-07	0.9%	2.7E-06	--	--
Benzo(k)fluoranthene	1.78	7.3E-02	NA	1.0E-07	7.3E-09	0.1%	1.7E-06	--	--
Carbazole	0.95	2.0E-02	NA	5.3E-08	1.1E-09	0.0%	9.3E-07	--	--
Chrysene	6.7	7.3E-03	NA	3.7E-07	2.7E-09	0.0%	6.6E-06	--	--
Dibenz(a,h)anthracene	0.695	7.3E+00	NA	3.9E-08	2.8E-07	2.2%	6.8E-07	--	--
Indeno(1,2,3-cd)pyrene	1.72	7.3E-01	NA	9.6E-08	7.0E-08	0.5%	1.7E-06	--	--
Dieldrin	0.052	1.6E+01	5.0E-05	2.9E-09	4.7E-08	0.4%	5.1E-08	1.0E-03	3.9%
Aroclor-1260	95.6	2.0E+00	NA	5.3E-06	1.1E-05	83.1%	9.4E-05	--	--
Arsenic	5.26	1.5E+00	3.0E-04	2.9E-07	4.4E-07	3.4%	5.1E-06	1.7E-02	66.4%
Iron	2,347	NA	3.0E-01	1.3E-04	--	--	2.3E-03	7.7E-03	29.7%
				Total ILCR:	1.3E-05	100.0%	Total HI:	2.6E-02	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT MILITARY BASE PERSONNEL - CURRENT SCENARIO
DERMAL CONTACT WITH SURFACE SOIL - SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

DAD (mg/kg/d) = (C*CF*AF*ABS*SA*EF*ED)/(BW*AT)
ILCR = CDI*CSFd
HQ = CDI/RfDd

Parameter	Units	Description	Military Personnel	
DAD	mg/kg/d	Dermally absorbed dose	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	
CSFd	1/(mg/kg/d)	Dermal cancer slope factor	CS	
HQ	NA	Hazard quotient	CS	
RfDd	mg/kg/d	Dermal reference dose	CS	
C	mg/kg	Concentration of chemical in soil	CS	
CF	kg/mg	Conversion factor	1.00E-06	
AF	mg/cm2	Soil to skin adherence factor	0.2	
ABS	NA	Absorption fraction	CS	
SA	cm2/day	Skin surface area available for contact	3,300	
EF	days/year	Exposure frequency	250	
ED	years	Exposure duration	4	
BW	kg	Body weight	70	
AT-C	days	Averaging time, carcinogens	25,550	
AT-N	days	Averaging time, noncarcinogens	1,460	

					Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	ABS	CSFd 1/(mg/kg/d)	RfDd (mg/kg/d)	DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	57.9	0.01	NA	NA	2.1E-07	--	--	3.7E-06	--	--
Benzo(a)anthracene	4.76	0.13	2.4E+00	NA	2.3E-07	5.4E-07	3.7%	4.0E-06	--	--
Benzo(a)pyrene	2.48	0.13	1.5E+01	NA	1.2E-07	1.7E-06	11.8%	2.1E-06	--	--
Benzo(b)fluoranthene	2.81	0.13	1.5E+00	NA	1.3E-07	2.0E-07	1.3%	2.4E-06	--	--
Benzo(k)fluoranthene	1.78	0.13	1.5E-01	NA	8.5E-08	1.2E-08	0.1%	1.5E-06	--	--
Carbazole	0.95	0.13	4.0E-02	NA	4.6E-08	1.8E-09	0.0%	8.0E-07	--	--
Chrysene	6.7	0.13	2.4E-02	NA	3.2E-07	7.6E-09	0.1%	5.6E-06	--	--
Dibenz(a,h)anthracene	0.695	0.13	2.4E+01	NA	3.3E-08	7.9E-07	5.4%	5.8E-07	--	--
Indeno(1,2,3-cd)pyrene	1.72	0.13	2.4E+00	NA	8.2E-08	1.9E-07	1.3%	1.4E-06	--	--
Dieldrin	0.052	0.01	3.2E+01	2.5E-05	1.9E-10	6.1E-09	0.0%	3.4E-09	1.3E-04	1.5%
Aroclor-1260	95.6	0.14	2.2E+00	NA	4.9E-06	1.1E-05	74.8%	8.6E-05	--	--
Arsenic	5.26	0.03	3.7E+00	1.2E-04	5.8E-08	2.1E-07	1.5%	1.0E-06	8.3E-03	94.6%
Iron	2,347	0.001	NA	4.5E-02	8.7E-07	--	--	1.5E-05	3.4E-04	3.8%
					Total ILCR:	1.5E-05	100.0%	Total HI:	8.8E-03	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT MILITARY BASE PERSONNEL - CURRENT SCENARIO
INHALATION OF FUGITIVE DUSTS EMANATING FROM SURFACE SOIL - SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (Ca*RR*ET*EF*ED)/(BW*AT)
Where: Ca = C * (1/PEF)

ILCR = CDI*CSFi
HQ = CDI/RfDi

Parameter	Units	Description	Military Personnel	
CDI	mg/kg/d	Chronic daily intake	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	
CSFi	1/(mg/kg/d)	Inhalation cancer slope factor	CS	
HQ	NA	Hazard quotient	CS	
RfDi	mg/kg/d	Inhalation reference dose	CS	
Ca	mg/m3	Concentration of chemical in air as fugitive dusts	CS	
C	mg/kg	Concentration of chemical in soil	CS	
PEF	m3/kg	Particulate emission factor	1.32E+09	
RR	m3/hour	Respiration rate	0.83	
ET	hours/day	Exposure time	8	
EF	days/year	Exposure frequency	250	
ED	years	Exposure duration	4	
BW	kg	Body weight	70	
AT-C	days	Averaging time, carcinogens	25,550	
AT-N	days	Averaging time, noncarcinogens	1,460	

					Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	Ca (mg/m3)	CSFi 1/(mg/kg/d)	RfDi (mg/kg/d)	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	57.9	4.39E-08	NA	NA	1.6E-10	--	--	2.8E-09	--	--
Benzo(a)anthracene	4.76	3.61E-09	3.1E-01	NA	1.3E-11	4.2E-12	0.5%	2.3E-10	--	--
Benzo(a)pyrene	2.48	1.88E-09	3.1E+00	NA	7.0E-12	2.2E-11	2.7%	1.2E-10	--	--
Benzo(b)fluoranthene	2.81	2.13E-09	3.1E-01	NA	7.9E-12	2.4E-12	0.3%	1.4E-10	--	--
Benzo(k)fluoranthene	1.78	1.35E-09	3.1E-02	NA	5.0E-12	1.6E-13	0.0%	8.8E-11	--	--
Carbazole	0.95	7.20E-10	2.0E-02	NA	2.7E-12	5.3E-14	0.0%	4.7E-11	--	--
Chrysene	6.7	5.08E-09	3.1E-03	NA	1.9E-11	5.8E-14	0.0%	3.3E-10	--	--
Dibenz(a,h)anthracene	0.695	5.27E-10	3.1E+00	NA	2.0E-12	6.1E-12	0.8%	3.4E-11	--	--
Indeno(1,2,3-cd)pyrene	1.72	1.30E-09	3.1E-01	NA	4.8E-12	1.5E-12	0.2%	8.5E-11	--	--
Dieldrin	0.052	3.94E-11	1.6E+01	5.0E-05	1.5E-13	2.4E-12	0.3%	2.6E-12	5.1E-08	100.0%
Aroclor-1260	95.6	7.24E-08	2.0E+00	NA	2.7E-10	5.4E-10	67.3%	4.7E-09	--	--
Arsenic	5.26	3.98E-09	1.5E+01	NA	1.5E-11	2.2E-10	27.9%	2.6E-10	--	--
Iron	2,347	1.78E-06	NA	NA	6.6E-09	--	--	1.2E-07	--	--
					Total ILCR:	8.0E-10	100.0%	Total HI:	5.1E-08	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT MILITARY BASE PERSONNEL - CURRENT SCENARIO
ACCIDENTAL INGESTION OF SURFACE WATER - SITE 84 (BUILDING 45 AREA)
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (C*IR*ET*EF*ED)/(BW*AT)
ILCR = CDI*CSFo
HQ = CDI/RfDo

Parameter	Units	Description	Military Personnel	
CDI	mg/kg/d	Chronic daily intake	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	
CSFo	1/(mg/kg/d)	Oral cancer slope factor	CS	
HQ	NA	Hazard quotient	CS	
RfDo	mg/kg/d	Oral reference dose	CS	
C	mg/L	Concentration of chemical in water	CS	
IR-W	L/hour	Ingestion rate of water	0.01	
ET	hours/day	Exposure time	2.6	
EF	days/year	Exposure frequency	250	
ED	years	Exposure duration	4	
BW	kg	Body weight	70	
AT-C	days	Averaging time, carcinogens	25,550	
AT-N	days	Averaging time, noncarcinogens	1,460	

				Carcinogens			Noncarcinogens		
Parameter	C (mg/L)	CSFo 1/(mg/kg/d)	RfDo (mg/kg/d)	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI
Acetone	0.0056	NA	1.0E-01	8.1E-08	--	--	1.4E-06	1.4E-05	78.6%
Toluene	0.0027	NA	2.0E-01	3.9E-08	--	--	6.9E-07	3.4E-06	18.9%
Xylenes, total	0.0035	NA	2.0E+00	5.1E-08	--	--	8.9E-07	4.5E-07	2.5%
				Total ILCR:	--	--	Total HI:	1.8E-05	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.

ADULT MILITARY BASE PERSONNEL - CURRENT SCENARIO
DERMAL CONTACT WITH SURFACE WATER - SITE 84 (BUILDING 45 AREA)
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

DAD (mg/kg/d) = (C*CF*Kp*SA*EF*ED*ET)/(BW*AT)

ILCR = CDI*CSFo Adj CSF Adj = CSF/AD
HQ = CDI/RfDo Adj RfD Adj = RfD*AD

Parameter	Units	Description	Military Personnel	
DAD	mg/kg/d	Dermally absorbed dose	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	
CSFd	1/(mg/kg/d)	Dermal cancer slope factor	CS	
HQ	NA	Hazard quotient	CS	
RfDd	mg/kg/d	Dermal reference dose	CS	
SA	cm2	Skin surface area available for contact	3,300	
EF	days/year	Exposure frequency	250	
ED	years	Exposure duration	4	
ET	hours/day	Exposure time	2.6	
BW	kg	Body weight	70	
AT-C	days	Averaging time, carcinogens	25,550	
AT-N	days	Averaging time, noncarcinogens	1,460	
C	mg/L	Concentration of chemical in water	CS	
CF	L/cm3	Conversion factor	1.00E-03	
Kp	cm/hour	Dermal permeability coefficient	CS	
AD	NA	Adjustment for absorbed dose	CS	

					Carcinogens			Noncarcinogens		
Parameter	C (mg/L)	Kp (cm/hour)	CSFd 1/(mg/kg/d)	RfDd (mg/kg/d)	DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI
Acetone	0.0056	0.00057	NA	8.3E-02	1.5E-08	--	--	2.7E-07	3.2E-06	3.9%
Toluene	0.0027	0.045	NA	1.6E-01	5.8E-07	--	--	1.0E-05	6.4E-05	77.6%
Xylenes, total	0.0035	0.095	NA	1.8E+00	1.6E-06	--	--	2.8E-05	1.5E-05	18.5%
					Total ILCR:	--	--	Total HI:	8.2E-05	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.

ADULT MILITARY BASE PERSONNEL - CURRENT SCENARIO
ACCIDENTAL INGESTION OF SEDIMENT - SITE 84 (BUILDING 45 AREA)
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (C*IR*CF*FI*EF*ED)/(BW*AT)
ILCR = CDI*CSFo
HQ = CDI/RfDo

Parameter	Units	Description	Military Personnel	
CDI	mg/kg/d	Chronic daily intake	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	
CSFo	1/(mg/kg/d)	Oral cancer slope factor	CS	
HQ	NA	Hazard quotient	CS	
RfDo	mg/kg/d	Oral reference dose	CS	
C	mg/kg	Concentration of chemical in soil	CS	
IR-S	mg/day	Ingestion rate of sediment	100	
CF	kg/mg	Conversion factor	1.00E-06	
FI	NA	Fraction of soil ingested from site	1	
EF	days/year	Exposure frequency	250	
ED	years	Exposure duration	4	
BW	kg	Body weight	70	
AT-C	days	Averaging time, carcinogens	25,550	
AT-N	days	Averaging time, noncarcinogens	1,460	

				Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	CSFo 1/(mg/kg/d)	RfDo (mg/kg/d)	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	10	NA	NA	5.6E-07	--	--	9.8E-06	--	--
Aroclor-1248	2.8	2.0E+00	NA	1.6E-07	3.1E-07	6.5%	2.7E-06	--	--
Aroclor-1260	40	2.0E+00	NA	2.2E-06	4.5E-06	93.5%	3.9E-05	--	--
Diesel Range Organics	11,600	NA	NA	6.5E-04	--	--	1.1E-02	--	--
				Total ILCR:	4.8E-06	100.0%	Total HI:	--	--

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.

ADULT MILITARY BASE PERSONNEL - CURRENT SCENARIO
DERMAL CONTACT WITH SEDIMENT - SITE 84 (BUILDING 45 AREA)
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

DAD (mg/kg/d) = (C*CF*AF*ABS*SA*EF*ED)/(BW*AT)
ILCR = CDI*CSFd
HQ = CDI/RfDd

Parameter	Units	Description	Military Personnel	
DAD	mg/kg/d	Dermally absorbed dose	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	
CSFd	1/(mg/kg/d)	Dermal cancer slope factor	CS	
HQ	NA	Hazard quotient	CS	
RfDd	mg/kg/d	Dermal reference dose	CS	
C	mg/kg	Concentration of chemical in soil	CS	
CF	kg/mg	Conversion factor	1.00E-06	
AF	mg/cm2	Soil to skin adherence factor	0	
ABS	NA	Absorption fraction	CS	
SA	cm2/day	Skin surface area available for contact	3,300	
EF	days/year	Exposure frequency	250	
ED	years	Exposure duration	4	
BW	kg	Body weight	70	
AT-C	days	Averaging time, carcinogens	25,550	
AT-N	days	Averaging time, noncarcinogens	1,460	

					Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	ABS	CSFd 1/(mg/kg/d)	RfDd (mg/kg/d)	DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	10	0.01	NA	NA	3.7E-08	--	--	6.5E-07	--	--
Aroclor-1248	2.8	0.14	2.2E+00	NA	1.4E-07	3.3E-07	6.6%	2.5E-06	--	--
Aroclor-1260	40	0.14	2.2E+00	NA	2.1E-06	4.6E-06	93.4%	3.6E-05	--	--
Diesel Range Organics	11,600	0.01	NA	NA	4.3E-05	--	--	7.5E-04	--	--
					Total ILCR:	4.9E-06	100.0%	Total HI:	--	--

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.

ADULT AND ADOLESCENT RECREATIONAL USERS - CURRENT SCENARIO
ACCIDENTAL INGESTION OF SURFACE SOIL - SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (C*IR*CF*FI*EF*ED)/(BW*AT)
ILCR = CDI*CSFo
HQ = CDI/RfDo

Parameter	Units	Description	Adult	Adolescent	
CDI	mg/kg/d	Chronic daily intake	CS	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	CS	
CSFo	1/(mg/kg/d)	Oral cancer slope factor	CS	CS	
HQ	NA	Hazard quotient	CS	CS	
RfDo	mg/kg/d	Oral reference dose	CS	CS	
C	mg/kg	Concentration of chemical in soil	CS	CS	
IR-S	mg/day	Ingestion rate of soil	100	100	
CF	kg/mg	Conversion factor	1.00E-06	1.00E-06	
FI	NA	Fraction of soil ingested from site	1	1	
EF	days/year	Exposure frequency	48	48	
ED	years	Exposure duration	24	9	
BW	kg	Body weight	70	45	
AT-C	days	Averaging time, carcinogens	25,550	25,550	
AT-N	days	Averaging time, noncarcinogens	8,760	3,285	

				Adult						Adolescent					
				Carcinogens			Noncarcinogens			Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	CSFo 1/(mg/kg/d)	RfDo (mg/kg/d)	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	1.96	NA	NA	1.3E-07	--	--	3.7E-07	--	--	7.4E-08	--	--	5.7E-07	--	--
Benzo(a)anthracene	69.0	7.3E-01	NA	4.4E-06	3.2E-06	8.1%	1.3E-05	--	--	2.6E-06	1.9E-06	8.1%	2.0E-05	--	--
Benzo(a)pyrene	30.5	7.3E+00	NA	2.0E-06	1.4E-05	35.6%	5.7E-06	--	--	1.1E-06	8.4E-06	35.6%	8.9E-06	--	--
Benzo(b)fluoranthene	40.9	7.3E-01	NA	2.6E-06	1.9E-06	4.8%	7.7E-06	--	--	1.5E-06	1.1E-06	4.8%	1.2E-05	--	--
Benzo(k)fluoranthene	18.7	7.3E-02	NA	1.2E-06	8.8E-08	0.2%	3.5E-06	--	--	7.0E-07	5.1E-08	0.2%	5.5E-06	--	--
Carbazole	3.16	2.0E-02	NA	2.0E-07	4.1E-09	0.0%	5.9E-07	--	--	1.2E-07	2.4E-09	0.0%	9.2E-07	--	--
Chrysene	96.0	7.3E-03	NA	6.2E-06	4.5E-08	0.1%	1.8E-05	--	--	3.6E-06	2.6E-08	0.1%	2.8E-05	--	--
Dibenz(a,h)anthracene	1.41	7.3E+00	NA	9.1E-08	6.6E-07	1.7%	2.7E-07	--	--	5.3E-08	3.9E-07	1.7%	4.1E-07	--	--
Fluoranthene	243	NA	4.0E-02	1.6E-05	--	--	4.6E-05	1.1E-03	0.9%	9.1E-06	--	--	7.1E-05	1.8E-03	0.9%
Indeno(1,2,3-cd)pyrene	8.79	7.3E-01	NA	5.7E-07	4.1E-07	1.0%	1.7E-06	--	--	3.3E-07	2.4E-07	1.0%	2.6E-06	--	--
Naphthalene	0.525	NA	2.0E-02	3.4E-08	--	--	9.9E-08	4.9E-06	0.0%	2.0E-08	--	--	1.5E-07	7.7E-06	0.0%
Pyrene	250	NA	3.0E-02	1.6E-05	--	--	4.7E-05	1.6E-03	1.2%	9.4E-06	--	--	7.3E-05	2.4E-03	1.2%
4,4'-DDD	3	2.4E-01	NA	1.9E-07	4.6E-08	0.1%	5.6E-07	--	--	1.1E-07	2.7E-08	0.1%	8.8E-07	--	--
Chlordane, alpha-	48	3.5E-01 (1)	5.0E-04 (1)	3.1E-06	1.1E-06	2.7%	9.0E-06	1.8E-02	13.7%	1.8E-06	6.3E-07	2.7%	1.4E-05	2.8E-02	13.7%
Chlordane, gamma-	58	3.5E-01 (1)	5.0E-04 (1)	3.7E-06	1.3E-06	3.3%	1.1E-05	2.2E-02	16.6%	2.2E-06	7.6E-07	3.3%	1.7E-05	3.4E-02	16.6%
Dieldrin	0.32	1.6E+01	5.0E-05	2.1E-08	3.3E-07	0.8%	6.0E-08	1.2E-03	0.9%	1.2E-08	1.9E-07	0.8%	9.4E-08	1.9E-03	0.9%
Heptachlor	22	4.5E+00	5.0E-04	1.4E-06	6.4E-06	15.9%	4.1E-06	8.3E-03	6.3%	8.3E-07	3.7E-06	15.9%	6.4E-06	1.3E-02	6.3%
Heptachlor Epoxide	4.5	9.1E+00	1.3E-05	2.9E-07	2.6E-06	6.6%	8.5E-07	6.5E-02	49.5%	1.7E-07	1.5E-06	6.6%	1.3E-06	1.0E-01	49.5%
Aroclor-1248	1.51	2.0E+00	NA	9.7E-08	1.9E-07	0.5%	2.8E-07	--	--	5.7E-08	1.1E-07	0.5%	4.4E-07	--	--
Aroclor-1254	0.975	2.0E+00	2.0E-05	6.3E-08	1.3E-07	0.3%	1.8E-07	9.2E-03	7.0%	3.7E-08	7.3E-08	0.3%	2.8E-07	1.4E-02	7.0%
Aroclor-1260	54.6	2.0E+00	NA	3.5E-06	7.0E-06	17.5%	1.0E-05	--	--	2.1E-06	4.1E-06	17.5%	1.6E-05	--	--
Gasoline Range Organics	0.207	NA	NA	1.3E-08	--	--	3.9E-08	--	--	7.8E-09	--	--	6.1E-08	--	--
Diesel Range Organics	470	NA	NA	3.0E-05	--	--	8.8E-05	--	--	1.8E-05	--	--	1.4E-04	--	--
Antimony	1.22	NA	4.0E-04	7.9E-08	--	--	2.3E-07	5.7E-04	0.4%	4.6E-08	--	--	3.6E-07	8.9E-04	0.4%
Arsenic	3.49	1.5E+00	3.0E-04	2.2E-07	3.4E-07	0.8%	6.6E-07	2.2E-03	1.7%	1.3E-07	2.0E-07	0.8%	1.0E-06	3.4E-03	1.7%
Iron	2,260	NA	3.0E-01	1.5E-04	--	--	4.2E-04	1.4E-03	1.1%	8.5E-05	--	--	6.6E-04	2.2E-03	1.1%
Thallium	0.31	NA	6.6E-05	2.0E-08	--	--	5.8E-08	8.7E-04	0.7%	1.2E-08	--	--	9.0E-08	1.4E-03	0.7%
				Total ILCR:	4.0E-05	100.0%	Total HI:	1.3E-01	100.0%	Total ILCR:	2.3E-05	100.0%	Total HI:	2.0E-01	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT AND ADOLESCENT RECREATIONAL USERS - CURRENT SCENARIO
DERMAL CONTACT WITH SURFACE SOIL - SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

DAD (mg/kg/d) = (C*CF*AF*ABS*SA*EF*ED)/(BW*AT)
ILCR = CDI*CSFd
HQ = CDI/RfDd

Parameter	Units	Description	Adult	Adolescent	
DAD	mg/kg/d	Dermally absorbed dose	CS	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	CS	
CSFd	1/(mg/kg/d)	Dermal cancer slope factor	CS	CS	
HQ	NA	Hazard quotient	CS	CS	
RfDd	mg/kg/d	Dermal reference dose	CS	CS	
C	mg/kg	Concentration of chemical in soil	CS	CS	
CF	kg/mg	Conversion factor	1.00E-06	1.00E-06	
AF	mg/cm2	Soil to skin adherence factor	0.2	0.2	
ABS	NA	Absorption fraction	CS	CS	
SA	cm2/day	Skin surface area available for contact	5,700	5,300	
EF	days/year	Exposure frequency	48	48	
ED	years	Exposure duration	24	9	
BW	kg	Body weight	70	45	
AT-C	days	Averaging time, carcinogens	25,550	25,550	
AT-N	days	Averaging time, noncarcinogens	8,760	3,285	

					Adult						Adolescent					
					Carcinogens			Noncarcinogens			Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	ABS	CSFd 1/(mg/kg/d)	RfDd (mg/kg/d)	DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI	DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	1.96	0.01	NA	NA	1.4E-08	--	--	4.2E-08	--	--	7.8E-09	--	--	6.1E-08	--	--
Benzo(a)anthracene	69.0	0.13	2.4E+00	NA	6.6E-06	1.6E-05	18.1%	1.9E-05	--	--	3.6E-06	8.4E-06	18.1%	2.8E-05	--	--
Benzo(a)pyrene	30.5	0.13	1.5E+01	NA	2.9E-06	4.2E-05	49.7%	8.5E-06	--	--	1.6E-06	2.3E-05	49.7%	1.2E-05	--	--
Benzo(b)fluoranthene	40.9	0.13	1.5E+00	NA	3.9E-06	5.7E-06	6.7%	1.1E-05	--	--	2.1E-06	3.1E-06	6.7%	1.6E-05	--	--
Benzo(k)fluoranthene	18.7	0.13	1.5E-01	NA	1.8E-06	2.6E-07	0.3%	5.2E-06	--	--	9.7E-07	1.4E-07	0.3%	7.5E-06	--	--
Carbazole	3.16	0.13	4.0E-02	NA	3.0E-07	1.2E-08	0.0%	8.8E-07	--	--	1.6E-07	6.5E-09	0.0%	1.3E-06	--	--
Chrysene	96.0	0.13	2.4E-02	NA	9.2E-06	2.2E-07	0.3%	2.7E-05	--	--	5.0E-06	1.2E-07	0.3%	3.9E-05	--	--
Dibenz(a,h)anthracene	1.41	0.13	2.4E+01	NA	1.3E-07	3.2E-06	3.7%	3.9E-07	--	--	7.3E-08	1.7E-06	3.7%	5.7E-07	--	--
Fluoranthene	243	0.01	NA	1.2E-02	1.8E-06	--	--	5.2E-06	4.2E-04	0.8%	9.7E-07	--	--	7.5E-06	6.1E-04	0.8%
Indeno(1,2,3-cd)pyrene	8.79	0.13	2.4E+00	NA	8.4E-07	2.0E-06	2.3%	2.4E-06	--	--	4.6E-07	1.1E-06	2.3%	3.5E-06	--	--
Naphthalene	0.525	0.01	NA	1.6E-02	3.9E-09	--	--	1.1E-08	7.0E-07	0.0%	2.1E-09	--	--	1.6E-08	1.0E-06	0.0%
Pyrene	250	0.01	NA	9.3E-03	1.8E-06	--	--	5.4E-06	5.8E-04	1.1%	1.0E-06	--	--	7.7E-06	8.3E-04	1.1%
4,4'-DDD	3	0.01	3.4E-01	NA	2.2E-08	7.6E-09	0.0%	6.4E-08	--	--	1.2E-08	4.1E-09	0.0%	9.3E-08	--	--
Chlordane, alpha-	48	0.04	4.4E-01 (1)	4.0E-04 (1)	1.4E-06	6.2E-07	0.7%	4.1E-06	1.0E-02	19.0%	7.6E-07	3.3E-07	0.7%	5.9E-06	1.5E-02	19.0%
Chlordane, gamma-	58	0.04	4.4E-01 (1)	4.0E-04 (1)	1.7E-06	7.5E-07	0.9%	5.0E-06	1.2E-02	22.9%	9.2E-07	4.0E-07	0.9%	7.2E-06	1.8E-02	22.9%
Dieldrin	0.32	0.01	3.2E+01	2.5E-05	2.3E-09	7.5E-08	0.1%	6.9E-09	2.7E-04	0.5%	1.3E-09	4.1E-08	0.1%	9.9E-09	4.0E-04	0.5%
Heptachlor	22	0.01	6.3E+00	3.6E-04	1.6E-07	1.0E-06	1.2%	4.7E-07	1.3E-03	2.4%	8.8E-08	5.5E-07	1.2%	6.8E-07	1.9E-03	2.4%
Heptachlor Epoxide	4.5	0.01	1.3E+01	9.4E-06	3.3E-08	4.2E-07	0.5%	9.6E-08	1.0E-02	19.0%	1.8E-08	2.3E-07	0.5%	1.4E-07	1.5E-02	19.0%
Aroclor-1248	1.51	0.14	2.2E+00	NA	1.5E-07	3.5E-07	0.4%	4.5E-07	--	--	8.4E-08	1.9E-07	0.4%	6.5E-07	--	--
Aroclor-1254	0.975	0.14	2.2E+00	1.8E-05	1.0E-07	2.2E-07	0.3%	2.9E-07	1.6E-02	30.0%	5.4E-08	1.2E-07	0.3%	4.2E-07	2.3E-02	30.0%
Aroclor-1260	54.6	0.14	2.2E+00	NA	5.6E-06	1.2E-05	14.6%	1.6E-05	--	--	3.0E-06	6.8E-06	14.6%	2.4E-05	--	--
Gasoline Range Organics	0.207	0.01	NA	NA	1.5E-09	--	--	4.4E-09	--	--	8.2E-10	--	--	6.4E-09	--	--
Diesel Range Organics	470	0.01	NA	NA	3.5E-06	--	--	1.0E-05	--	--	1.9E-06	--	--	1.5E-05	--	--
Antimony	1.22	0.001	NA	8.0E-06	9.0E-10	--	--	2.6E-09	3.3E-04	0.6%	4.9E-10	--	--	3.8E-09	4.7E-04	0.6%
Arsenic	3.49	0.03	3.7E+00	1.2E-04	7.7E-08	2.8E-07	0.3%	2.2E-07	1.8E-03	3.4%	4.2E-08	1.5E-07	0.3%	3.2E-07	2.6E-03	3.4%
Iron	2,260	0.001	NA	4.5E-02	1.7E-06	--	--	4.8E-06	1.1E-04	0.2%	9.0E-07	--	--	7.0E-06	1.6E-04	0.2%
Thallium	0.31	0.001	NA	9.9E-06	2.3E-10	--	--	6.6E-10	6.6E-05	0.1%	1.2E-10	--	--	9.5E-10	9.6E-05	0.1%
					Total ILCR:	8.5E-05	100.0%	Total HI:	5.4E-02	100.0%	Total ILCR:	4.6E-05	100.0%	Total HI:	7.8E-02	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT AND ADOLESCENT RECREATIONAL USERS - CURRENT SCENARIO
INHALATION OF FUGITIVE DUSTS EMANATING FROM SURFACE SOIL - SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (Ca*RR*ET*EF*ED)/(BW*AT)
Where: Ca = C * (1/PEF)

ILCR = CDI*CSFi
HQ = CDI/RfDi

Parameter	Units	Description	Adult	Adolescent	
CDI	mg/kg/d	Chronic daily intake	CS	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	CS	
CSFi	1/(mg/kg/d)	Inhalation cancer slope factor	CS	CS	
HQ	NA	Hazard quotient	CS	CS	
RfDi	mg/kg/d	Inhalation reference dose	CS	CS	
Ca	mg/m3	Concentration of chemical in air as fugitive dusts	CS	CS	
C	mg/kg	Concentration of chemical in soil	CS	CS	
PEF	m3/kg	Particulate emission factor	1.32E+09	1.32E+09	
RR	m3/hour	Respiration rate	0.83	0.83	
ET	hours/day	Exposure time	8	8	
EF	days/year	Exposure frequency	48	48	
ED	years	Exposure duration	24	9	
BW	kg	Body weight	70	45	
AT-C	days	Averaging time, carcinogens	25,550	25,550	
AT-N	days	Averaging time, noncarcinogens	8,760	3,285	

					Adult						Adolescent					
					Carcinogens			Noncarcinogens			Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	Ca (mg/m3)	CSFi 1/(mg/kg/d)	RfDi (mg/kg/d)	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	1.96	1.48E-09	NA	NA	6.3E-12	--	--	1.9E-11	--	--	3.7E-12	--	--	2.9E-11	--	--
Benzo(a)anthracene	69.0	5.23E-08	3.1E-01	NA	2.2E-10	6.9E-11	4.4%	6.5E-10	--	--	1.3E-10	4.0E-11	4.4%	1.0E-09	--	--
Benzo(a)pyrene	30.5	2.31E-08	3.1E+00	NA	9.9E-11	3.1E-10	19.4%	2.9E-10	--	--	5.8E-11	1.8E-10	19.4%	4.5E-10	--	--
Benzo(b)fluoranthene	40.9	3.10E-08	3.1E-01	NA	1.3E-10	4.1E-11	2.6%	3.9E-10	--	--	7.7E-11	2.4E-11	2.6%	6.0E-10	--	--
Benzo(k)fluoranthene	18.7	1.41E-08	3.1E-02	NA	6.0E-11	1.9E-12	0.1%	1.8E-10	--	--	3.5E-11	1.1E-12	0.1%	2.7E-10	--	--
Carbazole	3.16	2.39E-09	2.0E-02	NA	1.0E-11	2.0E-13	0.0%	3.0E-11	--	--	6.0E-12	1.2E-13	0.0%	4.6E-11	--	--
Chrysene	96.0	7.27E-08	3.1E-03	NA	3.1E-10	9.6E-13	0.1%	9.1E-10	--	--	1.8E-10	5.6E-13	0.1%	1.4E-09	--	--
Dibenz(a,h)anthracene	1.41	1.07E-09	3.1E+00	NA	4.6E-12	1.4E-11	0.9%	1.3E-11	--	--	2.7E-12	8.3E-12	0.9%	2.1E-11	--	--
Fluoranthene	243	1.84E-07	NA	4.0E-02	7.9E-10	--	--	2.3E-09	5.7E-08	0.6%	4.6E-10	--	--	3.6E-09	8.9E-08	0.6%
Indeno(1,2,3-cd)pyrene	8.79	6.66E-09	3.1E-01	NA	2.8E-11	8.8E-12	0.6%	8.3E-11	--	--	1.7E-11	5.2E-12	0.6%	1.3E-10	--	--
Naphthalene	0.525	3.98E-10	NA	8.6E-04	1.7E-12	--	--	5.0E-12	5.8E-09	0.1%	9.9E-13	--	--	7.7E-12	9.0E-09	0.1%
Pyrene	250	1.89E-07	NA	3.0E-02	8.1E-10	--	--	2.4E-09	7.9E-08	0.8%	4.7E-10	--	--	3.7E-09	1.2E-07	0.8%
4,4'-DDD	3	2.27E-09	2.4E-01	NA	9.7E-12	2.3E-12	0.1%	2.8E-11	--	--	5.7E-12	1.4E-12	0.1%	4.4E-11	--	--
Chlordane, alpha-	48	3.64E-08	3.5E-01 (1)	2.0E-04 (1)	1.6E-10	5.4E-11	3.4%	4.5E-10	2.3E-06	24.2%	9.1E-11	3.2E-11	3.4%	7.1E-10	3.5E-06	24.2%
Chlordane, gamma-	58	4.39E-08	3.5E-01 (1)	2.0E-04 (1)	1.9E-10	6.6E-11	4.2%	5.5E-10	2.7E-06	29.3%	1.1E-10	3.8E-11	4.2%	8.5E-10	4.3E-06	29.3%
Dieldrin	0.32	2.42E-10	1.6E+01	5.0E-05	1.0E-12	1.7E-11	1.1%	3.0E-12	6.0E-08	0.6%	6.0E-13	9.7E-12	1.1%	4.7E-12	9.4E-08	0.6%
Heptachlor	22	1.67E-08	4.6E+00	5.0E-04	7.1E-11	3.2E-10	20.5%	2.1E-10	4.2E-07	4.4%	4.2E-11	1.9E-10	20.5%	3.2E-10	6.5E-07	4.4%
Heptachlor Epoxide	4.5	3.41E-09	9.1E+00	1.3E-05	1.5E-11	1.3E-10	8.4%	4.3E-11	3.3E-06	35.0%	8.5E-12	7.7E-11	8.4%	6.6E-11	5.1E-06	35.0%
Aroclor-1248	1.51	1.14E-09	2.0E+00	NA	4.9E-12	9.8E-12	0.6%	1.4E-11	--	--	2.8E-12	5.7E-12	0.6%	2.2E-11	--	--
Aroclor-1254	0.975	7.39E-10	2.0E+00	2.0E-05	3.2E-12	6.3E-12	0.4%	9.2E-12	4.6E-07	4.9%	1.8E-12	3.7E-12	0.4%	1.4E-11	7.2E-07	4.9%
Aroclor-1260	54.6	4.13E-08	2.0E+00	NA	1.8E-10	3.5E-10	22.4%	5.2E-10	--	--	1.0E-10	2.1E-10	22.4%	8.0E-10	--	--
Gasoline Range Organics	0.207	1.57E-10	NA	NA	6.7E-13	--	--	2.0E-12	--	--	3.9E-13	--	--	3.0E-12	--	--
Diesel Range Organics	470	3.56E-07	NA	NA	1.5E-09	--	--	4.4E-09	--	--	8.9E-10	--	--	6.9E-09	--	--
Antimony	1.22	9.25E-10	NA	NA	4.0E-12	--	--	1.2E-11	--	--	2.3E-12	--	--	1.8E-11	--	--
Arsenic	3.49	2.65E-09	1.5E+01	NA	1.1E-11	1.7E-10	10.8%	3.3E-11	--	--	6.6E-12	1.0E-10	10.8%	5.1E-11	--	--
Iron	2,260	1.71E-06	NA	NA	7.3E-09	--	--	2.1E-08	--	--	4.3E-09	--	--	3.3E-08	--	--
Thallium	0.31	2.32E-10	NA	NA	9.9E-13	--	--	2.9E-12	--	--	5.8E-13	--	--	4.5E-12	--	--
					Total ILCR:	1.6E-09	100.0%	Total HI:	9.4E-06	100.0%	Total ILCR:	9.2E-10	100.0%	Total HI:	1.5E-05	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT AND ADOLESCENT RECREATIONAL USERS - CURRENT SCENARIO
ACCIDENTAL INGESTION OF SURFACE SOIL - SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (C*IR*CF*FI*EF*ED)/(BW*AT)
ILCR = CDI*CSFo
HQ = CDI/RfDo

Parameter	Units	Description	Adult	Adolescent	
CDI	mg/kg/d	Chronic daily intake	CS	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	CS	
CSFo	1/(mg/kg/d)	Oral cancer slope factor	CS	CS	
HQ	NA	Hazard quotient	CS	CS	
RfDo	mg/kg/d	Oral reference dose	CS	CS	
C	mg/kg	Concentration of chemical in soil	CS	CS	
IR-S	mg/day	Ingestion rate of soil	100	100	
CF	kg/mg	Conversion factor	1.00E-06	1.00E-06	
FI	NA	Fraction of soil ingested from site	1	1	
EF	days/year	Exposure frequency	48	48	
ED	years	Exposure duration	24	9	
BW	kg	Body weight	70	45	
AT-C	days	Averaging time, carcinogens	25,550	25,550	
AT-N	days	Averaging time, noncarcinogens	8,760	3,285	

				Adult						Adolescent					
				Carcinogens			Noncarcinogens			Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	CSFo 1/(mg/kg/d)	RfDo (mg/kg/d)	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	57.9	NA	NA	3.7E-06	--	--	1.1E-05	--	--	2.2E-06	--	--	1.7E-05	--	--
Benzo(a)anthracene	4.76	7.3E-01	NA	3.1E-07	2.2E-07	1.5%	8.9E-07	--	--	1.8E-07	1.3E-07	1.5%	1.4E-06	--	--
Benzo(a)pyrene	2.48	7.3E+00	NA	1.6E-07	1.2E-06	7.9%	4.7E-07	--	--	9.3E-08	6.8E-07	7.9%	7.2E-07	--	--
Benzo(b)fluoranthene	2.81	7.3E-01	NA	1.8E-07	1.3E-07	0.9%	5.3E-07	--	--	1.1E-07	7.7E-08	0.9%	8.2E-07	--	--
Benzo(k)fluoranthene	1.78	7.3E-02	NA	1.1E-07	8.4E-09	0.1%	3.3E-07	--	--	6.7E-08	4.9E-09	0.1%	5.2E-07	--	--
Carbazole	0.95	2.0E-02	NA	6.1E-08	1.2E-09	0.0%	1.8E-07	--	--	3.6E-08	7.1E-10	0.0%	2.8E-07	--	--
Chrysene	6.7	7.3E-03	NA	4.3E-07	3.2E-09	0.0%	1.3E-06	--	--	2.5E-07	1.8E-09	0.0%	2.0E-06	--	--
Dibenz(a,h)anthracene	0.695	7.3E+00	NA	4.5E-08	3.3E-07	2.2%	1.3E-07	--	--	2.6E-08	1.9E-07	2.2%	2.0E-07	--	--
Indeno(1,2,3-cd)pyrene	1.72	7.3E-01	NA	1.1E-07	8.1E-08	0.5%	3.2E-07	--	--	6.5E-08	4.7E-08	0.5%	5.0E-07	--	--
Dieldrin	0.052	1.6E+01	5.0E-05	3.3E-09	5.4E-08	0.4%	9.8E-09	2.0E-04	3.9%	2.0E-09	3.1E-08	0.4%	1.5E-08	3.0E-04	3.9%
Aroclor-1260	95.6	2.0E+00	NA	6.2E-06	1.2E-05	83.1%	1.8E-05	--	--	3.6E-06	7.2E-06	83.1%	2.8E-05	--	--
Arsenic	5.26	1.5E+00	3.0E-04	3.4E-07	5.1E-07	3.4%	9.9E-07	3.3E-03	66.4%	2.0E-07	3.0E-07	3.4%	1.5E-06	5.1E-03	66.4%
Iron	2,347	NA	3.0E-01	1.5E-04	--	--	4.4E-04	1.5E-03	29.7%	8.8E-05	--	--	6.9E-04	2.3E-03	29.7%
				Total ILCR:	1.5E-05	100.0%	Total HI:	5.0E-03	100.0%	Total ILCR:	8.6E-06	100.0%	Total HI:	7.7E-03	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT AND ADOLESCENT RECREATIONAL USERS - CURRENT SCENARIO
DERMAL CONTACT WITH SURFACE SOIL - SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

DAD (mg/kg/d) = (C*CF*AF*ABS*SA*EF*ED)/(BW*AT)
ILCR = CDI*CSFd
HQ = CDI/RfDd

Parameter	Units	Description	Adult	Adolescent	
DAD	mg/kg/d	Dermally absorbed dose	CS	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	CS	
CSFd	1/(mg/kg/d)	Dermal cancer slope factor	CS	CS	
HQ	NA	Hazard quotient	CS	CS	
RfDd	mg/kg/d	Dermal reference dose	CS	CS	
C	mg/kg	Concentration of chemical in soil	CS	CS	
CF	kg/mg	Conversion factor	1.00E-06	1.00E-06	
AF	mg/cm2	Soil to skin adherence factor	0.2	0.2	
ABS	NA	Absorption fraction	CS	CS	
SA	cm2/day	Skin surface area available for contact	5,700	5,300	
EF	days/year	Exposure frequency	48	48	
ED	years	Exposure duration	24	9	
BW	kg	Body weight	70	45	
AT-C	days	Averaging time, carcinogens	25,550	25,550	
AT-N	days	Averaging time, noncarcinogens	8,760	3,285	

					Adult						Adolescent					
					Carcinogens			Noncarcinogens			Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	ABS	CSFd 1/(mg/kg/d)	RfDd (mg/kg/d)	DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI	DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	57.9	0.01	NA	NA	4.3E-07	--	--	1.2E-06	--	--	2.3E-07	--	--	1.8E-06	--	--
Benzo(a)anthracene	4.76	0.13	2.4E+00	NA	4.5E-07	1.1E-06	3.7%	1.3E-06	--	--	2.5E-07	5.8E-07	3.7%	1.9E-06	--	--
Benzo(a)pyrene	2.48	0.13	1.5E+01	NA	2.4E-07	3.5E-06	11.8%	6.9E-07	--	--	1.3E-07	1.9E-06	11.8%	1.0E-06	--	--
Benzo(b)fluoranthene	2.81	0.13	1.5E+00	NA	2.7E-07	3.9E-07	1.3%	7.8E-07	--	--	1.5E-07	2.1E-07	1.3%	1.1E-06	--	--
Benzo(k)fluoranthene	1.78	0.13	1.5E-01	NA	1.7E-07	2.5E-08	0.1%	5.0E-07	--	--	9.2E-08	1.3E-08	0.1%	7.2E-07	--	--
Carbazole	0.95	0.13	4.0E-02	NA	9.1E-08	3.6E-09	0.0%	2.6E-07	--	--	4.9E-08	2.0E-09	0.0%	3.8E-07	--	--
Chrysene	6.7	0.13	2.4E-02	NA	6.4E-07	1.5E-08	0.1%	1.9E-06	--	--	3.5E-07	8.2E-09	0.1%	2.7E-06	--	--
Dibenz(a,h)anthracene	0.695	0.13	2.4E+01	NA	6.6E-08	1.6E-06	5.4%	1.9E-07	--	--	3.6E-08	8.5E-07	5.4%	2.8E-07	--	--
Indeno(1,2,3-cd)pyrene	1.72	0.13	2.4E+00	NA	1.6E-07	3.9E-07	1.3%	4.8E-07	--	--	8.9E-08	2.1E-07	1.3%	6.9E-07	--	--
Dieldrin	0.052	0.01	3.2E+01	2.5E-05	3.8E-10	1.2E-08	0.0%	1.1E-09	4.5E-05	1.5%	2.1E-10	6.6E-09	0.0%	1.6E-09	6.4E-05	1.5%
Aroclor-1260	95.6	0.14	2.2E+00	NA	9.8E-06	2.2E-05	74.8%	2.9E-05	--	--	5.3E-06	1.2E-05	74.8%	4.1E-05	--	--
Arsenic	5.26	0.03	3.7E+00	1.2E-04	1.2E-07	4.2E-07	1.5%	3.4E-07	2.7E-03	94.6%	6.3E-08	2.3E-07	1.5%	4.9E-07	4.0E-03	94.6%
Iron	2,347	0.001	NA	4.5E-02	1.7E-06	--	--	5.0E-06	1.1E-04	3.8%	9.3E-07	--	--	7.3E-06	1.6E-04	3.8%
					Total ILCR:	2.9E-05	100.0%	Total HI:	2.9E-03	100.0%	Total ILCR:	1.6E-05	100.0%	Total HI:	4.2E-03	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT AND ADOLESCENT RECREATIONAL USERS - CURRENT SCENARIO
INHALATION OF FUGITIVE DUSTS EMANATING FROM SURFACE SOIL - SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (Ca*RR*ET*EF*ED)/(BW*AT)
Where: Ca = C * (1/PEF)

ILCR = CDI*CSFi
HQ = CDI/RfDi

Parameter	Units	Description	Adult	Adolescent	
CDI	mg/kg/d	Chronic daily intake	CS	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	CS	
CSFi	1/(mg/kg/d)	Inhalation cancer slope factor	CS	CS	
HQ	NA	Hazard quotient	CS	CS	
RfDi	mg/kg/d	Inhalation reference dose	CS	CS	
Ca	mg/m3	Concentration of chemical in air as fugitive dusts	CS	CS	
C	mg/kg	Concentration of chemical in soil	CS	CS	
PEF	m3/kg	Particulate emission factor	1.32E+09	1.32E+09	
RR	m3/hour	Respiration rate	0.83	0.83	
ET	hours/day	Exposure time	8	8	
EF	days/year	Exposure frequency	48	48	
ED	years	Exposure duration	24	9	
BW	kg	Body weight	70	45	
AT-C	days	Averaging time, carcinogens	25,550	25,550	
AT-N	days	Averaging time, noncarcinogens	8,760	3,285	

					Adult						Adolescent					
					Carcinogens			Noncarcinogens			Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	Ca (mg/m3)	CSFi 1/(mg/kg/d)	RfDi (mg/kg/d)	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	57.9	4.39E-08	NA	NA	1.9E-10	--	--	5.5E-10	--	--	1.1E-10	--	--	8.5E-10	--	--
Benzo(a)anthracene	4.76	3.61E-09	3.1E-01	NA	1.5E-11	4.8E-12	0.5%	4.5E-11	--	--	9.0E-12	2.8E-12	0.5%	7.0E-11	--	--
Benzo(a)pyrene	2.48	1.88E-09	3.1E+00	NA	8.0E-12	2.5E-11	2.7%	2.3E-11	--	--	4.7E-12	1.5E-11	2.7%	3.6E-11	--	--
Benzo(b)fluoranthene	2.81	2.13E-09	3.1E-01	NA	9.1E-12	2.8E-12	0.3%	2.7E-11	--	--	5.3E-12	1.6E-12	0.3%	4.1E-11	--	--
Benzo(k)fluoranthene	1.78	1.35E-09	3.1E-02	NA	5.8E-12	1.8E-13	0.0%	1.7E-11	--	--	3.4E-12	1.0E-13	0.0%	2.6E-11	--	--
Carbazole	0.95	7.20E-10	2.0E-02	NA	3.1E-12	6.2E-14	0.0%	9.0E-12	--	--	1.8E-12	3.6E-14	0.0%	1.4E-11	--	--
Chrysene	6.7	5.08E-09	3.1E-03	NA	2.2E-11	6.7E-14	0.0%	6.3E-11	--	--	1.3E-11	3.9E-14	0.0%	9.8E-11	--	--
Dibenz(a,h)anthracene	0.695	5.27E-10	3.1E+00	NA	2.3E-12	7.0E-12	0.8%	6.6E-12	--	--	1.3E-12	4.1E-12	0.8%	1.0E-11	--	--
Indeno(1,2,3-cd)pyrene	1.72	1.30E-09	3.1E-01	NA	5.6E-12	1.7E-12	0.2%	1.6E-11	--	--	3.2E-12	1.0E-12	0.2%	2.5E-11	--	--
Dieldrin	0.052	3.94E-11	1.6E+01	5.0E-05	1.7E-13	2.7E-12	0.3%	4.9E-13	9.8E-09	100.0%	9.8E-14	1.6E-12	0.3%	7.6E-13	1.5E-08	100.0%
Aroclor-1260	95.6	7.24E-08	2.0E+00	NA	3.1E-10	6.2E-10	67.3%	9.0E-10	--	--	1.8E-10	3.6E-10	67.3%	1.4E-09	--	--
Arsenic	5.26	3.98E-09	1.5E+01	NA	1.7E-11	2.6E-10	27.9%	5.0E-11	--	--	9.9E-12	1.5E-10	27.9%	7.7E-11	--	--
Iron	2,347	1.78E-06	NA	NA	7.6E-09	--	--	2.2E-08	--	--	4.4E-09	--	--	3.5E-08	--	--
					Total ILCR:	9.2E-10	100.0%	Total HI:	9.8E-09	100.0%	Total ILCR:	5.4E-10	100.0%	Total HI:	1.5E-08	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT AND ADOLESCENT RECREATIONAL USERS - CURRENT SCENARIO
ACCIDENTAL INGESTION OF SURFACE WATER - SITE 84 (BUILDING 45 AREA)
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (C*IR*ET*EF*ED)/(BW*AT)
ILCR = CDI*CSFo
HQ = CDI/RfDo

Parameter	Units	Description	Adult	Adolescent	
CDI	mg/kg/d	Chronic daily intake	CS	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	CS	
CSFo	1/(mg/kg/d)	Oral cancer slope factor	CS	CS	
HQ	NA	Hazard quotient	CS	CS	
RfDo	mg/kg/d	Oral reference dose	CS	CS	
C	mg/L	Concentration of chemical in water	CS	CS	
IR-W	L/hour	Ingestion rate of water	0.01	0.01	
ET	hours/day	Exposure time	2.6	2.6	
EF	days/year	Exposure frequency	48	48	
ED	years	Exposure duration	24	9	
BW	kg	Body weight	70	45	
AT-C	days	Averaging time, carcinogens	25,550	25,550	
AT-N	days	Averaging time, noncarcinogens	8,760	3,285	

				Adult						Adolescent					
				Carcinogens			Noncarcinogens			Carcinogens			Noncarcinogens		
Parameter	C (mg/L)	CSFo 1/(mg/kg/d)	RfDo (mg/kg/d)	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI
Acetone	0.0056	NA	1.0E-01	9.4E-08	--	--	2.7E-07	2.7E-06	78.6%	5.5E-08	--	--	4.3E-07	4.3E-06	78.6%
Toluene	0.0027	NA	2.0E-01	4.5E-08	--	--	1.3E-07	6.6E-07	18.9%	2.6E-08	--	--	2.1E-07	1.0E-06	18.9%
Xylenes, total	0.0035	NA	2.0E+00	5.9E-08	--	--	1.7E-07	8.5E-08	2.5%	3.4E-08	--	--	2.7E-07	1.3E-07	2.5%
				Total ILCR:	--	--	Total HI:	3.5E-06	100.0%	Total ILCR:	--	--	Total HI:	5.4E-06	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.

ADULT AND ADOLESCENT RECREATIONAL USERS - CURRENT SCENARIO
DERMAL CONTACT WITH SURFACE WATER - SITE 84 (BUILDING 45 AREA)
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

DAD (mg/kg/d) = (C*CF*Kp*SA*EF*ED*ET)/(BW*AT)

ILCR = CDI*CSFo Adj CSF Adj = CSF/AD
HQ = CDI/RfDo Adj RfD Adj = RfD*AD

Parameter	Units	Description	Adult	Adolescent	
DAD	mg/kg/d	Dermally absorbed dose	CS	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	CS	
CSFd	1/(mg/kg/d)	Dermal cancer slope factor	CS	CS	
HQ	NA	Hazard quotient	CS	CS	
RfDd	mg/kg/d	Dermal reference dose	CS	CS	
SA	cm2	Skin surface area available for contact	5,700	5,300	
EF	days/year	Exposure frequency	48	48	
ED	years	Exposure duration	24	9	
ET	hours/day	Exposure time	2.6	2.6	
BW	kg	Body weight	70	45	
AT-C	days	Averaging time, carcinogens	25,550	25,550	
AT-N	days	Averaging time, noncarcinogens	8,760	3,285	
C	mg/L	Concentration of chemical in water	CS	CS	
CF	L/cm3	Conversion factor	1.00E-03	1.00E-03	
Kp	cm/hour	Dermal permeability coefficient	CS	CS	
AD	NA	Adjustment for absorbed dose	CS	CS	

					Adult						Adolescent					
					Carcinogens			Noncarcinogens			Carcinogens			Noncarcinogens		
Parameter	C (mg/L)	Kp (cm/hour)	CSFd 1/(mg/kg/d)	RfDd (mg/kg/d)	DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI	DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI
Acetone	0.0056	0.00057	NA	8.3E-02	3.0E-08	--	--	8.9E-08	1.1E-06	3.9%	1.7E-08	--	--	1.3E-07	1.5E-06	3.9%
Toluene	0.0027	0.045	NA	1.6E-01	1.2E-06	--	--	3.4E-06	2.1E-05	77.6%	6.3E-07	--	--	4.9E-06	3.1E-05	77.6%
Xylenes, total	0.0035	0.095	NA	1.8E+00	3.2E-06	--	--	9.3E-06	5.0E-06	18.5%	1.7E-06	--	--	1.3E-05	7.3E-06	18.5%
					Total ILCR:	--	--	Total HI:	2.7E-05	100.0%	Total ILCR:	--	--	Total HI:	3.9E-05	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.

ADULT AND ADOLESCENT RECREATIONAL USERS - CURRENT SCENARIO
ACCIDENTAL INGESTION OF SEDIMENT - SITE 84 (BUILDING 45 AREA)
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (C*IR*CF*FI*EF*ED)/(BW*AT)
ILCR = CDI*CSFo
HQ = CDI/RfDo

Parameter	Units	Description	Adult	Adolescent	
CDI	mg/kg/d	Chronic daily intake	CS	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	CS	
CSFo	1/(mg/kg/d)	Oral cancer slope factor	CS	CS	
HQ	NA	Hazard quotient	CS	CS	
RfDo	mg/kg/d	Oral reference dose	CS	CS	
C	mg/kg	Concentration of chemical in soil	CS	CS	
IR-S	mg/day	Ingestion rate of sediment	100	100	
CF	kg/mg	Conversion factor	1.00E-06	1.00E-06	
FI	NA	Fraction of soil ingested from site	1	1	
EF	days/year	Exposure frequency	48	48	
ED	years	Exposure duration	24	9	
BW	kg	Body weight	70	45	
AT-C	days	Averaging time, carcinogens	25,550	25,550	
AT-N	days	Averaging time, noncarcinogens	8,760	3,285	

				Adult						Adolescent					
				Carcinogens			Noncarcinogens			Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	CSFo 1/(mg/kg/d)	RfDo (mg/kg/d)	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	10	NA	NA	6.4E-07	--	--	1.9E-06	--	--	3.8E-07	--	--	2.9E-06	--	--
Aroclor-1248	2.8	2.0E+00	NA	1.8E-07	3.6E-07	6.5%	5.3E-07	--	--	1.1E-07	2.1E-07	6.5%	8.2E-07	--	--
Aroclor-1260	40	2.0E+00	NA	2.6E-06	5.2E-06	93.5%	7.5E-06	--	--	1.5E-06	3.0E-06	93.5%	1.2E-05	--	--
Diesel Range Organics	11,600	NA	NA	7.5E-04	--	--	2.2E-03	--	--	4.4E-04	--	--	3.4E-03	--	--
				Total ILCR:	5.5E-06	100.0%	Total HI:	--	--	Total ILCR:	3.2E-06	100.0%	Total HI:	--	--

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.

ADULT AND ADOLESCENT RECREATIONAL USERS - CURRENT SCENARIO
DERMAL CONTACT WITH SEDIMENT - SITE 84 (BUILDING 45 AREA)
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

DAD (mg/kg/d) = (C*CF*AF*ABS*SA*EF*ED)/(BW*AT)
ILCR = CDI*CSFd
HQ = CDI/RfDd

Parameter	Units	Description	Adult	Adolescent	
DAD	mg/kg/d	Dermally absorbed dose	CS	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	CS	
CSFd	1/(mg/kg/d)	Dermal cancer slope factor	CS	CS	
HQ	NA	Hazard quotient	CS	CS	
RfDd	mg/kg/d	Dermal reference dose	CS	CS	
C	mg/kg	Concentration of chemical in soil	CS	CS	
CF	kg/mg	Conversion factor	1.00E-06	1.00E-06	
AF	mg/cm2	Soil to skin adherence factor	0	0	
ABS	NA	Absorption fraction	CS	CS	
SA	cm2/day	Skin surface area available for contact	5,700	5,300	
EF	days/year	Exposure frequency	48	48	
ED	years	Exposure duration	24	9	
BW	kg	Body weight	70	45	
AT-C	days	Averaging time, carcinogens	25,550	25,550	
AT-N	days	Averaging time, noncarcinogens	8,760	3,285	

					Adult						Adolescent					
					Carcinogens			Noncarcinogens			Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	ABS	CSFd 1/(mg/kg/d)	RfDd (mg/kg/d)	DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI	DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	10	0.01	NA	NA	7.3E-08	--	--	2.1E-07	--	--	4.0E-08	--	--	3.1E-07	--	--
Aroclor-1248	2.8	0.14	2.2E+00	NA	2.9E-07	6.5E-07	6.6%	8.4E-07	--	--	1.6E-07	3.5E-07	6.6%	1.2E-06	--	--
Aroclor-1260	40	0.14	2.2E+00	NA	4.1E-06	9.1E-06	93.4%	1.2E-05	--	--	2.2E-06	5.0E-06	93.4%	1.7E-05	--	--
Diesel Range Organics	11,600	0.01	NA	NA	8.5E-05	--	--	2.5E-04	--	--	4.6E-05	--	--	3.6E-04	--	--
					Total ILCR:	9.8E-06	100.0%	Total HI:	--	--	Total ILCR:	5.3E-06	100.0%	Total HI:	--	--

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.

ADULT AND YOUNG CHILD RESIDENTS - FUTURE SCENARIOS
ACCIDENTAL INGESTION OF SURFACE SOIL - SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (C*IR*CF*FI*EF*ED)/(BW*AT)
ILCR = CDI*CSFo
HQ = CDI/RfDo

Parameter	Units	Description	Adult	Young Child	
CDI	mg/kg/d	Chronic daily intake	CS	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	CS	
CSFo	1/(mg/kg/d)	Oral cancer slope factor	CS	CS	
HQ	NA	Hazard quotient	CS	CS	
RfDo	mg/kg/d	Oral reference dose	CS	CS	
C	mg/kg	Concentration of chemical in soil	CS	CS	
IR-S	mg/day	Ingestion rate of soil	100	200	
CF	kg/mg	Conversion factor	1.00E-06	1.00E-06	
FI	NA	Fraction of soil ingested from site	1	1	
EF	days/year	Exposure frequency	350	350	
ED	years	Exposure duration	24	6	
BW	kg	Body weight	70	15	
AT-C	days	Averaging time, carcinogens	25,550	25,550	
AT-N	days	Averaging time, noncarcinogens	8,760	2,190	

				Adult						Young Child					
				Carcinogens			Noncarcinogens			Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	CSFo 1/(mg/kg/d)	RfDo (mg/kg/d)	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	1.96	NA	NA	9.2E-07	--	--	2.7E-06	--	--	2.1E-06	--	--	2.5E-05	--	--
Benzo(a)anthracene	69.0	7.3E-01	NA	3.2E-05	2.4E-05	8.1%	9.5E-05	--	--	7.6E-05	5.5E-05	8.1%	8.8E-04	--	--
Benzo(a)pyrene	30.5	7.3E+00	NA	1.4E-05	1.0E-04	35.6%	4.2E-05	--	--	3.3E-05	2.4E-04	35.6%	3.9E-04	--	--
Benzo(b)fluoranthene	40.9	7.3E-01	NA	1.9E-05	1.4E-05	4.8%	5.6E-05	--	--	4.5E-05	3.3E-05	4.8%	5.2E-04	--	--
Benzo(k)fluoranthene	18.7	7.3E-02	NA	8.8E-06	6.4E-07	0.2%	2.6E-05	--	--	2.0E-05	1.5E-06	0.2%	2.4E-04	--	--
Carbazole	3.16	2.0E-02	NA	1.5E-06	3.0E-08	0.0%	4.3E-06	--	--	3.5E-06	6.9E-08	0.0%	4.0E-05	--	--
Chrysene	96.0	7.3E-03	NA	4.5E-05	3.3E-07	0.1%	1.3E-04	--	--	1.1E-04	7.7E-07	0.1%	1.2E-03	--	--
Dibenz(a,h)anthracene	1.41	7.3E+00	NA	6.6E-07	4.8E-06	1.7%	1.9E-06	--	--	1.5E-06	1.1E-05	1.7%	1.8E-05	--	--
Fluoranthene	243	NA	4.0E-02	1.1E-04	--	--	3.3E-04	8.3E-03	0.9%	2.7E-04	--	--	3.1E-03	7.8E-02	0.9%
Indeno(1,2,3-cd)pyrene	8.79	7.3E-01	NA	4.1E-06	3.0E-06	1.0%	1.2E-05	--	--	9.6E-06	7.0E-06	1.0%	1.1E-04	--	--
Naphthalene	0.525	NA	2.0E-02	2.5E-07	--	--	7.2E-07	3.6E-05	0.0%	5.8E-07	--	--	6.7E-06	3.4E-04	0.0%
Pyrene	250	NA	3.0E-02	1.2E-04	--	--	3.4E-04	1.1E-02	1.2%	2.7E-04	--	--	3.2E-03	1.1E-01	1.2%
4,4'-DDD	3	2.4E-01	NA	1.4E-06	3.4E-07	0.1%	4.1E-06	--	--	3.3E-06	7.9E-07	0.1%	3.8E-05	--	--
Chlordane, alpha-	48	3.5E-01 (1)	5.0E-04 (1)	2.3E-05	7.9E-06	2.7%	6.6E-05	1.3E-01	13.7%	5.3E-05	1.8E-05	2.7%	6.1E-04	1.2E+00	13.7%
Chlordane, gamma-	58	3.5E-01 (1)	5.0E-04 (1)	2.7E-05	9.5E-06	3.3%	7.9E-05	1.6E-01	16.6%	6.4E-05	2.2E-05	3.3%	7.4E-04	1.5E+00	16.6%
Dieldrin	0.32	1.6E+01	5.0E-05	1.5E-07	2.4E-06	0.8%	4.4E-07	8.8E-03	0.9%	3.5E-07	5.6E-06	0.8%	4.1E-06	8.2E-02	0.9%
Heptachlor	22	4.5E+00	5.0E-04	1.0E-05	4.6E-05	15.9%	3.0E-05	6.0E-02	6.3%	2.4E-05	1.1E-04	15.9%	2.8E-04	5.6E-01	6.3%
Heptachlor Epoxide	4.5	9.1E+00	1.3E-05	2.1E-06	1.9E-05	6.6%	6.2E-06	4.7E-01	49.5%	4.9E-06	4.5E-05	6.6%	5.8E-05	4.4E+00	49.5%
Aroclor-1248	1.51	2.0E+00	NA	7.1E-07	1.4E-06	0.5%	2.1E-06	--	--	1.7E-06	3.3E-06	0.5%	1.9E-05	--	--
Aroclor-1254	0.975	2.0E+00	2.0E-05	4.6E-07	9.2E-07	0.3%	1.3E-06	6.7E-02	7.0%	1.1E-06	2.1E-06	0.3%	1.2E-05	6.2E-01	7.0%
Aroclor-1260	54.6	2.0E+00	NA	2.6E-05	5.1E-05	17.5%	7.5E-05	--	--	6.0E-05	1.2E-04	17.5%	7.0E-04	--	--
Gasoline Range Organics	0.207	NA	NA	9.7E-08	--	--	2.8E-07	--	--	2.3E-07	--	--	2.6E-06	--	--
Diesel Range Organics	470	NA	NA	2.2E-04	--	--	6.4E-04	--	--	5.2E-04	--	--	6.0E-03	--	--
Antimony	1.22	NA	4.0E-04	5.7E-07	--	--	1.7E-06	4.2E-03	0.4%	1.3E-06	--	--	1.6E-05	3.9E-02	0.4%
Arsenic	3.49	1.5E+00	3.0E-04	1.6E-06	2.5E-06	0.8%	4.8E-06	1.6E-02	1.7%	3.8E-06	5.7E-06	0.8%	4.5E-05	1.5E-01	1.7%
Iron	2,260	NA	3.0E-01	1.1E-03	--	--	3.1E-03	1.0E-02	1.1%	2.5E-03	--	--	2.9E-02	9.6E-02	1.1%
Thallium	0.31	NA	6.6E-05	1.4E-07	--	--	4.2E-07	6.4E-03	0.7%	3.4E-07	--	--	3.9E-06	5.9E-02	0.7%
				Total ILCR:	2.9E-04	100.0%	Total HI:	9.6E-01	100.0%	Total ILCR:	6.8E-04	100.0%	Total HI:	8.9E+00	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT AND YOUNG CHILD RESIDENTS - FUTURE SCENARIOS
DERMAL CONTACT WITH SURFACE SOIL - SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

DAD (mg/kg/d) = (C*CF*AF*ABS*SA*EF*ED)/(BW*AT)
ILCR = CDI*CSFd
HQ = CDI/RfDd

Parameter	Units	Description	Adult	Young Child	
DAD	mg/kg/d	Dermally absorbed dose	CS	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	CS	
CSFd	1/(mg/kg/d)	Dermal cancer slope factor	CS	CS	
HQ	NA	Hazard quotient	CS	CS	
RfDd	mg/kg/d	Dermal reference dose	CS	CS	
C	mg/kg	Concentration of chemical in soil	CS	CS	
CF	kg/mg	Conversion factor	1.00E-06	1.00E-06	
AF	mg/cm2	Soil to skin adherence factor	0.07	0.2	
ABS	NA	Absorption fraction	CS	CS	
SA	cm2/day	Skin surface area available for contact	5,700	2,800	
EF	days/year	Exposure frequency	350	350	
ED	years	Exposure duration	24	6	
BW	kg	Body weight	70	15	
AT-C	days	Averaging time, carcinogens	25,550	25,550	
AT-N	days	Averaging time, noncarcinogens	8,760	2,190	

					Adult						Young Child					
					Carcinogens			Noncarcinogens			Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	ABS	CSFd 1/(mg/kg/d)	RfDd (mg/kg/d)	DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI	DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	1.96	0.01	NA	NA	3.7E-08	--	--	1.1E-07	--	--	6.0E-08	--	--	7.0E-07	--	--
Benzo(a)anthracene	69.0	0.13	2.4E+00	NA	1.7E-05	4.0E-05	18.1%	4.9E-05	--	--	2.8E-05	6.5E-05	18.1%	3.2E-04	--	--
Benzo(a)pyrene	30.5	0.13	1.5E+01	NA	7.4E-06	1.1E-04	49.7%	2.2E-05	--	--	1.2E-05	1.8E-04	49.7%	1.4E-04	--	--
Benzo(b)fluoranthene	40.9	0.13	1.5E+00	NA	1.0E-05	1.5E-05	6.7%	2.9E-05	--	--	1.6E-05	2.4E-05	6.7%	1.9E-04	--	--
Benzo(k)fluoranthene	18.7	0.13	1.5E-01	NA	4.5E-06	6.6E-07	0.3%	1.3E-05	--	--	7.4E-06	1.1E-06	0.3%	8.7E-05	--	--
Carbazole	3.16	0.13	4.0E-02	NA	7.7E-07	3.1E-08	0.0%	2.2E-06	--	--	1.3E-06	5.0E-08	0.0%	1.5E-05	--	--
Chrysene	96.0	0.13	2.4E-02	NA	2.3E-05	5.5E-07	0.3%	6.8E-05	--	--	3.8E-05	9.0E-07	0.3%	4.5E-04	--	--
Dibenz(a,h)anthracene	1.41	0.13	2.4E+01	NA	3.4E-07	8.1E-06	3.7%	1.0E-06	--	--	5.6E-07	1.3E-05	3.7%	6.6E-06	--	--
Fluoranthene	243	0.01	NA	1.2E-02	4.6E-06	--	--	1.3E-05	1.1E-03	0.8%	7.5E-06	--	--	8.7E-05	7.0E-03	0.8%
Indeno(1,2,3-cd)pyrene	8.79	0.13	2.4E+00	NA	2.1E-06	5.0E-06	2.3%	6.2E-06	--	--	3.5E-06	8.3E-06	2.3%	4.1E-05	--	--
Naphthalene	0.525	0.01	NA	1.6E-02	9.8E-09	--	--	2.9E-08	1.8E-06	0.0%	1.6E-08	--	--	1.9E-07	1.2E-05	0.0%
Pyrene	250	0.01	NA	9.3E-03	4.7E-06	--	--	1.4E-05	1.5E-03	1.1%	7.7E-06	--	--	8.9E-05	9.6E-03	1.1%
4,4'-DDD	3	0.01	3.4E-01	NA	5.6E-08	1.9E-08	0.0%	1.6E-07	--	--	9.2E-08	3.2E-08	0.0%	1.1E-06	--	--
Chlordane, alpha-	48	0.04	4.4E-01 (1)	4.0E-04 (1)	3.6E-06	1.6E-06	0.7%	1.0E-05	2.6E-02	19.0%	5.9E-06	2.6E-06	0.7%	6.9E-05	1.7E-01	19.0%
Chlordane, gamma-	58	0.04	4.4E-01 (1)	4.0E-04 (1)	4.3E-06	1.9E-06	0.9%	1.3E-05	3.2E-02	22.9%	7.1E-06	3.1E-06	0.9%	8.3E-05	2.1E-01	22.9%
Dieldrin	0.32	0.01	3.2E+01	2.5E-05	6.0E-09	1.9E-07	0.1%	1.7E-08	7.0E-04	0.5%	9.8E-09	3.1E-07	0.1%	1.1E-07	4.6E-03	0.5%
Heptachlor	22	0.01	6.3E+00	3.6E-04	4.1E-07	2.6E-06	1.2%	1.2E-06	3.3E-03	2.4%	6.8E-07	4.2E-06	1.2%	7.9E-06	2.2E-02	2.4%
Heptachlor Epoxide	4.5	0.01	1.3E+01	9.4E-06	8.4E-08	1.1E-06	0.5%	2.5E-07	2.6E-02	19.0%	1.4E-07	1.7E-06	0.5%	1.6E-06	1.7E-01	19.0%
Aroclor-1248	1.51	0.14	2.2E+00	NA	4.0E-07	8.9E-07	0.4%	1.2E-06	--	--	6.5E-07	1.5E-06	0.4%	7.6E-06	--	--
Aroclor-1254	0.975	0.14	2.2E+00	1.8E-05	2.6E-07	5.7E-07	0.3%	7.5E-07	4.1E-02	30.0%	4.2E-07	9.3E-07	0.3%	4.9E-06	2.7E-01	30.0%
Aroclor-1260	54.6	0.14	2.2E+00	NA	1.4E-05	3.2E-05	14.6%	4.2E-05	--	--	2.3E-05	5.2E-05	14.6%	2.7E-04	--	--
Gasoline Range Organics	0.207	0.01	NA	NA	3.9E-09	--	--	1.1E-08	--	--	6.4E-09	--	--	7.4E-08	--	--
Diesel Range Organics	470	0.01	NA	NA	8.8E-06	--	--	2.6E-05	--	--	1.4E-05	--	--	1.7E-04	--	--
Antimony	1.22	0.001	NA	8.0E-06	2.3E-09	--	--	6.7E-09	8.3E-04	0.6%	3.7E-09	--	--	4.4E-08	5.5E-03	0.6%
Arsenic	3.49	0.03	3.7E+00	1.2E-04	2.0E-07	7.2E-07	0.3%	5.7E-07	4.7E-03	3.4%	3.2E-07	1.2E-06	0.3%	3.8E-06	3.0E-02	3.4%
Iron	2,260	0.001	NA	4.5E-02	4.2E-06	--	--	1.2E-05	2.7E-04	0.2%	6.9E-06	--	--	8.1E-05	1.8E-03	0.2%
Thallium	0.31	0.001	NA	9.9E-06	5.7E-10	--	--	1.7E-09	1.7E-04	0.1%	9.4E-10	--	--	1.1E-08	1.1E-03	0.1%
					Total ILCR:	2.2E-04	100.0%	Total HI:	1.4E-01	100.0%	Total ILCR:	3.6E-04	100.0%	Total HI:	9.1E-01	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT AND YOUNG CHILD RESIDENTS - FUTURE SCENARIOS
INHALATION OF FUGITIVE DUSTS EMANATING FROM SURFACE SOIL - SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (Ca*RR*ET*EF*ED)/(BW*AT)
Where: Ca = C * (1/PEF)

ILCR = CDI*CSFi
HQ = CDI/RfDi

Parameter	Units	Description	Adult	Young Child	
CDI	mg/kg/d	Chronic daily intake	CS	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	CS	
CSFi	1/(mg/kg/d)	Inhalation cancer slope factor	CS	CS	
HQ	NA	Hazard quotient	CS	CS	
RfDi	mg/kg/d	Inhalation reference dose	CS	CS	
Ca	mg/m3	Concentration of chemical in air as fugitive dusts	CS	CS	
C	mg/kg	Concentration of chemical in soil	CS	CS	
PEF	m3/kg	Particulate emission factor	1.32E+09	1.32E+09	
RR	m3/hour	Respiration rate	0.83	0.63	
ET	hours/day	Exposure time	24	24	
EF	days/year	Exposure frequency	350	350	
ED	years	Exposure duration	24	6	
BW	kg	Body weight	70	15	
AT-C	days	Averaging time, carcinogens	25,550	25,550	
AT-N	days	Averaging time, noncarcinogens	8,760	2,190	

					Adult						Young Child					
					Carcinogens			Noncarcinogens			Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	Ca (mg/m3)	CSFi 1/(mg/kg/d)	RfDi (mg/kg/d)	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	1.96	1.48E-09	NA	NA	1.4E-10	--	--	4.0E-10	--	--	1.2E-10	--	--	1.4E-09	--	--
Benzo(a)anthracene	69.0	5.23E-08	3.1E-01	NA	4.9E-09	1.5E-09	4.4%	1.4E-08	--	--	4.3E-09	1.3E-09	4.4%	5.0E-08	--	--
Benzo(a)pyrene	30.5	2.31E-08	3.1E+00	NA	2.2E-09	6.7E-09	19.4%	6.3E-09	--	--	1.9E-09	5.9E-09	19.4%	2.2E-08	--	--
Benzo(b)fluoranthene	40.9	3.10E-08	3.1E-01	NA	2.9E-09	9.0E-10	2.6%	8.4E-09	--	--	2.5E-09	7.9E-10	2.6%	3.0E-08	--	--
Benzo(k)fluoranthene	18.7	1.41E-08	3.1E-02	NA	1.3E-09	4.1E-11	0.1%	3.9E-09	--	--	1.2E-09	3.6E-11	0.1%	1.4E-08	--	--
Carbazole	3.16	2.39E-09	2.0E-02	NA	2.2E-10	4.5E-12	0.0%	6.5E-10	--	--	2.0E-10	3.9E-12	0.0%	2.3E-09	--	--
Chrysene	96.0	7.27E-08	3.1E-03	NA	6.8E-09	2.1E-11	0.1%	2.0E-08	--	--	6.0E-09	1.9E-11	0.1%	7.0E-08	--	--
Dibenz(a,h)anthracene	1.41	1.07E-09	3.1E+00	NA	1.0E-10	3.1E-10	0.9%	2.9E-10	--	--	8.8E-11	2.7E-10	0.9%	1.0E-09	--	--
Fluoranthene	243	1.84E-07	NA	4.0E-02	1.7E-08	--	--	5.0E-08	1.3E-06	0.6%	1.5E-08	--	--	1.8E-07	4.4E-06	0.6%
Indeno(1,2,3-cd)pyrene	8.79	6.66E-09	3.1E-01	NA	6.2E-10	1.9E-10	0.6%	1.8E-09	--	--	5.5E-10	1.7E-10	0.6%	6.4E-09	--	--
Naphthalene	0.525	3.98E-10	NA	8.6E-04	3.7E-11	--	--	1.1E-10	1.3E-07	0.1%	3.3E-11	--	--	3.8E-10	4.5E-07	0.1%
Pyrene	250	1.89E-07	NA	3.0E-02	1.8E-08	--	--	5.2E-08	1.7E-06	0.8%	1.6E-08	--	--	1.8E-07	6.1E-06	0.8%
4,4'-DDD	3	2.27E-09	2.4E-01	NA	2.1E-10	5.1E-11	0.1%	6.2E-10	--	--	1.9E-10	4.5E-11	0.1%	2.2E-09	--	--
Chlordane, alpha-	48	3.64E-08	3.5E-01 (1)	2.0E-04 (1)	3.4E-09	1.2E-09	3.4%	9.9E-09	5.0E-05	24.2%	3.0E-09	1.0E-09	3.4%	3.5E-08	1.7E-04	24.2%
Chlordane, gamma-	58	4.39E-08	3.5E-01 (1)	2.0E-04 (1)	4.1E-09	1.4E-09	4.2%	1.2E-08	6.0E-05	29.3%	3.6E-09	1.3E-09	4.2%	4.2E-08	2.1E-04	29.3%
Dieldrin	0.32	2.42E-10	1.6E+01	5.0E-05	2.3E-11	3.7E-10	1.1%	6.6E-11	1.3E-06	0.6%	2.0E-11	3.2E-10	1.1%	2.3E-10	4.6E-06	0.6%
Heptachlor	22	1.67E-08	4.6E+00	5.0E-04	1.6E-09	7.1E-09	20.5%	4.5E-09	9.1E-06	4.4%	1.4E-09	6.2E-09	20.5%	1.6E-08	3.2E-05	4.4%
Heptachlor Epoxide	4.5	3.41E-09	9.1E+00	1.3E-05	3.2E-10	2.9E-09	8.4%	9.3E-10	7.2E-05	35.0%	2.8E-10	2.5E-09	8.4%	3.3E-09	2.5E-04	35.0%
Aroclor-1248	1.51	1.14E-09	2.0E+00	NA	1.1E-10	2.1E-10	0.6%	3.1E-10	--	--	9.4E-11	1.9E-10	0.6%	1.1E-09	--	--
Aroclor-1254	0.975	7.39E-10	2.0E+00	2.0E-05	6.9E-11	1.4E-10	0.4%	2.0E-10	1.0E-05	4.9%	6.1E-11	1.2E-10	0.4%	7.1E-10	3.5E-05	4.9%
Aroclor-1260	54.6	4.13E-08	2.0E+00	NA	3.9E-09	7.7E-09	22.4%	1.1E-08	--	--	3.4E-09	6.8E-09	22.4%	4.0E-08	--	--
Gasoline Range Organics	0.207	1.57E-10	NA	NA	1.5E-11	--	--	4.3E-11	--	--	1.3E-11	--	--	1.5E-10	--	--
Diesel Range Organics	470	3.56E-07	NA	NA	3.3E-08	--	--	9.7E-08	--	--	2.9E-08	--	--	3.4E-07	--	--
Antimony	1.22	9.25E-10	NA	NA	8.7E-11	--	--	2.5E-10	--	--	7.6E-11	--	--	8.9E-10	--	--
Arsenic	3.49	2.65E-09	1.5E+01	NA	2.5E-10	3.7E-09	10.8%	7.2E-10	--	--	2.2E-10	3.3E-09	10.8%	2.5E-09	--	--
Iron	2,260	1.71E-06	NA	NA	1.6E-07	--	--	4.7E-07	--	--	1.4E-07	--	--	1.6E-06	--	--
Thallium	0.31	2.32E-10	NA	NA	2.2E-11	--	--	6.3E-11	--	--	1.9E-11	--	--	2.2E-10	--	--
					Total ILCR:	3.5E-08	100.0%	Total HI:	2.0E-04	100.0%	Total ILCR:	3.0E-08	100.0%	Total HI:	7.2E-04	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT AND YOUNG CHILD RESIDENTS - FUTURE SCENARIOS
ACCIDENTAL INGESTION OF SURFACE SOIL - SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (C*IR*CF*FI*EF*ED)/(BW*AT)
ILCR = CDI*CSFo
HQ = CDI/RfDo

Parameter	Units	Description	Adult	Young Child	
CDI	mg/kg/d	Chronic daily intake	CS	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	CS	
CSFo	1/(mg/kg/d)	Oral cancer slope factor	CS	CS	
HQ	NA	Hazard quotient	CS	CS	
RfDo	mg/kg/d	Oral reference dose	CS	CS	
C	mg/kg	Concentration of chemical in soil	CS	CS	
IR-S	mg/day	Ingestion rate of soil	100	200	
CF	kg/mg	Conversion factor	1.00E-06	1.00E-06	
FI	NA	Fraction of soil ingested from site	1	1	
EF	days/year	Exposure frequency	350	350	
ED	years	Exposure duration	24	6	
BW	kg	Body weight	70	15	
AT-C	days	Averaging time, carcinogens	25,550	25,550	
AT-N	days	Averaging time, noncarcinogens	8,760	2,190	

				Adult						Young Child					
				Carcinogens			Noncarcinogens			Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	CSFo 1/(mg/kg/d)	RfDo (mg/kg/d)	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	57.9	NA	NA	2.7E-05	--	--	7.9E-05	--	--	6.3E-05	--	--	7.4E-04	--	--
Benzo(a)anthracene	4.76	7.3E-01	NA	2.2E-06	1.6E-06	1.5%	6.5E-06	--	--	5.2E-06	3.8E-06	1.5%	6.1E-05	--	--
Benzo(a)pyrene	2.48	7.3E+00	NA	1.2E-06	8.5E-06	7.9%	3.4E-06	--	--	2.7E-06	2.0E-05	7.9%	3.2E-05	--	--
Benzo(b)fluoranthene	2.81	7.3E-01	NA	1.3E-06	9.6E-07	0.9%	3.8E-06	--	--	3.1E-06	2.2E-06	0.9%	3.6E-05	--	--
Benzo(k)fluoranthene	1.78	7.3E-02	NA	8.4E-07	6.1E-08	0.1%	2.4E-06	--	--	2.0E-06	1.4E-07	0.1%	2.3E-05	--	--
Carbazole	0.95	2.0E-02	NA	4.5E-07	8.9E-09	0.0%	1.3E-06	--	--	1.0E-06	2.1E-08	0.0%	1.2E-05	--	--
Chrysene	6.7	7.3E-03	NA	3.1E-06	2.3E-08	0.0%	9.2E-06	--	--	7.3E-06	5.4E-08	0.0%	8.6E-05	--	--
Dibenz(a,h)anthracene	0.695	7.3E+00	NA	3.3E-07	2.4E-06	2.2%	9.5E-07	--	--	7.6E-07	5.6E-06	2.2%	8.9E-06	--	--
Indeno(1,2,3-cd)pyrene	1.72	7.3E-01	NA	8.1E-07	5.9E-07	0.5%	2.4E-06	--	--	1.9E-06	1.4E-06	0.5%	2.2E-05	--	--
Dieldrin	0.052	1.6E+01	5.0E-05	2.4E-08	3.9E-07	0.4%	7.1E-08	1.4E-03	3.9%	5.7E-08	9.1E-07	0.4%	6.6E-07	1.3E-02	3.9%
Aroclor-1260	95.6	2.0E+00	NA	4.5E-05	9.0E-05	83.1%	1.3E-04	--	--	1.0E-04	2.1E-04	83.1%	1.2E-03	--	--
Arsenic	5.26	1.5E+00	3.0E-04	2.5E-06	3.7E-06	3.4%	7.2E-06	2.4E-02	66.4%	5.8E-06	8.6E-06	3.4%	6.7E-05	2.2E-01	66.4%
Iron	2,347	NA	3.0E-01	1.1E-03	--	--	3.2E-03	1.1E-02	29.7%	2.6E-03	--	--	3.0E-02	1.0E-01	29.7%
				Total ILCR:	1.1E-04	100.0%	Total HI:	3.6E-02	100.0%	Total ILCR:	2.5E-04	100.0%	Total HI:	3.4E-01	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT AND YOUNG CHILD RESIDENTS - FUTURE SCENARIOS
DERMAL CONTACT WITH SURFACE SOIL - SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

DAD (mg/kg/d) = (C*CF*AF*ABS*SA*EF*ED)/(BW*AT)
ILCR = CDI*CSFd
HQ = CDI/RfDd

Parameter	Units	Description	Adult	Young Child	
DAD	mg/kg/d	Dermally absorbed dose	CS	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	CS	
CSFd	1/(mg/kg/d)	Dermal cancer slope factor	CS	CS	
HQ	NA	Hazard quotient	CS	CS	
RfDd	mg/kg/d	Dermal reference dose	CS	CS	
C	mg/kg	Concentration of chemical in soil	CS	CS	
CF	kg/mg	Conversion factor	1.00E-06	1.00E-06	
AF	mg/cm2	Soil to skin adherence factor	0.07	0.2	
ABS	NA	Absorption fraction	CS	CS	
SA	cm2/day	Skin surface area available for contact	5,700	2,800	
EF	days/year	Exposure frequency	350	350	
ED	years	Exposure duration	24	6	
BW	kg	Body weight	70	15	
AT-C	days	Averaging time, carcinogens	25,550	25,550	
AT-N	days	Averaging time, noncarcinogens	8,760	2,190	

					Adult						Young Child					
					Carcinogens			Noncarcinogens			Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	ABS	CSFd 1/(mg/kg/d)	RfDd (mg/kg/d)	DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI	DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	57.9	0.01	NA	NA	1.1E-06	--	--	3.2E-06	--	--	1.8E-06	--	--	2.1E-05	--	--
Benzo(a)anthracene	4.76	0.13	2.4E+00	NA	1.2E-06	2.7E-06	3.7%	3.4E-06	--	--	1.9E-06	4.5E-06	3.7%	2.2E-05	--	--
Benzo(a)pyrene	2.48	0.13	1.5E+01	NA	6.0E-07	8.8E-06	11.8%	1.8E-06	--	--	9.9E-07	1.4E-05	11.8%	1.2E-05	--	--
Benzo(b)fluoranthene	2.81	0.13	1.5E+00	NA	6.8E-07	1.0E-06	1.3%	2.0E-06	--	--	1.1E-06	1.6E-06	1.3%	1.3E-05	--	--
Benzo(k)fluoranthene	1.78	0.13	1.5E-01	NA	4.3E-07	6.3E-08	0.1%	1.3E-06	--	--	7.1E-07	1.0E-07	0.1%	8.3E-06	--	--
Carbazole	0.95	0.13	4.0E-02	NA	2.3E-07	9.3E-09	0.0%	6.8E-07	--	--	3.8E-07	1.5E-08	0.0%	4.4E-06	--	--
Chrysene	6.7	0.13	2.4E-02	NA	1.6E-06	3.8E-08	0.1%	4.8E-06	--	--	2.7E-06	6.3E-08	0.1%	3.1E-05	--	--
Dibenz(a,h)anthracene	0.695	0.13	2.4E+01	NA	1.7E-07	4.0E-06	5.4%	4.9E-07	--	--	2.8E-07	6.5E-06	5.4%	3.2E-06	--	--
Indeno(1,2,3-cd)pyrene	1.72	0.13	2.4E+00	NA	4.2E-07	9.9E-07	1.3%	1.2E-06	--	--	6.9E-07	1.6E-06	1.3%	8.0E-06	--	--
Dieldrin	0.052	0.01	3.2E+01	2.5E-05	9.7E-10	3.1E-08	0.0%	2.8E-09	1.1E-04	1.5%	1.6E-09	5.1E-08	0.0%	1.9E-08	7.4E-04	1.5%
Aroclor-1260	95.6	0.14	2.2E+00	NA	2.5E-05	5.6E-05	74.8%	7.3E-05	--	--	4.1E-05	9.1E-05	74.8%	4.8E-04	--	--
Arsenic	5.26	0.03	3.7E+00	1.2E-04	3.0E-07	1.1E-06	1.5%	8.6E-07	7.0E-03	94.6%	4.8E-07	1.8E-06	1.5%	5.6E-06	4.6E-02	94.6%
Iron	2,347	0.001	NA	4.5E-02	4.4E-06	--	--	1.3E-05	2.9E-04	3.8%	7.2E-06	--	--	8.4E-05	1.9E-03	3.8%
					Total ILCR:	7.4E-05	100.0%	Total HI:	7.4E-03	100.0%	Total ILCR:	1.2E-04	100.0%	Total HI:	4.9E-02	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT AND YOUNG CHILD RESIDENTS - FUTURE SCENARIOS
INHALATION OF FUGITIVE DUSTS EMANATING FROM SURFACE SOIL - SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (Ca*RR*ET*EF*ED)/(BW*AT)
Where: Ca = C * (1/PEF)

ILCR = CDI*CSFi
HQ = CDI/RfDi

Parameter	Units	Description	Adult	Young Child	
CDI	mg/kg/d	Chronic daily intake	CS	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	CS	
CSFi	1/(mg/kg/d)	Inhalation cancer slope factor	CS	CS	
HQ	NA	Hazard quotient	CS	CS	
RfDi	mg/kg/d	Inhalation reference dose	CS	CS	
Ca	mg/m3	Concentration of chemical in air as fugitive dusts	CS	CS	
C	mg/kg	Concentration of chemical in soil	CS	CS	
PEF	m3/kg	Particulate emission factor	1.32E+09	1.32E+09	
RR	m3/hour	Respiration rate	0.83	0.63	
ET	hours/day	Exposure time	24	24	
EF	days/year	Exposure frequency	350	350	
ED	years	Exposure duration	24	6	
BW	kg	Body weight	70	15	
AT-C	days	Averaging time, carcinogens	25,550	25,550	
AT-N	days	Averaging time, noncarcinogens	8,760	2,190	

					Adult						Young Child					
					Carcinogens			Noncarcinogens			Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	Ca (mg/m3)	CSFi 1/(mg/kg/d)	RfDi (mg/kg/d)	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	57.9	4.39E-08	NA	NA	4.1E-09	--	--	1.2E-08	--	--	3.6E-09	--	--	4.2E-08	--	--
Benzo(a)anthracene	4.76	3.61E-09	3.1E-01	NA	3.4E-10	1.0E-10	0.5%	9.8E-10	--	--	3.0E-10	9.2E-11	0.5%	3.5E-09	--	--
Benzo(a)pyrene	2.48	1.88E-09	3.1E+00	NA	1.8E-10	5.4E-10	2.7%	5.1E-10	--	--	1.5E-10	4.8E-10	2.7%	1.8E-09	--	--
Benzo(b)fluoranthene	2.81	2.13E-09	3.1E-01	NA	2.0E-10	6.2E-11	0.3%	5.8E-10	--	--	1.7E-10	5.4E-11	0.3%	2.0E-09	--	--
Benzo(k)fluoranthene	1.78	1.35E-09	3.1E-02	NA	1.3E-10	3.9E-12	0.0%	3.7E-10	--	--	1.1E-10	3.4E-12	0.0%	1.3E-09	--	--
Carbazole	0.95	7.20E-10	2.0E-02	NA	6.7E-11	1.3E-12	0.0%	2.0E-10	--	--	5.9E-11	1.2E-12	0.0%	6.9E-10	--	--
Chrysene	6.7	5.08E-09	3.1E-03	NA	4.7E-10	1.5E-12	0.0%	1.4E-09	--	--	4.2E-10	1.3E-12	0.0%	4.9E-09	--	--
Dibenz(a,h)anthracene	0.695	5.27E-10	3.1E+00	NA	4.9E-11	1.5E-10	0.8%	1.4E-10	--	--	4.3E-11	1.3E-10	0.8%	5.1E-10	--	--
Indeno(1,2,3-cd)pyrene	1.72	1.30E-09	3.1E-01	NA	1.2E-10	3.8E-11	0.2%	3.6E-10	--	--	1.1E-10	3.3E-11	0.2%	1.2E-09	--	--
Dieldrin	0.052	3.94E-11	1.6E+01	5.0E-05	3.7E-12	5.9E-11	0.3%	1.1E-11	2.1E-07	100.0%	3.2E-12	5.2E-11	0.3%	3.8E-11	7.6E-07	100.0%
Aroclor-1260	95.6	7.24E-08	2.0E+00	NA	6.8E-09	1.4E-08	67.3%	2.0E-08	--	--	6.0E-09	1.2E-08	67.3%	6.9E-08	--	--
Arsenic	5.26	3.98E-09	1.5E+01	NA	3.7E-10	5.6E-09	27.9%	1.1E-09	--	--	3.3E-10	4.9E-09	27.9%	3.8E-09	--	--
Iron	2,347	1.78E-06	NA	NA	1.7E-07	--	--	4.9E-07	--	--	1.5E-07	--	--	1.7E-06	--	--
					Total ILCR:	2.0E-08	100.0%	Total HI:	2.1E-07	100.0%	Total ILCR:	1.8E-08	100.0%	Total HI:	7.6E-07	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT AND YOUNG CHILD RESIDENTS - FUTURE SCENARIOS
INGESTION OF GROUNDWATER AS DRINKING WATER - SITE 84 (BUILDING 45 AREA)
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (C*IR*EF*ED)/(BW*AT)
ILCR = CDI*CSFo
HQ = CDI/RfDo

Parameter	Units	Description	Adult	Young Child	
CDI	mg/kg/d	Chronic daily intake	CS	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	CS	
CSFo	1/(mg/kg/d)	Oral cancer slope factor	CS	CS	
HQ	NA	Hazard quotient	CS	CS	
RfDo	mg/kg/d	Oral reference dose	CS	CS	
C	mg/L	Concentration of chemical in water	CS	CS	
IR-W	L/day	Ingestion rate of water	2	1	
EF	days/year	Exposure frequency	350	350	
ED	years	Exposure duration	24	6	
BW	kg	Body weight	70	15	
AT-C	days	Averaging time, carcinogens	25,550	25,550	
AT-N	days	Averaging time, noncarcinogens	8,760	2,190	

				Adult						Young Child					
				Carcinogens			Noncarcinogens			Carcinogens			Noncarcinogens		
Parameter	C (mg/L)	CSFo 1/(mg/kg/d)	RfDo (mg/kg/d)	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI
Benzene	0.0034	5.5E-02	3.0E-03	3.2E-05	1.8E-06	0.4%	9.3E-05	3.1E-02	0.2%	1.9E-05	1.0E-06	0.4%	2.2E-04	7.2E-02	0.2%
Chloroform	0.016	6.1E-03	1.0E-02	1.5E-04	9.2E-07	0.2%	4.4E-04	4.4E-02	0.3%	8.8E-05	5.3E-07	0.2%	1.0E-03	1.0E-01	0.3%
2-Methylnaphthalene	0.00105	NA	NA	9.9E-06	--	--	2.9E-05	--	--	5.8E-06	--	--	6.7E-05	--	--
Naphthalene	0.0022	NA	2.0E-02	2.1E-05	--	--	6.0E-05	3.0E-03	0.0%	1.2E-05	--	--	1.4E-04	7.0E-03	0.0%
Heptachlor Epoxide	0.0000167	9.1E+00	1.3E-05	1.6E-07	1.4E-06	0.3%	4.6E-07	3.5E-02	0.2%	9.2E-08	8.3E-07	0.3%	1.1E-06	8.2E-02	0.2%
MCPA	0.044	NA	5.0E-04	4.1E-04	--	--	1.2E-03	2.4E+00	16.0%	2.4E-04	--	--	2.8E-03	5.6E+00	16.0%
Antimony	0.011	NA	4.0E-04	1.0E-04	--	--	3.0E-04	7.5E-01	5.0%	6.0E-05	--	--	7.0E-04	1.8E+00	5.0%
Arsenic	0.03	1.5E+00	3.0E-04	2.8E-04	4.2E-04	99.0%	8.2E-04	2.7E+00	18.2%	1.6E-04	2.5E-04	99.0%	1.9E-03	6.4E+00	18.2%
Iron	67.7	NA	3.0E-01	6.4E-01	--	--	1.9E+00	6.2E+00	41.0%	3.7E-01	--	--	4.3E+00	1.4E+01	41.0%
Manganese	0.45	NA	2.4E-02	4.2E-03	--	--	1.2E-02	5.1E-01	3.4%	2.5E-03	--	--	2.9E-02	1.2E+00	3.4%
Thallium	0.0057	NA	6.6E-05	5.4E-05	--	--	1.6E-04	2.4E+00	15.7%	3.1E-05	--	--	3.6E-04	5.5E+00	15.7%
				Total ILCR:	4.3E-04	100.0%	Total HI:	1.5E+01	100.0%	Total ILCR:	2.5E-04	100.0%	Total HI:	3.5E+01	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.

ADULT AND YOUNG CHILD RESIDENTS - FUTURE SCENARIOS
DERMAL CONTACT WITH GROUNDWATER - SITE 84 (BUILDING 45 AREA)
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

DAD (mg/kg/d) = (C*CF*Kp*SA*EF*ED*ET)/(BW*AT)

ILCR = CDI*CSFo Adj CSF Adj = CSF/AD
HQ = CDI/RfDo Adj RfD Adj = RfD*AD

Parameter	Units	Description	Adult	Young Child	
DAD	mg/kg/d	Dermally absorbed dose	CS	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	CS	
CSFd	1/(mg/kg/d)	Dermal cancer slope factor	CS	CS	
HQ	NA	Hazard quotient	CS	CS	
RfDd	mg/kg/d	Dermal reference dose	CS	CS	
SA	cm2	Skin surface area available for contact	18,000	6,600	
EF	days/year	Exposure frequency	350	350	
ED	years	Exposure duration	24	6	
ET	hours/day	Exposure time	0.25	0.25	
BW	kg	Body weight	70	15	
AT-C	days	Averaging time, carcinogens	25,550	25,550	
AT-N	days	Averaging time, noncarcinogens	8,760	2,190	
C	mg/L	Concentration of chemical in water	CS	CS	
CF	L/cm3	Conversion factor	1.00E-03	1.00E-03	
Kp	cm/hour	Dermal permeability coefficient	CS	CS	
AD	NA	Adjustment for absorbed dose	CS	CS	

					Adult						Young Child					
					Carcinogens			Noncarcinogens			Carcinogens			Noncarcinogens		
Parameter	C (mg/L)	Kp (cm/hour)	CSFd 1/(mg/kg/d)	RfDd (mg/kg/d)	DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI	DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI
Benzene	0.0034	0.021	5.9E-02	2.8E-03	1.5E-06	8.9E-08	3.2%	4.4E-06	1.6E-03	0.5%	6.5E-07	3.8E-08	3.2%	7.5E-06	2.7E-03	0.5%
Chloroform	0.016	0.0089	3.1E-02	2.0E-03	3.0E-06	9.2E-08	3.3%	8.8E-06	4.4E-03	1.4%	1.3E-06	3.9E-08	3.3%	1.5E-05	7.5E-03	1.4%
2-Methylnaphthalene	0.00105	0.1423	NA	NA	3.2E-06	--	--	9.2E-06	--	--	1.4E-06	--	--	1.6E-05	--	--
Naphthalene	0.0022	0.069	NA	1.6E-02	3.2E-06	--	--	9.4E-06	5.8E-04	0.2%	1.4E-06	--	--	1.6E-05	1.0E-03	0.2%
Heptachlor Epoxide	0.0000167	0.055	1.3E+01	9.4E-06	1.9E-08	2.5E-07	8.9%	5.7E-08	6.0E-03	1.9%	8.3E-09	1.0E-07	8.9%	9.7E-08	1.0E-02	1.9%
MCPA	0.044	0.0049	NA	2.5E-04	4.6E-06	--	--	1.3E-05	5.3E-02	16.5%	1.9E-06	--	--	2.3E-05	9.1E-02	16.5%
Antimony	0.011	0.001	NA	8.0E-06	2.3E-07	--	--	6.8E-07	8.5E-02	26.3%	9.9E-08	--	--	1.2E-06	1.5E-01	26.3%
Arsenic	0.03	0.001	3.7E+00	1.2E-04	6.3E-07	2.3E-06	84.5%	1.8E-06	1.5E-02	4.7%	2.7E-07	9.9E-07	84.5%	3.2E-06	2.6E-02	4.7%
Iron	67.7	0.001	NA	4.5E-02	1.4E-03	--	--	4.2E-03	9.3E-02	28.7%	6.1E-04	--	--	7.1E-03	1.6E-01	28.7%
Manganese	0.45	0.001	NA	9.6E-04	9.5E-06	--	--	2.8E-05	2.9E-02	9.0%	4.1E-06	--	--	4.7E-05	4.9E-02	9.0%
Thallium	0.0057	0.001	NA	9.9E-06	1.2E-07	--	--	3.5E-07	3.5E-02	11.0%	5.2E-08	--	--	6.0E-07	6.1E-02	11.0%
					Total ILCR:	2.7E-06	100.0%	Total HI:	3.2E-01	100.0%	Total ILCR:	1.2E-06	100.0%	Total HI:	5.5E-01	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.

ADULT AND YOUNG CHILD RESIDENTS - FUTURE SCENARIOS
INHALATION OF VOLATILES IN GROUNDWATER EMANATING FROM SHOWER WATER - SITE 84 (BUILDING 45 AREA)
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (Ca*RR*ET*EF*ED)/(BW*AT)
Where: Ca = Shower Model

ILCR = CDI*CSFi
HQ = CDI/RfDi

Parameter	Units	Description	Adult	
CDI	mg/kg/d	Chronic daily intake	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	
CSFi	1/(mg/kg/d)	Inhalation cancer slope factor	CS	
HQ	NA	Hazard quotient	CS	
RfDi	mg/kg/d	Inhalation reference dose	CS	
C	mg/L	Concentration of chemical in groundwater	CS	
Ca	mg/m3	Concentration of chemical in shower water Calculated using shower model	CS	
RR	m3/hour	Respiration rate	0.83	
ET	hours/day	Exposure time	0.25	
EF	days/year	Exposure frequency	350	
ED	years	Exposure duration	24	
BW	kg	Body weight	70	
AT-C	days	Averaging time, carcinogens	25,550	
AT-N	days	Averaging time, noncarcinogens	8,760	

					Adult					
					Carcinogens			Noncarcinogens		
Parameter	C (mg/L)	Shower Ca (mg/m3)	CSFi 1/(mg/kg/d)	RfDi (mg/kg/d)	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI
Benzene	0.0034	4.81E-03	2.7E-02	1.7E-03	4.7E-06	1.3E-07	8.2%	1.4E-05	8.0E-03	1.3%
Chloroform	0.016	1.80E-02	8.1E-02	8.6E-05	1.8E-05	1.4E-06	91.8%	5.1E-05	6.0E-01	98.7%
					Total ILCR:	1.5E-06	100.0%	Total HI:	6.0E-01	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.

ADULT AND YOUNG CHILD RESIDENTS - FUTURE SCENARIOS
ACCIDENTAL INGESTION OF SURFACE WATER - SITE 84 (BUILDING 45 AREA)
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (C*IR*ET*EF*ED)/(BW*AT)
ILCR = CDI*CSFo
HQ = CDI/RfDo

Parameter	Units	Description	Adult	Young Child	
CDI	mg/kg/d	Chronic daily intake	CS	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	CS	
CSFo	1/(mg/kg/d)	Oral cancer slope factor	CS	CS	
HQ	NA	Hazard quotient	CS	CS	
RfDo	mg/kg/d	Oral reference dose	CS	CS	
C	mg/L	Concentration of chemical in water	CS	CS	
IR-W	L/hour	Ingestion rate of water	0.01	0.05	
ET	hours/day	Exposure time	2.6	2.6	
EF	days/year	Exposure frequency	48	48	
ED	years	Exposure duration	24	6	
BW	kg	Body weight	70	15	
AT-C	days	Averaging time, carcinogens	25,550	25,550	
AT-N	days	Averaging time, noncarcinogens	8,760	2,190	

				Adult						Young Child					
				Carcinogens			Noncarcinogens			Carcinogens			Noncarcinogens		
Parameter	C (mg/L)	CSFo 1/(mg/kg/d)	RfDo (mg/kg/d)	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI
Acetone	0.0056	NA	1.0E-01	9.4E-08	--	--	2.7E-07	2.7E-06	78.6%	5.5E-07	--	--	6.4E-06	6.4E-05	78.6%
Toluene	0.0027	NA	2.0E-01	4.5E-08	--	--	1.3E-07	6.6E-07	18.9%	2.6E-07	--	--	3.1E-06	1.5E-05	18.9%
Xylenes, total	0.0035	NA	2.0E+00	5.9E-08	--	--	1.7E-07	8.5E-08	2.5%	3.4E-07	--	--	4.0E-06	2.0E-06	2.5%
				Total ILCR:	--	--	Total HI:	3.5E-06	100.0%	Total ILCR:	--	--	Total HI:	8.1E-05	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.

ADULT AND YOUNG CHILD RESIDENTS - FUTURE SCENARIOS
DERMAL CONTACT WITH SURFACE WATER - SITE 84 (BUILDING 45 AREA)
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

DAD (mg/kg/d) = (C*CF*Kp*SA*EF*ED*ET)/(BW*AT)

ILCR = CDI*CSFo Adj CSF Adj = CSF/AD
HQ = CDI/RfDo Adj RfD Adj = RfD*AD

Parameter	Units	Description	Adult	Young Child	
DAD	mg/kg/d	Dermally absorbed dose	CS	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	CS	
CSFd	1/(mg/kg/d)	Dermal cancer slope factor	CS	CS	
HQ	NA	Hazard quotient	CS	CS	
RfDd	mg/kg/d	Dermal reference dose	CS	CS	
SA	cm2	Skin surface area available for contact	5,700	2,800	
EF	days/year	Exposure frequency	48	48	
ED	years	Exposure duration	24	6	
ET	hours/day	Exposure time	2.6	2.6	
BW	kg	Body weight	70	15	
AT-C	days	Averaging time, carcinogens	25,550	25,550	
AT-N	days	Averaging time, noncarcinogens	8,760	2,190	
C	mg/L	Concentration of chemical in water	CS	CS	
CF	L/cm3	Conversion factor	1.00E-03	1.00E-03	
Kp	cm/hour	Dermal permeability coefficient	CS	CS	
AD	NA	Adjustment for absorbed dose	CS	CS	

					Adult						Young Child					
					Carcinogens			Noncarcinogens			Carcinogens			Noncarcinogens		
Parameter	C (mg/L)	Kp (cm/hour)	CSFd 1/(mg/kg/d)	RfDd (mg/kg/d)	DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI	DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI
Acetone	0.0056	0.00057	NA	8.3E-02	3.0E-08	--	--	8.9E-08	1.1E-06	3.9%	1.7E-08	--	--	2.0E-07	2.5E-06	3.9%
Toluene	0.0027	0.045	NA	1.6E-01	1.2E-06	--	--	3.4E-06	2.1E-05	77.6%	6.6E-07	--	--	7.8E-06	4.8E-05	77.6%
Xylenes, total	0.0035	0.095	NA	1.8E+00	3.2E-06	--	--	9.3E-06	5.0E-06	18.5%	1.8E-06	--	--	2.1E-05	1.2E-05	18.5%
					Total ILCR:	--	--	Total HI:	2.7E-05	100.0%	Total ILCR:	--	--	Total HI:	6.2E-05	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.

ADULT AND YOUNG CHILD RESIDENTS - FUTURE SCENARIOS
ACCIDENTAL INGESTION OF SEDIMENT - SITE 84 (BUILDING 45 AREA)
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (C*IR*CF*FI*EF*ED)/(BW*AT)
ILCR = CDI*CSFo
HQ = CDI/RfDo

Parameter	Units	Description	Adult	Young Child	
CDI	mg/kg/d	Chronic daily intake	CS	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	CS	
CSFo	1/(mg/kg/d)	Oral cancer slope factor	CS	CS	
HQ	NA	Hazard quotient	CS	CS	
RfDo	mg/kg/d	Oral reference dose	CS	CS	
C	mg/kg	Concentration of chemical in soil	CS	CS	
IR-S	mg/day	Ingestion rate of sediment	100	200	
CF	kg/mg	Conversion factor	1.00E-06	1.00E-06	
FI	NA	Fraction of soil ingested from site	1	1	
EF	days/year	Exposure frequency	48	48	
ED	years	Exposure duration	24	6	
BW	kg	Body weight	70	15	
AT-C	days	Averaging time, carcinogens	25,550	25,550	
AT-N	days	Averaging time, noncarcinogens	8,760	2,190	

				Adult						Young Child					
				Carcinogens			Noncarcinogens			Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	CSFo 1/(mg/kg/d)	RfDo (mg/kg/d)	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	10	NA	NA	6.4E-07	--	--	1.9E-06	--	--	1.5E-06	--	--	1.8E-05	--	--
Aroclor-1248	2.8	2.0E+00	NA	1.8E-07	3.6E-07	6.5%	5.3E-07	--	--	4.2E-07	8.4E-07	6.5%	4.9E-06	--	--
Aroclor-1260	40	2.0E+00	NA	2.6E-06	5.2E-06	93.5%	7.5E-06	--	--	6.0E-06	1.2E-05	93.5%	7.0E-05	--	--
Diesel Range Organics	11,600	NA	NA	7.5E-04	--	--	2.2E-03	--	--	1.7E-03	--	--	2.0E-02	--	--
				Total ILCR:	5.5E-06	100.0%	Total HI:	--	--	Total ILCR:	1.3E-05	100.0%	Total HI:	--	--

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.

ADULT AND YOUNG CHILD RESIDENTS - FUTURE SCENARIOS
DERMAL CONTACT WITH SEDIMENT - SITE 84 (BUILDING 45 AREA)
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

DAD (mg/kg/d) = (C*CF*AF*ABS*SA*EF*ED)/(BW*AT)
ILCR = CDI*CSFd
HQ = CDI/RfDd

Parameter	Units	Description	Adult	Young Child	
DAD	mg/kg/d	Dermally absorbed dose	CS	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	CS	
CSFd	1/(mg/kg/d)	Dermal cancer slope factor	CS	CS	
HQ	NA	Hazard quotient	CS	CS	
RfDd	mg/kg/d	Dermal reference dose	CS	CS	
C	mg/kg	Concentration of chemical in soil	CS	CS	
CF	kg/mg	Conversion factor	1.00E-06	1.00E-06	
AF	mg/cm2	Soil to skin adherence factor	0.07	0.20	
ABS	NA	Absorption fraction	CS	CS	
SA	cm2/day	Skin surface area available for contact	5,700	2,800	
EF	days/year	Exposure frequency	48	48	
ED	years	Exposure duration	24	6	
BW	kg	Body weight	70	15	
AT-C	days	Averaging time, carcinogens	25,550	25,550	
AT-N	days	Averaging time, noncarcinogens	8,760	2,190	

					Adult						Young Child					
					Carcinogens			Noncarcinogens			Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	ABS	CSFd 1/(mg/kg/d)	RfDd (mg/kg/d)	DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI	DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	10	0.01	NA	NA	2.6E-08	--	--	7.5E-08	--	--	4.2E-08	--	--	4.9E-07	--	--
Aroclor-1248	2.8	0.14	2.2E+00	NA	1.0E-07	2.3E-07	6.6%	2.9E-07	--	--	1.6E-07	3.7E-07	6.6%	1.9E-06	--	--
Aroclor-1260	40	0.14	2.2E+00	NA	1.4E-06	3.2E-06	93.4%	4.2E-06	--	--	2.4E-06	5.2E-06	93.4%	2.7E-05	--	--
Diesel Range Organics	11,600	0.01	NA	NA	3.0E-05	--	--	8.7E-05	--	--	4.9E-05	--	--	5.7E-04	--	--
					Total ILCR:	3.4E-06	100.0%	Total HI:	--	--	Total ILCR:	5.6E-06	100.0%	Total HI:	--	--

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.

ADULT AND YOUNG CHILD RESIDENTS - FUTURE SCENARIOS
ACCIDENTAL INGESTION OF SURFACE SOIL - SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
CENTRAL TENDENCY
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (C*IR*CF*FI*EF*ED)/(BW*AT)
ILCR = CDI*CSFo
HQ = CDI/RfDo

Parameter	Units	Description	Adult	Young Child	
CDI	mg/kg/d	Chronic daily intake	CS	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	CS	
CSFo	1/(mg/kg/d)	Oral cancer slope factor	CS	CS	
HQ	NA	Hazard quotient	CS	CS	
RfDo	mg/kg/d	Oral reference dose	CS	CS	
C	mg/kg	Concentration of chemical in soil	CS	CS	
IR-S	mg/day	Ingestion rate of soil	50	100	
CF	kg/mg	Conversion factor	1.00E-06	1.00E-06	
FI	NA	Fraction of soil ingested from site	1	1	
EF	days/year	Exposure frequency	234	234	
ED	years	Exposure duration	9	6	
BW	kg	Body weight	70	15	
AT-C	days	Averaging time, carcinogens	25,550	25,550	
AT-N	days	Averaging time, noncarcinogens	3,285	2,190	

				Adult						Young Child					
				Carcinogens			Noncarcinogens			Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	CSFo 1/(mg/kg/d)	RfDo (mg/kg/d)	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	1.96	NA	NA	1.2E-07	--	--	9.0E-07	--	--	7.2E-07	--	--	8.4E-06	--	--
Benzo(a)anthracene	69.0	7.3E-01	NA	4.1E-06	3.0E-06	8.1%	3.2E-05	--	--	2.5E-05	1.8E-05	8.1%	2.9E-04	--	--
Benzo(a)pyrene	30.5	7.3E+00	NA	1.8E-06	1.3E-05	35.6%	1.4E-05	--	--	1.1E-05	8.1E-05	35.6%	1.3E-04	--	--
Benzo(b)fluoranthene	40.9	7.3E-01	NA	2.4E-06	1.8E-06	4.8%	1.9E-05	--	--	1.5E-05	1.1E-05	4.8%	1.7E-04	--	--
Benzo(k)fluoranthene	18.7	7.3E-02	NA	1.1E-06	8.0E-08	0.2%	8.5E-06	--	--	6.8E-06	5.0E-07	0.2%	8.0E-05	--	--
Carbazole	3.16	2.0E-02	NA	1.9E-07	3.7E-09	0.0%	1.4E-06	--	--	1.2E-06	2.3E-08	0.0%	1.3E-05	--	--
Chrysene	96.0	7.3E-03	NA	5.7E-06	4.1E-08	0.1%	4.4E-05	--	--	3.5E-05	2.6E-07	0.1%	4.1E-04	--	--
Dibenz(a,h)anthracene	1.41	7.3E+00	NA	8.3E-08	6.1E-07	1.7%	6.5E-07	--	--	5.2E-07	3.8E-06	1.7%	6.0E-06	--	--
Fluoranthene	243	NA	4.0E-02	1.4E-05	--	--	1.1E-04	2.8E-03	0.9%	8.9E-05	--	--	1.0E-03	2.6E-02	0.9%
Indeno(1,2,3-cd)pyrene	8.79	7.3E-01	NA	5.2E-07	3.8E-07	1.0%	4.0E-06	--	--	3.2E-06	2.4E-06	1.0%	3.8E-05	--	--
Naphthalene	0.525	NA	2.0E-02	3.1E-08	--	--	2.4E-07	1.2E-05	0.0%	1.9E-07	--	--	2.2E-06	1.1E-04	0.0%
Pyrene	250	NA	3.0E-02	1.5E-05	--	--	1.1E-04	3.8E-03	1.2%	9.2E-05	--	--	1.1E-03	3.6E-02	1.2%
4,4'-DDD	3	2.4E-01	NA	1.8E-07	4.2E-08	0.1%	1.4E-06	--	--	1.1E-06	2.6E-07	0.1%	1.3E-05	--	--
Chlordane, alpha-	48	3.5E-01 (1)	5.0E-04 (1)	2.8E-06	9.9E-07	2.7%	2.2E-05	4.4E-02	13.7%	1.8E-05	6.2E-06	2.7%	2.1E-04	4.1E-01	13.7%
Chlordane, gamma-	58	3.5E-01 (1)	5.0E-04 (1)	3.4E-06	1.2E-06	3.3%	2.7E-05	5.3E-02	16.6%	2.1E-05	7.4E-06	3.3%	2.5E-04	5.0E-01	16.6%
Dieldrin	0.32	1.6E+01	5.0E-05	1.9E-08	3.0E-07	0.8%	1.5E-07	2.9E-03	0.9%	1.2E-07	1.9E-06	0.8%	1.4E-06	2.7E-02	0.9%
Heptachlor	22	4.5E+00	5.0E-04	1.3E-06	5.8E-06	15.9%	1.0E-05	2.0E-02	6.3%	8.1E-06	3.6E-05	15.9%	9.4E-05	1.9E-01	6.3%
Heptachlor Epoxide	4.5	9.1E+00	1.3E-05	2.6E-07	2.4E-06	6.6%	2.1E-06	1.6E-01	49.5%	1.6E-06	1.5E-05	6.6%	1.9E-05	1.5E+00	49.5%
Aroclor-1248	1.51	2.0E+00	NA	8.9E-08	1.8E-07	0.5%	6.9E-07	--	--	5.5E-07	1.1E-06	0.5%	6.4E-06	--	--
Aroclor-1254	0.975	2.0E+00	2.0E-05	5.7E-08	1.1E-07	0.3%	4.5E-07	2.2E-02	7.0%	3.6E-07	7.1E-07	0.3%	4.2E-06	2.1E-01	7.0%
Aroclor-1260	54.6	2.0E+00	NA	3.2E-06	6.4E-06	17.5%	2.5E-05	--	--	2.0E-05	4.0E-05	17.5%	2.3E-04	--	--
Gasoline Range Organics	0.207	NA	NA	1.2E-08	--	--	9.5E-08	--	--	7.6E-08	--	--	8.9E-07	--	--
Diesel Range Organics	470	NA	NA	2.8E-05	--	--	2.2E-04	--	--	1.7E-04	--	--	2.0E-03	--	--
Antimony	1.22	NA	4.0E-04	7.2E-08	--	--	5.6E-07	1.4E-03	0.4%	4.5E-07	--	--	5.2E-06	1.3E-02	0.4%
Arsenic	3.49	1.5E+00	3.0E-04	2.1E-07	3.1E-07	0.8%	1.6E-06	5.3E-03	1.7%	1.3E-06	1.9E-06	0.8%	1.5E-05	5.0E-02	1.7%
Iron	2,260	NA	3.0E-01	1.3E-04	--	--	1.0E-03	3.4E-03	1.1%	8.3E-04	--	--	9.7E-03	3.2E-02	1.1%
Thallium	0.31	NA	6.6E-05	1.8E-08	--	--	1.4E-07	2.1E-03	0.7%	1.1E-07	--	--	1.3E-06	2.0E-02	0.7%
				Total ILCR:	3.7E-05	100.0%	Total HI:	3.2E-01	100.0%	Total ILCR:	2.3E-04	100.0%	Total HI:	3.0E+00	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT AND YOUNG CHILD RESIDENTS - FUTURE SCENARIOS
DERMAL CONTACT WITH SURFACE SOIL - SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
CENTRAL TENDENCY
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

DAD (mg/kg/d) = (C*CF*AF*ABS*SA*EF*ED)/(BW*AT)
ILCR = CDI*CSFd
HQ = CDI/RfDd

Parameter	Units	Description	Adult	Young Child	
DAD	mg/kg/d	Dermally absorbed dose	CS	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	CS	
CSFd	1/(mg/kg/d)	Dermal cancer slope factor	CS	CS	
HQ	NA	Hazard quotient	CS	CS	
RfDd	mg/kg/d	Dermal reference dose	CS	CS	
C	mg/kg	Concentration of chemical in soil	CS	CS	
CF	kg/mg	Conversion factor	1.00E-06	1.00E-06	
AF	mg/cm2	Soil to skin adherence factor	0.07	0.2	
ABS	NA	Absorption fraction	CS	CS	
SA	cm2/day	Skin surface area available for contact	5,000	2,000	
EF	days/year	Exposure frequency	234	234	
ED	years	Exposure duration	9	6	
BW	kg	Body weight	70	15	
AT-C	days	Averaging time, carcinogens	25,550	25,550	
AT-N	days	Averaging time, noncarcinogens	3,285	2,190	

					Adult						Young Child					
					Carcinogens			Noncarcinogens			Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	ABS	CSFd 1/(mg/kg/d)	RfDd (mg/kg/d)	DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI	DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	1.96	0.01	NA	NA	8.1E-09	--	--	6.3E-08	--	--	2.9E-08	--	--	3.3E-07	--	--
Benzo(a)anthracene	69.0	0.13	2.4E+00	NA	3.7E-06	8.7E-06	18.1%	2.9E-05	--	--	1.3E-05	3.1E-05	18.1%	1.5E-04	--	--
Benzo(a)pyrene	30.5	0.13	1.5E+01	NA	1.6E-06	2.4E-05	49.7%	1.3E-05	--	--	5.8E-06	8.5E-05	49.7%	6.8E-05	--	--
Benzo(b)fluoranthene	40.9	0.13	1.5E+00	NA	2.2E-06	3.2E-06	6.7%	1.7E-05	--	--	7.8E-06	1.1E-05	6.7%	9.1E-05	--	--
Benzo(k)fluoranthene	18.7	0.13	1.5E-01	NA	1.0E-06	1.5E-07	0.3%	7.8E-06	--	--	3.6E-06	5.2E-07	0.3%	4.1E-05	--	--
Carbazole	3.16	0.13	4.0E-02	NA	1.7E-07	6.8E-09	0.0%	1.3E-06	--	--	6.0E-07	2.4E-08	0.0%	7.0E-06	--	--
Chrysene	96.0	0.13	2.4E-02	NA	5.1E-06	1.2E-07	0.3%	4.0E-05	--	--	1.8E-05	4.3E-07	0.3%	2.1E-04	--	--
Dibenz(a,h)anthracene	1.41	0.13	2.4E+01	NA	7.6E-08	1.8E-06	3.7%	5.9E-07	--	--	2.7E-07	6.3E-06	3.7%	3.1E-06	--	--
Fluoranthene	243	0.01	NA	1.2E-02	1.0E-06	--	--	7.8E-06	6.3E-04	0.8%	3.6E-06	--	--	4.2E-05	3.4E-03	0.8%
Indeno(1,2,3-cd)pyrene	8.79	0.13	2.4E+00	NA	4.7E-07	1.1E-06	2.3%	3.7E-06	--	--	1.7E-06	3.9E-06	2.3%	2.0E-05	--	--
Naphthalene	0.525	0.01	NA	1.6E-02	2.2E-09	--	--	1.7E-08	1.1E-06	0.0%	7.7E-09	--	--	9.0E-08	5.6E-06	0.0%
Pyrene	250	0.01	NA	9.3E-03	1.0E-06	--	--	8.0E-06	8.6E-04	1.1%	3.7E-06	--	--	4.3E-05	4.6E-03	1.1%
4,4'-DDD	3	0.01	3.4E-01	NA	1.2E-08	4.2E-09	0.0%	9.6E-08	--	--	4.4E-08	1.5E-08	0.0%	5.1E-07	--	--
Chlordane, alpha-	48	0.04	4.4E-01 (1)	4.0E-04 (1)	7.9E-07	3.5E-07	0.7%	6.2E-06	1.5E-02	19.0%	2.8E-06	1.2E-06	0.7%	3.3E-05	8.2E-02	19.0%
Chlordane, gamma-	58	0.04	4.4E-01 (1)	4.0E-04 (1)	9.6E-07	4.2E-07	0.9%	7.4E-06	1.9E-02	22.9%	3.4E-06	1.5E-06	0.9%	4.0E-05	9.9E-02	22.9%
Dieldrin	0.32	0.01	3.2E+01	2.5E-05	1.3E-09	4.2E-08	0.1%	1.0E-08	4.1E-04	0.5%	4.7E-09	1.5E-07	0.1%	5.5E-08	2.2E-03	0.5%
Heptachlor	22	0.01	6.3E+00	3.6E-04	9.1E-08	5.7E-07	1.2%	7.1E-07	2.0E-03	2.4%	3.2E-07	2.0E-06	1.2%	3.8E-06	1.0E-02	2.4%
Heptachlor Epoxide	4.5	0.01	1.3E+01	9.4E-06	1.9E-08	2.3E-07	0.5%	1.4E-07	1.5E-02	19.0%	6.6E-08	8.3E-07	0.5%	7.7E-07	8.2E-02	19.0%
Aroclor-1248	1.51	0.14	2.2E+00	NA	8.7E-08	2.0E-07	0.4%	6.8E-07	--	--	3.1E-07	6.9E-07	0.4%	3.6E-06	--	--
Aroclor-1254	0.975	0.14	2.2E+00	1.8E-05	5.6E-08	1.3E-07	0.3%	4.4E-07	2.4E-02	30.0%	2.0E-07	4.4E-07	0.3%	2.3E-06	1.3E-01	30.0%
Aroclor-1260	54.6	0.14	2.2E+00	NA	3.1E-06	7.0E-06	14.6%	2.4E-05	--	--	1.1E-05	2.5E-05	14.6%	1.3E-04	--	--
Gasoline Range Organics	0.207	0.01	NA	NA	8.5E-10	--	--	6.6E-09	--	--	3.0E-09	--	--	3.5E-08	--	--
Diesel Range Organics	470	0.01	NA	NA	1.9E-06	--	--	1.5E-05	--	--	6.9E-06	--	--	8.0E-05	--	--
Antimony	1.22	0.001	NA	8.0E-06	5.0E-10	--	--	3.9E-09	4.9E-04	0.6%	1.8E-09	--	--	2.1E-08	2.6E-03	0.6%
Arsenic	3.49	0.03	3.7E+00	1.2E-04	4.3E-08	1.6E-07	0.3%	3.4E-07	2.7E-03	3.4%	1.5E-07	5.6E-07	0.3%	1.8E-06	1.5E-02	3.4%
Iron	2,260	0.001	NA	4.5E-02	9.3E-07	--	--	7.2E-06	1.6E-04	0.2%	3.3E-06	--	--	3.9E-05	8.6E-04	0.2%
Thallium	0.31	0.001	NA	9.9E-06	1.3E-10	--	--	9.8E-10	9.9E-05	0.1%	4.5E-10	--	--	5.2E-09	5.3E-04	0.1%
					Total ILCR:	4.8E-05	100.0%	Total HI:	8.1E-02	100.0%	Total ILCR:	1.7E-04	100.0%	Total HI:	4.3E-01	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT AND YOUNG CHILD RESIDENTS - FUTURE SCENARIOS
INHALATION OF FUGITIVE DUSTS EMANATING FROM SURFACE SOIL - SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
CENTRAL TENDENCY
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (Ca*RR*ET*EF*ED)/(BW*AT)
Where: Ca = C * (1/PEF)

ILCR = CDI*CSFi
HQ = CDI/RfDi

Parameter	Units	Description	Adult	Young Child	
CDI	mg/kg/d	Chronic daily intake	CS	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	CS	
CSFi	1/(mg/kg/d)	Inhalation cancer slope factor	CS	CS	
HQ	NA	Hazard quotient	CS	CS	
RfDi	mg/kg/d	Inhalation reference dose	CS	CS	
Ca	mg/m3	Concentration of chemical in air as fugitive dusts	CS	CS	
C	mg/kg	Concentration of chemical in soil	CS	CS	
PEF	m3/kg	Particulate emission factor	1.32E+09	1.32E+09	
RR	m3/hour	Respiration rate	0.80	0.63	
ET	hours/day	Exposure time	24	24	
EF	days/year	Exposure frequency	234	234	
ED	years	Exposure duration	9	6	
BW	kg	Body weight	70	15	
AT-C	days	Averaging time, carcinogens	25,550	25,550	
AT-N	days	Averaging time, noncarcinogens	3,285	2,190	

					Adult						Young Child					
					Carcinogens			Noncarcinogens			Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	Ca (mg/m3)	CSFi 1/(mg/kg/d)	RfDi (mg/kg/d)	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	1.96	1.48E-09	NA	NA	3.4E-11	--	--	2.6E-10	--	--	8.2E-11	--	--	9.5E-10	--	--
Benzo(a)anthracene	69.0	5.23E-08	3.1E-01	NA	1.2E-09	3.7E-10	4.4%	9.2E-09	--	--	2.9E-09	8.9E-10	4.4%	3.4E-08	--	--
Benzo(a)pyrene	30.5	2.31E-08	3.1E+00	NA	5.2E-10	1.6E-09	19.4%	4.1E-09	--	--	1.3E-09	3.9E-09	19.4%	1.5E-08	--	--
Benzo(b)fluoranthene	40.9	3.10E-08	3.1E-01	NA	7.0E-10	2.2E-10	2.6%	5.4E-09	--	--	1.7E-09	5.3E-10	2.6%	2.0E-08	--	--
Benzo(k)fluoranthene	18.7	1.41E-08	3.1E-02	NA	3.2E-10	9.9E-12	0.1%	2.5E-09	--	--	7.8E-10	2.4E-11	0.1%	9.1E-09	--	--
Carbazole	3.16	2.39E-09	2.0E-02	NA	5.4E-11	1.1E-12	0.0%	4.2E-10	--	--	1.3E-10	2.6E-12	0.0%	1.5E-09	--	--
Chrysene	96.0	7.27E-08	3.1E-03	NA	1.6E-09	5.1E-12	0.1%	1.3E-08	--	--	4.0E-09	1.2E-11	0.1%	4.7E-08	--	--
Dibenz(a,h)anthracene	1.41	1.07E-09	3.1E+00	NA	2.4E-11	7.5E-11	0.9%	1.9E-10	--	--	5.9E-11	1.8E-10	0.9%	6.9E-10	--	--
Fluoranthene	243	1.84E-07	NA	4.0E-02	4.2E-09	--	--	3.2E-08	8.1E-07	0.6%	1.0E-08	--	--	1.2E-07	3.0E-06	0.6%
Indeno(1,2,3-cd)pyrene	8.79	6.66E-09	3.1E-01	NA	1.5E-10	4.7E-11	0.6%	1.2E-09	--	--	3.7E-10	1.1E-10	0.6%	4.3E-09	--	--
Naphthalene	0.525	3.98E-10	NA	8.6E-04	9.0E-12	--	--	7.0E-11	8.2E-08	0.1%	2.2E-11	--	--	2.6E-10	3.0E-07	0.1%
Pyrene	250	1.89E-07	NA	3.0E-02	4.3E-09	--	--	3.3E-08	1.1E-06	0.8%	1.0E-08	--	--	1.2E-07	4.0E-06	0.8%
4,4'-DDD	3	2.27E-09	2.4E-01	NA	5.1E-11	1.2E-11	0.1%	4.0E-10	--	--	1.2E-10	3.0E-11	0.1%	1.5E-09	--	--
Chlordane, alpha-	48	3.64E-08	3.5E-01 (1)	2.0E-04 (1)	8.2E-10	2.9E-10	3.4%	6.4E-09	3.2E-05	24.2%	2.0E-09	7.0E-10	3.4%	2.3E-08	1.2E-04	24.2%
Chlordane, gamma-	58	4.39E-08	3.5E-01 (1)	2.0E-04 (1)	9.9E-10	3.5E-10	4.2%	7.7E-09	3.9E-05	29.3%	2.4E-09	8.5E-10	4.2%	2.8E-08	1.4E-04	29.3%
Dieldrin	0.32	2.42E-10	1.6E+01	5.0E-05	5.5E-12	8.8E-11	1.1%	4.3E-11	8.5E-07	0.6%	1.3E-11	2.1E-10	1.1%	1.6E-10	3.1E-06	0.6%
Heptachlor	22	1.67E-08	4.6E+00	5.0E-04	3.8E-10	1.7E-09	20.5%	2.9E-09	5.9E-06	4.4%	9.2E-10	4.2E-09	20.5%	1.1E-08	2.1E-05	4.4%
Heptachlor Epoxide	4.5	3.41E-09	9.1E+00	1.3E-05	7.7E-11	7.0E-10	8.4%	6.0E-10	4.6E-05	35.0%	1.9E-10	1.7E-09	8.4%	2.2E-09	1.7E-04	35.0%
Aroclor-1248	1.51	1.14E-09	2.0E+00	NA	2.6E-11	5.2E-11	0.6%	2.0E-10	--	--	6.3E-11	1.3E-10	0.6%	7.3E-10	--	--
Aroclor-1254	0.975	7.39E-10	2.0E+00	2.0E-05	1.7E-11	3.3E-11	0.4%	1.3E-10	6.5E-06	4.9%	4.1E-11	8.1E-11	0.4%	4.7E-10	2.4E-05	4.9%
Aroclor-1260	54.6	4.13E-08	2.0E+00	NA	9.3E-10	1.9E-09	22.4%	7.3E-09	--	--	2.3E-09	4.5E-09	22.4%	2.6E-08	--	--
Gasoline Range Organics	0.207	1.57E-10	NA	NA	3.5E-12	--	--	2.8E-11	--	--	8.6E-12	--	--	1.0E-10	--	--
Diesel Range Organics	470	3.56E-07	NA	NA	8.0E-09	--	--	6.3E-08	--	--	2.0E-08	--	--	2.3E-07	--	--
Antimony	1.22	9.25E-10	NA	NA	2.1E-11	--	--	1.6E-10	--	--	5.1E-11	--	--	5.9E-10	--	--
Arsenic	3.49	2.65E-09	1.5E+01	NA	6.0E-11	9.0E-10	10.8%	4.7E-10	--	--	1.5E-10	2.2E-09	10.8%	1.7E-09	--	--
Iron	2,260	1.71E-06	NA	NA	3.9E-08	--	--	3.0E-07	--	--	9.4E-08	--	--	1.1E-06	--	--
Thallium	0.31	2.32E-10	NA	NA	5.3E-12	--	--	4.1E-11	--	--	1.3E-11	--	--	1.5E-10	--	--
					Total ILCR:	8.3E-09	100.0%	Total HI:	1.3E-04	100.0%	Total ILCR:	2.0E-08	100.0%	Total HI:	4.8E-04	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT AND YOUNG CHILD RESIDENTS - FUTURE SCENARIOS
ACCIDENTAL INGESTION OF SURFACE SOIL - SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
CENTRAL TENDENCY
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (C*IR*CF*FI*EF*ED)/(BW*AT)
ILCR = CDI*CSFo
HQ = CDI/RfDo

Parameter	Units	Description	Adult	Young Child	
CDI	mg/kg/d	Chronic daily intake	CS	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	CS	
CSFo	1/(mg/kg/d)	Oral cancer slope factor	CS	CS	
HQ	NA	Hazard quotient	CS	CS	
RfDo	mg/kg/d	Oral reference dose	CS	CS	
C	mg/kg	Concentration of chemical in soil	CS	CS	
IR-S	mg/day	Ingestion rate of soil	50	100	
CF	kg/mg	Conversion factor	1.00E-06	1.00E-06	
FI	NA	Fraction of soil ingested from site	1	1	
EF	days/year	Exposure frequency	234	234	
ED	years	Exposure duration	9	6	
BW	kg	Body weight	70	15	
AT-C	days	Averaging time, carcinogens	25,550	25,550	
AT-N	days	Averaging time, noncarcinogens	3,285	2,190	

				Adult						Young Child					
				Carcinogens			Noncarcinogens			Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	CSFo 1/(mg/kg/d)	RfDo (mg/kg/d)	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	57.9	NA	NA	3.4E-06	--	--	2.7E-05	--	--	2.1E-05	--	--	2.5E-04	--	--
Benzo(a)anthracene	4.76	7.3E-01	NA	2.8E-07	2.0E-07	1.5%	2.2E-06	--	--	1.7E-06	1.3E-06	1.5%	2.0E-05	--	--
Benzo(a)pyrene	2.48	7.3E+00	NA	1.5E-07	1.1E-06	7.9%	1.1E-06	--	--	9.1E-07	6.6E-06	7.9%	1.1E-05	--	--
Benzo(b)fluoranthene	2.81	7.3E-01	NA	1.7E-07	1.2E-07	0.9%	1.3E-06	--	--	1.0E-06	7.5E-07	0.9%	1.2E-05	--	--
Benzo(k)fluoranthene	1.78	7.3E-02	NA	1.0E-07	7.7E-09	0.1%	8.2E-07	--	--	6.5E-07	4.8E-08	0.1%	7.6E-06	--	--
Carbazole	0.95	2.0E-02	NA	5.6E-08	1.1E-09	0.0%	4.4E-07	--	--	3.5E-07	7.0E-09	0.0%	4.1E-06	--	--
Chrysene	6.7	7.3E-03	NA	3.9E-07	2.9E-09	0.0%	3.1E-06	--	--	2.5E-06	1.8E-08	0.0%	2.9E-05	--	--
Dibenz(a,h)anthracene	0.695	7.3E+00	NA	4.1E-08	3.0E-07	2.2%	3.2E-07	--	--	2.5E-07	1.9E-06	2.2%	3.0E-06	--	--
Indeno(1,2,3-cd)pyrene	1.72	7.3E-01	NA	1.0E-07	7.4E-08	0.5%	7.9E-07	--	--	6.3E-07	4.6E-07	0.5%	7.3E-06	--	--
Dieldrin	0.052	1.6E+01	5.0E-05	3.1E-09	4.9E-08	0.4%	2.4E-08	4.8E-04	3.9%	1.9E-08	3.0E-07	0.4%	2.2E-07	4.4E-03	3.9%
Aroclor-1260	95.6	2.0E+00	NA	5.6E-06	1.1E-05	83.1%	4.4E-05	--	--	3.5E-05	7.0E-05	83.1%	4.1E-04	--	--
Arsenic	5.26	1.5E+00	3.0E-04	3.1E-07	4.6E-07	3.4%	2.4E-06	8.0E-03	66.4%	1.9E-06	2.9E-06	3.4%	2.2E-05	7.5E-02	66.4%
Iron	2,347	NA	3.0E-01	1.4E-04	--	--	1.1E-03	3.6E-03	29.7%	8.6E-04	--	--	1.0E-02	3.3E-02	29.7%
				Total ILCR:	1.4E-05	100.0%	Total HI:	1.2E-02	100.0%	Total ILCR:	8.4E-05	100.0%	Total HI:	1.1E-01	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT AND YOUNG CHILD RESIDENTS - FUTURE SCENARIOS
DERMAL CONTACT WITH SURFACE SOIL - SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
CENTRAL TENDENCY
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

DAD (mg/kg/d) = (C*CF*AF*ABS*SA*EF*ED)/(BW*AT)
ILCR = CDI*CSFd
HQ = CDI/RfDd

Parameter	Units	Description	Adult	Young Child	
DAD	mg/kg/d	Dermally absorbed dose	CS	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	CS	
CSFd	1/(mg/kg/d)	Dermal cancer slope factor	CS	CS	
HQ	NA	Hazard quotient	CS	CS	
RfDd	mg/kg/d	Dermal reference dose	CS	CS	
C	mg/kg	Concentration of chemical in soil	CS	CS	
CF	kg/mg	Conversion factor	1.00E-06	1.00E-06	
AF	mg/cm2	Soil to skin adherence factor	0.07	0.2	
ABS	NA	Absorption fraction	CS	CS	
SA	cm2/day	Skin surface area available for contact	5,000	2,000	
EF	days/year	Exposure frequency	234	234	
ED	years	Exposure duration	9	6	
BW	kg	Body weight	70	15	
AT-C	days	Averaging time, carcinogens	25,550	25,550	
AT-N	days	Averaging time, noncarcinogens	3,285	2,190	

					Adult						Young Child					
					Carcinogens			Noncarcinogens			Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	ABS	CSFd 1/(mg/kg/d)	RfDd (mg/kg/d)	DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI	DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	57.9	0.01	NA	NA	2.4E-07	--	--	1.9E-06	--	--	8.5E-07	--	--	9.9E-06	--	--
Benzo(a)anthracene	4.76	0.13	2.4E+00	NA	2.6E-07	6.0E-07	3.7%	2.0E-06	--	--	9.1E-07	2.1E-06	3.7%	1.1E-05	--	--
Benzo(a)pyrene	2.48	0.13	1.5E+01	NA	1.3E-07	1.9E-06	11.8%	1.0E-06	--	--	4.7E-07	6.9E-06	11.8%	5.5E-06	--	--
Benzo(b)fluoranthene	2.81	0.13	1.5E+00	NA	1.5E-07	2.2E-07	1.3%	1.2E-06	--	--	5.3E-07	7.8E-07	1.3%	6.2E-06	--	--
Benzo(k)fluoranthene	1.78	0.13	1.5E-01	NA	9.5E-08	1.4E-08	0.1%	7.4E-07	--	--	3.4E-07	5.0E-08	0.1%	4.0E-06	--	--
Carbazole	0.95	0.13	4.0E-02	NA	5.1E-08	2.0E-09	0.0%	4.0E-07	--	--	1.8E-07	7.2E-09	0.0%	2.1E-06	--	--
Chrysene	6.7	0.13	2.4E-02	NA	3.6E-07	8.5E-09	0.1%	2.8E-06	--	--	1.3E-06	3.0E-08	0.1%	1.5E-05	--	--
Dibenz(a,h)anthracene	0.695	0.13	2.4E+01	NA	3.7E-08	8.8E-07	5.4%	2.9E-07	--	--	1.3E-07	3.1E-06	5.4%	1.5E-06	--	--
Indeno(1,2,3-cd)pyrene	1.72	0.13	2.4E+00	NA	9.2E-08	2.2E-07	1.3%	7.2E-07	--	--	3.3E-07	7.7E-07	1.3%	3.8E-06	--	--
Dieldrin	0.052	0.01	3.2E+01	2.5E-05	2.1E-10	6.9E-09	0.0%	1.7E-09	6.7E-05	1.5%	7.6E-10	2.4E-08	0.0%	8.9E-09	3.6E-04	1.5%
Aroclor-1260	95.6	0.14	2.2E+00	NA	5.5E-06	1.2E-05	74.8%	4.3E-05	--	--	2.0E-05	4.4E-05	74.8%	2.3E-04	--	--
Arsenic	5.26	0.03	3.7E+00	1.2E-04	6.5E-08	2.4E-07	1.5%	5.1E-07	4.1E-03	94.6%	2.3E-07	8.5E-07	1.5%	2.7E-06	2.2E-02	94.6%
Iron	2,347	0.001	NA	4.5E-02	9.7E-07	--	--	7.5E-06	1.7E-04	3.8%	3.4E-06	--	--	4.0E-05	8.9E-04	3.8%
					Total ILCR:	1.6E-05	100.0%	Total HI:	4.3E-03	100.0%	Total ILCR:	5.8E-05	100.0%	Total HI:	2.3E-02	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT AND YOUNG CHILD RESIDENTS - FUTURE SCENARIOS
INHALATION OF FUGITIVE DUSTS EMANATING FROM SURFACE SOIL - SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
CENTRAL TENDENCY
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (Ca*RR*ET*EF*ED)/(BW*AT)
Where: Ca = C * (1/PEF)

ILCR = CDI*CSFi
HQ = CDI/RfDi

Parameter	Units	Description	Adult	Young Child	
CDI	mg/kg/d	Chronic daily intake	CS	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	CS	
CSFi	1/(mg/kg/d)	Inhalation cancer slope factor	CS	CS	
HQ	NA	Hazard quotient	CS	CS	
RfDi	mg/kg/d	Inhalation reference dose	CS	CS	
Ca	mg/m3	Concentration of chemical in air as fugitive dusts	CS	CS	
C	mg/kg	Concentration of chemical in soil	CS	CS	
PEF	m3/kg	Particulate emission factor	1.32E+09	1.32E+09	
RR	m3/hour	Respiration rate	0.80	0.63	
ET	hours/day	Exposure time	24	24	
EF	days/year	Exposure frequency	234	234	
ED	years	Exposure duration	9	6	
BW	kg	Body weight	70	15	
AT-C	days	Averaging time, carcinogens	25,550	25,550	
AT-N	days	Averaging time, noncarcinogens	3,285	2,190	

					Adult						Young Child					
					Carcinogens			Noncarcinogens			Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	Ca (mg/m3)	CSFi 1/(mg/kg/d)	RfDi (mg/kg/d)	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	57.9	4.39E-08	NA	NA	9.9E-10	--	--	7.7E-09	--	--	2.4E-09	--	--	2.8E-08	--	--
Benzo(a)anthracene	4.76	3.61E-09	3.1E-01	NA	8.2E-11	2.5E-11	0.5%	6.3E-10	--	--	2.0E-10	6.1E-11	0.5%	2.3E-09	--	--
Benzo(a)pyrene	2.48	1.88E-09	3.1E+00	NA	4.2E-11	1.3E-10	2.7%	3.3E-10	--	--	1.0E-10	3.2E-10	2.7%	1.2E-09	--	--
Benzo(b)fluoranthene	2.81	2.13E-09	3.1E-01	NA	4.8E-11	1.5E-11	0.3%	3.7E-10	--	--	1.2E-10	3.6E-11	0.3%	1.4E-09	--	--
Benzo(k)fluoranthene	1.78	1.35E-09	3.1E-02	NA	3.0E-11	9.5E-13	0.0%	2.4E-10	--	--	7.4E-11	2.3E-12	0.0%	8.6E-10	--	--
Carbazole	0.95	7.20E-10	2.0E-02	NA	1.6E-11	3.3E-13	0.0%	1.3E-10	--	--	4.0E-11	7.9E-13	0.0%	4.6E-10	--	--
Chrysene	6.7	5.08E-09	3.1E-03	NA	1.1E-10	3.6E-13	0.0%	8.9E-10	--	--	2.8E-10	8.6E-13	0.0%	3.3E-09	--	--
Dibenz(a,h)anthracene	0.695	5.27E-10	3.1E+00	NA	1.2E-11	3.7E-11	0.8%	9.3E-11	--	--	2.9E-11	9.0E-11	0.8%	3.4E-10	--	--
Indeno(1,2,3-cd)pyrene	1.72	1.30E-09	3.1E-01	NA	2.9E-11	9.1E-12	0.2%	2.3E-10	--	--	7.2E-11	2.2E-11	0.2%	8.3E-10	--	--
Dieldrin	0.052	3.94E-11	1.6E+01	5.0E-05	8.9E-13	1.4E-11	0.3%	6.9E-12	1.4E-07	100.0%	2.2E-12	3.5E-11	0.3%	2.5E-11	5.1E-07	100.0%
Aroclor-1260	95.6	7.24E-08	2.0E+00	NA	1.6E-09	3.3E-09	67.3%	1.3E-08	--	--	4.0E-09	8.0E-09	67.3%	4.6E-08	--	--
Arsenic	5.26	3.98E-09	1.5E+01	NA	9.0E-11	1.4E-09	27.9%	7.0E-10	--	--	2.2E-10	3.3E-09	27.9%	2.6E-09	--	--
Iron	2,347	1.78E-06	NA	NA	4.0E-08	--	--	3.1E-07	--	--	9.8E-08	--	--	1.1E-06	--	--
					Total ILCR:	4.9E-09	100.0%	Total HI:	1.4E-07	100.0%	Total ILCR:	1.2E-08	100.0%	Total HI:	5.1E-07	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT AND YOUNG CHILD RESIDENTS - FUTURE SCENARIOS
INGESTION OF GROUNDWATER AS DRINKING WATER - SITE 84 (BUILDING 45 AREA)
CENTRAL TENDENCY
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (C*IR*EF*ED)/(BW*AT)
ILCR = CDI*CSFo
HQ = CDI/RfDo

Parameter	Units	Description	Adult	Young Child	
CDI	mg/kg/d	Chronic daily intake	CS	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	CS	
CSFo	1/(mg/kg/d)	Oral cancer slope factor	CS	CS	
HQ	NA	Hazard quotient	CS	CS	
RfDo	mg/kg/d	Oral reference dose	CS	CS	
C	mg/L	Concentration of chemical in water	CS	CS	
IR-W	L/day	Ingestion rate of water	1.4	1.0	
EF	days/year	Exposure frequency	234	234	
ED	years	Exposure duration	9	6	
BW	kg	Body weight	70	15	
AT-C	days	Averaging time, carcinogens	25,550	25,550	
AT-N	days	Averaging time, noncarcinogens	3,285	2,190	

				Adult						Young Child					
				Carcinogens			Noncarcinogens			Carcinogens			Noncarcinogens		
Parameter	C (mg/L)	CSFo 1/(mg/kg/d)	RfDo (mg/kg/d)	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI
Benzene	0.0034	5.5E-02	3.0E-03	5.6E-06	3.1E-07	0.4%	4.4E-05	1.5E-02	0.2%	1.2E-05	6.9E-07	0.4%	1.5E-04	4.8E-02	0.2%
Chloroform	0.016	6.1E-03	1.0E-02	2.6E-05	1.6E-07	0.2%	2.1E-04	2.1E-02	0.3%	5.9E-05	3.6E-07	0.2%	6.8E-04	6.8E-02	0.3%
2-Methylnaphthalene	0.00105	NA	NA	1.7E-06	--	--	1.3E-05	--	--	3.8E-06	--	--	4.5E-05	--	--
Naphthalene	0.0022	NA	2.0E-02	3.6E-06	--	--	2.8E-05	1.4E-03	0.0%	8.1E-06	--	--	9.4E-05	4.7E-03	0.0%
Heptachlor Epoxide	0.0000167	9.1E+00	1.3E-05	2.8E-08	2.5E-07	0.3%	2.1E-07	1.6E-02	0.2%	6.1E-08	5.6E-07	0.3%	7.1E-07	5.5E-02	0.2%
MCPA	0.044	NA	5.0E-04	7.3E-05	--	--	5.6E-04	1.1E+00	16.0%	1.6E-04	--	--	1.9E-03	3.8E+00	16.0%
Antimony	0.011	NA	4.0E-04	1.8E-05	--	--	1.4E-04	3.5E-01	5.0%	4.0E-05	--	--	4.7E-04	1.2E+00	5.0%
Arsenic	0.03	1.5E+00	3.0E-04	4.9E-05	7.4E-05	99.0%	3.8E-04	1.3E+00	18.2%	1.1E-04	1.6E-04	99.0%	1.3E-03	4.3E+00	18.2%
Iron	67.7	NA	3.0E-01	1.1E-01	--	--	8.7E-01	2.9E+00	41.0%	2.5E-01	--	--	2.9E+00	9.6E+00	41.0%
Manganese	0.45	NA	2.4E-02	7.4E-04	--	--	5.8E-03	2.4E-01	3.4%	1.6E-03	--	--	1.9E-02	8.0E-01	3.4%
Thallium	0.0057	NA	6.6E-05	9.4E-06	--	--	7.3E-05	1.1E+00	15.7%	2.1E-05	--	--	2.4E-04	3.7E+00	15.7%
				Total ILCR:	7.5E-05	100.0%	Total HI:	7.1E+00	100.0%	Total ILCR:	1.7E-04	100.0%	Total HI:	2.4E+01	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.

ADULT AND YOUNG CHILD RESIDENTS - FUTURE SCENARIOS
DERMAL CONTACT WITH GROUNDWATER - SITE 84 (BUILDING 45 AREA)
CENTRAL TENDENCY
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

DAD (mg/kg/d) = (C*CF*Kp*SA*EF*ED*ET)/(BW*AT)

ILCR = CDI*CSFo Adj CSF Adj = CSF/AD
HQ = CDI/RfDo Adj RfD Adj = RfD*AD

Parameter	Units	Description	Adult	Young Child	
DAD	mg/kg/d	Dermally absorbed dose	CS	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	CS	
CSFd	1/(mg/kg/d)	Dermal cancer slope factor	CS	CS	
HQ	NA	Hazard quotient	CS	CS	
RfDd	mg/kg/d	Dermal reference dose	CS	CS	
SA	cm2	Skin surface area available for contact	20,000	7,930	
EF	days/year	Exposure frequency	234	234	
ED	years	Exposure duration	9	6	
ET	hours/day	Exposure time	0.25	0.25	
BW	kg	Body weight	70	15	
AT-C	days	Averaging time, carcinogens	25,550	25,550	
AT-N	days	Averaging time, noncarcinogens	3,285	2,190	
C	mg/L	Concentration of chemical in water	CS	CS	
CF	L/cm3	Conversion factor	1.00E-03	1.00E-03	
Kp	cm/hour	Dermal permeability coefficient	CS	CS	
AD	NA	Adjustment for absorbed dose	CS	CS	

					Adult						Young Child					
					Carcinogens			Noncarcinogens			Carcinogens			Noncarcinogens		
Parameter	C (mg/L)	Kp (cm/hour)	CSFd 1/(mg/kg/d)	RfDd (mg/kg/d)	DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI	DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI
Benzene	0.0034	0.021	5.9E-02	2.8E-03	4.2E-07	2.5E-08	3.2%	3.3E-06	1.2E-03	0.5%	5.2E-07	3.1E-08	3.2%	6.0E-06	2.2E-03	0.5%
Chloroform	0.016	0.0089	3.1E-02	2.0E-03	8.4E-07	2.6E-08	3.3%	6.5E-06	3.3E-03	1.4%	1.0E-06	3.2E-08	3.3%	1.2E-05	6.0E-03	1.4%
2-Methylnaphthalene	0.00105	0.1423	NA	NA	8.8E-07	--	--	6.8E-06	--	--	1.1E-06	--	--	1.3E-05	--	--
Naphthalene	0.0022	0.069	NA	1.6E-02	8.9E-07	--	--	7.0E-06	4.3E-04	0.2%	1.1E-06	--	--	1.3E-05	8.0E-04	0.2%
Heptachlor Epoxide	0.0000167	0.055	1.3E+01	9.4E-06	5.4E-09	6.8E-08	8.9%	4.2E-08	4.5E-03	1.9%	6.7E-09	8.4E-08	8.9%	7.8E-08	8.3E-03	1.9%
MCPA	0.044	0.0049	NA	2.5E-04	1.3E-06	--	--	9.9E-06	3.9E-02	16.5%	1.6E-06	--	--	1.8E-05	7.3E-02	16.5%
Antimony	0.011	0.001	NA	8.0E-06	6.5E-08	--	--	5.0E-07	6.3E-02	26.3%	8.0E-08	--	--	9.3E-07	1.2E-01	26.3%
Arsenic	0.03	0.001	3.7E+00	1.2E-04	1.8E-07	6.5E-07	84.5%	1.4E-06	1.1E-02	4.7%	2.2E-07	8.0E-07	84.5%	2.5E-06	2.1E-02	4.7%
Iron	67.7	0.001	NA	4.5E-02	4.0E-04	--	--	3.1E-03	6.9E-02	28.7%	4.9E-04	--	--	5.7E-03	1.3E-01	28.7%
Manganese	0.45	0.001	NA	9.6E-04	2.6E-06	--	--	2.1E-05	2.1E-02	9.0%	3.3E-06	--	--	3.8E-05	4.0E-02	9.0%
Thallium	0.0057	0.001	NA	9.9E-06	3.4E-08	--	--	2.6E-07	2.6E-02	11.0%	4.1E-08	--	--	4.8E-07	4.9E-02	11.0%
					Total ILCR:	7.6E-07	100.0%	Total HI:	2.4E-01	100.0%	Total ILCR:	9.4E-07	100.0%	Total HI:	4.4E-01	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.

ADULT AND YOUNG CHILD RESIDENTS - FUTURE SCENARIOS
INHALATION OF VOLATILES IN GROUNDWATER EMANATING FROM SHOWER WATER - SITE 84 (BUILDING 45 AREA)
CENTRAL TENDENCY
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (Ca*RR*ET*EF*ED)/(BW*AT)
Where: Ca = Shower Model

ILCR = CDI*CSFi
HQ = CDI/RfDi

Parameter	Units	Description	Adult	
CDI	mg/kg/d	Chronic daily intake	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	
CSFi	1/(mg/kg/d)	Inhalation cancer slope factor	CS	
HQ	NA	Hazard quotient	CS	
RfDi	mg/kg/d	Inhalation reference dose	CS	
C	mg/L	Concentration of chemical in groundwater	CS	
Ca	mg/m3	Concentration of chemical in shower water Calculated using shower model	CS	
RR	m3/hour	Respiration rate	0.83	
ET	hours/day	Exposure time	0.25	
EF	days/year	Exposure frequency	234	
ED	years	Exposure duration	9	
BW	kg	Body weight	70	
AT-C	days	Averaging time, carcinogens	25,550	
AT-N	days	Averaging time, noncarcinogens	3,285	

Parameter	C (mg/L)	Shower Ca (mg/m3)	CSFi 1/(mg/kg/d)	RfDi (mg/kg/d)	Adult					
					Carcinogens			Noncarcinogens		
					CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI
Benzene	0.0034	4.81E-03	2.7E-02	1.7E-03	1.2E-06	3.2E-08	8.2%	9.1E-06	5.3E-03	1.3%
Chloroform	0.016	1.80E-02	8.1E-02	8.6E-05	4.4E-06	3.5E-07	91.8%	3.4E-05	4.0E-01	98.7%
					Total ILCR:	3.9E-07	100.0%	Total HI:	4.0E-01	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.

ADULT AND YOUNG CHILD RESIDENTS - FUTURE SCENARIOS
ACCIDENTAL INGESTION OF SURFACE WATER - SITE 84 (BUILDING 45 AREA)
CENTRAL TENDENCY
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (C*IR*ET*EF*ED)/(BW*AT)
ILCR = CDI*CSFo
HQ = CDI/RfDo

Parameter	Units	Description	Adult	Young Child	
CDI	mg/kg/d	Chronic daily intake	CS	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	CS	
CSFo	1/(mg/kg/d)	Oral cancer slope factor	CS	CS	
HQ	NA	Hazard quotient	CS	CS	
RfDo	mg/kg/d	Oral reference dose	CS	CS	
C	mg/L	Concentration of chemical in water	CS	CS	
IR-W	L/hour	Ingestion rate of water	0.01	0.05	
ET	hours/day	Exposure time	2.6	2.6	
EF	days/year	Exposure frequency	48	48	
ED	years	Exposure duration	9	6	
BW	kg	Body weight	70	15	
AT-C	days	Averaging time, carcinogens	25,550	25,550	
AT-N	days	Averaging time, noncarcinogens	3,285	2,190	

				Adult						Young Child					
				Carcinogens			Noncarcinogens			Carcinogens			Noncarcinogens		
Parameter	C (mg/L)	CSFo 1/(mg/kg/d)	RfDo (mg/kg/d)	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI
Acetone	0.0056	NA	1.0E-01	3.5E-08	--	--	2.7E-07	2.7E-06	78.6%	5.5E-07	--	--	6.4E-06	6.4E-05	78.6%
Toluene	0.0027	NA	2.0E-01	1.7E-08	--	--	1.3E-07	6.6E-07	18.9%	2.6E-07	--	--	3.1E-06	1.5E-05	18.9%
Xylenes, total	0.0035	NA	2.0E+00	2.2E-08	--	--	1.7E-07	8.5E-08	2.5%	3.4E-07	--	--	4.0E-06	2.0E-06	2.5%
				Total ILCR:	--	--	Total HI:	3.5E-06	100.0%	Total ILCR:	--	--	Total HI:	8.1E-05	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.

ADULT AND YOUNG CHILD RESIDENTS - FUTURE SCENARIOS
DERMAL CONTACT WITH SURFACE WATER - SITE 84 (BUILDING 45 AREA)
CENTRAL TENDENCY
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

DAD (mg/kg/d) = (C*CF*Kp*SA*EF*ED*ET)/(BW*AT)

ILCR = CDI*CSFo Adj CSF Adj = CSF/AD
HQ = CDI/RfDo Adj RfD Adj = RfD*AD

Parameter	Units	Description	Adult	Young Child	
DAD	mg/kg/d	Dermally absorbed dose	CS	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	CS	
CSFd	1/(mg/kg/d)	Dermal cancer slope factor	CS	CS	
HQ	NA	Hazard quotient	CS	CS	
RfDd	mg/kg/d	Dermal reference dose	CS	CS	
SA	cm2	Skin surface area available for contact	5,000	2,000	
EF	days/year	Exposure frequency	48	48	
ED	years	Exposure duration	9	6	
ET	hours/day	Exposure time	2.6	2.6	
BW	kg	Body weight	70	15	
AT-C	days	Averaging time, carcinogens	25,550	25,550	
AT-N	days	Averaging time, noncarcinogens	3,285	2,190	
C	mg/L	Concentration of chemical in water	CS	CS	
CF	L/cm3	Conversion factor	1.00E-03	1.00E-03	
Kp	cm/hour	Dermal permeability coefficient	CS	CS	
AD	NA	Adjustment for absorbed dose	CS	CS	

					Adult						Young Child					
					Carcinogens			Noncarcinogens			Carcinogens			Noncarcinogens		
Parameter	C (mg/L)	Kp (cm/hour)	CSFd 1/(mg/kg/d)	RfDd (mg/kg/d)	DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI	DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI
Acetone	0.0056	0.00057	NA	8.3E-02	1.0E-08	--	--	7.8E-08	9.4E-07	3.9%	1.2E-08	--	--	1.5E-07	1.8E-06	3.9%
Toluene	0.0027	0.045	NA	1.6E-01	3.8E-07	--	--	3.0E-06	1.9E-05	77.6%	4.7E-07	--	--	5.5E-06	3.5E-05	77.6%
Xylenes, total	0.0035	0.095	NA	1.8E+00	1.0E-06	--	--	8.1E-06	4.4E-06	18.5%	1.3E-06	--	--	1.5E-05	8.2E-06	18.5%
					Total ILCR:	--	--	Total HI:	2.4E-05	100.0%	Total ILCR:	--	--	Total HI:	4.5E-05	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.

ADULT AND YOUNG CHILD RESIDENTS - FUTURE SCENARIOS
ACCIDENTAL INGESTION OF SEDIMENT - SITE 84 (BUILDING 45 AREA)
CENTRAL TENDENCY
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (C*IR*CF*FI*EF*ED)/(BW*AT)
ILCR = CDI*CSFo
HQ = CDI/RfDo

Parameter	Units	Description	Adult	Young Child	
CDI	mg/kg/d	Chronic daily intake	CS	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	CS	
CSFo	1/(mg/kg/d)	Oral cancer slope factor	CS	CS	
HQ	NA	Hazard quotient	CS	CS	
RfDo	mg/kg/d	Oral reference dose	CS	CS	
C	mg/kg	Concentration of chemical in soil	CS	CS	
IR-S	mg/day	Ingestion rate of sediment	50	100	
CF	kg/mg	Conversion factor	1.00E-06	1.00E-06	
FI	NA	Fraction of soil ingested from site	1	1	
EF	days/year	Exposure frequency	48	48	
ED	years	Exposure duration	9	6	
BW	kg	Body weight	70	15	
AT-C	days	Averaging time, carcinogens	25,550	25,550	
AT-N	days	Averaging time, noncarcinogens	3,285	2,190	

				Adult						Young Child					
				Carcinogens			Noncarcinogens			Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	CSFo 1/(mg/kg/d)	RfDo (mg/kg/d)	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	10	NA	NA	1.2E-07	--	--	9.4E-07	--	--	7.5E-07	--	--	8.8E-06	--	--
Aroclor-1248	2.8	2.0E+00	NA	3.4E-08	6.8E-08	6.5%	2.6E-07	--	--	2.1E-07	4.2E-07	6.5%	2.5E-06	--	--
Aroclor-1260	40	2.0E+00	NA	4.8E-07	9.7E-07	93.5%	3.8E-06	--	--	3.0E-06	6.0E-06	93.5%	3.5E-05	--	--
Diesel Range Organics	11,600	NA	NA	1.4E-04	--	--	1.1E-03	--	--	8.7E-04	--	--	1.0E-02	--	--
				Total ILCR:	1.0E-06	100.0%	Total HI:	--	--	Total ILCR:	6.4E-06	100.0%	Total HI:	--	--

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.

ADULT AND YOUNG CHILD RESIDENTS - FUTURE SCENARIOS
DERMAL CONTACT WITH SEDIMENT - SITE 84 (BUILDING 45 AREA)
CENTRAL TENDENCY
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

DAD (mg/kg/d) = (C*CF*AF*ABS*SA*EF*ED)/(BW*AT)
ILCR = CDI*CSFd
HQ = CDI/RfDd

Parameter	Units	Description	Adult	Young Child	
DAD	mg/kg/d	Dermally absorbed dose	CS	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	CS	
CSFd	1/(mg/kg/d)	Dermal cancer slope factor	CS	CS	
HQ	NA	Hazard quotient	CS	CS	
RfDd	mg/kg/d	Dermal reference dose	CS	CS	
C	mg/kg	Concentration of chemical in soil	CS	CS	
CF	kg/mg	Conversion factor	1.00E-06	1.00E-06	
AF	mg/cm2	Soil to skin adherence factor	0.07	0.20	
ABS	NA	Absorption fraction	CS	CS	
SA	cm2/day	Skin surface area available for contact	5,000	1,745	
EF	days/year	Exposure frequency	48	48	
ED	years	Exposure duration	9	6	
BW	kg	Body weight	70	15	
AT-C	days	Averaging time, carcinogens	25,550	25,550	
AT-N	days	Averaging time, noncarcinogens	3,285	2,190	

					Adult						Young Child					
					Carcinogens			Noncarcinogens			Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	ABS	CSFd 1/(mg/kg/d)	RfDd (mg/kg/d)	DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI	DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	10	0.01	NA	NA	8.5E-09	--	--	6.6E-08	--	--	2.6E-08	--	--	3.1E-07	--	--
Aroclor-1248	2.8	0.14	2.2E+00	NA	3.3E-08	7.4E-08	6.6%	2.6E-07	--	--	1.0E-07	2.3E-07	6.6%	1.2E-06	--	--
Aroclor-1260	40	0.14	2.2E+00	NA	4.7E-07	1.1E-06	93.4%	3.7E-06	--	--	1.5E-06	3.3E-06	93.4%	1.7E-05	--	--
Diesel Range Organics	11,600	0.01	NA	NA	9.8E-06	--	--	7.6E-05	--	--	3.0E-05	--	--	3.5E-04	--	--
					Total ILCR:	1.1E-06	100.0%	Total HI:	--	--	Total ILCR:	3.5E-06	100.0%	Total HI:	--	--

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.

ADULT CONSTRUCTION WORKERS - FUTURE SCENARIO
ACCIDENTAL INGESTION OF SURFACE SOIL - SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (C*IR*CF*FI*EF*ED)/(BW*AT)
ILCR = CDI*CSFo
HQ = CDI/RfDo

Parameter	Units	Description	Construction Worker	
CDI	mg/kg/d	Chronic daily intake	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	
CSFo	1/(mg/kg/d)	Oral cancer slope factor	CS	
HQ	NA	Hazard quotient	CS	
RfDo	mg/kg/d	Oral reference dose	CS	
C	mg/kg	Concentration of chemical in soil	CS	
IR-S	mg/day	Ingestion rate of soil	480	
CF	kg/mg	Conversion factor	1.00E-06	
FI	NA	Fraction of soil ingested from site	1	
EF	days/year	Exposure frequency	250	
ED	years	Exposure duration	1	
BW	kg	Body weight	70	
AT-C	days	Averaging time, carcinogens	25,550	
AT-N	days	Averaging time, noncarcinogens	365	

				Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	CSFo 1/(mg/kg/d)	RfDo (mg/kg/d)	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	1.96	NA	NA	1.3E-07	--	--	9.2E-06	--	--
Benzo(a)anthracene	69.0	7.3E-01	NA	4.6E-06	3.4E-06	8.1%	3.2E-04	--	--
Benzo(a)pyrene	30.5	7.3E+00	NA	2.0E-06	1.5E-05	35.6%	1.4E-04	--	--
Benzo(b)fluoranthene	40.9	7.3E-01	NA	2.7E-06	2.0E-06	4.8%	1.9E-04	--	--
Benzo(k)fluoranthene	18.7	7.3E-02	NA	1.3E-06	9.1E-08	0.2%	8.8E-05	--	--
Carbazole	3.16	2.0E-02	NA	2.1E-07	4.2E-09	0.0%	1.5E-05	--	--
Chrysene	96.0	7.3E-03	NA	6.4E-06	4.7E-08	0.1%	4.5E-04	--	--
Dibenz(a,h)anthracene	1.41	7.3E+00	NA	9.5E-08	6.9E-07	1.7%	6.6E-06	--	--
Fluoranthene	243	NA	4.0E-02	1.6E-05	--	--	1.1E-03	2.9E-02	0.9%
Indeno(1,2,3-cd)pyrene	8.79	7.3E-01	NA	5.9E-07	4.3E-07	1.0%	4.1E-05	--	--
Naphthalene	0.525	NA	2.0E-02	3.5E-08	--	--	2.5E-06	1.2E-04	0.0%
Pyrene	250	NA	3.0E-02	1.7E-05	--	--	1.2E-03	3.9E-02	1.2%
4,4'-DDD	3	2.4E-01	NA	2.0E-07	4.8E-08	0.1%	1.4E-05	--	--
Chlordane, alpha-	48	3.5E-01 (1)	5.0E-04 (1)	3.2E-06	1.1E-06	2.7%	2.3E-04	4.5E-01	13.7%
Chlordane, gamma-	58	3.5E-01 (1)	5.0E-04 (1)	3.9E-06	1.4E-06	3.3%	2.7E-04	5.4E-01	16.6%
Dieldrin	0.32	1.6E+01	5.0E-05	2.1E-08	3.4E-07	0.8%	1.5E-06	3.0E-02	0.9%
Heptachlor	22	4.5E+00	5.0E-04	1.5E-06	6.6E-06	15.9%	1.0E-04	2.1E-01	6.3%
Heptachlor Epoxide	4.5	9.1E+00	1.3E-05	3.0E-07	2.7E-06	6.6%	2.1E-05	1.6E+00	49.5%
Aroclor-1248	1.51	2.0E+00	NA	1.0E-07	2.0E-07	0.5%	7.1E-06	--	--
Aroclor-1254	0.975	2.0E+00	2.0E-05	6.5E-08	1.3E-07	0.3%	4.6E-06	2.3E-01	7.0%
Aroclor-1260	54.6	2.0E+00	NA	3.7E-06	7.3E-06	17.5%	2.6E-04	--	--
Gasoline Range Organics	0.207	NA	NA	1.4E-08	--	--	9.7E-07	--	--
Diesel Range Organics	470	NA	NA	3.2E-05	--	--	2.2E-03	--	--
Antimony	1.22	NA	4.0E-04	8.2E-08	--	--	5.7E-06	1.4E-02	0.4%
Arsenic	3.49	1.5E+00	3.0E-04	2.3E-07	3.5E-07	0.8%	1.6E-05	5.5E-02	1.7%
Iron	2,260	NA	3.0E-01	1.5E-04	--	--	1.1E-02	3.5E-02	1.1%
Thallium	0.31	NA	6.6E-05	2.1E-08	--	--	1.4E-06	2.2E-02	0.7%
				Total ILCR:	4.2E-05	100.0%	Total HI:	3.3E+00	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT CONSTRUCTION WORKERS - FUTURE SCENARIO
DERMAL CONTACT WITH SURFACE SOIL - SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

DAD (mg/kg/d) = (C*CF*AF*ABS*SA*EF*ED)/(BW*AT)
ILCR = CDI*CSFd
HQ = CDI/RfDd

Parameter	Units	Description	Construction Worker	
DAD	mg/kg/d	Dermally absorbed dose	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	
CSFd	1/(mg/kg/d)	Dermal cancer slope factor	CS	
HQ	NA	Hazard quotient	CS	
RfDd	mg/kg/d	Dermal reference dose	CS	
C	mg/kg	Concentration of chemical in soil	CS	
CF	kg/mg	Conversion factor	1.00E-06	
AF	mg/cm2	Soil to skin adherence factor	0.2	
ABS	NA	Absorption fraction	CS	
SA	cm2/day	Skin surface area available for contact	3,300	
EF	days/year	Exposure frequency	250	
ED	years	Exposure duration	1	
BW	kg	Body weight	70	
AT-C	days	Averaging time, carcinogens	25,550	
AT-N	days	Averaging time, noncarcinogens	365	

					Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	ABS	CSFd 1/(mg/kg/d)	RfDd (mg/kg/d)	DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	1.96	0.01	NA	NA	1.8E-09	--	--	1.3E-07	--	--
Benzo(a)anthracene	69.0	0.13	2.4E+00	NA	8.3E-07	1.9E-06	18.1%	5.8E-05	--	--
Benzo(a)pyrene	30.5	0.13	1.5E+01	NA	3.7E-07	5.3E-06	49.7%	2.6E-05	--	--
Benzo(b)fluoranthene	40.9	0.13	1.5E+00	NA	4.9E-07	7.2E-07	6.7%	3.4E-05	--	--
Benzo(k)fluoranthene	18.7	0.13	1.5E-01	NA	2.2E-07	3.3E-08	0.3%	1.6E-05	--	--
Carbazole	3.16	0.13	4.0E-02	NA	3.8E-08	1.5E-09	0.0%	2.7E-06	--	--
Chrysene	96.0	0.13	2.4E-02	NA	1.2E-06	2.7E-08	0.3%	8.1E-05	--	--
Dibenz(a,h)anthracene	1.41	0.13	2.4E+01	NA	1.7E-08	4.0E-07	3.7%	1.2E-06	--	--
Fluoranthene	243	0.01	NA	1.2E-02	2.2E-07	--	--	1.6E-05	1.3E-03	0.8%
Indeno(1,2,3-cd)pyrene	8.79	0.13	2.4E+00	NA	1.1E-07	2.5E-07	2.3%	7.4E-06	--	--
Naphthalene	0.525	0.01	NA	1.6E-02	4.8E-10	--	--	3.4E-08	2.1E-06	0.0%
Pyrene	250	0.01	NA	9.3E-03	2.3E-07	--	--	1.6E-05	1.7E-03	1.1%
4,4'-DDD	3	0.01	3.4E-01	NA	2.8E-09	9.5E-10	0.0%	1.9E-07	--	--
Chlordane, alpha-	48	0.04	4.4E-01 (1)	4.0E-04 (1)	1.8E-07	7.7E-08	0.7%	1.2E-05	3.1E-02	19.0%
Chlordane, gamma-	58	0.04	4.4E-01 (1)	4.0E-04 (1)	2.1E-07	9.4E-08	0.9%	1.5E-05	3.7E-02	22.9%
Dieldrin	0.32	0.01	3.2E+01	2.5E-05	3.0E-10	9.4E-09	0.1%	2.1E-08	8.3E-04	0.5%
Heptachlor	22	0.01	6.3E+00	3.6E-04	2.0E-08	1.3E-07	1.2%	1.4E-06	3.9E-03	2.4%
Heptachlor Epoxide	4.5	0.01	1.3E+01	9.4E-06	4.2E-09	5.2E-08	0.5%	2.9E-07	3.1E-02	19.0%
Aroclor-1248	1.51	0.14	2.2E+00	NA	1.9E-08	4.4E-08	0.4%	1.4E-06	--	--
Aroclor-1254	0.975	0.14	2.2E+00	1.8E-05	1.3E-08	2.8E-08	0.3%	8.8E-07	4.9E-02	30.0%
Aroclor-1260	54.6	0.14	2.2E+00	NA	7.0E-07	1.6E-06	14.6%	4.9E-05	--	--
Gasoline Range Organics	0.207	0.01	NA	NA	1.9E-10	--	--	1.3E-08	--	--
Diesel Range Organics	470	0.01	NA	NA	4.3E-07	--	--	3.0E-05	--	--
Antimony	1.22	0.001	NA	8.0E-06	1.1E-10	--	--	7.9E-09	9.9E-04	0.6%
Arsenic	3.49	0.03	3.7E+00	1.2E-04	9.7E-09	3.5E-08	0.3%	6.8E-07	5.5E-03	3.4%
Iron	2,260	0.001	NA	4.5E-02	2.1E-07	--	--	1.5E-05	3.2E-04	0.2%
Thallium	0.31	0.001	NA	9.9E-06	2.8E-11	--	--	2.0E-09	2.0E-04	0.1%
					Total ILCR:	1.1E-05	100.0%	Total HI:	1.6E-01	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT CONSTRUCTION WORKERS - FUTURE SCENARIO
INHALATION OF FUGITIVE DUSTS EMANATING FROM SURFACE SOIL - SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (Ca*RR*ET*EF*ED)/(BW*AT)
Where: Ca = C * (1/PEF)

ILCR = CDI*CSFi
HQ = CDI/RfDi

Parameter	Units	Description	Construction Worker	
CDI	mg/kg/d	Chronic daily intake	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	
CSFi	1/(mg/kg/d)	Inhalation cancer slope factor	CS	
HQ	NA	Hazard quotient	CS	
RfDi	mg/kg/d	Inhalation reference dose	CS	
Ca	mg/m3	Concentration of chemical in air as fugitive dusts	CS	
C	mg/kg	Concentration of chemical in soil	CS	
PEF	m3/kg	Particulate emission factor	1.32E+09	
RR	m3/hour	Respiration rate	0.83	
ET	hours/day	Exposure time	8	
EF	days/year	Exposure frequency	250	
ED	years	Exposure duration	1	
BW	kg	Body weight	70	
AT-C	days	Averaging time, carcinogens	25,550	
AT-N	days	Averaging time, noncarcinogens	365	

					Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	Ca (mg/m3)	CSFi 1/(mg/kg/d)	RfDi (mg/kg/d)	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	1.96	1.48E-09	NA	NA	1.4E-12	--	--	9.6E-11	--	--
Benzo(a)anthracene	69.0	5.23E-08	3.1E-01	NA	4.9E-11	1.5E-11	4.4%	3.4E-09	--	--
Benzo(a)pyrene	30.5	2.31E-08	3.1E+00	NA	2.1E-11	6.6E-11	19.4%	1.5E-09	--	--
Benzo(b)fluoranthene	40.9	3.10E-08	3.1E-01	NA	2.9E-11	8.9E-12	2.6%	2.0E-09	--	--
Benzo(k)fluoranthene	18.7	1.41E-08	3.1E-02	NA	1.3E-11	4.1E-13	0.1%	9.2E-10	--	--
Carbazole	3.16	2.39E-09	2.0E-02	NA	2.2E-12	4.4E-14	0.0%	1.6E-10	--	--
Chrysene	96.0	7.27E-08	3.1E-03	NA	6.8E-11	2.1E-13	0.1%	4.7E-09	--	--
Dibenz(a,h)anthracene	1.41	1.07E-09	3.1E+00	NA	9.9E-13	3.1E-12	0.9%	7.0E-11	--	--
Fluoranthene	243	1.84E-07	NA	4.0E-02	1.7E-10	--	--	1.2E-08	3.0E-07	0.6%
Indeno(1,2,3-cd)pyrene	8.79	6.66E-09	3.1E-01	NA	6.2E-12	1.9E-12	0.6%	4.3E-10	--	--
Naphthalene	0.525	3.98E-10	NA	8.6E-04	3.7E-13	--	--	2.6E-11	3.0E-08	0.1%
Pyrene	250	1.89E-07	NA	3.0E-02	1.8E-10	--	--	1.2E-08	4.1E-07	0.8%
4,4'-DDD	3	2.27E-09	2.4E-01	NA	2.1E-12	5.1E-13	0.1%	1.5E-10	--	--
Chlordane, alpha-	48	3.64E-08	3.5E-01 (1)	2.0E-04 (1)	3.4E-11	1.2E-11	3.4%	2.4E-09	1.2E-05	24.2%
Chlordane, gamma-	58	4.39E-08	3.5E-01 (1)	2.0E-04 (1)	4.1E-11	1.4E-11	4.2%	2.9E-09	1.4E-05	29.3%
Dieldrin	0.32	2.42E-10	1.6E+01	5.0E-05	2.3E-13	3.6E-12	1.1%	1.6E-11	3.2E-07	0.6%
Heptachlor	22	1.67E-08	4.6E+00	5.0E-04	1.5E-11	7.0E-11	20.5%	1.1E-09	2.2E-06	4.4%
Heptachlor Epoxide	4.5	3.41E-09	9.1E+00	1.3E-05	3.2E-12	2.9E-11	8.4%	2.2E-10	1.7E-05	35.0%
Aroclor-1248	1.51	1.14E-09	2.0E+00	NA	1.1E-12	2.1E-12	0.6%	7.4E-11	--	--
Aroclor-1254	0.975	7.39E-10	2.0E+00	2.0E-05	6.9E-13	1.4E-12	0.4%	4.8E-11	2.4E-06	4.9%
Aroclor-1260	54.6	4.13E-08	2.0E+00	NA	3.8E-11	7.7E-11	22.4%	2.7E-09	--	--
Gasoline Range Organics	0.207	1.57E-10	NA	NA	1.5E-13	--	--	1.0E-11	--	--
Diesel Range Organics	470	3.56E-07	NA	NA	3.3E-10	--	--	2.3E-08	--	--
Antimony	1.22	9.25E-10	NA	NA	8.6E-13	--	--	6.0E-11	--	--
Arsenic	3.49	2.65E-09	1.5E+01	NA	2.5E-12	3.7E-11	10.8%	1.7E-10	--	--
Iron	2,260	1.71E-06	NA	NA	1.6E-09	--	--	1.1E-07	--	--
Thallium	0.31	2.32E-10	NA	NA	2.2E-13	--	--	1.5E-11	--	--
					Total ILCR:	3.4E-10	100.0%	Total HI:	4.9E-05	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT CONSTRUCTION WORKERS - FUTURE SCENARIO
ACCIDENTAL INGESTION OF SUBSURFACE SOIL - SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (C*IR*CF*FI*EF*ED)/(BW*AT)
ILCR = CDI*CSFo
HQ = CDI/RfDo

Parameter	Units	Description	Construction Worker	
CDI	mg/kg/d	Chronic daily intake	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	
CSFo	1/(mg/kg/d)	Oral cancer slope factor	CS	
HQ	NA	Hazard quotient	CS	
RfDo	mg/kg/d	Oral reference dose	CS	
C	mg/kg	Concentration of chemical in soil	CS	
IR-S	mg/day	Ingestion rate of soil	480	
CF	kg/mg	Conversion factor	1.00E-06	
FI	NA	Fraction of soil ingested from site	1	
EF	days/year	Exposure frequency	250	
ED	years	Exposure duration	1	
BW	kg	Body weight	70	
AT-C	days	Averaging time, carcinogens	25,550	
AT-N	days	Averaging time, noncarcinogens	365	

Parameter	C (mg/kg)	CSFo 1/(mg/kg/d)	RfDo (mg/kg/d)	Carcinogens CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	Noncarcinogens CDI (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	0.573	NA	NA	3.8E-08	--	--	2.7E-06	--	--
Benzo(a)anthracene	0.199	7.3E-01	NA	1.3E-08	9.7E-09	0.8%	9.3E-07	--	--
Benzo(a)pyrene	0.194	7.3E+00	NA	1.3E-08	9.5E-08	7.7%	9.1E-07	--	--
Benzo(b)fluoranthene	0.217	7.3E-01	NA	1.5E-08	1.1E-08	0.9%	1.0E-06	--	--
Benzo(k)fluoranthene	0.137	7.3E-02	NA	9.2E-09	6.7E-10	0.1%	6.5E-07	--	--
Bis(2-chloroethoxy)methane	0.0512	NA	NA	3.4E-09	--	--	2.4E-07	--	--
Carbazole	0.0845	2.0E-02	NA	5.7E-09	1.1E-10	0.0%	4.0E-07	--	--
Chrysene	0.209	7.3E-03	NA	1.4E-08	1.0E-10	0.0%	9.8E-07	--	--
Dibenz(a,h)anthracene	0.0758	7.3E+00	NA	5.1E-09	3.7E-08	3.0%	3.6E-07	--	--
Indeno(1,2,3-cd)pyrene	0.145	7.3E-01	NA	9.7E-09	7.1E-09	0.6%	6.8E-07	--	--
Naphthalene	0.226	NA	2.0E-02	1.5E-08	--	--	1.1E-06	5.3E-05	0.0%
Chlordane, alpha-	1.22	3.5E-01 (1)	5.0E-04 (1)	8.2E-08	2.9E-08	2.3%	5.7E-06	1.1E-02	5.7%
Chlordane, gamma-	1.65	3.5E-01 (1)	5.0E-04 (1)	1.1E-07	3.9E-08	3.1%	7.7E-06	1.5E-02	7.7%
Heptachlor	0.155	4.5E+00	5.0E-04	1.0E-08	4.7E-08	3.8%	7.3E-07	1.5E-03	0.7%
Heptachlor Epoxide	0.0161	9.1E+00	1.3E-05	1.1E-09	9.8E-09	0.8%	7.5E-08	5.8E-03	2.9%
Aroclor-1248	0.318	2.0E+00	NA	2.1E-08	4.3E-08	3.4%	1.5E-06	--	--
Aroclor-1254	0.333	2.0E+00	2.0E-05	2.2E-08	4.5E-08	3.6%	1.6E-06	7.8E-02	38.7%
Aroclor-1260	5.61	2.0E+00	NA	3.8E-07	7.5E-07	60.9%	2.6E-05	--	--
Gasoline Range Organics	580	NA	NA	3.9E-05	--	--	2.7E-03	--	--
Diesel Range Organics	5,500	NA	NA	3.7E-04	--	--	2.6E-02	--	--
Arsenic	1.11	1.5E+00	3.0E-04	7.4E-08	1.1E-07	9.0%	5.2E-06	1.7E-02	8.6%
Iron	2,754	NA	3.0E-01	1.8E-04	--	--	1.3E-02	4.3E-02	21.4%
Thallium	0.405	NA	6.6E-05	2.7E-08	--	--	1.9E-06	2.9E-02	14.3%
				Total ILCR:	1.2E-06	100.0%	Total HI:	2.0E-01	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT CONSTRUCTION WORKERS - FUTURE SCENARIO
DERMAL CONTACT WITH SUBSURFACE SOIL - SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

DAD (mg/kg/d) = (C*CF*AF*ABS*SA*EF*ED)/(BW*AT)
ILCR = CDI*CSFd
HQ = CDI/RfDd

Parameter	Units	Description	Construction Worker	
DAD	mg/kg/d	Dermally absorbed dose	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	
CSFd	1/(mg/kg/d)	Dermal cancer slope factor	CS	
HQ	NA	Hazard quotient	CS	
RfDd	mg/kg/d	Dermal reference dose	CS	
C	mg/kg	Concentration of chemical in soil	CS	
CF	kg/mg	Conversion factor	1.00E-06	
AF	mg/cm2	Soil to skin adherence factor	0.2	
ABS	NA	Absorption fraction	CS	
SA	cm2/day	Skin surface area available for contact	3,300	
EF	days/year	Exposure frequency	250	
ED	years	Exposure duration	1	
BW	kg	Body weight	70	
AT-C	days	Averaging time, carcinogens	25,550	
AT-N	days	Averaging time, noncarcinogens	365	

					Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	ABS	CSFd 1/(mg/kg/d)	RfDd (mg/kg/d)	DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	0.573	0.01	NA	NA	5.3E-10	--	--	3.7E-08	--	--
Benzo(a)anthracene	0.199	0.13	2.4E+00	NA	2.4E-09	5.6E-09	2.1%	1.7E-07	--	--
Benzo(a)pyrene	0.194	0.13	1.5E+01	NA	2.3E-09	3.4E-08	12.8%	1.6E-07	--	--
Benzo(b)fluoranthene	0.217	0.13	1.5E+00	NA	2.6E-09	3.8E-09	1.4%	1.8E-07	--	--
Benzo(k)fluoranthene	0.137	0.13	1.5E-01	NA	1.6E-09	2.4E-10	0.1%	1.2E-07	--	--
Bis(2-chloroethoxy)methane	0.0512	0.1	NA	NA	4.7E-10	--	--	3.3E-08	--	--
Carbazole	0.0845	0.13	4.0E-02	NA	1.0E-09	4.1E-11	0.0%	7.1E-08	--	--
Chrysene	0.209	0.13	2.4E-02	NA	2.5E-09	5.9E-11	0.0%	1.8E-07	--	--
Dibenz(a,h)anthracene	0.0758	0.13	2.4E+01	NA	9.1E-10	2.1E-08	8.1%	6.4E-08	--	--
Indeno(1,2,3-cd)pyrene	0.145	0.13	2.4E+00	NA	1.7E-09	4.1E-09	1.5%	1.2E-07	--	--
Naphthalene	0.226	0.01	NA	1.6E-02	2.1E-10	--	--	1.5E-08	9.1E-07	0.0%
Chlordane, alpha-	1.22	0.04	4.4E-01 (1)	4.0E-04 (1)	4.5E-09	2.0E-09	0.7%	3.1E-07	7.8E-04	3.7%
Chlordane, gamma-	1.65	0.04	4.4E-01 (1)	4.0E-04 (1)	6.1E-09	2.7E-09	1.0%	4.3E-07	1.1E-03	5.0%
Heptachlor	0.155	0.01	6.3E+00	3.6E-04	1.4E-10	8.9E-10	0.3%	1.0E-08	2.8E-05	0.1%
Heptachlor Epoxide	0.0161	0.01	1.3E+01	9.4E-06	1.5E-11	1.9E-10	0.1%	1.0E-09	1.1E-04	0.5%
Aroclor-1248	0.318	0.14	2.2E+00	NA	4.1E-09	9.2E-09	3.5%	2.9E-07	--	--
Aroclor-1254	0.333	0.14	2.2E+00	1.8E-05	4.3E-09	9.6E-09	3.6%	3.0E-07	1.7E-02	79.2%
Aroclor-1260	5.61	0.14	2.2E+00	NA	7.2E-08	1.6E-07	60.5%	5.1E-06	--	--
Gasoline Range Organics	580	0.01	NA	NA	5.4E-07	--	--	3.7E-05	--	--
Diesel Range Organics	5,500	0.01	NA	NA	5.1E-06	--	--	3.6E-04	--	--
Arsenic	1.11	0.03	3.7E+00	1.2E-04	3.1E-09	1.1E-08	4.2%	2.1E-07	1.7E-03	8.3%
Iron	2,754	0.001	NA	4.5E-02	2.5E-07	--	--	1.8E-05	4.0E-04	1.9%
Thallium	0.405	0.001	NA	9.9E-06	3.7E-11	--	--	2.6E-09	2.6E-04	1.3%
					Total ILCR:	2.7E-07	100.0%	Total HI:	2.1E-02	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT CONSTRUCTION WORKERS - FUTURE SCENARIO
INHALATION OF FUGITIVE DUSTS EMANATING FROM EXCAVATED SUBSURFACE SOIL - SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (Ca*RR*ET*EF*ED)/(BW*AT)
Where: Ca = C * (1/PEF)

ILCR = CDI*CSFi
HQ = CDI/RfDi

Parameter	Units	Description	Construction Worker	
CDI	mg/kg/d	Chronic daily intake	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	
CSFi	1/(mg/kg/d)	Inhalation cancer slope factor	CS	
HQ	NA	Hazard quotient	CS	
RfDi	mg/kg/d	Inhalation reference dose	CS	
Ca	mg/m3	Concentration of chemical in air as fugitive dusts	CS	
C	mg/kg	Concentration of chemical in soil	CS	
PEF	m3/kg	Particulate emission factor	1.32E+09	
RR	m3/hour	Respiration rate	0.83	
ET	hours/day	Exposure time	8	
EF	days/year	Exposure frequency	250	
ED	years	Exposure duration	1	
BW	kg	Body weight	70	
AT-C	days	Averaging time, carcinogens	25,550	
AT-N	days	Averaging time, noncarcinogens	365	

					Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	Ca (mg/m3)	CSFi 1/(mg/kg/d)	RfDi (mg/kg/d)	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	0.573	4.34E-10	NA	NA	4.0E-13	--	--	2.8E-11	--	--
Benzo(a)anthracene	0.199	1.51E-10	3.1E-01	NA	1.4E-13	4.3E-14	0.2%	9.8E-12	--	--
Benzo(a)pyrene	0.194	1.47E-10	3.1E+00	NA	1.4E-13	4.2E-13	1.9%	9.5E-12	--	--
Benzo(b)fluoranthene	0.217	1.64E-10	3.1E-01	NA	1.5E-13	4.7E-14	0.2%	1.1E-11	--	--
Benzo(k)fluoranthene	0.137	1.04E-10	3.1E-02	NA	9.7E-14	3.0E-15	0.0%	6.8E-12	--	--
Bis(2-chloroethoxy)methane	0.0512	3.88E-11	NA	NA	3.6E-14	--	--	2.5E-12	--	--
Carbazole	0.0845	6.40E-11	2.0E-02	NA	5.9E-14	1.2E-15	0.0%	4.2E-12	--	--
Chrysene	0.209	1.59E-10	3.1E-03	NA	1.5E-13	4.6E-16	0.0%	1.0E-11	--	--
Dibenz(a,h)anthracene	0.0758	5.75E-11	3.1E+00	NA	5.3E-14	1.7E-13	0.7%	3.7E-12	--	--
Indeno(1,2,3-cd)pyrene	0.145	1.10E-10	3.1E-01	NA	1.0E-13	3.2E-14	0.1%	7.1E-12	--	--
Naphthalene	0.226	1.71E-10	NA	8.6E-04	1.6E-13	--	--	1.1E-11	1.3E-08	0.8%
Chlordane, alpha-	1.22	9.21E-10	3.5E-01 (1)	2.0E-04 (1)	8.5E-13	3.0E-13	1.3%	6.0E-11	3.0E-07	18.5%
Chlordane, gamma-	1.65	1.25E-09	3.5E-01 (1)	2.0E-04 (1)	1.2E-12	4.1E-13	1.8%	8.1E-11	4.1E-07	25.2%
Heptachlor	0.155	1.17E-10	4.6E+00	5.0E-04	1.1E-13	5.0E-13	2.2%	7.6E-12	1.5E-08	0.9%
Heptachlor Epoxide	0.0161	1.22E-11	9.1E+00	1.3E-05	1.1E-14	1.0E-13	0.5%	7.9E-13	6.1E-08	3.8%
Aroclor-1248	0.318	2.41E-10	2.0E+00	NA	2.2E-13	4.5E-13	2.0%	1.6E-11	--	--
Aroclor-1254	0.333	2.52E-10	2.0E+00	2.0E-05	2.3E-13	4.7E-13	2.1%	1.6E-11	8.2E-07	50.8%
Aroclor-1260	5.61	4.25E-09	2.0E+00	NA	3.9E-12	7.9E-12	34.9%	2.8E-10	--	--
Gasoline Range Organics	580	4.39E-07	NA	NA	4.1E-10	--	--	2.9E-08	--	--
Diesel Range Organics	5,500	4.17E-06	NA	NA	3.9E-09	--	--	2.7E-07	--	--
Arsenic	1.11	8.41E-10	1.5E+01	NA	7.8E-13	1.2E-11	52.1%	5.5E-11	--	--
Iron	2,754	2.09E-06	NA	NA	1.9E-09	--	--	1.4E-07	--	--
Thallium	0.405	3.07E-10	NA	NA	2.9E-13	--	--	2.0E-11	--	--
					Total ILCR:	2.3E-11	100.0%	Total HI:	1.6E-06	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT CONSTRUCTION WORKERS - FUTURE SCENARIO
ACCIDENTAL INGESTION OF SURFACE SOIL - SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (C*IR*CF*FI*EF*ED)/(BW*AT)
ILCR = CDI*CSFo
HQ = CDI/RfDo

Parameter	Units	Description	Construction Worker	
CDI	mg/kg/d	Chronic daily intake	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	
CSFo	1/(mg/kg/d)	Oral cancer slope factor	CS	
HQ	NA	Hazard quotient	CS	
RfDo	mg/kg/d	Oral reference dose	CS	
C	mg/kg	Concentration of chemical in soil	CS	
IR-S	mg/day	Ingestion rate of soil	480	
CF	kg/mg	Conversion factor	1.00E-06	
FI	NA	Fraction of soil ingested from site	1	
EF	days/year	Exposure frequency	250	
ED	years	Exposure duration	1	
BW	kg	Body weight	70	
AT-C	days	Averaging time, carcinogens	25,550	
AT-N	days	Averaging time, noncarcinogens	365	

				Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	CSFo 1/(mg/kg/d)	RfDo (mg/kg/d)	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	57.9	NA	NA	3.9E-06	--	--	2.7E-04	--	--
Benzo(a)anthracene	4.76	7.3E-01	NA	3.2E-07	2.3E-07	1.5%	2.2E-05	--	--
Benzo(a)pyrene	2.48	7.3E+00	NA	1.7E-07	1.2E-06	7.9%	1.2E-05	--	--
Benzo(b)fluoranthene	2.81	7.3E-01	NA	1.9E-07	1.4E-07	0.9%	1.3E-05	--	--
Benzo(k)fluoranthene	1.78	7.3E-02	NA	1.2E-07	8.7E-09	0.1%	8.4E-06	--	--
Carbazole	0.95	2.0E-02	NA	6.4E-08	1.3E-09	0.0%	4.5E-06	--	--
Chrysene	6.7	7.3E-03	NA	4.5E-07	3.3E-09	0.0%	3.1E-05	--	--
Dibenz(a,h)anthracene	0.695	7.3E+00	NA	4.7E-08	3.4E-07	2.2%	3.3E-06	--	--
Indeno(1,2,3-cd)pyrene	1.72	7.3E-01	NA	1.2E-07	8.4E-08	0.5%	8.1E-06	--	--
Dieldrin	0.052	1.6E+01	5.0E-05	3.5E-09	5.6E-08	0.4%	2.4E-07	4.9E-03	3.9%
Aroclor-1260	95.6	2.0E+00	NA	6.4E-06	1.3E-05	83.1%	4.5E-04	--	--
Arsenic	5.26	1.5E+00	3.0E-04	3.5E-07	5.3E-07	3.4%	2.5E-05	8.2E-02	66.4%
Iron	2,347	NA	3.0E-01	1.6E-04	--	--	1.1E-02	3.7E-02	29.7%
				Total ILCR:	1.5E-05	100.0%	Total HI:	1.2E-01	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT CONSTRUCTION WORKERS - FUTURE SCENARIO
DERMAL CONTACT WITH SURFACE SOIL - SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

DAD (mg/kg/d) = (C*CF*AF*ABS*SA*EF*ED)/(BW*AT)
ILCR = CDI*CSFd
HQ = CDI/RfDd

Parameter	Units	Description	Construction Worker	
DAD	mg/kg/d	Dermally absorbed dose	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	
CSFd	1/(mg/kg/d)	Dermal cancer slope factor	CS	
HQ	NA	Hazard quotient	CS	
RfDd	mg/kg/d	Dermal reference dose	CS	
C	mg/kg	Concentration of chemical in soil	CS	
CF	kg/mg	Conversion factor	1.00E-06	
AF	mg/cm2	Soil to skin adherence factor	0.2	
ABS	NA	Absorption fraction	CS	
SA	cm2/day	Skin surface area available for contact	3,300	
EF	days/year	Exposure frequency	250	
ED	years	Exposure duration	1	
BW	kg	Body weight	70	
AT-C	days	Averaging time, carcinogens	25,550	
AT-N	days	Averaging time, noncarcinogens	365	

Parameter	C (mg/kg)	ABS	CSFd 1/(mg/kg/d)	RfDd (mg/kg/d)	Carcinogens DAD (mg/kg/d)	Carcinogens ILCR	Carcinogens % Contrib. Total ILCR	Noncarcinogens DAD (mg/kg/d)	Noncarcinogens HQ	Noncarcinogens % Contrib. HI
2-Methylnaphthalene	57.9	0.01	NA	NA	5.3E-08	--	--	3.7E-06	--	--
Benzo(a)anthracene	4.76	0.13	2.4E+00	NA	5.7E-08	1.3E-07	3.7%	4.0E-06	--	--
Benzo(a)pyrene	2.48	0.13	1.5E+01	NA	3.0E-08	4.3E-07	11.8%	2.1E-06	--	--
Benzo(b)fluoranthene	2.81	0.13	1.5E+00	NA	3.4E-08	4.9E-08	1.3%	2.4E-06	--	--
Benzo(k)fluoranthene	1.78	0.13	1.5E-01	NA	2.1E-08	3.1E-09	0.1%	1.5E-06	--	--
Carbazole	0.95	0.13	4.0E-02	NA	1.1E-08	4.6E-10	0.0%	8.0E-07	--	--
Chrysene	6.7	0.13	2.4E-02	NA	8.0E-08	1.9E-09	0.1%	5.6E-06	--	--
Dibenz(a,h)anthracene	0.695	0.13	2.4E+01	NA	8.3E-09	2.0E-07	5.4%	5.8E-07	--	--
Indeno(1,2,3-cd)pyrene	1.72	0.13	2.4E+00	NA	2.1E-08	4.9E-08	1.3%	1.4E-06	--	--
Dieldrin	0.052	0.01	3.2E+01	2.5E-05	4.8E-11	1.5E-09	0.0%	3.4E-09	1.3E-04	1.5%
Aroclor-1260	95.6	0.14	2.2E+00	NA	1.2E-06	2.7E-06	74.8%	8.6E-05	--	--
Arsenic	5.26	0.03	3.7E+00	1.2E-04	1.5E-08	5.3E-08	1.5%	1.0E-06	8.3E-03	94.6%
Iron	2,347	0.001	NA	4.5E-02	2.2E-07	--	--	1.5E-05	3.4E-04	3.8%
					Total ILCR:	3.7E-06	100.0%	Total HI:	8.8E-03	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT CONSTRUCTION WORKERS - FUTURE SCENARIO
INHALATION OF FUGITIVE DUSTS EMANATING FROM SURFACE SOIL - SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (Ca*RR*ET*EF*ED)/(BW*AT)
Where: Ca = C * (1/PEF)

ILCR = CDI*CSFi
HQ = CDI/RfDi

Parameter	Units	Description	Construction Worker	
CDI	mg/kg/d	Chronic daily intake	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	
CSFi	1/(mg/kg/d)	Inhalation cancer slope factor	CS	
HQ	NA	Hazard quotient	CS	
RfDi	mg/kg/d	Inhalation reference dose	CS	
Ca	mg/m3	Concentration of chemical in air as fugitive dusts	CS	
C	mg/kg	Concentration of chemical in soil	CS	
PEF	m3/kg	Particulate emission factor	1.32E+09	
RR	m3/hour	Respiration rate	0.83	
ET	hours/day	Exposure time	8	
EF	days/year	Exposure frequency	250	
ED	years	Exposure duration	1	
BW	kg	Body weight	70	
AT-C	days	Averaging time, carcinogens	25,550	
AT-N	days	Averaging time, noncarcinogens	365	

					Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	Ca (mg/m3)	CSFi 1/(mg/kg/d)	RfDi (mg/kg/d)	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	57.9	4.39E-08	NA	NA	4.1E-11	--	--	2.8E-09	--	--
Benzo(a)anthracene	4.76	3.61E-09	3.1E-01	NA	3.3E-12	1.0E-12	0.5%	2.3E-10	--	--
Benzo(a)pyrene	2.48	1.88E-09	3.1E+00	NA	1.7E-12	5.4E-12	2.7%	1.2E-10	--	--
Benzo(b)fluoranthene	2.81	2.13E-09	3.1E-01	NA	2.0E-12	6.1E-13	0.3%	1.4E-10	--	--
Benzo(k)fluoranthene	1.78	1.35E-09	3.1E-02	NA	1.3E-12	3.9E-14	0.0%	8.8E-11	--	--
Carbazole	0.95	7.20E-10	2.0E-02	NA	6.7E-13	1.3E-14	0.0%	4.7E-11	--	--
Chrysene	6.7	5.08E-09	3.1E-03	NA	4.7E-12	1.5E-14	0.0%	3.3E-10	--	--
Dibenz(a,h)anthracene	0.695	5.27E-10	3.1E+00	NA	4.9E-13	1.5E-12	0.8%	3.4E-11	--	--
Indeno(1,2,3-cd)pyrene	1.72	1.30E-09	3.1E-01	NA	1.2E-12	3.7E-13	0.2%	8.5E-11	--	--
Dieldrin	0.052	3.94E-11	1.6E+01	5.0E-05	3.7E-14	5.9E-13	0.3%	2.6E-12	5.1E-08	100.0%
Aroclor-1260	95.6	7.24E-08	2.0E+00	NA	6.7E-11	1.3E-10	67.3%	4.7E-09	--	--
Arsenic	5.26	3.98E-09	1.5E+01	NA	3.7E-12	5.6E-11	27.9%	2.6E-10	--	--
Iron	2,347	1.78E-06	NA	NA	1.7E-09	--	--	1.2E-07	--	--
					Total ILCR:	2.0E-10	100.0%	Total HI:	5.1E-08	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT CONSTRUCTION WORKERS - FUTURE SCENARIO
ACCIDENTAL INGESTION OF SUBSURFACE SOIL - SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (C*IR*CF*FI*EF*ED)/(BW*AT)
ILCR = CDI*CSFo
HQ = CDI/RfDo

Parameter	Units	Description	Construction Worker	
CDI	mg/kg/d	Chronic daily intake	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	
CSFo	1/(mg/kg/d)	Oral cancer slope factor	CS	
HQ	NA	Hazard quotient	CS	
RfDo	mg/kg/d	Oral reference dose	CS	
C	mg/kg	Concentration of chemical in soil	CS	
IR-S	mg/day	Ingestion rate of soil	480	
CF	kg/mg	Conversion factor	1.00E-06	
FI	NA	Fraction of soil ingested from site	1	
EF	days/year	Exposure frequency	250	
ED	years	Exposure duration	1	
BW	kg	Body weight	70	
AT-C	days	Averaging time, carcinogens	25,550	
AT-N	days	Averaging time, noncarcinogens	365	

Parameter	C (mg/kg)	CSFo 1/(mg/kg/d)	RfDo (mg/kg/d)	Carcinogens CDI (mg/kg/d)	Carcinogens ILCR	Carcinogens % Contrib. Total ILCR	Noncarcinogens CDI (mg/kg/d)	Noncarcinogens HQ	Noncarcinogens % Contrib. HI
2-Methylnaphthalene	6.38	NA	NA	4.3E-07	--	--	3.0E-05	--	--
Bis(2-chloroethoxy)methane	0.054	NA	NA	3.6E-09	--	--	2.5E-07	--	--
Naphthalene	0.862	NA	2.0E-02	5.8E-08	--	--	4.0E-06	2.0E-04	0.2%
Aroclor-1260	27.0	2.0E+00	NA	1.8E-06	3.6E-06	96.0%	1.3E-04	--	--
Gasoline Range Organics	580	NA	NA	3.9E-05	--	--	2.7E-03	--	--
Diesel Range Organics	5,500	NA	NA	3.7E-04	--	--	2.6E-02	--	--
Arsenic	1.50	1.5E+00	3.0E-04	1.0E-07	1.5E-07	4.0%	7.0E-06	2.3E-02	22.3%
Iron	3,007	NA	3.0E-01	2.0E-04	--	--	1.4E-02	4.7E-02	44.6%
Thallium	0.488	NA	6.6E-05	3.3E-08	--	--	2.3E-06	3.5E-02	32.9%
				Total ILCR:	3.8E-06	100.0%	Total HI:	1.1E-01	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT CONSTRUCTION WORKERS - FUTURE SCENARIO
DERMAL CONTACT WITH SUBSURFACE SOIL - SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

DAD (mg/kg/d) = (C*CF*AF*ABS*SA*EF*ED)/(BW*AT)
ILCR = CDI*CSFd
HQ = CDI/RfDd

Parameter	Units	Description	Construction Worker	
DAD	mg/kg/d	Dermally absorbed dose	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	
CSFd	1/(mg/kg/d)	Dermal cancer slope factor	CS	
HQ	NA	Hazard quotient	CS	
RfDd	mg/kg/d	Dermal reference dose	CS	
C	mg/kg	Concentration of chemical in soil	CS	
CF	kg/mg	Conversion factor	1.00E-06	
AF	mg/cm2	Soil to skin adherence factor	0.2	
ABS	NA	Absorption fraction	CS	
SA	cm2/day	Skin surface area available for contact	3,300	
EF	days/year	Exposure frequency	250	
ED	years	Exposure duration	1	
BW	kg	Body weight	70	
AT-C	days	Averaging time, carcinogens	25,550	
AT-N	days	Averaging time, noncarcinogens	365	

					Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	ABS	CSFd 1/(mg/kg/d)	RfDd (mg/kg/d)	DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	6.38	0.01	NA	NA	5.9E-09	--	--	4.1E-07	--	--
Bis(2-chloroethoxy)methane	0.054	0.1	NA	NA	5.0E-10	--	--	3.5E-08	--	--
Naphthalene	0.862	0.01	NA	1.6E-02	8.0E-10	--	--	5.6E-08	3.5E-06	0.1%
Aroclor-1260	27.0	0.14	2.2E+00	NA	3.5E-07	7.8E-07	98.1%	2.4E-05	--	--
Gasoline Range Organics	580	0.01	NA	NA	5.4E-07	--	--	3.7E-05	--	--
Diesel Range Organics	5,500	0.01	NA	NA	5.1E-06	--	--	3.6E-04	--	--
Arsenic	1.50	0.03	3.7E+00	1.2E-04	4.2E-09	1.5E-08	1.9%	2.9E-07	2.4E-03	75.8%
Iron	3,007	0.001	NA	4.5E-02	2.8E-07	--	--	1.9E-05	4.3E-04	13.8%
Thallium	0.488	0.001	NA	9.9E-06	4.5E-11	--	--	3.2E-09	3.2E-04	10.2%
					Total ILCR:	7.9E-07	100.0%	Total HI:	3.1E-03	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT CONSTRUCTION WORKERS - FUTURE SCENARIO
INHALATION OF FUGITIVE DUSTS EMANATING FROM EXCAVATED SUBSURFACE SOIL - SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (Ca*RR*ET*EF*ED)/(BW*AT)
Where: Ca = C * (1/PEF)

ILCR = CDI*CSFi
HQ = CDI/RfDi

Parameter	Units	Description	Construction Worker	
CDI	mg/kg/d	Chronic daily intake	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	
CSFi	1/(mg/kg/d)	Inhalation cancer slope factor	CS	
HQ	NA	Hazard quotient	CS	
RfDi	mg/kg/d	Inhalation reference dose	CS	
Ca	mg/m3	Concentration of chemical in air as fugitive dusts	CS	
C	mg/kg	Concentration of chemical in soil	CS	
PEF	m3/kg	Particulate emission factor	1.32E+09	
RR	m3/hour	Respiration rate	0.83	
ET	hours/day	Exposure time	8	
EF	days/year	Exposure frequency	250	
ED	years	Exposure duration	1	
BW	kg	Body weight	70	
AT-C	days	Averaging time, carcinogens	25,550	
AT-N	days	Averaging time, noncarcinogens	365	

					Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	Ca (mg/m3)	CSFi 1/(mg/kg/d)	RfDi (mg/kg/d)	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	6.38	4.83E-09	NA	NA	4.5E-12	--	--	3.1E-10	--	--
Bis(2-chloroethoxy)methane	0.054	4.09E-11	NA	NA	3.8E-14	--	--	2.7E-12	--	--
Naphthalene	0.862	6.53E-10	NA	8.6E-04	6.1E-13	--	--	4.2E-11	5.0E-08	100.0%
Aroclor-1260	27.0	2.05E-08	2.0E+00	NA	1.9E-11	3.8E-11	70.5%	1.3E-09	--	--
Gasoline Range Organics	580	4.39E-07	NA	NA	4.1E-10	--	--	2.9E-08	--	--
Diesel Range Organics	5,500	4.17E-06	NA	NA	3.9E-09	--	--	2.7E-07	--	--
Arsenic	1.50	1.14E-09	1.5E+01	NA	1.1E-12	1.6E-11	29.5%	7.4E-11	--	--
Iron	3,007	2.28E-06	NA	NA	2.1E-09	--	--	1.5E-07	--	--
Thallium	0.488	3.70E-10	NA	NA	3.4E-13	--	--	2.4E-11	--	--
					Total ILCR:	5.4E-11	100.0%	Total HI:	5.0E-08	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT CONSTRUCTION WORKERS - FUTURE SCENARIO
DERMAL CONTACT WITH GROUNDWATER IN NON-POTABLE USE SCENARIO - SITE 84 (BUILDING 45 AREA)
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

DAD (mg/kg/d) = (C*CF*Kp*SA*EF*ED*ET)/(BW*AT)

ILCR = CDI*CSFo Adj CSF Adj = CSF/AD
HQ = CDI/RfDo Adj RfD Adj = RfD*AD

Parameter	Units	Description	Construction Worker	
DAD	mg/kg/d	Dermally absorbed dose	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	
CSFd	1/(mg/kg/d)	Dermal cancer slope factor	CS	
HQ	NA	Hazard quotient	CS	
RfDd	mg/kg/d	Dermal reference dose	CS	
SA	cm2	Skin surface area available for contact	3,300	
EF	days/year	Exposure frequency	250	
ED	years	Exposure duration	1	
ET	hours/day	Exposure time	8	
BW	kg	Body weight	70	
AT-C	days	Averaging time, carcinogens	25,550	
AT-N	days	Averaging time, noncarcinogens	365	
C	mg/L	Concentration of chemical in water	CS	
CF	L/cm3	Conversion factor	1.00E-03	
Kp	cm/hour	Dermal permeability coefficient	CS	
AD	NA	Adjustment for absorbed dose	CS	

					Carcinogens			Noncarcinogens		
Parameter	C (mg/L)	Kp (cm/hour)	CSFd 1/(mg/kg/d)	RfDd (mg/kg/d)	DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI
Benzene	0.0034	0.021	5.9E-02	2.8E-03	2.6E-07	1.6E-08	3.2%	1.8E-05	6.6E-03	0.5%
Chloroform	0.016	0.0089	3.1E-02	2.0E-03	5.3E-07	1.6E-08	3.3%	3.7E-05	1.8E-02	1.4%
2-Methylnaphthalene	0.00105	0.1423	NA	NA	5.5E-07	--	--	3.9E-05	--	--
Naphthalene	0.0022	0.069	NA	1.6E-02	5.6E-07	--	--	3.9E-05	2.5E-03	0.2%
Heptachlor Epoxide	0.0000167	0.055	1.3E+01	9.4E-06	3.4E-09	4.3E-08	8.9%	2.4E-07	2.5E-02	1.9%
MCPA	0.044	0.0049	NA	2.5E-04	8.0E-07	--	--	5.6E-05	2.2E-01	16.5%
Antimony	0.011	0.001	NA	8.0E-06	4.1E-08	--	--	2.8E-06	3.6E-01	26.3%
Arsenic	0.03	0.001	3.7E+00	1.2E-04	1.1E-07	4.1E-07	84.5%	7.7E-06	6.3E-02	4.7%
Iron	67.7	0.001	NA	4.5E-02	2.5E-04	--	--	1.7E-02	3.9E-01	28.7%
Manganese	0.45	0.001	NA	9.6E-04	1.7E-06	--	--	1.2E-04	1.2E-01	9.0%
Thallium	0.0057	0.001	NA	9.9E-06	2.1E-08	--	--	1.5E-06	1.5E-01	11.0%
					Total ILCR:	4.8E-07	100.0%	Total HI:	1.4E+00	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.

ADULT CONSTRUCTION WORKERS - FUTURE SCENARIO
DERMAL CONTACT WITH SURFACE WATER - SITE 84 (BUILDING 45 AREA)
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

DAD (mg/kg/d) = (C*CF*Kp*SA*EF*ED*ET)/(BW*AT)

ILCR = CDI*CSFo Adj CSF Adj = CSF/AD
HQ = CDI/RfDo Adj RfD Adj = RfD*AD

Parameter	Units	Description	Construction Worker	
DAD	mg/kg/d	Dermally absorbed dose	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	
CSFd	1/(mg/kg/d)	Dermal cancer slope factor	CS	
HQ	NA	Hazard quotient	CS	
RfDd	mg/kg/d	Dermal reference dose	CS	
SA	cm2	Skin surface area available for contact	3,300	
EF	days/year	Exposure frequency	250	
ED	years	Exposure duration	1	
ET	hours/day	Exposure time	8	
BW	kg	Body weight	70	
AT-C	days	Averaging time, carcinogens	25,550	
AT-N	days	Averaging time, noncarcinogens	365	
C	mg/L	Concentration of chemical in water	CS	
CF	L/cm3	Conversion factor	1.00E-03	
Kp	cm/hour	Dermal permeability coefficient	CS	
AD	NA	Adjustment for absorbed dose	CS	

Parameter	C (mg/L)	Kp (cm/hour)	CSFd 1/(mg/kg/d)	RfDd (mg/kg/d)	Carcinogens DAD (mg/kg/d)	Carcinogens ILCR	Carcinogens % Contrib. Total ILCR	Noncarcinogens DAD (mg/kg/d)	Noncarcinogens HQ	Noncarcinogens % Contrib. HI
Acetone	0.0056	0.00057	NA	8.3E-02	1.2E-08	--	--	8.2E-07	9.9E-06	3.9%
Toluene	0.0027	0.045	NA	1.6E-01	4.5E-07	--	--	3.1E-05	2.0E-04	77.6%
Xylenes, total	0.0035	0.095	NA	1.8E+00	1.2E-06	--	--	8.6E-05	4.7E-05	18.5%
					Total ILCR:	--	--	Total HI:	2.5E-04	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.

ADULT CONSTRUCTION WORKERS - FUTURE SCENARIO
DERMAL CONTACT WITH SEDIMENT - SITE 84 (BUILDING 45 AREA)
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

DAD (mg/kg/d) = (C*CF*AF*ABS*SA*EF*ED)/(BW*AT)
ILCR = CDI*CSFd
HQ = CDI/RfDd

Parameter	Units	Description	Construction Worker	
DAD	mg/kg/d	Dermally absorbed dose	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	
CSFd	1/(mg/kg/d)	Dermal cancer slope factor	CS	
HQ	NA	Hazard quotient	CS	
RfDd	mg/kg/d	Dermal reference dose	CS	
C	mg/kg	Concentration of chemical in soil	CS	
CF	kg/mg	Conversion factor	1.00E-06	
AF	mg/cm2	Soil to skin adherence factor	0.2	
ABS	NA	Absorption fraction	CS	
SA	cm2/day	Skin surface area available for contact	3,300	
EF	days/year	Exposure frequency	250	
ED	years	Exposure duration	1	
BW	kg	Body weight	70	
AT-C	days	Averaging time, carcinogens	25,550	
AT-N	days	Averaging time, noncarcinogens	365	

					Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	ABS	CSFd 1/(mg/kg/d)	RfDd (mg/kg/d)	DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	10	0.01	NA	NA	9.2E-09	--	--	6.5E-07	--	--
Aroclor-1248	2.8	0.14	2.2E+00	NA	3.6E-08	8.1E-08	6.6%	2.5E-06	--	--
Aroclor-1260	40	0.14	2.2E+00	NA	5.2E-07	1.1E-06	93.4%	3.6E-05	--	--
Diesel Range Organics	11,600	0.01	NA	NA	1.1E-05	--	--	7.5E-04	--	--
					Total ILCR:	1.2E-06	100.0%	Total HI:	--	--

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.

ADULT INDUSTRIAL / COMMERCIAL WORKERS - FUTURE SCENARIO
ACCIDENTAL INGESTION OF SURFACE SOIL - SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (C*IR*CF*FI*EF*ED)/(BW*AT)
ILCR = CDI*CSFo
HQ = CDI/RfDo

Parameter	Units	Description	Industrial / Commercial Worker	
CDI	mg/kg/d	Chronic daily intake	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	
CSFo	1/(mg/kg/d)	Oral cancer slope factor	CS	
HQ	NA	Hazard quotient	CS	
RfDo	mg/kg/d	Oral reference dose	CS	
C	mg/kg	Concentration of chemical in soil	CS	
IR-S	mg/day	Ingestion rate of soil	50	
CF	kg/mg	Conversion factor	1.00E-06	
FI	NA	Fraction of soil ingested from site	1	
EF	days/year	Exposure frequency	250	
ED	years	Exposure duration	25	
BW	kg	Body weight	70	
AT-C	days	Averaging time, carcinogens	25,550	
AT-N	days	Averaging time, noncarcinogens	9,125	

Parameter	C (mg/kg)	CSFo 1/(mg/kg/d)	RfDo (mg/kg/d)	Carcinogens CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	Noncarcinogens CDI (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	1.96	NA	NA	3.4E-07	--	--	9.6E-07	--	--
Benzo(a)anthracene	69.0	7.3E-01	NA	1.2E-05	8.8E-06	8.1%	3.4E-05	--	--
Benzo(a)pyrene	30.5	7.3E+00	NA	5.3E-06	3.9E-05	35.6%	1.5E-05	--	--
Benzo(b)fluoranthene	40.9	7.3E-01	NA	7.1E-06	5.2E-06	4.8%	2.0E-05	--	--
Benzo(k)fluoranthene	18.7	7.3E-02	NA	3.3E-06	2.4E-07	0.2%	9.1E-06	--	--
Carbazole	3.16	2.0E-02	NA	5.5E-07	1.1E-08	0.0%	1.5E-06	--	--
Chrysene	96.0	7.3E-03	NA	1.7E-05	1.2E-07	0.1%	4.7E-05	--	--
Dibenz(a,h)anthracene	1.41	7.3E+00	NA	2.5E-07	1.8E-06	1.7%	6.9E-07	--	--
Fluoranthene	243	NA	4.0E-02	4.2E-05	--	--	1.2E-04	3.0E-03	0.9%
Indeno(1,2,3-cd)pyrene	8.79	7.3E-01	NA	1.5E-06	1.1E-06	1.0%	4.3E-06	--	--
Naphthalene	0.525	NA	2.0E-02	9.2E-08	--	--	2.6E-07	1.3E-05	0.0%
Pyrene	250	NA	3.0E-02	4.4E-05	--	--	1.2E-04	4.1E-03	1.2%
4,4'-DDD	3	2.4E-01	NA	5.2E-07	1.3E-07	0.1%	1.5E-06	--	--
Chlordane, alpha-	48	3.5E-01 (1)	5.0E-04 (1)	8.4E-06	2.9E-06	2.7%	2.3E-05	4.7E-02	13.7%
Chlordane, gamma-	58	3.5E-01 (1)	5.0E-04 (1)	1.0E-05	3.5E-06	3.3%	2.8E-05	5.7E-02	16.6%
Dieldrin	0.32	1.6E+01	5.0E-05	5.6E-08	8.9E-07	0.8%	1.6E-07	3.1E-03	0.9%
Heptachlor	22	4.5E+00	5.0E-04	3.8E-06	1.7E-05	15.9%	1.1E-05	2.2E-02	6.3%
Heptachlor Epoxide	4.5	9.1E+00	1.3E-05	7.9E-07	7.2E-06	6.6%	2.2E-06	1.7E-01	49.5%
Aroclor-1248	1.51	2.0E+00	NA	2.6E-07	5.3E-07	0.5%	7.4E-07	--	--
Aroclor-1254	0.975	2.0E+00	2.0E-05	1.7E-07	3.4E-07	0.3%	4.8E-07	2.4E-02	7.0%
Aroclor-1260	54.6	2.0E+00	NA	9.5E-06	1.9E-05	17.5%	2.7E-05	--	--
Gasoline Range Organics	0.207	NA	NA	3.6E-08	--	--	1.0E-07	--	--
Diesel Range Organics	470	NA	NA	8.2E-05	--	--	2.3E-04	--	--
Antimony	1.22	NA	4.0E-04	2.1E-07	--	--	6.0E-07	1.5E-03	0.4%
Arsenic	3.49	1.5E+00	3.0E-04	6.1E-07	9.2E-07	0.8%	1.7E-06	5.7E-03	1.7%
Iron	2,260	NA	3.0E-01	3.9E-04	--	--	1.1E-03	3.7E-03	1.1%
Thallium	0.31	NA	6.6E-05	5.4E-08	--	--	1.5E-07	2.3E-03	0.7%
				Total ILCR:	1.1E-04	100.0%	Total HI:	3.4E-01	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT INDUSTRIAL / COMMERCIAL WORKERS - FUTURE SCENARIO
DERMAL CONTACT WITH SURFACE SOIL - SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

DAD (mg/kg/d) = (C*CF*AF*ABS*SA*EF*ED)/(BW*AT)
ILCR = CDI*CSFd
HQ = CDI/RfDd

Parameter	Units	Description	Industrial / Commercial Worker	
DAD	mg/kg/d	Dermally absorbed dose	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	
CSFd	1/(mg/kg/d)	Dermal cancer slope factor	CS	
HQ	NA	Hazard quotient	CS	
RfDd	mg/kg/d	Dermal reference dose	CS	
C	mg/kg	Concentration of chemical in soil	CS	
CF	kg/mg	Conversion factor	1.00E-06	
AF	mg/cm2	Soil to skin adherence factor	0.2	
ABS	NA	Absorption fraction	CS	
SA	cm2/day	Skin surface area available for contact	3,300	
EF	days/year	Exposure frequency	250	
ED	years	Exposure duration	25	
BW	kg	Body weight	70	
AT-C	days	Averaging time, carcinogens	25,550	
AT-N	days	Averaging time, noncarcinogens	9,125	

					Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	ABS	CSFd 1/(mg/kg/d)	RfDd (mg/kg/d)	DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	1.96	0.01	NA	NA	4.5E-08	--	--	1.3E-07	--	--
Benzo(a)anthracene	69.0	0.13	2.4E+00	NA	2.1E-05	4.9E-05	18.1%	5.8E-05	--	--
Benzo(a)pyrene	30.5	0.13	1.5E+01	NA	9.1E-06	1.3E-04	49.7%	2.6E-05	--	--
Benzo(b)fluoranthene	40.9	0.13	1.5E+00	NA	1.2E-05	1.8E-05	6.7%	3.4E-05	--	--
Benzo(k)fluoranthene	18.7	0.13	1.5E-01	NA	5.6E-06	8.2E-07	0.3%	1.6E-05	--	--
Carbazole	3.16	0.13	4.0E-02	NA	9.5E-07	3.8E-08	0.0%	2.7E-06	--	--
Chrysene	96.0	0.13	2.4E-02	NA	2.9E-05	6.8E-07	0.3%	8.1E-05	--	--
Dibenz(a,h)anthracene	1.41	0.13	2.4E+01	NA	4.2E-07	1.0E-05	3.7%	1.2E-06	--	--
Fluoranthene	243	0.01	NA	1.2E-02	5.6E-06	--	--	1.6E-05	1.3E-03	0.8%
Indeno(1,2,3-cd)pyrene	8.79	0.13	2.4E+00	NA	2.6E-06	6.2E-06	2.3%	7.4E-06	--	--
Naphthalene	0.525	0.01	NA	1.6E-02	1.2E-08	--	--	3.4E-08	2.1E-06	0.0%
Pyrene	250	0.01	NA	9.3E-03	5.8E-06	--	--	1.6E-05	1.7E-03	1.1%
4,4'-DDD	3	0.01	3.4E-01	NA	6.9E-08	2.4E-08	0.0%	1.9E-07	--	--
Chlordane, alpha-	48	0.04	4.4E-01 (1)	4.0E-04 (1)	4.4E-06	1.9E-06	0.7%	1.2E-05	3.1E-02	19.0%
Chlordane, gamma-	58	0.04	4.4E-01 (1)	4.0E-04 (1)	5.4E-06	2.3E-06	0.9%	1.5E-05	3.7E-02	22.9%
Dieldrin	0.32	0.01	3.2E+01	2.5E-05	7.4E-09	2.4E-07	0.1%	2.1E-08	8.3E-04	0.5%
Heptachlor	22	0.01	6.3E+00	3.6E-04	5.1E-07	3.2E-06	1.2%	1.4E-06	3.9E-03	2.4%
Heptachlor Epoxide	4.5	0.01	1.3E+01	9.4E-06	1.0E-07	1.3E-06	0.5%	2.9E-07	3.1E-02	19.0%
Aroclor-1248	1.51	0.14	2.2E+00	NA	4.9E-07	1.1E-06	0.4%	1.4E-06	--	--
Aroclor-1254	0.975	0.14	2.2E+00	1.8E-05	3.1E-07	7.0E-07	0.3%	8.8E-07	4.9E-02	30.0%
Aroclor-1260	54.6	0.14	2.2E+00	NA	1.8E-05	3.9E-05	14.6%	4.9E-05	--	--
Gasoline Range Organics	0.207	0.01	NA	NA	4.8E-09	--	--	1.3E-08	--	--
Diesel Range Organics	470	0.01	NA	NA	1.1E-05	--	--	3.0E-05	--	--
Antimony	1.22	0.001	NA	8.0E-06	2.8E-09	--	--	7.9E-09	9.9E-04	0.6%
Arsenic	3.49	0.03	3.7E+00	1.2E-04	2.4E-07	8.8E-07	0.3%	6.8E-07	5.5E-03	3.4%
Iron	2,260	0.001	NA	4.5E-02	5.2E-06	--	--	1.5E-05	3.2E-04	0.2%
Thallium	0.31	0.001	NA	9.9E-06	7.1E-10	--	--	2.0E-09	2.0E-04	0.1%
					Total ILCR:	2.7E-04	100.0%	Total HI:	1.6E-01	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT INDUSTRIAL / COMMERCIAL WORKERS - FUTURE SCENARIO
INHALATION OF FUGITIVE DUSTS EMANATING FROM SURFACE SOIL - SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (Ca*RR*ET*EF*ED)/(BW*AT)
Where: Ca = C * (1/PEF)

ILCR = CDI*CSFi
HQ = CDI/RfDi

Parameter	Units	Description	Industrial / Commercial Worker	
CDI	mg/kg/d	Chronic daily intake	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	
CSFi	1/(mg/kg/d)	Inhalation cancer slope factor	CS	
HQ	NA	Hazard quotient	CS	
RfDi	mg/kg/d	Inhalation reference dose	CS	
Ca	mg/m3	Concentration of chemical in air as fugitive dusts	CS	
C	mg/kg	Concentration of chemical in soil	CS	
PEF	m3/kg	Particulate emission factor	1.32E+09	
RR	m3/hour	Respiration rate	0.83	
ET	hours/day	Exposure time	8	
EF	days/year	Exposure frequency	250	
ED	years	Exposure duration	25	
BW	kg	Body weight	70	
AT-C	days	Averaging time, carcinogens	25,550	
AT-N	days	Averaging time, noncarcinogens	9,125	

					Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	Ca (mg/m3)	CSFi 1/(mg/kg/d)	RfDi (mg/kg/d)	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	1.96	1.48E-09	NA	NA	3.4E-11	--	--	9.6E-11	--	--
Benzo(a)anthracene	69.0	5.23E-08	3.1E-01	NA	1.2E-09	3.8E-10	4.4%	3.4E-09	--	--
Benzo(a)pyrene	30.5	2.31E-08	3.1E+00	NA	5.4E-10	1.7E-09	19.4%	1.5E-09	--	--
Benzo(b)fluoranthene	40.9	3.10E-08	3.1E-01	NA	7.2E-10	2.2E-10	2.6%	2.0E-09	--	--
Benzo(k)fluoranthene	18.7	1.41E-08	3.1E-02	NA	3.3E-10	1.0E-11	0.1%	9.2E-10	--	--
Carbazole	3.16	2.39E-09	2.0E-02	NA	5.5E-11	1.1E-12	0.0%	1.6E-10	--	--
Chrysene	96.0	7.27E-08	3.1E-03	NA	1.7E-09	5.2E-12	0.1%	4.7E-09	--	--
Dibenz(a,h)anthracene	1.41	1.07E-09	3.1E+00	NA	2.5E-11	7.7E-11	0.9%	7.0E-11	--	--
Fluoranthene	243	1.84E-07	NA	4.0E-02	4.3E-09	--	--	1.2E-08	3.0E-07	0.6%
Indeno(1,2,3-cd)pyrene	8.79	6.66E-09	3.1E-01	NA	1.5E-10	4.8E-11	0.6%	4.3E-10	--	--
Naphthalene	0.525	3.98E-10	NA	8.6E-04	9.2E-12	--	--	2.6E-11	3.0E-08	0.1%
Pyrene	250	1.89E-07	NA	3.0E-02	4.4E-09	--	--	1.2E-08	4.1E-07	0.8%
4,4'-DDD	3	2.27E-09	2.4E-01	NA	5.3E-11	1.3E-11	0.1%	1.5E-10	--	--
Chlordane, alpha-	48	3.64E-08	3.5E-01 (1)	2.0E-04 (1)	8.4E-10	3.0E-10	3.4%	2.4E-09	1.2E-05	24.2%
Chlordane, gamma-	58	4.39E-08	3.5E-01 (1)	2.0E-04 (1)	1.0E-09	3.6E-10	4.2%	2.9E-09	1.4E-05	29.3%
Dieldrin	0.32	2.42E-10	1.6E+01	5.0E-05	5.6E-12	9.1E-11	1.1%	1.6E-11	3.2E-07	0.6%
Heptachlor	22	1.67E-08	4.6E+00	5.0E-04	3.9E-10	1.8E-09	20.5%	1.1E-09	2.2E-06	4.4%
Heptachlor Epoxide	4.5	3.41E-09	9.1E+00	1.3E-05	7.9E-11	7.2E-10	8.4%	2.2E-10	1.7E-05	35.0%
Aroclor-1248	1.51	1.14E-09	2.0E+00	NA	2.6E-11	5.3E-11	0.6%	7.4E-11	--	--
Aroclor-1254	0.975	7.39E-10	2.0E+00	2.0E-05	1.7E-11	3.4E-11	0.4%	4.8E-11	2.4E-06	4.9%
Aroclor-1260	54.6	4.13E-08	2.0E+00	NA	9.6E-10	1.9E-09	22.4%	2.7E-09	--	--
Gasoline Range Organics	0.207	1.57E-10	NA	NA	3.6E-12	--	--	1.0E-11	--	--
Diesel Range Organics	470	3.56E-07	NA	NA	8.3E-09	--	--	2.3E-08	--	--
Antimony	1.22	9.25E-10	NA	NA	2.1E-11	--	--	6.0E-11	--	--
Arsenic	3.49	2.65E-09	1.5E+01	NA	6.1E-11	9.3E-10	10.8%	1.7E-10	--	--
Iron	2,260	1.71E-06	NA	NA	4.0E-08	--	--	1.1E-07	--	--
Thallium	0.31	2.32E-10	NA	NA	5.4E-12	--	--	1.5E-11	--	--
					Total ILCR:	8.6E-09	100.0%	Total HI:	4.9E-05	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT INDUSTRIAL / COMMERCIAL WORKERS - FUTURE SCENARIO
ACCIDENTAL INGESTION OF SURFACE SOIL - SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (C*IR*CF*FI*EF*ED)/(BW*AT)
ILCR = CDI*CSFo
HQ = CDI/RfDo

Parameter	Units	Description	Industrial / Commercial Worker	
CDI	mg/kg/d	Chronic daily intake	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	
CSFo	1/(mg/kg/d)	Oral cancer slope factor	CS	
HQ	NA	Hazard quotient	CS	
RfDo	mg/kg/d	Oral reference dose	CS	
C	mg/kg	Concentration of chemical in soil	CS	
IR-S	mg/day	Ingestion rate of soil	50	
CF	kg/mg	Conversion factor	1.00E-06	
FI	NA	Fraction of soil ingested from site	1	
EF	days/year	Exposure frequency	250	
ED	years	Exposure duration	25	
BW	kg	Body weight	70	
AT-C	days	Averaging time, carcinogens	25,550	
AT-N	days	Averaging time, noncarcinogens	9,125	

				Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	CSFo 1/(mg/kg/d)	RfDo (mg/kg/d)	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	57.9	NA	NA	1.0E-05	--	--	2.8E-05	--	--
Benzo(a)anthracene	4.76	7.3E-01	NA	8.3E-07	6.1E-07	1.5%	2.3E-06	--	--
Benzo(a)pyrene	2.48	7.3E+00	NA	4.3E-07	3.2E-06	7.9%	1.2E-06	--	--
Benzo(b)fluoranthene	2.81	7.3E-01	NA	4.9E-07	3.6E-07	0.9%	1.4E-06	--	--
Benzo(k)fluoranthene	1.78	7.3E-02	NA	3.1E-07	2.3E-08	0.1%	8.7E-07	--	--
Carbazole	0.95	2.0E-02	NA	1.7E-07	3.3E-09	0.0%	4.6E-07	--	--
Chrysene	6.7	7.3E-03	NA	1.2E-06	8.5E-09	0.0%	3.3E-06	--	--
Dibenz(a,h)anthracene	0.695	7.3E+00	NA	1.2E-07	8.9E-07	2.2%	3.4E-07	--	--
Indeno(1,2,3-cd)pyrene	1.72	7.3E-01	NA	3.0E-07	2.2E-07	0.5%	8.4E-07	--	--
Dieldrin	0.052	1.6E+01	5.0E-05	9.1E-09	1.5E-07	0.4%	2.5E-08	5.1E-04	3.9%
Aroclor-1260	95.6	2.0E+00	NA	1.7E-05	3.3E-05	83.1%	4.7E-05	--	--
Arsenic	5.26	1.5E+00	3.0E-04	9.2E-07	1.4E-06	3.4%	2.6E-06	8.6E-03	66.4%
Iron	2,347	NA	3.0E-01	4.1E-04	--	--	1.1E-03	3.8E-03	29.7%
				Total ILCR:	4.0E-05	100.0%	Total HI:	1.3E-02	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT INDUSTRIAL / COMMERCIAL WORKERS - FUTURE SCENARIO
DERMAL CONTACT WITH SURFACE SOIL - SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

DAD (mg/kg/d) = (C*CF*AF*ABS*SA*EF*ED)/(BW*AT)
ILCR = CDI*CSFd
HQ = CDI/RfDd

Parameter	Units	Description	Industrial / Commercial Worker	
DAD	mg/kg/d	Dermally absorbed dose	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	
CSFd	1/(mg/kg/d)	Dermal cancer slope factor	CS	
HQ	NA	Hazard quotient	CS	
RfDd	mg/kg/d	Dermal reference dose	CS	
C	mg/kg	Concentration of chemical in soil	CS	
CF	kg/mg	Conversion factor	1.00E-06	
AF	mg/cm2	Soil to skin adherence factor	0.2	
ABS	NA	Absorption fraction	CS	
SA	cm2/day	Skin surface area available for contact	3,300	
EF	days/year	Exposure frequency	250	
ED	years	Exposure duration	25	
BW	kg	Body weight	70	
AT-C	days	Averaging time, carcinogens	25,550	
AT-N	days	Averaging time, noncarcinogens	9,125	

					Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	ABS	CSFd 1/(mg/kg/d)	RfDd (mg/kg/d)	DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	57.9	0.01	NA	NA	1.3E-06	--	--	3.7E-06	--	--
Benzo(a)anthracene	4.76	0.13	2.4E+00	NA	1.4E-06	3.4E-06	3.7%	4.0E-06	--	--
Benzo(a)pyrene	2.48	0.13	1.5E+01	NA	7.4E-07	1.1E-05	11.8%	2.1E-06	--	--
Benzo(b)fluoranthene	2.81	0.13	1.5E+00	NA	8.4E-07	1.2E-06	1.3%	2.4E-06	--	--
Benzo(k)fluoranthene	1.78	0.13	1.5E-01	NA	5.3E-07	7.8E-08	0.1%	1.5E-06	--	--
Carbazole	0.95	0.13	4.0E-02	NA	2.8E-07	1.1E-08	0.0%	8.0E-07	--	--
Chrysene	6.7	0.13	2.4E-02	NA	2.0E-06	4.7E-08	0.1%	5.6E-06	--	--
Dibenz(a,h)anthracene	0.695	0.13	2.4E+01	NA	2.1E-07	4.9E-06	5.4%	5.8E-07	--	--
Indeno(1,2,3-cd)pyrene	1.72	0.13	2.4E+00	NA	5.2E-07	1.2E-06	1.3%	1.4E-06	--	--
Dieldrin	0.052	0.01	3.2E+01	2.5E-05	1.2E-09	3.8E-08	0.0%	3.4E-09	1.3E-04	1.5%
Aroclor-1260	95.6	0.14	2.2E+00	NA	3.1E-05	6.9E-05	74.8%	8.6E-05	--	--
Arsenic	5.26	0.03	3.7E+00	1.2E-04	3.6E-07	1.3E-06	1.5%	1.0E-06	8.3E-03	94.6%
Iron	2,347	0.001	NA	4.5E-02	5.4E-06	--	--	1.5E-05	3.4E-04	3.8%
					Total ILCR:	9.2E-05	100.0%	Total HI:	8.8E-03	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT INDUSTRIAL / COMMERCIAL WORKERS - FUTURE SCENARIO
INHALATION OF FUGITIVE DUSTS EMANATING FROM SURFACE SOIL - SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (Ca*RR*ET*EF*ED)/(BW*AT)
Where: Ca = C * (1/PEF)

ILCR = CDI*CSFi
HQ = CDI/RfDi

Parameter	Units	Description	Industrial / Commercial Worker	
CDI	mg/kg/d	Chronic daily intake	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	
CSFi	1/(mg/kg/d)	Inhalation cancer slope factor	CS	
HQ	NA	Hazard quotient	CS	
RfDi	mg/kg/d	Inhalation reference dose	CS	
Ca	mg/m3	Concentration of chemical in air as fugitive dusts	CS	
C	mg/kg	Concentration of chemical in soil	CS	
PEF	m3/kg	Particulate emission factor	1.32E+09	
RR	m3/hour	Respiration rate	0.83	
ET	hours/day	Exposure time	8	
EF	days/year	Exposure frequency	250	
ED	years	Exposure duration	25	
BW	kg	Body weight	70	
AT-C	days	Averaging time, carcinogens	25,550	
AT-N	days	Averaging time, noncarcinogens	9,125	

					Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	Ca (mg/m3)	CSFi 1/(mg/kg/d)	RfDi (mg/kg/d)	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	57.9	4.39E-08	NA	NA	1.0E-09	--	--	2.8E-09	--	--
Benzo(a)anthracene	4.76	3.61E-09	3.1E-01	NA	8.4E-11	2.6E-11	0.5%	2.3E-10	--	--
Benzo(a)pyrene	2.48	1.88E-09	3.1E+00	NA	4.4E-11	1.3E-10	2.7%	1.2E-10	--	--
Benzo(b)fluoranthene	2.81	2.13E-09	3.1E-01	NA	4.9E-11	1.5E-11	0.3%	1.4E-10	--	--
Benzo(k)fluoranthene	1.78	1.35E-09	3.1E-02	NA	3.1E-11	9.7E-13	0.0%	8.8E-11	--	--
Carbazole	0.95	7.20E-10	2.0E-02	NA	1.7E-11	3.3E-13	0.0%	4.7E-11	--	--
Chrysene	6.7	5.08E-09	3.1E-03	NA	1.2E-10	3.7E-13	0.0%	3.3E-10	--	--
Dibenz(a,h)anthracene	0.695	5.27E-10	3.1E+00	NA	1.2E-11	3.8E-11	0.8%	3.4E-11	--	--
Indeno(1,2,3-cd)pyrene	1.72	1.30E-09	3.1E-01	NA	3.0E-11	9.4E-12	0.2%	8.5E-11	--	--
Dieldrin	0.052	3.94E-11	1.6E+01	5.0E-05	9.1E-13	1.5E-11	0.3%	2.6E-12	5.1E-08	100.0%
Aroclor-1260	95.6	7.24E-08	2.0E+00	NA	1.7E-09	3.4E-09	67.3%	4.7E-09	--	--
Arsenic	5.26	3.98E-09	1.5E+01	NA	9.2E-11	1.4E-09	27.9%	2.6E-10	--	--
Iron	2,347	1.78E-06	NA	NA	4.1E-08	--	--	1.2E-07	--	--
					Total ILCR:	5.0E-09	100.0%	Total HI:	5.1E-08	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT INDUSTRIAL / COMMERCIAL WORKERS - FUTURE SCENARIO
INGESTION OF GROUNDWATER - SITE 84 (BUILDING 45 AREA)
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (C*IR*EF*ED)/(BW*AT)
ILCR = CDI*CSFo
HQ = CDI/RfDo

Parameter	Units	Description	Industrial / Commercial Worker	
CDI	mg/kg/d	Chronic daily intake	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	
CSFo	1/(mg/kg/d)	Oral cancer slope factor	CS	
HQ	NA	Hazard quotient	CS	
RfDo	mg/kg/d	Oral reference dose	CS	
C	mg/L	Concentration of chemical in water	CS	
IR-W	L/day	Ingestion rate of water	2	
EF	days/year	Exposure frequency	250	
ED	years	Exposure duration	25	
BW	kg	Body weight	70	
AT-C	days	Averaging time, carcinogens	25,550	
AT-N	days	Averaging time, noncarcinogens	9,125	

Parameter	C (mg/L)	CSFo 1/(mg/kg/d)	RfDo (mg/kg/d)	Carcinogens CDI (mg/kg/d)	Carcinogens ILCR	Carcinogens % Contrib. Total ILCR	Noncarcinogens CDI (mg/kg/d)	Noncarcinogens HQ	Noncarcinogens % Contrib. HI
Benzene	0.0034	5.5E-02	3.0E-03	2.4E-05	1.3E-06	0.4%	6.7E-05	2.2E-02	0.2%
Chloroform	0.016	6.1E-03	1.0E-02	1.1E-04	6.8E-07	0.2%	3.1E-04	3.1E-02	0.3%
2-Methylnaphthalene	0.00105	NA	NA	7.3E-06	--	--	2.1E-05	--	--
Naphthalene	0.0022	NA	2.0E-02	1.5E-05	--	--	4.3E-05	2.2E-03	0.0%
Heptachlor Epoxide	0.0000167	9.1E+00	1.3E-05	1.2E-07	1.1E-06	0.3%	3.3E-07	2.5E-02	0.2%
MCPA	0.044	NA	5.0E-04	3.1E-04	--	--	8.6E-04	1.7E+00	16.0%
Antimony	0.011	NA	4.0E-04	7.7E-05	--	--	2.2E-04	5.4E-01	5.0%
Arsenic	0.03	1.5E+00	3.0E-04	2.1E-04	3.1E-04	99.0%	5.9E-04	2.0E+00	18.2%
Iron	67.7	NA	3.0E-01	4.7E-01	--	--	1.3E+00	4.4E+00	41.0%
Manganese	0.45	NA	2.4E-02	3.1E-03	--	--	8.8E-03	3.7E-01	3.4%
Thallium	0.0057	NA	6.6E-05	4.0E-05	--	--	1.1E-04	1.7E+00	15.7%
				Total ILCR:	3.2E-04	100.0%	Total HI:	1.1E+01	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.

ADULT INDUSTRIAL / COMMERCIAL WORKERS - FUTURE SCENARIO
DERMAL CONTACT WITH GROUNDWATER - SITE 84 (BUILDING 45 AREA)
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

DAD (mg/kg/d) = (C*CF*Kp*SA*EF*ED*ET)/(BW*AT)

ILCR = CDI*CSFo Adj CSF Adj = CSF/AD
HQ = CDI/RfDo Adj RfD Adj = RfD*AD

Parameter	Units	Description	Industrial / Commercial Worker	
DAD	mg/kg/d	Dermally absorbed dose	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	
CSFd	1/(mg/kg/d)	Dermal cancer slope factor	CS	
HQ	NA	Hazard quotient	CS	
RfDd	mg/kg/d	Dermal reference dose	CS	
SA	cm2	Skin surface area available for contact	18,000	
EF	days/year	Exposure frequency	250	
ED	years	Exposure duration	25	
ET	hours/day	Exposure time	0	
BW	kg	Body weight	70	
AT-C	days	Averaging time, carcinogens	25,550	
AT-N	days	Averaging time, noncarcinogens	9,125	
C	mg/L	Concentration of chemical in water	CS	
CF	L/cm3	Conversion factor	1.00E-03	
Kp	cm/hour	Dermal permeability coefficient	CS	
AD	NA	Adjustment for absorbed dose	CS	

					Carcinogens			Noncarcinogens		
Parameter	C (mg/L)	Kp (cm/hour)	CSFd 1/(mg/kg/d)	RfDd (mg/kg/d)	DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI
Benzene	0.0034	0.021	5.9E-02	2.8E-03	1.1E-06	6.6E-08	3.2%	3.1E-06	1.1E-03	0.5%
Chloroform	0.016	0.0089	3.1E-02	2.0E-03	2.2E-06	6.8E-08	3.3%	6.3E-06	3.1E-03	1.4%
2-Methylnaphthalene	0.00105	0.1423	NA	NA	2.3E-06	--	--	6.6E-06	--	--
Naphthalene	0.0022	0.069	NA	1.6E-02	2.4E-06	--	--	6.7E-06	4.2E-04	0.2%
Heptachlor Epoxide	0.0000167	0.055	1.3E+01	9.4E-06	1.4E-08	1.8E-07	8.9%	4.0E-08	4.3E-03	1.9%
MCPA	0.044	0.0049	NA	2.5E-04	3.4E-06	--	--	9.5E-06	3.8E-02	16.5%
Antimony	0.011	0.001	NA	8.0E-06	1.7E-07	--	--	4.8E-07	6.1E-02	26.3%
Arsenic	0.03	0.001	3.7E+00	1.2E-04	4.7E-07	1.7E-06	84.5%	1.3E-06	1.1E-02	4.7%
Iron	67.7	0.001	NA	4.5E-02	1.1E-03	--	--	3.0E-03	6.6E-02	28.7%
Manganese	0.45	0.001	NA	9.6E-04	7.1E-06	--	--	2.0E-05	2.1E-02	9.0%
Thallium	0.0057	0.001	NA	9.9E-06	9.0E-08	--	--	2.5E-07	2.5E-02	11.0%
					Total ILCR:	2.0E-06	100.0%	Total HI:	2.3E-01	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.

ADULT INDUSTRIAL / COMMERCIAL WORKERS - FUTURE SCENARIO
INHALATION OF VOLATILES IN GROUNDWATER EMANATING FROM SHOWER WATER - SITE 84 (BUILDING 45 AREA)
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (Ca*RR*ET*EF*ED)/(BW*AT)
Where: Ca = Shower Model

ILCR = CDI*CSFi
HQ = CDI/RfDi

Parameter	Units	Description	Industrial / Commercial Worker	
CDI	mg/kg/d	Chronic daily intake	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	
CSFi	1/(mg/kg/d)	Inhalation cancer slope factor	CS	
HQ	NA	Hazard quotient	CS	
RfDi	mg/kg/d	Inhalation reference dose	CS	
C	mg/L	Concentration of chemical in groundwater	CS	
Ca	mg/m3	Concentration of chemical in shower water Calculated using shower model	CS	
RR	m3/hour	Respiration rate	0.83	
ET	hours/day	Exposure time	0.25	
EF	days/year	Exposure frequency	250	
ED	years	Exposure duration	25	
BW	kg	Body weight	70	
AT-C	days	Averaging time, carcinogens	25,550	
AT-N	days	Averaging time, noncarcinogens	9,125	

Parameter	C (mg/L)	Shower Ca (mg/m3)	CSFi 1/(mg/kg/d)	RfDi (mg/kg/d)	Carcinogens CDI (mg/kg/d)	Carcinogens ILCR	Carcinogens % Contrib. Total ILCR	Noncarcinogens CDI (mg/kg/d)	Noncarcinogens HQ	Noncarcinogens % Contrib. HI
Benzene	0.0034	4.81E-03	2.7E-02	1.7E-03	3.5E-06	9.4E-08	8.2%	9.8E-06	5.7E-03	1.3%
Chloroform	0.016	1.80E-02	8.1E-02	8.6E-05	1.3E-05	1.1E-06	91.8%	3.7E-05	4.3E-01	98.7%
					Total ILCR:	1.1E-06	100.0%	Total HI:	4.3E-01	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.

ORAL ABSORPTION EFFICIENCIES TABLE

Table 6. Dermal risk values derived by calculation from gastrointestinal (GI) absorption data in chemical order

	CAS Number	GI Absorption Factor (%)[a]	GI Absorption Reference	Oral RfD (mg/kg/day)		Oral Slope Factor (mg/kg/day)$^{-1}$	Dermal RfD (mg/kg/day)		Dermal Slope Factor (mg/kg/day)$^{-1}$
				Chronic	Subchronic		Chronic	Subchronic	
Acenaphthene	000083-32-9	31	2	6.00E-02 [b]	6.00E-01 [c]	NA	1.86E-02	1.86E-01	NA
Acenaphthylene	000208-96-8	31	2	NA	NA	NA	NA	NA	NA
Acetone	000067-64-1	83	3	1.00E-01 [b]	1.00E+00 [c]	NA	8.30E-02	8.30E-01	NA
Aldrin	000309-00-2	50	65	3.00E-05 [b]	3.00E-05 [c]	1.70E+01 [b]	1.50E-05	1.50E-05	3.40E+01
Aluminum	007429-90-5	10	4,5	NA	NA	NA	NA	NA	NA
Anthracene	000120-12-7	76	6	3.00E-01 [b]	3.00E+00 [c]	NA	2.28E-01	2.28E+00	NA
Antimony (metallic)	007440-36-0	20	7	4.00E-04 [b]	4.00E-04 [c]	NA	8.00E-06	8.00E-06	NA
Aroclor 1016	012674-11-2	90	46	7.00E-05 [b]	NA	NA	6.30E-05	NA	NA
Aroclor 1254	011097-69-1	90	46	2.00E-05 [b]	5.00E-05 [c]	NA	1.80E-05	4.50E-05	NA
Aroclor 1260	011096-82-5	90	46	NA	NA	NA	NA	NA	NA
Arsenic Salts	NA	90	26	NA	NA	NA	NA	NA	NA
Arsenic, Inorganic	007440-38-2	41	8	3.00E-04 [b]	3.00E-04 [c]	1.50E+00 [b]	1.23E-04	1.23E-04	3.66E+00
Barium	007440-39-3	7.0	9	7.00E-02 [b]	7.00E-02 [c]	NA	4.90E-03	4.90E-03	NA
Benz[a]anthracene	000056-55-3	31	2	NA	NA	NA	NA	NA	NA
Benzene	000071-43-2	97	10	NA	NA	2.90E-02 [b]	NA	NA	2.99E-02
Benzene Hexachloride	NA	97	10	NA	NA	NA	NA	NA	NA
Benzene, Ethyldimethyl	NA	97	10	NA	NA	NA	NA	NA	NA
Benzene, Ethylmethyl	NA	97	10	NA	NA	NA	NA	NA	NA
Benzene, Methylisopropenyl	NA	97	10	NA	NA	NA	NA	NA	NA
Benzene, Methylpropyl	NA	97	10	NA	NA	NA	NA	NA	NA
Benzene, Trimethyl	025551-13-7	97	10	NA	NA	NA	NA	NA	NA

d by calculation
ata in chemical order

Oral Slope Factor (mg/kg/day)$^{-1}$	Dermal RfD (mg/kg/day)		Dermal Slope Factor (mg/kg/day)$^{-1}$
	Chronic	Subchronic	
2.30E+02 [b]	2.40E-01	2.40E-01	2.85E+02
2.30E+00 [b]	NA	NA	2.35E+01
NA	NA	NA	NA
NA	NA	NA	NA
NA	NA	NA	NA
NA	4.00E+00	4.00E+00	NA
NA	1.98E-01	6.60E-01	NA
4.30E+00 [b]	5.00E-05	5.00E-05	4.30E+02
1.40E-02 [b]	3.80E-03	3.80E-03	3.33E-02
NA	8.10E-02	8.10E-02	NA
6.20E-02 [b]	1.96E-02	1.96E-02	6.33E-02
3.90E-01 [b]	1.26E-02	1.26E-01	1.32E-02
NA	NA	NA	NA
NA	1.22E-01	1.22E+00	NA
NA	1.50E-05	NA	NA
NA	5.00E-06	NA	NA
2.90E-02 [c]	NA	NA	7.84E-02
NA	6.30E-02	6.30E-02	NA
1.30E-01 [b]	4.55E-03	4.55E-03	2.60E-01
1.30E+00 [b]	3.60E-05	3.90E-05	2.60E+00
NA	NA	NA	NA

Table 6. Dermal risk values derived by calculation from gastrointestinal (GI) absorption data in chemical order

Chemical	CAS Number	GI Absorption Factor (%)[a]	GI Absorption Reference	Oral RfD (mg/kg/day)		Oral Slope Factor (mg/kg/day)$^{-1}$	Dermal RfD (mg/kg/day)		Dermal Slope Factor (mg/kg/day)$^{-1}$
				Chronic	Subchronic		Chronic	Subchronic	
Chlorobenzene	000108-90-7	31	23	2.00E-02 [b]	2.00E-01 [c]	NA	6.20E-03	6.20E-02	NA
Chloroform	000067-66-3	20	24	1.00E-02 [b]	1.00E-02 [c]	6.10E-03 [b]	2.00E-03	2.00E-03	3.05E-02
Chromium (III) (Insoluble Salts)	016065-83-1	0.50	78	1.00E+00 [b]	1.00E+00 [c]	NA	5.00E-03	5.00E-03	NA
Chromium (VI)	018540-29-9	2.0	25	5.00E-03 [b]	2.00E-02 [c]	NA	1.00E-04	4.00E-04	NA
Chromium Salts	NA	2.0	78	NA	NA	NA	NA	NA	NA
Chrysene	000218-01-9	31	2	NA	NA	NA	NA	NA	NA
Cobalt	007440-48-4	80	26	NA	NA	NA	NA	NA	NA
Copper	007440-50-8	30	27	NA	NA	NA	NA	NA	NA
Cresol, p-	000106-44-5	65	72	5.00E-03 [c]	5.00E-03 [c]	NA	3.25E-03	3.25E-03	NA
Cyanide (CN-)	000057-12-5	17	37	2.00E-02 [b]	2.00E-02 [c]	NA	3.40E-03	3.40E-03	NA
DDD	000072-54-8	70	28	NA	NA	2.40E-01 [b]	NA	NA	3.43E-01
DDE	000072-55-9	70	28	NA	NA	3.40E-01 [b]	NA	NA	4.86E-01
DDT	000050-29-3	70	28	5.00E-04 [b]	5.00E-04 [c]	3.40E-01 [b]	3.50E-04	3.50E-04	4.86E-01
Dibenz[a,h]anthracene	000053-70-3	31	2	NA	NA	NA	NA	NA	NA
Dibromochloromethane	000124-48-1	60	69	2.00E-02 [b]	2.00E-01 [c]	8.40E-02 [b]	1.20E-02	1.20E-01	1.40E-01
Dibutyl Phthalate	000084-74-2	100	29	1.00E-01 [b]	1.00E+00 [c]	NA	1.00E-01	NA	NA
Dichlorobenzene, 1,4-	000106-46-7	90	82	NA	NA	2.40E-02 [c]	NA	NA	2.67E-02
Dichlorodifluoromethane	000075-71-8	23	12	2.00E-01 [c]	9.00E-01 [c]	NA	4.60E-02	2.07E-01	NA
Dichloroethane, 1,1-	000075-34-3	100	80	1.00E-01 [c]	1.00E+00 [c]	NA	1.00E-01	NA	NA
Dichloroethane, 1,2-	000107-06-2	100	30	NA	NA	9.10E-02 [b]	NA	NA	9.10E-02
Dichloroethylene, 1,1-	000075-35-4	100	31	9.00E-03 [b]	9.00E-03 [c]	6.00E-01 [b]	9.00E-03	9.00E-03	6.00E-01

Table 6. Dermal risk values derived by calculation from gastrointestinal (GI) absorption data in chemical order

Chemical	CAS Number	GI Absorption Factor (%)[a]	GI Absorption Reference	Oral RfD (mg/kg/day)		Oral Slope Factor (mg/kg/day)$^{-1}$	Dermal RfD (mg/kg/day)		Dermal Slope Factor (mg/kg/day)$^{-1}$
				Chronic	Subchronic		Chronic	Subchronic	
Dichloroethylene, 1,2-cis-	000156-59-2	100	83	1.00E-02[c]	1.00E-01[c]	NA	1.00E-02	1.00E-01	NA
Dichloroethylene, 1,2-trans-	000156-60-5	100	83	2.00E-02[b]	2.00E-01[c]	NA	2.00E-02	2.00E-01	NA
Dichlorophenol, 2,4-	000120-83-2	82	81	3.00E-03[b]	3.00E-03[c]	NA	2.46E-03	2.46E-03	NA
Dichloropropane, 1,2-	000078-87-5	74	68	NA	NA	6.80E-02[c]	NA	NA	9.19E-02
Dichloropropene, 1,3-	000542-75-6	55	73	3.00E-04[b]	3.00E-03[c]	1.80E-01[c]	1.65E-04	1.65E-03	3.27E-01
Dieldrin	000060-57-1	50	65	5.00E-05[b]	5.00E-05[c]	1.60E+01[b]	2.50E-05	2.50E-05	3.20E+01
Diethyl Phthalate	000084-66-2	90	79	8.00E-01[b]	8.00E+00[c]	NA	7.20E-01	7.20E+00	NA
Dimethylphthalate	000131-11-3	90	79	NA	NA	NA	NA	NA	NA
Dinitro-o-cresol, 4,6-	000534-52-1	100	12	NA	NA	NA	NA	NA	NA
Dinitrobenzene, 1,2-	000528-29-0	93	32	4.00E-04[c]	4.00E-03[c]	NA	3.72E-04	3.72E-03	NA
Dinitrobenzene, 1,3-	000099-65-0	65	32	1.00E-04[b]	1.00E-03[c]	NA	6.50E-05	6.50E-04	NA
Dinitrophenol, 2,4-	000051-28-5	100	81	2.00E-03[b]	2.00E-03[c]	NA	2.00E-03	2.00E-03	NA
Dinitrotoluene, 2,4-	000121-14-2	85	33	2.00E-03[b]	2.00E-03[c]	6.80E-01[b,d]	1.70E-03	1.70E-03	8.00E-01
Dinitrotoluene, 2,6-	000606-20-2	85	33	1.00E-03[c]	1.00E-02[c]	6.80E-01[b,d]	8.50E-04	8.50E-03	8.00E-01
Dinitrotoluene, 2-Amino-4,6-	035572-78-2	50	85	NA	NA	NA	NA	NA	NA
Endrin	000072-20-8	2.0	77	3.00E-04[b]	3.00E-04[c]	NA	6.00E-06	6.00E-06	NA
Ethylbenzene	000100-41-4	97	10	1.00E-01[b]	NA	NA	9.70E-02	NA	NA
Fluoranthene	000206-44-0	31	2	4.00E-02[b]	4.00E-01[c]	NA	1.24E-02	1.24E-01	NA
Fluoride	007782-41-4	97	34	6.00E-02[b]	6.00E-02[c]	NA	5.82E-02	5.82E-02	NA
Heptachlor	000076-44-8	72	35	5.00E-04[b]	5.00E-04[c]	4.50E+00[b]	3.60E-04	3.60E-04	6.25E+00
Heptachlor Epoxide	001024-57-3	72	35	1.30E-05[b]	1.30E-05[c]	9.10E+00[b]	9.36E-06	9.36E-06	1.26E+01

Table 6. Dermal risk values derived by calculation from gastrointestinal (GI) absorption data in chemical order

Chemical	CAS Number	GI Absorption Factor (%)[a]	GI Absorption Reference	Oral RfD (mg/kg/day)		Oral Slope Factor (mg/kg/day)$^{-1}$	Dermal RfD (mg/kg/day)		Dermal Slope Factor (mg/kg/day)$^{-1}$
				Chronic	Subchronic		Chronic	Subchronic	
Hexachlorocyclohexane, Alpha-	000319-84-6	97	70	NA	NA	6.30E+00[b]	NA	NA	6.49E+00
Hexachlorocyclohexane, Beta-	000319-85-7	91	70	NA	NA	1.80E+00[b]	NA	NA	1.98E+00
Hexachlorocyclohexane, Gamma-	000058-89-9	97	10	3.00E-04[b]	3.00E-03[c]	1.30E+00[c]	2.91E-04	2.91E-03	1.34E+00
Hexahydro-1,3,5-trinitro-1,3,5-triazine	000121-82-4	100	92	3.00E-03[b]	3.00E-03[c]	1.10E-01[b]	3.00E-03	3.00E-03	1.10E-01
Hexane, N-	000110-54-3	80	85	6.00E-02[c]	6.00E-01[c]	NA	4.80E-02	4.80E-01	NA
Hexanone, 2-	000591-78-6	66	36	NA	NA	NA	NA	NA	NA
Hydrogen Cyanide	000074-90-8	17	37	2.00E-02[b]	NA	NA	3.40E-03	NA	NA
Indeno[1,2,3-cd]pyrene	000193-39-5	31	2	NA	NA	NA	NA	NA	NA
Iron	007439-89-6	15	26	NA	NA	NA	NA	NA	NA
Isopropanol	000067-63-0	100	12	NA	NA	NA	NA	NA	NA
Lead And Compounds	007439-92-1	15	26	NA	NA	NA	NA	NA	NA
Lithium	007439-93-2	80	26	NA	NA	NA	NA	NA	NA
Magnesium	007439-95-4	20	26	NA	NA	NA	NA	NA	NA
Manganese (Diet)	007439-96-5	4.0	38	1.40E-01[b]	1.40E-01[c]	NA	5.60E-03	5.60E-03	NA
Manganese (Water)	007439-96-5	4.0	38	1.40E-01[b]	5.00E-03[c]	NA	5.60E-03	2.00E-04	NA
Mercury (elemental)	007439-97-6	0.01	26, 39	3.00E-04[c]	3.00E-04[c]	NA	3.00E-08	3.00E-08	NA
Mercury, Inorganic Salts	VARIOUS	7.0	26	NA	NA	NA	NA	NA	NA
Methyl Ethyl Ketone	000078-93-3	80	1	6.00E-01[b]	2.00E+00[c]	NA	4.80E-01	1.60E+00	NA
Methyl Isobutyl Ketone	000108-10-1	80	1	8.00E-02[c]	8.00E-01[c]	NA	6.40E-02	6.40E-01	NA
Methyl Mercury	022967-92-6	90	26, 39, 40	1.00E-04[b]	1.00E-04[c]	NA	9.00E-05	9.00E-05	NA
Methyl-5-Nitroaniline, 2-	000099-55-8	50	85	NA	NA	3.30E-02[c]	NA	NA	6.60E-02

Table 6. Dermal risk values derived by calculation from gastrointestinal (GI) absorption data in chemical order

Chemical	CAS Number	GI Absorption Factor (%)[a]	GI Absorption Reference	Oral RfD (mg/kg/day)		Oral Slope Factor $(mg/kg/day)^{-1}$	Dermal RfD (mg/kg/day)		Dermal Slope Factor $(mg/kg/day)^{-1}$
				Chronic	Subchronic		Chronic	Subchronic	
Pyrene	000129-00-0	31	2	3.00E-02[b]	3.00E-01[c]	NA	9.30E-03	9.30E-02	NA
Radium 226	013982-63-3	20	88	NA	NA	NA	NA	NA	NA
Radium 228	015262-20-1	20	88	NA	NA	NA	NA	NA	NA
Selenious Acid	007783-00-8	87	47	5.00E-03[b]	5.00E-03[c]	NA	4.35E-03	4.35E-03	NA
Selenite	014124-67-5	70	48	NA	NA	NA	NA	NA	NA
Selenium	007782-49-2	44	47	5.00E-03[b]	5.00E-03[c]	NA	2.20E-03	2.20E-03	NA
Silver	007440-22-4	18	49	5.00E-03[b]	5.00E-03[c]	NA	9.00E-04	9.00E-04	NA
Sodium	007440-23-5	100	91	NA	NA	NA	NA	NA	NA
Strontium-90	010098-97-2	16	84	NA	NA	NA	NA	NA	NA
Sulfate	014808-79-8	20	50	NA	NA	NA	NA	NA	NA
TCDD, 2,3,7,8-	001746-01-6	50	93	NA	NA	1.50E+05[c]	NA	NA	3.00E+05
Tetrachloroethane, 1,1,2,2-	000079-34-5	70	51	NA	NA	2.00E-01[b]	NA	NA	2.86E-01
Tetrachloroethylene	000127-18-4	100	63	1.00E-02[b]	1.00E-01[c]	NA	1.00E-02	1.00E-01	NA
Thallium	007440-28-0	15	52	NA	NA	NA	NA	NA	NA
Thorium	007440-29-1	1.0	53	NA	NA	NA	NA	NA	NA
Tin	007440-31-5	10	26	6.00E-01[c]	6.00E-01[c]	NA	6.00E-02	6.00E-02	NA
Titanium	007440-32-6	3.0	26	NA	NA	NA	NA	NA	NA
Toluene	000108-88-3	80	54	2.00E-01[b]	2.00E+00[c]	NA	1.60E-01	1.60E+00	NA
Trichlorobenzene, 1,2,4-	000120-82-1	97	89	1.00E-02[b]	1.00E-02[c]	NA	9.70E-03	9.70E-03	NA
Trichloroethane, 1,1,1-	000071-55-6	90	55	NA	NA	NA	NA	NA	NA
Trichloroethane, 1,1,2-	000079-00-5	81	56	4.00E-03[b]	4.00E-02[c]	5.70E-02[b]	3.24E-03	3.24E-02	7.04E-02

Table 6. Dermal risk values derived by calculation from gastrointestinal (GI) absorption data in chemical order

Chemical	CAS Number	GI Absorption Factor (%)[a]	GI Absorption Reference	Oral RfD (mg/kg/day)		Oral Slope Factor (mg/kg/day)$^{-1}$	Dermal RfD (mg/kg/day)		Dermal Slope Factor (mg/kg/day)$^{-1}$
				Chronic	Subchronic		Chronic	Subchronic	
Trichloroethylene	000079-01-6	15	57	NA	NA	NA	NA	NA	NA
Trichlorofluoromethane	000075-69-4	23	12	3.00E-01 [b]	7.00E-01 [c]	NA	6.90E-02	1.61E-01	NA
Trinitrobenzene, 1,3,5-	000099-35-4	65	32	5.00E-05 [b]	5.00E-04 [c]	NA	3.25E-05	3.25E-04	NA
Trinitrophenylmethylnitramine	000479-45-8	50	85	1.00E-02 [c]	1.00E-01 [c]	NA	5.00E-03	5.00E-02	NA
Trinitrotoluene, 2,4,6-	000118-96-7	60	87	5.00E-04 [b]	5.00E-04 [c]	3.00E-02 [b]	3.00E-04	3.00E-04	5.00E-02
Uranium	007440-61-1	85	26	NA	NA	NA	NA	NA	NA
Uranium (Soluble Salts)	NA	85	26	3.00E-03 [b]	NA	NA	2.55E-03	NA	NA
Vanadium, Metallic	007440-62-2	1.0	58, 59	7.00E-03 [c]	7.00E-03 [c]	NA	7.00E-05	7.00E-05	NA
Vinyl Acetate	000108-05-4	65	60	1.00E+00 [c]	1.00E+00 [c]	NA	6.50E-01	6.50E-01	NA
Vinyl Chloride	000075-01-4	100	66	NA	NA	1.90E+00 [c]	NA	NA	1.90E+00
Xylene, Mixture	001330-20-7	92	61	2.00E+00 [b]	NA	NA	1.84E+00	NA	NA
Zinc (Metallic)	007440-66-6	20	62	3.00E-01 [b]	3.00E-01 [c]	NA	6.00E-02	6.00E-02	NA
Zirconium	007440-67-7	80	12	NA	NA	NA	NA	NA	NA

[a] GI absoprtion factors obtained from literature by BEIA staff
[b] Source: Integrated Risk Information System (IRIS)
[c] Source: Health and Environmental Affects Summary Table (HEAST) 1995
[d] Listed as "Dinitrotoluene mixture, 2,4-/2,6-" in IRIS. The value is based on a study using technical grade DNT.
[e] Interim U.S. EPA Region IV default value

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Reference Number	Reference
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SHOWER MODEL RESULTS

ADULT AND YOUNG CHILD (AGES 1 TO 6 YEARS) RESIDENTS - FUTURE SCENARIO
RESULTING FROM SHOWERING WITH WATER CONTAINING VOLATILE CONSTITUENTS OF INTEREST*
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA)
MCB, CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

(1) Estimation of overall mass transfer coefficient, KL (cm/hr):

$$KL = 1/(1/kl + RT/Hkg),$$

where

H = Henry's Law Constant (atm-m3/mol-K);
RT = product of ideal gas constant (8.2E-5atm-m3/mol-K) and absolute temperature (293K) = 0.024 atm-m3/mole;
kl = VOC-specific liquid-film mass transfer coefficient (cm/hr); and = kl(CO2)*(44/MWvoc)^0.5; and
kg = VOC-specific gas-film mass transfer coefficient (cm/hr) kl(H2O)*(18/MWvoc)^0.5

where

kl(CO2) = 20 cm/hr
kl(H2O) = 3000 cm/hr
MWvoc = Molecular weight of VOC.

(2) Adjustment of overall mass transfer coefficient, KL, to shower water temperature:

$$KaL = KL[(Tc*us)/(Ts*uc)]^{-0.5}$$

where

KaL = adjusted overall mass transfer coefficient (cm/hr);
Tc = calibration water temperature of KL (K);
uc = water viscosity at Tc (cp); and
us = water viscosity at Ts (cp).

(3) Estimation of VOC concentration leaving shower droplet, Cwd (ug/L):

$$Cwd = Cw[1-exp((-KaL*ts)/60d)]$$

where

Cw = shower water concentrations (ug;L);
d = shower droplet diameter (mm); and
ts = shower droplet drop time (sec).

(4) Estimation of VOC generation rate in the shower room,

S (ug/m3-min):

$$S = (Cwd*FR)/SV$$

where

FR = shower water flow rate (L/min); and
SV = shower room air volume (m3).

(5) Calculation of time-dependent indoor air concentration, Ca(t) (ug/m3):

$$Ca(t) = (S/R)[wxp(RDs)-1]*exp(-Rt) \text{ for } t>Ds$$

where

Ds = shower duration (min); and
t = time (min).

* Chrostowski, Foster, 1987.

ADULT AND YOUNG CHILD (AGES 1 TO 6 YEARS) RESIDENTS - FUTURE SCENARIO
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REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA)
MCB, CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

(1) Estimation of overall mass transfer coefficient, KL (cm/hr):

$$KL = 1/(1/kl + RT/Hkg),$$

COPC	kl(CO2) (cm/hr)	kg(H2O) (cm/hr)	MW (g/mol)	kl (cm/hr)	kg (cm/hr)	RT (atm-m3/mol)	H atm-m3/mol-K	KL (cm/hr)
Benzene	20	3000	78.11364	15.01	1440.10	0.024	0.00555	14.36
Chloroform	20	3000	119.37704	12.14	1164.92	0.024	0.00367	11.37

(2) Adjustment of overall mass transfer coefficient, KL, to shower water temperature:

$$KaL = KL[(Tc*us)/(Ts*uc)]^{-0.5}$$

COPC	KL (cm/hr)	Tc (K)	Ts (K)	uc (cp)	us (cp)	KaL (cm/hr)
Benzene	14.36	293	318	0.01002	0.5996	1.93
Chloroform	11.37	293	318	0.01002	0.5996	1.53

(3) Estimation of VOC concentration leaving shower droplet, Cwd (ug/L):

$$Cwd = Cw*[1-exp(-KaL*ts)/60*d)]$$
$$= Cw(1-exp(A))$$

COPC	C (ug/L)	KaL (cm/hr)	ts (sec)	d (mm)	A	exp(A)	Cwd (ug/L)
Benzene	3.4	1.93	2	1	-0.064	0.938	0.21
Chloroform	16	1.53	2	1	-0.051	0.950	0.80

(4) Estimation of VOC generation rate in the shower room, S (ug/m3-min):

$$S = (Cwd*FR)/SV$$

COPC	Cwd (ug/L)	FR (L/min)	SV (M3)	S (ug/m3-min)
Benzene	0.21	10	6	0.35
Chloroform	0.80	10	6	1.33

(5) Calculation of time-dependent indoor air concentration, Ca(t) (ug/m3):

$$Ca(t) = (S/R)[exp(RDs)-1]*exp(-Rt) \text{ for } t>Ds$$

COPC	S (ug/m3-min)	R (1/min)	Ds (min)	t (min)	RDs	Rt	exp(RDs)	exp(-Rt)	Ca(t) (ug/m3)	Ca(t) (mg/m3)
Benzene	0.35	0.008	15	20	0.12	0.16	1.13	0.85	4.81	0.00480543
Chloroform	1.33	0.008	15	20	0.12	0.16	1.13	0.85	18.02	0.0180168

ADULT AND YOUNG CHILD (AGES 1 TO 6 YEARS) RESIDENTS - FUTURE SCENARIO
RESULTING FROM SHOWERING WITH WATER CONTAINING VOLATILE CONSTITUENTS OF INTEREST*
CENTRAL TENDENCY EXPOSURE
SITE 84 (BUILDING 45 AREA)
MCB, CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

(1) Estimation of overall mass transfer coefficient, KL (cm/hr):

$$KL = 1/(1/kl + RT/Hkg),$$

where

H = Henry's Law Constant (atm-m3/mol-K);
RT = product of ideal gas constant (8.2E-5atm-m3/mol-K) and absolute temperature (293K)
= 0.024 atm-m3/mole;
kl = VOC-specific liquid-film mass transfer coefficient (cm/hr); and
= kl(CO2)*(44/MWvoc)^0.5; and
kg = VOC-specific gas-film mass transfer coefficient (cm/hr)
kl(H2O)*(18/MWvoc)^0.5

where

kl(CO2) = 20 cm/hr
kl(H2O) = 3000 cm/hr
MWvoc = Molecular weight of VOC.

(2) Adjustment of overall mass transfer coefficient, KL, to shower water temperature:

$$KaL = KL[(Tc*us)/(Ts*uc)]^{-0.5}$$

where

KaL = adjusted overall mass transfer coefficient (cm/hr);
Tc = calibration water temperature of KL (K);
uc = water viscosity at Tc (cp); and
us = water viscosity at Ts (cp).

(3) Estimation of VOC concentration leaving shower droplet, Cwd (ug/L):

$$Cwd = Cw[1-exp((-KaL*ts)/60d)]$$

where

Cw = shower water concentrations (ug;L);
d = shower droplet diameter (mm); and
ts = shower droplet drop time (sec).

(4) Estimation of VOC generation rate in the shower room,

S (ug/m3-min):

$$S = (Cwd*FR)/SV$$

where

FR = shower water flow rate (L/min); and
SV = shower room air volume (m3).

(5) Calculation of time-dependent indoor air concentration, Ca(t) (ug/m3):

$$Ca(t) = (S/R)[wxp(RDs)-1]*exp(-Rt) \text{ for } t>Ds$$

where

Ds = shower duration (min); and
t = time (min).

* Chrostowski, Foster, 1987.

ADULT AND YOUNG CHILD (AGES 1 TO 6 YEARS) RESIDENTS - FUTURE SCENARIO
RESULTING FROM SHOWERING WITH WATER CONTAINING VOLATILE CONSTITUENTS OF INTEREST*
CENTRAL TENDENCY EXPOSURE
SITE 84 (BUILDING 45 AREA)
MCB, CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

(1) Estimation of overall mass transfer coefficient, KL (cm/hr):

KL = 1/(1/kl + RT/Hkg),

COPC	kl(CO2) (cm/hr)	kg(H2O) (cm/hr)	MW (g/mol)	kl (cm/hr)	kg (cm/hr)	RT (atm-m3/mol)	H (atm-m3/mol-K	KL (cm/hr)
Benzene	20	3000	78.11364	15.01	1440.10	0.024	0.00555	14.36
Chloroform	20	3000	119.37704	12.14	1164.92	0.024	0.00367	11.37

(2) Adjustment of overall mass transfer coefficient, KL, to shower water temperature:

KaL = KL[(Tc*us)/(Ts*uc)]^-0.5

COPC	KL (cm/hr)	Tc (K)	Ts (K)	uc (cp)	us (cp)	KaL (cm/hr)
Benzene	14.36	293	318	0.01002	0.5996	1.93
Chloroform	11.37	293	318	0.01002	0.5996	1.53

(3) Estimation of VOC concentration leaving shower droplet, Cwd (ug/L):

Cwd = Cw*[1-exp((-KaL*ts)/60*d)]
= Cw(1-exp(A))

COPC	C (ug/L)	KaL (cm/hr)	ts (sec)	d (mm)	A	exp(A)	Cwd (ug/L)
Benzene	3.4	1.93	2	1	-0.064	0.938	0.21
Chloroform	16	1.53	2	1	-0.051	0.950	0.80

ADULT AND YOUNG CHILD (AGES 1 TO 6 YEARS) RESIDENTS - FUTURE SCENARIO
RESULTING FROM SHOWERING WITH WATER CONTAINING VOLATILE CONSTITUENTS OF INTEREST*
CENTRAL TENDENCY EXPOSURE
SITE 84 (BUILDING 45 AREA)
MCB, CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

(4) Estimation of VOC generation rate in the shower room, S (ug/m3-min):

$$S = (Cwd*FR)/SV$$

COPC	Cwd (ug/L)	FR (L/min)	SV (M3)	S (ug/m3-min)
Benzene	0.21	10	6	0.35
Chloroform	0.80	10	6	1.33

(5) Calculation of time-dependent indoor air concentration, Ca(t) (ug/m3):

$$Ca(t) = (S/R)[exp(RDs)-1]*exp(-Rt) \text{ for } t>Ds$$

COPC	S (ug/m3-min)	R (1/min)	Ds (min)	t (min)	RDs	Rt	exp(RDs)	exp(-Rt)	Ca(t) (ug/m3)	Ca(t) (mg/m3)
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ADULT INDUSTRIAL / COMMERCIAL WORKER - FUTURE SCENARIO
RESULTING FROM SHOWERING WITH WATER CONTAINING VOLATILE CONSTITUENTS OF INTEREST*
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA)
MCB, CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

(1) Estimation of overall mass transfer coefficient, KL (cm/hr):

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where

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RT = product of ideal gas constant (8.2E-5atm-m3/mol-K) and absolute temperature (293K)
= 0.024 atm-m3/mole;
kl = VOC-specific liquid-film mass transfer coefficient (cm/hr); and
= kl(CO2)*(44/MWvoc)^0.5; and
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kl(H2O)*(18/MWvoc)^0.5

where

kl(CO2) = 20 cm/hr
kl(H2O) = 3000 cm/hr
MWvoc = Molecular weight of VOC.

(2) Adjustment of overall mass transfer coefficient, KL, to shower water temperature:

KuL = KL[(Tc*us)/(Ts*uc)]^-0.5

where

KuL = adjusted overall mass transfer coefficient (cm/hr);
Tc = calibration water temperature of KL (K);
uc = water viscosity at Tc (cp); and
us = water viscosity at Ts (cp).

(3) Estimation of VOC concentration leaving shower droplet, Cwd (ug/L):

Cwd = Cw[1-exp(-KuL*ts)/60d)]

where

Cw = shower water concentrations (ug;L);
d = shower droplet diameter (mm); and
ts = shower droplet drop time (sec).

(4) Estimation of VOC generation rate in the shower room,

S (ug/m3-min):

S = (Cwd*FR)/SV

where

FR = shower water flow rate (L/min); and
SV = shower room air volume (m3).

(5) Calculation of time-dependent indoor air concentration, Ca(t) (ug/m3):

Ca(t) = (S/R)[wxp(RDs)-1]*exp(-Rt) for t>Ds

where

Ds = shower duration (min); and
t = time (min).

* Chrostowski, Foster, 1987.

ADULT INDUSTRIAL / COMMERCIAL WORKER - FUTURE SCENARIO
RESULTING FROM SHOWERING WITH WATER CONTAINING VOLATILE CONSTITUENTS OF INTEREST*
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA)
MCB, CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

(1) Estimation of overall mass transfer coefficient, KL (cm/hr):

KL = 1/(1/kl + RT/Hkg),

COPC	kl(CO2) (cm/hr)	kg(H2O) (cm/hr)	MW (g/mol)	kl (cm/hr)	kg (cm/hr)	RT (atm-m3/mol)	H atm-m3/mol-K	KL (cm/hr)
Benzene	20	3000	78.11364	15.01	1440.10	0.024	0.00555	14.36
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Benzene	3.4	1.93	2	1	-0.064	0.938	0.21
Chloroform	16	1.53	2	1	-0.051	0.950	0.80

(4) Estimation of VOC generation rate in the shower room, S (ug/m3-min):

S = (Cwd*FR)/SV

COPC	Cwd (ug/L)	FR (L/min)	SV (M3)	S (ug/m3-min)
Benzene	0.21	10	6	0.35
Chloroform	0.80	10	6	1.33

(5) Calculation of time-dependent indoor air concentration, Ca(t) (ug/m3):

Ca(t) = (S/R)[exp(RDs)-1]*exp(-Rt) for t>Ds

COPC	S (ug/m3-min)	R (1/min)	Ds (min)	t (min)	RDs	Rt	exp(RDs)	exp(-Rt)	Ca(t) (ug/m3)	Ca(t) (mg/m3)
Benzene	0.35	0.008	15	20	0.12	0.16	1.13	0.85	4.81	0.00480543
Chloroform	1.33	0.008	15	20	0.12	0.16	1.13	0.85	18.02	0.0180168

APPENDIX H
HUMAN HEALTH RISK CALCULATION SPREADSHEETS

RISK CALCULATION SPREADSHEETS

ADULT AND YOUNG CHILD RESIDENTS - FUTURE SCENARIOS
ACCIDENTAL INGESTION OF SURFACE SOIL - SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (C*IR*CF*FI*EF*ED)/(BW*AT)
ILCR = CDI*CSFo
HQ = CDI/RfDo

Parameter	Units	Description	Adult	Young Child	
CDI	mg/kg/d	Chronic daily intake	CS	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	CS	
CSFo	1/(mg/kg/d)	Oral cancer slope factor	CS	CS	
HQ	NA	Hazard quotient	CS	CS	
RfDo	mg/kg/d	Oral reference dose	CS	CS	
C	mg/kg	Concentration of chemical in soil	CS	CS	
IR-S	mg/day	Ingestion rate of soil	100	200	
CF	kg/mg	Conversion factor	1.00E-06	1.00E-06	
FI	NA	Fraction of soil ingested from site	1	1	
EF	days/year	Exposure frequency	350	350	
ED	years	Exposure duration	24	6	
BW	kg	Body weight	70	15	
AT-C	days	Averaging time, carcinogens	25,550	25,550	
AT-N	days	Averaging time, noncarcinogens	8,760	2,190	

				Adult						Young Child					
				Carcinogens			Noncarcinogens			Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	CSFo 1/(mg/kg/d)	RfDo (mg/kg/d)	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	57.9	NA	NA	2.7E-05	--	--	7.9E-05	--	--	6.3E-05	--	--	7.4E-04	--	--
Benzo(a)anthracene	4.76	7.3E-01	NA	2.2E-06	1.6E-06	1.5%	6.5E-06	--	--	5.2E-06	3.8E-06	1.5%	6.1E-05	--	--
Benzo(a)pyrene	2.48	7.3E+00	NA	1.2E-06	8.5E-06	7.9%	3.4E-06	--	--	2.7E-06	2.0E-05	7.9%	3.2E-05	--	--
Benzo(b)fluoranthene	2.81	7.3E-01	NA	1.3E-06	9.6E-07	0.9%	3.8E-06	--	--	3.1E-06	2.2E-06	0.9%	3.6E-05	--	--
Benzo(k)fluoranthene	1.78	7.3E-02	NA	8.4E-07	6.1E-08	0.1%	2.4E-06	--	--	2.0E-06	1.4E-07	0.1%	2.3E-05	--	--
Carbazole	0.95	2.0E-02	NA	4.5E-07	8.9E-09	0.0%	1.3E-06	--	--	1.0E-06	2.1E-08	0.0%	1.2E-05	--	--
Chrysene	6.7	7.3E-03	NA	3.1E-06	2.3E-08	0.0%	9.2E-06	--	--	7.3E-06	5.4E-08	0.0%	8.6E-05	--	--
Dibenz(a,h)anthracene	0.695	7.3E+00	NA	3.3E-07	2.4E-06	2.2%	9.5E-07	--	--	7.6E-07	5.6E-06	2.2%	8.9E-06	--	--
Indeno(1,2,3-cd)pyrene	1.72	7.3E-01	NA	8.1E-07	5.9E-07	0.5%	2.4E-06	--	--	1.9E-06	1.4E-06	0.5%	2.2E-05	--	--
Dieldrin	0.052	1.6E+01	5.0E-05	2.4E-08	3.9E-07	0.4%	7.1E-08	1.4E-03	3.9%	5.7E-08	9.1E-07	0.4%	6.6E-07	1.3E-02	3.9%
Aroclor-1260	95.6	2.0E+00	NA	4.5E-05	9.0E-05	83.1%	1.3E-04	--	--	1.0E-04	2.1E-04	83.1%	1.2E-03	--	--
Arsenic	5.26	1.5E+00	3.0E-04	2.5E-06	3.7E-06	3.4%	7.2E-06	2.4E-02	66.4%	5.8E-06	8.6E-06	3.4%	6.7E-05	2.2E-01	66.4%
Iron	2,347	NA	3.0E-01	1.1E-03	--	--	3.2E-03	1.1E-02	29.7%	2.6E-03	--	--	3.0E-02	1.0E-01	29.7%
				Total ILCR:	1.1E-04	100.0%	Total HI:	3.6E-02	100.0%	Total ILCR:	2.5E-04	100.0%	Total HI:	3.4E-01	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT AND YOUNG CHILD RESIDENTS - FUTURE SCENARIOS
DERMAL CONTACT WITH SURFACE SOIL - SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

DAD (mg/kg/d) = (C*CF*AF*ABS*SA*EF*ED)/(BW*AT)
ILCR = CDI*CSFd
HQ = CDI/RfDd

Parameter	Units	Description	Adult	Young Child	
DAD	mg/kg/d	Dermally absorbed dose	CS	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	CS	
CSFd	1/(mg/kg/d)	Dermal cancer slope factor	CS	CS	
HQ	NA	Hazard quotient	CS	CS	
RfDd	mg/kg/d	Dermal reference dose	CS	CS	
C	mg/kg	Concentration of chemical in soil	CS	CS	
CF	kg/mg	Conversion factor	1.00E-06	1.00E-06	
AF	mg/cm2	Soil to skin adherence factor	0.07	0.2	
ABS	NA	Absorption fraction	CS	CS	
SA	cm2/day	Skin surface area available for contact	5,700	2,800	
EF	days/year	Exposure frequency	350	350	
ED	years	Exposure duration	24	6	
BW	kg	Body weight	70	15	
AT-C	days	Averaging time, carcinogens	25,550	25,550	
AT-N	days	Averaging time, noncarcinogens	8,760	2,190	

					Adult						Young Child					
					Carcinogens			Noncarcinogens			Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	ABS	CSFd 1/(mg/kg/d)	RfDd (mg/kg/d)	DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI	DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	57.9	0.01	NA	NA	1.1E-06	--	--	3.2E-06	--	--	1.8E-06	--	--	2.1E-05	--	--
Benzo(a)anthracene	4.76	0.13	2.4E+00	NA	1.2E-06	2.7E-06	3.7%	3.4E-06	--	--	1.9E-06	4.5E-06	3.7%	2.2E-05	--	--
Benzo(a)pyrene	2.48	0.13	1.5E+01	NA	6.0E-07	8.8E-06	11.8%	1.8E-06	--	--	9.9E-07	1.4E-05	11.8%	1.2E-05	--	--
Benzo(b)fluoranthene	2.81	0.13	1.5E+00	NA	6.8E-07	1.0E-06	1.3%	2.0E-06	--	--	1.1E-06	1.6E-06	1.3%	1.3E-05	--	--
Benzo(k)fluoranthene	1.78	0.13	1.5E-01	NA	4.3E-07	6.3E-08	0.1%	1.3E-06	--	--	7.1E-07	1.0E-07	0.1%	8.3E-06	--	--
Carbazole	0.95	0.13	4.0E-02	NA	2.3E-07	9.3E-09	0.0%	6.8E-07	--	--	3.8E-07	1.5E-08	0.0%	4.4E-06	--	--
Chrysene	6.7	0.13	2.4E-02	NA	1.6E-06	3.8E-08	0.1%	4.8E-06	--	--	2.7E-06	6.3E-08	0.1%	3.1E-05	--	--
Dibenz(a,h)anthracene	0.695	0.13	2.4E+01	NA	1.7E-07	4.0E-06	5.4%	4.9E-07	--	--	2.8E-07	6.5E-06	5.4%	3.2E-06	--	--
Indeno(1,2,3-cd)pyrene	1.72	0.13	2.4E+00	NA	4.2E-07	9.9E-07	1.3%	1.2E-06	--	--	6.9E-07	1.6E-06	1.3%	8.0E-06	--	--
Dieldrin	0.052	0.01	3.2E+01	2.5E-05	9.7E-10	3.1E-08	0.0%	2.8E-09	1.1E-04	1.5%	1.6E-09	5.1E-08	0.0%	1.9E-08	7.4E-04	1.5%
Aroclor-1260	95.6	0.14	2.2E+00	NA	2.5E-05	5.6E-05	74.8%	7.3E-05	--	--	4.1E-05	9.1E-05	74.8%	4.8E-04	--	--
Arsenic	5.26	0.03	3.7E+00	1.2E-04	3.0E-07	1.1E-06	1.5%	8.6E-07	7.0E-03	94.6%	4.8E-07	1.8E-06	1.5%	5.6E-06	4.6E-02	94.6%
Iron	2,347	0.001	NA	4.5E-02	4.4E-06	--	--	1.3E-05	2.9E-04	3.8%	7.2E-06	--	--	8.4E-05	1.9E-03	3.8%
					Total ILCR:	7.4E-05	100.0%	Total HI:	7.4E-03	100.0%	Total ILCR:	1.2E-04	100.0%	Total HI:	4.9E-02	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT MILITARY BASE PERSONNEL - CURRENT SCENARIO
INHALATION OF FUGITIVE DUSTS EMANATING FROM SURFACE SOIL - SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (Ca*RR*ET*EF*ED)/(BW*AT)
Where: Ca = C * (1/PEF)

ILCR = CDI*CSFi
HQ = CDI/RfDi

Parameter	Units	Description	Military Personnel	
CDI	mg/kg/d	Chronic daily intake	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	
CSFi	1/(mg/kg/d)	Inhalation cancer slope factor	CS	
HQ	NA	Hazard quotient	CS	
RfDi	mg/kg/d	Inhalation reference dose	CS	
Ca	mg/m3	Concentration of chemical in air as fugitive dusts	CS	
C	mg/kg	Concentration of chemical in soil	CS	
PEF	m3/kg	Particulate emission factor	1.32E+09	
RR	m3/hour	Respiration rate	0.83	
ET	hours/day	Exposure time	8	
EF	days/year	Exposure frequency	250	
ED	years	Exposure duration	4	
BW	kg	Body weight	70	
AT-C	days	Averaging time, carcinogens	25,550	
AT-N	days	Averaging time, noncarcinogens	1,460	

					Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	Ca (mg/m3)	CSFi 1/(mg/kg/d)	RfDi (mg/kg/d)	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	1.96	1.48E-09	NA	NA	5.5E-12	--	--	9.6E-11	--	--
Benzo(a)anthracene	69.0	5.23E-08	3.1E-01	NA	1.9E-10	6.0E-11	4.4%	3.4E-09	--	--
Benzo(a)pyrene	30.5	2.31E-08	3.1E+00	NA	8.6E-11	2.7E-10	19.4%	1.5E-09	--	--
Benzo(b)fluoranthene	40.9	3.10E-08	3.1E-01	NA	1.1E-10	3.6E-11	2.6%	2.0E-09	--	--
Benzo(k)fluoranthene	18.7	1.41E-08	3.1E-02	NA	5.2E-11	1.6E-12	0.1%	9.2E-10	--	--
Carbazole	3.16	2.39E-09	2.0E-02	NA	8.9E-12	1.8E-13	0.0%	1.6E-10	--	--
Chrysene	96.0	7.27E-08	3.1E-03	NA	2.7E-10	8.4E-13	0.1%	4.7E-09	--	--
Dibenz(a,h)anthracene	1.41	1.07E-09	3.1E+00	NA	4.0E-12	1.2E-11	0.9%	7.0E-11	--	--
Fluoranthene	243	1.84E-07	NA	4.0E-02	6.8E-10	--	--	1.2E-08	3.0E-07	0.6%
Indeno(1,2,3-cd)pyrene	8.79	6.66E-09	3.1E-01	NA	2.5E-11	7.7E-12	0.6%	4.3E-10	--	--
Naphthalene	0.525	3.98E-10	NA	8.6E-04	1.5E-12	--	--	2.6E-11	3.0E-08	0.1%
Pyrene	250	1.89E-07	NA	3.0E-02	7.0E-10	--	--	1.2E-08	4.1E-07	0.8%
4,4'-DDD	3	2.27E-09	2.4E-01	NA	8.4E-12	2.0E-12	0.1%	1.5E-10	--	--
Chlordane, alpha-	48	3.64E-08	3.5E-01 (1)	2.0E-04 (1)	1.4E-10	4.7E-11	3.4%	2.4E-09	1.2E-05	24.2%
Chlordane, gamma-	58	4.39E-08	3.5E-01 (1)	2.0E-04 (1)	1.6E-10	5.7E-11	4.2%	2.9E-09	1.4E-05	29.3%
Dieldrin	0.32	2.42E-10	1.6E+01	5.0E-05	9.0E-13	1.4E-11	1.1%	1.6E-11	3.2E-07	0.6%
Heptachlor	22	1.67E-08	4.6E+00	5.0E-04	6.2E-11	2.8E-10	20.5%	1.1E-09	2.2E-06	4.4%
Heptachlor Epoxide	4.5	3.41E-09	9.1E+00	1.3E-05	1.3E-11	1.2E-10	8.4%	2.2E-10	1.7E-05	35.0%
Aroclor-1248	1.51	1.14E-09	2.0E+00	NA	4.2E-12	8.5E-12	0.6%	7.4E-11	--	--
Aroclor-1254	0.975	7.39E-10	2.0E+00	2.0E-05	2.7E-12	5.5E-12	0.4%	4.8E-11	2.4E-06	4.9%
Aroclor-1260	54.6	4.13E-08	2.0E+00	NA	1.5E-10	3.1E-10	22.4%	2.7E-09	--	--
Gasoline Range Organics	0.207	1.57E-10	NA	NA	5.8E-13	--	--	1.0E-11	--	--
Diesel Range Organics	470	3.56E-07	NA	NA	1.3E-09	--	--	2.3E-08	--	--
Antimony	1.22	9.25E-10	NA	NA	3.4E-12	--	--	6.0E-11	--	--
Arsenic	3.49	2.65E-09	1.5E+01	NA	9.8E-12	1.5E-10	10.8%	1.7E-10	--	--
Iron	2,260	1.71E-06	NA	NA	6.4E-09	--	--	1.1E-07	--	--
Thallium	0.31	2.32E-10	NA	NA	8.6E-13	--	--	1.5E-11	--	--
					Total ILCR:	1.4E-09	100.0%	Total HI:	4.9E-05	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT MILITARY BASE PERSONNEL - CURRENT SCENARIO
ACCIDENTAL INGESTION OF SURFACE SOIL - SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (C*IR*CF*FI*EF*ED)/(BW*AT)
ILCR = CDI*CSFo
HQ = CDI/RfDo

Parameter	Units	Description	Military Personnel	
CDI	mg/kg/d	Chronic daily intake	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	
CSFo	1/(mg/kg/d)	Oral cancer slope factor	CS	
HQ	NA	Hazard quotient	CS	
RfDo	mg/kg/d	Oral reference dose	CS	
C	mg/kg	Concentration of chemical in soil	CS	
IR-S	mg/day	Ingestion rate of soil	100	
CF	kg/mg	Conversion factor	1.00E-06	
FI	NA	Fraction of soil ingested from site	1	
EF	days/year	Exposure frequency	250	
ED	years	Exposure duration	4	
BW	kg	Body weight	70	
AT-C	days	Averaging time, carcinogens	25,550	
AT-N	days	Averaging time, noncarcinogens	1,460	

Parameter	C (mg/kg)	CSFo 1/(mg/kg/d)	RfDo (mg/kg/d)	Carcinogens CDI (mg/kg/d)	Carcinogens ILCR	Carcinogens % Contrib. Total ILCR	Noncarcinogens CDI (mg/kg/d)	Noncarcinogens HQ	Noncarcinogens % Contrib. HI
2-Methylnaphthalene	57.9	NA	NA	3.2E-06	--	--	5.7E-05	--	--
Benzo(a)anthracene	4.76	7.3E-01	NA	2.7E-07	1.9E-07	1.5%	4.7E-06	--	--
Benzo(a)pyrene	2.48	7.3E+00	NA	1.4E-07	1.0E-06	7.9%	2.4E-06	--	--
Benzo(b)fluoranthene	2.81	7.3E-01	NA	1.6E-07	1.1E-07	0.9%	2.7E-06	--	--
Benzo(k)fluoranthene	1.78	7.3E-02	NA	1.0E-07	7.3E-09	0.1%	1.7E-06	--	--
Carbazole	0.95	2.0E-02	NA	5.3E-08	1.1E-09	0.0%	9.3E-07	--	--
Chrysene	6.7	7.3E-03	NA	3.7E-07	2.7E-09	0.0%	6.6E-06	--	--
Dibenz(a,h)anthracene	0.695	7.3E+00	NA	3.9E-08	2.8E-07	2.2%	6.8E-07	--	--
Indeno(1,2,3-cd)pyrene	1.72	7.3E-01	NA	9.6E-08	7.0E-08	0.5%	1.7E-06	--	--
Dieldrin	0.052	1.6E+01	5.0E-05	2.9E-09	4.7E-08	0.4%	5.1E-08	1.0E-03	3.9%
Aroclor-1260	95.6	2.0E+00	NA	5.3E-06	1.1E-05	83.1%	9.4E-05	--	--
Arsenic	5.26	1.5E+00	3.0E-04	2.9E-07	4.4E-07	3.4%	5.1E-06	1.7E-02	66.4%
Iron	2,347	NA	3.0E-01	1.3E-04	--	--	2.3E-03	7.7E-03	29.7%
				Total ILCR:	1.3E-05	100.0%	Total HI:	2.6E-02	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT MILITARY BASE PERSONNEL - CURRENT SCENARIO
DERMAL CONTACT WITH SURFACE SOIL - SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

DAD (mg/kg/d) = (C*CF*AF*ABS*SA*EF*ED)/(BW*AT)
ILCR = CDI*CSFd
HQ = CDI/RfDd

Parameter	Units	Description	Military Personnel	
DAD	mg/kg/d	Dermally absorbed dose	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	
CSFd	1/(mg/kg/d)	Dermal cancer slope factor	CS	
HQ	NA	Hazard quotient	CS	
RfDd	mg/kg/d	Dermal reference dose	CS	
C	mg/kg	Concentration of chemical in soil	CS	
CF	kg/mg	Conversion factor	1.00E-06	
AF	mg/cm2	Soil to skin adherence factor	0.2	
ABS	NA	Absorption fraction	CS	
SA	cm2/day	Skin surface area available for contact	3,300	
EF	days/year	Exposure frequency	250	
ED	years	Exposure duration	4	
BW	kg	Body weight	70	
AT-C	days	Averaging time, carcinogens	25,550	
AT-N	days	Averaging time, noncarcinogens	1,460	

					Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	ABS	CSFd 1/(mg/kg/d)	RfDd (mg/kg/d)	DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	57.9	0.01	NA	NA	2.1E-07	--	--	3.7E-06	--	--
Benzo(a)anthracene	4.76	0.13	2.4E+00	NA	2.3E-07	5.4E-07	3.7%	4.0E-06	--	--
Benzo(a)pyrene	2.48	0.13	1.5E+01	NA	1.2E-07	1.7E-06	11.8%	2.1E-06	--	--
Benzo(b)fluoranthene	2.81	0.13	1.5E+00	NA	1.3E-07	2.0E-07	1.3%	2.4E-06	--	--
Benzo(k)fluoranthene	1.78	0.13	1.5E-01	NA	8.5E-08	1.2E-08	0.1%	1.5E-06	--	--
Carbazole	0.95	0.13	4.0E-02	NA	4.6E-08	1.8E-09	0.0%	8.0E-07	--	--
Chrysene	6.7	0.13	2.4E-02	NA	3.2E-07	7.6E-09	0.1%	5.6E-06	--	--
Dibenz(a,h)anthracene	0.695	0.13	2.4E+01	NA	3.3E-08	7.9E-07	5.4%	5.8E-07	--	--
Indeno(1,2,3-cd)pyrene	1.72	0.13	2.4E+00	NA	8.2E-08	1.9E-07	1.3%	1.4E-06	--	--
Dieldrin	0.052	0.01	3.2E+01	2.5E-05	1.9E-10	6.1E-09	0.0%	3.4E-09	1.3E-04	1.5%
Aroclor-1260	95.6	0.14	2.2E+00	NA	4.9E-06	1.1E-05	74.8%	8.6E-05	--	--
Arsenic	5.26	0.03	3.7E+00	1.2E-04	5.8E-08	2.1E-07	1.5%	1.0E-06	8.3E-03	94.6%
Iron	2,347	0.001	NA	4.5E-02	8.7E-07	--	--	1.5E-05	3.4E-04	3.8%
					Total ILCR:	1.5E-05	100.0%	Total HI:	8.8E-03	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT MILITARY BASE PERSONNEL - CURRENT SCENARIO
INHALATION OF FUGITIVE DUSTS EMANATING FROM SURFACE SOIL - SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (Ca*RR*ET*EF*ED)/(BW*AT)
Where: Ca = C * (1/PEF)

ILCR = CDI*CSFi
HQ = CDI/RfDi

Parameter	Units	Description	Military Personnel	
CDI	mg/kg/d	Chronic daily intake	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	
CSFi	1/(mg/kg/d)	Inhalation cancer slope factor	CS	
HQ	NA	Hazard quotient	CS	
RfDi	mg/kg/d	Inhalation reference dose	CS	
Ca	mg/m3	Concentration of chemical in air as fugitive dusts	CS	
C	mg/kg	Concentration of chemical in soil	CS	
PEF	m3/kg	Particulate emission factor	1.32E+09	
RR	m3/hour	Respiration rate	0.83	
ET	hours/day	Exposure time	8	
EF	days/year	Exposure frequency	250	
ED	years	Exposure duration	4	
BW	kg	Body weight	70	
AT-C	days	Averaging time, carcinogens	25,550	
AT-N	days	Averaging time, noncarcinogens	1,460	

					Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	Ca (mg/m3)	CSFi 1/(mg/kg/d)	RfDi (mg/kg/d)	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	57.9	4.39E-08	NA	NA	1.6E-10	--	--	2.8E-09	--	--
Benzo(a)anthracene	4.76	3.61E-09	3.1E-01	NA	1.3E-11	4.2E-12	0.5%	2.3E-10	--	--
Benzo(a)pyrene	2.48	1.88E-09	3.1E+00	NA	7.0E-12	2.2E-11	2.7%	1.2E-10	--	--
Benzo(b)fluoranthene	2.81	2.13E-09	3.1E-01	NA	7.9E-12	2.4E-12	0.3%	1.4E-10	--	--
Benzo(k)fluoranthene	1.78	1.35E-09	3.1E-02	NA	5.0E-12	1.6E-13	0.0%	8.8E-11	--	--
Carbazole	0.95	7.20E-10	2.0E-02	NA	2.7E-12	5.3E-14	0.0%	4.7E-11	--	--
Chrysene	6.7	5.08E-09	3.1E-03	NA	1.9E-11	5.8E-14	0.0%	3.3E-10	--	--
Dibenz(a,h)anthracene	0.695	5.27E-10	3.1E+00	NA	2.0E-12	6.1E-12	0.8%	3.4E-11	--	--
Indeno(1,2,3-cd)pyrene	1.72	1.30E-09	3.1E-01	NA	4.8E-12	1.5E-12	0.2%	8.5E-11	--	--
Dieldrin	0.052	3.94E-11	1.6E+01	5.0E-05	1.5E-13	2.4E-12	0.3%	2.6E-12	5.1E-08	100.0%
Aroclor-1260	95.6	7.24E-08	2.0E+00	NA	2.7E-10	5.4E-10	67.3%	4.7E-09	--	--
Arsenic	5.26	3.98E-09	1.5E+01	NA	1.5E-11	2.2E-10	27.9%	2.6E-10	--	--
Iron	2,347	1.78E-06	NA	NA	6.6E-09	--	--	1.2E-07	--	--
					Total ILCR:	8.0E-10	100.0%	Total HI:	5.1E-08	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT MILITARY BASE PERSONNEL - CURRENT SCENARIO
ACCIDENTAL INGESTION OF SURFACE WATER - SITE 84 (BUILDING 45 AREA)
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (C*IR*ET*EF*ED)/(BW*AT)
ILCR = CDI*CSFo
HQ = CDI/RfDo

Parameter	Units	Description	Military Personnel	
CDI	mg/kg/d	Chronic daily intake	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	
CSFo	1/(mg/kg/d)	Oral cancer slope factor	CS	
HQ	NA	Hazard quotient	CS	
RfDo	mg/kg/d	Oral reference dose	CS	
C	mg/L	Concentration of chemical in water	CS	
IR-W	L/hour	Ingestion rate of water	0.01	
ET	hours/day	Exposure time	2.6	
EF	days/year	Exposure frequency	250	
ED	years	Exposure duration	4	
BW	kg	Body weight	70	
AT-C	days	Averaging time, carcinogens	25,550	
AT-N	days	Averaging time, noncarcinogens	1,460	

Parameter	C (mg/L)	CSFo 1/(mg/kg/d)	RfDo (mg/kg/d)	Carcinogens			Noncarcinogens		
				CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI
Acetone	0.0056	NA	1.0E-01	8.1E-08	--	--	1.4E-06	1.4E-05	78.6%
Toluene	0.0027	NA	2.0E-01	3.9E-08	--	--	6.9E-07	3.4E-06	18.9%
Xylenes, total	0.0035	NA	2.0E+00	5.1E-08	--	--	8.9E-07	4.5E-07	2.5%
				Total ILCR:	--	--	Total HI:	1.8E-05	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.

ADULT MILITARY BASE PERSONNEL - CURRENT SCENARIO
DERMAL CONTACT WITH SURFACE WATER - SITE 84 (BUILDING 45 AREA)
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

DAD (mg/kg/d) = (C*CF*Kp*SA*EF*ED*ET)/(BW*AT)

ILCR = CDI*CSFo Adj CSF Adj = CSF/AD
HQ = CDI/RfDo Adj RfD Adj = RfD*AD

Parameter	Units	Description	Military Personnel	
DAD	mg/kg/d	Dermally absorbed dose	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	
CSFd	1/(mg/kg/d)	Dermal cancer slope factor	CS	
HQ	NA	Hazard quotient	CS	
RfDd	mg/kg/d	Dermal reference dose	CS	
SA	cm2	Skin surface area available for contact	3,300	
EF	days/year	Exposure frequency	250	
ED	years	Exposure duration	4	
ET	hours/day	Exposure time	2.6	
BW	kg	Body weight	70	
AT-C	days	Averaging time, carcinogens	25,550	
AT-N	days	Averaging time, noncarcinogens	1,460	
C	mg/L	Concentration of chemical in water	CS	
CF	L/cm3	Conversion factor	1.00E-03	
Kp	cm/hour	Dermal permeability coefficient	CS	
AD	NA	Adjustment for absorbed dose	CS	

					Carcinogens			Noncarcinogens		
Parameter	C (mg/L)	Kp (cm/hour)	CSFd 1/(mg/kg/d)	RfDd (mg/kg/d)	DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI
Acetone	0.0056	0.00057	NA	8.3E-02	1.5E-08	--	--	2.7E-07	3.2E-06	3.9%
Toluene	0.0027	0.045	NA	1.6E-01	5.8E-07	--	--	1.0E-05	6.4E-05	77.6%
Xylenes, total	0.0035	0.095	NA	1.8E+00	1.6E-06	--	--	2.8E-05	1.5E-05	18.5%
					Total ILCR:	--	--	Total HI:	8.2E-05	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.

ADULT MILITARY BASE PERSONNEL - CURRENT SCENARIO
ACCIDENTAL INGESTION OF SEDIMENT - SITE 84 (BUILDING 45 AREA)
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (C*IR*CF*FI*EF*ED)/(BW*AT)
ILCR = CDI*CSFo
HQ = CDI/RfDo

Parameter	Units	Description	Military Personnel	
CDI	mg/kg/d	Chronic daily intake	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	
CSFo	1/(mg/kg/d)	Oral cancer slope factor	CS	
HQ	NA	Hazard quotient	CS	
RfDo	mg/kg/d	Oral reference dose	CS	
C	mg/kg	Concentration of chemical in soil	CS	
IR-S	mg/day	Ingestion rate of sediment	100	
CF	kg/mg	Conversion factor	1.00E-06	
FI	NA	Fraction of soil ingested from site	1	
EF	days/year	Exposure frequency	250	
ED	years	Exposure duration	4	
BW	kg	Body weight	70	
AT-C	days	Averaging time, carcinogens	25,550	
AT-N	days	Averaging time, noncarcinogens	1,460	

Parameter	C (mg/kg)	CSFo 1/(mg/kg/d)	RfDo (mg/kg/d)	Carcinogens			Noncarcinogens		
				CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	10	NA	NA	5.6E-07	--	--	9.8E-06	--	--
Aroclor-1248	2.8	2.0E+00	NA	1.6E-07	3.1E-07	6.5%	2.7E-06	--	--
Aroclor-1260	40	2.0E+00	NA	2.2E-06	4.5E-06	93.5%	3.9E-05	--	--
Diesel Range Organics	11,600	NA	NA	6.5E-04	--	--	1.1E-02	--	--
				Total ILCR:	4.8E-06	100.0%	Total HI:	--	--

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.

ADULT MILITARY BASE PERSONNEL - CURRENT SCENARIO
DERMAL CONTACT WITH SEDIMENT - SITE 84 (BUILDING 45 AREA)
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

DAD (mg/kg/d) = (C*CF*AF*ABS*SA*EF*ED)/(BW*AT)
ILCR = CDI*CSFd
HQ = CDI/RfDd

Parameter	Units	Description	Military Personnel	
DAD	mg/kg/d	Dermally absorbed dose	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	
CSFd	1/(mg/kg/d)	Dermal cancer slope factor	CS	
HQ	NA	Hazard quotient	CS	
RfDd	mg/kg/d	Dermal reference dose	CS	
C	mg/kg	Concentration of chemical in soil	CS	
CF	kg/mg	Conversion factor	1.00E-06	
AF	mg/cm2	Soil to skin adherence factor	0	
ABS	NA	Absorption fraction	CS	
SA	cm2/day	Skin surface area available for contact	3,300	
EF	days/year	Exposure frequency	250	
ED	years	Exposure duration	4	
BW	kg	Body weight	70	
AT-C	days	Averaging time, carcinogens	25,550	
AT-N	days	Averaging time, noncarcinogens	1,460	

					Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	ABS	CSFd 1/(mg/kg/d)	RfDd (mg/kg/d)	DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	10	0.01	NA	NA	3.7E-08	--	--	6.5E-07	--	--
Aroclor-1248	2.8	0.14	2.2E+00	NA	1.4E-07	3.3E-07	6.6%	2.5E-06	--	--
Aroclor-1260	40	0.14	2.2E+00	NA	2.1E-06	4.6E-06	93.4%	3.6E-05	--	--
Diesel Range Organics	11,600	0.01	NA	NA	4.3E-05	--	--	7.5E-04	--	--
					Total ILCR:	4.9E-06	100.0%	Total HI:	--	--

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.

ADULT AND ADOLESCENT RECREATIONAL USERS - CURRENT SCENARIO
ACCIDENTAL INGESTION OF SURFACE SOIL - SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (C*IR*CF*FI*EF*ED)/(BW*AT)
ILCR = CDI*CSFo
HQ = CDI/RfDo

Parameter	Units	Description	Adult	Adolescent	
CDI	mg/kg/d	Chronic daily intake	CS	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	CS	
CSFo	1/(mg/kg/d)	Oral cancer slope factor	CS	CS	
HQ	NA	Hazard quotient	CS	CS	
RfDo	mg/kg/d	Oral reference dose	CS	CS	
C	mg/kg	Concentration of chemical in soil	CS	CS	
IR-S	mg/day	Ingestion rate of soil	100	100	
CF	kg/mg	Conversion factor	1.00E-06	1.00E-06	
FI	NA	Fraction of soil ingested from site	1	1	
EF	days/year	Exposure frequency	48	48	
ED	years	Exposure duration	24	9	
BW	kg	Body weight	70	45	
AT-C	days	Averaging time, carcinogens	25,550	25,550	
AT-N	days	Averaging time, noncarcinogens	8,760	3,285	

				Adult						Adolescent					
				Carcinogens			Noncarcinogens			Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	CSFo 1/(mg/kg/d)	RfDo (mg/kg/d)	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	1.96	NA	NA	1.3E-07	--	--	3.7E-07	--	--	7.4E-08	--	--	5.7E-07	--	--
Benzo(a)anthracene	69.0	7.3E-01	NA	4.4E-06	3.2E-06	8.1%	1.3E-05	--	--	2.6E-06	1.9E-06	8.1%	2.0E-05	--	--
Benzo(a)pyrene	30.5	7.3E+00	NA	2.0E-06	1.4E-05	35.6%	5.7E-06	--	--	1.1E-06	8.4E-06	35.6%	8.9E-06	--	--
Benzo(b)fluoranthene	40.9	7.3E-01	NA	2.6E-06	1.9E-06	4.8%	7.7E-06	--	--	1.5E-06	1.1E-06	4.8%	1.2E-05	--	--
Benzo(k)fluoranthene	18.7	7.3E-02	NA	1.2E-06	8.8E-08	0.2%	3.5E-06	--	--	7.0E-07	5.1E-08	0.2%	5.5E-06	--	--
Carbazole	3.16	2.0E-02	NA	2.0E-07	4.1E-09	0.0%	5.9E-07	--	--	1.2E-07	2.4E-09	0.0%	9.2E-07	--	--
Chrysene	96.0	7.3E-03	NA	6.2E-06	4.5E-08	0.1%	1.8E-05	--	--	3.6E-06	2.6E-08	0.1%	2.8E-05	--	--
Dibenz(a,h)anthracene	1.41	7.3E+00	NA	9.1E-08	6.6E-07	1.7%	2.7E-07	--	--	5.3E-08	3.9E-07	1.7%	4.1E-07	--	--
Fluoranthene	243	NA	4.0E-02	1.6E-05	--	--	4.6E-05	1.1E-03	0.9%	9.1E-06	--	--	7.1E-05	1.8E-03	0.9%
Indeno(1,2,3-cd)pyrene	8.79	7.3E-01	NA	5.7E-07	4.1E-07	1.0%	1.7E-06	--	--	3.3E-07	2.4E-07	1.0%	2.6E-06	--	--
Naphthalene	0.525	NA	2.0E-02	3.4E-08	--	--	9.9E-08	4.9E-06	0.0%	2.0E-08	--	--	1.5E-07	7.7E-06	0.0%
Pyrene	250	NA	3.0E-02	1.6E-05	--	--	4.7E-05	1.6E-03	1.2%	9.4E-06	--	--	7.3E-05	2.4E-03	1.2%
4,4'-DDD	3	2.4E-01	NA	1.9E-07	4.6E-08	0.1%	5.6E-07	--	--	1.1E-07	2.7E-08	0.1%	8.8E-07	--	--
Chlordane, alpha-	48	3.5E-01 (1)	5.0E-04 (1)	3.1E-06	1.1E-06	2.7%	9.0E-06	1.8E-02	13.7%	1.8E-06	6.3E-07	2.7%	1.4E-05	2.8E-02	13.7%
Chlordane, gamma-	58	3.5E-01 (1)	5.0E-04 (1)	3.7E-06	1.3E-06	3.3%	1.1E-05	2.2E-02	16.6%	2.2E-06	7.6E-07	3.3%	1.7E-05	3.4E-02	16.6%
Dieldrin	0.32	1.6E+01	5.0E-05	2.1E-08	3.3E-07	0.8%	6.0E-08	1.2E-03	0.9%	1.2E-08	1.9E-07	0.8%	9.4E-08	1.9E-03	0.9%
Heptachlor	22	4.5E+00	5.0E-04	1.4E-06	6.4E-06	15.9%	4.1E-06	8.3E-03	6.3%	8.3E-07	3.7E-06	15.9%	6.4E-06	1.3E-02	6.3%
Heptachlor Epoxide	4.5	9.1E+00	1.3E-05	2.9E-07	2.6E-06	6.6%	8.5E-07	6.5E-02	49.5%	1.7E-07	1.5E-06	6.6%	1.3E-06	1.0E-01	49.5%
Aroclor-1248	1.51	2.0E+00	NA	9.7E-08	1.9E-07	0.5%	2.8E-07	--	--	5.7E-08	1.1E-07	0.5%	4.4E-07	--	--
Aroclor-1254	0.975	2.0E+00	2.0E-05	6.3E-08	1.3E-07	0.3%	1.8E-07	9.2E-03	7.0%	3.7E-08	7.3E-08	0.3%	2.8E-07	1.4E-02	7.0%
Aroclor-1260	54.6	2.0E+00	NA	3.5E-06	7.0E-06	17.5%	1.0E-05	--	--	2.1E-06	4.1E-06	17.5%	1.6E-05	--	--
Gasoline Range Organics	0.207	NA	NA	1.3E-08	--	--	3.9E-08	--	--	7.8E-09	--	--	6.1E-08	--	--
Diesel Range Organics	470	NA	NA	3.0E-05	--	--	8.8E-05	--	--	1.8E-05	--	--	1.4E-04	--	--
Antimony	1.22	NA	4.0E-04	7.9E-08	--	--	2.3E-07	5.7E-04	0.4%	4.6E-08	--	--	3.6E-07	8.9E-04	0.4%
Arsenic	3.49	1.5E+00	3.0E-04	2.2E-07	3.4E-07	0.8%	6.6E-07	2.2E-03	1.7%	1.3E-07	2.0E-07	0.8%	1.0E-06	3.4E-03	1.7%
Iron	2,260	NA	3.0E-01	1.5E-04	--	--	4.2E-04	1.4E-03	1.1%	8.5E-05	--	--	6.6E-04	2.2E-03	1.1%
Thallium	0.31	NA	6.6E-05	2.0E-08	--	--	5.8E-08	8.7E-04	0.7%	1.2E-08	--	--	9.0E-08	1.4E-03	0.7%
				Total ILCR:	4.0E-05	100.0%	Total HI:	1.3E-01	100.0%	Total ILCR:	2.3E-05	100.0%	Total HI:	2.0E-01	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT AND ADOLESCENT RECREATIONAL USERS - CURRENT SCENARIO
DERMAL CONTACT WITH SURFACE SOIL - SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

DAD (mg/kg/d) = (C*CF*AF*ABS*SA*EF*ED)/(BW*AT)
ILCR = CDI*CSFd
HQ = CDI/RfDd

Parameter	Units	Description	Adult	Adolescent	
DAD	mg/kg/d	Dermally absorbed dose	CS	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	CS	
CSFd	1/(mg/kg/d)	Dermal cancer slope factor	CS	CS	
HQ	NA	Hazard quotient	CS	CS	
RfDd	mg/kg/d	Dermal reference dose	CS	CS	
C	mg/kg	Concentration of chemical in soil	CS	CS	
CF	kg/mg	Conversion factor	1.00E-06	1.00E-06	
AF	mg/cm2	Soil to skin adherence factor	0.2	0.2	
ABS	NA	Absorption fraction	CS	CS	
SA	cm2/day	Skin surface area available for contact	5,700	5,300	
EF	days/year	Exposure frequency	48	48	
ED	years	Exposure duration	24	9	
BW	kg	Body weight	70	45	
AT-C	days	Averaging time, carcinogens	25,550	25,550	
AT-N	days	Averaging time, noncarcinogens	8,760	3,285	

					Adult						Adolescent					
					Carcinogens			Noncarcinogens			Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	ABS	CSFd 1/(mg/kg/d)	RfDd (mg/kg/d)	DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI	DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	1.96	0.01	NA	NA	1.4E-08	--	--	4.2E-08	--	--	7.8E-09	--	--	6.1E-08	--	--
Benzo(a)anthracene	69.0	0.13	2.4E+00	NA	6.6E-06	1.6E-05	18.1%	1.9E-05	--	--	3.6E-06	8.4E-06	18.1%	2.8E-05	--	--
Benzo(a)pyrene	30.5	0.13	1.5E+01	NA	2.9E-06	4.2E-05	49.7%	8.5E-06	--	--	1.6E-06	2.3E-05	49.7%	1.2E-05	--	--
Benzo(b)fluoranthene	40.9	0.13	1.5E+00	NA	3.9E-06	5.7E-06	6.7%	1.1E-05	--	--	2.1E-06	3.1E-06	6.7%	1.6E-05	--	--
Benzo(k)fluoranthene	18.7	0.13	1.5E-01	NA	1.8E-06	2.6E-07	0.3%	5.2E-06	--	--	9.7E-07	1.4E-07	0.3%	7.5E-06	--	--
Carbazole	3.16	0.13	4.0E-02	NA	3.0E-07	1.2E-08	0.0%	8.8E-07	--	--	1.6E-07	6.5E-09	0.0%	1.3E-06	--	--
Chrysene	96.0	0.13	2.4E-02	NA	9.2E-06	2.2E-07	0.3%	2.7E-05	--	--	5.0E-06	1.2E-07	0.3%	3.9E-05	--	--
Dibenz(a,h)anthracene	1.41	0.13	2.4E+01	NA	1.3E-07	3.2E-06	3.7%	3.9E-07	--	--	7.3E-08	1.7E-06	3.7%	5.7E-07	--	--
Fluoranthene	243	0.01	NA	1.2E-02	1.8E-06	--	--	5.2E-06	4.2E-04	0.8%	9.7E-07	--	--	7.5E-06	6.1E-04	0.8%
Indeno(1,2,3-cd)pyrene	8.79	0.13	2.4E+00	NA	8.4E-07	2.0E-06	2.3%	2.4E-06	--	--	4.6E-07	1.1E-06	2.3%	3.5E-06	--	--
Naphthalene	0.525	0.01	NA	1.6E-02	3.9E-09	--	--	1.1E-08	7.0E-07	0.0%	2.1E-09	--	--	1.6E-08	1.0E-06	0.0%
Pyrene	250	0.01	NA	9.3E-03	1.8E-06	--	--	5.4E-06	5.8E-04	1.1%	1.0E-06	--	--	7.7E-06	8.3E-04	1.1%
4,4'-DDD	3	0.01	3.4E-01	NA	2.2E-08	7.6E-09	0.0%	6.4E-08	--	--	1.2E-08	4.1E-09	0.0%	9.3E-08	--	--
Chlordane, alpha-	48	0.04	4.4E-01 (1)	4.0E-04 (1)	1.4E-06	6.2E-07	0.7%	4.1E-06	1.0E-02	19.0%	7.6E-07	3.3E-07	0.7%	5.9E-06	1.5E-02	19.0%
Chlordane, gamma-	58	0.04	4.4E-01 (1)	4.0E-04 (1)	1.7E-06	7.5E-07	0.9%	5.0E-06	1.2E-02	22.9%	9.2E-07	4.0E-07	0.9%	7.2E-06	1.8E-02	22.9%
Dieldrin	0.32	0.01	3.2E+01	2.5E-05	2.3E-09	7.5E-08	0.1%	6.9E-09	2.7E-04	0.5%	1.3E-09	4.1E-08	0.1%	9.9E-09	4.0E-04	0.5%
Heptachlor	22	0.01	6.3E+00	3.6E-04	1.6E-07	1.0E-06	1.2%	4.7E-07	1.3E-03	2.4%	8.8E-08	5.5E-07	1.2%	6.8E-07	1.9E-03	2.4%
Heptachlor Epoxide	4.5	0.01	1.3E+01	9.4E-06	3.3E-08	4.2E-07	0.5%	9.6E-08	1.0E-02	19.0%	1.8E-08	2.3E-07	0.5%	1.4E-07	1.5E-02	19.0%
Aroclor-1248	1.51	0.14	2.2E+00	NA	1.5E-07	3.5E-07	0.4%	4.5E-07	--	--	8.4E-08	1.9E-07	0.4%	6.5E-07	--	--
Aroclor-1254	0.975	0.14	2.2E+00	1.8E-05	1.0E-07	2.2E-07	0.3%	2.9E-07	1.6E-02	30.0%	5.4E-08	1.2E-07	0.3%	4.2E-07	2.3E-02	30.0%
Aroclor-1260	54.6	0.14	2.2E+00	NA	5.6E-06	1.2E-05	14.6%	1.6E-05	--	--	3.0E-06	6.8E-06	14.6%	2.4E-05	--	--
Gasoline Range Organics	0.207	0.01	NA	NA	1.5E-09	--	--	4.4E-09	--	--	8.2E-10	--	--	6.4E-09	--	--
Diesel Range Organics	470	0.01	NA	NA	3.5E-06	--	--	1.0E-05	--	--	1.9E-06	--	--	1.5E-05	--	--
Antimony	1.22	0.001	NA	8.0E-06	9.0E-10	--	--	2.6E-09	3.3E-04	0.6%	4.9E-10	--	--	3.8E-09	4.7E-04	0.6%
Arsenic	3.49	0.03	3.7E+00	1.2E-04	7.7E-08	2.8E-07	0.3%	2.2E-07	1.8E-03	3.4%	4.2E-08	1.5E-07	0.3%	3.2E-07	2.6E-03	3.4%
Iron	2,260	0.001	NA	4.5E-02	1.7E-06	--	--	4.8E-06	1.1E-04	0.2%	9.0E-07	--	--	7.0E-06	1.6E-04	0.2%
Thallium	0.31	0.001	NA	9.9E-06	2.3E-10	--	--	6.6E-10	6.6E-05	0.1%	1.2E-10	--	--	9.5E-10	9.6E-05	0.1%
					Total ILCR:	8.5E-05	100.0%	Total HI:	5.4E-02	100.0%	Total ILCR:	4.6E-05	100.0%	Total HI:	7.8E-02	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT AND ADOLESCENT RECREATIONAL USERS - CURRENT SCENARIO
INHALATION OF FUGITIVE DUSTS EMANATING FROM SURFACE SOIL - SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (Ca*RR*ET*EF*ED)/(BW*AT)
Where: Ca = C * (1/PEF)

ILCR = CDI*CSFi
HQ = CDI/RfDi

Parameter	Units	Description	Adult	Adolescent	
CDI	mg/kg/d	Chronic daily intake	CS	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	CS	
CSFi	1/(mg/kg/d)	Inhalation cancer slope factor	CS	CS	
HQ	NA	Hazard quotient	CS	CS	
RfDi	mg/kg/d	Inhalation reference dose	CS	CS	
Ca	mg/m3	Concentration of chemical in air as fugitive dusts	CS	CS	
C	mg/kg	Concentration of chemical in soil	CS	CS	
PEF	m3/kg	Particulate emission factor	1.32E+09	1.32E+09	
RR	m3/hour	Respiration rate	0.83	0.83	
ET	hours/day	Exposure time	8	8	
EF	days/year	Exposure frequency	48	48	
ED	years	Exposure duration	24	9	
BW	kg	Body weight	70	45	
AT-C	days	Averaging time, carcinogens	25,550	25,550	
AT-N	days	Averaging time, noncarcinogens	8,760	3,285	

					Adult						Adolescent					
					Carcinogens			Noncarcinogens			Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	Ca (mg/m3)	CSFi 1/(mg/kg/d)	RfDi (mg/kg/d)	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	1.96	1.48E-09	NA	NA	6.3E-12	--	--	1.9E-11	--	--	3.7E-12	--	--	2.9E-11	--	--
Benzo(a)anthracene	69.0	5.23E-08	3.1E-01	NA	2.2E-10	6.9E-11	4.4%	6.5E-10	--	--	1.3E-10	4.0E-11	4.4%	1.0E-09	--	--
Benzo(a)pyrene	30.5	2.31E-08	3.1E+00	NA	9.9E-11	3.1E-10	19.4%	2.9E-10	--	--	5.8E-11	1.8E-10	19.4%	4.5E-10	--	--
Benzo(b)fluoranthene	40.9	3.10E-08	3.1E-01	NA	1.3E-10	4.1E-11	2.6%	3.9E-10	--	--	7.7E-11	2.4E-11	2.6%	6.0E-10	--	--
Benzo(k)fluoranthene	18.7	1.41E-08	3.1E-02	NA	6.0E-11	1.9E-12	0.1%	1.8E-10	--	--	3.5E-11	1.1E-12	0.1%	2.7E-10	--	--
Carbazole	3.16	2.39E-09	2.0E-02	NA	1.0E-11	2.0E-13	0.0%	3.0E-11	--	--	6.0E-12	1.2E-13	0.0%	4.6E-11	--	--
Chrysene	96.0	7.27E-08	3.1E-03	NA	3.1E-10	9.6E-13	0.1%	9.1E-10	--	--	1.8E-10	5.6E-13	0.1%	1.4E-09	--	--
Dibenz(a,h)anthracene	1.41	1.07E-09	3.1E+00	NA	4.6E-12	1.4E-11	0.9%	1.3E-11	--	--	2.7E-12	8.3E-12	0.9%	2.1E-11	--	--
Fluoranthene	243	1.84E-07	NA	4.0E-02	7.9E-10	--	--	2.3E-09	5.7E-08	0.6%	4.6E-10	--	--	3.6E-09	8.9E-08	0.6%
Indeno(1,2,3-cd)pyrene	8.79	6.66E-09	3.1E-01	NA	2.8E-11	8.8E-12	0.6%	8.3E-11	--	--	1.7E-11	5.2E-12	0.6%	1.3E-10	--	--
Naphthalene	0.525	3.98E-10	NA	8.6E-04	1.7E-12	--	--	5.0E-12	5.8E-09	0.1%	9.9E-13	--	--	7.7E-12	9.0E-09	0.1%
Pyrene	250	1.89E-07	NA	3.0E-02	8.1E-10	--	--	2.4E-09	7.9E-08	0.8%	4.7E-10	--	--	3.7E-09	1.2E-07	0.8%
4,4'-DDD	3	2.27E-09	2.4E-01	NA	9.7E-12	2.3E-12	0.1%	2.8E-11	--	--	5.7E-12	1.4E-12	0.1%	4.4E-11	--	--
Chlordane, alpha-	48	3.64E-08	3.5E-01 (1)	2.0E-04 (1)	1.6E-10	5.4E-11	3.4%	4.5E-10	2.3E-06	24.2%	9.1E-11	3.2E-11	3.4%	7.1E-10	3.5E-06	24.2%
Chlordane, gamma-	58	4.39E-08	3.5E-01 (1)	2.0E-04 (1)	1.9E-10	6.6E-11	4.2%	5.5E-10	2.7E-06	29.3%	1.1E-10	3.8E-11	4.2%	8.5E-10	4.3E-06	29.3%
Dieldrin	0.32	2.42E-10	1.6E+01	5.0E-05	1.0E-12	1.7E-11	1.1%	3.0E-12	6.0E-08	0.6%	6.0E-13	9.7E-12	1.1%	4.7E-12	9.4E-08	0.6%
Heptachlor	22	1.67E-08	4.6E+00	5.0E-04	7.1E-11	3.2E-10	20.5%	2.1E-10	4.2E-07	4.4%	4.2E-11	1.9E-10	20.5%	3.2E-10	6.5E-07	4.4%
Heptachlor Epoxide	4.5	3.41E-09	9.1E+00	1.3E-05	1.5E-11	1.3E-10	8.4%	4.3E-11	3.3E-06	35.0%	8.5E-12	7.7E-11	8.4%	6.6E-11	5.1E-06	35.0%
Aroclor-1248	1.51	1.14E-09	2.0E+00	NA	4.9E-12	9.8E-12	0.6%	1.4E-11	--	--	2.8E-12	5.7E-12	0.6%	2.2E-11	--	--
Aroclor-1254	0.975	7.39E-10	2.0E+00	2.0E-05	3.2E-12	6.3E-12	0.4%	9.2E-12	4.6E-07	4.9%	1.8E-12	3.7E-12	0.4%	1.4E-11	7.2E-07	4.9%
Aroclor-1260	54.6	4.13E-08	2.0E+00	NA	1.8E-10	3.5E-10	22.4%	5.2E-10	--	--	1.0E-10	2.1E-10	22.4%	8.0E-10	--	--
Gasoline Range Organics	0.207	1.57E-10	NA	NA	6.7E-13	--	--	2.0E-12	--	--	3.9E-13	--	--	3.0E-12	--	--
Diesel Range Organics	470	3.56E-07	NA	NA	1.5E-09	--	--	4.4E-09	--	--	8.9E-10	--	--	6.9E-09	--	--
Antimony	1.22	9.25E-10	NA	NA	4.0E-12	--	--	1.2E-11	--	--	2.3E-12	--	--	1.8E-11	--	--
Arsenic	3.49	2.65E-09	1.5E+01	NA	1.1E-11	1.7E-10	10.8%	3.3E-11	--	--	6.6E-12	1.0E-10	10.8%	5.1E-11	--	--
Iron	2,260	1.71E-06	NA	NA	7.3E-09	--	--	2.1E-08	--	--	4.3E-09	--	--	3.3E-08	--	--
Thallium	0.31	2.32E-10	NA	NA	9.9E-13	--	--	2.9E-12	--	--	5.8E-13	--	--	4.5E-12	--	--
					Total ILCR:	1.6E-09	100.0%	Total HI:	9.4E-06	100.0%	Total ILCR:	9.2E-10	100.0%	Total HI:	1.5E-05	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT AND ADOLESCENT RECREATIONAL USERS - CURRENT SCENARIO
ACCIDENTAL INGESTION OF SURFACE SOIL - SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (C*IR*CF*FI*EF*ED)/(BW*AT)
ILCR = CDI*CSFo
HQ = CDI/RfDo

Parameter	Units	Description	Adult	Adolescent	
CDI	mg/kg/d	Chronic daily intake	CS	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	CS	
CSFo	1/(mg/kg/d)	Oral cancer slope factor	CS	CS	
HQ	NA	Hazard quotient	CS	CS	
RfDo	mg/kg/d	Oral reference dose	CS	CS	
C	mg/kg	Concentration of chemical in soil	CS	CS	
IR-S	mg/day	Ingestion rate of soil	100	100	
CF	kg/mg	Conversion factor	1.00E-06	1.00E-06	
FI	NA	Fraction of soil ingested from site	1	1	
EF	days/year	Exposure frequency	48	48	
ED	years	Exposure duration	24	9	
BW	kg	Body weight	70	45	
AT-C	days	Averaging time, carcinogens	25,550	25,550	
AT-N	days	Averaging time, noncarcinogens	8,760	3,285	

				Adult						Adolescent					
				Carcinogens			Noncarcinogens			Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	CSFo 1/(mg/kg/d)	RfDo (mg/kg/d)	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	57.9	NA	NA	3.7E-06	--	--	1.1E-05	--	--	2.2E-06	--	--	1.7E-05	--	--
Benzo(a)anthracene	4.76	7.3E-01	NA	3.1E-07	2.2E-07	1.5%	8.9E-07	--	--	1.8E-07	1.3E-07	1.5%	1.4E-06	--	--
Benzo(a)pyrene	2.48	7.3E+00	NA	1.6E-07	1.2E-06	7.9%	4.7E-07	--	--	9.3E-08	6.8E-07	7.9%	7.2E-07	--	--
Benzo(b)fluoranthene	2.81	7.3E-01	NA	1.8E-07	1.3E-07	0.9%	5.3E-07	--	--	1.1E-07	7.7E-08	0.9%	8.2E-07	--	--
Benzo(k)fluoranthene	1.78	7.3E-02	NA	1.1E-07	8.4E-09	0.1%	3.3E-07	--	--	6.7E-08	4.9E-09	0.1%	5.2E-07	--	--
Carbazole	0.95	2.0E-02	NA	6.1E-08	1.2E-09	0.0%	1.8E-07	--	--	3.6E-08	7.1E-10	0.0%	2.8E-07	--	--
Chrysene	6.7	7.3E-03	NA	4.3E-07	3.2E-09	0.0%	1.3E-06	--	--	2.5E-07	1.8E-09	0.0%	2.0E-06	--	--
Dibenz(a,h)anthracene	0.695	7.3E+00	NA	4.5E-08	3.3E-07	2.2%	1.3E-07	--	--	2.6E-08	1.9E-07	2.2%	2.0E-07	--	--
Indeno(1,2,3-cd)pyrene	1.72	7.3E-01	NA	1.1E-07	8.1E-08	0.5%	3.2E-07	--	--	6.5E-08	4.7E-08	0.5%	5.0E-07	--	--
Dieldrin	0.052	1.6E+01	5.0E-05	3.3E-09	5.4E-08	0.4%	9.8E-09	2.0E-04	3.9%	2.0E-09	3.1E-08	0.4%	1.5E-08	3.0E-04	3.9%
Aroclor-1260	95.6	2.0E+00	NA	6.2E-06	1.2E-05	83.1%	1.8E-05	--	--	3.6E-06	7.2E-06	83.1%	2.8E-05	--	--
Arsenic	5.26	1.5E+00	3.0E-04	3.4E-07	5.1E-07	3.4%	9.9E-07	3.3E-03	66.4%	2.0E-07	3.0E-07	3.4%	1.5E-06	5.1E-03	66.4%
Iron	2,347	NA	3.0E-01	1.5E-04	--	--	4.4E-04	1.5E-03	29.7%	8.8E-05	--	--	6.9E-04	2.3E-03	29.7%
				Total ILCR:	1.5E-05	100.0%	Total HI:	5.0E-03	100.0%	Total ILCR:	8.6E-06	100.0%	Total HI:	7.7E-03	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT AND ADOLESCENT RECREATIONAL USERS - CURRENT SCENARIO
DERMAL CONTACT WITH SURFACE SOIL - SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

DAD (mg/kg/d) = (C*CF*AF*ABS*SA*EF*ED)/(BW*AT)
ILCR = CDI*CSFd
HQ = CDI/RfDd

Parameter	Units	Description	Adult	Adolescent	
DAD	mg/kg/d	Dermally absorbed dose	CS	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	CS	
CSFd	1/(mg/kg/d)	Dermal cancer slope factor	CS	CS	
HQ	NA	Hazard quotient	CS	CS	
RfDd	mg/kg/d	Dermal reference dose	CS	CS	
C	mg/kg	Concentration of chemical in soil	CS	CS	
CF	kg/mg	Conversion factor	1.00E-06	1.00E-06	
AF	mg/cm2	Soil to skin adherence factor	0.2	0.2	
ABS	NA	Absorption fraction	CS	CS	
SA	cm2/day	Skin surface area available for contact	5,700	5,300	
EF	days/year	Exposure frequency	48	48	
ED	years	Exposure duration	24	9	
BW	kg	Body weight	70	45	
AT-C	days	Averaging time, carcinogens	25,550	25,550	
AT-N	days	Averaging time, noncarcinogens	8,760	3,285	

					Adult						Adolescent					
					Carcinogens			Noncarcinogens			Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	ABS	CSFd 1/(mg/kg/d)	RfDd (mg/kg/d)	DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI	DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	57.9	0.01	NA	NA	4.3E-07	--	--	1.2E-06	--	--	2.3E-07	--	--	1.8E-06	--	--
Benzo(a)anthracene	4.76	0.13	2.4E+00	NA	4.5E-07	1.1E-06	3.7%	1.3E-06	--	--	2.5E-07	5.8E-07	3.7%	1.9E-06	--	--
Benzo(a)pyrene	2.48	0.13	1.5E+01	NA	2.4E-07	3.5E-06	11.8%	6.9E-07	--	--	1.3E-07	1.9E-06	11.8%	1.0E-06	--	--
Benzo(b)fluoranthene	2.81	0.13	1.5E+00	NA	2.7E-07	3.9E-07	1.3%	7.8E-07	--	--	1.5E-07	2.1E-07	1.3%	1.1E-06	--	--
Benzo(k)fluoranthene	1.78	0.13	1.5E-01	NA	1.7E-07	2.5E-08	0.1%	5.0E-07	--	--	9.2E-08	1.3E-08	0.1%	7.2E-07	--	--
Carbazole	0.95	0.13	4.0E-02	NA	9.1E-08	3.6E-09	0.0%	2.6E-07	--	--	4.9E-08	2.0E-09	0.0%	3.8E-07	--	--
Chrysene	6.7	0.13	2.4E-02	NA	6.4E-07	1.5E-08	0.1%	1.9E-06	--	--	3.5E-07	8.2E-09	0.1%	2.7E-06	--	--
Dibenz(a,h)anthracene	0.695	0.13	2.4E+01	NA	6.6E-08	1.6E-06	5.4%	1.9E-07	--	--	3.6E-08	8.5E-07	5.4%	2.8E-07	--	--
Indeno(1,2,3-cd)pyrene	1.72	0.13	2.4E+00	NA	1.6E-07	3.9E-07	1.3%	4.8E-07	--	--	8.9E-08	2.1E-07	1.3%	6.9E-07	--	--
Dieldrin	0.052	0.01	3.2E+01	2.5E-05	3.8E-10	1.2E-08	0.0%	1.1E-09	4.5E-05	1.5%	2.1E-10	6.6E-09	0.0%	1.6E-09	6.4E-05	1.5%
Aroclor-1260	95.6	0.14	2.2E+00	NA	9.8E-06	2.2E-05	74.8%	2.9E-05	--	--	5.3E-06	1.2E-05	74.8%	4.1E-05	--	--
Arsenic	5.26	0.03	3.7E+00	1.2E-04	1.2E-07	4.2E-07	1.5%	3.4E-07	2.7E-03	94.6%	6.3E-08	2.3E-07	1.5%	4.9E-07	4.0E-03	94.6%
Iron	2,347	0.001	NA	4.5E-02	1.7E-06	--	--	5.0E-06	1.1E-04	3.8%	9.3E-07	--	--	7.3E-06	1.6E-04	3.8%
					Total ILCR:	2.9E-05	100.0%	Total HI:	2.9E-03	100.0%	Total ILCR:	1.6E-05	100.0%	Total HI:	4.2E-03	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT AND ADOLESCENT RECREATIONAL USERS - CURRENT SCENARIO
INHALATION OF FUGITIVE DUSTS EMANATING FROM SURFACE SOIL - SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (Ca*RR*ET*EF*ED)/(BW*AT)
Where: Ca = C * (1/PEF)

ILCR = CDI*CSFi
HQ = CDI/RfDi

Parameter	Units	Description	Adult	Adolescent	
CDI	mg/kg/d	Chronic daily intake	CS	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	CS	
CSFi	1/(mg/kg/d)	Inhalation cancer slope factor	CS	CS	
HQ	NA	Hazard quotient	CS	CS	
RfDi	mg/kg/d	Inhalation reference dose	CS	CS	
Ca	mg/m3	Concentration of chemical in air as fugitive dusts	CS	CS	
C	mg/kg	Concentration of chemical in soil	CS	CS	
PEF	m3/kg	Particulate emission factor	1.32E+09	1.32E+09	
RR	m3/hour	Respiration rate	0.83	0.83	
ET	hours/day	Exposure time	8	8	
EF	days/year	Exposure frequency	48	48	
ED	years	Exposure duration	24	9	
BW	kg	Body weight	70	45	
AT-C	days	Averaging time, carcinogens	25,550	25,550	
AT-N	days	Averaging time, noncarcinogens	8,760	3,285	

					Adult						Adolescent					
					Carcinogens			Noncarcinogens			Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	Ca (mg/m3)	CSFi 1/(mg/kg/d)	RfDi (mg/kg/d)	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	57.9	4.39E-08	NA	NA	1.9E-10	--	--	5.5E-10	--	--	1.1E-10	--	--	8.5E-10	--	--
Benzo(a)anthracene	4.76	3.61E-09	3.1E-01	NA	1.5E-11	4.8E-12	0.5%	4.5E-11	--	--	9.0E-12	2.8E-12	0.5%	7.0E-11	--	--
Benzo(a)pyrene	2.48	1.88E-09	3.1E+00	NA	8.0E-12	2.5E-11	2.7%	2.3E-11	--	--	4.7E-12	1.5E-11	2.7%	3.6E-11	--	--
Benzo(b)fluoranthene	2.81	2.13E-09	3.1E-01	NA	9.1E-12	2.8E-12	0.3%	2.7E-11	--	--	5.3E-12	1.6E-12	0.3%	4.1E-11	--	--
Benzo(k)fluoranthene	1.78	1.35E-09	3.1E-02	NA	5.8E-12	1.8E-13	0.0%	1.7E-11	--	--	3.4E-12	1.0E-13	0.0%	2.6E-11	--	--
Carbazole	0.95	7.20E-10	2.0E-02	NA	3.1E-12	6.2E-14	0.0%	9.0E-12	--	--	1.8E-12	3.6E-14	0.0%	1.4E-11	--	--
Chrysene	6.7	5.08E-09	3.1E-03	NA	2.2E-11	6.7E-14	0.0%	6.3E-11	--	--	1.3E-11	3.9E-14	0.0%	9.8E-11	--	--
Dibenz(a,h)anthracene	0.695	5.27E-10	3.1E+00	NA	2.3E-12	7.0E-12	0.8%	6.6E-12	--	--	1.3E-12	4.1E-12	0.8%	1.0E-11	--	--
Indeno(1,2,3-cd)pyrene	1.72	1.30E-09	3.1E-01	NA	5.6E-12	1.7E-12	0.2%	1.6E-11	--	--	3.2E-12	1.0E-12	0.2%	2.5E-11	--	--
Dieldrin	0.052	3.94E-11	1.6E+01	5.0E-05	1.7E-13	2.7E-12	0.3%	4.9E-13	9.8E-09	100.0%	9.8E-14	1.6E-12	0.3%	7.6E-13	1.5E-08	100.0%
Aroclor-1260	95.6	7.24E-08	2.0E+00	NA	3.1E-10	6.2E-10	67.3%	9.0E-10	--	--	1.8E-10	3.6E-10	67.3%	1.4E-09	--	--
Arsenic	5.26	3.98E-09	1.5E+01	NA	1.7E-11	2.6E-10	27.9%	5.0E-11	--	--	9.9E-12	1.5E-10	27.9%	7.7E-11	--	--
Iron	2,347	1.78E-06	NA	NA	7.6E-09	--	--	2.2E-08	--	--	4.4E-09	--	--	3.5E-08	--	--
					Total ILCR:	9.2E-10	100.0%	Total HI:	9.8E-09	100.0%	Total ILCR:	5.4E-10	100.0%	Total HI:	1.5E-08	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT AND ADOLESCENT RECREATIONAL USERS - CURRENT SCENARIO
ACCIDENTAL INGESTION OF SURFACE WATER - SITE 84 (BUILDING 45 AREA)
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (C*IR*ET*EF*ED)/(BW*AT)
ILCR = CDI*CSFo
HQ = CDI/RfDo

Parameter	Units	Description	Adult	Adolescent	
CDI	mg/kg/d	Chronic daily intake	CS	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	CS	
CSFo	1/(mg/kg/d)	Oral cancer slope factor	CS	CS	
HQ	NA	Hazard quotient	CS	CS	
RfDo	mg/kg/d	Oral reference dose	CS	CS	
C	mg/L	Concentration of chemical in water	CS	CS	
IR-W	L/hour	Ingestion rate of water	0.01	0.01	
ET	hours/day	Exposure time	2.6	2.6	
EF	days/year	Exposure frequency	48	48	
ED	years	Exposure duration	24	9	
BW	kg	Body weight	70	45	
AT-C	days	Averaging time, carcinogens	25,550	25,550	
AT-N	days	Averaging time, noncarcinogens	8,760	3,285	

				Adult						Adolescent					
				Carcinogens			Noncarcinogens			Carcinogens			Noncarcinogens		
Parameter	C (mg/L)	CSFo 1/(mg/kg/d)	RfDo (mg/kg/d)	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI
Acetone	0.0056	NA	1.0E-01	9.4E-08	--	--	2.7E-07	2.7E-06	78.6%	5.5E-08	--	--	4.3E-07	4.3E-06	78.6%
Toluene	0.0027	NA	2.0E-01	4.5E-08	--	--	1.3E-07	6.6E-07	18.9%	2.6E-08	--	--	2.1E-07	1.0E-06	18.9%
Xylenes, total	0.0035	NA	2.0E+00	5.9E-08	--	--	1.7E-07	8.5E-08	2.5%	3.4E-08	--	--	2.7E-07	1.3E-07	2.5%
				Total ILCR:	--	--	Total HI:	3.5E-06	100.0%	Total ILCR:	--	--	Total HI:	5.4E-06	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.

ADULT AND ADOLESCENT RECREATIONAL USERS - CURRENT SCENARIO
DERMAL CONTACT WITH SURFACE WATER - SITE 84 (BUILDING 45 AREA)
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

DAD (mg/kg/d) = (C*CF*Kp*SA*EF*ED*ET)/(BW*AT)

ILCR = CDI*CSFo Adj CSF Adj = CSF/AD
HQ = CDI/RfDo Adj RfD Adj = RfD*AD

Parameter	Units	Description	Adult	Adolescent	
DAD	mg/kg/d	Dermally absorbed dose	CS	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	CS	
CSFd	1/(mg/kg/d)	Dermal cancer slope factor	CS	CS	
HQ	NA	Hazard quotient	CS	CS	
RfDd	mg/kg/d	Dermal reference dose	CS	CS	
SA	cm2	Skin surface area available for contact	5,700	5,300	
EF	days/year	Exposure frequency	48	48	
ED	years	Exposure duration	24	9	
ET	hours/day	Exposure time	2.6	2.6	
BW	kg	Body weight	70	45	
AT-C	days	Averaging time, carcinogens	25,550	25,550	
AT-N	days	Averaging time, noncarcinogens	8,760	3,285	
C	mg/L	Concentration of chemical in water	CS	CS	
CF	L/cm3	Conversion factor	1.00E-03	1.00E-03	
Kp	cm/hour	Dermal permeability coefficient	CS	CS	
AD	NA	Adjustment for absorbed dose	CS	CS	

					Adult						Adolescent					
					Carcinogens			Noncarcinogens			Carcinogens			Noncarcinogens		
Parameter	C (mg/L)	Kp (cm/hour)	CSFd 1/(mg/kg/d)	RfDd (mg/kg/d)	DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI	DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI
Acetone	0.0056	0.00057	NA	8.3E-02	3.0E-08	--	--	8.9E-08	1.1E-06	3.9%	1.7E-08	--	--	1.3E-07	1.5E-06	3.9%
Toluene	0.0027	0.045	NA	1.6E-01	1.2E-06	--	--	3.4E-06	2.1E-05	77.6%	6.3E-07	--	--	4.9E-06	3.1E-05	77.6%
Xylenes, total	0.0035	0.095	NA	1.8E+00	3.2E-06	--	--	9.3E-06	5.0E-06	18.5%	1.7E-06	--	--	1.3E-05	7.3E-06	18.5%
					Total ILCR:	--	--	Total HI:	2.7E-05	100.0%	Total ILCR:	--	--	Total HI:	3.9E-05	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.

ADULT AND ADOLESCENT RECREATIONAL USERS - CURRENT SCENARIO
ACCIDENTAL INGESTION OF SEDIMENT - SITE 84 (BUILDING 45 AREA)
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (C*IR*CF*FI*EF*ED)/(BW*AT)
ILCR = CDI*CSFo
HQ = CDI/RfDo

Parameter	Units	Description	Adult	Adolescent	
CDI	mg/kg/d	Chronic daily intake	CS	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	CS	
CSFo	1/(mg/kg/d)	Oral cancer slope factor	CS	CS	
HQ	NA	Hazard quotient	CS	CS	
RfDo	mg/kg/d	Oral reference dose	CS	CS	
C	mg/kg	Concentration of chemical in soil	CS	CS	
IR-S	mg/day	Ingestion rate of sediment	100	100	
CF	kg/mg	Conversion factor	1.00E-06	1.00E-06	
FI	NA	Fraction of soil ingested from site	1	1	
EF	days/year	Exposure frequency	48	48	
ED	years	Exposure duration	24	9	
BW	kg	Body weight	70	45	
AT-C	days	Averaging time, carcinogens	25,550	25,550	
AT-N	days	Averaging time, noncarcinogens	8,760	3,285	

				Adult						Adolescent					
				Carcinogens			Noncarcinogens			Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	CSFo 1/(mg/kg/d)	RfDo (mg/kg/d)	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	10	NA	NA	6.4E-07	--	--	1.9E-06	--	--	3.8E-07	--	--	2.9E-06	--	--
Aroclor-1248	2.8	2.0E+00	NA	1.8E-07	3.6E-07	6.5%	5.3E-07	--	--	1.1E-07	2.1E-07	6.5%	8.2E-07	--	--
Aroclor-1260	40	2.0E+00	NA	2.6E-06	5.2E-06	93.5%	7.5E-06	--	--	1.5E-06	3.0E-06	93.5%	1.2E-05	--	--
Diesel Range Organics	11,600	NA	NA	7.5E-04	--	--	2.2E-03	--	--	4.4E-04	--	--	3.4E-03	--	--
				Total ILCR:	5.5E-06	100.0%	Total HI:	--	--	Total ILCR:	3.2E-06	100.0%	Total HI:	--	--

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.

ADULT AND ADOLESCENT RECREATIONAL USERS - CURRENT SCENARIO
DERMAL CONTACT WITH SEDIMENT - SITE 84 (BUILDING 45 AREA)
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

DAD (mg/kg/d) = (C*CF*AF*ABS*SA*EF*ED)/(BW*AT)
ILCR = CDI*CSFd
HQ = CDI/RfDd

Parameter	Units	Description	Adult	Adolescent	
DAD	mg/kg/d	Dermally absorbed dose	CS	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	CS	
CSFd	1/(mg/kg/d)	Dermal cancer slope factor	CS	CS	
HQ	NA	Hazard quotient	CS	CS	
RfDd	mg/kg/d	Dermal reference dose	CS	CS	
C	mg/kg	Concentration of chemical in soil	CS	CS	
CF	kg/mg	Conversion factor	1.00E-06	1.00E-06	
AF	mg/cm2	Soil to skin adherence factor	0	0	
ABS	NA	Absorption fraction	CS	CS	
SA	cm2/day	Skin surface area available for contact	5,700	5,300	
EF	days/year	Exposure frequency	48	48	
ED	years	Exposure duration	24	9	
BW	kg	Body weight	70	45	
AT-C	days	Averaging time, carcinogens	25,550	25,550	
AT-N	days	Averaging time, noncarcinogens	8,760	3,285	

					Adult						Adolescent					
					Carcinogens			Noncarcinogens			Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	ABS	CSFd 1/(mg/kg/d)	RfDd (mg/kg/d)	DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI	DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	10	0.01	NA	NA	7.3E-08	--	--	2.1E-07	--	--	4.0E-08	--	--	3.1E-07	--	--
Aroclor-1248	2.8	0.14	2.2E+00	NA	2.9E-07	6.5E-07	6.6%	8.4E-07	--	--	1.6E-07	3.5E-07	6.6%	1.2E-06	--	--
Aroclor-1260	40	0.14	2.2E+00	NA	4.1E-06	9.1E-06	93.4%	1.2E-05	--	--	2.2E-06	5.0E-06	93.4%	1.7E-05	--	--
Diesel Range Organics	11,600	0.01	NA	NA	8.5E-05	--	--	2.5E-04	--	--	4.6E-05	--	--	3.6E-04	--	--
					Total ILCR:	9.8E-06	100.0%	Total HI:	--	--	Total ILCR:	5.3E-06	100.0%	Total HI:	--	--

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.

ADULT AND YOUNG CHILD RESIDENTS - FUTURE SCENARIOS
ACCIDENTAL INGESTION OF SURFACE SOIL - SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (C*IR*CF*FI*EF*ED)/(BW*AT)
ILCR = CDI*CSFo
HQ = CDI/RfDo

Parameter	Units	Description	Adult	Young Child	
CDI	mg/kg/d	Chronic daily intake	CS	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	CS	
CSFo	1/(mg/kg/d)	Oral cancer slope factor	CS	CS	
HQ	NA	Hazard quotient	CS	CS	
RfDo	mg/kg/d	Oral reference dose	CS	CS	
C	mg/kg	Concentration of chemical in soil	CS	CS	
IR-S	mg/day	Ingestion rate of soil	100	200	
CF	kg/mg	Conversion factor	1.00E-06	1.00E-06	
FI	NA	Fraction of soil ingested from site	1	1	
EF	days/year	Exposure frequency	350	350	
ED	years	Exposure duration	24	6	
BW	kg	Body weight	70	15	
AT-C	days	Averaging time, carcinogens	25,550	25,550	
AT-N	days	Averaging time, noncarcinogens	8,760	2,190	

				Adult						Young Child					
				Carcinogens			Noncarcinogens			Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	CSFo 1/(mg/kg/d)	RfDo (mg/kg/d)	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	1.96	NA	NA	9.2E-07	--	--	2.7E-06	--	--	2.1E-06	--	--	2.5E-05	--	--
Benzo(a)anthracene	69.0	7.3E-01	NA	3.2E-05	2.4E-05	8.1%	9.5E-05	--	--	7.6E-05	5.5E-05	8.1%	8.8E-04	--	--
Benzo(a)pyrene	30.5	7.3E+00	NA	1.4E-05	1.0E-04	35.6%	4.2E-05	--	--	3.3E-05	2.4E-04	35.6%	3.9E-04	--	--
Benzo(b)fluoranthene	40.9	7.3E-01	NA	1.9E-05	1.4E-05	4.8%	5.6E-05	--	--	4.5E-05	3.3E-05	4.8%	5.2E-04	--	--
Benzo(k)fluoranthene	18.7	7.3E-02	NA	8.8E-06	6.4E-07	0.2%	2.6E-05	--	--	2.0E-05	1.5E-06	0.2%	2.4E-04	--	--
Carbazole	3.16	2.0E-02	NA	1.5E-06	3.0E-08	0.0%	4.3E-06	--	--	3.5E-06	6.9E-08	0.0%	4.0E-05	--	--
Chrysene	96.0	7.3E-03	NA	4.5E-05	3.3E-07	0.1%	1.3E-04	--	--	1.1E-04	7.7E-07	0.1%	1.2E-03	--	--
Dibenz(a,h)anthracene	1.41	7.3E+00	NA	6.6E-07	4.8E-06	1.7%	1.9E-06	--	--	1.5E-06	1.1E-05	1.7%	1.8E-05	--	--
Fluoranthene	243	NA	4.0E-02	1.1E-04	--	--	3.3E-04	8.3E-03	0.9%	2.7E-04	--	--	3.1E-03	7.8E-02	0.9%
Indeno(1,2,3-cd)pyrene	8.79	7.3E-01	NA	4.1E-06	3.0E-06	1.0%	1.2E-05	--	--	9.6E-06	7.0E-06	1.0%	1.1E-04	--	--
Naphthalene	0.525	NA	2.0E-02	2.5E-07	--	--	7.2E-07	3.6E-05	0.0%	5.8E-07	--	--	6.7E-06	3.4E-04	0.0%
Pyrene	250	NA	3.0E-02	1.2E-04	--	--	3.4E-04	1.1E-02	1.2%	2.7E-04	--	--	3.2E-03	1.1E-01	1.2%
4,4'-DDD	3	2.4E-01	NA	1.4E-06	3.4E-07	0.1%	4.1E-06	--	--	3.3E-06	7.9E-07	0.1%	3.8E-05	--	--
Chlordane, alpha-	48	3.5E-01 (1)	5.0E-04 (1)	2.3E-05	7.9E-06	2.7%	6.6E-05	1.3E-01	13.7%	5.3E-05	1.8E-05	2.7%	6.1E-04	1.2E+00	13.7%
Chlordane, gamma-	58	3.5E-01 (1)	5.0E-04 (1)	2.7E-05	9.5E-06	3.3%	7.9E-05	1.6E-01	16.6%	6.4E-05	2.2E-05	3.3%	7.4E-04	1.5E+00	16.6%
Dieldrin	0.32	1.6E+01	5.0E-05	1.5E-07	2.4E-06	0.8%	4.4E-07	8.8E-03	0.9%	3.5E-07	5.6E-06	0.8%	4.1E-06	8.2E-02	0.9%
Heptachlor	22	4.5E+00	5.0E-04	1.0E-05	4.6E-05	15.9%	3.0E-05	6.0E-02	6.3%	2.4E-05	1.1E-04	15.9%	2.8E-04	5.6E-01	6.3%
Heptachlor Epoxide	4.5	9.1E+00	1.3E-05	2.1E-06	1.9E-05	6.6%	6.2E-06	4.7E-01	49.5%	4.9E-06	4.5E-05	6.6%	5.8E-05	4.4E+00	49.5%
Aroclor-1248	1.51	2.0E+00	NA	7.1E-07	1.4E-06	0.5%	2.1E-06	--	--	1.7E-06	3.3E-06	0.5%	1.9E-05	--	--
Aroclor-1254	0.975	2.0E+00	2.0E-05	4.6E-07	9.2E-07	0.3%	1.3E-06	6.7E-02	7.0%	1.1E-06	2.1E-06	0.3%	1.2E-05	6.2E-01	7.0%
Aroclor-1260	54.6	2.0E+00	NA	2.6E-05	5.1E-05	17.5%	7.5E-05	--	--	6.0E-05	1.2E-04	17.5%	7.0E-04	--	--
Gasoline Range Organics	0.207	NA	NA	9.7E-08	--	--	2.8E-07	--	--	2.3E-07	--	--	2.6E-06	--	--
Diesel Range Organics	470	NA	NA	2.2E-04	--	--	6.4E-04	--	--	5.2E-04	--	--	6.0E-03	--	--
Antimony	1.22	NA	4.0E-04	5.7E-07	--	--	1.7E-06	4.2E-03	0.4%	1.3E-06	--	--	1.6E-05	3.9E-02	0.4%
Arsenic	3.49	1.5E+00	3.0E-04	1.6E-06	2.5E-06	0.8%	4.8E-06	1.6E-02	1.7%	3.8E-06	5.7E-06	0.8%	4.5E-05	1.5E-01	1.7%
Iron	2,260	NA	3.0E-01	1.1E-03	--	--	3.1E-03	1.0E-02	1.1%	2.5E-03	--	--	2.9E-02	9.6E-02	1.1%
Thallium	0.31	NA	6.6E-05	1.4E-07	--	--	4.2E-07	6.4E-03	0.7%	3.4E-07	--	--	3.9E-06	5.9E-02	0.7%
				Total ILCR:	2.9E-04	100.0%	Total HI:	9.6E-01	100.0%	Total ILCR:	6.8E-04	100.0%	Total HI:	8.9E+00	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT AND YOUNG CHILD RESIDENTS - FUTURE SCENARIOS
DERMAL CONTACT WITH SURFACE SOIL - SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

DAD (mg/kg/d) = (C*CF*AF*ABS*SA*EF*ED)/(BW*AT)
ILCR = CDI*CSFd
HQ = CDI/RfDd

Parameter	Units	Description	Adult	Young Child	
DAD	mg/kg/d	Dermally absorbed dose	CS	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	CS	
CSFd	1/(mg/kg/d)	Dermal cancer slope factor	CS	CS	
HQ	NA	Hazard quotient	CS	CS	
RfDd	mg/kg/d	Dermal reference dose	CS	CS	
C	mg/kg	Concentration of chemical in soil	CS	CS	
CF	kg/mg	Conversion factor	1.00E-06	1.00E-06	
AF	mg/cm2	Soil to skin adherence factor	0.07	0.2	
ABS	NA	Absorption fraction	CS	CS	
SA	cm2/day	Skin surface area available for contact	5,700	2,800	
EF	days/year	Exposure frequency	350	350	
ED	years	Exposure duration	24	6	
BW	kg	Body weight	70	15	
AT-C	days	Averaging time, carcinogens	25,550	25,550	
AT-N	days	Averaging time, noncarcinogens	8,760	2,190	

					Adult						Young Child					
					Carcinogens			Noncarcinogens			Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	ABS	CSFd 1/(mg/kg/d)	RfDd (mg/kg/d)	DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI	DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	1.96	0.01	NA	NA	3.7E-08	--	--	1.1E-07	--	--	6.0E-08	--	--	7.0E-07	--	--
Benzo(a)anthracene	69.0	0.13	2.4E+00	NA	1.7E-05	4.0E-05	18.1%	4.9E-05	--	--	2.8E-05	6.5E-05	18.1%	3.2E-04	--	--
Benzo(a)pyrene	30.5	0.13	1.5E+01	NA	7.4E-06	1.1E-04	49.7%	2.2E-05	--	--	1.2E-05	1.8E-04	49.7%	1.4E-04	--	--
Benzo(b)fluoranthene	40.9	0.13	1.5E+00	NA	1.0E-05	1.5E-05	6.7%	2.9E-05	--	--	1.6E-05	2.4E-05	6.7%	1.9E-04	--	--
Benzo(k)fluoranthene	18.7	0.13	1.5E-01	NA	4.5E-06	6.6E-07	0.3%	1.3E-05	--	--	7.4E-06	1.1E-06	0.3%	8.7E-05	--	--
Carbazole	3.16	0.13	4.0E-02	NA	7.7E-07	3.1E-08	0.0%	2.2E-06	--	--	1.3E-06	5.0E-08	0.0%	1.5E-05	--	--
Chrysene	96.0	0.13	2.4E-02	NA	2.3E-05	5.5E-07	0.3%	6.8E-05	--	--	3.8E-05	9.0E-07	0.3%	4.5E-04	--	--
Dibenz(a,h)anthracene	1.41	0.13	2.4E+01	NA	3.4E-07	8.1E-06	3.7%	1.0E-06	--	--	5.6E-07	1.3E-05	3.7%	6.6E-06	--	--
Fluoranthene	243	0.01	NA	1.2E-02	4.6E-06	--	--	1.3E-05	1.1E-03	0.8%	7.5E-06	--	--	8.7E-05	7.0E-03	0.8%
Indeno(1,2,3-cd)pyrene	8.79	0.13	2.4E+00	NA	2.1E-06	5.0E-06	2.3%	6.2E-06	--	--	3.5E-06	8.3E-06	2.3%	4.1E-05	--	--
Naphthalene	0.525	0.01	NA	1.6E-02	9.8E-09	--	--	2.9E-08	1.8E-06	0.0%	1.6E-08	--	--	1.9E-07	1.2E-05	0.0%
Pyrene	250	0.01	NA	9.3E-03	4.7E-06	--	--	1.4E-05	1.5E-03	1.1%	7.7E-06	--	--	8.9E-05	9.6E-03	1.1%
4,4'-DDD	3	0.01	3.4E-01	NA	5.6E-08	1.9E-08	0.0%	1.6E-07	--	--	9.2E-08	3.2E-08	0.0%	1.1E-06	--	--
Chlordane, alpha-	48	0.04	4.4E-01 (1)	4.0E-04 (1)	3.6E-06	1.6E-06	0.7%	1.0E-05	2.6E-02	19.0%	5.9E-06	2.6E-06	0.7%	6.9E-05	1.7E-01	19.0%
Chlordane, gamma-	58	0.04	4.4E-01 (1)	4.0E-04 (1)	4.3E-06	1.9E-06	0.9%	1.3E-05	3.2E-02	22.9%	7.1E-06	3.1E-06	0.9%	8.3E-05	2.1E-01	22.9%
Dieldrin	0.32	0.01	3.2E+01	2.5E-05	6.0E-09	1.9E-07	0.1%	1.7E-08	7.0E-04	0.5%	9.8E-09	3.1E-07	0.1%	1.1E-07	4.6E-03	0.5%
Heptachlor	22	0.01	6.3E+00	3.6E-04	4.1E-07	2.6E-06	1.2%	1.2E-06	3.3E-03	2.4%	6.8E-07	4.2E-06	1.2%	7.9E-06	2.2E-02	2.4%
Heptachlor Epoxide	4.5	0.01	1.3E+01	9.4E-06	8.4E-08	1.1E-06	0.5%	2.5E-07	2.6E-02	19.0%	1.4E-07	1.7E-06	0.5%	1.6E-06	1.7E-01	19.0%
Aroclor-1248	1.51	0.14	2.2E+00	NA	4.0E-07	8.9E-07	0.4%	1.2E-06	--	--	6.5E-07	1.5E-06	0.4%	7.6E-06	--	--
Aroclor-1254	0.975	0.14	2.2E+00	1.8E-05	2.6E-07	5.7E-07	0.3%	7.5E-07	4.1E-02	30.0%	4.2E-07	9.3E-07	0.3%	4.9E-06	2.7E-01	30.0%
Aroclor-1260	54.6	0.14	2.2E+00	NA	1.4E-05	3.2E-05	14.6%	4.2E-05	--	--	2.3E-05	5.2E-05	14.6%	2.7E-04	--	--
Gasoline Range Organics	0.207	0.01	NA	NA	3.9E-09	--	--	1.1E-08	--	--	6.4E-09	--	--	7.4E-08	--	--
Diesel Range Organics	470	0.01	NA	NA	8.8E-06	--	--	2.6E-05	--	--	1.4E-05	--	--	1.7E-04	--	--
Antimony	1.22	0.001	NA	8.0E-06	2.3E-09	--	--	6.7E-09	8.3E-04	0.6%	3.7E-09	--	--	4.4E-08	5.5E-03	0.6%
Arsenic	3.49	0.03	3.7E+00	1.2E-04	2.0E-07	7.2E-07	0.3%	5.7E-07	4.7E-03	3.4%	3.2E-07	1.2E-06	0.3%	3.8E-06	3.0E-02	3.4%
Iron	2,260	0.001	NA	4.5E-02	4.2E-06	--	--	1.2E-05	2.7E-04	0.2%	6.9E-06	--	--	8.1E-05	1.8E-03	0.2%
Thallium	0.31	0.001	NA	9.9E-06	5.7E-10	--	--	1.7E-09	1.7E-04	0.1%	9.4E-10	--	--	1.1E-08	1.1E-03	0.1%
					Total ILCR:	2.2E-04	100.0%	Total HI:	1.4E-01	100.0%	Total ILCR:	3.6E-04	100.0%	Total HI:	9.1E-01	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT AND YOUNG CHILD RESIDENTS - FUTURE SCENARIOS
INHALATION OF FUGITIVE DUSTS EMANATING FROM SURFACE SOIL - SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (Ca*RR*ET*EF*ED)/(BW*AT)
Where: Ca = C * (1/PEF)

ILCR = CDI*CSFi
HQ = CDI/RfDi

Parameter	Units	Description	Adult	Young Child	
CDI	mg/kg/d	Chronic daily intake	CS	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	CS	
CSFi	1/(mg/kg/d)	Inhalation cancer slope factor	CS	CS	
HQ	NA	Hazard quotient	CS	CS	
RfDi	mg/kg/d	Inhalation reference dose	CS	CS	
Ca	mg/m3	Concentration of chemical in air as fugitive dusts	CS	CS	
C	mg/kg	Concentration of chemical in soil	CS	CS	
PEF	m3/kg	Particulate emission factor	1.32E+09	1.32E+09	
RR	m3/hour	Respiration rate	0.83	0.63	
ET	hours/day	Exposure time	24	24	
EF	days/year	Exposure frequency	350	350	
ED	years	Exposure duration	24	6	
BW	kg	Body weight	70	15	
AT-C	days	Averaging time, carcinogens	25,550	25,550	
AT-N	days	Averaging time, noncarcinogens	8,760	2,190	

					Adult						Young Child					
					Carcinogens			Noncarcinogens			Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	Ca (mg/m3)	CSFi 1/(mg/kg/d)	RfDi (mg/kg/d)	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	1.96	1.48E-09	NA	NA	1.4E-10	--	--	4.0E-10	--	--	1.2E-10	--	--	1.4E-09	--	--
Benzo(a)anthracene	69.0	5.23E-08	3.1E-01	NA	4.9E-09	1.5E-09	4.4%	1.4E-08	--	--	4.3E-09	1.3E-09	4.4%	5.0E-08	--	--
Benzo(a)pyrene	30.5	2.31E-08	3.1E+00	NA	2.2E-09	6.7E-09	19.4%	6.3E-09	--	--	1.9E-09	5.9E-09	19.4%	2.2E-08	--	--
Benzo(b)fluoranthene	40.9	3.10E-08	3.1E-01	NA	2.9E-09	9.0E-10	2.6%	8.4E-09	--	--	2.5E-09	7.9E-10	2.6%	3.0E-08	--	--
Benzo(k)fluoranthene	18.7	1.41E-08	3.1E-02	NA	1.3E-09	4.1E-11	0.1%	3.9E-09	--	--	1.2E-09	3.6E-11	0.1%	1.4E-08	--	--
Carbazole	3.16	2.39E-09	2.0E-02	NA	2.2E-10	4.5E-12	0.0%	6.5E-10	--	--	2.0E-10	3.9E-12	0.0%	2.3E-09	--	--
Chrysene	96.0	7.27E-08	3.1E-03	NA	6.8E-09	2.1E-11	0.1%	2.0E-08	--	--	6.0E-09	1.9E-11	0.1%	7.0E-08	--	--
Dibenz(a,h)anthracene	1.41	1.07E-09	3.1E+00	NA	1.0E-10	3.1E-10	0.9%	2.9E-10	--	--	8.8E-11	2.7E-10	0.9%	1.0E-09	--	--
Fluoranthene	243	1.84E-07	NA	4.0E-02	1.7E-08	--	--	5.0E-08	1.3E-06	0.6%	1.5E-08	--	--	1.8E-07	4.4E-06	0.6%
Indeno(1,2,3-cd)pyrene	8.79	6.66E-09	3.1E-01	NA	6.2E-10	1.9E-10	0.6%	1.8E-09	--	--	5.5E-10	1.7E-10	0.6%	6.4E-09	--	--
Naphthalene	0.525	3.98E-10	NA	8.6E-04	3.7E-11	--	--	1.1E-10	1.3E-07	0.1%	3.3E-11	--	--	3.8E-10	4.5E-07	0.1%
Pyrene	250	1.89E-07	NA	3.0E-02	1.8E-08	--	--	5.2E-08	1.7E-06	0.8%	1.6E-08	--	--	1.8E-07	6.1E-06	0.8%
4,4'-DDD	3	2.27E-09	2.4E-01	NA	2.1E-10	5.1E-11	0.1%	6.2E-10	--	--	1.9E-10	4.5E-11	0.1%	2.2E-09	--	--
Chlordane, alpha-	48	3.64E-08	3.5E-01 (1)	2.0E-04 (1)	3.4E-09	1.2E-09	3.4%	9.9E-09	5.0E-05	24.2%	3.0E-09	1.0E-09	3.4%	3.5E-08	1.7E-04	24.2%
Chlordane, gamma-	58	4.39E-08	3.5E-01 (1)	2.0E-04 (1)	4.1E-09	1.4E-09	4.2%	1.2E-08	6.0E-05	29.3%	3.6E-09	1.3E-09	4.2%	4.2E-08	2.1E-04	29.3%
Dieldrin	0.32	2.42E-10	1.6E+01	5.0E-05	2.3E-11	3.7E-10	1.1%	6.6E-11	1.3E-06	0.6%	2.0E-11	3.2E-10	1.1%	2.3E-10	4.6E-06	0.6%
Heptachlor	22	1.67E-08	4.6E+00	5.0E-04	1.6E-09	7.1E-09	20.5%	4.5E-09	9.1E-06	4.4%	1.4E-09	6.2E-09	20.5%	1.6E-08	3.2E-05	4.4%
Heptachlor Epoxide	4.5	3.41E-09	9.1E+00	1.3E-05	3.2E-10	2.9E-09	8.4%	9.3E-10	7.2E-05	35.0%	2.8E-10	2.5E-09	8.4%	3.3E-09	2.5E-04	35.0%
Aroclor-1248	1.51	1.14E-09	2.0E+00	NA	1.1E-10	2.1E-10	0.6%	3.1E-10	--	--	9.4E-11	1.9E-10	0.6%	1.1E-09	--	--
Aroclor-1254	0.975	7.39E-10	2.0E+00	2.0E-05	6.9E-11	1.4E-10	0.4%	2.0E-10	1.0E-05	4.9%	6.1E-11	1.2E-10	0.4%	7.1E-10	3.5E-05	4.9%
Aroclor-1260	54.6	4.13E-08	2.0E+00	NA	3.9E-09	7.7E-09	22.4%	1.1E-08	--	--	3.4E-09	6.8E-09	22.4%	4.0E-08	--	--
Gasoline Range Organics	0.207	1.57E-10	NA	NA	1.5E-11	--	--	4.3E-11	--	--	1.3E-11	--	--	1.5E-10	--	--
Diesel Range Organics	470	3.56E-07	NA	NA	3.3E-08	--	--	9.7E-08	--	--	2.9E-08	--	--	3.4E-07	--	--
Antimony	1.22	9.25E-10	NA	NA	8.7E-11	--	--	2.5E-10	--	--	7.6E-11	--	--	8.9E-10	--	--
Arsenic	3.49	2.65E-09	1.5E+01	NA	2.5E-10	3.7E-09	10.8%	7.2E-10	--	--	2.2E-10	3.3E-09	10.8%	2.5E-09	--	--
Iron	2,260	1.71E-06	NA	NA	1.6E-07	--	--	4.7E-07	--	--	1.4E-07	--	--	1.6E-06	--	--
Thallium	0.31	2.32E-10	NA	NA	2.2E-11	--	--	6.3E-11	--	--	1.9E-11	--	--	2.2E-10	--	--
					Total ILCR:	3.5E-08	100.0%	Total HI:	2.0E-04	100.0%	Total ILCR:	3.0E-08	100.0%	Total HI:	7.2E-04	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT AND YOUNG CHILD RESIDENTS - FUTURE SCENARIOS
ACCIDENTAL INGESTION OF SURFACE SOIL - SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (C*IR*CF*FI*EF*ED)/(BW*AT)
ILCR = CDI*CSFo
HQ = CDI/RfDo

Parameter	Units	Description	Adult	Young Child	
CDI	mg/kg/d	Chronic daily intake	CS	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	CS	
CSFo	1/(mg/kg/d)	Oral cancer slope factor	CS	CS	
HQ	NA	Hazard quotient	CS	CS	
RfDo	mg/kg/d	Oral reference dose	CS	CS	
C	mg/kg	Concentration of chemical in soil	CS	CS	
IR-S	mg/day	Ingestion rate of soil	100	200	
CF	kg/mg	Conversion factor	1.00E-06	1.00E-06	
FI	NA	Fraction of soil ingested from site	1	1	
EF	days/year	Exposure frequency	350	350	
ED	years	Exposure duration	24	6	
BW	kg	Body weight	70	15	
AT-C	days	Averaging time, carcinogens	25,550	25,550	
AT-N	days	Averaging time, noncarcinogens	8,760	2,190	

				Adult						Young Child					
				Carcinogens			Noncarcinogens			Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	CSFo 1/(mg/kg/d)	RfDo (mg/kg/d)	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	57.9	NA	NA	2.7E-05	--	--	7.9E-05	--	--	6.3E-05	--	--	7.4E-04	--	--
Benzo(a)anthracene	4.76	7.3E-01	NA	2.2E-06	1.6E-06	1.5%	6.5E-06	--	--	5.2E-06	3.8E-06	1.5%	6.1E-05	--	--
Benzo(a)pyrene	2.48	7.3E+00	NA	1.2E-06	8.5E-06	7.9%	3.4E-06	--	--	2.7E-06	2.0E-05	7.9%	3.2E-05	--	--
Benzo(b)fluoranthene	2.81	7.3E-01	NA	1.3E-06	9.6E-07	0.9%	3.8E-06	--	--	3.1E-06	2.2E-06	0.9%	3.6E-05	--	--
Benzo(k)fluoranthene	1.78	7.3E-02	NA	8.4E-07	6.1E-08	0.1%	2.4E-06	--	--	2.0E-06	1.4E-07	0.1%	2.3E-05	--	--
Carbazole	0.95	2.0E-02	NA	4.5E-07	8.9E-09	0.0%	1.3E-06	--	--	1.0E-06	2.1E-08	0.0%	1.2E-05	--	--
Chrysene	6.7	7.3E-03	NA	3.1E-06	2.3E-08	0.0%	9.2E-06	--	--	7.3E-06	5.4E-08	0.0%	8.6E-05	--	--
Dibenz(a,h)anthracene	0.695	7.3E+00	NA	3.3E-07	2.4E-06	2.2%	9.5E-07	--	--	7.6E-07	5.6E-06	2.2%	8.9E-06	--	--
Indeno(1,2,3-cd)pyrene	1.72	7.3E-01	NA	8.1E-07	5.9E-07	0.5%	2.4E-06	--	--	1.9E-06	1.4E-06	0.5%	2.2E-05	--	--
Dieldrin	0.052	1.6E+01	5.0E-05	2.4E-08	3.9E-07	0.4%	7.1E-08	1.4E-03	3.9%	5.7E-08	9.1E-07	0.4%	6.6E-07	1.3E-02	3.9%
Aroclor-1260	95.6	2.0E+00	NA	4.5E-05	9.0E-05	83.1%	1.3E-04	--	--	1.0E-04	2.1E-04	83.1%	1.2E-03	--	--
Arsenic	5.26	1.5E+00	3.0E-04	2.5E-06	3.7E-06	3.4%	7.2E-06	2.4E-02	66.4%	5.8E-06	8.6E-06	3.4%	6.7E-05	2.2E-01	66.4%
Iron	2,347	NA	3.0E-01	1.1E-03	--	--	3.2E-03	1.1E-02	29.7%	2.6E-03	--	--	3.0E-02	1.0E-01	29.7%
				Total ILCR:	1.1E-04	100.0%	Total HI:	3.6E-02	100.0%	Total ILCR:	2.5E-04	100.0%	Total HI:	3.4E-01	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT AND YOUNG CHILD RESIDENTS - FUTURE SCENARIOS
DERMAL CONTACT WITH SURFACE SOIL - SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

DAD (mg/kg/d) = (C*CF*AF*ABS*SA*EF*ED)/(BW*AT)
ILCR = CDI*CSFd
HQ = CDI/RfDd

Parameter	Units	Description	Adult	Young Child	
DAD	mg/kg/d	Dermally absorbed dose	CS	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	CS	
CSFd	1/(mg/kg/d)	Dermal cancer slope factor	CS	CS	
HQ	NA	Hazard quotient	CS	CS	
RfDd	mg/kg/d	Dermal reference dose	CS	CS	
C	mg/kg	Concentration of chemical in soil	CS	CS	
CF	kg/mg	Conversion factor	1.00E-06	1.00E-06	
AF	mg/cm2	Soil to skin adherence factor	0.07	0.2	
ABS	NA	Absorption fraction	CS	CS	
SA	cm2/day	Skin surface area available for contact	5,700	2,800	
EF	days/year	Exposure frequency	350	350	
ED	years	Exposure duration	24	6	
BW	kg	Body weight	70	15	
AT-C	days	Averaging time, carcinogens	25,550	25,550	
AT-N	days	Averaging time, noncarcinogens	8,760	2,190	

					Adult						Young Child					
					Carcinogens			Noncarcinogens			Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	ABS	CSFd 1/(mg/kg/d)	RfDd (mg/kg/d)	DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI	DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	57.9	0.01	NA	NA	1.1E-06	--	--	3.2E-06	--	--	1.8E-06	--	--	2.1E-05	--	--
Benzo(a)anthracene	4.76	0.13	2.4E+00	NA	1.2E-06	2.7E-06	3.7%	3.4E-06	--	--	1.9E-06	4.5E-06	3.7%	2.2E-05	--	--
Benzo(a)pyrene	2.48	0.13	1.5E+01	NA	6.0E-07	8.8E-06	11.8%	1.8E-06	--	--	9.9E-07	1.4E-05	11.8%	1.2E-05	--	--
Benzo(b)fluoranthene	2.81	0.13	1.5E+00	NA	6.8E-07	1.0E-06	1.3%	2.0E-06	--	--	1.1E-06	1.6E-06	1.3%	1.3E-05	--	--
Benzo(k)fluoranthene	1.78	0.13	1.5E-01	NA	4.3E-07	6.3E-08	0.1%	1.3E-06	--	--	7.1E-07	1.0E-07	0.1%	8.3E-06	--	--
Carbazole	0.95	0.13	4.0E-02	NA	2.3E-07	9.3E-09	0.0%	6.8E-07	--	--	3.8E-07	1.5E-08	0.0%	4.4E-06	--	--
Chrysene	6.7	0.13	2.4E-02	NA	1.6E-06	3.8E-08	0.1%	4.8E-06	--	--	2.7E-06	6.3E-08	0.1%	3.1E-05	--	--
Dibenz(a,h)anthracene	0.695	0.13	2.4E+01	NA	1.7E-07	4.0E-06	5.4%	4.9E-07	--	--	2.8E-07	6.5E-06	5.4%	3.2E-06	--	--
Indeno(1,2,3-cd)pyrene	1.72	0.13	2.4E+00	NA	4.2E-07	9.9E-07	1.3%	1.2E-06	--	--	6.9E-07	1.6E-06	1.3%	8.0E-06	--	--
Dieldrin	0.052	0.01	3.2E+01	2.5E-05	9.7E-10	3.1E-08	0.0%	2.8E-09	1.1E-04	1.5%	1.6E-09	5.1E-08	0.0%	1.9E-08	7.4E-04	1.5%
Aroclor-1260	95.6	0.14	2.2E+00	NA	2.5E-05	5.6E-05	74.8%	7.3E-05	--	--	4.1E-05	9.1E-05	74.8%	4.8E-04	--	--
Arsenic	5.26	0.03	3.7E+00	1.2E-04	3.0E-07	1.1E-06	1.5%	8.6E-07	7.0E-03	94.6%	4.8E-07	1.8E-06	1.5%	5.6E-06	4.6E-02	94.6%
Iron	2,347	0.001	NA	4.5E-02	4.4E-06	--	--	1.3E-05	2.9E-04	3.8%	7.2E-06	--	--	8.4E-05	1.9E-03	3.8%
					Total ILCR:	7.4E-05	100.0%	Total HI:	7.4E-03	100.0%	Total ILCR:	1.2E-04	100.0%	Total HI:	4.9E-02	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT AND YOUNG CHILD RESIDENTS - FUTURE SCENARIOS
INHALATION OF FUGITIVE DUSTS EMANATING FROM SURFACE SOIL - SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (Ca*RR*ET*EF*ED)/(BW*AT)
Where: Ca = C * (1/PEF)

ILCR = CDI*CSFi
HQ = CDI/RfDi

Parameter	Units	Description	Adult	Young Child	
CDI	mg/kg/d	Chronic daily intake	CS	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	CS	
CSFi	1/(mg/kg/d)	Inhalation cancer slope factor	CS	CS	
HQ	NA	Hazard quotient	CS	CS	
RfDi	mg/kg/d	Inhalation reference dose	CS	CS	
Ca	mg/m3	Concentration of chemical in air as fugitive dusts	CS	CS	
C	mg/kg	Concentration of chemical in soil	CS	CS	
PEF	m3/kg	Particulate emission factor	1.32E+09	1.32E+09	
RR	m3/hour	Respiration rate	0.83	0.63	
ET	hours/day	Exposure time	24	24	
EF	days/year	Exposure frequency	350	350	
ED	years	Exposure duration	24	6	
BW	kg	Body weight	70	15	
AT-C	days	Averaging time, carcinogens	25,550	25,550	
AT-N	days	Averaging time, noncarcinogens	8,760	2,190	

					Adult						Young Child					
					Carcinogens			Noncarcinogens			Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	Ca (mg/m3)	CSFi 1/(mg/kg/d)	RfDi (mg/kg/d)	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	57.9	4.39E-08	NA	NA	4.1E-09	--	--	1.2E-08	--	--	3.6E-09	--	--	4.2E-08	--	--
Benzo(a)anthracene	4.76	3.61E-09	3.1E-01	NA	3.4E-10	1.0E-10	0.5%	9.8E-10	--	--	3.0E-10	9.2E-11	0.5%	3.5E-09	--	--
Benzo(a)pyrene	2.48	1.88E-09	3.1E+00	NA	1.8E-10	5.4E-10	2.7%	5.1E-10	--	--	1.5E-10	4.8E-10	2.7%	1.8E-09	--	--
Benzo(b)fluoranthene	2.81	2.13E-09	3.1E-01	NA	2.0E-10	6.2E-11	0.3%	5.8E-10	--	--	1.7E-10	5.4E-11	0.3%	2.0E-09	--	--
Benzo(k)fluoranthene	1.78	1.35E-09	3.1E-02	NA	1.3E-10	3.9E-12	0.0%	3.7E-10	--	--	1.1E-10	3.4E-12	0.0%	1.3E-09	--	--
Carbazole	0.95	7.20E-10	2.0E-02	NA	6.7E-11	1.3E-12	0.0%	2.0E-10	--	--	5.9E-11	1.2E-12	0.0%	6.9E-10	--	--
Chrysene	6.7	5.08E-09	3.1E-03	NA	4.7E-10	1.5E-12	0.0%	1.4E-09	--	--	4.2E-10	1.3E-12	0.0%	4.9E-09	--	--
Dibenz(a,h)anthracene	0.695	5.27E-10	3.1E+00	NA	4.9E-11	1.5E-10	0.8%	1.4E-10	--	--	4.3E-11	1.3E-10	0.8%	5.1E-10	--	--
Indeno(1,2,3-cd)pyrene	1.72	1.30E-09	3.1E-01	NA	1.2E-10	3.8E-11	0.2%	3.6E-10	--	--	1.1E-10	3.3E-11	0.2%	1.2E-09	--	--
Dieldrin	0.052	3.94E-11	1.6E+01	5.0E-05	3.7E-12	5.9E-11	0.3%	1.1E-11	2.1E-07	100.0%	3.2E-12	5.2E-11	0.3%	3.8E-11	7.6E-07	100.0%
Aroclor-1260	95.6	7.24E-08	2.0E+00	NA	6.8E-09	1.4E-08	67.3%	2.0E-08	--	--	6.0E-09	1.2E-08	67.3%	6.9E-08	--	--
Arsenic	5.26	3.98E-09	1.5E+01	NA	3.7E-10	5.6E-09	27.9%	1.1E-09	--	--	3.3E-10	4.9E-09	27.9%	3.8E-09	--	--
Iron	2,347	1.78E-06	NA	NA	1.7E-07	--	--	4.9E-07	--	--	1.5E-07	--	--	1.7E-06	--	--
					Total ILCR:	2.0E-08	100.0%	Total HI:	2.1E-07	100.0%	Total ILCR:	1.8E-08	100.0%	Total HI:	7.6E-07	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT AND YOUNG CHILD RESIDENTS - FUTURE SCENARIOS
INGESTION OF GROUNDWATER AS DRINKING WATER - SITE 84 (BUILDING 45 AREA)
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (C*IR*EF*ED)/(BW*AT)
ILCR = CDI*CSFo
HQ = CDI/RfDo

Parameter	Units	Description	Adult	Young Child	
CDI	mg/kg/d	Chronic daily intake	CS	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	CS	
CSFo	1/(mg/kg/d)	Oral cancer slope factor	CS	CS	
HQ	NA	Hazard quotient	CS	CS	
RfDo	mg/kg/d	Oral reference dose	CS	CS	
C	mg/L	Concentration of chemical in water	CS	CS	
IR-W	L/day	Ingestion rate of water	2	1	
EF	days/year	Exposure frequency	350	350	
ED	years	Exposure duration	24	6	
BW	kg	Body weight	70	15	
AT-C	days	Averaging time, carcinogens	25,550	25,550	
AT-N	days	Averaging time, noncarcinogens	8,760	2,190	

				Adult						Young Child					
				Carcinogens			Noncarcinogens			Carcinogens			Noncarcinogens		
Parameter	C (mg/L)	CSFo 1/(mg/kg/d)	RfDo (mg/kg/d)	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI
Benzene	0.0034	5.5E-02	3.0E-03	3.2E-05	1.8E-06	0.4%	9.3E-05	3.1E-02	0.2%	1.9E-05	1.0E-06	0.4%	2.2E-04	7.2E-02	0.2%
Chloroform	0.016	6.1E-03	1.0E-02	1.5E-04	9.2E-07	0.2%	4.4E-04	4.4E-02	0.3%	8.8E-05	5.3E-07	0.2%	1.0E-03	1.0E-01	0.3%
2-Methylnaphthalene	0.00105	NA	NA	9.9E-06	--	--	2.9E-05	--	--	5.8E-06	--	--	6.7E-05	--	--
Naphthalene	0.0022	NA	2.0E-02	2.1E-05	--	--	6.0E-05	3.0E-03	0.0%	1.2E-05	--	--	1.4E-04	7.0E-03	0.0%
Heptachlor Epoxide	0.0000167	9.1E+00	1.3E-05	1.6E-07	1.4E-06	0.3%	4.6E-07	3.5E-02	0.2%	9.2E-08	8.3E-07	0.3%	1.1E-06	8.2E-02	0.2%
MCPA	0.044	NA	5.0E-04	4.1E-04	--	--	1.2E-03	2.4E+00	16.0%	2.4E-04	--	--	2.8E-03	5.6E+00	16.0%
Antimony	0.011	NA	4.0E-04	1.0E-04	--	--	3.0E-04	7.5E-01	5.0%	6.0E-05	--	--	7.0E-04	1.8E+00	5.0%
Arsenic	0.03	1.5E+00	3.0E-04	2.8E-04	4.2E-04	99.0%	8.2E-04	2.7E+00	18.2%	1.6E-04	2.5E-04	99.0%	1.9E-03	6.4E+00	18.2%
Iron	67.7	NA	3.0E-01	6.4E-01	--	--	1.9E+00	6.2E+00	41.0%	3.7E-01	--	--	4.3E+00	1.4E+01	41.0%
Manganese	0.45	NA	2.4E-02	4.2E-03	--	--	1.2E-02	5.1E-01	3.4%	2.5E-03	--	--	2.9E-02	1.2E+00	3.4%
Thallium	0.0057	NA	6.6E-05	5.4E-05	--	--	1.6E-04	2.4E+00	15.7%	3.1E-05	--	--	3.6E-04	5.5E+00	15.7%
				Total ILCR:	4.3E-04	100.0%	Total HI:	1.5E+01	100.0%	Total ILCR:	2.5E-04	100.0%	Total HI:	3.5E+01	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.

ADULT AND YOUNG CHILD RESIDENTS - FUTURE SCENARIOS
DERMAL CONTACT WITH GROUNDWATER - SITE 84 (BUILDING 45 AREA)
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

DAD (mg/kg/d) = (C*CF*Kp*SA*EF*ED*ET)/(BW*AT)

ILCR = CDI*CSFo Adj CSF Adj = CSF/AD
HQ = CDI/RfDo Adj RfD Adj = RfD*AD

Parameter	Units	Description	Adult	Young Child	
DAD	mg/kg/d	Dermally absorbed dose	CS	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	CS	
CSFd	1/(mg/kg/d)	Dermal cancer slope factor	CS	CS	
HQ	NA	Hazard quotient	CS	CS	
RfDd	mg/kg/d	Dermal reference dose	CS	CS	
SA	cm2	Skin surface area available for contact	18,000	6,600	
EF	days/year	Exposure frequency	350	350	
ED	years	Exposure duration	24	6	
ET	hours/day	Exposure time	0.25	0.25	
BW	kg	Body weight	70	15	
AT-C	days	Averaging time, carcinogens	25,550	25,550	
AT-N	days	Averaging time, noncarcinogens	8,760	2,190	
C	mg/L	Concentration of chemical in water	CS	CS	
CF	L/cm3	Conversion factor	1.00E-03	1.00E-03	
Kp	cm/hour	Dermal permeability coefficient	CS	CS	
AD	NA	Adjustment for absorbed dose	CS	CS	

					Adult						Young Child					
					Carcinogens			Noncarcinogens			Carcinogens			Noncarcinogens		
Parameter	C (mg/L)	Kp (cm/hour)	CSFd 1/(mg/kg/d)	RfDd (mg/kg/d)	DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI	DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI
Benzene	0.0034	0.021	5.9E-02	2.8E-03	1.5E-06	8.9E-08	3.2%	4.4E-06	1.6E-03	0.5%	6.5E-07	3.8E-08	3.2%	7.5E-06	2.7E-03	0.5%
Chloroform	0.016	0.0089	3.1E-02	2.0E-03	3.0E-06	9.2E-08	3.3%	8.8E-06	4.4E-03	1.4%	1.3E-06	3.9E-08	3.3%	1.5E-05	7.5E-03	1.4%
2-Methylnaphthalene	0.00105	0.1423	NA	NA	3.2E-06	--	--	9.2E-06	--	--	1.4E-06	--	--	1.6E-05	--	--
Naphthalene	0.0022	0.069	NA	1.6E-02	3.2E-06	--	--	9.4E-06	5.8E-04	0.2%	1.4E-06	--	--	1.6E-05	1.0E-03	0.2%
Heptachlor Epoxide	0.0000167	0.055	1.3E+01	9.4E-06	1.9E-08	2.5E-07	8.9%	5.7E-08	6.0E-03	1.9%	8.3E-09	1.0E-07	8.9%	9.7E-08	1.0E-02	1.9%
MCPA	0.044	0.0049	NA	2.5E-04	4.6E-06	--	--	1.3E-05	5.3E-02	16.5%	1.9E-06	--	--	2.3E-05	9.1E-02	16.5%
Antimony	0.011	0.001	NA	8.0E-06	2.3E-07	--	--	6.8E-07	8.5E-02	26.3%	9.9E-08	--	--	1.2E-06	1.5E-01	26.3%
Arsenic	0.03	0.001	3.7E+00	1.2E-04	6.3E-07	2.3E-06	84.5%	1.8E-06	1.5E-02	4.7%	2.7E-07	9.9E-07	84.5%	3.2E-06	2.6E-02	4.7%
Iron	67.7	0.001	NA	4.5E-02	1.4E-03	--	--	4.2E-03	9.3E-02	28.7%	6.1E-04	--	--	7.1E-03	1.6E-01	28.7%
Manganese	0.45	0.001	NA	9.6E-04	9.5E-06	--	--	2.8E-05	2.9E-02	9.0%	4.1E-06	--	--	4.7E-05	4.9E-02	9.0%
Thallium	0.0057	0.001	NA	9.9E-06	1.2E-07	--	--	3.5E-07	3.5E-02	11.0%	5.2E-08	--	--	6.0E-07	6.1E-02	11.0%
					Total ILCR:	2.7E-06	100.0%	Total HI:	3.2E-01	100.0%	Total ILCR:	1.2E-06	100.0%	Total HI:	5.5E-01	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.

ADULT AND YOUNG CHILD RESIDENTS - FUTURE SCENARIOS
INHALATION OF VOLATILES IN GROUNDWATER EMANATING FROM SHOWER WATER - SITE 84 (BUILDING 45 AREA)
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (Ca*RR*ET*EF*ED)/(BW*AT)
Where: Ca = Shower Model

ILCR = CDI*CSFi
HQ = CDI/RfDi

Parameter	Units	Description	Adult	
CDI	mg/kg/d	Chronic daily intake	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	
CSFi	1/(mg/kg/d)	Inhalation cancer slope factor	CS	
HQ	NA	Hazard quotient	CS	
RfDi	mg/kg/d	Inhalation reference dose	CS	
C	mg/L	Concentration of chemical in groundwater	CS	
Ca	mg/m3	Concentration of chemical in shower water Calculated using shower model	CS	
RR	m3/hour	Respiration rate	0.83	
ET	hours/day	Exposure time	0.25	
EF	days/year	Exposure frequency	350	
ED	years	Exposure duration	24	
BW	kg	Body weight	70	
AT-C	days	Averaging time, carcinogens	25,550	
AT-N	days	Averaging time, noncarcinogens	8,760	

					Adult					
					Carcinogens			Noncarcinogens		
Parameter	C (mg/L)	Shower Ca (mg/m3)	CSFi 1/(mg/kg/d)	RfDi (mg/kg/d)	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI
Benzene	0.0034	4.81E-03	2.7E-02	1.7E-03	4.7E-06	1.3E-07	8.2%	1.4E-05	8.0E-03	1.3%
Chloroform	0.016	1.80E-02	8.1E-02	8.6E-05	1.8E-05	1.4E-06	91.8%	5.1E-05	6.0E-01	98.7%
					Total ILCR:	1.5E-06	100.0%	Total HI:	6.0E-01	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.

ADULT AND YOUNG CHILD RESIDENTS - FUTURE SCENARIOS
ACCIDENTAL INGESTION OF SURFACE WATER - SITE 84 (BUILDING 45 AREA)
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (C*IR*ET*EF*ED)/(BW*AT)
ILCR = CDI*CSFo
HQ = CDI/RfDo

Parameter	Units	Description	Adult	Young Child	
CDI	mg/kg/d	Chronic daily intake	CS	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	CS	
CSFo	1/(mg/kg/d)	Oral cancer slope factor	CS	CS	
HQ	NA	Hazard quotient	CS	CS	
RfDo	mg/kg/d	Oral reference dose	CS	CS	
C	mg/L	Concentration of chemical in water	CS	CS	
IR-W	L/hour	Ingestion rate of water	0.01	0.05	
ET	hours/day	Exposure time	2.6	2.6	
EF	days/year	Exposure frequency	48	48	
ED	years	Exposure duration	24	6	
BW	kg	Body weight	70	15	
AT-C	days	Averaging time, carcinogens	25,550	25,550	
AT-N	days	Averaging time, noncarcinogens	8,760	2,190	

				Adult						Young Child					
				Carcinogens			Noncarcinogens			Carcinogens			Noncarcinogens		
Parameter	C (mg/L)	CSFo 1/(mg/kg/d)	RfDo (mg/kg/d)	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI
Acetone	0.0056	NA	1.0E-01	9.4E-08	--	--	2.7E-07	2.7E-06	78.6%	5.5E-07	--	--	6.4E-06	6.4E-05	78.6%
Toluene	0.0027	NA	2.0E-01	4.5E-08	--	--	1.3E-07	6.6E-07	18.9%	2.6E-07	--	--	3.1E-06	1.5E-05	18.9%
Xylenes, total	0.0035	NA	2.0E+00	5.9E-08	--	--	1.7E-07	8.5E-08	2.5%	3.4E-07	--	--	4.0E-06	2.0E-06	2.5%
				Total ILCR:	--	--	Total HI:	3.5E-06	100.0%	Total ILCR:	--	--	Total HI:	8.1E-05	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.

ADULT AND YOUNG CHILD RESIDENTS - FUTURE SCENARIOS
DERMAL CONTACT WITH SURFACE WATER - SITE 84 (BUILDING 45 AREA)
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

DAD (mg/kg/d) = (C*CF*Kp*SA*EF*ED*ET)/(BW*AT)

ILCR = CDI*CSFo Adj CSF Adj = CSF/AD
HQ = CDI/RfDo Adj RfD Adj = RfD*AD

Parameter	Units	Description	Adult	Young Child	
DAD	mg/kg/d	Dermally absorbed dose	CS	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	CS	
CSFd	1/(mg/kg/d)	Dermal cancer slope factor	CS	CS	
HQ	NA	Hazard quotient	CS	CS	
RfDd	mg/kg/d	Dermal reference dose	CS	CS	
SA	cm2	Skin surface area available for contact	5,700	2,800	
EF	days/year	Exposure frequency	48	48	
ED	years	Exposure duration	24	6	
ET	hours/day	Exposure time	2.6	2.6	
BW	kg	Body weight	70	15	
AT-C	days	Averaging time, carcinogens	25,550	25,550	
AT-N	days	Averaging time, noncarcinogens	8,760	2,190	
C	mg/L	Concentration of chemical in water	CS	CS	
CF	L/cm3	Conversion factor	1.00E-03	1.00E-03	
Kp	cm/hour	Dermal permeability coefficient	CS	CS	
AD	NA	Adjustment for absorbed dose	CS	CS	

					Adult						Young Child					
					Carcinogens			Noncarcinogens			Carcinogens			Noncarcinogens		
Parameter	C (mg/L)	Kp (cm/hour)	CSFd 1/(mg/kg/d)	RfDd (mg/kg/d)	DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI	DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI
Acetone	0.0056	0.00057	NA	8.3E-02	3.0E-08	--	--	8.9E-08	1.1E-06	3.9%	1.7E-08	--	--	2.0E-07	2.5E-06	3.9%
Toluene	0.0027	0.045	NA	1.6E-01	1.2E-06	--	--	3.4E-06	2.1E-05	77.6%	6.6E-07	--	--	7.8E-06	4.8E-05	77.6%
Xylenes, total	0.0035	0.095	NA	1.8E+00	3.2E-06	--	--	9.3E-06	5.0E-06	18.5%	1.8E-06	--	--	2.1E-05	1.2E-05	18.5%
					Total ILCR:	--	--	Total HI:	2.7E-05	100.0%	Total ILCR:	--	--	Total HI:	6.2E-05	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.

ADULT AND YOUNG CHILD RESIDENTS - FUTURE SCENARIOS
ACCIDENTAL INGESTION OF SEDIMENT - SITE 84 (BUILDING 45 AREA)
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (C*IR*CF*FI*EF*ED)/(BW*AT)
ILCR = CDI*CSFo
HQ = CDI/RfDo

Parameter	Units	Description	Adult	Young Child	
CDI	mg/kg/d	Chronic daily intake	CS	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	CS	
CSFo	1/(mg/kg/d)	Oral cancer slope factor	CS	CS	
HQ	NA	Hazard quotient	CS	CS	
RfDo	mg/kg/d	Oral reference dose	CS	CS	
C	mg/kg	Concentration of chemical in soil	CS	CS	
IR-S	mg/day	Ingestion rate of sediment	100	200	
CF	kg/mg	Conversion factor	1.00E-06	1.00E-06	
FI	NA	Fraction of soil ingested from site	1	1	
EF	days/year	Exposure frequency	48	48	
ED	years	Exposure duration	24	6	
BW	kg	Body weight	70	15	
AT-C	days	Averaging time, carcinogens	25,550	25,550	
AT-N	days	Averaging time, noncarcinogens	8,760	2,190	

				Adult						Young Child					
				Carcinogens			Noncarcinogens			Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	CSFo 1/(mg/kg/d)	RfDo (mg/kg/d)	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	10	NA	NA	6.4E-07	--	--	1.9E-06	--	--	1.5E-06	--	--	1.8E-05	--	--
Aroclor-1248	2.8	2.0E+00	NA	1.8E-07	3.6E-07	6.5%	5.3E-07	--	--	4.2E-07	8.4E-07	6.5%	4.9E-06	--	--
Aroclor-1260	40	2.0E+00	NA	2.6E-06	5.2E-06	93.5%	7.5E-06	--	--	6.0E-06	1.2E-05	93.5%	7.0E-05	--	--
Diesel Range Organics	11,600	NA	NA	7.5E-04	--	--	2.2E-03	--	--	1.7E-03	--	--	2.0E-02	--	--
				Total ILCR:	5.5E-06	100.0%	Total HI:	--	--	Total ILCR:	1.3E-05	100.0%	Total HI:	--	--

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.

ADULT AND YOUNG CHILD RESIDENTS - FUTURE SCENARIOS
DERMAL CONTACT WITH SEDIMENT - SITE 84 (BUILDING 45 AREA)
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

DAD (mg/kg/d) = (C*CF*AF*ABS*SA*EF*ED)/(BW*AT)
ILCR = CDI*CSFd
HQ = CDI/RfDd

Parameter	Units	Description	Adult	Young Child	
DAD	mg/kg/d	Dermally absorbed dose	CS	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	CS	
CSFd	1/(mg/kg/d)	Dermal cancer slope factor	CS	CS	
HQ	NA	Hazard quotient	CS	CS	
RfDd	mg/kg/d	Dermal reference dose	CS	CS	
C	mg/kg	Concentration of chemical in soil	CS	CS	
CF	kg/mg	Conversion factor	1.00E-06	1.00E-06	
AF	mg/cm2	Soil to skin adherence factor	0.07	0.20	
ABS	NA	Absorption fraction	CS	CS	
SA	cm2/day	Skin surface area available for contact	5,700	2,800	
EF	days/year	Exposure frequency	48	48	
ED	years	Exposure duration	24	6	
BW	kg	Body weight	70	15	
AT-C	days	Averaging time, carcinogens	25,550	25,550	
AT-N	days	Averaging time, noncarcinogens	8,760	2,190	

					Adult						Young Child					
					Carcinogens			Noncarcinogens			Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	ABS	CSFd 1/(mg/kg/d)	RfDd (mg/kg/d)	DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI	DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	10	0.01	NA	NA	2.6E-08	--	--	7.5E-08	--	--	4.2E-08	--	--	4.9E-07	--	--
Aroclor-1248	2.8	0.14	2.2E+00	NA	1.0E-07	2.3E-07	6.6%	2.9E-07	--	--	1.6E-07	3.7E-07	6.6%	1.9E-06	--	--
Aroclor-1260	40	0.14	2.2E+00	NA	1.4E-06	3.2E-06	93.4%	4.2E-06	--	--	2.4E-06	5.2E-06	93.4%	2.7E-05	--	--
Diesel Range Organics	11,600	0.01	NA	NA	3.0E-05	--	--	8.7E-05	--	--	4.9E-05	--	--	5.7E-04	--	--
					Total ILCR:	3.4E-06	100.0%	Total HI:	--	--	Total ILCR:	5.6E-06	100.0%	Total HI:	--	--

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.

ADULT AND YOUNG CHILD RESIDENTS - FUTURE SCENARIOS
ACCIDENTAL INGESTION OF SURFACE SOIL - SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
CENTRAL TENDENCY
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (C*IR*CF*FI*EF*ED)/(BW*AT)
ILCR = CDI*CSFo
HQ = CDI/RfDo

Parameter	Units	Description	Adult	Young Child	
CDI	mg/kg/d	Chronic daily intake	CS	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	CS	
CSFo	1/(mg/kg/d)	Oral cancer slope factor	CS	CS	
HQ	NA	Hazard quotient	CS	CS	
RfDo	mg/kg/d	Oral reference dose	CS	CS	
C	mg/kg	Concentration of chemical in soil	CS	CS	
IR-S	mg/day	Ingestion rate of soil	50	100	
CF	kg/mg	Conversion factor	1.00E-06	1.00E-06	
FI	NA	Fraction of soil ingested from site	1	1	
EF	days/year	Exposure frequency	234	234	
ED	years	Exposure duration	9	6	
BW	kg	Body weight	70	15	
AT-C	days	Averaging time, carcinogens	25,550	25,550	
AT-N	days	Averaging time, noncarcinogens	3,285	2,190	

				Adult						Young Child					
				Carcinogens			Noncarcinogens			Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	CSFo 1/(mg/kg/d)	RfDo (mg/kg/d)	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	1.96	NA	NA	1.2E-07	--	--	9.0E-07	--	--	7.2E-07	--	--	8.4E-06	--	--
Benzo(a)anthracene	69.0	7.3E-01	NA	4.1E-06	3.0E-06	8.1%	3.2E-05	--	--	2.5E-05	1.8E-05	8.1%	2.9E-04	--	--
Benzo(a)pyrene	30.5	7.3E+00	NA	1.8E-06	1.3E-05	35.6%	1.4E-05	--	--	1.1E-05	8.1E-05	35.6%	1.3E-04	--	--
Benzo(b)fluoranthene	40.9	7.3E-01	NA	2.4E-06	1.8E-06	4.8%	1.9E-05	--	--	1.5E-05	1.1E-05	4.8%	1.7E-04	--	--
Benzo(k)fluoranthene	18.7	7.3E-02	NA	1.1E-06	8.0E-08	0.2%	8.5E-06	--	--	6.8E-06	5.0E-07	0.2%	8.0E-05	--	--
Carbazole	3.16	2.0E-02	NA	1.9E-07	3.7E-09	0.0%	1.4E-06	--	--	1.2E-06	2.3E-08	0.0%	1.3E-05	--	--
Chrysene	96.0	7.3E-03	NA	5.7E-06	4.1E-08	0.1%	4.4E-05	--	--	3.5E-05	2.6E-07	0.1%	4.1E-04	--	--
Dibenz(a,h)anthracene	1.41	7.3E+00	NA	8.3E-08	6.1E-07	1.7%	6.5E-07	--	--	5.2E-07	3.8E-06	1.7%	6.0E-06	--	--
Fluoranthene	243	NA	4.0E-02	1.4E-05	--	--	1.1E-04	2.8E-03	0.9%	8.9E-05	--	--	1.0E-03	2.6E-02	0.9%
Indeno(1,2,3-cd)pyrene	8.79	7.3E-01	NA	5.2E-07	3.8E-07	1.0%	4.0E-06	--	--	3.2E-06	2.4E-06	1.0%	3.8E-05	--	--
Naphthalene	0.525	NA	2.0E-02	3.1E-08	--	--	2.4E-07	1.2E-05	0.0%	1.9E-07	--	--	2.2E-06	1.1E-04	0.0%
Pyrene	250	NA	3.0E-02	1.5E-05	--	--	1.1E-04	3.8E-03	1.2%	9.2E-05	--	--	1.1E-03	3.6E-02	1.2%
4,4'-DDD	3	2.4E-01	NA	1.8E-07	4.2E-08	0.1%	1.4E-06	--	--	1.1E-06	2.6E-07	0.1%	1.3E-05	--	--
Chlordane, alpha-	48	3.5E-01 (1)	5.0E-04 (1)	2.8E-06	9.9E-07	2.7%	2.2E-05	4.4E-02	13.7%	1.8E-05	6.2E-06	2.7%	2.1E-04	4.1E-01	13.7%
Chlordane, gamma-	58	3.5E-01 (1)	5.0E-04 (1)	3.4E-06	1.2E-06	3.3%	2.7E-05	5.3E-02	16.6%	2.1E-05	7.4E-06	3.3%	2.5E-04	5.0E-01	16.6%
Dieldrin	0.32	1.6E+01	5.0E-05	1.9E-08	3.0E-07	0.8%	1.5E-07	2.9E-03	0.9%	1.2E-07	1.9E-06	0.8%	1.4E-06	2.7E-02	0.9%
Heptachlor	22	4.5E+00	5.0E-04	1.3E-06	5.8E-06	15.9%	1.0E-05	2.0E-02	6.3%	8.1E-06	3.6E-05	15.9%	9.4E-05	1.9E-01	6.3%
Heptachlor Epoxide	4.5	9.1E+00	1.3E-05	2.6E-07	2.4E-06	6.6%	2.1E-06	1.6E-01	49.5%	1.6E-06	1.5E-05	6.6%	1.9E-05	1.5E+00	49.5%
Aroclor-1248	1.51	2.0E+00	NA	8.9E-08	1.8E-07	0.5%	6.9E-07	--	--	5.5E-07	1.1E-06	0.5%	6.4E-06	--	--
Aroclor-1254	0.975	2.0E+00	2.0E-05	5.7E-08	1.1E-07	0.3%	4.5E-07	2.2E-02	7.0%	3.6E-07	7.1E-07	0.3%	4.2E-06	2.1E-01	7.0%
Aroclor-1260	54.6	2.0E+00	NA	3.2E-06	6.4E-06	17.5%	2.5E-05	--	--	2.0E-05	4.0E-05	17.5%	2.3E-04	--	--
Gasoline Range Organics	0.207	NA	NA	1.2E-08	--	--	9.5E-08	--	--	7.6E-08	--	--	8.9E-07	--	--
Diesel Range Organics	470	NA	NA	2.8E-05	--	--	2.2E-04	--	--	1.7E-04	--	--	2.0E-03	--	--
Antimony	1.22	NA	4.0E-04	7.2E-08	--	--	5.6E-07	1.4E-03	0.4%	4.5E-07	--	--	5.2E-06	1.3E-02	0.4%
Arsenic	3.49	1.5E+00	3.0E-04	2.1E-07	3.1E-07	0.8%	1.6E-06	5.3E-03	1.7%	1.3E-06	1.9E-06	0.8%	1.5E-05	5.0E-02	1.7%
Iron	2,260	NA	3.0E-01	1.3E-04	--	--	1.0E-03	3.4E-03	1.1%	8.3E-04	--	--	9.7E-03	3.2E-02	1.1%
Thallium	0.31	NA	6.6E-05	1.8E-08	--	--	1.4E-07	2.1E-03	0.7%	1.1E-07	--	--	1.3E-06	2.0E-02	0.7%
				Total ILCR:	3.7E-05	100.0%	Total HI:	3.2E-01	100.0%	Total ILCR:	2.3E-04	100.0%	Total HI:	3.0E+00	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT AND YOUNG CHILD RESIDENTS - FUTURE SCENARIOS
DERMAL CONTACT WITH SURFACE SOIL - SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
CENTRAL TENDENCY
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

DAD (mg/kg/d) = (C*CF*AF*ABS*SA*EF*ED)/(BW*AT)
ILCR = CDI*CSFd
HQ = CDI/RfDd

Parameter	Units	Description	Adult	Young Child	
DAD	mg/kg/d	Dermally absorbed dose	CS	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	CS	
CSFd	1/(mg/kg/d)	Dermal cancer slope factor	CS	CS	
HQ	NA	Hazard quotient	CS	CS	
RfDd	mg/kg/d	Dermal reference dose	CS	CS	
C	mg/kg	Concentration of chemical in soil	CS	CS	
CF	kg/mg	Conversion factor	1.00E-06	1.00E-06	
AF	mg/cm2	Soil to skin adherence factor	0.07	0.2	
ABS	NA	Absorption fraction	CS	CS	
SA	cm2/day	Skin surface area available for contact	5,000	2,000	
EF	days/year	Exposure frequency	234	234	
ED	years	Exposure duration	9	6	
BW	kg	Body weight	70	15	
AT-C	days	Averaging time, carcinogens	25,550	25,550	
AT-N	days	Averaging time, noncarcinogens	3,285	2,190	

					Adult						Young Child					
					Carcinogens			Noncarcinogens			Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	ABS	CSFd 1/(mg/kg/d)	RfDd (mg/kg/d)	DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI	DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	1.96	0.01	NA	NA	8.1E-09	--	--	6.3E-08	--	--	2.9E-08	--	--	3.3E-07	--	--
Benzo(a)anthracene	69.0	0.13	2.4E+00	NA	3.7E-06	8.7E-06	18.1%	2.9E-05	--	--	1.3E-05	3.1E-05	18.1%	1.5E-04	--	--
Benzo(a)pyrene	30.5	0.13	1.5E+01	NA	1.6E-06	2.4E-05	49.7%	1.3E-05	--	--	5.8E-06	8.5E-05	49.7%	6.8E-05	--	--
Benzo(b)fluoranthene	40.9	0.13	1.5E+00	NA	2.2E-06	3.2E-06	6.7%	1.7E-05	--	--	7.8E-06	1.1E-05	6.7%	9.1E-05	--	--
Benzo(k)fluoranthene	18.7	0.13	1.5E-01	NA	1.0E-06	1.5E-07	0.3%	7.8E-06	--	--	3.6E-06	5.2E-07	0.3%	4.1E-05	--	--
Carbazole	3.16	0.13	4.0E-02	NA	1.7E-07	6.8E-09	0.0%	1.3E-06	--	--	6.0E-07	2.4E-08	0.0%	7.0E-06	--	--
Chrysene	96.0	0.13	2.4E-02	NA	5.1E-06	1.2E-07	0.3%	4.0E-05	--	--	1.8E-05	4.3E-07	0.3%	2.1E-04	--	--
Dibenz(a,h)anthracene	1.41	0.13	2.4E+01	NA	7.6E-08	1.8E-06	3.7%	5.9E-07	--	--	2.7E-07	6.3E-06	3.7%	3.1E-06	--	--
Fluoranthene	243	0.01	NA	1.2E-02	1.0E-06	--	--	7.8E-06	6.3E-04	0.8%	3.6E-06	--	--	4.2E-05	3.4E-03	0.8%
Indeno(1,2,3-cd)pyrene	8.79	0.13	2.4E+00	NA	4.7E-07	1.1E-06	2.3%	3.7E-06	--	--	1.7E-06	3.9E-06	2.3%	2.0E-05	--	--
Naphthalene	0.525	0.01	NA	1.6E-02	2.2E-09	--	--	1.7E-08	1.1E-06	0.0%	7.7E-09	--	--	9.0E-08	5.6E-06	0.0%
Pyrene	250	0.01	NA	9.3E-03	1.0E-06	--	--	8.0E-06	8.6E-04	1.1%	3.7E-06	--	--	4.3E-05	4.6E-03	1.1%
4,4'-DDD	3	0.01	3.4E-01	NA	1.2E-08	4.2E-09	0.0%	9.6E-08	--	--	4.4E-08	1.5E-08	0.0%	5.1E-07	--	--
Chlordane, alpha-	48	0.04	4.4E-01 (1)	4.0E-04 (1)	7.9E-07	3.5E-07	0.7%	6.2E-06	1.5E-02	19.0%	2.8E-06	1.2E-06	0.7%	3.3E-05	8.2E-02	19.0%
Chlordane, gamma-	58	0.04	4.4E-01 (1)	4.0E-04 (1)	9.6E-07	4.2E-07	0.9%	7.4E-06	1.9E-02	22.9%	3.4E-06	1.5E-06	0.9%	4.0E-05	9.9E-02	22.9%
Dieldrin	0.32	0.01	3.2E+01	2.5E-05	1.3E-09	4.2E-08	0.1%	1.0E-08	4.1E-04	0.5%	4.7E-09	1.5E-07	0.1%	5.5E-08	2.2E-03	0.5%
Heptachlor	22	0.01	6.3E+00	3.6E-04	9.1E-08	5.7E-07	1.2%	7.1E-07	2.0E-03	2.4%	3.2E-07	2.0E-06	1.2%	3.8E-06	1.0E-02	2.4%
Heptachlor Epoxide	4.5	0.01	1.3E+01	9.4E-06	1.9E-08	2.3E-07	0.5%	1.4E-07	1.5E-02	19.0%	6.6E-08	8.3E-07	0.5%	7.7E-07	8.2E-02	19.0%
Aroclor-1248	1.51	0.14	2.2E+00	NA	8.7E-08	2.0E-07	0.4%	6.8E-07	--	--	3.1E-07	6.9E-07	0.4%	3.6E-06	--	--
Aroclor-1254	0.975	0.14	2.2E+00	1.8E-05	5.6E-08	1.3E-07	0.3%	4.4E-07	2.4E-02	30.0%	2.0E-07	4.4E-07	0.3%	2.3E-06	1.3E-01	30.0%
Aroclor-1260	54.6	0.14	2.2E+00	NA	3.1E-06	7.0E-06	14.6%	2.4E-05	--	--	1.1E-05	2.5E-05	14.6%	1.3E-04	--	--
Gasoline Range Organics	0.207	0.01	NA	NA	8.5E-10	--	--	6.6E-09	--	--	3.0E-09	--	--	3.5E-08	--	--
Diesel Range Organics	470	0.01	NA	NA	1.9E-06	--	--	1.5E-05	--	--	6.9E-06	--	--	8.0E-05	--	--
Antimony	1.22	0.001	NA	8.0E-06	5.0E-10	--	--	3.9E-09	4.9E-04	0.6%	1.8E-09	--	--	2.1E-08	2.6E-03	0.6%
Arsenic	3.49	0.03	3.7E+00	1.2E-04	4.3E-08	1.6E-07	0.3%	3.4E-07	2.7E-03	3.4%	1.5E-07	5.6E-07	0.3%	1.8E-06	1.5E-02	3.4%
Iron	2,260	0.001	NA	4.5E-02	9.3E-07	--	--	7.2E-06	1.6E-04	0.2%	3.3E-06	--	--	3.9E-05	8.6E-04	0.2%
Thallium	0.31	0.001	NA	9.9E-06	1.3E-10	--	--	9.8E-10	9.9E-05	0.1%	4.5E-10	--	--	5.2E-09	5.3E-04	0.1%
					Total ILCR:	4.8E-05	100.0%	Total HI:	8.1E-02	100.0%	Total ILCR:	1.7E-04	100.0%	Total HI:	4.3E-01	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT AND YOUNG CHILD RESIDENTS - FUTURE SCENARIOS
INHALATION OF FUGITIVE DUSTS EMANATING FROM SURFACE SOIL - SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
CENTRAL TENDENCY
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (Ca*RR*ET*EF*ED)/(BW*AT)
Where: Ca = C * (1/PEF)

ILCR = CDI*CSFi
HQ = CDI/RfDi

Parameter	Units	Description	Adult	Young Child	
CDI	mg/kg/d	Chronic daily intake	CS	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	CS	
CSFi	1/(mg/kg/d)	Inhalation cancer slope factor	CS	CS	
HQ	NA	Hazard quotient	CS	CS	
RfDi	mg/kg/d	Inhalation reference dose	CS	CS	
Ca	mg/m3	Concentration of chemical in air as fugitive dusts	CS	CS	
C	mg/kg	Concentration of chemical in soil	CS	CS	
PEF	m3/kg	Particulate emission factor	1.32E+09	1.32E+09	
RR	m3/hour	Respiration rate	0.80	0.63	
ET	hours/day	Exposure time	24	24	
EF	days/year	Exposure frequency	234	234	
ED	years	Exposure duration	9	6	
BW	kg	Body weight	70	15	
AT-C	days	Averaging time, carcinogens	25,550	25,550	
AT-N	days	Averaging time, noncarcinogens	3,285	2,190	

					Adult						Young Child					
					Carcinogens			Noncarcinogens			Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	Ca (mg/m3)	CSFi 1/(mg/kg/d)	RfDi (mg/kg/d)	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	1.96	1.48E-09	NA	NA	3.4E-11	--	--	2.6E-10	--	--	8.2E-11	--	--	9.5E-10	--	--
Benzo(a)anthracene	69.0	5.23E-08	3.1E-01	NA	1.2E-09	3.7E-10	4.4%	9.2E-09	--	--	2.9E-09	8.9E-10	4.4%	3.4E-08	--	--
Benzo(a)pyrene	30.5	2.31E-08	3.1E+00	NA	5.2E-10	1.6E-09	19.4%	4.1E-09	--	--	1.3E-09	3.9E-09	19.4%	1.5E-08	--	--
Benzo(b)fluoranthene	40.9	3.10E-08	3.1E-01	NA	7.0E-10	2.2E-10	2.6%	5.4E-09	--	--	1.7E-09	5.3E-10	2.6%	2.0E-08	--	--
Benzo(k)fluoranthene	18.7	1.41E-08	3.1E-02	NA	3.2E-10	9.9E-12	0.1%	2.5E-09	--	--	7.8E-10	2.4E-11	0.1%	9.1E-09	--	--
Carbazole	3.16	2.39E-09	2.0E-02	NA	5.4E-11	1.1E-12	0.0%	4.2E-10	--	--	1.3E-10	2.6E-12	0.0%	1.5E-09	--	--
Chrysene	96.0	7.27E-08	3.1E-03	NA	1.6E-09	5.1E-12	0.1%	1.3E-08	--	--	4.0E-09	1.2E-11	0.1%	4.7E-08	--	--
Dibenz(a,h)anthracene	1.41	1.07E-09	3.1E+00	NA	2.4E-11	7.5E-11	0.9%	1.9E-10	--	--	5.9E-11	1.8E-10	0.9%	6.9E-10	--	--
Fluoranthene	243	1.84E-07	NA	4.0E-02	4.2E-09	--	--	3.2E-08	8.1E-07	0.6%	1.0E-08	--	--	1.2E-07	3.0E-06	0.6%
Indeno(1,2,3-cd)pyrene	8.79	6.66E-09	3.1E-01	NA	1.5E-10	4.7E-11	0.6%	1.2E-09	--	--	3.7E-10	1.1E-10	0.6%	4.3E-09	--	--
Naphthalene	0.525	3.98E-10	NA	8.6E-04	9.0E-12	--	--	7.0E-11	8.2E-08	0.1%	2.2E-11	--	--	2.6E-10	3.0E-07	0.1%
Pyrene	250	1.89E-07	NA	3.0E-02	4.3E-09	--	--	3.3E-08	1.1E-06	0.8%	1.0E-08	--	--	1.2E-07	4.0E-06	0.8%
4,4'-DDD	3	2.27E-09	2.4E-01	NA	5.1E-11	1.2E-11	0.1%	4.0E-10	--	--	1.2E-10	3.0E-11	0.1%	1.5E-09	--	--
Chlordane, alpha-	48	3.64E-08	3.5E-01 (1)	2.0E-04 (1)	8.2E-10	2.9E-10	3.4%	6.4E-09	3.2E-05	24.2%	2.0E-09	7.0E-10	3.4%	2.3E-08	1.2E-04	24.2%
Chlordane, gamma-	58	4.39E-08	3.5E-01 (1)	2.0E-04 (1)	9.9E-10	3.5E-10	4.2%	7.7E-09	3.9E-05	29.3%	2.4E-09	8.5E-10	4.2%	2.8E-08	1.4E-04	29.3%
Dieldrin	0.32	2.42E-10	1.6E+01	5.0E-05	5.5E-12	8.8E-11	1.1%	4.3E-11	8.5E-07	0.6%	1.3E-11	2.1E-10	1.1%	1.6E-10	3.1E-06	0.6%
Heptachlor	22	1.67E-08	4.6E+00	5.0E-04	3.8E-10	1.7E-09	20.5%	2.9E-09	5.9E-06	4.4%	9.2E-10	4.2E-09	20.5%	1.1E-08	2.1E-05	4.4%
Heptachlor Epoxide	4.5	3.41E-09	9.1E+00	1.3E-05	7.7E-11	7.0E-10	8.4%	6.0E-10	4.6E-05	35.0%	1.9E-10	1.7E-09	8.4%	2.2E-09	1.7E-04	35.0%
Aroclor-1248	1.51	1.14E-09	2.0E+00	NA	2.6E-11	5.2E-11	0.6%	2.0E-10	--	--	6.3E-11	1.3E-10	0.6%	7.3E-10	--	--
Aroclor-1254	0.975	7.39E-10	2.0E+00	2.0E-05	1.7E-11	3.3E-11	0.4%	1.3E-10	6.5E-06	4.9%	4.1E-11	8.1E-11	0.4%	4.7E-10	2.4E-05	4.9%
Aroclor-1260	54.6	4.13E-08	2.0E+00	NA	9.3E-10	1.9E-09	22.4%	7.3E-09	--	--	2.3E-09	4.5E-09	22.4%	2.6E-08	--	--
Gasoline Range Organics	0.207	1.57E-10	NA	NA	3.5E-12	--	--	2.8E-11	--	--	8.6E-12	--	--	1.0E-10	--	--
Diesel Range Organics	470	3.56E-07	NA	NA	8.0E-09	--	--	6.3E-08	--	--	2.0E-08	--	--	2.3E-07	--	--
Antimony	1.22	9.25E-10	NA	NA	2.1E-11	--	--	1.6E-10	--	--	5.1E-11	--	--	5.9E-10	--	--
Arsenic	3.49	2.65E-09	1.5E+01	NA	6.0E-11	9.0E-10	10.8%	4.7E-10	--	--	1.5E-10	2.2E-09	10.8%	1.7E-09	--	--
Iron	2,260	1.71E-06	NA	NA	3.9E-08	--	--	3.0E-07	--	--	9.4E-08	--	--	1.1E-06	--	--
Thallium	0.31	2.32E-10	NA	NA	5.3E-12	--	--	4.1E-11	--	--	1.3E-11	--	--	1.5E-10	--	--
					Total ILCR:	8.3E-09	100.0%	Total HI:	1.3E-04	100.0%	Total ILCR:	2.0E-08	100.0%	Total HI:	4.8E-04	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT AND YOUNG CHILD RESIDENTS - FUTURE SCENARIOS
ACCIDENTAL INGESTION OF SURFACE SOIL - SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
CENTRAL TENDENCY
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (C*IR*CF*FI*EF*ED)/(BW*AT)
ILCR = CDI*CSFo
HQ = CDI/RfDo

Parameter	Units	Description	Adult	Young Child	
CDI	mg/kg/d	Chronic daily intake	CS	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	CS	
CSFo	1/(mg/kg/d)	Oral cancer slope factor	CS	CS	
HQ	NA	Hazard quotient	CS	CS	
RfDo	mg/kg/d	Oral reference dose	CS	CS	
C	mg/kg	Concentration of chemical in soil	CS	CS	
IR-S	mg/day	Ingestion rate of soil	50	100	
CF	kg/mg	Conversion factor	1.00E-06	1.00E-06	
FI	NA	Fraction of soil ingested from site	1	1	
EF	days/year	Exposure frequency	234	234	
ED	years	Exposure duration	9	6	
BW	kg	Body weight	70	15	
AT-C	days	Averaging time, carcinogens	25,550	25,550	
AT-N	days	Averaging time, noncarcinogens	3,285	2,190	

				Adult						Young Child					
				Carcinogens			Noncarcinogens			Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	CSFo 1/(mg/kg/d)	RfDo (mg/kg/d)	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	57.9	NA	NA	3.4E-06	--	--	2.7E-05	--	--	2.1E-05	--	--	2.5E-04	--	--
Benzo(a)anthracene	4.76	7.3E-01	NA	2.8E-07	2.0E-07	1.5%	2.2E-06	--	--	1.7E-06	1.3E-06	1.5%	2.0E-05	--	--
Benzo(a)pyrene	2.48	7.3E+00	NA	1.5E-07	1.1E-06	7.9%	1.1E-06	--	--	9.1E-07	6.6E-06	7.9%	1.1E-05	--	--
Benzo(b)fluoranthene	2.81	7.3E-01	NA	1.7E-07	1.2E-07	0.9%	1.3E-06	--	--	1.0E-06	7.5E-07	0.9%	1.2E-05	--	--
Benzo(k)fluoranthene	1.78	7.3E-02	NA	1.0E-07	7.7E-09	0.1%	8.2E-07	--	--	6.5E-07	4.8E-08	0.1%	7.6E-06	--	--
Carbazole	0.95	2.0E-02	NA	5.6E-08	1.1E-09	0.0%	4.4E-07	--	--	3.5E-07	7.0E-09	0.0%	4.1E-06	--	--
Chrysene	6.7	7.3E-03	NA	3.9E-07	2.9E-09	0.0%	3.1E-06	--	--	2.5E-06	1.8E-08	0.0%	2.9E-05	--	--
Dibenz(a,h)anthracene	0.695	7.3E+00	NA	4.1E-08	3.0E-07	2.2%	3.2E-07	--	--	2.5E-07	1.9E-06	2.2%	3.0E-06	--	--
Indeno(1,2,3-cd)pyrene	1.72	7.3E-01	NA	1.0E-07	7.4E-08	0.5%	7.9E-07	--	--	6.3E-07	4.6E-07	0.5%	7.3E-06	--	--
Dieldrin	0.052	1.6E+01	5.0E-05	3.1E-09	4.9E-08	0.4%	2.4E-08	4.8E-04	3.9%	1.9E-08	3.0E-07	0.4%	2.2E-07	4.4E-03	3.9%
Aroclor-1260	95.6	2.0E+00	NA	5.6E-06	1.1E-05	83.1%	4.4E-05	--	--	3.5E-05	7.0E-05	83.1%	4.1E-04	--	--
Arsenic	5.26	1.5E+00	3.0E-04	3.1E-07	4.6E-07	3.4%	2.4E-06	8.0E-03	66.4%	1.9E-06	2.9E-06	3.4%	2.2E-05	7.5E-02	66.4%
Iron	2,347	NA	3.0E-01	1.4E-04	--	--	1.1E-03	3.6E-03	29.7%	8.6E-04	--	--	1.0E-02	3.3E-02	29.7%
				Total ILCR:	1.4E-05	100.0%	Total HI:	1.2E-02	100.0%	Total ILCR:	8.4E-05	100.0%	Total HI:	1.1E-01	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT AND YOUNG CHILD RESIDENTS - FUTURE SCENARIOS
DERMAL CONTACT WITH SURFACE SOIL - SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
CENTRAL TENDENCY
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

DAD (mg/kg/d) = (C*CF*AF*ABS*SA*EF*ED)/(BW*AT)
ILCR = CDI*CSFd
HQ = CDI/RfDd

Parameter	Units	Description	Adult	Young Child	
DAD	mg/kg/d	Dermally absorbed dose	CS	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	CS	
CSFd	1/(mg/kg/d)	Dermal cancer slope factor	CS	CS	
HQ	NA	Hazard quotient	CS	CS	
RfDd	mg/kg/d	Dermal reference dose	CS	CS	
C	mg/kg	Concentration of chemical in soil	CS	CS	
CF	kg/mg	Conversion factor	1.00E-06	1.00E-06	
AF	mg/cm2	Soil to skin adherence factor	0.07	0.2	
ABS	NA	Absorption fraction	CS	CS	
SA	cm2/day	Skin surface area available for contact	5,000	2,000	
EF	days/year	Exposure frequency	234	234	
ED	years	Exposure duration	9	6	
BW	kg	Body weight	70	15	
AT-C	days	Averaging time, carcinogens	25,550	25,550	
AT-N	days	Averaging time, noncarcinogens	3,285	2,190	

					Adult						Young Child					
					Carcinogens			Noncarcinogens			Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	ABS	CSFd 1/(mg/kg/d)	RfDd (mg/kg/d)	DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI	DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	57.9	0.01	NA	NA	2.4E-07	--	--	1.9E-06	--	--	8.5E-07	--	--	9.9E-06	--	--
Benzo(a)anthracene	4.76	0.13	2.4E+00	NA	2.6E-07	6.0E-07	3.7%	2.0E-06	--	--	9.1E-07	2.1E-06	3.7%	1.1E-05	--	--
Benzo(a)pyrene	2.48	0.13	1.5E+01	NA	1.3E-07	1.9E-06	11.8%	1.0E-06	--	--	4.7E-07	6.9E-06	11.8%	5.5E-06	--	--
Benzo(b)fluoranthene	2.81	0.13	1.5E+00	NA	1.5E-07	2.2E-07	1.3%	1.2E-06	--	--	5.3E-07	7.8E-07	1.3%	6.2E-06	--	--
Benzo(k)fluoranthene	1.78	0.13	1.5E-01	NA	9.5E-08	1.4E-08	0.1%	7.4E-07	--	--	3.4E-07	5.0E-08	0.1%	4.0E-06	--	--
Carbazole	0.95	0.13	4.0E-02	NA	5.1E-08	2.0E-09	0.0%	4.0E-07	--	--	1.8E-07	7.2E-09	0.0%	2.1E-06	--	--
Chrysene	6.7	0.13	2.4E-02	NA	3.6E-07	8.5E-09	0.1%	2.8E-06	--	--	1.3E-06	3.0E-08	0.1%	1.5E-05	--	--
Dibenz(a,h)anthracene	0.695	0.13	2.4E+01	NA	3.7E-08	8.8E-07	5.4%	2.9E-07	--	--	1.3E-07	3.1E-06	5.4%	1.5E-06	--	--
Indeno(1,2,3-cd)pyrene	1.72	0.13	2.4E+00	NA	9.2E-08	2.2E-07	1.3%	7.2E-07	--	--	3.3E-07	7.7E-07	1.3%	3.8E-06	--	--
Dieldrin	0.052	0.01	3.2E+01	2.5E-05	2.1E-10	6.9E-09	0.0%	1.7E-09	6.7E-05	1.5%	7.6E-10	2.4E-08	0.0%	8.9E-09	3.6E-04	1.5%
Aroclor-1260	95.6	0.14	2.2E+00	NA	5.5E-06	1.2E-05	74.8%	4.3E-05	--	--	2.0E-05	4.4E-05	74.8%	2.3E-04	--	--
Arsenic	5.26	0.03	3.7E+00	1.2E-04	6.5E-08	2.4E-07	1.5%	5.1E-07	4.1E-03	94.6%	2.3E-07	8.5E-07	1.5%	2.7E-06	2.2E-02	94.6%
Iron	2,347	0.001	NA	4.5E-02	9.7E-07	--	--	7.5E-06	1.7E-04	3.8%	3.4E-06	--	--	4.0E-05	8.9E-04	3.8%
					Total ILCR:	1.6E-05	100.0%	Total HI:	4.3E-03	100.0%	Total ILCR:	5.8E-05	100.0%	Total HI:	2.3E-02	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT AND YOUNG CHILD RESIDENTS - FUTURE SCENARIOS
INHALATION OF FUGITIVE DUSTS EMANATING FROM SURFACE SOIL - SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
CENTRAL TENDENCY
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (Ca*RR*ET*EF*ED)/(BW*AT)
Where: Ca = C * (1/PEF)

ILCR = CDI*CSFi
HQ = CDI/RfDi

Parameter	Units	Description	Adult	Young Child	
CDI	mg/kg/d	Chronic daily intake	CS	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	CS	
CSFi	1/(mg/kg/d)	Inhalation cancer slope factor	CS	CS	
HQ	NA	Hazard quotient	CS	CS	
RfDi	mg/kg/d	Inhalation reference dose	CS	CS	
Ca	mg/m3	Concentration of chemical in air as fugitive dusts	CS	CS	
C	mg/kg	Concentration of chemical in soil	CS	CS	
PEF	m3/kg	Particulate emission factor	1.32E+09	1.32E+09	
RR	m3/hour	Respiration rate	0.80	0.63	
ET	hours/day	Exposure time	24	24	
EF	days/year	Exposure frequency	234	234	
ED	years	Exposure duration	9	6	
BW	kg	Body weight	70	15	
AT-C	days	Averaging time, carcinogens	25,550	25,550	
AT-N	days	Averaging time, noncarcinogens	3,285	2,190	

					Adult						Young Child					
					Carcinogens			Noncarcinogens			Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	Ca (mg/m3)	CSFi 1/(mg/kg/d)	RfDi (mg/kg/d)	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	57.9	4.39E-08	NA	NA	9.9E-10	--	--	7.7E-09	--	--	2.4E-09	--	--	2.8E-08	--	--
Benzo(a)anthracene	4.76	3.61E-09	3.1E-01	NA	8.2E-11	2.5E-11	0.5%	6.3E-10	--	--	2.0E-10	6.1E-11	0.5%	2.3E-09	--	--
Benzo(a)pyrene	2.48	1.88E-09	3.1E+00	NA	4.2E-11	1.3E-10	2.7%	3.3E-10	--	--	1.0E-10	3.2E-10	2.7%	1.2E-09	--	--
Benzo(b)fluoranthene	2.81	2.13E-09	3.1E-01	NA	4.8E-11	1.5E-11	0.3%	3.7E-10	--	--	1.2E-10	3.6E-11	0.3%	1.4E-09	--	--
Benzo(k)fluoranthene	1.78	1.35E-09	3.1E-02	NA	3.0E-11	9.5E-13	0.0%	2.4E-10	--	--	7.4E-11	2.3E-12	0.0%	8.6E-10	--	--
Carbazole	0.95	7.20E-10	2.0E-02	NA	1.6E-11	3.3E-13	0.0%	1.3E-10	--	--	4.0E-11	7.9E-13	0.0%	4.6E-10	--	--
Chrysene	6.7	5.08E-09	3.1E-03	NA	1.1E-10	3.6E-13	0.0%	8.9E-10	--	--	2.8E-10	8.6E-13	0.0%	3.3E-09	--	--
Dibenz(a,h)anthracene	0.695	5.27E-10	3.1E+00	NA	1.2E-11	3.7E-11	0.8%	9.3E-11	--	--	2.9E-11	9.0E-11	0.8%	3.4E-10	--	--
Indeno(1,2,3-cd)pyrene	1.72	1.30E-09	3.1E-01	NA	2.9E-11	9.1E-12	0.2%	2.3E-10	--	--	7.2E-11	2.2E-11	0.2%	8.3E-10	--	--
Dieldrin	0.052	3.94E-11	1.6E+01	5.0E-05	8.9E-13	1.4E-11	0.3%	6.9E-12	1.4E-07	100.0%	2.2E-12	3.5E-11	0.3%	2.5E-11	5.1E-07	100.0%
Aroclor-1260	95.6	7.24E-08	2.0E+00	NA	1.6E-09	3.3E-09	67.3%	1.3E-08	--	--	4.0E-09	8.0E-09	67.3%	4.6E-08	--	--
Arsenic	5.26	3.98E-09	1.5E+01	NA	9.0E-11	1.4E-09	27.9%	7.0E-10	--	--	2.2E-10	3.3E-09	27.9%	2.6E-09	--	--
Iron	2,347	1.78E-06	NA	NA	4.0E-08	--	--	3.1E-07	--	--	9.8E-08	--	--	1.1E-06	--	--
					Total ILCR:	4.9E-09	100.0%	Total HI:	1.4E-07	100.0%	Total ILCR:	1.2E-08	100.0%	Total HI:	5.1E-07	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT AND YOUNG CHILD RESIDENTS - FUTURE SCENARIOS
INGESTION OF GROUNDWATER AS DRINKING WATER - SITE 84 (BUILDING 45 AREA)
CENTRAL TENDENCY
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (C*IR*EF*ED)/(BW*AT)
ILCR = CDI*CSFo
HQ = CDI/RfDo

Parameter	Units	Description	Adult	Young Child	
CDI	mg/kg/d	Chronic daily intake	CS	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	CS	
CSFo	1/(mg/kg/d)	Oral cancer slope factor	CS	CS	
HQ	NA	Hazard quotient	CS	CS	
RfDo	mg/kg/d	Oral reference dose	CS	CS	
C	mg/L	Concentration of chemical in water	CS	CS	
IR-W	L/day	Ingestion rate of water	1.4	1.0	
EF	days/year	Exposure frequency	234	234	
ED	years	Exposure duration	9	6	
BW	kg	Body weight	70	15	
AT-C	days	Averaging time, carcinogens	25,550	25,550	
AT-N	days	Averaging time, noncarcinogens	3,285	2,190	

				Adult						Young Child					
				Carcinogens			Noncarcinogens			Carcinogens			Noncarcinogens		
Parameter	C (mg/L)	CSFo 1/(mg/kg/d)	RfDo (mg/kg/d)	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI
Benzene	0.0034	5.5E-02	3.0E-03	5.6E-06	3.1E-07	0.4%	4.4E-05	1.5E-02	0.2%	1.2E-05	6.9E-07	0.4%	1.5E-04	4.8E-02	0.2%
Chloroform	0.016	6.1E-03	1.0E-02	2.6E-05	1.6E-07	0.2%	2.1E-04	2.1E-02	0.3%	5.9E-05	3.6E-07	0.2%	6.8E-04	6.8E-02	0.3%
2-Methylnaphthalene	0.00105	NA	NA	1.7E-06	--	--	1.3E-05	--	--	3.8E-06	--	--	4.5E-05	--	--
Naphthalene	0.0022	NA	2.0E-02	3.6E-06	--	--	2.8E-05	1.4E-03	0.0%	8.1E-06	--	--	9.4E-05	4.7E-03	0.0%
Heptachlor Epoxide	0.0000167	9.1E+00	1.3E-05	2.8E-08	2.5E-07	0.3%	2.1E-07	1.6E-02	0.2%	6.1E-08	5.6E-07	0.3%	7.1E-07	5.5E-02	0.2%
MCPA	0.044	NA	5.0E-04	7.3E-05	--	--	5.6E-04	1.1E+00	16.0%	1.6E-04	--	--	1.9E-03	3.8E+00	16.0%
Antimony	0.011	NA	4.0E-04	1.8E-05	--	--	1.4E-04	3.5E-01	5.0%	4.0E-05	--	--	4.7E-04	1.2E+00	5.0%
Arsenic	0.03	1.5E+00	3.0E-04	4.9E-05	7.4E-05	99.0%	3.8E-04	1.3E+00	18.2%	1.1E-04	1.6E-04	99.0%	1.3E-03	4.3E+00	18.2%
Iron	67.7	NA	3.0E-01	1.1E-01	--	--	8.7E-01	2.9E+00	41.0%	2.5E-01	--	--	2.9E+00	9.6E+00	41.0%
Manganese	0.45	NA	2.4E-02	7.4E-04	--	--	5.8E-03	2.4E-01	3.4%	1.6E-03	--	--	1.9E-02	8.0E-01	3.4%
Thallium	0.0057	NA	6.6E-05	9.4E-06	--	--	7.3E-05	1.1E+00	15.7%	2.1E-05	--	--	2.4E-04	3.7E+00	15.7%
				Total ILCR:	7.5E-05	100.0%	Total HI:	7.1E+00	100.0%	Total ILCR:	1.7E-04	100.0%	Total HI:	2.4E+01	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.

ADULT AND YOUNG CHILD RESIDENTS - FUTURE SCENARIOS
DERMAL CONTACT WITH GROUNDWATER - SITE 84 (BUILDING 45 AREA)
CENTRAL TENDENCY
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

DAD (mg/kg/d) = (C*CF*Kp*SA*EF*ED*ET)/(BW*AT)

ILCR = CDI*CSFo Adj CSF Adj = CSF/AD
HQ = CDI/RfDo Adj RfD Adj = RfD*AD

Parameter	Units	Description	Adult	Young Child	
DAD	mg/kg/d	Dermally absorbed dose	CS	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	CS	
CSFd	1/(mg/kg/d)	Dermal cancer slope factor	CS	CS	
HQ	NA	Hazard quotient	CS	CS	
RfDd	mg/kg/d	Dermal reference dose	CS	CS	
SA	cm2	Skin surface area available for contact	20,000	7,930	
EF	days/year	Exposure frequency	234	234	
ED	years	Exposure duration	9	6	
ET	hours/day	Exposure time	0.25	0.25	
BW	kg	Body weight	70	15	
AT-C	days	Averaging time, carcinogens	25,550	25,550	
AT-N	days	Averaging time, noncarcinogens	3,285	2,190	
C	mg/L	Concentration of chemical in water	CS	CS	
CF	L/cm3	Conversion factor	1.00E-03	1.00E-03	
Kp	cm/hour	Dermal permeability coefficient	CS	CS	
AD	NA	Adjustment for absorbed dose	CS	CS	

					Adult						Young Child					
					Carcinogens			Noncarcinogens			Carcinogens			Noncarcinogens		
Parameter	C (mg/L)	Kp (cm/hour)	CSFd 1/(mg/kg/d)	RfDd (mg/kg/d)	DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI	DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI
Benzene	0.0034	0.021	5.9E-02	2.8E-03	4.2E-07	2.5E-08	3.2%	3.3E-06	1.2E-03	0.5%	5.2E-07	3.1E-08	3.2%	6.0E-06	2.2E-03	0.5%
Chloroform	0.016	0.0089	3.1E-02	2.0E-03	8.4E-07	2.6E-08	3.3%	6.5E-06	3.3E-03	1.4%	1.0E-06	3.2E-08	3.3%	1.2E-05	6.0E-03	1.4%
2-Methylnaphthalene	0.00105	0.1423	NA	NA	8.8E-07	--	--	6.8E-06	--	--	1.1E-06	--	--	1.3E-05	--	--
Naphthalene	0.0022	0.069	NA	1.6E-02	8.9E-07	--	--	7.0E-06	4.3E-04	0.2%	1.1E-06	--	--	1.3E-05	8.0E-04	0.2%
Heptachlor Epoxide	0.0000167	0.055	1.3E+01	9.4E-06	5.4E-09	6.8E-08	8.9%	4.2E-08	4.5E-03	1.9%	6.7E-09	8.4E-08	8.9%	7.8E-08	8.3E-03	1.9%
MCPA	0.044	0.0049	NA	2.5E-04	1.3E-06	--	--	9.9E-06	3.9E-02	16.5%	1.6E-06	--	--	1.8E-05	7.3E-02	16.5%
Antimony	0.011	0.001	NA	8.0E-06	6.5E-08	--	--	5.0E-07	6.3E-02	26.3%	8.0E-08	--	--	9.3E-07	1.2E-01	26.3%
Arsenic	0.03	0.001	3.7E+00	1.2E-04	1.8E-07	6.5E-07	84.5%	1.4E-06	1.1E-02	4.7%	2.2E-07	8.0E-07	84.5%	2.5E-06	2.1E-02	4.7%
Iron	67.7	0.001	NA	4.5E-02	4.0E-04	--	--	3.1E-03	6.9E-02	28.7%	4.9E-04	--	--	5.7E-03	1.3E-01	28.7%
Manganese	0.45	0.001	NA	9.6E-04	2.6E-06	--	--	2.1E-05	2.1E-02	9.0%	3.3E-06	--	--	3.8E-05	4.0E-02	9.0%
Thallium	0.0057	0.001	NA	9.9E-06	3.4E-08	--	--	2.6E-07	2.6E-02	11.0%	4.1E-08	--	--	4.8E-07	4.9E-02	11.0%
					Total ILCR:	7.6E-07	100.0%	Total HI:	2.4E-01	100.0%	Total ILCR:	9.4E-07	100.0%	Total HI:	4.4E-01	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.

ADULT AND YOUNG CHILD RESIDENTS - FUTURE SCENARIOS
INHALATION OF VOLATILES IN GROUNDWATER EMANATING FROM SHOWER WATER - SITE 84 (BUILDING 45 AREA)
CENTRAL TENDENCY
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (Ca*RR*ET*EF*ED)/(BW*AT)
Where: Ca = Shower Model

ILCR = CDI*CSFi
HQ = CDI/RfDi

Parameter	Units	Description	Adult	
CDI	mg/kg/d	Chronic daily intake	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	
CSFi	1/(mg/kg/d)	Inhalation cancer slope factor	CS	
HQ	NA	Hazard quotient	CS	
RfDi	mg/kg/d	Inhalation reference dose	CS	
C	mg/L	Concentration of chemical in groundwater	CS	
Ca	mg/m3	Concentration of chemical in shower water Calculated using shower model	CS	
RR	m3/hour	Respiration rate	0.83	
ET	hours/day	Exposure time	0.25	
EF	days/year	Exposure frequency	234	
ED	years	Exposure duration	9	
BW	kg	Body weight	70	
AT-C	days	Averaging time, carcinogens	25,550	
AT-N	days	Averaging time, noncarcinogens	3,285	

					Adult					
					Carcinogens			Noncarcinogens		
Parameter	C (mg/L)	Shower Ca (mg/m3)	CSFi 1/(mg/kg/d)	RfDi (mg/kg/d)	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI
Benzene	0.0034	4.81E-03	2.7E-02	1.7E-03	1.2E-06	3.2E-08	8.2%	9.1E-06	5.3E-03	1.3%
Chloroform	0.016	1.80E-02	8.1E-02	8.6E-05	4.4E-06	3.5E-07	91.8%	3.4E-05	4.0E-01	98.7%
					Total ILCR:	3.9E-07	100.0%	Total HI:	4.0E-01	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.

ADULT AND YOUNG CHILD RESIDENTS - FUTURE SCENARIOS
ACCIDENTAL INGESTION OF SURFACE WATER - SITE 84 (BUILDING 45 AREA)
CENTRAL TENDENCY
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (C*IR*ET*EF*ED)/(BW*AT)
ILCR = CDI*CSFo
HQ = CDI/RfDo

Parameter	Units	Description	Adult	Young Child	
CDI	mg/kg/d	Chronic daily intake	CS	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	CS	
CSFo	1/(mg/kg/d)	Oral cancer slope factor	CS	CS	
HQ	NA	Hazard quotient	CS	CS	
RfDo	mg/kg/d	Oral reference dose	CS	CS	
C	mg/L	Concentration of chemical in water	CS	CS	
IR-W	L/hour	Ingestion rate of water	0.01	0.05	
ET	hours/day	Exposure time	2.6	2.6	
EF	days/year	Exposure frequency	48	48	
ED	years	Exposure duration	9	6	
BW	kg	Body weight	70	15	
AT-C	days	Averaging time, carcinogens	25,550	25,550	
AT-N	days	Averaging time, noncarcinogens	3,285	2,190	

				Adult						Young Child					
				Carcinogens			Noncarcinogens			Carcinogens			Noncarcinogens		
Parameter	C (mg/L)	CSFo 1/(mg/kg/d)	RfDo (mg/kg/d)	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI
Acetone	0.0056	NA	1.0E-01	3.5E-08	--	--	2.7E-07	2.7E-06	78.6%	5.5E-07	--	--	6.4E-06	6.4E-05	78.6%
Toluene	0.0027	NA	2.0E-01	1.7E-08	--	--	1.3E-07	6.6E-07	18.9%	2.6E-07	--	--	3.1E-06	1.5E-05	18.9%
Xylenes, total	0.0035	NA	2.0E+00	2.2E-08	--	--	1.7E-07	8.5E-08	2.5%	3.4E-07	--	--	4.0E-06	2.0E-06	2.5%
				Total ILCR:	--	--	Total HI:	3.5E-06	100.0%	Total ILCR:	--	--	Total HI:	8.1E-05	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.

ADULT AND YOUNG CHILD RESIDENTS - FUTURE SCENARIOS
DERMAL CONTACT WITH SURFACE WATER - SITE 84 (BUILDING 45 AREA)
CENTRAL TENDENCY
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

DAD (mg/kg/d) = (C*CF*Kp*SA*EF*ED*ET)/(BW*AT)

ILCR = CDI*CSFo Adj CSF Adj = CSF/AD
HQ = CDI/RfDo Adj RfD Adj = RfD*AD

Parameter	Units	Description	Adult	Young Child	
DAD	mg/kg/d	Dermally absorbed dose	CS	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	CS	
CSFd	1/(mg/kg/d)	Dermal cancer slope factor	CS	CS	
HQ	NA	Hazard quotient	CS	CS	
RfDd	mg/kg/d	Dermal reference dose	CS	CS	
SA	cm2	Skin surface area available for contact	5,000	2,000	
EF	days/year	Exposure frequency	48	48	
ED	years	Exposure duration	9	6	
ET	hours/day	Exposure time	2.6	2.6	
BW	kg	Body weight	70	15	
AT-C	days	Averaging time, carcinogens	25,550	25,550	
AT-N	days	Averaging time, noncarcinogens	3,285	2,190	
C	mg/L	Concentration of chemical in water	CS	CS	
CF	L/cm3	Conversion factor	1.00E-03	1.00E-03	
Kp	cm/hour	Dermal permeability coefficient	CS	CS	
AD	NA	Adjustment for absorbed dose	CS	CS	

					Adult						Young Child					
					Carcinogens			Noncarcinogens			Carcinogens			Noncarcinogens		
Parameter	C (mg/L)	Kp (cm/hour)	CSFd 1/(mg/kg/d)	RfDd (mg/kg/d)	DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI	DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI
Acetone	0.0056	0.00057	NA	8.3E-02	1.0E-08	--	--	7.8E-08	9.4E-07	3.9%	1.2E-08	--	--	1.5E-07	1.8E-06	3.9%
Toluene	0.0027	0.045	NA	1.6E-01	3.8E-07	--	--	3.0E-06	1.9E-05	77.6%	4.7E-07	--	--	5.5E-06	3.5E-05	77.6%
Xylenes, total	0.0035	0.095	NA	1.8E+00	1.0E-06	--	--	8.1E-06	4.4E-06	18.5%	1.3E-06	--	--	1.5E-05	8.2E-06	18.5%
					Total ILCR:	--	--	Total HI:	2.4E-05	100.0%	Total ILCR:	--	--	Total HI:	4.5E-05	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.

ADULT AND YOUNG CHILD RESIDENTS - FUTURE SCENARIOS
ACCIDENTAL INGESTION OF SEDIMENT - SITE 84 (BUILDING 45 AREA)
CENTRAL TENDENCY
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (C*IR*CF*FI*EF*ED)/(BW*AT)
ILCR = CDI*CSFo
HQ = CDI/RfDo

Parameter	Units	Description	Adult	Young Child	
CDI	mg/kg/d	Chronic daily intake	CS	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	CS	
CSFo	1/(mg/kg/d)	Oral cancer slope factor	CS	CS	
HQ	NA	Hazard quotient	CS	CS	
RfDo	mg/kg/d	Oral reference dose	CS	CS	
C	mg/kg	Concentration of chemical in soil	CS	CS	
IR-S	mg/day	Ingestion rate of sediment	50	100	
CF	kg/mg	Conversion factor	1.00E-06	1.00E-06	
FI	NA	Fraction of soil ingested from site	1	1	
EF	days/year	Exposure frequency	48	48	
ED	years	Exposure duration	9	6	
BW	kg	Body weight	70	15	
AT-C	days	Averaging time, carcinogens	25,550	25,550	
AT-N	days	Averaging time, noncarcinogens	3,285	2,190	

				Adult						Young Child					
				Carcinogens			Noncarcinogens			Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	CSFo 1/(mg/kg/d)	RfDo (mg/kg/d)	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	10	NA	NA	1.2E-07	--	--	9.4E-07	--	--	7.5E-07	--	--	8.8E-06	--	--
Aroclor-1248	2.8	2.0E+00	NA	3.4E-08	6.8E-08	6.5%	2.6E-07	--	--	2.1E-07	4.2E-07	6.5%	2.5E-06	--	--
Aroclor-1260	40	2.0E+00	NA	4.8E-07	9.7E-07	93.5%	3.8E-06	--	--	3.0E-06	6.0E-06	93.5%	3.5E-05	--	--
Diesel Range Organics	11,600	NA	NA	1.4E-04	--	--	1.1E-03	--	--	8.7E-04	--	--	1.0E-02	--	--
				Total ILCR:	1.0E-06	100.0%	Total HI:	--	--	Total ILCR:	6.4E-06	100.0%	Total HI:	--	--

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.

ADULT AND YOUNG CHILD RESIDENTS - FUTURE SCENARIOS
DERMAL CONTACT WITH SEDIMENT - SITE 84 (BUILDING 45 AREA)
CENTRAL TENDENCY
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

DAD (mg/kg/d) = (C*CF*AF*ABS*SA*EF*ED)/(BW*AT)
ILCR = CDI*CSFd
HQ = CDI/RfDd

Parameter	Units	Description	Adult	Young Child	
DAD	mg/kg/d	Dermally absorbed dose	CS	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	CS	
CSFd	1/(mg/kg/d)	Dermal cancer slope factor	CS	CS	
HQ	NA	Hazard quotient	CS	CS	
RfDd	mg/kg/d	Dermal reference dose	CS	CS	
C	mg/kg	Concentration of chemical in soil	CS	CS	
CF	kg/mg	Conversion factor	1.00E-06	1.00E-06	
AF	mg/cm2	Soil to skin adherence factor	0.07	0.20	
ABS	NA	Absorption fraction	CS	CS	
SA	cm2/day	Skin surface area available for contact	5,000	1,745	
EF	days/year	Exposure frequency	48	48	
ED	years	Exposure duration	9	6	
BW	kg	Body weight	70	15	
AT-C	days	Averaging time, carcinogens	25,550	25,550	
AT-N	days	Averaging time, noncarcinogens	3,285	2,190	

					Adult						Young Child					
					Carcinogens			Noncarcinogens			Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	ABS	CSFd 1/(mg/kg/d)	RfDd (mg/kg/d)	DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI	DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	10	0.01	NA	NA	8.5E-09	--	--	6.6E-08	--	--	2.6E-08	--	--	3.1E-07	--	--
Aroclor-1248	2.8	0.14	2.2E+00	NA	3.3E-08	7.4E-08	6.6%	2.6E-07	--	--	1.0E-07	2.3E-07	6.6%	1.2E-06	--	--
Aroclor-1260	40	0.14	2.2E+00	NA	4.7E-07	1.1E-06	93.4%	3.7E-06	--	--	1.5E-06	3.3E-06	93.4%	1.7E-05	--	--
Diesel Range Organics	11,600	0.01	NA	NA	9.8E-06	--	--	7.6E-05	--	--	3.0E-05	--	--	3.5E-04	--	--
					Total ILCR:	1.1E-06	100.0%	Total HI:	--	--	Total ILCR:	3.5E-06	100.0%	Total HI:	--	--

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.

ADULT CONSTRUCTION WORKERS - FUTURE SCENARIO
ACCIDENTAL INGESTION OF SURFACE SOIL - SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (C*IR*CF*FI*EF*ED)/(BW*AT)
ILCR = CDI*CSFo
HQ = CDI/RfDo

Parameter	Units	Description	Construction Worker	
CDI	mg/kg/d	Chronic daily intake	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	
CSFo	1/(mg/kg/d)	Oral cancer slope factor	CS	
HQ	NA	Hazard quotient	CS	
RfDo	mg/kg/d	Oral reference dose	CS	
C	mg/kg	Concentration of chemical in soil	CS	
IR-S	mg/day	Ingestion rate of soil	480	
CF	kg/mg	Conversion factor	1.00E-06	
FI	NA	Fraction of soil ingested from site	1	
EF	days/year	Exposure frequency	250	
ED	years	Exposure duration	1	
BW	kg	Body weight	70	
AT-C	days	Averaging time, carcinogens	25,550	
AT-N	days	Averaging time, noncarcinogens	365	

				Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	CSFo 1/(mg/kg/d)	RfDo (mg/kg/d)	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	1.96	NA	NA	1.3E-07	--	--	9.2E-06	--	--
Benzo(a)anthracene	69.0	7.3E-01	NA	4.6E-06	3.4E-06	8.1%	3.2E-04	--	--
Benzo(a)pyrene	30.5	7.3E+00	NA	2.0E-06	1.5E-05	35.6%	1.4E-04	--	--
Benzo(b)fluoranthene	40.9	7.3E-01	NA	2.7E-06	2.0E-06	4.8%	1.9E-04	--	--
Benzo(k)fluoranthene	18.7	7.3E-02	NA	1.3E-06	9.1E-08	0.2%	8.8E-05	--	--
Carbazole	3.16	2.0E-02	NA	2.1E-07	4.2E-09	0.0%	1.5E-05	--	--
Chrysene	96.0	7.3E-03	NA	6.4E-06	4.7E-08	0.1%	4.5E-04	--	--
Dibenz(a,h)anthracene	1.41	7.3E+00	NA	9.5E-08	6.9E-07	1.7%	6.6E-06	--	--
Fluoranthene	243	NA	4.0E-02	1.6E-05	--	--	1.1E-03	2.9E-02	0.9%
Indeno(1,2,3-cd)pyrene	8.79	7.3E-01	NA	5.9E-07	4.3E-07	1.0%	4.1E-05	--	--
Naphthalene	0.525	NA	2.0E-02	3.5E-08	--	--	2.5E-06	1.2E-04	0.0%
Pyrene	250	NA	3.0E-02	1.7E-05	--	--	1.2E-03	3.9E-02	1.2%
4,4'-DDD	3	2.4E-01	NA	2.0E-07	4.8E-08	0.1%	1.4E-05	--	--
Chlordane, alpha-	48	3.5E-01 (1)	5.0E-04 (1)	3.2E-06	1.1E-06	2.7%	2.3E-04	4.5E-01	13.7%
Chlordane, gamma-	58	3.5E-01 (1)	5.0E-04 (1)	3.9E-06	1.4E-06	3.3%	2.7E-04	5.4E-01	16.6%
Dieldrin	0.32	1.6E+01	5.0E-05	2.1E-08	3.4E-07	0.8%	1.5E-06	3.0E-02	0.9%
Heptachlor	22	4.5E+00	5.0E-04	1.5E-06	6.6E-06	15.9%	1.0E-04	2.1E-01	6.3%
Heptachlor Epoxide	4.5	9.1E+00	1.3E-05	3.0E-07	2.7E-06	6.6%	2.1E-05	1.6E+00	49.5%
Aroclor-1248	1.51	2.0E+00	NA	1.0E-07	2.0E-07	0.5%	7.1E-06	--	--
Aroclor-1254	0.975	2.0E+00	2.0E-05	6.5E-08	1.3E-07	0.3%	4.6E-06	2.3E-01	7.0%
Aroclor-1260	54.6	2.0E+00	NA	3.7E-06	7.3E-06	17.5%	2.6E-04	--	--
Gasoline Range Organics	0.207	NA	NA	1.4E-08	--	--	9.7E-07	--	--
Diesel Range Organics	470	NA	NA	3.2E-05	--	--	2.2E-03	--	--
Antimony	1.22	NA	4.0E-04	8.2E-08	--	--	5.7E-06	1.4E-02	0.4%
Arsenic	3.49	1.5E+00	3.0E-04	2.3E-07	3.5E-07	0.8%	1.6E-05	5.5E-02	1.7%
Iron	2,260	NA	3.0E-01	1.5E-04	--	--	1.1E-02	3.5E-02	1.1%
Thallium	0.31	NA	6.6E-05	2.1E-08	--	--	1.4E-06	2.2E-02	0.7%
				Total ILCR:	4.2E-05	100.0%	Total HI:	3.3E+00	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT CONSTRUCTION WORKERS - FUTURE SCENARIO
DERMAL CONTACT WITH SURFACE SOIL - SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

DAD (mg/kg/d) = (C*CF*AF*ABS*SA*EF*ED)/(BW*AT)
ILCR = CDI*CSFd
HQ = CDI/RfDd

Parameter	Units	Description	Construction Worker	
DAD	mg/kg/d	Dermally absorbed dose	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	
CSFd	1/(mg/kg/d)	Dermal cancer slope factor	CS	
HQ	NA	Hazard quotient	CS	
RfDd	mg/kg/d	Dermal reference dose	CS	
C	mg/kg	Concentration of chemical in soil	CS	
CF	kg/mg	Conversion factor	1.00E-06	
AF	mg/cm2	Soil to skin adherence factor	0.2	
ABS	NA	Absorption fraction	CS	
SA	cm2/day	Skin surface area available for contact	3,300	
EF	days/year	Exposure frequency	250	
ED	years	Exposure duration	1	
BW	kg	Body weight	70	
AT-C	days	Averaging time, carcinogens	25,550	
AT-N	days	Averaging time, noncarcinogens	365	

					Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	ABS	CSFd 1/(mg/kg/d)	RfDd (mg/kg/d)	DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	1.96	0.01	NA	NA	1.8E-09	--	--	1.3E-07	--	--
Benzo(a)anthracene	69.0	0.13	2.4E+00	NA	8.3E-07	1.9E-06	18.1%	5.8E-05	--	--
Benzo(a)pyrene	30.5	0.13	1.5E+01	NA	3.7E-07	5.3E-06	49.7%	2.6E-05	--	--
Benzo(b)fluoranthene	40.9	0.13	1.5E+00	NA	4.9E-07	7.2E-07	6.7%	3.4E-05	--	--
Benzo(k)fluoranthene	18.7	0.13	1.5E-01	NA	2.2E-07	3.3E-08	0.3%	1.6E-05	--	--
Carbazole	3.16	0.13	4.0E-02	NA	3.8E-08	1.5E-09	0.0%	2.7E-06	--	--
Chrysene	96.0	0.13	2.4E-02	NA	1.2E-06	2.7E-08	0.3%	8.1E-05	--	--
Dibenz(a,h)anthracene	1.41	0.13	2.4E+01	NA	1.7E-08	4.0E-07	3.7%	1.2E-06	--	--
Fluoranthene	243	0.01	NA	1.2E-02	2.2E-07	--	--	1.6E-05	1.3E-03	0.8%
Indeno(1,2,3-cd)pyrene	8.79	0.13	2.4E+00	NA	1.1E-07	2.5E-07	2.3%	7.4E-06	--	--
Naphthalene	0.525	0.01	NA	1.6E-02	4.8E-10	--	--	3.4E-08	2.1E-06	0.0%
Pyrene	250	0.01	NA	9.3E-03	2.3E-07	--	--	1.6E-05	1.7E-03	1.1%
4,4'-DDD	3	0.01	3.4E-01	NA	2.8E-09	9.5E-10	0.0%	1.9E-07	--	--
Chlordane, alpha-	48	0.04	4.4E-01 (1)	4.0E-04 (1)	1.8E-07	7.7E-08	0.7%	1.2E-05	3.1E-02	19.0%
Chlordane, gamma-	58	0.04	4.4E-01 (1)	4.0E-04 (1)	2.1E-07	9.4E-08	0.9%	1.5E-05	3.7E-02	22.9%
Dieldrin	0.32	0.01	3.2E+01	2.5E-05	3.0E-10	9.4E-09	0.1%	2.1E-08	8.3E-04	0.5%
Heptachlor	22	0.01	6.3E+00	3.6E-04	2.0E-08	1.3E-07	1.2%	1.4E-06	3.9E-03	2.4%
Heptachlor Epoxide	4.5	0.01	1.3E+01	9.4E-06	4.2E-09	5.2E-08	0.5%	2.9E-07	3.1E-02	19.0%
Aroclor-1248	1.51	0.14	2.2E+00	NA	1.9E-08	4.4E-08	0.4%	1.4E-06	--	--
Aroclor-1254	0.975	0.14	2.2E+00	1.8E-05	1.3E-08	2.8E-08	0.3%	8.8E-07	4.9E-02	30.0%
Aroclor-1260	54.6	0.14	2.2E+00	NA	7.0E-07	1.6E-06	14.6%	4.9E-05	--	--
Gasoline Range Organics	0.207	0.01	NA	NA	1.9E-10	--	--	1.3E-08	--	--
Diesel Range Organics	470	0.01	NA	NA	4.3E-07	--	--	3.0E-05	--	--
Antimony	1.22	0.001	NA	8.0E-06	1.1E-10	--	--	7.9E-09	9.9E-04	0.6%
Arsenic	3.49	0.03	3.7E+00	1.2E-04	9.7E-09	3.5E-08	0.3%	6.8E-07	5.5E-03	3.4%
Iron	2,260	0.001	NA	4.5E-02	2.1E-07	--	--	1.5E-05	3.2E-04	0.2%
Thallium	0.31	0.001	NA	9.9E-06	2.8E-11	--	--	2.0E-09	2.0E-04	0.1%
					Total ILCR:	1.1E-05	100.0%	Total HI:	1.6E-01	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT CONSTRUCTION WORKERS - FUTURE SCENARIO
INHALATION OF FUGITIVE DUSTS EMANATING FROM SURFACE SOIL - SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (Ca*RR*ET*EF*ED)/(BW*AT)
Where: Ca = C * (1/PEF)

ILCR = CDI*CSFi
HQ = CDI/RfDi

Parameter	Units	Description	Construction Worker	
CDI	mg/kg/d	Chronic daily intake	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	
CSFi	1/(mg/kg/d)	Inhalation cancer slope factor	CS	
HQ	NA	Hazard quotient	CS	
RfDi	mg/kg/d	Inhalation reference dose	CS	
Ca	mg/m3	Concentration of chemical in air as fugitive dusts	CS	
C	mg/kg	Concentration of chemical in soil	CS	
PEF	m3/kg	Particulate emission factor	1.32E+09	
RR	m3/hour	Respiration rate	0.83	
ET	hours/day	Exposure time	8	
EF	days/year	Exposure frequency	250	
ED	years	Exposure duration	1	
BW	kg	Body weight	70	
AT-C	days	Averaging time, carcinogens	25,550	
AT-N	days	Averaging time, noncarcinogens	365	

					Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	Ca (mg/m3)	CSFi 1/(mg/kg/d)	RfDi (mg/kg/d)	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	1.96	1.48E-09	NA	NA	1.4E-12	--	--	9.6E-11	--	--
Benzo(a)anthracene	69.0	5.23E-08	3.1E-01	NA	4.9E-11	1.5E-11	4.4%	3.4E-09	--	--
Benzo(a)pyrene	30.5	2.31E-08	3.1E+00	NA	2.1E-11	6.6E-11	19.4%	1.5E-09	--	--
Benzo(b)fluoranthene	40.9	3.10E-08	3.1E-01	NA	2.9E-11	8.9E-12	2.6%	2.0E-09	--	--
Benzo(k)fluoranthene	18.7	1.41E-08	3.1E-02	NA	1.3E-11	4.1E-13	0.1%	9.2E-10	--	--
Carbazole	3.16	2.39E-09	2.0E-02	NA	2.2E-12	4.4E-14	0.0%	1.6E-10	--	--
Chrysene	96.0	7.27E-08	3.1E-03	NA	6.8E-11	2.1E-13	0.1%	4.7E-09	--	--
Dibenz(a,h)anthracene	1.41	1.07E-09	3.1E+00	NA	9.9E-13	3.1E-12	0.9%	7.0E-11	--	--
Fluoranthene	243	1.84E-07	NA	4.0E-02	1.7E-10	--	--	1.2E-08	3.0E-07	0.6%
Indeno(1,2,3-cd)pyrene	8.79	6.66E-09	3.1E-01	NA	6.2E-12	1.9E-12	0.6%	4.3E-10	--	--
Naphthalene	0.525	3.98E-10	NA	8.6E-04	3.7E-13	--	--	2.6E-11	3.0E-08	0.1%
Pyrene	250	1.89E-07	NA	3.0E-02	1.8E-10	--	--	1.2E-08	4.1E-07	0.8%
4,4'-DDD	3	2.27E-09	2.4E-01	NA	2.1E-12	5.1E-13	0.1%	1.5E-10	--	--
Chlordane, alpha-	48	3.64E-08	3.5E-01 (1)	2.0E-04 (1)	3.4E-11	1.2E-11	3.4%	2.4E-09	1.2E-05	24.2%
Chlordane, gamma-	58	4.39E-08	3.5E-01 (1)	2.0E-04 (1)	4.1E-11	1.4E-11	4.2%	2.9E-09	1.4E-05	29.3%
Dieldrin	0.32	2.42E-10	1.6E+01	5.0E-05	2.3E-13	3.6E-12	1.1%	1.6E-11	3.2E-07	0.6%
Heptachlor	22	1.67E-08	4.6E+00	5.0E-04	1.5E-11	7.0E-11	20.5%	1.1E-09	2.2E-06	4.4%
Heptachlor Epoxide	4.5	3.41E-09	9.1E+00	1.3E-05	3.2E-12	2.9E-11	8.4%	2.2E-10	1.7E-05	35.0%
Aroclor-1248	1.51	1.14E-09	2.0E+00	NA	1.1E-12	2.1E-12	0.6%	7.4E-11	--	--
Aroclor-1254	0.975	7.39E-10	2.0E+00	2.0E-05	6.9E-13	1.4E-12	0.4%	4.8E-11	2.4E-06	4.9%
Aroclor-1260	54.6	4.13E-08	2.0E+00	NA	3.8E-11	7.7E-11	22.4%	2.7E-09	--	--
Gasoline Range Organics	0.207	1.57E-10	NA	NA	1.5E-13	--	--	1.0E-11	--	--
Diesel Range Organics	470	3.56E-07	NA	NA	3.3E-10	--	--	2.3E-08	--	--
Antimony	1.22	9.25E-10	NA	NA	8.6E-13	--	--	6.0E-11	--	--
Arsenic	3.49	2.65E-09	1.5E+01	NA	2.5E-12	3.7E-11	10.8%	1.7E-10	--	--
Iron	2,260	1.71E-06	NA	NA	1.6E-09	--	--	1.1E-07	--	--
Thallium	0.31	2.32E-10	NA	NA	2.2E-13	--	--	1.5E-11	--	--
					Total ILCR:	3.4E-10	100.0%	Total HI:	4.9E-05	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT CONSTRUCTION WORKERS - FUTURE SCENARIO
ACCIDENTAL INGESTION OF SUBSURFACE SOIL - SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (C*IR*CF*FI*EF*ED)/(BW*AT)
ILCR = CDI*CSFo
HQ = CDI/RfDo

Parameter	Units	Description	Construction Worker	
CDI	mg/kg/d	Chronic daily intake	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	
CSFo	1/(mg/kg/d)	Oral cancer slope factor	CS	
HQ	NA	Hazard quotient	CS	
RfDo	mg/kg/d	Oral reference dose	CS	
C	mg/kg	Concentration of chemical in soil	CS	
IR-S	mg/day	Ingestion rate of soil	480	
CF	kg/mg	Conversion factor	1.00E-06	
FI	NA	Fraction of soil ingested from site	1	
EF	days/year	Exposure frequency	250	
ED	years	Exposure duration	1	
BW	kg	Body weight	70	
AT-C	days	Averaging time, carcinogens	25,550	
AT-N	days	Averaging time, noncarcinogens	365	

Parameter	C (mg/kg)	CSFo 1/(mg/kg/d)	RfDo (mg/kg/d)	Carcinogens CDI (mg/kg/d)	Carcinogens ILCR	Carcinogens % Contrib. Total ILCR	Noncarcinogens CDI (mg/kg/d)	Noncarcinogens HQ	Noncarcinogens % Contrib. HI
2-Methylnaphthalene	0.573	NA	NA	3.8E-08	--	--	2.7E-06	--	--
Benzo(a)anthracene	0.199	7.3E-01	NA	1.3E-08	9.7E-09	0.8%	9.3E-07	--	--
Benzo(a)pyrene	0.194	7.3E+00	NA	1.3E-08	9.5E-08	7.7%	9.1E-07	--	--
Benzo(b)fluoranthene	0.217	7.3E-01	NA	1.5E-08	1.1E-08	0.9%	1.0E-06	--	--
Benzo(k)fluoranthene	0.137	7.3E-02	NA	9.2E-09	6.7E-10	0.1%	6.5E-07	--	--
Bis(2-chloroethoxy)methane	0.0512	NA	NA	3.4E-09	--	--	2.4E-07	--	--
Carbazole	0.0845	2.0E-02	NA	5.7E-09	1.1E-10	0.0%	4.0E-07	--	--
Chrysene	0.209	7.3E-03	NA	1.4E-08	1.0E-10	0.0%	9.8E-07	--	--
Dibenz(a,h)anthracene	0.0758	7.3E+00	NA	5.1E-09	3.7E-08	3.0%	3.6E-07	--	--
Indeno(1,2,3-cd)pyrene	0.145	7.3E-01	NA	9.7E-09	7.1E-09	0.6%	6.8E-07	--	--
Naphthalene	0.226	NA	2.0E-02	1.5E-08	--	--	1.1E-06	5.3E-05	0.0%
Chlordane, alpha-	1.22	3.5E-01 (1)	5.0E-04 (1)	8.2E-08	2.9E-08	2.3%	5.7E-06	1.1E-02	5.7%
Chlordane, gamma-	1.65	3.5E-01 (1)	5.0E-04 (1)	1.1E-07	3.9E-08	3.1%	7.7E-06	1.5E-02	7.7%
Heptachlor	0.155	4.5E+00	5.0E-04	1.0E-08	4.7E-08	3.8%	7.3E-07	1.5E-03	0.7%
Heptachlor Epoxide	0.0161	9.1E+00	1.3E-05	1.1E-09	9.8E-09	0.8%	7.5E-08	5.8E-03	2.9%
Aroclor-1248	0.318	2.0E+00	NA	2.1E-08	4.3E-08	3.4%	1.5E-06	--	--
Aroclor-1254	0.333	2.0E+00	2.0E-05	2.2E-08	4.5E-08	3.6%	1.6E-06	7.8E-02	38.7%
Aroclor-1260	5.61	2.0E+00	NA	3.8E-07	7.5E-07	60.9%	2.6E-05	--	--
Gasoline Range Organics	580	NA	NA	3.9E-05	--	--	2.7E-03	--	--
Diesel Range Organics	5,500	NA	NA	3.7E-04	--	--	2.6E-02	--	--
Arsenic	1.11	1.5E+00	3.0E-04	7.4E-08	1.1E-07	9.0%	5.2E-06	1.7E-02	8.6%
Iron	2,754	NA	3.0E-01	1.8E-04	--	--	1.3E-02	4.3E-02	21.4%
Thallium	0.405	NA	6.6E-05	2.7E-08	--	--	1.9E-06	2.9E-02	14.3%
				Total ILCR:	1.2E-06	100.0%	Total HI:	2.0E-01	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT CONSTRUCTION WORKERS - FUTURE SCENARIO
DERMAL CONTACT WITH SUBSURFACE SOIL - SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

DAD (mg/kg/d) = (C*CF*AF*ABS*SA*EF*ED)/(BW*AT)
ILCR = CDI*CSFd
HQ = CDI/RfDd

Parameter	Units	Description	Construction Worker	
DAD	mg/kg/d	Dermally absorbed dose	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	
CSFd	1/(mg/kg/d)	Dermal cancer slope factor	CS	
HQ	NA	Hazard quotient	CS	
RfDd	mg/kg/d	Dermal reference dose	CS	
C	mg/kg	Concentration of chemical in soil	CS	
CF	kg/mg	Conversion factor	1.00E-06	
AF	mg/cm2	Soil to skin adherence factor	0.2	
ABS	NA	Absorption fraction	CS	
SA	cm2/day	Skin surface area available for contact	3,300	
EF	days/year	Exposure frequency	250	
ED	years	Exposure duration	1	
BW	kg	Body weight	70	
AT-C	days	Averaging time, carcinogens	25,550	
AT-N	days	Averaging time, noncarcinogens	365	

					Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	ABS	CSFd 1/(mg/kg/d)	RfDd (mg/kg/d)	DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	0.573	0.01	NA	NA	5.3E-10	--	--	3.7E-08	--	--
Benzo(a)anthracene	0.199	0.13	2.4E+00	NA	2.4E-09	5.6E-09	2.1%	1.7E-07	--	--
Benzo(a)pyrene	0.194	0.13	1.5E+01	NA	2.3E-09	3.4E-08	12.8%	1.6E-07	--	--
Benzo(b)fluoranthene	0.217	0.13	1.5E+00	NA	2.6E-09	3.8E-09	1.4%	1.8E-07	--	--
Benzo(k)fluoranthene	0.137	0.13	1.5E-01	NA	1.6E-09	2.4E-10	0.1%	1.2E-07	--	--
Bis(2-chloroethoxy)methane	0.0512	0.1	NA	NA	4.7E-10	--	--	3.3E-08	--	--
Carbazole	0.0845	0.13	4.0E-02	NA	1.0E-09	4.1E-11	0.0%	7.1E-08	--	--
Chrysene	0.209	0.13	2.4E-02	NA	2.5E-09	5.9E-11	0.0%	1.8E-07	--	--
Dibenz(a,h)anthracene	0.0758	0.13	2.4E+01	NA	9.1E-10	2.1E-08	8.1%	6.4E-08	--	--
Indeno(1,2,3-cd)pyrene	0.145	0.13	2.4E+00	NA	1.7E-09	4.1E-09	1.5%	1.2E-07	--	--
Naphthalene	0.226	0.01	NA	1.6E-02	2.1E-10	--	--	1.5E-08	9.1E-07	0.0%
Chlordane, alpha-	1.22	0.04	4.4E-01 (1)	4.0E-04 (1)	4.5E-09	2.0E-09	0.7%	3.1E-07	7.8E-04	3.7%
Chlordane, gamma-	1.65	0.04	4.4E-01 (1)	4.0E-04 (1)	6.1E-09	2.7E-09	1.0%	4.3E-07	1.1E-03	5.0%
Heptachlor	0.155	0.01	6.3E+00	3.6E-04	1.4E-10	8.9E-10	0.3%	1.0E-08	2.8E-05	0.1%
Heptachlor Epoxide	0.0161	0.01	1.3E+01	9.4E-06	1.5E-11	1.9E-10	0.1%	1.0E-09	1.1E-04	0.5%
Aroclor-1248	0.318	0.14	2.2E+00	NA	4.1E-09	9.2E-09	3.5%	2.9E-07	--	--
Aroclor-1254	0.333	0.14	2.2E+00	1.8E-05	4.3E-09	9.6E-09	3.6%	3.0E-07	1.7E-02	79.2%
Aroclor-1260	5.61	0.14	2.2E+00	NA	7.2E-08	1.6E-07	60.5%	5.1E-06	--	--
Gasoline Range Organics	580	0.01	NA	NA	5.4E-07	--	--	3.7E-05	--	--
Diesel Range Organics	5,500	0.01	NA	NA	5.1E-06	--	--	3.6E-04	--	--
Arsenic	1.11	0.03	3.7E+00	1.2E-04	3.1E-09	1.1E-08	4.2%	2.1E-07	1.7E-03	8.3%
Iron	2,754	0.001	NA	4.5E-02	2.5E-07	--	--	1.8E-05	4.0E-04	1.9%
Thallium	0.405	0.001	NA	9.9E-06	3.7E-11	--	--	2.6E-09	2.6E-04	1.3%
					Total ILCR:	2.7E-07	100.0%	Total HI:	2.1E-02	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT CONSTRUCTION WORKERS - FUTURE SCENARIO
INHALATION OF FUGITIVE DUSTS EMANATING FROM EXCAVATED SUBSURFACE SOIL - SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (Ca*RR*ET*EF*ED)/(BW*AT)
Where: Ca = C * (1/PEF)

ILCR = CDI*CSFi
HQ = CDI/RfDi

Parameter	Units	Description	Construction Worker	
CDI	mg/kg/d	Chronic daily intake	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	
CSFi	1/(mg/kg/d)	Inhalation cancer slope factor	CS	
HQ	NA	Hazard quotient	CS	
RfDi	mg/kg/d	Inhalation reference dose	CS	
Ca	mg/m3	Concentration of chemical in air as fugitive dusts	CS	
C	mg/kg	Concentration of chemical in soil	CS	
PEF	m3/kg	Particulate emission factor	1.32E+09	
RR	m3/hour	Respiration rate	0.83	
ET	hours/day	Exposure time	8	
EF	days/year	Exposure frequency	250	
ED	years	Exposure duration	1	
BW	kg	Body weight	70	
AT-C	days	Averaging time, carcinogens	25,550	
AT-N	days	Averaging time, noncarcinogens	365	

					Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	Ca (mg/m3)	CSFi 1/(mg/kg/d)	RfDi (mg/kg/d)	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	0.573	4.34E-10	NA	NA	4.0E-13	--	--	2.8E-11	--	--
Benzo(a)anthracene	0.199	1.51E-10	3.1E-01	NA	1.4E-13	4.3E 14	0.2%	9.8E-12	--	--
Benzo(a)pyrene	0.194	1.47E-10	3.1E+00	NA	1.4E-13	4.2E-13	1.9%	9.5E-12	--	--
Benzo(b)fluoranthene	0.217	1.64E-10	3.1E-01	NA	1.5E-13	4.7E-14	0.2%	1.1E-11	--	--
Benzo(k)fluoranthene	0.137	1.04E-10	3.1E-02	NA	9.7E-14	3.0E-15	0.0%	6.8E-12	--	--
Bis(2-chloroethoxy)methane	0.0512	3.88E-11	NA	NA	3.6E-14	--	--	2.5E-12	--	--
Carbazole	0.0845	6.40E-11	2.0E-02	NA	5.9E-14	1.2E-15	0.0%	4.2E-12	--	--
Chrysene	0.209	1.59E-10	3.1E-03	NA	1.5E-13	4.6E-16	0.0%	1.0E-11	--	--
Dibenz(a,h)anthracene	0.0758	5.75E-11	3.1E+00	NA	5.3E-14	1.7E-13	0.7%	3.7E-12	--	--
Indeno(1,2,3-cd)pyrene	0.145	1.10E-10	3.1E-01	NA	1.0E-13	3.2E-14	0.1%	7.1E-12	--	--
Naphthalene	0.226	1.71E-10	NA	8.6E-04	1.6E-13	--	--	1.1E-11	1.3E-08	0.8%
Chlordane, alpha-	1.22	9.21E-10	3.5E-01 (1)	2.0E-04 (1)	8.5E-13	3.0E-13	1.3%	6.0E-11	3.0E-07	18.5%
Chlordane, gamma-	1.65	1.25E-09	3.5E-01 (1)	2.0E-04 (1)	1.2E-12	4.1E-13	1.8%	8.1E-11	4.1E-07	25.2%
Heptachlor	0.155	1.17E-10	4.6E+00	5.0E-04	1.1E-13	5.0E-13	2.2%	7.6E-12	1.5E-08	0.9%
Heptachlor Epoxide	0.0161	1.22E-11	9.1E+00	1.3E-05	1.1E-14	1.0E-13	0.5%	7.9E-13	6.1E-08	3.8%
Aroclor-1248	0.318	2.41E-10	2.0E+00	NA	2.2E-13	4.5E-13	2.0%	1.6E-11	--	--
Aroclor-1254	0.333	2.52E-10	2.0E+00	2.0E-05	2.3E-13	4.7E-13	2.1%	1.6E-11	8.2E-07	50.8%
Aroclor-1260	5.61	4.25E-09	2.0E+00	NA	3.9E-12	7.9E-12	34.9%	2.8E-10	--	--
Gasoline Range Organics	580	4.39E-07	NA	NA	4.1E-10	--	--	2.9E-08	--	--
Diesel Range Organics	5,500	4.17E-06	NA	NA	3.9E-09	--	--	2.7E-07	--	--
Arsenic	1.11	8.41E-10	1.5E+01	NA	7.8E-13	1.2E-11	52.1%	5.5E-11	--	--
Iron	2,754	2.09E-06	NA	NA	1.9E-09	--	--	1.4E-07	--	--
Thallium	0.405	3.07E-10	NA	NA	2.9E-13	--	--	2.0E-11	--	--
					Total ILCR:	2.3E-11	100.0%	Total HI:	1.6E-06	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT CONSTRUCTION WORKERS - FUTURE SCENARIO
ACCIDENTAL INGESTION OF SURFACE SOIL - SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (C*IR*CF*FI*EF*ED)/(BW*AT)
ILCR = CDI*CSFo
HQ = CDI/RfDo

Parameter	Units	Description	Construction Worker	
CDI	mg/kg/d	Chronic daily intake	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	
CSFo	1/(mg/kg/d)	Oral cancer slope factor	CS	
HQ	NA	Hazard quotient	CS	
RfDo	mg/kg/d	Oral reference dose	CS	
C	mg/kg	Concentration of chemical in soil	CS	
IR-S	mg/day	Ingestion rate of soil	480	
CF	kg/mg	Conversion factor	1.00E-06	
FI	NA	Fraction of soil ingested from site	1	
EF	days/year	Exposure frequency	250	
ED	years	Exposure duration	1	
BW	kg	Body weight	70	
AT-C	days	Averaging time, carcinogens	25,550	
AT-N	days	Averaging time, noncarcinogens	365	

Parameter	C (mg/kg)	CSFo 1/(mg/kg/d)	RfDo (mg/kg/d)	Carcinogens CDI (mg/kg/d)	Carcinogens ILCR	Carcinogens % Contrib. Total ILCR	Noncarcinogens CDI (mg/kg/d)	Noncarcinogens HQ	Noncarcinogens % Contrib. HI
2-Methylnaphthalene	57.9	NA	NA	3.9E-06	--	--	2.7E-04	--	--
Benzo(a)anthracene	4.76	7.3E-01	NA	3.2E-07	2.3E-07	1.5%	2.2E-05	--	--
Benzo(a)pyrene	2.48	7.3E+00	NA	1.7E-07	1.2E-06	7.9%	1.2E-05	--	--
Benzo(b)fluoranthene	2.81	7.3E-01	NA	1.9E-07	1.4E-07	0.9%	1.3E-05	--	--
Benzo(k)fluoranthene	1.78	7.3E-02	NA	1.2E-07	8.7E-09	0.1%	8.4E-06	--	--
Carbazole	0.95	2.0E-02	NA	6.4E-08	1.3E-09	0.0%	4.5E-06	--	--
Chrysene	6.7	7.3E-03	NA	4.5E-07	3.3E-09	0.0%	3.1E-05	--	--
Dibenz(a,h)anthracene	0.695	7.3E+00	NA	4.7E-08	3.4E-07	2.2%	3.3E-06	--	--
Indeno(1,2,3-cd)pyrene	1.72	7.3E-01	NA	1.2E-07	8.4E-08	0.5%	8.1E-06	--	--
Dieldrin	0.052	1.6E+01	5.0E-05	3.5E-09	5.6E-08	0.4%	2.4E-07	4.9E-03	3.9%
Aroclor-1260	95.6	2.0E+00	NA	6.4E-06	1.3E-05	83.1%	4.5E-04	--	--
Arsenic	5.26	1.5E+00	3.0E-04	3.5E-07	5.3E-07	3.4%	2.5E-05	8.2E-02	66.4%
Iron	2,347	NA	3.0E-01	1.6E-04	--	--	1.1E-02	3.7E-02	29.7%
				Total ILCR:	1.5E-05	100.0%	Total HI:	1.2E-01	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT CONSTRUCTION WORKERS - FUTURE SCENARIO
DERMAL CONTACT WITH SURFACE SOIL - SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

DAD (mg/kg/d) = (C*CF*AF*ABS*SA*EF*ED)/(BW*AT)
ILCR = CDI*CSFd
HQ = CDI/RfDd

Parameter	Units	Description	Construction Worker	
DAD	mg/kg/d	Dermally absorbed dose	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	
CSFd	1/(mg/kg/d)	Dermal cancer slope factor	CS	
HQ	NA	Hazard quotient	CS	
RfDd	mg/kg/d	Dermal reference dose	CS	
C	mg/kg	Concentration of chemical in soil	CS	
CF	kg/mg	Conversion factor	1.00E-06	
AF	mg/cm2	Soil to skin adherence factor	0.2	
ABS	NA	Absorption fraction	CS	
SA	cm2/day	Skin surface area available for contact	3,300	
EF	days/year	Exposure frequency	250	
ED	years	Exposure duration	1	
BW	kg	Body weight	70	
AT-C	days	Averaging time, carcinogens	25,550	
AT-N	days	Averaging time, noncarcinogens	365	

					Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	ABS	CSFd 1/(mg/kg/d)	RfDd (mg/kg/d)	DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	57.9	0.01	NA	NA	5.3E-08	--	--	3.7E-06	--	--
Benzo(a)anthracene	4.76	0.13	2.4E+00	NA	5.7E-08	1.3E-07	3.7%	4.0E-06	--	--
Benzo(a)pyrene	2.48	0.13	1.5E+01	NA	3.0E-08	4.3E-07	11.8%	2.1E-06	--	--
Benzo(b)fluoranthene	2.81	0.13	1.5E+00	NA	3.4E-08	4.9E-08	1.3%	2.4E-06	--	--
Benzo(k)fluoranthene	1.78	0.13	1.5E-01	NA	2.1E-08	3.1E-09	0.1%	1.5E-06	--	--
Carbazole	0.95	0.13	4.0E-02	NA	1.1E-08	4.6E-10	0.0%	8.0E-07	--	--
Chrysene	6.7	0.13	2.4E-02	NA	8.0E-08	1.9E-09	0.1%	5.6E-06	--	--
Dibenz(a,h)anthracene	0.695	0.13	2.4E+01	NA	8.3E-09	2.0E-07	5.4%	5.8E-07	--	--
Indeno(1,2,3-cd)pyrene	1.72	0.13	2.4E+00	NA	2.1E-08	4.9E-08	1.3%	1.4E-06	--	--
Dieldrin	0.052	0.01	3.2E+01	2.5E-05	4.8E-11	1.5E-09	0.0%	3.4E-09	1.3E-04	1.5%
Aroclor-1260	95.6	0.14	2.2E+00	NA	1.2E-06	2.7E-06	74.8%	8.6E-05	--	--
Arsenic	5.26	0.03	3.7E+00	1.2E-04	1.5E-08	5.3E-08	1.5%	1.0E-06	8.3E-03	94.6%
Iron	2,347	0.001	NA	4.5E-02	2.2E-07	--	--	1.5E-05	3.4E-04	3.8%
					Total ILCR:	3.7E-06	100.0%	Total HI:	8.8E-03	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT CONSTRUCTION WORKERS - FUTURE SCENARIO
INHALATION OF FUGITIVE DUSTS EMANATING FROM SURFACE SOIL - SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (Ca*RR*ET*EF*ED)/(BW*AT)
Where: Ca = C * (1/PEF)

ILCR = CDI*CSFi
HQ = CDI/RfDi

Parameter	Units	Description	Construction Worker	
CDI	mg/kg/d	Chronic daily intake	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	
CSFi	1/(mg/kg/d)	Inhalation cancer slope factor	CS	
HQ	NA	Hazard quotient	CS	
RfDi	mg/kg/d	Inhalation reference dose	CS	
Ca	mg/m3	Concentration of chemical in air as fugitive dusts	CS	
C	mg/kg	Concentration of chemical in soil	CS	
PEF	m3/kg	Particulate emission factor	1.32E+09	
RR	m3/hour	Respiration rate	0.83	
ET	hours/day	Exposure time	8	
EF	days/year	Exposure frequency	250	
ED	years	Exposure duration	1	
BW	kg	Body weight	70	
AT-C	days	Averaging time, carcinogens	25,550	
AT-N	days	Averaging time, noncarcinogens	365	

					Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	Ca (mg/m3)	CSFi 1/(mg/kg/d)	RfDi (mg/kg/d)	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	57.9	4.39E-08	NA	NA	4.1E-11	--	--	2.8E-09	--	--
Benzo(a)anthracene	4.76	3.61E-09	3.1E-01	NA	3.3E-12	1.0E-12	0.5%	2.3E-10	--	--
Benzo(a)pyrene	2.48	1.88E-09	3.1E+00	NA	1.7E-12	5.4E-12	2.7%	1.2E-10	--	--
Benzo(b)fluoranthene	2.81	2.13E-09	3.1E-01	NA	2.0E-12	6.1E-13	0.3%	1.4E-10	--	--
Benzo(k)fluoranthene	1.78	1.35E-09	3.1E-02	NA	1.3E-12	3.9E-14	0.0%	8.8E-11	--	--
Carbazole	0.95	7.20E-10	2.0E-02	NA	6.7E-13	1.3E-14	0.0%	4.7E-11	--	--
Chrysene	6.7	5.08E-09	3.1E-03	NA	4.7E-12	1.5E-14	0.0%	3.3E-10	--	--
Dibenz(a,h)anthracene	0.695	5.27E-10	3.1E+00	NA	4.9E-13	1.5E-12	0.8%	3.4E-11	--	--
Indeno(1,2,3-cd)pyrene	1.72	1.30E-09	3.1E-01	NA	1.2E-12	3.7E-13	0.2%	8.5E-11	--	--
Dieldrin	0.052	3.94E-11	1.6E+01	5.0E-05	3.7E-14	5.9E-13	0.3%	2.6E-12	5.1E-08	100.0%
Aroclor-1260	95.6	7.24E-08	2.0E+00	NA	6.7E-11	1.3E-10	67.3%	4.7E-09	--	--
Arsenic	5.26	3.98E-09	1.5E+01	NA	3.7E-12	5.6E-11	27.9%	2.6E-10	--	--
Iron	2,347	1.78E-06	NA	NA	1.7E-09	--	--	1.2E-07	--	--
					Total ILCR:	2.0E-10	100.0%	Total HI:	5.1E-08	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT CONSTRUCTION WORKERS - FUTURE SCENARIO
ACCIDENTAL INGESTION OF SUBSURFACE SOIL - SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (C*IR*CF*FI*EF*ED)/(BW*AT)
ILCR = CDI*CSFo
HQ = CDI/RfDo

Parameter	Units	Description	Construction Worker	
CDI	mg/kg/d	Chronic daily intake	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	
CSFo	1/(mg/kg/d)	Oral cancer slope factor	CS	
HQ	NA	Hazard quotient	CS	
RfDo	mg/kg/d	Oral reference dose	CS	
C	mg/kg	Concentration of chemical in soil	CS	
IR-S	mg/day	Ingestion rate of soil	480	
CF	kg/mg	Conversion factor	1.00E-06	
FI	NA	Fraction of soil ingested from site	1	
EF	days/year	Exposure frequency	250	
ED	years	Exposure duration	1	
BW	kg	Body weight	70	
AT-C	days	Averaging time, carcinogens	25,550	
AT-N	days	Averaging time, noncarcinogens	365	

Parameter	C (mg/kg)	CSFo 1/(mg/kg/d)	RfDo (mg/kg/d)	Carcinogens CDI (mg/kg/d)	Carcinogens ILCR	Carcinogens % Contrib. Total ILCR	Noncarcinogens CDI (mg/kg/d)	Noncarcinogens HQ	Noncarcinogens % Contrib. HI
2-Methylnaphthalene	6.38	NA	NA	4.3E-07	--	--	3.0E-05	--	--
Bis(2-chloroethoxy)methane	0.054	NA	NA	3.6E-09	--	--	2.5E-07	--	--
Naphthalene	0.862	NA	2.0E-02	5.8E-08	--	--	4.0E-06	2.0E-04	0.2%
Aroclor-1260	27.0	2.0E+00	NA	1.8E-06	3.6E-06	96.0%	1.3E-04	--	--
Gasoline Range Organics	580	NA	NA	3.9E-05	--	--	2.7E-03	--	--
Diesel Range Organics	5,500	NA	NA	3.7E-04	--	--	2.6E-02	--	--
Arsenic	1.50	1.5E+00	3.0E-04	1.0E-07	1.5E-07	4.0%	7.0E-06	2.3E-02	22.3%
Iron	3,007	NA	3.0E-01	2.0E-04	--	--	1.4E-02	4.7E-02	44.6%
Thallium	0.488	NA	6.6E-05	3.3E-08	--	--	2.3E-06	3.5E-02	32.9%
				Total ILCR:	3.8E-06	100.0%	Total HI:	1.1E-01	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT CONSTRUCTION WORKERS - FUTURE SCENARIO
DERMAL CONTACT WITH SUBSURFACE SOIL - SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

DAD (mg/kg/d) = (C*CF*AF*ABS*SA*EF*ED)/(BW*AT)
ILCR = CDI*CSFd
HQ = CDI/RfDd

Parameter	Units	Description	Construction Worker	
DAD	mg/kg/d	Dermally absorbed dose	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	
CSFd	1/(mg/kg/d)	Dermal cancer slope factor	CS	
HQ	NA	Hazard quotient	CS	
RfDd	mg/kg/d	Dermal reference dose	CS	
C	mg/kg	Concentration of chemical in soil	CS	
CF	kg/mg	Conversion factor	1.00E-06	
AF	mg/cm2	Soil to skin adherence factor	0.2	
ABS	NA	Absorption fraction	CS	
SA	cm2/day	Skin surface area available for contact	3,300	
EF	days/year	Exposure frequency	250	
ED	years	Exposure duration	1	
BW	kg	Body weight	70	
AT-C	days	Averaging time, carcinogens	25,550	
AT-N	days	Averaging time, noncarcinogens	365	

Parameter	C (mg/kg)	ABS	CSFd 1/(mg/kg/d)	RfDd (mg/kg/d)	Carcinogens DAD (mg/kg/d)	Carcinogens ILCR	Carcinogens % Contrib. Total ILCR	Noncarcinogens DAD (mg/kg/d)	Noncarcinogens HQ	Noncarcinogens % Contrib. HI
2-Methylnaphthalene	6.38	0.01	NA	NA	5.9E-09	--	--	4.1E-07	--	--
Bis(2-chloroethoxy)methane	0.054	0.1	NA	NA	5.0E-10	--	--	3.5E-08	--	--
Naphthalene	0.862	0.01	NA	1.6E-02	8.0E-10	--	--	5.6E-08	3.5E-06	0.1%
Aroclor-1260	27.0	0.14	2.2E+00	NA	3.5E-07	7.8E-07	98.1%	2.4E-05	--	--
Gasoline Range Organics	580	0.01	NA	NA	5.4E-07	--	--	3.7E-05	--	--
Diesel Range Organics	5,500	0.01	NA	NA	5.1E-06	--	--	3.6E-04	--	--
Arsenic	1.50	0.03	3.7E+00	1.2E-04	4.2E-09	1.5E-08	1.9%	2.9E-07	2.4E-03	75.8%
Iron	3,007	0.001	NA	4.5E-02	2.8E-07	--	--	1.9E-05	4.3E-04	13.8%
Thallium	0.488	0.001	NA	9.9E-06	4.5E-11	--	--	3.2E-09	3.2E-04	10.2%
					Total ILCR:	7.9E-07	100.0%	Total HI:	3.1E-03	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT CONSTRUCTION WORKERS - FUTURE SCENARIO
INHALATION OF FUGITIVE DUSTS EMANATING FROM EXCAVATED SUBSURFACE SOIL - SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (Ca*RR*ET*EF*ED)/(BW*AT)
Where: Ca = C * (1/PEF)

ILCR = CDI*CSFi
HQ = CDI/RfDi

Parameter	Units	Description	Construction Worker	
CDI	mg/kg/d	Chronic daily intake	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	
CSFi	1/(mg/kg/d)	Inhalation cancer slope factor	CS	
HQ	NA	Hazard quotient	CS	
RfDi	mg/kg/d	Inhalation reference dose	CS	
Ca	mg/m3	Concentration of chemical in air as fugitive dusts	CS	
C	mg/kg	Concentration of chemical in soil	CS	
PEF	m3/kg	Particulate emission factor	1.32E+09	
RR	m3/hour	Respiration rate	0.83	
ET	hours/day	Exposure time	8	
EF	days/year	Exposure frequency	250	
ED	years	Exposure duration	1	
BW	kg	Body weight	70	
AT-C	days	Averaging time, carcinogens	25,550	
AT-N	days	Averaging time, noncarcinogens	365	

Parameter	C (mg/kg)	Ca (mg/m3)	CSFi 1/(mg/kg/d)	RfDi (mg/kg/d)	Carcinogens CDI (mg/kg/d)	Carcinogens ILCR	Carcinogens % Contrib. Total ILCR	Noncarcinogens CDI (mg/kg/d)	Noncarcinogens HQ	Noncarcinogens % Contrib. HI
2-Methylnaphthalene	6.38	4.83E-09	NA	NA	4.5E-12	--	--	3.1E-10	--	--
Bis(2-chloroethoxy)methane	0.054	4.09E-11	NA	NA	3.8E-14	--	--	2.7E-12	--	--
Naphthalene	0.862	6.53E-10	NA	8.6E-04	6.1E-13	--	--	4.2E-11	5.0E-08	100.0%
Aroclor-1260	27.0	2.05E-08	2.0E+00	NA	1.9E-11	3.8E-11	70.5%	1.3E-09	--	--
Gasoline Range Organics	580	4.39E-07	NA	NA	4.1E-10	--	--	2.9E-08	--	--
Diesel Range Organics	5,500	4.17E-06	NA	NA	3.9E-09	--	--	2.7E-07	--	--
Arsenic	1.50	1.14E-09	1.5E+01	NA	1.1E-12	1.6E-11	29.5%	7.4E-11	--	--
Iron	3,007	2.28E-06	NA	NA	2.1E-09	--	--	1.5E-07	--	--
Thallium	0.488	3.70E-10	NA	NA	3.4E-13	--	--	2.4E-11	--	--
					Total ILCR:	5.4E-11	100.0%	Total HI:	5.0E-08	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT CONSTRUCTION WORKERS - FUTURE SCENARIO
DERMAL CONTACT WITH GROUNDWATER IN NON-POTABLE USE SCENARIO - SITE 84 (BUILDING 45 AREA)
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

DAD (mg/kg/d) = (C*CF*Kp*SA*EF*ED*ET)/(BW*AT)

ILCR = CDI*CSFo Adj CSF Adj = CSF/AD
HQ = CDI/RfDo Adj RfD Adj = RfD*AD

Parameter	Units	Description	Construction Worker	
DAD	mg/kg/d	Dermally absorbed dose	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	
CSFd	1/(mg/kg/d)	Dermal cancer slope factor	CS	
HQ	NA	Hazard quotient	CS	
RfDd	mg/kg/d	Dermal reference dose	CS	
SA	cm2	Skin surface area available for contact	3,300	
EF	days/year	Exposure frequency	250	
ED	years	Exposure duration	1	
ET	hours/day	Exposure time	8	
BW	kg	Body weight	70	
AT-C	days	Averaging time, carcinogens	25,550	
AT-N	days	Averaging time, noncarcinogens	365	
C	mg/L	Concentration of chemical in water	CS	
CF	L/cm3	Conversion factor	1.00E-03	
Kp	cm/hour	Dermal permeability coefficient	CS	
AD	NA	Adjustment for absorbed dose	CS	

Parameter	C (mg/L)	Kp (cm/hour)	CSFd 1/(mg/kg/d)	RfDd (mg/kg/d)	Carcinogens DAD (mg/kg/d)	Carcinogens ILCR	Carcinogens % Contrib. Total ILCR	Noncarcinogens DAD (mg/kg/d)	Noncarcinogens HQ	Noncarcinogens % Contrib. HI
Benzene	0.0034	0.021	5.9E-02	2.8E-03	2.6E-07	1.6E-08	3.2%	1.8E-05	6.6E-03	0.5%
Chloroform	0.016	0.0089	3.1E-02	2.0E-03	5.3E-07	1.6E-08	3.3%	3.7E-05	1.8E-02	1.4%
2-Methylnaphthalene	0.00105	0.1423	NA	NA	5.5E-07	--	--	3.9E-05	--	--
Naphthalene	0.0022	0.069	NA	1.6E-02	5.6E-07	--	--	3.9E-05	2.5E-03	0.2%
Heptachlor Epoxide	0.0000167	0.055	1.3E+01	9.4E-06	3.4E-09	4.3E-08	8.9%	2.4E-07	2.5E-02	1.9%
MCPA	0.044	0.0049	NA	2.5E-04	8.0E-07	--	--	5.6E-05	2.2E-01	16.5%
Antimony	0.011	0.001	NA	8.0E-06	4.1E-08	--	--	2.8E-06	3.6E-01	26.3%
Arsenic	0.03	0.001	3.7E+00	1.2E-04	1.1E-07	4.1E-07	84.5%	7.7E-06	6.3E-02	4.7%
Iron	67.7	0.001	NA	4.5E-02	2.5E-04	--	--	1.7E-02	3.9E-01	28.7%
Manganese	0.45	0.001	NA	9.6E-04	1.7E-06	--	--	1.2E-04	1.2E-01	9.0%
Thallium	0.0057	0.001	NA	9.9E-06	2.1E-08	--	--	1.5E-06	1.5E-01	11.0%
					Total ILCR:	4.8E-07	100.0%	Total HI:	1.4E+00	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.

ADULT CONSTRUCTION WORKERS - FUTURE SCENARIO
DERMAL CONTACT WITH SURFACE WATER - SITE 84 (BUILDING 45 AREA)
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

DAD (mg/kg/d) = (C*CF*Kp*SA*EF*ED*ET)/(BW*AT)

ILCR = CDI*CSFo Adj CSF Adj = CSF/AD
HQ = CDI/RfDo Adj RfD Adj = RfD*AD

Parameter	Units	Description	Construction Worker	
DAD	mg/kg/d	Dermally absorbed dose	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	
CSFd	1/(mg/kg/d)	Dermal cancer slope factor	CS	
HQ	NA	Hazard quotient	CS	
RfDd	mg/kg/d	Dermal reference dose	CS	
SA	cm2	Skin surface area available for contact	3,300	
EF	days/year	Exposure frequency	250	
ED	years	Exposure duration	1	
ET	hours/day	Exposure time	8	
BW	kg	Body weight	70	
AT-C	days	Averaging time, carcinogens	25,550	
AT-N	days	Averaging time, noncarcinogens	365	
C	mg/L	Concentration of chemical in water	CS	
CF	L/cm3	Conversion factor	1.00E-03	
Kp	cm/hour	Dermal permeability coefficient	CS	
AD	NA	Adjustment for absorbed dose	CS	

Parameter	C (mg/L)	Kp (cm/hour)	CSFd 1/(mg/kg/d)	RfDd (mg/kg/d)	Carcinogens DAD (mg/kg/d)	Carcinogens ILCR	Carcinogens % Contrib. Total ILCR	Noncarcinogens DAD (mg/kg/d)	Noncarcinogens HQ	Noncarcinogens % Contrib. HI
Acetone	0.0056	0.00057	NA	8.3E-02	1.2E-08	--	--	8.2E-07	9.9E-06	3.9%
Toluene	0.0027	0.045	NA	1.6E-01	4.5E-07	--	--	3.1E-05	2.0E-04	77.6%
Xylenes, total	0.0035	0.095	NA	1.8E+00	1.2E-06	--	--	8.6E-05	4.7E-05	18.5%
					Total ILCR:	--	--	Total HI:	2.5E-04	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.

ADULT CONSTRUCTION WORKERS - FUTURE SCENARIO
DERMAL CONTACT WITH SEDIMENT - SITE 84 (BUILDING 45 AREA)
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

DAD (mg/kg/d) = (C*CF*AF*ABS*SA*EF*ED)/(BW*AT)
ILCR = CDI*CSFd
HQ = CDI/RfDd

Parameter	Units	Description	Construction Worker	
DAD	mg/kg/d	Dermally absorbed dose	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	
CSFd	1/(mg/kg/d)	Dermal cancer slope factor	CS	
HQ	NA	Hazard quotient	CS	
RfDd	mg/kg/d	Dermal reference dose	CS	
C	mg/kg	Concentration of chemical in soil	CS	
CF	kg/mg	Conversion factor	1.00E-06	
AF	mg/cm2	Soil to skin adherence factor	0.2	
ABS	NA	Absorption fraction	CS	
SA	cm2/day	Skin surface area available for contact	3,300	
EF	days/year	Exposure frequency	250	
ED	years	Exposure duration	1	
BW	kg	Body weight	70	
AT-C	days	Averaging time, carcinogens	25,550	
AT-N	days	Averaging time, noncarcinogens	365	

Parameter	C (mg/kg)	ABS	CSFd 1/(mg/kg/d)	RfDd (mg/kg/d)	Carcinogens			Noncarcinogens		
					DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	DAD (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	10	0.01	NA	NA	9.2E-09	--	--	6.5E-07	--	--
Aroclor-1248	2.8	0.14	2.2E+00	NA	3.6E-08	8.1E-08	6.6%	2.5E-06	--	--
Aroclor-1260	40	0.14	2.2E+00	NA	5.2E-07	1.1E-06	93.4%	3.6E-05	--	--
Diesel Range Organics	11,600	0.01	NA	NA	1.1E-05	--	--	7.5E-04	--	--
					Total ILCR:	1.2E-06	100.0%	Total HI:	--	--

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.

ADULT INDUSTRIAL / COMMERCIAL WORKERS - FUTURE SCENARIO
ACCIDENTAL INGESTION OF SURFACE SOIL - SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (C*IR*CF*FI*EF*ED)/(BW*AT)
ILCR = CDI*CSFo
HQ = CDI/RfDo

Parameter	Units	Description	Industrial / Commercial Worker	
CDI	mg/kg/d	Chronic daily intake	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	
CSFo	1/(mg/kg/d)	Oral cancer slope factor	CS	
HQ	NA	Hazard quotient	CS	
RfDo	mg/kg/d	Oral reference dose	CS	
C	mg/kg	Concentration of chemical in soil	CS	
IR-S	mg/day	Ingestion rate of soil	50	
CF	kg/mg	Conversion factor	1.00E-06	
FI	NA	Fraction of soil ingested from site	1	
EF	days/year	Exposure frequency	250	
ED	years	Exposure duration	25	
BW	kg	Body weight	70	
AT-C	days	Averaging time, carcinogens	25,550	
AT-N	days	Averaging time, noncarcinogens	9,125	

				Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	CSFo 1/(mg/kg/d)	RfDo (mg/kg/d)	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	1.96	NA	NA	3.4E-07	--	--	9.6E-07	--	--
Benzo(a)anthracene	69.0	7.3E-01	NA	1.2E-05	8.8E-06	8.1%	3.4E-05	--	--
Benzo(a)pyrene	30.5	7.3E+00	NA	5.3E-06	3.9E-05	35.6%	1.5E-05	--	--
Benzo(b)fluoranthene	40.9	7.3E-01	NA	7.1E-06	5.2E-06	4.8%	2.0E-05	--	--
Benzo(k)fluoranthene	18.7	7.3E-02	NA	3.3E-06	2.4E-07	0.2%	9.1E-06	--	--
Carbazole	3.16	2.0E-02	NA	5.5E-07	1.1E-08	0.0%	1.5E-06	--	--
Chrysene	96.0	7.3E-03	NA	1.7E-05	1.2E-07	0.1%	4.7E-05	--	--
Dibenz(a,h)anthracene	1.41	7.3E+00	NA	2.5E-07	1.8E-06	1.7%	6.9E-07	--	--
Fluoranthene	243	NA	4.0E-02	4.2E-05	--	--	1.2E-04	3.0E-03	0.9%
Indeno(1,2,3-cd)pyrene	8.79	7.3E-01	NA	1.5E-06	1.1E-06	1.0%	4.3E-06	--	--
Naphthalene	0.525	NA	2.0E-02	9.2E-08	--	--	2.6E-07	1.3E-05	0.0%
Pyrene	250	NA	3.0E-02	4.4E-05	--	--	1.2E-04	4.1E-03	1.2%
4,4'-DDD	3	2.4E-01	NA	5.2E-07	1.3E-07	0.1%	1.5E-06	--	--
Chlordane, alpha-	48	3.5E-01 (1)	5.0E-04 (1)	8.4E-06	2.9E-06	2.7%	2.3E-05	4.7E-02	13.7%
Chlordane, gamma-	58	3.5E-01 (1)	5.0E-04 (1)	1.0E-05	3.5E-06	3.3%	2.8E-05	5.7E-02	16.6%
Dieldrin	0.32	1.6E+01	5.0E-05	5.6E-08	8.9E-07	0.8%	1.6E-07	3.1E-03	0.9%
Heptachlor	22	4.5E+00	5.0E-04	3.8E-06	1.7E-05	15.9%	1.1E-05	2.2E-02	6.3%
Heptachlor Epoxide	4.5	9.1E+00	1.3E-05	7.9E-07	7.2E-06	6.6%	2.2E-06	1.7E-01	49.5%
Aroclor-1248	1.51	2.0E+00	NA	2.6E-07	5.3E-07	0.5%	7.4E-07	--	--
Aroclor-1254	0.975	2.0E+00	2.0E-05	1.7E-07	3.4E-07	0.3%	4.8E-07	2.4E-02	7.0%
Aroclor-1260	54.6	2.0E+00	NA	9.5E-06	1.9E-05	17.5%	2.7E-05	--	--
Gasoline Range Organics	0.207	NA	NA	3.6E-08	--	--	1.0E-07	--	--
Diesel Range Organics	470	NA	NA	8.2E-05	--	--	2.3E-04	--	--
Antimony	1.22	NA	4.0E-04	2.1E-07	--	--	6.0E-07	1.5E-03	0.4%
Arsenic	3.49	1.5E+00	3.0E-04	6.1E-07	9.2E-07	0.8%	1.7E-06	5.7E-03	1.7%
Iron	2,260	NA	3.0E-01	3.9E-04	--	--	1.1E-03	3.7E-03	1.1%
Thallium	0.31	NA	6.6E-05	5.4E-08	--	--	1.5E-07	2.3E-03	0.7%
				Total ILCR:	1.1E-04	100.0%	Total HI:	3.4E-01	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT INDUSTRIAL / COMMERCIAL WORKERS - FUTURE SCENARIO
DERMAL CONTACT WITH SURFACE SOIL - SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

DAD (mg/kg/d) = (C*CF*AF*ABS*SA*EF*ED)/(BW*AT)
ILCR = CDI*CSFd
HQ = CDI/RfDd

Parameter	Units	Description	Industrial / Commercial Worker	
DAD	mg/kg/d	Dermally absorbed dose	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	
CSFd	1/(mg/kg/d)	Dermal cancer slope factor	CS	
HQ	NA	Hazard quotient	CS	
RfDd	mg/kg/d	Dermal reference dose	CS	
C	mg/kg	Concentration of chemical in soil	CS	
CF	kg/mg	Conversion factor	1.00E-06	
AF	mg/cm2	Soil to skin adherence factor	0.2	
ABS	NA	Absorption fraction	CS	
SA	cm2/day	Skin surface area available for contact	3,300	
EF	days/year	Exposure frequency	250	
ED	years	Exposure duration	25	
BW	kg	Body weight	70	
AT-C	days	Averaging time, carcinogens	25,550	
AT-N	days	Averaging time, noncarcinogens	9,125	

Parameter	C (mg/kg)	ABS	CSFd 1/(mg/kg/d)	RfDd (mg/kg/d)	Carcinogens DAD (mg/kg/d)	ILCR	% Contrib. Total ILCR	Noncarcinogens DAD (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	1.96	0.01	NA	NA	4.5E-08	--	--	1.3E-07	--	--
Benzo(a)anthracene	69.0	0.13	2.4E+00	NA	2.1E-05	4.9E-05	18.1%	5.8E-05	--	--
Benzo(a)pyrene	30.5	0.13	1.5E+01	NA	9.1E-06	1.3E-04	49.7%	2.6E-05	--	--
Benzo(b)fluoranthene	40.9	0.13	1.5E+00	NA	1.2E-05	1.8E-05	6.7%	3.4E-05	--	--
Benzo(k)fluoranthene	18.7	0.13	1.5E-01	NA	5.6E-06	8.2E-07	0.3%	1.6E-05	--	--
Carbazole	3.16	0.13	4.0E-02	NA	9.5E-07	3.8E-08	0.0%	2.7E-06	--	--
Chrysene	96.0	0.13	2.4E-02	NA	2.9E-05	6.8E-07	0.3%	8.1E-05	--	--
Dibenz(a,h)anthracene	1.41	0.13	2.4E+01	NA	4.2E-07	1.0E-05	3.7%	1.2E-06	--	--
Fluoranthene	243	0.01	NA	1.2E-02	5.6E-06	--	--	1.6E-05	1.3E-03	0.8%
Indeno(1,2,3-cd)pyrene	8.79	0.13	2.4E+00	NA	2.6E-06	6.2E-06	2.3%	7.4E-06	--	--
Naphthalene	0.525	0.01	NA	1.6E-02	1.2E-08	--	--	3.4E-08	2.1E-06	0.0%
Pyrene	250	0.01	NA	9.3E-03	5.8E-06	--	--	1.6E-05	1.7E-03	1.1%
4,4'-DDD	3	0.01	3.4E-01	NA	6.9E-08	2.4E-08	0.0%	1.9E-07	--	--
Chlordane, alpha-	48	0.04	4.4E-01 (1)	4.0E-04 (1)	4.4E-06	1.9E-06	0.7%	1.2E-05	3.1E-02	19.0%
Chlordane, gamma-	58	0.04	4.4E-01 (1)	4.0E-04 (1)	5.4E-06	2.3E-06	0.9%	1.5E-05	3.7E-02	22.9%
Dieldrin	0.32	0.01	3.2E+01	2.5E-05	7.4E-09	2.4E-07	0.1%	2.1E-08	8.3E-04	0.5%
Heptachlor	22	0.01	6.3E+00	3.6E-04	5.1E-07	3.2E-06	1.2%	1.4E-06	3.9E-03	2.4%
Heptachlor Epoxide	4.5	0.01	1.3E+01	9.4E-06	1.0E-07	1.3E-06	0.5%	2.9E-07	3.1E-02	19.0%
Aroclor-1248	1.51	0.14	2.2E+00	NA	4.9E-07	1.1E-06	0.4%	1.4E-06	--	--
Aroclor-1254	0.975	0.14	2.2E+00	1.8E-05	3.1E-07	7.0E-07	0.3%	8.8E-07	4.9E-02	30.0%
Aroclor-1260	54.6	0.14	2.2E+00	NA	1.8E-05	3.9E-05	14.6%	4.9E-05	--	--
Gasoline Range Organics	0.207	0.01	NA	NA	4.8E-09	--	--	1.3E-08	--	--
Diesel Range Organics	470	0.01	NA	NA	1.1E-05	--	--	3.0E-05	--	--
Antimony	1.22	0.001	NA	8.0E-06	2.8E-09	--	--	7.9E-09	9.9E-04	0.6%
Arsenic	3.49	0.03	3.7E+00	1.2E-04	2.4E-07	8.8E-07	0.3%	6.8E-07	5.5E-03	3.4%
Iron	2,260	0.001	NA	4.5E-02	5.2E-06	--	--	1.5E-05	3.2E-04	0.2%
Thallium	0.31	0.001	NA	9.9E-06	7.1E-10	--	--	2.0E-09	2.0E-04	0.1%
					Total ILCR:	2.7E-04	100.0%	Total HI:	1.6E-01	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT INDUSTRIAL / COMMERCIAL WORKERS - FUTURE SCENARIO
INHALATION OF FUGITIVE DUSTS EMANATING FROM SURFACE SOIL - SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (Ca*RR*ET*EF*ED)/(BW*AT)
Where: Ca = C * (1/PEF)

ILCR = CDI*CSFi
HQ = CDI/RfDi

Parameter	Units	Description	Industrial / Commercial Worker	
CDI	mg/kg/d	Chronic daily intake	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	
CSFi	1/(mg/kg/d)	Inhalation cancer slope factor	CS	
HQ	NA	Hazard quotient	CS	
RfDi	mg/kg/d	Inhalation reference dose	CS	
Ca	mg/m3	Concentration of chemical in air as fugitive dusts	CS	
C	mg/kg	Concentration of chemical in soil	CS	
PEF	m3/kg	Particulate emission factor	1.32E+09	
RR	m3/hour	Respiration rate	0.83	
ET	hours/day	Exposure time	8	
EF	days/year	Exposure frequency	250	
ED	years	Exposure duration	25	
BW	kg	Body weight	70	
AT-C	days	Averaging time, carcinogens	25,550	
AT-N	days	Averaging time, noncarcinogens	9,125	

					Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	Ca (mg/m3)	CSFi 1/(mg/kg/d)	RfDi (mg/kg/d)	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	1.96	1.48E-09	NA	NA	3.4E-11	--	--	9.6E-11	--	--
Benzo(a)anthracene	69.0	5.23E-08	3.1E-01	NA	1.2E-09	3.8E-10	4.4%	3.4E-09	--	--
Benzo(a)pyrene	30.5	2.31E-08	3.1E+00	NA	5.4E-10	1.7E-09	19.4%	1.5E-09	--	--
Benzo(b)fluoranthene	40.9	3.10E-08	3.1E-01	NA	7.2E-10	2.2E-10	2.6%	2.0E-09	--	--
Benzo(k)fluoranthene	18.7	1.41E-08	3.1E-02	NA	3.3E-10	1.0E-11	0.1%	9.2E-10	--	--
Carbazole	3.16	2.39E-09	2.0E-02	NA	5.5E-11	1.1E-12	0.0%	1.6E-10	--	--
Chrysene	96.0	7.27E-08	3.1E-03	NA	1.7E-09	5.2E-12	0.1%	4.7E-09	--	--
Dibenz(a,h)anthracene	1.41	1.07E-09	3.1E+00	NA	2.5E-11	7.7E-11	0.9%	7.0E-11	--	--
Fluoranthene	243	1.84E-07	NA	4.0E-02	4.3E-09	--	--	1.2E-08	3.0E-07	0.6%
Indeno(1,2,3-cd)pyrene	8.79	6.66E-09	3.1E-01	NA	1.5E-10	4.8E-11	0.6%	4.3E-10	--	--
Naphthalene	0.525	3.98E-10	NA	8.6E-04	9.2E-12	--	--	2.6E-11	3.0E-08	0.1%
Pyrene	250	1.89E-07	NA	3.0E-02	4.4E-09	--	--	1.2E-08	4.1E-07	0.8%
4,4'-DDD	3	2.27E-09	2.4E-01	NA	5.3E-11	1.3E-11	0.1%	1.5E-10	--	--
Chlordane, alpha-	48	3.64E-08	3.5E-01 (1)	2.0E-04 (1)	8.4E-10	3.0E-10	3.4%	2.4E-09	1.2E-05	24.2%
Chlordane, gamma-	58	4.39E-08	3.5E-01 (1)	2.0E-04 (1)	1.0E-09	3.6E-10	4.2%	2.9E-09	1.4E-05	29.3%
Dieldrin	0.32	2.42E-10	1.6E+01	5.0E-05	5.6E-12	9.1E-11	1.1%	1.6E-11	3.2E-07	0.6%
Heptachlor	22	1.67E-08	4.6E+00	5.0E-04	3.9E-10	1.8E-09	20.5%	1.1E-09	2.2E-06	4.4%
Heptachlor Epoxide	4.5	3.41E-09	9.1E+00	1.3E-05	7.9E-11	7.2E-10	8.4%	2.2E-10	1.7E-05	35.0%
Aroclor-1248	1.51	1.14E-09	2.0E+00	NA	2.6E-11	5.3E-11	0.6%	7.4E-11	--	--
Aroclor-1254	0.975	7.39E-10	2.0E+00	2.0E-05	1.7E-11	3.4E-11	0.4%	4.8E-11	2.4E-06	4.9%
Aroclor-1260	54.6	4.13E-08	2.0E+00	NA	9.6E-10	1.9E-09	22.4%	2.7E-09	--	--
Gasoline Range Organics	0.207	1.57E-10	NA	NA	3.6E-12	--	--	1.0E-11	--	--
Diesel Range Organics	470	3.56E-07	NA	NA	8.3E-09	--	--	2.3E-08	--	--
Antimony	1.22	9.25E-10	NA	NA	2.1E-11	--	--	6.0E-11	--	--
Arsenic	3.49	2.65E-09	1.5E+01	NA	6.1E-11	9.3E-10	10.8%	1.7E-10	--	--
Iron	2,260	1.71E-06	NA	NA	4.0E-08	--	--	1.1E-07	--	--
Thallium	0.31	2.32E-10	NA	NA	5.4E-12	--	--	1.5E-11	--	--
					Total ILCR:	8.6E-09	100.0%	Total HI:	4.9E-05	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT INDUSTRIAL / COMMERCIAL WORKERS - FUTURE SCENARIO
ACCIDENTAL INGESTION OF SURFACE SOIL - SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (C*IR*CF*FI*EF*ED)/(BW*AT)
ILCR = CDI*CSFo
HQ = CDI/RfDo

Parameter	Units	Description	Industrial / Commercial Worker	
CDI	mg/kg/d	Chronic daily intake	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	
CSFo	1/(mg/kg/d)	Oral cancer slope factor	CS	
HQ	NA	Hazard quotient	CS	
RfDo	mg/kg/d	Oral reference dose	CS	
C	mg/kg	Concentration of chemical in soil	CS	
IR-S	mg/day	Ingestion rate of soil	50	
CF	kg/mg	Conversion factor	1.00E-06	
FI	NA	Fraction of soil ingested from site	1	
EF	days/year	Exposure frequency	250	
ED	years	Exposure duration	25	
BW	kg	Body weight	70	
AT-C	days	Averaging time, carcinogens	25,550	
AT-N	days	Averaging time, noncarcinogens	9,125	

				Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	CSFo 1/(mg/kg/d)	RfDo (mg/kg/d)	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	57.9	NA	NA	1.0E-05	--	--	2.8E-05	--	--
Benzo(a)anthracene	4.76	7.3E-01	NA	8.3E-07	6.1E-07	1.5%	2.3E-06	--	--
Benzo(a)pyrene	2.48	7.3E+00	NA	4.3E-07	3.2E-06	7.9%	1.2E-06	--	--
Benzo(b)fluoranthene	2.81	7.3E-01	NA	4.9E-07	3.6E-07	0.9%	1.4E-06	--	--
Benzo(k)fluoranthene	1.78	7.3E-02	NA	3.1E-07	2.3E-08	0.1%	8.7E-07	--	--
Carbazole	0.95	2.0E-02	NA	1.7E-07	3.3E-09	0.0%	4.6E-07	--	--
Chrysene	6.7	7.3E-03	NA	1.2E-06	8.5E-09	0.0%	3.3E-06	--	--
Dibenz(a,h)anthracene	0.695	7.3E+00	NA	1.2E-07	8.9E-07	2.2%	3.4E-07	--	--
Indeno(1,2,3-cd)pyrene	1.72	7.3E-01	NA	3.0E-07	2.2E-07	0.5%	8.4E-07	--	--
Dieldrin	0.052	1.6E+01	5.0E-05	9.1E-09	1.5E-07	0.4%	2.5E-08	5.1E-04	3.9%
Aroclor-1260	95.6	2.0E+00	NA	1.7E-05	3.3E-05	83.1%	4.7E-05	--	--
Arsenic	5.26	1.5E+00	3.0E-04	9.2E-07	1.4E-06	3.4%	2.6E-06	8.6E-03	66.4%
Iron	2,347	NA	3.0E-01	4.1E-04	--	--	1.1E-03	3.8E-03	29.7%
				Total ILCR:	4.0E-05	100.0%	Total HI:	1.3E-02	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT INDUSTRIAL / COMMERCIAL WORKERS - FUTURE SCENARIO
DERMAL CONTACT WITH SURFACE SOIL - SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

DAD (mg/kg/d) = (C*CF*AF*ABS*SA*EF*ED)/(BW*AT)
ILCR = CDI*CSFd
HQ = CDI/RfDd

Parameter	Units	Description	Industrial / Commercial Worker	
DAD	mg/kg/d	Dermally absorbed dose	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	
CSFd	1/(mg/kg/d)	Dermal cancer slope factor	CS	
HQ	NA	Hazard quotient	CS	
RfDd	mg/kg/d	Dermal reference dose	CS	
C	mg/kg	Concentration of chemical in soil	CS	
CF	kg/mg	Conversion factor	1.00E-06	
AF	mg/cm2	Soil to skin adherence factor	0.2	
ABS	NA	Absorption fraction	CS	
SA	cm2/day	Skin surface area available for contact	3,300	
EF	days/year	Exposure frequency	250	
ED	years	Exposure duration	25	
BW	kg	Body weight	70	
AT-C	days	Averaging time, carcinogens	25,550	
AT-N	days	Averaging time, noncarcinogens	9,125	

Parameter	C (mg/kg)	ABS	CSFd 1/(mg/kg/d)	RfDd (mg/kg/d)	Carcinogens DAD (mg/kg/d)	Carcinogens ILCR	Carcinogens % Contrib. Total ILCR	Noncarcinogens DAD (mg/kg/d)	Noncarcinogens HQ	Noncarcinogens % Contrib. HI
2-Methylnaphthalene	57.9	0.01	NA	NA	1.3E-06	--	--	3.7E-06	--	--
Benzo(a)anthracene	4.76	0.13	2.4E+00	NA	1.4E-06	3.4E-06	3.7%	4.0E-06	--	--
Benzo(a)pyrene	2.48	0.13	1.5E+01	NA	7.4E-07	1.1E-05	11.8%	2.1E-06	--	--
Benzo(b)fluoranthene	2.81	0.13	1.5E+00	NA	8.4E-07	1.2E-06	1.3%	2.4E-06	--	--
Benzo(k)fluoranthene	1.78	0.13	1.5E-01	NA	5.3E-07	7.8E-08	0.1%	1.5E-06	--	--
Carbazole	0.95	0.13	4.0E-02	NA	2.8E-07	1.1E-08	0.0%	8.0E-07	--	--
Chrysene	6.7	0.13	2.4E-02	NA	2.0E-06	4.7E-08	0.1%	5.6E-06	--	--
Dibenz(a,h)anthracene	0.695	0.13	2.4E+01	NA	2.1E-07	4.9E-06	5.4%	5.8E-07	--	--
Indeno(1,2,3-cd)pyrene	1.72	0.13	2.4E+00	NA	5.2E-07	1.2E-06	1.3%	1.4E-06	--	--
Dieldrin	0.052	0.01	3.2E+01	2.5E-05	1.2E-09	3.8E-08	0.0%	3.4E-09	1.3E-04	1.5%
Aroclor-1260	95.6	0.14	2.2E+00	NA	3.1E-05	6.9E-05	74.8%	8.6E-05	--	--
Arsenic	5.26	0.03	3.7E+00	1.2E-04	3.6E-07	1.3E-06	1.5%	1.0E-06	8.3E-03	94.6%
Iron	2,347	0.001	NA	4.5E-02	5.4E-06	--	--	1.5E-05	3.4E-04	3.8%
					Total ILCR:	9.2E-05	100.0%	Total HI:	8.8E-03	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT INDUSTRIAL / COMMERCIAL WORKERS - FUTURE SCENARIO
INHALATION OF FUGITIVE DUSTS EMANATING FROM SURFACE SOIL - SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (Ca*RR*ET*EF*ED)/(BW*AT)
Where: Ca = C * (1/PEF)

ILCR = CDI*CSFi
HQ = CDI/RfDi

Parameter	Units	Description	Industrial / Commercial Worker	
CDI	mg/kg/d	Chronic daily intake	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	
CSFi	1/(mg/kg/d)	Inhalation cancer slope factor	CS	
HQ	NA	Hazard quotient	CS	
RfDi	mg/kg/d	Inhalation reference dose	CS	
Ca	mg/m3	Concentration of chemical in air as fugitive dusts	CS	
C	mg/kg	Concentration of chemical in soil	CS	
PEF	m3/kg	Particulate emission factor	1.32E+09	
RR	m3/hour	Respiration rate	0.83	
ET	hours/day	Exposure time	8	
EF	days/year	Exposure frequency	250	
ED	years	Exposure duration	25	
BW	kg	Body weight	70	
AT-C	days	Averaging time, carcinogens	25,550	
AT-N	days	Averaging time, noncarcinogens	9,125	

					Carcinogens			Noncarcinogens		
Parameter	C (mg/kg)	Ca (mg/m3)	CSFi 1/(mg/kg/d)	RfDi (mg/kg/d)	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI
2-Methylnaphthalene	57.9	4.39E-08	NA	NA	1.0E-09	--	--	2.8E-09	--	--
Benzo(a)anthracene	4.76	3.61E-09	3.1E-01	NA	8.4E-11	2.6E-11	0.5%	2.3E-10	--	--
Benzo(a)pyrene	2.48	1.88E-09	3.1E+00	NA	4.4E-11	1.3E-10	2.7%	1.2E-10	--	--
Benzo(b)fluoranthene	2.81	2.13E-09	3.1E-01	NA	4.9E-11	1.5E-11	0.3%	1.4E-10	--	--
Benzo(k)fluoranthene	1.78	1.35E-09	3.1E-02	NA	3.1E-11	9.7E-13	0.0%	8.8E-11	--	--
Carbazole	0.95	7.20E-10	2.0E-02	NA	1.7E-11	3.3E-13	0.0%	4.7E-11	--	--
Chrysene	6.7	5.08E-09	3.1E-03	NA	1.2E-10	3.7E-13	0.0%	3.3E-10	--	--
Dibenz(a,h)anthracene	0.695	5.27E-10	3.1E+00	NA	1.2E-11	3.8E-11	0.8%	3.4E-11	--	--
Indeno(1,2,3-cd)pyrene	1.72	1.30E-09	3.1E-01	NA	3.0E-11	9.4E-12	0.2%	8.5E-11	--	--
Dieldrin	0.052	3.94E-11	1.6E+01	5.0E-05	9.1E-13	1.5E-11	0.3%	2.6E-12	5.1E-08	100.0%
Aroclor-1260	95.6	7.24E-08	2.0E+00	NA	1.7E-09	3.4E-09	67.3%	4.7E-09	--	--
Arsenic	5.26	3.98E-09	1.5E+01	NA	9.2E-11	1.4E-09	27.9%	2.6E-10	--	--
Iron	2,347	1.78E-06	NA	NA	4.1E-08	--	--	1.2E-07	--	--
					Total ILCR:	5.0E-09	100.0%	Total HI:	5.1E-08	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.
(1) Value for chlordane

ADULT INDUSTRIAL / COMMERCIAL WORKERS - FUTURE SCENARIO
INGESTION OF GROUNDWATER - SITE 84 (BUILDING 45 AREA)
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (C*IR*EF*ED)/(BW*AT)
ILCR = CDI*CSFo
HQ = CDI/RfDo

Parameter	Units	Description	Industrial / Commercial Worker	
CDI	mg/kg/d	Chronic daily intake	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	
CSFo	1/(mg/kg/d)	Oral cancer slope factor	CS	
HQ	NA	Hazard quotient	CS	
RfDo	mg/kg/d	Oral reference dose	CS	
C	mg/L	Concentration of chemical in water	CS	
IR-W	L/day	Ingestion rate of water	2	
EF	days/year	Exposure frequency	250	
ED	years	Exposure duration	25	
BW	kg	Body weight	70	
AT-C	days	Averaging time, carcinogens	25,550	
AT-N	days	Averaging time, noncarcinogens	9,125	

				Carcinogens			Noncarcinogens		
Parameter	C (mg/L)	CSFo 1/(mg/kg/d)	RfDo (mg/kg/d)	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI
Benzene	0.0034	5.5E-02	3.0E-03	2.4E-05	1.3E-06	0.4%	6.7E-05	2.2E-02	0.2%
Chloroform	0.016	6.1E-03	1.0E-02	1.1E-04	6.8E-07	0.2%	3.1E-04	3.1E-02	0.3%
2-Methylnaphthalene	0.00105	NA	NA	7.3E-06	--	--	2.1E-05	--	--
Naphthalene	0.0022	NA	2.0E-02	1.5E-05	--	--	4.3E-05	2.2E-03	0.0%
Heptachlor Epoxide	0.0000167	9.1E+00	1.3E-05	1.2E-07	1.1E-06	0.3%	3.3E-07	2.5E-02	0.2%
MCPA	0.044	NA	5.0E-04	3.1E-04	--	--	8.6E-04	1.7E+00	16.0%
Antimony	0.011	NA	4.0E-04	7.7E-05	--	--	2.2E-04	5.4E-01	5.0%
Arsenic	0.03	1.5E+00	3.0E-04	2.1E-04	3.1E-04	99.0%	5.9E-04	2.0E+00	18.2%
Iron	67.7	NA	3.0E-01	4.7E-01	--	--	1.3E+00	4.4E+00	41.0%
Manganese	0.45	NA	2.4E-02	3.1E-03	--	--	8.8E-03	3.7E-01	3.4%
Thallium	0.0057	NA	6.6E-05	4.0E-05	--	--	1.1E-04	1.7E+00	15.7%
				Total ILCR:	3.2E-04	100.0%	Total HI:	1.1E+01	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.

ADULT INDUSTRIAL / COMMERCIAL WORKERS - FUTURE SCENARIO
DERMAL CONTACT WITH GROUNDWATER - SITE 84 (BUILDING 45 AREA)
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

DAD (mg/kg/d) = (C*CF*Kp*SA*EF*ED*ET)/(BW*AT)

ILCR = CDI*CSFo Adj CSF Adj = CSF/AD
HQ = CDI/RfDo Adj RfD Adj = RfD*AD

Parameter	Units	Description	Industrial / Commercial Worker	
DAD	mg/kg/d	Dermally absorbed dose	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	
CSFd	1/(mg/kg/d)	Dermal cancer slope factor	CS	
HQ	NA	Hazard quotient	CS	
RfDd	mg/kg/d	Dermal reference dose	CS	
SA	cm2	Skin surface area available for contact	18,000	
EF	days/year	Exposure frequency	250	
ED	years	Exposure duration	25	
ET	hours/day	Exposure time	0	
BW	kg	Body weight	70	
AT-C	days	Averaging time, carcinogens	25,550	
AT-N	days	Averaging time, noncarcinogens	9,125	
C	mg/L	Concentration of chemical in water	CS	
CF	L/cm3	Conversion factor	1.00E-03	
Kp	cm/hour	Dermal permeability coefficient	CS	
AD	NA	Adjustment for absorbed dose	CS	

Parameter	C (mg/L)	Kp (cm/hour)	CSFd 1/(mg/kg/d)	RfDd (mg/kg/d)	Carcinogens DAD (mg/kg/d)	Carcinogens ILCR	Carcinogens % Contrib. Total ILCR	Noncarcinogens DAD (mg/kg/d)	Noncarcinogens HQ	Noncarcinogens % Contrib. HI
Benzene	0.0034	0.021	5.9E-02	2.8E-03	1.1E-06	6.6E-08	3.2%	3.1E-06	1.1E-03	0.5%
Chloroform	0.016	0.0089	3.1E-02	2.0E-03	2.2E-06	6.8E-08	3.3%	6.3E-06	3.1E-03	1.4%
2-Methylnaphthalene	0.00105	0.1423	NA	NA	2.3E-06	--	--	6.6E-06	--	--
Naphthalene	0.0022	0.069	NA	1.6E-02	2.4E-06	--	--	6.7E-06	4.2E-04	0.2%
Heptachlor Epoxide	0.0000167	0.055	1.3E+01	9.4E-06	1.4E-08	1.8E-07	8.9%	4.0E-08	4.3E-03	1.9%
MCPA	0.044	0.0049	NA	2.5E-04	3.4E-06	--	--	9.5E-06	3.8E-02	16.5%
Antimony	0.011	0.001	NA	8.0E-06	1.7E-07	--	--	4.8E-07	6.1E-02	26.3%
Arsenic	0.03	0.001	3.7E+00	1.2E-04	4.7E-07	1.7E-06	84.5%	1.3E-06	1.1E-02	4.7%
Iron	67.7	0.001	NA	4.5E-02	1.1E-03	--	--	3.0E-03	6.6E-02	28.7%
Manganese	0.45	0.001	NA	9.6E-04	7.1E-06	--	--	2.0E-05	2.1E-02	9.0%
Thallium	0.0057	0.001	NA	9.9E-06	9.0E-08	--	--	2.5E-07	2.5E-02	11.0%
					Total ILCR:	2.0E-06	100.0%	Total HI:	2.3E-01	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.

ADULT INDUSTRIAL / COMMERCIAL WORKERS - FUTURE SCENARIO
INHALATION OF VOLATILES IN GROUNDWATER EMANATING FROM SHOWER WATER - SITE 84 (BUILDING 45 AREA)
REASONABLE MAXIMUM EXPOSURE
POTENTIAL CARCINOGENIC AND NONCARCINOGENIC RISKS
MCB CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

CDI (mg/kg/d) = (Ca*RR*ET*EF*ED)/(BW*AT)
Where: Ca = Shower Model

ILCR = CDI*CSFi
HQ = CDI/RfDi

Parameter	Units	Description	Industrial / Commercial Worker	
CDI	mg/kg/d	Chronic daily intake	CS	(Chemical Specific)
ILCR	NA	Incremental lifetime cancer risk	CS	
CSFi	1/(mg/kg/d)	Inhalation cancer slope factor	CS	
HQ	NA	Hazard quotient	CS	
RfDi	mg/kg/d	Inhalation reference dose	CS	
C	mg/L	Concentration of chemical in groundwater	CS	
Ca	mg/m3	Concentration of chemical in shower water Calculated using shower model	CS	
RR	m3/hour	Respiration rate	0.83	
ET	hours/day	Exposure time	0.25	
EF	days/year	Exposure frequency	250	
ED	years	Exposure duration	25	
BW	kg	Body weight	70	
AT-C	days	Averaging time, carcinogens	25,550	
AT-N	days	Averaging time, noncarcinogens	9,125	

Parameter	C (mg/L)	Shower Ca (mg/m3)	CSFi 1/(mg/kg/d)	RfDi (mg/kg/d)	Carcinogens CDI (mg/kg/d)	Carcinogens ILCR	Carcinogens % Contrib. Total ILCR	Noncarcinogens CDI (mg/kg/d)	Noncarcinogens HQ	Noncarcinogens % Contrib. HI
Benzene	0.0034	4.81E-03	2.7E-02	1.7E-03	3.5E-06	9.4E-08	8.2%	9.8E-06	5.7E-03	1.3%
Chloroform	0.016	1.80E-02	8.1E-02	8.6E-05	1.3E-05	1.1E-06	91.8%	3.7E-05	4.3E-01	98.7%
					Total ILCR:	1.1E-06	100.0%	Total HI:	4.3E-01	100.0%

NOTES:
-- - Not applicable.
NA - Toxicity criterion not available.

ORAL ABSORPTION EFFICIENCIES TABLE

Table 6. Dermal risk values derived by calculation from gastrointestinal (GI) absorption data in chemical order

	CAS Number	GI Absorption Factor (%)[a]	GI Absorption Reference	Oral RfD (mg/kg/day)		Oral Slope Factor (mg/kg/day)$^{-1}$	Dermal RfD (mg/kg/day)		Dermal Slope Factor (mg/kg/day)$^{-1}$
				Chronic	Subchronic		Chronic	Subchronic	
Acenaphthene	000083-32-9	31	2	6.00E-02 [b]	6.00E-01 [c]	NA	1.86E-02	1.86E-01	NA
Acenaphthylene	000208-96-8	31	2	NA	NA	NA	NA	NA	NA
Acetone	000067-64-1	83	3	1.00E-01 [b]	1.00E+00 [c]	NA	8.30E-02	8.30E-01	NA
Aldrin	000309-00-2	50	65	3.00E-05 [b]	3.00E-05 [c]	1.70E+01 [b]	1.50E-05	1.50E-05	1.40E+01
Aluminum	007429-90-5	10	4,5	NA	NA	NA	NA	NA	NA
Anthracene	000120-12-7	36	6	3.00E-01 [b]	3.00E+00 [c]	NA	2.28E-01	2.28E+00	NA
Antimony (metallic)	007440-36-0	20	7	4.00E-04 [b]	4.00E-04 [c]	NA	8.00E-06	8.00E-06	NA
Aroclor 1016	012674-11-2	90	46	7.00E-05 [b]	NA	NA	6.30E-05	NA	NA
Aroclor 1254	011097-69-1	90	46	2.00E-05 [b]	5.00E-05 [c]	NA	1.80E-05	4.50E-05	NA
Aroclor 1260	011096-82-5	90	46	NA	NA	NA	NA	NA	NA
Arsenic Salts	NA	90	26	NA	NA	NA	NA	NA	NA
Arsenic, Inorganic	007440-38-2	41	8	3.00E-04 [b]	3.00E-04 [c]	1.50E+00 [b]	1.23E-04	1.23E-04	3.66E+00
Barium	007440-39-3	7.0	9	7.00E-02 [b]	7.00E-02 [c]	NA	4.90E-03	4.90E-03	NA
Benz[a]anthracene	000056-55-3	31	2	NA	NA	NA	NA	NA	NA
Benzene	000071-43-2	97	10	NA	NA	2.90E-02 [b]	NA	NA	2.99E-02
Benzene Hexachloride	NA	97	10	NA	NA	NA	NA	NA	NA
Benzene, Ethyldimethyl	NA	97	10	NA	NA	NA	NA	NA	NA
Benzene, Ethylmethyl	NA	97	10	NA	NA	NA	NA	NA	NA
Benzene, Methylpropenyl	NA	97	10	NA	NA	NA	NA	NA	NA
Benzene, Methylpropyl	NA	97	10	NA	NA	NA	NA	NA	NA
Benzene, Trimethyl	025551-13-7	97	10	NA	NA	NA	NA	NA	NA

Oral Slope Factor (mg/kg/day)$^{-1}$	Dermal RfD (mg/kg/day)		Dermal Slope Factor (mg/kg/day)$^{-1}$
	Chronic	Subchronic	
2.30E+02 [b]	2.40E-03	2.40E-03	2.88E+02
7.30E+00 [b]	NA	NA	2.35E+01
NA	NA	NA	NA
NA	NA	NA	NA
NA	NA	NA	NA
NA	4.00E+00	4.00E+00	NA
NA	1.98E-01	6.60E-01	NA
4.30E+00 [b]	3.00E-04	3.00E-03	4.30E+02
1.40E-02 [b]	3.80E-03	3.80E-03	7.31E-02
NA	8.10E-02	8.10E-02	NA
6.20E-02 [b]	1.96E-02	1.96E-02	6.33E-02
3.90E-03 [b]	1.26E-02	1.26E-01	1.32E-02
NA	NA	NA	NA
NA	1.22E-01	1.22E+00	NA
NA	1.05E-05	NA	NA
NA	5.60E-05	NA	NA
2.60E-01 [c]	NA	NA	2.84E-01
NA	6.30E-02	6.30E-02	NA
1.30E-01 [b]	4.55E-04	4.55E-03	7.69E-01
1.10E+00 [b]	3.60E-05	1.90E-05	2.60E+00
NA	NA	NA	NA

Table 6. Dermal risk values derived by calculation from gastrointestinal (GI) absorption data in chemical order

Chemical	CAS Number	GI Absorption Factor (%)[a]	GI Absorption Reference	Oral RfD (mg/kg/day)		Oral Slope Factor (mg/kg/day)$^{-1}$	Dermal RfD (mg/kg/day)		Dermal Slope Factor (mg/kg/day)$^{-1}$
				Chronic	Subchronic		Chronic	Subchronic	
Chlorobenzene	000108-90-7	31	23	2.00E-02[b]	2.00E-01[c]	NA	6.20E-03	6.20E-02	NA
Chloroform	000067-66-3	20	24	1.00E-02[b]	1.00E-02[c]	6.10E-03[b]	2.00E-03	2.00E-03	3.05E-02
Chromium (III) (Insoluble Salts)	016065-83-1	0.50	74	1.00E+00[b]	1.00E+00[c]	NA	5.00E-03	5.00E-03	NA
Chromium (VI)	018540-29-9	2.0	25	5.00E-03[b]	2.00E-02[c]	NA	1.00E-04	4.00E-04	NA
Chromium Salts	NA	2.0	74	NA	NA	NA	NA	NA	NA
Chrysene	000218-01-9	31	2	NA	NA	NA	NA	NA	NA
Cobalt	007440-48-4	80	26	NA	NA	NA	NA	NA	NA
Copper	007440-50-8	30	27	NA	NA	NA	NA	NA	NA
Cresol, p-	000106-44-5	65	72	5.00E-03[c]	5.00E-01[c]	NA	3.25E-03	3.25E-03	NA
Cyanide (CN-)	000057-12-5	17	37	2.00E-02[b]	2.00E-01[c]	NA	3.40E-03	3.40E-03	NA
DDD	000072-54-8	70	28	NA	NA	2.40E-01[b]	NA	NA	3.43E-01
DDE	000072-55-9	70	28	NA	NA	3.40E-01[b]	NA	NA	4.86E-01
DDT	000650-29-3	70	28	5.00E-04[b]	5.00E-04[c]	3.40E-01[b]	3.50E-04	3.50E-04	4.86E-01
Dibenz[a,h]anthracene	000053-70-3	31	2	NA	NA	NA	NA	NA	NA
Dibromochloromethane	000124-48-1	60	69	2.00E-02[b]	2.00E-01[c]	8.40E-02[b]	1.20E-02	1.20E-01	1.40E-01
Dibutyl Phthalate	000084-74-2	100	29	1.00E-01[b]	1.00E+00[c]	NA	1.00E-01	NA	NA
Dichlorobenzene, 1,4-	000106-46-7	90	82	NA	NA	2.40E-02[c]	NA	NA	2.67E-02
Dichlorodifluoromethane	000075-71-8	23	12	2.00E-01[c]	9.00E-01[c]	NA	4.60E-02	2.07E-01	NA
Dichloroethane, 1,1-	000075-34-3	100	80	1.00E-01[c]	1.00E+00[c]	NA	1.00E-01	NA	NA
Dichloroethane, 1,2-	000107-06-2	100	30	NA	NA	9.10E-02[b]	NA	NA	9.10E-02
Dichloroethylene, 1,1-	000075-35-4	100	31	9.00E-03[b]	9.00E-03[c]	6.00E-01[b]	9.00E-03	9.00E-03	6.00E-01

Table 6. Dermal risk values derived by calculation from gastrointestinal (GI) absorption data in chemical order

Chemical	CAS Number	GI Absorption Factor (%)[a]	GI Absorption Reference	Oral RfD (mg/kg/day)		Oral Slope Factor (mg/kg/day)$^{-1}$	Dermal RfD (mg/kg/day)		Dermal Slope Factor (mg/kg/day)$^{-1}$
				Chronic	Subchronic		Chronic	Subchronic	
Dichloroethylene, 1,2-cis-	000156-59-2	100	83	1.00E-02 [c]	1.00E-01 [c]	NA	1.00E-02	1.00E-01	NA
Dichloroethylene, 1,2-trans-	000156-60-5	100	83	2.00E-02 [b]	2.00E-01 [c]	NA	2.00E-02	2.00E-01	NA
Dichlorophenol, 2,4-	000120-83-2	82	81	3.00E-03 [b]	3.00E-03 [c]	NA	2.46E-03	2.46E-03	NA
Dichloropropane, 1,2-	000078-87-5	74	68	NA	NA	6.80E-02 [c]	NA	NA	9.19E-02
Dichloropropene, 1,3-	000542-75-6	55	73	3.00E-04 [b]	3.00E-03 [c]	1.80E-01 [c]	1.65E-04	1.65E-03	3.27E-01
Dieldrin	000060-57-1	50	65	5.00E-05 [b]	5.00E-05 [c]	1.60E+01 [b]	2.50E-05	2.50E-05	3.20E+01
Diethyl Phthalate	000084-66-2	90	79	8.00E-01 [b]	8.00E+00 [c]	NA	7.20E-01	7.20E+00	NA
Dimethylphthalate	000131-11-3	90	79	NA	NA	NA	NA	NA	NA
Dinitro-o-cresol, 4,6-	000534-52-1	100	12	NA	NA	NA	NA	NA	NA
Dinitrobenzene, 1,2-	000528-29-0	93	32	4.00E-04 [c]	4.00E-03 [c]	NA	3.72E-04	3.72E-03	NA
Dinitrobenzene, 1,3-	000099-65-0	65	32	1.00E-04 [b]	1.00E-03 [c]	NA	6.50E-05	6.50E-04	NA
Dinitrophenol, 2,4-	000051-28-5	100	81	2.00E-03 [b]	2.00E-03 [c]	NA	2.00E-03	2.00E-03	NA
Dinitrotoluene, 2,4-	000121-14-2	85	33	2.00E-03 [b]	2.00E-03 [c]	6.80E-01 [b,d]	1.70E-03	1.70E-03	8.00E-01
Dinitrotoluene, 2,6-	000606-20-2	85	33	1.00E-03 [c]	1.00E-02 [c]	6.80E-01 [b,d]	8.50E-04	8.50E-03	8.00E-01
Dinitrotoluene, 2-Amino-4,6-	035572-78-2	50	85	NA	NA	NA	NA	NA	NA
Endrin	000072-20-8	2.0	77	3.00E-04 [b]	3.00E-04 [c]	NA	6.00E-06	6.00E-06	NA
Ethylbenzene	000100-41-4	97	10	1.00E-01 [b]	NA	NA	9.70E-02	NA	NA
Fluoranthene	000206-44-0	31	2	4.00E-02 [b]	4.00E-01 [c]	NA	1.24E-02	1.24E-01	NA
Fluoride	007782-41-4	97	34	6.00E-02 [b]	6.00E-02 [c]	NA	5.82E-02	5.82E-02	NA
Heptachlor	000076-44-8	72	35	5.00E-04 [b]	5.00E-04 [c]	4.50E+00 [b]	3.60E-04	3.60E-04	6.25E+00
Heptachlor Epoxide	001024-57-3	72	35	1.30E-05 [b]	1.30E-05 [c]	9.10E+00 [b]	9.36E-06	9.36E-06	1.26E+01

Table 6. Dermal risk values derived by calculation from gastrointestinal (GI) absorption data in chemical order

Chemical	CAS Number	GI Absorption Factor (%)[a]	GI Absorption Reference	Oral RfD (mg/kg/day)		Oral Slope Factor (mg/kg/day)$^{-1}$	Dermal RfD (mg/kg/day)		Dermal Slope Factor (mg/kg/day)$^{-1}$
				Chronic	Subchronic		Chronic	Subchronic	
Hexachlorocyclohexane, Alpha-	000319-84-6	97	70	NA	NA	6.30E+00[b]	NA	NA	6.49E+00
Hexachlorocyclohexane, Beta-	000319-85-7	91	70	NA	NA	1.80E+00[b]	NA	NA	1.98E+00
Hexachlorocyclohexane, Gamma-	000058-89-9	97	10	3.00E-04[b]	3.00E-03[c]	1.30E+00[c]	2.91E-04	2.91E-03	1.34E+00
Hexahydro-1,3,5-trinitro-1,3,5-triazine	000121-82-4	100	92	3.00E-03[b]	3.00E-03[c]	1.10E-01[b]	3.00E-03	3.00E-03	1.10E-01
Hexane, N-	000110-54-3	80	85	6.00E-02[c]	6.00E-01[c]	NA	4.80E-02	4.80E-01	NA
Hexanone, 2-	000591-78-6	66	36	NA	NA	NA	NA	NA	NA
Hydrogen Cyanide	000074-90-8	17	37	2.00E-02[b]	NA	NA	3.40E-03	NA	NA
Indeno[1,2,3-cd]pyrene	000193-39-5	31	2	NA	NA	NA	NA	NA	NA
Iron	007439-89-6	15	26	NA	NA	NA	NA	NA	NA
Isopropanol	000067-63-0	100	12	NA	NA	NA	NA	NA	NA
Lead And Compounds	007439-92-1	15	26	NA	NA	NA	NA	NA	NA
Lithium	007439-93-2	80	26	NA	NA	NA	NA	NA	NA
Magnesium	007439-95-4	20	26	NA	NA	NA	NA	NA	NA
Manganese (Diet)	007439-96-5	4.0	38	1.40E-01[b]	1.40E-01[c]	NA	5.60E-03	5.60E-03	NA
Manganese (Water)	007439-96-5	4.0	38	1.40E-01[b]	5.00E-03[c]	NA	5.60E-03	2.00E-01	NA
Mercury (elemental)	007439-97-6	0.01	26, 39	3.00E-01[c]	3.00E-04[c]	NA	3.00E-08	3.00E-08	NA
Mercury, Inorganic Salts	VARIOUS	7.0	26	NA	NA	NA	NA	NA	NA
Methyl Ethyl Ketone	000078-93-3	80	1	6.00E-01[b]	2.00E+00[c]	NA	4.80E-01	1.60E+00	NA
Methyl Isobutyl Ketone	000108-10-1	80	1	8.00E-02[c]	8.00E-01[c]	NA	6.40E-02	6.40E-01	NA
Methyl Mercury	022967-92-6	90	26, 39, 40	1.00E-04[b]	1.00E-04[c]	NA	9.00E-05	9.00E-05	NA
Methyl-5-Nitroaniline, 2-	000099-55-8	50	85	NA	NA	3.30E-02[c]	NA	NA	6.60E-02

Table 6. Dermal risk values derived by calculation from gastrointestinal (GI) absorption data in chemical order

Chemical	CAS Number	GI Absorption Factor (%)[a]	GI Absorption Reference	Oral RfD (mg/kg/day)		Oral Slope Factor $(mg/kg/day)^{-1}$	Dermal RfD (mg/kg/day)		Dermal Slope Factor $(mg/kg/day)^{-1}$
				Chronic	Subchronic		Chronic	Subchronic	
Pyrene	000129-00-0	31	2	3.00E-02[b]	3.00E-01[c]	NA	9.30E-03	9.30E-02	NA
Radium 226	013982-63-3	20	88	NA	NA	NA	NA	NA	NA
Radium 228	015262-20-1	20	88	NA	NA	NA	NA	NA	NA
Selenious Acid	007783-00-8	87	47	5.00E-03[b]	5.00E-03[c]	NA	4.35E-03	4.35E-03	NA
Selenite	014124-67-5	70	48	NA	NA	NA	NA	NA	NA
Selenium	007782-49-2	44	47	5.00E-03[b]	5.00E-03[c]	NA	2.20E-03	2.20E-03	NA
Silver	007440-22-4	18	49	5.00E-03[b]	5.00E-03[c]	NA	9.00E-04	9.00E-04	NA
Sodium	007440-23-5	100	91	NA	NA	NA	NA	NA	NA
Strontium-90	010098-97-2	16	84	NA	NA	NA	NA	NA	NA
Sulfate	014808-79-8	20	50	NA	NA	NA	NA	NA	NA
TCDD, 2,3,7,8-	001746-01-6	50	93	NA	NA	1.50E+05[c]	NA	NA	3.00E+05
Tetrachloroethane, 1,1,2,2-	000079-34-5	70	51	NA	NA	2.00E-01[b]	NA	NA	2.86E-01
Tetrachloroethylene	000127-18-4	100	63	1.00E-02[b]	1.00E-01[c]	NA	1.00E-02	1.00E-01	NA
Thallium	007440-28-0	15	52	NA	NA	NA	NA	NA	NA
Thorium	007440-29-1	1.0	53	NA	NA	NA	NA	NA	NA
Tin	007440-31-5	10	26	6.00E-01[c]	6.00E-01[c]	NA	6.00E-02	6.00E-02	NA
Titanium	007440-32-6	3.0	26	NA	NA	NA	NA	NA	NA
Toluene	000108-88-3	80	54	2.00E-01[b]	2.00E+00[c]	NA	1.60E-01	1.60E+00	NA
Trichlorobenzene, 1,2,4-	000120-82-1	97	89	1.00E-02[b]	1.00E-02[c]	NA	9.70E-03	9.70E-03	NA
Trichloroethane, 1,1,1-	000071-55-6	90	55	NA	NA	NA	NA	NA	NA
Trichloroethane, 1,1,2-	000079-00-5	81	56	4.00E-03[b]	4.00E-02[c]	5.70E-02[b]	3.24E-03	3.24E-02	7.04E-02

Table 6. Dermal risk values derived by calculation from gastrointestinal (GI) absorption data in chemical order

Chemical	CAS Number	GI Absorption Factor (%)[a]	GI Absorption Reference	Oral RfD (mg/kg/day)		Oral Slope Factor (mg/kg/day)$^{-1}$	Dermal RfD (mg/kg/day)		Dermal Slope Factor (mg/kg/day)$^{-1}$
				Chronic	Subchronic		Chronic	Subchronic	
Trichloroethylene	000079-01-6	15	57	NA	NA	NA	NA	NA	NA
Trichlorofluoromethane	000075-69-4	23	12	3.00E-01[b]	7.00E-01[c]	NA	6.90E-02	1.61E-01	NA
Trinitrobenzene, 1,3,5-	000099-35-4	65	32	5.00E-05[b]	5.00E-04[c]	NA	3.25E-05	3.25E-04	NA
Trinitrophenylmethylnitramine	000479-45-8	50	85	1.00E-02[c]	1.00E-01[c]	NA	5.00E-03	5.00E-02	NA
Trinitrotoluene, 2,4,6-	000118-96-7	60	87	5.00E-04[b]	5.00E-04[c]	3.00E-02[b]	3.00E-04	3.00E-04	5.00E-02
Uranium	007440-61-1	85	26	NA	NA	NA	NA	NA	NA
Uranium (Soluble Salts)	NA	85	26	3.00E-03[b]	NA	NA	2.55E-03	NA	NA
Vanadium, Metallic	007440-62-2	1.0	58, 59	7.00E-03[c]	7.00E-03[c]	NA	7.00E-05	7.00E-05	NA
Vinyl Acetate	000108-05-4	65	60	1.00E+00[c]	1.00E+00[c]	NA	6.50E-01	6.50E-01	NA
Vinyl Chloride	000075-01-4	100	66	NA	NA	1.90E+00[c]	NA	NA	1.90E+00
Xylene, Mixture	001330-20-7	92	61	2.00E+00[b]	NA	NA	1.84E+00	NA	NA
Zinc (Metallic)	007440-66-6	20	62	3.00E-01[b]	3.00E-01[c]	NA	6.00E-02	6.00E-02	NA
Zirconium	007440-67-7	80	12	NA	NA	NA	NA	NA	NA

[a] GI absorption factors obtained from literature by BEIA staff
[b] Source: Integrated Risk Information System (IRIS)
[c] Source: Health and Environmental Affects Summary Table (HEAST) 1995
[d] Listed as "Dinitrotoluene mixture, 2,4-/2,6-" in IRIS. The value is based on a study using technical grade DNT.
[e] Interim U.S. EPA Region IV default value

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Reference Number	Reference
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References for Table 6 GI absorption data

Reference Number	Reference
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SHOWER MODEL RESULTS

ADULT AND YOUNG CHILD (AGES 1 TO 6 YEARS) RESIDENTS - FUTURE SCENARIO
RESULTING FROM SHOWERING WITH WATER CONTAINING VOLATILE CONSTITUENTS OF INTEREST*
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA)
MCB, CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

(1) Estimation of overall mass transfer coefficient, KL (cm/hr):

$$KL = 1/(1/kl + RT/Hkg),$$

where

H = Henry's Law Constant (atm-m3/mol-K);
RT = product of ideal gas constant (8.2E-5atm-m3/mol-K) and absolute temperature (293K)
= 0.024 atm-m3/mole;
kl = VOC-specific liquid-film mass transfer coefficient (cm/hr); and
= kl(CO2)*(44/MWvoc)^0.5; and
kg = VOC-specific gas-film mass transfer coefficient (cm/hr)
kl(H2O)*(18/MWvoc)^0.5

where

kl(CO2) = 20 cm/hr
kl(H2O) = 3000 cm/hr
MWvoc = Molecular weight of VOC.

(2) Adjustment of overall mass transfer coefficient, KL, to shower water temperature:

$$KaL = KL[(Tc*us)/(Ts*uc)]^{-0.5}$$

where

KaL = adjusted overall mass transfer coefficient (cm/hr);
Tc = calibration water temperature of KL (K);
uc = water viscosity at Tc (cp); and
us = water viscosity at Ts (cp).

(3) Estimation of VOC concentration leaving shower droplet, Cwd (ug/L):

$$Cwd = Cw[1-exp((-KaL*ts)/60d)]$$

where

Cw = shower water concentrations (ug;L);
d = shower droplet diameter (mm); and
ts = shower droplet drop time (sec).

(4) Estimation of VOC generation rate in the shower room,

S (ug/m3-min):

$$S = (Cwd*FR)/SV$$

where

FR = shower water flow rate (L/min); and
SV = shower room air volume (m3).

(5) Calculation of time-dependent indoor air concentration, Ca(t) (ug/m3):

$$Ca(t) = (S/R)[wxp(RDs)-1]*exp(-Rt) \text{ for } t>Ds$$

where

Ds = shower duration (min); and
t = time (min).

* Chrostowski, Foster, 1987.

ADULT AND YOUNG CHILD (AGES 1 TO 6 YEARS) RESIDENTS - FUTURE SCENARIO
RESULTING FROM SHOWERING WITH WATER CONTAINING VOLATILE CONSTITUENTS OF INTEREST*
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA)
MCB, CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

(1) Estimation of overall mass transfer coefficient, KL (cm/hr):

KL = 1/(1/kl + RT/Hkg),

COPC	kl(CO2) (cm/hr)	kg(H2O) (cm/hr)	MW (g/mol)	kl (cm/hr)	kg (cm/hr)	RT (atm-m3/mol)	H atm-m3/mol-K	KL (cm/hr)
Benzene	20	3000	78.11364	15.01	1440.10	0.024	0.00555	14.36
Chloroform	20	3000	119.37704	12.14	1164.92	0.024	0.00367	11.37

(2) Adjustment of overall mass transfer coefficient, KL, to shower water temperature:

KaL = KL[(Tc*us)/(Ts*uc)]^-0.5

COPC	KL (cm/hr)	Tc (K)	Ts (K)	uc (cp)	us (cp)	KaL (cm/hr)
Benzene	14.36	293	318	0.01002	0.5996	1.93
Chloroform	11.37	293	318	0.01002	0.5996	1.53

(3) Estimation of VOC concentration leaving shower droplet, Cwd (ug/L):

Cwd = Cw*[1-exp((-KaL*ts)/60*d)]
= Cw(1-exp(A))

COPC	C (ug/L)	KaL (cm/hr)	ts (sec)	d (mm)	A	exp(A)	Cwd (ug/L)
Benzene	3.4	1.93	2	1	-0.064	0.938	0.21
Chloroform	16	1.53	2	1	-0.051	0.950	0.80

(4) Estimation of VOC generation rate in the shower room, S (ug/m3-min):

S = (Cwd*FR)/SV

COPC	Cwd (ug/L)	FR (L/min)	SV (M3)	S (ug/m3-min)
Benzene	0.21	10	6	0.35
Chloroform	0.80	10	6	1.33

(5) Calculation of time-dependent indoor air concentration, Ca(t) (ug/m3):

Ca(t) = (S/R)[exp(RDs)-1]*exp(-Rt) for t>Ds

COPC	S (ug/m3-min)	R (1/min)	Ds (min)	t (min)	RDs	Rt	exp(RDs)	exp(-Rt)	Ca(t) (ug/m3)	Ca(t) (mg/m3)
Benzene	0.35	0.008	15	20	0.12	0.16	1.13	0.85	4.81	0.00480543
Chloroform	1.33	0.008	15	20	0.12	0.16	1.13	0.85	18.02	0.0180168

ADULT AND YOUNG CHILD (AGES 1 TO 6 YEARS) RESIDENTS - FUTURE SCENARIO
RESULTING FROM SHOWERING WITH WATER CONTAINING VOLATILE CONSTITUENTS OF INTEREST*
CENTRAL TENDENCY EXPOSURE
SITE 84 (BUILDING 45 AREA)
MCB, CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

(1) Estimation of overall mass transfer coefficient, KL (cm/hr):

$$KL = 1/(1/kl + RT/Hkg),$$

where

H = Henry's Law Constant (atm-m3/mol-K);
RT = product of ideal gas constant (8.2E-5atm-m3/mol-K) and absolute temperature (293K)
= 0.024 atm-m3/mole;
kl = VOC-specific liquid-film mass transfer coefficient (cm/hr); and
= kl(CO2)*(44/MWvoc)^0.5; and
kg = VOC-specific gas-film mass transfer coefficient (cm/hr)
kl(H2O)*(18/MWvoc)^0.5

where

kl(CO2) = 20 cm/hr
kl(H2O) = 3000 cm/hr
MWvoc = Molecular weight of VOC.

(2) Adjustment of overall mass transfer coefficient, KL, to shower water temperature:

$$KaL = KL[(Tc*us)/(Ts*uc)]^{-0.5}$$

where

KaL = adjusted overall mass transfer coefficient (cm/hr);
Tc = calibration water temperature of KL (K);
uc = water viscosity at Tc (cp); and
us = water viscosity at Ts (cp).

(3) Estimation of VOC concentration leaving shower droplet, Cwd (ug/L):

$$Cwd = Cw[1-exp((-KaL*ts)/60d)]$$

where

Cw = shower water concentrations (ug;L);
d = shower droplet diameter (mm); and
ts = shower droplet drop time (sec).

(4) Estimation of VOC generation rate in the shower room,

S (ug/m3-min):

$$S = (Cwd*FR)/SV$$

where

FR = shower water flow rate (L/min); and
SV = shower room air volume (m3).

(5) Calculation of time-dependent indoor air concentration, Ca(t) (ug/m3):

$$Ca(t) = (S/R)[wxp(RDs)-1]*exp(-Rt) \text{ for } t>Ds$$

where

Ds = shower duration (min); and
t = time (min).

* Chrostowski, Foster, 1987.

ADULT AND YOUNG CHILD (AGES 1 TO 6 YEARS) RESIDENTS - FUTURE SCENARIO
RESULTING FROM SHOWERING WITH WATER CONTAINING VOLATILE CONSTITUENTS OF INTEREST*
CENTRAL TENDENCY EXPOSURE
SITE 84 (BUILDING 45 AREA)
MCB, CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

(1) Estimation of overall mass transfer coefficient, KL (cm/hr):

KL = 1/(1/kl + RT/Hkg),

COPC	kl(CO2) (cm/hr)	kg(H2O) (cm/hr)	MW (g/mol)	kl (cm/hr)	kg (cm/hr)	RT (atm-m3/mol)	H (atm-m3/mol-M	KL (cm/hr)
Benzene	20	3000	78.11364	15.01	1440.10	0.024	0.00555	14.36
Chloroform	20	3000	119.37704	12.14	1164.92	0.024	0.00367	11.37

(2) Adjustment of overall mass transfer coefficient, KL, to shower water temperature:

KaL = KL[(Tc*us)/(Ts*uc)]^-0.5

COPC	KL (cm/hr)	Tc (K)	Ts (K)	uc (cp)	us (cp)	KaL (cm/hr)
Benzene	14.36	293	318	0.01002	0.5996	1.93
Chloroform	11.37	293	318	0.01002	0.5996	1.53

(3) Estimation of VOC concentration leaving shower droplet, Cwd (ug/L):

Cwd = Cw*[1-exp((-KaL*ts)/60*d)]
= Cw(1-exp(A))

COPC	C (ug/L)	KaL (cm/hr)	ts (sec)	d (mm)	A	exp(A)	Cwd (ug/L)
Benzene	3.4	1.93	2	1	-0.064	0.938	0.21
Chloroform	16	1.53	2	1	-0.051	0.950	0.80

ADULT AND YOUNG CHILD (AGES 1 TO 6 YEARS) RESIDENTS - FUTURE SCENARIO
RESULTING FROM SHOWERING WITH WATER CONTAINING VOLATILE CONSTITUENTS OF INTEREST*
CENTRAL TENDENCY EXPOSURE
SITE 84 (BUILDING 45 AREA)
MCB, CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

(4) Estimation of VOC generation rate in the shower room, S (ug/m3-min):

$$S = (Cwd*FR)/SV$$

COPC	Cwd (ug/L)	FR (L/min)	SV (M3)	S (ug/m3-min)
Benzene	0.21	10	6	0.35
Chloroform	0.80	10	6	1.33

(5) Calculation of time-dependent indoor air concentration, Ca(t) (ug/m3):

$$Ca(t) = (S/R)[\exp(RDs)-1]*\exp(-Rt) \text{ for } t>Ds$$

COPC	S (ug/m3-min)	R (1/min)	Ds (min)	t (min)	RDs	Rt	exp(RDs)	exp(-Rt)	Ca(t) (ug/m3)	Ca(t) (mg/m3)
Benzene	0.35	0.008	15	20	0.12	0.16	1.13	0.85	4.81	0.00480543
Chloroform	1.33	0.008	15	20	0.12	0.16	1.13	0.85	18.02	0.0180168

ADULT INDUSTRIAL / COMMERCIAL WORKER - FUTURE SCENARIO
RESULTING FROM SHOWERING WITH WATER CONTAINING VOLATILE CONSTITUENTS OF INTEREST*
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA)
MCB, CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

(1) Estimation of overall mass transfer coefficient, KL (cm/hr):

$$KL = 1/(1/Kl + RT/Hkg),$$

where

H = Henry's Law Constant (atm-m3/mol-K);
RT = product of ideal gas constant (8.2E-5atm-m3/mol-K) and absolute temperature (293K)
= 0.024 atm-m3/mole;
kl = VOC-specific liquid-film mass transfer coefficient (cm/hr); and
= kl(CO2)*(44/MWvoc)^0.5; and
kg = VOC-specific gas-film mass transfer coefficient (cm/hr)
kl(H2O)*(18/MWvoc)^0.5

where

kl(CO2) = 20 cm/hr
kl(H2O) = 3000 cm/hr
MWvoc = Molecular weight of VOC.

(2) Adjustment of overall mass transfer coefficient, KL, to shower water temperature:

$$KaL = KL[(Tc*us)/(Ts*uc)]^{-0.5}$$

where

KaL = adjusted overall mass transfer coefficient (cm/hr);
Tc = calibration water temperature of KL (K);
uc = water viscosity at Tc (cp); and
us = water viscosity at Ts (cp).

(3) Estimation of VOC concentration leaving shower droplet, Cwd (ug/L):

$$Cwd = Cw[1-exp(-KaL*ts)/60d)]$$

where

Cw = shower water concentrations (ug;L);
d = shower droplet diameter (mm); and
ts = shower droplet drop time (sec).

(4) Estimation of VOC generation rate in the shower room,

S (ug/m3-min):

$$S = (Cwd*FR)/SV$$

where

FR = shower water flow rate (L/min); and
SV = shower room air volume (m3).

(5) Calculation of time-dependent indoor air concentration, Ca(t) (ug/m3):

$$Ca(t) = (S/R)[wxp(RDs)-1]*exp(-Rt) \text{ for } t>Ds$$

where

Ds = shower duration (min); and
t = time (min).

* Chrostowski, Foster, 1987.

ADULT INDUSTRIAL / COMMERCIAL WORKER - FUTURE SCENARIO
RESULTING FROM SHOWERING WITH WATER CONTAINING VOLATILE CONSTITUENTS OF INTEREST*
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA)
MCB, CAMP LEJEUNE - JACKSONVILLE, NORTH CAROLINA

(1) Estimation of overall mass transfer coefficient, KL (cm/hr):

KL = 1/(1/kl + RT/Hkg),

COPC	kl(CO2) (cm/hr)	kg(H2O) (cm/hr)	MW (g/mol)	kl (cm/hr)	kg (cm/hr)	RT (atm-m3/mol)	H atm-m3/mol-K	KL (cm/hr)
Benzene	20	3000	78.11364	15.01	1440.10	0.024	0.00555	14.36
Chloroform	20	3000	119.37704	12.14	1164.92	0.024	0.00367	11.37

(2) Adjustment of overall mass transfer coefficient, KL, to shower water temperature:

KaL = KL[(Tc*us)/(Ts*uc)]^-0.5

COPC	KL (cm/hr)	Tc (K)	Ts (K)	uc (cp)	us (cp)	KaL (cm/hr)
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Chloroform	11.37	293	318	0.01002	0.5996	1.53

(3) Estimation of VOC concentration leaving shower droplet, Cwd (ug/L):

Cwd = Cw*[1-exp((-KaL*ts)/60*d)]
= Cw(1-exp(A))

COPC	C (ug/L)	KaL (cm/hr)	ts (sec)	d (mm)	A	exp(A)	Cwd (ug/L)
Benzene	3.4	1.93	2	1	-0.064	0.938	0.21
Chloroform	16	1.53	2	1	-0.051	0.950	0.80

(4) Estimation of VOC generation rate in the shower room, S (ug/m3-min):

S = (Cwd*FR)/SV

COPC	Cwd (ug/L)	FR (L/min)	SV (M3)	S (ug/m3-min)
Benzene	0.21	10	6	0.35
Chloroform	0.80	10	6	1.33

(5) Calculation of time-dependent indoor air concentration, Ca(t) (ug/m3):

Ca(t) = (S/R)[exp(RDs)-1]*exp(-Rt) for t>Ds

COPC	S (ug/m3-min)	R (1/min)	Ds (min)	t (min)	RDs	Rt	exp(RDs)	exp(-Rt)	Ca(t) (ug/m3)	Ca(t) (mg/m3)
Benzene	0.35	0.008	15	20	0.12	0.16	1.13	0.85	4.81	0.00480543
Chloroform	1.33	0.008	15	20	0.12	0.16	1.13	0.85	18.02	0.0180168

APPENDIX I
RAGS PART D TABLES

TABLE 1A
SELECTION OF EXPOSURE PATHWAYS
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current	Surface Soil	Surface Soil	Surface Soil	Military Base Personnel	Adult	Ingestion Dermal	On-site	Quant	Personnel may access site for work/training related activities
				Recreational Users	Adult and Adolescent	Ingestion Dermal	On-site	Quant	Visiting park area.
				Residents	Adult and Young Child	Ingestion Dermal	On-site	Quant	Potential future residential development.
		Air	Fugitive Dusts	Military Base Personnel	Adult	Inhalation	On-site	Quant	Personnel may access site for work/training related activities
				Recreational Users	Adult and Adolescent	Inhalation	On-site	Quant	Visiting park area.
				Residents	Adult and Young Child	Inhalation	On-site	Quant	Potential future residential development.
	Groundwater	Groundwater	Groundwater	Residents	Adult and Young Child	Ingestion Dermal	On-site	Quant	Potential future residential development.
		Air	Volatiles in groundwater	Residents	Adult	Inhalation	On-site	Quant	Potential future residential development.
	Surface Water	Surface Water	Surface Water	Military Base Personnel	Adult	Ingestion Dermal	On-site	Quant	Personnel may access site for work/training related activities
				Recreational Users	Adult and Adolescent	Ingestion Dermal	On-site	Quant	Visiting park area.
				Residents	Adult and Young Child	Ingestion Dermal	On-site	Quant	Potential future residential development.
	Sediment	Sediment	Sediment	Construction Workers	Adult	Ingestion Dermal	On-site	Quant	Excavation, construction activities for potential future development.
				Residents	Adult and Young Child	Ingestion Dermal	On-site	Quant	Potential future residential development.

TABLE 1A (Continued)
SELECTION OF EXPOSURE PATHWAYS
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Future	Surface Soil	Surface Soil	Surface Soil	Industrial / Commercial Workers	Adult	Ingestion Dermal	On-site	Quant	Groundskeeping activities
				Construction Workers	Adult	Ingestion Dermal	On-site	Quant	Excavation, construction activities for potential future development.
				Residents	Adult and Young Child	Ingestion Dermal	On-site	Quant	Potential future residential development.
		Air	Fugitive Dusts	Industrial / Commercial Workers	Adult	Inhalation	On-site	Quant	Groundskeeping activities
				Construction Workers	Adult	Inhalation	On-site	Quant	Excavation, construction activities for potential future development.
				Residents	Adult and Young Child	Inhalation	On-site	Quant	Potential future residential development.
	Subsurface Soil	Subsurface Soil	Subsurface Soil	Construction Workers	Adult	Ingestion Dermal	On-site	Quant	Excavation, construction activities for potential future development.
		Air	Fugitive Dusts	Construction Workers	Adult	Inhalation	On-site	Quant	Excavation, construction activities for potential future development.
	Groundwater	Groundwater	Groundwater	Industrial / Commercial Workers	Adult	Ingestion Dermal	On-site	Quant	Groundskeeping activities
				Construction Workers	Adult	Dermal	On-site	Quant	Excavation, construction activities for potential future development.
				Residents	Adult and Young Child	Ingestion Dermal	On-site	Quant	Potential future residential development.
		Air	Volatiles in groundwater	Industrial / Commercial Workers	Adult	Inhalation	On-site	Quant	Groundskeeping activities
				Residents	Adult	Inhalation	On-site	Quant	Potential future residential development.
	Surface Water	Surface Water	Surface Water	Construction Workers	Adult	Dermal	On-site	Quant	Excavation, construction activities for potential future development.
				Residents	Adult and Young Child	Ingestion Dermal	On-site	Quant	Potential future residential development.
	Sediment	Sediment	Sediment	Construction Workers	Adult	Dermal	On-site	Quant	Excavation, construction activities for potential future development.
				Residents	Adult and Young Child	Ingestion Dermal	On-site	Quant	Potential future residential development.

TABLE 1B
SELECTION OF EXPOSURE PATHWAYS
SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current	Surface Soil	Surface Soil	Surface Soil	Military Base Personnel	Adult	Ingestion Dermal	On-site	Quant	Personnel may access site for work/training related activities
				Recreational Users	Adult and Adolescent	Ingestion Dermal	On-site	Quant	Visiting park area.
				Residents	Adult and Young Child	Ingestion Dermal	On-site	Quant	Potential future residential development.
		Air	Fugitive Dusts	Military Base Personnel	Adult	Inhalation	On-site	Quant	Personnel may access site for work/training related activities
				Recreational Users	Adult and Adolescent	Inhalation	On-site	Quant	Visiting park area.
				Residents	Adult and Young Child	Inhalation	On-site	Quant	Potential future residential development.
	Groundwater	Groundwater	Groundwater	Residents	Adult and Young Child	Ingestion Dermal	On-site	Quant	Potential future residential development.
		Air	Volatiles in groundwater	Residents	Adult	Inhalation	On-site	Quant	Potential future residential development.
	Surface Water	Surface Water	Surface Water	Military Base Personnel	Adult	Ingestion Dermal	On-site	Quant	Personnel may access site for work/training related activities
				Recreational Users	Adult and Adolescent	Ingestion Dermal	On-site	Quant	Visiting park area.
				Residents	Adult and Young Child	Ingestion Dermal	On-site	Quant	Potential future residential development.
	Sediment	Sediment	Sediment	Construction Workers	Adult	Ingestion Dermal	On-site	Quant	Excavation, construction activities for potential future development.
				Residents	Adult and Young Child	Ingestion Dermal	On-site	Quant	Potential future residential development.

TABLE 1B (Continued)
SELECTION OF EXPOSURE PATHWAYS
SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Future	Surface Soil	Surface Soil	Surface Soil	Industrial / Commercial Workers	Adult	Ingestion Dermal	On-site	Quant	Groundskeeping activities
				Construction Workers	Adult	Ingestion Dermal	On-site	Quant	Excavation, construction activities for potential future development.
				Residents	Adult and Young Child	Ingestion Dermal	On-site	Quant	Potential future residential development.
		Air	Fugitive Dusts	Industrial / Commercial Workers	Adult	Inhalation	On-site	Quant	Groundskeeping activities
				Construction Workers	Adult	Inhalation	On-site	Quant	Excavation, construction activities for potential future development.
				Residents	Adult and Young Child	Inhalation	On-site	Quant	Potential future residential development.
	Subsurface Soil	Subsurface Soil	Subsurface Soil	Construction Workers	Adult	Ingestion Dermal	On-site	Quant	Excavation, construction activities for potential future development.
		Air	Fugitive Dusts	Construction Workers	Adult	Inhalation	On-site	Quant	Excavation, construction activities for potential future development.
	Groundwater	Groundwater	Groundwater	Industrial / Commercial Workers	Adult	Ingestion Dermal	On-site	Quant	Groundskeeping activities
				Construction Workers	Adult	Dermal	On-site	Quant	Excavation, construction activities for potential future development.
				Residents	Adult and Young Child	Ingestion Dermal	On-site	Quant	Potential future residential development.
		Air	Volatiles in groundwater	Industrial / Commercial Workers	Adult	Inhalation	On-site	Quant	Groundskeeping activities
				Residents	Adult	Inhalation	On-site	Quant	Potential future residential development.
	Surface Water	Surface Water	Surface Water	Construction Workers	Adult	Dermal	On-site	Quant	Excavation, construction activities for potential future development.
				Residents	Adult and Young Child	Ingestion Dermal	On-site	Quant	Potential future residential development.
	Sediment	Sediment	Sediment	Construction Workers	Adult	Dermal	On-site	Quant	Excavation, construction activities for potential future development.
				Residents	Adult and Young Child	Ingestion Dermal	On-site	Quant	Potential future residential development.

TABLE 2.1A
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Current, Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Surface Soil

CAS Number	Chemical	Minimum Concentration	Minimum Qualifier	Maximum Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening	Background Value [1]	Screening [2] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [3] Contaminant Deletion or Selection
	VOLATILES (ug/kg)															
78-93-3	2-Butanone (MEK)	6.9	J	6.9	J	µg/kg	IR84-MW20-00	1/25	2.7U - 110U	6.9	NA	7.30E+05 N	N/A	N/A	NO	BSL
67-64-1	Acetone	40	J	40	J	µg/kg	84-MW15-00	1/25	2.1U - 1400U	40	NA	1.60E+05 N	N/A	N/A	NO	BSL
100-41-4	Ethylbenzene	330	J	330	J	µg/kg	IR84-DP82-00	1/25	0.58U - 1.5U	330	NA	2.30E+05 S	N/A	N/A	NO	BSL
1330-20-7	Xylenes, total	8.7	J	120	J	µg/kg	IR84-DP82-00	2/25	1.9U - 2.2U	120	NA	2.10E+05 S	N/A	N/A	NO	BSL
	SEMIVOLATILES (ug/kg)															
91-57-6	2-Methylnaphthalene	120	J	92,000		µg/kg	IR84-DP84-00	3/25	50U - 6700U	92,000	NA	5.60E+03 N [5]	N/A	N/A	YES	ASL
83-32-9	Acenaphthene	140	J	20,000	J	µg/kg	IR84-DP46-00	8/25	53U - 590U	20,000	NA	3.70E+05 N	N/A	N/A	NO	BSL
120-12-7	Anthracene	210	J	56,000		µg/kg	IR84-DP46-00	8/25	51U - 560U	56,000	NA	2.20E+06 N	N/A	N/A	NO	BSL
56-55-3	Benzo(a)anthracene	520		190,000		µg/kg	IR84-DP46-00	8/25	57U - 630U	190,000	NA	6.20E+02 C	N/A	N/A	YES	ASL
50-32-8	Benzo(a)pyrene	470		150,000		µg/kg	IR84-DP46-00	7/25	63U - 1700U	150,000	NA	6.20E+01 C	N/A	N/A	YES	ASL
205-99-2	Benzo(b)fluoranthene	540		170,000		µg/kg	IR84-DP46-00	7/25	61U - 1600U	170,000	NA	6.20E+02 C	N/A	N/A	YES	ASL
191-24-2	Benzo(g,h,i)perylene	74	J	55,000		µg/kg	IR84-DP46-00	9/25	57U - 630U	55,000	NA	2.30E+05 N [6]	N/A	N/A	NO	BSL
207-08-9	Benzo(k)fluoranthene	340	J	120,000		µg/kg	IR84-DP46-00	7/25	55U - 1500U	120,000	NA	6.20E+03 C	N/A	N/A	YES	ASL
117-81-7	Bis(2-ethylhexyl)phthalate	380	J	380	J	µg/kg	IR84-MW20-00	1/25	56U - 7600U	380	NA	3.50E+04 C	N/A	N/A	NO	BSL
86-74-8	Carbazole	130	J	38,000	J	µg/kg	IR84-DP46-00	7/25	54U - 1400U	38,000	NA	2.40E+04 C	N/A	N/A	YES	ASL
218-01-9	Chrysene	560		180,000		µg/kg	IR84-DP46-00	8/25	48U - 530U	180,000	NA	6.20E+04 C	N/A	N/A	YES	ASL
53-70-3	Dibenz(a,h)anthracene	70	J	17,000	J	µg/kg	IR84-DP46-00	7/25	53U - 1400U	17,000	NA	6.20E+01 C	N/A	N/A	YES	ASL
132-64-9	Dibenzofuran	84	J	8,900	J	µg/kg	IR84-DP46-00	7/25	52U - 1400U	8,900	NA	2.90E+04 N	N/A	N/A	NO	BSL
206-44-0	Fluoranthene	1,200		300,000		µg/kg	IR84-DP46-00	8/25	59U - 640U	300,000	NA	2.30E+05 N	N/A	N/A	YES	ASL
86-73-7	Fluorene	130	J	19,000	J	µg/kg	IR84-DP46-00	9/25	50U - 59U	19,000	NA	2.60E+05 N	N/A	N/A	NO	BSL
77-47-4	Hexachlorocyclopentadiene	410	J	410	J	µg/kg	IR84-DP47-00	1/25	63U - 8400U	410	NA	4.20E+04 N	N/A	N/A	NO	BSL
193-39-5	Indeno(1,2,3-cd)pyrene	250	J	59,000		µg/kg	IR84-DP46-00	7/25	73U - 1900U	59,000	NA	6.20E+02 C	N/A	N/A	YES	ASL
91-20-3	Naphthalene	140	J	7,500	J	µg/kg	IR84-DP46-00	5/25	51U - 1400U	7,500	NA	5.60E+03 N	N/A	N/A	YES	ASL
85-01-8	Phenanthrene	910	J	180,000		µg/kg	IR84-DP46-00	9/25	54U - 63.5U	180,000	NA	2.30E+05 N [6]	N/A	N/A	NO	BSL
129-00-0	Pyrene	760		250,000		µg/kg	IR84-DP46-00	8/25	53U - 590U	250,000	NA	2.30E+05 N	N/A	N/A	YES	ASL
	PCBs (ug/kg)															
72-54-8	4,4'-DDD	3.2	J	3,000	J	µg/kg	IR84-DP47-00	7/23	0.83U - 890U	3,000	NA	2.40E+03 C	N/A	N/A	YES	ASL
72-55-9	4,4'-DDE	2.9625	J	58		µg/kg	IR84-DP49-00	7/23	0.6U - 640U	58	NA	1.70E+03 C	N/A	N/A	NO	BSL
50-29-3	4,4'-DDT	1.9		190		µg/kg	IR84-DP49-00	7/23	1.4U - 1500U	190	NA	1.70E+03 C	N/A	N/A	NO	BSL
319-84-6	BHC, alpha-	21		21		µg/kg	IR84-DP82-00	1/23	0.48U - 520U	21	NA	9.00E+01 C	N/A	N/A	NO	BSL
5103-71-9	Chlordane, alpha-	2	J	48,000	J	µg/kg	IR84-DP47-00	10/23	0.62U - 6.8U	48,000	NA	1.60E+03 C [7]	N/A	N/A	YES	ASL
5103-74-2	Chlordane, gamma-	3.5125	J	58,000		µg/kg	IR84-DP47-00	10/23	0.6U - 6.5U	58,000	NA	1.60E+03 C [7]	N/A	N/A	YES	ASL
60-57-1	Dieldrin	3.5	J	320		µg/kg	IR84-DP49-00	8/23	1.6U - 1700U	320	NA	3.00E+01 C	N/A	N/A	YES	ASL
1031-07-8	Endosulfan Sulfate	3.2		40	J	µg/kg	IR84-DP82-00	5/24	0.29U - 320U	40	NA	3.70E+04 N [8]	N/A	N/A	NO	BSL
72-20-8	Endrin	3.6225	J	3.6225	J	µg/kg	IR84-MW20-00	1/23	0.64U - 690U	3.6225	NA	1.80E+03 N	N/A	N/A	NO	BSL
7421-93-4	Endrin Aldehyde	4.5	J	61	J	µg/kg	IR84-DP82-00	7/24	1.6U - 1700U	61	NA	1.80E+03 N [9]	N/A	N/A	NO	BSL
53494-70-5	Endrin Ketone	1.7	J	26	J	µg/kg	IR84-DP81-00	5/24	0.27U - 290U	26	NA	1.80E+03 N [9]	N/A	N/A	NO	BSL
76-44-8	Heptachlor	1.5	J	22,000		µg/kg	IR84-DP47-00	8/23	0.65U - 7U	22,000	NA	1.10E+02 C	N/A	N/A	YES	ASL
1024-57-3	Heptachlor Epoxide	4.2	J	4,500	J	µg/kg	IR84-DP47-00	6/23	0.69U - 7.6U	4,500	NA	5.30E+01 C	N/A	N/A	YES	ASL
72-43-5	Methoxychlor	1.9	J	79	J	µg/kg	IR84-DP82-00	7/24	0.86U - 920U	79	NA	3.10E+04 N	N/A	N/A	NO	BSL
12672-29-6	Aroclor-1248	56		160,000		µg/kg	IR84-DP47-00	4/91	4.8U - 18000U	160,000	NA	2.20E+02 C	N/A	N/A	YES	ASL
11097-69-1	Aroclor-1254	51,000		51,000		µg/kg	IR84-DP53-00	1/91	21U - 18000U	51,000	NA	2.20E+02 C	N/A	N/A	YES	ASL
11096-82-5	Aroclor-1260	18	J	200,000		µg/kg	IR84-SB27-01	64/91	7.8U - 4200U	200,000	NA	2.20E+02 C	N/A	N/A	YES	ASL

TABLE 2.1A (Continued)
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Current, Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Surface Soil

CAS Number	Chemical	Minimum Concentration	Minimum Qualifier	Maximum Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening	Background Value (1)	Screening (2) Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for (3) Contaminant Deletion or Selection
	TOTAL PETROLEUM HYDROCARBONS															
86290-81-5	Gasoline Range Organics (ug/kg)	880		880		µg/kg	IR84-DP46-00	1/11	18U - 19U	880	NA	N/A	N/A	N/A	YES	NSC
68334-30-5	Diesel Range Organics (mg/kg)	7	J	470		mg/kg	IR84-DP46-00	11/11	(4)	470	ND	N/A	N/A	N/A	YES	NSC
	METALS (mg/kg)															
7429-90-5	Aluminum	1,270		5,910		mg/kg	IR84-MW20-00	25/25	(4)	5,910	3556.3052	7.60E+03 N	N/A	N/A	NO	BSL
7440-36-0	Antimony	0.66	J	3.3	J	mg/kg	IR84-DP49-00	13/25	0.52UJ - 0.6UJ	3.3	0.3934	3.10E+00 N	N/A	N/A	YES	ASL
7440-38-2	Arsenic	0.33	J	9.1		mg/kg	IR84-DP49-00	23/25	0.32U - 0.32U	9.1	0.5108	3.90E-01 C	N/A	N/A	YES	ASL
7440-39-3	Barium	3	J	65.7		mg/kg	IR84-DP49-00	22/25	3.7U - 9.8U	65.7	10.6444	5.40E+02 N	N/A	N/A	NO	BSL
7440-41-7	Beryllium	0.06	J	0.075	J	mg/kg	IR84-DP46-00	5/25	0.048U - 0.11U	0.075	0.0728	1.50E+01 N	N/A	N/A	NO	BSL
7440-43-9	Cadmium	0.067	J	0.57		mg/kg	IR84-DP53-00	13/25	0.045U - 0.049U	0.57	0.0278	3.70E+00 N	N/A	N/A	NO	BSL
7440-70-2	Calcium	109	J	100,000	J	mg/kg	IR84-DP50-00	25/25	(4)	100,000	1462.2764	N/A	N/A	N/A	NO	NUT
18540-29-9	Chromium VI	1.7		20.2		mg/kg	IR84-DP49-00	25/25	(4)	20.2	ND	3.00E+01 C	N/A	N/A	NO	BSL
7440-48-4	Cobalt	0.18	J	0.76	J	mg/kg	IR84-DP49-00	22/25	0.16U - 0.17U	0.76	0.2302	4.70E+02 N	N/A	N/A	NO	BSL
7440-50-8	Copper	0.35	J	146		mg/kg	IR84-DP49-00	25/25	(4)	146	5.2188	2.90E+02 N	N/A	N/A	NO	BSL
7439-89-6	Iron	684		3,480		mg/kg	IR84-MW20-00	25/25	(4)	3,480	1737.4264	2.30E+03 N	N/A	N/A	YES	ASL
7439-92-1	Lead	1.8		97.3		mg/kg	IR84-DP49-00	25/25	(4)	97.3	10.4738	4.00E+02 N (10)	N/A	N/A	NO	BSL
7439-95-4	Magnesium	47.3	J	1,480		mg/kg	IR84-DP49-00	25/25	(4)	1,480	211.5692	N/A	N/A	N/A	NO	NUT
7439-96-5	Manganese	2.7		32.8		mg/kg	IR84-DP49-00	25/25	(4)	32.8	11.3294	1.80E+02 N	N/A	N/A	NO	BSL
7439-97-6	Mercury	0.01	J	0.2		mg/kg	IR84-DP74-00	18/25	0.0089U - 0.0095U	0.2	0.0732	2.30E+00 N	N/A	N/A	NO	BSL
7440-02-0	Nickel	0.46	J	2.9	J	mg/kg	IR84-DP49-00	25/25	(4)	2.9	1.0454	1.60E+02 N	N/A	N/A	NO	BSL
7440-09-7	Potassium	70.2	J	258	J	mg/kg	IR84-DP76-00	16/25	34.8U - 97.6U	258	89.1538	N/A	N/A	N/A	NO	NUT
7782-49-2	Selenium	0.365	J	0.61		mg/kg	IR84-DP74-00	2/25	0.32U - 0.56U	0.61	0.3194	3.90E+01 N	N/A	N/A	NO	BSL
7440-23-5	Sodium	165	J	235	J	mg/kg	IR84-DP50-00	3/25	52.2U - 69.6U	235	ND	N/A	N/A	N/A	NO	NUT
7440-28-0	Thallium	0.6	J	0.6	J	mg/kg	IR84-DP45-00	1/25	0.52U - 0.7U	0.6	ND	5.20E-01 N	N/A	N/A	YES	ASL
7440-62-2	Vanadium	2.3	J	10.4		mg/kg	IR84-DP76-00	25/25	(4)	10.4	5.9918	5.50E+01 N	N/A	N/A	NO	BSL
7440-66-6	Zinc	1.3	J	154	J	mg/kg	IR84-DP49-00	25/25	(4)	154	10.748	2.30E+03 N	N/A	N/A	NO	BSL

(1) MCB Camp Lejeune Base Background Study, Final (Baker, 2001): 2 * Mean (1/2 nondetects)
(2) All non-carcinogenic criteria were divided by 10 to account for potential additive effects of chemicals
USEPA Region IX COC Screening Value (derived from USEPA Region IX PRG Table)
(3) Rationale Codes Selection Reason: No Screening Criteria (NSC)
Above Screening Levels (ASL)
Deletion Reason: Essential Nutrient (NUT)
Below Screening Level (BSL)

(4) No detection limits given; analyte detected in every sample.
(5) Screening values for naphthalene used as a surrogate
(6) Screening value for pyrene used as a surrogate.
(7) Screening value for chlordane used as a surrogate.
(8) Screening value for endosulfan used as a surrogate.
(9) Screening value for endrin used as a surrogate.
(10) Action level for lead.

Definitions: N/A = Not applicable
NA = Not Analyzed
ND = Not Detected
COPC = Chemical of Potential Concern
ARAR/TBC = arplicable or Relevant and arpropriate Requirement/To Be Considered

J - Analyte present - Reported value is estimated
Delete NJ - Presumptive evidence for the presence of the material at an estimated value
* = (Inorganics) Duplicate analysis was not within control limits
U - Not detected
UJ - Reported quantitation limit is qualified as estimated

C = Carcinogenic mg/kg = milligrams per kilogram
N = Non-Carcinogenic ug/kg = microgram per kilogram
S = Soil Saturation

TABLE 2.1B
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Current, Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Surface Soil

CAS Number	Chemical	Minimum Concentration	Minimum Qualifier	Maximum Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening	Background Value [1]	Screening [2] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [3] Contaminant Deletion or Selection
	VOLATILES (ug/kg)															
78-93-3	2-Butanone (MEK)	6.9	J	6.9	J	µg/kg	IR84-MW20-00	1/13	2.7U - 110U	6.9	NA	7.30E+05 N	N/A	N/A	NO	BSL
67-64-1	Acetone	40	J	40	J	µg/kg	84-MW15-00	1/13	2.1U - 1400U	40	NA	1.60E+05 N	N/A	N/A	NO	BSL
100-41-4	Ethylbenzene	330	J	330	J	µg/kg	IR84-DP82-00	1/13	0.58U - 1.5U	330	NA	2.30E+05 S	N/A	N/A	NO	BSL
1330-20-7	Xylenes, total	8.7	J	120	J	µg/kg	IR84-DP82-00	2/13	1.9U - 2.2U	120	NA	2.10E+05 S	N/A	N/A	NO	BSL
	SEMIVOLATILES (ug/kg)															
91-57-6	2-Methylnaphthalene	350	J	92,000		µg/kg	IR84-DP84-00	2/13	51U - 550U	92,000	NA	5.60E+03 N [5]	N/A	N/A	YES	ASL
83-32-9	Acenaphthene	2,300		2,800	J	µg/kg	IR84-DP84-00	2/13	54U - 590U	2,800	NA	3.70E+05 N	N/A	N/A	NO	BSL
120-12-7	Anthracene	3,500		4,100	J	µg/kg	IR84-DP84-00	2/13	52U - 560U	4,100	NA	2.20E+06 N	N/A	N/A	NO	BSL
56-55-3	Benzo(a)anthracene	1,800	J	5,900		µg/kg	84-MW17-00	2/13	58U - 630U	5,900	NA	6.20E+02 C	N/A	N/A	YES	ASL
50-32-8	Benzo(a)pyrene	5,800		5,800		µg/kg	84-MW17-00	1/13	64U - 1700U	5,800	NA	6.20E+01 C	N/A	N/A	YES	ASL
205-99-2	Benzo(b)fluoranthene	7,100		7,100		µg/kg	84-MW17-00	1/13	61U - 1600U	7,100	NA	6.20E+02 C	N/A	N/A	YES	ASL
191-24-2	Benzo(g,h,i)perylene	1,500	J	3,200		µg/kg	84-MW17-00	2/13	58U - 630U	3,200	NA	2.30E+05 N [6]	N/A	N/A	NO	BSL
207-08-9	Benzo(k)fluoranthene	3,800		3,800		µg/kg	84-MW17-00	1/13	56U - 1500U	3,800	NA	6.20E+03 C	N/A	N/A	YES	CHEM
117-81-7	Bis(2-ethylhexyl)phthalate	380	J	380	J	µg/kg	IR84-MW20-00	1/13	57U - 1500U	380	NA	3.50E+04 C	N/A	N/A	NO	BSL
86-74-8	Carbazole	2,100		2,100		µg/kg	84-MW17-00	1/13	55U - 1400U	2,100	NA	2.40E+04 C	N/A	N/A	YES	CHEM
218-01-9	Chrysene	2,800	J	6,700		µg/kg	84-MW17-00	2/13	49U - 530U	6,700	NA	6.20E+04 C	N/A	N/A	YES	CHEM
53-70-3	Dibenz(a,h)anthracene	1,200	J	1,200	J	µg/kg	84-MW17-00	1/13	54U - 1400U	1,200	NA	6.20E+01 C	N/A	N/A	YES	ASL
132-64-9	Dibenzofuran	1,800	J	1,800	J	µg/kg	84-MW17-00	1/13	53U - 1400U	1,800	NA	2.90E+04 N	N/A	N/A	NO	BSL
206-44-0	Fluoranthene	1,700	J	16,000		µg/kg	84-MW17-00	2/13	59U - 640U	16,000	NA	2.30E+05 N	N/A	N/A	NO	BSL
86-73-7	Fluorene	580	J	9,000	J	µg/kg	IR84-DP84-00	3/13	51U - 59U	9,000	NA	2.60E+05 N	N/A	N/A	NO	BSL
193-39-5	Indeno(1,2,3-cd)pyrene	3,200		3,200		µg/kg	84-MW17-00	1/13	74U - 1900U	3,200	NA	6.20E+02 C	N/A	N/A	YES	ASL
91-20-3	Naphthalene	640	J	640	J	µg/kg	84-MW17-00	1/13	52U - 1400U	640	NA	5.60E+03 N	N/A	N/A	NO	BSL
85-01-8	Phenanthrene	910	J	24,000		µg/kg	IR84-DP84-00	3/13	55U - 63.5U	24,000	NA	2.30E+05 N [6]	N/A	N/A	NO	BSL
129-00-0	Pyrene	10,000		16,000		µg/kg	IR84-DP84-00	2/13	54U - 590U	16,000	NA	2.30E+05 N	N/A	N/A	NO	BSL
	PESTICIDES/PCBs (ug/kg)															
72-54-8	4,4'-DDD	3.6	J	32	J	µg/kg	IR84-DP82-00	4/11	0.84U - 1.7U	32	NA	2.40E+03 C	N/A	N/A	NO	BSL
72-55-9	4,4'-DDE	2.9625	J	2.9625	J	µg/kg	IR84-MW20-00	1/11	0.6U - 6.5U	2.9625	NA	1.70E+03 C	N/A	N/A	NO	BSL
50-29-3	4,4'-DDT	8.2	J	8.2	J	µg/kg	IR84-DP83-00	1/11	1.4U - 15U	8.2	NA	1.70E+03 C	N/A	N/A	NO	BSL
319-84-6	BHC, alpha-	21		21		µg/kg	IR84-DP82-00	1/11	0.49U - 2.6U	21	NA	9.00E+01 C	N/A	N/A	NO	BSL
5103-71-9	Chlordane, alpha-	2.4175	J	40	J	µg/kg	84-MW17-00	2/11	0.63U - 6.8U	40	NA	1.60E+03 C [7]	N/A	N/A	NO	BSL
5103-74-2	Chlordane, gamma-	3.5125	J	43		µg/kg	84-MW17-00	2/11	0.6U - 6.5U	43	NA	1.60E+03 C [7]	N/A	N/A	NO	BSL
60-57-1	Dieldrin	14	J	52		µg/kg	IR84-DP82-00	3/11	1.6U - 3.3U	52	NA	3.00E+01 C	N/A	N/A	YES	ASL
1031-07-8	Endosulfan Sulfate	3.2		40	J	µg/kg	IR84-DP82-00	5/12	0.3U - 0.61U	40	NA	3.70E+04 N [8]	N/A	N/A	NO	BSL
72-20-8	Endrin	3.6225	J	3.6225	J	µg/kg	IR84-MW20-00	1/11	0.65U - 7U	3.6225	NA	1.80E+03 N	N/A	N/A	NO	BSL
7421-93-4	Endrin Aldehyde	4.5	J	61	J	µg/kg	IR84-DP82-00	5/12	1.6U - 3.3U	61	NA	1.80E+03 N [9]	N/A	N/A	NO	BSL
53494-70-5	Endrin Ketone	1.7	J	26	J	µg/kg	IR84-DP81-00	4/12	0.28U - 3U	26	NA	1.80E+03 N [9]	N/A	N/A	NO	BSL
72-43-5	Methoxychlor	8.7	J	79	J	µg/kg	IR84-DP82-00	4/12	0.87U - 4.7U	79	NA	3.10E+04 N	N/A	N/A	NO	BSL
12672-29-6	Aroclor-1248	56		56		µg/kg	IR84-DP20-00	1/77	4.8U - 18000U	56	NA	2.20E+02 C	N/A	N/A	NO	BSL
11096-82-5	Aroclor-1260	18	J	200,000		µg/kg	IR84-SB27-01	58/77	7.8U - 140U	200,000	NA	2.20E+02 C	N/A	N/A	YES	ASL

TABLE 2.1B (Continued)
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Current, Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Surface Soil

CAS Number	Chemical	Minimum Concentration	Minimum Qualifier	Maximum Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening	Background Value (1)	Screening (2) Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for (3) Contaminant Deletion or Selection
	METALS (mg/kg)															
7440-36-0	Antimony	0.66	J	2	J	mg/kg	IR84-DP84-00	5/13	0.52UJ - 0.6UJ	2	0.3934	3.10E+00 N	N/A	N/A	NO	BSL
7440-38-2	Arsenic	0.64	J	6.7		mg/kg	84-MW17-00	11/13	0.32U - 0.32U	6.7	0.5108	3.90E-01 C	N/A	N/A	YES	ASL
7440-39-3	Barium	3	J	24.6	J	mg/kg	IR84-DP84-00	11/13	6.3U - 9.8U	24.6	10.6444	5.40E+02 N	N/A	N/A	NO	BSL
7440-43-9	Cadmium	0.1155	J	0.23	J	mg/kg	IR84-DP82-00	4/13	0.046U - 0.049U	0.23	0.0278	3.70E+00 N	N/A	N/A	NO	BSL
7440-70-2	Calcium	109	J	17,900		mg/kg	IR84-DP82-00	13/13	(4)	17,900	1462.2764	N/A	N/A	N/A	NO	NUT
7440-47-3	Chromium	1.7		7.5		mg/kg	IR84-DP76-00	13/13	(4)	7.5	4.5002	2.10E+02 C	N/A	N/A	NO	BSL
7440-48-4	Cobalt	0.18	J	0.41	J	mg/kg	IR84-DP74-00	11/13	0.16U - 0.17U	0.41	0.2302	4.70E+02 N	N/A	N/A	NO	BSL
7440-50-8	Copper	0.35	J	28.4		mg/kg	IR84-DP84-00	13/13	(4)	28.4	5.2188	2.90E+02 N	N/A	N/A	NO	BSL
7439-89-6	Iron	950		3,480		mg/kg	IR84-MW20-00	13/13	(4)	3,480	1737.4264	2.30E+03 N	N/A	N/A	YES	ASL
7439-92-1	Lead	1.8		65.4		mg/kg	IR84-DP82-00	13/13	(4)	65.4	10.4738	4.00E+02 N (10)	N/A	N/A	NO	BSL
7439-95-4	Magnesium	47.3	J	347	J	mg/kg	IR84-DP82-00	13/13	(4)	347	211.5692	N/A	N/A	N/A	NO	NUT
7439-96-5	Manganese	2.7		15.9		mg/kg	IR84-DP83-00	13/13	(4)	15.9	11.3294	1.80E+02 N	N/A	N/A	NO	BSL
7439-97-6	Mercury	0.015	J	0.2		mg/kg	IR84-DP74-00	7/13	0.0089U - 0.0095U	0.2	0.0732	2.30E+00 N	N/A	N/A	NO	BSL
7440-02-0	Nickel	0.46	J	2.6	J	mg/kg	IR84-DP84-00	13/13	(4)	2.6	1.0454	1.60E+02 N	N/A	N/A	NO	BSL
7440-09-7	Potassium	70.2	J	258	J	mg/kg	IR84-DP76-00	7/13	34.8U - 75.9U	258	89.1538	N/A	N/A	N/A	NO	NUT
7782-49-2	Selenium	0.365	J	0.61		mg/kg	IR84-DP74-00	2/13	0.33U - 0.43U	0.61	0.3194	3.90E+01 N	N/A	N/A	NO	BSL
7440-62-2	Vanadium	2.5	J	10.4		mg/kg	IR84-DP76-00	13/13	(4)	10.4	5.9918	5.50E+01 N	N/A	N/A	NO	BSL
7440-66-6	Zinc	1.3	J	40.7	J	mg/kg	IR84-DP82-00	13/13	(4)	40.7	10.748	2.30E+03 N	N/A	N/A	NO	BSL

(1) MCB Camp Lejeune Base Background Study, Final (Baker, 2001): 2 * Mean (1/2 nondetects)
(2) All non-carcinogenic criteria were divided by 10 to account for potential additive effects of chemicals
USEPA Region IX COC Screening Value (derived from USEPA Region IX PRG Table)
(3) Rationale Codes Selection Reason: Above Screening Levels (ASL)
Deletion Reason: Essential Nutrient (NUT)
Below Screening Level (BSL)

(4) No detection limits given; analyte detected in every sample.
(5) Screening values for naphthalene used as a surrogate
(6) Screening value for pyrene used as a surrogate.
(7) Screening value for chlordane used as a surrogate.
(8) Screening value for endosulfan used as a surrogate.
(9) Screening value for endrin used as a surrogate.
(10) Action level for lead.

Definitions: N/A = Not applicable
NA = Not Analyzed
COPC = Chemical of Potential Concern
ARAR/TBC = arplicable or Relevant and arpropriate Requirement/To Be Considered

J - Analyte present - Reported value is estimated
* = (Inorganics) Duplicate analysis was not within control limits
U - Not detected
UJ - Reported quantitation limit is qualified as estimated

C = Carcinogenic
N = Non-Carcinogenic
S = Soil Saturation

mg/kg = milligrams per kilogram
ug/kg = microgram per kilogram

TABLE 2.2A
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Subsurface Soil
Exposure Medium: Subsurface Soil
Exposure Point: Subsurface Soil

CAS Number	Chemical	Minimum Concentration	Minimum Qualifier	Maximum Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening	Background Value [1]	Screening [2] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [3] Contaminant Deletion or Selection
	VOLATILES (ug/kg)															
540-59-0	1,2-Dichloroethene (total)	91	J	91	J	µg/kg	IR84-DP82-04	1/23	1.3U - 93U	91	NA	4.30E+03 N [5]	N/A	N/A	NO	BSL
78-93-3	2-Butanone (MEK)	3.8	J	3.8	J	µg/kg	IR84-MW21-04	1/23	2.6U - 260U	3.8	NA	7.30E+05 N	N/A	N/A	NO	BSL
67-64-1	Acetone	14	J	18	J	µg/kg	IR84-MW21-04	2/23	2U - 940U	18	NA	1.60E+05 N	N/A	N/A	NO	BSL
71-43-2	Benzene	120	J	160	J	µg/kg	84-MW15-04	2/23	0.62U - 54U	160	NA	6.50E+02 C	N/A	N/A	NO	BSL
67-66-3	Chloroform	0.98	J	0.98	J	µg/kg	IR84-MW22-02	1/23	0.81U - 32U	0.98	NA	2.40E+02 C	N/A	N/A	NO	BSL
100-41-4	Ethylbenzene	0.89	J	1,300		µg/kg	IR84-DP75-05	5/23	0.56U - 15U	1,300	NA	2.30E+05 S	N/A	N/A	NO	BSL
75-09-2	Methylene Chloride	1.3	J	1.3	J	µg/kg	IR84-DP78-03	1/23	1.2U - 270U	1.3	NA	8.90E+03 C	N/A	N/A	NO	BSL
100-42-5	Styrene	2.1	J	2.1	J	µg/kg	IR84-MW23-01	1/23	0.47U - 54U	2.1	NA	1.70E+06 S	N/A	N/A	NO	BSL
108-88-3	Toluene	75	J	75	J	µg/kg	IR84-DP75-05	1/23	0.5U - 310U	75	NA	5.20E+05 S	N/A	N/A	NO	BSL
1330-20-7	Xylenes, total	4.1	J	3,100		µg/kg	IR84-DP75-05	4/23	1.8U - 63U	3,100	NA	2.10E+05 S	N/A	N/A	NO	BSL
	SEMIVOLATILES (ug/kg)															
91-57-6	2-Methylnaphthalene	1,000		27,000		µg/kg	84-MW15-04	3/31	50U - 130U	27,000	NA	5.60E+03 N [6]	N/A	N/A	YES	ASL
83-32-9	Acenaphthene	61	J	950	J	µg/kg	IR84-DP15-03	4/31	53U - 640U	950	NA	3.70E+05 N	N/A	N/A	NO	BSL
120-12-7	Anthracene	190	J	830	J	µg/kg	IR84-DP46-02	3/31	51U - 630U	830	NA	2.20E+06 N	N/A	N/A	NO	BSL
56-55-3	Benzo(a)anthracene	640		3,000		µg/kg	IR84-DP46-02	3/31	57U - 700U	3,000	NA	6.20E+02 C	N/A	N/A	YES	ASL
50-32-8	Benzo(a)pyrene	590		2,600		µg/kg	IR84-DP46-02	3/31	63U - 770U	2,600	NA	6.20E+01 C	N/A	N/A	YES	ASL
205-99-2	Benzo(b)fluoranthene	68	J	2,800		µg/kg	IR84-DP46-02	5/31	60U - 740U	2,800	NA	6.20E+02 C	N/A	N/A	YES	ASL
191-24-2	Benzo(g,h,i)perylene	65	J	1,200		µg/kg	IR84-DP46-02	5/31	57U - 700U	1,200	NA	2.30E+05 N [4]	N/A	N/A	NO	BSL
207-08-9	Benzo(k)fluoranthene	280	J	1,700		µg/kg	IR84-DP46-02	3/31	55U - 680U	1,700	NA	6.20E+03 C	N/A	N/A	YES	CHEM
111-91-1	Bis(2-chloroethoxy)methane	54		54		µg/kg	IR84-DP81-04	1/31	49U - 600U	54	NA	N/A	N/A	N/A	YES	NSC
117-81-7	Bis(2-ethylhexyl)phthalate	91	J	1,800		µg/kg	IR84-MW22-02	7/31	56U - 690U	1,800	NA	3.50E+04 C	N/A	N/A	NO	BSL
86-74-8	Carbazole	110	J	480	J	µg/kg	IR84-DP46-02	3/31	54U - 660U	480	NA	2.40E+04 C	N/A	N/A	YES	CHEM
218-01-9	Chrysene	57	J	3,100		µg/kg	IR84-DP46-02	5/31	48U - 590U	3,100	NA	6.20E+04 C	N/A	N/A	YES	CHEM
53-70-3	Dibenz(a,h)anthracene	98	J	430	J	µg/kg	IR84-DP46-02	3/31	53U - 650U	430	NA	6.20E+01 C	N/A	N/A	YES	ASL
132-64-9	Dibenzofuran	160	J	1,300	J	µg/kg	IR84-DP15-03	3/31	52U - 620U	1,300	NA	2.90E+04 N	N/A	N/A	NO	BSL
206-44-0	Fluoranthene	74	J	4,800		µg/kg	IR84-DP46-02	5/31	58U - 720U	4,800	NA	2.30E+05 N	N/A	N/A	NO	BSL
86-73-7	Fluorene	61	J	1,500	J	µg/kg	IR84-DP15-03	5/31	50U - 600U	1,500	NA	2.60E+05 N	N/A	N/A	NO	BSL
77-47-4	Hexachlorocyclopentadiene	94	J	94	J	µg/kg	IR84-DP47-01	1/31	63U - 770U	94	NA	4.20E+04 N	N/A	N/A	NO	BSL
193-39-5	Indeno(1,2,3-cd)pyrene	340	J	1,200		µg/kg	IR84-DP46-02	3/31	73U - 890U	1,200	NA	6.20E+02 C	N/A	N/A	YES	ASL
91-20-3	Naphthalene	55	J	8,500		µg/kg	84-MW15-04	4/31	51U - 140U	8,500	NA	5.60E+03 N	N/A	N/A	YES	ASL
85-01-8	Phenanthrene	150	J	3,400	J	µg/kg	84-MW15-04,IR84-DP15-03	6/31	54U - 78U	3,400	NA	2.30E+05 N [4]	N/A	N/A	NO	BSL
85-44-9	Phthalic anhydride	120	NJ	170	NJ	µg/kg	IR84-SB04-02	2/2	(4)	170	NA	1.00E+08 M	N/A	N/A	NO	BSL
129-00-0	Pyrene	69	J	4,100		µg/kg	IR84-DP46-02	5/31	53U - 650U	4,100	NA	2.30E+05 N	N/A	N/A	NO	BSL
	PESTICIDES / PCBs (ug/kg)															
72-54-8	4,4'-DDD	1.1675	J	46	J	µg/kg	IR84-DP45-03	7/31	0.82U - 880U	46	NA	2.40E+03 C	N/A	N/A	NO	BSL
72-55-9	4,4'-DDE	1.155	J	16		µg/kg	IR84-DP52-01	5/31	0.59U - 630U	16	NA	1.70E+03 C	N/A	N/A	NO	BSL
50-29-3	4,4'-DDT	2.5		120	J	µg/kg	IR84-DP52-01	5/31	1.4U - 1400U	120	NA	1.70E+03 C	N/A	N/A	NO	BSL
319-85-7	BHC, beta-	1.7	J	1.7	J	µg/kg	84-MW17-07	1/31	0.48U - 510U	1.7	NA	3.20E+02 C	N/A	N/A	NO	BSL
5103-71-9	Chlordane, alpha-	5.9	J	14,000	J	µg/kg	IR84-DP47-01	7/31	0.61U - 3.8U	14,000	NA	1.60E+03 C [8]	N/A	N/A	YES	ASL
5103-74-2	Chlordane, gamma-	6.3		18,000		µg/kg	IR84-DP47-01	7/31	0.59U - 3.6U	18,000	NA	1.60E+03 C [8]	N/A	N/A	YES	ASL
60-57-1	Dieldrin	1.4	J	2.4		µg/kg	IR84-SB01-02	3/31	1.6U - 1700U	2.4	NA	3.00E+01 C	N/A	N/A	NO	BSL
7421-93-4	Endrin Aldehyde	10	J	10	J	µg/kg	IR84-DP15-03	1/31	1.6U - 1700U	10	NA	1.80E+03 N [9]	N/A	N/A	NO	BSL
76-44-8	Heptachlor	1.6	J	6,900		µg/kg	IR84-DP47-01	6/31	0.64U - 3.9U	6,900	NA	1.10E+02 C	N/A	N/A	YES	ASL
1024-57-3	Heptachlor Epoxide	63	J	200	J	µg/kg	IR84-DP46-02	2/31	0.69U - 730U	200	NA	5.30E+01 C	N/A	N/A	YES	ASL
72-43-5	Methoxychlor	2.9	J	24	J	µg/kg	IR84-DP15-03	3/31	0.85U - 910U	24	NA	3.10E+04 N	N/A	N/A	NO	BSL
12672-29-6	Aroclor-1248	47,000		47,000		µg/kg	IR84-DP47-01	1/37	4.8U - 530U	47,000	NA	2.20E+02 C	N/A	N/A	YES	ASL
11097-69-1	Aroclor-1254	5,000		5,000		µg/kg	IR84-DP46-02	1/37	21U - 2300U	5,000	NA	2.20E+02 C	N/A	N/A	YES	ASL
11096-82-5	Aroclor-1260	13	J	45,000		µg/kg	IR84-DP18-02	11/37	7.8U - 820U	45,000	NA	2.20E+02 C	N/A	N/A	YES	ASL

TABLE 2.2A (Continued)
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Subsurface Soil
Exposure Medium: Subsurface Soil
Exposure Point: Subsurface Soil

CAS Number	Chemical	Minimum Concentration	Minimum Qualifier	Maximum Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening	Background Value [1]	Screening [2] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [3] Contaminant Deletion or Selection
	TOTAL PETROLEUM HYDROCARBONS															
86290-81-5	Gasoline Range Organics (ug/kg)	220		580,000		µg/kg	IR84-DP15-03	2/8	18U - 19U	580,000	NA	N/A	N/A	N/A	YES	NSC
68334-30-5	Diesel Range Organics (mg/kg)	15		5,500		mg/kg	IR84-DP15-03	8/8	(4)	5,500	ND	N/A	N/A	N/A	YES	NSC
	METALS (mg/kg)															
7429-90-5	Aluminum	589		7,210		mg/kg	IR84-DP77-03	31/31	(4)	7,210	7216.4828	7.60E+03 N	N/A	N/A	NO	BSL
7440-36-0	Antimony	0.6	J	1.3	B	mg/kg	IR84-DP15-03	7/31	0.51UJ - 0.74U	1.3	0.3762	3.10E+00 N	N/A	N/A	NO	BSL
7440-38-2	Arsenic	0.33	J	2		mg/kg	IR84-DP15-03	27/31	0.31U - 0.39U	2	0.4976	3.90E-01 C	N/A	N/A	YES	ASL
7440-39-3	Barium	0.92	J	24.3		mg/kg	IR84-DP49-01	20/31	2.9U - 56.6U	24.3	11.3358	5.40E+02 N	N/A	N/A	NO	BSL
7440-41-7	Beryllium	0.051	J	0.13	B	mg/kg	IR84-DP15-03	5/31	0.05U - 0.12U	0.13	0.0686	1.50E+01 N	N/A	N/A	NO	BSL
7440-43-9	Cadmium	0.03675	J	0.18	J	mg/kg	IR84-DP49-01	7/31	0.045U - 0.065U	0.18	ND	3.70E+00 N	N/A	N/A	NO	BSL
7440-70-2	Calcium	71.4	J	66,800	J	mg/kg	IR84-SB03-02	31/31	(4)	66,800	116.3862	N/A	N/A	N/A	NO	NUT
18540-29-9	Chromium VI	1.2		9.9		mg/kg	IR84-DP45-03	31/31	(4)	9.9	ND	3.00E+01 C	N/A	N/A	NO	BSL
7440-48-4	Cobalt	0.16	J	0.69	J	mg/kg	IR84-DP52-01	25/31	0.16U - 0.19U	0.69	0.3964	4.70E+02 N	N/A	N/A	NO	BSL
7440-50-8	Copper	0.34	J	25.5		mg/kg	IR84-DP50-01	27/31	0.28U - 0.33U	25.5	1.5224	2.90E+02 N	N/A	N/A	NO	BSL
7439-89-6	Iron	155		6,140		mg/kg	IR84-DP15-03	31/31	(4)	6,140	2423.8344	2.30E+03 N	N/A	N/A	YES	ASL
7439-92-1	Lead	0.87		52.7		mg/kg	IR84-DP49-01	31/31	(4)	52.7	5.7656	4.00E+02 N [10]	N/A	N/A	NO	BSL
7439-95-4	Magnesium	16.4	J	943		mg/kg	IR84-SB03-02	31/31	(4)	943	187.6828	N/A	N/A	N/A	NO	NUT
7439-96-5	Manganese	0.48	J	50.5		mg/kg	IR84-SB03-02	31/31	(4)	50.5	5.3896	1.80E+02 N	N/A	N/A	NO	BSL
7439-97-6	Mercury	0.01	J	0.055	J	mg/kg	IR84-DP46-02	22/31	0.0088U - 0.01U	0.055	0.0626	2.30E+00 N	N/A	N/A	NO	BSL
7440-02-0	Nickel	0.42	J	3.5	J	mg/kg	IR84-DP50-01	30/31	0.32U - 0.32U	3.5	1.5576	1.60E+02 N	N/A	N/A	NO	BSL
7440-09-7	Potassium	21.3	J	195	J	mg/kg	IR84-DP77-03	26/31	32.9U - 79.8U	195	162.6276	N/A	N/A	N/A	NO	NUT
7782-49-2	Selenium	0.295	J	0.73		mg/kg	IR84-SB03-02	8/31	0.32U - 0.82U	0.73	0.4128	3.90E+01 N	N/A	N/A	NO	BSL
7440-23-5	Sodium	89.7	J	89.7	J	mg/kg	IR84-SB03-02	1/31	52.1U - 75.4U	89.7	ND	N/A	N/A	N/A	NO	NUT
7440-28-0	Thallium	0.64	J	0.9	J	mg/kg	IR84-SB03-02	5/31	0.52U - 0.75U	0.9	ND	5.20E-01 N	N/A	N/A	YES	ASL
7440-62-2	Vanadium	1.1	J	11.2		mg/kg	IR84-DP15-03	31/31	(4)	11.2	9.831	5.50E+01 N	N/A	N/A	NO	BSL
7440-66-6	Zinc	1.4	J	42.6	J	mg/kg	IR84-DP49-01	27/31	1.3U - 1.5U	42.6	3.0842	2.30E+03 N	N/A	N/A	NO	BSL

(1) MCB Camp Lejeune Base Background Study, Final (Baker, 2001): 2 * Mean (1/2 nondetects)
(2) All non-carcinogenic criteria were divided by 10 to account for potential additive effects of chemicals
USEPA Region IX COC Screening Value (derived from USEPA Region IX PRG Table)
(3) Rationale Codes
Selection Reason: Same chemical class (CHEM)
No Screening Criteria (NSC)
Above Screening Levels (ASL)
Deletion Reason: Essential Nutrient (NUT)
Below Screening Level (BSL)

(4) No detection limits given; analyte detected in every sample.
(5) Screening value for 1,2-dichloroethene (cis) used as a surrogate.
(6) Screening values for naphthalene used as a surrogate
(7) Screening value for pyrene used as a surrogate.
(8) Screening value for chlordane used as a surrogate.
(9) Screening value for endrin used as a surrogate.
(10) Action level for lead.

Definitions: N/A = Not applicable
NA = Not Analyzed
ND = Not Detected
COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered

J - Analyte present - Reported value is estimated
NJ - Presumptive evidence for the presence of the material at an estimated value
B - Constituent was detected in a blank
U - Not detected
UJ - Reported quantitation limit is qualified as estimated

C = Carcinogenic
N = Non-Carcinogenic
S = Soil Saturation
M = Max, Ceiling Limit

mg/kg = milligrams per kilogram
ug/kg = microgram per kilogram

TABLE 2.2B
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Subsurface Soil
Exposure Medium: Subsurface Soil
Exposure Point: Subsurface Soil

CAS Number	Chemical	Minimum Concentration	Minimum Qualifier	Maximum Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening	Background Value [1]	Screening [2] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [3] Contaminant Deletion or Selection
	VOLATILES (ug/kg)															
540-59-0	1,2-Dichloroethene (total)	91	J	91	J	µg/kg	IR84-DP82-04	1/14	1.4U - 93U	91	NA	4.30E+03 N [5]	N/A	N/A	NO	BSL
78-93-3	2-Butanone (MEK)	3.8	J	3.8	J	µg/kg	IR84-MW21-04	1/14	2.7U - 260U	3.8	NA	7.30E+05 N	N/A	N/A	NO	BSL
67-64-1	Acetone	14	J	18	J	µg/kg	IR84-MW21-04	2/14	2.1U - 940U	18	NA	1.60E+05 N	N/A	N/A	NO	BSL
71-43-2	Benzene	160	J	160	J	µg/kg	84-MW15-04	1/14	0.64U - 54U	160	NA	6.50E+02 C	N/A	N/A	NO	BSL
100-41-4	Ethylbenzene	0.89	J	1,000		µg/kg	84-MW15-04	4/14	0.58U - 15U	1,000	NA	2.30E+05 S	N/A	N/A	NO	BSL
75-09-2	Methylene Chloride	1.3	J	1.3	J	µg/kg	IR84-DP78-03	1/14	1.3U - 270U	1.3	NA	8.90E+03 C	N/A	N/A	NO	BSL
100-42-5	Styrene	2.1	J	2.1	J	µg/kg	IR84-MW23-01	1/14	0.49U - 54U	2.1	NA	1.70E+06 S	N/A	N/A	NO	BSL
1330-20-7	Xylenes, total	4.1	J	2,800		µg/kg	84-MW15-04	3/14	1.9U - 63U	2,800	NA	2.10E+05 S	N/A	N/A	NO	BSL
	SEMIVOLATILES (ug/kg)															
91-57-6	2-Methylnaphthalene	9,100		27,000		µg/kg	84-MW15-04	2/18	50U - 72U	27,000	NA	5.60E+03 N [6]	N/A	N/A	YES	ASL
83-32-9	Acenaphthene	950	J	950	J	µg/kg	IR84-DP15-03	1/18	53U - 640U	950	NA	3.70E+05 N	N/A	N/A	NO	BSL
205-99-2	Benzo(b)fluoranthene	68	J	68	J	µg/kg	IR84-SB01-02	1/18	60U - 740U	68	NA	6.20E+02 C	N/A	N/A	NO	BSL
111-91-1	Bis(2-chloroethoxy)methane	54		54		µg/kg	IR84-DP81-04	1/18	49U - 600U	54	NA	N/A	N/A	N/A	YES	NSC
117-81-7	Bis(2-ethylhexyl)phthalate	91	J	381	J	µg/kg	IR84-DP79-02	4/18	56U - 690U	381	NA	3.50E+04 C	N/A	N/A	NO	BSL
218-01-9	Chrysene	59	J	59	J	µg/kg	IR84-SB03-02	1/18	48U - 590U	59	NA	6.20E+04 C	N/A	N/A	NO	BSL
132-64-9	Dibenzofuran	1,300	J	1,300	J	µg/kg	IR84-DP15-03	1/18	52U - 620U	1,300	NA	2.90E+04 N	N/A	N/A	NO	BSL
206-44-0	Fluoranthene	82	J	82	J	µg/kg	IR84-SB03-02	1/18	58U - 720U	82	NA	2.30E+05 N	N/A	N/A	NO	BSL
86-73-7	Fluorene	1,500	J	1,500	J	µg/kg	IR84-DP15-03	1/18	50U - 600U	1,500	NA	2.60E+05 N	N/A	N/A	NO	BSL
91-20-3	Naphthalene	2,000	J	8,500		µg/kg	84-MW15-04	2/18	51U - 74U	8,500	NA	5.60E+03 N	N/A	N/A	YES	ASL
85-01-8	Phenanthrene	3,400	J	3,400	J	µg/kg	84-MW15-04,IR84-DP15-03	2/18	54U - 78U	3,400	NA	2.30E+05 N [7]	N/A	N/A	NO	BSL
85-44-9	Phthalic anhydride	120	NJ	170	NJ	µg/kg	IR84-SB04-02	2/2	(4)	170	NA	1.00E+08 M	N/A	N/A	NO	BSL
129-00-0	Pyrene	91	J	91	J	µg/kg	IR84-SB03-02	1/18	53U - 650U	91	NA	2.30E+05 N	N/A	N/A	NO	BSL
	PESTICIDES/PCBs (ug/kg)															
72-54-8	4,4'-DDD	2.4		9.1	J	µg/kg	IR84-DP15-03	3/18	0.82U - 2U	9.1	NA	2.40E+03 C	N/A	N/A	NO	BSL
72-55-9	4,4'-DDE	2.2		4.4		µg/kg	IR84-SB03-02	2/18	0.59U - 3.6U	4.4	NA	1.70E+03 C	N/A	N/A	NO	BSL
50-29-3	4,4'-DDT	2.5		8.7		µg/kg	IR84-SB03-02	2/18	1.4U - 8.3U	8.7	NA	1.70E+03 C	N/A	N/A	NO	BSL
319-85-7	BHC, beta-	1.7	J	1.7	J	µg/kg	84-MW17-07	1/18	0.48U - 2.9U	1.7	NA	3.20E+02 C	N/A	N/A	NO	BSL
5103-71-9	Chlordane, alpha-	5.9	J	5.9	J	µg/kg	IR84-SB03-02	1/18	0.61U - 3.8U	5.9	NA	1.60E+03 C [8]	N/A	N/A	NO	BSL
5103-74-2	Chlordane, gamma-	6.3		6.3		µg/kg	IR84-SB03-02	1/18	0.59U - 3.6U	6.3	NA	1.60E+03 C [8]	N/A	N/A	NO	BSL
60-57-1	Dieldrin	2.4		2.4		µg/kg	IR84-SB01-02	1/18	1.6U - 9.6U	2.4	NA	3.00E+01 C	N/A	N/A	NO	BSL
7421-93-4	Endrin Aldehyde	10	J	10	J	µg/kg	IR84-DP15-03	1/18	1.6U - 4.5U	10	NA	1.80E+03 N [9]	N/A	N/A	NO	BSL
72-43-5	Methoxychlor	2.9	J	24	J	µg/kg	IR84-DP15-03	2/18	0.85U - 2.5U	24	NA	3.10E+04 N	N/A	N/A	NO	BSL
11096-82-5	Aroclor-1260	13	J	45,000		µg/kg	IR84-DP18-02	8/24	7.8U - 11U	45,000	NA	2.20E+02 C	N/A	N/A	YES	ASL
	TOTAL PETROLEUM HYDROCARBONS															
86290-81-5	Gasoline Range Organics (ug/kg)	580,000		580,000		µg/kg	IR84-DP15-03	1/1	(4)	580,000	NA	N/A	N/A	N/A	YES	NSC
68334-30-5	Diesel Range Organics (mg/kg)	5,500		5,500		mg/kg	IR84-DP15-03	1/1	(4)	5,500	ND	N/A	N/A	N/A	YES	NSC

TABLE 2.2B (Continued)
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Subsurface Soil
Exposure Medium: Subsurface Soil
Exposure Point: Subsurface Soil

CAS Number	Chemical	Minimum Concentration	Minimum Qualifier	Maximum Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening	Background Value [1]	Screening [2] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [3] Contaminant Deletion or Selection
	METALS (mg/kg)															
7429-90-5	Aluminum	589		7,210		mg/kg	IR84-DP77-03	18/18	(4)	7,210	7216.4828	7.60E+03 N	N/A	N/A	NO	BSL
7440-36-0	Antimony	1.3	B	1.3	B	mg/kg	IR84-DP15-03	1/18	0.51UJ - 0.74U	1.3	0.3762	3.10E+00 N	N/A	N/A	NO	BSL
7440-38-2	Arsenic	0.33	J	2		mg/kg	IR84-DP15-03	15/18	0.31U - 0.35U	2	0.4976	3.90E-01 C	N/A	N/A	YES	ASL
7440-39-3	Barium	0.92	J	21.6	B	mg/kg	IR84-MW23-01	11/18	4U - 56.6U	21.6	11.3358	5.40E+02 N	N/A	N/A	NO	BSL
7440-41-7	Beryllium	0.1	B	0.13	B	mg/kg	IR84-DP15-03	2/18	0.05U - 0.12U	0.13	0.0686	1.50E+01 N	N/A	N/A	NO	BSL
7440-43-9	Cadmium	0.097	J	0.12	J	mg/kg	IR84-SB03-02	2/18	0.045U - 0.065U	0.12	ND	3.70E+00 N	N/A	N/A	NO	BSL
7440-70-2	Calcium	71.4	J	66,800	J	mg/kg	IR84-SB03-02	18/18	(4)	66,800	116.3862	N/A	N/A	N/A	NO	NUT
7440-47-3	Chromium	1.2		9.7		mg/kg	IR84-DP15-03	18/18	(4)	9.7	8.8572	2.10E+02 C	N/A	N/A	NO	BSL
7440-48-4	Cobalt	0.16	J	0.68	J	mg/kg	IR84-DP15-03	14/18	0.16U - 0.18U	0.68	0.3964	4.70E+02 N	N/A	N/A	NO	BSL
7440-50-8	Copper	0.34	J	5.1		mg/kg	IR84-DP15-03	14/18	0.28U - 0.33U	5.1	1.5224	2.90E+02 N	N/A	N/A	NO	BSL
7439-89-6	Iron	475		6,140		mg/kg	IR84-DP15-03	18/18	(4)	6,140	2423.8344	2.30E+03 N	N/A	N/A	YES	ASL
7439-92-1	Lead	0.87		11.4		mg/kg	IR84-DP15-03	18/18	(4)	11.4	5.7656	4.00E+02 N [10]	N/A	N/A	NO	BSL
7439-95-4	Magnesium	16.4	J	943		mg/kg	IR84-SB03-02	18/18	(4)	943	187.6828	N/A	N/A	N/A	NO	NUT
7439-96-5	Manganese	0.48	J	50.5		mg/kg	IR84-SB03-02	18/18	(4)	50.5	5.3896	1.80E+02 N	N/A	N/A	NO	BSL
7439-97-6	Mercury	0.0116	J	0.037	J	mg/kg	IR84-MW21-04	10/18	0.0088U - 0.01U	0.037	0.0626	2.30E+00 N	N/A	N/A	NO	BSL
7440-02-0	Nickel	0.42	J	2.3	J	mg/kg	IR84-DP15-03	17/18	0.32U - 0.32U	2.3	1.5576	1.60E+02 N	N/A	N/A	NO	BSL
7440-09-7	Potassium	21.3	J	195	J	mg/kg	IR84-DP77-03	14/18	32.9U - 73.2U	195	162.6276	N/A	N/A	N/A	NO	NUT
7782-49-2	Selenium	0.39	J	0.73		mg/kg	IR84-SB03-02	5/18	0.32U - 0.82U	0.73	0.4128	3.90E+01 N	N/A	N/A	NO	BSL
7440-23-5	Sodium	89.7	J	89.7	J	mg/kg	IR84-SB03-02	1/18	52.1U - 75.4U	89.7	ND	N/A	N/A	N/A	NO	NUT
7440-28-0	Thallium	0.65	J	0.9	J	mg/kg	IR84-SB03-02	4/18	0.52U - 0.75U	0.9	ND	5.20E-01 N	N/A	N/A	YES	ASL
7440-62-2	Vanadium	1.1	J	11.2		mg/kg	IR84-DP15-03	18/18	(4)	11.2	9.831	5.50E+01 N	N/A	N/A	NO	BSL
7440-66-6	Zinc	1.4	J	33.2		mg/kg	IR84-SB03-02	15/18	1.3U - 1.5U	33.2	3.0842	2.30E+03 N	N/A	N/A	NO	BSL

(1) MCB Camp Lejeune Base Background Study, Final (Baker, 2001): 2 * Mean (1/2 nondetects)
(2) All non-carcinogenic criteria were divided by 10 to account for potential additive effects of chemicals
USEPA Region IX COC Screening Value (derived from USEPA Region IX PRG Table)
(3) Rationale Codes
Selection Reason: No Screening Criteria (NSC)
Above Screening Levels (ASL)
Deletion Reason: Essential Nutrient (NUT)
Below Screening Level (BSL)

(4) No detection limits given; analyte detected in every sample.
(5) Screening value for 1,2-dichloroethene (cis) used as a surrogate.
(6) Screening values for naphthalene used as a surrogate
(7) Screening value for pyrene used as a surrogate.
(8) Screening value for chlordane used as a surrogate.
(9) Screening value for endrin used as a surrogate.
(10) Action level for lead.

Definitions: N/A = Not applicable
NA = Not Analyzed
ND = Not Detected
COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered

J - Analyte present - Reported value is estimated
NJ - Presumptive evidence for the presence of the material at an estimated value
B - Constituent was detected in a blank
U - Not detected
UJ - Reported quantitation limit is qualified as estimated

C = Carcinogenic
N = Non-Carcinogenic
S = Soil Saturation
M = Max, Ceiling Limit

mg/kg = milligrams per kilogram
ug/kg = microgram per kilogram

TABLE 2.3
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
SITE 84 (BUILDING 45 AREA)
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Groundwater

CAS Number	Chemical	Minimum Concentration	Minimum Qualifier	Maximum Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening	Screening (1) Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for (2) Contaminant Deletion or Selection
	VOLATILES (ug/L)														
78-93-3	2-Butanone (MEK)	0.53	J	0.69	J	µg/L	IR84-MW22-01C	2/19	0.41U - 10U	0.69	1.90E+02 N	170	NC WQC	NO	BSL
71-43-2	Benzene	1.5	J	3.4	J	µg/L	AST781-GW03-98B	2/19	0.16U - 10U	3.4	3.50E-01 C	5	MCL	YES	ASL
75-15-0	Carbon Disulfide	0.49	J	0.49	J	µg/L	IR84-MW18-01C	1/19	0.2U - 10U	0.49	1.00E+02 N	N/A	N/A	NO	BSL
67-66-3	Chloroform	16		16		µg/L	AST781-GW11-98B,AST781-GW12-98B	2/19	0.14U - 10U	16	1.60E-01 C	100	MCL	YES	ASL
74-87-3	Chloromethane	0.17	J	0.62	J	µg/L	IR84-MW18-01C	2/19	0.13U - 10U	0.62	1.50E+00 C	N/A	N/A	NO	BSL
100-41-4	Ethylbenzene	0.6	J	6.7	J	µg/L	AST781-GW04-98B	4/19	0.12U - 10U	6.7	1.30E+02 N	700	MCL	NO	BSL
1634-04-4	Methyl Tert-Butyl Ether (MTBE)	0.52	J	0.52	J	µg/L	IR84-MW16-01C	1/19	0.13U - 10U	0.52	2.00E+01 N/C	200	NC WQC	NO	BSL
75-09-2	Methylene Chloride	0.37	J	0.7	J	µg/L	IR84-MW22-01C	3/19	0.34U - 10U	0.7	4.30E+00 C	5	NC WQC	NO	BSL
79-01-6	Trichloroethene (TCE)	0.19	J	0.19	J	µg/L	IR84-MW17-01C	1/19	0.14U - 10U	0.19	1.60E+00 C	5	MCL	NO	BSL
1330-20-7	Xylenes, total	1.8		1.8		µg/L	IR84-MW17-01C	1/19	0.33U - 10U	1.8	1.40E+02 N	10000	MCL	NO	BSL
	SEMIVOLATILES (ug/L)														
91-57-6	2-Methylnaphthalene	1.05	J	1.05	J	µg/L	IR84-MW20-01C	1/13	0.64U - 0.64U	1.05	6.20E-01 N (4)	N/A	N/A	YES	ASL
91-20-3	Naphthalene	2.2	J	2.2	J	µg/L	IR84-MW22-01C	1/13	0.75U - 0.75U	2.2	6.20E-01 N	21	NC WQC	YES	ASL
	PESTICIDES / PCBs (ug/L)														
72-54-8	4,4'-DDD	0.0285	J	0.044	J	µg/L	IR84-MW18-01C	3/13	0.0064U - 0.13U	0.044	2.80E-01 C	N/A	N/A	NO	BSL
72-55-9	4,4'-DDE	0.025	J	0.025	J	µg/L	IR84-MW20-01C	1/13	0.0074U - 0.15U	0.025	2.00E-01 C	N/A	N/A	NO	BSL
50-29-3	4,4'-DDT	0.029	J	0.046	J	µg/L	IR84-MW21-01C	3/13	0.0072U - 0.14U	0.046	2.00E-01 C	N/A	N/A	NO	BSL
319-85-7	BHC, beta-	0.01405	J	0.029	J	µg/L	IR84-MW21-01C	4/13	0.0062U - 0.12U	0.029	3.70E-02 C	N/A	N/A	NO	BSL
5103-74-2	Chlordane, gamma-	0.04	J	0.04	J	µg/L	IR84-MW18-01C	1/13	0.0065U - 0.13U	0.04	1.90E-01 C (5)	0.027	NC WQC	NO	BSL
959-98-8	Endosulfan I	0.023	J	0.023	J	µg/L	IR84-MW18-01C	1/13	0.0069U - 0.14U	0.023	2.20E+01 N (6)	N/A	N/A	NO	BSL
1024-57-3	Heptachlor Epoxide	0.0167	J	0.0167	J	µg/L	IR84-MW20-01C	1/13	0.0068U - 0.14U	0.0167	7.40E-03 C	0.2	MCL	YES	ASL
	HERBICIDES (ug/L)														
88-85-7	Dinoseb	0.015	J	1.5	J	µg/L	IR84-MW17-01C	4/13	0.013U - 0.13U	1.5	3.60E+00 N	7	MCL	NO	BSL
94-74-6	MCPA	44	J	44	J	µg/L	IR84-MW18-01C	1/13	8U - 80U	44	1.80E+00 N	N/A	N/A	YES	ASL
	METALS (mg/L)														
7429-90-5	Aluminum	0.44		0.73		µg/L	IR84-MW17-01C	9/13	0.11U - 0.225U	0.73	3.60E+00 N	50	sMCL	NO	BSL
7440-36-0	Antimony	0.0022	J	0.011	J	µg/L	IR84-MW17-01C	3/13	0.0022U - 0.0022U	0.011	1.50E-03 N	6	MCL	YES	ASL
7440-38-2	Arsenic	0.0074	J	0.03		µg/L	IR84-MW08-01C	3/13	0.0039U - 0.0039U	0.03	4.50E-05 C	50	MCL	YES	ASL
7440-39-3	Barium	0.0036	J	0.12	J	µg/L	IR84-MW18-01C	13/13	(3)	0.12	2.60E-01 N	2000	MCL	NO	BSL
7440-41-7	Beryllium	0.00057	J	0.0011	J	µg/L	IR84-MW10-01C,IR84-MW10-01C	13/13	(3)	0.0011	7.30E-03 N	4	MCL	NO	BSL
7440-43-9	Cadmium	0.00056	J	0.00061	J	µg/L	IR84-MW23-01C	2/13	0.00028U - 0.00028U	0.00061	1.80E-03 N	5	MCL	NO	BSL
7440-70-2	Calcium	1.4	J	106		µg/L	IR84-MW07-01C	13/13	(3)	106	N/A	N/A	N/A	NO	NUT
18540-29-9	Chromium VI	0.0011	J	0.0022	J	µg/L	IR84-MW19-01C	3/13	0.0014U - 0.0014U	0.0022	1.10E-02 N	100	MCL (7)	NO	BSL
7440-48-4	Cobalt	0.0022	J	0.0057	J	µg/L	IR84-MW18-01C	3/13	0.0013U - 0.0013U	0.0057	2.20E-01 N	N/A	N/A	NO	BSL
7439-89-6	Iron	0.18		67.7		µg/L	IR84-MW08-01C	11/13	0.088U - 0.088U	67.7	1.10E+00 N	300	sMCL	YES	ASL
7439-95-4	Magnesium	0.34	J	11.3		µg/L	IR84-MW18-01C	13/13	(3)	11.3	N/A	N/A	N/A	NO	NUT
7439-96-5	Manganese	0.004	J	0.45		µg/L	IR84-MW07-01C	13/13	(3)	0.45	8.80E-02 N	50	sMCL	YES	ASL
7439-97-6	Mercury	0.000072	J	0.000072	J	µg/L	IR84-MW17-01C	1/13	0.000069U - 0.000069U	0.000072	1.10E-03 N	2	MCL	NO	BSL
7440-02-0	Nickel	0.0027	J	0.011	J	µg/L	IR84-MW18-01C	2/13	0.0022U - 0.0022U	0.011	7.30E-02 N	100	MCL	NO	BSL
7440-09-7	Potassium	0.86	J	11		µg/L	IR84-MW21-01C	10/13	0.26U - 0.69U	11	N/A	N/A	N/A	NO	NUT
7440-23-5	Sodium	2.1	J	22		µg/L	IR84-MW19-01C	13/13	(3)	22	N/A	N/A	N/A	NO	NUT
7440-28-0	Thallium	0.0054	J	0.0057	J	µg/L	IR84-MW08-01C	2/13	0.005U - 0.005U	0.0057	2.40E-04 N	2	MCL	YES	ASL
7440-62-2	Vanadium	0.00084	J	0.0037	J	µg/L	IR84-MW21-01C	9/13	0.00082U - 0.00082U	0.0037	2.60E-02 N	N/A	N/A	NO	BSL
7440-66-6	Zinc	0.013	J	0.31		µg/L	IR84-MW18-01C	3/13	0.012U - 0.012U	0.31	1.10E+00 N	5000	sMCL	NO	BSL

(1) All non-carcinogenic RBCs were divided by 10 to account for potential additive effects of chemicals
USEPA Region IX COC Screening Value (derived from USEPA Region IX PRG Table)

(2) Rationale Codes — Selection Reason: Above Screening Levels (ASL)
Deletion Reason: Essential Nutrient (NUT)
Below Screening Level (BSL)

(3) No detection limits given; analyte detected in every sample.
(4) Screening values for naphthalene used as a surrogate
(5) Screening value for chlordane used as a surrogate.

Definitions: N/A = Not Applicable
NA = Not Analyzed
C = Carcinogenic
N = Non-Carcinogenic
ug/L = microgram per liter

J - Analyte present - Reported value is estimated
U - Not detected
COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered

MCL = Maximum Contaminant Level
sMCL = Secondary Maximum Contaminant Level
NC WQC = North Carolina Water Quality Criteria (EHNR)

(6) Screening value for endosulfan used as a surrogate.
(7) Screening values for chromium (total) used.

TABLE 2.4
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
SITE 84 (BUILDING 45 AREA)
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Current, Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: Surface Water

CAS Number	Chemical	Minimum Concentration	Minimum Qualifier	Maximum Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening	Screening (1) Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for (2) Contaminant Deletion or Selection
	VOLATILES (ug/L)														
67-64-1	Acetone	5.6	J	5.6	J	µg/L	IR84-SW07-98B	1/1	(3)	5.6	N/A	N/A	N/A	YES	NSC
71-43-2	Benzene	1.2	J	1.2	J	µg/L	IR84-SW07-98B	1/1	(3)	1.2	1.20E+00	N/A	N/A	NO	BSL
108-88-3	Toluene	2.7	J	2.7	J	µg/L	IR84-SW07-98B	1/1	(3)	2.7	6.80E+03	N/A	N/A	NO	BSL
1330-20-7	Xylenes, total	3.5	J	3.5	J	µg/L	IR84-SW07-98B	1/1	(3)	3.5	N/A	N/A	N/A	YES	NSC

(1) All non-carcinogenic RBCs were divided by 10 to account for potential additive effects of chemicals
EPA Ambient Water Quality Criteria: Consumption of water and organisms

(2) Rationale Codes Selection Reason: No Screening Criteria (NSC)
Deletion Reason: Below Screening Level (BSL)

(3) No detection limits given; analyte detected in every sample.

Definitions: N/A = Not applicable
NA = Not Analyzed
COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered

J - Analyte present - Reported value is estimated

ug/L = microgram per liter

TABLE 2.4
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
SITE 84 (BUILDING 45 AREA)
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Current, Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: Surface Water

CAS Number	Chemical	Minimum Concentration	Minimum Qualifier	Maximum Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening	Screening (1) Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for (2) Contaminant Deletion or Selection
	VOLATILES (ug/L)														
67-64-1	Acetone	5.6	J	5.6	J	µg/L	IR84-SW07-98B	1/1	(3)	5.6	N/A	N/A	N/A	YES	NSC
71-43-2	Benzene	1.2	J	1.2	J	µg/L	IR84-SW07-98B	1/1	(3)	1.2	7.14E+01	N/A	N/A	NO	BSL
108-88-3	Toluene	2.7	J	2.7	J	µg/L	IR84-SW07-98B	1/1	(3)	2.7	N/A	N/A	N/A	YES	NSC
1330-20-7	Xylenes, total	3.5	J	3.5	J	µg/L	IR84-SW07-98B	1/1	(3)	3.5	N/A	N/A	N/A	YES	NSC

(1) North Carolina Surface Water Quality Standards (human health consumption of fish)
(2) Rationale Codes Selection Reason: No Screening Criteria (NSC)
Deletion Reason: Below Screening Level (BSL)

(3) No detection limits given; analyte detected in every sample.

Definitions: N/A = Not applicable
NA = Not Analyzed
COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered

ug/L = microgram per liter

J - Analyte present - Reported value is estimated

TABLE 2.5
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
SITE 84 (BUILDING 45 AREA)
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Current, Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Sediment

CAS Number	Chemical	Minimum Concentration	Minimum Qualifier	Maximum Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening	Screening (1) Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for (2) Contaminant Deletion or Selection
	VOLATILES (ug/kg)														
1330-20-7	Xylenes, total	910	J	910	J	µg/kg	IR84-SD07-98B	1/1	(3)	910	2.10E+05 S	N/A	N/A	NO	BSL
	SEMIVOLATILES (ug/kg)														
91-57-6	2-Methylnaphthalene	10,000		10,000		µg/kg	IR84-SD07-98B	1/1	(3)	10,000	5.60E+03 N (4)	N/A	N/A	YES	ASL
117-81-7	Bis(2-ethylhexyl)phthalate	2,400	J	2,400	J	µg/kg	IR84-SD07-98B	1/1	(3)	2,400	3.50E+04 C	N/A	N/A	NO	BSL
91-20-3	Naphthalene	2,000		2,000		µg/kg	IR84-SD07-98B	1/1	(3)	2,000	5.60E+03 N	N/A	N/A	NO	BSL
85-01-8	Phenanthrene	2,500		2,500		µg/kg	IR84-SD07-98B	1/1	(3)	2,500	2.30E+05 N (5)	N/A	N/A	NO	BSL
	PCBs (ug/kg)														
12672-29-6	Aroclor-1248	2,800		2,800		µg/kg	84-SD05-01	1/7	160U - 4700U	2,800	2.20E+02 C	N/A	N/A	YES	ASL
11096-82-5	Aroclor-1260	3,700		40,000		µg/kg	IR84-SD01-98B	7/7	(3)	40,000	2.20E+02 C	N/A	N/A	YES	ASL
	TOTAL PETROLEUM HYDROCARBONS														
68334-30-5	Diesel Range Organics (mg/kg)	3,500		11,600		mg/kg	IR84-SD01-98B	3/3	(3)	11,600	N/A	N/A	N/A	YES	NSC

(1) All non-carcinogenic RBCs were divided by 10 to account for potential additive effects of chemicals USEPA Region IX COC Screening Value (derived from USEPA Region IX PRG Table)

(2) Rationale Codes
Selection Reason: No Screening Criteria (NSC)
Above Screening Levels (ASL)
Deletion Reason: Below Screening Level (BSL)

(3) No detection limits given; analyte detected in every sample.
(4) Screening values for naphthalene used as a surrogate
(5) Screening value for pyrene used as a surrogate.

Definitions: N/A = Not applicable
NA = Not Analyzed
COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered

J - Analyte present - Reported value is estimated
U - Not detected

C = Carcinogenic
N = Non-Carcinogenic
S = Soil Saturation

mg/kg = milligrams per kilogram
ug/kg = microgram per kilogram

TABLE 3.1A
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Current, Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Surface Soil

Chemical of Potential Concern	Units	Arithmetic Mean	95% Upper Confidence Level (95% UCL)	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
2-Methylnaphthalene	mg/kg	3.87	1.96	92		mg/kg	1.96	W-Lognormal	(1)	1.96	W-Lognormal	(1)
Benzo(a)anthracene	mg/kg	8.48	69.0	190		mg/kg	69.0	W-Lognormal	(1)	69.0	W-Lognormal	(1)
Benzo(a)pyrene	mg/kg	6.80	30.5	150		mg/kg	30.5	W-Lognormal	(1)	30.5	W-Lognormal	(1)
Benzo(b)fluoranthene	mg/kg	7.75	40.9	170		mg/kg	40.9	W-Lognormal	(1)	40.9	W-Lognormal	(1)
Benzo(k)fluoranthene	mg/kg	5.34	18.7	120		mg/kg	18.7	W-Lognormal	(1)	18.7	W-Lognormal	(1)
Carbazole	mg/kg	1.78	3.16	38	J	mg/kg	3.16	W-Lognormal	(1)	3.16	W-Lognormal	(1)
Chrysene	mg/kg	8.18	96.0	180		mg/kg	96.0	W-Lognormal	(1)	96.0	W-Lognormal	(1)
Dibenz(a,h)anthracene	mg/kg	0.867	1.41	17	J	mg/kg	1.41	W-Lognormal	(1)	1.41	W-Lognormal	(1)
Fluoranthene	mg/kg	13.9	243	300		mg/kg	243	W-Lognormal	(1)	243	W-Lognormal	(1)
Indeno(1,2,3-cd)pyrene	mg/kg	2.81	8.79	59		mg/kg	8.79	W-Lognormal	(1)	8.79	W-Lognormal	(1)
Naphthalene	mg/kg	0.414	0.525	7.5	J	mg/kg	0.525	W-Lognormal	(1)	0.525	W-Lognormal	(1)
Pyrene	mg/kg	12.0	282	250		mg/kg	250	Max	(2)	250	Max	(2)
4,4'-DDD	mg/kg	0.189	4.81	3	J	mg/kg	3	Max	(2)	3	Max	(2)
Chlordane, alpha-	mg/kg	4.44	44,123	48	J	mg/kg	48	Max	(2)	48	Max	(2)
Chlordane, gamma-	mg/kg	5.35	75,346	58		mg/kg	58	Max	(2)	58	Max	(2)
Dieldrin	mg/kg	0.161	7.48	0.32		mg/kg	0.32	Max	(2)	0.32	Max	(2)
Heptachlor	mg/kg	1.91	1,785	22		mg/kg	22	Max	(2)	22	Max	(2)
Heptachlor Epoxide	mg/kg	0.418	47.6	4.5	J	mg/kg	4.5	Max	(2)	4.5	Max	(2)
Aroclor-1248	mg/kg	2.23	1.51	160		mg/kg	1.51	D-Lognormal	(1)	1.51	D-Lognormal	(1)
Aroclor-1254	mg/kg	0.953	0.975	51		mg/kg	0.975	D-Lognormal	(1)	0.975	D-Lognormal	(1)
Aroclor-1260	mg/kg	5.20	54.6	200		mg/kg	54.6	D-Lognormal	(1)	54.6	D-Lognormal	(1)
Gasoline Range Organics	mg/kg	0.0883	0.207	0.88		mg/kg	0.207	W-Lognormal	(1)	0.207	W-Lognormal	(1)
Diesel Range Organics	mg/kg	188	1,794	470		mg/kg	470	Max	(2)	470	Max	(2)
Antimony	mg/kg	0.82	1.22	3.3	J	mg/kg	1.22	W-Lognormal	(1)	1.22	W-Lognormal	(1)
Arsenic	mg/kg	1.93	3.49	9.1		mg/kg	3.49	W-Lognormal	(1)	3.49	W-Lognormal	(1)
Iron	mg/kg	1,934	2,260	3480		mg/kg	2,260	W-Lognormal	(1)	2,260	W-Lognormal	(1)
Thallium	mg/kg	0.29	0.31	0.6	J	mg/kg	0.31	W-Lognormal	(1)	0.31	W-Lognormal	(1)

EPC = Exposure Point Concentration
For non-detects, 1/2 sample quantitation limit was used as a proxy concentration.

(1) Conservative estimate of the arithmetic average concentration (95% UCL), based on the Shapiro-Wilks (W-) or D-Augostino (D-) distribution tests
(2) 95% UCL exceeds maximum detected concentration. Therefore, maximum concentration used for EPC.

TABLE 3.1B
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Current, Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Surface Soil

Chemical of Potential Concern	Units	Arithmetic Mean	95% Upper Confidence Level (95% UCL)	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
2-Methylnaphthalene	mg/kg	7.15	57.9	92		mg/kg	57.9	W-Lognormal	(1)	57.9	W-Lognormal	(1)
Benzo(a)anthracene	mg/kg	0.640	4.76	5.9		mg/kg	4.76	W-Lognormal	(1)	4.76	W-Lognormal	(1)
Benzo(a)pyrene	mg/kg	0.564	2.48	5.8		mg/kg	2.48	W-Lognormal	(1)	2.48	W-Lognormal	(1)
Benzo(b)fluoranthene	mg/kg	0.658	2.81	7.1		mg/kg	2.81	W-Lognormal	(1)	2.81	W-Lognormal	(1)
Benzo(k)fluoranthene	mg/kg	0.396	1.78	3.8		mg/kg	1.78	W-Lognormal	(1)	1.78	W-Lognormal	(1)
Carbazole	mg/kg	0.261	0.95	2.1		mg/kg	0.95	W-Lognormal	(1)	0.95	W-Lognormal	(1)
Chrysene	mg/kg	0.771	7.11	6.7		mg/kg	6.7	Max	(2)	6.7	Max	(2)
Dibenz(a,h)anthracene	mg/kg	0.191	0.695	1.2	J	mg/kg	0.695	W-Lognormal	(1)	0.695	W-Lognormal	(1)
Indeno(1,2,3-cd)pyrene	mg/kg	0.380	1.72	3.2		mg/kg	1.72	W-Lognormal	(1)	1.72	W-Lognormal	(1)
Dieldrin	mg/kg	0.00899	0.0877	0.052		mg/kg	0.052	Max	(2)	0.052	Max	(2)
Aroclor-1260	mg/kg	5.98	95.6	200		mg/kg	95.6	D-Lognormal	(1)	95.6	D-Lognormal	(1)
Arsenic	mg/kg	1.68	5.26	6.7		mg/kg	5.26	W-Lognormal	(1)	5.26	W-Lognormal	(1)
Iron	mg/kg	1,922	2,347	3480		mg/kg	2,347	W-Lognormal	(1)	2,347	W-Lognormal	(1)

EPC = Exposure Point Concentration
For non-detects, 1/2 sample quantitation limit was used as a proxy concentration.

(1) Conservative estimate of the arithmetic average concentration (95% UCL), based on the Shapiro-Wilks (W-) or D-Augostino (D-) distribution tests
(2) 95% UCL exceeds maximum detected concentration. Therefore, maximum concentration used for EPC.

TABLE 3.2A
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Subsurface Soil
Exposure Medium: Subsurface Soil
Exposure Point: Subsurface Soil

Chemical of Potential Concern	Units	Arithmetic Mean	95% Upper Confidence Level (95% UCL)	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
2-Methylnaphthalene	mg/kg	1.22	0.573	27		mg/kg	0.573	W-Lognormal	(1)	0.573	W-Lognormal	(1)
Benzo(a)anthracene	mg/kg	0.192	0.199	3		mg/kg	0.199	W-Lognormal	(1)	0.199	W-Lognormal	(1)
Benzo(a)pyrene	mg/kg	0.178	0.194	2.6		mg/kg	0.194	W-Lognormal	(1)	0.194	W-Lognormal	(1)
Benzo(b)fluoranthene	mg/kg	0.196	0.217	2.8		mg/kg	0.217	W-Lognormal	(1)	0.217	W-Lognormal	(1)
Benzo(k)fluoranthene	mg/kg	0.123	0.137	1.7		mg/kg	0.137	W-Lognormal	(1)	0.137	W-Lognormal	(1)
Bis(2-chloroethoxy)methane	mg/kg	0.0467	0.0512	0.054		mg/kg	0.0512	W-Lognormal	(1)	0.0512	W-Lognormal	(1)
Carbazole	mg/kg	0.0713	0.0845	0.48	J	mg/kg	0.0845	W-Lognormal	(1)	0.0845	W-Lognormal	(1)
Chrysene	mg/kg	0.190	0.209	3.1		mg/kg	0.209	W-Lognormal	(1)	0.209	W-Lognormal	(1)
Dibenz(a,h)anthracene	mg/kg	0.0659	0.0758	0.43	J	mg/kg	0.0758	W-Lognormal	(1)	0.0758	W-Lognormal	(1)
Indeno(1,2,3-cd)pyrene	mg/kg	0.124	0.145	1.2		mg/kg	0.145	W-Lognormal	(1)	0.145	W-Lognormal	(1)
Naphthalene	mg/kg	0.379	0.226	8.5		mg/kg	0.226	W-Lognormal	(1)	0.226	W-Lognormal	(1)
Chlordane, alpha-	mg/kg	0.545	1.22	14	J	mg/kg	1.22	W-Lognormal	(1)	1.22	W-Lognormal	(1)
Chlordane, gamma-	mg/kg	0.690	1.65	18		mg/kg	1.65	W-Lognormal	(1)	1.65	W-Lognormal	(1)
Heptachlor	mg/kg	0.255	0.155	6.9		mg/kg	0.155	W-Lognormal	(1)	0.155	W-Lognormal	(1)
Heptachlor Epoxide	mg/kg	0.0207	0.0161	0.2	J	mg/kg	0.0161	W-Lognormal	(1)	0.0161	W-Lognormal	(1)
Aroclor-1248	mg/kg	1.30	0.318	47		mg/kg	0.318	W-Lognormal	(1)	0.318	W-Lognormal	(1)
Aroclor-1254	mg/kg	0.276	0.333	5		mg/kg	0.333	W-Lognormal	(1)	0.333	W-Lognormal	(1)
Aroclor-1260	mg/kg	1.63	5.61	45		mg/kg	5.61	W-Lognormal	(1)	5.61	W-Lognormal	(1)
Gasoline Range Organics	mg/kg	72.5	4,837,171,589	580		mg/kg	580	Max	(2)	580	Max	(2)
Diesel Range Organics	mg/kg	727	32,931	5,500		mg/kg	5,500	Max	(2)	5,500	Max	(2)
Arsenic	mg/kg	0.804	1.11	2		mg/kg	1.11	W-Lognormal	(1)	1.11	W-Lognormal	(1)
Iron	mg/kg	1,951	2,754	6140		mg/kg	2,754	W-Lognormal	(1)	2,754	W-Lognormal	(1)
Thallium	mg/kg	0.363	0.405	0.9	J	mg/kg	0.405	W-Lognormal	(1)	0.405	W-Lognormal	(1)

EPC = Exposure Point Concentration
For non-detects, 1/2 sample quantitation limit was used as a proxy concentration.

(1) Conservative estimate of the arithmetic average concentration (95% UCL), based on the Shapiro-Wilks (W-) or D-Augostino (D-) distribution tests
(2) 95% UCL exceeds maximum detected concentration. Therefore, maximum concentration used for EPC.

TABLE 3.2B
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Subsurface Soil
Exposure Medium: Subsurface Soil
Exposure Point: Subsurface Soil

Chemical of Potential Concern	Units	Arithmetic Mean	95% Upper Confidence Level (95% UCL)	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
2-Methylnaphthalene	mg/kg	2.03	6.38	27		mg/kg	6.38	W-Lognormal	(1)	6.38	W-Lognormal	(1)
Bis(2-chloroethoxy)methane	mg/kg	0.0591	0.0785	0.054		mg/kg	0.054	Max	(2)	0.054	Max	(2)
Naphthalene	mg/kg	0.609	0.862	8.5		mg/kg	0.862	W-Lognormal	(1)	0.862	W-Lognormal	(1)
Aroclor-1260	mg/kg	2.41	27.0	45		mg/kg	27.0	W-Lognormal	(1)	27.0	W-Lognormal	(1)
Gasoline Range Organics	mg/kg	580	ND	580		mg/kg	580	Max	(3)	580	Max	(3)
Diesel Range Organics	mg/kg	5,500	ND	5,500		mg/kg	5,500	Max	(3)	5,500	Max	(3)
Arsenic	mg/kg	0.856	1.50	2		mg/kg	1.50	W-Lognormal	(1)	1.50	W-Lognormal	(1)
Iron	mg/kg	1,958	3,007	6140		mg/kg	3,007	W-Lognormal	(1)	3,007	W-Lognormal	(1)
Thallium	mg/kg	0.401	0.488	0.9	J	mg/kg	0.488	W-Lognormal	(1)	0.488	W-Lognormal	(1)

EPC = Exposure Point Concentration
For non-detects, 1/2 sample quantitation limit was used as a proxy concentration.

(1) Conservative estimate of the arithmetic average concentration (95% UCL), based on the Shapiro-Wilks (W-) or D-Augostino (D-) distribution tests
(2) 95% UCL exceeds maximum detected concentration. Therefore, maximum concentration used for EPC.
(3) Data set contains fewer than five samples. Therefore, maximum concentration used for EPC.

TABLE 3.3
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
SITE 84 (BUILDING 45 AREA)
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Groundwater, total inorganics

Chemical of Potential Concern	Units	Arithmetic Mean	95% Upper Confidence Level (95% UCL)	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Benzene	mg/L	0.00137	0.0100	0.0034	J	mg/L	0.0034	Max	(1)	0.0034	Max	(1)
Chloroform	mg/L	0.00323	0.0961	0.016		mg/L	0.016	Max	(1)	0.016	Max	(1)
2-Methylnaphthalene	mg/L	0.000376	0.000448	0.00105	J	mg/L	0.00105	Max	(1)	0.00105	Max	(1)
Naphthalene	mg/L	0.000515	0.000654	0.0022	J	mg/L	0.0022	Max	(1)	0.0022	Max	(1)
Heptachlor Epoxide	mg/L	0.0000095	0.0000186	0.0000167	J	mg/L	0.0000167	Max	(1)	0.0000167	Max	(1)
MCPA	mg/L	0.0105	0.0184	0.044	J	mg/L	0.044	Max	(1)	0.044	Max	(1)
Antimony	mg/L	0.00000200	0.00000330	0.011	J	mg/L	0.011	Max	(1)	0.011	Max	(1)
Arsenic	mg/L	0.00000540	0.00000940	0.03		mg/L	0.03	Max	(1)	0.03	Max	(1)
Iron	mg/L	0.0133	5.90	67.7		mg/L	67.7	Max	(1)	67.7	Max	(1)
Manganese	mg/L	0.000100	0.000876	0.45		mg/L	0.45	Max	(1)	0.45	Max	(1)
Thallium	mg/L	0.00000300	0.00000350	0.0057	J	mg/L	0.0057	Max	(1)	0.0057	Max	(1)

EPC = Exposure Point Concentration
For non-detects, 1/2 sample quantitation limit was used as a proxy concentration.

(1) Conservative estimate using the maximum concentration.

TABLE 3.4
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
SITE 84 (BUILDING 45 AREA)
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Current, Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: Surface Water, total inorganics

Chemical of Potential Concern	Units	Arithmetic Mean	95% Upper Confidence Level (95% UCL)	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Acetone	mg/L	0.00560	ND	0.0056	J	mg/L	0.0056	Max	(1)	0.0056	Max	(1)
Toluene	mg/L	0.00270	ND	0.0027	J	mg/L	0.0027	Max	(1)	0.0027	Max	(1)
Xylenes, total	mg/L	0.00350	ND	0.0035	J	mg/L	0.0035	Max	(1)	0.0035	Max	(1)

EPC = Exposure Point Concentration
For non-detects, 1/2 sample quantitation limit was used as a proxy concentration.

(1) Data set contains fewer than five samples. Therefore, maximum concentration used for EPC.

TABLE 3.5
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
SITE 84 (BUILDING 45 AREA)
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Current, Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Sediment

Chemical of Potential Concern	Units	Arithmetic Mean	95% Upper Confidence Level (95% UCL)	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
2-Methylnaphthalene	mg/kg	10.0	ND	10		mg/kg	10	Max	(2)	10	Max	(2)
Aroclor-1248	mg/kg	1.09	62.0	2.8		mg/kg	2.8	Max	(1)	2.8	Max	(1)
Aroclor-1260	mg/kg	14.1	51.2	40		mg/kg	40	Max	(1)	40	Max	(1)
Diesel Range Organics	mg/kg	6,467	427,412	11,600		mg/kg	11,600	Max	(2)	11,600	Max	(2)

EPC = Exposure Point Concentration
For non-detects, 1/2 sample quantitation limit was used as a proxy concentration.

(1) 95% UCL exceeds maximum detected concentration. Therefore, maximum concentration used for EPC.
(2) Data set contains fewer than five samples. Therefore, maximum concentration used for EPC.

TABLE 4.1.1
VALUES USED FOR DAILY INTAKE CALCULATIONS
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Current
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Surface Soil
Receptor Population: Military Base Personnel
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	C	Contaminant Concentration in Soil	mg/kg	See Table	See Table	--	--	Chronic Daily Intake (CDI) (mg/kg-day) =
	IR-S	Ingestion Rate of Soil	mg/day	100	USEPA, 1989	--	--	C x IR x CF x Fi x EF x ED x 1/BW x 1/AT
	CF	Conversion Factor	kg/mg	1.00E-06	USEPA, 1989	--	--	
	Fi	Fraction Ingested from Source	NA	1	USEPA, 1995	--	--	
	EF	Exposure Frequency	days/year	250	USEPA, 1995	--	--	
	ED	Exposure Duration	years	4	Std Tour of Duty	--	--	
	BW	Body Weight	kg	70	USEPA, 1989	--	--	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, 1989	--	--	
	AT-N	Averaging Time (Non-Cancer)	days	1,460	USEPA, 1989	--	--	
Dermal	C	Contaminant Concentration in Soil	mg/kg	See Table	See Table	--	--	CDI (mg/kg-day) =
	CF	Conversion Factor	kg/mg	1.00E-06	USEPA, 1989	--	--	C x CF x SA x AF x ABS x EF x ED x
	SA	Surface Area Available for Contact	cm2/day	3,300	USEPA, 1997	--	--	1/BW x1/AT
	AF	Soil to Skin Adherence Factor	mg/cm2	0.2	USEPA, 1997	--	--	
	ABS	Absorption Factor	NA	(1)	USEPA, 1995	--	--	
	EF	Exposure Frequency	days/year	250	USEPA, 1995	--	--	
	ED	Exposure Duration	years	4	Std Tour of Duty	--	--	
	BW	Body Weight	kg	70	USEPA, 1989	--	--	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, 1989	--	--	
	AT-N	Averaging Time (Non-Cancer)	days	1,460	USEPA, 1989	--	--	
Inhalation	C	Contaminant Concentration in Soil	mg/kg	See Table	See Table	--	--	CDI (mg/kg-day) =
	RR	Respiration Rate	m3/hour	0.83	USEPA, 1995	--	--	C x IR x ET x EF x ED x 1/PEF x
	ET	Exposure Time	hours/day	8	Prof Judge	--	--	1/BW x1/AT
	EF	Exposure Frequency	days/year	250	USEPA, 1995	--	--	
	ED	Exposure Duration	years	4	Std Tour of Duty	--	--	
	PEF	Particulate Emission Factor	m3/kg	1.32E+09	USEPA, 1996	--	--	
	BW	Body Weight	kg	70	USEPA, 1989	--	--	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, 1989	--	--	
	AT-N	Averaging Time (Non-Cancer)	days	1,460	USEPA, 1989	--	--	

Notes

(1) USEPA Region IV default values of 0.01% organics and 0.001% for inorganics were used for ABS values.

Prof Judge - Professional Judgement
Std Tour of Duty - Standard Tour of Duty

Sources:

TABLE 4.1.2
VALUES USED FOR DAILY INTAKE CALCULATIONS
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Current
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: Surface Water
Receptor Population: Military Base Personnel
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	C	Contaminant Concentration in Surface Water	mg/L	See Table	See Table	--	--	Chronic Daily Intake (CDI) (mg/kg-day) =
	IR-W	Ingestion Rate of Surface Water	L/hour	0.01	USEPA, 1995	--	--	C x IR-W x EF x ED x 1/BW x 1/AT
	ET	Exposure Time	hours/day	2.6	USEPA, 1992	--	--	
	EF	Exposure Frequency	days/year	250	USEPA, 1995	--	--	
	ED	Exposure Duration	years	4	Std Tour of Duty	--	--	
	BW	Body Weight	kg	70	USEPA, 1989	--	--	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, 1989	--	--	
	AT-N	Averaging Time (Non-Cancer)	days	1,460	USEPA, 1989	--	--	
Dermal	C	Contaminant Concentration in Surface Water	mg/L	See Table	See Table	--	--	CDI (mg/kg-day) =
	CF	Conversion Factor	L/cm3	1.00E-03	USEPA, 1989	--	--	C x CF x SA x PC x ET x EF x ED x
	SA	Surface Area Available for Contact	cm2	3,300	USEPA, 1997	--	--	1/BW x1/AT
	PC	Permeability Constant	cm/hour	Chemical Specific	USEPA, 1992	--	--	
	ET	Exposure Time	hours/day	2.6	USEPA, 1992	--	--	
	EF	Exposure Frequency	days/year	250	USEPA, 1995	--	--	
	ED	Exposure Duration	years	4	Std Tour of Duty	--	--	
	BW	Body Weight	kg	70	USEPA, 1989	--	--	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, 1989	--	--	
	AT-N	Averaging Time (Non-Cancer)	days	1,460	USEPA, 1989	--	--	

Notes

Std Tour of Duty - Standard Tour of Duty

Sources:

TABLE 4.1.3
VALUES USED FOR DAILY INTAKE CALCULATIONS
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Current
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Sediment
Receptor Population: Military Base Personnel
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	C	Contaminant Concentration in Sediment	mg/kg	See Table	See Table	--	--	Chronic Daily Intake (CDI) (mg/kg-day) =
	IR-S	Ingestion Rate of Sediment	mg/day	100	USEPA, 1991	--	--	C x IR x CF x Fi x EF x ED x 1/BW x 1/AT
	CF	Conversion Factor	kg/mg	1.00E-06	USEPA, 1989	--	--	
	Fi	Fraction Ingested from Source	NA	1	Prof Judge	--	--	
	EF	Exposure Frequency	days/year	250	USEPA, 1991	--	--	
	ED	Exposure Duration	years	4	Std Tour of Duty	--	--	
	BW	Body Weight	kg	70	USEPA, 1989	--	--	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, 1989	--	--	
	AT-N	Averaging Time (Non-Cancer)	days	1,460	USEPA, 1989	--	--	
Dermal	C	Contaminant Concentration in Sediment	mg/kg	See Table	See Table	--	--	CDI (mg/kg-day) =
	CF	Conversion Factor	kg/mg	1.00E-06	USEPA, 1989	--	--	C x CF x SA x AF x ABS x EF x ED x
	SA	Surface Area Available for Contact	cm2/day	3,300	USEPA, 1997	--	--	1/BW x1/AT
	AF	Soil to Skin Adherence Factor	mg/cm2	0.2	USEPA, 1997	--	--	
	ABS	Absorption Factor	NA	(1)	USEPA, 1995	--	--	
	EF	Exposure Frequency	days/year	250	USEPA, 1991	--	--	
	ED	Exposure Duration	years	4	Std Tour of Duty	--	--	
	BW	Body Weight	kg	70	USEPA, 1989	--	--	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, 1989	--	--	
	AT-N	Averaging Time (Non-Cancer)	days	1,460	USEPA, 1989	--	--	

Notes

(1) USEPA Region IV default values of 0.01% organics and 0.001% for inorganics were used for ABS values.

Prof Judge - Professional Judgement
Std Tour of Duty - Standard Tour of Duty

TABLE 4.2.1
VALUES USED FOR DAILY INTAKE CALCULATIONS
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Current
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Surface Soil
Receptor Population: Recreational Users
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	C	Contaminant Concentration in Soil	mg/kg	See Table	See Table	--	--	Chronic Daily Intake (CDI) (mg/kg-day) =
	IR-S	Ingestion Rate of Soil	mg/day	100	USEPA, 1989	--	--	C x IR x CF x Fi x EF x ED x 1/BW x 1/AT
	CF	Conversion Factor	kg/mg	1.00E-06	USEPA, 1989	--	--	
	Fi	Fraction Ingested from Source	NA	1	USEPA, 1995	--	--	
	EF	Exposure Frequency	days/year	48	Prof Judge	--	--	
	ED	Exposure Duration	years	24	USEPA, 1989	--	--	
	BW	Body Weight	kg	70	USEPA, 1989	--	--	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, 1989	--	--	
	AT-N	Averaging Time (Non-Cancer)	days	8,760	USEPA, 1989	--	--	
Dermal	C	Contaminant Concentration in Soil	mg/kg	See Table	See Table	--	--	CDI (mg/kg-day) =
	CF	Conversion Factor	kg/mg	1.00E-06	USEPA, 1989	--	--	C x CF x SA x AF x ABS x EF x ED x
	SA	Surface Area Available for Contact	cm2/day	5,700	USEPA, 1997	--	--	1/BW x1/AT
	AF	Soil to Skin Adherence Factor	mg/cm2	0.2	USEPA, 1997	--	--	
	ABS	Absorption Factor	NA	(1)	USEPA, 1995	--	--	
	EF	Exposure Frequency	days/year	48	Prof Judge	--	--	
	ED	Exposure Duration	years	24	USEPA, 1989	--	--	
	BW	Body Weight	kg	70	USEPA, 1989	--	--	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, 1989	--	--	
	AT-N	Averaging Time (Non-Cancer)	days	8,760	USEPA, 1989	--	--	
Inhalation	C	Contaminant Concentration in Soil	mg/kg	See Table	See Table	--	--	CDI (mg/kg-day) =
	RR	Respiration Rate	m3/hour	0.83	USEPA, 1991	--	--	C x IR x ET x EF x ED x 1/PEF x
	ET	Exposure Time	hours/day	8	USEPA, 1991	--	--	1/BW x1/AT
	EF	Exposure Frequency	days/year	48	Prof Judge	--	--	
	ED	Exposure Duration	years	24	USEPA, 1989	--	--	
	PEF	Particulate Emission Factor	m3/kg	1.32E+09	USEPA, 1996	--	--	
	BW	Body Weight	kg	70	USEPA, 1989	--	--	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, 1989	--	--	
	AT-N	Averaging Time (Non-Cancer)	days	8,760	USEPA, 1989	--	--	

Notes

(1) USEPA Region IV default values of 0.01% organics and 0.001% for inorganics were used for ABS values.

Prof Judge - Professional Judgement

Sources:

TABLE 4.2.2
VALUES USED FOR DAILY INTAKE CALCULATIONS
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Current
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: Surface Water
Receptor Population: Recreational Users
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	C	Contaminant Concentration in Surface Water	mg/L	See Table	See Table	--	--	Chronic Daily Intake (CDI) (mg/kg-day) =
	IR-W	Ingestion Rate of Surface Water	L/hour	0.01	USEPA, 1995	--	--	C x IR-W x EF x ED x 1/BW x 1/AT
	ET	Exposure Time	hours/day	2.6	USEPA, 1992	--	--	
	EF	Exposure Frequency	days/year	48	Prof Judge	--	--	
	ED	Exposure Duration	years	24	USEPA, 1989	--	--	
	BW	Body Weight	kg	70	USEPA, 1989	--	--	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, 1989	--	--	
	AT-N	Averaging Time (Non-Cancer)	days	8,760	USEPA, 1989	--	--	
Dermal	C	Contaminant Concentration in Surface Water	mg/L	See Table	See Table	--	--	CDI (mg/kg-day) =
	CF	Conversion Factor	L/cm3	1.00E-03	USEPA, 1989	--	--	C x CF x SA x PC x ET x EF x ED x
	SA	Surface Area Available for Contact	cm2	5,700	USEPA, 1997	--	--	1/BW x1/AT
	PC	Permeability Constant	cm/hour	Chemical Specific	USEPA, 1992	--	--	
	ET	Exposure Time	hours/day	2.6	USEPA, 1992	--	--	
	EF	Exposure Frequency	days/year	48	Prof Judge	--	--	
	ED	Exposure Duration	years	24	USEPA, 1989	--	--	
	BW	Body Weight	kg	70	USEPA, 1989	--	--	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, 1989	--	--	
	AT-N	Averaging Time (Non-Cancer)	days	8,760	USEPA, 1989	--	--	

Notes

Prof Judge - Professional Judgement

Sources:

TABLE 4.2.3
VALUES USED FOR DAILY INTAKE CALCULATIONS
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Current
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Sediment
Receptor Population: Recreational Users
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	C	Contaminant Concentration in Sediment	mg/kg	See Table	See Table	--	--	Chronic Daily Intake (CDI) (mg/kg-day) =
	IR-S	Ingestion Rate of Sediment	mg/day	100	USEPA, 1989	--	--	C x IR x CF x Fi x EF x ED x 1/BW x 1/AT
	CF	Conversion Factor	kg/mg	1.00E-06	USEPA, 1989	--	--	
	Fi	Fraction Ingested from Source	NA	1	USEPA, 1995	--	--	
	EF	Exposure Frequency	days/year	48	Prof Judge	--	--	
	ED	Exposure Duration	years	24	USEPA, 1989	--	--	
	BW	Body Weight	kg	70	USEPA, 1989	--	--	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, 1989	--	--	
	AT-N	Averaging Time (Non-Cancer)	days	8,760	USEPA, 1989	--	--	
Dermal	C	Contaminant Concentration in Sediment	mg/kg	See Table	See Table	--	--	CDI (mg/kg-day) =
	CF	Conversion Factor	kg/mg	1.00E-06	USEPA, 1989	--	--	C x CF x SA x AF x ABS x EF x ED x
	SA	Surface Area Available for Contact	cm2/day	5,700	USEPA, 1997	--	--	1/BW x1/AT
	AF	Soil to Skin Adherence Factor	mg/cm2	0.2	USEPA, 1997	--	--	
	ABS	Absorption Factor	NA	(1)	USEPA, 1995	--	--	
	EF	Exposure Frequency	days/year	48	Prof Judge	--	--	
	ED	Exposure Duration	years	24	USEPA, 1989	--	--	
	BW	Body Weight	kg	70	USEPA, 1989	--	--	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, 1989	--	--	
	AT-N	Averaging Time (Non-Cancer)	days	8,760	USEPA, 1989	--	--	

Notes

(1) USEPA Region IV default values of 0.01% organics and 0.001% for inorganics were used for ABS values.

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TABLE 4.3.1
VALUES USED FOR DAILY INTAKE CALCULATIONS
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Current
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Surface Soil
Receptor Population: Recreational Users
Receptor Age: Adolescent

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	C	Contaminant Concentration in Soil	mg/kg	See Table	See Table	--	--	Chronic Daily Intake (CDI) (mg/kg-day) =
	IR-S	Ingestion Rate of Soil	mg/day	100	USEPA, 1989	--	--	C x IR x CF x Fi x EF x ED x 1/BW x 1/AT
	CF	Conversion Factor	kg/mg	1.00E-06	USEPA, 1989	--	--	
	Fi	Fraction Ingested from Source	NA	1	Prof Judge	--	--	
	EF	Exposure Frequency	days/year	48	Prof Judge	--	--	
	ED	Exposure Duration	years	9	USEPA, 1989	--	--	
	BW	Body Weight	kg	45	USEPA, 1995	--	--	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, 1989	--	--	
	AT-N	Averaging Time (Non-Cancer)	days	3,285	USEPA, 1989	--	--	
Dermal	C	Contaminant Concentration in Soil	mg/kg	See Table	See Table	--	--	CDI (mg/kg-day) =
	CF	Conversion Factor	kg/mg	1.00E-06	USEPA, 1989	--	--	C x CF x SA x AF x ABS x EF x ED x
	SA	Surface Area Available for Contact	cm2/day	5,300	USEPA, 1997	--	--	1/BW x1/AT
	AF	Soil to Skin Adherence Factor	mg/cm2	0.2	USEPA, 1997	--	--	
	ABS	Absorption Factor	NA	(1)	USEPA, 1995	--	--	
	EF	Exposure Frequency	days/year	48	Prof Judge	--	--	
	ED	Exposure Duration	years	9	USEPA, 1989	--	--	
	BW	Body Weight	kg	45	USEPA, 1995	--	--	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, 1989	--	--	
	AT-N	Averaging Time (Non-Cancer)	days	3,285	USEPA, 1989	--	--	
Inhalation	C	Contaminant Concentration in Soil	mg/kg	See Table	See Table	--	--	CDI (mg/kg-day) =
	RR	Respiration Rate	m3/hour	0.83	USEPA, 1991	--	--	C x IR x ET x EF x ED x 1/PEF x
	ET	Exposure Time	hours/day	8	USEPA, 1991	--	--	1/BW x1/AT
	EF	Exposure Frequency	days/year	48	Prof Judge	--	--	
	ED	Exposure Duration	years	9	USEPA, 1989	--	--	
	PEF	Particulate Emission Factor	m3/kg	1.32E+09	USEPA, 1996	--	--	
	BW	Body Weight	kg	45	USEPA, 1995	--	--	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, 1989	--	--	
	AT-N	Averaging Time (Non-Cancer)	days	3,285	USEPA, 1989	--	--	

Notes

(1) USEPA Region IV default values of 0.01% organics and 0.001% for inorganics were used for ABS values.

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Sources:

TABLE 4.3.2
VALUES USED FOR DAILY INTAKE CALCULATIONS
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Current
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: Surface Water
Receptor Population: Recreational Users
Receptor Age: Adolescent

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	C	Contaminant Concentration in Surface Water	mg/L	See Table	See Table	--	--	Chronic Daily Intake (CDI) (mg/kg-day) =
	IR-W	Ingestion Rate of Surface Water	L/hour	0.01	USEPA, 1995	--	--	C x IR-W x EF x ED x 1/BW x 1/AT
	ET	Exposure Time	hours/day	2.6	USEPA, 1992	--	--	
	EF	Exposure Frequency	days/year	48	Prof Judge	--	--	
	ED	Exposure Duration	years	9	USEPA, 1989	--	--	
	BW	Body Weight	kg	45	USEPA, 1995	--	--	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, 1989	--	--	
	AT-N	Averaging Time (Non-Cancer)	days	3,285	USEPA, 1989	--	--	
Dermal	C	Contaminant Concentration in Surface Water	mg/L	See Table	See Table	--	--	CDI (mg/kg-day) =
	CF	Conversion Factor	L/cm3	1.00E-03	USEPA, 1989	--	--	C x CF x SA x PC x ET x EF x ED x
	SA	Surface Area Available for Contact	cm2	5,300	USEPA, 1997	--	--	1/BW x1/AT
	PC	Permeability Constant	cm/hour	Chemical Specific	USEPA, 1992	--	--	
	ET	Exposure Time	hours/day	2.6	USEPA, 1992	--	--	
	EF	Exposure Frequency	days/year	48	Prof Judge	--	--	
	ED	Exposure Duration	years	9	USEPA, 1989	--	--	
	BW	Body Weight	kg	45	USEPA, 1995	--	--	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, 1989	--	--	
	AT-N	Averaging Time (Non-Cancer)	days	3,285	USEPA, 1989	--	--	

Notes

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Sources:

TABLE 4.3.3
VALUES USED FOR DAILY INTAKE CALCULATIONS
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Current
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Sediment
Receptor Population: Recreational Users
Receptor Age: Adolescent

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	C	Contaminant Concentration in Sediment	mg/kg	See Table	See Table	--	--	Chronic Daily Intake (CDI) (mg/kg-day) =
	IR-S	Ingestion Rate of Sediment	mg/day	100	USEPA, 1989	--	--	C x IR x CF x Fi x EF x ED x 1/BW x 1/AT
	CF	Conversion Factor	kg/mg	1.00E-06	USEPA, 1989	--	--	
	Fi	Fraction Ingested from Source	NA	1	Prof Judge	--	--	
	EF	Exposure Frequency	days/year	48	Prof Judge	--	--	
	ED	Exposure Duration	years	9	USEPA, 1989	--	--	
	BW	Body Weight	kg	45	USEPA, 1995	--	--	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, 1989	--	--	
	AT-N	Averaging Time (Non-Cancer)	days	3,285	USEPA, 1989	--	--	
Dermal	C	Contaminant Concentration in Sediment	mg/kg	See Table	See Table	--	--	CDI (mg/kg-day) =
	CF	Conversion Factor	kg/mg	1.00E-06	USEPA, 1989	--	--	C x CF x SA x AF x ABS x EF x ED x
	SA	Surface Area Available for Contact	cm2/day	5,300	USEPA, 1997	--	--	1/BW x1/AT
	AF	Soil to Skin Adherence Factor	mg/cm2	0.2	USEPA, 1997	--	--	
	ABS	Absorption Factor	NA	(1)	USEPA, 1995	--	--	
	EF	Exposure Frequency	days/year	48	Prof Judge	--	--	
	ED	Exposure Duration	years	9	USEPA, 1989	--	--	
	BW	Body Weight	kg	45	USEPA, 1995	--	--	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, 1989	--	--	
	AT-N	Averaging Time (Non-Cancer)	days	3,285	USEPA, 1989	--	--	

Notes

(1) USEPA Region IV default values of 0.01% organics and 0.001% for inorganics were used for ABS values.

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TABLE 4.4.1
VALUES USED FOR DAILY INTAKE CALCULATIONS
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Surface Soil
Receptor Population: Residents
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	C	Contaminant Concentration in Soil	mg/kg	See Table	See Table	See Table	See Table	Chronic Daily Intake (CDI) (mg/kg-day) =
	IR-S	Ingestion Rate of Soil	mg/day	100	USEPA, 1989	50	USEPA, 1993	C x IR x CF x Fi x EF x ED x 1/BW x 1/AT
	CF	Conversion Factor	kg/mg	1.00E-06	USEPA, 1989	1.00E-06	USEPA, 1989	
	Fi	Fraction Ingested from Source	NA	1	Prof Judge	1	Prof Judge	
	EF	Exposure Frequency	days/year	350	USEPA, 1991	234	USEPA, 1993	
	ED	Exposure Duration	years	24	USEPA, 1989	9	USEPA, 1993	
	BW	Body Weight	kg	70	USEPA, 1989	70	USEPA, 1989	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, 1989	25,550	USEPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	8,760	USEPA, 1989	3,285	USEPA, 1993	
Dermal	C	Contaminant Concentration in Soil	mg/kg	See Table	See Table	See Table	See Table	CDI (mg/kg-day) =
	CF	Conversion Factor	kg/mg	1.00E-06	USEPA, 1989	1.00E-06	USEPA, 1989	C x CF x SA x AF x ABS x EF x ED x
	SA	Surface Area Available for Contact	cm2/day	5,700	USEPA, 1997	5,000	USEPA, 1992	1/BW x1/AT
	AF	Soil to Skin Adherence Factor	mg/cm2	0.07	USEPA, 1997	0.07	USEPA, 1997	
	ABS	Absorption Factor	NA	(1)	USEPA, 1995	(1)	USEPA, 1995	
	EF	Exposure Frequency	days/year	350	USEPA, 1991	234	USEPA, 1993	
	ED	Exposure Duration	years	24	USEPA, 1989	9	USEPA, 1993	
	BW	Body Weight	kg	70	USEPA, 1989	70	USEPA, 1989	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, 1989	25,550	USEPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	8,760	USEPA, 1989	3,285	USEPA, 1993	
Inhalation	C	Contaminant Concentration in Soil	mg/kg	See Table	See Table	See Table	See Table	CDI (mg/kg-day) =
	RR	Respiration Rate	m3/hour	0.83	USEPA, 1995	0.8	USEPA, 1995	C x IR x ET x EF x ED x 1/PEF x
	ET	Exposure Time	hours/day	24	Prof Judge	24	Prof Judge	1/BW x1/AT
	EF	Exposure Frequency	days/year	350	USEPA, 1991	234	USEPA, 1993	
	ED	Exposure Duration	years	24	USEPA, 1989	9	USEPA, 1993	
	PEF	Particulate Emission Factor	m3/kg	1.32E+09	USEPA, 1996	1.32E+09	USEPA, 1996	
	BW	Body Weight	kg	70	USEPA, 1989	70	USEPA, 1989	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, 1989	25,550	USEPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	8,760	USEPA, 1989	3,285	USEPA, 1993	

Notes

(1) USEPA Region IV default values of 0.01% organics and 0.001% for inorganics were used for ABS values.

Prof Judge - Professional Judgement

Sources:

TABLE 4.4.2
VALUES USED FOR DAILY INTAKE CALCULATIONS
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Tap Water - Drinking Water Scenario
Receptor Population: Residents
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	C	Contaminant Concentration in Groundwater	mg/L	See Table	See Table	See Table	See Table	Chronic Daily Intake (CDI) (mg/kg-day) =
	IR-W	Ingestion Rate of Groundwater	L/day	2	USEPA, 1995	1.4	USEPA, 1993	C x IR-W x EF x ED x 1/BW x 1/AT
	EF	Exposure Frequency	days/year	350	Prof Judge	234	USEPA, 1993	
	ED	Exposure Duration	years	24	USEPA, 1989	9	USEPA, 1993	
	BW	Body Weight	kg	70	USEPA, 1989	70	USEPA, 1989	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, 1989	25,550	USEPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	8,760	USEPA, 1989	3,285	USEPA, 1989	
Dermal	C	Contaminant Concentration in Groundwater	mg/L	See Table	See Table	See Table	See Table	CDI (mg/kg-day) =
	CF	Conversion Factor	L/cm3	1.00E-03	USEPA, 1989	1.00E-03	USEPA, 1989	C x CF x SA x PC x ET x EF x ED x
	SA	Surface Area Available for Contact	cm2	18,000	USEPA, 1997	20,000	USEPA, 1992	1/BW x1/AT
	PC	Permeability Constant	cm/hour	Chemical Specific	USEPA, 1992	Chemical Specific	USEPA, 1992	
	ET	Exposure Time	hours/day	0.25	USEPA, 1989	0.25	USEPA, 1992	
	EF	Exposure Frequency	days/year	350	Prof Judge	234	USEPA, 1993	
	ED	Exposure Duration	years	24	USEPA, 1989	9	USEPA, 1993	
	BW	Body Weight	kg	70	USEPA, 1989	70	USEPA, 1989	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, 1989	25,550	USEPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	8,760	USEPA, 1989	3,285	USEPA, 1989	
Inhalation	C	Contaminant Concentration in Soil	mg/L	See Table	See Table	See Table	See Table	CDI (mg/kg-day) =
	RR	Respiration Rate	m3/hour	0.83	USEPA, 1995	0.83	USEPA, 1995	C x IR x ET x EF x ED x 1/PEF x
	ET	Exposure Time	hours/day	0	USEPA, 1989	0	USEPA, 1992	1/BW x1/AT
	EF	Exposure Frequency	days/year	350	Prof Judge	234	USEPA, 1993	
	ED	Exposure Duration	years	24	USEPA, 1989	9	USEPA, 1993	
	PEF	Particulate Emission Factor	m3/kg	--	--	--	--	
	BW	Body Weight	kg	70	USEPA, 1989	70	USEPA, 1989	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, 1989	25,550	USEPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	8,760	USEPA, 1989	3,285	USEPA, 1989	

Notes

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TABLE 4.4.3
VALUES USED FOR DAILY INTAKE CALCULATIONS
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: Surface Water
Receptor Population: Residents
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	C	Contaminant Concentration in Surface Water	mg/L	See Table	See Table	See Table	See Table	Chronic Daily Intake (CDI) (mg/kg-day) =
	IR-W	Ingestion Rate of Surface Water	L/hour	0.01	USEPA, 1995	0.01	USEPA, 1995	C x IR-W x EF x ED x 1/BW x 1/AT
	ET	Exposure Time	hours/day	2.6	USEPA, 1992	2.6	USEPA, 1992	
	EF	Exposure Frequency	days/year	48	Prof Judge	48	Prof Judge	
	ED	Exposure Duration	years	24	USEPA, 1989	9	USEPA, 1993	
	BW	Body Weight	kg	70	USEPA, 1989	70	USEPA, 1989	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, 1989	25,550	USEPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	8,760	USEPA, 1989	3,285	USEPA, 1993	
Dermal	C	Contaminant Concentration in Surface Water	mg/L	See Table	See Table	See Table	See Table	CDI (mg/kg-day) =
	CF	Conversion Factor	L/cm3	1.00E-03	USEPA, 1989	1.00E-03	USEPA, 1989	C x CF x SA x PC x ET x EF x ED x
	SA	Surface Area Available for Contact	cm2	5,700	USEPA, 1997	5,000	USEPA, 1992	1/BW x1/AT
	PC	Permeability Constant	cm/hour	Chemical Specific	USEPA, 1992	Chemical Specific	USEPA, 1992	
	ET	Exposure Time	hours/day	2.6	USEPA, 1992	2.6	USEPA, 1992	
	EF	Exposure Frequency	days/year	48	Prof Judge	48	Prof Judge	
	ED	Exposure Duration	years	24	USEPA, 1989	9	USEPA, 1993	
	BW	Body Weight	kg	70	USEPA, 1989	70	USEPA, 1989	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, 1989	25,550	USEPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	8,760	USEPA, 1989	3,285	USEPA, 1993	

Notes

Prof Judge - Professional Judgement

Sources:

TABLE 4.4.4
VALUES USED FOR DAILY INTAKE CALCULATIONS
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Sediment
Receptor Population: Residents
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	C	Contaminant Concentration in Sediment	mg/kg	See Table	See Table	See Table	See Table	Chronic Daily Intake (CDI) (mg/kg-day) =
	IR-S	Ingestion Rate of Sediment	mg/day	100	USEPA, 1989	50	USEPA, 1993	C x IR x CF x Fi x EF x ED x 1/BW x 1/AT
	CF	Conversion Factor	kg/mg	1.00E-06	USEPA, 1989	1.00E-06	USEPA, 1989	
	Fi	Fraction Ingested from Source	NA	1	Prof Judge	1	USEPA, 1989	
	EF	Exposure Frequency	days/year	48	Prof Judge	48	Prof Judge	
	ED	Exposure Duration	years	24	USEPA, 1989	9	USEPA, 1993	
	BW	Body Weight	kg	70	USEPA, 1989	70	USEPA, 1989	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, 1989	25,550	USEPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	8,760	USEPA, 1989	3,285	USEPA, 1989	
Dermal	C	Contaminant Concentration in Sediment	mg/kg	See Table	See Table	See Table	See Table	CDI (mg/kg-day) =
	CF	Conversion Factor	kg/mg	1.00E-06	USEPA, 1989	1.00E-06	USEPA, 1989	C x CF x SA x AF x ABS x EF x ED x
	SA	Surface Area Available for Contact	cm2/day	5,700	USEPA, 1997	5,000	USEPA, 1992	1/BW x1/AT
	AF	Soil to Skin Adherence Factor	mg/cm2	0.07	USEPA, 1997	0.07	USEPA, 1997	
	ABS	Absorption Factor	NA	(1)	USEPA, 1995	(1)	USEPA, 1995	
	EF	Exposure Frequency	days/year	48	Prof Judge	48	Prof Judge	
	ED	Exposure Duration	years	24	USEPA, 1989	9	USEPA, 1993	
	BW	Body Weight	kg	70	USEPA, 1989	70	USEPA, 1989	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, 1989	25,550	USEPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	8,760	USEPA, 1989	3,285	USEPA, 1989	

Notes

(1) USEPA Region IV default values of 0.01% organics and 0.001% for inorganics were used for ABS values.

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TABLE 4.5.1
VALUES USED FOR DAILY INTAKE CALCULATIONS
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Surface Soil
Receptor Population: Residents
Receptor Age: Young Child

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	C	Contaminant Concentration in Soil	mg/kg	See Table	See Table	See Table	See Table	Chronic Daily Intake (CDI) (mg/kg-day) =
	IR-S	Ingestion Rate of Soil	mg/day	200	USEPA, 1989	100	USEPA, 1993	C x IR x CF x Fi x EF x ED x 1/BW x 1/AT
	CF	Conversion Factor	kg/mg	1.00E-06	USEPA, 1989	1.00E-06	--	
	Fi	Fraction Ingested from Source	NA	1	USEPA, 1995	1	USEPA, 1995	
	EF	Exposure Frequency	days/year	350	USEPA, 1991	234	USEPA, 1993	
	ED	Exposure Duration	years	6	USEPA, 1989	6	USEPA, 1989	
	BW	Body Weight	kg	15	USEPA, 1991	15	USEPA, 1989	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, 1989	25,550	USEPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	2,190	USEPA, 1989	2,190	USEPA, 1989	
Dermal	C	Contaminant Concentration in Soil	mg/kg	See Table	See Table	See Table	See Table	CDI (mg/kg-day) =
	CF	Conversion Factor	kg/mg	1.00E-06	USEPA, 1989	1.00E-06	--	C x CF x SA x AF x ABS x EF x ED x
	SA	Surface Area Available for Contact	cm2/day	2,800	USEPA, 1997	2,000	USEPA, 1992	1/BW x1/AT
	AF	Soil to Skin Adherence Factor	mg/cm2	0.2	USEPA, 1997	0.2	USEPA, 1992	
	ABS	Absorption Factor	NA	(1)	USEPA, 1995	(1)	USEPA, 1995	
	EF	Exposure Frequency	days/year	350	USEPA, 1991	234	USEPA, 1993	
	ED	Exposure Duration	years	6	USEPA, 1989	6	USEPA, 1989	
	BW	Body Weight	kg	15	USEPA, 1991	15	USEPA, 1989	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, 1989	25,550	USEPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	2,190	USEPA, 1989	2,190	USEPA, 1989	
Inhalation	C	Contaminant Concentration in Soil	mg/kg	See Table	See Table	See Table	See Table	CDI (mg/kg-day) =
	RR	Respiration Rate	m3/hour	0.625	USEPA, 1995	0.625	USEPA, 1995	C x IR x ET x EF x ED x 1/PEF x
	ET	Exposure Time	hours/day	24	Prof Judge	24	USEPA, 1991	1/BW x1/AT
	EF	Exposure Frequency	days/year	350	USEPA, 1991	234	USEPA, 1993	
	ED	Exposure Duration	years	6	USEPA, 1989	6	USEPA, 1989	
	PEF	Particulate Emission Factor	m3/kg	1.32E+09	USEPA, 1996	1.32E+09	USEPA, 1996	
	BW	Body Weight	kg	15	USEPA, 1991	15	USEPA, 1989	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, 1989	25,550	USEPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	2,190	USEPA, 1989	2,190	USEPA, 1989	

Notes

(1) USEPA Region IV default values of 0.01% organics and 0.001% for inorganics were used for ABS values.

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Sources:

TABLE 4.5.2
VALUES USED FOR DAILY INTAKE CALCULATIONS
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Tap Water - Drinking Water Scenario
Receptor Population: Residents
Receptor Age: Young Child

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	C	Contaminant Concentration in Groundwater	mg/L	See Table	See Table	See Table	See Table	Chronic Daily Intake (CDI) (mg/kg-day) =
	IR-W	Ingestion Rate of Groundwater	L/day	1	USEPA, 1989	1	USEPA, 1995	C x IR-W x EF x ED x 1/BW x 1/AT
	EF	Exposure Frequency	days/year	350	USEPA, 1991	234	USEPA, 1993	
	ED	Exposure Duration	years	6	USEPA, 1989	6	USEPA, 1989	
	BW	Body Weight	kg	15	USEPA, 1989	15	USEPA, 1989	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, 1989	25,550	USEPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	2,190	USEPA, 1989	2,190	USEPA, 1989	
Dermal	C	Contaminant Concentration in Groundwater	mg/L	See Table	See Table	See Table	See Table	CDI (mg/kg-day) =
	CF	Conversion Factor	L/cm3	1.00E-03	USEPA, 1989	1.00E-03	--	C x CF x SA x PC x ET x EF x ED x
	SA	Surface Area Available for Contact	cm2	6,600	USEPA, 1997	7,930	USEPA, 1992	1/BW x1/AT
	PC	Permeability Constant	cm/hour	Chemical Specific	USEPA, 1992	Chemical Specific	USEPA, 1992	
	ET	Exposure Time	hours/day	0.25	USEPA, 1989	0.25	USEPA, 1992	
	EF	Exposure Frequency	days/year	350	USEPA, 1991	234	USEPA, 1993	
	ED	Exposure Duration	years	6	USEPA, 1989	6	USEPA, 1989	
	BW	Body Weight	kg	15	USEPA, 1989	15	USEPA, 1989	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, 1989	25,550	USEPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	2,190	USEPA, 1989	2,190	USEPA, 1989	
Inhalation	C	Contaminant Concentration in Soil	mg/L	See Table	See Table	See Table	See Table	CDI (mg/kg-day) =
	RR	Respiration Rate	m3/hour	0.63	USEPA, 1995	0.63	USEPA, 1995	C x IR x ET x EF x ED x 1/PEF x
	ET	Exposure Time	hours/day	0	USEPA, 1989	0	USEPA, 1992	1/BW x1/AT
	EF	Exposure Frequency	days/year	350	USEPA, 1991	234	USEPA, 1993	
	ED	Exposure Duration	years	6	USEPA, 1989	6	USEPA, 1989	
	PEF	Particulate Emission Factor	m3/kg	--	--	--	--	
	BW	Body Weight	kg	15	USEPA, 1989	15	USEPA, 1989	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, 1989	25,550	USEPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	2,190	USEPA, 1989	2,190	USEPA, 1989	

Notes

TABLE 4.5.3
VALUES USED FOR DAILY INTAKE CALCULATIONS
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: Surface Water
Receptor Population: Residents
Receptor Age: Young Child

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	C	Contaminant Concentration in Surface Water	mg/L	See Table	See Table	See Table	See Table	Chronic Daily Intake (CDI) (mg/kg-day) =
	IR-W	Ingestion Rate of Surface Water	L/hour	0.05	USEPA, 1995	0.05	USEPA, 1995	C x IR-W x EF x ED x 1/BW x 1/AT
	ET	Exposure Time	hours/day	2.6	USEPA, 1992	2.6	USEPA, 1992	
	EF	Exposure Frequency	days/year	48	Prof Judge	48	Prof Judge	
	ED	Exposure Duration	years	6	USEPA, 1989	6	USEPA, 1989	
	BW	Body Weight	kg	15	USEPA, 1991	15	USEPA, 1989	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, 1989	25,550	USEPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	2,190	USEPA, 1989	2,190	USEPA, 1989	
Dermal	C	Contaminant Concentration in Surface Water	mg/L	See Table	See Table	See Table	See Table	CDI (mg/kg-day) =
	CF	Conversion Factor	L/cm3	1.00E-03	USEPA, 1989	1.00E-03	--	C x CF x SA x PC x ET x EF x ED x
	SA	Surface Area Available for Contact	cm2	2,800	USEPA, 1997	2,000	USEPA, 1993	1/BW x1/AT
	PC	Permeability Constant	cm/hour	Chemical Specific	USEPA, 1992	Chemical Specific	USEPA, 1992	
	ET	Exposure Time	hours/day	2.6	USEPA, 1992	2.6	USEPA, 1992	
	EF	Exposure Frequency	days/year	48	Prof Judge	48	Prof Judge	
	ED	Exposure Duration	years	6	USEPA, 1989	6	USEPA, 1989	
	BW	Body Weight	kg	15	USEPA, 1991	15	USEPA, 1989	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, 1989	25,550	USEPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	2,190	USEPA, 1989	2,190	USEPA, 1989	

Notes

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Sources:

TABLE 4.5.4
VALUES USED FOR DAILY INTAKE CALCULATIONS
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Sediment
Receptor Population: Residents
Receptor Age: Young Child

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	C	Contaminant Concentration in Sediment	mg/kg	See Table	See Table	See Table	See Table	Chronic Daily Intake (CDI) (mg/kg-day) =
	IR-S	Ingestion Rate of Sediment	mg/day	200	USEPA, 1989	100	USEPA, 1993	C x IR x CF x Fi x EF x ED x 1/BW x 1/AT
	CF	Conversion Factor	kg/mg	1.00E-06	USEPA, 1989	1.00E-06	--	
	Fi	Fraction Ingested from Source	NA	1	USEPA, 1995	1	USEPA, 1995	
	EF	Exposure Frequency	days/year	48	Prof Judge	48	Prof Judge	
	ED	Exposure Duration	years	6	USEPA, 1989	6	USEPA, 1989	
	BW	Body Weight	kg	15	USEPA, 1991	15	USEPA, 1989	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, 1989	25,550	USEPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	2,190	USEPA, 1989	2,190	USEPA, 1989	
Dermal	C	Contaminant Concentration in Sediment	mg/kg	See Table	See Table	See Table	See Table	CDI (mg/kg-day) =
	CF	Conversion Factor	kg/mg	1.00E-06	USEPA, 1989	1.00E-06	--	C x CF x SA x AF x ABS x EF x ED x
	SA	Surface Area Available for Contact	cm2/day	2,800	USEPA, 1997	1,745	USEPA, 1992	1/BW x1/AT
	AF	Soil to Skin Adherence Factor	mg/cm2	0.2	USEPA, 1997	0.2	USEPA, 1992	
	ABS	Absorption Factor	NA	(1)	USEPA, 1995	(1)	USEPA, 1995	
	EF	Exposure Frequency	days/year	48	Prof Judge	48	Prof Judge	
	ED	Exposure Duration	years	6	USEPA, 1989	6	USEPA, 1989	
	BW	Body Weight	kg	15	USEPA, 1991	15	USEPA, 1989	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, 1989	25,550	USEPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	2,190	USEPA, 1989	2,190	USEPA, 1989	

Notes

(1) USEPA Region IV default values of 0.01% organics and 0.001% for inorganics were used for ABS values.

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TABLE 4.6.1
VALUES USED FOR DAILY INTAKE CALCULATIONS
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Surface Soil
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	C	Contaminant Concentration in Soil	mg/kg	See Table	See Table	--	--	Chronic Daily Intake (CDI) (mg/kg-day) =
	IR-S	Ingestion Rate of Soil	mg/day	480	USEPA, 1997	--	--	C x IR x CF x Fi x EF x ED x 1/BW x 1/AT
	CF	Conversion Factor	kg/mg	1.00E-06	USEPA, 1989	--	--	
	Fi	Fraction Ingested from Source	NA	1	USEPA, 1995	--	--	
	EF	Exposure Frequency	days/year	250	USEPA, 1991	--	--	
	ED	Exposure Duration	years	1	Prof Judge	--	--	
	BW	Body Weight	kg	70	USEPA, 1989	--	--	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, 1989	--	--	
	AT-N	Averaging Time (Non-Cancer)	days	365	USEPA, 1989	--	--	
Dermal	C	Contaminant Concentration in Soil	mg/kg	See Table	See Table	--	--	CDI (mg/kg-day) =
	CF	Conversion Factor	kg/mg	1.00E-06	USEPA, 1989	--	--	C x CF x SA x AF x ABS x EF x ED x
	SA	Surface Area Available for Contact	cm2/day	3,300	USEPA, 1997	--	--	1/BW x1/AT
	AF	Soil to Skin Adherence Factor	mg/cm2	0.2	USEPA, 1997	--	--	
	ABS	Absorption Factor	NA	(1)	USEPA, 1995	--	--	
	EF	Exposure Frequency	days/year	250	USEPA, 1991	--	--	
	ED	Exposure Duration	years	1	Prof Judge	--	--	
	BW	Body Weight	kg	70	USEPA, 1989	--	--	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, 1989	--	--	
	AT-N	Averaging Time (Non-Cancer)	days	365	USEPA, 1989	--	--	
Inhalation	C	Contaminant Concentration in Soil	mg/kg	See Table	See Table	--	--	CDI (mg/kg-day) =
	RR	Respiration Rate	m3/hour	0.8	USEPA, 1995	--	--	C x IR x ET x EF x ED x 1/PEF x
	ET	Exposure Time	hours/day	8	Prof Judge	--	--	1/BW x1/AT
	EF	Exposure Frequency	days/year	250	USEPA, 1991	--	--	
	ED	Exposure Duration	years	1	Prof Judge	--	--	
	PEF	Particulate Emission Factor	m3/kg	1.32E+09	USEPA, 1996	--	--	
	BW	Body Weight	kg	70	USEPA, 1989	--	--	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, 1989	--	--	
	AT-N	Averaging Time (Non-Cancer)	days	365	USEPA, 1989	--	--	

Notes

(1) USEPA Region IV default values of 0.01% organics and 0.001% for inorganics were used for ABS values.

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Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund Vol 1, Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.
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TABLE 4.6.2
VALUES USED FOR DAILY INTAKE CALCULATIONS
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Subsurface Soil
Exposure Medium: Subsurface Soil
Exposure Point: Subsurface Soil
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	C	Contaminant Concentration in Soil	mg/kg	See Table	See Table	--	--	Chronic Daily Intake (CDI) (mg/kg-day) =
	IR-S	Ingestion Rate of Soil	mg/day	480	USEPA, 1997	--	--	C x IR x CF x Fi x EF x ED x 1/BW x 1/AT
	CF	Conversion Factor	kg/mg	1.00E-06	USEPA, 1989	--	--	
	Fi	Fraction Ingested from Source	NA	1	USEPA, 1995	--	--	
	EF	Exposure Frequency	days/year	250	USEPA, 1991	--	--	
	ED	Exposure Duration	years	1	Prof Judge	--	--	
	BW	Body Weight	kg	70	USEPA, 1989	--	--	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, 1989	--	--	
	AT-N	Averaging Time (Non-Cancer)	days	365	USEPA, 1989	--	--	
Dermal	C	Contaminant Concentration in Soil	mg/kg	See Table	See Table	--	--	CDI (mg/kg-day) =
	CF	Conversion Factor	kg/mg	1.00E-06	USEPA, 1989	--	--	C x CF x SA x AF x ABS x EF x ED x
	SA	Surface Area Available for Contact	cm2/day	3,300	USEPA, 1997	--	--	1/BW x1/AT
	AF	Soil to Skin Adherence Factor	mg/cm2	0.2	USEPA, 1997	--	--	
	ABS	Absorption Factor	NA	(1)	USEPA, 1995	--	--	
	EF	Exposure Frequency	days/year	250	USEPA, 1991	--	--	
	ED	Exposure Duration	years	1	Prof Judge	--	--	
	BW	Body Weight	kg	70	USEPA, 1989	--	--	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, 1989	--	--	
	AT-N	Averaging Time (Non-Cancer)	days	365	USEPA, 1989	--	--	
Inhalation	C	Contaminant Concentration in Soil	mg/kg	See Table	See Table	--	--	CDI (mg/kg-day) =
	RR	Respiration Rate	m3/hour	0.83	USEPA, 1995	--	--	C x IR x ET x EF x ED x 1/PEF x
	ET	Exposure Time	hours/day	8	Prof Judge	--	--	1/BW x1/AT
	EF	Exposure Frequency	days/year	250	USEPA, 1991	--	--	
	ED	Exposure Duration	years	1	Prof Judge	--	--	
	PEF	Particulate Emission Factor	m3/kg	1.32E+09	USEPA, 1996	--	--	
	BW	Body Weight	kg	70	USEPA, 1989	--	--	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, 1989	--	--	
	AT-N	Averaging Time (Non-Cancer)	days	365	USEPA, 1989	--	--	

Notes

(1) USEPA Region IV default values of 0.01% organics and 0.001% for inorganics were used for ABS values.

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TABLE 4.6.3
VALUES USED FOR DAILY INTAKE CALCULATIONS
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Groundwater
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	C	Contaminant Concentration in Groundwater	mg/L	See Table	See Table	--	--	Chronic Daily Intake (CDI) (mg/kg-day) =
	IR-W	Ingestion Rate of Groundwater	L/day	NA	USEPA, 1989	--	--	C x IR-W x EF x ED x 1/BW x 1/AT
	EF	Exposure Frequency	days/year	250	USEPA, 1991	--	--	
	ED	Exposure Duration	years	1	Prof Judge	--	--	
	BW	Body Weight	kg	70	USEPA, 1989	--	--	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, 1989	--	--	
	AT-N	Averaging Time (Non-Cancer)	days	365	USEPA, 1989	--	--	
Dermal	C	Contaminant Concentration in Groundwater	mg/L	See Table	See Table	--	--	CDI (mg/kg-day) =
	CF	Conversion Factor	L/cm3	1.00E-03	USEPA, 1989	--	--	C x CF x SA x PC x ET x EF x ED x
	SA	Surface Area Available for Contact	cm2	3,300	USEPA, 1997	--	--	1/BW x1/AT
	PC	Permeability Constant	cm/hour	Chemical Specific	USEPA, 1992	--	--	
	ET	Exposure Time	hours/day	8.00E+00	USEPA, 1989	--	--	
	EF	Exposure Frequency	days/year	2.50E+02	USEPA, 1991	--	--	
	ED	Exposure Duration	years	1.00E+00	Prof Judge	--	--	
	BW	Body Weight	kg	7.00E+01	USEPA, 1989	--	--	
	AT-C	Averaging Time (Cancer)	days	2.56E+04	USEPA, 1989	--	--	
	AT-N	Averaging Time (Non-Cancer)	days	3.65E+02	USEPA, 1989	--	--	

Notes

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TABLE 4.6.4
VALUES USED FOR DAILY INTAKE CALCULATIONS
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: Surface Water
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	C	Contaminant Concentration in Surface Water	mg/L	See Table	See Table	--	--	Chronic Daily Intake (CDI) (mg/kg-day) =
	IR-W	Ingestion Rate of Surface Water	L/hour	NA	USEPA, 1989	--	--	C x IR-W x EF x ED x 1/BW x 1/AT
	ET	Exposure Time	hours/day	8	USEPA, 1989	--	--	
	EF	Exposure Frequency	days/year	250	USEPA, 1991	--	--	
	ED	Exposure Duration	years	1	Prof Judge	--	--	
	BW	Body Weight	kg	70	USEPA, 1989	--	--	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, 1989	--	--	
	AT-N	Averaging Time (Non-Cancer)	days	365	USEPA, 1989	--	--	
Dermal	C	Contaminant Concentration in Surface Water	mg/L	See Table	See Table	--	--	CDI (mg/kg-day) =
	CF	Conversion Factor	L/cm3	1.00E-03	USEPA, 1989	--	--	C x CF x SA x PC x ET x EF x ED x
	SA	Surface Area Available for Contact	cm2	3,300	USEPA, 1997	--	--	1/BW x1/AT
	PC	Permeability Constant	cm/hour	Chemical Specific	USEPA, 1992	--	--	
	ET	Exposure Time	hours/day	8	USEPA, 1989	--	--	
	EF	Exposure Frequency	days/year	250	USEPA, 1991	--	--	
	ED	Exposure Duration	years	1	Prof Judge	--	--	
	BW	Body Weight	kg	70	USEPA, 1989	--	--	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, 1989	--	--	
	AT-N	Averaging Time (Non-Cancer)	days	365	USEPA, 1989	--	--	

Notes

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Sources:

TABLE 4.6.5
VALUES USED FOR DAILY INTAKE CALCULATIONS
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Sediment
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	C	Contaminant Concentration in Sediment	mg/kg	See Table	See Table	--	--	Chronic Daily Intake (CDI) (mg/kg-day) =
	IR-S	Ingestion Rate of Sediment	mg/day	NA	Prof Judge	--	--	C x IR x CF x Fi x EF x ED x 1/BW x 1/AT
	CF	Conversion Factor	kg/mg	1.00E-06	USEPA, 1989	--	--	
	Fi	Fraction Ingested from Source	NA	1	USEPA, 1995	--	--	
	EF	Exposure Frequency	days/year	250	USEPA, 1991	--	--	
	ED	Exposure Duration	years	1	Prof Judge	--	--	
	BW	Body Weight	kg	70	USEPA, 1989	--	--	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, 1989	--	--	
	AT-N	Averaging Time (Non-Cancer)	days	365	USEPA, 1989	--	--	
Dermal	C	Contaminant Concentration in Sediment	mg/kg	See Table	See Table	--	--	CDI (mg/kg-day) =
	CF	Conversion Factor	kg/mg	1.00E-06	USEPA, 1989	--	--	C x CF x SA x AF x ABS x EF x ED x
	SA	Surface Area Available for Contact	cm2/day	3,300	USEPA, 1997	--	--	1/BW x1/AT
	AF	Soil to Skin Adherence Factor	mg/cm2	0.2	USEPA, 1997	--	--	
	ABS	Absorption Factor	NA	(1)	USEPA, 1995	--	--	
	EF	Exposure Frequency	days/year	250	USEPA, 1991	--	--	
	ED	Exposure Duration	years	1	Prof Judge	--	--	
	BW	Body Weight	kg	70	USEPA, 1989	--	--	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, 1989	--	--	
	AT-N	Averaging Time (Non-Cancer)	days	365	USEPA, 1989	--	--	

Notes

(1) USEPA Region IV default values of 0.01% organics and 0.001% for inorganics were used for ABS values.

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TABLE 4.7.1
VALUES USED FOR DAILY INTAKE CALCULATIONS
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Surface Soil
Receptor Population: Industrial / Commercial Workers
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	C	Contaminant Concentration in Soil	mg/kg	See Table	See Table	--	--	Chronic Daily Intake (CDI) (mg/kg-day) =
	IR-S	Ingestion Rate of Soil	mg/day	50	USEPA, 1995	--	--	C x IR x CF x Fi x EF x ED x 1/BW x 1/AT
	CF	Conversion Factor	kg/mg	1.00E-06	USEPA, 1989	--	--	
	Fi	Fraction Ingested from Source	NA	1	USEPA, 1995	--	--	
	EF	Exposure Frequency	days/year	250	USEPA, 1991	--	--	
	ED	Exposure Duration	years	25	USEPA, 1991	--	--	
	BW	Body Weight	kg	70	USEPA, 1989	--	--	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, 1989	--	--	
	AT-N	Averaging Time (Non-Cancer)	days	9,125	USEPA, 1989	--	--	
Dermal	C	Contaminant Concentration in Soil	mg/kg	See Table	See Table	--	--	CDI (mg/kg-day) =
	CF	Conversion Factor	kg/mg	1.00E-06	USEPA, 1989	--	--	C x CF x SA x AF x ABS x EF x ED x
	SA	Surface Area Available for Contact	cm2/day	3,300	USEPA, 1997	--	--	1/BW x1/AT
	AF	Soil to Skin Adherence Factor	mg/cm2	0.2	USEPA, 1997	--	--	
	ABS	Absorption Factor	NA	(1)	USEPA, 1995	--	--	
	EF	Exposure Frequency	days/year	250	USEPA, 1991	--	--	
	ED	Exposure Duration	years	25	USEPA, 1991	--	--	
	BW	Body Weight	kg	70	USEPA, 1989	--	--	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, 1989	--	--	
	AT-N	Averaging Time (Non-Cancer)	days	9,125	USEPA, 1989	--	--	
Inhalation	C	Contaminant Concentration in Soil	mg/kg	See Table	See Table	--	--	CDI (mg/kg-day) =
	RR	Respiration Rate	m3/hour	0.83	USEPA, 1995	--	--	C x IR x ET x EF x ED x 1/PEF x
	ET	Exposure Time	hours/day	8	USEPA, 1991	--	--	1/BW x1/AT
	EF	Exposure Frequency	days/year	250	USEPA, 1991	--	--	
	ED	Exposure Duration	years	25	USEPA, 1991	--	--	
	PEF	Particulate Emission Factor	m3/kg	1.32E+09	USEPA, 1996	--	--	
	BW	Body Weight	kg	70	USEPA, 1989	--	--	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, 1989	--	--	
	AT-N	Averaging Time (Non-Cancer)	days	9,125	USEPA, 1989	--	--	

Notes

(1) USEPA Region IV default values of 0.01% organics and 0.001% for inorganics were used for ABS values.

Sources:

TABLE 4.7.2
VALUES USED FOR DAILY INTAKE CALCULATIONS
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Groundwater
Receptor Population: Industrial / Commercial Workers
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	C	Contaminant Concentration in Groundwater	mg/L	See Table	See Table	--	--	Chronic Daily Intake (CDI) (mg/kg-day) =
	IR-W	Ingestion Rate of Groundwater	L/day	2	USEPA, 1995	--	--	C x IR-W x EF x ED x 1/BW x 1/AT
	EF	Exposure Frequency	days/year	250	USEPA, 1991	--	--	
	ED	Exposure Duration	years	25	USEPA, 1991	--	--	
	BW	Body Weight	kg	70	USEPA, 1989	--	--	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, 1989	--	--	
	AT-N	Averaging Time (Non-Cancer)	days	9,125	USEPA, 1989	--	--	
Dermal	C	Contaminant Concentration in Groundwater	mg/L	See Table	See Table	--	--	CDI (mg/kg-day) =
	CF	Conversion Factor	L/cm3	1.00E-03	USEPA, 1989	--	--	C x CF x SA x PC x ET x EF x ED x
	SA	Surface Area Available for Contact	cm2	18,000	USEPA, 1997	--	--	1/BW x1/AT
	PC	Permeability Constant	cm/hour	Chemical Specific	USEPA, 1992	--	--	
	ET	Exposure Time	hours/day	0.25	USEPA, 1989	--	--	
	EF	Exposure Frequency	days/year	250	USEPA, 1991	--	--	
	ED	Exposure Duration	years	25	USEPA, 1991	--	--	
	BW	Body Weight	kg	70	USEPA, 1989	--	--	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, 1989	--	--	
	AT-N	Averaging Time (Non-Cancer)	days	9,125	USEPA, 1989	--	--	

Notes

TABLE 5.1
NON-CANCER TOXICITY DATA -- ORAL/DERMAL
SITE 84 (BUILDING 45 AREA)
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD Value	Oral RfD Units	Oral to Dermal Adjustment Factor (1)	Adjusted Dermal RfD (2)	Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Sources of RfD: Target Organ	Dates of RfD: Target Organ (3) (MM/DD/YY)
Acetone	Subchronic	1.00E-01	(mg/kg/day)	8.30E-01	8.30E-02	(mg/kg/day)	Liver / Kidney	1000/1	IRIS	9/18/2000
Benzene	Subchronic	3.00E-03	(mg/kg/day)	9.30E-01	2.79E-03	(mg/kg/day)	CVS	10000/1	NCEA	9/1/1998
Chloroform	Chronic	1.00E-02	(mg/kg/day)	2.00E-01	2.00E-03	(mg/kg/day)	Liver	100/1	IRIS	4/12/2002
Toluene	Subchronic	2.00E-01	(mg/kg/day)	8.00E-01	1.60E-01	(mg/kg/day)	Liver / Kidney	1000/1	IRIS	4/12/2002
Xylenes, total	Chronic	2.00E+00	(mg/kg/day)	9.20E-01	1.84E+00	(mg/kg/day)	Whole body	100/1	IRIS	9/19/2000
2-Methylnaphthalene	NA	NA	(mg/kg/day)	8.00E-01	NA	(mg/kg/day)	NA	NA	NA	NA
Bis(2-chloroethoxy)methane	NA	NA	(mg/kg/day)	5.00E-01	NA	(mg/kg/day)	NA	NA	NA	NA
Benzo(a)anthracene	NA	NA	(mg/kg/day)	3.10E-01	NA	(mg/kg/day)	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	(mg/kg/day)	5.00E-01	NA	(mg/kg/day)	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	(mg/kg/day)	5.00E-01	NA	(mg/kg/day)	NA	NA	NA	NA
Benzo(k)fluoranthene	NA	NA	(mg/kg/day)	5.00E-01	NA	(mg/kg/day)	NA	NA	NA	NA
Carbazole	NA	NA	(mg/kg/day)	5.00E-01	NA	(mg/kg/day)	NA	NA	NA	NA
Chrysene	NA	NA	(mg/kg/day)	3.10E-01	NA	(mg/kg/day)	NA	NA	NA	NA
Dibenz(a,h)anthracene	NA	NA	(mg/kg/day)	3.10E-01	NA	(mg/kg/day)	NA	NA	NA	NA
Fluoranthene	Subchronic	4.00E-02	(mg/kg/day)	3.10E-01	1.24E-02	(mg/kg/day)	Liver / CVS	3000/1	IRIS	9/18/2000
Indeno(1,2,3-cd)pyrene	NA	NA	(mg/kg/day)	3.10E-01	NA	(mg/kg/day)	NA	NA	NA	NA
Naphthalene	Subchronic	2.00E-02	(mg/kg/day)	8.00E-01	1.60E-02	(mg/kg/day)	Whole Body	3000/1	IRIS	9/19/2000
Pyrene	Subchronic	3.00E-02	(mg/kg/day)	3.10E-01	9.30E-03	(mg/kg/day)	Kidney	3000/1	IRIS	9/18/2000
4,4'-DDD	NA	NA	(mg/kg/day)	7.00E-01	NA	(mg/kg/day)	NA	NA	NA	NA
Chlordane, alpha-	Subchronic	5.00E-04	(mg/kg/day)	8.00E-01	4.00E-04	(mg/kg/day)	Liver	300/1	IRIS	3/22/2001
Chlordane, gamma-	Subchronic	5.00E-04	(mg/kg/day)	8.00E-01	4.00E-04	(mg/kg/day)	Liver	300/1	IRIS	3/22/2001
Dieldrin	Subchronic	5.00E-05	(mg/kg/day)	5.00E-01	2.50E-05	(mg/kg/day)	Liver	100/1	IRIS	9/18/2000
Heptachlor	Subchronic	5.00E-04	(mg/kg/day)	7.20E-01	3.60E-04	(mg/kg/day)	Liver	300/1	IRIS	9/18/2000
Heptachlor Epoxide	Chronic	1.30E-05	(mg/kg/day)	7.20E-01	9.36E-06	(mg/kg/day)	Liver	1000/1	IRIS	9/18/2000
Aroclor-1248	NA	NA	(mg/kg/day)	8.90E-01	NA	(mg/kg/day)	NA	NA	NA	NA
Aroclor-1254	Chronic	2.00E-05	(mg/kg/day)	9.00E-01	1.80E-05	(mg/kg/day)	Whole Body / ImS	300/1	IRIS	9/18/2000
Aroclor-1260	NA	NA	(mg/kg/day)	9.00E-01	NA	(mg/kg/day)	NA	NA	NA	NA
MCPA	Subchronic	5.00E-04	(mg/kg/day)	5.00E-01	2.50E-04	(mg/kg/day)	Kidney / Liver	300/1	IRIS	8/14/2001
Diesel Range Organics	NA	NA	(mg/kg/day)	5.00E-01	NA	(mg/kg/day)	NA	NA	NA	NA
Gasoline Range Organics	NA	NA	(mg/kg/day)	5.00E-01	NA	(mg/kg/day)	NA	NA	NA	NA
Antimony	Chronic	4.00E-04	(mg/kg/day)	2.00E-02	8.00E-06	(mg/kg/day)	Whole Body	1000/1	IRIS	5/23/2000
Arsenic	Chronic	3.00E-04	(mg/kg/day)	4.10E-01	1.23E-04	(mg/kg/day)	Skin / CVS	3/1	IRIS	9/18/2000
Iron	Chronic	3.00E-01	(mg/kg/day)	1.50E-01	4.50E-02	(mg/kg/day)	Liver / CVS / GIS	NA	NCEA	4/26/2000
Manganese	Chronic	2.40E-02	(mg/kg/day)	4.00E-02	9.60E-04	(mg/kg/day)	CNS	1/1	IRIS	9/19/2000
Thallium	Subchronic	6.60E-05	(mg/kg/day)	1.50E-01	9.90E-06	(mg/kg/day)	CVS	3000/1	IRIS	3/29/1999

Notes:

(1) Refer to table presented as subsection of Appendix H
(2) Adjusted dermal RfD = Oral RfD * Adj Factor
(3) For IRIS values, provide the date IRIS was searched.
For HEAST values, provide the date of HEAST.
For NCEA values, provide the date of the article provided by NCEA.

Target Organ Abbreviations:
CNS = Central Nervous System
CVS = Cardiovascular System
GIS = Gastrointestinal System
ImS = Immune System

Sources:
IRIS = Integrated Risk Information System
NCEA = National Center for Environmental Assessment, USEPA

NA = Not Applicable

TABLE 5.2
NON-CANCER TOXICITY DATA -- INHALATION
SITE 84 (BUILDING 45 AREA)
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Chemical of Potential Concern	Chronic/ Subchronic	Value Inhalation RfC	Units	Adjusted Inhalation RfD (1)	Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Sources of RfC:RfD: Target Organ	Dates (2) (MM/DD/YY)
Acetone	NA	NA	NA	1.00E-01	mg/kg/day	NA	NA	RE	NA
Benzene	Subchronic	9.0E-03	mg/m3	1.71E-03	mg/kg/day	CVS	1000/1	NCEA	9/1/1998
Chloroform	NA	NA	NA	8.60E-05	mg/kg/day	NA	NA	NCEA	NA
Toluene	Chronic	4.0E-01	mg/m3	1.10E-01	mg/kg/day	CNS / RsS	300/1	HEAST	4/12/2002
Xylenes, total	NA	NA	NA	NA	mg/kg/day	NA	NA	Withdrawn	NA
2-Methylnaphthalene	NA	NA	NA	NA	mg/kg/day	NA	NA	NA	NA
Bis(2-chloroethoxy)methane	NA	NA	NA	NA	mg/kg/day	NA	NA	NA	NA
Benzo(a)anthracene	NA	NA	NA	NA	mg/kg/day	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	mg/kg/day	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	mg/kg/day	NA	NA	NA	NA
Benzo(k)fluoranthene	NA	NA	NA	NA	mg/kg/day	NA	NA	NA	NA
Carbazole	NA	NA	NA	NA	mg/kg/day	NA	NA	NA	NA
Chrysene	NA	NA	NA	NA	mg/kg/day	NA	NA	NA	NA
Dibenz(a,h)anthracene	NA	NA	NA	NA	mg/kg/day	NA	NA	NA	NA
Fluoranthene	NA	NA	NA	4.00E-02	mg/kg/day	NA	NA	RE	NA
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	mg/kg/day	NA	NA	NA	NA
Naphthalene	Chronic	3.0E-03	mg/m3	8.57E-04	mg/kg/day	RsS	3000/1	IRIS	9/19/2000
Pyrene	NA	NA	NA	3.00E-02	mg/kg/day	NA	NA	RE	NA
4,4'-DDD	NA	NA	NA	NA	mg/kg/day	NA	NA	NA	NA
Chlordane, alpha-	Subchronic	7.0E-04	mg/m3	2.00E-04	mg/kg/day	Liver	1000/1	IRIS	3/22/2001
Chlordane, gamma-	Subchronic	7.0E-04	mg/m3	2.00E-04	mg/kg/day	Liver	1000/1	IRIS	3/22/2001
Dieldrin	NA	NA	NA	5.00E-05	mg/kg/day	NA	NA	RE	NA
Heptachlor	NA	NA	NA	5.00E-04	mg/kg/day	NA	NA	RE	NA
Heptachlor Epoxide	NA	NA	NA	1.30E-05	mg/kg/day	NA	NA	RE	NA
Aroclor-1248	NA	NA	NA	NA	mg/kg/day	NA	NA	NA	NA
Aroclor-1254	NA	NA	NA	2.00E-05	mg/kg/day	NA	NA	RE	NA
Aroclor-1260	NA	NA	NA	NA	mg/kg/day	NA	NA	NA	NA
MCPA	NA	NA	NA	5.00E-04	mg/kg/day	NA	NA	RE	NA
Diesel Range Organics	NA	NA	NA	NA	mg/kg/day	NA	NA	NA	NA
Gasoline Range Organics	NA	NA	NA	NA	mg/kg/day	NA	NA	NA	NA
Antimony	NA	NA	NA	NA	mg/kg/day	NA	NA	NA	NA
Arsenic	NA	NA	NA	NA	mg/kg/day	NA	NA	NA	NA
Iron	NA	NA	NA	NA	mg/kg/day	NA	NA	NA	NA
Manganese	Chronic	5.0E-05	mg/m3	1.40E-05	mg/kg/day	CNS	1000/1	IRIS	9/19/2000
Thallium	NA	NA	NA	NA	mg/kg/day	NA	NA	NA	NA

Notes:

(1) Provide equation used for derivation in text.
(2) For IRIS values, provide the date IRIS was searched.
For HEAST values, provide the date of HEAST.
For NCEA values, provide the date of the article provided by NCEA.

NA = Not Applicable

Target Organ Abbreviations:
CNS = Central Nervous System
CVS = Cardiovascular System
RsS = Respiratory System

Sources:
IRIS = Integrated Risk Information System
HEAST= Health Effects Assessment Summary Tables
NCEA = National Center for Environmental Assessment, USI
RE = Region 9 Route Extrapolation

TABLE 6.1
CANCER TOXICITY DATA -- ORAL/DERMAL
SITE 84 (BUILDING 45 AREA)
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Chemical of Potential Concern	Oral Cancer Slope Factor	Oral to Dermal Adjustment Factor (1)	Adjusted Dermal Cancer Slope Factor (2)	Units	Weight of Evidence/ Cancer Guideline Description	Source	Date (3) (MM/DD/YY)
Acetone	NA	8.30E-01	NA	$(mg/kg/day)^{-1}$	D	NA	NA
Benzene	5.50E-02	9.30E-01	5.91E-02	$(mg/kg/day)^{-1}$	A	IRIS	9/18/2000
Chloroform	6.10E-03	2.00E-01	3.05E-02	$(mg/kg/day)^{-1}$	B2	IRIS	4/12/2002
Toluene	NA	8.00E-01	NA	$(mg/kg/day)^{-1}$	D	NA	4/12/2002
Xylenes, total	NA	9.20E-01	NA	$(mg/kg/day)^{-1}$	D	NA	2/28/2001
2-Methylnaphthalene	NA	8.00E-01	NA	$(mg/kg/day)^{-1}$	D	NA	NA
Bis(2-chloroethoxy)methane	NA	5.00E-01	NA	$(mg/kg/day)^{-1}$	D	NA	2/23/2001
Benzo(a)anthracene	7.30E-01	3.10E-01	2.35E+00	$(mg/kg/day)^{-1}$	B2	NCEA	4/26/2000
Benzo(a)pyrene	7.30E+00	5.00E-01	1.46E+01	$(mg/kg/day)^{-1}$	B2	IRIS	9/18/2000
Benzo(b)fluoranthene	7.30E-01	5.00E-01	1.46E+00	$(mg/kg/day)^{-1}$	B2	NCEA	4/26/2000
Benzo(k)fluoranthene	7.30E-02	5.00E-01	1.46E-01	$(mg/kg/day)^{-1}$	B2	NCEA	4/26/2000
Carbazole	2.00E-02	5.00E-01	4.00E-02	$(mg/kg/day)^{-1}$	B2	HEAST	7/1/1997
Chrysene	7.30E-03	3.10E-01	2.35E-02	$(mg/kg/day)^{-1}$	B2	NCEA	4/26/2000
Dibenz(a,h)anthracene	7.30E+00	3.10E-01	2.35E+01	$(mg/kg/day)^{-1}$	B2	NCEA	4/26/2000
Fluoranthene	NA	3.10E-01	NA	$(mg/kg/day)^{-1}$	D	NA	9/18/2000
Indeno(1,2,3-cd)pyrene	7.30E-01	3.10E-01	2.35E+00	$(mg/kg/day)^{-1}$	B2	NCEA	4/26/2000
Naphthalene	NA	8.00E-01	NA	$(mg/kg/day)^{-1}$	D	NA	9/19/2000
Pyrene	NA	3.10E-01	NA	$(mg/kg/day)^{-1}$	D	NA	9/18/2000
4,4'-DDD	2.40E-01	7.00E-01	3.43E-01	$(mg/kg/day)^{-1}$	B2	IRIS	9/15/2000
Chlordane, alpha-	3.50E-01	8.00E-01	4.38E-01	$(mg/kg/day)^{-1}$	B2	IRIS	3/22/2001
Chlordane, gamma-	3.50E-01	8.00E-01	4.38E-01	$(mg/kg/day)^{-1}$	B2	IRIS	9/18/2000
Dieldrin	1.60E+01	5.00E-01	3.20E+01	$(mg/kg/day)^{-1}$	B2	IRIS	9/18/2000
Heptachlor	4.50E+00	7.20E-01	6.25E+00	$(mg/kg/day)^{-1}$	B2	IRIS	9/18/2000
Heptachlor Epoxide	9.10E+00	7.20E-01	1.26E+01	$(mg/kg/day)^{-1}$	B2	IRIS	9/18/2000
Aroclor-1248	2.00E+00	8.90E-01	2.25E+00	$(mg/kg/day)^{-1}$	B2	IRIS	3/8/2001
Aroclor-1254	2.00E+00	9.00E-01	2.22E+00	$(mg/kg/day)^{-1}$	B2	IRIS	3/8/2001
Aroclor-1260	2.00E+00	9.00E-01	2.22E+00	$(mg/kg/day)^{-1}$	B2	IRIS	3/8/2001
MCPA	NA	5.00E-01	NA	$(mg/kg/day)^{-1}$	D	NA	NA
Diesel Range Organics	NA	5.00E-01	NA	$(mg/kg/day)^{-1}$	D	NA	NA

TABLE 6.1 (Continued)
CANCER TOXICITY DATA -- ORAL/DERMAL
SITE 84 (BUILDING 45 AREA)
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Chemical of Potential Concern	Oral Cancer Slope Factor	Oral to Dermal Adjustment Factor (1)	Adjusted Dermal Cancer Slope Factor (2)	Units	Weight of Evidence/ Cancer Guideline Description	Source	Date (3) (MM/DD/YY)
Gasoline Range Organics	NA	5.00E-01	NA	$(mg/kg/day)^{-1}$	D	NA	NA
Antimony	NA	2.00E-02	NA	$(mg/kg/day)^{-1}$	D	NA	NA
Arsenic	1.50E+00	4.10E-01	3.66E+00	$(mg/kg/day)^{-1}$	A	IRIS	9/18/2000
Iron	NA	1.50E-01	NA	$(mg/kg/day)^{-1}$	D	NA	NA
Manganese	NA	4.00E-02	NA	$(mg/kg/day)^{-1}$	D	NA	9/19/2000
Thallium	NA	1.50E-01	NA	$(mg/kg/day)^{-1}$	D	NA	NA

Notes:

(1) Refer to table presented as subsection of Appendix H
(2) Adjusted dermal CSF = Oral CSF / Adj Factor
(3) For IRIS values, provide the date IRIS was searched.
For HEAST values, provide the date of HEAST.
For NCEA values, provide article date provided by NCEA.

NA = Not Applicable

Sources:
IRIS = Integrated Risk Information System
HEAST= Health Effects Assessment Summary Tables
NCEA = National Center for Environmental Assessment, USEPA

EPA Group:
A - Human carcinogen
B1 - Probable human carcinogen - indicates that limited human data are available
B2 - Probable human carcinogen - indicates sufficient evidence in animals and inadequate or no evidence in humans
C - Possible human carcinogen
D - Not classifiable as a human carcinogen
E - Evidence of noncarcinogenicity

Weight of Evidence:
Known/Likely (EPA classes A, B1, B2, C)
Cannot be Determined (EPA class D)
Not Likely (EPA class E)

TABLE 6.2
CANCER TOXICITY DATA -- INHALATION
SITE 84 (BUILDING 45 AREA)
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Chemical of Potential Concern	Unit Risk	Units	Adjustment (1)	Inhalation Cancer Slope Factor	Units	Weight of Evidence/ Cancer Guideline Description	Source	Date (2) (MM/DD/YY)
Acetone	NA	NA	NA	NA	mg/kg/day	D	NA	NA
Benzene	4.5E+01	ug/m3	3,500	2.70E-02	mg/kg/day	A	IRIS	9/18/2000
Chloroform	2.3E-05	ug/m3	3,500	8.05E-02	mg/kg/day	B2	IRIS	4/12/2002
Toluene	NA	NA	NA	NA	mg/kg/day	D	NA	4/12/2002
Xylenes, total	NA	NA	NA	NA	mg/kg/day	D	NA	2/28/2001
2-Methylnaphthalene	NA	NA	NA	NA	mg/kg/day	D	NA	NA
Bis(2-chloroethoxy)methane	NA	NA	NA	NA	mg/kg/day	D	NA	2/23/2001
Benzo(a)anthracene	NA	NA	3,500	3.10E-01	mg/kg/day	D	NCEA	NA
Benzo(a)pyrene	8.9E-04	ug/m3	3,500	3.10E+00	mg/kg/day	B2	NCEA	4/26/2000
Benzo(b)fluoranthene	NA	NA	3,500	3.10E-01	mg/kg/day	B2	NCEA	NA
Benzo(k)fluoranthene	NA	NA	3,500	3.10E-02	mg/kg/day	B2	NCEA	NA
Carbazole	NA	NA	3,500	2.00E-02	mg/kg/day	D	RE	NA
Chrysene	NA	NA	3,500	3.10E-03	mg/kg/day	B2	NCEA	9/18/2000
Dibenz(a,h)anthracene	NA	NA	3,500	3.10E+00	mg/kg/day	D	NCEA	NA
Fluoranthene	NA	NA	NA	NA	mg/kg/day	D	NA	9/18/2000
Indeno(1,2,3-cd)pyrene	NA	NA	3,500	3.10E-01	mg/kg/day	B2	NCEA	9/18/2000
Naphthalene	NA	NA	NA	NA	mg/kg/day	C	NA	9/19/2000
Pyrene	NA	NA	NA	NA	mg/kg/day	D	NA	9/18/2000
4,4'-DDD	NA	NA	3,500	2.40E-01	mg/kg/day	B2	RE	NA
Chlordane, alpha-	1.0E-04	ug/m3	3,500	3.50E-01	mg/kg/day	B2	IRIS	3/22/2001
Chlordane, gamma-	1.0E-04	ug/m3	3,500	3.50E-01	mg/kg/day	B2	IRIS	9/18/2000
Dieldrin	4.6E-03	ug/m3	3,500	1.61E+01	mg/kg/day	B2	IRIS	9/18/2000
Heptachlor	1.3E-03	ug/m3	3,500	4.55E+00	mg/kg/day	B2	IRIS	9/18/2000
Heptachlor Epoxide	2.6E-03	ug/m3	3,500	9.10E+00	mg/kg/day	B2	IRIS	9/18/2000
Aroclor-1248	1.0E+00	ug/m3	3,500	2.00E+00	mg/kg/day	B2	IRIS	3/8/2001
Aroclor-1254	1.0E+00	ug/m3	3,500	2.00E+00	mg/kg/day	B2	IRIS	3/8/2001
Aroclor-1260	1.0E+00	ug/m3	3,500	2.00E+00	mg/kg/day	B2	IRIS	3/8/2001
MCPA	NA	NA	NA	NA	mg/kg/day	D	NA	NA
Diesel Range Organics	NA	NA	NA	NA	mg/kg/day	D	NA	NA

TABLE 6.2 (Continued)
CANCER TOXICITY DATA -- INHALATION
SITE 84 (BUILDING 45 AREA)
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Chemical of Potential Concern	Unit Risk	Units	Adjustment (1)	Inhalation Cancer Slope Factor	Units	Weight of Evidence/ Cancer Guideline Description	Source	Date (2) (MM/DD/YY)
Gasoline Range Organics	NA	NA	NA	NA	mg/kg/day	D	NA	NA
Antimony	NA	NA	NA	NA	mg/kg/day	D	NA	NA
Arsenic	4.3E-03	ug/m3	3,500	1.51E+01	mg/kg/day	A	IRIS	9/18/2000
Iron	NA	NA	NA	NA	mg/kg/day	D	NA	NA
Manganese	NA	NA	NA	NA	mg/kg/day	D	NA	9/19/2000
Thallium	NA	NA	NA	NA	mg/kg/day	D	NA	NA

Notes:

(1) Adjustment Factor applied to Unit Risk to calculate Inhalation Slope Factor = 70kg x 1/20m3/day x 1000ug/mg
(2) For IRIS values, provide the date IRIS was searched.
For HEAST values, provide the date of HEAST.
For NCEA values, provide the date of the article provided by NCEA.

NA = Not Applicable

Sources:
IRIS = Integrated Risk Information System
NCEA = National Center for Environmental Assessment, USEPA
RE = Region 9 Route Extrapolation

EPA Group:
A - Human carcinogen
B1 - Probable human carcinogen - indicates that limited human data a
B2 - Probable human carcinogen - indicates sufficient evidence in ani
inadequate or no evidence in humans
C - Possible human carcinogen
D - Not classifiable as a human carcinogen
E - Evidence of noncarcinogenicity

Weight of Evidence:
Known/Likely (EPA classes A, B1, B2, C)
Cannot be Determined (EPA class D)
Not Likely (EPA class E)

TABLE 7.1.1A RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Current
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Surface Soil
Receptor Population: Military Base Personnel
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	2-Methylnaphthalene	1.96	mg/kg	1.96	mg/kg	M	1.9E-06	mg/kg-day	NA	--	--	--	--
	Benzo(a)anthracene	69.0	mg/kg	69.0	mg/kg	M	6.8E-05	mg/kg-day	NA	--	--	--	--
	Benzo(a)pyrene	30.5	mg/kg	30.5	mg/kg	M	3.0E-05	mg/kg-day	NA	--	--	--	--
	Benzo(b)fluoranthene	40.9	mg/kg	40.9	mg/kg	M	4.0E-05	mg/kg-day	NA	--	--	--	--
	Benzo(k)fluoranthene	18.7	mg/kg	18.7	mg/kg	M	1.8E-05	mg/kg-day	NA	--	--	--	--
	Carbazole	3.16	mg/kg	3.16	mg/kg	M	3.1E-06	mg/kg-day	NA	--	--	--	--
	Chrysene	96.0	mg/kg	96.0	mg/kg	M	9.4E-05	mg/kg-day	NA	--	--	--	--
	Dibenz(a,h)anthracene	1.41	mg/kg	1.41	mg/kg	M	1.4E-06	mg/kg-day	NA	--	--	--	--
	Fluoranthene	243	mg/kg	243	mg/kg	M	2.4E-04	mg/kg-day	4.0E-02	mg/kg-day	--	--	5.9E-03
	Indeno(1,2,3-cd)pyrene	8.79	mg/kg	8.79	mg/kg	M	8.6E-06	mg/kg-day	NA	--	--	--	--
	Naphthalene	0.525	mg/kg	0.525	mg/kg	M	5.1E-07	mg/kg-day	2.0E-02	mg/kg-day	--	--	2.6E-05
	Pyrene	250	mg/kg	250	mg/kg	M	2.4E-04	mg/kg-day	3.0E-02	mg/kg-day	--	--	8.2E-03
	4,4'-DDD	3	mg/kg	3	mg/kg	M	2.9E-06	mg/kg-day	NA	--	--	--	--
	Chlordane, alpha-	48	mg/kg	48	mg/kg	M	4.7E-05	mg/kg-day	5.0E-04	mg/kg-day	--	--	9.4E-02
	Chlordane, gamma-	58	mg/kg	58	mg/kg	M	5.7E-05	mg/kg-day	5.0E-04	mg/kg-day	--	--	1.1E-01
	Dieldrin	0.32	mg/kg	0.32	mg/kg	M	3.1E-07	mg/kg-day	5.0E-05	mg/kg-day	--	--	6.3E-03
	Heptachlor	22	mg/kg	22	mg/kg	M	2.2E-05	mg/kg-day	5.0E-04	mg/kg-day	--	--	4.3E-02
	Heptachlor Epoxide	4.5	mg/kg	4.5	mg/kg	M	4.4E-06	mg/kg-day	1.3E-05	mg/kg-day	--	--	3.4E-01
	Aroclor-1248	1.51	mg/kg	1.51	mg/kg	M	1.5E-06	mg/kg-day	NA	--	--	--	--
	Aroclor-1254	0.975	mg/kg	0.975	mg/kg	M	9.5E-07	mg/kg-day	2.0E-05	mg/kg-day	--	--	4.8E-02
	Aroclor-1260	54.6	mg/kg	54.6	mg/kg	M	5.3E-05	mg/kg-day	NA	--	--	--	--
	Gasoline Range Organics	0.207	mg/kg	0.207	mg/kg	M	2.0E-07	mg/kg-day	NA	--	--	--	--
	Diesel Range Organics	470	mg/kg	470	mg/kg	M	4.6E-04	mg/kg-day	NA	--	--	--	--
	Antimony	1.22	mg/kg	1.22	mg/kg	M	1.2E-06	mg/kg-day	4.0E-04	mg/kg-day	--	--	3.0E-03
	Arsenic	3.49	mg/kg	3.49	mg/kg	M	3.4E-06	mg/kg-day	3.0E-04	mg/kg-day	--	--	1.1E-02
	Iron	2,260	mg/kg	2,260	mg/kg	M	2.2E-03	mg/kg-day	3.0E-01	mg/kg-day	--	--	7.4E-03
	Thallium	0.31	mg/kg	0.31	mg/kg	M	3.0E-07	mg/kg-day	6.6E-05	mg/kg-day	--	--	4.5E-03
	(total)												6.8E-01

TABLE 7.1.1A RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Current
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Surface Soil
Receptor Population: Military Base Personnel
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Dermal	2-Methylnaphthalene	1.96	mg/kg	1.96	mg/kg	M	1.3E-07	mg/kg-day	NA	--	--	--	--
	Benzo(a)anthracene	69.0	mg/kg	69.0	mg/kg	M	5.8E-05	mg/kg-day	NA	--	--	--	--
	Benzo(a)pyrene	30.5	mg/kg	30.5	mg/kg	M	2.6E-05	mg/kg-day	NA	--	--	--	--
	Benzo(b)fluoranthene	40.9	mg/kg	40.9	mg/kg	M	3.4E-05	mg/kg-day	NA	--	--	--	--
	Benzo(k)fluoranthene	18.7	mg/kg	18.7	mg/kg	M	1.6E-05	mg/kg-day	NA	--	--	--	--
	Carbazole	3.16	mg/kg	3.16	mg/kg	M	2.7E-06	mg/kg-day	NA	--	--	--	--
	Chrysene	96.0	mg/kg	96.0	mg/kg	M	8.1E-05	mg/kg-day	NA	--	--	--	--
	Dibenz(a,h)anthracene	1.41	mg/kg	1.41	mg/kg	M	1.2E-06	mg/kg-day	NA	--	--	--	--
	Fluoranthene	243	mg/kg	243	mg/kg	M	1.6E-05	mg/kg-day	1.2E-02	mg/kg-day	--	--	1.3E-03
	Indeno(1,2,3-cd)pyrene	8.79	mg/kg	8.79	mg/kg	M	7.4E-06	mg/kg-day	NA	--	--	--	--
	Naphthalene	0.525	mg/kg	0.525	mg/kg	M	3.4E-08	mg/kg-day	1.6E-02	mg/kg-day	--	--	2.1E-06
	Pyrene	250	mg/kg	250	mg/kg	M	1.6E-05	mg/kg-day	9.3E-03	mg/kg-day	--	--	1.7E-03
	4,4'-DDD	3	mg/kg	3	mg/kg	M	1.9E-07	mg/kg-day	NA	--	--	--	--
	Chlordane, alpha-	48	mg/kg	48	mg/kg	M	1.2E-05	mg/kg-day	4.0E-04	mg/kg-day	--	--	3.1E-02
	Chlordane, gamma-	58	mg/kg	58	mg/kg	M	1.5E-05	mg/kg-day	4.0E-04	mg/kg-day	--	--	3.7E-02
	Dieldrin	0.32	mg/kg	0.32	mg/kg	M	2.1E-08	mg/kg-day	2.5E-05	mg/kg-day	--	--	8.3E-04
	Heptachlor	22	mg/kg	22	mg/kg	M	1.4E-06	mg/kg-day	3.6E-04	mg/kg-day	--	--	3.9E-03
	Heptachlor Epoxide	4.5	mg/kg	4.5	mg/kg	M	2.9E-07	mg/kg-day	9.4E-06	mg/kg-day	--	--	3.1E-02
	Aroclor-1248	1.51	mg/kg	1.51	mg/kg	M	1.4E-06	mg/kg-day	NA	--	--	--	--
	Aroclor-1254	0.975	mg/kg	0.975	mg/kg	M	8.8E-07	mg/kg-day	1.8E-05	mg/kg-day	--	--	4.9E-02
	Aroclor-1260	54.6	mg/kg	54.6	mg/kg	M	4.9E-05	mg/kg-day	NA	--	--	--	--
	Gasoline Range Organics	0.207	mg/kg	0.207	mg/kg	M	1.3E-08	mg/kg-day	NA	--	--	--	--
	Diesel Range Organics	470	mg/kg	470	mg/kg	M	3.0E-05	mg/kg-day	NA	--	--	--	--
	Antimony	1.22	mg/kg	1.22	mg/kg	M	7.9E-09	mg/kg-day	8.0E-06	mg/kg-day	--	--	9.9E-04
	Arsenic	3.49	mg/kg	3.49	mg/kg	M	6.8E-07	mg/kg-day	1.2E-04	mg/kg-day	--	--	5.5E-03
	Iron	2,260	mg/kg	2,260	mg/kg	M	1.5E-05	mg/kg-day	4.5E-02	mg/kg-day	--	--	3.2E-04
	Thallium	0.31	mg/kg	0.31	mg/kg	M	2.0E-09	mg/kg-day	9.9E-06	mg/kg-day	--	--	2.0E-04
	(Total)												1.6E-01
												Total Hazard Index Across All Exposure Routes/Pathways	8.5E-01

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.
(2) Specify if subchronic.

TABLE 7.1.1aA RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Current
Medium: Surface Soil
Exposure Medium: Air
Exposure Point: Fugative dust
Receptor Population: Military Base Personnel
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Inhalation	2-Methylnaphthalene	1.96	mg/kg	1.48E-09	mg/m^3	R	9.6E-11	mg/kg-day	NA	--	NA	--	--
	Benzo(a)anthracene	69.0	mg/kg	5.23E-08	mg/m^3	R	3.4E-09	mg/kg-day	NA	--	NA	--	--
	Benzo(a)pyrene	30.5	mg/kg	2.31E-08	mg/m^3	R	1.5E-09	mg/kg-day	NA	--	NA	--	--
	Benzo(b)fluoranthene	40.9	mg/kg	3.10E-08	mg/m^3	R	2.0E-09	mg/kg-day	NA	--	NA	--	--
	Benzo(k)fluoranthene	18.7	mg/kg	1.41E-08	mg/m^3	R	9.2E-10	mg/kg-day	NA	--	NA	--	--
	Carbazole	3.16	mg/kg	2.39E-09	mg/m^3	R	1.6E-10	mg/kg-day	NA	--	NA	--	--
	Chrysene	96.0	mg/kg	7.27E-08	mg/m^3	R	4.7E-09	mg/kg-day	NA	--	NA	--	--
	Dibenz(a,h)anthracene	1.41	mg/kg	1.07E-09	mg/m^3	R	7.0E-11	mg/kg-day	NA	--	NA	--	--
	Fluoranthene	243	mg/kg	1.84E-07	mg/m^3	R	1.2E-08	mg/kg-day	4.0E-02	mg/kg-day	NA	--	3.0E-07
	Indeno(1,2,3-cd)pyrene	8.79	mg/kg	6.66E-09	mg/m^3	R	4.3E-10	mg/kg-day	NA	--	NA	--	--
	Naphthalene	0.525	mg/kg	3.98E-10	mg/m^3	R	2.6E-11	mg/kg-day	8.6E-04	mg/kg-day	3.0E-03	mg/m3	3.0E-08
	Pyrene	250	mg/kg	1.89E-07	mg/m^3	R	1.2E-08	mg/kg-day	3.0E-02	mg/kg-day	NA	--	4.1E-07
	4,4'-DDD	3	mg/kg	2.27E-09	mg/m^3	R	1.5E-10	mg/kg-day	NA	--	NA	--	--
	Chlordane, alpha-	48	mg/kg	3.64E-08	mg/m^3	R	2.4E-09	mg/kg-day	2.0E-04	mg/kg-day	7.0E-04	mg/m3	1.2E-05
	Chlordane, gamma-	58	mg/kg	4.39E-08	mg/m^3	R	2.9E-09	mg/kg-day	2.0E-04	mg/kg-day	7.0E-04	mg/m3	1.4E-05
	Dieldrin	0.32	mg/kg	2.42E-10	mg/m^3	R	1.6E-11	mg/kg-day	5.0E-05	mg/kg-day	NA	--	3.2E-07
	Heptachlor	22	mg/kg	1.67E-08	mg/m^3	R	1.1E-09	mg/kg-day	5.0E-04	mg/kg-day	NA	--	2.2E-06
	Heptachlor Epoxide	4.5	mg/kg	3.41E-09	mg/m^3	R	2.2E-10	mg/kg-day	1.3E-05	mg/kg-day	NA	--	1.7E-05
	Aroclor-1248	1.51	mg/kg	1.14E-09	mg/m^3	R	7.4E-11	mg/kg-day	NA	--	NA	--	--
	Aroclor-1254	0.975	mg/kg	7.39E-10	mg/m^3	R	4.8E-11	mg/kg-day	2.0E-05	mg/kg-day	NA	--	2.4E-06
	Aroclor-1260	54.6	mg/kg	4.13E-08	mg/m^3	R	2.7E-09	mg/kg-day	NA	--	NA	--	--
	Gasoline Range Organics	0.207	mg/kg	1.57E-10	mg/m^3	R	1.0E-11	mg/kg-day	NA	--	NA	--	--
	Diesel Range Organics	470	mg/kg	3.56E-07	mg/m^3	R	2.3E-08	mg/kg-day	NA	--	NA	--	--
	Antimony	1.22	mg/kg	9.25E-10	mg/m^3	R	6.0E-11	mg/kg-day	NA	--	NA	--	--
	Arsenic	3.49	mg/kg	2.65E-09	mg/m^3	R	1.7E-10	mg/kg-day	NA	--	NA	--	--
	Iron	2,260	mg/kg	1.71E-06	mg/m^3	R	1.1E-07	mg/kg-day	NA	--	NA	--	--
	Thallium	0.31	mg/kg	2.32E-10	mg/m^3	R	1.5E-11	mg/kg-day	NA	--	NA	--	--
	(Total)												4.9E-05
								Total Hazard Index Across All Exposure Routes/Pathways					4.9E-05

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/m^3 - milligram per cubic meter
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.
(2) Specify if subchronic.

TABLE 7.1.1B RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Current
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Surface Soil
Receptor Population: Military Base Personnel
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	2-Methylnaphthalene	57.9	mg/kg	57.9	mg/kg	M	5.7E-05	mg/kg-day	NA	--	--	--	--
	Benzo(a)anthracene	4.76	mg/kg	4.76	mg/kg	M	4.7E-06	mg/kg-day	NA	--	--	--	--
	Benzo(a)pyrene	2.48	mg/kg	2.48	mg/kg	M	2.4E-06	mg/kg-day	NA	--	--	--	--
	Benzo(b)fluoranthene	2.81	mg/kg	2.81	mg/kg	M	2.7E-06	mg/kg-day	NA	--	--	--	--
	Benzo(k)fluoranthene	1.78	mg/kg	1.78	mg/kg	M	1.7E-06	mg/kg-day	NA	--	--	--	--
	Carbazole	0.95	mg/kg	0.95	mg/kg	M	9.3E-07	mg/kg-day	NA	--	--	--	--
	Chrysene	6.7	mg/kg	6.7	mg/kg	M	6.6E-06	mg/kg-day	NA	--	--	--	--
	Dibenz(a,h)anthracene	0.695	mg/kg	0.695	mg/kg	M	6.8E-07	mg/kg-day	NA	--	--	--	--
	Indeno(1,2,3-cd)pyrene	1.72	mg/kg	1.72	mg/kg	M	1.7E-06	mg/kg-day	NA	--	--	--	--
	Dieldrin	0.052	mg/kg	0.052	mg/kg	M	5.1E-08	mg/kg-day	5.0E-05	mg/kg-day	--	--	1.0E-03
	Aroclor-1260	95.6	mg/kg	95.6	mg/kg	M	9.4E-05	mg/kg-day	NA	--	--	--	--
	Arsenic	5.26	mg/kg	5.26	mg/kg	M	5.1E-06	mg/kg-day	3.0E-04	mg/kg-day	--	--	1.7E-02
	Iron	2,347	mg/kg	2,347	mg/kg	M	2.3E-03	mg/kg-day	3.0E-01	mg/kg-day	--	--	7.7E-03
	(total)												2.6E-02
Dermal	2-Methylnaphthalene	57.9	mg/kg	57.9	mg/kg	M	3.7E-06	mg/kg-day	NA	--	--	--	--
	Benzo(a)anthracene	4.76	mg/kg	4.76	mg/kg	M	4.0E-06	mg/kg-day	NA	--	--	--	--
	Benzo(a)pyrene	2.48	mg/kg	2.48	mg/kg	M	2.1E-06	mg/kg-day	NA	--	--	--	--
	Benzo(b)fluoranthene	2.81	mg/kg	2.81	mg/kg	M	2.4E-06	mg/kg-day	NA	--	--	--	--
	Benzo(k)fluoranthene	1.78	mg/kg	1.78	mg/kg	M	1.5E-06	mg/kg-day	NA	--	--	--	--
	Carbazole	0.95	mg/kg	0.95	mg/kg	M	8.0E-07	mg/kg-day	NA	--	--	--	--
	Chrysene	6.7	mg/kg	6.7	mg/kg	M	5.6E-06	mg/kg-day	NA	--	--	--	--
	Dibenz(a,h)anthracene	0.695	mg/kg	0.695	mg/kg	M	5.8E-07	mg/kg-day	NA	--	--	--	--
	Indeno(1,2,3-cd)pyrene	1.72	mg/kg	1.72	mg/kg	M	1.4E-06	mg/kg-day	NA	--	--	--	--
	Dieldrin	0.052	mg/kg	0.052	mg/kg	M	3.4E-09	mg/kg-day	2.5E-05	mg/kg-day	--	--	1.3E-04
	Aroclor-1260	95.6	mg/kg	95.6	mg/kg	M	8.6E-05	mg/kg-day	NA	--	--	--	--
	Arsenic	5.26	mg/kg	5.26	mg/kg	M	1.0E-06	mg/kg-day	1.2E-04	mg/kg-day	--	--	8.3E-03
	Iron	2,347	mg/kg	2,347	mg/kg	M	1.5E-05	mg/kg-day	4.5E-02	mg/kg-day	--	--	3.4E-04
	(Total)												8.8E-03
												Total Hazard Index Across All Exposure Routes/Pathways	3.5E-02

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.
(2) Specify if subchronic.

TABLE 7.1.1aB RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Current
Medium: Surface Soil
Exposure Medium: Air
Exposure Point: Fugative dust
Receptor Population: Military Base Personnel
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Inhalation	2-Methylnaphthalene	57.9	mg/kg	4.39E-08	mg/m^3	R	2.8E-09	mg/kg-day	NA	--	NA	--	--
	Benzo(a)anthracene	4.76	mg/kg	3.61E-09	mg/m^3	R	2.3E-10	mg/kg-day	NA	--	NA	--	--
	Benzo(a)pyrene	2.48	mg/kg	1.88E-09	mg/m^3	R	1.2E-10	mg/kg-day	NA	--	NA	--	--
	Benzo(b)fluoranthene	2.81	mg/kg	2.13E-09	mg/m^3	R	1.4E-10	mg/kg-day	NA	--	NA	--	--
	Benzo(k)fluoranthene	1.78	mg/kg	1.35E-09	mg/m^3	R	8.8E-11	mg/kg-day	NA	--	NA	--	--
	Carbazole	0.95	mg/kg	7.20E-10	mg/m^3	R	4.7E-11	mg/kg-day	NA	--	NA	--	--
	Chrysene	6.7	mg/kg	5.08E-09	mg/m^3	R	3.3E-10	mg/kg-day	NA	--	NA	--	--
	Dibenz(a,h)anthracene	0.695	mg/kg	5.27E-10	mg/m^3	R	3.4E-11	mg/kg-day	NA	--	NA	--	--
	Indeno(1,2,3-cd)pyrene	1.72	mg/kg	1.30E-09	mg/m^3	R	8.5E-11	mg/kg-day	NA	--	NA	--	--
	Dieldrin	0.052	mg/kg	3.94E-11	mg/m^3	R	2.6E-12	mg/kg-day	5.0E-05	mg/kg-day	NA	--	5.1E-08
	Aroclor-1260	95.6	mg/kg	7.24E-08	mg/m^3	R	4.7E-09	mg/kg-day	NA	--	NA	--	--
	Arsenic	5.26	mg/kg	3.98E-09	mg/m^3	R	2.6E-10	mg/kg-day	NA	--	NA	--	--
	Iron	2,347	mg/kg	1.78E-06	mg/m^3	R	1.2E-07	mg/kg-day	NA	--	NA	--	--
	(Total)												5.1E-08
								Total Hazard Index Across All Exposure Routes/Pathways					5.1E-08

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/m^3 - milligram per cubic meter
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.
(2) Specify if subchronic.

TABLE 7.1.2 RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Current
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: Surface Water
Receptor Population: Military Base Personnel
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Acetone	0.0056	mg/L	0.0056	mg/L	M	1.4E-06	mg/kg-day	1.0E-01	mg/kg-day	--	--	1.4E-05
	Toluene	0.0027	mg/L	0.0027	mg/L	M	6.9E-07	mg/kg-day	2.0E-01	mg/kg-day	--	--	3.4E-06
	Xylenes, total	0.0035	mg/L	0.0035	mg/L	M	8.9E-07	mg/kg-day	2.0E+00	mg/kg-day	--	--	4.5E-07
	(Total)												1.8E-05
Dermal	Acetone	0.0056	mg/L	0.0056	mg/L	M	2.7E-07	mg/kg-day	8.3E-02	mg/kg-day	--	--	3.2E-06
	Toluene	0.0027	mg/L	0.0027	mg/L	M	1.0E-05	mg/kg-day	1.6E-01	mg/kg-day	--	--	6.4E-05
	Xylenes, total	0.0035	mg/L	0.0035	mg/L	M	2.8E-05	mg/kg-day	1.8E+00	mg/kg-day	--	--	1.5E-05
	(Total)												8.2E-05
												Total Hazard Index Across All Exposure Routes/Pathways	1.0E-04

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/L - milligram per liter
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.
(2) Specify if subchronic.

TABLE 7.1.3 RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Current
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Sediment
Receptor Population: Military Base Personnel
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	2-Methylnaphthalene	10	mg/kg	10	mg/kg	M	9.8E-06	mg/kg-day	NA	--	--	--	--
	Aroclor-1248	2.8	mg/kg	2.8	mg/kg	M	2.7E-06	mg/kg-day	NA	--	--	--	--
	Aroclor-1260	40	mg/kg	40	mg/kg	M	3.9E-05	mg/kg-day	NA	--	--	--	--
	Diesel Range Organics	11,600	mg/kg	11,600	mg/kg	M	1.1E-02	mg/kg-day	NA	--	--	--	--
	(Total)												--
Dermal	2-Methylnaphthalene	10	mg/kg	10	mg/kg	M	6.5E-07	mg/kg-day	NA	--	--	--	--
	Aroclor-1248	2.8	mg/kg	2.8	mg/kg	M	2.5E-06	mg/kg-day	NA	--	--	--	--
	Aroclor-1260	40	mg/kg	40	mg/kg	M	3.6E-05	mg/kg-day	NA	--	--	--	--
	Diesel Range Organics	11,600	mg/kg	11,600	mg/kg	M	7.5E-04	mg/kg-day	NA	--	--	--	--
	(Total)												--
												Total Hazard Index Across All Exposure Routes/Pathways	--

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.
(2) Specify if subchronic.

TABLE 7.2.1A RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Current
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Surface Soil
Receptor Population: Recreational Users
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	2-Methylnaphthalene	1.96	mg/kg	1.96	mg/kg	M	3.7E-07	mg/kg-day	NA	--	--	--	--
	Benzo(a)anthracene	69.0	mg/kg	69.0	mg/kg	M	1.3E-05	mg/kg-day	NA	--	--	--	--
	Benzo(a)pyrene	30.5	mg/kg	30.5	mg/kg	M	5.7E-06	mg/kg-day	NA	--	--	--	--
	Benzo(b)fluoranthene	40.9	mg/kg	40.9	mg/kg	M	7.7E-06	mg/kg-day	NA	--	--	--	--
	Benzo(k)fluoranthene	18.7	mg/kg	18.7	mg/kg	M	3.5E-06	mg/kg-day	NA	--	--	--	--
	Carbazole	3.16	mg/kg	3.16	mg/kg	M	5.9E-07	mg/kg-day	NA	--	--	--	--
	Chrysene	96.0	mg/kg	96.0	mg/kg	M	1.8E-05	mg/kg-day	NA	--	--	--	--
	Dibenz(a,h)anthracene	1.41	mg/kg	1.41	mg/kg	M	2.7E-07	mg/kg-day	NA	--	--	--	--
	Fluoranthene	243	mg/kg	243	mg/kg	M	4.6E-05	mg/kg-day	4.0E-02	mg/kg-day	--	--	1.1E-03
	Indeno(1,2,3-cd)pyrene	8.79	mg/kg	8.79	mg/kg	M	1.7E-06	mg/kg-day	NA	--	--	--	--
	Naphthalene	0.525	mg/kg	0.525	mg/kg	M	9.9E-08	mg/kg-day	2.0E-02	mg/kg-day	--	--	4.9E-06
	Pyrene	250	mg/kg	250	mg/kg	M	4.7E-05	mg/kg-day	3.0E-02	mg/kg-day	--	--	1.6E-03
	4,4'-DDD	3	mg/kg	3	mg/kg	M	5.6E-07	mg/kg-day	NA	--	--	--	--
	Chlordane, alpha-	48	mg/kg	48	mg/kg	M	9.0E-06	mg/kg-day	5.0E-04	mg/kg-day	--	--	1.8E-02
	Chlordane, gamma-	58	mg/kg	58	mg/kg	M	1.1E-05	mg/kg-day	5.0E-04	mg/kg-day	--	--	2.2E-02
	Dieldrin	0.32	mg/kg	0.32	mg/kg	M	6.0E-08	mg/kg-day	5.0E-05	mg/kg-day	--	--	1.2E-03
	Heptachlor	22	mg/kg	22	mg/kg	M	4.1E-06	mg/kg-day	5.0E-04	mg/kg-day	--	--	8.3E-03
	Heptachlor Epoxide	4.5	mg/kg	4.5	mg/kg	M	8.5E-07	mg/kg-day	1.3E-05	mg/kg-day	--	--	6.5E-02
	Aroclor-1248	1.51	mg/kg	1.51	mg/kg	M	2.8E-07	mg/kg-day	NA	--	--	--	--
	Aroclor-1254	0.975	mg/kg	0.975	mg/kg	M	1.8E-07	mg/kg-day	2.0E-05	mg/kg-day	--	--	9.2E-03
	Aroclor-1260	54.6	mg/kg	54.6	mg/kg	M	1.0E-05	mg/kg-day	NA	--	--	--	--
	Gasoline Range Organics	0.207	mg/kg	0.207	mg/kg	M	3.9E-08	mg/kg-day	NA	--	--	--	--
	Diesel Range Organics	470	mg/kg	470	mg/kg	M	8.8E-05	mg/kg-day	NA	--	--	--	--
	Antimony	1.22	mg/kg	1.22	mg/kg	M	2.3E-07	mg/kg-day	4.0E-04	mg/kg-day	--	--	5.7E-04
	Arsenic	3.49	mg/kg	3.49	mg/kg	M	6.6E-07	mg/kg-day	3.0E-04	mg/kg-day	--	--	2.2E-03
	Iron	2,260	mg/kg	2,260	mg/kg	M	4.2E-04	mg/kg-day	3.0E-01	mg/kg-day	--	--	1.4E-03
	Thallium	0.31	mg/kg	0.31	mg/kg	M	5.8E-08	mg/kg-day	6.6E-05	mg/kg-day	--	--	8.7E-04
	(total)												1.3E-01

TABLE 7.2.1A RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Current
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Surface Soil
Receptor Population: Recreational Users
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Dermal	2-Methylnaphthalene	1.96	mg/kg	1.96	mg/kg	M	4.2E-08	mg/kg-day	NA	--	--	--	--
	Benzo(a)anthracene	69.0	mg/kg	69.0	mg/kg	M	1.9E-05	mg/kg-day	NA	--	--	--	--
	Benzo(a)pyrene	30.5	mg/kg	30.5	mg/kg	M	8.5E-06	mg/kg-day	NA	--	--	--	--
	Benzo(b)fluoranthene	40.9	mg/kg	40.9	mg/kg	M	1.1E-05	mg/kg-day	NA	--	--	--	--
	Benzo(k)fluoranthene	18.7	mg/kg	18.7	mg/kg	M	5.2E-06	mg/kg-day	NA	--	--	--	--
	Carbazole	3.16	mg/kg	3.16	mg/kg	M	8.8E-07	mg/kg-day	NA	--	--	--	--
	Chrysene	96.0	mg/kg	96.0	mg/kg	M	2.7E-05	mg/kg-day	NA	--	--	--	--
	Dibenz(a,h)anthracene	1.41	mg/kg	1.41	mg/kg	M	3.9E-07	mg/kg-day	NA	--	--	--	--
	Fluoranthene	243	mg/kg	243	mg/kg	M	5.2E-06	mg/kg-day	1.2E-02	mg/kg-day	--	--	4.2E-04
	Indeno(1,2,3-cd)pyrene	8.79	mg/kg	8.79	mg/kg	M	2.4E-06	mg/kg-day	NA	--	--	--	--
	Naphthalene	0.525	mg/kg	0.525	mg/kg	M	1.1E-08	mg/kg-day	1.6E-02	mg/kg-day	--	--	7.0E-07
	Pyrene	250	mg/kg	250	mg/kg	M	5.4E-06	mg/kg-day	9.3E-03	mg/kg-day	--	--	5.8E-04
	4,4'-DDD	3	mg/kg	3	mg/kg	M	6.4E-08	mg/kg-day	NA	--	--	--	--
	Chlordane, alpha-	48	mg/kg	48	mg/kg	M	4.1E-06	mg/kg-day	4.0E-04	mg/kg-day	--	--	1.0E-02
	Chlordane, gamma-	58	mg/kg	58	mg/kg	M	5.0E-06	mg/kg-day	4.0E-04	mg/kg-day	--	--	1.2E-02
	Dieldrin	0.32	mg/kg	0.32	mg/kg	M	6.9E-09	mg/kg-day	2.5E-05	mg/kg-day	--	--	2.7E-04
	Heptachlor	22	mg/kg	22	mg/kg	M	4.7E-07	mg/kg-day	3.6E-04	mg/kg-day	--	--	1.3E-03
	Heptachlor Epoxide	4.5	mg/kg	4.5	mg/kg	M	9.6E-08	mg/kg-day	9.4E-06	mg/kg-day	--	--	1.0E-02
	Aroclor-1248	1.51	mg/kg	1.51	mg/kg	M	4.5E-07	mg/kg-day	NA	--	--	--	--
	Aroclor-1254	0.975	mg/kg	0.975	mg/kg	M	2.9E-07	mg/kg-day	1.8E-05	mg/kg-day	--	--	1.6E-02
	Aroclor-1260	54.6	mg/kg	54.6	mg/kg	M	1.6E-05	mg/kg-day	NA	--	--	--	--
	Gasoline Range Organics	0.207	mg/kg	0.207	mg/kg	M	4.4E-09	mg/kg-day	NA	--	--	--	--
	Diesel Range Organics	470	mg/kg	470	mg/kg	M	1.0E-05	mg/kg-day	NA	--	--	--	--
	Antimony	1.22	mg/kg	1.22	mg/kg	M	2.6E-09	mg/kg-day	8.0E-06	mg/kg-day	--	--	3.3E-04
	Arsenic	3.49	mg/kg	3.49	mg/kg	M	2.2E-07	mg/kg-day	1.2E-04	mg/kg-day	--	--	1.8E-03
	Iron	2,260	mg/kg	2,260	mg/kg	M	4.8E-06	mg/kg-day	4.5E-02	mg/kg-day	--	--	1.1E-04
	Thallium	0.31	mg/kg	0.31	mg/kg	M	6.6E-10	mg/kg-day	9.9E-06	mg/kg-day	--	--	6.6E-05
	(Total)												5.4E-02
												Total Hazard Index Across All Exposure Routes/Pathways	1.9E-01

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.
(2) Specify if subchronic.

TABLE 7.2.1B RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Current
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Surface Soil
Receptor Population: Recreational Users
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	2-Methylnaphthalene	57.9	mg/kg	57.9	mg/kg	M	1.1E-05	mg/kg-day	NA	--	--	--	--
	Benzo(a)anthracene	4.76	mg/kg	4.76	mg/kg	M	8.9E-07	mg/kg-day	NA	--	--	--	--
	Benzo(a)pyrene	2.48	mg/kg	2.48	mg/kg	M	4.7E-07	mg/kg-day	NA	--	--	--	--
	Benzo(b)fluoranthene	2.81	mg/kg	2.81	mg/kg	M	5.3E-07	mg/kg-day	NA	--	--	--	--
	Benzo(k)fluoranthene	1.78	mg/kg	1.78	mg/kg	M	3.3E-07	mg/kg-day	NA	--	--	--	--
	Carbazole	0.95	mg/kg	0.95	mg/kg	M	1.8E-07	mg/kg-day	NA	--	--	--	--
	Chrysene	6.7	mg/kg	6.7	mg/kg	M	1.3E-06	mg/kg-day	NA	--	--	--	--
	Dibenz(a,h)anthracene	0.695	mg/kg	0.695	mg/kg	M	1.3E-07	mg/kg-day	NA	--	--	--	--
	Indeno(1,2,3-cd)pyrene	1.72	mg/kg	1.72	mg/kg	M	3.2E-07	mg/kg-day	NA	--	--	--	--
	Dieldrin	0.052	mg/kg	0.052	mg/kg	M	9.8E-09	mg/kg-day	5.0E-05	mg/kg-day	--	--	2.0E-04
	Aroclor-1260	95.6	mg/kg	95.6	mg/kg	M	1.8E-05	mg/kg-day	NA	--	--	--	--
	Arsenic	5.26	mg/kg	5.26	mg/kg	M	9.9E-07	mg/kg-day	3.0E-04	mg/kg-day	--	--	3.3E-03
	Iron	2,347	mg/kg	2,347	mg/kg	M	4.4E-04	mg/kg-day	3.0E-01	mg/kg-day	--	--	1.5E-03
	(total)												5.0E-03
Dermal	2-Methylnaphthalene	57.9	mg/kg	57.9	mg/kg	M	1.2E-06	mg/kg-day	NA	--	--	--	--
	Benzo(a)anthracene	4.76	mg/kg	4.76	mg/kg	M	1.3E-06	mg/kg-day	NA	--	--	--	--
	Benzo(a)pyrene	2.48	mg/kg	2.48	mg/kg	M	6.9E-07	mg/kg-day	NA	--	--	--	--
	Benzo(b)fluoranthene	2.81	mg/kg	2.81	mg/kg	M	7.8E-07	mg/kg-day	NA	--	--	--	--
	Benzo(k)fluoranthene	1.78	mg/kg	1.78	mg/kg	M	5.0E-07	mg/kg-day	NA	--	--	--	--
	Carbazole	0.95	mg/kg	0.95	mg/kg	M	2.6E-07	mg/kg-day	NA	--	--	--	--
	Chrysene	6.7	mg/kg	6.7	mg/kg	M	1.9E-06	mg/kg-day	NA	--	--	--	--
	Dibenz(a,h)anthracene	0.695	mg/kg	0.695	mg/kg	M	1.9E-07	mg/kg-day	NA	--	--	--	--
	Indeno(1,2,3-cd)pyrene	1.72	mg/kg	1.72	mg/kg	M	4.8E-07	mg/kg-day	NA	--	--	--	--
	Dieldrin	0.052	mg/kg	0.052	mg/kg	M	1.1E-09	mg/kg-day	2.5E-05	mg/kg-day	--	--	4.5E-05
	Aroclor-1260	95.6	mg/kg	95.6	mg/kg	M	2.9E-05	mg/kg-day	NA	--	--	--	--
	Arsenic	5.26	mg/kg	5.26	mg/kg	M	3.4E-07	mg/kg-day	1.2E-04	mg/kg-day	--	--	2.7E-03
	Iron	2,347	mg/kg	2,347	mg/kg	M	5.0E-06	mg/kg-day	4.5E-02	mg/kg-day	--	--	1.1E-04
	(Total)												2.9E-03
												Total Hazard Index Across All Exposure Routes/Pathways	7.9E-03

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.
(2) Specify if subchronic.

TABLE 7.2.1aA RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Current
Medium: Surface Soil
Exposure Medium: Air
Exposure Point: Fugative dust
Receptor Population: Recreational Users
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Inhalation	2-Methylnaphthalene	1.96	mg/kg	1.48E-09	mg/m^3	R	1.9E-11	mg/kg-day	NA	--	NA	--	--
	Benzo(a)anthracene	69.0	mg/kg	5.23E-08	mg/m^3	R	6.5E-10	mg/kg-day	NA	--	NA	--	--
	Benzo(a)pyrene	30.5	mg/kg	2.31E-08	mg/m^3	R	2.9E-10	mg/kg-day	NA	--	NA	--	--
	Benzo(b)fluoranthene	40.9	mg/kg	3.10E-08	mg/m^3	R	3.9E-10	mg/kg-day	NA	--	NA	--	--
	Benzo(k)fluoranthene	18.7	mg/kg	1.41E-08	mg/m^3	R	1.8E-10	mg/kg-day	NA	--	NA	--	--
	Carbazole	3.16	mg/kg	2.39E-09	mg/m^3	R	3.0E-11	mg/kg-day	NA	--	NA	--	--
	Chrysene	96.0	mg/kg	7.27E-08	mg/m^3	R	9.1E-10	mg/kg-day	NA	--	NA	--	--
	Dibenz(a,h)anthracene	1.41	mg/kg	1.07E-09	mg/m^3	R	1.3E-11	mg/kg-day	NA	--	NA	--	--
	Fluoranthene	243	mg/kg	1.84E-07	mg/m^3	R	2.3E-09	mg/kg-day	4.0E-02	mg/kg-day	NA	--	5.7E-08
	Indeno(1,2,3-cd)pyrene	8.79	mg/kg	6.66E-09	mg/m^3	R	8.3E-11	mg/kg-day	NA	--	NA	--	--
	Naphthalene	0.525	mg/kg	3.98E-10	mg/m^3	R	5.0E-12	mg/kg-day	8.6E-04	mg/kg-day	3.0E-03	mg/m3	5.8E-09
	Pyrene	250	mg/kg	1.89E-07	mg/m^3	R	2.4E-09	mg/kg-day	3.0E-02	mg/kg-day	NA	--	7.9E-08
	4,4'-DDD	3	mg/kg	2.27E-09	mg/m^3	R	2.8E-11	mg/kg-day	NA	--	NA	--	--
	Chlordane, alpha-	48	mg/kg	3.64E-08	mg/m^3	R	4.5E-10	mg/kg-day	2.0E-04	mg/kg-day	7.0E-04	mg/m3	2.3E-06
	Chlordane, gamma-	58	mg/kg	4.39E-08	mg/m^3	R	5.5E-10	mg/kg-day	2.0E-04	mg/kg-day	7.0E-04	mg/m3	2.7E-06
	Dieldrin	0.32	mg/kg	2.42E-10	mg/m^3	R	3.0E-12	mg/kg-day	5.0E-05	mg/kg-day	NA	--	6.0E-08
	Heptachlor	22	mg/kg	1.67E-08	mg/m^3	R	2.1E-10	mg/kg-day	5.0E-04	mg/kg-day	NA	--	4.2E-07
	Heptachlor Epoxide	4.5	mg/kg	3.41E-09	mg/m^3	R	4.3E-11	mg/kg-day	1.3E-05	mg/kg-day	NA	--	3.3E-06
	Aroclor-1248	1.51	mg/kg	1.14E-09	mg/m^3	R	1.4E-11	mg/kg-day	NA	--	NA	--	--
	Aroclor-1254	0.975	mg/kg	7.39E-10	mg/m^3	R	9.2E-12	mg/kg-day	2.0E-05	mg/kg-day	NA	--	4.6E-07
	Aroclor-1260	54.6	mg/kg	4.13E-08	mg/m^3	R	5.2E-10	mg/kg-day	NA	--	NA	--	--
	Gasoline Range Organics	0.207	mg/kg	1.57E-10	mg/m^3	R	2.0E-12	mg/kg-day	NA	--	NA	--	--
	Diesel Range Organics	470	mg/kg	3.56E-07	mg/m^3	R	4.4E-09	mg/kg-day	NA	--	NA	--	--
	Antimony	1.22	mg/kg	9.25E-10	mg/m^3	R	1.2E-11	mg/kg-day	NA	--	NA	--	--
	Arsenic	3.49	mg/kg	2.65E-09	mg/m^3	R	3.3E-11	mg/kg-day	NA	--	NA	--	--
	Iron	2,260	mg/kg	1.71E-06	mg/m^3	R	2.1E-08	mg/kg-day	NA	--	NA	--	--
	Thallium	0.31	mg/kg	2.32E-10	mg/m^3	R	2.9E-12	mg/kg-day	NA	--	NA	--	--
	(Total)												9.4E-06
								Total Hazard Index Across All Exposure Routes/Pathways					9.4E-06

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/m^3 - milligram per cubic meter
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.
(2) Specify if subchronic.

TABLE 7.2.1aB RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Current
Medium: Surface Soil
Exposure Medium: Air
Exposure Point: Fugative dust
Receptor Population: Recreational Users
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Inhalation	2-Methylnaphthalene	57.9	mg/kg	4.39E-08	mg/m^3	R	5.5E-10	mg/kg-day	NA	--	NA	--	--
	Benzo(a)anthracene	4.76	mg/kg	3.61E-09	mg/m^3	R	4.5E-11	mg/kg-day	NA	--	NA	--	--
	Benzo(a)pyrene	2.48	mg/kg	1.88E-09	mg/m^3	R	2.3E-11	mg/kg-day	NA	--	NA	--	--
	Benzo(b)fluoranthene	2.81	mg/kg	2.13E-09	mg/m^3	R	2.7E-11	mg/kg-day	NA	--	NA	--	--
	Benzo(k)fluoranthene	1.78	mg/kg	1.35E-09	mg/m^3	R	1.7E-11	mg/kg-day	NA	--	NA	--	--
	Carbazole	0.95	mg/kg	7.20E-10	mg/m^3	R	9.0E-12	mg/kg-day	NA	--	NA	--	--
	Chrysene	6.7	mg/kg	5.08E-09	mg/m^3	R	6.3E-11	mg/kg-day	NA	--	NA	--	--
	Dibenz(a,h)anthracene	0.695	mg/kg	5.27E-10	mg/m^3	R	6.6E-12	mg/kg-day	NA	--	NA	--	--
	Indeno(1,2,3-cd)pyrene	1.72	mg/kg	1.30E-09	mg/m^3	R	1.6E-11	mg/kg-day	NA	--	NA	--	--
	Dieldrin	0.052	mg/kg	3.94E-11	mg/m^3	R	4.9E-13	mg/kg-day	5.0E-05	mg/kg-day	NA	--	9.8E-09
	Aroclor-1260	95.6	mg/kg	7.24E-08	mg/m^3	R	9.0E-10	mg/kg-day	NA	--	NA	--	--
	Arsenic	5.26	mg/kg	3.98E-09	mg/m^3	R	5.0E-11	mg/kg-day	NA	--	NA	--	--
	Iron	2,347	mg/kg	1.78E-06	mg/m^3	R	2.2E-08	mg/kg-day	NA	--	NA	--	--
	(Total)												9.8E-09
								Total Hazard Index Across All Exposure Routes/Pathways					9.8E-09

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/m^3 - milligram per cubic meter
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.
(2) Specify if subchronic.

TABLE 7.2.2 RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Current
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: Surface Water
Receptor Population: Recreational Users
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Acetone	0.0056	mg/L	0.0056	mg/L	M	2.7E-07	mg/kg-day	1.0E-01	mg/kg-day	--	--	2.7E-06
	Toluene	0.0027	mg/L	0.0027	mg/L	M	1.3E-07	mg/kg-day	2.0E-01	mg/kg-day	--	--	6.6E-07
	Xylenes, total	0.0035	mg/L	0.0035	mg/L	M	1.7E-07	mg/kg-day	2.0E+00	mg/kg-day	--	--	8.5E-08
	(Total)												3.5E-06
Dermal	Acetone	0.0056	mg/L	0.0056	mg/L	M	8.9E-08	mg/kg-day	8.3E-02	mg/kg-day	--	--	1.1E-06
	Toluene	0.0027	mg/L	0.0027	mg/L	M	3.4E-06	mg/kg-day	1.6E-01	mg/kg-day	--	--	2.1E-05
	Xylenes, total	0.0035	mg/L	0.0035	mg/L	M	9.3E-06	mg/kg-day	1.8E+00	mg/kg-day	--	--	5.0E-06
	(Total)												2.7E-05
												Total Hazard Index Across All Exposure Routes/Pathways	3.1E-05

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/L - milligram per liter
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.
(2) Specify if subchronic.

TABLE 7.3.1A RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Current
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Surface Soil
Receptor Population: Recreational Users
Receptor Age: Adolescent

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	2-Methylnaphthalene	1.96	mg/kg	1.96	mg/kg	M	5.7E-07	mg/kg-day	NA	--	--	--	--
	Benzo(a)anthracene	69.0	mg/kg	69.0	mg/kg	M	2.0E-05	mg/kg-day	NA	--	--	--	--
	Benzo(a)pyrene	30.5	mg/kg	30.5	mg/kg	M	8.9E-06	mg/kg-day	NA	--	--	--	--
	Benzo(b)fluoranthene	40.9	mg/kg	40.9	mg/kg	M	1.2E-05	mg/kg-day	NA	--	--	--	--
	Benzo(k)fluoranthene	18.7	mg/kg	18.7	mg/kg	M	5.5E-06	mg/kg-day	NA	--	--	--	--
	Carbazole	3.16	mg/kg	3.16	mg/kg	M	9.2E-07	mg/kg-day	NA	--	--	--	--
	Chrysene	96.0	mg/kg	96.0	mg/kg	M	2.8E-05	mg/kg-day	NA	--	--	--	--
	Dibenz(a,h)anthracene	1.41	mg/kg	1.41	mg/kg	M	4.1E-07	mg/kg-day	NA	--	--	--	--
	Fluoranthene	243	mg/kg	243	mg/kg	M	7.1E-05	mg/kg-day	4.0E-02	mg/kg-day	--	--	1.8E-03
	Indeno(1,2,3-cd)pyrene	8.79	mg/kg	8.79	mg/kg	M	2.6E-06	mg/kg-day	NA	--	--	--	--
	Naphthalene	0.525	mg/kg	0.525	mg/kg	M	1.5E-07	mg/kg-day	2.0E-02	mg/kg-day	--	--	7.7E-06
	Pyrene	250	mg/kg	250	mg/kg	M	7.3E-05	mg/kg-day	3.0E-02	mg/kg-day	--	--	2.4E-03
	4,4'-DDD	3	mg/kg	3	mg/kg	M	8.8E-07	mg/kg-day	NA	--	--	--	--
	Chlordane, alpha-	48	mg/kg	48	mg/kg	M	1.4E-05	mg/kg-day	5.0E-04	mg/kg-day	--	--	2.8E-02
	Chlordane, gamma-	58	mg/kg	58	mg/kg	M	1.7E-05	mg/kg-day	5.0E-04	mg/kg-day	--	--	3.4E-02
	Dieldrin	0.32	mg/kg	0.32	mg/kg	M	9.4E-08	mg/kg-day	5.0E-05	mg/kg-day	--	--	1.9E-03
	Heptachlor	22	mg/kg	22	mg/kg	M	6.4E-06	mg/kg-day	5.0E-04	mg/kg-day	--	--	1.3E-02
	Heptachlor Epoxide	4.5	mg/kg	4.5	mg/kg	M	1.3E-06	mg/kg-day	1.3E-05	mg/kg-day	--	--	1.0E-01
	Aroclor-1248	1.51	mg/kg	1.51	mg/kg	M	4.4E-07	mg/kg-day	NA	--	--	--	--
	Aroclor-1254	0.975	mg/kg	0.975	mg/kg	M	2.8E-07	mg/kg-day	2.0E-05	mg/kg-day	--	--	1.4E-02
	Aroclor-1260	54.6	mg/kg	54.6	mg/kg	M	1.6E-05	mg/kg-day	NA	--	--	--	--
	Gasoline Range Organics	0.207	mg/kg	0.207	mg/kg	M	6.1E-08	mg/kg-day	NA	--	--	--	--
	Diesel Range Organics	470	mg/kg	470	mg/kg	M	1.4E-04	mg/kg-day	NA	--	--	--	--
	Antimony	1.22	mg/kg	1.22	mg/kg	M	3.6E-07	mg/kg-day	4.0E-04	mg/kg-day	--	--	8.9E-04
	Arsenic	3.49	mg/kg	3.49	mg/kg	M	1.0E-06	mg/kg-day	3.0E-04	mg/kg-day	--	--	3.4E-03
	Iron	2,260	mg/kg	2,260	mg/kg	M	6.6E-04	mg/kg-day	3.0E-01	mg/kg-day	--	--	2.2E-03
	Thallium	0.31	mg/kg	0.31	mg/kg	M	9.0E-08	mg/kg-day	6.6E-05	mg/kg-day	--	--	1.4E-03
	(total)												2.0E-01

TABLE 7.3.1A RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Current
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Surface Soil
Receptor Population: Recreational Users
Receptor Age: Adolescent

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Dermal	2-Methylnaphthalene	1.96	mg/kg	1.96	mg/kg	M	6.1E-08	mg/kg-day	NA	--	--	--	--
	Benzo(a)anthracene	69.0	mg/kg	69.0	mg/kg	M	2.8E-05	mg/kg-day	NA	--	--	--	--
	Benzo(a)pyrene	30.5	mg/kg	30.5	mg/kg	M	1.2E-05	mg/kg-day	NA	--	--	--	--
	Benzo(b)fluoranthene	40.9	mg/kg	40.9	mg/kg	M	1.6E-05	mg/kg-day	NA	--	--	--	--
	Benzo(k)fluoranthene	18.7	mg/kg	18.7	mg/kg	M	7.5E-06	mg/kg-day	NA	--	--	--	--
	Carbazole	3.16	mg/kg	3.16	mg/kg	M	1.3E-06	mg/kg-day	NA	--	--	--	--
	Chrysene	96.0	mg/kg	96.0	mg/kg	M	3.9E-05	mg/kg-day	NA	--	--	--	--
	Dibenz(a,h)anthracene	1.41	mg/kg	1.41	mg/kg	M	5.7E-07	mg/kg-day	NA	--	--	--	--
	Fluoranthene	243	mg/kg	243	mg/kg	M	7.5E-06	mg/kg-day	1.2E-02	mg/kg-day	--	--	6.1E-04
	Indeno(1,2,3-cd)pyrene	8.79	mg/kg	8.79	mg/kg	M	3.5E-06	mg/kg-day	NA	--	--	--	--
	Naphthalene	0.525	mg/kg	0.525	mg/kg	M	1.6E-08	mg/kg-day	1.6E-02	mg/kg-day	--	--	1.0E-06
	Pyrene	250	mg/kg	250	mg/kg	M	7.7E-06	mg/kg-day	9.3E-03	mg/kg-day	--	--	8.3E-04
	4,4'-DDD	3	mg/kg	3	mg/kg	M	9.3E-08	mg/kg-day	NA	--	--	--	--
	Chlordane, alpha-	48	mg/kg	48	mg/kg	M	5.9E-06	mg/kg-day	4.0E-04	mg/kg-day	--	--	1.5E-02
	Chlordane, gamma-	58	mg/kg	58	mg/kg	M	7.2E-06	mg/kg-day	4.0E-04	mg/kg-day	--	--	1.8E-02
	Dieldrin	0.32	mg/kg	0.32	mg/kg	M	9.9E-09	mg/kg-day	2.5E-05	mg/kg-day	--	--	4.0E-04
	Heptachlor	22	mg/kg	22	mg/kg	M	6.8E-07	mg/kg-day	3.6E-04	mg/kg-day	--	--	1.9E-03
	Heptachlor Epoxide	4.5	mg/kg	4.5	mg/kg	M	1.4E-07	mg/kg-day	9.4E-06	mg/kg-day	--	--	1.5E-02
	Aroclor-1248	1.51	mg/kg	1.51	mg/kg	M	6.5E-07	mg/kg-day	NA	--	--	--	--
	Aroclor-1254	0.975	mg/kg	0.975	mg/kg	M	4.2E-07	mg/kg-day	1.8E-05	mg/kg-day	--	--	2.3E-02
	Aroclor-1260	54.6	mg/kg	54.6	mg/kg	M	2.4E-05	mg/kg-day	NA	--	--	--	--
	Gasoline Range Organics	0.207	mg/kg	0.207	mg/kg	M	6.4E-09	mg/kg-day	NA	--	--	--	--
	Diesel Range Organics	470	mg/kg	470	mg/kg	M	1.5E-05	mg/kg-day	NA	--	--	--	--
	Antimony	1.22	mg/kg	1.22	mg/kg	M	3.8E-09	mg/kg-day	8.0E-06	mg/kg-day	--	--	4.7E-04
	Arsenic	3.49	mg/kg	3.49	mg/kg	M	3.2E-07	mg/kg-day	1.2E-04	mg/kg-day	--	--	2.6E-03
	Iron	2,260	mg/kg	2,260	mg/kg	M	7.0E-06	mg/kg-day	4.5E-02	mg/kg-day	--	--	1.6E-04
	Thallium	0.31	mg/kg	0.31	mg/kg	M	9.5E-10	mg/kg-day	9.9E-06	mg/kg-day	--	--	9.6E-05
	(Total)												7.8E-02
								Total Hazard Index Across All Exposure Routes/Pathways					2.8E-01

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.

mg/kg - milligram per kilogram
mg/kg-day - milligram per kilogram per day

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.
(2) Specify if subchronic.

TABLE 7.3.1B RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Current
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Surface Soil
Receptor Population: Recreational Users
Receptor Age: Adolescent

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	2-Methylnaphthalene	57.9	mg/kg	57.9	mg/kg	M	1.7E-05	mg/kg-day	NA	--	--	--	--
	Benzo(a)anthracene	4.76	mg/kg	4.76	mg/kg	M	1.4E-06	mg/kg-day	NA	--	--	--	--
	Benzo(a)pyrene	2.48	mg/kg	2.48	mg/kg	M	7.2E-07	mg/kg-day	NA	--	--	--	--
	Benzo(b)fluoranthene	2.81	mg/kg	2.81	mg/kg	M	8.2E-07	mg/kg-day	NA	--	--	--	--
	Benzo(k)fluoranthene	1.78	mg/kg	1.78	mg/kg	M	5.2E-07	mg/kg-day	NA	--	--	--	--
	Carbazole	0.95	mg/kg	0.95	mg/kg	M	2.8E-07	mg/kg-day	NA	--	--	--	--
	Chrysene	6.7	mg/kg	6.7	mg/kg	M	2.0E-06	mg/kg-day	NA	--	--	--	--
	Dibenz(a,h)anthracene	0.695	mg/kg	0.695	mg/kg	M	2.0E-07	mg/kg-day	NA	--	--	--	--
	Indeno(1,2,3-cd)pyrene	1.72	mg/kg	1.72	mg/kg	M	5.0E-07	mg/kg-day	NA	--	--	--	--
	Dieldrin	0.052	mg/kg	0.052	mg/kg	M	1.5E-08	mg/kg-day	5.0E-05	mg/kg-day	--	--	3.0E-04
	Aroclor-1260	95.6	mg/kg	95.6	mg/kg	M	2.8E-05	mg/kg-day	NA	--	--	--	--
	Arsenic	5.26	mg/kg	5.26	mg/kg	M	1.5E-06	mg/kg-day	3.0E-04	mg/kg-day	--	--	5.1E-03
	Iron	2,347	mg/kg	2,347	mg/kg	M	6.9E-04	mg/kg-day	3.0E-01	mg/kg-day	--	--	2.3E-03
	(total)												7.7E-03
Dermal	2-Methylnaphthalene	57.9	mg/kg	57.9	mg/kg	M	1.8E-06	mg/kg-day	NA	--	--	--	--
	Benzo(a)anthracene	4.76	mg/kg	4.76	mg/kg	M	1.9E-06	mg/kg-day	NA	--	--	--	--
	Benzo(a)pyrene	2.48	mg/kg	2.48	mg/kg	M	1.0E-06	mg/kg-day	NA	--	--	--	--
	Benzo(b)fluoranthene	2.81	mg/kg	2.81	mg/kg	M	1.1E-06	mg/kg-day	NA	--	--	--	--
	Benzo(k)fluoranthene	1.78	mg/kg	1.78	mg/kg	M	7.2E-07	mg/kg-day	NA	--	--	--	--
	Carbazole	0.95	mg/kg	0.95	mg/kg	M	3.8E-07	mg/kg-day	NA	--	--	--	--
	Chrysene	6.7	mg/kg	6.7	mg/kg	M	2.7E-06	mg/kg-day	NA	--	--	--	--
	Dibenz(a,h)anthracene	0.695	mg/kg	0.695	mg/kg	M	2.8E-07	mg/kg-day	NA	--	--	--	--
	Indeno(1,2,3-cd)pyrene	1.72	mg/kg	1.72	mg/kg	M	6.9E-07	mg/kg-day	NA	--	--	--	--
	Dieldrin	0.052	mg/kg	0.052	mg/kg	M	1.6E-09	mg/kg-day	2.5E-05	mg/kg-day	--	--	6.4E-05
	Aroclor-1260	95.6	mg/kg	95.6	mg/kg	M	4.1E-05	mg/kg-day	NA	--	--	--	--
	Arsenic	5.26	mg/kg	5.26	mg/kg	M	4.9E-07	mg/kg-day	1.2E-04	mg/kg-day	--	--	4.0E-03
	Iron	2,347	mg/kg	2,347	mg/kg	M	7.3E-06	mg/kg-day	4.5E-02	mg/kg-day	--	--	1.6E-04
	(Total)												4.2E-03
												Total Hazard Index Across All Exposure Routes/Pathways	1.2E-02

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.
(2) Specify if subchronic.

TABLE 7.3.1aA RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Current
Medium: Surface Soil
Exposure Medium: Air
Exposure Point: Fugative dust
Receptor Population: Recreational Users
Receptor Age: Adolescent

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Inhalation	2-Methylnaphthalene	1.96	mg/kg	1.48E-09	mg/m^3	R	2.9E-11	mg/kg-day	NA	--	NA	--	--
	Benzo(a)anthracene	69.0	mg/kg	5.23E-08	mg/m^3	R	1.0E-09	mg/kg-day	NA	--	NA	--	--
	Benzo(a)pyrene	30.5	mg/kg	2.31E-08	mg/m^3	R	4.5E-10	mg/kg-day	NA	--	NA	--	--
	Benzo(b)fluoranthene	40.9	mg/kg	3.10E-08	mg/m^3	R	6.0E-10	mg/kg-day	NA	--	NA	--	--
	Benzo(k)fluoranthene	18.7	mg/kg	1.41E-08	mg/m^3	R	2.7E-10	mg/kg-day	NA	--	NA	--	--
	Carbazole	3.16	mg/kg	2.39E-09	mg/m^3	R	4.6E-11	mg/kg-day	NA	--	NA	--	--
	Chrysene	96.0	mg/kg	7.27E-08	mg/m^3	R	1.4E-09	mg/kg-day	NA	--	NA	--	--
	Dibenz(a,h)anthracene	1.41	mg/kg	1.07E-09	mg/m^3	R	2.1E-11	mg/kg-day	NA	--	NA	--	--
	Fluoranthene	243	mg/kg	1.84E-07	mg/m^3	R	3.6E-09	mg/kg-day	4.0E-02	mg/kg-day	NA	--	8.9E-08
	Indeno(1,2,3-cd)pyrene	8.79	mg/kg	6.66E-09	mg/m^3	R	1.3E-10	mg/kg-day	NA	--	NA	--	--
	Naphthalene	0.525	mg/kg	3.98E-10	mg/m^3	R	7.7E-12	mg/kg-day	8.6E-04	mg/kg-day	3.0E-03	mg/m3	9.0E-09
	Pyrene	250	mg/kg	1.89E-07	mg/m^3	R	3.7E-09	mg/kg-day	3.0E-02	mg/kg-day	NA	--	1.2E-07
	4,4'-DDD	3	mg/kg	2.27E-09	mg/m^3	R	4.4E-11	mg/kg-day	NA	--	NA	--	--
	Chlordane, alpha-	48	mg/kg	3.64E-08	mg/m^3	R	7.1E-10	mg/kg-day	2.0E-04	mg/kg-day	7.0E-04	mg/m3	3.5E-06
	Chlordane, gamma-	58	mg/kg	4.39E-08	mg/m^3	R	8.5E-10	mg/kg-day	2.0E-04	mg/kg-day	7.0E-04	mg/m3	4.3E-06
	Dieldrin	0.32	mg/kg	2.42E-10	mg/m^3	R	4.7E-12	mg/kg-day	5.0E-05	mg/kg-day	NA	--	9.4E-08
	Heptachlor	22	mg/kg	1.67E-08	mg/m^3	R	3.2E-10	mg/kg-day	5.0E-04	mg/kg-day	NA	--	6.5E-07
	Heptachlor Epoxide	4.5	mg/kg	3.41E-09	mg/m^3	R	6.6E-11	mg/kg-day	1.3E-05	mg/kg-day	NA	--	5.1E-06
	Aroclor-1248	1.51	mg/kg	1.14E-09	mg/m^3	R	2.2E-11	mg/kg-day	NA	--	NA	--	--
	Aroclor-1254	0.975	mg/kg	7.39E-10	mg/m^3	R	1.4E-11	mg/kg-day	2.0E-05	mg/kg-day	NA	--	7.2E-07
	Aroclor-1260	54.6	mg/kg	4.13E-08	mg/m^3	R	8.0E-10	mg/kg-day	NA	--	NA	--	--
	Gasoline Range Organics	0.207	mg/kg	1.57E-10	mg/m^3	R	3.0E-12	mg/kg-day	NA	--	NA	--	--
	Diesel Range Organics	470	mg/kg	3.56E-07	mg/m^3	R	6.9E-09	mg/kg-day	NA	--	NA	--	--
	Antimony	1.22	mg/kg	9.25E-10	mg/m^3	R	1.8E-11	mg/kg-day	NA	--	NA	--	--
	Arsenic	3.49	mg/kg	2.65E-09	mg/m^3	R	5.1E-11	mg/kg-day	NA	--	NA	--	--
	Iron	2,260	mg/kg	1.71E-06	mg/m^3	R	3.3E-08	mg/kg-day	NA	--	NA	--	--
	Thallium	0.31	mg/kg	2.32E-10	mg/m^3	R	4.5E-12	mg/kg-day	NA	--	NA	--	--
	(Total)												1.5E-05
								Total Hazard Index Across All Exposure Routes/Pathways					1.5E-05

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/m^3 - milligram per cubic meter
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.
(2) Specify if subchronic.

TABLE 7.3.1aB RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Current
Medium: Surface Soil
Exposure Medium: Air
Exposure Point: Fugative dust
Receptor Population: Recreational Users
Receptor Age: Adolescent

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Inhalation	2-Methylnaphthalene	57.9	mg/kg	4.39E-08	mg/m^3	R	8.5E-10	mg/kg-day	NA	--	NA	--	--
	Benzo(a)anthracene	4.76	mg/kg	3.61E-09	mg/m^3	R	7.0E-11	mg/kg-day	NA	--	NA	--	--
	Benzo(a)pyrene	2.48	mg/kg	1.88E-09	mg/m^3	R	3.6E-11	mg/kg-day	NA	--	NA	--	--
	Benzo(b)fluoranthene	2.81	mg/kg	2.13E-09	mg/m^3	R	4.1E-11	mg/kg-day	NA	--	NA	--	--
	Benzo(k)fluoranthene	1.78	mg/kg	1.35E-09	mg/m^3	R	2.6E-11	mg/kg-day	NA	--	NA	--	--
	Carbazole	0.95	mg/kg	7.20E-10	mg/m^3	R	1.4E-11	mg/kg-day	NA	--	NA	--	--
	Chrysene	6.7	mg/kg	5.08E-09	mg/m^3	R	9.8E-11	mg/kg-day	NA	--	NA	--	--
	Dibenz(a,h)anthracene	0.695	mg/kg	5.27E-10	mg/m^3	R	1.0E-11	mg/kg-day	NA	--	NA	--	--
	Indeno(1,2,3-cd)pyrene	1.72	mg/kg	1.30E-09	mg/m^3	R	2.5E-11	mg/kg-day	NA	--	NA	--	--
	Dieldrin	0.052	mg/kg	3.94E-11	mg/m^3	R	7.6E-13	mg/kg-day	5.0E-05	mg/kg-day	NA	--	1.5E-08
	Aroclor-1260	95.6	mg/kg	7.24E-08	mg/m^3	R	1.4E-09	mg/kg-day	NA	--	NA	--	--
	Arsenic	5.26	mg/kg	3.98E-09	mg/m^3	R	7.7E-11	mg/kg-day	NA	--	NA	--	--
	Iron	2,347	mg/kg	1.78E-06	mg/m^3	R	3.5E-08	mg/kg-day	NA	--	NA	--	--
	(Total)												1.5E-08
								Total Hazard Index Across All Exposure Routes/Pathways					1.5E-08

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/m^3 - milligram per cubic meter
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.
(2) Specify if subchronic.

TABLE 7.3.2 RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Current
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: Surface Water
Receptor Population: Recreational Users
Receptor Age: Adolescent

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Acetone	0.0056	mg/L	0.0056	mg/L	M	4.3E-07	mg/kg-day	1.0E-01	mg/kg-day	--	--	4.3E-06
	Toluene	0.0027	mg/L	0.0027	mg/L	M	2.1E-07	mg/kg-day	2.0E-01	mg/kg-day	--	--	1.0E-06
	Xylenes, total	0.0035	mg/L	0.0035	mg/L	M	2.7E-07	mg/kg-day	2.0E+00	mg/kg-day	--	--	1.3E-07
	(Total)												5.4E-06
Dermal	Acetone	0.0056	mg/L	0.0056	mg/L	M	1.3E-07	mg/kg-day	8.3E-02	mg/kg-day	--	--	1.5E-06
	Toluene	0.0027	mg/L	0.0027	mg/L	M	4.9E-06	mg/kg-day	1.6E-01	mg/kg-day	--	--	3.1E-05
	Xylenes, total	0.0035	mg/L	0.0035	mg/L	M	1.3E-05	mg/kg-day	1.8E+00	mg/kg-day	--	--	7.3E-06
	(Total)												3.9E-05
												Total Hazard Index Across All Exposure Routes/Pathways	4.5E-05

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/L - milligram per liter
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.
(2) Specify if subchronic.

TABLE 7.3.3 RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Current
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Sediment
Receptor Population: Recreational Users
Receptor Age: Adolescent

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	2-Methylnaphthalene	10	mg/kg	10	mg/kg	M	2.9E-06	mg/kg-day	NA	--	--	--	--
	Aroclor-1248	2.8	mg/kg	2.8	mg/kg	M	8.2E-07	mg/kg-day	NA	--	--	--	--
	Aroclor-1260	40	mg/kg	40	mg/kg	M	1.2E-05	mg/kg-day	NA	--	--	--	--
	Diesel Range Organics	11,600	mg/kg	11,600	mg/kg	M	3.4E-03	mg/kg-day	NA	--	--	--	--
	(Total)												--
Dermal	2-Methylnaphthalene	10	mg/kg	10	mg/kg	M	3.1E-07	mg/kg-day	NA	--	--	--	--
	Aroclor-1248	2.8	mg/kg	2.8	mg/kg	M	1.2E-06	mg/kg-day	NA	--	--	--	--
	Aroclor-1260	40	mg/kg	40	mg/kg	M	1.7E-05	mg/kg-day	NA	--	--	--	--
	Diesel Range Organics	11,600	mg/kg	11,600	mg/kg	M	3.6E-04	mg/kg-day	NA	--	--	--	--
	(Total)												--
								Total Hazard Index Across All Exposure Routes/Pathways					--

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.
(2) Specify if subchronic.

TABLE 7.4.1A RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Surface Soil
Receptor Population: Residents
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	2-Methylnaphthalene	1.96	mg/kg	1.96	mg/kg	M	2.7E-06	mg/kg-day	NA	--	--	--	--
	Benzo(a)anthracene	69.0	mg/kg	69.0	mg/kg	M	9.5E-05	mg/kg-day	NA	--	--	--	--
	Benzo(a)pyrene	30.5	mg/kg	30.5	mg/kg	M	4.2E-05	mg/kg-day	NA	--	--	--	--
	Benzo(b)fluoranthene	40.9	mg/kg	40.9	mg/kg	M	5.6E-05	mg/kg-day	NA	--	--	--	--
	Benzo(k)fluoranthene	18.7	mg/kg	18.7	mg/kg	M	2.6E-05	mg/kg-day	NA	--	--	--	--
	Carbazole	3.16	mg/kg	3.16	mg/kg	M	4.3E-06	mg/kg-day	NA	--	--	--	--
	Chrysene	96.0	mg/kg	96.0	mg/kg	M	1.3E-04	mg/kg-day	NA	--	--	--	--
	Dibenz(a,h)anthracene	1.41	mg/kg	1.41	mg/kg	M	1.9E-06	mg/kg-day	NA	--	--	--	--
	Fluoranthene	243	mg/kg	243	mg/kg	M	3.3E-04	mg/kg-day	4.0E-02	mg/kg-day	--	--	8.3E-03
	Indeno(1,2,3-cd)pyrene	8.79	mg/kg	8.79	mg/kg	M	1.2E-05	mg/kg-day	NA	--	--	--	--
	Naphthalene	0.525	mg/kg	0.525	mg/kg	M	7.2E-07	mg/kg-day	2.0E-02	mg/kg-day	--	--	3.6E-05
	Pyrene	250	mg/kg	250	mg/kg	M	3.4E-04	mg/kg-day	3.0E-02	mg/kg-day	--	--	1.1E-02
	4,4'-DDD	3	mg/kg	3	mg/kg	M	4.1E-06	mg/kg-day	NA	--	--	--	--
	Chlordane, alpha-	48	mg/kg	48	mg/kg	M	6.6E-05	mg/kg-day	5.0E-04	mg/kg-day	--	--	1.3E-01
	Chlordane, gamma-	58	mg/kg	58	mg/kg	M	7.9E-05	mg/kg-day	5.0E-04	mg/kg-day	--	--	1.6E-01
	Dieldrin	0.32	mg/kg	0.32	mg/kg	M	4.4E-07	mg/kg-day	5.0E-05	mg/kg-day	--	--	8.8E-03
	Heptachlor	22	mg/kg	22	mg/kg	M	3.0E-05	mg/kg-day	5.0E-04	mg/kg-day	--	--	6.0E-02
	Heptachlor Epoxide	4.5	mg/kg	4.5	mg/kg	M	6.2E-06	mg/kg-day	1.3E-05	mg/kg-day	--	--	4.7E-01
	Aroclor-1248	1.51	mg/kg	1.51	mg/kg	M	2.1E-06	mg/kg-day	NA	--	--	--	--
	Aroclor-1254	0.975	mg/kg	0.975	mg/kg	M	1.3E-06	mg/kg-day	2.0E-05	mg/kg-day	--	--	6.7E-02
	Aroclor-1260	54.6	mg/kg	54.6	mg/kg	M	7.5E-05	mg/kg-day	NA	--	--	--	--
	Gasoline Range Organics	0.207	mg/kg	0.207	mg/kg	M	2.8E-07	mg/kg-day	NA	--	--	--	--
	Diesel Range Organics	470	mg/kg	470	mg/kg	M	6.4E-04	mg/kg-day	NA	--	--	--	--
	Antimony	1.22	mg/kg	1.22	mg/kg	M	1.7E-06	mg/kg-day	4.0E-04	mg/kg-day	--	--	4.2E-03
	Arsenic	3.49	mg/kg	3.49	mg/kg	M	4.8E-06	mg/kg-day	3.0E-04	mg/kg-day	--	--	1.6E-02
	Iron	2,260	mg/kg	2,260	mg/kg	M	3.1E-03	mg/kg-day	3.0E-01	mg/kg-day	--	--	1.0E-02
	Thallium	0.31	mg/kg	0.31	mg/kg	M	4.2E-07	mg/kg-day	6.6E-05	mg/kg-day	--	--	6.4E-03
	(total)												9.6E-01

TABLE 7.4.1A RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Surface Soil
Receptor Population: Residents
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Dermal	2-Methylnaphthalene	1.96	mg/kg	1.96	mg/kg	M	1.1E-07	mg/kg-day	NA	--	--	--	--
	Benzo(a)anthracene	69.0	mg/kg	69.0	mg/kg	M	4.9E-05	mg/kg-day	NA	--	--	--	--
	Benzo(a)pyrene	30.5	mg/kg	30.5	mg/kg	M	2.2E-05	mg/kg-day	NA	--	--	--	--
	Benzo(b)fluoranthene	40.9	mg/kg	40.9	mg/kg	M	2.9E-05	mg/kg-day	NA	--	--	--	--
	Benzo(k)fluoranthene	18.7	mg/kg	18.7	mg/kg	M	1.3E-05	mg/kg-day	NA	--	--	--	--
	Carbazole	3.16	mg/kg	3.16	mg/kg	M	2.2E-06	mg/kg-day	NA	--	--	--	--
	Chrysene	96.0	mg/kg	96.0	mg/kg	M	6.8E-05	mg/kg-day	NA	--	--	--	--
	Dibenz(a,h)anthracene	1.41	mg/kg	1.41	mg/kg	M	1.0E-06	mg/kg-day	NA	--	--	--	--
	Fluoranthene	243	mg/kg	243	mg/kg	M	1.3E-05	mg/kg-day	1.2E-02	mg/kg-day	--	--	1.1E-03
	Indeno(1,2,3-cd)pyrene	8.79	mg/kg	8.79	mg/kg	M	6.2E-06	mg/kg-day	NA	--	--	--	--
	Naphthalene	0.525	mg/kg	0.525	mg/kg	M	2.9E-08	mg/kg-day	1.6E-02	mg/kg-day	--	--	1.8E-06
	Pyrene	250	mg/kg	250	mg/kg	M	1.4E-05	mg/kg-day	9.3E-03	mg/kg-day	--	--	1.5E-03
	4,4'-DDD	3	mg/kg	3	mg/kg	M	1.6E-07	mg/kg-day	NA	--	--	--	--
	Chlordane, alpha-	48	mg/kg	48	mg/kg	M	1.0E-05	mg/kg-day	4.0E-04	mg/kg-day	--	--	2.6E-02
	Chlordane, gamma-	58	mg/kg	58	mg/kg	M	1.3E-05	mg/kg-day	4.0E-04	mg/kg-day	--	--	3.2E-02
	Dieldrin	0.32	mg/kg	0.32	mg/kg	M	1.7E-08	mg/kg-day	2.5E-05	mg/kg-day	--	--	7.0E-04
	Heptachlor	22	mg/kg	22	mg/kg	M	1.2E-06	mg/kg-day	3.6E-04	mg/kg-day	--	--	3.3E-03
	Heptachlor Epoxide	4.5	mg/kg	4.5	mg/kg	M	2.5E-07	mg/kg-day	9.4E-06	mg/kg-day	--	--	2.6E-02
	Aroclor-1248	1.51	mg/kg	1.51	mg/kg	M	1.2E-06	mg/kg-day	NA	--	--	--	--
	Aroclor-1254	0.975	mg/kg	0.975	mg/kg	M	7.5E-07	mg/kg-day	1.8E-05	mg/kg-day	--	--	4.1E-02
	Aroclor-1260	54.6	mg/kg	54.6	mg/kg	M	4.2E-05	mg/kg-day	NA	--	--	--	--
	Gasoline Range Organics	0.207	mg/kg	0.207	mg/kg	M	1.1E-08	mg/kg-day	NA	--	--	--	--
	Diesel Range Organics	470	mg/kg	470	mg/kg	M	2.6E-05	mg/kg-day	NA	--	--	--	--
	Antimony	1.22	mg/kg	1.22	mg/kg	M	6.7E-09	mg/kg-day	8.0E-06	mg/kg-day	--	--	8.3E-04
	Arsenic	3.49	mg/kg	3.49	mg/kg	M	5.7E-07	mg/kg-day	1.2E-04	mg/kg-day	--	--	4.7E-03
	Iron	2,260	mg/kg	2,260	mg/kg	M	1.2E-05	mg/kg-day	4.5E-02	mg/kg-day	--	--	2.7E-04
	Thallium	0.31	mg/kg	0.31	mg/kg	M	1.7E-09	mg/kg-day	9.9E-06	mg/kg-day	--	--	1.7E-04
	(Total)												1.4E-01
												Total Hazard Index Across All Exposure Routes/Pathways	1.1E+00

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.
(2) Specify if subchronic.

TABLE 7.4.1B RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Surface Soil
Receptor Population: Residents
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	2-Methylnaphthalene	57.9	mg/kg	57.9	mg/kg	M	7.9E-05	mg/kg-day	NA	--	--	--	--
	Benzo(a)anthracene	4.76	mg/kg	4.76	mg/kg	M	6.5E-06	mg/kg-day	NA	--	--	--	--
	Benzo(a)pyrene	2.48	mg/kg	2.48	mg/kg	M	3.4E-06	mg/kg-day	NA	--	--	--	--
	Benzo(b)fluoranthene	2.81	mg/kg	2.81	mg/kg	M	3.8E-06	mg/kg-day	NA	--	--	--	--
	Benzo(k)fluoranthene	1.78	mg/kg	1.78	mg/kg	M	2.4E-06	mg/kg-day	NA	--	--	--	--
	Carbazole	0.95	mg/kg	0.95	mg/kg	M	1.3E-06	mg/kg-day	NA	--	--	--	--
	Chrysene	6.7	mg/kg	6.7	mg/kg	M	9.2E-06	mg/kg-day	NA	--	--	--	--
	Dibenz(a,h)anthracene	0.695	mg/kg	0.695	mg/kg	M	9.5E-07	mg/kg-day	NA	--	--	--	--
	Indeno(1,2,3-cd)pyrene	1.72	mg/kg	1.72	mg/kg	M	2.4E-06	mg/kg-day	NA	--	--	--	--
	Dieldrin	0.052	mg/kg	0.052	mg/kg	M	7.1E-08	mg/kg-day	5.0E-05	mg/kg-day	--	--	1.4E-03
	Aroclor-1260	95.6	mg/kg	95.6	mg/kg	M	1.3E-04	mg/kg-day	NA	--	--	--	--
	Arsenic	5.26	mg/kg	5.26	mg/kg	M	7.2E-06	mg/kg-day	3.0E-04	mg/kg-day	--	--	2.4E-02
	Iron	2,347	mg/kg	2,347	mg/kg	M	3.2E-03	mg/kg-day	3.0E-01	mg/kg-day	--	--	1.1E-02
	(total)												3.6E-02
Dermal	2-Methylnaphthalene	57.9	mg/kg	57.9	mg/kg	M	3.2E-06	mg/kg-day	NA	--	--	--	--
	Benzo(a)anthracene	4.76	mg/kg	4.76	mg/kg	M	3.4E-06	mg/kg-day	NA	--	--	--	--
	Benzo(a)pyrene	2.48	mg/kg	2.48	mg/kg	M	1.8E-06	mg/kg-day	NA	--	--	--	--
	Benzo(b)fluoranthene	2.81	mg/kg	2.81	mg/kg	M	2.0E-06	mg/kg-day	NA	--	--	--	--
	Benzo(k)fluoranthene	1.78	mg/kg	1.78	mg/kg	M	1.3E-06	mg/kg-day	NA	--	--	--	--
	Carbazole	0.95	mg/kg	0.95	mg/kg	M	6.8E-07	mg/kg-day	NA	--	--	--	--
	Chrysene	6.7	mg/kg	6.7	mg/kg	M	4.8E-06	mg/kg-day	NA	--	--	--	--
	Dibenz(a,h)anthracene	0.695	mg/kg	0.695	mg/kg	M	4.9E-07	mg/kg-day	NA	--	--	--	--
	Indeno(1,2,3-cd)pyrene	1.72	mg/kg	1.72	mg/kg	M	1.2E-06	mg/kg-day	NA	--	--	--	--
	Dieldrin	0.052	mg/kg	0.052	mg/kg	M	2.8E-09	mg/kg-day	2.5E-05	mg/kg-day	--	--	1.1E-04
	Aroclor-1260	95.6	mg/kg	95.6	mg/kg	M	7.3E-05	mg/kg-day	NA	--	--	--	--
	Arsenic	5.26	mg/kg	5.26	mg/kg	M	8.6E-07	mg/kg-day	1.2E-04	mg/kg-day	--	--	7.0E-03
	Iron	2,347	mg/kg	2,347	mg/kg	M	1.3E-05	mg/kg-day	4.5E-02	mg/kg-day	--	--	2.9E-04
	(Total)												7.4E-03
												Total Hazard Index Across All Exposure Routes/Pathways	4.4E-02

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.
(2) Specify if subchronic.

TABLE 7.4.1aA RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Air
Exposure Point: Fugative dust
Receptor Population: Residents
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Inhalation	2-Methylnaphthalene	1.96	mg/kg	1.48E-09	mg/m^3	R	4.0E-10	mg/kg-day	NA	--	NA	--	--
	Benzo(a)anthracene	69.0	mg/kg	5.23E-08	mg/m^3	R	1.4E-08	mg/kg-day	NA	--	NA	--	--
	Benzo(a)pyrene	30.5	mg/kg	2.31E-08	mg/m^3	R	6.3E-09	mg/kg-day	NA	--	NA	--	--
	Benzo(b)fluoranthene	40.9	mg/kg	3.10E-08	mg/m^3	R	8.4E-09	mg/kg-day	NA	--	NA	--	--
	Benzo(k)fluoranthene	18.7	mg/kg	1.41E-08	mg/m^3	R	3.9E-09	mg/kg-day	NA	--	NA	--	--
	Carbazole	3.16	mg/kg	2.39E-09	mg/m^3	R	6.5E-10	mg/kg-day	NA	--	NA	--	--
	Chrysene	96.0	mg/kg	7.27E-08	mg/m^3	R	2.0E-08	mg/kg-day	NA	--	NA	--	--
	Dibenz(a,h)anthracene	1.41	mg/kg	1.07E-09	mg/m^3	R	2.9E-10	mg/kg-day	NA	--	NA	--	--
	Fluoranthene	243	mg/kg	1.84E-07	mg/m^3	R	5.0E-08	mg/kg-day	4.0E-02	mg/kg-day	NA	--	1.3E-06
	Indeno(1,2,3-cd)pyrene	8.79	mg/kg	6.66E-09	mg/m^3	R	1.8E-09	mg/kg-day	NA	--	NA	--	--
	Naphthalene	0.525	mg/kg	3.98E-10	mg/m^3	R	1.1E-10	mg/kg-day	8.6E-04	mg/kg-day	3.0E-03	mg/m3	1.3E-07
	Pyrene	250	mg/kg	1.89E-07	mg/m^3	R	5.2E-08	mg/kg-day	3.0E-02	mg/kg-day	NA	--	1.7E-06
	4,4'-DDD	3	mg/kg	2.27E-09	mg/m^3	R	6.2E-10	mg/kg-day	NA	--	NA	--	--
	Chlordane, alpha-	48	mg/kg	3.64E-08	mg/m^3	R	9.9E-09	mg/kg-day	2.0E-04	mg/kg-day	7.0E-04	mg/m3	5.0E-05
	Chlordane, gamma-	58	mg/kg	4.39E-08	mg/m^3	R	1.2E-08	mg/kg-day	2.0E-04	mg/kg-day	7.0E-04	mg/m3	6.0E-05
	Dieldrin	0.32	mg/kg	2.42E-10	mg/m^3	R	6.6E-11	mg/kg-day	5.0E-05	mg/kg-day	NA	--	1.3E-06
	Heptachlor	22	mg/kg	1.67E-08	mg/m^3	R	4.5E-09	mg/kg-day	5.0E-04	mg/kg-day	NA	--	9.1E-06
	Heptachlor Epoxide	4.5	mg/kg	3.41E-09	mg/m^3	R	9.3E-10	mg/kg-day	1.3E-05	mg/kg-day	NA	--	7.2E-05
	Aroclor-1248	1.51	mg/kg	1.14E-09	mg/m^3	R	3.1E-10	mg/kg-day	NA	--	NA	--	--
	Aroclor-1254	0.975	mg/kg	7.39E-10	mg/m^3	R	2.0E-10	mg/kg-day	2.0E-05	mg/kg-day	NA	--	1.0E-05
	Aroclor-1260	54.6	mg/kg	4.13E-08	mg/m^3	R	1.1E-08	mg/kg-day	NA	--	NA	--	--
	Gasoline Range Organics	0.207	mg/kg	1.57E-10	mg/m^3	R	4.3E-11	mg/kg-day	NA	--	NA	--	--
	Diesel Range Organics	470	mg/kg	3.56E-07	mg/m^3	R	9.7E-08	mg/kg-day	NA	--	NA	--	--
	Antimony	1.22	mg/kg	9.25E-10	mg/m^3	R	2.5E-10	mg/kg-day	NA	--	NA	--	--
	Arsenic	3.49	mg/kg	2.65E-09	mg/m^3	R	7.2E-10	mg/kg-day	NA	--	NA	--	--
	Iron	2,260	mg/kg	1.71E-06	mg/m^3	R	4.7E-07	mg/kg-day	NA	--	NA	--	--
	Thallium	0.31	mg/kg	2.32E-10	mg/m^3	R	6.3E-11	mg/kg-day	NA	--	NA	--	--
	(Total)												2.0E-04
							Total Hazard Index Across All Exposure Routes/Pathways						2.0E-04

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.

mg/kg - milligram per kilogram
mg/m^3 - milligram per cubic meter
mg/kg-day - milligram per kilogram per day

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.
(2) Specify if subchronic.

TABLE 7.4.1aB RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Air
Exposure Point: Fugative dust
Receptor Population: Residents
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Inhalation	2-Methylnaphthalene	57.9	mg/kg	4.39E-08	mg/m^3	R	1.2E-08	mg/kg-day	NA	--	NA	--	--
	Benzo(a)anthracene	4.76	mg/kg	3.61E-09	mg/m^3	R	9.8E-10	mg/kg-day	NA	--	NA	--	--
	Benzo(a)pyrene	2.48	mg/kg	1.88E-09	mg/m^3	R	5.1E-10	mg/kg-day	NA	--	NA	--	--
	Benzo(b)fluoranthene	2.81	mg/kg	2.13E-09	mg/m^3	R	5.8E-10	mg/kg-day	NA	--	NA	--	--
	Benzo(k)fluoranthene	1.78	mg/kg	1.35E-09	mg/m^3	R	3.7E-10	mg/kg-day	NA	--	NA	--	--
	Carbazole	0.95	mg/kg	7.20E-10	mg/m^3	R	2.0E-10	mg/kg-day	NA	--	NA	--	--
	Chrysene	6.7	mg/kg	5.08E-09	mg/m^3	R	1.4E-09	mg/kg-day	NA	--	NA	--	--
	Dibenz(a,h)anthracene	0.695	mg/kg	5.27E-10	mg/m^3	R	1.4E-10	mg/kg-day	NA	--	NA	--	--
	Indeno(1,2,3-cd)pyrene	1.72	mg/kg	1.30E-09	mg/m^3	R	3.6E-10	mg/kg-day	NA	--	NA	--	--
	Dieldrin	0.052	mg/kg	3.94E-11	mg/m^3	R	1.1E-11	mg/kg-day	5.0E-05	mg/kg-day	NA	--	2.1E-07
	Aroclor-1260	95.6	mg/kg	7.24E-08	mg/m^3	R	2.0E-08	mg/kg-day	NA	--	NA	--	--
	Arsenic	5.26	mg/kg	3.98E-09	mg/m^3	R	1.1E-09	mg/kg-day	NA	--	NA	--	--
	Iron	2,347	mg/kg	1.78E-06	mg/m^3	R	4.9E-07	mg/kg-day	NA	--	NA	--	--
	(Total)												2.1E-07
								Total Hazard Index Across All Exposure Routes/Pathways					2.1E-07

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/m^3 - milligram per cubic meter
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.
(2) Specify if subchronic.

TABLE 7.4.2 RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Tap
Receptor Population: Residents
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzene	0.0034	mg/L	0.0034	mg/L	M	9.3E-05	mg/kg-day	3.0E-03	mg/kg-day	--	--	3.1E-02
	Chloroform	0.016	mg/L	0.016	mg/L	M	4.4E-04	mg/kg-day	1.0E-02	mg/kg-day	--	--	4.4E-02
	2-Methylnaphthalene	0.00105	mg/L	0.00105	mg/L	M	2.9E-05	mg/kg-day	NA	--	--	--	--
	Naphthalene	0.0022	mg/L	0.0022	mg/L	M	6.0E-05	mg/kg-day	2.0E-02	mg/kg-day	--	--	3.0E-03
	Heptachlor Epoxide	0.0000167	mg/L	0.0000167	mg/L	M	4.6E-07	mg/kg-day	1.3E-05	mg/kg-day	--	--	3.5E-02
	MCPA	0.044	mg/L	0.044	mg/L	M	1.2E-03	mg/kg-day	5.0E-04	mg/kg-day	--	--	2.4E+00
	Antimony	0.011	mg/L	0.011	mg/L	M	3.0E-04	mg/kg-day	4.0E-04	mg/kg-day	--	--	7.5E-01
	Arsenic	0.03	mg/L	0.03	mg/L	M	8.2E-04	mg/kg-day	3.0E-04	mg/kg-day	--	--	2.7E+00
	Iron	67.7	mg/L	67.7	mg/L	M	1.9E+00	mg/kg-day	3.0E-01	mg/kg-day	--	--	6.2E+00
	Manganese	0.45	mg/L	0.45	mg/L	M	1.2E-02	mg/kg-day	2.4E-02	mg/kg-day	--	--	5.1E-01
	Thallium	0.0057	mg/L	0.0057	mg/L	M	1.6E-04	mg/kg-day	6.6E-05	mg/kg-day	--	--	2.4E+00
	(Total)												1.5E+01
Dermal	Benzene	0.0034	mg/L	0.0034	mg/L	M	4.4E-06	mg/kg-day	2.8E-03	mg/kg-day	--	--	1.6E-03
	Chloroform	0.016	mg/L	0.016	mg/L	M	8.8E-06	mg/kg-day	2.0E-03	mg/kg-day	--	--	4.4E-03
	2-Methylnaphthalene	0.00105	mg/L	0.00105	mg/L	M	9.2E-06	mg/kg-day	NA	--	--	--	--
	Naphthalene	0.0022	mg/L	0.0022	mg/L	M	9.4E-06	mg/kg-day	1.6E-02	mg/kg-day	--	--	5.8E-04
	Heptachlor Epoxide	0.0000167	mg/L	0.0000167	mg/L	M	5.7E-08	mg/kg-day	9.4E-06	mg/kg-day	--	--	6.0E-03
	MCPA	0.044	mg/L	0.044	mg/L	M	1.3E-05	mg/kg-day	2.5E-04	mg/kg-day	--	--	5.3E-02
	Antimony	0.011	mg/L	0.011	mg/L	M	6.8E-07	mg/kg-day	8.0E-06	mg/kg-day	--	--	8.5E-02
	Arsenic	0.03	mg/L	0.03	mg/L	M	1.8E-06	mg/kg-day	1.2E-04	mg/kg-day	--	--	1.5E-02
	Iron	67.7	mg/L	67.7	mg/L	M	4.2E-03	mg/kg-day	4.5E-02	mg/kg-day	--	--	9.3E-02
	Manganese	0.45	mg/L	0.45	mg/L	M	2.8E-05	mg/kg-day	9.6E-04	mg/kg-day	--	--	2.9E-02
	Thallium	0.0057	mg/L	0.0057	mg/L	M	3.5E-07	mg/kg-day	9.9E-06	mg/kg-day	--	--	3.5E-02
	(Total)												3.2E-01
												Total Hazard Index Across All Exposure Routes/Pathways	1.5E+01

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/L - milligram per liter
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.
(2) Specify if subchronic.

TABLE 7.4.2a RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Air
Exposure Point: Tap
Receptor Population: Residents
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Inhalation	Benzene	0.0034	mg/L	4.81E-03	mg/m^3	R	1.4E-05	mg/kg-day	1.7E-03	mg/kg-day	9.0E-03	mg/m3	8.0E-03
	Chloroform	0.016	mg/L	1.80E-02	mg/m^3	R	5.1E-05	mg/kg-day	8.6E-05	mg/kg-day	NA	--	6.0E-01
	(Total)												6.0E-01
													6.0E-01

Total Hazard Index Across All Exposure Routes/Pathways

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/L - milligram per liter
mg/m^3 - milligram per cubic meter
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.
(2) Specify if subchronic.

TABLE 7.4.3 RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: Surface Water
Receptor Population: Residents
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Acetone	0.0056	mg/L	0.0056	mg/L	M	2.7E-07	mg/kg-day	1.0E-01	mg/kg-day	--	--	2.7E-06
	Toluene	0.0027	mg/L	0.0027	mg/L	M	1.3E-07	mg/kg-day	2.0E-01	mg/kg-day	--	--	6.6E-07
	Xylenes, total	0.0035	mg/L	0.0035	mg/L	M	1.7E-07	mg/kg-day	2.0E+00	mg/kg-day	--	--	8.5E-08
	(Total)												3.5E-06
Dermal	Acetone	0.0056	mg/L	0.0056	mg/L	M	8.9E-08	mg/kg-day	8.3E-02	mg/kg-day	--	--	1.1E-06
	Toluene	0.0027	mg/L	0.0027	mg/L	M	3.4E-06	mg/kg-day	1.6E-01	mg/kg-day	--	--	2.1E-05
	Xylenes, total	0.0035	mg/L	0.0035	mg/L	M	9.3E-06	mg/kg-day	1.8E+00	mg/kg-day	--	--	5.0E-06
	(Total)												2.7E-05
								Total Hazard Index Across All Exposure Routes/Pathways					3.1E-05

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/L - milligram per liter
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.
(2) Specify if subchronic.

TABLE 7.4.4 RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Sediment
Receptor Population: Residents
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	2-Methylnaphthalene	10	mg/kg	10	mg/kg	M	1.9E-06	mg/kg-day	NA	--	--	--	--
	Aroclor-1248	2.8	mg/kg	2.8	mg/kg	M	5.3E-07	mg/kg-day	NA	--	--	--	--
	Aroclor-1260	40	mg/kg	40	mg/kg	M	7.5E-06	mg/kg-day	NA	--	--	--	--
	Diesel Range Organics	11,600	mg/kg	11,600	mg/kg	M	2.2E-03	mg/kg-day	NA	--	--	--	--
	(Total)												--
Dermal	2-Methylnaphthalene	10	mg/kg	10	mg/kg	M	7.5E-08	mg/kg-day	NA	--	--	--	--
	Aroclor-1248	2.8	mg/kg	2.8	mg/kg	M	2.9E-07	mg/kg-day	NA	--	--	--	--
	Aroclor-1260	40	mg/kg	40	mg/kg	M	4.2E-06	mg/kg-day	NA	--	--	--	--
	Diesel Range Organics	11,600	mg/kg	11,600	mg/kg	M	8.7E-05	mg/kg-day	NA	--	--	--	--
	(Total)												--
												Total Hazard Index Across All Exposure Routes/Pathways	--

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.
(2) Specify if subchronic.

TABLE 7.4.1A CT
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Surface Soil
Receptor Population: Residents
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	2-Methylnaphthalene	1.96	mg/kg	1.96	mg/kg	M	9.0E-07	mg/kg-day	NA	--	--	--	--
	Benzo(a)anthracene	69.0	mg/kg	69.0	mg/kg	M	3.2E-05	mg/kg-day	NA	--	--	--	--
	Benzo(a)pyrene	30.5	mg/kg	30.5	mg/kg	M	1.4E-05	mg/kg-day	NA	--	--	--	--
	Benzo(b)fluoranthene	40.9	mg/kg	40.9	mg/kg	M	1.9E-05	mg/kg-day	NA	--	--	--	--
	Benzo(k)fluoranthene	18.7	mg/kg	18.7	mg/kg	M	8.5E-06	mg/kg-day	NA	--	--	--	--
	Carbazole	3.16	mg/kg	3.16	mg/kg	M	1.4E-06	mg/kg-day	NA	--	--	--	--
	Chrysene	96.0	mg/kg	96.0	mg/kg	M	4.4E-05	mg/kg-day	NA	--	--	--	--
	Dibenz(a,h)anthracene	1.41	mg/kg	1.41	mg/kg	M	6.5E-07	mg/kg-day	NA	--	--	--	--
	Fluoranthene	243	mg/kg	243	mg/kg	M	1.1E-04	mg/kg-day	4.0E-02	mg/kg-day	--	--	2.8E-03
	Indeno(1,2,3-cd)pyrene	8.79	mg/kg	8.79	mg/kg	M	4.0E-06	mg/kg-day	NA	--	--	--	--
	Naphthalene	0.525	mg/kg	0.525	mg/kg	M	2.4E-07	mg/kg-day	2.0E-02	mg/kg-day	--	--	1.2E-05
	Pyrene	250	mg/kg	250	mg/kg	M	1.1E-04	mg/kg-day	3.0E-02	mg/kg-day	--	--	3.8E-03
	4,4'-DDD	3	mg/kg	3	mg/kg	M	1.4E-06	mg/kg-day	NA	--	--	--	--
	Chlordane, alpha-	48	mg/kg	48	mg/kg	M	2.2E-05	mg/kg-day	5.0E-04	mg/kg-day	--	--	4.4E-02
	Chlordane, gamma-	58	mg/kg	58	mg/kg	M	2.7E-05	mg/kg-day	5.0E-04	mg/kg-day	--	--	5.3E-02
	Dieldrin	0.32	mg/kg	0.32	mg/kg	M	1.5E-07	mg/kg-day	5.0E-05	mg/kg-day	--	--	2.9E-03
	Heptachlor	22	mg/kg	22	mg/kg	M	1.0E-05	mg/kg-day	5.0E-04	mg/kg-day	--	--	2.0E-02
	Heptachlor Epoxide	4.5	mg/kg	4.5	mg/kg	M	2.1E-06	mg/kg-day	1.3E-05	mg/kg-day	--	--	1.6E-01
	Aroclor-1248	1.51	mg/kg	1.51	mg/kg	M	6.9E-07	mg/kg-day	NA	--	--	--	--
	Aroclor-1254	0.975	mg/kg	0.975	mg/kg	M	4.5E-07	mg/kg-day	2.0E-05	mg/kg-day	--	--	2.2E-02
	Aroclor-1260	54.6	mg/kg	54.6	mg/kg	M	2.5E-05	mg/kg-day	NA	--	--	--	--
	Gasoline Range Organics	0.207	mg/kg	0.207	mg/kg	M	9.5E-08	mg/kg-day	NA	--	--	--	--
	Diesel Range Organics	470	mg/kg	470	mg/kg	M	2.2E-04	mg/kg-day	NA	--	--	--	--
	Antimony	1.22	mg/kg	1.22	mg/kg	M	5.6E-07	mg/kg-day	4.0E-04	mg/kg-day	--	--	1.4E-03
	Arsenic	3.49	mg/kg	3.49	mg/kg	M	1.6E-06	mg/kg-day	3.0E-04	mg/kg-day	--	--	5.3E-03
	Iron	2,260	mg/kg	2,260	mg/kg	M	1.0E-03	mg/kg-day	3.0E-01	mg/kg-day	--	--	3.4E-03
	Thallium	0.31	mg/kg	0.31	mg/kg	M	1.4E-07	mg/kg-day	6.6E-05	mg/kg-day	--	--	2.1E-03
	(total)												3.2E-01

TABLE 7.4.1A CT
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Surface Soil
Receptor Population: Residents
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Dermal	2-Methylnaphthalene	1.96	mg/kg	1.96	mg/kg	M	6.3E-08	mg/kg-day	NA	--	--	--	--
	Benzo(a)anthracene	69.0	mg/kg	69.0	mg/kg	M	2.9E-05	mg/kg-day	NA	--	--	--	--
	Benzo(a)pyrene	30.5	mg/kg	30.5	mg/kg	M	1.3E-05	mg/kg-day	NA	--	--	--	--
	Benzo(b)fluoranthene	40.9	mg/kg	40.9	mg/kg	M	1.7E-05	mg/kg-day	NA	--	--	--	--
	Benzo(k)fluoranthene	18.7	mg/kg	18.7	mg/kg	M	7.8E-06	mg/kg-day	NA	--	--	--	--
	Carbazole	3.16	mg/kg	3.16	mg/kg	M	1.3E-06	mg/kg-day	NA	--	--	--	--
	Chrysene	96.0	mg/kg	96.0	mg/kg	M	4.0E-05	mg/kg-day	NA	--	--	--	--
	Dibenz(a,h)anthracene	1.41	mg/kg	1.41	mg/kg	M	5.9E-07	mg/kg-day	NA	--	--	--	--
	Fluoranthene	243	mg/kg	243	mg/kg	M	7.8E-06	mg/kg-day	1.2E-02	mg/kg-day	--	--	6.3E-04
	Indeno(1,2,3-cd)pyrene	8.79	mg/kg	8.79	mg/kg	M	3.7E-06	mg/kg-day	NA	--	--	--	--
	Naphthalene	0.525	mg/kg	0.525	mg/kg	M	1.7E-08	mg/kg-day	1.6E-02	mg/kg-day	--	--	1.1E-06
	Pyrene	250	mg/kg	250	mg/kg	M	8.0E-06	mg/kg-day	9.3E-03	mg/kg-day	--	--	8.6E-04
	4,4'-DDD	3	mg/kg	3	mg/kg	M	9.6E-08	mg/kg-day	NA	--	--	--	--
	Chlordane, alpha-	48	mg/kg	48	mg/kg	M	6.2E-06	mg/kg-day	4.0E-04	mg/kg-day	--	--	1.5E-02
	Chlordane, gamma-	58	mg/kg	58	mg/kg	M	7.4E-06	mg/kg-day	4.0E-04	mg/kg-day	--	--	1.9E-02
	Dieldrin	0.32	mg/kg	0.32	mg/kg	M	1.0E-08	mg/kg-day	2.5E-05	mg/kg-day	--	--	4.1E-04
	Heptachlor	22	mg/kg	22	mg/kg	M	7.1E-07	mg/kg-day	3.6E-04	mg/kg-day	--	--	2.0E-03
	Heptachlor Epoxide	4.5	mg/kg	4.5	mg/kg	M	1.4E-07	mg/kg-day	9.4E-06	mg/kg-day	--	--	1.5E-02
	Aroclor-1248	1.51	mg/kg	1.51	mg/kg	M	6.8E-07	mg/kg-day	NA	--	--	--	--
	Aroclor-1254	0.975	mg/kg	0.975	mg/kg	M	4.4E-07	mg/kg-day	1.8E-05	mg/kg-day	--	--	2.4E-02
	Aroclor-1260	54.6	mg/kg	54.6	mg/kg	M	2.4E-05	mg/kg-day	NA	--	--	--	--
	Gasoline Range Organics	0.207	mg/kg	0.207	mg/kg	M	6.6E-09	mg/kg-day	NA	--	--	--	--
	Diesel Range Organics	470	mg/kg	470	mg/kg	M	1.5E-05	mg/kg-day	NA	--	--	--	--
	Antimony	1.22	mg/kg	1.22	mg/kg	M	3.9E-09	mg/kg-day	8.0E-06	mg/kg-day	--	--	4.9E-04
	Arsenic	3.49	mg/kg	3.49	mg/kg	M	3.4E-07	mg/kg-day	1.2E-04	mg/kg-day	--	--	2.7E-03
	Iron	2,260	mg/kg	2,260	mg/kg	M	7.2E-06	mg/kg-day	4.5E-02	mg/kg-day	--	--	1.6E-04
	Thallium	0.31	mg/kg	0.31	mg/kg	M	9.8E-10	mg/kg-day	9.9E-06	mg/kg-day	--	--	9.9E-05
	(Total)												8.1E-02
								Total Hazard Index Across All Exposure Routes/Pathways					4.0E-01

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.
(2) Specify if subchronic.

TABLE 7.4.1B CT
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY
SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Surface Soil
Receptor Population: Residents
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	2-Methylnaphthalene	57.9	mg/kg	57.9	mg/kg	M	2.7E-05	mg/kg-day	NA	--	--	--	--
	Benzo(a)anthracene	4.76	mg/kg	4.76	mg/kg	M	2.2E-06	mg/kg-day	NA	--	--	--	--
	Benzo(a)pyrene	2.48	mg/kg	2.48	mg/kg	M	1.1E-06	mg/kg-day	NA	--	--	--	--
	Benzo(b)fluoranthene	2.81	mg/kg	2.81	mg/kg	M	1.3E-06	mg/kg-day	NA	--	--	--	--
	Benzo(k)fluoranthene	1.78	mg/kg	1.78	mg/kg	M	8.2E-07	mg/kg-day	NA	--	--	--	--
	Carbazole	0.95	mg/kg	0.95	mg/kg	M	4.4E-07	mg/kg-day	NA	--	--	--	--
	Chrysene	6.7	mg/kg	6.7	mg/kg	M	3.1E-06	mg/kg-day	NA	--	--	--	--
	Dibenz(a,h)anthracene	0.695	mg/kg	0.695	mg/kg	M	3.2E-07	mg/kg-day	NA	--	--	--	--
	Indeno(1,2,3-cd)pyrene	1.72	mg/kg	1.72	mg/kg	M	7.9E-07	mg/kg-day	NA	--	--	--	--
	Dieldrin	0.052	mg/kg	0.052	mg/kg	M	2.4E-08	mg/kg-day	5.0E-05	mg/kg-day	--	--	4.8E-04
	Aroclor-1260	95.6	mg/kg	95.6	mg/kg	M	4.4E-05	mg/kg-day	NA	--	--	--	--
	Arsenic	5.26	mg/kg	5.26	mg/kg	M	2.4E-06	mg/kg-day	3.0E-04	mg/kg-day	--	--	8.0E-03
	Iron	2,347	mg/kg	2,347	mg/kg	M	1.1E-03	mg/kg-day	3.0E-01	mg/kg-day	--	--	3.6E-03
	(total)												1.2E-02
Dermal	2-Methylnaphthalene	57.9	mg/kg	57.9	mg/kg	M	1.9E-06	mg/kg-day	NA	--	--	--	--
	Benzo(a)anthracene	4.76	mg/kg	4.76	mg/kg	M	2.0E-06	mg/kg-day	NA	--	--	--	--
	Benzo(a)pyrene	2.48	mg/kg	2.48	mg/kg	M	1.0E-06	mg/kg-day	NA	--	--	--	--
	Benzo(b)fluoranthene	2.81	mg/kg	2.81	mg/kg	M	1.2E-06	mg/kg-day	NA	--	--	--	--
	Benzo(k)fluoranthene	1.78	mg/kg	1.78	mg/kg	M	7.4E-07	mg/kg-day	NA	--	--	--	--
	Carbazole	0.95	mg/kg	0.95	mg/kg	M	4.0E-07	mg/kg-day	NA	--	--	--	--
	Chrysene	6.7	mg/kg	6.7	mg/kg	M	2.8E-06	mg/kg-day	NA	--	--	--	--
	Dibenz(a,h)anthracene	0.695	mg/kg	0.695	mg/kg	M	2.9E-07	mg/kg-day	NA	--	--	--	--
	Indeno(1,2,3-cd)pyrene	1.72	mg/kg	1.72	mg/kg	M	7.2E-07	mg/kg-day	NA	--	--	--	--
	Dieldrin	0.052	mg/kg	0.052	mg/kg	M	1.7E-09	mg/kg-day	2.5E-05	mg/kg-day	--	--	6.7E-05
	Aroclor-1260	95.6	mg/kg	95.6	mg/kg	M	4.3E-05	mg/kg-day	NA	--	--	--	--
	Arsenic	5.26	mg/kg	5.26	mg/kg	M	5.1E-07	mg/kg-day	1.2E-04	mg/kg-day	--	--	4.1E-03
	Iron	2,347	mg/kg	2,347	mg/kg	M	7.5E-06	mg/kg-day	4.5E-02	mg/kg-day	--	--	1.7E-04
	(Total)												4.3E-03
								Total Hazard Index Across All Exposure Routes/Pathways					1.6E-02

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.
(2) Specify if subchronic.

TABLE 7.4.1aA CT
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Air
Exposure Point: Fugative dust
Receptor Population: Residents
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Inhalation	2-Methylnaphthalene	1.96	mg/kg	1.48E-09	mg/m^3	R	2.6E-10	mg/kg-day	NA	--	NA	--	--
	Benzo(a)anthracene	69.0	mg/kg	5.23E-08	mg/m^3	R	9.2E-09	mg/kg-day	NA	--	NA	--	--
	Benzo(a)pyrene	30.5	mg/kg	2.31E-08	mg/m^3	R	4.1E-09	mg/kg-day	NA	--	NA	--	--
	Benzo(b)fluoranthene	40.9	mg/kg	3.10E-08	mg/m^3	R	5.4E-09	mg/kg-day	NA	--	NA	--	--
	Benzo(k)fluoranthene	18.7	mg/kg	1.41E-08	mg/m^3	R	2.5E-09	mg/kg-day	NA	--	NA	--	--
	Carbazole	3.16	mg/kg	2.39E-09	mg/m^3	R	4.2E-10	mg/kg-day	NA	--	NA	--	--
	Chrysene	96.0	mg/kg	7.27E-08	mg/m^3	R	1.3E-08	mg/kg-day	NA	--	NA	--	--
	Dibenz(a,h)anthracene	1.41	mg/kg	1.07E-09	mg/m^3	R	1.9E-10	mg/kg-day	NA	--	NA	--	--
	Fluoranthene	243	mg/kg	1.84E-07	mg/m^3	R	3.2E-08	mg/kg-day	4.0E-02	mg/kg-day	NA	--	8.1E-07
	Indeno(1,2,3-cd)pyrene	8.79	mg/kg	6.66E-09	mg/m^3	R	1.2E-09	mg/kg-day	NA	--	NA	--	--
	Naphthalene	0.525	mg/kg	3.98E-10	mg/m^3	R	7.0E-11	mg/kg-day	8.6E-04	mg/kg-day	3.0E-03	mg/m3	8.2E-08
	Pyrene	250	mg/kg	1.89E-07	mg/m^3	R	3.3E-08	mg/kg-day	3.0E-02	mg/kg-day	NA	--	1.1E-06
	4,4'-DDD	3	mg/kg	2.27E-09	mg/m^3	R	4.0E-10	mg/kg-day	NA	--	NA	--	--
	Chlordane, alpha-	48	mg/kg	3.64E-08	mg/m^3	R	6.4E-09	mg/kg-day	2.0E-04	mg/kg-day	7.0E-04	mg/m3	3.2E-05
	Chlordane, gamma-	58	mg/kg	4.39E-08	mg/m^3	R	7.7E-09	mg/kg-day	2.0E-04	mg/kg-day	7.0E-04	mg/m3	3.9E-05
	Dieldrin	0.32	mg/kg	2.42E-10	mg/m^3	R	4.3E-11	mg/kg-day	5.0E-05	mg/kg-day	NA	--	8.5E-07
	Heptachlor	22	mg/kg	1.67E-08	mg/m^3	R	2.9E-09	mg/kg-day	5.0E-04	mg/kg-day	NA	--	5.9E-06
	Heptachlor Epoxide	4.5	mg/kg	3.41E-09	mg/m^3	R	6.0E-10	mg/kg-day	1.3E-05	mg/kg-day	NA	--	4.6E-05
	Aroclor-1248	1.51	mg/kg	1.14E-09	mg/m^3	R	2.0E-10	mg/kg-day	NA	--	NA	--	--
	Aroclor-1254	0.975	mg/kg	7.39E-10	mg/m^3	R	1.3E-10	mg/kg-day	2.0E-05	mg/kg-day	NA	--	6.5E-06
	Aroclor-1260	54.6	mg/kg	4.13E-08	mg/m^3	R	7.3E-09	mg/kg-day	NA	--	NA	--	--
	Gasoline Range Organics	0.207	mg/kg	1.57E-10	mg/m^3	R	2.8E-11	mg/kg-day	NA	--	NA	--	--
	Diesel Range Organics	470	mg/kg	3.56E-07	mg/m^3	R	6.3E-08	mg/kg-day	NA	--	NA	--	--
	Antimony	1.22	mg/kg	9.25E-10	mg/m^3	R	1.6E-10	mg/kg-day	NA	--	NA	--	--
	Arsenic	3.49	mg/kg	2.65E-09	mg/m^3	R	4.7E-10	mg/kg-day	NA	--	NA	--	--
	Iron	2,260	mg/kg	1.71E-06	mg/m^3	R	3.0E-07	mg/kg-day	NA	--	NA	--	--
	Thallium	0.31	mg/kg	2.32E-10	mg/m^3	R	4.1E-11	mg/kg-day	NA	--	NA	--	--
	(Total)												1.3E-04
							Total Hazard Index Across All Exposure Routes/Pathways						1.3E-04

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/m^3 - milligram per cubic meter
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.
(2) Specify if subchronic.

TABLE 7.4.1aB CT
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY
SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Air
Exposure Point: Fugative dust
Receptor Population: Residents
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Inhalation	2-Methylnaphthalene	57.9	mg/kg	4.39E-08	mg/m^3	R	7.7E-09	mg/kg-day	NA	--	NA	--	--
	Benzo(a)anthracene	4.76	mg/kg	3.61E-09	mg/m^3	R	6.3E-10	mg/kg-day	NA	--	NA	--	--
	Benzo(a)pyrene	2.48	mg/kg	1.88E-09	mg/m^3	R	3.3E-10	mg/kg-day	NA	--	NA	--	--
	Benzo(b)fluoranthene	2.81	mg/kg	2.13E-09	mg/m^3	R	3.7E-10	mg/kg-day	NA	--	NA	--	--
	Benzo(k)fluoranthene	1.78	mg/kg	1.35E-09	mg/m^3	R	2.4E-10	mg/kg-day	NA	--	NA	--	--
	Carbazole	0.95	mg/kg	7.20E-10	mg/m^3	R	1.3E-10	mg/kg-day	NA	--	NA	--	--
	Chrysene	6.7	mg/kg	5.08E-09	mg/m^3	R	8.9E-10	mg/kg-day	NA	--	NA	--	--
	Dibenz(a,h)anthracene	0.695	mg/kg	5.27E-10	mg/m^3	R	9.3E-11	mg/kg-day	NA	--	NA	--	--
	Indeno(1,2,3-cd)pyrene	1.72	mg/kg	1.30E-09	mg/m^3	R	2.3E-10	mg/kg-day	NA	--	NA	--	--
	Dieldrin	0.052	mg/kg	3.94E-11	mg/m^3	R	6.9E-12	mg/kg-day	5.0E-05	mg/kg-day	NA	--	1.4E-07
	Aroclor-1260	95.6	mg/kg	7.24E-08	mg/m^3	R	1.3E-08	mg/kg-day	NA	--	NA	--	--
	Arsenic	5.26	mg/kg	3.98E-09	mg/m^3	R	7.0E-10	mg/kg-day	NA	--	NA	--	--
	Iron	2,347	mg/kg	1.78E-06	mg/m^3	R	3.1E-07	mg/kg-day	NA	--	NA	--	--
	(Total)												1.4E-07
								Total Hazard Index Across All Exposure Routes/Pathways					1.4E-07

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/m^3 - milligram per cubic meter
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.
(2) Specify if subchronic.

TABLE 7.4.2 CT
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Tap
Receptor Population: Residents
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzene	0.0034	mg/L	0.0034	mg/L	M	4.4E-05	mg/kg-day	3.0E-03	mg/kg-day	--	--	1.5E-02
	Chloroform	0.016	mg/L	0.016	mg/L	M	2.1E-04	mg/kg-day	1.0E-02	mg/kg-day	--	--	2.1E-02
	2-Methylnaphthalene	0.00105	mg/L	0.00105	mg/L	M	1.3E-05	mg/kg-day	NA	--	--	--	--
	Naphthalene	0.0022	mg/L	0.0022	mg/L	M	2.8E-05	mg/kg-day	2.0E-02	mg/kg-day	--	--	1.4E-03
	Heptachlor Epoxide	0.0000167	mg/L	0.0000167	mg/L	M	2.1E-07	mg/kg-day	1.3E-05	mg/kg-day	--	--	1.6E-02
	MCPA	0.044	mg/L	0.044	mg/L	M	5.6E-04	mg/kg-day	5.0E-04	mg/kg-day	--	--	1.1E+00
	Antimony	0.011	mg/L	0.011	mg/L	M	1.4E-04	mg/kg-day	4.0E-04	mg/kg-day	--	--	3.5E-01
	Arsenic	0.03	mg/L	0.03	mg/L	M	3.8E-04	mg/kg-day	3.0E-04	mg/kg-day	--	--	1.3E+00
	Iron	67.7	mg/L	67.7	mg/L	M	8.7E-01	mg/kg-day	3.0E-01	mg/kg-day	--	--	2.9E+00
	Manganese	0.45	mg/L	0.45	mg/L	M	5.8E-03	mg/kg-day	2.4E-02	mg/kg-day	--	--	2.4E-01
	Thallium	0.0057	mg/L	0.0057	mg/L	M	7.3E-05	mg/kg-day	6.6E-05	mg/kg-day	--	--	1.1E+00
	(Total)												7.1E+00
Dermal	Benzene	0.0034	mg/L	0.0034	mg/L	M	3.3E-06	mg/kg-day	2.8E-03	mg/kg-day	--	--	1.2E-03
	Chloroform	0.016	mg/L	0.016	mg/L	M	6.5E-06	mg/kg-day	2.0E-03	mg/kg-day	--	--	3.3E-03
	2-Methylnaphthalene	0.00105	mg/L	0.00105	mg/L	M	6.8E-06	mg/kg-day	NA	--	--	--	--
	Naphthalene	0.0022	mg/L	0.0022	mg/L	M	7.0E-06	mg/kg-day	1.6E-02	mg/kg-day	--	--	4.3E-04
	Heptachlor Epoxide	0.0000167	mg/L	0.0000167	mg/L	M	4.2E-08	mg/kg-day	9.4E-06	mg/kg-day	--	--	4.5E-03
	MCPA	0.044	mg/L	0.044	mg/L	M	9.9E-06	mg/kg-day	2.5E-04	mg/kg-day	--	--	3.9E-02
	Antimony	0.011	mg/L	0.011	mg/L	M	5.0E-07	mg/kg-day	8.0E-06	mg/kg-day	--	--	6.3E-02
	Arsenic	0.03	mg/L	0.03	mg/L	M	1.4E-06	mg/kg-day	1.2E-04	mg/kg-day	--	--	1.1E-02
	Iron	67.7	mg/L	67.7	mg/L	M	3.1E-03	mg/kg-day	4.5E-02	mg/kg-day	--	--	6.9E-02
	Manganese	0.45	mg/L	0.45	mg/L	M	2.1E-05	mg/kg-day	9.6E-04	mg/kg-day	--	--	2.1E-02
	Thallium	0.0057	mg/L	0.0057	mg/L	M	2.6E-07	mg/kg-day	9.9E-06	mg/kg-day	--	--	2.6E-02
	(Total)												2.4E-01
								Total Hazard Index Across All Exposure Routes/Pathways					7.3E+00

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/L - milligram per liter
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.
(2) Specify if subchronic.

TABLE 7.4.2a CT
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Air
Exposure Point: Tap
Receptor Population: Residents
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Inhalation	Benzene	0.0034	mg/L	4.81E-03	mg/m^3	R	9.1E-06	mg/kg-day	1.7E-03	mg/kg-day	9.0E-03	mg/m3	5.3E-03
	Chloroform	0.016	mg/L	1.80E-02	mg/m^3	R	3.4E-05	mg/kg-day	8.6E-05	mg/kg-day	NA	--	4.0E-01
	(Total)												4.0E-01
													4.0E-01

Total Hazard Index Across All Exposure Routes/Pathways

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/L - milligram per liter
mg/m^3 - milligram per cubic meter
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.
(2) Specify if subchronic.

TABLE 7.4.3 CT
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: Surface Water
Receptor Population: Residents
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Acetone	0.0056	mg/L	0.0056	mg/L	M	2.7E-07	mg/kg-day	1.0E-01	mg/kg-day	--	--	2.7E-06
	Toluene	0.0027	mg/L	0.0027	mg/L	M	1.3E-07	mg/kg-day	2.0E-01	mg/kg-day	--	--	6.6E-07
	Xylenes, total	0.0035	mg/L	0.0035	mg/L	M	1.7E-07	mg/kg-day	2.0E+00	mg/kg-day	--	--	8.5E-08
	(Total)												3.5E-06
Dermal	Acetone	0.0056	mg/L	0.0056	mg/L	M	7.8E-08	mg/kg-day	8.3E-02	mg/kg-day	--	--	9.4E-07
	Toluene	0.0027	mg/L	0.0027	mg/L	M	3.0E-06	mg/kg-day	1.6E-01	mg/kg-day	--	--	1.9E-05
	Xylenes, total	0.0035	mg/L	0.0035	mg/L	M	8.1E-06	mg/kg-day	1.8E+00	mg/kg-day	--	--	4.4E-06
	(Total)												2.4E-05
												Total Hazard Index Across All Exposure Routes/Pathways	2.7E-05

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/L - milligram per liter
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.
(2) Specify if subchronic.

TABLE 7.4.4 CT
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Sediment
Receptor Population: Residents
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	2-Methylnaphthalene	10	mg/kg	10	mg/kg	M	9.4E-07	mg/kg-day	NA	--	--	--	--
	Aroclor-1248	2.8	mg/kg	2.8	mg/kg	M	2.6E-07	mg/kg-day	NA	--	--	--	--
	Aroclor-1260	40	mg/kg	40	mg/kg	M	3.8E-06	mg/kg-day	NA	--	--	--	--
	Diesel Range Organics (Total)	11,600	mg/kg	11,600	mg/kg	M	1.1E-03	mg/kg-day	NA	--	--	--	--
													--
Dermal	2-Methylnaphthalene	10	mg/kg	10	mg/kg	M	6.6E-08	mg/kg-day	NA	--	--	--	--
	Aroclor-1248	2.8	mg/kg	2.8	mg/kg	M	2.6E-07	mg/kg-day	NA	--	--	--	--
	Aroclor-1260	40	mg/kg	40	mg/kg	M	3.7E-06	mg/kg-day	NA	--	--	--	--
	Diesel Range Organics (Total)	11,600	mg/kg	11,600	mg/kg	M	7.6E-05	mg/kg-day	NA	--	--	--	--
													--
												Total Hazard Index Across All Exposure Routes/Pathways	--

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.
(2) Specify if subchronic.

TABLE 7.5.1A RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Surface Soil
Receptor Population: Residents
Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	2-Methylnaphthalene	1.96	mg/kg	1.96	mg/kg	M	2.5E-05	mg/kg-day	NA	--	--	--	--
	Benzo(a)anthracene	69.0	mg/kg	69.0	mg/kg	M	8.8E-04	mg/kg-day	NA	--	--	--	--
	Benzo(a)pyrene	30.5	mg/kg	30.5	mg/kg	M	3.9E-04	mg/kg-day	NA	--	--	--	--
	Benzo(b)fluoranthene	40.9	mg/kg	40.9	mg/kg	M	5.2E-04	mg/kg-day	NA	--	--	--	--
	Benzo(k)fluoranthene	18.7	mg/kg	18.7	mg/kg	M	2.4E-04	mg/kg-day	NA	--	--	--	--
	Carbazole	3.16	mg/kg	3.16	mg/kg	M	4.0E-05	mg/kg-day	NA	--	--	--	--
	Chrysene	96.0	mg/kg	96.0	mg/kg	M	1.2E-03	mg/kg-day	NA	--	--	--	--
	Dibenz(a,h)anthracene	1.41	mg/kg	1.41	mg/kg	M	1.8E-05	mg/kg-day	NA	--	--	--	--
	Fluoranthene	243	mg/kg	243	mg/kg	M	3.1E-03	mg/kg-day	4.0E-02	mg/kg-day	--	--	7.8E-02
	Indeno(1,2,3-cd)pyrene	8.79	mg/kg	8.79	mg/kg	M	1.1E-04	mg/kg-day	NA	--	--	--	--
	Naphthalene	0.525	mg/kg	0.525	mg/kg	M	6.7E-06	mg/kg-day	2.0E-02	mg/kg-day	--	--	3.4E-04
	Pyrene	250	mg/kg	250	mg/kg	M	3.2E-03	mg/kg-day	3.0E-02	mg/kg-day	--	--	1.1E-01
	4,4'-DDD	3	mg/kg	3	mg/kg	M	3.8E-05	mg/kg-day	NA	--	--	--	--
	Chlordane, alpha-	48	mg/kg	48	mg/kg	M	6.1E-04	mg/kg-day	5.0E-04	mg/kg-day	--	--	1.2E+00
	Chlordane, gamma-	58	mg/kg	58	mg/kg	M	7.4E-04	mg/kg-day	5.0E-04	mg/kg-day	--	--	1.5E+00
	Dieldrin	0.32	mg/kg	0.32	mg/kg	M	4.1E-06	mg/kg-day	5.0E-05	mg/kg-day	--	--	8.2E-02
	Heptachlor	22	mg/kg	22	mg/kg	M	2.8E-04	mg/kg-day	5.0E-04	mg/kg-day	--	--	5.6E-01
	Heptachlor Epoxide	4.5	mg/kg	4.5	mg/kg	M	5.8E-05	mg/kg-day	1.3E-05	mg/kg-day	--	--	4.4E+00
	Aroclor-1248	1.51	mg/kg	1.51	mg/kg	M	1.9E-05	mg/kg-day	NA	--	--	--	--
	Aroclor-1254	0.975	mg/kg	0.975	mg/kg	M	1.2E-05	mg/kg-day	2.0E-05	mg/kg-day	--	--	6.2E-01
	Aroclor-1260	54.6	mg/kg	54.6	mg/kg	M	7.0E-04	mg/kg-day	NA	--	--	--	--
	Gasoline Range Organics	0.207	mg/kg	0.207	mg/kg	M	2.6E-06	mg/kg-day	NA	--	--	--	--
	Diesel Range Organics	470	mg/kg	470	mg/kg	M	6.0E-03	mg/kg-day	NA	--	--	--	--
	Antimony	1.22	mg/kg	1.22	mg/kg	M	1.6E-05	mg/kg-day	4.0E-04	mg/kg-day	--	--	3.9E-02
	Arsenic	3.49	mg/kg	3.49	mg/kg	M	4.5E-05	mg/kg-day	3.0E-04	mg/kg-day	--	--	1.5E-01
	Iron	2,260	mg/kg	2,260	mg/kg	M	2.9E-02	mg/kg-day	3.0E-01	mg/kg-day	--	--	9.6E-02
	Thallium	0.31	mg/kg	0.31	mg/kg	M	3.9E-06	mg/kg-day	6.6E-05	mg/kg-day	--	--	5.9E-02
	(total)												8.9E+00

TABLE 7.5.1A RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Surface Soil
Receptor Population: Residents
Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Dermal	2-Methylnaphthalene	1.96	mg/kg	1.96	mg/kg	M	7.0E-07	mg/kg-day	NA	--	--	--	--
	Benzo(a)anthracene	69.0	mg/kg	69.0	mg/kg	M	3.2E-04	mg/kg-day	NA	--	--	--	--
	Benzo(a)pyrene	30.5	mg/kg	30.5	mg/kg	M	1.4E-04	mg/kg-day	NA	--	--	--	--
	Benzo(b)fluoranthene	40.9	mg/kg	40.9	mg/kg	M	1.9E-04	mg/kg-day	NA	--	--	--	--
	Benzo(k)fluoranthene	18.7	mg/kg	18.7	mg/kg	M	8.7E-05	mg/kg-day	NA	--	--	--	--
	Carbazole	3.16	mg/kg	3.16	mg/kg	M	1.5E-05	mg/kg-day	NA	--	--	--	--
	Chrysene	96.0	mg/kg	96.0	mg/kg	M	4.5E-04	mg/kg-day	NA	--	--	--	--
	Dibenz(a,h)anthracene	1.41	mg/kg	1.41	mg/kg	M	6.6E-06	mg/kg-day	NA	--	--	--	--
	Fluoranthene	243	mg/kg	243	mg/kg	M	8.7E-05	mg/kg-day	1.2E-02	mg/kg-day	--	--	7.0E-03
	Indeno(1,2,3-cd)pyrene	8.79	mg/kg	8.79	mg/kg	M	4.1E-05	mg/kg-day	NA	--	--	--	--
	Naphthalene	0.525	mg/kg	0.525	mg/kg	M	1.9E-07	mg/kg-day	1.6E-02	mg/kg-day	--	--	1.2E-05
	Pyrene	250	mg/kg	250	mg/kg	M	8.9E-05	mg/kg-day	9.3E-03	mg/kg-day	--	--	9.6E-03
	4,4'-DDD	3	mg/kg	3	mg/kg	M	1.1E-06	mg/kg-day	NA	--	--	--	--
	Chlordane, alpha-	48	mg/kg	48	mg/kg	M	6.9E-05	mg/kg-day	4.0E-04	mg/kg-day	--	--	1.7E-01
	Chlordane, gamma-	58	mg/kg	58	mg/kg	M	8.3E-05	mg/kg-day	4.0E-04	mg/kg-day	--	--	2.1E-01
	Dieldrin	0.32	mg/kg	0.32	mg/kg	M	1.1E-07	mg/kg-day	2.5E-05	mg/kg-day	--	--	4.6E-03
	Heptachlor	22	mg/kg	22	mg/kg	M	7.9E-06	mg/kg-day	3.6E-04	mg/kg-day	--	--	2.2E-02
	Heptachlor Epoxide	4.5	mg/kg	4.5	mg/kg	M	1.6E-06	mg/kg-day	9.4E-06	mg/kg-day	--	--	1.7E-01
	Aroclor-1248	1.51	mg/kg	1.51	mg/kg	M	7.6E-06	mg/kg-day	NA	--	--	--	--
	Aroclor-1254	0.975	mg/kg	0.975	mg/kg	M	4.9E-06	mg/kg-day	1.8E-05	mg/kg-day	--	--	2.7E-01
	Aroclor-1260	54.6	mg/kg	54.6	mg/kg	M	2.7E-04	mg/kg-day	NA	--	--	--	--
	Gasoline Range Organics	0.207	mg/kg	0.207	mg/kg	M	7.4E-08	mg/kg-day	NA	--	--	--	--
	Diesel Range Organics	470	mg/kg	470	mg/kg	M	1.7E-04	mg/kg-day	NA	--	--	--	--
	Antimony	1.22	mg/kg	1.22	mg/kg	M	4.4E-08	mg/kg-day	8.0E-06	mg/kg-day	--	--	5.5E-03
	Arsenic	3.49	mg/kg	3.49	mg/kg	M	3.8E-06	mg/kg-day	1.2E-04	mg/kg-day	--	--	3.0E-02
	Iron	2,260	mg/kg	2,260	mg/kg	M	8.1E-05	mg/kg-day	4.5E-02	mg/kg-day	--	--	1.8E-03
	Thallium	0.31	mg/kg	0.31	mg/kg	M	1.1E-08	mg/kg-day	9.9E-06	mg/kg-day	--	--	1.1E-03
	(Total)												9.1E-01
												Total Hazard Index Across All Exposure Routes/Pathways	9.8E+00

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.

mg/kg - milligram per kilogram
mg/kg-day - milligram per kilogram per day

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.
(2) Specify if subchronic.

TABLE 7.5.1B RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Surface Soil
Receptor Population: Residents
Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	2-Methylnaphthalene	57.9	mg/kg	57.9	mg/kg	M	7.4E-04	mg/kg-day	NA	--	--	--	--
	Benzo(a)anthracene	4.76	mg/kg	4.76	mg/kg	M	6.1E-05	mg/kg-day	NA	--	--	--	--
	Benzo(a)pyrene	2.48	mg/kg	2.48	mg/kg	M	3.2E-05	mg/kg-day	NA	--	--	--	--
	Benzo(b)fluoranthene	2.81	mg/kg	2.81	mg/kg	M	3.6E-05	mg/kg-day	NA	--	--	--	--
	Benzo(k)fluoranthene	1.78	mg/kg	1.78	mg/kg	M	2.3E-05	mg/kg-day	NA	--	--	--	--
	Carbazole	0.95	mg/kg	0.95	mg/kg	M	1.2E-05	mg/kg-day	NA	--	--	--	--
	Chrysene	6.7	mg/kg	6.7	mg/kg	M	8.6E-05	mg/kg-day	NA	--	--	--	--
	Dibenz(a,h)anthracene	0.695	mg/kg	0.695	mg/kg	M	8.9E-06	mg/kg-day	NA	--	--	--	--
	Indeno(1,2,3-cd)pyrene	1.72	mg/kg	1.72	mg/kg	M	2.2E-05	mg/kg-day	NA	--	--	--	--
	Dieldrin	0.052	mg/kg	0.052	mg/kg	M	6.6E-07	mg/kg-day	5.0E-05	mg/kg-day	--	--	1.3E-02
	Aroclor-1260	95.6	mg/kg	95.6	mg/kg	M	1.2E-03	mg/kg-day	NA	--	--	--	--
	Arsenic	5.26	mg/kg	5.26	mg/kg	M	6.7E-05	mg/kg-day	3.0E-04	mg/kg-day	--	--	2.2E-01
	Iron	2,347	mg/kg	2,347	mg/kg	M	3.0E-02	mg/kg-day	3.0E-01	mg/kg-day	--	--	1.0E-01
	(total)												3.4E-01
Dermal	2-Methylnaphthalene	57.9	mg/kg	57.9	mg/kg	M	2.1E-05	mg/kg-day	NA	--	--	--	--
	Benzo(a)anthracene	4.76	mg/kg	4.76	mg/kg	M	2.2E-05	mg/kg-day	NA	--	--	--	--
	Benzo(a)pyrene	2.48	mg/kg	2.48	mg/kg	M	1.2E-05	mg/kg-day	NA	--	--	--	--
	Benzo(b)fluoranthene	2.81	mg/kg	2.81	mg/kg	M	1.3E-05	mg/kg-day	NA	--	--	--	--
	Benzo(k)fluoranthene	1.78	mg/kg	1.78	mg/kg	M	8.3E-06	mg/kg-day	NA	--	--	--	--
	Carbazole	0.95	mg/kg	0.95	mg/kg	M	4.4E-06	mg/kg-day	NA	--	--	--	--
	Chrysene	6.7	mg/kg	6.7	mg/kg	M	3.1E-05	mg/kg-day	NA	--	--	--	--
	Dibenz(a,h)anthracene	0.695	mg/kg	0.695	mg/kg	M	3.2E-06	mg/kg-day	NA	--	--	--	--
	Indeno(1,2,3-cd)pyrene	1.72	mg/kg	1.72	mg/kg	M	8.0E-06	mg/kg-day	NA	--	--	--	--
	Dieldrin	0.052	mg/kg	0.052	mg/kg	M	1.9E-08	mg/kg-day	2.5E-05	mg/kg-day	--	--	7.4E-04
	Aroclor-1260	95.6	mg/kg	95.6	mg/kg	M	4.8E-04	mg/kg-day	NA	--	--	--	--
	Arsenic	5.26	mg/kg	5.26	mg/kg	M	5.6E-06	mg/kg-day	1.2E-04	mg/kg-day	--	--	4.6E-02
	Iron	2,347	mg/kg	2,347	mg/kg	M	8.4E-05	mg/kg-day	4.5E-02	mg/kg-day	--	--	1.9E-03
	(Total)												4.9E-02
												Total Hazard Index Across All Exposure Routes/Pathways	3.9E-01

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.
(2) Specify if subchronic.

TABLE 7.5.1aA RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Air
Exposure Point: Fugative dust
Receptor Population: Residents
Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Inhalation	2-Methylnaphthalene	1.96	mg/kg	1.48E-09	mg/m^3	R	1.4E-09	mg/kg-day	NA	--	NA	--	--
	Benzo(a)anthracene	69.0	mg/kg	5.23E-08	mg/m^3	R	5.0E-08	mg/kg-day	NA	--	NA	--	--
	Benzo(a)pyrene	30.5	mg/kg	2.31E-08	mg/m^3	R	2.2E-08	mg/kg-day	NA	--	NA	--	--
	Benzo(b)fluoranthene	40.9	mg/kg	3.10E-08	mg/m^3	R	3.0E-08	mg/kg-day	NA	--	NA	--	--
	Benzo(k)fluoranthene	18.7	mg/kg	1.41E-08	mg/m^3	R	1.4E-08	mg/kg-day	NA	--	NA	--	--
	Carbazole	3.16	mg/kg	2.39E-09	mg/m^3	R	2.3E-09	mg/kg-day	NA	--	NA	--	--
	Chrysene	96.0	mg/kg	7.27E-08	mg/m^3	R	7.0E-08	mg/kg-day	NA	--	NA	--	--
	Dibenz(a,h)anthracene	1.41	mg/kg	1.07E-09	mg/m^3	R	1.0E-09	mg/kg-day	NA	--	NA	--	--
	Fluoranthene	243	mg/kg	1.84E-07	mg/m^3	R	1.8E-07	mg/kg-day	4.0E-02	mg/kg-day	NA	--	4.4E-06
	Indeno(1,2,3-cd)pyrene	8.79	mg/kg	6.66E-09	mg/m^3	R	6.4E-09	mg/kg-day	NA	--	NA	--	--
	Naphthalene	0.525	mg/kg	3.98E-10	mg/m^3	R	3.8E-10	mg/kg-day	8.6E-04	mg/kg-day	3.0E-03	mg/m3	4.5E-07
	Pyrene	250	mg/kg	1.89E-07	mg/m^3	R	1.8E-07	mg/kg-day	3.0E-02	mg/kg-day	NA	--	6.1E-06
	4,4'-DDD	3	mg/kg	2.27E-09	mg/m^3	R	2.2E-09	mg/kg-day	NA	--	NA	--	--
	Chlordane, alpha-	48	mg/kg	3.64E-08	mg/m^3	R	3.5E-08	mg/kg-day	2.0E-04	mg/kg-day	7.0E-04	mg/m3	1.7E-04
	Chlordane, gamma-	58	mg/kg	4.39E-08	mg/m^3	R	4.2E-08	mg/kg-day	2.0E-04	mg/kg-day	7.0E-04	mg/m3	2.1E-04
	Dieldrin	0.32	mg/kg	2.42E-10	mg/m^3	R	2.3E-10	mg/kg-day	5.0E-05	mg/kg-day	NA	--	4.6E-06
	Heptachlor	22	mg/kg	1.67E-08	mg/m^3	R	1.6E-08	mg/kg-day	5.0E-04	mg/kg-day	NA	--	3.2E-05
	Heptachlor Epoxide	4.5	mg/kg	3.41E-09	mg/m^3	R	3.3E-09	mg/kg-day	1.3E-05	mg/kg-day	NA	--	2.5E-04
	Aroclor-1248	1.51	mg/kg	1.14E-09	mg/m^3	R	1.1E-09	mg/kg-day	NA	--	NA	--	--
	Aroclor-1254	0.975	mg/kg	7.39E-10	mg/m^3	R	7.1E-10	mg/kg-day	2.0E-05	mg/kg-day	NA	--	3.5E-05
	Aroclor-1260	54.6	mg/kg	4.13E-08	mg/m^3	R	4.0E-08	mg/kg-day	NA	--	NA	--	--
	Gasoline Range Organics	0.207	mg/kg	1.57E-10	mg/m^3	R	1.5E-10	mg/kg-day	NA	--	NA	--	--
	Diesel Range Organics	470	mg/kg	3.56E-07	mg/m^3	R	3.4E-07	mg/kg-day	NA	--	NA	--	--
	Antimony	1.22	mg/kg	9.25E-10	mg/m^3	R	8.9E-10	mg/kg-day	NA	--	NA	--	--
	Arsenic	3.49	mg/kg	2.65E-09	mg/m^3	R	2.5E-09	mg/kg-day	NA	--	NA	--	--
	Iron	2,260	mg/kg	1.71E-06	mg/m^3	R	1.6E-06	mg/kg-day	NA	--	NA	--	--
	Thallium	0.31	mg/kg	2.32E-10	mg/m^3	R	2.2E-10	mg/kg-day	NA	--	NA	--	--
	(Total)												7.2E-04
							Total Hazard Index Across All Exposure Routes/Pathways						7.2E-04

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/m^3 - milligram per cubic meter
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.
(2) Specify if subchronic.

TABLE 7.5.1aB RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Air
Exposure Point: Fugative dust
Receptor Population: Residents
Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Inhalation	2-Methylnaphthalene	57.9	mg/kg	4.39E-08	mg/m^3	R	4.2E-08	mg/kg-day	NA	--	NA	--	--
	Benzo(a)anthracene	4.76	mg/kg	3.61E-09	mg/m^3	R	3.5E-09	mg/kg-day	NA	--	NA	--	--
	Benzo(a)pyrene	2.48	mg/kg	1.88E-09	mg/m^3	R	1.8E-09	mg/kg-day	NA	--	NA	--	--
	Benzo(b)fluoranthene	2.81	mg/kg	2.13E-09	mg/m^3	R	2.0E-09	mg/kg-day	NA	--	NA	--	--
	Benzo(k)fluoranthene	1.78	mg/kg	1.35E-09	mg/m^3	R	1.3E-09	mg/kg-day	NA	--	NA	--	--
	Carbazole	0.95	mg/kg	7.20E-10	mg/m^3	R	6.9E-10	mg/kg-day	NA	--	NA	--	--
	Chrysene	6.7	mg/kg	5.08E-09	mg/m^3	R	4.9E-09	mg/kg-day	NA	--	NA	--	--
	Dibenz(a,h)anthracene	0.695	mg/kg	5.27E-10	mg/m^3	R	5.1E-10	mg/kg-day	NA	--	NA	--	--
	Indeno(1,2,3-cd)pyrene	1.72	mg/kg	1.30E-09	mg/m^3	R	1.2E-09	mg/kg-day	NA	--	NA	--	--
	Dieldrin	0.052	mg/kg	3.94E-11	mg/m^3	R	3.8E-11	mg/kg-day	5.0E-05	mg/kg-day	NA	--	7.6E-07
	Aroclor-1260	95.6	mg/kg	7.24E-08	mg/m^3	R	6.9E-08	mg/kg-day	NA	--	NA	--	--
	Arsenic	5.26	mg/kg	3.98E-09	mg/m^3	R	3.8E-09	mg/kg-day	NA	--	NA	--	--
	Iron	2,347	mg/kg	1.78E-06	mg/m^3	R	1.7E-06	mg/kg-day	NA	--	NA	--	--
	(Total)												7.6E-07
												Total Hazard Index Across All Exposure Routes/Pathways	7.6E-07

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/m^3 - milligram per cubic meter
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.
(2) Specify if subchronic.

TABLE 7.5.2 RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Tap
Receptor Population: Residents
Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzene	0.0034	mg/L	0.0034	mg/L	M	2.2E-04	mg/kg-day	3.0E-03	mg/kg-day	--	--	7.2E-02
	Chloroform	0.016	mg/L	0.016	mg/L	M	1.0E-03	mg/kg-day	1.0E-02	mg/kg-day	--	--	1.0E-01
	2-Methylnaphthalene	0.00105	mg/L	0.00105	mg/L	M	6.7E-05	mg/kg-day	NA	--	--	--	--
	Naphthalene	0.0022	mg/L	0.0022	mg/L	M	1.4E-04	mg/kg-day	2.0E-02	mg/kg-day	--	--	7.0E-03
	Heptachlor Epoxide	0.0000167	mg/L	0.0000167	mg/L	M	1.1E-06	mg/kg-day	1.3E-05	mg/kg-day	--	--	8.2E-02
	MCPA	0.044	mg/L	0.044	mg/L	M	2.8E-03	mg/kg-day	5.0E-04	mg/kg-day	--	--	5.6E+00
	Antimony	0.011	mg/L	0.011	mg/L	M	7.0E-04	mg/kg-day	4.0E-04	mg/kg-day	--	--	1.8E+00
	Arsenic	0.03	mg/L	0.03	mg/L	M	1.9E-03	mg/kg-day	3.0E-04	mg/kg-day	--	--	6.4E+00
	Iron	67.7	mg/L	67.7	mg/L	M	4.3E+00	mg/kg-day	3.0E-01	mg/kg-day	--	--	1.4E+01
	Manganese	0.45	mg/L	0.45	mg/L	M	2.9E-02	mg/kg-day	2.4E-02	mg/kg-day	--	--	1.2E+00
	Thallium	0.0057	mg/L	0.0057	mg/L	M	3.6E-04	mg/kg-day	6.6E-05	mg/kg-day	--	--	5.5E+00
	(Total)												3.5E+01
Dermal	Benzene	0.0034	mg/L	0.0034	mg/L	M	7.5E-06	mg/kg-day	2.8E-03	mg/kg-day	--	--	2.7E-03
	Chloroform	0.016	mg/L	0.016	mg/L	M	1.5E-05	mg/kg-day	2.0E-03	mg/kg-day	--	--	7.5E-03
	2-Methylnaphthalene	0.00105	mg/L	0.00105	mg/L	M	1.6E-05	mg/kg-day	NA	--	--	--	--
	Naphthalene	0.0022	mg/L	0.0022	mg/L	M	1.6E-05	mg/kg-day	1.6E-02	mg/kg-day	--	--	1.0E-03
	Heptachlor Epoxide	0.0000167	mg/L	0.0000167	mg/L	M	9.7E-08	mg/kg-day	9.4E-06	mg/kg-day	--	--	1.0E-02
	MCPA	0.044	mg/L	0.044	mg/L	M	2.3E-05	mg/kg-day	2.5E-04	mg/kg-day	--	--	9.1E-02
	Antimony	0.011	mg/L	0.011	mg/L	M	1.2E-06	mg/kg-day	8.0E-06	mg/kg-day	--	--	1.5E-01
	Arsenic	0.03	mg/L	0.03	mg/L	M	3.2E-06	mg/kg-day	1.2E-04	mg/kg-day	--	--	2.6E-02
	Iron	67.7	mg/L	67.7	mg/L	M	7.1E-03	mg/kg-day	4.5E-02	mg/kg-day	--	--	1.6E-01
	Manganese	0.45	mg/L	0.45	mg/L	M	4.7E-05	mg/kg-day	9.6E-04	mg/kg-day	--	--	4.9E-02
	Thallium	0.0057	mg/L	0.0057	mg/L	M	6.0E-07	mg/kg-day	9.9E-06	mg/kg-day	--	--	6.1E-02
	(Total)												5.5E-01
								Total Hazard Index Across All Exposure Routes/Pathways					3.6E+01

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/L - milligram per liter
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.
(2) Specify if subchronic.

TABLE 7.5.3 RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: Surface Water
Receptor Population: Residents
Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Acetone	0.0056	mg/L	0.0056	mg/L	M	6.4E-06	mg/kg-day	1.0E-01	mg/kg-day	--	--	6.4E-05
	Toluene	0.0027	mg/L	0.0027	mg/L	M	3.1E-06	mg/kg-day	2.0E-01	mg/kg-day	--	--	1.5E-05
	Xylenes, total	0.0035	mg/L	0.0035	mg/L	M	4.0E-06	mg/kg-day	2.0E+00	mg/kg-day	--	--	2.0E-06
	(Total)												8.1E-05
Dermal	Acetone	0.0056	mg/L	0.0056	mg/L	M	2.0E-07	mg/kg-day	8.3E-02	mg/kg-day	--	--	2.5E-06
	Toluene	0.0027	mg/L	0.0027	mg/L	M	7.8E-06	mg/kg-day	1.6E-01	mg/kg-day	--	--	4.8E-05
	Xylenes, total	0.0035	mg/L	0.0035	mg/L	M	2.1E-05	mg/kg-day	1.8E+00	mg/kg-day	--	--	1.2E-05
	(Total)												6.2E-05
								Total Hazard Index Across All Exposure Routes/Pathways					1.4E-04

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/L - milligram per liter
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.
(2) Specify if subchronic.

TABLE 7.5.4 RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Sediment
Receptor Population: Residents
Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	2-Methylnaphthalene	10	mg/kg	10	mg/kg	M	1.8E-05	mg/kg-day	NA	--	--	--	--
	Aroclor-1248	2.8	mg/kg	2.8	mg/kg	M	4.9E-06	mg/kg-day	NA	--	--	--	--
	Aroclor-1260	40	mg/kg	40	mg/kg	M	7.0E-05	mg/kg-day	NA	--	--	--	--
	Diesel Range Organics	11,600	mg/kg	11,600	mg/kg	M	2.0E-02	mg/kg-day	NA	--	--	--	--
	(Total)												--
Dermal	2-Methylnaphthalene	10	mg/kg	10	mg/kg	M	4.9E-07	mg/kg-day	NA	--	--	--	--
	Aroclor-1248	2.8	mg/kg	2.8	mg/kg	M	1.9E-06	mg/kg-day	NA	--	--	--	--
	Aroclor-1260	40	mg/kg	40	mg/kg	M	2.7E-05	mg/kg-day	NA	--	--	--	--
	Diesel Range Organics	11,600	mg/kg	11,600	mg/kg	M	5.7E-04	mg/kg-day	NA	--	--	--	--
	(Total)												--
												Total Hazard Index Across All Exposure Routes/Pathways	--

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.
(2) Specify if subchronic.

TABLE 7.5.1A CT
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Surface Soil
Receptor Population: Residents
Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	2-Methylnaphthalene	1.96	mg/kg	1.96	mg/kg	M	8.4E-06	mg/kg-day	NA	--	--	--	--
	Benzo(a)anthracene	69.0	mg/kg	69.0	mg/kg	M	2.9E-04	mg/kg-day	NA	--	--	--	--
	Benzo(a)pyrene	30.5	mg/kg	30.5	mg/kg	M	1.3E-04	mg/kg-day	NA	--	--	--	--
	Benzo(b)fluoranthene	40.9	mg/kg	40.9	mg/kg	M	1.7E-04	mg/kg-day	NA	--	--	--	--
	Benzo(k)fluoranthene	18.7	mg/kg	18.7	mg/kg	M	8.0E-05	mg/kg-day	NA	--	--	--	--
	Carbazole	3.16	mg/kg	3.16	mg/kg	M	1.3E-05	mg/kg-day	NA	--	--	--	--
	Chrysene	96.0	mg/kg	96.0	mg/kg	M	4.1E-04	mg/kg-day	NA	--	--	--	--
	Dibenz(a,h)anthracene	1.41	mg/kg	1.41	mg/kg	M	6.0E-06	mg/kg-day	NA	--	--	--	--
	Fluoranthene	243	mg/kg	243	mg/kg	M	1.0E-03	mg/kg-day	4.0E-02	mg/kg-day	--	--	2.6E-02
	Indeno(1,2,3-cd)pyrene	8.79	mg/kg	8.79	mg/kg	M	3.8E-05	mg/kg-day	NA	--	--	--	--
	Naphthalene	0.525	mg/kg	0.525	mg/kg	M	2.2E-06	mg/kg-day	2.0E-02	mg/kg-day	--	--	1.1E-04
	Pyrene	250	mg/kg	250	mg/kg	M	1.1E-03	mg/kg-day	3.0E-02	mg/kg-day	--	--	3.6E-02
	4,4'-DDD	3	mg/kg	3	mg/kg	M	1.3E-05	mg/kg-day	NA	--	--	--	--
	Chlordane, alpha-	48	mg/kg	48	mg/kg	M	2.1E-04	mg/kg-day	5.0E-04	mg/kg-day	--	--	4.1E-01
	Chlordane, gamma-	58	mg/kg	58	mg/kg	M	2.5E-04	mg/kg-day	5.0E-04	mg/kg-day	--	--	5.0E-01
	Dieldrin	0.32	mg/kg	0.32	mg/kg	M	1.4E-06	mg/kg-day	5.0E-05	mg/kg-day	--	--	2.7E-02
	Heptachlor	22	mg/kg	22	mg/kg	M	9.4E-05	mg/kg-day	5.0E-04	mg/kg-day	--	--	1.9E-01
	Heptachlor Epoxide	4.5	mg/kg	4.5	mg/kg	M	1.9E-05	mg/kg-day	1.3E-05	mg/kg-day	--	--	1.5E+00
	Aroclor-1248	1.51	mg/kg	1.51	mg/kg	M	6.4E-06	mg/kg-day	NA	--	--	--	--
	Aroclor-1254	0.975	mg/kg	0.975	mg/kg	M	4.2E-06	mg/kg-day	2.0E-05	mg/kg-day	--	--	2.1E-01
	Aroclor-1260	54.6	mg/kg	54.6	mg/kg	M	2.3E-04	mg/kg-day	NA	--	--	--	--
	Gasoline Range Organics	0.207	mg/kg	0.207	mg/kg	M	8.9E-07	mg/kg-day	NA	--	--	--	--
	Diesel Range Organics	470	mg/kg	470	mg/kg	M	2.0E-03	mg/kg-day	NA	--	--	--	--
	Antimony	1.22	mg/kg	1.22	mg/kg	M	5.2E-06	mg/kg-day	4.0E-04	mg/kg-day	--	--	1.3E-02
	Arsenic	3.49	mg/kg	3.49	mg/kg	M	1.5E-05	mg/kg-day	3.0E-04	mg/kg-day	--	--	5.0E-02
	Iron	2,260	mg/kg	2,260	mg/kg	M	9.7E-03	mg/kg-day	3.0E-01	mg/kg-day	--	--	3.2E-02
	Thallium	0.31	mg/kg	0.31	mg/kg	M	1.3E-06	mg/kg-day	6.6E-05	mg/kg-day	--	--	2.0E-02
	(total)												3.0E+00

TABLE 7.5.1A CT
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Surface Soil
Receptor Population: Residents
Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Dermal	2-Methylnaphthalene	1.96	mg/kg	1.96	mg/kg	M	3.3E-07	mg/kg-day	NA	--	--	--	--
	Benzo(a)anthracene	69.0	mg/kg	69.0	mg/kg	M	1.5E-04	mg/kg-day	NA	--	--	--	--
	Benzo(a)pyrene	30.5	mg/kg	30.5	mg/kg	M	6.8E-05	mg/kg-day	NA	--	--	--	--
	Benzo(b)fluoranthene	40.9	mg/kg	40.9	mg/kg	M	9.1E-05	mg/kg-day	NA	--	--	--	--
	Benzo(k)fluoranthene	18.7	mg/kg	18.7	mg/kg	M	4.1E-05	mg/kg-day	NA	--	--	--	--
	Carbazole	3.16	mg/kg	3.16	mg/kg	M	7.0E-06	mg/kg-day	NA	--	--	--	--
	Chrysene	96.0	mg/kg	96.0	mg/kg	M	2.1E-04	mg/kg-day	NA	--	--	--	--
	Dibenz(a,h)anthracene	1.41	mg/kg	1.41	mg/kg	M	3.1E-06	mg/kg-day	NA	--	--	--	--
	Fluoranthene	243	mg/kg	243	mg/kg	M	4.2E-05	mg/kg-day	1.2E-02	mg/kg-day	--	--	3.4E-03
	Indeno(1,2,3-cd)pyrene	8.79	mg/kg	8.79	mg/kg	M	2.0E-05	mg/kg-day	NA	--	--	--	--
	Naphthalene	0.525	mg/kg	0.525	mg/kg	M	9.0E-08	mg/kg-day	1.6E-02	mg/kg-day	--	--	5.6E-06
	Pyrene	250	mg/kg	250	mg/kg	M	4.3E-05	mg/kg-day	9.3E-03	mg/kg-day	--	--	4.6E-03
	4,4'-DDD	3	mg/kg	3	mg/kg	M	5.1E-07	mg/kg-day	NA	--	--	--	--
	Chlordane, alpha-	48	mg/kg	48	mg/kg	M	3.3E-05	mg/kg-day	4.0E-04	mg/kg-day	--	--	8.2E-02
	Chlordane, gamma-	58	mg/kg	58	mg/kg	M	4.0E-05	mg/kg-day	4.0E-04	mg/kg-day	--	--	9.9E-02
	Dieldrin	0.32	mg/kg	0.32	mg/kg	M	5.5E-08	mg/kg-day	2.5E-05	mg/kg-day	--	--	2.2E-03
	Heptachlor	22	mg/kg	22	mg/kg	M	3.8E-06	mg/kg-day	3.6E-04	mg/kg-day	--	--	1.0E-02
	Heptachlor Epoxide	4.5	mg/kg	4.5	mg/kg	M	7.7E-07	mg/kg-day	9.4E-06	mg/kg-day	--	--	8.2E-02
	Aroclor-1248	1.51	mg/kg	1.51	mg/kg	M	3.6E-06	mg/kg-day	NA	--	--	--	--
	Aroclor-1254	0.975	mg/kg	0.975	mg/kg	M	2.3E-06	mg/kg-day	1.8E-05	mg/kg-day	--	--	1.3E-01
	Aroclor-1260	54.6	mg/kg	54.6	mg/kg	M	1.3E-04	mg/kg-day	NA	--	--	--	--
	Gasoline Range Organics	0.207	mg/kg	0.207	mg/kg	M	3.5E-08	mg/kg-day	NA	--	--	--	--
	Diesel Range Organics	470	mg/kg	470	mg/kg	M	8.0E-05	mg/kg-day	NA	--	--	--	--
	Antimony	1.22	mg/kg	1.22	mg/kg	M	2.1E-08	mg/kg-day	8.0E-06	mg/kg-day	--	--	2.6E-03
	Arsenic	3.49	mg/kg	3.49	mg/kg	M	1.8E-06	mg/kg-day	1.2E-04	mg/kg-day	--	--	1.5E-02
	Iron	2,260	mg/kg	2,260	mg/kg	M	3.9E-05	mg/kg-day	4.5E-02	mg/kg-day	--	--	8.6E-04
	Thallium	0.31	mg/kg	0.31	mg/kg	M	5.2E-09	mg/kg-day	9.9E-06	mg/kg-day	--	--	5.3E-04
	(Total)												4.3E-01
								Total Hazard Index Across All Exposure Routes/Pathways					3.4E+00

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.
(2) Specify if subchronic.

TABLE 7.5.1B CT
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY
SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Surface Soil
Receptor Population: Residents
Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	2-Methylnaphthalene	57.9	mg/kg	57.9	mg/kg	M	2.5E-04	mg/kg-day	NA	--	--	--	--
	Benzo(a)anthracene	4.76	mg/kg	4.76	mg/kg	M	2.0E-05	mg/kg-day	NA	--	--	--	--
	Benzo(a)pyrene	2.48	mg/kg	2.48	mg/kg	M	1.1E-05	mg/kg-day	NA	--	--	--	--
	Benzo(b)fluoranthene	2.81	mg/kg	2.81	mg/kg	M	1.2E-05	mg/kg-day	NA	--	--	--	--
	Benzo(k)fluoranthene	1.78	mg/kg	1.78	mg/kg	M	7.6E-06	mg/kg-day	NA	--	--	--	--
	Carbazole	0.95	mg/kg	0.95	mg/kg	M	4.1E-06	mg/kg-day	NA	--	--	--	--
	Chrysene	6.7	mg/kg	6.7	mg/kg	M	2.9E-05	mg/kg-day	NA	--	--	--	--
	Dibenz(a,h)anthracene	0.695	mg/kg	0.695	mg/kg	M	3.0E-06	mg/kg-day	NA	--	--	--	--
	Indeno(1,2,3-cd)pyrene	1.72	mg/kg	1.72	mg/kg	M	7.3E-06	mg/kg-day	NA	--	--	--	--
	Dieldrin	0.052	mg/kg	0.052	mg/kg	M	2.2E-07	mg/kg-day	5.0E-05	mg/kg-day	--	--	4.4E-03
	Aroclor-1260	95.6	mg/kg	95.6	mg/kg	M	4.1E-04	mg/kg-day	NA	--	--	--	--
	Arsenic	5.26	mg/kg	5.26	mg/kg	M	2.2E-05	mg/kg-day	3.0E-04	mg/kg-day	--	--	7.5E-02
	Iron	2,347	mg/kg	2,347	mg/kg	M	1.0E-02	mg/kg-day	3.0E-01	mg/kg-day	--	--	3.3E-02
	(total)												1.1E-01
Dermal	2-Methylnaphthalene	57.9	mg/kg	57.9	mg/kg	M	9.9E-06	mg/kg-day	NA	--	--	--	--
	Benzo(a)anthracene	4.76	mg/kg	4.76	mg/kg	M	1.1E-05	mg/kg-day	NA	--	--	--	--
	Benzo(a)pyrene	2.48	mg/kg	2.48	mg/kg	M	5.5E-06	mg/kg-day	NA	--	--	--	--
	Benzo(b)fluoranthene	2.81	mg/kg	2.81	mg/kg	M	6.2E-06	mg/kg-day	NA	--	--	--	--
	Benzo(k)fluoranthene	1.78	mg/kg	1.78	mg/kg	M	4.0E-06	mg/kg-day	NA	--	--	--	--
	Carbazole	0.95	mg/kg	0.95	mg/kg	M	2.1E-06	mg/kg-day	NA	--	--	--	--
	Chrysene	6.7	mg/kg	6.7	mg/kg	M	1.5E-05	mg/kg-day	NA	--	--	--	--
	Dibenz(a,h)anthracene	0.695	mg/kg	0.695	mg/kg	M	1.5E-06	mg/kg-day	NA	--	--	--	--
	Indeno(1,2,3-cd)pyrene	1.72	mg/kg	1.72	mg/kg	M	3.8E-06	mg/kg-day	NA	--	--	--	--
	Dieldrin	0.052	mg/kg	0.052	mg/kg	M	8.9E-09	mg/kg-day	2.5E-05	mg/kg-day	--	--	3.6E-04
	Aroclor-1260	95.6	mg/kg	95.6	mg/kg	M	2.3E-04	mg/kg-day	NA	--	--	--	--
	Arsenic	5.26	mg/kg	5.26	mg/kg	M	2.7E-06	mg/kg-day	1.2E-04	mg/kg-day	--	--	2.2E-02
	Iron	2,347	mg/kg	2,347	mg/kg	M	4.0E-05	mg/kg-day	4.5E-02	mg/kg-day	--	--	8.9E-04
	(Total)												2.3E-02
												Total Hazard Index Across All Exposure Routes/Pathways	1.4E-01

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.
(2) Specify if subchronic.

TABLE 7.5.1aA CT
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Air
Exposure Point: Fugative dust
Receptor Population: Residents
Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Inhalation	2-Methylnaphthalene	1.96	mg/kg	1.48E-09	mg/m^3	R	9.5E-10	mg/kg-day	NA	--	NA	--	--
	Benzo(a)anthracene	69.0	mg/kg	5.23E-08	mg/m^3	R	3.4E-08	mg/kg-day	NA	--	NA	--	--
	Benzo(a)pyrene	30.5	mg/kg	2.31E-08	mg/m^3	R	1.5E-08	mg/kg-day	NA	--	NA	--	--
	Benzo(b)fluoranthene	40.9	mg/kg	3.10E-08	mg/m^3	R	2.0E-08	mg/kg-day	NA	--	NA	--	--
	Benzo(k)fluoranthene	18.7	mg/kg	1.41E-08	mg/m^3	R	9.1E-09	mg/kg-day	NA	--	NA	--	--
	Carbazole	3.16	mg/kg	2.39E-09	mg/m^3	R	1.5E-09	mg/kg-day	NA	--	NA	--	--
	Chrysene	96.0	mg/kg	7.27E-08	mg/m^3	R	4.7E-08	mg/kg-day	NA	--	NA	--	--
	Dibenz(a,h)anthracene	1.41	mg/kg	1.07E-09	mg/m^3	R	6.9E-10	mg/kg-day	NA	--	NA	--	--
	Fluoranthene	243	mg/kg	1.84E-07	mg/m^3	R	1.2E-07	mg/kg-day	4.0E-02	mg/kg-day	NA	--	3.0E-06
	Indeno(1,2,3-cd)pyrene	8.79	mg/kg	6.66E-09	mg/m^3	R	4.3E-09	mg/kg-day	NA	--	NA	--	--
	Naphthalene	0.525	mg/kg	3.98E-10	mg/m^3	R	2.6E-10	mg/kg-day	8.6E-04	mg/kg-day	3.0E-03	mg/m3	3.0E-07
	Pyrene	250	mg/kg	1.89E-07	mg/m^3	R	1.2E-07	mg/kg-day	3.0E-02	mg/kg-day	NA	--	4.0E-06
	4,4'-DDD	3	mg/kg	2.27E-09	mg/m^3	R	1.5E-09	mg/kg-day	NA	--	NA	--	--
	Chlordane, alpha-	48	mg/kg	3.64E-08	mg/m^3	R	2.3E-08	mg/kg-day	2.0E-04	mg/kg-day	7.0E-04	mg/m3	1.2E-04
	Chlordane, gamma-	58	mg/kg	4.39E-08	mg/m^3	R	2.8E-08	mg/kg-day	2.0E-04	mg/kg-day	7.0E-04	mg/m3	1.4E-04
	Dieldrin	0.32	mg/kg	2.42E-10	mg/m^3	R	1.6E-10	mg/kg-day	5.0E-05	mg/kg-day	NA	--	3.1E-06
	Heptachlor	22	mg/kg	1.67E-08	mg/m^3	R	1.1E-08	mg/kg-day	5.0E-04	mg/kg-day	NA	--	2.1E-05
	Heptachlor Epoxide	4.5	mg/kg	3.41E-09	mg/m^3	R	2.2E-09	mg/kg-day	1.3E-05	mg/kg-day	NA	--	1.7E-04
	Aroclor-1248	1.51	mg/kg	1.14E-09	mg/m^3	R	7.3E-10	mg/kg-day	NA	--	NA	--	--
	Aroclor-1254	0.975	mg/kg	7.39E-10	mg/m^3	R	4.7E-10	mg/kg-day	2.0E-05	mg/kg-day	NA	--	2.4E-05
	Aroclor-1260	54.6	mg/kg	4.13E-08	mg/m^3	R	2.6E-08	mg/kg-day	NA	--	NA	--	--
	Gasoline Range Organics	0.207	mg/kg	1.57E-10	mg/m^3	R	1.0E-10	mg/kg-day	NA	--	NA	--	--
	Diesel Range Organics	470	mg/kg	3.56E-07	mg/m^3	R	2.3E-07	mg/kg-day	NA	--	NA	--	--
	Antimony	1.22	mg/kg	9.25E-10	mg/m^3	R	5.9E-10	mg/kg-day	NA	--	NA	--	--
	Arsenic	3.49	mg/kg	2.65E-09	mg/m^3	R	1.7E-09	mg/kg-day	NA	--	NA	--	--
	Iron	2,260	mg/kg	1.71E-06	mg/m^3	R	1.1E-06	mg/kg-day	NA	--	NA	--	--
	Thallium	0.31	mg/kg	2.32E-10	mg/m^3	R	1.5E-10	mg/kg-day	NA	--	NA	--	--
	(Total)												4.8E-04
								Total Hazard Index Across All Exposure Routes/Pathways					4.8E-04

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.

mg/kg - milligram per kilogram
mg/m^3 - milligram per cubic meter
mg/kg-day - milligram per kilogram per day

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.
(2) Specify if subchronic.

TABLE 7.5.1aB CT
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY
SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Air
Exposure Point: Fugative dust
Receptor Population: Residents
Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Inhalation	2-Methylnaphthalene	57.9	mg/kg	4.39E-08	mg/m^3	R	2.8E-08	mg/kg-day	NA	--	NA	--	--
	Benzo(a)anthracene	4.76	mg/kg	3.61E-09	mg/m^3	R	2.3E-09	mg/kg-day	NA	--	NA	--	--
	Benzo(a)pyrene	2.48	mg/kg	1.88E-09	mg/m^3	R	1.2E-09	mg/kg-day	NA	--	NA	--	--
	Benzo(b)fluoranthene	2.81	mg/kg	2.13E-09	mg/m^3	R	1.4E-09	mg/kg-day	NA	--	NA	--	--
	Benzo(k)fluoranthene	1.78	mg/kg	1.35E-09	mg/m^3	R	8.6E-10	mg/kg-day	NA	--	NA	--	--
	Carbazole	0.95	mg/kg	7.20E-10	mg/m^3	R	4.6E-10	mg/kg-day	NA	--	NA	--	--
	Chrysene	6.7	mg/kg	5.08E-09	mg/m^3	R	3.3E-09	mg/kg-day	NA	--	NA	--	--
	Dibenz(a,h)anthracene	0.695	mg/kg	5.27E-10	mg/m^3	R	3.4E-10	mg/kg-day	NA	--	NA	--	--
	Indeno(1,2,3-cd)pyrene	1.72	mg/kg	1.30E-09	mg/m^3	R	8.3E-10	mg/kg-day	NA	--	NA	--	--
	Dieldrin	0.052	mg/kg	3.94E-11	mg/m^3	R	2.5E-11	mg/kg-day	5.0E-05	mg/kg-day	NA	--	5.1E-07
	Aroclor-1260	95.6	mg/kg	7.24E-08	mg/m^3	R	4.6E-08	mg/kg-day	NA	--	NA	--	--
	Arsenic	5.26	mg/kg	3.98E-09	mg/m^3	R	2.6E-09	mg/kg-day	NA	--	NA	--	--
	Iron	2,347	mg/kg	1.78E-06	mg/m^3	R	1.1E-06	mg/kg-day	NA	--	NA	--	--
	(Total)												5.1E-07
												Total Hazard Index Across All Exposure Routes/Pathways	5.1E-07

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/m^3 - milligram per cubic meter
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.
(2) Specify if subchronic.

TABLE 7.5.2 CT
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Tap
Receptor Population: Residents
Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzene	0.0034	mg/L	0.0034	mg/L	M	1.5E-04	mg/kg-day	3.0E-03	mg/kg-day	--	--	4.8E-02
	Chloroform	0.016	mg/L	0.016	mg/L	M	6.8E-04	mg/kg-day	1.0E-02	mg/kg-day	--	--	6.8E-02
	2-Methylnaphthalene	0.00105	mg/L	0.00105	mg/L	M	4.5E-05	mg/kg-day	NA	--	--	--	--
	Naphthalene	0.0022	mg/L	0.0022	mg/L	M	9.4E-05	mg/kg-day	2.0E-02	mg/kg-day	--	--	4.7E-03
	Heptachlor Epoxide	0.0000167	mg/L	0.0000167	mg/L	M	7.1E-07	mg/kg-day	1.3E-05	mg/kg-day	--	--	5.5E-02
	MCPA	0.044	mg/L	0.044	mg/L	M	1.9E-03	mg/kg-day	5.0E-04	mg/kg-day	--	--	3.8E+00
	Antimony	0.011	mg/L	0.011	mg/L	M	4.7E-04	mg/kg-day	4.0E-04	mg/kg-day	--	--	1.2E+00
	Arsenic	0.03	mg/L	0.03	mg/L	M	1.3E-03	mg/kg-day	3.0E-04	mg/kg-day	--	--	4.3E+00
	Iron	67.7	mg/L	67.7	mg/L	M	2.9E+00	mg/kg-day	3.0E-01	mg/kg-day	--	--	9.6E+00
	Manganese	0.45	mg/L	0.45	mg/L	M	1.9E-02	mg/kg-day	2.4E-02	mg/kg-day	--	--	8.0E-01
	Thallium	0.0057	mg/L	0.0057	mg/L	M	2.4E-04	mg/kg-day	6.6E-05	mg/kg-day	--	--	3.7E+00
	(Total)												2.4E+01
Dermal	Benzene	0.0034	mg/L	0.0034	mg/L	M	6.0E-06	mg/kg-day	2.8E-03	mg/kg-day	--	--	2.2E-03
	Chloroform	0.016	mg/L	0.016	mg/L	M	1.2E-05	mg/kg-day	2.0E-03	mg/kg-day	--	--	6.0E-03
	2-Methylnaphthalene	0.00105	mg/L	0.00105	mg/L	M	1.3E-05	mg/kg-day	NA	--	--	--	--
	Naphthalene	0.0022	mg/L	0.0022	mg/L	M	1.3E-05	mg/kg-day	1.6E-02	mg/kg-day	--	--	8.0E-04
	Heptachlor Epoxide	0.0000167	mg/L	0.0000167	mg/L	M	7.8E-08	mg/kg-day	9.4E-06	mg/kg-day	--	--	8.3E-03
	MCPA	0.044	mg/L	0.044	mg/L	M	1.8E-05	mg/kg-day	2.5E-04	mg/kg-day	--	--	7.3E-02
	Antimony	0.011	mg/L	0.011	mg/L	M	9.3E-07	mg/kg-day	8.0E-06	mg/kg-day	--	--	1.2E-01
	Arsenic	0.03	mg/L	0.03	mg/L	M	2.5E-06	mg/kg-day	1.2E-04	mg/kg-day	--	--	2.1E-02
	Iron	67.7	mg/L	67.7	mg/L	M	5.7E-03	mg/kg-day	4.5E-02	mg/kg-day	--	--	1.3E-01
	Manganese	0.45	mg/L	0.45	mg/L	M	3.8E-05	mg/kg-day	9.6E-04	mg/kg-day	--	--	4.0E-02
	Thallium	0.0057	mg/L	0.0057	mg/L	M	4.8E-07	mg/kg-day	9.9E-06	mg/kg-day	--	--	4.9E-02
	(Total)												4.4E-01
										Total Hazard Index Across All Exposure Routes/Pathways			2.4E+01

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/L - milligram per liter
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.
(2) Specify if subchronic.

TABLE 7.5.3 CT
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: Surface Water
Receptor Population: Residents
Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Acetone	0.0056	mg/L	0.0056	mg/L	M	6.4E-06	mg/kg-day	1.0E-01	mg/kg-day	--	--	6.4E-05
	Toluene	0.0027	mg/L	0.0027	mg/L	M	3.1E-06	mg/kg-day	2.0E-01	mg/kg-day	--	--	1.5E-05
	Xylenes, total	0.0035	mg/L	0.0035	mg/L	M	4.0E-06	mg/kg-day	2.0E+00	mg/kg-day	--	--	2.0E-06
	(Total)												8.1E-05
Dermal	Acetone	0.0056	mg/L	0.0056	mg/L	M	1.5E-07	mg/kg-day	8.3E-02	mg/kg-day	--	--	1.8E-06
	Toluene	0.0027	mg/L	0.0027	mg/L	M	5.5E-06	mg/kg-day	1.6E-01	mg/kg-day	--	--	3.5E-05
	Xylenes, total	0.0035	mg/L	0.0035	mg/L	M	1.5E-05	mg/kg-day	1.8E+00	mg/kg-day	--	--	8.2E-06
	(Total)												4.5E-05
												Total Hazard Index Across All Exposure Routes/Pathways	1.3E-04

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/L - milligram per liter
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.
(2) Specify if subchronic.

TABLE 7.5.4 CT
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Sediment
Receptor Population: Residents
Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	2-Methylnaphthalene	10	mg/kg	10	mg/kg	M	8.8E-06	mg/kg-day	NA	--	--	--	--
	Aroclor-1248	2.8	mg/kg	2.8	mg/kg	M	2.5E-06	mg/kg-day	NA	--	--	--	--
	Aroclor-1260	40	mg/kg	40	mg/kg	M	3.5E-05	mg/kg-day	NA	--	--	--	--
	Diesel Range Organics (Total)	11,600	mg/kg	11,600	mg/kg	M	1.0E-02	mg/kg-day	NA	--	--	--	--
													--
Dermal	2-Methylnaphthalene	10	mg/kg	10	mg/kg	M	3.1E-07	mg/kg-day	NA	--	--	--	--
	Aroclor-1248	2.8	mg/kg	2.8	mg/kg	M	1.2E-06	mg/kg-day	NA	--	--	--	--
	Aroclor-1260	40	mg/kg	40	mg/kg	M	1.7E-05	mg/kg-day	NA	--	--	--	--
	Diesel Range Organics (Total)	11,600	mg/kg	11,600	mg/kg	M	3.5E-04	mg/kg-day	NA	--	--	--	--
													--
												Total Hazard Index Across All Exposure Routes/Pathways	--

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.
(2) Specify if subchronic.

TABLE 7.6.1A RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Surface Soil
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	2-Methylnaphthalene	1.96	mg/kg	1.96	mg/kg	M	9.2E-06	mg/kg-day	NA	--	--	--	--
	Benzo(a)anthracene	69.0	mg/kg	69.0	mg/kg	M	3.2E-04	mg/kg-day	NA	--	--	--	--
	Benzo(a)pyrene	30.5	mg/kg	30.5	mg/kg	M	1.4E-04	mg/kg-day	NA	--	--	--	--
	Benzo(b)fluoranthene	40.9	mg/kg	40.9	mg/kg	M	1.9E-04	mg/kg-day	NA	--	--	--	--
	Benzo(k)fluoranthene	18.7	mg/kg	18.7	mg/kg	M	8.8E-05	mg/kg-day	NA	--	--	--	--
	Carbazole	3.16	mg/kg	3.16	mg/kg	M	1.5E-05	mg/kg-day	NA	--	--	--	--
	Chrysene	96.0	mg/kg	96.0	mg/kg	M	4.5E-04	mg/kg-day	NA	--	--	--	--
	Dibenz(a,h)anthracene	1.41	mg/kg	1.41	mg/kg	M	6.6E-06	mg/kg-day	NA	--	--	--	--
	Fluoranthene	243	mg/kg	243	mg/kg	M	1.1E-03	mg/kg-day	4.0E-02	mg/kg-day	--	--	2.9E-02
	Indeno(1,2,3-cd)pyrene	8.79	mg/kg	8.79	mg/kg	M	4.1E-05	mg/kg-day	NA	--	--	--	--
	Naphthalene	0.525	mg/kg	0.525	mg/kg	M	2.5E-06	mg/kg-day	2.0E-02	mg/kg-day	--	--	1.2E-04
	Pyrene	250	mg/kg	250	mg/kg	M	1.2E-03	mg/kg-day	3.0E-02	mg/kg-day	--	--	3.9E-02
	4,4'-DDD	3	mg/kg	3	mg/kg	M	1.4E-05	mg/kg-day	NA	--	--	--	--
	Chlordane, alpha-	48	mg/kg	48	mg/kg	M	2.3E-04	mg/kg-day	5.0E-04	mg/kg-day	--	--	4.5E-01
	Chlordane, gamma-	58	mg/kg	58	mg/kg	M	2.7E-04	mg/kg-day	5.0E-04	mg/kg-day	--	--	5.4E-01
	Dieldrin	0.32	mg/kg	0.32	mg/kg	M	1.5E-06	mg/kg-day	5.0E-05	mg/kg-day	--	--	3.0E-02
	Heptachlor	22	mg/kg	22	mg/kg	M	1.0E-04	mg/kg-day	5.0E-04	mg/kg-day	--	--	2.1E-01
	Heptachlor Epoxide	4.5	mg/kg	4.5	mg/kg	M	2.1E-05	mg/kg-day	1.3E-05	mg/kg-day	--	--	1.6E+00
	Aroclor-1248	1.51	mg/kg	1.51	mg/kg	M	7.1E-06	mg/kg-day	NA	--	--	--	--
	Aroclor-1254	0.975	mg/kg	0.975	mg/kg	M	4.6E-06	mg/kg-day	2.0E-05	mg/kg-day	--	--	2.3E-01
	Aroclor-1260	54.6	mg/kg	54.6	mg/kg	M	2.6E-04	mg/kg-day	NA	--	--	--	--
	Gasoline Range Organics	0.207	mg/kg	0.207	mg/kg	M	9.7E-07	mg/kg-day	NA	--	--	--	--
	Diesel Range Organics	470	mg/kg	470	mg/kg	M	2.2E-03	mg/kg-day	NA	--	--	--	--
	Antimony	1.22	mg/kg	1.22	mg/kg	M	5.7E-06	mg/kg-day	4.0E-04	mg/kg-day	--	--	1.4E-02
	Arsenic	3.49	mg/kg	3.49	mg/kg	M	1.6E-05	mg/kg-day	3.0E-04	mg/kg-day	--	--	5.5E-02
	Iron	2,260	mg/kg	2,260	mg/kg	M	1.1E-02	mg/kg-day	3.0E-01	mg/kg-day	--	--	3.5E-02
	Thallium	0.31	mg/kg	0.31	mg/kg	M	1.4E-06	mg/kg-day	6.6E-05	mg/kg-day	--	--	2.2E-02
	(total)												3.3E+00

TABLE 7.6.1A RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Surface Soil
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Dermal	2-Methylnaphthalene	1.96	mg/kg	1.96	mg/kg	M	1.3E-07	mg/kg-day	NA	--	--	--	--
	Benzo(a)anthracene	69.0	mg/kg	69.0	mg/kg	M	5.8E-05	mg/kg-day	NA	--	--	--	--
	Benzo(a)pyrene	30.5	mg/kg	30.5	mg/kg	M	2.6E-05	mg/kg-day	NA	--	--	--	--
	Benzo(b)fluoranthene	40.9	mg/kg	40.9	mg/kg	M	3.4E-05	mg/kg-day	NA	--	--	--	--
	Benzo(k)fluoranthene	18.7	mg/kg	18.7	mg/kg	M	1.6E-05	mg/kg-day	NA	--	--	--	--
	Carbazole	3.16	mg/kg	3.16	mg/kg	M	2.7E-06	mg/kg-day	NA	--	--	--	--
	Chrysene	96.0	mg/kg	96.0	mg/kg	M	8.1E-05	mg/kg-day	NA	--	--	--	--
	Dibenz(a,h)anthracene	1.41	mg/kg	1.41	mg/kg	M	1.2E-06	mg/kg-day	NA	--	--	--	--
	Fluoranthene	243	mg/kg	243	mg/kg	M	1.6E-05	mg/kg-day	1.2E-02	mg/kg-day	--	--	1.3E-03
	Indeno(1,2,3-cd)pyrene	8.79	mg/kg	8.79	mg/kg	M	7.4E-06	mg/kg-day	NA	--	--	--	--
	Naphthalene	0.525	mg/kg	0.525	mg/kg	M	3.4E-08	mg/kg-day	1.6E-02	mg/kg-day	--	--	2.1E-06
	Pyrene	250	mg/kg	250	mg/kg	M	1.6E-05	mg/kg-day	9.3E-03	mg/kg-day	--	--	1.7E-03
	4,4'-DDD	3	mg/kg	3	mg/kg	M	1.9E-07	mg/kg-day	NA	--	--	--	--
	Chlordane, alpha-	48	mg/kg	48	mg/kg	M	1.2E-05	mg/kg-day	4.0E-04	mg/kg-day	--	--	3.1E-02
	Chlordane, gamma-	58	mg/kg	58	mg/kg	M	1.5E-05	mg/kg-day	4.0E-04	mg/kg-day	--	--	3.7E-02
	Dieldrin	0.32	mg/kg	0.32	mg/kg	M	2.1E-08	mg/kg-day	2.5E-05	mg/kg-day	--	--	8.3E-04
	Heptachlor	22	mg/kg	22	mg/kg	M	1.4E-06	mg/kg-day	3.6E-04	mg/kg-day	--	--	3.9E-03
	Heptachlor Epoxide	4.5	mg/kg	4.5	mg/kg	M	2.9E-07	mg/kg-day	9.4E-06	mg/kg-day	--	--	3.1E-02
	Aroclor-1248	1.51	mg/kg	1.51	mg/kg	M	1.4E-06	mg/kg-day	NA	--	--	--	--
	Aroclor-1254	0.975	mg/kg	0.975	mg/kg	M	8.8E-07	mg/kg-day	1.8E-05	mg/kg-day	--	--	4.9E-02
	Aroclor-1260	54.6	mg/kg	54.6	mg/kg	M	4.9E-05	mg/kg-day	NA	--	--	--	--
	Gasoline Range Organics	0.207	mg/kg	0.207	mg/kg	M	1.3E-08	mg/kg-day	NA	--	--	--	--
	Diesel Range Organics	470	mg/kg	470	mg/kg	M	3.0E-05	mg/kg-day	NA	--	--	--	--
	Antimony	1.22	mg/kg	1.22	mg/kg	M	7.9E-09	mg/kg-day	8.0E-06	mg/kg-day	--	--	9.9E-04
	Arsenic	3.49	mg/kg	3.49	mg/kg	M	6.8E-07	mg/kg-day	1.2E-04	mg/kg-day	--	--	5.5E-03
	Iron	2,260	mg/kg	2,260	mg/kg	M	1.5E-05	mg/kg-day	4.5E-02	mg/kg-day	--	--	3.2E-04
	Thallium	0.31	mg/kg	0.31	mg/kg	M	2.0E-09	mg/kg-day	9.9E-06	mg/kg-day	--	--	2.0E-04
	(Total)												1.6E-01
										Total Hazard Index Across All Exposure Routes/Pathways			3.4E+00

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.
(2) Specify if subchronic.

TABLE 7.6.1B RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Surface Soil
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	2-Methylnaphthalene	57.9	mg/kg	57.9	mg/kg	M	2.7E-04	mg/kg-day	NA	--	--	--	--
	Benzo(a)anthracene	4.76	mg/kg	4.76	mg/kg	M	2.2E-05	mg/kg-day	NA	--	--	--	--
	Benzo(a)pyrene	2.48	mg/kg	2.48	mg/kg	M	1.2E-05	mg/kg-day	NA	--	--	--	--
	Benzo(b)fluoranthene	2.81	mg/kg	2.81	mg/kg	M	1.3E-05	mg/kg-day	NA	--	--	--	--
	Benzo(k)fluoranthene	1.78	mg/kg	1.78	mg/kg	M	8.4E-06	mg/kg-day	NA	--	--	--	--
	Carbazole	0.95	mg/kg	0.95	mg/kg	M	4.5E-06	mg/kg-day	NA	--	--	--	--
	Chrysene	6.7	mg/kg	6.7	mg/kg	M	3.1E-05	mg/kg-day	NA	--	--	--	--
	Dibenz(a,h)anthracene	0.695	mg/kg	0.695	mg/kg	M	3.3E-06	mg/kg-day	NA	--	--	--	--
	Indeno(1,2,3-cd)pyrene	1.72	mg/kg	1.72	mg/kg	M	8.1E-06	mg/kg-day	NA	--	--	--	--
	Dieldrin	0.052	mg/kg	0.052	mg/kg	M	2.4E-07	mg/kg-day	5.0E-05	mg/kg-day	--	--	4.9E-03
	Aroclor-1260	95.6	mg/kg	95.6	mg/kg	M	4.5E-04	mg/kg-day	NA	--	--	--	--
	Arsenic	5.26	mg/kg	5.26	mg/kg	M	2.5E-05	mg/kg-day	3.0E-04	mg/kg-day	--	--	8.2E-02
	Iron	2,347	mg/kg	2,347	mg/kg	M	1.1E-02	mg/kg-day	3.0E-01	mg/kg-day	--	--	3.7E-02
	(total)												1.2E-01
Dermal	2-Methylnaphthalene	57.9	mg/kg	57.9	mg/kg	M	3.7E-06	mg/kg-day	NA	--	--	--	--
	Benzo(a)anthracene	4.76	mg/kg	4.76	mg/kg	M	4.0E-06	mg/kg-day	NA	--	--	--	--
	Benzo(a)pyrene	2.48	mg/kg	2.48	mg/kg	M	2.1E-06	mg/kg-day	NA	--	--	--	--
	Benzo(b)fluoranthene	2.81	mg/kg	2.81	mg/kg	M	2.4E-06	mg/kg-day	NA	--	--	--	--
	Benzo(k)fluoranthene	1.78	mg/kg	1.78	mg/kg	M	1.5E-06	mg/kg-day	NA	--	--	--	--
	Carbazole	0.95	mg/kg	0.95	mg/kg	M	8.0E-07	mg/kg-day	NA	--	--	--	--
	Chrysene	6.7	mg/kg	6.7	mg/kg	M	5.6E-06	mg/kg-day	NA	--	--	--	--
	Dibenz(a,h)anthracene	0.695	mg/kg	0.695	mg/kg	M	5.8E-07	mg/kg-day	NA	--	--	--	--
	Indeno(1,2,3-cd)pyrene	1.72	mg/kg	1.72	mg/kg	M	1.4E-06	mg/kg-day	NA	--	--	--	--
	Dieldrin	0.052	mg/kg	0.052	mg/kg	M	3.4E-09	mg/kg-day	2.5E-05	mg/kg-day	--	--	1.3E-04
	Aroclor-1260	95.6	mg/kg	95.6	mg/kg	M	8.6E-05	mg/kg-day	NA	--	--	--	--
	Arsenic	5.26	mg/kg	5.26	mg/kg	M	1.0E-06	mg/kg-day	1.2E-04	mg/kg-day	--	--	8.3E-03
	Iron	2,347	mg/kg	2,347	mg/kg	M	1.5E-05	mg/kg-day	4.5E-02	mg/kg-day	--	--	3.4E-04
	(Total)												8.8E-03
												Total Hazard Index Across All Exposure Routes/Pathways	1.3E-01

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.
(2) Specify if subchronic.

TABLE 7.6.1aA RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Air
Exposure Point: Fugative dust
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Inhalation	2-Methylnaphthalene	1.96	mg/kg	1.48E-09	mg/m^3	R	9.6E-11	mg/kg-day	NA	--	NA	--	--
	Benzo(a)anthracene	69.0	mg/kg	5.23E-08	mg/m^3	R	3.4E-09	mg/kg-day	NA	--	NA	--	--
	Benzo(a)pyrene	30.5	mg/kg	2.31E-08	mg/m^3	R	1.5E-09	mg/kg-day	NA	--	NA	--	--
	Benzo(b)fluoranthene	40.9	mg/kg	3.10E-08	mg/m^3	R	2.0E-09	mg/kg-day	NA	--	NA	--	--
	Benzo(k)fluoranthene	18.7	mg/kg	1.41E-08	mg/m^3	R	9.2E-10	mg/kg-day	NA	--	NA	--	--
	Carbazole	3.16	mg/kg	2.39E-09	mg/m^3	R	1.6E-10	mg/kg-day	NA	--	NA	--	--
	Chrysene	96.0	mg/kg	7.27E-08	mg/m^3	R	4.7E-09	mg/kg-day	NA	--	NA	--	--
	Dibenz(a,h)anthracene	1.41	mg/kg	1.07E-09	mg/m^3	R	7.0E-11	mg/kg-day	NA	--	NA	--	--
	Fluoranthene	243	mg/kg	1.84E-07	mg/m^3	R	1.2E-08	mg/kg-day	4.0E-02	mg/kg-day	NA	--	3.0E-07
	Indeno(1,2,3-cd)pyrene	8.79	mg/kg	6.66E-09	mg/m^3	R	4.3E-10	mg/kg-day	NA	--	NA	--	--
	Naphthalene	0.525	mg/kg	3.98E-10	mg/m^3	R	2.6E-11	mg/kg-day	8.6E-04	mg/kg-day	3.0E-03	mg/m3	3.0E-08
	Pyrene	250	mg/kg	1.89E-07	mg/m^3	R	1.2E-08	mg/kg-day	3.0E-02	mg/kg-day	NA	--	4.1E-07
	4,4'-DDD	3	mg/kg	2.27E-09	mg/m^3	R	1.5E-10	mg/kg-day	NA	--	NA	--	--
	Chlordane, alpha-	48	mg/kg	3.64E-08	mg/m^3	R	2.4E-09	mg/kg-day	2.0E-04	mg/kg-day	7.0E-04	mg/m3	1.2E-05
	Chlordane, gamma-	58	mg/kg	4.39E-08	mg/m^3	R	2.9E-09	mg/kg-day	2.0E-04	mg/kg-day	7.0E-04	mg/m3	1.4E-05
	Dieldrin	0.32	mg/kg	2.42E-10	mg/m^3	R	1.6E-11	mg/kg-day	5.0E-05	mg/kg-day	NA	--	3.2E-07
	Heptachlor	22	mg/kg	1.67E-08	mg/m^3	R	1.1E-09	mg/kg-day	5.0E-04	mg/kg-day	NA	--	2.2E-06
	Heptachlor Epoxide	4.5	mg/kg	3.41E-09	mg/m^3	R	2.2E-10	mg/kg-day	1.3E-05	mg/kg-day	NA	--	1.7E-05
	Aroclor-1248	1.51	mg/kg	1.14E-09	mg/m^3	R	7.4E-11	mg/kg-day	NA	--	NA	--	--
	Aroclor-1254	0.975	mg/kg	7.39E-10	mg/m^3	R	4.8E-11	mg/kg-day	2.0E-05	mg/kg-day	NA	--	2.4E-06
	Aroclor-1260	54.6	mg/kg	4.13E-08	mg/m^3	R	2.7E-09	mg/kg-day	NA	--	NA	--	--
	Gasoline Range Organics	0.207	mg/kg	1.57E-10	mg/m^3	R	1.0E-11	mg/kg-day	NA	--	NA	--	--
	Diesel Range Organics	470	mg/kg	3.56E-07	mg/m^3	R	2.3E-08	mg/kg-day	NA	--	NA	--	--
	Antimony	1.22	mg/kg	9.25E-10	mg/m^3	R	6.0E-11	mg/kg-day	NA	--	NA	--	--
	Arsenic	3.49	mg/kg	2.65E-09	mg/m^3	R	1.7E-10	mg/kg-day	NA	--	NA	--	--
	Iron	2,260	mg/kg	1.71E-06	mg/m^3	R	1.1E-07	mg/kg-day	NA	--	NA	--	--
	Thallium	0.31	mg/kg	2.32E-10	mg/m^3	R	1.5E-11	mg/kg-day	NA	--	NA	--	--
	(Total)												4.9E-05
								Total Hazard Index Across All Exposure Routes/Pathways					4.9E-05

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/m^3 - milligram per cubic meter
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.
(2) Specify if subchronic.

TABLE 7.6.1aB RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Air
Exposure Point: Fugative dust
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Inhalation	2-Methylnaphthalene	57.9	mg/kg	4.39E-08	mg/m^3	R	2.8E-09	mg/kg-day	NA	--	NA	--	--
	Benzo(a)anthracene	4.76	mg/kg	3.61E-09	mg/m^3	R	2.3E-10	mg/kg-day	NA	--	NA	--	--
	Benzo(a)pyrene	2.48	mg/kg	1.88E-09	mg/m^3	R	1.2E-10	mg/kg-day	NA	--	NA	--	--
	Benzo(b)fluoranthene	2.81	mg/kg	2.13E-09	mg/m^3	R	1.4E-10	mg/kg-day	NA	--	NA	--	--
	Benzo(k)fluoranthene	1.78	mg/kg	1.35E-09	mg/m^3	R	8.8E-11	mg/kg-day	NA	--	NA	--	--
	Carbazole	0.95	mg/kg	7.20E-10	mg/m^3	R	4.7E-11	mg/kg-day	NA	--	NA	--	--
	Chrysene	6.7	mg/kg	5.08E-09	mg/m^3	R	3.3E-10	mg/kg-day	NA	--	NA	--	--
	Dibenz(a,h)anthracene	0.695	mg/kg	5.27E-10	mg/m^3	R	3.4E-11	mg/kg-day	NA	--	NA	--	--
	Indeno(1,2,3-cd)pyrene	1.72	mg/kg	1.30E-09	mg/m^3	R	8.5E-11	mg/kg-day	NA	--	NA	--	--
	Dieldrin	0.052	mg/kg	3.94E-11	mg/m^3	R	2.6E-12	mg/kg-day	5.0E-05	mg/kg-day	NA	--	5.1E-08
	Aroclor-1260	95.6	mg/kg	7.24E-08	mg/m^3	R	4.7E-09	mg/kg-day	NA	--	NA	--	--
	Arsenic	5.26	mg/kg	3.98E-09	mg/m^3	R	2.6E-10	mg/kg-day	NA	--	NA	--	--
	Iron	2,347	mg/kg	1.78E-06	mg/m^3	R	1.2E-07	mg/kg-day	NA	--	NA	--	--
	(Total)												5.1E-08
								Total Hazard Index Across All Exposure Routes/Pathways					5.1E-08

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/m^3 - milligram per cubic meter
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.
(2) Specify if subchronic.

TABLE 7.6.2A RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Subsurface Soil
Exposure Medium: Subsurface Soil
Exposure Point: Subsurface Soil
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	2-Methylnaphthalene	0.573	mg/kg	0.573	mg/kg	M	2.7E-06	mg/kg-day	NA	--	--	--	--
	Benzo(a)anthracene	0.199	mg/kg	0.199	mg/kg	M	9.3E-07	mg/kg-day	NA	--	--	--	--
	Benzo(a)pyrene	0.194	mg/kg	0.194	mg/kg	M	9.1E-07	mg/kg-day	NA	--	--	--	--
	Benzo(b)fluoranthene	0.217	mg/kg	0.217	mg/kg	M	1.0E-06	mg/kg-day	NA	--	--	--	--
	Benzo(k)fluoranthene	0.137	mg/kg	0.137	mg/kg	M	6.5E-07	mg/kg-day	NA	--	--	--	--
	Bis(2-chloroethoxy)methane	0.0512	mg/kg	0.0512	mg/kg	M	2.4E-07	mg/kg-day	NA	--	--	--	--
	Carbazole	0.0845	mg/kg	0.0845	mg/kg	M	4.0E-07	mg/kg-day	NA	--	--	--	--
	Chrysene	0.209	mg/kg	0.209	mg/kg	M	9.8E-07	mg/kg-day	NA	--	--	--	--
	Dibenz(a,h)anthracene	0.0758	mg/kg	0.0758	mg/kg	M	3.6E-07	mg/kg-day	NA	--	--	--	--
	Indeno(1,2,3-cd)pyrene	0.145	mg/kg	0.145	mg/kg	M	6.8E-07	mg/kg-day	NA	--	--	--	--
	Naphthalene	0.226	mg/kg	0.226	mg/kg	M	1.1E-06	mg/kg-day	2.0E-02	mg/kg-day	--	--	5.3E-05
	Chlordane, alpha-	1.22	mg/kg	1.22	mg/kg	M	5.7E-06	mg/kg-day	5.0E-04	mg/kg-day	--	--	1.1E-02
	Chlordane, gamma-	1.65	mg/kg	1.65	mg/kg	M	7.7E-06	mg/kg-day	5.0E-04	mg/kg-day	--	--	1.5E-02
	Heptachlor	0.155	mg/kg	0.155	mg/kg	M	7.3E-07	mg/kg-day	5.0E-04	mg/kg-day	--	--	1.5E-03
	Heptachlor Epoxide	0.0161	mg/kg	0.0161	mg/kg	M	7.5E-08	mg/kg-day	1.3E-05	mg/kg-day	--	--	5.8E-03
	Aroclor-1248	0.318	mg/kg	0.318	mg/kg	M	1.5E-06	mg/kg-day	NA	--	--	--	--
	Aroclor-1254	0.333	mg/kg	0.333	mg/kg	M	1.6E-06	mg/kg-day	2.0E-05	mg/kg-day	--	--	7.8E-02
	Aroclor-1260	5.61	mg/kg	5.61	mg/kg	M	2.6E-05	mg/kg-day	NA	--	--	--	--
	Gasoline Range Organics	580	mg/kg	580	mg/kg	M	2.7E-03	mg/kg-day	NA	--	--	--	--
	Diesel Range Organics	5,500	mg/kg	5,500	mg/kg	M	2.6E-02	mg/kg-day	NA	--	--	--	--
	Arsenic	1.11	mg/kg	1.11	mg/kg	M	5.2E-06	mg/kg-day	3.0E-04	mg/kg-day	--	--	1.7E-02
	Iron	2,754	mg/kg	2,754	mg/kg	M	1.3E-02	mg/kg-day	3.0E-01	mg/kg-day	--	--	4.3E-02
	Thallium	0.405	mg/kg	0.405	mg/kg	M	1.9E-06	mg/kg-day	6.6E-05	mg/kg-day	--	--	2.9E-02
	(Total)												2.0E-01

TABLE 7.6.2A RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Subsurface Soil
Exposure Medium: Subsurface Soil
Exposure Point: Subsurface Soil
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Dermal	2-Methylnaphthalene	0.573	mg/kg	0.573	mg/kg	M	3.7E-08	mg/kg-day	NA	--	--	--	--
	Benzo(a)anthracene	0.199	mg/kg	0.199	mg/kg	M	1.7E-07	mg/kg-day	NA	--	--	--	--
	Benzo(a)pyrene	0.194	mg/kg	0.194	mg/kg	M	1.6E-07	mg/kg-day	NA	--	--	--	--
	Benzo(b)fluoranthene	0.217	mg/kg	0.217	mg/kg	M	1.8E-07	mg/kg-day	NA	--	--	--	--
	Benzo(k)fluoranthene	0.137	mg/kg	0.137	mg/kg	M	1.2E-07	mg/kg-day	NA	--	--	--	--
	Bis(2-chloroethoxy)methane	0.0512	mg/kg	0.0512	mg/kg	M	3.3E-08	mg/kg-day	NA	--	--	--	--
	Carbazole	0.0845	mg/kg	0.0845	mg/kg	M	7.1E-08	mg/kg-day	NA	--	--	--	--
	Chrysene	0.209	mg/kg	0.209	mg/kg	M	1.8E-07	mg/kg-day	NA	--	--	--	--
	Dibenz(a,h)anthracene	0.0758	mg/kg	0.0758	mg/kg	M	6.4E-08	mg/kg-day	NA	--	--	--	--
	Indeno(1,2,3-cd)pyrene	0.145	mg/kg	0.145	mg/kg	M	1.2E-07	mg/kg-day	NA	--	--	--	--
	Naphthalene	0.226	mg/kg	0.226	mg/kg	M	1.5E-08	mg/kg-day	1.6E-02	mg/kg-day	--	--	9.1E-07
	Chlordane, alpha-	1.22	mg/kg	1.22	mg/kg	M	3.1E-07	mg/kg-day	4.0E-04	mg/kg-day	--	--	7.8E-04
	Chlordane, gamma-	1.65	mg/kg	1.65	mg/kg	M	4.3E-07	mg/kg-day	4.0E-04	mg/kg-day	--	--	1.1E-03
	Heptachlor	0.155	mg/kg	0.155	mg/kg	M	1.0E-08	mg/kg-day	3.6E-04	mg/kg-day	--	--	2.8E-05
	Heptachlor Epoxide	0.0161	mg/kg	0.0161	mg/kg	M	1.0E-09	mg/kg-day	9.4E-06	mg/kg-day	--	--	1.1E-04
	Aroclor-1248	0.318	mg/kg	0.318	mg/kg	M	2.9E-07	mg/kg-day	NA	--	--	--	--
	Aroclor-1254	0.333	mg/kg	0.333	mg/kg	M	3.0E-07	mg/kg-day	1.8E-05	mg/kg-day	--	--	1.7E-02
	Aroclor-1260	5.61	mg/kg	5.61	mg/kg	M	5.1E-06	mg/kg-day	NA	--	--	--	--
	Gasoline Range Organics	580	mg/kg	580	mg/kg	M	3.7E-05	mg/kg-day	NA	--	--	--	--
	Diesel Range Organics	5,500	mg/kg	5,500	mg/kg	M	3.6E-04	mg/kg-day	NA	--	--	--	--
	Arsenic	1.11	mg/kg	1.11	mg/kg	M	2.1E-07	mg/kg-day	1.2E-04	mg/kg-day	--	--	1.7E-03
	Iron	2,754	mg/kg	2,754	mg/kg	M	1.8E-05	mg/kg-day	4.5E-02	mg/kg-day	--	--	4.0E-04
	Thallium	0.405	mg/kg	0.405	mg/kg	M	2.6E-09	mg/kg-day	9.9E-06	mg/kg-day	--	--	2.6E-04
	(Total)												2.1E-02
								Total Hazard Index Across All Exposure Routes/Pathways					2.2E-01

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.
(2) Specify if subchronic.

TABLE 7.6.2B RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Subsurface Soil
Exposure Medium: Subsurface Soil
Exposure Point: Subsurface Soil
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	2-Methylnaphthalene	6.38	mg/kg	6.38	mg/kg	M	3.0E-05	mg/kg-day	NA	--	--	--	--
	Bis(2-chloroethoxy)methane	0.054	mg/kg	0.054	mg/kg	M	2.5E-07	mg/kg-day	NA	--	--	--	--
	Naphthalene	0.862	mg/kg	0.862	mg/kg	M	4.0E-06	mg/kg-day	2.0E-02	mg/kg-day	--	--	2.0E-04
	Aroclor-1260	27.0	mg/kg	27.0	mg/kg	M	1.3E-04	mg/kg-day	NA	--	--	--	--
	Gasoline Range Organics	580	mg/kg	580	mg/kg	M	2.7E-03	mg/kg-day	NA	--	--	--	--
	Diesel Range Organics	5,500	mg/kg	5,500	mg/kg	M	2.6E-02	mg/kg-day	NA	--	--	--	--
	Arsenic	1.50	mg/kg	1.50	mg/kg	M	7.0E-06	mg/kg-day	3.0E-04	mg/kg-day	--	--	2.3E-02
	Iron	3,007	mg/kg	3,007	mg/kg	M	1.4E-02	mg/kg-day	3.0E-01	mg/kg-day	--	--	4.7E-02
	Thallium	0.488	mg/kg	0.488	mg/kg	M	2.3E-06	mg/kg-day	6.6E-05	mg/kg-day	--	--	3.5E-02
	(Total)												1.1E-01
Dermal	2-Methylnaphthalene	6.38	mg/kg	6.38	mg/kg	M	4.1E-07	mg/kg-day	NA	--	--	--	--
	Bis(2-chloroethoxy)methane	0.054	mg/kg	0.054	mg/kg	M	3.5E-08	mg/kg-day	NA	--	--	--	--
	Naphthalene	0.862	mg/kg	0.862	mg/kg	M	5.6E-08	mg/kg-day	1.6E-02	mg/kg-day	--	--	3.5E-06
	Aroclor-1260	27.0	mg/kg	27.0	mg/kg	M	2.4E-05	mg/kg-day	NA	--	--	--	--
	Gasoline Range Organics	580	mg/kg	580	mg/kg	M	3.7E-05	mg/kg-day	NA	--	--	--	--
	Diesel Range Organics	5,500	mg/kg	5,500	mg/kg	M	3.6E-04	mg/kg-day	NA	--	--	--	--
	Arsenic	1.50	mg/kg	1.50	mg/kg	M	2.9E-07	mg/kg-day	1.2E-04	mg/kg-day	--	--	2.4E-03
	Iron	3,007	mg/kg	3,007	mg/kg	M	1.9E-05	mg/kg-day	4.5E-02	mg/kg-day	--	--	4.3E-04
	Thallium	0.488	mg/kg	0.488	mg/kg	M	3.2E-09	mg/kg-day	9.9E-06	mg/kg-day	--	--	3.2E-04
	(Total)												3.1E-03
												Total Hazard Index Across All Exposure Routes/Pathways	1.1E-01

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.
(2) Specify if subchronic.

TABLE 7.6.2aA RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Subsurface Soil
Exposure Medium: Air
Exposure Point: Fugative dust
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Inhalation	2-Methylnaphthalene	0.573	mg/kg	4.34E-10	mg/m^3	R	2.8E-11	mg/kg-day	NA	--	NA	--	--
	Benzo(a)anthracene	0.199	mg/kg	1.51E-10	mg/m^3	R	9.8E-12	mg/kg-day	NA	--	NA	--	--
	Benzo(a)pyrene	0.194	mg/kg	1.47E-10	mg/m^3	R	9.5E-12	mg/kg-day	NA	--	NA	--	--
	Benzo(b)fluoranthene	0.217	mg/kg	1.64E-10	mg/m^3	R	1.1E-11	mg/kg-day	NA	--	NA	--	--
	Benzo(k)fluoranthene	0.137	mg/kg	1.04E-10	mg/m^3	R	6.8E-12	mg/kg-day	NA	--	NA	--	--
	Bis(2-chloroethoxy)methane	0.0512	mg/kg	3.88E-11	mg/m^3	R	2.5E-12	mg/kg-day	NA	--	NA	--	--
	Carbazole	0.0845	mg/kg	6.40E-11	mg/m^3	R	4.2E-12	mg/kg-day	NA	--	NA	--	--
	Chrysene	0.209	mg/kg	1.59E-10	mg/m^3	R	1.0E-11	mg/kg-day	NA	--	NA	--	--
	Dibenz(a,h)anthracene	0.0758	mg/kg	5.75E-11	mg/m^3	R	3.7E-12	mg/kg-day	NA	--	NA	--	--
	Indeno(1,2,3-cd)pyrene	0.145	mg/kg	1.10E-10	mg/m^3	R	7.1E-12	mg/kg-day	NA	--	NA	--	--
	Naphthalene	0.226	mg/kg	1.71E-10	mg/m^3	R	1.1E-11	mg/kg-day	8.6E-04	mg/kg-day	3.0E-03	mg/m3	1.3E-08
	Chlordane, alpha-	1.22	mg/kg	9.21E-10	mg/m^3	R	6.0E-11	mg/kg-day	2.0E-04	mg/kg-day	7.0E-04	mg/m3	3.0E-07
	Chlordane, gamma-	1.65	mg/kg	1.25E-09	mg/m^3	R	8.1E-11	mg/kg-day	2.0E-04	mg/kg-day	7.0E-04	mg/m3	4.1E-07
	Heptachlor	0.155	mg/kg	1.17E-10	mg/m^3	R	7.6E-12	mg/kg-day	5.0E-04	mg/kg-day	NA	--	1.5E-08
	Heptachlor Epoxide	0.0161	mg/kg	1.22E-11	mg/m^3	R	7.9E-13	mg/kg-day	1.3E-05	mg/kg-day	NA	--	6.1E-08
	Aroclor-1248	0.318	mg/kg	2.41E-10	mg/m^3	R	1.6E-11	mg/kg-day	NA	--	NA	--	--
	Aroclor-1254	0.333	mg/kg	2.52E-10	mg/m^3	R	1.6E-11	mg/kg-day	2.0E-05	mg/kg-day	NA	--	8.2E-07
	Aroclor-1260	5.61	mg/kg	4.25E-09	mg/m^3	R	2.8E-10	mg/kg-day	NA	--	NA	--	--
	Gasoline Range Organics	580	mg/kg	4.39E-07	mg/m^3	R	2.9E-08	mg/kg-day	NA	--	NA	--	--
	Diesel Range Organics	5,500	mg/kg	4.17E-06	mg/m^3	R	2.7E-07	mg/kg-day	NA	--	NA	--	--
	Arsenic	1.11	mg/kg	8.41E-10	mg/m^3	R	5.5E-11	mg/kg-day	NA	--	NA	--	--
	Iron	2,754	mg/kg	2.09E-06	mg/m^3	R	1.4E-07	mg/kg-day	NA	--	NA	--	--
	Thallium	0.405	mg/kg	3.07E-10	mg/m^3	R	2.0E-11	mg/kg-day	NA	--	NA	--	--
	(Total)												1.6E-06
												Total Hazard Index Across All Exposure Routes/Pathways	1.6E-06

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/m^3 - milligram per cubic meter
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.
(2) Specify if subchronic.

TABLE 7.6.2aB RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Subsurface Soil
Exposure Medium: Air
Exposure Point: Fugative dust
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Inhalation	2-Methylnaphthalene	6.38	mg/kg	4.83E-09	mg/m^3	R	3.1E-10	mg/kg-day	NA	--	NA	--	--
	Bis(2-chloroethoxy)methane	0.054	mg/kg	4.09E-11	mg/m^3	R	2.7E-12	mg/kg-day	NA	--	NA	--	--
	Naphthalene	0.862	mg/kg	6.53E-10	mg/m^3	R	4.2E-11	mg/kg-day	8.6E-04	mg/kg-day	3.0E-03	mg/m3	5.0E-08
	Aroclor-1260	27.0	mg/kg	2.05E-08	mg/m^3	R	1.3E-09	mg/kg-day	NA	--	NA	--	--
	Gasoline Range Organics	580	mg/kg	4.39E-07	mg/m^3	R	2.9E-08	mg/kg-day	NA	--	NA	--	--
	Diesel Range Organics	5,500	mg/kg	4.17E-06	mg/m^3	R	2.7E-07	mg/kg-day	NA	--	NA	--	--
	Arsenic	1.50	mg/kg	1.14E-09	mg/m^3	R	7.4E-11	mg/kg-day	NA	--	NA	--	--
	Iron	3,007	mg/kg	2.28E-06	mg/m^3	R	1.5E-07	mg/kg-day	NA	--	NA	--	--
	Thallium	0.488	mg/kg	3.70E-10	mg/m^3	R	2.4E-11	mg/kg-day	NA	--	NA	--	--
	(Total)												5.0E-08
								Total Hazard Index Across All Exposure Routes/Pathways					5.0E-08

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/m^3 - milligram per cubic meter
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.
(2) Specify if subchronic.

TABLE 7.6.3 RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Groundwater
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Dermal	Benzene	0.0034	mg/L	0.0034	mg/L	M	1.8E-05	mg/kg-day	2.8E-03	mg/kg-day	--	--	6.6E-03
	Chloroform	0.016	mg/L	0.016	mg/L	M	3.7E-05	mg/kg-day	2.0E-03	mg/kg-day	--	--	1.8E-02
	2-Methylnaphthalene	0.00105	mg/L	0.00105	mg/L	M	3.9E-05	mg/kg-day	NA	--	--	--	--
	Naphthalene	0.0022	mg/L	0.0022	mg/L	M	3.9E-05	mg/kg-day	1.6E-02	mg/kg-day	--	--	2.5E-03
	Heptachlor Epoxide	0.0000167	mg/L	0.0000167	mg/L	M	2.4E-07	mg/kg-day	9.4E-06	mg/kg-day	--	--	2.5E-02
	MCPA	0.044	mg/L	0.044	mg/L	M	5.6E-05	mg/kg-day	2.5E-04	mg/kg-day	--	--	2.2E-01
	Antimony	0.011	mg/L	0.011	mg/L	M	2.8E-06	mg/kg-day	8.0E-06	mg/kg-day	--	--	3.6E-01
	Arsenic	0.03	mg/L	0.03	mg/L	M	7.7E-06	mg/kg-day	1.2E-04	mg/kg-day	--	--	6.3E-02
	Iron	67.7	mg/L	67.7	mg/L	M	1.7E-02	mg/kg-day	4.5E-02	mg/kg-day	--	--	3.9E-01
	Manganese	0.45	mg/L	0.45	mg/L	M	1.2E-04	mg/kg-day	9.6E-04	mg/kg-day	--	--	1.2E-01
	Thallium	0.0057	mg/L	0.0057	mg/L	M	1.5E-06	mg/kg-day	9.9E-06	mg/kg-day	--	--	1.5E-01
	(Total)												1.4E+00
								Total Hazard Index Across All Exposure Routes/Pathways					1.4E+00

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/L - milligram per liter
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.
(2) Specify if subchronic.

TABLE 7.6.4 RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: Surface Water
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Dermal	Acetone	0.0056	mg/L	0.0056	mg/L	M	8.2E-07	mg/kg-day	8.3E-02	mg/kg-day	--	--	9.9E-06
	Toluene	0.0027	mg/L	0.0027	mg/L	M	3.1E-05	mg/kg-day	1.6E-01	mg/kg-day	--	--	2.0E-04
	Xylenes, total	0.0035	mg/L	0.0035	mg/L	M	8.6E-05	mg/kg-day	1.8E+00	mg/kg-day	--	--	4.7E-05
	(Total)												2.5E-04
								Total Hazard Index Across All Exposure Routes/Pathways					2.5E-04

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/L - milligram per liter
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.
(2) Specify if subchronic.

TABLE 7.6.5 RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Sediment
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Dermal	2-Methylnaphthalene	10	mg/kg	10	mg/kg	M	6.5E-07	mg/kg-day	NA	--	--	--	--
	Aroclor-1248	2.8	mg/kg	2.8	mg/kg	M	2.5E-06	mg/kg-day	NA	--	--	--	--
	Aroclor-1260	40	mg/kg	40	mg/kg	M	3.6E-05	mg/kg-day	NA	--	--	--	--
	Diesel Range Organics (Total)	11,600	mg/kg	11,600	mg/kg	M	7.5E-04	mg/kg-day	NA	--	--	--	--
													--
												Total Hazard Index Across All Exposure Routes/Pathways	--

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.
(2) Specify if subchronic.

TABLE 7.7.1A RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Surface Soil
Receptor Population: Industrial / Commercial Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	2-Methylnaphthalene	1.96	mg/kg	1.96	mg/kg	M	9.6E-07	mg/kg-day	NA	--	--	--	--
	Benzo(a)anthracene	69.0	mg/kg	69.0	mg/kg	M	3.4E-05	mg/kg-day	NA	--	--	--	--
	Benzo(a)pyrene	30.5	mg/kg	30.5	mg/kg	M	1.5E-05	mg/kg-day	NA	--	--	--	--
	Benzo(b)fluoranthene	40.9	mg/kg	40.9	mg/kg	M	2.0E-05	mg/kg-day	NA	--	--	--	--
	Benzo(k)fluoranthene	18.7	mg/kg	18.7	mg/kg	M	9.1E-06	mg/kg-day	NA	--	--	--	--
	Carbazole	3.16	mg/kg	3.16	mg/kg	M	1.5E-06	mg/kg-day	NA	--	--	--	--
	Chrysene	96.0	mg/kg	96.0	mg/kg	M	4.7E-05	mg/kg-day	NA	--	--	--	--
	Dibenz(a,h)anthracene	1.41	mg/kg	1.41	mg/kg	M	6.9E-07	mg/kg-day	NA	--	--	--	--
	Fluoranthene	243	mg/kg	243	mg/kg	M	1.2E-04	mg/kg-day	4.0E-02	mg/kg-day	--	--	3.0E-03
	Indeno(1,2,3-cd)pyrene	8.79	mg/kg	8.79	mg/kg	M	4.3E-06	mg/kg-day	NA	--	--	--	--
	Naphthalene	0.525	mg/kg	0.525	mg/kg	M	2.6E-07	mg/kg-day	2.0E-02	mg/kg-day	--	--	1.3E-05
	Pyrene	250	mg/kg	250	mg/kg	M	1.2E-04	mg/kg-day	3.0E-02	mg/kg-day	--	--	4.1E-03
	4,4'-DDD	3	mg/kg	3	mg/kg	M	1.5E-06	mg/kg-day	NA	--	--	--	--
	Chlordane, alpha-	48	mg/kg	48	mg/kg	M	2.3E-05	mg/kg-day	5.0E-04	mg/kg-day	--	--	4.7E-02
	Chlordane, gamma-	58	mg/kg	58	mg/kg	M	2.8E-05	mg/kg-day	5.0E-04	mg/kg-day	--	--	5.7E-02
	Dieldrin	0.32	mg/kg	0.32	mg/kg	M	1.6E-07	mg/kg-day	5.0E-05	mg/kg-day	--	--	3.1E-03
	Heptachlor	22	mg/kg	22	mg/kg	M	1.1E-05	mg/kg-day	5.0E-04	mg/kg-day	--	--	2.2E-02
	Heptachlor Epoxide	4.5	mg/kg	4.5	mg/kg	M	2.2E-06	mg/kg-day	1.3E-05	mg/kg-day	--	--	1.7E-01
	Aroclor-1248	1.51	mg/kg	1.51	mg/kg	M	7.4E-07	mg/kg-day	NA	--	--	--	--
	Aroclor-1254	0.975	mg/kg	0.975	mg/kg	M	4.8E-07	mg/kg-day	2.0E-05	mg/kg-day	--	--	2.4E-02
	Aroclor-1260	54.6	mg/kg	54.6	mg/kg	M	2.7E-05	mg/kg-day	NA	--	--	--	--
	Gasoline Range Organics	0.207	mg/kg	0.207	mg/kg	M	1.0E-07	mg/kg-day	NA	--	--	--	--
	Diesel Range Organics	470	mg/kg	470	mg/kg	M	2.3E-04	mg/kg-day	NA	--	--	--	--
	Antimony	1.22	mg/kg	1.22	mg/kg	M	6.0E-07	mg/kg-day	4.0E-04	mg/kg-day	--	--	1.5E-03
	Arsenic	3.49	mg/kg	3.49	mg/kg	M	1.7E-06	mg/kg-day	3.0E-04	mg/kg-day	--	--	5.7E-03
	Iron	2,260	mg/kg	2,260	mg/kg	M	1.1E-03	mg/kg-day	3.0E-01	mg/kg-day	--	--	3.7E-03
	Thallium	0.31	mg/kg	0.31	mg/kg	M	1.5E-07	mg/kg-day	6.6E-05	mg/kg-day	--	--	2.3E-03
	(total)												3.4E-01

TABLE 7.7.1A RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Surface Soil
Receptor Population: Industrial / Commercial Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Dermal	2-Methylnaphthalene	1.96	mg/kg	1.96	mg/kg	M	1.3E-07	mg/kg-day	NA	--	--	--	--
	Benzo(a)anthracene	69.0	mg/kg	69.0	mg/kg	M	5.8E-05	mg/kg-day	NA	--	--	--	--
	Benzo(a)pyrene	30.5	mg/kg	30.5	mg/kg	M	2.6E-05	mg/kg-day	NA	--	--	--	--
	Benzo(b)fluoranthene	40.9	mg/kg	40.9	mg/kg	M	3.4E-05	mg/kg-day	NA	--	--	--	--
	Benzo(k)fluoranthene	18.7	mg/kg	18.7	mg/kg	M	1.6E-05	mg/kg-day	NA	--	--	--	--
	Carbazole	3.16	mg/kg	3.16	mg/kg	M	2.7E-06	mg/kg-day	NA	--	--	--	--
	Chrysene	96.0	mg/kg	96.0	mg/kg	M	8.1E-05	mg/kg-day	NA	--	--	--	--
	Dibenz(a,h)anthracene	1.41	mg/kg	1.41	mg/kg	M	1.2E-06	mg/kg-day	NA	--	--	--	--
	Fluoranthene	243	mg/kg	243	mg/kg	M	1.6E-05	mg/kg-day	1.2E-02	mg/kg-day	--	--	1.3E-03
	Indeno(1,2,3-cd)pyrene	8.79	mg/kg	8.79	mg/kg	M	7.4E-06	mg/kg-day	NA	--	--	--	--
	Naphthalene	0.525	mg/kg	0.525	mg/kg	M	3.4E-08	mg/kg-day	1.6E-02	mg/kg-day	--	--	2.1E-06
	Pyrene	250	mg/kg	250	mg/kg	M	1.6E-05	mg/kg-day	9.3E-03	mg/kg-day	--	--	1.7E-03
	4,4'-DDD	3	mg/kg	3	mg/kg	M	1.9E-07	mg/kg-day	NA	--	--	--	--
	Chlordane, alpha-	48	mg/kg	48	mg/kg	M	1.2E-05	mg/kg-day	4.0E-04	mg/kg-day	--	--	3.1E-02
	Chlordane, gamma-	58	mg/kg	58	mg/kg	M	1.5E-05	mg/kg-day	4.0E-04	mg/kg-day	--	--	3.7E-02
	Dieldrin	0.32	mg/kg	0.32	mg/kg	M	2.1E-08	mg/kg-day	2.5E-05	mg/kg-day	--	--	8.3E-04
	Heptachlor	22	mg/kg	22	mg/kg	M	1.4E-06	mg/kg-day	3.6E-04	mg/kg-day	--	--	3.9E-03
	Heptachlor Epoxide	4.5	mg/kg	4.5	mg/kg	M	2.9E-07	mg/kg-day	9.4E-06	mg/kg-day	--	--	3.1E-02
	Aroclor-1248	1.51	mg/kg	1.51	mg/kg	M	1.4E-06	mg/kg-day	NA	--	--	--	--
	Aroclor-1254	0.975	mg/kg	0.975	mg/kg	M	8.8E-07	mg/kg-day	1.8E-05	mg/kg-day	--	--	4.9E-02
	Aroclor-1260	54.6	mg/kg	54.6	mg/kg	M	4.9E-05	mg/kg-day	NA	--	--	--	--
	Gasoline Range Organics	0.207	mg/kg	0.207	mg/kg	M	1.3E-08	mg/kg-day	NA	--	--	--	--
	Diesel Range Organics	470	mg/kg	470	mg/kg	M	3.0E-05	mg/kg-day	NA	--	--	--	--
	Antimony	1.22	mg/kg	1.22	mg/kg	M	7.9E-09	mg/kg-day	8.0E-06	mg/kg-day	--	--	9.9E-04
	Arsenic	3.49	mg/kg	3.49	mg/kg	M	6.8E-07	mg/kg-day	1.2E-04	mg/kg-day	--	--	5.5E-03
	Iron	2,260	mg/kg	2,260	mg/kg	M	1.5E-05	mg/kg-day	4.5E-02	mg/kg-day	--	--	3.2E-04
	Thallium	0.31	mg/kg	0.31	mg/kg	M	2.0E-09	mg/kg-day	9.9E-06	mg/kg-day	--	--	2.0E-04
	(Total)												1.6E-01
												Total Hazard Index Across All Exposure Routes/Pathways	5.1E-01

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.
(2) Specify if subchronic.

TABLE 7.7.1B RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Surface Soil
Receptor Population: Industrial / Commercial Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	2-Methylnaphthalene	57.9	mg/kg	57.9	mg/kg	M	2.8E-05	mg/kg-day	NA	--	--	--	--
	Benzo(a)anthracene	4.76	mg/kg	4.76	mg/kg	M	2.3E-06	mg/kg-day	NA	--	--	--	--
	Benzo(a)pyrene	2.48	mg/kg	2.48	mg/kg	M	1.2E-06	mg/kg-day	NA	--	--	--	--
	Benzo(b)fluoranthene	2.81	mg/kg	2.81	mg/kg	M	1.4E-06	mg/kg-day	NA	--	--	--	--
	Benzo(k)fluoranthene	1.78	mg/kg	1.78	mg/kg	M	8.7E-07	mg/kg-day	NA	--	--	--	--
	Carbazole	0.95	mg/kg	0.95	mg/kg	M	4.6E-07	mg/kg-day	NA	--	--	--	--
	Chrysene	6.7	mg/kg	6.7	mg/kg	M	3.3E-06	mg/kg-day	NA	--	--	--	--
	Dibenz(a,h)anthracene	0.695	mg/kg	0.695	mg/kg	M	3.4E-07	mg/kg-day	NA	--	--	--	--
	Indeno(1,2,3-cd)pyrene	1.72	mg/kg	1.72	mg/kg	M	8.4E-07	mg/kg-day	NA	--	--	--	--
	Dieldrin	0.052	mg/kg	0.052	mg/kg	M	2.5E-08	mg/kg-day	5.0E-05	mg/kg-day	--	--	5.1E-04
	Aroclor-1260	95.6	mg/kg	95.6	mg/kg	M	4.7E-05	mg/kg-day	NA	--	--	--	--
	Arsenic	5.26	mg/kg	5.26	mg/kg	M	2.6E-06	mg/kg-day	3.0E-04	mg/kg-day	--	--	8.6E-03
	Iron	2,347	mg/kg	2,347	mg/kg	M	1.1E-03	mg/kg-day	3.0E-01	mg/kg-day	--	--	3.8E-03
	(total)												1.3E-02
Dermal	2-Methylnaphthalene	57.9	mg/kg	57.9	mg/kg	M	3.7E-06	mg/kg-day	NA	--	--	--	--
	Benzo(a)anthracene	4.76	mg/kg	4.76	mg/kg	M	4.0E-06	mg/kg-day	NA	--	--	--	--
	Benzo(a)pyrene	2.48	mg/kg	2.48	mg/kg	M	2.1E-06	mg/kg-day	NA	--	--	--	--
	Benzo(b)fluoranthene	2.81	mg/kg	2.81	mg/kg	M	2.4E-06	mg/kg-day	NA	--	--	--	--
	Benzo(k)fluoranthene	1.78	mg/kg	1.78	mg/kg	M	1.5E-06	mg/kg-day	NA	--	--	--	--
	Carbazole	0.95	mg/kg	0.95	mg/kg	M	8.0E-07	mg/kg-day	NA	--	--	--	--
	Chrysene	6.7	mg/kg	6.7	mg/kg	M	5.6E-06	mg/kg-day	NA	--	--	--	--
	Dibenz(a,h)anthracene	0.695	mg/kg	0.695	mg/kg	M	5.8E-07	mg/kg-day	NA	--	--	--	--
	Indeno(1,2,3-cd)pyrene	1.72	mg/kg	1.72	mg/kg	M	1.4E-06	mg/kg-day	NA	--	--	--	--
	Dieldrin	0.052	mg/kg	0.052	mg/kg	M	3.4E-09	mg/kg-day	2.5E-05	mg/kg-day	--	--	1.3E-04
	Aroclor-1260	95.6	mg/kg	95.6	mg/kg	M	8.6E-05	mg/kg-day	NA	--	--	--	--
	Arsenic	5.26	mg/kg	5.26	mg/kg	M	1.0E-06	mg/kg-day	1.2E-04	mg/kg-day	--	--	8.3E-03
	Iron	2,347	mg/kg	2,347	mg/kg	M	1.5E-05	mg/kg-day	4.5E-02	mg/kg-day	--	--	3.4E-04
	(Total)												8.8E-03
												Total Hazard Index Across All Exposure Routes/Pathways	2.2E-02

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.
(2) Specify if subchronic.

TABLE 7.7.1aA RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Air
Exposure Point: Fugative dust
Receptor Population: Industrial / Commercial Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Inhalation	2-Methylnaphthalene	1.96	mg/kg	1.48E-09	mg/m^3	R	9.6E-11	mg/kg-day	NA	--	NA	--	--
	Benzo(a)anthracene	69.0	mg/kg	5.23E-08	mg/m^3	R	3.4E-09	mg/kg-day	NA	--	NA	--	--
	Benzo(a)pyrene	30.5	mg/kg	2.31E-08	mg/m^3	R	1.5E-09	mg/kg-day	NA	--	NA	--	--
	Benzo(b)fluoranthene	40.9	mg/kg	3.10E-08	mg/m^3	R	2.0E-09	mg/kg-day	NA	--	NA	--	--
	Benzo(k)fluoranthene	18.7	mg/kg	1.41E-08	mg/m^3	R	9.2E-10	mg/kg-day	NA	--	NA	--	--
	Carbazole	3.16	mg/kg	2.39E-09	mg/m^3	R	1.6E-10	mg/kg-day	NA	--	NA	--	--
	Chrysene	96.0	mg/kg	7.27E-08	mg/m^3	R	4.7E-09	mg/kg-day	NA	--	NA	--	--
	Dibenz(a,h)anthracene	1.41	mg/kg	1.07E-09	mg/m^3	R	7.0E-11	mg/kg-day	NA	--	NA	--	--
	Fluoranthene	243	mg/kg	1.84E-07	mg/m^3	R	1.2E-08	mg/kg-day	4.0E-02	mg/kg-day	NA	--	3.0E-07
	Indeno(1,2,3-cd)pyrene	8.79	mg/kg	6.66E-09	mg/m^3	R	4.3E-10	mg/kg-day	NA	--	NA	--	--
	Naphthalene	0.525	mg/kg	3.98E-10	mg/m^3	R	2.6E-11	mg/kg-day	8.6E-04	mg/kg-day	3.0E-03	mg/m3	3.0E-08
	Pyrene	250	mg/kg	1.89E-07	mg/m^3	R	1.2E-08	mg/kg-day	3.0E-02	mg/kg-day	NA	--	4.1E-07
	4,4'-DDD	3	mg/kg	2.27E-09	mg/m^3	R	1.5E-10	mg/kg-day	NA	--	NA	--	--
	Chlordane, alpha-	48	mg/kg	3.64E-08	mg/m^3	R	2.4E-09	mg/kg-day	2.0E-04	mg/kg-day	7.0E-04	mg/m3	1.2E-05
	Chlordane, gamma-	58	mg/kg	4.39E-08	mg/m^3	R	2.9E-09	mg/kg-day	2.0E-04	mg/kg-day	7.0E-04	mg/m3	1.4E-05
	Dieldrin	0.32	mg/kg	2.42E-10	mg/m^3	R	1.6E-11	mg/kg-day	5.0E-05	mg/kg-day	NA	--	3.2E-07
	Heptachlor	22	mg/kg	1.67E-08	mg/m^3	R	1.1E-09	mg/kg-day	5.0E-04	mg/kg-day	NA	--	2.2E-06
	Heptachlor Epoxide	4.5	mg/kg	3.41E-09	mg/m^3	R	2.2E-10	mg/kg-day	1.3E-05	mg/kg-day	NA	--	1.7E-05
	Aroclor-1248	1.51	mg/kg	1.14E-09	mg/m^3	R	7.4E-11	mg/kg-day	NA	--	NA	--	--
	Aroclor-1254	0.975	mg/kg	7.39E-10	mg/m^3	R	4.8E-11	mg/kg-day	2.0E-05	mg/kg-day	NA	--	2.4E-06
	Aroclor-1260	54.6	mg/kg	4.13E-08	mg/m^3	R	2.7E-09	mg/kg-day	NA	--	NA	--	--
	Gasoline Range Organics	0.207	mg/kg	1.57E-10	mg/m^3	R	1.0E-11	mg/kg-day	NA	--	NA	--	--
	Diesel Range Organics	470	mg/kg	3.56E-07	mg/m^3	R	2.3E-08	mg/kg-day	NA	--	NA	--	--
	Antimony	1.22	mg/kg	9.25E-10	mg/m^3	R	6.0E-11	mg/kg-day	NA	--	NA	--	--
	Arsenic	3.49	mg/kg	2.65E-09	mg/m^3	R	1.7E-10	mg/kg-day	NA	--	NA	--	--
	Iron	2,260	mg/kg	1.71E-06	mg/m^3	R	1.1E-07	mg/kg-day	NA	--	NA	--	--
	Thallium	0.31	mg/kg	2.32E-10	mg/m^3	R	1.5E-11	mg/kg-day	NA	--	NA	--	--
	(Total)												4.9E-05
								Total Hazard Index Across All Exposure Routes/Pathways					4.9E-05

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/m^3 - milligram per cubic meter
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.
(2) Specify if subchronic.

TABLE 7.7.1aB RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Air
Exposure Point: Fugative dust
Receptor Population: Industrial / Commercial Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Inhalation	2-Methylnaphthalene	57.9	mg/kg	4.39E-08	mg/m^3	R	2.8E-09	mg/kg-day	NA	--	NA	--	--
	Benzo(a)anthracene	4.76	mg/kg	3.61E-09	mg/m^3	R	2.3E-10	mg/kg-day	NA	--	NA	--	--
	Benzo(a)pyrene	2.48	mg/kg	1.88E-09	mg/m^3	R	1.2E-10	mg/kg-day	NA	--	NA	--	--
	Benzo(b)fluoranthene	2.81	mg/kg	2.13E-09	mg/m^3	R	1.4E-10	mg/kg-day	NA	--	NA	--	--
	Benzo(k)fluoranthene	1.78	mg/kg	1.35E-09	mg/m^3	R	8.8E-11	mg/kg-day	NA	--	NA	--	--
	Carbazole	0.95	mg/kg	7.20E-10	mg/m^3	R	4.7E-11	mg/kg-day	NA	--	NA	--	--
	Chrysene	6.7	mg/kg	5.08E-09	mg/m^3	R	3.3E-10	mg/kg-day	NA	--	NA	--	--
	Dibenz(a,h)anthracene	0.695	mg/kg	5.27E-10	mg/m^3	R	3.4E-11	mg/kg-day	NA	--	NA	--	--
	Indeno(1,2,3-cd)pyrene	1.72	mg/kg	1.30E-09	mg/m^3	R	8.5E-11	mg/kg-day	NA	--	NA	--	--
	Dieldrin	0.052	mg/kg	3.94E-11	mg/m^3	R	2.6E-12	mg/kg-day	5.0E-05	mg/kg-day	NA	--	5.1E-08
	Aroclor-1260	95.6	mg/kg	7.24E-08	mg/m^3	R	4.7E-09	mg/kg-day	NA	--	NA	--	--
	Arsenic	5.26	mg/kg	3.98E-09	mg/m^3	R	2.6E-10	mg/kg-day	NA	--	NA	--	--
	Iron	2,347	mg/kg	1.78E-06	mg/m^3	R	1.2E-07	mg/kg-day	NA	--	NA	--	--
	(Total)												5.1E-08
								Total Hazard Index Across All Exposure Routes/Pathways					5.1E-08

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.

mg/kg - milligram per kilogram
mg/m^3 - milligram per cubic meter
mg/kg-day - milligram per kilogram per day

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.
(2) Specify if subchronic.

TABLE 7.7.2 RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Groundwater
Receptor Population: Industrial / Commercial Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzene	0.0034	mg/L	0.0034	mg/L	M	6.7E-05	mg/kg-day	3.0E-03	mg/kg-day	--	--	2.2E-02
	Chloroform	0.016	mg/L	0.016	mg/L	M	3.1E-04	mg/kg-day	1.0E-02	mg/kg-day	--	--	3.1E-02
	2-Methylnaphthalene	0.00105	mg/L	0.00105	mg/L	M	2.1E-05	mg/kg-day	NA	--	--	--	--
	Naphthalene	0.0022	mg/L	0.0022	mg/L	M	4.3E-05	mg/kg-day	2.0E-02	mg/kg-day	--	--	2.2E-03
	Heptachlor Epoxide	0.0000167	mg/L	0.0000167	mg/L	M	3.3E-07	mg/kg-day	1.3E-05	mg/kg-day	--	--	2.5E-02
	MCPA	0.044	mg/L	0.044	mg/L	M	8.6E-04	mg/kg-day	5.0E-04	mg/kg-day	--	--	1.7E+00
	Antimony	0.011	mg/L	0.011	mg/L	M	2.2E-04	mg/kg-day	4.0E-04	mg/kg-day	--	--	5.4E-01
	Arsenic	0.03	mg/L	0.03	mg/L	M	5.9E-04	mg/kg-day	3.0E-04	mg/kg-day	--	--	2.0E+00
	Iron	67.7	mg/L	67.7	mg/L	M	1.3E+00	mg/kg-day	3.0E-01	mg/kg-day	--	--	4.4E+00
	Manganese	0.45	mg/L	0.45	mg/L	M	8.8E-03	mg/kg-day	2.4E-02	mg/kg-day	--	--	3.7E-01
	Thallium	0.0057	mg/L	0.0057	mg/L	M	1.1E-04	mg/kg-day	6.6E-05	mg/kg-day	--	--	1.7E+00
	(Total)												1.1E+01
Dermal	Benzene	0.0034	mg/L	0.0034	mg/L	M	3.1E-06	mg/kg-day	2.8E-03	mg/kg-day	--	--	1.1E-03
	Chloroform	0.016	mg/L	0.016	mg/L	M	6.3E-06	mg/kg-day	2.0E-03	mg/kg-day	--	--	3.1E-03
	2-Methylnaphthalene	0.00105	mg/L	0.00105	mg/L	M	6.6E-06	mg/kg-day	NA	--	--	--	--
	Naphthalene	0.0022	mg/L	0.0022	mg/L	M	6.7E-06	mg/kg-day	1.6E-02	mg/kg-day	--	--	4.2E-04
	Heptachlor Epoxide	0.0000167	mg/L	0.0000167	mg/L	M	4.0E-08	mg/kg-day	9.4E-06	mg/kg-day	--	--	4.3E-03
	MCPA	0.044	mg/L	0.044	mg/L	M	9.5E-06	mg/kg-day	2.5E-04	mg/kg-day	--	--	3.8E-02
	Antimony	0.011	mg/L	0.011	mg/L	M	4.8E-07	mg/kg-day	8.0E-06	mg/kg-day	--	--	6.1E-02
	Arsenic	0.03	mg/L	0.03	mg/L	M	1.3E-06	mg/kg-day	1.2E-04	mg/kg-day	--	--	1.1E-02
	Iron	67.7	mg/L	67.7	mg/L	M	3.0E-03	mg/kg-day	4.5E-02	mg/kg-day	--	--	6.6E-02
	Manganese	0.45	mg/L	0.45	mg/L	M	2.0E-05	mg/kg-day	9.6E-04	mg/kg-day	--	--	2.1E-02
	Thallium	0.0057	mg/L	0.0057	mg/L	M	2.5E-07	mg/kg-day	9.9E-06	mg/kg-day	--	--	2.5E-02
	(Total)												2.3E-01
												Total Hazard Index Across All Exposure Routes/Pathways	1.1E+01

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/L - milligram per liter
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.
(2) Specify if subchronic.

TABLE 7.7.2a RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Air
Exposure Point: Shower
Receptor Population: Industrial / Commercial Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Inhalation	Benzene	0.0034	mg/L	4.81E-03	mg/m^3	R	9.8E-06	mg/kg-day	1.7E-03	mg/kg-day	9.0E-03	mg/m3	5.7E-03
	Chloroform	0.016	mg/L	1.80E-02	mg/m^3	R	3.7E-05	mg/kg-day	8.6E-05	mg/kg-day	NA	--	4.3E-01
	(Total)												4.3E-01
													4.3E-01

Total Hazard Index Across All Exposure Routes/Pathways

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/L - milligram per liter
mg/m^3 - milligram per cubic meter
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.
(2) Specify if subchronic.

TABLE 8.1.1A RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Current
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Surface Soil
Receptor Population: Military Base Personnel
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	2-Methylnaphthalene	1.96	mg/kg	1.96	mg/kg	M	1.1E-07	mg/kg-day	NA	--	--
	Benzo(a)anthracene	69.0	mg/kg	69.0	mg/kg	M	3.9E-06	mg/kg-day	7.3E-01	(mg/kg-day) $^{-1}$	2.8E-06
	Benzo(a)pyrene	30.5	mg/kg	30.5	mg/kg	M	1.7E-06	mg/kg-day	7.3E+00	(mg/kg-day) $^{-1}$	1.2E-05
	Benzo(b)fluoranthene	40.9	mg/kg	40.9	mg/kg	M	2.3E-06	mg/kg-day	7.3E-01	(mg/kg-day) $^{-1}$	1.7E-06
	Benzo(k)fluoranthene	18.7	mg/kg	18.7	mg/kg	M	1.0E-06	mg/kg-day	7.3E-02	(mg/kg-day) $^{-1}$	7.6E-08
	Carbazole	3.16	mg/kg	3.16	mg/kg	M	1.8E-07	mg/kg-day	2.0E-02	(mg/kg-day) $^{-1}$	3.5E-09
	Chrysene	96.0	mg/kg	96.0	mg/kg	M	5.4E-06	mg/kg-day	7.3E-03	(mg/kg-day) $^{-1}$	3.9E-08
	Dibenz(a,h)anthracene	1.41	mg/kg	1.41	mg/kg	M	7.9E-08	mg/kg-day	7.3E+00	(mg/kg-day) $^{-1}$	5.8E-07
	Fluoranthene	243	mg/kg	243	mg/kg	M	1.4E-05	mg/kg-day	NA	--	--
	Indeno(1,2,3-cd)pyrene	8.79	mg/kg	8.79	mg/kg	M	4.9E-07	mg/kg-day	7.3E-01	(mg/kg-day) $^{-1}$	3.6E-07
	Naphthalene	0.525	mg/kg	0.525	mg/kg	M	2.9E-08	mg/kg-day	NA	--	--
	Pyrene	250	mg/kg	250	mg/kg	M	1.4E-05	mg/kg-day	NA	--	--
	4,4'-DDD	3	mg/kg	3	mg/kg	M	1.7E-07	mg/kg-day	2.4E-01	(mg/kg-day) $^{-1}$	4.0E-08
	Chlordane, alpha-	48	mg/kg	48	mg/kg	M	2.7E-06	mg/kg-day	3.5E-01	(mg/kg-day) $^{-1}$	9.4E-07
	Chlordane, gamma-	58	mg/kg	58	mg/kg	M	3.2E-06	mg/kg-day	3.5E-01	(mg/kg-day) $^{-1}$	1.1E-06
	Dieldrin	0.32	mg/kg	0.32	mg/kg	M	1.8E-08	mg/kg-day	1.6E+01	(mg/kg-day) $^{-1}$	2.9E-07
	Heptachlor	22	mg/kg	22	mg/kg	M	1.2E-06	mg/kg-day	4.5E+00	(mg/kg-day) $^{-1}$	5.5E-06
	Heptachlor Epoxide	4.5	mg/kg	4.5	mg/kg	M	2.5E-07	mg/kg-day	9.1E+00	(mg/kg-day) $^{-1}$	2.3E-06
	Aroclor-1248	1.51	mg/kg	1.51	mg/kg	M	8.4E-08	mg/kg-day	2.0E+00	(mg/kg-day) $^{-1}$	1.7E-07
	Aroclor-1254	0.975	mg/kg	0.975	mg/kg	M	5.5E-08	mg/kg-day	2.0E+00	(mg/kg-day) $^{-1}$	1.1E-07
	Aroclor-1260	54.6	mg/kg	54.6	mg/kg	M	3.1E-06	mg/kg-day	2.0E+00	(mg/kg-day) $^{-1}$	6.1E-06
	Gasoline Range Organics	0.207	mg/kg	0.207	mg/kg	M	1.2E-08	mg/kg-day	NA	--	--
	Diesel Range Organics	470	mg/kg	470	mg/kg	M	2.6E-05	mg/kg-day	NA	--	--
	Antimony	1.22	mg/kg	1.22	mg/kg	M	6.8E-08	mg/kg-day	NA	--	--
	Arsenic	3.49	mg/kg	3.49	mg/kg	M	2.0E-07	mg/kg-day	1.5E+00	(mg/kg-day) $^{-1}$	2.9E-07
	Iron	2,260	mg/kg	2,260	mg/kg	M	1.3E-04	mg/kg-day	NA	--	--
	Thallium	0.31	mg/kg	0.31	mg/kg	M	1.7E-08	mg/kg-day	NA	--	--
	(total)										3.5E-05

TABLE 8.1.1A RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Current
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Surface Soil
Receptor Population: Military Base Personnel
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Dermal	2-Methylnaphthalene	1.96	mg/kg	1.96	mg/kg	M	7.2E-09	mg/kg-day	NA	--	--
	Benzo(a)anthracene	69.0	mg/kg	69.0	mg/kg	M	3.3E-06	mg/kg-day	2.4E+00	(mg/kg-day) $^{-1}$	7.8E-06
	Benzo(a)pyrene	30.5	mg/kg	30.5	mg/kg	M	1.5E-06	mg/kg-day	1.5E+01	(mg/kg-day) $^{-1}$	2.1E-05
	Benzo(b)fluoranthene	40.9	mg/kg	40.9	mg/kg	M	2.0E-06	mg/kg-day	1.5E+00	(mg/kg-day) $^{-1}$	2.9E-06
	Benzo(k)fluoranthene	18.7	mg/kg	18.7	mg/kg	M	8.9E-07	mg/kg-day	1.5E-01	(mg/kg-day) $^{-1}$	1.3E-07
	Carbazole	3.16	mg/kg	3.16	mg/kg	M	1.5E-07	mg/kg-day	4.0E-02	(mg/kg-day) $^{-1}$	6.1E-09
	Chrysene	96.0	mg/kg	96.0	mg/kg	M	4.6E-06	mg/kg-day	2.4E-02	(mg/kg-day) $^{-1}$	1.1E-07
	Dibenz(a,h)anthracene	1.41	mg/kg	1.41	mg/kg	M	6.8E-08	mg/kg-day	2.4E+01	(mg/kg-day) $^{-1}$	1.6E-06
	Fluoranthene	243	mg/kg	243	mg/kg	M	9.0E-07	mg/kg-day	NA	--	--
	Indeno(1,2,3-cd)pyrene	8.79	mg/kg	8.79	mg/kg	M	4.2E-07	mg/kg-day	2.4E+00	(mg/kg-day) $^{-1}$	9.9E-07
	Naphthalene	0.525	mg/kg	0.525	mg/kg	M	1.9E-09	mg/kg-day	NA	--	--
	Pyrene	250	mg/kg	250	mg/kg	M	9.2E-07	mg/kg-day	NA	--	--
	4,4'-DDD	3	mg/kg	3	mg/kg	M	1.1E-08	mg/kg-day	3.4E-01	(mg/kg-day) $^{-1}$	3.8E-09
	Chlordane, alpha-	48	mg/kg	48	mg/kg	M	7.1E-07	mg/kg-day	4.4E-01	(mg/kg-day) $^{-1}$	3.1E-07
	Chlordane, gamma-	58	mg/kg	58	mg/kg	M	8.6E-07	mg/kg-day	4.4E-01	(mg/kg-day) $^{-1}$	3.7E-07
	Dieldrin	0.32	mg/kg	0.32	mg/kg	M	1.2E-09	mg/kg-day	3.2E+01	(mg/kg-day) $^{-1}$	3.8E-08
	Heptachlor	22	mg/kg	22	mg/kg	M	8.1E-08	mg/kg-day	6.3E+00	(mg/kg-day) $^{-1}$	5.1E-07
	Heptachlor Epoxide	4.5	mg/kg	4.5	mg/kg	M	1.7E-08	mg/kg-day	1.3E+01	(mg/kg-day) $^{-1}$	2.1E-07
	Aroclor-1248	1.51	mg/kg	1.51	mg/kg	M	7.8E-08	mg/kg-day	2.2E+00	(mg/kg-day) $^{-1}$	1.7E-07
	Aroclor-1254	0.975	mg/kg	0.975	mg/kg	M	5.0E-08	mg/kg-day	2.2E+00	(mg/kg-day) $^{-1}$	1.1E-07
	Aroclor-1260	54.6	mg/kg	54.6	mg/kg	M	2.8E-06	mg/kg-day	2.2E+00	(mg/kg-day) $^{-1}$	6.3E-06
	Gasoline Range Organics	0.207	mg/kg	0.207	mg/kg	M	7.6E-10	mg/kg-day	NA	--	--
	Diesel Range Organics	470	mg/kg	470	mg/kg	M	1.7E-06	mg/kg-day	NA	--	--
	Antimony	1.22	mg/kg	1.22	mg/kg	M	4.5E-10	mg/kg-day	NA	--	--
	Arsenic	3.49	mg/kg	3.49	mg/kg	M	3.9E-08	mg/kg-day	3.7E+00	(mg/kg-day) $^{-1}$	1.4E-07
	Iron	2,260	mg/kg	2,260	mg/kg	M	8.3E-07	mg/kg-day	NA	--	--
	Thallium	0.31	mg/kg	0.31	mg/kg	M	1.1E-10	mg/kg-day	NA	--	--
	(Total)										4.3E-05
										Total Risk Across All Exposure Routes/Pathways	7.8E-05

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

TABLE 8.1.1B RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Current
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Surface Soil
Receptor Population: Military Base Personnel
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	2-Methylnaphthalene	57.9	mg/kg	57.9	mg/kg	M	3.2E-06	mg/kg-day	NA	--	--
	Benzo(a)anthracene	4.76	mg/kg	4.76	mg/kg	M	2.7E-07	mg/kg-day	7.3E-01	(mg/kg-day) $^{-1}$	1.9E-07
	Benzo(a)pyrene	2.48	mg/kg	2.48	mg/kg	M	1.4E-07	mg/kg-day	7.3E+00	(mg/kg-day) $^{-1}$	1.0E-06
	Benzo(b)fluoranthene	2.81	mg/kg	2.81	mg/kg	M	1.6E-07	mg/kg-day	7.3E-01	(mg/kg-day) $^{-1}$	1.1E-07
	Benzo(k)fluoranthene	1.78	mg/kg	1.78	mg/kg	M	1.0E-07	mg/kg-day	7.3E-02	(mg/kg-day) $^{-1}$	7.3E-09
	Carbazole	0.95	mg/kg	0.95	mg/kg	M	5.3E-08	mg/kg-day	2.0E-02	(mg/kg-day) $^{-1}$	1.1E-09
	Chrysene	6.7	mg/kg	6.7	mg/kg	M	3.7E-07	mg/kg-day	7.3E-03	(mg/kg-day) $^{-1}$	2.7E-09
	Dibenz(a,h)anthracene	0.695	mg/kg	0.695	mg/kg	M	3.9E-08	mg/kg-day	7.3E+00	(mg/kg-day) $^{-1}$	2.8E-07
	Indeno(1,2,3-cd)pyrene	1.72	mg/kg	1.72	mg/kg	M	9.6E-08	mg/kg-day	7.3E-01	(mg/kg-day) $^{-1}$	7.0E-08
	Dieldrin	0.052	mg/kg	0.052	mg/kg	M	2.9E-09	mg/kg-day	1.6E+01	(mg/kg-day) $^{-1}$	4.7E-08
	Aroclor-1260	95.6	mg/kg	95.6	mg/kg	M	5.3E-06	mg/kg-day	2.0E+00	(mg/kg-day) $^{-1}$	1.1E-05
	Arsenic	5.26	mg/kg	5.26	mg/kg	M	2.9E-07	mg/kg-day	1.5E+00	(mg/kg-day) $^{-1}$	4.4E-07
	Iron	2,347	mg/kg	2,347	mg/kg	M	1.3E-04	mg/kg-day	NA	--	--
	(total)										1.3E-05
Dermal	2-Methylnaphthalene	57.9	mg/kg	57.9	mg/kg	M	2.1E-07	mg/kg-day	NA	--	--
	Benzo(a)anthracene	4.76	mg/kg	4.76	mg/kg	M	2.3E-07	mg/kg-day	2.4E+00	(mg/kg-day) $^{-1}$	5.4E-07
	Benzo(a)pyrene	2.48	mg/kg	2.48	mg/kg	M	1.2E-07	mg/kg-day	1.5E+01	(mg/kg-day) $^{-1}$	1.7E-06
	Benzo(b)fluoranthene	2.81	mg/kg	2.81	mg/kg	M	1.3E-07	mg/kg-day	1.5E+00	(mg/kg-day) $^{-1}$	2.0E-07
	Benzo(k)fluoranthene	1.78	mg/kg	1.78	mg/kg	M	8.5E-08	mg/kg-day	1.5E-01	(mg/kg-day) $^{-1}$	1.2E-08
	Carbazole	0.95	mg/kg	0.95	mg/kg	M	4.6E-08	mg/kg-day	4.0E-02	(mg/kg-day) $^{-1}$	1.8E-09
	Chrysene	6.7	mg/kg	6.7	mg/kg	M	3.2E-07	mg/kg-day	2.4E-02	(mg/kg-day) $^{-1}$	7.6E-09
	Dibenz(a,h)anthracene	0.695	mg/kg	0.695	mg/kg	M	3.3E-08	mg/kg-day	2.4E+01	(mg/kg-day) $^{-1}$	7.9E-07
	Indeno(1,2,3-cd)pyrene	1.72	mg/kg	1.72	mg/kg	M	8.2E-08	mg/kg-day	2.4E+00	(mg/kg-day) $^{-1}$	1.9E-07
	Dieldrin	0.052	mg/kg	0.052	mg/kg	M	1.9E-10	mg/kg-day	3.2E+01	(mg/kg-day) $^{-1}$	6.1E-09
	Aroclor-1260	95.6	mg/kg	95.6	mg/kg	M	4.9E-06	mg/kg-day	2.2E+00	(mg/kg-day) $^{-1}$	1.1E-05
	Arsenic	5.26	mg/kg	5.26	mg/kg	M	5.8E-08	mg/kg-day	3.7E+00	(mg/kg-day) $^{-1}$	2.1E-07
	Iron	2,347	mg/kg	2,347	mg/kg	M	8.7E-07	mg/kg-day	NA	--	--
	(Total)										1.5E-05
										Total Risk Across All Exposure Routes/Pathways	2.8E-05

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

TABLE 8.1.1aA RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Current
Medium: Surface Soil
Exposure Medium: Air
Exposure Point: Fugative dust
Receptor Population: Military Base Personnel
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Inhalation	2-Methylnaphthalene	1.96	mg/kg	1.48E-09	mg/m^3	R	5.5E-12	mg/kg-day	NA	--	--
	Benzo(a)anthracene	69.0	mg/kg	5.23E-08	mg/m^3	R	1.9E-10	mg/kg-day	3.1E-01	$(mg/kg\text{-}day)^{-1}$	6.0E-11
	Benzo(a)pyrene	30.5	mg/kg	2.31E-08	mg/m^3	R	8.6E-11	mg/kg-day	3.1E+00	$(mg/kg\text{-}day)^{-1}$	2.7E-10
	Benzo(b)fluoranthene	40.9	mg/kg	3.10E-08	mg/m^3	R	1.1E-10	mg/kg-day	3.1E-01	$(mg/kg\text{-}day)^{-1}$	3.6E-11
	Benzo(k)fluoranthene	18.7	mg/kg	1.41E-08	mg/m^3	R	5.2E-11	mg/kg-day	3.1E-02	$(mg/kg\text{-}day)^{-1}$	1.6E-12
	Carbazole	3.16	mg/kg	2.39E-09	mg/m^3	R	8.9E-12	mg/kg-day	2.0E-02	$(mg/kg\text{-}day)^{-1}$	1.8E-13
	Chrysene	96.0	mg/kg	7.27E-08	mg/m^3	R	2.7E-10	mg/kg-day	3.1E-03	$(mg/kg\text{-}day)^{-1}$	8.4E-13
	Dibenz(a,h)anthracene	1.41	mg/kg	1.07E-09	mg/m^3	R	4.0E-12	mg/kg-day	3.1E+00	$(mg/kg\text{-}day)^{-1}$	1.2E-11
	Fluoranthene	243	mg/kg	1.84E-07	mg/m^3	R	6.8E-10	mg/kg-day	NA	--	--
	Indeno(1,2,3-cd)pyrene	8.79	mg/kg	6.66E-09	mg/m^3	R	2.5E-11	mg/kg-day	3.1E-01	$(mg/kg\text{-}day)^{-1}$	7.7E-12
	Naphthalene	0.525	mg/kg	3.98E-10	mg/m^3	R	1.5E-12	mg/kg-day	NA	--	--
	Pyrene	250	mg/kg	1.89E-07	mg/m^3	R	7.0E-10	mg/kg-day	NA	--	--
	4,4'-DDD	3	mg/kg	2.27E-09	mg/m^3	R	8.4E-12	mg/kg-day	2.4E-01	$(mg/kg\text{-}day)^{-1}$	2.0E-12
	Chlordane, alpha-	48	mg/kg	3.64E-08	mg/m^3	R	1.4E-10	mg/kg-day	3.5E-01	$(mg/kg\text{-}day)^{-1}$	4.7E-11
	Chlordane, gamma-	58	mg/kg	4.39E-08	mg/m^3	R	1.6E-10	mg/kg-day	3.5E-01	$(mg/kg\text{-}day)^{-1}$	5.7E-11
	Dieldrin	0.32	mg/kg	2.42E-10	mg/m^3	R	9.0E-13	mg/kg-day	1.6E+01	$(mg/kg\text{-}day)^{-1}$	1.4E-11
	Heptachlor	22	mg/kg	1.67E-08	mg/m^3	R	6.2E-11	mg/kg-day	4.6E+00	$(mg/kg\text{-}day)^{-1}$	2.8E-10
	Heptachlor Epoxide	4.5	mg/kg	3.41E-09	mg/m^3	R	1.3E-11	mg/kg-day	9.1E+00	$(mg/kg\text{-}day)^{-1}$	1.2E-10
	Aroclor-1248	1.51	mg/kg	1.14E-09	mg/m^3	R	4.2E-12	mg/kg-day	2.0E+00	$(mg/kg\text{-}day)^{-1}$	8.5E-12
	Aroclor-1254	0.975	mg/kg	7.39E-10	mg/m^3	R	2.7E-12	mg/kg-day	2.0E+00	$(mg/kg\text{-}day)^{-1}$	5.5E-12
	Aroclor-1260	54.6	mg/kg	4.13E-08	mg/m^3	R	1.5E-10	mg/kg-day	2.0E+00	$(mg/kg\text{-}day)^{-1}$	3.1E-10
	Gasoline Range Organics	0.207	mg/kg	1.57E-10	mg/m^3	R	5.8E-13	mg/kg-day	NA	--	--
	Diesel Range Organics	470	mg/kg	3.56E-07	mg/m^3	R	1.3E-09	mg/kg-day	NA	--	--
	Antimony	1.22	mg/kg	9.25E-10	mg/m^3	R	3.4E-12	mg/kg-day	NA	--	--
	Arsenic	3.49	mg/kg	2.65E-09	mg/m^3	R	9.8E-12	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	1.5E-10
	Iron	2,260	mg/kg	1.71E-06	mg/m^3	R	6.4E-09	mg/kg-day	NA	--	--
	Thallium	0.31	mg/kg	2.32E-10	mg/m^3	R	8.6E-13	mg/kg-day	NA	--	--
	(Total)										1.4E-09
										Total Risk Across All Exposure Routes/Pathways	1.4E-09

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/m^3 - milligram per cubic meter
mg/kg-day - milligram per kilogram per day

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

TABLE 8.1.1aB RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Current
Medium: Surface Soil
Exposure Medium: Air
Exposure Point: Fugative dust
Receptor Population: Military Base Personnel
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Inhalation	2-Methylnaphthalene	57.9	mg/kg	4.39E-08	mg/m^3	R	1.6E-10	mg/kg-day	NA	--	--
	Benzo(a)anthracene	4.76	mg/kg	3.61E-09	mg/m^3	R	1.3E-11	mg/kg-day	3.1E-01	$(mg/kg\text{-}day)^{-1}$	4.2E-12
	Benzo(a)pyrene	2.48	mg/kg	1.88E-09	mg/m^3	R	7.0E-12	mg/kg-day	3.1E+00	$(mg/kg\text{-}day)^{-1}$	2.2E-11
	Benzo(b)fluoranthene	2.81	mg/kg	2.13E-09	mg/m^3	R	7.9E-12	mg/kg-day	3.1E-01	$(mg/kg\text{-}day)^{-1}$	2.4E-12
	Benzo(k)fluoranthene	1.78	mg/kg	1.35E-09	mg/m^3	R	5.0E-12	mg/kg-day	3.1E-02	$(mg/kg\text{-}day)^{-1}$	1.6E-13
	Carbazole	0.95	mg/kg	7.20E-10	mg/m^3	R	2.7E-12	mg/kg-day	2.0E-02	$(mg/kg\text{-}day)^{-1}$	5.3E-14
	Chrysene	6.7	mg/kg	5.08E-09	mg/m^3	R	1.9E-11	mg/kg-day	3.1E-03	$(mg/kg\text{-}day)^{-1}$	5.8E-14
	Dibenz(a,h)anthracene	0.695	mg/kg	5.27E-10	mg/m^3	R	2.0E-12	mg/kg-day	3.1E+00	$(mg/kg\text{-}day)^{-1}$	6.1E-12
	Indeno(1,2,3-cd)pyrene	1.72	mg/kg	1.30E-09	mg/m^3	R	4.8E-12	mg/kg-day	3.1E-01	$(mg/kg\text{-}day)^{-1}$	1.5E-12
	Dieldrin	0.052	mg/kg	3.94E-11	mg/m^3	R	1.5E-13	mg/kg-day	1.6E+01	$(mg/kg\text{-}day)^{-1}$	2.4E-12
	Aroclor-1260	95.6	mg/kg	7.24E-08	mg/m^3	R	2.7E-10	mg/kg-day	2.0E+00	$(mg/kg\text{-}day)^{-1}$	5.4E-10
	Arsenic	5.26	mg/kg	3.98E-09	mg/m^3	R	1.5E-11	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	2.2E-10
	Iron	2,347	mg/kg	1.78E-06	mg/m^3	R	6.6E-09	mg/kg-day	NA	--	--
	(Total)										8.0E-10
							Total Risk Across All Exposure Routes/Pathways				8.0E-10

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.

mg/kg - milligram per kilogram
mg/m^3 - milligram per cubic meter
mg/kg-day - milligram per kilogram per day

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

TABLE 8.1.2 RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Current
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: Surface Water
Receptor Population: Military Base Personnel
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Acetone	0.0056	mg/L	0.0056	mg/L	M	8.1E-08	mg/kg-day	NA	--	--
	Toluene	0.0027	mg/L	0.0027	mg/L	M	3.9E-08	mg/kg-day	NA	--	--
	Xylenes, total	0.0035	mg/L	0.0035	mg/L	M	5.1E-08	mg/kg-day	NA	--	--
	(total)										--
Dermal	Acetone	0.0056	mg/L	0.0056	mg/L	M	1.5E-08	mg/kg-day	NA	--	--
	Toluene	0.0027	mg/L	0.0027	mg/L	M	5.8E-07	mg/kg-day	NA	--	--
	Xylenes, total	0.0035	mg/L	0.0035	mg/L	M	1.6E-06	mg/kg-day	NA	--	--
	(Total)										--
										Total Risk Across All Exposure Routes/Pathways	--

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/L - milligram per liter
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

TABLE 8.1.3 RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Current
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Sediment
Receptor Population: Military Base Personnel
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	2-Methylnaphthalene	10	mg/kg	10	mg/kg	M	5.6E-07	mg/kg-day	NA	--	--
	Aroclor-1248	2.8	mg/kg	2.8	mg/kg	M	1.6E-07	mg/kg-day	2.0E+00	$(mg/kg\text{-}day)^{-1}$	3.1E-07
	Aroclor-1260	40	mg/kg	40	mg/kg	M	2.2E-06	mg/kg-day	2.0E+00	$(mg/kg\text{-}day)^{-1}$	4.5E-06
	Diesel Range Organics	11,600	mg/kg	11,600	mg/kg	M	6.5E-04	mg/kg-day	NA	--	--
	(total)										4.8E-06
Dermal	2-Methylnaphthalene	10	mg/kg	10	mg/kg	M	3.7E-08	mg/kg-day	NA	--	--
	Aroclor-1248	2.8	mg/kg	2.8	mg/kg	M	1.4E-07	mg/kg-day	2.2E+00	$(mg/kg\text{-}day)^{-1}$	3.3E-07
	Aroclor-1260	40	mg/kg	40	mg/kg	M	2.1E-06	mg/kg-day	2.2E+00	$(mg/kg\text{-}day)^{-1}$	4.6E-06
	Diesel Range Organics	11,600	mg/kg	11,600	mg/kg	M	4.3E-05	mg/kg-day	NA	--	--
	(Total)										4.9E-06
										Total Risk Across All Exposure Routes/Pathways	9.7E-06

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

TABLE 8.2.1A RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Current
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Surface Soil
Receptor Population: Recreational Users
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	2-Methylnaphthalene	1.96	mg/kg	1.96	mg/kg	M	1.3E-07	mg/kg-day	NA	--	--
	Benzo(a)anthracene	69.0	mg/kg	69.0	mg/kg	M	4.4E-06	mg/kg-day	7.3E-01	(mg/kg-day) $^{-1}$	3.2E-06
	Benzo(a)pyrene	30.5	mg/kg	30.5	mg/kg	M	2.0E-06	mg/kg-day	7.3E+00	(mg/kg-day) $^{-1}$	1.4E-05
	Benzo(b)fluoranthene	40.9	mg/kg	40.9	mg/kg	M	2.6E-06	mg/kg-day	7.3E-01	(mg/kg-day) $^{-1}$	1.9E-06
	Benzo(k)fluoranthene	18.7	mg/kg	18.7	mg/kg	M	1.2E-06	mg/kg-day	7.3E-02	(mg/kg-day) $^{-1}$	8.8E-08
	Carbazole	3.16	mg/kg	3.16	mg/kg	M	2.0E-07	mg/kg-day	2.0E-02	(mg/kg-day) $^{-1}$	4.1E-09
	Chrysene	96.0	mg/kg	96.0	mg/kg	M	6.2E-06	mg/kg-day	7.3E-03	(mg/kg-day) $^{-1}$	4.5E-08
	Dibenz(a,h)anthracene	1.41	mg/kg	1.41	mg/kg	M	9.1E-08	mg/kg-day	7.3E+00	(mg/kg-day) $^{-1}$	6.6E-07
	Fluoranthene	243	mg/kg	243	mg/kg	M	1.6E-05	mg/kg-day	NA	--	--
	Indeno(1,2,3-cd)pyrene	8.79	mg/kg	8.79	mg/kg	M	5.7E-07	mg/kg-day	7.3E-01	(mg/kg-day) $^{-1}$	4.1E-07
	Naphthalene	0.525	mg/kg	0.525	mg/kg	M	3.4E-08	mg/kg-day	NA	--	--
	Pyrene	250	mg/kg	250	mg/kg	M	1.6E-05	mg/kg-day	NA	--	--
	4,4'-DDD	3	mg/kg	3	mg/kg	M	1.9E-07	mg/kg-day	2.4E-01	(mg/kg-day) $^{-1}$	4.6E-08
	Chlordane, alpha-	48	mg/kg	48	mg/kg	M	3.1E-06	mg/kg-day	3.5E-01	(mg/kg-day) $^{-1}$	1.1E-06
	Chlordane, gamma-	58	mg/kg	58	mg/kg	M	3.7E-06	mg/kg-day	3.5E-01	(mg/kg-day) $^{-1}$	1.3E-06
	Dieldrin	0.32	mg/kg	0.32	mg/kg	M	2.1E-08	mg/kg-day	1.6E+01	(mg/kg-day) $^{-1}$	3.3E-07
	Heptachlor	22	mg/kg	22	mg/kg	M	1.4E-06	mg/kg-day	4.5E+00	(mg/kg-day) $^{-1}$	6.4E-06
	Heptachlor Epoxide	4.5	mg/kg	4.5	mg/kg	M	2.9E-07	mg/kg-day	9.1E+00	(mg/kg-day) $^{-1}$	2.6E-06
	Aroclor-1248	1.51	mg/kg	1.51	mg/kg	M	9.7E-08	mg/kg-day	2.0E+00	(mg/kg-day) $^{-1}$	1.9E-07
	Aroclor-1254	0.975	mg/kg	0.975	mg/kg	M	6.3E-08	mg/kg-day	2.0E+00	(mg/kg-day) $^{-1}$	1.3E-07
	Aroclor-1260	54.6	mg/kg	54.6	mg/kg	M	3.5E-06	mg/kg-day	2.0E+00	(mg/kg-day) $^{-1}$	7.0E-06
	Gasoline Range Organics	0.207	mg/kg	0.207	mg/kg	M	1.3E-08	mg/kg-day	NA	--	--
	Diesel Range Organics	470	mg/kg	470	mg/kg	M	3.0E-05	mg/kg-day	NA	--	--
	Antimony	1.22	mg/kg	1.22	mg/kg	M	7.9E-08	mg/kg-day	NA	--	--
	Arsenic	3.49	mg/kg	3.49	mg/kg	M	2.2E-07	mg/kg-day	1.5E+00	(mg/kg-day) $^{-1}$	3.4E-07
	Iron	2,260	mg/kg	2,260	mg/kg	M	1.5E-04	mg/kg-day	NA	--	--
	Thallium	0.31	mg/kg	0.31	mg/kg	M	2.0E-08	mg/kg-day	NA	--	--
	(total)										4.0E-05

TABLE 8.2.1A RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Current
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Surface Soil
Receptor Population: Recreational Users
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Dermal	2-Methylnaphthalene	1.96	mg/kg	1.96	mg/kg	M	1.4E-08	mg/kg-day	NA	--	--
	Benzo(a)anthracene	69.0	mg/kg	69.0	mg/kg	M	6.6E-06	mg/kg-day	2.4E+00	(mg/kg-day) $^{-1}$	1.6E-05
	Benzo(a)pyrene	30.5	mg/kg	30.5	mg/kg	M	2.9E-06	mg/kg-day	1.5E+01	(mg/kg-day) $^{-1}$	4.2E-05
	Benzo(b)fluoranthene	40.9	mg/kg	40.9	mg/kg	M	3.9E-06	mg/kg-day	1.5E+00	(mg/kg-day) $^{-1}$	5.7E-06
	Benzo(k)fluoranthene	18.7	mg/kg	18.7	mg/kg	M	1.8E-06	mg/kg-day	1.5E-01	(mg/kg-day) $^{-1}$	2.6E-07
	Carbazole	3.16	mg/kg	3.16	mg/kg	M	3.0E-07	mg/kg-day	4.0E-02	(mg/kg-day) $^{-1}$	1.2E-08
	Chrysene	96.0	mg/kg	96.0	mg/kg	M	9.2E-06	mg/kg-day	2.4E-02	(mg/kg-day) $^{-1}$	2.2E-07
	Dibenz(a,h)anthracene	1.41	mg/kg	1.41	mg/kg	M	1.3E-07	mg/kg-day	2.4E+01	(mg/kg-day) $^{-1}$	3.2E-06
	Fluoranthene	243	mg/kg	243	mg/kg	M	1.8E-06	mg/kg-day	NA	--	--
	Indeno(1,2,3-cd)pyrene	8.79	mg/kg	8.79	mg/kg	M	8.4E-07	mg/kg-day	2.4E+00	(mg/kg-day) $^{-1}$	2.0E-06
	Naphthalene	0.525	mg/kg	0.525	mg/kg	M	3.9E-09	mg/kg-day	NA	--	--
	Pyrene	250	mg/kg	250	mg/kg	M	1.8E-06	mg/kg-day	NA	--	--
	4,4'-DDD	3	mg/kg	3	mg/kg	M	2.2E-08	mg/kg-day	3.4E-01	(mg/kg-day) $^{-1}$	7.6E-09
	Chlordane, alpha-	48	mg/kg	48	mg/kg	M	1.4E-06	mg/kg-day	4.4E-01	(mg/kg-day) $^{-1}$	6.2E-07
	Chlordane, gamma-	58	mg/kg	58	mg/kg	M	1.7E-06	mg/kg-day	4.4E-01	(mg/kg-day) $^{-1}$	7.5E-07
	Dieldrin	0.32	mg/kg	0.32	mg/kg	M	2.3E-09	mg/kg-day	3.2E+01	(mg/kg-day) $^{-1}$	7.5E-08
	Heptachlor	22	mg/kg	22	mg/kg	M	1.6E-07	mg/kg-day	6.3E+00	(mg/kg-day) $^{-1}$	1.0E-06
	Heptachlor Epoxide	4.5	mg/kg	4.5	mg/kg	M	3.3E-08	mg/kg-day	1.3E+01	(mg/kg-day) $^{-1}$	4.2E-07
	Aroclor-1248	1.51	mg/kg	1.51	mg/kg	M	1.5E-07	mg/kg-day	2.2E+00	(mg/kg-day) $^{-1}$	3.5E-07
	Aroclor-1254	0.975	mg/kg	0.975	mg/kg	M	1.0E-07	mg/kg-day	2.2E+00	(mg/kg-day) $^{-1}$	2.2E-07
	Aroclor-1260	54.6	mg/kg	54.6	mg/kg	M	5.6E-06	mg/kg-day	2.2E+00	(mg/kg-day) $^{-1}$	1.2E-05
	Gasoline Range Organics	0.207	mg/kg	0.207	mg/kg	M	1.5E-09	mg/kg-day	NA	--	--
	Diesel Range Organics	470	mg/kg	470	mg/kg	M	3.5E-06	mg/kg-day	NA	--	--
	Antimony	1.22	mg/kg	1.22	mg/kg	M	9.0E-10	mg/kg-day	NA	--	--
	Arsenic	3.49	mg/kg	3.49	mg/kg	M	7.7E-08	mg/kg-day	3.7E+00	(mg/kg-day) $^{-1}$	2.8E-07
	Iron	2,260	mg/kg	2,260	mg/kg	M	1.7E-06	mg/kg-day	NA	--	--
	Thallium	0.31	mg/kg	0.31	mg/kg	M	2.3E-10	mg/kg-day	NA	--	--
	(Total)										8.5E-05
										Total Risk Across All Exposure Routes/Pathways	1.3E-04

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

TABLE 8.2.1B RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Current
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Surface Soil
Receptor Population: Recreational Users
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	2-Methylnaphthalene	57.9	mg/kg	57.9	mg/kg	M	3.7E-06	mg/kg-day	NA	--	--
	Benzo(a)anthracene	4.76	mg/kg	4.76	mg/kg	M	3.1E-07	mg/kg-day	7.3E-01	(mg/kg-day) $^{-1}$	2.2E-07
	Benzo(a)pyrene	2.48	mg/kg	2.48	mg/kg	M	1.6E-07	mg/kg-day	7.3E+00	(mg/kg-day) $^{-1}$	1.2E-06
	Benzo(b)fluoranthene	2.81	mg/kg	2.81	mg/kg	M	1.8E-07	mg/kg-day	7.3E-01	(mg/kg-day) $^{-1}$	1.3E-07
	Benzo(k)fluoranthene	1.78	mg/kg	1.78	mg/kg	M	1.1E-07	mg/kg-day	7.3E-02	(mg/kg-day) $^{-1}$	8.4E-09
	Carbazole	0.95	mg/kg	0.95	mg/kg	M	6.1E-08	mg/kg-day	2.0E-02	(mg/kg-day) $^{-1}$	1.2E-09
	Chrysene	6.7	mg/kg	6.7	mg/kg	M	4.3E-07	mg/kg-day	7.3E-03	(mg/kg-day) $^{-1}$	3.2E-09
	Dibenz(a,h)anthracene	0.695	mg/kg	0.695	mg/kg	M	4.5E-08	mg/kg-day	7.3E+00	(mg/kg-day) $^{-1}$	3.3E-07
	Indeno(1,2,3-cd)pyrene	1.72	mg/kg	1.72	mg/kg	M	1.1E-07	mg/kg-day	7.3E-01	(mg/kg-day) $^{-1}$	8.1E-08
	Dieldrin	0.052	mg/kg	0.052	mg/kg	M	3.3E-09	mg/kg-day	1.6E+01	(mg/kg-day) $^{-1}$	5.4E-08
	Aroclor-1260	95.6	mg/kg	95.6	mg/kg	M	6.2E-06	mg/kg-day	2.0E+00	(mg/kg-day) $^{-1}$	1.2E-05
	Arsenic	5.26	mg/kg	5.26	mg/kg	M	3.4E-07	mg/kg-day	1.5E+00	(mg/kg-day) $^{-1}$	5.1E-07
	Iron	2,347	mg/kg	2,347	mg/kg	M	1.5E-04	mg/kg-day	NA	--	--
	(total)										1.5E-05
Dermal	2-Methylnaphthalene	57.9	mg/kg	57.9	mg/kg	M	4.3E-07	mg/kg-day	NA	--	--
	Benzo(a)anthracene	4.76	mg/kg	4.76	mg/kg	M	4.5E-07	mg/kg-day	2.4E+00	(mg/kg-day) $^{-1}$	1.1E-06
	Benzo(a)pyrene	2.48	mg/kg	2.48	mg/kg	M	2.4E-07	mg/kg-day	1.5E+01	(mg/kg-day) $^{-1}$	3.5E-06
	Benzo(b)fluoranthene	2.81	mg/kg	2.81	mg/kg	M	2.7E-07	mg/kg-day	1.5E+00	(mg/kg-day) $^{-1}$	3.9E-07
	Benzo(k)fluoranthene	1.78	mg/kg	1.78	mg/kg	M	1.7E-07	mg/kg-day	1.5E-01	(mg/kg-day) $^{-1}$	2.5E-08
	Carbazole	0.95	mg/kg	0.95	mg/kg	M	9.1E-08	mg/kg-day	4.0E-02	(mg/kg-day) $^{-1}$	3.6E-09
	Chrysene	6.7	mg/kg	6.7	mg/kg	M	6.4E-07	mg/kg-day	2.4E-02	(mg/kg-day) $^{-1}$	1.5E-08
	Dibenz(a,h)anthracene	0.695	mg/kg	0.695	mg/kg	M	6.6E-08	mg/kg-day	2.4E+01	(mg/kg-day) $^{-1}$	1.6E-06
	Indeno(1,2,3-cd)pyrene	1.72	mg/kg	1.72	mg/kg	M	1.6E-07	mg/kg-day	2.4E+00	(mg/kg-day) $^{-1}$	3.9E-07
	Dieldrin	0.052	mg/kg	0.052	mg/kg	M	3.8E-10	mg/kg-day	3.2E+01	(mg/kg-day) $^{-1}$	1.2E-08
	Aroclor-1260	95.6	mg/kg	95.6	mg/kg	M	9.8E-06	mg/kg-day	2.2E+00	(mg/kg-day) $^{-1}$	2.2E-05
	Arsenic	5.26	mg/kg	5.26	mg/kg	M	1.2E-07	mg/kg-day	3.7E+00	(mg/kg-day) $^{-1}$	4.2E-07
	Iron	2,347	mg/kg	2,347	mg/kg	M	1.7E-06	mg/kg-day	NA	--	--
	(Total)										2.9E-05
										Total Risk Across All Exposure Routes/Pathways	4.4E-05

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

TABLE 8.2.1aA RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Current
Medium: Surface Soil
Exposure Medium: Air
Exposure Point: Fugative dust
Receptor Population: Recreational Users
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Inhalation	2-Methylnaphthalene	1.96	mg/kg	1.48E-09	mg/m^3	R	6.3E-12	mg/kg-day	NA	--	--
	Benzo(a)anthracene	69.0	mg/kg	5.23E-08	mg/m^3	R	2.2E-10	mg/kg-day	3.1E-01	$(mg/kg-day)^{-1}$	6.9E-11
	Benzo(a)pyrene	30.5	mg/kg	2.31E-08	mg/m^3	R	9.9E-11	mg/kg-day	3.1E+00	$(mg/kg-day)^{-1}$	3.1E-10
	Benzo(b)fluoranthene	40.9	mg/kg	3.10E-08	mg/m^3	R	1.3E-10	mg/kg-day	3.1E-01	$(mg/kg-day)^{-1}$	4.1E-11
	Benzo(k)fluoranthene	18.7	mg/kg	1.41E-08	mg/m^3	R	6.0E-11	mg/kg-day	3.1E-02	$(mg/kg-day)^{-1}$	1.9E-12
	Carbazole	3.16	mg/kg	2.39E-09	mg/m^3	R	1.0E-11	mg/kg-day	2.0E-02	$(mg/kg-day)^{-1}$	2.0E-13
	Chrysene	96.0	mg/kg	7.27E-08	mg/m^3	R	3.1E-10	mg/kg-day	3.1E-03	$(mg/kg-day)^{-1}$	9.6E-13
	Dibenz(a,h)anthracene	1.41	mg/kg	1.07E-09	mg/m^3	R	4.6E-12	mg/kg-day	3.1E+00	$(mg/kg-day)^{-1}$	1.4E-11
	Fluoranthene	243	mg/kg	1.84E-07	mg/m^3	R	7.9E-10	mg/kg-day	NA	--	--
	Indeno(1,2,3-cd)pyrene	8.79	mg/kg	6.66E-09	mg/m^3	R	2.8E-11	mg/kg-day	3.1E-01	$(mg/kg-day)^{-1}$	8.8E-12
	Naphthalene	0.525	mg/kg	3.98E-10	mg/m^3	R	1.7E-12	mg/kg-day	NA	--	--
	Pyrene	250	mg/kg	1.89E-07	mg/m^3	R	8.1E-10	mg/kg-day	NA	--	--
	4,4'-DDD	3	mg/kg	2.27E-09	mg/m^3	R	9.7E-12	mg/kg-day	2.4E-01	$(mg/kg-day)^{-1}$	2.3E-12
	Chlordane, alpha-	48	mg/kg	3.64E-08	mg/m^3	R	1.6E-10	mg/kg-day	3.5E-01	$(mg/kg-day)^{-1}$	5.4E-11
	Chlordane, gamma-	58	mg/kg	4.39E-08	mg/m^3	R	1.9E-10	mg/kg-day	3.5E-01	$(mg/kg-day)^{-1}$	6.6E-11
	Dieldrin	0.32	mg/kg	2.42E-10	mg/m^3	R	1.0E-12	mg/kg-day	1.6E+01	$(mg/kg-day)^{-1}$	1.7E-11
	Heptachlor	22	mg/kg	1.67E-08	mg/m^3	R	7.1E-11	mg/kg-day	4.6E+00	$(mg/kg-day)^{-1}$	3.2E-10
	Heptachlor Epoxide	4.5	mg/kg	3.41E-09	mg/m^3	R	1.5E-11	mg/kg-day	9.1E+00	$(mg/kg-day)^{-1}$	1.3E-10
	Aroclor-1248	1.51	mg/kg	1.14E-09	mg/m^3	R	4.9E-12	mg/kg-day	2.0E+00	$(mg/kg-day)^{-1}$	9.8E-12
	Aroclor-1254	0.975	mg/kg	7.39E-10	mg/m^3	R	3.2E-12	mg/kg-day	2.0E+00	$(mg/kg-day)^{-1}$	6.3E-12
	Aroclor-1260	54.6	mg/kg	4.13E-08	mg/m^3	R	1.8E-10	mg/kg-day	2.0E+00	$(mg/kg-day)^{-1}$	3.5E-10
	Gasoline Range Organics	0.207	mg/kg	1.57E-10	mg/m^3	R	6.7E-13	mg/kg-day	NA	--	--
	Diesel Range Organics	470	mg/kg	3.56E-07	mg/m^3	R	1.5E-09	mg/kg-day	NA	--	--
	Antimony	1.22	mg/kg	9.25E-10	mg/m^3	R	4.0E-12	mg/kg-day	NA	--	--
	Arsenic	3.49	mg/kg	2.65E-09	mg/m^3	R	1.1E-11	mg/kg-day	1.5E+01	$(mg/kg-day)^{-1}$	1.7E-10
	Iron	2,260	mg/kg	1.71E-06	mg/m^3	R	7.3E-09	mg/kg-day	NA	--	--
	Thallium	0.31	mg/kg	2.32E-10	mg/m^3	R	9.9E-13	mg/kg-day	NA	--	--
	(Total)										1.6E-09
										Total Risk Across All Exposure Routes/Pathways	1.6E-09

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/m^3 - milligram per cubic meter
mg/kg-day - milligram per kilogram per day

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

TABLE 8.2.1aB RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Current
Medium: Surface Soil
Exposure Medium: Air
Exposure Point: Fugative dust
Receptor Population: Recreational Users
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Inhalation	2-Methylnaphthalene	57.9	mg/kg	4.39E-08	mg/m^3	R	1.9E-10	mg/kg-day	NA	--	--
	Benzo(a)anthracene	4.76	mg/kg	3.61E-09	mg/m^3	R	1.5E-11	mg/kg-day	3.1E-01	$(mg/kg\text{-}day)^{-1}$	4.8E-12
	Benzo(a)pyrene	2.48	mg/kg	1.88E-09	mg/m^3	R	8.0E-12	mg/kg-day	3.1E+00	$(mg/kg\text{-}day)^{-1}$	2.5E-11
	Benzo(b)fluoranthene	2.81	mg/kg	2.13E-09	mg/m^3	R	9.1E-12	mg/kg-day	3.1E-01	$(mg/kg\text{-}day)^{-1}$	2.8E-12
	Benzo(k)fluoranthene	1.78	mg/kg	1.35E-09	mg/m^3	R	5.8E-12	mg/kg-day	3.1E-02	$(mg/kg\text{-}day)^{-1}$	1.8E-13
	Carbazole	0.95	mg/kg	7.20E-10	mg/m^3	R	3.1E-12	mg/kg-day	2.0E-02	$(mg/kg\text{-}day)^{-1}$	6.2E-14
	Chrysene	6.7	mg/kg	5.08E-09	mg/m^3	R	2.2E-11	mg/kg-day	3.1E-03	$(mg/kg\text{-}day)^{-1}$	6.7E-14
	Dibenz(a,h)anthracene	0.695	mg/kg	5.27E-10	mg/m^3	R	2.3E-12	mg/kg-day	3.1E+00	$(mg/kg\text{-}day)^{-1}$	7.0E-12
	Indeno(1,2,3-cd)pyrene	1.72	mg/kg	1.30E-09	mg/m^3	R	5.6E-12	mg/kg-day	3.1E-01	$(mg/kg\text{-}day)^{-1}$	1.7E-12
	Dieldrin	0.052	mg/kg	3.94E-11	mg/m^3	R	1.7E-13	mg/kg-day	1.6E+01	$(mg/kg\text{-}day)^{-1}$	2.7E-12
	Aroclor-1260	95.6	mg/kg	7.24E-08	mg/m^3	R	3.1E-10	mg/kg-day	2.0E+00	$(mg/kg\text{-}day)^{-1}$	6.2E-10
	Arsenic	5.26	mg/kg	3.98E-09	mg/m^3	R	1.7E-11	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	2.6E-10
	Iron	2,347	mg/kg	1.78E-06	mg/m^3	R	7.6E-09	mg/kg-day	NA	--	--
	(Total)										9.2E-10
										Total Risk Across All Exposure Routes/Pathways	9.2E-10

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/m^3 - milligram per cubic meter
mg/kg-day - milligram per kilogram per day

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

TABLE 8.2.2 RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Current
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: Surface Water
Receptor Population: Recreational Users
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Acetone	0.0056	mg/L	0.0056	mg/L	M	9.4E-08	mg/kg-day	NA	--	--
	Toluene	0.0027	mg/L	0.0027	mg/L	M	4.5E-08	mg/kg-day	NA	--	--
	Xylenes, total	0.0035	mg/L	0.0035	mg/L	M	5.9E-08	mg/kg-day	NA	--	--
	(total)										--
Dermal	Acetone	0.0056	mg/L	0.0056	mg/L	M	3.0E-08	mg/kg-day	NA	--	--
	Toluene	0.0027	mg/L	0.0027	mg/L	M	1.2E-06	mg/kg-day	NA	--	--
	Xylenes, total	0.0035	mg/L	0.0035	mg/L	M	3.2E-06	mg/kg-day	NA	--	--
	(Total)										--
										Total Risk Across All Exposure Routes/Pathways	--

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/L - milligram per liter
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

TABLE 8.2.3 RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Current
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Sediment
Receptor Population: Recreational Users
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	2-Methylnaphthalene	10	mg/kg	10	mg/kg	M	6.4E-07	mg/kg-day	NA	--	--
	Aroclor-1248	2.8	mg/kg	2.8	mg/kg	M	1.8E-07	mg/kg-day	2.0E+00	(mg/kg-day) $^{-1}$	3.6E-07
	Aroclor-1260	40	mg/kg	40	mg/kg	M	2.6E-06	mg/kg-day	2.0E+00	(mg/kg-day) $^{-1}$	5.2E-06
	Diesel Range Organics (total)	11,600	mg/kg	11,600	mg/kg	M	7.5E-04	mg/kg-day	NA	--	--
											5.5E-06
Dermal	2-Methylnaphthalene	10	mg/kg	10	mg/kg	M	7.3E-08	mg/kg-day	NA	--	--
	Aroclor-1248	2.8	mg/kg	2.8	mg/kg	M	2.9E-07	mg/kg-day	2.2E+00	(mg/kg-day) $^{-1}$	6.5E-07
	Aroclor-1260	40	mg/kg	40	mg/kg	M	4.1E-06	mg/kg-day	2.2E+00	(mg/kg-day) $^{-1}$	9.1E-06
	Diesel Range Organics (Total)	11,600	mg/kg	11,600	mg/kg	M	8.5E-05	mg/kg-day	NA	--	--
											9.8E-06
									Total Risk Across All Exposure Routes/Pathways		1.5E-05

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

TABLE 8.3.1A RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Current
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Surface Soil
Receptor Population: Recreational Users
Receptor Age: Adolescent

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	2-Methylnaphthalene	1.96	mg/kg	1.96	mg/kg	M	7.4E-08	mg/kg-day	NA	--	--
	Benzo(a)anthracene	69.0	mg/kg	69.0	mg/kg	M	2.6E-06	mg/kg-day	7.3E-01	(mg/kg-day) $^{-1}$	1.9E-06
	Benzo(a)pyrene	30.5	mg/kg	30.5	mg/kg	M	1.1E-06	mg/kg-day	7.3E+00	(mg/kg-day) $^{-1}$	8.4E-06
	Benzo(b)fluoranthene	40.9	mg/kg	40.9	mg/kg	M	1.5E-06	mg/kg-day	7.3E-01	(mg/kg-day) $^{-1}$	1.1E-06
	Benzo(k)fluoranthene	18.7	mg/kg	18.7	mg/kg	M	7.0E-07	mg/kg-day	7.3E-02	(mg/kg-day) $^{-1}$	5.1E-08
	Carbazole	3.16	mg/kg	3.16	mg/kg	M	1.2E-07	mg/kg-day	2.0E-02	(mg/kg-day) $^{-1}$	2.4E-09
	Chrysene	96.0	mg/kg	96.0	mg/kg	M	3.6E-06	mg/kg-day	7.3E-03	(mg/kg-day) $^{-1}$	2.6E-08
	Dibenz(a,h)anthracene	1.41	mg/kg	1.41	mg/kg	M	5.3E-08	mg/kg-day	7.3E+00	(mg/kg-day) $^{-1}$	3.9E-07
	Fluoranthene	243	mg/kg	243	mg/kg	M	9.1E-06	mg/kg-day	NA	--	--
	Indeno(1,2,3-cd)pyrene	8.79	mg/kg	8.79	mg/kg	M	3.3E-07	mg/kg-day	7.3E-01	(mg/kg-day) $^{-1}$	2.4E-07
	Naphthalene	0.525	mg/kg	0.525	mg/kg	M	2.0E-08	mg/kg-day	NA	--	--
	Pyrene	250	mg/kg	250	mg/kg	M	9.4E-06	mg/kg-day	NA	--	--
	4,4'-DDD	3	mg/kg	3	mg/kg	M	1.1E-07	mg/kg-day	2.4E-01	(mg/kg-day) $^{-1}$	2.7E-08
	Chlordane, alpha-	48	mg/kg	48	mg/kg	M	1.8E-06	mg/kg-day	3.5E-01	(mg/kg-day) $^{-1}$	6.3E-07
	Chlordane, gamma-	58	mg/kg	58	mg/kg	M	2.2E-06	mg/kg-day	3.5E-01	(mg/kg-day) $^{-1}$	7.6E-07
	Dieldrin	0.32	mg/kg	0.32	mg/kg	M	1.2E-08	mg/kg-day	1.6E+01	(mg/kg-day) $^{-1}$	1.9E-07
	Heptachlor	22	mg/kg	22	mg/kg	M	8.3E-07	mg/kg-day	4.5E+00	(mg/kg-day) $^{-1}$	3.7E-06
	Heptachlor Epoxide	4.5	mg/kg	4.5	mg/kg	M	1.7E-07	mg/kg-day	9.1E+00	(mg/kg-day) $^{-1}$	1.5E-06
	Aroclor-1248	1.51	mg/kg	1.51	mg/kg	M	5.7E-08	mg/kg-day	2.0E+00	(mg/kg-day) $^{-1}$	1.1E-07
	Aroclor-1254	0.975	mg/kg	0.975	mg/kg	M	3.7E-08	mg/kg-day	2.0E+00	(mg/kg-day) $^{-1}$	7.3E-08
	Aroclor-1260	54.6	mg/kg	54.6	mg/kg	M	2.1E-06	mg/kg-day	2.0E+00	(mg/kg-day) $^{-1}$	4.1E-06
	Gasoline Range Organics	0.207	mg/kg	0.207	mg/kg	M	7.8E-09	mg/kg-day	NA	--	--
	Diesel Range Organics	470	mg/kg	470	mg/kg	M	1.8E-05	mg/kg-day	NA	--	--
	Antimony	1.22	mg/kg	1.22	mg/kg	M	4.6E-08	mg/kg-day	NA	--	--
	Arsenic	3.49	mg/kg	3.49	mg/kg	M	1.3E-07	mg/kg-day	1.5E+00	(mg/kg-day) $^{-1}$	2.0E-07
	Iron	2,260	mg/kg	2,260	mg/kg	M	8.5E-05	mg/kg-day	NA	--	--
	Thallium	0.31	mg/kg	0.31	mg/kg	M	1.2E-08	mg/kg-day	NA	--	--
	(total)										2.3E-05

TABLE 8.3.1A RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Current
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Surface Soil
Receptor Population: Recreational Users
Receptor Age: Adolescent

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Dermal	2-Methylnaphthalene	1.96	mg/kg	1.96	mg/kg	M	7.8E-09	mg/kg-day	NA	--	--
	Benzo(a)anthracene	69.0	mg/kg	69.0	mg/kg	M	3.6E-06	mg/kg-day	2.4E+00	(mg/kg-day) $^{-1}$	8.4E-06
	Benzo(a)pyrene	30.5	mg/kg	30.5	mg/kg	M	1.6E-06	mg/kg-day	1.5E+01	(mg/kg-day) $^{-1}$	2.3E-05
	Benzo(b)fluoranthene	40.9	mg/kg	40.9	mg/kg	M	2.1E-06	mg/kg-day	1.5E+00	(mg/kg-day) $^{-1}$	3.1E-06
	Benzo(k)fluoranthene	18.7	mg/kg	18.7	mg/kg	M	9.7E-07	mg/kg-day	1.5E-01	(mg/kg-day) $^{-1}$	1.4E-07
	Carbazole	3.16	mg/kg	3.16	mg/kg	M	1.6E-07	mg/kg-day	4.0E-02	(mg/kg-day) $^{-1}$	6.5E-09
	Chrysene	96.0	mg/kg	96.0	mg/kg	M	5.0E-06	mg/kg-day	2.4E-02	(mg/kg-day) $^{-1}$	1.2E-07
	Dibenz(a,h)anthracene	1.41	mg/kg	1.41	mg/kg	M	7.3E-08	mg/kg-day	2.4E+01	(mg/kg-day) $^{-1}$	1.7E-06
	Fluoranthene	243	mg/kg	243	mg/kg	M	9.7E-07	mg/kg-day	NA	--	--
	Indeno(1,2,3-cd)pyrene	8.79	mg/kg	8.79	mg/kg	M	4.6E-07	mg/kg-day	2.4E+00	(mg/kg-day) $^{-1}$	1.1E-06
	Naphthalene	0.525	mg/kg	0.525	mg/kg	M	2.1E-09	mg/kg-day	NA	--	--
	Pyrene	250	mg/kg	250	mg/kg	M	1.0E-06	mg/kg-day	NA	--	--
	4,4'-DDD	3	mg/kg	3	mg/kg	M	1.2E-08	mg/kg-day	3.4E-01	(mg/kg-day) $^{-1}$	4.1E-09
	Chlordane, alpha-	48	mg/kg	48	mg/kg	M	7.6E-07	mg/kg-day	4.4E-01	(mg/kg-day) $^{-1}$	3.3E-07
	Chlordane, gamma-	58	mg/kg	58	mg/kg	M	9.2E-07	mg/kg-day	4.4E-01	(mg/kg-day) $^{-1}$	4.0E-07
	Dieldrin	0.32	mg/kg	0.32	mg/kg	M	1.3E-09	mg/kg-day	3.2E+01	(mg/kg-day) $^{-1}$	4.1E-08
	Heptachlor	22	mg/kg	22	mg/kg	M	8.8E-08	mg/kg-day	6.3E+00	(mg/kg-day) $^{-1}$	5.5E-07
	Heptachlor Epoxide	4.5	mg/kg	4.5	mg/kg	M	1.8E-08	mg/kg-day	1.3E+01	(mg/kg-day) $^{-1}$	2.3E-07
	Aroclor-1248	1.51	mg/kg	1.51	mg/kg	M	8.4E-08	mg/kg-day	2.2E+00	(mg/kg-day) $^{-1}$	1.9E-07
	Aroclor-1254	0.975	mg/kg	0.975	mg/kg	M	5.4E-08	mg/kg-day	2.2E+00	(mg/kg-day) $^{-1}$	1.2E-07
	Aroclor-1260	54.6	mg/kg	54.6	mg/kg	M	3.0E-06	mg/kg-day	2.2E+00	(mg/kg-day) $^{-1}$	6.8E-06
	Gasoline Range Organics	0.207	mg/kg	0.207	mg/kg	M	8.2E-10	mg/kg-day	NA	--	--
	Diesel Range Organics	470	mg/kg	470	mg/kg	M	1.9E-06	mg/kg-day	NA	--	--
	Antimony	1.22	mg/kg	1.22	mg/kg	M	4.9E-10	mg/kg-day	NA	--	--
	Arsenic	3.49	mg/kg	3.49	mg/kg	M	4.2E-08	mg/kg-day	3.7E+00	(mg/kg-day) $^{-1}$	1.5E-07
	Iron	2,260	mg/kg	2,260	mg/kg	M	9.0E-07	mg/kg-day	NA	--	--
	Thallium	0.31	mg/kg	0.31	mg/kg	M	1.2E-10	mg/kg-day	NA	--	--
	(Total)										4.6E-05
										Total Risk Across All Exposure Routes/Pathways	7.0E-05

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

TABLE 8.3.1B RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Current
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Surface Soil
Receptor Population: Recreational Users
Receptor Age: Adolescent

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	2-Methylnaphthalene	57.9	mg/kg	57.9	mg/kg	M	2.2E-06	mg/kg-day	NA	--	--
	Benzo(a)anthracene	4.76	mg/kg	4.76	mg/kg	M	1.8E-07	mg/kg-day	7.3E-01	(mg/kg-day) $^{-1}$	1.3E-07
	Benzo(a)pyrene	2.48	mg/kg	2.48	mg/kg	M	9.3E-08	mg/kg-day	7.3E+00	(mg/kg-day) $^{-1}$	6.8E-07
	Benzo(b)fluoranthene	2.81	mg/kg	2.81	mg/kg	M	1.1E-07	mg/kg-day	7.3E-01	(mg/kg-day) $^{-1}$	7.7E-08
	Benzo(k)fluoranthene	1.78	mg/kg	1.78	mg/kg	M	6.7E-08	mg/kg-day	7.3E-02	(mg/kg-day) $^{-1}$	4.9E-09
	Carbazole	0.95	mg/kg	0.95	mg/kg	M	3.6E-08	mg/kg-day	2.0E-02	(mg/kg-day) $^{-1}$	7.1E-10
	Chrysene	6.7	mg/kg	6.7	mg/kg	M	2.5E-07	mg/kg-day	7.3E-03	(mg/kg-day) $^{-1}$	1.8E-09
	Dibenz(a,h)anthracene	0.695	mg/kg	0.695	mg/kg	M	2.6E-08	mg/kg-day	7.3E+00	(mg/kg-day) $^{-1}$	1.9E-07
	Indeno(1,2,3-cd)pyrene	1.72	mg/kg	1.72	mg/kg	M	6.5E-08	mg/kg-day	7.3E-01	(mg/kg-day) $^{-1}$	4.7E-08
	Dieldrin	0.052	mg/kg	0.052	mg/kg	M	2.0E-09	mg/kg-day	1.6E+01	(mg/kg-day) $^{-1}$	3.1E-08
	Aroclor-1260	95.6	mg/kg	95.6	mg/kg	M	3.6E-06	mg/kg-day	2.0E+00	(mg/kg-day) $^{-1}$	7.2E-06
	Arsenic	5.26	mg/kg	5.26	mg/kg	M	2.0E-07	mg/kg-day	1.5E+00	(mg/kg-day) $^{-1}$	3.0E-07
	Iron	2,347	mg/kg	2,347	mg/kg	M	8.8E-05	mg/kg-day	NA	--	--
	(total)										8.6E-06
Dermal	2-Methylnaphthalene	57.9	mg/kg	57.9	mg/kg	M	2.3E-07	mg/kg-day	NA	--	--
	Benzo(a)anthracene	4.76	mg/kg	4.76	mg/kg	M	2.5E-07	mg/kg-day	2.4E+00	(mg/kg-day) $^{-1}$	5.8E-07
	Benzo(a)pyrene	2.48	mg/kg	2.48	mg/kg	M	1.3E-07	mg/kg-day	1.5E+01	(mg/kg-day) $^{-1}$	1.9E-06
	Benzo(b)fluoranthene	2.81	mg/kg	2.81	mg/kg	M	1.5E-07	mg/kg-day	1.5E+00	(mg/kg-day) $^{-1}$	2.1E-07
	Benzo(k)fluoranthene	1.78	mg/kg	1.78	mg/kg	M	9.2E-08	mg/kg-day	1.5E-01	(mg/kg-day) $^{-1}$	1.3E-08
	Carbazole	0.95	mg/kg	0.95	mg/kg	M	4.9E-08	mg/kg-day	4.0E-02	(mg/kg-day) $^{-1}$	2.0E-09
	Chrysene	6.7	mg/kg	6.7	mg/kg	M	3.5E-07	mg/kg-day	2.4E-02	(mg/kg-day) $^{-1}$	8.2E-09
	Dibenz(a,h)anthracene	0.695	mg/kg	0.695	mg/kg	M	3.6E-08	mg/kg-day	2.4E+01	(mg/kg-day) $^{-1}$	8.5E-07
	Indeno(1,2,3-cd)pyrene	1.72	mg/kg	1.72	mg/kg	M	8.9E-08	mg/kg-day	2.4E+00	(mg/kg-day) $^{-1}$	2.1E-07
	Dieldrin	0.052	mg/kg	0.052	mg/kg	M	2.1E-10	mg/kg-day	3.2E+01	(mg/kg-day) $^{-1}$	6.6E-09
	Aroclor-1260	95.6	mg/kg	95.6	mg/kg	M	5.3E-06	mg/kg-day	2.2E+00	(mg/kg-day) $^{-1}$	1.2E-05
	Arsenic	5.26	mg/kg	5.26	mg/kg	M	6.3E-08	mg/kg-day	3.7E+00	(mg/kg-day) $^{-1}$	2.3E-07
	Iron	2,347	mg/kg	2,347	mg/kg	M	9.3E-07	mg/kg-day	NA	--	--
	(Total)										1.6E-05
										Total Risk Across All Exposure Routes/Pathways	2.4E-05

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

TABLE 8.3.1aA RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Current
Medium: Surface Soil
Exposure Medium: Air
Exposure Point: Fugative dust
Receptor Population: Recreational Users
Receptor Age: Adolescent

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Inhalation	2-Methylnaphthalene	1.96	mg/kg	1.48E-09	mg/m^3	R	3.7E-12	mg/kg-day	NA	--	--
	Benzo(a)anthracene	69.0	mg/kg	5.23E-08	mg/m^3	R	1.3E-10	mg/kg-day	3.1E-01	$(mg/kg-day)^{-1}$	4.0E-11
	Benzo(a)pyrene	30.5	mg/kg	2.31E-08	mg/m^3	R	5.8E-11	mg/kg-day	3.1E+00	$(mg/kg-day)^{-1}$	1.8E-10
	Benzo(b)fluoranthene	40.9	mg/kg	3.10E-08	mg/m^3	R	7.7E-11	mg/kg-day	3.1E-01	$(mg/kg-day)^{-1}$	2.4E-11
	Benzo(k)fluoranthene	18.7	mg/kg	1.41E-08	mg/m^3	R	3.5E-11	mg/kg-day	3.1E-02	$(mg/kg-day)^{-1}$	1.1E-12
	Carbazole	3.16	mg/kg	2.39E-09	mg/m^3	R	6.0E-12	mg/kg-day	2.0E-02	$(mg/kg-day)^{-1}$	1.2E-13
	Chrysene	96.0	mg/kg	7.27E-08	mg/m^3	R	1.8E-10	mg/kg-day	3.1E-03	$(mg/kg-day)^{-1}$	5.6E-13
	Dibenz(a,h)anthracene	1.41	mg/kg	1.07E-09	mg/m^3	R	2.7E-12	mg/kg-day	3.1E+00	$(mg/kg-day)^{-1}$	8.3E-12
	Fluoranthene	243	mg/kg	1.84E-07	mg/m^3	R	4.6E-10	mg/kg-day	NA	--	--
	Indeno(1,2,3-cd)pyrene	8.79	mg/kg	6.66E-09	mg/m^3	R	1.7E-11	mg/kg-day	3.1E-01	$(mg/kg-day)^{-1}$	5.2E-12
	Naphthalene	0.525	mg/kg	3.98E-10	mg/m^3	R	9.9E-13	mg/kg-day	NA	--	--
	Pyrene	250	mg/kg	1.89E-07	mg/m^3	R	4.7E-10	mg/kg-day	NA	--	--
	4,4'-DDD	3	mg/kg	2.27E-09	mg/m^3	R	5.7E-12	mg/kg-day	2.4E-01	$(mg/kg-day)^{-1}$	1.4E-12
	Chlordane, alpha-	48	mg/kg	3.64E-08	mg/m^3	R	9.1E-11	mg/kg-day	3.5E-01	$(mg/kg-day)^{-1}$	3.2E-11
	Chlordane, gamma-	58	mg/kg	4.39E-08	mg/m^3	R	1.1E-10	mg/kg-day	3.5E-01	$(mg/kg-day)^{-1}$	3.8E-11
	Dieldrin	0.32	mg/kg	2.42E-10	mg/m^3	R	6.0E-13	mg/kg-day	1.6E+01	$(mg/kg-day)^{-1}$	9.7E-12
	Heptachlor	22	mg/kg	1.67E-08	mg/m^3	R	4.2E-11	mg/kg-day	4.6E+00	$(mg/kg-day)^{-1}$	1.9E-10
	Heptachlor Epoxide	4.5	mg/kg	3.41E-09	mg/m^3	R	8.5E-12	mg/kg-day	9.1E+00	$(mg/kg-day)^{-1}$	7.7E-11
	Aroclor-1248	1.51	mg/kg	1.14E-09	mg/m^3	R	2.8E-12	mg/kg-day	2.0E+00	$(mg/kg-day)^{-1}$	5.7E-12
	Aroclor-1254	0.975	mg/kg	7.39E-10	mg/m^3	R	1.8E-12	mg/kg-day	2.0E+00	$(mg/kg-day)^{-1}$	3.7E-12
	Aroclor-1260	54.6	mg/kg	4.13E-08	mg/m^3	R	1.0E-10	mg/kg-day	2.0E+00	$(mg/kg-day)^{-1}$	2.1E-10
	Gasoline Range Organics	0.207	mg/kg	1.57E-10	mg/m^3	R	3.9E-13	mg/kg-day	NA	--	--
	Diesel Range Organics	470	mg/kg	3.56E-07	mg/m^3	R	8.9E-10	mg/kg-day	NA	--	--
	Antimony	1.22	mg/kg	9.25E-10	mg/m^3	R	2.3E-12	mg/kg-day	NA	--	--
	Arsenic	3.49	mg/kg	2.65E-09	mg/m^3	R	6.6E-12	mg/kg-day	1.5E+01	$(mg/kg-day)^{-1}$	1.0E-10
	Iron	2,260	mg/kg	1.71E-06	mg/m^3	R	4.3E-09	mg/kg-day	NA	--	--
	Thallium	0.31	mg/kg	2.32E-10	mg/m^3	R	5.8E-13	mg/kg-day	NA	--	--
	(Total)										9.2E-10
										Total Risk Across All Exposure Routes/Pathways	9.2E-10

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/m^3 - milligram per cubic meter
mg/kg-day - milligram per kilogram per day

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

TABLE 8.3.1aB RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Current
Medium: Surface Soil
Exposure Medium: Air
Exposure Point: Fugative dust
Receptor Population: Recreational Users
Receptor Age: Adolescent

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Inhalation	2-Methylnaphthalene	57.9	mg/kg	4.39E-08	mg/m^3	R	1.1E-10	mg/kg-day	NA	--	--
	Benzo(a)anthracene	4.76	mg/kg	3.61E-09	mg/m^3	R	9.0E-12	mg/kg-day	3.1E-01	$(mg/kg\text{-}day)^{-1}$	2.8E-12
	Benzo(a)pyrene	2.48	mg/kg	1.88E-09	mg/m^3	R	4.7E-12	mg/kg-day	3.1E+00	$(mg/kg\text{-}day)^{-1}$	1.5E-11
	Benzo(b)fluoranthene	2.81	mg/kg	2.13E-09	mg/m^3	R	5.3E-12	mg/kg-day	3.1E-01	$(mg/kg\text{-}day)^{-1}$	1.6E-12
	Benzo(k)fluoranthene	1.78	mg/kg	1.35E-09	mg/m^3	R	3.4E-12	mg/kg-day	3.1E-02	$(mg/kg\text{-}day)^{-1}$	1.0E-13
	Carbazole	0.95	mg/kg	7.20E-10	mg/m^3	R	1.8E-12	mg/kg-day	2.0E-02	$(mg/kg\text{-}day)^{-1}$	3.6E-14
	Chrysene	6.7	mg/kg	5.08E-09	mg/m^3	R	1.3E-11	mg/kg-day	3.1E-03	$(mg/kg\text{-}day)^{-1}$	3.9E-14
	Dibenz(a,h)anthracene	0.695	mg/kg	5.27E-10	mg/m^3	R	1.3E-12	mg/kg-day	3.1E+00	$(mg/kg\text{-}day)^{-1}$	4.1E-12
	Indeno(1,2,3-cd)pyrene	1.72	mg/kg	1.30E-09	mg/m^3	R	3.2E-12	mg/kg-day	3.1E-01	$(mg/kg\text{-}day)^{-1}$	1.0E-12
	Dieldrin	0.052	mg/kg	3.94E-11	mg/m^3	R	9.8E-14	mg/kg-day	1.6E+01	$(mg/kg\text{-}day)^{-1}$	1.6E-12
	Aroclor-1260	95.6	mg/kg	7.24E-08	mg/m^3	R	1.8E-10	mg/kg-day	2.0E+00	$(mg/kg\text{-}day)^{-1}$	3.6E-10
	Arsenic	5.26	mg/kg	3.98E-09	mg/m^3	R	9.9E-12	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	1.5E-10
	Iron	2,347	mg/kg	1.78E-06	mg/m^3	R	4.4E-09	mg/kg-day	NA	--	--
	(Total)										5.4E-10
										Total Risk Across All Exposure Routes/Pathways	5.4E-10

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/m^3 - milligram per cubic meter
mg/kg-day - milligram per kilogram per day

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

TABLE 8.3.2 RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Current
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: Surface Water
Receptor Population: Recreational Users
Receptor Age: Adolescent

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Acetone	0.0056	mg/L	0.0056	mg/L	M	5.5E-08	mg/kg-day	NA	--	--
	Toluene	0.0027	mg/L	0.0027	mg/L	M	2.6E-08	mg/kg-day	NA	--	--
	Xylenes, total	0.0035	mg/L	0.0035	mg/L	M	3.4E-08	mg/kg-day	NA	--	--
	(total)										--
Dermal	Acetone	0.0056	mg/L	0.0056	mg/L	M	1.7E-08	mg/kg-day	NA	--	--
	Toluene	0.0027	mg/L	0.0027	mg/L	M	6.3E-07	mg/kg-day	NA	--	--
	Xylenes, total	0.0035	mg/L	0.0035	mg/L	M	1.7E-06	mg/kg-day	NA	--	--
	(Total)										--
										Total Risk Across All Exposure Routes/Pathways	--

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/L - milligram per liter
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

TABLE 8.3.3 RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Current
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Sediment
Receptor Population: Recreational Users
Receptor Age: Adolescent

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	2-Methylnaphthalene	10	mg/kg	10	mg/kg	M	3.8E-07	mg/kg-day	NA	--	--
	Aroclor-1248	2.8	mg/kg	2.8	mg/kg	M	1.1E-07	mg/kg-day	2.0E+00	(mg/kg-day) $^{-1}$	2.1E-07
	Aroclor-1260	40	mg/kg	40	mg/kg	M	1.5E-06	mg/kg-day	2.0E+00	(mg/kg-day) $^{-1}$	3.0E-06
	Diesel Range Organics (total)	11,600	mg/kg	11,600	mg/kg	M	4.4E-04	mg/kg-day	NA	--	--
											3.2E-06
Dermal	2-Methylnaphthalene	10	mg/kg	10	mg/kg	M	4.0E-08	mg/kg-day	NA	--	--
	Aroclor-1248	2.8	mg/kg	2.8	mg/kg	M	1.6E-07	mg/kg-day	2.2E+00	(mg/kg-day) $^{-1}$	3.5E-07
	Aroclor-1260	40	mg/kg	40	mg/kg	M	2.2E-06	mg/kg-day	2.2E+00	(mg/kg-day) $^{-1}$	5.0E-06
	Diesel Range Organics (Total)	11,600	mg/kg	11,600	mg/kg	M	4.6E-05	mg/kg-day	NA	--	--
											5.3E-06
									Total Risk Across All Exposure Routes/Pathways		8.5E-06

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

TABLE 8.4.1A RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Surface Soil
Receptor Population: Residents
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	2-Methylnaphthalene	1.96	mg/kg	1.96	mg/kg	M	9.2E-07	mg/kg-day	NA	--	--
	Benzo(a)anthracene	69.0	mg/kg	69.0	mg/kg	M	3.2E-05	mg/kg-day	7.3E-01	(mg/kg-day) $^{-1}$	2.4E-05
	Benzo(a)pyrene	30.5	mg/kg	30.5	mg/kg	M	1.4E-05	mg/kg-day	7.3E+00	(mg/kg-day) $^{-1}$	1.0E-04
	Benzo(b)fluoranthene	40.9	mg/kg	40.9	mg/kg	M	1.9E-05	mg/kg-day	7.3E-01	(mg/kg-day) $^{-1}$	1.4E-05
	Benzo(k)fluoranthene	18.7	mg/kg	18.7	mg/kg	M	8.8E-06	mg/kg-day	7.3E-02	(mg/kg-day) $^{-1}$	6.4E-07
	Carbazole	3.16	mg/kg	3.16	mg/kg	M	1.5E-06	mg/kg-day	2.0E-02	(mg/kg-day) $^{-1}$	3.0E-08
	Chrysene	96.0	mg/kg	96.0	mg/kg	M	4.5E-05	mg/kg-day	7.3E-03	(mg/kg-day) $^{-1}$	3.3E-07
	Dibenz(a,h)anthracene	1.41	mg/kg	1.41	mg/kg	M	6.6E-07	mg/kg-day	7.3E+00	(mg/kg-day) $^{-1}$	4.8E-06
	Fluoranthene	243	mg/kg	243	mg/kg	M	1.1E-04	mg/kg-day	NA	--	--
	Indeno(1,2,3-cd)pyrene	8.79	mg/kg	8.79	mg/kg	M	4.1E-06	mg/kg-day	7.3E-01	(mg/kg-day) $^{-1}$	3.0E-06
	Naphthalene	0.525	mg/kg	0.525	mg/kg	M	2.5E-07	mg/kg-day	NA	--	--
	Pyrene	250	mg/kg	250	mg/kg	M	1.2E-04	mg/kg-day	NA	--	--
	4,4'-DDD	3	mg/kg	3	mg/kg	M	1.4E-06	mg/kg-day	2.4E-01	(mg/kg-day) $^{-1}$	3.4E-07
	Chlordane, alpha-	48	mg/kg	48	mg/kg	M	2.3E-05	mg/kg-day	3.5E-01	(mg/kg-day) $^{-1}$	7.9E-06
	Chlordane, gamma-	58	mg/kg	58	mg/kg	M	2.7E-05	mg/kg-day	3.5E-01	(mg/kg-day) $^{-1}$	9.5E-06
	Dieldrin	0.32	mg/kg	0.32	mg/kg	M	1.5E-07	mg/kg-day	1.6E+01	(mg/kg-day) $^{-1}$	2.4E-06
	Heptachlor	22	mg/kg	22	mg/kg	M	1.0E-05	mg/kg-day	4.5E+00	(mg/kg-day) $^{-1}$	4.6E-05
	Heptachlor Epoxide	4.5	mg/kg	4.5	mg/kg	M	2.1E-06	mg/kg-day	9.1E+00	(mg/kg-day) $^{-1}$	1.9E-05
	Aroclor-1248	1.51	mg/kg	1.51	mg/kg	M	7.1E-07	mg/kg-day	2.0E+00	(mg/kg-day) $^{-1}$	1.4E-06
	Aroclor-1254	0.975	mg/kg	0.975	mg/kg	M	4.6E-07	mg/kg-day	2.0E+00	(mg/kg-day) $^{-1}$	9.2E-07
	Aroclor-1260	54.6	mg/kg	54.6	mg/kg	M	2.6E-05	mg/kg-day	2.0E+00	(mg/kg-day) $^{-1}$	5.1E-05
	Gasoline Range Organics	0.207	mg/kg	0.207	mg/kg	M	9.7E-08	mg/kg-day	NA	--	--
	Diesel Range Organics	470	mg/kg	470	mg/kg	M	2.2E-04	mg/kg-day	NA	--	--
	Antimony	1.22	mg/kg	1.22	mg/kg	M	5.7E-07	mg/kg-day	NA	--	--
	Arsenic	3.49	mg/kg	3.49	mg/kg	M	1.6E-06	mg/kg-day	1.5E+00	(mg/kg-day) $^{-1}$	2.5E-06
	Iron	2,260	mg/kg	2,260	mg/kg	M	1.1E-03	mg/kg-day	NA	--	--
	Thallium	0.31	mg/kg	0.31	mg/kg	M	1.4E-07	mg/kg-day	NA	--	--
	(total)										2.9E-04

TABLE 8.4.1A RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Surface Soil
Receptor Population: Residents
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Dermal	2-Methylnaphthalene	1.96	mg/kg	1.96	mg/kg	M	3.7E-08	mg/kg-day	NA	--	--
	Benzo(a)anthracene	69.0	mg/kg	69.0	mg/kg	M	1.7E-05	mg/kg-day	2.4E+00	(mg/kg-day) $^{-1}$	4.0E-05
	Benzo(a)pyrene	30.5	mg/kg	30.5	mg/kg	M	7.4E-06	mg/kg-day	1.5E+01	(mg/kg-day) $^{-1}$	1.1E-04
	Benzo(b)fluoranthene	40.9	mg/kg	40.9	mg/kg	M	1.0E-05	mg/kg-day	1.5E+00	(mg/kg-day) $^{-1}$	1.5E-05
	Benzo(k)fluoranthene	18.7	mg/kg	18.7	mg/kg	M	4.5E-06	mg/kg-day	1.5E-01	(mg/kg-day) $^{-1}$	6.6E-07
	Carbazole	3.16	mg/kg	3.16	mg/kg	M	7.7E-07	mg/kg-day	4.0E-02	(mg/kg-day) $^{-1}$	3.1E-08
	Chrysene	96.0	mg/kg	96.0	mg/kg	M	2.3E-05	mg/kg-day	2.4E-02	(mg/kg-day) $^{-1}$	5.5E-07
	Dibenz(a,h)anthracene	1.41	mg/kg	1.41	mg/kg	M	3.4E-07	mg/kg-day	2.4E+01	(mg/kg-day) $^{-1}$	8.1E-06
	Fluoranthene	243	mg/kg	243	mg/kg	M	4.6E-06	mg/kg-day	NA	--	--
	Indeno(1,2,3-cd)pyrene	8.79	mg/kg	8.79	mg/kg	M	2.1E-06	mg/kg-day	2.4E+00	(mg/kg-day) $^{-1}$	5.0E-06
	Naphthalene	0.525	mg/kg	0.525	mg/kg	M	9.8E-09	mg/kg-day	NA	--	--
	Pyrene	250	mg/kg	250	mg/kg	M	4.7E-06	mg/kg-day	NA	--	--
	4,4'-DDD	3	mg/kg	3	mg/kg	M	5.6E-08	mg/kg-day	3.4E-01	(mg/kg-day) $^{-1}$	1.9E-08
	Chlordane, alpha-	48	mg/kg	48	mg/kg	M	3.6E-06	mg/kg-day	4.4E-01	(mg/kg-day) $^{-1}$	1.6E-06
	Chlordane, gamma-	58	mg/kg	58	mg/kg	M	4.3E-06	mg/kg-day	4.4E-01	(mg/kg-day) $^{-1}$	1.9E-06
	Dieldrin	0.32	mg/kg	0.32	mg/kg	M	6.0E-09	mg/kg-day	3.2E+01	(mg/kg-day) $^{-1}$	1.9E-07
	Heptachlor	22	mg/kg	22	mg/kg	M	4.1E-07	mg/kg-day	6.3E+00	(mg/kg-day) $^{-1}$	2.6E-06
	Heptachlor Epoxide	4.5	mg/kg	4.5	mg/kg	M	8.4E-08	mg/kg-day	1.3E+01	(mg/kg-day) $^{-1}$	1.1E-06
	Aroclor-1248	1.51	mg/kg	1.51	mg/kg	M	4.0E-07	mg/kg-day	2.2E+00	(mg/kg-day) $^{-1}$	8.9E-07
	Aroclor-1254	0.975	mg/kg	0.975	mg/kg	M	2.6E-07	mg/kg-day	2.2E+00	(mg/kg-day) $^{-1}$	5.7E-07
	Aroclor-1260	54.6	mg/kg	54.6	mg/kg	M	1.4E-05	mg/kg-day	2.2E+00	(mg/kg-day) $^{-1}$	3.2E-05
	Gasoline Range Organics	0.207	mg/kg	0.207	mg/kg	M	3.9E-09	mg/kg-day	NA	--	--
	Diesel Range Organics	470	mg/kg	470	mg/kg	M	8.8E-06	mg/kg-day	NA	--	--
	Antimony	1.22	mg/kg	1.22	mg/kg	M	2.3E-09	mg/kg-day	NA	--	--
	Arsenic	3.49	mg/kg	3.49	mg/kg	M	2.0E-07	mg/kg-day	3.7E+00	(mg/kg-day) $^{-1}$	7.2E-07
	Iron	2,260	mg/kg	2,260	mg/kg	M	4.2E-06	mg/kg-day	NA	--	--
	Thallium	0.31	mg/kg	0.31	mg/kg	M	5.7E-10	mg/kg-day	NA	--	--
	(Total)										2.2E-04
										Total Risk Across All Exposure Routes/Pathways	5.1E-04

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

TABLE 8.4.1B RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Surface Soil
Receptor Population: Residents
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	2-Methylnaphthalene	57.9	mg/kg	57.9	mg/kg	M	2.7E-05	mg/kg-day	NA	--	--
	Benzo(a)anthracene	4.76	mg/kg	4.76	mg/kg	M	2.2E-06	mg/kg-day	7.3E-01	$(mg/kg-day)^{-1}$	1.6E-06
	Benzo(a)pyrene	2.48	mg/kg	2.48	mg/kg	M	1.2E-06	mg/kg-day	7.3E+00	$(mg/kg-day)^{-1}$	8.5E-06
	Benzo(b)fluoranthene	2.81	mg/kg	2.81	mg/kg	M	1.3E-06	mg/kg-day	7.3E-01	$(mg/kg-day)^{-1}$	9.6E-07
	Benzo(k)fluoranthene	1.78	mg/kg	1.78	mg/kg	M	8.4E-07	mg/kg-day	7.3E-02	$(mg/kg-day)^{-1}$	6.1E-08
	Carbazole	0.95	mg/kg	0.95	mg/kg	M	4.5E-07	mg/kg-day	2.0E-02	$(mg/kg-day)^{-1}$	8.9E-09
	Chrysene	6.7	mg/kg	6.7	mg/kg	M	3.1E-06	mg/kg-day	7.3E-03	$(mg/kg-day)^{-1}$	2.3E-08
	Dibenz(a,h)anthracene	0.695	mg/kg	0.695	mg/kg	M	3.3E-07	mg/kg-day	7.3E+00	$(mg/kg-day)^{-1}$	2.4E-06
	Indeno(1,2,3-cd)pyrene	1.72	mg/kg	1.72	mg/kg	M	8.1E-07	mg/kg-day	7.3E-01	$(mg/kg-day)^{-1}$	5.9E-07
	Dieldrin	0.052	mg/kg	0.052	mg/kg	M	2.4E-08	mg/kg-day	1.6E+01	$(mg/kg-day)^{-1}$	3.9E-07
	Aroclor-1260	95.6	mg/kg	95.6	mg/kg	M	4.5E-05	mg/kg-day	2.0E+00	$(mg/kg-day)^{-1}$	9.0E-05
	Arsenic	5.26	mg/kg	5.26	mg/kg	M	2.5E-06	mg/kg-day	1.5E+00	$(mg/kg-day)^{-1}$	3.7E-06
	Iron	2,347	mg/kg	2,347	mg/kg	M	1.1E-03	mg/kg-day	NA	--	--
	(total)										1.1E-04
Dermal	2-Methylnaphthalene	57.9	mg/kg	57.9	mg/kg	M	1.1E-06	mg/kg-day	NA	--	--
	Benzo(a)anthracene	4.76	mg/kg	4.76	mg/kg	M	1.2E-06	mg/kg-day	2.4E+00	$(mg/kg-day)^{-1}$	2.7E-06
	Benzo(a)pyrene	2.48	mg/kg	2.48	mg/kg	M	6.0E-07	mg/kg-day	1.5E+01	$(mg/kg-day)^{-1}$	8.8E-06
	Benzo(b)fluoranthene	2.81	mg/kg	2.81	mg/kg	M	6.8E-07	mg/kg-day	1.5E+00	$(mg/kg-day)^{-1}$	1.0E-06
	Benzo(k)fluoranthene	1.78	mg/kg	1.78	mg/kg	M	4.3E-07	mg/kg-day	1.5E-01	$(mg/kg-day)^{-1}$	6.3E-08
	Carbazole	0.95	mg/kg	0.95	mg/kg	M	2.3E-07	mg/kg-day	4.0E-02	$(mg/kg-day)^{-1}$	9.3E-09
	Chrysene	6.7	mg/kg	6.7	mg/kg	M	1.6E-06	mg/kg-day	2.4E-02	$(mg/kg-day)^{-1}$	3.8E-08
	Dibenz(a,h)anthracene	0.695	mg/kg	0.695	mg/kg	M	1.7E-07	mg/kg-day	2.4E+01	$(mg/kg-day)^{-1}$	4.0E-06
	Indeno(1,2,3-cd)pyrene	1.72	mg/kg	1.72	mg/kg	M	4.2E-07	mg/kg-day	2.4E+00	$(mg/kg-day)^{-1}$	9.9E-07
	Dieldrin	0.052	mg/kg	0.052	mg/kg	M	9.7E-10	mg/kg-day	3.2E+01	$(mg/kg-day)^{-1}$	3.1E-08
	Aroclor-1260	95.6	mg/kg	95.6	mg/kg	M	2.5E-05	mg/kg-day	2.2E+00	$(mg/kg-day)^{-1}$	5.6E-05
	Arsenic	5.26	mg/kg	5.26	mg/kg	M	3.0E-07	mg/kg-day	3.7E+00	$(mg/kg-day)^{-1}$	1.1E-06
	Iron	2,347	mg/kg	2,347	mg/kg	M	4.4E-06	mg/kg-day	NA	--	--
	(Total)										7.4E-05
										Total Risk Across All Exposure Routes/Pathways	1.8E-04

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

TABLE 8.4.1aA RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Air
Exposure Point: Fugative dust
Receptor Population: Residents
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Inhalation	2-Methylnaphthalene	1.96	mg/kg	1.48E-09	mg/m^3	R	1.4E-10	mg/kg-day	NA	--	--
	Benzo(a)anthracene	69.0	mg/kg	5.23E-08	mg/m^3	R	4.9E-09	mg/kg-day	3.1E-01	$(mg/kg-day)^{-1}$	1.5E-09
	Benzo(a)pyrene	30.5	mg/kg	2.31E-08	mg/m^3	R	2.2E-09	mg/kg-day	3.1E+00	$(mg/kg-day)^{-1}$	6.7E-09
	Benzo(b)fluoranthene	40.9	mg/kg	3.10E-08	mg/m^3	R	2.9E-09	mg/kg-day	3.1E-01	$(mg/kg-day)^{-1}$	9.0E-10
	Benzo(k)fluoranthene	18.7	mg/kg	1.41E-08	mg/m^3	R	1.3E-09	mg/kg-day	3.1E-02	$(mg/kg-day)^{-1}$	4.1E-11
	Carbazole	3.16	mg/kg	2.39E-09	mg/m^3	R	2.2E-10	mg/kg-day	2.0E-02	$(mg/kg-day)^{-1}$	4.5E-12
	Chrysene	96.0	mg/kg	7.27E-08	mg/m^3	R	6.8E-09	mg/kg-day	3.1E-03	$(mg/kg-day)^{-1}$	2.1E-11
	Dibenz(a,h)anthracene	1.41	mg/kg	1.07E-09	mg/m^3	R	1.0E-10	mg/kg-day	3.1E+00	$(mg/kg-day)^{-1}$	3.1E-10
	Fluoranthene	243	mg/kg	1.84E-07	mg/m^3	R	1.7E-08	mg/kg-day	NA	--	--
	Indeno(1,2,3-cd)pyrene	8.79	mg/kg	6.66E-09	mg/m^3	R	6.2E-10	mg/kg-day	3.1E-01	$(mg/kg-day)^{-1}$	1.9E-10
	Naphthalene	0.525	mg/kg	3.98E-10	mg/m^3	R	3.7E-11	mg/kg-day	NA	--	--
	Pyrene	250	mg/kg	1.89E-07	mg/m^3	R	1.8E-08	mg/kg-day	NA	--	--
	4,4'-DDD	3	mg/kg	2.27E-09	mg/m^3	R	2.1E-10	mg/kg-day	2.4E-01	$(mg/kg-day)^{-1}$	5.1E-11
	Chlordane, alpha-	48	mg/kg	3.64E-08	mg/m^3	R	3.4E-09	mg/kg-day	3.5E-01	$(mg/kg-day)^{-1}$	1.2E-09
	Chlordane, gamma-	58	mg/kg	4.39E-08	mg/m^3	R	4.1E-09	mg/kg-day	3.5E-01	$(mg/kg-day)^{-1}$	1.4E-09
	Dieldrin	0.32	mg/kg	2.42E-10	mg/m^3	R	2.3E-11	mg/kg-day	1.6E+01	$(mg/kg-day)^{-1}$	3.7E-10
	Heptachlor	22	mg/kg	1.67E-08	mg/m^3	R	1.6E-09	mg/kg-day	4.6E+00	$(mg/kg-day)^{-1}$	7.1E-09
	Heptachlor Epoxide	4.5	mg/kg	3.41E-09	mg/m^3	R	3.2E-10	mg/kg-day	9.1E+00	$(mg/kg-day)^{-1}$	2.9E-09
	Aroclor-1248	1.51	mg/kg	1.14E-09	mg/m^3	R	1.1E-10	mg/kg-day	2.0E+00	$(mg/kg-day)^{-1}$	2.1E-10
	Aroclor-1254	0.975	mg/kg	7.39E-10	mg/m^3	R	6.9E-11	mg/kg-day	2.0E+00	$(mg/kg-day)^{-1}$	1.4E-10
	Aroclor-1260	54.6	mg/kg	4.13E-08	mg/m^3	R	3.9E-09	mg/kg-day	2.0E+00	$(mg/kg-day)^{-1}$	7.7E-09
	Gasoline Range Organics	0.207	mg/kg	1.57E-10	mg/m^3	R	1.5E-11	mg/kg-day	NA	--	--
	Diesel Range Organics	470	mg/kg	3.56E-07	mg/m^3	R	3.3E-08	mg/kg-day	NA	--	--
	Antimony	1.22	mg/kg	9.25E-10	mg/m^3	R	8.7E-11	mg/kg-day	NA	--	--
	Arsenic	3.49	mg/kg	2.65E-09	mg/m^3	R	2.5E-10	mg/kg-day	1.5E+01	$(mg/kg-day)^{-1}$	3.7E-09
	Iron	2,260	mg/kg	1.71E-06	mg/m^3	R	1.6E-07	mg/kg-day	NA	--	--
	Thallium	0.31	mg/kg	2.32E-10	mg/m^3	R	2.2E-11	mg/kg-day	NA	--	--
	(Total)										3.5E-08
										Total Risk Across All Exposure Routes/Pathways	3.5E-08

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/m^3 - milligram per cubic meter
mg/kg-day - milligram per kilogram per day

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

TABLE 8.4.1aB RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Air
Exposure Point: Fugative dust
Receptor Population: Residents
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Inhalation	2-Methylnaphthalene	57.9	mg/kg	4.39E-08	mg/m^3	R	4.1E-09	mg/kg-day	NA	--	--
	Benzo(a)anthracene	4.76	mg/kg	3.61E-09	mg/m^3	R	3.4E-10	mg/kg-day	3.1E-01	$(mg/kg\text{-}day)^{-1}$	1.0E-10
	Benzo(a)pyrene	2.48	mg/kg	1.88E-09	mg/m^3	R	1.8E-10	mg/kg-day	3.1E+00	$(mg/kg\text{-}day)^{-1}$	5.4E-10
	Benzo(b)fluoranthene	2.81	mg/kg	2.13E-09	mg/m^3	R	2.0E-10	mg/kg-day	3.1E-01	$(mg/kg\text{-}day)^{-1}$	6.2E-11
	Benzo(k)fluoranthene	1.78	mg/kg	1.35E-09	mg/m^3	R	1.3E-10	mg/kg-day	3.1E-02	$(mg/kg\text{-}day)^{-1}$	3.9E-12
	Carbazole	0.95	mg/kg	7.20E-10	mg/m^3	R	6.7E-11	mg/kg-day	2.0E-02	$(mg/kg\text{-}day)^{-1}$	1.3E-12
	Chrysene	6.7	mg/kg	5.08E-09	mg/m^3	R	4.7E-10	mg/kg-day	3.1E-03	$(mg/kg\text{-}day)^{-1}$	1.5E-12
	Dibenz(a,h)anthracene	0.695	mg/kg	5.27E-10	mg/m^3	R	4.9E-11	mg/kg-day	3.1E+00	$(mg/kg\text{-}day)^{-1}$	1.5E-10
	Indeno(1,2,3-cd)pyrene	1.72	mg/kg	1.30E-09	mg/m^3	R	1.2E-10	mg/kg-day	3.1E-01	$(mg/kg\text{-}day)^{-1}$	3.8E-11
	Dieldrin	0.052	mg/kg	3.94E-11	mg/m^3	R	3.7E-12	mg/kg-day	1.6E+01	$(mg/kg\text{-}day)^{-1}$	5.9E-11
	Aroclor-1260	95.6	mg/kg	7.24E-08	mg/m^3	R	6.8E-09	mg/kg-day	2.0E+00	$(mg/kg\text{-}day)^{-1}$	1.4E-08
	Arsenic	5.26	mg/kg	3.98E-09	mg/m^3	R	3.7E-10	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	5.6E-09
	Iron	2,347	mg/kg	1.78E-06	mg/m^3	R	1.7E-07	mg/kg-day	NA	--	--
	(Total)										2.0E-08
										Total Risk Across All Exposure Routes/Pathways	2.0E-08

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/m^3 - milligram per cubic meter
mg/kg-day - milligram per kilogram per day

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

TABLE 8.4.2 RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Tap
Receptor Population: Residents
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzene	0.0034	mg/L	0.0034	mg/L	M	3.2E-05	mg/kg-day	5.5E-02	(mg/kg-day) $^{-1}$	1.8E-06
	Chloroform	0.016	mg/L	0.016	mg/L	M	1.5E-04	mg/kg-day	6.1E-03	(mg/kg-day) $^{-1}$	9.2E-07
	2-Methylnaphthalene	0.00105	mg/L	0.00105	mg/L	M	9.9E-06	mg/kg-day	NA	--	--
	Naphthalene	0.0022	mg/L	0.0022	mg/L	M	2.1E-05	mg/kg-day	NA	--	--
	Heptachlor Epoxide	0.0000167	mg/L	0.0000167	mg/L	M	1.6E-07	mg/kg-day	9.1E+00	(mg/kg-day) $^{-1}$	1.4E-06
	MCPA	0.044	mg/L	0.044	mg/L	M	4.1E-04	mg/kg-day	NA	--	--
	Antimony	0.011	mg/L	0.011	mg/L	M	1.0E-04	mg/kg-day	NA	--	--
	Arsenic	0.03	mg/L	0.03	mg/L	M	2.8E-04	mg/kg-day	1.5E+00	(mg/kg-day) $^{-1}$	4.2E-04
	Iron	67.7	mg/L	67.7	mg/L	M	6.4E-01	mg/kg-day	NA	--	--
	Manganese	0.45	mg/L	0.45	mg/L	M	4.2E-03	mg/kg-day	NA	--	--
	Thallium	0.0057	mg/L	0.0057	mg/L	M	5.4E-05	mg/kg-day	NA	--	--
	(total)										4.3E-04
Dermal	Benzene	0.0034	mg/L	0.0034	mg/L	M	1.5E-06	mg/kg-day	5.9E-02	(mg/kg-day) $^{-1}$	8.9E-08
	Chloroform	0.016	mg/L	0.016	mg/L	M	3.0E-06	mg/kg-day	3.1E-02	(mg/kg-day) $^{-1}$	9.2E-08
	2-Methylnaphthalene	0.00105	mg/L	0.00105	mg/L	M	3.2E-06	mg/kg-day	NA	--	--
	Naphthalene	0.0022	mg/L	0.0022	mg/L	M	3.2E-06	mg/kg-day	NA	--	--
	Heptachlor Epoxide	0.0000167	mg/L	0.0000167	mg/L	M	1.9E-08	mg/kg-day	1.3E+01	(mg/kg-day) $^{-1}$	2.5E-07
	MCPA	0.044	mg/L	0.044	mg/L	M	4.6E-06	mg/kg-day	NA	--	--
	Antimony	0.011	mg/L	0.011	mg/L	M	2.3E-07	mg/kg-day	NA	--	--
	Arsenic	0.03	mg/L	0.03	mg/L	M	6.3E-07	mg/kg-day	3.7E+00	(mg/kg-day) $^{-1}$	2.3E-06
	Iron	67.7	mg/L	67.7	mg/L	M	1.4E-03	mg/kg-day	NA	--	--
	Manganese	0.45	mg/L	0.45	mg/L	M	9.5E-06	mg/kg-day	NA	--	--
	Thallium	0.0057	mg/L	0.0057	mg/L	M	1.2E-07	mg/kg-day	NA	--	--
	(Total)										2.7E-06
										Total Risk Across All Exposure Routes/Pathways	4.3E-04

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/L - milligram per liter
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

TABLE 8.4.2a RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Air
Exposure Point: Tap
Receptor Population: Residents
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Inhalation	Benzene	0.0034	mg/L	4.81E-03	mg/m^3	R	4.7E-06	mg/kg-day	2.7E-02	$(mg/kg\text{-}day)^{-1}$	1.3E-07
	Chloroform	0.016	mg/L	1.80E-02	mg/m^3	R	1.8E-05	mg/kg-day	8.1E-02	$(mg/kg\text{-}day)^{-1}$	1.4E-06
	(Total)										1.5E-06
										Total Risk Across All Exposure Routes/Pathways	1.5E-06

NOTES:

EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.

mg/L - milligram per liter
mg/m^3 - milligram per cubic meter
mg/kg-day - milligram per kilogram per day

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

TABLE 8.4.3 RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: Surface Water
Receptor Population: Residents
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Acetone	0.0056	mg/L	0.0056	mg/L	M	9.4E-08	mg/kg-day	NA	--	--
	Toluene	0.0027	mg/L	0.0027	mg/L	M	4.5E-08	mg/kg-day	NA	--	--
	Xylenes, total	0.0035	mg/L	0.0035	mg/L	M	5.9E-08	mg/kg-day	NA	--	--
	(total)										--
Dermal	Acetone	0.0056	mg/L	0.0056	mg/L	M	3.0E-08	mg/kg-day	NA	--	--
	Toluene	0.0027	mg/L	0.0027	mg/L	M	1.2E-06	mg/kg-day	NA	--	--
	Xylenes, total	0.0035	mg/L	0.0035	mg/L	M	3.2E-06	mg/kg-day	NA	--	--
	(Total)										--
										Total Risk Across All Exposure Routes/Pathways	--

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/L - milligram per liter
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

TABLE 8.4.4 RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Sediment
Receptor Population: Residents
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	2-Methylnaphthalene	10	mg/kg	10	mg/kg	M	6.4E-07	mg/kg-day	NA	--	--
	Aroclor-1248	2.8	mg/kg	2.8	mg/kg	M	1.8E-07	mg/kg-day	2.0E+00	$(mg/kg\text{-}day)^{-1}$	3.6E-07
	Aroclor-1260	40	mg/kg	40	mg/kg	M	2.6E-06	mg/kg-day	2.0E+00	$(mg/kg\text{-}day)^{-1}$	5.2E-06
	Diesel Range Organics (total)	11,600	mg/kg	11,600	mg/kg	M	7.5E-04	mg/kg-day	NA	--	--
											5.5E-06
Dermal	2-Methylnaphthalene	10	mg/kg	10	mg/kg	M	2.6E-08	mg/kg-day	NA	--	--
	Aroclor-1248	2.8	mg/kg	2.8	mg/kg	M	1.0E-07	mg/kg-day	2.2E+00	$(mg/kg\text{-}day)^{-1}$	2.3E-07
	Aroclor-1260	40	mg/kg	40	mg/kg	M	1.4E-06	mg/kg-day	2.2E+00	$(mg/kg\text{-}day)^{-1}$	3.2E-06
	Diesel Range Organics (Total)	11,600	mg/kg	11,600	mg/kg	M	3.0E-05	mg/kg-day	NA	--	--
											3.4E-06
									Total Risk Across All Exposure Routes/Pathways		8.9E-06

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

TABLE 8.4.1A CT
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Surface Soil
Receptor Population: Residents
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	2-Methylnaphthalene	1.96	mg/kg	1.96	mg/kg	M	1.2E-07	mg/kg-day	NA	--	--
	Benzo(a)anthracene	69.0	mg/kg	69.0	mg/kg	M	4.1E-06	mg/kg-day	7.3E-01	(mg/kg-day) $^{-1}$	3.0E-06
	Benzo(a)pyrene	30.5	mg/kg	30.5	mg/kg	M	1.8E-06	mg/kg-day	7.3E+00	(mg/kg-day) $^{-1}$	1.3E-05
	Benzo(b)fluoranthene	40.9	mg/kg	40.9	mg/kg	M	2.4E-06	mg/kg-day	7.3E-01	(mg/kg-day) $^{-1}$	1.8E-06
	Benzo(k)fluoranthene	18.7	mg/kg	18.7	mg/kg	M	1.1E-06	mg/kg-day	7.3E-02	(mg/kg-day) $^{-1}$	8.0E-08
	Carbazole	3.16	mg/kg	3.16	mg/kg	M	1.9E-07	mg/kg-day	2.0E-02	(mg/kg-day) $^{-1}$	3.7E-09
	Chrysene	96.0	mg/kg	96.0	mg/kg	M	5.7E-06	mg/kg-day	7.3E-03	(mg/kg-day) $^{-1}$	4.1E-08
	Dibenz(a,h)anthracene	1.41	mg/kg	1.41	mg/kg	M	8.3E-08	mg/kg-day	7.3E+00	(mg/kg-day) $^{-1}$	6.1E-07
	Fluoranthene	243	mg/kg	243	mg/kg	M	1.4E-05	mg/kg-day	NA	--	--
	Indeno(1,2,3-cd)pyrene	8.79	mg/kg	8.79	mg/kg	M	5.2E-07	mg/kg-day	7.3E-01	(mg/kg-day) $^{-1}$	3.8E-07
	Naphthalene	0.525	mg/kg	0.525	mg/kg	M	3.1E-08	mg/kg-day	NA	--	--
	Pyrene	250	mg/kg	250	mg/kg	M	1.5E-05	mg/kg-day	NA	--	--
	4,4'-DDD	3	mg/kg	3	mg/kg	M	1.8E-07	mg/kg-day	2.4E-01	(mg/kg-day) $^{-1}$	4.2E-08
	Chlordane, alpha-	48	mg/kg	48	mg/kg	M	2.8E-06	mg/kg-day	3.5E-01	(mg/kg-day) $^{-1}$	9.9E-07
	Chlordane, gamma-	58	mg/kg	58	mg/kg	M	3.4E-06	mg/kg-day	3.5E-01	(mg/kg-day) $^{-1}$	1.2E-06
	Dieldrin	0.32	mg/kg	0.32	mg/kg	M	1.9E-08	mg/kg-day	1.6E+01	(mg/kg-day) $^{-1}$	3.0E-07
	Heptachlor	22	mg/kg	22	mg/kg	M	1.3E-06	mg/kg-day	4.5E+00	(mg/kg-day) $^{-1}$	5.8E-06
	Heptachlor Epoxide	4.5	mg/kg	4.5	mg/kg	M	2.6E-07	mg/kg-day	9.1E+00	(mg/kg-day) $^{-1}$	2.4E-06
	Aroclor-1248	1.51	mg/kg	1.51	mg/kg	M	8.9E-08	mg/kg-day	2.0E+00	(mg/kg-day) $^{-1}$	1.8E-07
	Aroclor-1254	0.975	mg/kg	0.975	mg/kg	M	5.7E-08	mg/kg-day	2.0E+00	(mg/kg-day) $^{-1}$	1.1E-07
	Aroclor-1260	54.6	mg/kg	54.6	mg/kg	M	3.2E-06	mg/kg-day	2.0E+00	(mg/kg-day) $^{-1}$	6.4E-06
	Gasoline Range Organics	0.207	mg/kg	0.207	mg/kg	M	1.2E-08	mg/kg-day	NA	--	--
	Diesel Range Organics	470	mg/kg	470	mg/kg	M	2.8E-05	mg/kg-day	NA	--	--
	Antimony	1.22	mg/kg	1.22	mg/kg	M	7.2E-08	mg/kg-day	NA	--	--
	Arsenic	3.49	mg/kg	3.49	mg/kg	M	2.1E-07	mg/kg-day	1.5E+00	(mg/kg-day) $^{-1}$	3.1E-07
	Iron	2,260	mg/kg	2,260	mg/kg	M	1.3E-04	mg/kg-day	NA	--	--
	Thallium	0.31	mg/kg	0.31	mg/kg	M	1.8E-08	mg/kg-day	NA	--	--
	(total)										3.7E-05

TABLE 8.4.1A CT
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Surface Soil
Receptor Population: Residents
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Dermal	2-Methylnaphthalene	1.96	mg/kg	1.96	mg/kg	M	8.1E-09	mg/kg-day	NA	--	--
	Benzo(a)anthracene	69.0	mg/kg	69.0	mg/kg	M	3.7E-06	mg/kg-day	2.4E+00	(mg/kg-day) $^{-1}$	8.7E-06
	Benzo(a)pyrene	30.5	mg/kg	30.5	mg/kg	M	1.6E-06	mg/kg-day	1.5E+01	(mg/kg-day) $^{-1}$	2.4E-05
	Benzo(b)fluoranthene	40.9	mg/kg	40.9	mg/kg	M	2.2E-06	mg/kg-day	1.5E+00	(mg/kg-day) $^{-1}$	3.2E-06
	Benzo(k)fluoranthene	18.7	mg/kg	18.7	mg/kg	M	1.0E-06	mg/kg-day	1.5E-01	(mg/kg-day) $^{-1}$	1.5E-07
	Carbazole	3.16	mg/kg	3.16	mg/kg	M	1.7E-07	mg/kg-day	4.0E-02	(mg/kg-day) $^{-1}$	6.8E-09
	Chrysene	96.0	mg/kg	96.0	mg/kg	M	5.1E-06	mg/kg-day	2.4E-02	(mg/kg-day) $^{-1}$	1.2E-07
	Dibenz(a,h)anthracene	1.41	mg/kg	1.41	mg/kg	M	7.6E-08	mg/kg-day	2.4E+01	(mg/kg-day) $^{-1}$	1.8E-06
	Fluoranthene	243	mg/kg	243	mg/kg	M	1.0E-06	mg/kg-day	NA	--	--
	Indeno(1,2,3-cd)pyrene	8.79	mg/kg	8.79	mg/kg	M	4.7E-07	mg/kg-day	2.4E+00	(mg/kg-day) $^{-1}$	1.1E-06
	Naphthalene	0.525	mg/kg	0.525	mg/kg	M	2.2E-09	mg/kg-day	NA	--	--
	Pyrene	250	mg/kg	250	mg/kg	M	1.0E-06	mg/kg-day	NA	--	--
	4,4'-DDD	3	mg/kg	3	mg/kg	M	1.2E-08	mg/kg-day	3.4E-01	(mg/kg-day) $^{-1}$	4.2E-09
	Chlordane, alpha-	48	mg/kg	48	mg/kg	M	7.9E-07	mg/kg-day	4.4E-01	(mg/kg-day) $^{-1}$	3.5E-07
	Chlordane, gamma-	58	mg/kg	58	mg/kg	M	9.6E-07	mg/kg-day	4.4E-01	(mg/kg-day) $^{-1}$	4.2E-07
	Dieldrin	0.32	mg/kg	0.32	mg/kg	M	1.3E-09	mg/kg-day	3.2E+01	(mg/kg-day) $^{-1}$	4.2E-08
	Heptachlor	22	mg/kg	22	mg/kg	M	9.1E-08	mg/kg-day	6.3E+00	(mg/kg-day) $^{-1}$	5.7E-07
	Heptachlor Epoxide	4.5	mg/kg	4.5	mg/kg	M	1.9E-08	mg/kg-day	1.3E+01	(mg/kg-day) $^{-1}$	2.3E-07
	Aroclor-1248	1.51	mg/kg	1.51	mg/kg	M	8.7E-08	mg/kg-day	2.2E+00	(mg/kg-day) $^{-1}$	2.0E-07
	Aroclor-1254	0.975	mg/kg	0.975	mg/kg	M	5.6E-08	mg/kg-day	2.2E+00	(mg/kg-day) $^{-1}$	1.3E-07
	Aroclor-1260	54.6	mg/kg	54.6	mg/kg	M	3.1E-06	mg/kg-day	2.2E+00	(mg/kg-day) $^{-1}$	7.0E-06
	Gasoline Range Organics	0.207	mg/kg	0.207	mg/kg	M	8.5E-10	mg/kg-day	NA	--	--
	Diesel Range Organics	470	mg/kg	470	mg/kg	M	1.9E-06	mg/kg-day	NA	--	--
	Antimony	1.22	mg/kg	1.22	mg/kg	M	5.0E-10	mg/kg-day	NA	--	--
	Arsenic	3.49	mg/kg	3.49	mg/kg	M	4.3E-08	mg/kg-day	3.7E+00	(mg/kg-day) $^{-1}$	1.6E-07
	Iron	2,260	mg/kg	2,260	mg/kg	M	9.3E-07	mg/kg-day	NA	--	--
	Thallium	0.31	mg/kg	0.31	mg/kg	M	1.3E-10	mg/kg-day	NA	--	--
	(Total)										4.8E-05
										Total Risk Across All Exposure Routes/Pathways	8.5E-05

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

TABLE 8.4.1B CT
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY
SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Surface Soil
Receptor Population: Residents
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	2-Methylnaphthalene	57.9	mg/kg	57.9	mg/kg	M	3.4E-06	mg/kg-day	NA	--	--
	Benzo(a)anthracene	4.76	mg/kg	4.76	mg/kg	M	2.8E-07	mg/kg-day	7.3E-01	(mg/kg-day) $^{-1}$	2.0E-07
	Benzo(a)pyrene	2.48	mg/kg	2.48	mg/kg	M	1.5E-07	mg/kg-day	7.3E+00	(mg/kg-day) $^{-1}$	1.1E-06
	Benzo(b)fluoranthene	2.81	mg/kg	2.81	mg/kg	M	1.7E-07	mg/kg-day	7.3E-01	(mg/kg-day) $^{-1}$	1.2E-07
	Benzo(k)fluoranthene	1.78	mg/kg	1.78	mg/kg	M	1.0E-07	mg/kg-day	7.3E-02	(mg/kg-day) $^{-1}$	7.7E-09
	Carbazole	0.95	mg/kg	0.95	mg/kg	M	5.6E-08	mg/kg-day	2.0E-02	(mg/kg-day) $^{-1}$	1.1E-09
	Chrysene	6.7	mg/kg	6.7	mg/kg	M	3.9E-07	mg/kg-day	7.3E-03	(mg/kg-day) $^{-1}$	2.9E-09
	Dibenz(a,h)anthracene	0.695	mg/kg	0.695	mg/kg	M	4.1E-08	mg/kg-day	7.3E+00	(mg/kg-day) $^{-1}$	3.0E-07
	Indeno(1,2,3-cd)pyrene	1.72	mg/kg	1.72	mg/kg	M	1.0E-07	mg/kg-day	7.3E-01	(mg/kg-day) $^{-1}$	7.4E-08
	Dieldrin	0.052	mg/kg	0.052	mg/kg	M	3.1E-09	mg/kg-day	1.6E+01	(mg/kg-day) $^{-1}$	4.9E-08
	Aroclor-1260	95.6	mg/kg	95.6	mg/kg	M	5.6E-06	mg/kg-day	2.0E+00	(mg/kg-day) $^{-1}$	1.1E-05
	Arsenic	5.26	mg/kg	5.26	mg/kg	M	3.1E-07	mg/kg-day	1.5E+00	(mg/kg-day) $^{-1}$	4.6E-07
	Iron	2,347	mg/kg	2,347	mg/kg	M	1.4E-04	mg/kg-day	NA	--	--
	(total)										1.4E-05
Dermal	2-Methylnaphthalene	57.9	mg/kg	57.9	mg/kg	M	2.4E-07	mg/kg-day	NA	--	--
	Benzo(a)anthracene	4.76	mg/kg	4.76	mg/kg	M	2.6E-07	mg/kg-day	2.4E+00	(mg/kg-day) $^{-1}$	6.0E-07
	Benzo(a)pyrene	2.48	mg/kg	2.48	mg/kg	M	1.3E-07	mg/kg-day	1.5E+01	(mg/kg-day) $^{-1}$	1.9E-06
	Benzo(b)fluoranthene	2.81	mg/kg	2.81	mg/kg	M	1.5E-07	mg/kg-day	1.5E+00	(mg/kg-day) $^{-1}$	2.2E-07
	Benzo(k)fluoranthene	1.78	mg/kg	1.78	mg/kg	M	9.5E-08	mg/kg-day	1.5E-01	(mg/kg-day) $^{-1}$	1.4E-08
	Carbazole	0.95	mg/kg	0.95	mg/kg	M	5.1E-08	mg/kg-day	4.0E-02	(mg/kg-day) $^{-1}$	2.0E-09
	Chrysene	6.7	mg/kg	6.7	mg/kg	M	3.6E-07	mg/kg-day	2.4E-02	(mg/kg-day) $^{-1}$	8.5E-09
	Dibenz(a,h)anthracene	0.695	mg/kg	0.695	mg/kg	M	3.7E-08	mg/kg-day	2.4E+01	(mg/kg-day) $^{-1}$	8.8E-07
	Indeno(1,2,3-cd)pyrene	1.72	mg/kg	1.72	mg/kg	M	9.2E-08	mg/kg-day	2.4E+00	(mg/kg-day) $^{-1}$	2.2E-07
	Dieldrin	0.052	mg/kg	0.052	mg/kg	M	2.1E-10	mg/kg-day	3.2E+01	(mg/kg-day) $^{-1}$	6.9E-09
	Aroclor-1260	95.6	mg/kg	95.6	mg/kg	M	5.5E-06	mg/kg-day	2.2E+00	(mg/kg-day) $^{-1}$	1.2E-05
	Arsenic	5.26	mg/kg	5.26	mg/kg	M	6.5E-08	mg/kg-day	3.7E+00	(mg/kg-day) $^{-1}$	2.4E-07
	Iron	2,347	mg/kg	2,347	mg/kg	M	9.7E-07	mg/kg-day	NA	--	--
	(Total)										1.6E-05
										Total Risk Across All Exposure Routes/Pathways	3.0E-05

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

TABLE 8.4.1aA CT
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Air
Exposure Point: Fugative dust
Receptor Population: Residents
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Inhalation	2-Methylnaphthalene	1.96	mg/kg	1.48E-09	mg/m^3	R	3.4E-11	mg/kg-day	NA	--	--
	Benzo(a)anthracene	69.0	mg/kg	5.23E-08	mg/m^3	R	1.2E-09	mg/kg-day	3.1E-01	$(mg/kg-day)^{-1}$	3.7E-10
	Benzo(a)pyrene	30.5	mg/kg	2.31E-08	mg/m^3	R	5.2E-10	mg/kg-day	3.1E+00	$(mg/kg-day)^{-1}$	1.6E-09
	Benzo(b)fluoranthene	40.9	mg/kg	3.10E-08	mg/m^3	R	7.0E-10	mg/kg-day	3.1E-01	$(mg/kg-day)^{-1}$	2.2E-10
	Benzo(k)fluoranthene	18.7	mg/kg	1.41E-08	mg/m^3	R	3.2E-10	mg/kg-day	3.1E-02	$(mg/kg-day)^{-1}$	9.9E-12
	Carbazole	3.16	mg/kg	2.39E-09	mg/m^3	R	5.4E-11	mg/kg-day	2.0E-02	$(mg/kg-day)^{-1}$	1.1E-12
	Chrysene	96.0	mg/kg	7.27E-08	mg/m^3	R	1.6E-09	mg/kg-day	3.1E-03	$(mg/kg-day)^{-1}$	5.1E-12
	Dibenz(a,h)anthracene	1.41	mg/kg	1.07E-09	mg/m^3	R	2.4E-11	mg/kg-day	3.1E+00	$(mg/kg-day)^{-1}$	7.5E-11
	Fluoranthene	243	mg/kg	1.84E-07	mg/m^3	R	4.2E-09	mg/kg-day	NA	--	--
	Indeno(1,2,3-cd)pyrene	8.79	mg/kg	6.66E-09	mg/m^3	R	1.5E-10	mg/kg-day	3.1E-01	$(mg/kg-day)^{-1}$	4.7E-11
	Naphthalene	0.525	mg/kg	3.98E-10	mg/m^3	R	9.0E-12	mg/kg-day	NA	--	--
	Pyrene	250	mg/kg	1.89E-07	mg/m^3	R	4.3E-09	mg/kg-day	NA	--	--
	4,4'-DDD	3	mg/kg	2.27E-09	mg/m^3	R	5.1E-11	mg/kg-day	2.4E-01	$(mg/kg-day)^{-1}$	1.2E-11
	Chlordane, alpha-	48	mg/kg	3.64E-08	mg/m^3	R	8.2E-10	mg/kg-day	3.5E-01	$(mg/kg-day)^{-1}$	2.9E-10
	Chlordane, gamma-	58	mg/kg	4.39E-08	mg/m^3	R	9.9E-10	mg/kg-day	3.5E-01	$(mg/kg-day)^{-1}$	3.5E-10
	Dieldrin	0.32	mg/kg	2.42E-10	mg/m^3	R	5.5E-12	mg/kg-day	1.6E+01	$(mg/kg-day)^{-1}$	8.8E-11
	Heptachlor	22	mg/kg	1.67E-08	mg/m^3	R	3.8E-10	mg/kg-day	4.6E+00	$(mg/kg-day)^{-1}$	1.7E-09
	Heptachlor Epoxide	4.5	mg/kg	3.41E-09	mg/m^3	R	7.7E-11	mg/kg-day	9.1E+00	$(mg/kg-day)^{-1}$	7.0E-10
	Aroclor-1248	1.51	mg/kg	1.14E-09	mg/m^3	R	2.6E-11	mg/kg-day	2.0E+00	$(mg/kg-day)^{-1}$	5.2E-11
	Aroclor-1254	0.975	mg/kg	7.39E-10	mg/m^3	R	1.7E-11	mg/kg-day	2.0E+00	$(mg/kg-day)^{-1}$	3.3E-11
	Aroclor-1260	54.6	mg/kg	4.13E-08	mg/m^3	R	9.3E-10	mg/kg-day	2.0E+00	$(mg/kg-day)^{-1}$	1.9E-09
	Gasoline Range Organics	0.207	mg/kg	1.57E-10	mg/m^3	R	3.5E-12	mg/kg-day	NA	--	--
	Diesel Range Organics	470	mg/kg	3.56E-07	mg/m^3	R	8.0E-09	mg/kg-day	NA	--	--
	Antimony	1.22	mg/kg	9.25E-10	mg/m^3	R	2.1E-11	mg/kg-day	NA	--	--
	Arsenic	3.49	mg/kg	2.65E-09	mg/m^3	R	6.0E-11	mg/kg-day	1.5E+01	$(mg/kg-day)^{-1}$	9.0E-10
	Iron	2,260	mg/kg	1.71E-06	mg/m^3	R	3.9E-08	mg/kg-day	NA	--	--
	Thallium	0.31	mg/kg	2.32E-10	mg/m^3	R	5.3E-12	mg/kg-day	NA	--	--
	(Total)										8.3E-09
										Total Risk Across All Exposure Routes/Pathways	8.3E-09

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/m^3 - milligram per cubic meter
mg/kg-day - milligram per kilogram per day

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

TABLE 8.4.1aB CT
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY
SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Air
Exposure Point: Fugative dust
Receptor Population: Residents
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Inhalation	2-Methylnaphthalene	57.9	mg/kg	4.39E-08	mg/m^3	R	9.9E-10	mg/kg-day	NA	--	--
	Benzo(a)anthracene	4.76	mg/kg	3.61E-09	mg/m^3	R	8.2E-11	mg/kg-day	3.1E-01	$(mg/kg\text{-}day)^{-1}$	2.5E-11
	Benzo(a)pyrene	2.48	mg/kg	1.88E-09	mg/m^3	R	4.2E-11	mg/kg-day	3.1E+00	$(mg/kg\text{-}day)^{-1}$	1.3E-10
	Benzo(b)fluoranthene	2.81	mg/kg	2.13E-09	mg/m^3	R	4.8E-11	mg/kg-day	3.1E-01	$(mg/kg\text{-}day)^{-1}$	1.5E-11
	Benzo(k)fluoranthene	1.78	mg/kg	1.35E-09	mg/m^3	R	3.0E-11	mg/kg-day	3.1E-02	$(mg/kg\text{-}day)^{-1}$	9.5E-13
	Carbazole	0.95	mg/kg	7.20E-10	mg/m^3	R	1.6E-11	mg/kg-day	2.0E-02	$(mg/kg\text{-}day)^{-1}$	3.3E-13
	Chrysene	6.7	mg/kg	5.08E-09	mg/m^3	R	1.1E-10	mg/kg-day	3.1E-03	$(mg/kg\text{-}day)^{-1}$	3.6E-13
	Dibenz(a,h)anthracene	0.695	mg/kg	5.27E-10	mg/m^3	R	1.2E-11	mg/kg-day	3.1E+00	$(mg/kg\text{-}day)^{-1}$	3.7E-11
	Indeno(1,2,3-cd)pyrene	1.72	mg/kg	1.30E-09	mg/m^3	R	2.9E-11	mg/kg-day	3.1E-01	$(mg/kg\text{-}day)^{-1}$	9.1E-12
	Dieldrin	0.052	mg/kg	3.94E-11	mg/m^3	R	8.9E-13	mg/kg-day	1.6E+01	$(mg/kg\text{-}day)^{-1}$	1.4E-11
	Aroclor-1260	95.6	mg/kg	7.24E-08	mg/m^3	R	1.6E-09	mg/kg-day	2.0E+00	$(mg/kg\text{-}day)^{-1}$	3.3E-09
	Arsenic	5.26	mg/kg	3.98E-09	mg/m^3	R	9.0E-11	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	1.4E-09
	Iron	2,347	mg/kg	1.78E-06	mg/m^3	R	4.0E-08	mg/kg-day	NA	--	--
	(Total)										4.9E-09
										Total Risk Across All Exposure Routes/Pathways	4.9E-09

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/m^3 - milligram per cubic meter
mg/kg-day - milligram per kilogram per day

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

TABLE 8.4.2 CT
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Tap
Receptor Population: Residents
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzene	0.0034	mg/L	0.0034	mg/L	M	5.6E-06	mg/kg-day	5.5E-02	(mg/kg-day) $^{-1}$	3.1E-07
	Chloroform	0.016	mg/L	0.016	mg/L	M	2.6E-05	mg/kg-day	6.1E-03	(mg/kg-day) $^{-1}$	1.6E-07
	2-Methylnaphthalene	0.00105	mg/L	0.00105	mg/L	M	1.7E-06	mg/kg-day	NA	--	--
	Naphthalene	0.0022	mg/L	0.0022	mg/L	M	3.6E-06	mg/kg-day	NA	--	--
	Heptachlor Epoxide	0.0000167	mg/L	0.0000167	mg/L	M	2.8E-08	mg/kg-day	9.1E+00	(mg/kg-day) $^{-1}$	2.5E-07
	MCPA	0.044	mg/L	0.044	mg/L	M	7.3E-05	mg/kg-day	NA	--	--
	Antimony	0.011	mg/L	0.011	mg/L	M	1.8E-05	mg/kg-day	NA	--	--
	Arsenic	0.03	mg/L	0.03	mg/L	M	4.9E-05	mg/kg-day	1.5E+00	(mg/kg-day) $^{-1}$	7.4E-05
	Iron	67.7	mg/L	67.7	mg/L	M	1.1E-01	mg/kg-day	NA	--	--
	Manganese	0.45	mg/L	0.45	mg/L	M	7.4E-04	mg/kg-day	NA	--	--
	Thallium	0.0057	mg/L	0.0057	mg/L	M	9.4E-06	mg/kg-day	NA	--	--
	(total)										7.5E-05
Dermal	Benzene	0.0034	mg/L	0.0034	mg/L	M	4.2E-07	mg/kg-day	5.9E-02	(mg/kg-day) $^{-1}$	2.5E-08
	Chloroform	0.016	mg/L	0.016	mg/L	M	8.4E-07	mg/kg-day	3.1E-02	(mg/kg-day) $^{-1}$	2.6E-08
	2-Methylnaphthalene	0.00105	mg/L	0.00105	mg/L	M	8.8E-07	mg/kg-day	NA	--	--
	Naphthalene	0.0022	mg/L	0.0022	mg/L	M	8.9E-07	mg/kg-day	NA	--	--
	Heptachlor Epoxide	0.0000167	mg/L	0.0000167	mg/L	M	5.4E-09	mg/kg-day	1.3E+01	(mg/kg-day) $^{-1}$	6.8E-08
	MCPA	0.044	mg/L	0.044	mg/L	M	1.3E-06	mg/kg-day	NA	--	--
	Antimony	0.011	mg/L	0.011	mg/L	M	6.5E-08	mg/kg-day	NA	--	--
	Arsenic	0.03	mg/L	0.03	mg/L	M	1.8E-07	mg/kg-day	3.7E+00	(mg/kg-day) $^{-1}$	6.5E-07
	Iron	67.7	mg/L	67.7	mg/L	M	4.0E-04	mg/kg-day	NA	--	--
	Manganese	0.45	mg/L	0.45	mg/L	M	2.6E-06	mg/kg-day	NA	--	--
	Thallium	0.0057	mg/L	0.0057	mg/L	M	3.4E-08	mg/kg-day	NA	--	--
	(Total)										7.6E-07
									Total Risk Across All Exposure Routes/Pathways		7.6E-05

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/L - milligram per liter
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

TABLE 8.4.2a CT
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Air
Exposure Point: Tap
Receptor Population: Residents
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Inhalation	Benzene	0.0034	mg/L	4.81E-03	mg/m^3	R	1.2E-06	mg/kg-day	2.7E-02	$(mg/kg\text{-}day)^{-1}$	3.2E-08
	Chloroform	0.016	mg/L	1.80E-02	mg/m^3	R	4.4E-06	mg/kg-day	8.1E-02	$(mg/kg\text{-}day)^{-1}$	3.5E-07
	(Total)										3.9E-07
										Total Risk Across All Exposure Routes/Pathways	3.9E-07

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/L - milligram per liter
mg/m^3 - milligram per cubic meter
mg/kg-day - milligram per kilogram per day

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

TABLE 8.4.3 CT
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: Surface Water
Receptor Population: Residents
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Acetone	0.0056	mg/L	0.0056	mg/L	M	3.5E-08	mg/kg-day	NA	--	--
	Toluene	0.0027	mg/L	0.0027	mg/L	M	1.7E-08	mg/kg-day	NA	--	--
	Xylenes, total	0.0035	mg/L	0.0035	mg/L	M	2.2E-08	mg/kg-day	NA	--	--
	(total)										--
Dermal	Acetone	0.0056	mg/L	0.0056	mg/L	M	1.0E-08	mg/kg-day	NA	--	--
	Toluene	0.0027	mg/L	0.0027	mg/L	M	3.8E-07	mg/kg-day	NA	--	--
	Xylenes, total	0.0035	mg/L	0.0035	mg/L	M	1.0E-06	mg/kg-day	NA	--	--
	(Total)										--
										Total Risk Across All Exposure Routes/Pathways	--

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/L - milligram per liter
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

TABLE 8.4.4 CT
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Sediment
Receptor Population: Residents
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	2-Methylnaphthalene	10	mg/kg	10	mg/kg	M	1.2E-07	mg/kg-day	NA	--	--
	Aroclor-1248	2.8	mg/kg	2.8	mg/kg	M	3.4E-08	mg/kg-day	2.0E+00	(mg/kg-day) $^{-1}$	6.8E-08
	Aroclor-1260	40	mg/kg	40	mg/kg	M	4.8E-07	mg/kg-day	2.0E+00	(mg/kg-day) $^{-1}$	9.7E-07
	Diesel Range Organics	11,600	mg/kg	11,600	mg/kg	M	1.4E-04	mg/kg-day	NA	--	--
	(total)										1.0E-06
Dermal	2-Methylnaphthalene	10	mg/kg	10	mg/kg	M	8.5E-09	mg/kg-day	NA	--	--
	Aroclor-1248	2.8	mg/kg	2.8	mg/kg	M	3.3E-08	mg/kg-day	2.2E+00	(mg/kg-day) $^{-1}$	7.4E-08
	Aroclor-1260	40	mg/kg	40	mg/kg	M	4.7E-07	mg/kg-day	2.2E+00	(mg/kg-day) $^{-1}$	1.1E-06
	Diesel Range Organics	11,600	mg/kg	11,600	mg/kg	M	9.8E-06	mg/kg-day	NA	--	--
	(Total)										1.1E-06
										Total Risk Across All Exposure Routes/Pathways	2.2E-06

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

TABLE 8.5.1A RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Surface Soil
Receptor Population: Residents
Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	2-Methylnaphthalene	1.96	mg/kg	1.96	mg/kg	M	2.1E-06	mg/kg-day	NA	--	--
	Benzo(a)anthracene	69.0	mg/kg	69.0	mg/kg	M	7.6E-05	mg/kg-day	7.3E-01	(mg/kg-day) $^{-1}$	5.5E-05
	Benzo(a)pyrene	30.5	mg/kg	30.5	mg/kg	M	3.3E-05	mg/kg-day	7.3E+00	(mg/kg-day) $^{-1}$	2.4E-04
	Benzo(b)fluoranthene	40.9	mg/kg	40.9	mg/kg	M	4.5E-05	mg/kg-day	7.3E-01	(mg/kg-day) $^{-1}$	3.3E-05
	Benzo(k)fluoranthene	18.7	mg/kg	18.7	mg/kg	M	2.0E-05	mg/kg-day	7.3E-02	(mg/kg-day) $^{-1}$	1.5E-06
	Carbazole	3.16	mg/kg	3.16	mg/kg	M	3.5E-06	mg/kg-day	2.0E-02	(mg/kg-day) $^{-1}$	6.9E-08
	Chrysene	96.0	mg/kg	96.0	mg/kg	M	1.1E-04	mg/kg-day	7.3E-03	(mg/kg-day) $^{-1}$	7.7E-07
	Dibenz(a,h)anthracene	1.41	mg/kg	1.41	mg/kg	M	1.5E-06	mg/kg-day	7.3E+00	(mg/kg-day) $^{-1}$	1.1E-05
	Fluoranthene	243	mg/kg	243	mg/kg	M	2.7E-04	mg/kg-day	NA	--	--
	Indeno(1,2,3-cd)pyrene	8.79	mg/kg	8.79	mg/kg	M	9.6E-06	mg/kg-day	7.3E-01	(mg/kg-day) $^{-1}$	7.0E-06
	Naphthalene	0.525	mg/kg	0.525	mg/kg	M	5.8E-07	mg/kg-day	NA	--	--
	Pyrene	250	mg/kg	250	mg/kg	M	2.7E-04	mg/kg-day	NA	--	--
	4,4'-DDD	3	mg/kg	3	mg/kg	M	3.3E-06	mg/kg-day	2.4E-01	(mg/kg-day) $^{-1}$	7.9E-07
	Chlordane, alpha-	48	mg/kg	48	mg/kg	M	5.3E-05	mg/kg-day	3.5E-01	(mg/kg-day) $^{-1}$	1.8E-05
	Chlordane, gamma-	58	mg/kg	58	mg/kg	M	6.4E-05	mg/kg-day	3.5E-01	(mg/kg-day) $^{-1}$	2.2E-05
	Dieldrin	0.32	mg/kg	0.32	mg/kg	M	3.5E-07	mg/kg-day	1.6E+01	(mg/kg-day) $^{-1}$	5.6E-06
	Heptachlor	22	mg/kg	22	mg/kg	M	2.4E-05	mg/kg-day	4.5E+00	(mg/kg-day) $^{-1}$	1.1E-04
	Heptachlor Epoxide	4.5	mg/kg	4.5	mg/kg	M	4.9E-06	mg/kg-day	9.1E+00	(mg/kg-day) $^{-1}$	4.5E-05
	Aroclor-1248	1.51	mg/kg	1.51	mg/kg	M	1.7E-06	mg/kg-day	2.0E+00	(mg/kg-day) $^{-1}$	3.3E-06
	Aroclor-1254	0.975	mg/kg	0.975	mg/kg	M	1.1E-06	mg/kg-day	2.0E+00	(mg/kg-day) $^{-1}$	2.1E-06
	Aroclor-1260	54.6	mg/kg	54.6	mg/kg	M	6.0E-05	mg/kg-day	2.0E+00	(mg/kg-day) $^{-1}$	1.2E-04
	Gasoline Range Organics	0.207	mg/kg	0.207	mg/kg	M	2.3E-07	mg/kg-day	NA	--	--
	Diesel Range Organics	470	mg/kg	470	mg/kg	M	5.2E-04	mg/kg-day	NA	--	--
	Antimony	1.22	mg/kg	1.22	mg/kg	M	1.3E-06	mg/kg-day	NA	--	--
	Arsenic	3.49	mg/kg	3.49	mg/kg	M	3.8E-06	mg/kg-day	1.5E+00	(mg/kg-day) $^{-1}$	5.7E-06
	Iron	2,260	mg/kg	2,260	mg/kg	M	2.5E-03	mg/kg-day	NA	--	--
	Thallium (total)	0.31	mg/kg	0.31	mg/kg	M	3.4E-07	mg/kg-day	NA	--	--
											6.8E-04

TABLE 8.5.1A RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Surface Soil
Receptor Population: Residents
Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Dermal	2-Methylnaphthalene	1.96	mg/kg	1.96	mg/kg	M	6.0E-08	mg/kg-day	NA	--	--
	Benzo(a)anthracene	69.0	mg/kg	69.0	mg/kg	M	2.8E-05	mg/kg-day	2.4E+00	(mg/kg-day) $^{-1}$	6.5E-05
	Benzo(a)pyrene	30.5	mg/kg	30.5	mg/kg	M	1.2E-05	mg/kg-day	1.5E+01	(mg/kg-day) $^{-1}$	1.8E-04
	Benzo(b)fluoranthene	40.9	mg/kg	40.9	mg/kg	M	1.6E-05	mg/kg-day	1.5E+00	(mg/kg-day) $^{-1}$	2.4E-05
	Benzo(k)fluoranthene	18.7	mg/kg	18.7	mg/kg	M	7.4E-06	mg/kg-day	1.5E-01	(mg/kg-day) $^{-1}$	1.1E-06
	Carbazole	3.16	mg/kg	3.16	mg/kg	M	1.3E-06	mg/kg-day	4.0E-02	(mg/kg-day) $^{-1}$	5.0E-08
	Chrysene	96.0	mg/kg	96.0	mg/kg	M	3.8E-05	mg/kg-day	2.4E-02	(mg/kg-day) $^{-1}$	9.0E-07
	Dibenz(a,h)anthracene	1.41	mg/kg	1.41	mg/kg	M	5.6E-07	mg/kg-day	2.4E+01	(mg/kg-day) $^{-1}$	1.3E-05
	Fluoranthene	243	mg/kg	243	mg/kg	M	7.5E-06	mg/kg-day	NA	--	--
	Indeno(1,2,3-cd)pyrene	8.79	mg/kg	8.79	mg/kg	M	3.5E-06	mg/kg-day	2.4E+00	(mg/kg-day) $^{-1}$	8.3E-06
	Naphthalene	0.525	mg/kg	0.525	mg/kg	M	1.6E-08	mg/kg-day	NA	--	--
	Pyrene	250	mg/kg	250	mg/kg	M	7.7E-06	mg/kg-day	NA	--	--
	4,4'-DDD	3	mg/kg	3	mg/kg	M	9.2E-08	mg/kg-day	3.4E-01	(mg/kg-day) $^{-1}$	3.2E-08
	Chlordane, alpha-	48	mg/kg	48	mg/kg	M	5.9E-06	mg/kg-day	4.4E-01	(mg/kg-day) $^{-1}$	2.6E-06
	Chlordane, gamma-	58	mg/kg	58	mg/kg	M	7.1E-06	mg/kg-day	4.4E-01	(mg/kg-day) $^{-1}$	3.1E-06
	Dieldrin	0.32	mg/kg	0.32	mg/kg	M	9.8E-09	mg/kg-day	3.2E+01	(mg/kg-day) $^{-1}$	3.1E-07
	Heptachlor	22	mg/kg	22	mg/kg	M	6.8E-07	mg/kg-day	6.3E+00	(mg/kg-day) $^{-1}$	4.2E-06
	Heptachlor Epoxide	4.5	mg/kg	4.5	mg/kg	M	1.4E-07	mg/kg-day	1.3E+01	(mg/kg-day) $^{-1}$	1.7E-06
	Aroclor-1248	1.51	mg/kg	1.51	mg/kg	M	6.5E-07	mg/kg-day	2.2E+00	(mg/kg-day) $^{-1}$	1.5E-06
	Aroclor-1254	0.975	mg/kg	0.975	mg/kg	M	4.2E-07	mg/kg-day	2.2E+00	(mg/kg-day) $^{-1}$	9.3E-07
	Aroclor-1260	54.6	mg/kg	54.6	mg/kg	M	2.3E-05	mg/kg-day	2.2E+00	(mg/kg-day) $^{-1}$	5.2E-05
	Gasoline Range Organics	0.207	mg/kg	0.207	mg/kg	M	6.4E-09	mg/kg-day	NA	--	--
	Diesel Range Organics	470	mg/kg	470	mg/kg	M	1.4E-05	mg/kg-day	NA	--	--
	Antimony	1.22	mg/kg	1.22	mg/kg	M	3.7E-09	mg/kg-day	NA	--	--
	Arsenic	3.49	mg/kg	3.49	mg/kg	M	3.2E-07	mg/kg-day	3.7E+00	(mg/kg-day) $^{-1}$	1.2E-06
	Iron	2,260	mg/kg	2,260	mg/kg	M	6.9E-06	mg/kg-day	NA	--	--
	Thallium	0.31	mg/kg	0.31	mg/kg	M	9.4E-10	mg/kg-day	NA	--	--
	(Total)										3.6E-04
										Total Risk Across All Exposure Routes/Pathways	1.0E-03

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

TABLE 8.5.1B RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Surface Soil
Receptor Population: Residents
Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	2-Methylnaphthalene	57.9	mg/kg	57.9	mg/kg	M	6.3E-05	mg/kg-day	NA	--	--
	Benzo(a)anthracene	4.76	mg/kg	4.76	mg/kg	M	5.2E-06	mg/kg-day	7.3E-01	(mg/kg-day) $^{-1}$	3.8E-06
	Benzo(a)pyrene	2.48	mg/kg	2.48	mg/kg	M	2.7E-06	mg/kg-day	7.3E+00	(mg/kg-day) $^{-1}$	2.0E-05
	Benzo(b)fluoranthene	2.81	mg/kg	2.81	mg/kg	M	3.1E-06	mg/kg-day	7.3E-01	(mg/kg-day) $^{-1}$	2.2E-06
	Benzo(k)fluoranthene	1.78	mg/kg	1.78	mg/kg	M	2.0E-06	mg/kg-day	7.3E-02	(mg/kg-day) $^{-1}$	1.4E-07
	Carbazole	0.95	mg/kg	0.95	mg/kg	M	1.0E-06	mg/kg-day	2.0E-02	(mg/kg-day) $^{-1}$	2.1E-08
	Chrysene	6.7	mg/kg	6.7	mg/kg	M	7.3E-06	mg/kg-day	7.3E-03	(mg/kg-day) $^{-1}$	5.4E-08
	Dibenz(a,h)anthracene	0.695	mg/kg	0.695	mg/kg	M	7.6E-07	mg/kg-day	7.3E+00	(mg/kg-day) $^{-1}$	5.6E-06
	Indeno(1,2,3-cd)pyrene	1.72	mg/kg	1.72	mg/kg	M	1.9E-06	mg/kg-day	7.3E-01	(mg/kg-day) $^{-1}$	1.4E-06
	Dieldrin	0.052	mg/kg	0.052	mg/kg	M	5.7E-08	mg/kg-day	1.6E+01	(mg/kg-day) $^{-1}$	9.1E-07
	Aroclor-1260	95.6	mg/kg	95.6	mg/kg	M	1.0E-04	mg/kg-day	2.0E+00	(mg/kg-day) $^{-1}$	2.1E-04
	Arsenic	5.26	mg/kg	5.26	mg/kg	M	5.8E-06	mg/kg-day	1.5E+00	(mg/kg-day) $^{-1}$	8.6E-06
	Iron	2,347	mg/kg	2,347	mg/kg	M	2.6E-03	mg/kg-day	NA	--	--
	(total)										2.5E-04
Dermal	2-Methylnaphthalene	57.9	mg/kg	57.9	mg/kg	M	1.8E-06	mg/kg-day	NA	--	--
	Benzo(a)anthracene	4.76	mg/kg	4.76	mg/kg	M	1.9E-06	mg/kg-day	2.4E+00	(mg/kg-day) $^{-1}$	4.5E-06
	Benzo(a)pyrene	2.48	mg/kg	2.48	mg/kg	M	9.9E-07	mg/kg-day	1.5E+01	(mg/kg-day) $^{-1}$	1.4E-05
	Benzo(b)fluoranthene	2.81	mg/kg	2.81	mg/kg	M	1.1E-06	mg/kg-day	1.5E+00	(mg/kg-day) $^{-1}$	1.6E-06
	Benzo(k)fluoranthene	1.78	mg/kg	1.78	mg/kg	M	7.1E-07	mg/kg-day	1.5E-01	(mg/kg-day) $^{-1}$	1.0E-07
	Carbazole	0.95	mg/kg	0.95	mg/kg	M	3.8E-07	mg/kg-day	4.0E-02	(mg/kg-day) $^{-1}$	1.5E-08
	Chrysene	6.7	mg/kg	6.7	mg/kg	M	2.7E-06	mg/kg-day	2.4E-02	(mg/kg-day) $^{-1}$	6.3E-08
	Dibenz(a,h)anthracene	0.695	mg/kg	0.695	mg/kg	M	2.8E-07	mg/kg-day	2.4E+01	(mg/kg-day) $^{-1}$	6.5E-06
	Indeno(1,2,3-cd)pyrene	1.72	mg/kg	1.72	mg/kg	M	6.9E-07	mg/kg-day	2.4E+00	(mg/kg-day) $^{-1}$	1.6E-06
	Dieldrin	0.052	mg/kg	0.052	mg/kg	M	1.6E-09	mg/kg-day	3.2E+01	(mg/kg-day) $^{-1}$	5.1E-08
	Aroclor-1260	95.6	mg/kg	95.6	mg/kg	M	4.1E-05	mg/kg-day	2.2E+00	(mg/kg-day) $^{-1}$	9.1E-05
	Arsenic	5.26	mg/kg	5.26	mg/kg	M	4.8E-07	mg/kg-day	3.7E+00	(mg/kg-day) $^{-1}$	1.8E-06
	Iron	2,347	mg/kg	2,347	mg/kg	M	7.2E-06	mg/kg-day	NA	--	--
	(Total)										1.2E-04
									Total Risk Across All Exposure Routes/Pathways		3.7E-04

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

TABLE 8.5.1aA RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Air
Exposure Point: Fugative dust
Receptor Population: Residents
Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Inhalation	2-Methylnaphthalene	1.96	mg/kg	1.48E-09	mg/m^3	R	1.2E-10	mg/kg-day	NA	--	--
	Benzo(a)anthracene	69.0	mg/kg	5.23E-08	mg/m^3	R	4.3E-09	mg/kg-day	3.1E-01	$(mg/kg\text{-}day)^{-1}$	1.3E-09
	Benzo(a)pyrene	30.5	mg/kg	2.31E-08	mg/m^3	R	1.9E-09	mg/kg-day	3.1E+00	$(mg/kg\text{-}day)^{-1}$	5.9E-09
	Benzo(b)fluoranthene	40.9	mg/kg	3.10E-08	mg/m^3	R	2.5E-09	mg/kg-day	3.1E-01	$(mg/kg\text{-}day)^{-1}$	7.9E-10
	Benzo(k)fluoranthene	18.7	mg/kg	1.41E-08	mg/m^3	R	1.2E-09	mg/kg-day	3.1E-02	$(mg/kg\text{-}day)^{-1}$	3.6E-11
	Carbazole	3.16	mg/kg	2.39E-09	mg/m^3	R	2.0E-10	mg/kg-day	2.0E-02	$(mg/kg\text{-}day)^{-1}$	3.9E-12
	Chrysene	96.0	mg/kg	7.27E-08	mg/m^3	R	6.0E-09	mg/kg-day	3.1E-03	$(mg/kg\text{-}day)^{-1}$	1.9E-11
	Dibenz(a,h)anthracene	1.41	mg/kg	1.07E-09	mg/m^3	R	8.8E-11	mg/kg-day	3.1E+00	$(mg/kg\text{-}day)^{-1}$	2.7E-10
	Fluoranthene	243	mg/kg	1.84E-07	mg/m^3	R	1.5E-08	mg/kg-day	NA	--	--
	Indeno(1,2,3-cd)pyrene	8.79	mg/kg	6.66E-09	mg/m^3	R	5.5E-10	mg/kg-day	3.1E-01	$(mg/kg\text{-}day)^{-1}$	1.7E-10
	Naphthalene	0.525	mg/kg	3.98E-10	mg/m^3	R	3.3E-11	mg/kg-day	NA	--	--
	Pyrene	250	mg/kg	1.89E-07	mg/m^3	R	1.6E-08	mg/kg-day	NA	--	--
	4,4'-DDD	3	mg/kg	2.27E-09	mg/m^3	R	1.9E-10	mg/kg-day	2.4E-01	$(mg/kg\text{-}day)^{-1}$	4.5E-11
	Chlordane, alpha-	48	mg/kg	3.64E-08	mg/m^3	R	3.0E-09	mg/kg-day	3.5E-01	$(mg/kg\text{-}day)^{-1}$	1.0E-09
	Chlordane, gamma-	58	mg/kg	4.39E-08	mg/m^3	R	3.6E-09	mg/kg-day	3.5E-01	$(mg/kg\text{-}day)^{-1}$	1.3E-09
	Dieldrin	0.32	mg/kg	2.42E-10	mg/m^3	R	2.0E-11	mg/kg-day	1.6E+01	$(mg/kg\text{-}day)^{-1}$	3.2E-10
	Heptachlor	22	mg/kg	1.67E-08	mg/m^3	R	1.4E-09	mg/kg-day	4.6E+00	$(mg/kg\text{-}day)^{-1}$	6.2E-09
	Heptachlor Epoxide	4.5	mg/kg	3.41E-09	mg/m^3	R	2.8E-10	mg/kg-day	9.1E+00	$(mg/kg\text{-}day)^{-1}$	2.5E-09
	Aroclor-1248	1.51	mg/kg	1.14E-09	mg/m^3	R	9.4E-11	mg/kg-day	2.0E+00	$(mg/kg\text{-}day)^{-1}$	1.9E-10
	Aroclor-1254	0.975	mg/kg	7.39E-10	mg/m^3	R	6.1E-11	mg/kg-day	2.0E+00	$(mg/kg\text{-}day)^{-1}$	1.2E-10
	Aroclor-1260	54.6	mg/kg	4.13E-08	mg/m^3	R	3.4E-09	mg/kg-day	2.0E+00	$(mg/kg\text{-}day)^{-1}$	6.8E-09
	Gasoline Range Organics	0.207	mg/kg	1.57E-10	mg/m^3	R	1.3E-11	mg/kg-day	NA	--	--
	Diesel Range Organics	470	mg/kg	3.56E-07	mg/m^3	R	2.9E-08	mg/kg-day	NA	--	--
	Antimony	1.22	mg/kg	9.25E-10	mg/m^3	R	7.6E-11	mg/kg-day	NA	--	--
	Arsenic	3.49	mg/kg	2.65E-09	mg/m^3	R	2.2E-10	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	3.3E-09
	Iron	2,260	mg/kg	1.71E-06	mg/m^3	R	1.4E-07	mg/kg-day	NA	--	--
	Thallium	0.31	mg/kg	2.32E-10	mg/m^3	R	1.9E-11	mg/kg-day	NA	--	--
	(Total)										3.0E-08
										Total Risk Across All Exposure Routes/Pathways	3.0E-08

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/m^3 - milligram per cubic meter
mg/kg-day - milligram per kilogram per day

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

TABLE 8.5.1aB RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Air
Exposure Point: Fugative dust
Receptor Population: Residents
Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Inhalation	2-Methylnaphthalene	57.9	mg/kg	4.39E-08	mg/m^3	R	3.6E-09	mg/kg-day	NA	--	--
	Benzo(a)anthracene	4.76	mg/kg	3.61E-09	mg/m^3	R	3.0E-10	mg/kg-day	3.1E-01	$(mg/kg-day)^{-1}$	9.2E-11
	Benzo(a)pyrene	2.48	mg/kg	1.88E-09	mg/m^3	R	1.5E-10	mg/kg-day	3.1E+00	$(mg/kg-day)^{-1}$	4.8E-10
	Benzo(b)fluoranthene	2.81	mg/kg	2.13E-09	mg/m^3	R	1.7E-10	mg/kg-day	3.1E-01	$(mg/kg-day)^{-1}$	5.4E-11
	Benzo(k)fluoranthene	1.78	mg/kg	1.35E-09	mg/m^3	R	1.1E-10	mg/kg-day	3.1E-02	$(mg/kg-day)^{-1}$	3.4E-12
	Carbazole	0.95	mg/kg	7.20E-10	mg/m^3	R	5.9E-11	mg/kg-day	2.0E-02	$(mg/kg-day)^{-1}$	1.2E-12
	Chrysene	6.7	mg/kg	5.08E-09	mg/m^3	R	4.2E-10	mg/kg-day	3.1E-03	$(mg/kg-day)^{-1}$	1.3E-12
	Dibenz(a,h)anthracene	0.695	mg/kg	5.27E-10	mg/m^3	R	4.3E-11	mg/kg-day	3.1E+00	$(mg/kg-day)^{-1}$	1.3E-10
	Indeno(1,2,3-cd)pyrene	1.72	mg/kg	1.30E-09	mg/m^3	R	1.1E-10	mg/kg-day	3.1E-01	$(mg/kg-day)^{-1}$	3.3E-11
	Dieldrin	0.052	mg/kg	3.94E-11	mg/m^3	R	3.2E-12	mg/kg-day	1.6E+01	$(mg/kg-day)^{-1}$	5.2E-11
	Aroclor-1260	95.6	mg/kg	7.24E-08	mg/m^3	R	6.0E-09	mg/kg-day	2.0E+00	$(mg/kg-day)^{-1}$	1.2E-08
	Arsenic	5.26	mg/kg	3.98E-09	mg/m^3	R	3.3E-10	mg/kg-day	1.5E+01	$(mg/kg-day)^{-1}$	4.9E-09
	Iron	2,347	mg/kg	1.78E-06	mg/m^3	R	1.5E-07	mg/kg-day	NA	--	--
	(Total)										1.8E-08
										Total Risk Across All Exposure Routes/Pathways	1.8E-08

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/m^3 - milligram per cubic meter
mg/kg-day - milligram per kilogram per day

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

TABLE 8.5.2 RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Tap
Receptor Population: Residents
Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzene	0.0034	mg/L	0.0034	mg/L	M	1.9E-05	mg/kg-day	5.5E-02	(mg/kg-day) $^{-1}$	1.0E-06
	Chloroform	0.016	mg/L	0.016	mg/L	M	8.8E-05	mg/kg-day	6.1E-03	(mg/kg-day) $^{-1}$	5.3E-07
	2-Methylnaphthalene	0.00105	mg/L	0.00105	mg/L	M	5.8E-06	mg/kg-day	NA	--	--
	Naphthalene	0.0022	mg/L	0.0022	mg/L	M	1.2E-05	mg/kg-day	NA	--	--
	Heptachlor Epoxide	0.0000167	mg/L	0.0000167	mg/L	M	9.2E-08	mg/kg-day	9.1E+00	(mg/kg-day) $^{-1}$	8.3E-07
	MCPA	0.044	mg/L	0.044	mg/L	M	2.4E-04	mg/kg-day	NA	--	--
	Antimony	0.011	mg/L	0.011	mg/L	M	6.0E-05	mg/kg-day	NA	--	--
	Arsenic	0.03	mg/L	0.03	mg/L	M	1.6E-04	mg/kg-day	1.5E+00	(mg/kg-day) $^{-1}$	2.5E-04
	Iron	67.7	mg/L	67.7	mg/L	M	3.7E-01	mg/kg-day	NA	--	--
	Manganese	0.45	mg/L	0.45	mg/L	M	2.5E-03	mg/kg-day	NA	--	--
	Thallium	0.0057	mg/L	0.0057	mg/L	M	3.1E-05	mg/kg-day	NA	--	--
	(total)										2.5E-04
Dermal	Benzene	0.0034	mg/L	0.0034	mg/L	M	6.5E-07	mg/kg-day	5.9E-02	(mg/kg-day) $^{-1}$	3.8E-08
	Chloroform	0.016	mg/L	0.016	mg/L	M	1.3E-06	mg/kg-day	3.1E-02	(mg/kg-day) $^{-1}$	3.9E-08
	2-Methylnaphthalene	0.00105	mg/L	0.00105	mg/L	M	1.4E-06	mg/kg-day	NA	--	--
	Naphthalene	0.0022	mg/L	0.0022	mg/L	M	1.4E-06	mg/kg-day	NA	--	--
	Heptachlor Epoxide	0.0000167	mg/L	0.0000167	mg/L	M	8.3E-09	mg/kg-day	1.3E+01	(mg/kg-day) $^{-1}$	1.0E-07
	MCPA	0.044	mg/L	0.044	mg/L	M	1.9E-06	mg/kg-day	NA	--	--
	Antimony	0.011	mg/L	0.011	mg/L	M	9.9E-08	mg/kg-day	NA	--	--
	Arsenic	0.03	mg/L	0.03	mg/L	M	2.7E-07	mg/kg-day	3.7E+00	(mg/kg-day) $^{-1}$	9.9E-07
	Iron	67.7	mg/L	67.7	mg/L	M	6.1E-04	mg/kg-day	NA	--	--
	Manganese	0.45	mg/L	0.45	mg/L	M	4.1E-06	mg/kg-day	NA	--	--
	Thallium	0.0057	mg/L	0.0057	mg/L	M	5.2E-08	mg/kg-day	NA	--	--
	(Total)										1.2E-06
										Total Risk Across All Exposure Routes/Pathways	2.5E-04

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/L - milligram per liter
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

TABLE 8.5.3 RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: Surface Water
Receptor Population: Residents
Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Acetone	0.0056	mg/L	0.0056	mg/L	M	5.5E-07	mg/kg-day	NA	--	--
	Toluene	0.0027	mg/L	0.0027	mg/L	M	2.6E-07	mg/kg-day	NA	--	--
	Xylenes, total	0.0035	mg/L	0.0035	mg/L	M	3.4E-07	mg/kg-day	NA	--	--
	(total)										--
Dermal	Acetone	0.0056	mg/L	0.0056	mg/L	M	1.7E-08	mg/kg-day	NA	--	--
	Toluene	0.0027	mg/L	0.0027	mg/L	M	6.6E-07	mg/kg-day	NA	--	--
	Xylenes, total	0.0035	mg/L	0.0035	mg/L	M	1.8E-06	mg/kg-day	NA	--	--
	(Total)										--
										Total Risk Across All Exposure Routes/Pathways	--

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/L - milligram per liter
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

TABLE 8.5.4 RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Sediment
Receptor Population: Residents
Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	2-Methylnaphthalene	10	mg/kg	10	mg/kg	M	1.5E-06	mg/kg-day	NA	--	--
	Aroclor-1248	2.8	mg/kg	2.8	mg/kg	M	4.2E-07	mg/kg-day	2.0E+00	(mg/kg-day) $^{-1}$	8.4E-07
	Aroclor-1260	40	mg/kg	40	mg/kg	M	6.0E-06	mg/kg-day	2.0E+00	(mg/kg-day) $^{-1}$	1.2E-05
	Diesel Range Organics (total)	11,600	mg/kg	11,600	mg/kg	M	1.7E-03	mg/kg-day	NA	--	--
											1.3E-05
Dermal	2-Methylnaphthalene	10	mg/kg	10	mg/kg	M	4.2E-08	mg/kg-day	NA	--	--
	Aroclor-1248	2.8	mg/kg	2.8	mg/kg	M	1.6E-07	mg/kg-day	2.2E+00	(mg/kg-day) $^{-1}$	3.7E-07
	Aroclor-1260	40	mg/kg	40	mg/kg	M	2.4E-06	mg/kg-day	2.2E+00	(mg/kg-day) $^{-1}$	5.2E-06
	Diesel Range Organics (Total)	11,600	mg/kg	11,600	mg/kg	M	4.9E-05	mg/kg-day	NA	--	--
											5.6E-06
									Total Risk Across All Exposure Routes/Pathways		1.8E-05

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

TABLE 8.5.1A CT
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Surface Soil
Receptor Population: Residents
Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	2-Methylnaphthalene	1.96	mg/kg	1.96	mg/kg	M	7.2E-07	mg/kg-day	NA	--	--
	Benzo(a)anthracene	69.0	mg/kg	69.0	mg/kg	M	2.5E-05	mg/kg-day	7.3E-01	(mg/kg-day) $^{-1}$	1.8E-05
	Benzo(a)pyrene	30.5	mg/kg	30.5	mg/kg	M	1.1E-05	mg/kg-day	7.3E+00	(mg/kg-day) $^{-1}$	8.1E-05
	Benzo(b)fluoranthene	40.9	mg/kg	40.9	mg/kg	M	1.5E-05	mg/kg-day	7.3E-01	(mg/kg-day) $^{-1}$	1.1E-05
	Benzo(k)fluoranthene	18.7	mg/kg	18.7	mg/kg	M	6.8E-06	mg/kg-day	7.3E-02	(mg/kg-day) $^{-1}$	5.0E-07
	Carbazole	3.16	mg/kg	3.16	mg/kg	M	1.2E-06	mg/kg-day	2.0E-02	(mg/kg-day) $^{-1}$	2.3E-08
	Chrysene	96.0	mg/kg	96.0	mg/kg	M	3.5E-05	mg/kg-day	7.3E-03	(mg/kg-day) $^{-1}$	2.6E-07
	Dibenz(a,h)anthracene	1.41	mg/kg	1.41	mg/kg	M	5.2E-07	mg/kg-day	7.3E+00	(mg/kg-day) $^{-1}$	3.8E-06
	Fluoranthene	243	mg/kg	243	mg/kg	M	8.9E-05	mg/kg-day	NA	--	--
	Indeno(1,2,3-cd)pyrene	8.79	mg/kg	8.79	mg/kg	M	3.2E-06	mg/kg-day	7.3E-01	(mg/kg-day) $^{-1}$	2.4E-06
	Naphthalene	0.525	mg/kg	0.525	mg/kg	M	1.9E-07	mg/kg-day	NA	--	--
	Pyrene	250	mg/kg	250	mg/kg	M	9.2E-05	mg/kg-day	NA	--	--
	4,4'-DDD	3	mg/kg	3	mg/kg	M	1.1E-06	mg/kg-day	2.4E-01	(mg/kg-day) $^{-1}$	2.6E-07
	Chlordane, alpha-	48	mg/kg	48	mg/kg	M	1.8E-05	mg/kg-day	3.5E-01	(mg/kg-day) $^{-1}$	6.2E-06
	Chlordane, gamma-	58	mg/kg	58	mg/kg	M	2.1E-05	mg/kg-day	3.5E-01	(mg/kg-day) $^{-1}$	7.4E-06
	Dieldrin	0.32	mg/kg	0.32	mg/kg	M	1.2E-07	mg/kg-day	1.6E+01	(mg/kg-day) $^{-1}$	1.9E-06
	Heptachlor	22	mg/kg	22	mg/kg	M	8.1E-06	mg/kg-day	4.5E+00	(mg/kg-day) $^{-1}$	3.6E-05
	Heptachlor Epoxide	4.5	mg/kg	4.5	mg/kg	M	1.6E-06	mg/kg-day	9.1E+00	(mg/kg-day) $^{-1}$	1.5E-05
	Aroclor-1248	1.51	mg/kg	1.51	mg/kg	M	5.5E-07	mg/kg-day	2.0E+00	(mg/kg-day) $^{-1}$	1.1E-06
	Aroclor-1254	0.975	mg/kg	0.975	mg/kg	M	3.6E-07	mg/kg-day	2.0E+00	(mg/kg-day) $^{-1}$	7.1E-07
	Aroclor-1260	54.6	mg/kg	54.6	mg/kg	M	2.0E-05	mg/kg-day	2.0E+00	(mg/kg-day) $^{-1}$	4.0E-05
	Gasoline Range Organics	0.207	mg/kg	0.207	mg/kg	M	7.6E-08	mg/kg-day	NA	--	--
	Diesel Range Organics	470	mg/kg	470	mg/kg	M	1.7E-04	mg/kg-day	NA	--	--
	Antimony	1.22	mg/kg	1.22	mg/kg	M	4.5E-07	mg/kg-day	NA	--	--
	Arsenic	3.49	mg/kg	3.49	mg/kg	M	1.3E-06	mg/kg-day	1.5E+00	(mg/kg-day) $^{-1}$	1.9E-06
	Iron	2,260	mg/kg	2,260	mg/kg	M	8.3E-04	mg/kg-day	NA	--	--
	Thallium	0.31	mg/kg	0.31	mg/kg	M	1.1E-07	mg/kg-day	NA	--	--
	(total)										2.3E-04

TABLE 8.5.1A CT
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Surface Soil
Receptor Population: Residents
Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Dermal	2-Methylnaphthalene	1.96	mg/kg	1.96	mg/kg	M	2.9E-08	mg/kg-day	NA	--	--
	Benzo(a)anthracene	69.0	mg/kg	69.0	mg/kg	M	1.3E-05	mg/kg-day	2.4E+00	(mg/kg-day) $^{-1}$	3.1E-05
	Benzo(a)pyrene	30.5	mg/kg	30.5	mg/kg	M	5.8E-06	mg/kg-day	1.5E+01	(mg/kg-day) $^{-1}$	8.5E-05
	Benzo(b)fluoranthene	40.9	mg/kg	40.9	mg/kg	M	7.8E-06	mg/kg-day	1.5E+00	(mg/kg-day) $^{-1}$	1.1E-05
	Benzo(k)fluoranthene	18.7	mg/kg	18.7	mg/kg	M	3.6E-06	mg/kg-day	1.5E-01	(mg/kg-day) $^{-1}$	5.2E-07
	Carbazole	3.16	mg/kg	3.16	mg/kg	M	6.0E-07	mg/kg-day	4.0E-02	(mg/kg-day) $^{-1}$	2.4E-08
	Chrysene	96.0	mg/kg	96.0	mg/kg	M	1.8E-05	mg/kg-day	2.4E-02	(mg/kg-day) $^{-1}$	4.3E-07
	Dibenz(a,h)anthracene	1.41	mg/kg	1.41	mg/kg	M	2.7E-07	mg/kg-day	2.4E+01	(mg/kg-day) $^{-1}$	6.3E-06
	Fluoranthene	243	mg/kg	243	mg/kg	M	3.6E-06	mg/kg-day	NA	--	--
	Indeno(1,2,3-cd)pyrene	8.79	mg/kg	8.79	mg/kg	M	1.7E-06	mg/kg-day	2.4E+00	(mg/kg-day) $^{-1}$	3.9E-06
	Naphthalene	0.525	mg/kg	0.525	mg/kg	M	7.7E-09	mg/kg-day	NA	--	--
	Pyrene	250	mg/kg	250	mg/kg	M	3.7E-06	mg/kg-day	NA	--	--
	4,4'-DDD	3	mg/kg	3	mg/kg	M	4.4E-08	mg/kg-day	3.4E-01	(mg/kg-day) $^{-1}$	1.5E-08
	Chlordane, alpha-	48	mg/kg	48	mg/kg	M	2.8E-06	mg/kg-day	4.4E-01	(mg/kg-day) $^{-1}$	1.2E-06
	Chlordane, gamma-	58	mg/kg	58	mg/kg	M	3.4E-06	mg/kg-day	4.4E-01	(mg/kg-day) $^{-1}$	1.5E-06
	Dieldrin	0.32	mg/kg	0.32	mg/kg	M	4.7E-09	mg/kg-day	3.2E+01	(mg/kg-day) $^{-1}$	1.5E-07
	Heptachlor	22	mg/kg	22	mg/kg	M	3.2E-07	mg/kg-day	6.3E+00	(mg/kg-day) $^{-1}$	2.0E-06
	Heptachlor Epoxide	4.5	mg/kg	4.5	mg/kg	M	6.6E-08	mg/kg-day	1.3E+01	(mg/kg-day) $^{-1}$	8.3E-07
	Aroclor-1248	1.51	mg/kg	1.51	mg/kg	M	3.1E-07	mg/kg-day	2.2E+00	(mg/kg-day) $^{-1}$	6.9E-07
	Aroclor-1254	0.975	mg/kg	0.975	mg/kg	M	2.0E-07	mg/kg-day	2.2E+00	(mg/kg-day) $^{-1}$	4.4E-07
	Aroclor-1260	54.6	mg/kg	54.6	mg/kg	M	1.1E-05	mg/kg-day	2.2E+00	(mg/kg-day) $^{-1}$	2.5E-05
	Gasoline Range Organics	0.207	mg/kg	0.207	mg/kg	M	3.0E-09	mg/kg-day	NA	--	--
	Diesel Range Organics	470	mg/kg	470	mg/kg	M	6.9E-06	mg/kg-day	NA	--	--
	Antimony	1.22	mg/kg	1.22	mg/kg	M	1.8E-09	mg/kg-day	NA	--	--
	Arsenic	3.49	mg/kg	3.49	mg/kg	M	1.5E-07	mg/kg-day	3.7E+00	(mg/kg-day) $^{-1}$	5.6E-07
	Iron	2,260	mg/kg	2,260	mg/kg	M	3.3E-06	mg/kg-day	NA	--	--
	Thallium	0.31	mg/kg	0.31	mg/kg	M	4.5E-10	mg/kg-day	NA	--	--
	(Total)										1.7E-04
										Total Risk Across All Exposure Routes/Pathways	4.0E-04

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

TABLE 8.5.1B CT
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY
SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Surface Soil
Receptor Population: Residents
Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	2-Methylnaphthalene	57.9	mg/kg	57.9	mg/kg	M	2.1E-05	mg/kg-day	NA	--	--
	Benzo(a)anthracene	4.76	mg/kg	4.76	mg/kg	M	1.7E-06	mg/kg-day	7.3E-01	(mg/kg-day) $^{-1}$	1.3E-06
	Benzo(a)pyrene	2.48	mg/kg	2.48	mg/kg	M	9.1E-07	mg/kg-day	7.3E+00	(mg/kg-day) $^{-1}$	6.6E-06
	Benzo(b)fluoranthene	2.81	mg/kg	2.81	mg/kg	M	1.0E-06	mg/kg-day	7.3E-01	(mg/kg-day) $^{-1}$	7.5E-07
	Benzo(k)fluoranthene	1.78	mg/kg	1.78	mg/kg	M	6.5E-07	mg/kg-day	7.3E-02	(mg/kg-day) $^{-1}$	4.8E-08
	Carbazole	0.95	mg/kg	0.95	mg/kg	M	3.5E-07	mg/kg-day	2.0E-02	(mg/kg-day) $^{-1}$	7.0E-09
	Chrysene	6.7	mg/kg	6.7	mg/kg	M	2.5E-06	mg/kg-day	7.3E-03	(mg/kg-day) $^{-1}$	1.8E-08
	Dibenz(a,h)anthracene	0.695	mg/kg	0.695	mg/kg	M	2.5E-07	mg/kg-day	7.3E+00	(mg/kg-day) $^{-1}$	1.9E-06
	Indeno(1,2,3-cd)pyrene	1.72	mg/kg	1.72	mg/kg	M	6.3E-07	mg/kg-day	7.3E-01	(mg/kg-day) $^{-1}$	4.6E-07
	Dieldrin	0.052	mg/kg	0.052	mg/kg	M	1.9E-08	mg/kg-day	1.6E+01	(mg/kg-day) $^{-1}$	3.0E-07
	Aroclor-1260	95.6	mg/kg	95.6	mg/kg	M	3.5E-05	mg/kg-day	2.0E+00	(mg/kg-day) $^{-1}$	7.0E-05
	Arsenic	5.26	mg/kg	5.26	mg/kg	M	1.9E-06	mg/kg-day	1.5E+00	(mg/kg-day) $^{-1}$	2.9E-06
	Iron	2,347	mg/kg	2,347	mg/kg	M	8.6E-04	mg/kg-day	NA	--	--
	(total)										8.4E-05
Dermal	2-Methylnaphthalene	57.9	mg/kg	57.9	mg/kg	M	8.5E-07	mg/kg-day	NA	--	--
	Benzo(a)anthracene	4.76	mg/kg	4.76	mg/kg	M	9.1E-07	mg/kg-day	2.4E+00	(mg/kg-day) $^{-1}$	2.1E-06
	Benzo(a)pyrene	2.48	mg/kg	2.48	mg/kg	M	4.7E-07	mg/kg-day	1.5E+01	(mg/kg-day) $^{-1}$	6.9E-06
	Benzo(b)fluoranthene	2.81	mg/kg	2.81	mg/kg	M	5.3E-07	mg/kg-day	1.5E+00	(mg/kg-day) $^{-1}$	7.8E-07
	Benzo(k)fluoranthene	1.78	mg/kg	1.78	mg/kg	M	3.4E-07	mg/kg-day	1.5E-01	(mg/kg-day) $^{-1}$	5.0E-08
	Carbazole	0.95	mg/kg	0.95	mg/kg	M	1.8E-07	mg/kg-day	4.0E-02	(mg/kg-day) $^{-1}$	7.2E-09
	Chrysene	6.7	mg/kg	6.7	mg/kg	M	1.3E-06	mg/kg-day	2.4E-02	(mg/kg-day) $^{-1}$	3.0E-08
	Dibenz(a,h)anthracene	0.695	mg/kg	0.695	mg/kg	M	1.3E-07	mg/kg-day	2.4E+01	(mg/kg-day) $^{-1}$	3.1E-06
	Indeno(1,2,3-cd)pyrene	1.72	mg/kg	1.72	mg/kg	M	3.3E-07	mg/kg-day	2.4E+00	(mg/kg-day) $^{-1}$	7.7E-07
	Dieldrin	0.052	mg/kg	0.052	mg/kg	M	7.6E-10	mg/kg-day	3.2E+01	(mg/kg-day) $^{-1}$	2.4E-08
	Aroclor-1260	95.6	mg/kg	95.6	mg/kg	M	2.0E-05	mg/kg-day	2.2E+00	(mg/kg-day) $^{-1}$	4.4E-05
	Arsenic	5.26	mg/kg	5.26	mg/kg	M	2.3E-07	mg/kg-day	3.7E+00	(mg/kg-day) $^{-1}$	8.5E-07
	Iron	2,347	mg/kg	2,347	mg/kg	M	3.4E-06	mg/kg-day	NA	--	--
	(Total)										5.8E-05
									Total Risk Across All Exposure Routes/Pathways		1.4E-04

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

TABLE 8.5.1aA CT
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Air
Exposure Point: Fugative dust
Receptor Population: Residents
Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Inhalation	2-Methylnaphthalene	1.96	mg/kg	1.48E-09	mg/m^3	R	8.2E-11	mg/kg-day	NA	--	--
	Benzo(a)anthracene	69.0	mg/kg	5.23E-08	mg/m^3	R	2.9E-09	mg/kg-day	3.1E-01	$(mg/kg\text{-}day)^{-1}$	8.9E-10
	Benzo(a)pyrene	30.5	mg/kg	2.31E-08	mg/m^3	R	1.3E-09	mg/kg-day	3.1E+00	$(mg/kg\text{-}day)^{-1}$	3.9E-09
	Benzo(b)fluoranthene	40.9	mg/kg	3.10E-08	mg/m^3	R	1.7E-09	mg/kg-day	3.1E-01	$(mg/kg\text{-}day)^{-1}$	5.3E-10
	Benzo(k)fluoranthene	18.7	mg/kg	1.41E-08	mg/m^3	R	7.8E-10	mg/kg-day	3.1E-02	$(mg/kg\text{-}day)^{-1}$	2.4E-11
	Carbazole	3.16	mg/kg	2.39E-09	mg/m^3	R	1.3E-10	mg/kg-day	2.0E-02	$(mg/kg\text{-}day)^{-1}$	2.6E-12
	Chrysene	96.0	mg/kg	7.27E-08	mg/m^3	R	4.0E-09	mg/kg-day	3.1E-03	$(mg/kg\text{-}day)^{-1}$	1.2E-11
	Dibenz(a,h)anthracene	1.41	mg/kg	1.07E-09	mg/m^3	R	5.9E-11	mg/kg-day	3.1E+00	$(mg/kg\text{-}day)^{-1}$	1.8E-10
	Fluoranthene	243	mg/kg	1.84E-07	mg/m^3	R	1.0E-08	mg/kg-day	NA	--	--
	Indeno(1,2,3-cd)pyrene	8.79	mg/kg	6.66E-09	mg/m^3	R	3.7E-10	mg/kg-day	3.1E-01	$(mg/kg\text{-}day)^{-1}$	1.1E-10
	Naphthalene	0.525	mg/kg	3.98E-10	mg/m^3	R	2.2E-11	mg/kg-day	NA	--	--
	Pyrene	250	mg/kg	1.89E-07	mg/m^3	R	1.0E-08	mg/kg-day	NA	--	--
	4,4'-DDD	3	mg/kg	2.27E-09	mg/m^3	R	1.2E-10	mg/kg-day	2.4E-01	$(mg/kg\text{-}day)^{-1}$	3.0E-11
	Chlordane, alpha-	48	mg/kg	3.64E-08	mg/m^3	R	2.0E-09	mg/kg-day	3.5E-01	$(mg/kg\text{-}day)^{-1}$	7.0E-10
	Chlordane, gamma-	58	mg/kg	4.39E-08	mg/m^3	R	2.4E-09	mg/kg-day	3.5E-01	$(mg/kg\text{-}day)^{-1}$	8.5E-10
	Dieldrin	0.32	mg/kg	2.42E-10	mg/m^3	R	1.3E-11	mg/kg-day	1.6E+01	$(mg/kg\text{-}day)^{-1}$	2.1E-10
	Heptachlor	22	mg/kg	1.67E-08	mg/m^3	R	9.2E-10	mg/kg-day	4.6E+00	$(mg/kg\text{-}day)^{-1}$	4.2E-09
	Heptachlor Epoxide	4.5	mg/kg	3.41E-09	mg/m^3	R	1.9E-10	mg/kg-day	9.1E+00	$(mg/kg\text{-}day)^{-1}$	1.7E-09
	Aroclor-1248	1.51	mg/kg	1.14E-09	mg/m^3	R	6.3E-11	mg/kg-day	2.0E+00	$(mg/kg\text{-}day)^{-1}$	1.3E-10
	Aroclor-1254	0.975	mg/kg	7.39E-10	mg/m^3	R	4.1E-11	mg/kg-day	2.0E+00	$(mg/kg\text{-}day)^{-1}$	8.1E-11
	Aroclor-1260	54.6	mg/kg	4.13E-08	mg/m^3	R	2.3E-09	mg/kg-day	2.0E+00	$(mg/kg\text{-}day)^{-1}$	4.5E-09
	Gasoline Range Organics	0.207	mg/kg	1.57E-10	mg/m^3	R	8.6E-12	mg/kg-day	NA	--	--
	Diesel Range Organics	470	mg/kg	3.56E-07	mg/m^3	R	2.0E-08	mg/kg-day	NA	--	--
	Antimony	1.22	mg/kg	9.25E-10	mg/m^3	R	5.1E-11	mg/kg-day	NA	--	--
	Arsenic	3.49	mg/kg	2.65E-09	mg/m^3	R	1.5E-10	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	2.2E-09
	Iron	2,260	mg/kg	1.71E-06	mg/m^3	R	9.4E-08	mg/kg-day	NA	--	--
	Thallium	0.31	mg/kg	2.32E-10	mg/m^3	R	1.3E-11	mg/kg-day	NA	--	--
	(Total)										2.0E-08
										Total Risk Across All Exposure Routes/Pathways	2.0E-08

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/m^3 - milligram per cubic meter
mg/kg-day - milligram per kilogram per day

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

TABLE 8.5.1aB CT
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY
SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Air
Exposure Point: Fugative dust
Receptor Population: Residents
Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Inhalation	2-Methylnaphthalene	57.9	mg/kg	4.39E-08	mg/m^3	R	2.4E-09	mg/kg-day	NA	--	--
	Benzo(a)anthracene	4.76	mg/kg	3.61E-09	mg/m^3	R	2.0E-10	mg/kg-day	3.1E-01	$(mg/kg\text{-}day)^{-1}$	6.1E-11
	Benzo(a)pyrene	2.48	mg/kg	1.88E-09	mg/m^3	R	1.0E-10	mg/kg-day	3.1E+00	$(mg/kg\text{-}day)^{-1}$	3.2E-10
	Benzo(b)fluoranthene	2.81	mg/kg	2.13E-09	mg/m^3	R	1.2E-10	mg/kg-day	3.1E-01	$(mg/kg\text{-}day)^{-1}$	3.6E-11
	Benzo(k)fluoranthene	1.78	mg/kg	1.35E-09	mg/m^3	R	7.4E-11	mg/kg-day	3.1E-02	$(mg/kg\text{-}day)^{-1}$	2.3E-12
	Carbazole	0.95	mg/kg	7.20E-10	mg/m^3	R	4.0E-11	mg/kg-day	2.0E-02	$(mg/kg\text{-}day)^{-1}$	7.9E-13
	Chrysene	6.7	mg/kg	5.08E-09	mg/m^3	R	2.8E-10	mg/kg-day	3.1E-03	$(mg/kg\text{-}day)^{-1}$	8.6E-13
	Dibenz(a,h)anthracene	0.695	mg/kg	5.27E-10	mg/m^3	R	2.9E-11	mg/kg-day	3.1E+00	$(mg/kg\text{-}day)^{-1}$	9.0E-11
	Indeno(1,2,3-cd)pyrene	1.72	mg/kg	1.30E-09	mg/m^3	R	7.2E-11	mg/kg-day	3.1E-01	$(mg/kg\text{-}day)^{-1}$	2.2E-11
	Dieldrin	0.052	mg/kg	3.94E-11	mg/m^3	R	2.2E-12	mg/kg-day	1.6E+01	$(mg/kg\text{-}day)^{-1}$	3.5E-11
	Aroclor-1260	95.6	mg/kg	7.24E-08	mg/m^3	R	4.0E-09	mg/kg-day	2.0E+00	$(mg/kg\text{-}day)^{-1}$	8.0E-09
	Arsenic	5.26	mg/kg	3.98E-09	mg/m^3	R	2.2E-10	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	3.3E-09
	Iron	2,347	mg/kg	1.78E-06	mg/m^3	R	9.8E-08	mg/kg-day	NA	--	--
	(Total)										1.2E-08
										Total Risk Across All Exposure Routes/Pathways	1.2E-08

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/m^3 - milligram per cubic meter
mg/kg-day - milligram per kilogram per day

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

TABLE 8.5.2 CT
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Tap
Receptor Population: Residents
Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzene	0.0034	mg/L	0.0034	mg/L	M	1.2E-05	mg/kg-day	5.5E-02	(mg/kg-day) $^{-1}$	6.9E-07
	Chloroform	0.016	mg/L	0.016	mg/L	M	5.9E-05	mg/kg-day	6.1E-03	(mg/kg-day) $^{-1}$	3.6E-07
	2-Methylnaphthalene	0.00105	mg/L	0.00105	mg/L	M	3.8E-06	mg/kg-day	NA	--	--
	Naphthalene	0.0022	mg/L	0.0022	mg/L	M	8.1E-06	mg/kg-day	NA	--	--
	Heptachlor Epoxide	0.0000167	mg/L	0.0000167	mg/L	M	6.1E-08	mg/kg-day	9.1E+00	(mg/kg-day) $^{-1}$	5.6E-07
	MCPA	0.044	mg/L	0.044	mg/L	M	1.6E-04	mg/kg-day	NA	--	--
	Antimony	0.011	mg/L	0.011	mg/L	M	4.0E-05	mg/kg-day	NA	--	--
	Arsenic	0.03	mg/L	0.03	mg/L	M	1.1E-04	mg/kg-day	1.5E+00	(mg/kg-day) $^{-1}$	1.6E-04
	Iron	67.7	mg/L	67.7	mg/L	M	2.5E-01	mg/kg-day	NA	--	--
	Manganese	0.45	mg/L	0.45	mg/L	M	1.6E-03	mg/kg-day	NA	--	--
	Thallium	0.0057	mg/L	0.0057	mg/L	M	2.1E-05	mg/kg-day	NA	--	--
	(total)										1.7E-04
Dermal	Benzene	0.0034	mg/L	0.0034	mg/L	M	5.2E-07	mg/kg-day	5.9E-02	(mg/kg-day) $^{-1}$	3.1E-08
	Chloroform	0.016	mg/L	0.016	mg/L	M	1.0E-06	mg/kg-day	3.1E-02	(mg/kg-day) $^{-1}$	3.2E-08
	2-Methylnaphthalene	0.00105	mg/L	0.00105	mg/L	M	1.1E-06	mg/kg-day	NA	--	--
	Naphthalene	0.0022	mg/L	0.0022	mg/L	M	1.1E-06	mg/kg-day	NA	--	--
	Heptachlor Epoxide	0.0000167	mg/L	0.0000167	mg/L	M	6.7E-09	mg/kg-day	1.3E+01	(mg/kg-day) $^{-1}$	8.4E-08
	MCPA	0.044	mg/L	0.044	mg/L	M	1.6E-06	mg/kg-day	NA	--	--
	Antimony	0.011	mg/L	0.011	mg/L	M	8.0E-08	mg/kg-day	NA	--	--
	Arsenic	0.03	mg/L	0.03	mg/L	M	2.2E-07	mg/kg-day	3.7E+00	(mg/kg-day) $^{-1}$	8.0E-07
	Iron	67.7	mg/L	67.7	mg/L	M	4.9E-04	mg/kg-day	NA	--	--
	Manganese	0.45	mg/L	0.45	mg/L	M	3.3E-06	mg/kg-day	NA	--	--
	Thallium	0.0057	mg/L	0.0057	mg/L	M	4.1E-08	mg/kg-day	NA	--	--
	(Total)										9.4E-07
										Total Risk Across All Exposure Routes/Pathways	1.7E-04

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/L - milligram per liter
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

TABLE 8.5.3 CT
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: Surface Water
Receptor Population: Residents
Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Acetone	0.0056	mg/L	0.0056	mg/L	M	5.5E-07	mg/kg-day	NA	--	--
	Toluene	0.0027	mg/L	0.0027	mg/L	M	2.6E-07	mg/kg-day	NA	--	--
	Xylenes, total	0.0035	mg/L	0.0035	mg/L	M	3.4E-07	mg/kg-day	NA	--	--
	(total)										--
Dermal	Acetone	0.0056	mg/L	0.0056	mg/L	M	1.2E-08	mg/kg-day	NA	--	--
	Toluene	0.0027	mg/L	0.0027	mg/L	M	4.7E-07	mg/kg-day	NA	--	--
	Xylenes, total	0.0035	mg/L	0.0035	mg/L	M	1.3E-06	mg/kg-day	NA	--	--
	(Total)										--
										Total Risk Across All Exposure Routes/Pathways	--

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/L - milligram per liter
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

TABLE 8.5.4 CT
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Sediment
Receptor Population: Residents
Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	2-Methylnaphthalene	10	mg/kg	10	mg/kg	M	7.5E-07	mg/kg-day	NA	--	--
	Aroclor-1248	2.8	mg/kg	2.8	mg/kg	M	2.1E-07	mg/kg-day	2.0E+00	$(mg/kg\text{-}day)^{-1}$	4.2E-07
	Aroclor-1260	40	mg/kg	40	mg/kg	M	3.0E-06	mg/kg-day	2.0E+00	$(mg/kg\text{-}day)^{-1}$	6.0E-06
	Diesel Range Organics	11,600	mg/kg	11,600	mg/kg	M	8.7E-04	mg/kg-day	NA	--	--
	(total)										6.4E-06
Dermal	2-Methylnaphthalene	10	mg/kg	10	mg/kg	M	2.6E-08	mg/kg-day	NA	--	--
	Aroclor-1248	2.8	mg/kg	2.8	mg/kg	M	1.0E-07	mg/kg-day	2.2E+00	$(mg/kg\text{-}day)^{-1}$	2.3E-07
	Aroclor-1260	40	mg/kg	40	mg/kg	M	1.5E-06	mg/kg-day	2.2E+00	$(mg/kg\text{-}day)^{-1}$	3.3E-06
	Diesel Range Organics	11,600	mg/kg	11,600	mg/kg	M	3.0E-05	mg/kg-day	NA	--	--
	(Total)										3.5E-06
										Total Risk Across All Exposure Routes/Pathways	9.9E-06

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

TABLE 8.6.1A RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Surface Soil
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	2-Methylnaphthalene	1.96	mg/kg	1.96	mg/kg	M	1.3E-07	mg/kg-day	NA	--	--
	Benzo(a)anthracene	69.0	mg/kg	69.0	mg/kg	M	4.6E-06	mg/kg-day	7.3E-01	(mg/kg-day) $^{-1}$	3.4E-06
	Benzo(a)pyrene	30.5	mg/kg	30.5	mg/kg	M	2.0E-06	mg/kg-day	7.3E+00	(mg/kg-day) $^{-1}$	1.5E-05
	Benzo(b)fluoranthene	40.9	mg/kg	40.9	mg/kg	M	2.7E-06	mg/kg-day	7.3E-01	(mg/kg-day) $^{-1}$	2.0E-06
	Benzo(k)fluoranthene	18.7	mg/kg	18.7	mg/kg	M	1.3E-06	mg/kg-day	7.3E-02	(mg/kg-day) $^{-1}$	9.1E-08
	Carbazole	3.16	mg/kg	3.16	mg/kg	M	2.1E-07	mg/kg-day	2.0E-02	(mg/kg-day) $^{-1}$	4.2E-09
	Chrysene	96.0	mg/kg	96.0	mg/kg	M	6.4E-06	mg/kg-day	7.3E-03	(mg/kg-day) $^{-1}$	4.7E-08
	Dibenz(a,h)anthracene	1.41	mg/kg	1.41	mg/kg	M	9.5E-08	mg/kg-day	7.3E+00	(mg/kg-day) $^{-1}$	6.9E-07
	Fluoranthene	243	mg/kg	243	mg/kg	M	1.6E-05	mg/kg-day	NA	--	--
	Indeno(1,2,3-cd)pyrene	8.79	mg/kg	8.79	mg/kg	M	5.9E-07	mg/kg-day	7.3E-01	(mg/kg-day) $^{-1}$	4.3E-07
	Naphthalene	0.525	mg/kg	0.525	mg/kg	M	3.5E-08	mg/kg-day	NA	--	--
	Pyrene	250	mg/kg	250	mg/kg	M	1.7E-05	mg/kg-day	NA	--	--
	4,4'-DDD	3	mg/kg	3	mg/kg	M	2.0E-07	mg/kg-day	2.4E-01	(mg/kg-day) $^{-1}$	4.8E-08
	Chlordane, alpha-	48	mg/kg	48	mg/kg	M	3.2E-06	mg/kg-day	3.5E-01	(mg/kg-day) $^{-1}$	1.1E-06
	Chlordane, gamma-	58	mg/kg	58	mg/kg	M	3.9E-06	mg/kg-day	3.5E-01	(mg/kg-day) $^{-1}$	1.4E-06
	Dieldrin	0.32	mg/kg	0.32	mg/kg	M	2.1E-08	mg/kg-day	1.6E+01	(mg/kg-day) $^{-1}$	3.4E-07
	Heptachlor	22	mg/kg	22	mg/kg	M	1.5E-06	mg/kg-day	4.5E+00	(mg/kg-day) $^{-1}$	6.6E-06
	Heptachlor Epoxide	4.5	mg/kg	4.5	mg/kg	M	3.0E-07	mg/kg-day	9.1E+00	(mg/kg-day) $^{-1}$	2.7E-06
	Aroclor-1248	1.51	mg/kg	1.51	mg/kg	M	1.0E-07	mg/kg-day	2.0E+00	(mg/kg-day) $^{-1}$	2.0E-07
	Aroclor-1254	0.975	mg/kg	0.975	mg/kg	M	6.5E-08	mg/kg-day	2.0E+00	(mg/kg-day) $^{-1}$	1.3E-07
	Aroclor-1260	54.6	mg/kg	54.6	mg/kg	M	3.7E-06	mg/kg-day	2.0E+00	(mg/kg-day) $^{-1}$	7.3E-06
	Gasoline Range Organics	0.207	mg/kg	0.207	mg/kg	M	1.4E-08	mg/kg-day	NA	--	--
	Diesel Range Organics	470	mg/kg	470	mg/kg	M	3.2E-05	mg/kg-day	NA	--	--
	Antimony	1.22	mg/kg	1.22	mg/kg	M	8.2E-08	mg/kg-day	NA	--	--
	Arsenic	3.49	mg/kg	3.49	mg/kg	M	2.3E-07	mg/kg-day	1.5E+00	(mg/kg-day) $^{-1}$	3.5E-07
	Iron	2,260	mg/kg	2,260	mg/kg	M	1.5E-04	mg/kg-day	NA	--	--
	Thallium	0.31	mg/kg	0.31	mg/kg	M	2.1E-08	mg/kg-day	NA	--	--
	(total)										4.2E-05

TABLE 8.6.1A RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Surface Soil
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Dermal	2-Methylnaphthalene	1.96	mg/kg	1.96	mg/kg	M	1.8E-09	mg/kg-day	NA	--	--
	Benzo(a)anthracene	69.0	mg/kg	69.0	mg/kg	M	8.3E-07	mg/kg-day	2.4E+00	(mg/kg-day) $^{-1}$	1.9E-06
	Benzo(a)pyrene	30.5	mg/kg	30.5	mg/kg	M	3.7E-07	mg/kg-day	1.5E+01	(mg/kg-day) $^{-1}$	5.3E-06
	Benzo(b)fluoranthene	40.9	mg/kg	40.9	mg/kg	M	4.9E-07	mg/kg-day	1.5E+00	(mg/kg-day) $^{-1}$	7.2E-07
	Benzo(k)fluoranthene	18.7	mg/kg	18.7	mg/kg	M	2.2E-07	mg/kg-day	1.5E-01	(mg/kg-day) $^{-1}$	3.3E-08
	Carbazole	3.16	mg/kg	3.16	mg/kg	M	3.8E-08	mg/kg-day	4.0E-02	(mg/kg-day) $^{-1}$	1.5E-09
	Chrysene	96.0	mg/kg	96.0	mg/kg	M	1.2E-06	mg/kg-day	2.4E-02	(mg/kg-day) $^{-1}$	2.7E-08
	Dibenz(a,h)anthracene	1.41	mg/kg	1.41	mg/kg	M	1.7E-08	mg/kg-day	2.4E+01	(mg/kg-day) $^{-1}$	4.0E-07
	Fluoranthene	243	mg/kg	243	mg/kg	M	2.2E-07	mg/kg-day	NA	--	--
	Indeno(1,2,3-cd)pyrene	8.79	mg/kg	8.79	mg/kg	M	1.1E-07	mg/kg-day	2.4E+00	(mg/kg-day) $^{-1}$	2.5E-07
	Naphthalene	0.525	mg/kg	0.525	mg/kg	M	4.8E-10	mg/kg-day	NA	--	--
	Pyrene	250	mg/kg	250	mg/kg	M	2.3E-07	mg/kg-day	NA	--	--
	4,4'-DDD	3	mg/kg	3	mg/kg	M	2.8E-09	mg/kg-day	3.4E-01	(mg/kg-day) $^{-1}$	9.5E-10
	Chlordane, alpha-	48	mg/kg	48	mg/kg	M	1.8E-07	mg/kg-day	4.4E-01	(mg/kg-day) $^{-1}$	7.7E-08
	Chlordane, gamma-	58	mg/kg	58	mg/kg	M	2.1E-07	mg/kg-day	4.4E-01	(mg/kg-day) $^{-1}$	9.4E-08
	Dieldrin	0.32	mg/kg	0.32	mg/kg	M	3.0E-10	mg/kg-day	3.2E+01	(mg/kg-day) $^{-1}$	9.4E-09
	Heptachlor	22	mg/kg	22	mg/kg	M	2.0E-08	mg/kg-day	6.3E+00	(mg/kg-day) $^{-1}$	1.3E-07
	Heptachlor Epoxide	4.5	mg/kg	4.5	mg/kg	M	4.2E-09	mg/kg-day	1.3E+01	(mg/kg-day) $^{-1}$	5.2E-08
	Aroclor-1248	1.51	mg/kg	1.51	mg/kg	M	1.9E-08	mg/kg-day	2.2E+00	(mg/kg-day) $^{-1}$	4.4E-08
	Aroclor-1254	0.975	mg/kg	0.975	mg/kg	M	1.3E-08	mg/kg-day	2.2E+00	(mg/kg-day) $^{-1}$	2.8E-08
	Aroclor-1260	54.6	mg/kg	54.6	mg/kg	M	7.0E-07	mg/kg-day	2.2E+00	(mg/kg-day) $^{-1}$	1.6E-06
	Gasoline Range Organics	0.207	mg/kg	0.207	mg/kg	M	1.9E-10	mg/kg-day	NA	--	--
	Diesel Range Organics	470	mg/kg	470	mg/kg	M	4.3E-07	mg/kg-day	NA	--	--
	Antimony	1.22	mg/kg	1.22	mg/kg	M	1.1E-10	mg/kg-day	NA	--	--
	Arsenic	3.49	mg/kg	3.49	mg/kg	M	9.7E-09	mg/kg-day	3.7E+00	(mg/kg-day) $^{-1}$	3.5E-08
	Iron	2,260	mg/kg	2,260	mg/kg	M	2.1E-07	mg/kg-day	NA	--	--
	Thallium	0.31	mg/kg	0.31	mg/kg	M	2.8E-11	mg/kg-day	NA	--	--
	(Total)										1.1E-05
										Total Risk Across All Exposure Routes/Pathways	5.3E-05

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

TABLE 8.6.1B RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Surface Soil
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	2-Methylnaphthalene	57.9	mg/kg	57.9	mg/kg	M	3.9E-06	mg/kg-day	NA	--	--
	Benzo(a)anthracene	4.76	mg/kg	4.76	mg/kg	M	3.2E-07	mg/kg-day	7.3E-01	(mg/kg-day) $^{-1}$	2.3E-07
	Benzo(a)pyrene	2.48	mg/kg	2.48	mg/kg	M	1.7E-07	mg/kg-day	7.3E+00	(mg/kg-day) $^{-1}$	1.2E-06
	Benzo(b)fluoranthene	2.81	mg/kg	2.81	mg/kg	M	1.9E-07	mg/kg-day	7.3E-01	(mg/kg-day) $^{-1}$	1.4E-07
	Benzo(k)fluoranthene	1.78	mg/kg	1.78	mg/kg	M	1.2E-07	mg/kg-day	7.3E-02	(mg/kg-day) $^{-1}$	8.7E-09
	Carbazole	0.95	mg/kg	0.95	mg/kg	M	6.4E-08	mg/kg-day	2.0E-02	(mg/kg-day) $^{-1}$	1.3E-09
	Chrysene	6.7	mg/kg	6.7	mg/kg	M	4.5E-07	mg/kg-day	7.3E-03	(mg/kg-day) $^{-1}$	3.3E-09
	Dibenz(a,h)anthracene	0.695	mg/kg	0.695	mg/kg	M	4.7E-08	mg/kg-day	7.3E+00	(mg/kg-day) $^{-1}$	3.4E-07
	Indeno(1,2,3-cd)pyrene	1.72	mg/kg	1.72	mg/kg	M	1.2E-07	mg/kg-day	7.3E-01	(mg/kg-day) $^{-1}$	8.4E-08
	Dieldrin	0.052	mg/kg	0.052	mg/kg	M	3.5E-09	mg/kg-day	1.6E+01	(mg/kg-day) $^{-1}$	5.6E-08
	Aroclor-1260	95.6	mg/kg	95.6	mg/kg	M	6.4E-06	mg/kg-day	2.0E+00	(mg/kg-day) $^{-1}$	1.3E-05
	Arsenic	5.26	mg/kg	5.26	mg/kg	M	3.5E-07	mg/kg-day	1.5E+00	(mg/kg-day) $^{-1}$	5.3E-07
	Iron	2,347	mg/kg	2,347	mg/kg	M	1.6E-04	mg/kg-day	NA	--	--
	(total)										1.5E-05
Dermal	2-Methylnaphthalene	57.9	mg/kg	57.9	mg/kg	M	5.3E-08	mg/kg-day	NA	--	--
	Benzo(a)anthracene	4.76	mg/kg	4.76	mg/kg	M	5.7E-08	mg/kg-day	2.4E+00	(mg/kg-day) $^{-1}$	1.3E-07
	Benzo(a)pyrene	2.48	mg/kg	2.48	mg/kg	M	3.0E-08	mg/kg-day	1.5E+01	(mg/kg-day) $^{-1}$	4.3E-07
	Benzo(b)fluoranthene	2.81	mg/kg	2.81	mg/kg	M	3.4E-08	mg/kg-day	1.5E+00	(mg/kg-day) $^{-1}$	4.9E-08
	Benzo(k)fluoranthene	1.78	mg/kg	1.78	mg/kg	M	2.1E-08	mg/kg-day	1.5E-01	(mg/kg-day) $^{-1}$	3.1E-09
	Carbazole	0.95	mg/kg	0.95	mg/kg	M	1.1E-08	mg/kg-day	4.0E-02	(mg/kg-day) $^{-1}$	4.6E-10
	Chrysene	6.7	mg/kg	6.7	mg/kg	M	8.0E-08	mg/kg-day	2.4E-02	(mg/kg-day) $^{-1}$	1.9E-09
	Dibenz(a,h)anthracene	0.695	mg/kg	0.695	mg/kg	M	8.3E-09	mg/kg-day	2.4E+01	(mg/kg-day) $^{-1}$	2.0E-07
	Indeno(1,2,3-cd)pyrene	1.72	mg/kg	1.72	mg/kg	M	2.1E-08	mg/kg-day	2.4E+00	(mg/kg-day) $^{-1}$	4.9E-08
	Dieldrin	0.052	mg/kg	0.052	mg/kg	M	4.8E-11	mg/kg-day	3.2E+01	(mg/kg-day) $^{-1}$	1.5E-09
	Aroclor-1260	95.6	mg/kg	95.6	mg/kg	M	1.2E-06	mg/kg-day	2.2E+00	(mg/kg-day) $^{-1}$	2.7E-06
	Arsenic	5.26	mg/kg	5.26	mg/kg	M	1.5E-08	mg/kg-day	3.7E+00	(mg/kg-day) $^{-1}$	5.3E-08
	Iron	2,347	mg/kg	2,347	mg/kg	M	2.2E-07	mg/kg-day	NA	--	--
	(Total)										3.7E-06
										Total Risk Across All Exposure Routes/Pathways	1.9E-05

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

TABLE 8.6.1aA RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Air
Exposure Point: Fugative dust
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Inhalation	2-Methylnaphthalene	1.96	mg/kg	1.48E-09	mg/m^3	R	1.4E-12	mg/kg-day	NA	--	--
	Benzo(a)anthracene	69.0	mg/kg	5.23E-08	mg/m^3	R	4.9E-11	mg/kg-day	3.1E-01	$(mg/kg-day)^{-1}$	1.5E-11
	Benzo(a)pyrene	30.5	mg/kg	2.31E-08	mg/m^3	R	2.1E-11	mg/kg-day	3.1E+00	$(mg/kg-day)^{-1}$	6.6E-11
	Benzo(b)fluoranthene	40.9	mg/kg	3.10E-08	mg/m^3	R	2.9E-11	mg/kg-day	3.1E-01	$(mg/kg-day)^{-1}$	8.9E-12
	Benzo(k)fluoranthene	18.7	mg/kg	1.41E-08	mg/m^3	R	1.3E-11	mg/kg-day	3.1E-02	$(mg/kg-day)^{-1}$	4.1E-13
	Carbazole	3.16	mg/kg	2.39E-09	mg/m^3	R	2.2E-12	mg/kg-day	2.0E-02	$(mg/kg-day)^{-1}$	4.4E-14
	Chrysene	96.0	mg/kg	7.27E-08	mg/m^3	R	6.8E-11	mg/kg-day	3.1E-03	$(mg/kg-day)^{-1}$	2.1E-13
	Dibenz(a,h)anthracene	1.41	mg/kg	1.07E-09	mg/m^3	R	9.9E-13	mg/kg-day	3.1E+00	$(mg/kg-day)^{-1}$	3.1E-12
	Fluoranthene	243	mg/kg	1.84E-07	mg/m^3	R	1.7E-10	mg/kg-day	NA	--	--
	Indeno(1,2,3-cd)pyrene	8.79	mg/kg	6.66E-09	mg/m^3	R	6.2E-12	mg/kg-day	3.1E-01	$(mg/kg-day)^{-1}$	1.9E-12
	Naphthalene	0.525	mg/kg	3.98E-10	mg/m^3	R	3.7E-13	mg/kg-day	NA	--	--
	Pyrene	250	mg/kg	1.89E-07	mg/m^3	R	1.8E-10	mg/kg-day	NA	--	--
	4,4'-DDD	3	mg/kg	2.27E-09	mg/m^3	R	2.1E-12	mg/kg-day	2.4E-01	$(mg/kg-day)^{-1}$	5.1E-13
	Chlordane, alpha-	48	mg/kg	3.64E-08	mg/m^3	R	3.4E-11	mg/kg-day	3.5E-01	$(mg/kg-day)^{-1}$	1.2E-11
	Chlordane, gamma-	58	mg/kg	4.39E-08	mg/m^3	R	4.1E-11	mg/kg-day	3.5E-01	$(mg/kg-day)^{-1}$	1.4E-11
	Dieldrin	0.32	mg/kg	2.42E-10	mg/m^3	R	2.3E-13	mg/kg-day	1.6E+01	$(mg/kg-day)^{-1}$	3.6E-12
	Heptachlor	22	mg/kg	1.67E-08	mg/m^3	R	1.5E-11	mg/kg-day	4.6E+00	$(mg/kg-day)^{-1}$	7.0E-11
	Heptachlor Epoxide	4.5	mg/kg	3.41E-09	mg/m^3	R	3.2E-12	mg/kg-day	9.1E+00	$(mg/kg-day)^{-1}$	2.9E-11
	Aroclor-1248	1.51	mg/kg	1.14E-09	mg/m^3	R	1.1E-12	mg/kg-day	2.0E+00	$(mg/kg-day)^{-1}$	2.1E-12
	Aroclor-1254	0.975	mg/kg	7.39E-10	mg/m^3	R	6.9E-13	mg/kg-day	2.0E+00	$(mg/kg-day)^{-1}$	1.4E-12
	Aroclor-1260	54.6	mg/kg	4.13E-08	mg/m^3	R	3.8E-11	mg/kg-day	2.0E+00	$(mg/kg-day)^{-1}$	7.7E-11
	Gasoline Range Organics	0.207	mg/kg	1.57E-10	mg/m^3	R	1.5E-13	mg/kg-day	NA	--	--
	Diesel Range Organics	470	mg/kg	3.56E-07	mg/m^3	R	3.3E-10	mg/kg-day	NA	--	--
	Antimony	1.22	mg/kg	9.25E-10	mg/m^3	R	8.6E-13	mg/kg-day	NA	--	--
	Arsenic	3.49	mg/kg	2.65E-09	mg/m^3	R	2.5E-12	mg/kg-day	1.5E+01	$(mg/kg-day)^{-1}$	3.7E-11
	Iron	2,260	mg/kg	1.71E-06	mg/m^3	R	1.6E-09	mg/kg-day	NA	--	--
	Thallium	0.31	mg/kg	2.32E-10	mg/m^3	R	2.2E-13	mg/kg-day	NA	--	--
	(Total)										3.4E-10
										Total Risk Across All Exposure Routes/Pathways	3.4E-10

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/m^3 - milligram per cubic meter
mg/kg-day - milligram per kilogram per day

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

TABLE 8.6.1aB RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Air
Exposure Point: Fugative dust
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Inhalation	2-Methylnaphthalene	57.9	mg/kg	4.39E-08	mg/m^3	R	4.1E-11	mg/kg-day	NA	--	--
	Benzo(a)anthracene	4.76	mg/kg	3.61E-09	mg/m^3	R	3.3E-12	mg/kg-day	3.1E-01	$(mg/kg\text{-}day)^{-1}$	1.0E-12
	Benzo(a)pyrene	2.48	mg/kg	1.88E-09	mg/m^3	R	1.7E-12	mg/kg-day	3.1E+00	$(mg/kg\text{-}day)^{-1}$	5.4E-12
	Benzo(b)fluoranthene	2.81	mg/kg	2.13E-09	mg/m^3	R	2.0E-12	mg/kg-day	3.1E-01	$(mg/kg\text{-}day)^{-1}$	6.1E-13
	Benzo(k)fluoranthene	1.78	mg/kg	1.35E-09	mg/m^3	R	1.3E-12	mg/kg-day	3.1E-02	$(mg/kg\text{-}day)^{-1}$	3.9E-14
	Carbazole	0.95	mg/kg	7.20E-10	mg/m^3	R	6.7E-13	mg/kg-day	2.0E-02	$(mg/kg\text{-}day)^{-1}$	1.3E-14
	Chrysene	6.7	mg/kg	5.08E-09	mg/m^3	R	4.7E-12	mg/kg-day	3.1E-03	$(mg/kg\text{-}day)^{-1}$	1.5E-14
	Dibenz(a,h)anthracene	0.695	mg/kg	5.27E-10	mg/m^3	R	4.9E-13	mg/kg-day	3.1E+00	$(mg/kg\text{-}day)^{-1}$	1.5E-12
	Indeno(1,2,3-cd)pyrene	1.72	mg/kg	1.30E-09	mg/m^3	R	1.2E-12	mg/kg-day	3.1E-01	$(mg/kg\text{-}day)^{-1}$	3.7E-13
	Dieldrin	0.052	mg/kg	3.94E-11	mg/m^3	R	3.7E-14	mg/kg-day	1.6E+01	$(mg/kg\text{-}day)^{-1}$	5.9E-13
	Aroclor-1260	95.6	mg/kg	7.24E-08	mg/m^3	R	6.7E-11	mg/kg-day	2.0E+00	$(mg/kg\text{-}day)^{-1}$	1.3E-10
	Arsenic	5.26	mg/kg	3.98E-09	mg/m^3	R	3.7E-12	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	5.6E-11
	Iron	2,347	mg/kg	1.78E-06	mg/m^3	R	1.7E-09	mg/kg-day	NA	--	--
	(Total)										2.0E-10
									Total Risk Across All Exposure Routes/Pathways		2.0E-10

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/m^3 - milligram per cubic meter
mg/kg-day - milligram per kilogram per day

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

TABLE 8.6.2A RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Subsurface Soil
Exposure Medium: Subsurface Soil
Exposure Point: Subsurface Soil
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	2-Methylnaphthalene	0.573	mg/kg	0.573	mg/kg	M	3.8E-08	mg/kg-day	NA	--	--
	Benzo(a)anthracene	0.199	mg/kg	0.199	mg/kg	M	1.3E-08	mg/kg-day	7.3E-01	(mg/kg-day) $^{-1}$	9.7E-09
	Benzo(a)pyrene	0.194	mg/kg	0.194	mg/kg	M	1.3E-08	mg/kg-day	7.3E+00	(mg/kg-day) $^{-1}$	9.5E-08
	Benzo(b)fluoranthene	0.217	mg/kg	0.217	mg/kg	M	1.5E-08	mg/kg-day	7.3E-01	(mg/kg-day) $^{-1}$	1.1E-08
	Benzo(k)fluoranthene	0.137	mg/kg	0.137	mg/kg	M	9.2E-09	mg/kg-day	7.3E-02	(mg/kg-day) $^{-1}$	6.7E-10
	Bis(2-chloroethoxy)methane	0.0512	mg/kg	0.0512	mg/kg	M	3.4E-09	mg/kg-day	NA	--	--
	Carbazole	0.0845	mg/kg	0.0845	mg/kg	M	5.7E-09	mg/kg-day	2.0E-02	(mg/kg-day) $^{-1}$	1.1E-10
	Chrysene	0.209	mg/kg	0.209	mg/kg	M	1.4E-08	mg/kg-day	7.3E-03	(mg/kg-day) $^{-1}$	1.0E-10
	Dibenz(a,h)anthracene	0.0758	mg/kg	0.0758	mg/kg	M	5.1E-09	mg/kg-day	7.3E+00	(mg/kg-day) $^{-1}$	3.7E-08
	Indeno(1,2,3-cd)pyrene	0.145	mg/kg	0.145	mg/kg	M	9.7E-09	mg/kg-day	7.3E-01	(mg/kg-day) $^{-1}$	7.1E-09
	Naphthalene	0.226	mg/kg	0.226	mg/kg	M	1.5E-08	mg/kg-day	NA	--	--
	Chlordane, alpha-	1.22	mg/kg	1.22	mg/kg	M	8.2E-08	mg/kg-day	3.5E-01	(mg/kg-day) $^{-1}$	2.9E-08
	Chlordane, gamma-	1.65	mg/kg	1.65	mg/kg	M	1.1E-07	mg/kg-day	3.5E-01	(mg/kg-day) $^{-1}$	3.9E-08
	Heptachlor	0.155	mg/kg	0.155	mg/kg	M	1.0E-08	mg/kg-day	4.5E+00	(mg/kg-day) $^{-1}$	4.7E-08
	Heptachlor Epoxide	0.0161	mg/kg	0.0161	mg/kg	M	1.1E-09	mg/kg-day	9.1E+00	(mg/kg-day) $^{-1}$	9.8E-09
	Aroclor-1248	0.318	mg/kg	0.318	mg/kg	M	2.1E-08	mg/kg-day	2.0E+00	(mg/kg-day) $^{-1}$	4.3E-08
	Aroclor-1254	0.333	mg/kg	0.333	mg/kg	M	2.2E-08	mg/kg-day	2.0E+00	(mg/kg-day) $^{-1}$	4.5E-08
	Aroclor-1260	5.61	mg/kg	5.61	mg/kg	M	3.8E-07	mg/kg-day	2.0E+00	(mg/kg-day) $^{-1}$	7.5E-07
	Gasoline Range Organics	580	mg/kg	580	mg/kg	M	3.9E-05	mg/kg-day	NA	--	--
	Diesel Range Organics	5,500	mg/kg	5,500	mg/kg	M	3.7E-04	mg/kg-day	NA	--	--
	Arsenic	1.11	mg/kg	1.11	mg/kg	M	7.4E-08	mg/kg-day	1.5E+00	(mg/kg-day) $^{-1}$	1.1E-07
	Iron	2,754	mg/kg	2,754	mg/kg	M	1.8E-04	mg/kg-day	NA	--	--
	Thallium	0.405	mg/kg	0.405	mg/kg	M	2.7E-08	mg/kg-day	NA	--	--
	(total)										1.2E-06

TABLE 8.6.2A RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Subsurface Soil
Exposure Medium: Subsurface Soil
Exposure Point: Subsurface Soil
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Dermal	2-Methylnaphthalene	0.573	mg/kg	0.573	mg/kg	M	5.3E-10	mg/kg-day	NA	--	--
	Benzo(a)anthracene	0.199	mg/kg	0.199	mg/kg	M	2.4E-09	mg/kg-day	2.4E+00	(mg/kg-day) $^{-1}$	5.6E-09
	Benzo(a)pyrene	0.194	mg/kg	0.194	mg/kg	M	2.3E-09	mg/kg-day	1.5E+01	(mg/kg-day) $^{-1}$	3.4E-08
	Benzo(b)fluoranthene	0.217	mg/kg	0.217	mg/kg	M	2.6E-09	mg/kg-day	1.5E+00	(mg/kg-day) $^{-1}$	3.8E-09
	Benzo(k)fluoranthene	0.137	mg/kg	0.137	mg/kg	M	1.6E-09	mg/kg-day	1.5E-01	(mg/kg-day) $^{-1}$	2.4E-10
	Bis(2-chloroethoxy)methane	0.0512	mg/kg	0.0512	mg/kg	M	4.7E-10	mg/kg-day	NA	--	--
	Carbazole	0.0845	mg/kg	0.0845	mg/kg	M	1.0E-09	mg/kg-day	4.0E-02	(mg/kg-day) $^{-1}$	4.1E-11
	Chrysene	0.209	mg/kg	0.209	mg/kg	M	2.5E-09	mg/kg-day	2.4E-02	(mg/kg-day) $^{-1}$	5.9E-11
	Dibenz(a,h)anthracene	0.0758	mg/kg	0.0758	mg/kg	M	9.1E-10	mg/kg-day	2.4E+01	(mg/kg-day) $^{-1}$	2.1E-08
	Indeno(1,2,3-cd)pyrene	0.145	mg/kg	0.145	mg/kg	M	1.7E-09	mg/kg-day	2.4E+00	(mg/kg-day) $^{-1}$	4.1E-09
	Naphthalene	0.226	mg/kg	0.226	mg/kg	M	2.1E-10	mg/kg-day	NA	--	--
	Chlordane, alpha-	1.22	mg/kg	1.22	mg/kg	M	4.5E-09	mg/kg-day	4.4E-01	(mg/kg-day) $^{-1}$	2.0E-09
	Chlordane, gamma-	1.65	mg/kg	1.65	mg/kg	M	6.1E-09	mg/kg-day	4.4E-01	(mg/kg-day) $^{-1}$	2.7E-09
	Heptachlor	0.155	mg/kg	0.155	mg/kg	M	1.4E-10	mg/kg-day	6.3E+00	(mg/kg-day) $^{-1}$	8.9E-10
	Heptachlor Epoxide	0.0161	mg/kg	0.0161	mg/kg	M	1.5E-11	mg/kg-day	1.3E+01	(mg/kg-day) $^{-1}$	1.9E-10
	Aroclor-1248	0.318	mg/kg	0.318	mg/kg	M	4.1E-09	mg/kg-day	2.2E+00	(mg/kg-day) $^{-1}$	9.2E-09
	Aroclor-1254	0.333	mg/kg	0.333	mg/kg	M	4.3E-09	mg/kg-day	2.2E+00	(mg/kg-day) $^{-1}$	9.6E-09
	Aroclor-1260	5.61	mg/kg	5.61	mg/kg	M	7.2E-08	mg/kg-day	2.2E+00	(mg/kg-day) $^{-1}$	1.6E-07
	Gasoline Range Organics	580	mg/kg	580	mg/kg	M	5.4E-07	mg/kg-day	NA	--	--
	Diesel Range Organics	5,500	mg/kg	5,500	mg/kg	M	5.1E-06	mg/kg-day	NA	--	--
	Arsenic	1.11	mg/kg	1.11	mg/kg	M	3.1E-09	mg/kg-day	3.7E+00	(mg/kg-day) $^{-1}$	1.1E-08
	Iron	2,754	mg/kg	2,754	mg/kg	M	2.5E-07	mg/kg-day	NA	--	--
	Thallium	0.405	mg/kg	0.405	mg/kg	M	3.7E-11	mg/kg-day	NA	--	--
	(Total)										2.7E-07
										Total Risk Across All Exposure Routes/Pathways	1.5E-06

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

TABLE 8.6.2B RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Subsurface Soil
Exposure Medium: Subsurface Soil
Exposure Point: Subsurface Soil
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	2-Methylnaphthalene	6.38	mg/kg	6.38	mg/kg	M	4.3E-07	mg/kg-day	NA	--	--
	Bis(2-chloroethoxy)methane	0.054	mg/kg	0.054	mg/kg	M	3.6E-09	mg/kg-day	NA	--	--
	Naphthalene	0.862	mg/kg	0.862	mg/kg	M	5.8E-08	mg/kg-day	NA	--	--
	Aroclor-1260	27.0	mg/kg	27.0	mg/kg	M	1.8E-06	mg/kg-day	2.0E+00	(mg/kg-day) $^{-1}$	3.6E-06
	Gasoline Range Organics	580	mg/kg	580	mg/kg	M	3.9E-05	mg/kg-day	NA	--	--
	Diesel Range Organics	5,500	mg/kg	5,500	mg/kg	M	3.7E-04	mg/kg-day	NA	--	--
	Arsenic	1.50	mg/kg	1.50	mg/kg	M	1.0E-07	mg/kg-day	1.5E+00	(mg/kg-day) $^{-1}$	1.5E-07
	Iron	3,007	mg/kg	3,007	mg/kg	M	2.0E-04	mg/kg-day	NA	--	--
	Thallium	0.488	mg/kg	0.488	mg/kg	M	3.3E-08	mg/kg-day	NA	--	--
	(total)										3.8E-06
Dermal	2-Methylnaphthalene	6.38	mg/kg	6.38	mg/kg	M	5.9E-09	mg/kg-day	NA	--	--
	Bis(2-chloroethoxy)methane	0.054	mg/kg	0.054	mg/kg	M	5.0E-10	mg/kg-day	NA	--	--
	Naphthalene	0.862	mg/kg	0.862	mg/kg	M	8.0E-10	mg/kg-day	NA	--	--
	Aroclor-1260	27.0	mg/kg	27.0	mg/kg	M	3.5E-07	mg/kg-day	2.2E+00	(mg/kg-day) $^{-1}$	7.8E-07
	Gasoline Range Organics	580	mg/kg	580	mg/kg	M	5.4E-07	mg/kg-day	NA	--	--
	Diesel Range Organics	5,500	mg/kg	5,500	mg/kg	M	5.1E-06	mg/kg-day	NA	--	--
	Arsenic	1.50	mg/kg	1.50	mg/kg	M	4.2E-09	mg/kg-day	3.7E+00	(mg/kg-day) $^{-1}$	1.5E-08
	Iron	3,007	mg/kg	3,007	mg/kg	M	2.8E-07	mg/kg-day	NA	--	--
	Thallium	0.488	mg/kg	0.488	mg/kg	M	4.5E-11	mg/kg-day	NA	--	--
	(Total)										7.9E-07
										Total Risk Across All Exposure Routes/Pathways	4.6E-06

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

TABLE 8.6.2aA RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Subsurface Soil
Exposure Medium: Air
Exposure Point: Fugative dust
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Inhalation	2-Methylnaphthalene	0.573	mg/kg	4.34E-10	mg/m^3	R	4.0E-13	mg/kg-day	NA	--	--
	Benzo(a)anthracene	0.199	mg/kg	1.51E-10	mg/m^3	R	1.4E-13	mg/kg-day	3.1E-01	$(mg/kg\text{-}day)^{-1}$	4.3E-14
	Benzo(a)pyrene	0.194	mg/kg	1.47E-10	mg/m^3	R	1.4E-13	mg/kg-day	3.1E+00	$(mg/kg\text{-}day)^{-1}$	4.2E-13
	Benzo(b)fluoranthene	0.217	mg/kg	1.64E-10	mg/m^3	R	1.5E-13	mg/kg-day	3.1E-01	$(mg/kg\text{-}day)^{-1}$	4.7E-14
	Benzo(k)fluoranthene	0.137	mg/kg	1.04E-10	mg/m^3	R	9.7E-14	mg/kg-day	3.1E-02	$(mg/kg\text{-}day)^{-1}$	3.0E-15
	Bis(2-chloroethoxy)methane	0.0512	mg/kg	3.88E-11	mg/m^3	R	3.6E-14	mg/kg-day	NA	--	--
	Carbazole	0.0845	mg/kg	6.40E-11	mg/m^3	R	5.9E-14	mg/kg-day	2.0E-02	$(mg/kg\text{-}day)^{-1}$	1.2E-15
	Chrysene	0.209	mg/kg	1.59E-10	mg/m^3	R	1.5E-13	mg/kg-day	3.1E-03	$(mg/kg\text{-}day)^{-1}$	4.6E-16
	Dibenz(a,h)anthracene	0.0758	mg/kg	5.75E-11	mg/m^3	R	5.3E-14	mg/kg-day	3.1E+00	$(mg/kg\text{-}day)^{-1}$	1.7E-13
	Indeno(1,2,3-cd)pyrene	0.145	mg/kg	1.10E-10	mg/m^3	R	1.0E-13	mg/kg-day	3.1E-01	$(mg/kg\text{-}day)^{-1}$	3.2E-14
	Naphthalene	0.226	mg/kg	1.71E-10	mg/m^3	R	1.6E-13	mg/kg-day	NA	--	--
	Chlordane, alpha-	1.22	mg/kg	9.21E-10	mg/m^3	R	8.5E-13	mg/kg-day	3.5E-01	$(mg/kg\text{-}day)^{-1}$	3.0E-13
	Chlordane, gamma-	1.65	mg/kg	1.25E-09	mg/m^3	R	1.2E-12	mg/kg-day	3.5E-01	$(mg/kg\text{-}day)^{-1}$	4.1E-13
	Heptachlor	0.155	mg/kg	1.17E-10	mg/m^3	R	1.1E-13	mg/kg-day	4.6E+00	$(mg/kg\text{-}day)^{-1}$	5.0E-13
	Heptachlor Epoxide	0.0161	mg/kg	1.22E-11	mg/m^3	R	1.1E-14	mg/kg-day	9.1E+00	$(mg/kg\text{-}day)^{-1}$	1.0E-13
	Aroclor-1248	0.318	mg/kg	2.41E-10	mg/m^3	R	2.2E-13	mg/kg-day	2.0E+00	$(mg/kg\text{-}day)^{-1}$	4.5E-13
	Aroclor-1254	0.333	mg/kg	2.52E-10	mg/m^3	R	2.3E-13	mg/kg-day	2.0E+00	$(mg/kg\text{-}day)^{-1}$	4.7E-13
	Aroclor-1260	5.61	mg/kg	4.25E-09	mg/m^3	R	3.9E-12	mg/kg-day	2.0E+00	$(mg/kg\text{-}day)^{-1}$	7.9E-12
	Gasoline Range Organics	580	mg/kg	4.39E-07	mg/m^3	R	4.1E-10	mg/kg-day	NA	--	--
	Diesel Range Organics	5,500	mg/kg	4.17E-06	mg/m^3	R	3.9E-09	mg/kg-day	NA	--	--
	Arsenic	1.11	mg/kg	8.41E-10	mg/m^3	R	7.8E-13	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	1.2E-11
	Iron	2,754	mg/kg	2.09E-06	mg/m^3	R	1.9E-09	mg/kg-day	NA	--	--
	Thallium	0.405	mg/kg	3.07E-10	mg/m^3	R	2.9E-13	mg/kg-day	NA	--	--
	(Total)										2.3E-11
										Total Risk Across All Exposure Routes/Pathways	2.3E-11

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/m^3 - milligram per cubic meter
mg/kg-day - milligram per kilogram per day

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

TABLE 8.6.2aB RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Subsurface Soil
Exposure Medium: Air
Exposure Point: Fugative dust
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Inhalation	2-Methylnaphthalene	6.38	mg/kg	4.83E-09	mg/m^3	R	4.5E-12	mg/kg-day	NA	--	--
	Bis(2-chloroethoxy)methane	0.054	mg/kg	4.09E-11	mg/m^3	R	3.8E-14	mg/kg-day	NA	--	--
	Naphthalene	0.862	mg/kg	6.53E-10	mg/m^3	R	6.1E-13	mg/kg-day	NA	--	--
	Aroclor-1260	27.0	mg/kg	2.05E-08	mg/m^3	R	1.9E-11	mg/kg-day	2.0E+00	$(mg/kg\text{-}day)^{-1}$	3.8E-11
	Gasoline Range Organics	580	mg/kg	4.39E-07	mg/m^3	R	4.1E-10	mg/kg-day	NA	--	--
	Diesel Range Organics	5,500	mg/kg	4.17E-06	mg/m^3	R	3.9E-09	mg/kg-day	NA	--	--
	Arsenic	1.50	mg/kg	1.14E-09	mg/m^3	R	1.1E-12	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	1.6E-11
	Iron	3,007	mg/kg	2.28E-06	mg/m^3	R	2.1E-09	mg/kg-day	NA	--	--
	Thallium	0.488	mg/kg	3.70E-10	mg/m^3	R	3.4E-13	mg/kg-day	NA	--	--
	(Total)										5.4E-11
										Total Risk Across All Exposure Routes/Pathways	5.4E-11

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/m^3 - milligram per cubic meter
mg/kg-day - milligram per kilogram per day

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

TABLE 8.6.3 RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Groundwater
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Dermal	Benzene	0.0034	mg/L	0.0034	mg/L	M	2.6E-07	mg/kg-day	5.9E-02	(mg/kg-day) $^{-1}$	1.6E-08
	Chloroform	0.016	mg/L	0.016	mg/L	M	5.3E-07	mg/kg-day	3.1E-02	(mg/kg-day) $^{-1}$	1.6E-08
	2-Methylnaphthalene	0.00105	mg/L	0.00105	mg/L	M	5.5E-07	mg/kg-day	NA	--	--
	Naphthalene	0.0022	mg/L	0.0022	mg/L	M	5.6E-07	mg/kg-day	NA	--	--
	Heptachlor Epoxide	0.0000167	mg/L	0.0000167	mg/L	M	3.4E-09	mg/kg-day	1.3E+01	(mg/kg-day) $^{-1}$	4.3E-08
	MCPA	0.044	mg/L	0.044	mg/L	M	8.0E-07	mg/kg-day	NA	--	--
	Antimony	0.011	mg/L	0.011	mg/L	M	4.1E-08	mg/kg-day	NA	--	--
	Arsenic	0.03	mg/L	0.03	mg/L	M	1.1E-07	mg/kg-day	3.7E+00	(mg/kg-day) $^{-1}$	4.1E-07
	Iron	67.7	mg/L	67.7	mg/L	M	2.5E-04	mg/kg-day	NA	--	--
	Manganese	0.45	mg/L	0.45	mg/L	M	1.7E-06	mg/kg-day	NA	--	--
	Thallium	0.0057	mg/L	0.0057	mg/L	M	2.1E-08	mg/kg-day	NA	--	--
	(Total)										4.8E-07
										Total Risk Across All Exposure Routes/Pathways	4.8E-07

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/L - milligram per liter
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

TABLE 8.6.4 RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: Surface Water
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Dermal	Acetone	0.0056	mg/L	0.0056	mg/L	M	1.2E-08	mg/kg-day	NA	--	--
	Toluene	0.0027	mg/L	0.0027	mg/L	M	4.5E-07	mg/kg-day	NA	--	--
	Xylenes, total	0.0035	mg/L	0.0035	mg/L	M	1.2E-06	mg/kg-day	NA	--	--
	(Total)										--
										Total Risk Across All Exposure Routes/Pathways	--

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/L - milligram per liter
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

TABLE 8.6.5 RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Sediment
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Dermal	2-Methylnaphthalene	10	mg/kg	10	mg/kg	M	9.2E-09	mg/kg-day	NA	--	--
	Aroclor-1248	2.8	mg/kg	2.8	mg/kg	M	3.6E-08	mg/kg-day	2.2E+00	$(mg/kg\text{-}day)^{-1}$	8.1E-08
	Aroclor-1260	40	mg/kg	40	mg/kg	M	5.2E-07	mg/kg-day	2.2E+00	$(mg/kg\text{-}day)^{-1}$	1.1E-06
	Diesel Range Organics (Total)	11,600	mg/kg	11,600	mg/kg	M	1.1E-05	mg/kg-day	NA	--	--
											1.2E-06
										Total Risk Across All Exposure Routes/Pathways	1.2E-06

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

TABLE 8.7.1B RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Surface Soil
Receptor Population: Industrial / Commercial Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	2-Methylnaphthalene	57.9	mg/kg	57.9	mg/kg	M	1.0E-05	mg/kg-day	NA	--	--
	Benzo(a)anthracene	4.76	mg/kg	4.76	mg/kg	M	8.3E-07	mg/kg-day	7.3E-01	(mg/kg-day) $^{-1}$	6.1E-07
	Benzo(a)pyrene	2.48	mg/kg	2.48	mg/kg	M	4.3E-07	mg/kg-day	7.3E+00	(mg/kg-day) $^{-1}$	3.2E-06
	Benzo(b)fluoranthene	2.81	mg/kg	2.81	mg/kg	M	4.9E-07	mg/kg-day	7.3E-01	(mg/kg-day) $^{-1}$	3.6E-07
	Benzo(k)fluoranthene	1.78	mg/kg	1.78	mg/kg	M	3.1E-07	mg/kg-day	7.3E-02	(mg/kg-day) $^{-1}$	2.3E-08
	Carbazole	0.95	mg/kg	0.95	mg/kg	M	1.7E-07	mg/kg-day	2.0E-02	(mg/kg-day) $^{-1}$	3.3E-09
	Chrysene	6.7	mg/kg	6.7	mg/kg	M	1.2E-06	mg/kg-day	7.3E-03	(mg/kg-day) $^{-1}$	8.5E-09
	Dibenz(a,h)anthracene	0.695	mg/kg	0.695	mg/kg	M	1.2E-07	mg/kg-day	7.3E+00	(mg/kg-day) $^{-1}$	8.9E-07
	Indeno(1,2,3-cd)pyrene	1.72	mg/kg	1.72	mg/kg	M	3.0E-07	mg/kg-day	7.3E-01	(mg/kg-day) $^{-1}$	2.2E-07
	Dieldrin	0.052	mg/kg	0.052	mg/kg	M	9.1E-09	mg/kg-day	1.6E+01	(mg/kg-day) $^{-1}$	1.5E-07
	Aroclor-1260	95.6	mg/kg	95.6	mg/kg	M	1.7E-05	mg/kg-day	2.0E+00	(mg/kg-day) $^{-1}$	3.3E-05
	Arsenic	5.26	mg/kg	5.26	mg/kg	M	9.2E-07	mg/kg-day	1.5E+00	(mg/kg-day) $^{-1}$	1.4E-06
	Iron	2,347	mg/kg	2,347	mg/kg	M	4.1E-04	mg/kg-day	NA	--	--
	(total)										4.0E-05
Dermal	2-Methylnaphthalene	57.9	mg/kg	57.9	mg/kg	M	1.3E-06	mg/kg-day	NA	--	--
	Benzo(a)anthracene	4.76	mg/kg	4.76	mg/kg	M	1.4E-06	mg/kg-day	2.4E+00	(mg/kg-day) $^{-1}$	3.4E-06
	Benzo(a)pyrene	2.48	mg/kg	2.48	mg/kg	M	7.4E-07	mg/kg-day	1.5E+01	(mg/kg-day) $^{-1}$	1.1E-05
	Benzo(b)fluoranthene	2.81	mg/kg	2.81	mg/kg	M	8.4E-07	mg/kg-day	1.5E+00	(mg/kg-day) $^{-1}$	1.2E-06
	Benzo(k)fluoranthene	1.78	mg/kg	1.78	mg/kg	M	5.3E-07	mg/kg-day	1.5E-01	(mg/kg-day) $^{-1}$	7.8E-08
	Carbazole	0.95	mg/kg	0.95	mg/kg	M	2.8E-07	mg/kg-day	4.0E-02	(mg/kg-day) $^{-1}$	1.1E-08
	Chrysene	6.7	mg/kg	6.7	mg/kg	M	2.0E-06	mg/kg-day	2.4E-02	(mg/kg-day) $^{-1}$	4.7E-08
	Dibenz(a,h)anthracene	0.695	mg/kg	0.695	mg/kg	M	2.1E-07	mg/kg-day	2.4E+01	(mg/kg-day) $^{-1}$	4.9E-06
	Indeno(1,2,3-cd)pyrene	1.72	mg/kg	1.72	mg/kg	M	5.2E-07	mg/kg-day	2.4E+00	(mg/kg-day) $^{-1}$	1.2E-06
	Dieldrin	0.052	mg/kg	0.052	mg/kg	M	1.2E-09	mg/kg-day	3.2E+01	(mg/kg-day) $^{-1}$	3.8E-08
	Aroclor-1260	95.6	mg/kg	95.6	mg/kg	M	3.1E-05	mg/kg-day	2.2E+00	(mg/kg-day) $^{-1}$	6.9E-05
	Arsenic	5.26	mg/kg	5.26	mg/kg	M	3.6E-07	mg/kg-day	3.7E+00	(mg/kg-day) $^{-1}$	1.3E-06
	Iron	2,347	mg/kg	2,347	mg/kg	M	5.4E-06	mg/kg-day	NA	--	--
	(Total)										9.2E-05
									Total Risk Across All Exposure Routes/Pathways		1.3E-04

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

TABLE 8.7.1A RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Surface Soil
Receptor Population: Industrial / Commercial Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	2-Methylnaphthalene	1.96	mg/kg	1.96	mg/kg	M	3.4E-07	mg/kg-day	NA	--	--
	Benzo(a)anthracene	69.0	mg/kg	69.0	mg/kg	M	1.2E-05	mg/kg-day	7.3E-01	(mg/kg-day) $^{-1}$	8.8E-06
	Benzo(a)pyrene	30.5	mg/kg	30.5	mg/kg	M	5.3E-06	mg/kg-day	7.3E+00	(mg/kg-day) $^{-1}$	3.9E-05
	Benzo(b)fluoranthene	40.9	mg/kg	40.9	mg/kg	M	7.1E-06	mg/kg-day	7.3E-01	(mg/kg-day) $^{-1}$	5.2E-06
	Benzo(k)fluoranthene	18.7	mg/kg	18.7	mg/kg	M	3.3E-06	mg/kg-day	7.3E-02	(mg/kg-day) $^{-1}$	2.4E-07
	Carbazole	3.16	mg/kg	3.16	mg/kg	M	5.5E-07	mg/kg-day	2.0E-02	(mg/kg-day) $^{-1}$	1.1E-08
	Chrysene	96.0	mg/kg	96.0	mg/kg	M	1.7E-05	mg/kg-day	7.3E-03	(mg/kg-day) $^{-1}$	1.2E-07
	Dibenz(a,h)anthracene	1.41	mg/kg	1.41	mg/kg	M	2.5E-07	mg/kg-day	7.3E+00	(mg/kg-day) $^{-1}$	1.8E-06
	Fluoranthene	243	mg/kg	243	mg/kg	M	4.2E-05	mg/kg-day	NA	--	--
	Indeno(1,2,3-cd)pyrene	8.79	mg/kg	8.79	mg/kg	M	1.5E-06	mg/kg-day	7.3E-01	(mg/kg-day) $^{-1}$	1.1E-06
	Naphthalene	0.525	mg/kg	0.525	mg/kg	M	9.2E-08	mg/kg-day	NA	--	--
	Pyrene	250	mg/kg	250	mg/kg	M	4.4E-05	mg/kg-day	NA	--	--
	4,4'-DDD	3	mg/kg	3	mg/kg	M	5.2E-07	mg/kg-day	2.4E-01	(mg/kg-day) $^{-1}$	1.3E-07
	Chlordane, alpha-	48	mg/kg	48	mg/kg	M	8.4E-06	mg/kg-day	3.5E-01	(mg/kg-day) $^{-1}$	2.9E-06
	Chlordane, gamma-	58	mg/kg	58	mg/kg	M	1.0E-05	mg/kg-day	3.5E-01	(mg/kg-day) $^{-1}$	3.5E-06
	Dieldrin	0.32	mg/kg	0.32	mg/kg	M	5.6E-08	mg/kg-day	1.6E+01	(mg/kg-day) $^{-1}$	8.9E-07
	Heptachlor	22	mg/kg	22	mg/kg	M	3.8E-06	mg/kg-day	4.5E+00	(mg/kg-day) $^{-1}$	1.7E-05
	Heptachlor Epoxide	4.5	mg/kg	4.5	mg/kg	M	7.9E-07	mg/kg-day	9.1E+00	(mg/kg-day) $^{-1}$	7.2E-06
	Aroclor-1248	1.51	mg/kg	1.51	mg/kg	M	2.6E-07	mg/kg-day	2.0E+00	(mg/kg-day) $^{-1}$	5.3E-07
	Aroclor-1254	0.975	mg/kg	0.975	mg/kg	M	1.7E-07	mg/kg-day	2.0E+00	(mg/kg-day) $^{-1}$	3.4E-07
	Aroclor-1260	54.6	mg/kg	54.6	mg/kg	M	9.5E-06	mg/kg-day	2.0E+00	(mg/kg-day) $^{-1}$	1.9E-05
	Gasoline Range Organics	0.207	mg/kg	0.207	mg/kg	M	3.6E-08	mg/kg-day	NA	--	--
	Diesel Range Organics	470	mg/kg	470	mg/kg	M	8.2E-05	mg/kg-day	NA	--	--
	Antimony	1.22	mg/kg	1.22	mg/kg	M	2.1E-07	mg/kg-day	NA	--	--
	Arsenic	3.49	mg/kg	3.49	mg/kg	M	6.1E-07	mg/kg-day	1.5E+00	(mg/kg-day) $^{-1}$	9.2E-07
	Iron	2,260	mg/kg	2,260	mg/kg	M	3.9E-04	mg/kg-day	NA	--	--
	Thallium	0.31	mg/kg	0.31	mg/kg	M	5.4E-08	mg/kg-day	NA	--	--
	(total)										1.1E-04

TABLE 8.7.1A RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Surface Soil
Receptor Population: Industrial / Commercial Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Dermal	2-Methylnaphthalene	1.96	mg/kg	1.96	mg/kg	M	4.5E-08	mg/kg-day	NA	--	--
	Benzo(a)anthracene	69.0	mg/kg	69.0	mg/kg	M	2.1E-05	mg/kg-day	2.4E+00	(mg/kg-day) $^{-1}$	4.9E-05
	Benzo(a)pyrene	30.5	mg/kg	30.5	mg/kg	M	9.1E-06	mg/kg-day	1.5E+01	(mg/kg-day) $^{-1}$	1.3E-04
	Benzo(b)fluoranthene	40.9	mg/kg	40.9	mg/kg	M	1.2E-05	mg/kg-day	1.5E+00	(mg/kg-day) $^{-1}$	1.8E-05
	Benzo(k)fluoranthene	18.7	mg/kg	18.7	mg/kg	M	5.6E-06	mg/kg-day	1.5E-01	(mg/kg-day) $^{-1}$	8.2E-07
	Carbazole	3.16	mg/kg	3.16	mg/kg	M	9.5E-07	mg/kg-day	4.0E-02	(mg/kg-day) $^{-1}$	3.8E-08
	Chrysene	96.0	mg/kg	96.0	mg/kg	M	2.9E-05	mg/kg-day	2.4E-02	(mg/kg-day) $^{-1}$	6.8E-07
	Dibenz(a,h)anthracene	1.41	mg/kg	1.41	mg/kg	M	4.2E-07	mg/kg-day	2.4E+01	(mg/kg-day) $^{-1}$	1.0E-05
	Fluoranthene	243	mg/kg	243	mg/kg	M	5.6E-06	mg/kg-day	NA	--	--
	Indeno(1,2,3-cd)pyrene	8.79	mg/kg	8.79	mg/kg	M	2.6E-06	mg/kg-day	2.4E+00	(mg/kg-day) $^{-1}$	6.2E-06
	Naphthalene	0.525	mg/kg	0.525	mg/kg	M	1.2E-08	mg/kg-day	NA	--	--
	Pyrene	250	mg/kg	250	mg/kg	M	5.8E-06	mg/kg-day	NA	--	--
	4,4'-DDD	3	mg/kg	3	mg/kg	M	6.9E-08	mg/kg-day	3.4E-01	(mg/kg-day) $^{-1}$	2.4E-08
	Chlordane, alpha-	48	mg/kg	48	mg/kg	M	4.4E-06	mg/kg-day	4.4E-01	(mg/kg-day) $^{-1}$	1.9E-06
	Chlordane, gamma-	58	mg/kg	58	mg/kg	M	5.4E-06	mg/kg-day	4.4E-01	(mg/kg-day) $^{-1}$	2.3E-06
	Dieldrin	0.32	mg/kg	0.32	mg/kg	M	7.4E-09	mg/kg-day	3.2E+01	(mg/kg-day) $^{-1}$	2.4E-07
	Heptachlor	22	mg/kg	22	mg/kg	M	5.1E-07	mg/kg-day	6.3E+00	(mg/kg-day) $^{-1}$	3.2E-06
	Heptachlor Epoxide	4.5	mg/kg	4.5	mg/kg	M	1.0E-07	mg/kg-day	1.3E+01	(mg/kg-day) $^{-1}$	1.3E-06
	Aroclor-1248	1.51	mg/kg	1.51	mg/kg	M	4.9E-07	mg/kg-day	2.2E+00	(mg/kg-day) $^{-1}$	1.1E-06
	Aroclor-1254	0.975	mg/kg	0.975	mg/kg	M	3.1E-07	mg/kg-day	2.2E+00	(mg/kg-day) $^{-1}$	7.0E-07
	Aroclor-1260	54.6	mg/kg	54.6	mg/kg	M	1.8E-05	mg/kg-day	2.2E+00	(mg/kg-day) $^{-1}$	3.9E-05
	Gasoline Range Organics	0.207	mg/kg	0.207	mg/kg	M	4.8E-09	mg/kg-day	NA	--	--
	Diesel Range Organics	470	mg/kg	470	mg/kg	M	1.1E-05	mg/kg-day	NA	--	--
	Antimony	1.22	mg/kg	1.22	mg/kg	M	2.8E-09	mg/kg-day	NA	--	--
	Arsenic	3.49	mg/kg	3.49	mg/kg	M	2.4E-07	mg/kg-day	3.7E+00	(mg/kg-day) $^{-1}$	8.8E-07
	Iron	2,260	mg/kg	2,260	mg/kg	M	5.2E-06	mg/kg-day	NA	--	--
	Thallium	0.31	mg/kg	0.31	mg/kg	M	7.1E-10	mg/kg-day	NA	--	--
	(Total)										2.7E-04
										Total Risk Across All Exposure Routes/Pathways	3.8E-04

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

TABLE 8.7.1aA RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Air
Exposure Point: Fugative dust
Receptor Population: Industrial / Commercial Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Inhalation	2-Methylnaphthalene	1.96	mg/kg	1.48E-09	mg/m^3	R	3.4E-11	mg/kg-day	NA	--	--
	Benzo(a)anthracene	69.0	mg/kg	5.23E-08	mg/m^3	R	1.2E-09	mg/kg-day	3.1E-01	$(mg/kg\text{-}day)^{-1}$	3.8E-10
	Benzo(a)pyrene	30.5	mg/kg	2.31E-08	mg/m^3	R	5.4E-10	mg/kg-day	3.1E+00	$(mg/kg\text{-}day)^{-1}$	1.7E-09
	Benzo(b)fluoranthene	40.9	mg/kg	3.10E-08	mg/m^3	R	7.2E-10	mg/kg-day	3.1E-01	$(mg/kg\text{-}day)^{-1}$	2.2E-10
	Benzo(k)fluoranthene	18.7	mg/kg	1.41E-08	mg/m^3	R	3.3E-10	mg/kg-day	3.1E-02	$(mg/kg\text{-}day)^{-1}$	1.0E-11
	Carbazole	3.16	mg/kg	2.39E-09	mg/m^3	R	5.5E-11	mg/kg-day	2.0E-02	$(mg/kg\text{-}day)^{-1}$	1.1E-12
	Chrysene	96.0	mg/kg	7.27E-08	mg/m^3	R	1.7E-09	mg/kg-day	3.1E-03	$(mg/kg\text{-}day)^{-1}$	5.2E-12
	Dibenz(a,h)anthracene	1.41	mg/kg	1.07E-09	mg/m^3	R	2.5E-11	mg/kg-day	3.1E+00	$(mg/kg\text{-}day)^{-1}$	7.7E-11
	Fluoranthene	243	mg/kg	1.84E-07	mg/m^3	R	4.3E-09	mg/kg-day	NA	--	--
	Indeno(1,2,3-cd)pyrene	8.79	mg/kg	6.66E-09	mg/m^3	R	1.5E-10	mg/kg-day	3.1E-01	$(mg/kg\text{-}day)^{-1}$	4.8E-11
	Naphthalene	0.525	mg/kg	3.98E-10	mg/m^3	R	9.2E-12	mg/kg-day	NA	--	--
	Pyrene	250	mg/kg	1.89E-07	mg/m^3	R	4.4E-09	mg/kg-day	NA	--	--
	4,4'-DDD	3	mg/kg	2.27E-09	mg/m^3	R	5.3E-11	mg/kg-day	2.4E-01	$(mg/kg\text{-}day)^{-1}$	1.3E-11
	Chlordane, alpha-	48	mg/kg	3.64E-08	mg/m^3	R	8.4E-10	mg/kg-day	3.5E-01	$(mg/kg\text{-}day)^{-1}$	3.0E-10
	Chlordane, gamma-	58	mg/kg	4.39E-08	mg/m^3	R	1.0E-09	mg/kg-day	3.5E-01	$(mg/kg\text{-}day)^{-1}$	3.6E-10
	Dieldrin	0.32	mg/kg	2.42E-10	mg/m^3	R	5.6E-12	mg/kg-day	1.6E+01	$(mg/kg\text{-}day)^{-1}$	9.1E-11
	Heptachlor	22	mg/kg	1.67E-08	mg/m^3	R	3.9E-10	mg/kg-day	4.6E+00	$(mg/kg\text{-}day)^{-1}$	1.8E-09
	Heptachlor Epoxide	4.5	mg/kg	3.41E-09	mg/m^3	R	7.9E-11	mg/kg-day	9.1E+00	$(mg/kg\text{-}day)^{-1}$	7.2E-10
	Aroclor-1248	1.51	mg/kg	1.14E-09	mg/m^3	R	2.6E-11	mg/kg-day	2.0E+00	$(mg/kg\text{-}day)^{-1}$	5.3E-11
	Aroclor-1254	0.975	mg/kg	7.39E-10	mg/m^3	R	1.7E-11	mg/kg-day	2.0E+00	$(mg/kg\text{-}day)^{-1}$	3.4E-11
	Aroclor-1260	54.6	mg/kg	4.13E-08	mg/m^3	R	9.6E-10	mg/kg-day	2.0E+00	$(mg/kg\text{-}day)^{-1}$	1.9E-09
	Gasoline Range Organics	0.207	mg/kg	1.57E-10	mg/m^3	R	3.6E-12	mg/kg-day	NA	--	--
	Diesel Range Organics	470	mg/kg	3.56E-07	mg/m^3	R	8.3E-09	mg/kg-day	NA	--	--
	Antimony	1.22	mg/kg	9.25E-10	mg/m^3	R	2.1E-11	mg/kg-day	NA	--	--
	Arsenic	3.49	mg/kg	2.65E-09	mg/m^3	R	6.1E-11	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	9.3E-10
	Iron	2,260	mg/kg	1.71E-06	mg/m^3	R	4.0E-08	mg/kg-day	NA	--	--
	Thallium	0.31	mg/kg	2.32E-10	mg/m^3	R	5.4E-12	mg/kg-day	NA	--	--
	(Total)										8.6E-09
										Total Risk Across All Exposure Routes/Pathways	8.6E-09

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/m^3 - milligram per cubic meter
mg/kg-day - milligram per kilogram per day

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

TABLE 8.7.1aB RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Air
Exposure Point: Fugative dust
Receptor Population: Industrial / Commercial Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Inhalation	2-Methylnaphthalene	57.9	mg/kg	4.39E-08	mg/m^3	R	1.0E-09	mg/kg-day	NA	--	--
	Benzo(a)anthracene	4.76	mg/kg	3.61E-09	mg/m^3	R	8.4E-11	mg/kg-day	3.1E-01	$(mg/kg\text{-}day)^{-1}$	2.6E-11
	Benzo(a)pyrene	2.48	mg/kg	1.88E-09	mg/m^3	R	4.4E-11	mg/kg-day	3.1E+00	$(mg/kg\text{-}day)^{-1}$	1.3E-10
	Benzo(b)fluoranthene	2.81	mg/kg	2.13E-09	mg/m^3	R	4.9E-11	mg/kg-day	3.1E-01	$(mg/kg\text{-}day)^{-1}$	1.5E-11
	Benzo(k)fluoranthene	1.78	mg/kg	1.35E-09	mg/m^3	R	3.1E-11	mg/kg-day	3.1E-02	$(mg/kg\text{-}day)^{-1}$	9.7E-13
	Carbazole	0.95	mg/kg	7.20E-10	mg/m^3	R	1.7E-11	mg/kg-day	2.0E-02	$(mg/kg\text{-}day)^{-1}$	3.3E-13
	Chrysene	6.7	mg/kg	5.08E-09	mg/m^3	R	1.2E-10	mg/kg-day	3.1E-03	$(mg/kg\text{-}day)^{-1}$	3.7E-13
	Dibenz(a,h)anthracene	0.695	mg/kg	5.27E-10	mg/m^3	R	1.2E-11	mg/kg-day	3.1E+00	$(mg/kg\text{-}day)^{-1}$	3.8E-11
	Indeno(1,2,3-cd)pyrene	1.72	mg/kg	1.30E-09	mg/m^3	R	3.0E-11	mg/kg-day	3.1E-01	$(mg/kg\text{-}day)^{-1}$	9.4E-12
	Dieldrin	0.052	mg/kg	3.94E-11	mg/m^3	R	9.1E-13	mg/kg-day	1.6E+01	$(mg/kg\text{-}day)^{-1}$	1.5E-11
	Aroclor-1260	95.6	mg/kg	7.24E-08	mg/m^3	R	1.7E-09	mg/kg-day	2.0E+00	$(mg/kg\text{-}day)^{-1}$	3.4E-09
	Arsenic	5.26	mg/kg	3.98E-09	mg/m^3	R	9.2E-11	mg/kg-day	1.5E+01	$(mg/kg\text{-}day)^{-1}$	1.4E-09
	Iron	2,347	mg/kg	1.78E-06	mg/m^3	R	4.1E-08	mg/kg-day	NA	--	--
	(Total)										5.0E-09
										Total Risk Across All Exposure Routes/Pathways	5.0E-09

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/kg - milligram per kilogram
mg/m^3 - milligram per cubic meter
mg/kg-day - milligram per kilogram per day

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

TABLE 8.7.2 RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Groundwater
Receptor Population: Industrial / Commercial Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzene	0.0034	mg/L	0.0034	mg/L	M	2.4E-05	mg/kg-day	5.5E-02	(mg/kg-day) $^{-1}$	1.3E-06
	Chloroform	0.016	mg/L	0.016	mg/L	M	1.1E-04	mg/kg-day	6.1E-03	(mg/kg-day) $^{-1}$	6.8E-07
	2-Methylnaphthalene	0.00105	mg/L	0.00105	mg/L	M	7.3E-06	mg/kg-day	NA	--	--
	Naphthalene	0.0022	mg/L	0.0022	mg/L	M	1.5E-05	mg/kg-day	NA	--	--
	Heptachlor Epoxide	0.0000167	mg/L	0.0000167	mg/L	M	1.2E-07	mg/kg-day	9.1E+00	(mg/kg-day) $^{-1}$	1.1E-06
	MCPA	0.044	mg/L	0.044	mg/L	M	3.1E-04	mg/kg-day	NA	--	--
	Antimony	0.011	mg/L	0.011	mg/L	M	7.7E-05	mg/kg-day	NA	--	--
	Arsenic	0.03	mg/L	0.03	mg/L	M	2.1E-04	mg/kg-day	1.5E+00	(mg/kg-day) $^{-1}$	3.1E-04
	Iron	67.7	mg/L	67.7	mg/L	M	4.7E-01	mg/kg-day	NA	--	--
	Manganese	0.45	mg/L	0.45	mg/L	M	3.1E-03	mg/kg-day	NA	--	--
	Thallium	0.0057	mg/L	0.0057	mg/L	M	4.0E-05	mg/kg-day	NA	--	--
	(total)										3.2E-04
Dermal	Benzene	0.0034	mg/L	0.0034	mg/L	M	1.1E-06	mg/kg-day	5.9E-02	(mg/kg-day) $^{-1}$	6.6E-08
	Chloroform	0.016	mg/L	0.016	mg/L	M	2.2E-06	mg/kg-day	3.1E-02	(mg/kg-day) $^{-1}$	6.8E-08
	2-Methylnaphthalene	0.00105	mg/L	0.00105	mg/L	M	2.3E-06	mg/kg-day	NA	--	--
	Naphthalene	0.0022	mg/L	0.0022	mg/L	M	2.4E-06	mg/kg-day	NA	--	--
	Heptachlor Epoxide	0.0000167	mg/L	0.0000167	mg/L	M	1.4E-08	mg/kg-day	1.3E+01	(mg/kg-day) $^{-1}$	1.8E-07
	MCPA	0.044	mg/L	0.044	mg/L	M	3.4E-06	mg/kg-day	NA	--	--
	Antimony	0.011	mg/L	0.011	mg/L	M	1.7E-07	mg/kg-day	NA	--	--
	Arsenic	0.03	mg/L	0.03	mg/L	M	4.7E-07	mg/kg-day	3.7E+00	(mg/kg-day) $^{-1}$	1.7E-06
	Iron	67.7	mg/L	67.7	mg/L	M	1.1E-03	mg/kg-day	NA	--	--
	Manganese	0.45	mg/L	0.45	mg/L	M	7.1E-06	mg/kg-day	NA	--	--
	Thallium	0.0057	mg/L	0.0057	mg/L	M	9.0E-08	mg/kg-day	NA	--	--
	(Total)										2.0E-06
										Total Risk Across All Exposure Routes/Pathways	3.2E-04

NOTES:
EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/L - milligram per liter
mg/kg-day - milligram per kilogram per day
(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

TABLE 8.7.2a RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Air
Exposure Point: Shower
Receptor Population: Industrial / Commercial Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Inhalation	Benzene	0.0034	mg/L	4.81E-03	mg/m^3	R	3.5E-06	mg/kg-day	2.7E-02	$(mg/kg\text{-}day)^{-1}$	9.4E-08
	Chloroform	0.016	mg/L	1.80E-02	mg/m^3	R	1.3E-05	mg/kg-day	8.1E-02	$(mg/kg\text{-}day)^{-1}$	1.1E-06
	(Total)										1.1E-06
										Total Risk Across All Exposure Routes/Pathways	1.1E-06

NOTES:

EPC - Exposure Point Concentration
NA - Toxicity criterion not available.
-- - Not applicable.
mg/L - milligram per liter
mg/m^3 - milligram per cubic meter
mg/kg-day - milligram per kilogram per day

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

TABLE 9.1A.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Current
Receptor Population: Military Base Personnel
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Surface Soil											
			2-Methylnaphthalene	--	--	--	--	2-Methylnaphthalene	NA	--	--	--	--
			Benzo(a)anthracene	2.8E-06	6.0E-11	7.8E-06	1.1E-05	Benzo(a)anthracene	NA	--	--	--	--
			Benzo(a)pyrene	1.2E-05	2.7E-10	2.1E-05	3.4E-05	Benzo(a)pyrene	NA	--	--	--	--
			Benzo(b)fluoranthene	1.7E-06	3.6E-11	2.9E-06	4.5E-06	Benzo(b)fluoranthene	NA	--	--	--	--
			Benzo(k)fluoranthene	7.6E-08	1.6E-12	1.3E-07	2.1E-07	Benzo(k)fluoranthene	NA	--	--	--	--
			Carbazole	3.5E-09	1.8E-13	6.1E-09	9.6E-09	Carbazole	NA	--	--	--	--
			Chrysene	3.9E-08	8.4E-13	1.1E-07	1.5E-07	Chrysene	NA	--	--	--	--
			Dibenz(a,h)anthracene	5.8E-07	1.2E-11	1.6E-06	2.2E-06	Dibenz(a,h)anthracene	NA	--	--	--	--
			Fluoranthene	--	--	--	--	Fluoranthene	(o) Liver / CVS	5.9E-03	3.0E-07	1.3E-03	7.2E-03
			Indeno(1,2,3-cd)pyrene	3.6E-07	7.7E-12	9.9E-07	1.4E-06	Indeno(1,2,3-cd)pyrene	NA	--	--	--	--
			Naphthalene	--	--	--	--	Naphthalene	(o) Whole Body, (i) RsS	2.6E-05	3.0E-08	2.1E-06	2.8E-05
			Pyrene	--	--	--	--	Pyrene	(o) Kidney	8.2E-03	4.1E-07	1.7E-03	9.9E-03
			4,4'-DDD	4.0E-08	2.0E-12	3.8E-09	4.4E-08	4,4'-DDD	NA	--	--	--	--
			Chlordane, alpha-	9.4E-07	4.7E-11	3.1E-07	1.2E-06	Chlordane, alpha-	Liver	9.4E-02	1.2E-05	3.1E-02	1.2E-01
			Chlordane, gamma-	1.1E-06	5.7E-11	3.7E-07	1.5E-06	Chlordane, gamma-	Liver	1.1E-01	1.4E-05	3.7E-02	1.5E-01
			Dieldrin	2.9E-07	1.4E-11	3.8E-08	3.2E-07	Dieldrin	(o) Liver	6.3E-03	3.2E-07	8.3E-04	7.1E-03
			Heptachlor	5.5E-06	2.8E-10	5.1E-07	6.0E-06	Heptachlor	(o) Liver	4.3E-02	2.2E-06	3.9E-03	4.7E-02
			Heptachlor Epoxide	2.3E-06	1.2E-10	2.1E-07	2.5E-06	Heptachlor Epoxide	(o) Liver	3.4E-01	1.7E-05	3.1E-02	3.7E-01
			Aroclor-1248	1.7E-07	8.5E-12	1.7E-07	3.4E-07	Aroclor-1248	NA	--	--	--	--
			Aroclor-1254	1.1E-07	5.5E-12	1.1E-07	2.2E-07	Aroclor-1254	(o) Whole Body / ImS	4.8E-02	2.4E-06	4.9E-02	9.7E-02
			Aroclor-1260	6.1E-06	3.1E-10	6.3E-06	1.2E-05	Aroclor-1260	NA	--	--	--	--
			Gasoline Range Organics	--	--	--	--	Gasoline Range Organics	NA	--	--	--	--
			Diesel Range Organics	--	--	--	--	Diesel Range Organics	NA	--	--	--	--
			Antimony	--	--	--	--	Antimony	(o) Whole Body	3.0E-03	--	9.9E-04	4.0E-03
			Arsenic	2.9E-07	1.5E-10	1.4E-07	4.3E-07	Arsenic	(o) Skin / CVS	1.1E-02	--	5.5E-03	1.7E-02
			Iron	--	--	--	--	Iron	(o) Liver / CVS / GIS	7.4E-03	--	3.2E-04	7.7E-03
			Thallium	--	--	--	--	Thallium	(o) CVS	4.5E-03	--	2.0E-04	4.7E-03
			(Total)	3.5E-05	1.4E-09	4.3E-05	7.8E-05	(Total)		6.8E-01	4.9E-05	1.6E-01	8.5E-01
Surface Water	Surface Water	Surface Water											
			Acetone	--	--	--	--	Acetone	(o) Liver / Kidney	1.4E-05	--	3.2E-06	1.7E-05
			Toluene	--	--	--	--	Toluene	(o) Liver / Kidney, (i) CNS / RsS	3.4E-06	--	6.4E-05	6.7E-05
			Xylenes, total	--	--	--	--	Xylenes, total	(o) Whole body	4.5E-07	--	1.5E-05	1.6E-05
			(Total)	--	--	--	--	(Total)		1.8E-05	--	8.2E-05	1.0E-04

TABLE 9.1A.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Current
Receptor Population: Military Base Personnel
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Sediment	Sediment	Sediment	2-Methylnaphthalene	--	--	--	--	2-Methylnaphthalene	NA	--	--	--	--
			Aroclor-1248	3.1E-07	--	3.3E-07	6.4E-07	Aroclor-1248	NA	--	--	--	--
			Aroclor-1260	4.5E-06	--	4.6E-06	9.1E-06	Aroclor-1260	NA	--	--	--	--
			Diesel Range Organics	--	--	--	--	Diesel Range Organics	NA	--	--	--	--
			(Total)	4.8E-06	--	4.9E-06	9.7E-06	(Total)		--	--	--	--

Notes:
Target Organ Abbreviations:
CNS = Central Nervous System
CVS = Cardiovascular System
GIS = Gastrointestinal System
ImS = Immune System
RsS = Respiratory System

(o) Oral exposure
(i) Inhalation exposure

Total Risk Across Surface Soil	7.8E-05
Total Risk Across Surface Water	--
Total Risk Across Sediment	9.7E-06
Total Risk Across All Media and All Exposure Routes	8.8E-05

All Exposure Routes:

Total Liver HI =	0.28

Inhalation Exposure Routes:

Inhalation Central Nervous System HI =	0.00E+00
Inhalation Respiratory System HI =	3.02E-08

Total Hazard Index Across Surface Soil	0.85
Total Hazard Index Across Surface Water	0.00
Total Hazard Index Across Sediment	--
Total Hazard Index Across All Media and All Exposure Routes	0.85

Oral and Dermal Exposure Routes:

Oral / Dermal Whole Body HI =	0.10
Oral / Dermal Immune System HI =	0.10
Oral / Dermal Gastrointestinal System HI =	0.01
Oral / Dermal Cardiovascular System HI =	0.04
Oral / Dermal Skin HI =	0.02
Oral / Dermal Kidney HI =	0.01
Oral / Dermal Liver HI =	0.44

TABLE 9.1B.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Current
Receptor Population: Military Base Personnel
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Surface Soil	2-Methylnaphthalene	--	--	--	--	2-Methylnaphthalene	NA	--	--	--	--
			Benzo(a)anthracene	1.9E-07	4.2E-12	5.4E-07	7.3E-07	Benzo(a)anthracene	NA	--	--	--	--
			Benzo(a)pyrene	1.0E-06	2.2E-11	1.7E-06	2.7E-06	Benzo(a)pyrene	NA	--	--	--	--
			Benzo(b)fluoranthene	1.1E-07	2.4E-12	2.0E-07	3.1E-07	Benzo(b)fluoranthene	NA	--	--	--	--
			Benzo(k)fluoranthene	7.3E-09	1.6E-13	1.2E-08	2.0E-08	Benzo(k)fluoranthene	NA	--	--	--	--
			Carbazole	1.1E-09	5.3E-14	1.8E-09	2.9E-09	Carbazole	NA	--	--	--	--
			Chrysene	2.7E-09	5.8E-14	7.6E-09	1.0E-08	Chrysene	NA	--	--	--	--
			Dibenz(a,h)anthracene	2.8E-07	6.1E-12	7.9E-07	1.1E-06	Dibenz(a,h)anthracene	NA	--	--	--	--
			Indeno(1,2,3-cd)pyrene	7.0E-08	1.5E-12	1.9E-07	2.6E-07	Indeno(1,2,3-cd)pyrene	NA	--	--	--	--
			Dieldrin	4.7E-08	2.4E-12	6.1E-09	5.3E-08	Dieldrin	(o) Liver	1.0E-03	5.1E-08	1.3E-04	1.2E-03
			Aroclor-1260	1.1E-05	5.4E-10	1.1E-05	2.2E-05	Aroclor-1260	NA	--	--	--	--
			Arsenic	4.4E-07	2.2E-10	2.1E-07	6.5E-07	Arsenic	(o) Skin / CVS	1.7E-02	--	8.3E-03	2.5E-02
			Iron	--	--	--	--	Iron	(o) Liver / CVS / GIS	7.7E-03	--	3.4E-04	8.0E-03
			(Total)	1.3E-05	8.0E-10	1.5E-05	2.8E-05	(Total)		2.6E-02	5.1E-08	8.8E-03	3.5E-02
Surface Water	Surface Water	Surface Water	Acetone	--	--	--	--	Acetone	(o) Liver / Kidney	1.4E-05	--	3.2E-06	1.7E-05
			Toluene	--	--	--	--	Toluene	(o) Liver / Kidney, (i) CNS / RsS	3.4E-06	--	6.4E-05	6.7E-05
			Xylenes, total	--	--	--	--	Xylenes, total	(o) Whole body	4.5E-07	--	1.5E-05	1.6E-05
			(Total)	--	--	--	--	(Total)		1.8E-05	--	8.2E-05	1.0E-04
Sediment	Sediment	Sediment	2-Methylnaphthalene	--	--	--	--	2-Methylnaphthalene	NA	--	--	--	--
			Aroclor-1248	3.1E-07	--	3.3E-07	6.4E-07	Aroclor-1248	NA	--	--	--	--
			Aroclor-1260	4.5E-06	--	4.6E-06	9.1E-06	Aroclor-1260	NA	--	--	--	--
			Diesel Range Organics	--	--	--	--	Diesel Range Organics	NA	--	--	--	--
			(Total)	4.8E-06	--	4.9E-06	9.7E-06	(Total)		--	--	--	--

Notes:
Target Organ Abbreviations:
CNS = Central Nervous System
CVS = Cardiovascular System
GIS = Gastrointestinal System
ImS = Immune System
RsS = Respiratory System

(o) Oral exposure
(i) Inhalation exposure

Total Risk Across Surface Soil	2.8E-05
Total Risk Across Surface Water	--
Total Risk Across Sediment	9.7E-06
Total Risk Across All Media and All Exposure Routes	3.7E-05

Inhalation Exposure Routes:

Inhalation Central Nervous System HI =	0.00E+00
Inhalation Respiratory System HI =	0.00E+00

Total Hazard Index Across Surface Soil	0.03
Total Hazard Index Across Surface Water	0.00
Total Hazard Index Across Sediment	--
Total Hazard Index Across All Media and All Exposure Routes	0.03

Oral and Dermal Exposure Routes:

Oral / Dermal Whole Body HI =	0.00
Oral / Dermal Gastrointestinal System HI =	0.01
Oral / Dermal Cardiovascular System HI =	0.03
Oral / Dermal Skin HI =	0.03
Oral / Dermal Kidney HI =	0.00
Oral / Dermal Liver HI =	0.01

TABLE 9.2A.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Current
Receptor Population: Recreational Users
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Surface Soil	2-Methylnaphthalene	--	--	--	--	2-Methylnaphthalene	NA	--	--	--	--
			Benzo(a)anthracene	3.2E-06	6.9E-11	1.6E-05	1.9E-05	Benzo(a)anthracene	NA	--	--	--	--
			Benzo(a)pyrene	1.4E-05	3.1E-10	4.2E-05	5.7E-05	Benzo(a)pyrene	NA	--	--	--	--
			Benzo(b)fluoranthene	1.9E-06	4.1E-11	5.7E-06	7.6E-06	Benzo(b)fluoranthene	NA	--	--	--	--
			Benzo(k)fluoranthene	8.8E-08	1.9E-12	2.6E-07	3.5E-07	Benzo(k)fluoranthene	NA	--	--	--	--
			Carbazole	4.1E-09	2.0E-13	1.2E-08	1.6E-08	Carbazole	NA	--	--	--	--
			Chrysene	4.5E-08	9.6E-13	2.2E-07	2.6E-07	Chrysene	NA	--	--	--	--
			Dibenz(a,h)anthracene	6.6E-07	1.4E-11	3.2E-06	3.8E-06	Dibenz(a,h)anthracene	NA	--	--	--	--
			Fluoranthene	--	--	--	--	Fluoranthene	(o) Liver / CVS	1.1E-03	5.7E-08	4.2E-04	1.6E-03
			Indeno(1,2,3-cd)pyrene	4.1E-07	8.8E-12	2.0E-06	2.4E-06	Indeno(1,2,3-cd)pyrene	NA	--	--	--	--
			Naphthalene	--	--	--	--	Naphthalene	(o) Whole Body, (i) RsS	4.9E-06	5.8E-09	7.0E-07	5.6E-06
			Pyrene	--	--	--	--	Pyrene	(o) Kidney	1.6E-03	7.9E-08	5.8E-04	2.1E-03
			4,4'-DDD	4.6E-08	2.3E-12	7.6E-09	5.4E-08	4,4'-DDD	NA	--	--	--	--
			Chlordane, alpha-	1.1E-06	5.4E-11	6.2E-07	1.7E-06	Chlordane, alpha-	Liver	1.8E-02	2.3E-06	1.0E-02	2.8E-02
			Chlordane, gamma-	1.3E-06	6.6E-11	7.5E-07	2.1E-06	Chlordane, gamma-	Liver	2.2E-02	2.7E-06	1.2E-02	3.4E-02
			Dieldrin	3.3E-07	1.7E-11	7.5E-08	4.0E-07	Dieldrin	(o) Liver	1.2E-03	6.0E-08	2.7E-04	1.5E-03
			Heptachlor	6.4E-06	3.2E-10	1.0E-06	7.4E-06	Heptachlor	(o) Liver	8.3E-03	4.2E-07	1.3E-03	9.6E-03
			Heptachlor Epoxide	2.6E-06	1.3E-10	4.2E-07	3.1E-06	Heptachlor Epoxide	(o) Liver	6.5E-02	3.3E-06	1.0E-02	7.5E-02
			Aroclor-1248	1.9E-07	9.8E-12	3.5E-07	5.4E-07	Aroclor-1248	NA	--	--	--	--
			Aroclor-1254	1.3E-07	6.3E-12	2.2E-07	3.5E-07	Aroclor-1254	(o) Whole Body / ImS	9.2E-03	4.6E-07	1.6E-02	2.5E-02
			Aroclor-1260	7.0E-06	3.5E-10	1.2E-05	1.9E-05	Aroclor-1260	NA	--	--	--	--
			Gasoline Range Organics	--	--	--	--	Gasoline Range Organics	NA	--	--	--	--
			Diesel Range Organics	--	--	--	--	Diesel Range Organics	NA	--	--	--	--
			Antimony	--	--	--	--	Antimony	(o) Whole Body	5.7E-04	--	3.3E-04	9.0E-04
			Arsenic	3.4E-07	1.7E-10	2.8E-07	6.2E-07	Arsenic	(o) Skin / CVS	2.2E-03	--	1.8E-03	4.0E-03
			Iron	--	--	--	--	Iron	(o) Liver / CVS / GIS	1.4E-03	--	1.1E-04	1.5E-03
			Thallium	--	--	--	--	Thallium	(o) CVS	8.7E-04	--	6.6E-05	9.4E-04
			(Total)	4.0E-05	1.6E-09	8.5E-05	**1.3E-04**	(Total)		1.3E-01	9.4E-06	5.4E-02	1.9E-01
Surface Water	Surface Water	Surface Water	Acetone	--	--	--	--	Acetone	(o) Liver / Kidney	2.7E-06	--	1.1E-06	3.8E-06
			Toluene	--	--	--	--	Toluene	(o) Liver / Kidney, (i) CNS / RsS	6.6E-07	--	2.1E-05	2.2E-05
			Xylenes, total	--	--	--	--	Xylenes, total	(o) Whole body	8.5E-08	--	5.0E-06	5.1E-06
			(Total)	--	--	--	--	(Total)		3.5E-06	--	2.7E-05	3.1E-05

TABLE 9.2A.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Current
Receptor Population: Recreational Users
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Sediment	Sediment	Sediment	2-Methylnaphthalene	--	--	--	--	2-Methylnaphthalene	NA	--	--	--	--
			Aroclor-1248	3.6E-07	--	6.5E-07	1.0E-06	Aroclor-1248	NA	--	--	--	--
			Aroclor-1260	5.2E-06	--	9.1E-06	1.4E-05	Aroclor-1260	NA	--	--	--	--
			Diesel Range Organics	--	--	--	--	Diesel Range Organics	NA	--	--	--	--
			(Total)	5.5E-06	--	9.8E-06	1.5E-05	(Total)		--	--	--	--

Notes:

Target Organ Abbreviations:
CNS = Central Nervous System
CVS = Cardiovascular System
GIS = Gastrointestinal System
ImS = Immune System
RsS = Respiratory System

(o) Oral exposure
(i) Inhalation exposure

Total Risk Across Surface Soil	1.3E-04
Total Risk Across Surface Water	--
Total Risk Across Sediment	1.5E-05
Total Risk Across All Media and All Exposure Routes	1.4E-04

All Exposure Routes:

Total Liver HI =	0.06

Inhalation Exposure Routes:

Inhalation Central Nervous System HI =	0.00E+00
Inhalation Respiratory System HI =	5.79E-09

Total Hazard Index Across Surface Soil	0.19
Total Hazard Index Across Surface Water	0.00
Total Hazard Index Across Sediment	--
Total Hazard Index Across All Media and All Exposure Routes	0.19

Oral and Dermal Exposure Routes:

Oral / Dermal Whole Body HI =	0.03
Oral / Dermal Immune System HI =	0.03
Oral / Dermal Gastrointestinal System HI =	0.00
Oral / Dermal Cardiovascular System HI =	0.01
Oral / Dermal Skin HI =	0.00
Oral / Dermal Kidney HI =	0.00
Oral / Dermal Liver HI =	0.09

TABLE 9.2B.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Current
Receptor Population: Recreational Users
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Surface Soil	2-Methylnaphthalene	--	--	--	--	2-Methylnaphthalene	NA	--	--	--	--
			Benzo(a)anthracene	2.2E-07	4.8E-12	1.1E-06	1.3E-06	Benzo(a)anthracene	NA	--	--	--	--
			Benzo(a)pyrene	1.2E-06	2.5E-11	3.5E-06	4.6E-06	Benzo(a)pyrene	NA	--	--	--	--
			Benzo(b)fluoranthene	1.3E-07	2.8E-12	3.9E-07	5.2E-07	Benzo(b)fluoranthene	NA	--	--	--	--
			Benzo(k)fluoranthene	8.4E-09	1.8E-13	2.5E-08	3.3E-08	Benzo(k)fluoranthene	NA	--	--	--	--
			Carbazole	1.2E-09	6.2E-14	3.6E-09	4.9E-09	Carbazole	NA	--	--	--	--
			Chrysene	3.2E-09	6.7E-14	1.5E-08	1.8E-08	Chrysene	NA	--	--	--	--
			Dibenz(a,h)anthracene	3.3E-07	7.0E-12	1.6E-06	1.9E-06	Dibenz(a,h)anthracene	NA	--	--	--	--
			Indeno(1,2,3-cd)pyrene	8.1E-08	1.7E-12	3.9E-07	4.7E-07	Indeno(1,2,3-cd)pyrene	NA	--	--	--	--
			Dieldrin	5.4E-08	2.7E-12	1.2E-08	6.6E-08	Dieldrin	(o) Liver	2.0E-04	9.8E-09	4.5E-05	2.4E-04
			Aroclor-1260	1.2E-05	6.2E-10	2.2E-05	3.4E-05	Aroclor-1260	NA	--	--	--	--
			Arsenic	5.1E-07	2.6E-10	4.2E-07	9.3E-07	Arsenic	(o) Skin / CVS	3.3E-03	--	2.7E-03	6.0E-03
			Iron	--	--	--	--	Iron	(o) Liver / CVS / GIS	1.5E-03	--	1.1E-04	1.6E-03
			(Total)	1.5E-05	9.2E-10	2.9E-05	4.4E-05	(Total)		5.0E-03	9.8E-09	2.9E-03	7.9E-03
Surface Water	Surface Water	Surface Water	Acetone	--	--	--	--	Acetone	(o) Liver / Kidney	2.7E-06	--	1.1E-06	3.8E-06
			Toluene	--	--	--	--	Toluene	(o) Liver / Kidney, (i) CNS / RsS	6.6E-07	--	2.1E-05	2.2E-05
			Xylenes, total	--	--	--	--	Xylenes, total	(o) Whole body	8.5E-08	--	5.0E-06	5.1E-06
			(Total)	--	--	--	--	(Total)		3.5E-06	--	2.7E-05	3.1E-05
Sediment	Sediment	Sediment	2-Methylnaphthalene	--	--	--	--	2-Methylnaphthalene	NA	--	--	--	--
			Aroclor-1248	3.6E-07	--	6.5E-07	1.0E-06	Aroclor-1248	NA	--	--	--	--
			Aroclor-1260	5.2E-06	--	9.1E-06	1.4E-05	Aroclor-1260	NA	--	--	--	--
			Diesel Range Organics	--	--	--	--	Diesel Range Organics	NA	--	--	--	--
			(Total)	5.5E-06	--	9.8E-06	1.5E-05	(Total)		--	--	--	--

Notes:

Target Organ Abbreviations:
CNS = Central Nervous System
CVS = Cardiovascular System
GIS = Gastrointestinal System
ImS = Immune System
RsS = Respiratory System

(o) Oral exposure
(i) Inhalation exposure

Total Risk Across Surface Soil	4.4E-05
Total Risk Across Surface Water	--
Total Risk Across Sediment	1.5E-05
Total Risk Across All Media and All Exposure Routes	5.9E-05

Inhalation Exposure Routes:

Inhalation Central Nervous System HI =	0.00E+00
Inhalation Respiratory System HI =	0.00E+00

Total Hazard Index Across Surface Soil	0.01
Total Hazard Index Across Surface Water	0.00
Total Hazard Index Across Sediment	--
Total Hazard Index Across All Media and All Exposure Routes	0.01

Oral and Dermal Exposure Routes:

Oral / Dermal Whole Body HI =	0.00
Oral / Dermal Gastrointestinal System HI =	0.00
Oral / Dermal Cardiovascular System HI =	0.01
Oral / Dermal Skin HI =	0.01
Oral / Dermal Kidney HI =	0.00
Oral / Dermal Liver HI =	0.00

TABLE 9.3A.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Current
Receptor Population: Recreational Users
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Surface Soil	2-Methylnaphthalene	--	--	--	--	2-Methylnaphthalene	NA	--	--	--	--
			Benzo(a)anthracene	1.9E-06	4.0E-11	8.4E-06	1.0E-05	Benzo(a)anthracene	NA	--	--	--	--
			Benzo(a)pyrene	8.4E-06	1.8E-10	2.3E-05	3.1E-05	Benzo(a)pyrene	NA	--	--	--	--
			Benzo(b)fluoranthene	1.1E-06	2.4E-11	3.1E-06	4.2E-06	Benzo(b)fluoranthene	NA	--	--	--	--
			Benzo(k)fluoranthene	5.1E-08	1.1E-12	1.4E-07	1.9E-07	Benzo(k)fluoranthene	NA	--	--	--	--
			Carbazole	2.4E-09	1.2E-13	6.5E-09	8.9E-09	Carbazole	NA	--	--	--	--
			Chrysene	2.6E-08	5.6E-13	1.2E-07	1.4E-07	Chrysene	NA	--	--	--	--
			Dibenz(a,h)anthracene	3.9E-07	8.3E-12	1.7E-06	2.1E-06	Dibenz(a,h)anthracene	NA	--	--	--	--
			Fluoranthene	--	--	--	--	Fluoranthene	(o) Liver / CVS	1.8E-03	8.9E-08	6.1E-04	2.4E-03
			Indeno(1,2,3-cd)pyrene	2.4E-07	5.2E-12	1.1E-06	1.3E-06	Indeno(1,2,3-cd)pyrene	NA	--	--	--	--
			Naphthalene	--	--	--	--	Naphthalene	(o) Whole Body, (i) RsS	7.7E-06	9.0E-09	1.0E-06	8.7E-06
			Pyrene	--	--	--	--	Pyrene	(o) Kidney	2.4E-03	1.2E-07	8.3E-04	3.3E-03
			4,4'-DDD	2.7E-08	1.4E-12	4.1E-09	3.1E-08	4,4'-DDD	NA	--	--	--	--
			Chlordane, alpha-	6.3E-07	3.2E-11	3.3E-07	9.7E-07	Chlordane, alpha-	Liver	2.8E-02	3.5E-06	1.5E-02	4.3E-02
			Chlordane, gamma-	7.6E-07	3.8E-11	4.0E-07	1.2E-06	Chlordane, gamma-	Liver	3.4E-02	4.3E-06	1.8E-02	5.2E-02
			Dieldrin	1.9E-07	9.7E-12	4.1E-08	2.3E-07	Dieldrin	(o) Liver	1.9E-03	9.4E-08	4.0E-04	2.3E-03
			Heptachlor	3.7E-06	1.9E-10	5.5E-07	4.3E-06	Heptachlor	(o) Liver	1.3E-02	6.5E-07	1.9E-03	1.5E-02
			Heptachlor Epoxide	1.5E-06	7.7E-11	2.3E-07	1.8E-06	Heptachlor Epoxide	(o) Liver	1.0E-01	5.1E-06	1.5E-02	1.2E-01
			Aroclor-1248	1.1E-07	5.7E-12	1.9E-07	3.0E-07	Aroclor-1248	NA	--	--	--	--
			Aroclor-1254	7.3E-08	3.7E-12	1.2E-07	1.9E-07	Aroclor-1254	(o) Whole Body / ImS	1.4E-02	7.2E-07	2.3E-02	3.8E-02
			Aroclor-1260	4.1E-06	2.1E-10	6.8E-06	1.1E-05	Aroclor-1260	NA	--	--	--	--
			Gasoline Range Organics	--	--	--	--	Gasoline Range Organics	NA	--	--	--	--
			Diesel Range Organics	--	--	--	--	Diesel Range Organics	NA	--	--	--	--
			Antimony	--	--	--	--	Antimony	(o) Whole Body	8.9E-04	--	4.7E-04	1.4E-03
			Arsenic	2.0E-07	1.0E-10	1.5E-07	3.5E-07	Arsenic	(o) Skin / CVS	3.4E-03	--	2.6E-03	6.0E-03
			Iron	--	--	--	--	Iron	(o) Liver / CVS / GIS	2.2E-03	--	1.6E-04	2.4E-03
			Thallium	--	--	--	--	Thallium	(o) CVS	1.4E-03	--	9.6E-05	1.5E-03
			(Total)	2.3E-05	9.2E-10	4.6E-05	7.0E-05	(Total)		2.0E-01	1.5E-05	7.8E-02	2.8E-01
Surface Water	Surface Water	Surface Water	Acetone	--	--	--	--	Acetone	(o) Liver / Kidney	4.3E-06	--	1.5E-06	5.8E-06
			Toluene	--	--	--	--	Toluene	(o) Liver / Kidney, (i) CNS / RsS	1.0E-06	--	3.1E-05	3.2E-05
			Xylenes, total	--	--	--	--	Xylenes, total	(o) Whole body	1.3E-07	--	7.3E-06	7.4E-06
			(Total)	--	--	--	--	(Total)		5.4E-06	--	3.9E-05	4.5E-05

TABLE 9.3A.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Current
Receptor Population: Recreational Users
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Sediment	Sediment	Sediment	2-Methylnaphthalene	--	--	--	--	2-Methylnaphthalene	NA	--	--	--	--
			Aroclor-1248	2.1E-07	--	3.5E-07	5.6E-07	Aroclor-1248	NA	--	--	--	--
			Aroclor-1260	3.0E-06	--	5.0E-06	8.0E-06	Aroclor-1260	NA	--	--	--	--
			Diesel Range Organics	--	--	--	--	Diesel Range Organics	NA	--	--	--	--
			(Total)	3.2E-06	--	5.3E-06	8.5E-06	(Total)		--	--	--	--

Notes:

Target Organ Abbreviations:
CNS = Central Nervous System
CVS = Cardiovascular System
GIS = Gastrointestinal System
ImS = Immune System
RsS = Respiratory System

(o) Oral exposure
(i) Inhalation exposure

Total Risk Across Surface Soil	7.0E-05
Total Risk Across Surface Water	--
Total Risk Across Sediment	8.5E-06
Total Risk Across All Media and All Exposure Routes	7.8E-05

All Exposure Routes:

Total Liver HI =	0.09

Inhalation Exposure Routes:

Inhalation Central Nervous System HI =	0.00E+00
Inhalation Respiratory System HI =	9.01E-09

Total Hazard Index Across Surface Soil	0.28
Total Hazard Index Across Surface Water	0.00
Total Hazard Index Across Sediment	--
Total Hazard Index Across All Media and All Exposure Routes	0.28

Oral and Dermal Exposure Routes:

Oral / Dermal Whole Body HI =	0.04
Oral / Dermal Immune System HI =	0.04
Oral / Dermal Gastrointestinal System HI =	0.00
Oral / Dermal Cardiovascular System HI =	0.01
Oral / Dermal Skin HI =	0.01
Oral / Dermal Kidney HI =	0.00
Oral / Dermal Liver HI =	0.14

TABLE 9.3B.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Current
Receptor Population: Recreational Users
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Surface Soil											
			2-Methylnaphthalene	--	--	--	--	2-Methylnaphthalene	NA	--	--	--	--
			Benzo(a)anthracene	1.3E-07	2.8E-12	5.8E-07	7.1E-07	Benzo(a)anthracene	NA	--	--	--	--
			Benzo(a)pyrene	6.8E-07	1.5E-11	1.9E-06	2.6E-06	Benzo(a)pyrene	NA	--	--	--	--
			Benzo(b)fluoranthene	7.7E-08	1.6E-12	2.1E-07	2.9E-07	Benzo(b)fluoranthene	NA	--	--	--	--
			Benzo(k)fluoranthene	4.9E-09	1.0E-13	1.3E-08	1.8E-08	Benzo(k)fluoranthene	NA	--	--	--	--
			Carbazole	7.1E-10	3.6E-14	2.0E-09	2.7E-09	Carbazole	NA	--	--	--	--
			Chrysene	1.8E-09	3.9E-14	8.2E-09	1.0E-08	Chrysene	NA	--	--	--	--
			Dibenz(a,h)anthracene	1.9E-07	4.1E-12	8.5E-07	1.0E-06	Dibenz(a,h)anthracene	NA	--	--	--	--
			Indeno(1,2,3-cd)pyrene	4.7E-08	1.0E-12	2.1E-07	2.6E-07	Indeno(1,2,3-cd)pyrene	NA	--	--	--	--
			Dieldrin	3.1E-08	1.6E-12	6.6E-09	3.8E-08	Dieldrin	(o) Liver	3.0E-04	1.5E-08	6.4E-05	3.7E-04
			Aroclor-1260	7.2E-06	3.6E-10	1.2E-05	1.9E-05	Aroclor-1260	NA	--	--	--	--
			Arsenic	3.0E-07	1.5E-10	2.3E-07	5.3E-07	Arsenic	(o) Skin / CVS	5.1E-03	--	4.0E-03	9.1E-03
			Iron	--	--	--	--	Iron	(o) Liver / CVS / GIS	2.3E-03	--	1.6E-04	2.4E-03
			(Total)	8.6E-06	5.4E-10	1.6E-05	2.4E-05	(Total)		7.7E-03	1.5E-08	4.2E-03	1.2E-02
Surface Water	Surface Water	Surface Water											
			Acetone	--	--	--	--	Acetone	(o) Liver / Kidney	4.3E-06	--	1.5E-06	5.8E-06
			Toluene	--	--	--	--	Toluene	(o) Liver / Kidney, (i) CNS / RsS	1.0E-06	--	3.1E-05	3.2E-05
			Xylenes, total	--	--	--	--	Xylenes, total	(o) Whole body	1.3E-07	--	7.3E-06	7.4E-06
			(Total)	--	--	--	--	(Total)		5.4E-06	--	3.9E-05	4.5E-05
Sediment	Sediment	Sediment											
			2-Methylnaphthalene	--	--	--	--	2-Methylnaphthalene	NA	--	--	--	--
			Aroclor-1248	2.1E-07	--	3.5E-07	5.6E-07	Aroclor-1248	NA	--	--	--	--
			Aroclor-1260	3.0E-06	--	5.0E-06	8.0E-06	Aroclor-1260	NA	--	--	--	--
			Diesel Range Organics	--	--	--	--	Diesel Range Organics	NA	--	--	--	--
			(Total)	3.2E-06	--	5.3E-06	8.5E-06	(Total)		--	--	--	--

Notes:

Target Organ Abbreviations:
CNS = Central Nervous System
CVS = Cardiovascular System
GIS = Gastrointestinal System
ImS = Immune System
RsS = Respiratory System

(o) Oral exposure
(i) Inhalation exposure

Total Risk Across Surface Soil	2.4E-05
Total Risk Across Surface Water	--
Total Risk Across Sediment	8.5E-06
Total Risk Across All Media and All Exposure Routes	3.3E-05

Inhalation Exposure Routes:

Inhalation Central Nervous System HI =	0.00E+00
Inhalation Respiratory System HI =	0.00E+00

Total Hazard Index Across Surface Soil	0.01
Total Hazard Index Across Surface Water	0.00
Total Hazard Index Across Sediment	--
Total Hazard Index Across All Media and All Exposure Routes	0.01

Oral and Dermal Exposure Routes:

Oral / Dermal Whole Body HI =	0.00
Oral / Dermal Gastrointestinal System HI =	0.00
Oral / Dermal Cardiovascular System HI =	0.01
Oral / Dermal Skin HI =	0.01
Oral / Dermal Kidney HI =	0.00
Oral / Dermal Liver HI =	0.00

TABLE 9.4A.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Receptor Population: Residents
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Surface Soil											
			2-Methylnaphthalene	--	--	--	--	2-Methylnaphthalene	NA	--	--	--	--
			Benzo(a)anthracene	2.4E-05	1.5E-09	4.0E-05	6.3E-05	Benzo(a)anthracene	NA	--	--	--	--
			Benzo(a)pyrene	1.0E-04	6.7E-09	1.1E-04	**2.1E-04**	Benzo(a)pyrene	NA	--	--	--	--
			Benzo(b)fluoranthene	1.4E-05	9.0E-10	1.5E-05	2.9E-05	Benzo(b)fluoranthene	NA	--	--	--	--
			Benzo(k)fluoranthene	6.4E-07	4.1E-11	6.6E-07	1.3E-06	Benzo(k)fluoranthene	NA	--	--	--	--
			Carbazole	3.0E-08	4.5E-12	3.1E-08	6.0E-08	Carbazole	NA	--	--	--	--
			Chrysene	3.3E-07	2.1E-11	5.5E-07	8.8E-07	Chrysene	NA	--	--	--	--
			Dibenz(a,h)anthracene	4.8E-06	3.1E-10	8.1E-06	1.3E-05	Dibenz(a,h)anthracene	NA	--	--	--	--
			Fluoranthene	--	--	--	--	Fluoranthene	(o) Liver / CVS	8.3E-03	1.3E-06	1.1E-03	9.4E-03
			Indeno(1,2,3-cd)pyrene	3.0E-06	1.9E-10	5.0E-06	8.1E-06	Indeno(1,2,3-cd)pyrene	NA	--	--	--	--
			Naphthalene	--	--	--	--	Naphthalene	(o) Whole Body, (i) RsS	3.6E-05	1.3E-07	1.8E-06	3.8E-05
			Pyrene	--	--	--	--	Pyrene	(o) Kidney	1.1E-02	1.7E-06	1.5E-03	1.3E-02
			4,4'-DDD	3.4E-07	5.1E-11	1.9E-08	3.6E-07	4,4'-DDD	NA	--	--	--	--
			Chlordane, alpha-	7.9E-06	1.2E-09	1.6E-06	9.5E-06	Chlordane, alpha-	Liver	1.3E-01	5.0E-05	2.6E-02	1.6E-01
			Chlordane, gamma-	9.5E-06	1.4E-09	1.9E-06	1.1E-05	Chlordane, gamma-	Liver	1.6E-01	6.0E-05	3.2E-02	1.9E-01
			Dieldrin	2.4E-06	3.7E-10	1.9E-07	2.6E-06	Dieldrin	(o) Liver	8.8E-03	1.3E-06	7.0E-04	9.5E-03
			Heptachlor	4.6E-05	7.1E-09	2.6E-06	4.9E-05	Heptachlor	(o) Liver	6.0E-02	9.1E-06	3.3E-03	6.4E-02
			Heptachlor Epoxide	1.9E-05	2.9E-09	1.1E-06	2.0E-05	Heptachlor Epoxide	(o) Liver	4.7E-01	7.2E-05	2.6E-02	5.0E-01
			Aroclor-1248	1.4E-06	2.1E-10	8.9E-07	2.3E-06	Aroclor-1248	NA	--	--	--	--
			Aroclor-1254	9.2E-07	1.4E-10	5.7E-07	1.5E-06	Aroclor-1254	(o) Whole Body / ImS	6.7E-02	1.0E-05	4.1E-02	1.1E-01
			Aroclor-1260	5.1E-05	7.7E-09	3.2E-05	8.3E-05	Aroclor-1260	NA	--	--	--	--
			Gasoline Range Organics	--	--	--	--	Gasoline Range Organics	NA	--	--	--	--
			Diesel Range Organics	--	--	--	--	Diesel Range Organics	NA	--	--	--	--
			Antimony	--	--	--	--	Antimony	(o) Whole Body	4.2E-03	--	8.3E-04	5.0E-03
			Arsenic	2.5E-06	3.7E-09	7.2E-07	3.2E-06	Arsenic	(o) Skin / CVS	1.6E-02	--	4.7E-03	2.1E-02
			Iron	--	--	--	--	Iron	(o) Liver / CVS / GIS	1.0E-02	--	2.7E-04	1.1E-02
			Thallium	--	--	--	--	Thallium	(o) CVS	6.4E-03	--	1.7E-04	6.5E-03
			(Total)	2.9E-04	3.5E-08	2.2E-04	**5.1E-04**	(Total)		9.6E-01	2.0E-04	1.4E-01	**1.1E+00**
Groundwater	Groundwater	Tap											
			Benzene	1.8E-06	1.3E-07	8.9E-08	2.0E-06	Benzene	CVS	3.1E-02	8.0E-03	1.6E-03	4.1E-02
			Chloroform	9.2E-07	1.4E-06	9.2E-08	2.4E-06	Chloroform	(o) Liver	4.4E-02	6.0E-01	4.4E-03	6.4E-01
			2-Methylnaphthalene	--	--	--	--	2-Methylnaphthalene	NA	--	--	--	--
			Naphthalene	--	--	--	--	Naphthalene	(o) Whole Body, (i) RsS	3.0E-03	--	5.8E-04	3.6E-03
			Heptachlor Epoxide	1.4E-06	--	2.5E-07	1.7E-06	Heptachlor Epoxide	(o) Liver	3.5E-02	--	6.0E-03	4.1E-02
			MCPA	--	--	--	--	MCPA	(o) Kidney / Liver	2.4E+00	--	5.3E-02	**2.5E+00**
			Antimony	--	--	--	--	Antimony	(o) Whole Body	7.5E-01	--	8.5E-02	8.4E-01
			Arsenic	4.2E-04	--	2.3E-06	**4.3E-04**	Arsenic	(o) Skin / CVS	2.7E+00	--	1.5E-02	**2.8E+00**
			Iron	--	--	--	--	Iron	(o) Liver / CVS / GIS	6.2E+00	--	9.3E-02	**6.3E+00**
			Manganese	--	--	--	--	Manganese	CNS	5.1E-01	--	2.9E-02	5.4E-01
			Thallium	--	--	--	--	Thallium	(o) CVS	2.4E+00	--	3.5E-02	**2.4E+00**
			(Total)	4.3E-04	1.5E-06	2.7E-06	**4.3E-04**	(Total)		1.5E+01	6.0E-01	3.2E-01	**1.6E+01**

TABLE 9.4A.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Receptor Population: Residents
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water	Surface Water	Surface Water	Acetone	--	--	--	--	Acetone	(o) Liver / Kidney	2.7E-06	--	1.1E-06	3.8E-06
			Toluene	--	--	--	--	Toluene	(o) Liver / Kidney, (i) CNS / RsS	6.6E-07	--	2.1E-05	2.2E-05
			Xylenes, total	--	--	--	--	Xylenes, total	(o) Whole body	8.5E-08	--	5.0E-06	5.1E-06
			(Total)	--	--	--	--	(Total)		3.5E-06	--	2.7E-05	3.1E-05
Sediment	Sediment	Sediment	2-Methylnaphthalene	--	--	--	--	2-Methylnaphthalene	NA	--	--	--	--
			Aroclor-1248	3.6E-07	--	2.3E-07	5.9E-07	Aroclor-1248	NA	--	--	--	--
			Aroclor-1260	5.2E-06	--	3.2E-06	8.4E-06	Aroclor-1260	NA	--	--	--	--
			Diesel Range Organics	--	--	--	--	Diesel Range Organics	NA	--	--	--	--
			(Total)	5.5E-06	--	3.4E-06	8.9E-06	(Total)		--	--	--	--

Notes:

Target Organ Abbreviations:
CNS = Central Nervous System
CVS = Cardiovascular System
GIS = Gastrointestinal System
ImS = Immune System
RsS = Respiratory System

(o) Oral exposure
(i) Inhalation exposure

Total Risk Across Surface Soil	5.1E-04
Total Risk Across Groundwater	4.3E-04
Total Risk Across Surface Water	--
Total Risk Across Sediment	8.9E-06
Total Risk Across All Media and All Exposure Routes	9.5E-04

Total Hazard Index Across Surface Soil	1.10
Total Hazard Index Across Groundwater	16.01
Total Hazard Index Across Surface Water	0.00
Total Hazard Index Across Sediment	--
Total Hazard Index Across All Media and All Exposure Routes	17.10

All Exposure Routes:

Total Central Nervous System HI =	0.54
Total Cardiovascular System HI =	0.04
Total Liver HI =	0.35

Inhalation Exposure Routes:

Inhalation Central Nervous System HI =	0.00E+00
Inhalation Respiratory System HI =	1.27E-07

Oral and Dermal Exposure Routes:

Oral / Dermal Whole Body HI =	0.96
Oral / Dermal Immune System HI =	0.11
Oral / Dermal Gastrointestinal System HI =	6.29
Oral / Dermal Cardiovascular System HI =	11.48
Oral / Dermal Skin HI =	2.78
Oral / Dermal Kidney HI =	2.48
Oral / Dermal Liver HI =	9.42

TABLE 9.4B.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Receptor Population: Residents
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Surface Soil											
			2-Methylnaphthalene	--	--	--	--	2-Methylnaphthalene	NA	--	--	--	--
			Benzo(a)anthracene	1.6E-06	1.0E-10	2.7E-06	4.4E-06	Benzo(a)anthracene	NA	--	--	--	--
			Benzo(a)pyrene	8.5E-06	5.4E-10	8.8E-06	1.7E-05	Benzo(a)pyrene	NA	--	--	--	--
			Benzo(b)fluoranthene	9.6E-07	6.2E-11	1.0E-06	2.0E-06	Benzo(b)fluoranthene	NA	--	--	--	--
			Benzo(k)fluoranthene	6.1E-08	3.9E-12	6.3E-08	1.2E-07	Benzo(k)fluoranthene	NA	--	--	--	--
			Carbazole	8.9E-09	1.3E-12	9.3E-09	1.8E-08	Carbazole	NA	--	--	--	--
			Chrysene	2.3E-08	1.5E-12	3.8E-08	6.1E-08	Chrysene	NA	--	--	--	--
			Dibenz(a,h)anthracene	2.4E-06	1.5E-10	4.0E-06	6.4E-06	Dibenz(a,h)anthracene	NA	--	--	--	--
			Indeno(1,2,3-cd)pyrene	5.9E-07	3.8E-11	9.9E-07	1.6E-06	Indeno(1,2,3-cd)pyrene	NA	--	--	--	--
			Dieldrin	3.9E-07	5.9E-11	3.1E-08	4.2E-07	Dieldrin	(o) Liver	1.4E-03	2.1E-07	1.1E-04	1.5E-03
			Aroclor-1260	9.0E-05	1.4E-08	5.6E-05	**1.5E-04**	Aroclor-1260	NA	--	--	--	--
			Arsenic	3.7E-06	5.6E-09	1.1E-06	4.8E-06	Arsenic	(o) Skin / CVS	2.4E-02	--	7.0E-03	3.1E-02
			Iron	--	--	--	--	Iron	(o) Liver / CVS / GIS	1.1E-02	--	2.9E-04	1.1E-02
			(Total)	1.1E-04	2.0E-08	7.4E-05	**1.8E-04**	(Total)		3.6E-02	2.1E-07	7.4E-03	4.4E-02
Groundwater	Groundwater	Tap											
			Benzene	1.8E-06	1.3E-07	8.9E-08	2.0E-06	Benzene	CVS	3.1E-02	8.0E-03	1.6E-03	4.1E-02
			Chloroform	9.2E-07	1.4E-06	9.2E-08	2.4E-06	Chloroform	(o) Liver	4.4E-02	6.0E-01	4.4E-03	6.4E-01
			2-Methylnaphthalene	--	--	--	--	2-Methylnaphthalene	NA	--	--	--	--
			Naphthalene	--	--	--	--	Naphthalene	(o) Whole Body, (i) RsS	3.0E-03	--	5.8E-04	3.6E-03
			Heptachlor Epoxide	1.4E-06	--	2.5E-07	1.7E-06	Heptachlor Epoxide	(o) Liver	3.5E-02	--	6.0E-03	4.1E-02
			MCPA	--	--	--	--	MCPA	(o) Kidney / Liver	2.4E+00	--	5.3E-02	**2.5E+00**
			Antimony	--	--	--	--	Antimony	(o) Whole Body	7.5E-01	--	8.5E-02	8.4E-01
			Arsenic	4.2E-04	--	2.3E-06	**4.3E-04**	Arsenic	(o) Skin / CVS	2.7E+00	--	1.5E-02	**2.8E+00**
			Iron	--	--	--	--	Iron	(o) Liver / CVS / GIS	6.2E+00	--	9.3E-02	**6.3E+00**
			Manganese	--	--	--	--	Manganese	CNS	5.1E-01	--	2.9E-02	5.4E-01
			Thallium	--	--	--	--	Thallium	(o) CVS	2.4E+00	--	3.5E-02	**2.4E+00**
			(Total)	4.3E-04	1.5E-06	2.7E-06	**4.3E-04**	(Total)		1.5E+01	6.0E-01	3.2E-01	**1.6E+01**
Surface Water	Surface Water	Surface Water											
			Acetone	--	--	--	--	Acetone	(o) Liver / Kidney	2.7E-06	--	1.1E-06	3.8E-06
			Toluene	--	--	--	--	Toluene	(o) Liver / Kidney, (i) CNS / RsS	6.6E-07	--	2.1E-05	2.2E-05
			Xylenes, total	--	--	--	--	Xylenes, total	(o) Whole body	8.5E-08	--	5.0E-06	5.1E-06
			(Total)	--	--	--	--	(Total)		3.5E-06	--	2.7E-05	3.1E-05
Sediment	Sediment	Sediment											
			2-Methylnaphthalene	--	--	--	--	2-Methylnaphthalene	NA	--	--	--	--
			Aroclor-1248	3.6E-07	--	2.3E-07	5.9E-07	Aroclor-1248	NA	--	--	--	--
			Aroclor-1260	5.2E-06	--	3.2E-06	8.4E-06	Aroclor-1260	NA	--	--	--	--
			Diesel Range Organics	--	--	--	--	Diesel Range Organics	NA	--	--	--	--
			(Total)	5.5E-06	--	3.4E-06	8.9E-06	(Total)		--	--	--	--

Notes:

Target Organ Abbreviations:
CNS = Central Nervous System
CVS = Cardiovascular System
GIS = Gastrointestinal System
ImS = Immune System
RsS = Respiratory System

(o) Oral exposure
(i) Inhalation exposure

Total Risk Across Surface Soil	1.8E-04
Total Risk Across Groundwater	4.3E-04
Total Risk Across Surface Water	--
Total Risk Across Sediment	8.9E-06
Total Risk Across All Media and All Exposure Routes	6.2E-04

Total Hazard Index Across Surface Soil	0.04
Total Hazard Index Across Groundwater	16.01
Total Hazard Index Across Surface Water	0.00
Total Hazard Index Across Sediment	--
Total Hazard Index Across All Media and All Exposure Routes	16.05

All Exposure Routes:

Total Central Nervous System HI =	0.54
Total Cardiovascular System HI =	0.04

Inhalation Exposure Routes:

Inhalation Central Nervous System HI =	0.00E+00
Inhalation Respiratory System HI =	0.00E+00

Oral and Dermal Exposure Routes:

Oral / Dermal Whole Body HI =	0.84
Oral / Dermal Gastrointestinal System HI =	6.29
Oral / Dermal Cardiovascular System HI =	11.47
Oral / Dermal Skin HI =	2.79
Oral / Dermal Kidney HI =	2.46
Oral / Dermal Liver HI =	8.84

TABLE 9.5A.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Receptor Population: Residents
Receptor Age: Young Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Surface Soil	2-Methylnaphthalene	--	--	--	--	2-Methylnaphthalene	NA	--	--	--	--
			Benzo(a)anthracene	5.5E-05	1.3E-09	6.5E-05	**1.2E-04**	Benzo(a)anthracene	NA	--	--	--	--
			Benzo(a)pyrene	2.4E-04	5.9E-09	1.8E-04	**4.2E-04**	Benzo(a)pyrene	NA	--	--	--	--
			Benzo(b)fluoranthene	3.3E-05	7.9E-10	2.4E-05	5.6E-05	Benzo(b)fluoranthene	NA	--	--	--	--
			Benzo(k)fluoranthene	1.5E-06	3.6E-11	1.1E-06	2.6E-06	Benzo(k)fluoranthene	NA	--	--	--	--
			Carbazole	6.9E-08	3.9E-12	5.0E-08	1.2E-07	Carbazole	NA	--	--	--	--
			Chrysene	7.7E-07	1.9E-11	9.0E-07	1.7E-06	Chrysene	NA	--	--	--	--
			Dibenz(a,h)anthracene	1.1E-05	2.7E-10	1.3E-05	2.5E-05	Dibenz(a,h)anthracene	NA	--	--	--	--
			Fluoranthene	--	--	--	--	Fluoranthene	(o) Liver / CVS	7.8E-02	4.4E-06	7.0E-03	8.5E-02
			Indeno(1,2,3-cd)pyrene	7.0E-06	1.7E-10	8.3E-06	1.5E-05	Indeno(1,2,3-cd)pyrene	NA	--	--	--	--
			Naphthalene	--	--	--	--	Naphthalene	(o) Whole Body, (i) RsS	3.4E-04	4.5E-07	1.2E-05	3.5E-04
			Pyrene	--	--	--	--	Pyrene	(o) Kidney	1.1E-01	6.1E-06	9.6E-03	1.2E-01
			4,4'-DDD	7.9E-07	4.5E-11	3.2E-08	8.2E-07	4,4'-DDD	NA	--	--	--	--
			Chlordane, alpha-	1.8E-05	1.0E-09	2.6E-06	2.1E-05	Chlordane, alpha-	Liver	1.2E+00	1.7E-04	1.7E-01	**1.4E+00**
			Chlordane, gamma-	2.2E-05	1.3E-09	3.1E-06	2.5E-05	Chlordane, gamma-	Liver	1.5E+00	2.1E-04	2.1E-01	**1.7E+00**
			Dieldrin	5.6E-06	3.2E-10	3.1E-07	5.9E-06	Dieldrin	(o) Liver	8.2E-02	4.6E-06	4.6E-03	8.6E-02
			Heptachlor	1.1E-04	6.2E-09	4.2E-06	**1.1E-04**	Heptachlor	(o) Liver	5.6E-01	3.2E-05	2.2E-02	5.8E-01
			Heptachlor Epoxide	4.5E-05	2.5E-09	1.7E-06	4.7E-05	Heptachlor Epoxide	(o) Liver	4.4E+00	2.5E-04	1.7E-01	**4.6E+00**
			Aroclor-1248	3.3E-06	1.9E-10	1.5E-06	4.8E-06	Aroclor-1248	NA	--	--	--	--
			Aroclor-1254	2.1E-06	1.2E-10	9.3E-07	3.1E-06	Aroclor-1254	(o) Whole Body / ImS	6.2E-01	3.5E-05	2.7E-01	8.9E-01
			Aroclor-1260	1.2E-04	6.8E-09	5.2E-05	**1.7E-04**	Aroclor-1260	NA	--	--	--	--
			Gasoline Range Organics	--	--	--	--	Gasoline Range Organics	NA	--	--	--	--
			Diesel Range Organics	--	--	--	--	Diesel Range Organics	NA	--	--	--	--
			Antimony	--	--	--	--	Antimony	(o) Whole Body	3.9E-02	--	5.5E-03	4.5E-02
			Arsenic	5.7E-06	3.3E-09	1.2E-06	6.9E-06	Arsenic	(o) Skin / CVS	1.5E-01	--	3.0E-02	1.8E-01
			Iron	--	--	--	--	Iron	(o) Liver / CVS / GIS	9.6E-02	--	1.8E-03	9.8E-02
			Thallium	--	--	--	--	Thallium	(o) CVS	5.9E-02	--	1.1E-03	6.1E-02
			(Total)	6.8E-04	3.0E-08	3.6E-04	**1.0E-03**	(Total)		8.9E+00	7.2E-04	9.1E-01	**9.8E+00**
Groundwater	Groundwater	Tap	Benzene	1.0E-06	1.1E-07	3.8E-08	1.2E-06	Benzene	CVS	7.2E-02	2.8E-02	2.7E-03	1.0E-01
			Chloroform	5.3E-07	1.2E-06	3.9E-08	1.8E-06	Chloroform	(o) Liver	1.0E-01	2.1E+00	7.5E-03	**2.2E+00**
			2-Methylnaphthalene	--	--	--	--	2-Methylnaphthalene	NA	--	--	--	--
			Naphthalene	--	--	--	--	Naphthalene	(o) Whole Body, (i) RsS	7.0E-03	--	1.0E-03	8.0E-03
			Heptachlor Epoxide	8.3E-07	--	1.0E-07	9.4E-07	Heptachlor Epoxide	(o) Liver	8.2E-02	--	1.0E-02	9.2E-02
			MCPA	--	--	--	--	MCPA	(o) Kidney / Liver	5.6E+00	--	9.1E-02	**5.7E+00**
			Antimony	--	--	--	--	Antimony	(o) Whole Body	1.8E+00	--	1.5E-01	**1.9E+00**
			Arsenic	2.5E-04	--	9.9E-07	**2.5E-04**	Arsenic	(o) Skin / CVS	6.4E+00	--	2.6E-02	**6.4E+00**
			Iron	--	--	--	--	Iron	(o) Liver / CVS / GIS	1.4E+01	--	1.6E-01	**1.5E+01**
			Manganese	--	--	--	--	Manganese	CNS	1.2E+00	--	4.9E-02	**1.2E+00**
			Thallium	--	--	--	--	Thallium	(o) CVS	5.5E+00	--	6.1E-02	**5.6E+00**
			(Total)	2.5E-04	1.4E-06	1.2E-06	**2.5E-04**	(Total)		3.5E+01	2.1E+00	5.5E-01	**3.8E+01**

TABLE 9.5A.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Receptor Population: Residents
Receptor Age: Young Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water	Surface Water	Surface Water											
			Acetone	--	--	--	--	Acetone	(o) Liver / Kidney	6.4E-05	--	2.5E-06	6.6E-05
			Toluene	--	--	--	--	Toluene	(o) Liver / Kidney, (i) CNS / RsS	1.5E-05	--	4.8E-05	6.4E-05
			Xylenes, total	--	--	--	--	Xylenes, total	(o) Whole body	2.0E-06	--	1.2E-05	1.4E-05
			(Total)	--	--	--	--	(Total)		8.1E-05	--	6.2E-05	1.4E-04
Sediment	Sediment	Sediment											
			2-Methylnaphthalene	--	--	--	--	2-Methylnaphthalene	NA	--	--	--	--
			Aroclor-1248	8.4E-07	--	3.7E-07	1.2E-06	Aroclor-1248	NA	--	--	--	--
			Aroclor-1260	1.2E-05	--	5.2E-06	1.7E-05	Aroclor-1260	NA	--	--	--	--
			Diesel Range Organics	--	--	--	--	Diesel Range Organics	NA	--	--	--	--
			(Total)	1.3E-05	--	5.6E-06	1.8E-05	(Total)		--	--	--	--

Notes:

Target Organ Abbreviations:
CNS = Central Nervous System
CVS = Cardiovascular System
GIS = Gastrointestinal System
ImS = Immune System
RsS = Respiratory System

(o) Oral exposure
(i) Inhalation exposure

Total Risk Across Surface Soil	1.0E-03
Total Risk Across Groundwater	2.5E-04
Total Risk Across Surface Water	--
Total Risk Across Sediment	1.8E-05
Total Risk Across All Media and All Exposure Routes	1.3E-03

All Exposure Routes:

Total Central Nervous System HI =	1.25
Total Cardiovascular System HI =	0.10
Total Liver HI =	3.09

Inhalation Exposure Routes:

Inhalation Central Nervous System HI =	0.00E+00
Inhalation Respiratory System HI =	4.45E-07

Total Hazard Index Across Surface Soil	9.84
Total Hazard Index Across Groundwater	37.86
Total Hazard Index Across Surface Water	0.00
Total Hazard Index Across Sediment	--
Total Hazard Index Across All Media and All Exposure Routes	47.70

Oral and Dermal Exposure Routes:

Oral / Dermal Whole Body HI =	2.85
Oral / Dermal Immune System HI =	0.89
Oral / Dermal Gastrointestinal System HI =	14.68
Oral / Dermal Cardiovascular System HI =	27.01
Oral / Dermal Skin HI =	6.60
Oral / Dermal Kidney HI =	5.83
Oral / Dermal Liver HI =	25.96

TABLE 9.5B.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Receptor Population: Residents
Receptor Age: Young Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Surface Soil	2-Methylnaphthalene	--	--	--	--	2-Methylnaphthalene	NA	--	--	--	--
			Benzo(a)anthracene	3.8E-06	9.2E-11	4.5E-06	8.3E-06	Benzo(a)anthracene	NA	--	--	--	--
			Benzo(a)pyrene	2.0E-05	4.8E-10	1.4E-05	3.4E-05	Benzo(a)pyrene	NA	--	--	--	--
			Benzo(b)fluoranthene	2.2E-06	5.4E-11	1.6E-06	3.9E-06	Benzo(b)fluoranthene	NA	--	--	--	--
			Benzo(k)fluoranthene	1.4E-07	3.4E-12	1.0E-07	2.5E-07	Benzo(k)fluoranthene	NA	--	--	--	--
			Carbazole	2.1E-08	1.2E-12	1.5E-08	3.6E-08	Carbazole	NA	--	--	--	--
			Chrysene	5.4E-08	1.3E-12	6.3E-08	1.2E-07	Chrysene	NA	--	--	--	--
			Dibenz(a,h)anthracene	5.6E-06	1.3E-10	6.5E-06	1.2E-05	Dibenz(a,h)anthracene	NA	--	--	--	--
			Indeno(1,2,3-cd)pyrene	1.4E-06	3.3E-11	1.6E-06	3.0E-06	Indeno(1,2,3-cd)pyrene	NA	--	--	--	--
			Dieldrin	9.1E-07	5.2E-11	5.1E-08	9.6E-07	Dieldrin	(o) Liver	1.3E-02	7.6E-07	7.4E-04	1.4E-02
			Aroclor-1260	2.1E-04	1.2E-08	9.1E-05	**3.0E-04**	Aroclor-1260	NA	--	--	--	--
			Arsenic	8.6E-06	4.9E-09	1.8E-06	1.0E-05	Arsenic	(o) Skin / CVS	2.2E-01	--	4.6E-02	2.7E-01
			Iron	--	--	--	--	Iron	(o) Liver / CVS / GIS	1.0E-01	--	1.9E-03	1.0E-01
			(Total)	2.5E-04	1.8E-08	1.2E-04	**3.7E-04**	(Total)		3.4E-01	7.6E-07	4.9E-02	3.9E-01
Groundwater	Groundwater	Tap	Benzene	1.0E-06	1.1E-07	3.8E-08	1.2E-06	Benzene	CVS	7.2E-02	2.8E-02	2.7E-03	1.0E-01
			Chloroform	5.3E-07	1.2E-06	3.9E-08	1.8E-06	Chloroform	(o) Liver	1.0E-01	2.1E+00	7.5E-03	**2.2E+00**
			2-Methylnaphthalene	--	--	--	--	2-Methylnaphthalene	NA	--	--	--	--
			Naphthalene	--	--	--	--	Naphthalene	(o) Whole Body, (i) RsS	7.0E-03	--	1.0E-03	8.0E-03
			Heptachlor Epoxide	8.3E-07	--	1.0E-07	9.4E-07	Heptachlor Epoxide	(o) Liver	8.2E-02	--	1.0E-02	9.2E-02
			MCPA	--	--	--	--	MCPA	(o) Kidney / Liver	5.6E+00	--	9.1E-02	**5.7E+00**
			Antimony	--	--	--	--	Antimony	(o) Whole Body	1.8E+00	--	1.5E-01	**1.9E+00**
			Arsenic	2.5E-04	--	9.9E-07	**2.5E-04**	Arsenic	(o) Skin / CVS	6.4E+00	--	2.6E-02	**6.4E+00**
			Iron	--	--	--	--	Iron	(o) Liver / CVS / GIS	1.4E+01	--	1.6E-01	**1.5E+01**
			Manganese	--	--	--	--	Manganese	CNS	1.2E+00	--	4.9E-02	**1.2E+00**
			Thallium	--	--	--	--	Thallium	(o) CVS	5.5E+00	--	6.1E-02	**5.6E+00**
			(Total)	2.5E-04	1.4E-06	1.2E-06	**2.5E-04**	(Total)		3.5E+01	2.1E+00	5.5E-01	**3.8E+01**
Surface Water	Surface Water	Surface Water	Acetone	--	--	--	--	Acetone	(o) Liver / Kidney	6.4E-05	--	2.5E-06	6.6E-05
			Toluene	--	--	--	--	Toluene	(o) Liver / Kidney, (i) CNS / RsS	1.5E-05	--	4.8E-05	6.4E-05
			Xylenes, total	--	--	--	--	Xylenes, total	(o) Whole body	2.0E-06	--	1.2E-05	1.4E-05
			(Total)	--	--	--	--	(Total)		8.1E-05	--	6.2E-05	1.4E-04
Sediment	Sediment	Sediment	2-Methylnaphthalene	--	--	--	--	2-Methylnaphthalene	NA	--	--	--	--
			Aroclor-1248	8.4E-07	--	3.7E-07	1.2E-06	Aroclor-1248	NA	--	--	--	--
			Aroclor-1260	1.2E-05	--	5.2E-06	1.7E-05	Aroclor-1260	NA	--	--	--	--
			Diesel Range Organics	--	--	--	--	Diesel Range Organics	NA	--	--	--	--
			(Total)	1.3E-05	--	5.6E-06	1.8E-05	(Total)		--	--	--	--

Notes:

Target Organ Abbreviations:
CNS = Central Nervous System
CVS = Cardiovascular System
GIS = Gastrointestinal System
ImS = Immune System
RsS = Respiratory System

(o) Oral exposure
(i) Inhalation exposure

Total Risk Across Surface Soil	3.7E-04
Total Risk Across Groundwater	2.5E-04
Total Risk Across Surface Water	--
Total Risk Across Sediment	1.8E-05
Total Risk Across All Media and All Exposure Routes	6.4E-04

All Exposure Routes:

Total Central Nervous System HI =	1.25
Total Cardiovascular System HI =	0.10

Inhalation Exposure Routes:

Inhalation Central Nervous System HI =	0.00E+00
Inhalation Respiratory System HI =	0.00E+00

Total Hazard Index Across Surface Soil	0.39
Total Hazard Index Across Groundwater	37.86
Total Hazard Index Across Surface Water	0.00
Total Hazard Index Across Sediment	--
Total Hazard Index Across All Media and All Exposure Routes	38.24

Oral and Dermal Exposure Routes:

Oral / Dermal Whole Body HI =	1.91
Oral / Dermal Gastrointestinal System HI =	14.69
Oral / Dermal Cardiovascular System HI =	26.96
Oral / Dermal Skin HI =	6.69
Oral / Dermal Kidney HI =	5.72
Oral / Dermal Liver HI =	20.62

TABLE 9.4A.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Receptor Population: Residents
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Surface Soil											
			2-Methylnaphthalene	--	--	--	--	2-Methylnaphthalene	NA	--	--	--	--
			Benzo(a)anthracene	3.0E-06	3.7E-10	8.7E-06	1.2E-05	Benzo(a)anthracene	NA	--	--	--	--
			Benzo(a)pyrene	1.3E-05	1.6E-09	2.4E-05	3.7E-05	Benzo(a)pyrene	NA	--	--	--	--
			Benzo(b)fluoranthene	1.8E-06	2.2E-10	3.2E-06	5.0E-06	Benzo(b)fluoranthene	NA	--	--	--	--
			Benzo(k)fluoranthene	8.0E-08	9.9E-12	1.5E-07	2.3E-07	Benzo(k)fluoranthene	NA	--	--	--	--
			Carbazole	3.7E-09	1.1E-12	6.8E-09	1.0E-08	Carbazole	NA	--	--	--	--
			Chrysene	4.1E-08	5.1E-12	1.2E-07	1.6E-07	Chrysene	NA	--	--	--	--
			Dibenz(a,h)anthracene	6.1E-07	7.5E-11	1.8E-06	2.4E-06	Dibenz(a,h)anthracene	NA	--	--	--	--
			Fluoranthene	--	--	--	--	Fluoranthene	(o) Liver / CVS	2.8E-03	8.1E-07	6.3E-04	3.4E-03
			Indeno(1,2,3-cd)pyrene	3.8E-07	4.7E-11	1.1E-06	1.5E-06	Indeno(1,2,3-cd)pyrene	NA	--	--	--	--
			Naphthalene	--	--	--	--	Naphthalene	(o) Whole Body, (i) RsS	1.2E-05	8.2E-08	1.1E-06	1.3E-05
			Pyrene	--	--	--	--	Pyrene	(o) Kidney	3.8E-03	1.1E-06	8.6E-04	4.7E-03
			4,4'-DDD	4.2E-08	1.2E-11	4.2E-09	4.7E-08	4,4'-DDD	NA	--	--	--	--
			Chlordane, alpha-	9.9E-07	2.9E-10	3.5E-07	1.3E-06	Chlordane, alpha-	Liver	4.4E-02	3.2E-05	1.5E-02	5.9E-02
			Chlordane, gamma-	1.2E-06	3.5E-10	4.2E-07	1.6E-06	Chlordane, gamma-	Liver	5.3E-02	3.9E-05	1.9E-02	7.2E-02
			Dieldrin	3.0E-07	8.8E-11	4.2E-08	3.4E-07	Dieldrin	(o) Liver	2.9E-03	8.5E-07	4.1E-04	3.3E-03
			Heptachlor	5.8E-06	1.7E-09	5.7E-07	6.4E-06	Heptachlor	(o) Liver	2.0E-02	5.9E-06	2.0E-03	2.2E-02
			Heptachlor Epoxide	2.4E-06	7.0E-10	2.3E-07	2.6E-06	Heptachlor Epoxide	(o) Liver	1.6E-01	4.6E-05	1.5E-02	1.7E-01
			Aroclor-1248	1.8E-07	5.2E-11	2.0E-07	3.7E-07	Aroclor-1248	NA	--	--	--	--
			Aroclor-1254	1.1E-07	3.3E-11	1.3E-07	2.4E-07	Aroclor-1254	(o) Whole Body / ImS	2.2E-02	6.5E-06	2.4E-02	4.7E-02
			Aroclor-1260	6.4E-06	1.9E-09	7.0E-06	1.3E-05	Aroclor-1260	NA	--	--	--	--
			Gasoline Range Organics	--	--	--	--	Gasoline Range Organics	NA	--	--	--	--
			Diesel Range Organics	--	--	--	--	Diesel Range Organics	NA	--	--	--	--
			Antimony	--	--	--	--	Antimony	(o) Whole Body	1.4E-03	--	4.9E-04	1.9E-03
			Arsenic	3.1E-07	9.0E-10	1.6E-07	4.7E-07	Arsenic	(o) Skin / CVS	5.3E-03	--	2.7E-03	8.1E-03
			Iron	--	--	--	--	Iron	(o) Liver / CVS / GIS	3.4E-03	--	1.6E-04	3.6E-03
			Thallium	--	--	--	--	Thallium	(o) CVS	2.1E-03	--	9.9E-05	2.2E-03
			(Total)	3.7E-05	8.3E-09	4.8E-05	8.5E-05	(Total)		3.2E-01	1.3E-04	8.1E-02	4.0E-01
Groundwater	Groundwater	Tap											
			Benzene	3.1E-07	3.2E-08	2.5E-08	3.6E-07	Benzene	CVS	1.5E-02	5.3E-03	1.2E-03	2.1E-02
			Chloroform	1.6E-07	3.5E-07	2.6E-08	5.4E-07	Chloroform	(o) Liver	2.1E-02	4.0E-01	3.3E-03	4.2E-01
			2-Methylnaphthalene	--	--	--	--	2-Methylnaphthalene	NA	--	--	--	--
			Naphthalene	--	--	--	--	Naphthalene	(o) Whole Body, (i) RsS	1.4E-03	--	4.3E-04	1.8E-03
			Heptachlor Epoxide	2.5E-07	--	6.8E-08	3.2E-07	Heptachlor Epoxide	(o) Liver	1.6E-02	--	4.5E-03	2.1E-02
			MCPA	--	--	--	--	MCPA	(o) Kidney / Liver	1.1E+00	--	3.9E-02	**1.2E+00**
			Antimony	--	--	--	--	Antimony	(o) Whole Body	3.5E-01	--	6.3E-02	4.2E-01
			Arsenic	7.4E-05	--	6.5E-07	7.5E-05	Arsenic	(o) Skin / CVS	1.3E+00	--	1.1E-02	**1.3E+00**
			Iron	--	--	--	--	Iron	(o) Liver / CVS / GIS	2.9E+00	--	6.9E-02	**3.0E+00**
			Manganese	--	--	--	--	Manganese	CNS	2.4E-01	--	2.1E-02	2.6E-01
			Thallium	--	--	--	--	Thallium	(o) CVS	1.1E+00	--	2.6E-02	**1.1E+00**
			(Total)	7.5E-05	3.9E-07	7.6E-07	7.6E-05	(Total)		7.1E+00	4.0E-01	2.4E-01	**7.7E+00**

TABLE 9.4A.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Receptor Population: Residents
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water	Surface Water	Surface Water	Acetone	--	--	--	--	Acetone	(o) Liver / Kidney	2.7E-06	--	9.4E-07	3.7E-06
			Toluene	--	--	--	--	Toluene	(o) Liver / Kidney, (i) CNS / RsS	6.6E-07	--	1.9E-05	1.9E-05
			Xylenes, total	--	--	--	--	Xylenes, total	(o) Whole body	8.5E-08	--	4.4E-06	4.5E-06
			(Total)	--	--	--	--	(Total)		3.5E-06	--	2.4E-05	2.7E-05
Sediment	Sediment	Sediment	2-Methylnaphthalene	--	--	--	--	2-Methylnaphthalene	NA	--	--	--	--
			Aroclor-1248	6.8E-08	--	7.4E-08	1.4E-07	Aroclor-1248	NA	--	--	--	--
			Aroclor-1260	9.7E-07	--	1.1E-06	2.0E-06	Aroclor-1260	NA	--	--	--	--
			Diesel Range Organics	--	--	--	--	Diesel Range Organics	NA	--	--	--	--
			(Total)	1.0E-06	--	1.1E-06	2.2E-06	(Total)		--	--	--	--

Notes:

Target Organ Abbreviations:
CNS = Central Nervous System
CVS = Cardiovascular System
GIS = Gastrointestinal System
ImS = Immune System
RsS = Respiratory System

(o) Oral exposure
(i) Inhalation exposure

Total Risk Across Surface Soil	8.5E-05
Total Risk Across Groundwater	7.6E-05
Total Risk Across Surface Water	--
Total Risk Across Sediment	2.2E-06
Total Risk Across All Media and All Exposure Routes	1.6E-04

All Exposure Routes:

Total Central Nervous System HI =	0.26
Total Cardiovascular System HI =	0.02
Total Liver HI =	0.13

Inhalation Exposure Routes:

Inhalation Central Nervous System HI =	0.00E+00
Inhalation Respiratory System HI =	8.17E-08

Total Hazard Index Across Surface Soil	0.40
Total Hazard Index Across Groundwater	7.70
Total Hazard Index Across Surface Water	0.00
Total Hazard Index Across Sediment	--
Total Hazard Index Across All Media and All Exposure Routes	8.10

Oral and Dermal Exposure Routes:

Oral / Dermal Whole Body HI =	0.47
Oral / Dermal Immune System HI =	0.05
Oral / Dermal Gastrointestinal System HI =	2.97
Oral / Dermal Cardiovascular System HI =	5.41
Oral / Dermal Skin HI =	1.30
Oral / Dermal Kidney HI =	1.17
Oral / Dermal Liver HI =	4.38

TABLE 9.4B.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY
SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Receptor Population: Residents
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Surface Soil	2-Methylnaphthalene	--	--	--	--	2-Methylnaphthalene	NA	--	--	--	--
			Benzo(a)anthracene	2.0E-07	2.5E-11	6.0E-07	8.1E-07	Benzo(a)anthracene	NA	--	--	--	--
			Benzo(a)pyrene	1.1E-06	1.3E-10	1.9E-06	3.0E-06	Benzo(a)pyrene	NA	--	--	--	--
			Benzo(b)fluoranthene	1.2E-07	1.5E-11	2.2E-07	3.4E-07	Benzo(b)fluoranthene	NA	--	--	--	--
			Benzo(k)fluoranthene	7.7E-09	9.5E-13	1.4E-08	2.2E-08	Benzo(k)fluoranthene	NA	--	--	--	--
			Carbazole	1.1E-09	3.3E-13	2.0E-09	3.2E-09	Carbazole	NA	--	--	--	--
			Chrysene	2.9E-09	3.6E-13	8.5E-09	1.1E-08	Chrysene	NA	--	--	--	--
			Dibenz(a,h)anthracene	3.0E-07	3.7E-11	8.8E-07	1.2E-06	Dibenz(a,h)anthracene	NA	--	--	--	--
			Indeno(1,2,3-cd)pyrene	7.4E-08	9.1E-12	2.2E-07	2.9E-07	Indeno(1,2,3-cd)pyrene	NA	--	--	--	--
			Dieldrin	4.9E-08	1.4E-11	6.9E-09	5.6E-08	Dieldrin	(o) Liver	4.8E-04	1.4E-07	6.7E-05	5.4E-04
			Aroclor-1260	1.1E-05	3.3E-09	1.2E-05	2.4E-05	Aroclor-1260	NA	--	--	--	--
			Arsenic	4.6E-07	1.4E-09	2.4E-07	7.0E-07	Arsenic	(o) Skin / CVS	8.0E-03	--	4.1E-03	1.2E-02
			Iron	--	--	--	--	Iron	(o) Liver / CVS / GIS	3.6E-03	--	1.7E-04	3.8E-03
			(Total)	1.4E-05	4.9E-09	1.6E-05	3.0E-05	(Total)		1.2E-02	1.4E-07	4.3E-03	1.6E-02
Groundwater	Groundwater	Tap	Benzene	3.1E-07	3.2E-08	2.5E-08	3.6E-07	Benzene	CVS	1.5E-02	5.3E-03	1.2E-03	2.1E-02
			Chloroform	1.6E-07	3.5E-07	2.6E-08	5.4E-07	Chloroform	(o) Liver	2.1E-02	4.0E-01	3.3E-03	4.2E-01
			2-Methylnaphthalene	--	--	--	--	2-Methylnaphthalene	NA	--	--	--	--
			Naphthalene	--	--	--	--	Naphthalene	(o) Whole Body, (i) RsS	1.4E-03	--	4.3E-04	1.8E-03
			Heptachlor Epoxide	2.5E-07	--	6.8E-08	3.2E-07	Heptachlor Epoxide	(o) Liver	1.6E-02	--	4.5E-03	2.1E-02
			MCPA	--	--	--	--	MCPA	(o) Kidney / Liver	1.1E+00	--	3.9E-02	**1.2E+00**
			Antimony	--	--	--	--	Antimony	(o) Whole Body	3.5E-01	--	6.3E-02	4.2E-01
			Arsenic	7.4E-05	--	6.5E-07	7.5E-05	Arsenic	(o) Skin / CVS	1.3E+00	--	1.1E-02	**1.3E+00**
			Iron	--	--	--	--	Iron	(o) Liver / CVS / GIS	2.9E+00	--	6.9E-02	**3.0E+00**
			Manganese	--	--	--	--	Manganese	CNS	2.4E-01	--	2.1E-02	2.6E-01
			Thallium	--	--	--	--	Thallium	(o) CVS	1.1E+00	--	2.6E-02	1.1E+00
			(Total)	7.5E-05	3.9E-07	7.6E-07	7.6E-05	(Total)		7.1E+00	4.0E-01	2.4E-01	**7.7E+00**
Surface Water	Surface Water	Surface Water	Acetone	--	--	--	--	Acetone	(o) Liver / Kidney	2.7E-06	--	9.4E-07	3.7E-06
			Toluene	--	--	--	--	Toluene	(o) Liver / Kidney, (i) CNS / RsS	6.6E-07	--	1.9E-05	1.9E-05
			Xylenes, total	--	--	--	--	Xylenes, total	(o) Whole body	8.5E-08	--	4.4E-06	4.5E-06
			(Total)	--	--	--	--	(Total)		3.5E-06	--	2.4E-05	2.7E-05
Sediment	Sediment	Sediment	2-Methylnaphthalene	--	--	--	--	2-Methylnaphthalene	NA	--	--	--	--
			Aroclor-1248	6.8E-08	--	7.4E-08	1.4E-07	Aroclor-1248	NA	--	--	--	--
			Aroclor-1260	9.7E-07	--	1.1E-06	2.0E-06	Aroclor-1260	NA	--	--	--	--
			Diesel Range Organics	--	--	--	--	Diesel Range Organics	NA	--	--	--	--
			(Total)	1.0E-06	--	1.1E-06	2.2E-06	(Total)		--	--	--	--

Notes:

Target Organ Abbreviations:
CNS = Central Nervous System
CVS = Cardiovascular System
GIS = Gastrointestinal System
ImS = Immune System
RsS = Respiratory System

(o) Oral exposure
(i) Inhalation exposure

Total Risk Across Surface Soil	3.0E-05
Total Risk Across Groundwater	7.6E-05
Total Risk Across Surface Water	--
Total Risk Across Sediment	2.2E-06
Total Risk Across All Media and All Exposure Routes	1.1E-04

Total Hazard Index Across Surface Soil	0.02
Total Hazard Index Across Groundwater	7.70
Total Hazard Index Across Surface Water	0.00
Total Hazard Index Across Sediment	--
Total Hazard Index Across All Media and All Exposure Routes	7.72

All Exposure Routes:

Total Central Nervous System HI =	0.26
Total Cardiovascular System HI =	0.02

Inhalation Exposure Routes:

Inhalation Central Nervous System HI =	0.00E+00
Inhalation Respiratory System HI =	0.00E+00

Oral and Dermal Exposure Routes:

Oral / Dermal Whole Body HI =	0.42
Oral / Dermal Gastrointestinal System HI =	2.97
Oral / Dermal Cardiovascular System HI =	5.41
Oral / Dermal Skin HI =	1.31
Oral / Dermal Kidney HI =	1.17
Oral / Dermal Liver HI =	4.18

TABLE 9.5A.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Receptor Population: Residents
Receptor Age: Young Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Surface Soil											
			2-Methylnaphthalene	--	--	--	--	2-Methylnaphthalene	NA	--	--	--	--
			Benzo(a)anthracene	1.8E-05	8.9E-10	3.1E-05	4.9E-05	Benzo(a)anthracene	NA	--	--	--	--
			Benzo(a)pyrene	8.1E-05	3.9E-09	8.5E-05	**1.7E-04**	Benzo(a)pyrene	NA	--	--	--	--
			Benzo(b)fluoranthene	1.1E-05	5.3E-10	1.1E-05	2.2E-05	Benzo(b)fluoranthene	NA	--	--	--	--
			Benzo(k)fluoranthene	5.0E-07	2.4E-11	5.2E-07	1.0E-06	Benzo(k)fluoranthene	NA	--	--	--	--
			Carbazole	2.3E-08	2.6E-12	2.4E-08	4.7E-08	Carbazole	NA	--	--	--	--
			Chrysene	2.6E-07	1.2E-11	4.3E-07	6.9E-07	Chrysene	NA	--	--	--	--
			Dibenz(a,h)anthracene	3.8E-06	1.8E-10	6.3E-06	1.0E-05	Dibenz(a,h)anthracene	NA	--	--	--	--
			Fluoranthene	--	--	--	--	Fluoranthene	(o) Liver / CVS	2.6E-02	3.0E-06	3.4E-03	2.9E-02
			Indeno(1,2,3-cd)pyrene	2.4E-06	1.1E-10	3.9E-06	6.3E-06	Indeno(1,2,3-cd)pyrene	NA	--	--	--	--
			Naphthalene	--	--	--	--	Naphthalene	(o) Whole Body, (i) RsS	1.1E-04	3.0E-07	5.6E-06	1.2E-04
			Pyrene	--	--	--	--	Pyrene	(o) Kidney	3.6E-02	4.0E-06	4.6E-03	4.0E-02
			4,4'-DDD	2.6E-07	3.0E-11	1.5E-08	2.8E-07	4,4'-DDD	NA	--	--	--	--
			Chlordane, alpha-	6.2E-06	7.0E-10	1.2E-06	7.4E-06	Chlordane, alpha-	Liver	4.1E-01	1.2E-04	8.2E-02	4.9E-01
			Chlordane, gamma-	7.4E-06	8.5E-10	1.5E-06	8.9E-06	Chlordane, gamma-	Liver	5.0E-01	1.4E-04	9.9E-02	6.0E-01
			Dieldrin	1.9E-06	2.1E-10	1.5E-07	2.0E-06	Dieldrin	(o) Liver	2.7E-02	3.1E-06	2.2E-03	3.0E-02
			Heptachlor	3.6E-05	4.2E-09	2.0E-06	3.8E-05	Heptachlor	(o) Liver	1.9E-01	2.1E-05	1.0E-02	2.0E-01
			Heptachlor Epoxide	1.5E-05	1.7E-09	8.3E-07	1.6E-05	Heptachlor Epoxide	(o) Liver	1.5E+00	1.7E-04	8.2E-02	**1.6E+00**
			Aroclor-1248	1.1E-06	1.3E-10	6.9E-07	1.8E-06	Aroclor-1248	NA	--	--	--	--
			Aroclor-1254	7.1E-07	8.1E-11	4.4E-07	1.2E-06	Aroclor-1254	(o) Whole Body / ImS	2.1E-01	2.4E-05	1.3E-01	3.4E-01
			Aroclor-1260	4.0E-05	4.5E-09	2.5E-05	6.5E-05	Aroclor-1260	NA	--	--	--	--
			Gasoline Range Organics	--	--	--	--	Gasoline Range Organics	NA	--	--	--	--
			Diesel Range Organics	--	--	--	--	Diesel Range Organics	NA	--	--	--	--
			Antimony	--	--	--	--	Antimony	(o) Whole Body	1.3E-02	--	2.6E-03	1.6E-02
			Arsenic	1.9E-06	2.2E-09	5.6E-07	2.5E-06	Arsenic	(o) Skin / CVS	5.0E-02	--	1.5E-02	6.4E-02
			Iron	--	--	--	--	Iron	(o) Liver / CVS / GIS	3.2E-02	--	8.6E-04	3.3E-02
			Thallium	--	--	--	--	Thallium	(o) CVS	2.0E-02	--	5.3E-04	2.0E-02
			(Total)	2.3E-04	2.0E-08	1.7E-04	**4.0E-04**	(Total)		3.0E+00	4.8E-04	4.3E-01	**3.4E+00**
Groundwater	Groundwater	Tap											
			Benzene	6.9E-07	1.1E-07	3.1E-08	8.3E-07	Benzene	CVS	4.8E-02	2.8E-02	2.2E-03	7.9E-02
			Chloroform	3.6E-07	1.2E-06	3.2E-08	1.6E-06	Chloroform	(o) Liver	6.8E-02	2.1E+00	6.0E-03	**2.2E+00**
			2-Methylnaphthalene	--	--	--	--	2-Methylnaphthalene	NA	--	--	--	--
			Naphthalene	--	--	--	--	Naphthalene	(o) Whole Body, (i) RsS	4.7E-03	--	8.0E-04	5.5E-03
			Heptachlor Epoxide	5.6E-07	--	8.4E-08	6.4E-07	Heptachlor Epoxide	(o) Liver	5.5E-02	--	8.3E-03	6.3E-02
			MCPA	--	--	--	--	MCPA	(o) Kidney / Liver	3.8E+00	--	7.3E-02	**3.8E+00**
			Antimony	--	--	--	--	Antimony	(o) Whole Body	1.2E+00	--	1.2E-01	**1.3E+00**
			Arsenic	1.6E-04	--	8.0E-07	**1.7E-04**	Arsenic	(o) Skin / CVS	4.3E+00	--	2.1E-02	**4.3E+00**
			Iron	--	--	--	--	Iron	(o) Liver / CVS / GIS	9.6E+00	--	1.3E-01	**9.8E+00**
			Manganese	--	--	--	--	Manganese	CNS	8.0E-01	--	4.0E-02	8.4E-01
			Thallium	--	--	--	--	Thallium	(o) CVS	3.7E+00	--	4.9E-02	**3.7E+00**
			(Total)	1.7E-04	1.4E-06	9.4E-07	**1.7E-04**	(Total)		2.4E+01	2.1E+00	4.4E-01	**2.6E+01**

TABLE 9.5A.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Receptor Population: Residents
Receptor Age: Young Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water	Surface Water	Surface Water											
			Acetone	--	--	--	--	Acetone	(o) Liver / Kidney	6.4E-05	--	1.8E-06	6.6E-05
			Toluene	--	--	--	--	Toluene	(o) Liver / Kidney, (i) CNS / RsS	1.5E-05	--	3.5E-05	5.0E-05
			Xylenes, total	--	--	--	--	Xylenes, total	(o) Whole body	2.0E-06	--	8.2E-06	1.0E-05
			(Total)	--	--	--	--	(Total)		8.1E-05	--	4.5E-05	1.3E-04
Sediment	Sediment	Sediment											
			2-Methylnaphthalene	--	--	--	--	2-Methylnaphthalene	NA	--	--	--	--
			Aroclor-1248	4.2E-07	--	2.3E-07	6.5E-07	Aroclor-1248	NA	--	--	--	--
			Aroclor-1260	6.0E-06	--	3.3E-06	9.3E-06	Aroclor-1260	NA	--	--	--	--
			Diesel Range Organics	--	--	--	--	Diesel Range Organics	NA	--	--	--	--
			(Total)	6.4E-06	--	3.5E-06	9.9E-06	(Total)		--	--	--	--

Notes:

Target Organ Abbreviations:
CNS = Central Nervous System
CVS = Cardiovascular System
GIS = Gastrointestinal System
ImS = Immune System
RsS = Respiratory System

(o) Oral exposure
(i) Inhalation exposure

Total Risk Across Surface Soil	4.0E-04
Total Risk Across Groundwater	1.7E-04
Total Risk Across Surface Water	--
Total Risk Across Sediment	9.9E-06
Total Risk Across All Media and All Exposure Routes	5.8E-04

All Exposure Routes:

Total Central Nervous System HI =	0.84
Total Cardiovascular System HI =	0.08
Total Liver HI =	1.09

Inhalation Exposure Routes:

Inhalation Central Nervous System HI =	0.00E+00
Inhalation Respiratory System HI =	2.98E-07

Total Hazard Index Across Surface Soil	3.42
Total Hazard Index Across Groundwater	26.09
Total Hazard Index Across Surface Water	0.00
Total Hazard Index Across Sediment	--
Total Hazard Index Across All Media and All Exposure Routes	29.51

Oral and Dermal Exposure Routes:

Oral / Dermal Whole Body HI =	1.65
Oral / Dermal Immune System HI =	0.34
Oral / Dermal Gastrointestinal System HI =	9.81
Oral / Dermal Cardiovascular System HI =	17.95
Oral / Dermal Skin HI =	4.36
Oral / Dermal Kidney HI =	3.87
Oral / Dermal Liver HI =	15.60

TABLE 9.5B.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY
SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Receptor Population: Residents
Receptor Age: Young Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Surface Soil	2-Methylnaphthalene	--	--	--	--	2-Methylnaphthalene	NA	--	--	--	--
			Benzo(a)anthracene	1.3E-06	6.1E-11	2.1E-06	3.4E-06	Benzo(a)anthracene	NA	--	--	--	--
			Benzo(a)pyrene	6.6E-06	3.2E-10	6.9E-06	1.4E-05	Benzo(a)pyrene	NA	--	--	--	--
			Benzo(b)fluoranthene	7.5E-07	3.6E-11	7.8E-07	1.5E-06	Benzo(b)fluoranthene	NA	--	--	--	--
			Benzo(k)fluoranthene	4.8E-08	2.3E-12	5.0E-08	9.7E-08	Benzo(k)fluoranthene	NA	--	--	--	--
			Carbazole	7.0E-09	7.9E-13	7.2E-09	1.4E-08	Carbazole	NA	--	--	--	--
			Chrysene	1.8E-08	8.6E-13	3.0E-08	4.8E-08	Chrysene	NA	--	--	--	--
			Dibenz(a,h)anthracene	1.9E-06	9.0E-11	3.1E-06	5.0E-06	Dibenz(a,h)anthracene	NA	--	--	--	--
			Indeno(1,2,3-cd)pyrene	4.6E-07	2.2E-11	7.7E-07	1.2E-06	Indeno(1,2,3-cd)pyrene	NA	--	--	--	--
			Dieldrin	3.0E-07	3.5E-11	2.4E-08	3.3E-07	Dieldrin	(o) Liver	4.4E-03	5.1E-07	3.6E-04	4.8E-03
			Aroclor-1260	7.0E-05	8.0E-09	4.4E-05	**1.1E-04**	Aroclor-1260	NA	--	--	--	--
			Arsenic	2.9E-06	3.3E-09	8.5E-07	3.7E-06	Arsenic	(o) Skin / CVS	7.5E-02	--	2.2E-02	9.7E-02
			Iron	--	--	--	--	Iron	(o) Liver / CVS / GIS	3.3E-02	--	8.9E-04	3.4E-02
			(Total)	8.4E-05	1.2E-08	5.8E-05	**1.4E-04**	(Total)		1.1E-01	5.1E-07	2.3E-02	1.4E-01
Groundwater	Groundwater	Tap	Benzene	6.9E-07	1.1E-07	3.1E-08	8.3E-07	Benzene	CVS	4.8E-02	2.8E-02	2.2E-03	7.9E-02
			Chloroform	3.6E-07	1.2E-06	3.2E-08	1.6E-06	Chloroform	(o) Liver	6.8E-02	2.1E+00	6.0E-03	**2.2E+00**
			2-Methylnaphthalene	--	--	--	--	2-Methylnaphthalene	NA	--	--	--	--
			Naphthalene	--	--	--	--	Naphthalene	(o) Whole Body, (i) RsS	4.7E-03	--	8.0E-04	5.5E-03
			Heptachlor Epoxide	5.6E-07	--	8.4E-08	6.4E-07	Heptachlor Epoxide	(o) Liver	5.5E-02	--	8.3E-03	6.3E-02
			MCPA	--	--	--	--	MCPA	(o) Kidney / Liver	3.8E+00	--	7.3E-02	**3.8E+00**
			Antimony	--	--	--	--	Antimony	(o) Whole Body	1.2E+00	--	1.2E-01	**1.3E+00**
			Arsenic	1.6E-04	--	8.0E-07	**1.7E-04**	Arsenic	(o) Skin / CVS	4.3E+00	--	2.1E-02	**4.3E+00**
			Iron	--	--	--	--	Iron	(o) Liver / CVS / GIS	9.6E+00	--	1.3E-01	**9.8E+00**
			Manganese	--	--	--	--	Manganese	CNS	8.0E-01	--	4.0E-02	8.4E-01
			Thallium	--	--	--	--	Thallium	(o) CVS	3.7E+00	--	4.9E-02	**3.7E+00**
			(Total)	1.7E-04	1.4E-06	9.4E-07	**1.7E-04**	(Total)		2.4E+01	2.1E+00	4.4E-01	**2.6E+01**
Surface Water	Surface Water	Surface Water	Acetone	--	--	--	--	Acetone	(o) Liver / Kidney	6.4E-05	--	1.8E-06	6.6E-05
			Toluene	--	--	--	--	Toluene	(o) Liver / Kidney, (i) CNS / RsS	1.5E-05	--	3.5E-05	5.0E-05
			Xylenes, total	--	--	--	--	Xylenes, total	(o) Whole body	2.0E-06	--	8.2E-06	1.0E-05
			(Total)	--	--	--	--	(Total)		8.1E-05	--	4.5E-05	1.3E-04
Sediment	Sediment	Sediment	2-Methylnaphthalene	--	--	--	--	2-Methylnaphthalene	NA	--	--	--	--
			Aroclor-1248	4.2E-07	--	2.3E-07	6.5E-07	Aroclor-1248	NA	--	--	--	--
			Aroclor-1260	6.0E-06	--	3.3E-06	9.3E-06	Aroclor-1260	NA	--	--	--	--
			Diesel Range Organics	--	--	--	--	Diesel Range Organics	NA	--	--	--	--
			(Total)	6.4E-06	--	3.5E-06	9.9E-06	(Total)		--	--	--	--

Notes:

Target Organ Abbreviations:
CNS = Central Nervous System
CVS = Cardiovascular System
GIS = Gastrointestinal System
ImS = Immune System
RsS = Respiratory System

(o) Oral exposure
(i) Inhalation exposure

Total Risk Across Surface Soil	1.4E-04
Total Risk Across Groundwater	1.7E-04
Total Risk Across Surface Water	--
Total Risk Across Sediment	9.9E-06
Total Risk Across All Media and All Exposure Routes	3.2E-04

All Exposure Routes:

Total Central Nervous System HI =	0.84
Total Cardiovascular System HI =	0.08

Inhalation Exposure Routes:

Inhalation Central Nervous System HI =	0.00E+00
Inhalation Respiratory System HI =	0.00E+00

Total Hazard Index Across Surface Soil	0.14
Total Hazard Index Across Groundwater	26.09
Total Hazard Index Across Surface Water	0.00
Total Hazard Index Across Sediment	--
Total Hazard Index Across All Media and All Exposure Routes	26.22

Oral and Dermal Exposure Routes:

Oral / Dermal Whole Body HI =	1.30
Oral / Dermal Gastrointestinal System HI =	9.81
Oral / Dermal Cardiovascular System HI =	17.94
Oral / Dermal Skin HI =	4.39
Oral / Dermal Kidney HI =	3.83
Oral / Dermal Liver HI =	13.78

TABLE 9.6A.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Receptor Population: Construction Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Surface Soil											
			2-Methylnaphthalene	--	--	--	--	2-Methylnaphthalene	NA	--	--	--	--
			Benzo(a)anthracene	3.4E-06	1.5E-11	1.9E-06	5.3E-06	Benzo(a)anthracene	NA	--	--	--	--
			Benzo(a)pyrene	1.5E-05	6.6E-11	5.3E-06	2.0E-05	Benzo(a)pyrene	NA	--	--	--	--
			Benzo(b)fluoranthene	2.0E-06	8.9E-12	7.2E-07	2.7E-06	Benzo(b)fluoranthene	NA	--	--	--	--
			Benzo(k)fluoranthene	9.1E-08	4.1E-13	3.3E-08	1.2E-07	Benzo(k)fluoranthene	NA	--	--	--	--
			Carbazole	4.2E-09	4.4E-14	1.5E-09	5.8E-09	Carbazole	NA	--	--	--	--
			Chrysene	4.7E-08	2.1E-13	2.7E-08	7.4E-08	Chrysene	NA	--	--	--	--
			Dibenz(a,h)anthracene	6.9E-07	3.1E-12	4.0E-07	1.1E-06	Dibenz(a,h)anthracene	NA	--	--	--	--
			Fluoranthene	--	--	--	--	Fluoranthene	(o) Liver / CVS	2.9E-02	3.0E-07	1.3E-03	3.0E-02
			Indeno(1,2,3-cd)pyrene	4.3E-07	1.9E-12	2.5E-07	6.8E-07	Indeno(1,2,3-cd)pyrene	NA	--	--	--	--
			Naphthalene	--	--	--	--	Naphthalene	(o) Whole Body, (i) RsS	1.2E-04	3.0E-08	2.1E-06	1.3E-04
			Pyrene	--	--	--	--	Pyrene	(o) Kidney	3.9E-02	4.1E-07	1.7E-03	4.1E-02
			4,4'-DDD	4.8E-08	5.1E-13	9.5E-10	4.9E-08	4,4'-DDD	NA	--	--	--	--
			Chlordane, alpha-	1.1E-06	1.2E-11	7.7E-08	1.2E-06	Chlordane, alpha-	Liver	4.5E-01	1.2E-05	3.1E-02	4.8E-01
			Chlordane, gamma-	1.4E-06	1.4E-11	9.4E-08	1.5E-06	Chlordane, gamma-	Liver	5.4E-01	1.4E-05	3.7E-02	5.8E-01
			Dieldrin	3.4E-07	3.6E-12	9.4E-09	3.5E-07	Dieldrin	(o) Liver	3.0E-02	3.2E-07	8.3E-04	3.1E-02
			Heptachlor	6.6E-06	7.0E-11	1.3E-07	6.8E-06	Heptachlor	(o) Liver	2.1E-01	2.2E-06	3.9E-03	2.1E-01
			Heptachlor Epoxide	2.7E-06	2.9E-11	5.2E-08	2.8E-06	Heptachlor Epoxide	(o) Liver	1.6E+00	1.7E-05	3.1E-02	**1.7E+00**
			Aroclor-1248	2.0E-07	2.1E-12	4.4E-08	2.5E-07	Aroclor-1248	NA	--	--	--	--
			Aroclor-1254	1.3E-07	1.4E-12	2.8E-08	1.6E-07	Aroclor-1254	(o) Whole Body / ImS	2.3E-01	2.4E-06	4.9E-02	2.8E-01
			Aroclor-1260	7.3E-06	7.7E-11	1.6E-06	8.9E-06	Aroclor-1260	NA	--	--	--	--
			Gasoline Range Organics	--	--	--	--	Gasoline Range Organics	NA	--	--	--	--
			Diesel Range Organics	--	--	--	--	Diesel Range Organics	NA	--	--	--	--
			Antimony	--	--	--	--	Antimony	(o) Whole Body	1.4E-02	--	9.9E-04	1.5E-02
			Arsenic	3.5E-07	3.7E-11	3.5E-08	3.9E-07	Arsenic	(o) Skin / CVS	5.5E-02	--	5.5E-03	6.0E-02
			Iron	--	--	--	--	Iron	(o) Liver / CVS / GIS	3.5E-02	--	3.2E-04	3.6E-02
			Thallium	--	--	--	--	Thallium	(o) CVS	2.2E-02	--	2.0E-04	2.2E-02
			(Total)	4.2E-05	3.4E-10	1.1E-05	5.3E-05	(Total)		3.3E+00	4.9E-05	1.6E-01	**3.4E+00**
Subsurface Soil	Subsurface Soil	Subsurface Soil											
			2-Methylnaphthalene	--	--	--	--	2-Methylnaphthalene	NA	--	--	--	--
			Benzo(a)anthracene	9.7E-09	4.3E-14	5.6E-09	1.5E-08	Benzo(a)anthracene	NA	--	--	--	--
			Benzo(a)pyrene	9.5E-08	4.2E-13	3.4E-08	1.3E-07	Benzo(a)pyrene	NA	--	--	--	--
			Benzo(b)fluoranthene	1.1E-08	4.7E-14	3.8E-09	1.4E-08	Benzo(b)fluoranthene	NA	--	--	--	--
			Benzo(k)fluoranthene	6.7E-10	3.0E-15	2.4E-10	9.1E-10	Benzo(k)fluoranthene	NA	--	--	--	--
			Bis(2-chloroethoxy)methane	--	--	--	--	Bis(2-chloroethoxy)methane	NA	--	--	--	--
			Carbazole	1.1E-10	1.2E-15	4.1E-11	1.5E-10	Carbazole	NA	--	--	--	--
			Chrysene	1.0E-10	4.6E-16	5.9E-11	1.6E-10	Chrysene	NA	--	--	--	--
			Dibenz(a,h)anthracene	3.7E-08	1.7E-13	2.1E-08	5.9E-08	Dibenz(a,h)anthracene	NA	--	--	--	--
			Indeno(1,2,3-cd)pyrene	7.1E-09	3.2E-14	4.1E-09	1.1E-08	Indeno(1,2,3-cd)pyrene	NA	--	--	--	--
			Naphthalene	--	--	--	--	Naphthalene	(o) Whole Body, (i) RsS	5.3E-05	1.3E-08	9.1E-07	5.4E-05
			Chlordane, alpha-	2.9E-08	3.0E-13	2.0E-09	3.0E-08	Chlordane, alpha-	Liver	1.1E-02	3.0E-07	7.8E-04	1.2E-02
			Chlordane, gamma-	3.9E-08	4.1E-13	2.7E-09	4.1E-08	Chlordane, gamma-	Liver	1.5E-02	4.1E-07	1.1E-03	1.7E-02
			Heptachlor	4.7E-08	5.0E-13	8.9E-10	4.8E-08	Heptachlor	(o) Liver	1.5E-03	1.5E-08	2.8E-05	1.5E-03
			Heptachlor Epoxide	9.8E-09	1.0E-13	1.9E-10	1.0E-08	Heptachlor Epoxide	(o) Liver	5.8E-03	6.1E-08	1.1E-04	5.9E-03
			Aroclor-1248	4.3E-08	4.5E-13	9.2E-09	5.2E-08	Aroclor-1248	NA	--	--	--	--
			Aroclor-1254	4.5E-08	4.7E-13	9.6E-09	5.4E-08	Aroclor-1254	(o) Whole Body / ImS	7.8E-02	8.2E-07	1.7E-02	9.5E-02
			Aroclor-1260	7.5E-07	7.9E-12	1.6E-07	9.1E-07	Aroclor-1260	NA	--	--	--	--

TABLE 9.6A.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Receptor Population: Construction Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Subsurface Soil (Cont)	Subsurface Soil (Cont)	Subsurface Soil (Cont)	Gasoline Range Organics	--	--	--	--	Gasoline Range Organics	NA	--	--	--	--
			Diesel Range Organics	--	--	--	--	Diesel Range Organics	NA	--	--	--	--
			Arsenic	1.1E-07	1.2E-11	1.1E-08	1.2E-07	Arsenic	(o) Skin / CVS	1.7E-02	--	1.7E-03	1.9E-02
			Iron	--	--	--	--	Iron	(o) Liver / CVS / GIS	4.3E-02	--	4.0E-04	4.4E-02
			Thallium	--	--	--	--	Thallium	(o) CVS	2.9E-02	--	2.6E-04	2.9E-02
			(Total)	1.2E-06	2.3E-11	2.7E-07	1.5E-06	(Total)		2.0E-01	1.6E-06	2.1E-02	2.2E-01
Groundwater	Groundwater	Groundwater	Benzene	--	--	1.6E-08	1.6E-08	Benzene	CVS	--	--	6.6E-03	6.6E-03
			Chloroform	--	--	1.6E-08	1.6E-08	Chloroform	(o) Liver	--	--	1.8E-02	1.8E-02
			2-Methylnaphthalene	--	--	--	--	2-Methylnaphthalene	NA	--	--	--	--
			Naphthalene	--	--	--	--	Naphthalene	(o) Whole Body, (i) RsS	--	--	2.5E-03	2.5E-03
			Heptachlor Epoxide	--	--	4.3E-08	4.3E-08	Heptachlor Epoxide	(o) Liver	--	--	2.5E-02	2.5E-02
			MCPA	--	--	--	--	MCPA	(o) Kidney / Liver	--	--	2.2E-01	2.2E-01
			Antimony	--	--	--	--	Antimony	(o) Whole Body	--	--	3.6E-01	3.6E-01
			Arsenic	--	--	4.1E-07	4.1E-07	Arsenic	(o) Skin / CVS	--	--	6.3E-02	6.3E-02
			Iron	--	--	--	--	Iron	(o) Liver / CVS / GIS	--	--	3.9E-01	3.9E-01
			Manganese	--	--	--	--	Manganese	CNS	--	--	1.2E-01	1.2E-01
			Thallium	--	--	--	--	Thallium	(o) CVS	--	--	1.5E-01	1.5E-01
			(Total)	--	--	4.8E-07	4.8E-07	(Total)		--	--	1.4E+00	**1.4E+00**
Surface Water	Surface Water	Surface Water	Acetone	--	--	1.2E-08	1.2E-08	Acetone	(o) Liver / Kidney	--	--	8.2E-07	8.2E-07
			Toluene	--	--	4.5E-07	4.5E-07	Toluene	(o) Liver / Kidney, (i) CNS / RsS	--	--	3.1E-05	3.1E-05
			Xylenes, total	--	--	--	1.2E-06	1.2E-06	Xylenes, total	(o) Whole body	--	--	8.6E-05	8.6E-05
			(Total)	--	--	1.7E-06	1.7E-06	(Total)		--	--	1.2E-04	1.2E-04
Sediment	Sediment	Sediment	2-Methylnaphthalene	--	--	--	--	2-Methylnaphthalene	NA	--	--	--	--
			Aroclor-1248	--	--	8.1E-08	8.1E-08	Aroclor-1248	NA	--	--	--	--
			Aroclor-1260	--	--	1.1E-06	1.1E-06	Aroclor-1260	NA	--	--	--	--
			Diesel Range Organics	--	--	--	--	Diesel Range Organics	NA	--	--	--	--
			(Total)	--	--	1.2E-06	1.2E-06	(Total)		--	--	--	--

Notes:

Target Organ Abbreviations:
CNS = Central Nervous System
CVS = Cardiovascular System
GIS = Gastrointestinal System
ImS = Immune System
RsS = Respiratory System

(o) Oral exposure
(i) Inhalation exposure

Total Risk Across Surface Soil	5.3E-05
Total Risk Across Subsurface Soil	1.5E-06
Total Risk Across Groundwater	4.8E-07
Total Risk Across Surface Water	1.7E-06
Total Risk Across Sediment	1.2E-06
Total Risk Across All Media and All Exposure Routes	5.7E-05

Total Hazard Index Across Surface Soil	3.44
Total Hazard Index Across Subsurface Soil	0.22
Total Hazard Index Across Groundwater	1.35
Total Hazard Index Across Surface Water	0.00
Total Hazard Index Across Sediment	--
Total Hazard Index Across All Media and All Exposure Routes	5.02

All Exposure Routes:

Total Central Nervous System HI =	0.12
Total Cardiovascular System HI =	0.01
Total Liver HI =	1.09

Inhalation Exposure Routes:

Inhalation Central Nervous System HI =	0.00E+00
Inhalation Respiratory System HI =	4.31E-08

Oral and Dermal Exposure Routes:

Oral / Dermal Whole Body HI =	0.75
Oral / Dermal Immune System HI =	0.37
Oral / Dermal Gastrointestinal System HI =	0.47
Oral / Dermal Cardiovascular System HI =	0.84
Oral / Dermal Skin HI =	0.14
Oral / Dermal Kidney HI =	0.26
Oral / Dermal Liver HI =	2.67

TABLE 9.6B.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Receptor Population: Construction Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Surface Soil											
			2-Methylnaphthalene	--	--	--	--	2-Methylnaphthalene	NA	--	--	--	--
			Benzo(a)anthracene	2.3E-07	1.0E-12	1.3E-07	3.7E-07	Benzo(a)anthracene	NA	--	--	--	--
			Benzo(a)pyrene	1.2E-06	5.4E-12	4.3E-07	1.6E-06	Benzo(a)pyrene	NA	--	--	--	--
			Benzo(b)fluoranthene	1.4E-07	6.1E-13	4.9E-08	1.9E-07	Benzo(b)fluoranthene	NA	--	--	--	--
			Benzo(k)fluoranthene	8.7E-09	3.9E-14	3.1E-09	1.2E-08	Benzo(k)fluoranthene	NA	--	--	--	--
			Carbazole	1.3E-09	1.3E-14	4.6E-10	1.7E-09	Carbazole	NA	--	--	--	--
			Chrysene	3.3E-09	1.5E-14	1.9E-09	5.2E-09	Chrysene	NA	--	--	--	--
			Dibenz(a,h)anthracene	3.4E-07	1.5E-12	2.0E-07	5.4E-07	Dibenz(a,h)anthracene	NA	--	--	--	--
			Indeno(1,2,3-cd)pyrene	8.4E-08	3.7E-13	4.9E-08	1.3E-07	Indeno(1,2,3-cd)pyrene	NA	--	--	--	--
			Dieldrin	5.6E-08	5.9E-13	1.5E-09	5.7E-08	Dieldrin	(o) Liver	4.9E-03	5.1E-08	1.3E-04	5.0E-03
			Aroclor-1260	1.3E-05	1.3E-10	2.7E-06	1.6E-05	Aroclor-1260	NA	--	--	--	--
			Arsenic	5.3E-07	5.6E-11	5.3E-08	5.8E-07	Arsenic	(o) Skin / CVS	8.2E-02	--	8.3E-03	9.1E-02
			Iron	--	--	--	--	Iron	(o) Liver / CVS / GIS	3.7E-02	--	3.4E-04	3.7E-02
			(Total)	1.5E-05	2.0E-10	3.7E-06	1.9E-05	(Total)		1.2E-01	5.1E-08	8.8E-03	1.3E-01
Subsurface Soil	Subsurface Soil	Subsurface Soil											
			2-Methylnaphthalene	--	--	--	--	2-Methylnaphthalene	NA	--	--	--	--
			Bis(2-chloroethoxy)methane	--	--	--	--	Bis(2-chloroethoxy)methane	NA	--	--	--	--
			Naphthalene	--	--	--	--	Naphthalene	(o) Whole Body, (i) RsS	2.0E-04	5.0E-08	3.5E-06	2.1E-04
			Aroclor-1260	3.6E-06	3.8E-11	7.8E-07	4.4E-06	Aroclor-1260	NA	--	--	--	--
			Gasoline Range Organics	--	--	--	--	Gasoline Range Organics	NA	--	--	--	--
			Diesel Range Organics	--	--	--	--	Diesel Range Organics	NA	--	--	--	--
			Arsenic	1.5E-07	1.6E-11	1.5E-08	1.7E-07	Arsenic	(o) Skin / CVS	2.3E-02	--	2.4E-03	2.6E-02
			Iron	--	--	--	--	Iron	(o) Liver / CVS / GIS	4.7E-02	--	4.3E-04	4.8E-02
			Thallium	--	--	--	--	Thallium	(o) CVS	3.5E-02	--	3.2E-04	3.5E-02
			(Total)	3.8E-06	5.4E-11	7.9E-07	4.6E-06	(Total)		1.1E-01	5.0E-08	3.1E-03	1.1E-01
Groundwater	Groundwater	Groundwater											
			Benzene	--	--	1.6E-08	1.6E-08	Benzene	CVS	--	--	6.6E-03	6.6E-03
			Chloroform	--	--	1.6E-08	1.6E-08	Chloroform	(o) Liver	--	--	1.8E-02	1.8E-02
			2-Methylnaphthalene	--	--	--	--	2-Methylnaphthalene	NA	--	--	--	--
			Naphthalene	--	--	--	--	Naphthalene	(o) Whole Body, (i) RsS	--	--	2.5E-03	2.5E-03
			Heptachlor Epoxide	--	--	4.3E-08	4.3E-08	Heptachlor Epoxide	(o) Liver	--	--	2.5E-02	2.5E-02
			MCPA	--	--	--	--	MCPA	(o) Kidney / Liver	--	--	2.2E-01	2.2E-01
			Antimony	--	--	--	--	Antimony	(o) Whole Body	--	--	3.6E-01	3.6E-01
			Arsenic	--	--	4.1E-07	4.1E-07	Arsenic	(o) Skin / CVS	--	--	6.3E-02	6.3E-02
			Iron	--	--	--	--	Iron	(o) Liver / CVS / GIS	--	--	3.9E-01	3.9E-01
			Manganese	--	--	--	--	Manganese	CNS	--	--	1.2E-01	1.2E-01
			Thallium	--	--	--	--	Thallium	(o) CVS	--	--	1.5E-01	1.5E-01
			(Total)	--	--	4.8E-07	4.8E-07	(Total)		--	--	1.4E+00	1.4E+00
Surface Water	Surface Water	Surface Water											
			Acetone	--	--	1.2E-08	1.2E-08	Acetone	(o) Liver / Kidney	--	--	8.2E-07	8.2E-07
			Toluene	--	--	4.5E-07	4.5E-07	Toluene	(o) Liver / Kidney, (i) CNS / RsS	--	--	3.1E-05	3.1E-05
			Xylenes, total	--	--	1.2E-06	1.2E-06	Xylenes, total	(o) Whole body	--	--	8.6E-05	8.6E-05
			(Total)	--	--	1.7E-06	1.7E-06	(Total)		--	--	1.2E-04	1.2E-04

TABLE 9.6B.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Receptor Population: Construction Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Sediment	Sediment	Sediment	2-Methylnaphthalene	--	--	--	--	2-Methylnaphthalene	NA	--	--	--	--
			Aroclor-1248	--	--	8.1E-08	8.1E-08	Aroclor-1248	NA	--	--	--	--
			Aroclor-1260	--	--	1.1E-06	1.1E-06	Aroclor-1260	NA	--	--	--	--
			Diesel Range Organics	--	--	--	--	Diesel Range Organics	NA	--	--	--	--
			(Total)	--	--	1.2E-06	1.2E-06	(Total)		--	--	--	--

Notes:

Target Organ Abbreviations:
CNS = Central Nervous System
CVS = Cardiovascular System
GIS = Gastrointestinal System
ImS = Immune System
RsS = Respiratory System

(o) Oral exposure
(i) Inhalation exposure

Total Risk Across Surface Soil	1.9E-05
Total Risk Across Subsurface Soil	4.6E-06
Total Risk Across Groundwater	4.8E-07
Total Risk Across Surface Water	1.7E-06
Total Risk Across Sediment	1.2E-06
Total Risk Across All Media and All Exposure Routes	2.7E-05

All Exposure Routes:

Total Central Nervous System HI =	0.12
Total Cardiovascular System HI =	0.01

Inhalation Exposure Routes:

Inhalation Central Nervous System HI =	0.00E+00
Inhalation Respiratory System HI =	4.95E-08

Total Hazard Index Across Surface Soil	0.13
Total Hazard Index Across Subsurface Soil	0.11
Total Hazard Index Across Groundwater	1.35
Total Hazard Index Across Surface Water	0.00
Total Hazard Index Across Sediment	--
Total Hazard Index Across All Media and All Exposure Routes	1.59

Oral and Dermal Exposure Routes:

Oral / Dermal Whole Body HI =	0.36
Oral / Dermal Gastrointestinal System HI =	0.47
Oral / Dermal Cardiovascular System HI =	0.84
Oral / Dermal Skin HI =	0.18
Oral / Dermal Kidney HI =	0.22
Oral / Dermal Liver HI =	0.74

TABLE 9.7A.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Receptor Population: Industrial / Commercial Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Surface Soil											
			2-Methylnaphthalene	--	--	--	--	2-Methylnaphthalene	NA	--	--	--	--
			Benzo(a)anthracene	8.8E-06	3.8E-10	4.9E-05	5.8E-05	Benzo(a)anthracene	NA	--	--	--	--
			Benzo(a)pyrene	3.9E-05	1.7E-09	1.3E-04	**1.7E-04**	Benzo(a)pyrene	NA	--	--	--	--
			Benzo(b)fluoranthene	5.2E-06	2.2E-10	1.8E-05	2.3E-05	Benzo(b)fluoranthene	NA	--	--	--	--
			Benzo(k)fluoranthene	2.4E-07	1.0E-11	8.2E-07	1.1E-06	Benzo(k)fluoranthene	NA	--	--	--	--
			Carbazole	1.1E-08	1.1E-12	3.8E-08	4.9E-08	Carbazole	NA	--	--	--	--
			Chrysene	1.2E-07	5.2E-12	6.8E-07	8.0E-07	Chrysene	NA	--	--	--	--
			Dibenz(a,h)anthracene	1.8E-06	7.7E-11	1.0E-05	1.2E-05	Dibenz(a,h)anthracene	NA	--	--	--	--
			Fluoranthene	--	--	--	--	Fluoranthene	(o) Liver / CVS	3.0E-03	3.0E-07	1.3E-03	4.2E-03
			Indeno(1,2,3-cd)pyrene	1.1E-06	4.8E-11	6.2E-06	7.3E-06	Indeno(1,2,3-cd)pyrene	NA	--	--	--	--
			Naphthalene	--	--	--	--	Naphthalene	(o) Whole Body, (i) RsS	1.3E-05	3.0E-08	2.1E-06	1.5E-05
			Pyrene	--	--	--	--	Pyrene	(o) Kidney	4.1E-03	4.1E-07	1.7E-03	5.8E-03
			4,4'-DDD	1.3E-07	1.3E-11	2.4E-08	1.5E-07	4,4'-DDD	NA	--	--	--	--
			Chlordane, alpha-	2.9E-06	3.0E-10	1.9E-06	4.9E-06	Chlordane, alpha-	Liver	4.7E-02	1.2E-05	3.1E-02	7.8E-02
			Chlordane, gamma-	3.5E-06	3.6E-10	2.3E-06	5.9E-06	Chlordane, gamma-	Liver	5.7E-02	1.4E-05	3.7E-02	9.4E-02
			Dieldrin	8.9E-07	9.1E-11	2.4E-07	1.1E-06	Dieldrin	(o) Liver	3.1E-03	3.2E-07	8.3E-04	4.0E-03
			Heptachlor	1.7E-05	1.8E-09	3.2E-06	2.0E-05	Heptachlor	(o) Liver	2.2E-02	2.2E-06	3.9E-03	2.5E-02
			Heptachlor Epoxide	7.2E-06	7.2E-10	1.3E-06	8.5E-06	Heptachlor Epoxide	(o) Liver	1.7E-01	1.7E-05	3.1E-02	2.0E-01
			Aroclor-1248	5.3E-07	5.3E-11	1.1E-06	1.6E-06	Aroclor-1248	NA	--	--	--	--
			Aroclor-1254	3.4E-07	3.4E-11	7.0E-07	1.0E-06	Aroclor-1254	(o) Whole Body / ImS	2.4E-02	2.4E-06	4.9E-02	7.3E-02
			Aroclor-1260	1.9E-05	1.9E-09	3.9E-05	5.8E-05	Aroclor-1260	NA	--	--	--	--
			Gasoline Range Organics	--	--	--	--	Gasoline Range Organics	NA	--	--	--	--
			Diesel Range Organics	--	--	--	--	Diesel Range Organics	NA	--	--	--	--
			Antimony	--	--	--	--	Antimony	(o) Whole Body	1.5E-03	--	9.9E-04	2.5E-03
			Arsenic	9.2E-07	9.3E-10	8.8E-07	1.8E-06	Arsenic	(o) Skin / CVS	5.7E-03	--	5.5E-03	1.1E-02
			Iron	--	--	--	--	Iron	(o) Liver / CVS / GIS	3.7E-03	--	3.2E-04	4.0E-03
			Thallium	--	--	--	--	Thallium	(o) CVS	2.3E-03	--	2.0E-04	2.5E-03
			(Total)	1.1E-04	8.6E-09	2.7E-04	**3.8E-04**	(Total)		3.4E-01	4.9E-05	1.6E-01	5.1E-01
Groundwater	Groundwater	Groundwater											
			Benzene	1.3E-06	9.4E-08	6.6E-08	1.5E-06	Benzene	CVS	2.2E-02	5.7E-03	1.1E-03	2.9E-02
			Chloroform	6.8E-07	1.1E-06	6.8E-08	1.8E-06	Chloroform	(o) Liver	3.1E-02	4.3E-01	3.1E-03	4.6E-01
			2-Methylnaphthalene	--	--	--	--	2-Methylnaphthalene	NA	--	--	--	--
			Naphthalene	--	--	--	--	Naphthalene	(o) Whole Body, (i) RsS	2.2E-03	--	4.2E-04	2.6E-03
			Heptachlor Epoxide	1.1E-06	--	1.8E-07	1.2E-06	Heptachlor Epoxide	(o) Liver	2.5E-02	--	4.3E-03	2.9E-02
			MCPA	--	--	--	--	MCPA	(o) Kidney / Liver	1.7E+00	--	3.8E-02	**1.8E+00**

TABLE 9.7A.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Receptor Population: Industrial / Commercial Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater (Cont)	Groundwater (Cont)	Groundwater (Cont)	Antimony	--	--	--	--	Antimony	(o) Whole Body	5.4E-01	--	6.1E-02	6.0E-01
			Arsenic	3.1E-04	--	1.7E-06	**3.2E-04**	Arsenic	(o) Skin / CVS	2.0E+00	--	1.1E-02	**2.0E+00**
			Iron	--	--	--	--	Iron	(o) Liver / CVS / GIS	4.4E+00	--	6.6E-02	**4.5E+00**
			Manganese	--	--	--	--	Manganese	CNS	3.7E-01	--	2.1E-02	3.9E-01
			Thallium	--	--	--	--	Thallium	(o) CVS	1.7E+00	--	2.5E-02	**1.7E+00**
			(Total)	3.2E-04	1.1E-06	2.0E-06	**3.2E-04**	(Total)		1.1E+01	4.3E-01	2.3E-01	**1.1E+01**

Notes:

Target Organ Abbreviations:
CNS = Central Nervous System
CVS = Cardiovascular System
GIS = Gastrointestinal System
ImS = Immune System
RsS = Respiratory System

(o) Oral exposure
(i) Inhalation exposure

Total Risk Across Surface Soil	3.8E-04
Total Risk Across Groundwater	3.2E-04
Total Risk Across All Media and All Exposure Routes	7.0E-04

All Exposure Routes:

Total Central Nervous System HI =	0.39
Total Cardiovascular System HI =	0.03
Total Liver HI =	0.17

Inhalation Exposure Routes:

Inhalation Respiratory System HI =	3.02E-08

Total Hazard Index Across Surface Soil	0.51
Total Hazard Index Across Groundwater	11.43
Total Hazard Index Across All Media and All Exposure Routes	11.94

Oral and Dermal Exposure Routes:

Oral / Dermal Whole Body HI =	0.68
Oral / Dermal Immune System HI =	0.07
Oral / Dermal Gastrointestinal System HI =	4.49
Oral / Dermal Cardiovascular System HI =	8.19
Oral / Dermal Skin HI =	1.98
Oral / Dermal Kidney HI =	1.77
Oral / Dermal Liver HI =	6.54

TABLE 9.7B.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Receptor Population: Industrial / Commercial Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Surface Soil											
			2-Methylnaphthalene	--	--	--	--	2-Methylnaphthalene	NA	--	--	--	--
			Benzo(a)anthracene	6.1E-07	2.6E-11	3.4E-06	4.0E-06	Benzo(a)anthracene	NA	--	--	--	--
			Benzo(a)pyrene	3.2E-06	1.3E-10	1.1E-05	1.4E-05	Benzo(a)pyrene	NA	--	--	--	--
			Benzo(b)fluoranthene	3.6E-07	1.5E-11	1.2E-06	1.6E-06	Benzo(b)fluoranthene	NA	--	--	--	--
			Benzo(k)fluoranthene	2.3E-08	9.7E-13	7.8E-08	1.0E-07	Benzo(k)fluoranthene	NA	--	--	--	--
			Carbazole	3.3E-09	3.3E-13	1.1E-08	1.5E-08	Carbazole	NA	--	--	--	--
			Chrysene	8.5E-09	3.7E-13	4.7E-08	5.6E-08	Chrysene	NA	--	--	--	--
			Dibenz(a,h)anthracene	8.9E-07	3.8E-11	4.9E-06	5.8E-06	Dibenz(a,h)anthracene	NA	--	--	--	--
			Indeno(1,2,3-cd)pyrene	2.2E-07	9.4E-12	1.2E-06	1.4E-06	Indeno(1,2,3-cd)pyrene	NA	--	--	--	--
			Dieldrin	1.5E-07	1.5E-11	3.8E-08	1.8E-07	Dieldrin	(o) Liver	5.1E-04	5.1E-08	1.3E-04	6.4E-04
			Aroclor-1260	3.3E-05	3.4E-09	6.9E-05	**1.0E-04**	Aroclor-1260	NA	--	--	--	--
			Arsenic	1.4E-06	1.4E-09	1.3E-06	2.7E-06	Arsenic	(o) Skin / CVS	8.6E-03	--	8.3E-03	1.7E-02
			Iron	--	--	--	--	Iron	(o) Liver / CVS / GIS	3.8E-03	--	3.4E-04	4.2E-03
			(Total)	4.0E-05	5.0E-09	9.2E-05	**1.3E-04**	(Total)		1.3E-02	5.1E-08	8.8E-03	2.2E-02
Groundwater	Groundwater	Groundwater											
			Benzene	1.3E-06	9.4E-08	6.6E-08	1.5E-06	Benzene	CVS	2.2E-02	5.7E-03	1.1E-03	2.9E-02
			Chloroform	6.8E-07	1.1E-06	6.8E-08	1.8E-06	Chloroform	(o) Liver	3.1E-02	4.3E-01	3.1E-03	4.6E-01
			2-Methylnaphthalene	--	--	--	--	2-Methylnaphthalene	NA	--	--	--	--
			Naphthalene	--	--	--	--	Naphthalene	(o) Whole Body, (i) RsS	2.2E-03	--	4.2E-04	2.6E-03
			Heptachlor Epoxide	1.1E-06	--	1.8E-07	1.2E-06	Heptachlor Epoxide	(o) Liver	2.5E-02	--	4.3E-03	2.9E-02
			MCPA	--	--	--	--	MCPA	(o) Kidney / Liver	1.7E+00	--	3.8E-02	**1.8E+00**
			Antimony	--	--	--	--	Antimony	(o) Whole Body	5.4E-01	--	6.1E-02	6.0E-01
			Arsenic	3.1E-04	--	1.7E-06	**3.2E-04**	Arsenic	(o) Skin / CVS	2.0E+00	--	1.1E-02	**2.0E+00**
			Iron	--	--	--	--	Iron	(o) Liver / CVS / GIS	4.4E+00	--	6.6E-02	**4.5E+00**
			Manganese	--	--	--	--	Manganese	CNS	3.7E-01	--	2.1E-02	3.9E-01
			Thallium	--	--	--	--	Thallium	(o) CVS	1.7E+00	--	2.5E-02	**1.7E+00**
			(Total)	3.2E-04	1.1E-06	2.0E-06	**3.2E-04**	(Total)		1.1E+01	4.3E-01	2.3E-01	**1.1E+01**

Notes:

Target Organ Abbreviations:
CNS = Central Nervous System
CVS = Cardiovascular System
GIS = Gastrointestinal System
ImS = Immune System
RsS = Respiratory System

(o) Oral exposure
(i) Inhalation exposure

Total Risk Across Surface Soil	1.3E-04
Total Risk Across Groundwater	3.2E-04
Total Risk Across All Media and All Exposure Routes	4.5E-04

All Exposure Routes:

Total Central Nervous System HI =	0.39
Total Cardiovascular System HI =	0.03

Inhalation Exposure Routes:

Inhalation Respiratory System HI =	0.00E+00

Total Hazard Index Across Surface Soil	0.02
Total Hazard Index Across Groundwater	11.43
Total Hazard Index Across All Media and All Exposure Routes	11.45

Oral and Dermal Exposure Routes:

Oral / Dermal Whole Body HI =	0.60
Oral / Dermal Gastrointestinal System HI =	4.49
Oral / Dermal Cardiovascular System HI =	8.19
Oral / Dermal Skin HI =	1.98
Oral / Dermal Kidney HI =	1.76
Oral / Dermal Liver HI =	6.31

TABLE 10.1A.RME
RISK ASSESSMENT SUMMARY
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Current
Receptor Population: Recreational Users
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Surface Soil											
			Benzo(a)anthracene	3.2E-06	6.9E-11	1.6E-05	1.9E-05						
			Benzo(a)pyrene	1.4E-05	3.1E-10	4.2E-05	5.7E-05						
			Benzo(b)fluoranthene	1.9E-06	4.1E-11	5.7E-06	7.6E-06						
			Dibenz(a,h)anthracene	6.6E-07	1.4E-11	3.2E-06	3.8E-06						
			Indeno(1,2,3-cd)pyrene	4.1E-07	8.8E-12	2.0E-06	2.4E-06						
			Heptachlor	6.4E-06	3.2E-10	1.0E-06	7.4E-06						
			Aroclor-1260	7.0E-06	3.5E-10	1.2E-05	1.9E-05						
			(Total)	3.4E-05	1.1E-09	8.2E-05	**1.2E-04**						

Total Risk Across Surface Soil: 1.2E-04
Total Risk Across All Media and All Exposure Routes: 1.2E-04

Total Hazard Index Across Surface Soil:
Total Hazard Index Across All Media and All Exposure Routes:

TABLE 10.2A.RME
RISK ASSESSMENT SUMMARY
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Receptor Population: Residents
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Surface Soil	Benzo(a)anthracene	2.4E-05	1.5E-09	4.0E-05	6.3E-05						
			Benzo(a)pyrene	1.0E-04	6.7E-09	1.1E-04	**2.1E-04**						
			Benzo(b)fluoranthene	1.4E-05	9.0E-10	1.5E-05	2.9E-05						
			Dibenz(a,h)anthracene	4.8E-06	3.1E-10	8.1E-06	1.3E-05						
								Chlordane, alpha-	Liver	1.3E-01	5.0E-05	2.6E-02	1.6E-01
			Chlordane, gamma-	9.5E-06	1.4E-09	1.9E-06	1.1E-05	Chlordane, gamma-	Liver	1.6E-01	6.0E-05	3.2E-02	1.9E-01
			Heptachlor	4.6E-05	7.1E-09	2.6E-06	4.9E-05						
			Heptachlor Epoxide	1.9E-05	2.9E-09	1.1E-06	2.0E-05	Heptachlor Epoxide	(o) Liver	4.7E-01	7.2E-05	2.6E-02	5.0E-01
								Aroclor-1254	(o) Whole Body / ImS	6.7E-02	1.0E-05	4.1E-02	1.1E-01
			Aroclor-1260	5.1E-05	7.7E-09	3.2E-05	8.3E-05						
			(Total)	2.9E-04	3.4E-08	2.2E-04	**5.1E-04**	(Total)		8.9E-01	2.0E-04	1.3E-01	**1.0E+00**
Groundwater	Groundwater	Tap						Chloroform	(o) Liver	4.4E-02	6.0E-01	4.4E-03	6.4E-01
								MCPA	(o) Kidney / Liver	2.4E+00	--	5.3E-02	**2.5E+00**
								Antimony	(o) Whole Body	7.5E-01	--	8.5E-02	8.4E-01
								Arsenic	(o) Skin / CVS	2.7E+00	--	1.5E-02	**2.8E+00**
								Iron	(o) Liver / CVS / GIS	6.2E+00	--	9.3E-02	**6.3E+00**
								Manganese	CNS	5.1E-01	--	2.9E-02	5.4E-01
								Thallium	(o) CVS	2.4E+00	--	3.5E-02	**2.4E+00**
								(Total)		1.5E+01	6.0E-01	3.1E-01	**1.6E+01**

Notes:

Target Organ Abbreviations:
CNS = Central Nervous System
CVS = Cardiovascular System
GIS = Gastrointestinal System
ImS = Immune System

(o) Oral exposure
(i) Inhalation exposure

Total Risk Across Surface Soil	**5.1E-04**
Total Risk Across All Media and All Exposure Routes	**5.1E-04**

All Exposure Routes:

Total Central Nervous System HI =	**0.54**
Total Liver HI =	**0.35**

Total Hazard Index Across Surface Soil	**1.02**
Total Hazard Index Across Groundwater	**15.92**
Total Hazard Index Across All Media and All Exposure Routes	**16.94**

Oral and Dermal Exposure Routes:

Oral / Dermal Whole Body HI =	0.95
Oral / Dermal Immune System HI =	0.11
Oral / Dermal Gastrointestinal System HI =	6.28
Oral / Dermal Cardiovascular System HI =	11.43
Oral / Dermal Skin HI =	2.75
Oral / Dermal Kidney HI =	2.46
Oral / Dermal Liver HI =	9.35

TABLE 10.2B.RME
RISK ASSESSMENT SUMMARY
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Receptor Population: Residents
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Surface Soil	Benzo(a)pyrene	8.5E-06	5.4E-10	8.8E-06	1.7E-05						
			Aroclor-1260	9.0E-05	1.4E-08	5.6E-05	**1.5E-04**						
			(Total)	9.8E-05	1.4E-08	6.5E-05	**1.6E-04**						
Groundwater	Groundwater	Tap						Chloroform	(o) Liver	4.4E-02	6.0E-01	4.4E-03	6.4E-01
								MCPA	(o) Kidney / Liver	2.4E+00	--	5.3E-02	**2.5E+00**
								Antimony	(o) Whole Body	7.5E-01	--	8.5E-02	8.4E-01
								Arsenic	(o) Skin / CVS	2.7E+00	--	1.5E-02	**2.8E+00**
								Iron	(o) Liver / CVS / GIS	6.2E+00	--	9.3E-02	**6.3E+00**
								Manganese	CNS	5.1E-01	--	2.9E-02	5.4E-01
								Thallium	(o) CVS	2.4E+00	--	3.5E-02	**2.4E+00**
								(Total)		1.5E+01	6.0E-01	3.1E-01	**1.6E+01**

Notes:
Target Organ Abbreviations:
CNS = Central Nervous System
CVS = Cardiovascular System
GIS = Gastrointestinal System
ImS = Immune System

(o) Oral exposure
(i) Inhalation exposure

Total Risk Across Surface Soil: 1.6E-04
Total Risk Across All Media and All Exposure Routes: 1.6E-04

All Exposure Routes:
Total Central Nervous System HI = 0.54

Total Hazard Index Across Groundwater: 15.92
Total Hazard Index Across All Media and All Exposure Routes: 15.92

Oral and Dermal Exposure Routes:
Oral / Dermal Whole Body HI = 0.84
Oral / Dermal Gastrointestinal System HI = 6.28
Oral / Dermal Cardiovascular System HI = 11.43
Oral / Dermal Skin HI = 2.75
Oral / Dermal Kidney HI = 2.46
Oral / Dermal Liver HI = 8.79

TABLE 10.3A.RME
RISK ASSESSMENT SUMMARY
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Receptor Population: Residents
Receptor Age: Young Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Surface Soil											
			Benzo(a)anthracene	5.5E-05	1.3E-09	6.5E-05	**1.2E-04**						
			Benzo(a)pyrene	2.4E-04	5.9E-09	1.8E-04	**4.2E-04**						
			Benzo(b)fluoranthene	3.3E-05	7.9E-10	2.4E-05	5.6E-05						
			Dibenz(a,h)anthracene	1.1E-05	2.7E-10	1.3E-05	2.5E-05						
			Indeno(1,2,3-cd)pyrene	7.0E-06	1.7E-10	8.3E-06	1.5E-05						
								Pyrene	(o) Kidney	1.1E-01	6.1E-06	9.6E-03	1.2E-01
			Chlordane, alpha-	1.8E-05	1.0E-09	2.6E-06	2.1E-05	Chlordane, alpha-	Liver	1.2E+00	1.7E-04	1.7E-01	**1.4E+00**
			Chlordane, gamma-	2.2E-05	1.3E-09	3.1E-06	2.5E-05	Chlordane, gamma-	Liver	1.5E+00	2.1E-04	2.1E-01	**1.7E+00**
			Heptachlor	1.1E-04	6.2E-09	4.2E-06	**1.1E-04**	Heptachlor	(o) Liver	5.6E-01	3.2E-05	2.2E-02	5.8E-01
			Heptachlor Epoxide	4.5E-05	2.5E-09	1.7E-06	4.7E-05	Heptachlor Epoxide	(o) Liver	4.4E+00	2.5E-04	1.7E-01	**4.6E+00**
								Aroclor-1254	(o) Whole Body / ImS	6.2E-01	3.5E-05	2.7E-01	8.9E-01
			Aroclor-1260	1.2E-04	6.8E-09	5.2E-05	**1.7E-04**						
								Arsenic	(o) Skin / CVS	1.5E-01	--	3.0E-02	1.8E-01
			(Total)	6.6E-04	2.6E-08	3.5E-04	**1.0E-03**	(Total)		8.8E+00	7.1E-04	8.9E-01	**9.6E+00**
Groundwater	Groundwater	Tap											
								Benzene	CVS	7.2E-02	2.8E-02	2.7E-03	1.0E-01
								Chloroform	(o) Liver	1.0E-01	2.1E+00	7.5E-03	**2.2E+00**
								MCPA	(o) Kidney / Liver	5.6E+00	--	9.1E-02	**5.7E+00**
								Antimony	(o) Whole Body	1.8E+00	--	1.5E-01	**1.9E+00**
								Arsenic	(o) Skin / CVS	6.4E+00	--	2.6E-02	**6.4E+00**
								Iron	(o) Liver / CVS / GIS	1.4E+01	--	1.6E-01	**1.5E+01**
								Manganese	CNS	1.2E+00	--	4.9E-02	**1.2E+00**
								Thallium	(o) CVS	5.5E+00	--	6.1E-02	**5.6E+00**
								(Total)		3.5E+01	2.1E+00	5.4E-01	**3.8E+01**

Notes:
Target Organ Abbreviations:
CNS = Central Nervous System
CVS = Cardiovascular System
GIS = Gastrointestinal System
ImS = Immune System

(o) Oral exposure
(i) Inhalation exposure

Total Risk Across Surface Soil	1.0E-03
Total Risk Across All Media and All Exposure Routes	1.0E-03

All Exposure Routes:

Total Central Nervous System HI =	1.25
Total Cardiovascular System HI =	0.10
Total Liver HI =	3.09

Total Hazard Index Across Surface Soil	9.65
Total Hazard Index Across Groundwater	37.76
Total Hazard Index Across All Media and All Exposure Routes	47.40

Oral and Dermal Exposure Routes:

Oral / Dermal Whole Body HI =	2.80
Oral / Dermal Immune System HI =	0.89
Oral / Dermal Gastrointestinal System HI =	14.68
Oral / Dermal Cardiovascular System HI =	26.95
Oral / Dermal Skin HI =	6.60
Oral / Dermal Kidney HI =	5.83
Oral / Dermal Liver HI =	25.78

TABLE 10.3B.RME
RISK ASSESSMENT SUMMARY
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Receptor Population: Residents
Receptor Age: Young Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Surface Soil	Benzo(a)pyrene	2.0E-05	4.8E-10	1.4E-05	3.4E-05						
			Dibenz(a,h)anthracene	5.6E-06	1.3E-10	6.5E-06	1.2E-05						
			Aroclor-1260	2.1E-04	1.2E-08	9.1E-05	**3.0E-04**						
			(Total)	2.4E-04	1.3E-08	1.2E-04	**3.6E-04**						
Groundwater	Groundwater	Tap						Benzene	CVS	7.2E-02	2.8E-02	2.7E-03	1.0E-01
								Chloroform	(o) Liver	1.0E-01	2.1E+00	7.5E-03	**2.2E+00**
								MCPA	(o) Kidney / Liver	5.6E+00	--	9.1E-02	**5.7E+00**
								Antimony	(o) Whole Body	1.8E+00	--	1.5E-01	**1.9E+00**
								Arsenic	(o) Skin / CVS	6.4E+00	--	2.6E-02	**6.4E+00**
								Iron	(o) Liver / CVS / GIS	1.4E+01	--	1.6E-01	**1.5E+01**
								Manganese	CNS	1.2E+00	--	4.9E-02	**1.2E+00**
								Thallium	(o) CVS	5.5E+00	--	6.1E-02	**5.6E+00**
								(Total)		3.5E+01	2.1E+00	5.4E-01	**3.8E+01**

Notes:

Target Organ Abbreviations:
CNS = Central Nervous System
CVS = Cardiovascular System
GIS = Gastrointestinal System
ImS = Immune System

(o) Oral exposure
(i) Inhalation exposure

Total Risk Across Surface Soil: **3.6E-04**

Total Risk Across All Media and All Exposure Routes: **3.6E-04**

All Exposure Routes:
Total Central Nervous System HI = 1.25
Total Cardiovascular System HI = 0.10

Total Hazard Index Across Groundwater: **37.76**

Total Hazard Index Across All Media and All Exposure Routes: **37.76**

Oral and Dermal Exposure Routes:
Oral / Dermal Whole Body HI = 1.90
Oral / Dermal Gastrointestinal System HI = 14.58
Oral / Dermal Cardiovascular System HI = 26.58
Oral / Dermal Skin HI = 6.42
Oral / Dermal Kidney HI = 5.72
Oral / Dermal Liver HI = 20.41

TABLE 10.2A.CT
RISK ASSESSMENT SUMMARY
CENTRAL TENDENCY
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Receptor Population: Residents
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Tap						Chloroform	(o) Liver	2.1E-02	4.0E-01	3.3E-03	4.2E-01
								MCPA	(o) Kidney / Liver	1.1E+00	--	3.9E-02	**1.2E+00**
								Antimony	(o) Whole Body	3.5E-01	--	6.3E-02	4.2E-01
								Arsenic	(o) Skin / CVS	1.3E+00	--	1.1E-02	**1.3E+00**
								Iron	(o) Liver / CVS / GIS	2.9E+00	--	6.9E-02	**3.0E+00**
								Manganese	CNS	2.4E-01	--	2.1E-02	2.6E-01
								Thallium	(o) CVS	1.1E+00	--	2.6E-02	**1.1E+00**
								(Total)		7.0E+00	4.0E-01	2.3E-01	**7.7E+00**

Notes:
Target Organ Abbreviations:
CNS = Central Nervous System
CVS = Cardiovascular System
GIS = Gastrointestinal System

(o) Oral exposure
(i) Inhalation exposure

All Exposure Routes:
Total Central Nervous System HI = **0.26**

Total Hazard Index Across Groundwater **7.66**
Total Hazard Index Across All Media and All Exposure Routes **7.66**

Oral and Dermal Exposure Routes:
Oral / Dermal Whole Body HI = 0.42
Oral / Dermal Gastrointestinal System HI = 2.96
Oral / Dermal Cardiovascular System HI = 5.39
Oral / Dermal Skin HI = 1.29
Oral / Dermal Kidney HI = 1.17
Oral / Dermal Liver HI = 4.15

TABLE 10.2B.CT
RISK ASSESSMENT SUMMARY
CENTRAL TENDENCY
SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Receptor Population: Residents
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Tap						Chloroform	(o) Liver	2.1E-02	4.0E-01	3.3E-03	4.2E-01
								MCPA	(o) Kidney / Liver	1.1E+00	--	3.9E-02	**1.2E+00**
								Antimony	(o) Whole Body	3.5E-01	--	6.3E-02	4.2E-01
								Arsenic	(o) Skin / CVS	1.3E+00	--	1.1E-02	**1.3E+00**
								Iron	(o) Liver / CVS / GIS	2.9E+00	--	6.9E-02	**3.0E+00**
								Manganese	CNS	2.4E-01	--	2.1E-02	2.6E-01
								Thallium	(o) CVS	1.1E+00	--	2.6E-02	**1.1E+00**
								(Total)		7.0E+00	4.0E-01	2.3E-01	**7.7E+00**

Notes:

Target Organ Abbreviations:
CNS = Central Nervous System
CVS = Cardiovascular System
GIS = Gastrointestinal System
ImS = Immune System

(o) Oral exposure

Total Risk Across Groundwater
Total Risk Across All Media and All Exposure Routes

All Exposure Routes:
Total Central Nervous System HI = 0.26

Total Hazard Index Across Groundwater 7.66
Total Hazard Index Across All Media and All Exposure Routes 7.66

Oral and Dermal Exposure Routes:
Oral / Dermal Whole Body HI = 0.42
Oral / Dermal Gastrointestinal System HI = 2.96
Oral / Dermal Cardiovascular System HI = 5.39
Oral / Dermal Skin HI = 1.29
Oral / Dermal Kidney HI = 1.17
Oral / Dermal Liver HI = 4.15

TABLE 10.3A.CT
RISK ASSESSMENT SUMMARY
CENTRAL TENDENCY
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Receptor Population: Residents
Receptor Age: Young Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Surface Soil	Benzo(a)anthracene	1.8E-05	8.9E-10	3.1E-05	4.9E-05						
			Benzo(a)pyrene	8.1E-05	3.9E-09	8.5E-05	**1.7E-04**						
			Benzo(b)fluoranthene	1.1E-05	5.3E-10	1.1E-05	2.2E-05						
			Dibenz(a,h)anthracene	3.8E-06	1.8E-10	6.3E-06	1.0E-05						
								Chlordane, alpha-	Liver	4.1E-01	1.2E-04	8.2E-02	4.9E-01
								Chlordane, gamma-	Liver	5.0E-01	1.4E-04	9.9E-02	6.0E-01
			Heptachlor	3.6E-05	4.2E-09	2.0E-06	3.8E-05	Heptachlor	(o) Liver	1.9E-01	2.1E-05	1.0E-02	2.0E-01
			Heptachlor Epoxide	1.5E-05	1.7E-09	8.3E-07	1.6E-05	Heptachlor Epoxide	(o) Liver	1.5E+00	1.7E-04	8.2E-02	**1.6E+00**
								Aroclor-1254	(o) Whole Body / ImS	2.1E-01	2.4E-05	1.3E-01	3.4E-01
			Aroclor-1260	4.0E-05	4.5E-09	2.5E-05	6.5E-05						
			(Total)	2.1E-04	1.6E-08	1.6E-04	**3.7E-04**	(Total)		2.8E+00	4.7E-04	4.0E-01	**3.2E+00**
Groundwater	Groundwater	Tap						Chloroform	(o) Liver	6.8E-02	2.1E+00	6.0E-03	**2.2E+00**
								MCPA	(o) Kidney / Liver	3.8E+00	--	7.3E-02	**3.8E+00**
								Antimony	(o) Whole Body	1.2E+00	--	1.2E-01	**1.3E+00**
								Arsenic	(o) Skin / CVS	4.3E+00	--	2.1E-02	**4.3E+00**
								Iron	(o) Liver / CVS / GIS	9.6E+00	--	1.3E-01	**9.8E+00**
								Manganese	CNS	8.0E-01	--	4.0E-02	8.4E-01
								Thallium	(o) CVS	3.7E+00	--	4.9E-02	**3.7E+00**
								(Total)		2.3E+01	2.1E+00	4.3E-01	**2.6E+01**

Notes:

Target Organ Abbreviations:
CNS = Central Nervous System
CVS = Cardiovascular System
GIS = Gastrointestinal System
ImS = Immune System

(o) Oral exposure

Total Risk Across Surface Soil	**3.7E-04**
Total Risk Across Groundwater	0.0E+00
Total Risk Across All Media and All Exposure Routes	**3.7E-04**

All Exposure Routes:

Total Central Nervous System HI =	**0.84**
Total Liver HI =	**1.09**

Total Hazard Index Across Surface Soil	**3.19**
Total Hazard Index Across Groundwater	**25.94**
Total Hazard Index Across All Media and All Exposure Routes	**29.13**

Oral and Dermal Exposure Routes:

Oral / Dermal Whole Body HI =	**1.63**
Oral / Dermal Immune System HI =	0.34
Oral / Dermal Gastrointestinal System HI =	**9.77**
Oral / Dermal Cardiovascular System HI =	**17.81**
Oral / Dermal Skin HI =	**4.29**
Oral / Dermal Kidney HI =	**3.83**
Oral / Dermal Liver HI =	**15.44**

TABLE 10.3B.CT
RISK ASSESSMENT SUMMARY
CENTRAL TENDENCY
SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Receptor Population: Residents
Receptor Age: Young Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Surface Soil	Benzo(a)pyrene	6.6E-06	3.2E-10	6.9E-06	1.4E-05						
			Aroclor-1260	7.0E-05	8.0E-09	4.4E-05	**1.1E-04**						
			(Total)	7.7E-05	8.3E-09	5.0E-05	**1.3E-04**						
Groundwater	Groundwater	Tap						Chloroform	(o) Liver	6.8E-02	2.1E+00	6.0E-03	**2.2E+00**
								MCPA	(o) Kidney / Liver	3.8E+00	--	7.3E-02	**3.8E+00**
								Antimony	(o) Whole Body	1.2E+00	--	1.2E-01	**1.3E+00**
								Arsenic	(o) Skin / CVS	4.3E+00	--	2.1E-02	**4.3E+00**
								Iron	(o) Liver / CVS / GIS	9.6E+00	--	1.3E-01	**9.8E+00**
								Manganese	CNS	8.0E-01	--	4.0E-02	8.4E-01
								Thallium	(o) CVS	3.7E+00	--	4.9E-02	**3.7E+00**
								(Total)		2.3E+01	2.1E+00	4.3E-01	**2.6E+01**

Notes:

Target Organ Abbreviations:
CNS = Central Nervous System
CVS = Cardiovascular System
GIS = Gastrointestinal System
ImS = Immune System

(o) Oral exposure

Total Risk Across Surface Soil	1.3E-04
Total Risk Across All Media and All Exposure Routes	1.3E-04

All Exposure Routes:
Total Central Nervous System HI = 0.84

Total Hazard Index Across Groundwater	25.94
Total Hazard Index Across All Media and All Exposure Routes	25.94

Oral and Dermal Exposure Routes:

Oral / Dermal Whole Body HI =	1.29
Oral / Dermal Gastrointestinal System HI =	9.77
Oral / Dermal Cardiovascular System HI =	17.81
Oral / Dermal Skin HI =	4.29
Oral / Dermal Kidney HI =	3.83
Oral / Dermal Liver HI =	13.68

TABLE 10.4A.RME
RISK ASSESSMENT SUMMARY
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Receptor Population: Construction Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Surface Soil											
								Chlordane, alpha-	Liver	4.5E-01	1.2E-05	3.1E-02	4.8E-01
								Chlordane, gamma-	Liver	5.4E-01	1.4E-05	3.7E-02	5.8E-01
								Heptachlor	(o) Liver	2.1E-01	2.2E-06	3.9E-03	2.1E-01
								Heptachlor Epoxide	(o) Liver	1.6E+00	1.7E-05	3.1E-02	**1.7E+00**
								Aroclor-1254	(o) Whole Body / ImS	2.3E-01	2.4E-06	4.9E-02	2.8E-01
								(Total)		3.1E+00	4.8E-05	1.6E-01	**3.3E+00**
Groundwater	Groundwater	Groundwater											
								MCPA	(o) Kidney / Liver	--	--	2.2E-01	2.2E-01
								Antimony	(o) Whole Body	--	--	3.6E-01	3.6E-01
								Iron	(o) Liver / CVS / GIS	--	--	3.9E-01	3.9E-01
								Manganese	CNS	--	--	1.2E-01	1.2E-01
								Thallium	(o) CVS	--	--	1.5E-01	1.5E-01
								(Total)		--	--	1.3E+00	**1.3E+00**

Notes:
Target Organ Abbreviations:
CNS = Central Nervous System
CVS = Cardiovascular System
GIS = Gastrointestinal System
ImS = Immune System
RsS = Respiratory System

(o) Oral exposure
(i) Inhalation exposure

Total Risk Across Surface Soil	3.4E-05
Total Risk Across All Media and All Exposure Routes	3.4E-05

All Exposure Routes:

Total Central Nervous System HI =	0.12
Total Liver HI =	1.06

Total Hazard Index Across Surface Soil	**3.27**
Total Hazard Index Across Groundwater	1.30
Total Hazard Index Across All Media and All Exposure Routes	4.57

Oral and Dermal Exposure Routes:

Oral / Dermal Whole Body HI =	0.63
Oral / Dermal Immune System HI =	0.28
Oral / Dermal Gastrointestinal System HI =	0.39
Oral / Dermal Cardiovascular System HI =	0.66
Oral / Dermal Skin HI =	0.12
Oral / Dermal Kidney HI =	0.22
Oral / Dermal Liver HI =	2.48

TABLE 10.4B.RME
RISK ASSESSMENT SUMMARY
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Receptor Population: Construction Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Groundwater						MCPA	(o) Kidney / Liver	--	--	2.2E-01	2.2E-01
								Antimony	(o) Whole Body	--	--	3.6E-01	3.6E-01
								Iron	(o) Liver / CVS / GIS	--	--	3.9E-01	3.9E-01
								Manganese	CNS	--	--	1.2E-01	1.2E-01
								Thallium	(o) CVS	--	--	1.5E-01	1.5E-01
								(Total)		--	--	1.3E+00	1.3E+00

Notes:
Target Organ Abbreviations:
CNS = Central Nervous System
CVS = Cardiovascular System
GIS = Gastrointestinal System
ImS = Immune System

(o) Oral exposure

All Exposure Routes:
Total Central Nervous System HI = 0.12

Total Hazard Index Across Groundwater: 1.30
Total Hazard Index Across All Media and All Exposure Routes: 1.30

Oral and Dermal Exposure Routes:
Oral / Dermal Whole Body HI = 0.36
Oral / Dermal Gastrointestinal System HI = 0.39
Oral / Dermal Cardiovascular System HI = 0.60
Oral / Dermal Skin HI = 0.06
Oral / Dermal Kidney HI = 0.22
Oral / Dermal Liver HI = 0.61

TABLE 10.5A.RME
RISK ASSESSMENT SUMMARY
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - BEFORE NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Receptor Population: Industrial / Commercial Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Surface Soil											
			Benzo(a)anthracene	8.8E-06	3.8E-10	4.9E-05	5.8E-05						
			Benzo(a)pyrene	3.9E-05	1.7E-09	1.3E-04	**1.7E-04**						
			Benzo(b)fluoranthene	5.2E-06	2.2E-10	1.8E-05	2.3E-05						
			Dibenz(a,h)anthracene	1.8E-06	7.7E-11	1.0E-05	1.2E-05						
			Heptachlor	1.7E-05	1.8E-09	3.2E-06	2.0E-05						
			Aroclor-1260	1.9E-05	1.9E-09	3.9E-05	5.8E-05						
			(Total)	9.2E-05	6.1E-09	2.6E-04	**3.5E-04**	(Total)		--	--	--	--
Groundwater	Groundwater	Groundwater											
								Chloroform	(o) Liver	3.1E-02	4.3E-01	3.1E-03	4.6E-01
								MCPA	(o) Kidney / Liver	1.7E+00	--	3.8E-02	**1.8E+00**
								Antimony	(o) Whole Body	5.4E-01	--	6.1E-02	6.0E-01
								Arsenic	(o) Skin / CVS	2.0E+00	--	1.1E-02	**2.0E+00**
								Iron	(o) Liver / CVS / GIS	4.4E+00	--	6.6E-02	**4.5E+00**
								Manganese	CNS	3.7E-01	--	2.1E-02	3.9E-01
								Thallium	(o) CVS	1.7E+00	--	2.5E-02	**1.7E+00**
								(Total)		1.1E+01	4.3E-01	2.2E-01	**1.1E+01**

Notes:

Target Organ Abbreviations:
CNS = Central Nervous System
CVS = Cardiovascular System
GIS = Gastrointestinal System
ImS = Immune System
RsS = Respiratory System

(o) Oral exposure
(i) Inhalation exposure

Total Risk Across Surface Soil	**3.5E-04**
Total Risk Across All Media and All Exposure Routes	**3.5E-04**

Total Hazard Index Across Groundwater	**11.37**
Total Hazard Index Across All Media and All Exposure Routes	**11.37**

All Exposure Routes:

Total Central Nervous System HI =	0.39

Oral and Dermal Exposure Routes:

Oral / Dermal Whole Body HI =	0.60
Oral / Dermal Gastrointestinal System HI =	4.48
Oral / Dermal Cardiovascular System HI =	8.17
Oral / Dermal Skin HI =	1.97
Oral / Dermal Kidney HI =	**1.76**
Oral / Dermal Liver HI =	6.28

TABLE 10.5B.RME
RISK ASSESSMENT SUMMARY
REASONABLE MAXIMUM EXPOSURE
SITE 84 (BUILDING 45 AREA) - AFTER NON-TCRA
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Scenario Timeframe: Future
Receptor Population: Industrial / Commercial Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Surface Soil	Benzo(a)pyrene	3.2E-06	1.3E-10	1.1E-05	1.4E-05						
			Aroclor-1260	3.3E-05	3.4E-09	6.9E-05	**1.0E-04**						
			(Total)	3.7E-05	3.5E-09	7.9E-05	**1.2E-04**						
Groundwater	Groundwater	Groundwater						Chloroform	(o) Liver	3.1E-02	4.3E-01	3.1E-03	4.6E-01
								MCPA	(o) Kidney / Liver	1.7E+00	--	3.8E-02	**1.8E+00**
								Antimony	(o) Whole Body	5.4E-01	--	6.1E-02	6.0E-01
								Arsenic	(o) Skin / CVS	2.0E+00	--	1.1E-02	**2.0E+00**
								Iron	(o) Liver / CVS / GIS	4.4E+00	--	6.6E-02	**4.5E+00**
								Manganese	CNS	3.7E-01	--	2.1E-02	3.9E-01
								Thallium	(o) CVS	1.7E+00	--	2.5E-02	**1.7E+00**
								(Total)		1.1E+01	4.3E-01	2.2E-01	**1.1E+01**

Notes:

Target Organ Abbreviations:
CNS = Central Nervous System
CVS = Cardiovascular System
GIS = Gastrointestinal System
ImS = Immune System

(o) Oral exposure

Total Risk Across Surface Soil: **1.2E-04**

Total Risk Across All Media and All Exposure Routes: **1.2E-04**

All Exposure Routes:
Total Central Nervous System HI = 0.39

Total Hazard Index Across Groundwater: **11.37**

Total Hazard Index Across All Media and All Exposure Routes: **11.37**

Oral and Dermal Exposure Routes:
Oral / Dermal Whole Body HI = 0.60
Oral / Dermal Gastrointestinal System HI = **4.48**
Oral / Dermal Cardiovascular System HI = **8.17**
Oral / Dermal Skin HI = **1.97**
Oral / Dermal Kidney HI = **1.76**
Oral / Dermal Liver HI = **6.28**

APPENDIX K
ENDPOINTS, EXPOSURE ESTIMATE, AND RISK CALCULATION FOR UPPER TROPHIC LEVEL RECEPTORS

APPENDIX K
ENDPOINTS, EXPOSURE ESTIMATE, AND RISK CALCULATION FOR UPPER TROPHIC LEVEL RECEPTORS

The sections that follow present the methodology used to conduct the conservative and more realistic exposure estimate for upper trophic level receptors. Assessment and measurement endpoints, as well as the specific receptors selected to represent the endpoints are also presented and discussed.

K.1 Endpoints and Hypotheses

Two types of endpoints, assessment endpoints and measurement endpoints, are defined as part of the ERA process as are risk hypotheses or risk questions (USEPA 1997). An assessment endpoint is an explicit expression of the environmental component or value that is to be protected. A measurement endpoint is a measurable ecological characteristic that is related to the component or value chosen as the assessment endpoint. The considerations for selecting assessment and measurement endpoints are summarized in USEPA (1997) and discussed in detail in Suter II (1989, 1990, and 1993). Risk hypotheses are testable hypotheses about the relationship among the assessment endpoints and their predicted responses when exposed to contaminants.

Endpoints in the risk assessment process define ecological attributes that are to be protected (assessment endpoints) and a measurable characteristic of those attributes (measurement endpoints) that can be used to gauge the degree of impact that has or may occur. Assessment endpoints most often relate to attributes of biological populations or communities, and are intended to focus the risk assessment on particular components of the ecosystem that could be adversely affected by chemicals attributable to the site (USEPA 1997). Assessment endpoints contain an entity (e.g., great blue heron population) and an attribute of that entity (e.g., survival rate). Individual assessment endpoints usually encompass a group of species or populations (the receptor) with some common characteristic, such as specific exposure route or chemical sensitivity, with the receptor then used to represent the assessment endpoint in the risk evaluation.

Assessment and measurement endpoints may involve ecological components from any level of biological organization, from individual organisms to the ecosystem itself (USEPA 1992). Effects on individuals are important for some receptors, such as rare and endangered species.

Population- and community-level effects are typically more relevant to ecosystems. Population- and community-level effects are usually difficult to evaluate directly without long-term and extensive study. However, measurement endpoint evaluations at the individual level, such as an evaluation of the effects of chemical exposure on reproduction, can be used to predict effects on an assessment endpoint at the population or community level.

Assessment endpoints, risk hypotheses, and measurement endpoints selected for the evaluation of upper trophic level receptors are summarized in Table K-1. It is noted that these endpoints are selected as part of Step 3a to evaluate potential upper trophic level risks contributed by site contaminants. These endpoints are distinct from those that would be selected in Steps 3b and 4. As evidenced by Table K-1, the assessment endpoints selected were based on survival, growth, and reproduction. These population traits of interest for each of the assessment endpoints represent components of a healthy population. Failure or impairment of survival, growth, or reproduction will adversely affect the ability of the population to be healthy and viable and fill its appropriate role in an ecosystem.

K.2 Selection of Upper Trophic Level Ecological Receptors

Because of the complexity of natural systems, it is generally not possible to directly assess the potential impacts to all upper trophic level ecological receptors present within an area. Therefore, specific receptor species (e.g., great blue heron) are often selected as surrogates to evaluate potential risks to larger components of the ecological community (e.g., piscivorous birds) that were selected to represent the assessment endpoints (e.g., survival, growth, and reproduction of piscivorous birds). Selection criteria typically include those species that:

- Are known to occur, or are likely to occur, at the site;
- Have a particular ecological, economic, or aesthetic value;
- Are representative of taxonomic groups, life history traits, and/or trophic levels in the habitats present at the site for which complete exposure pathways are likely to exist;
- Can, because of toxicological sensitivity or potential exposure magnitude, be expected to represent potentially sensitive populations at the site; and

- Have sufficient ecotoxicological information available on which to base an evaluation.

The upper trophic level receptor species listed below have been chosen for dietary exposure modeling based on the criteria listed above, the general guidelines presented in USEPA (1991), and the assessment endpoints presented in Table K-1.

Terrestrial species:

- American robin (*Turdus migratorius*) (avian omnivore)
- Easter screech owl (*Otus asio*) (avian carnivore)
- Red-tailed hawk (*Buteo jamaicensis*) (avian carnivore)
- Meadow vole (*Microtus pennsylvanicus*) (mammalian herbivore)
- Short-tailed shrew (*Blarina carolinensis carolinensis*) (mammalian insectivore)
- White-footed mouse (*Peromyscus maniculatus nubiterrae*) (mammalian omnivore)
- Red fox (*Vulpes vulpes*) (mammalian carnivore)

***Aquatic species*:**

- Great blue heron (*Ardea herodias*) (avian piscivore)
- Marsh wren (*Cistothorus palustris*) (avian insectivore)
- Raccoon (*Procyon lotor*) (semi-aquatic mammalian omnivore)
- Mink (*Mustela vison*) (semi-aquatic mammalian carnivore [piscivore])

With the exception of the red-tailed hawk, the upper trophic level receptors listed above were identified in the RI Work Plan. The red-tailed hawk was added to the list of upper trophic level receptors because this avian carnivore was observed during a site visit conducted in July 2001.

K.3 Conservative Evaluation

Upper trophic level receptor exposures to chemicals in surface soil, surface water, and/or sediment were determined by estimating the concentration of each chemical in each relevant dietary component using uptake and food web models. Ingestion of surface soil, surface water, and/or sediment was included when calculating the total exposure.

Not all surface soil, surface water, and sediment ECOCs were evaluated for food web exposures. The specific chemicals evaluated were limited to those ECOCs identified as important bioaccumulative chemicals by the USEPA (2000). Bioaccumulative chemicals are identified in Section 7, Tables 7-9 through 7-14.

Dietary items for which tissue concentrations were modeled included terrestrial plants, soil invertebrates (earthworms are the standard surrogate), small mammals (meadow vole, short-tailed shrew, and white-footed mouse), aquatic plants, aquatic invertebrates, and fish. The methodologies used for estimation of tissue concentrations are outlined in the following section. The uptake of chemicals from the abiotic media into these food items is based (where available) on conservative (e.g., maximum or 90th percentile) Bioconcentration Factors (BCFs) or Bioaccumulation Factors (BAFs) from the literature. A default BCF/BAF value of 1.0 was used for those bioaccumulative ECOCs lacking literature-based values.

K.3.1 Exposure Point Concentrations

Exposure point concentrations for upper trophic level terrestrial and aquatic dietary items were estimated using BAF/BCF models and maximum measured media concentrations. The methodology and models used to derive these estimates are described below. A BCF indicates the degree to which a chemical may accumulate in organisms coincident with the concentration of the chemical in the surrounding media. They are calculated by dividing the concentration of a chemical in the tissue of organisms by the concentration in the surrounding media. In the absence

of tissue data for aquatic life, BCF values for organic chemicals can be estimated from their log K_{ow} value. BCF values do not account for the uptake of chemicals from dietary exposures. BAF values consider both direct exposures to the surrounding media, as well as uptake from dietary exposures.

Terrestrial Plants. Tissue concentrations in the aboveground vegetative portion of terrestrial plants were estimated by multiplying the maximum measured surface soil concentration for each Bioaccumulative ECOPC by chemical-specific conservative (e.g., maximum or 90th percentile) soil-to-plant BCFs obtained from the literature. The BCF values used were based on root uptake from soil and on the ratio between dry-weight soil and dry-weight plant tissue. Literature values based on the ratio between dry-weight soil and wet-weight plant tissue were converted to a dry-weight basis by dividing the wet-weight BCF by the estimated solids content for terrestrial plants (15 percent [0.15]; Sample et al. 1997).

The BCFs for terrestrial plants were those reported in Baes et al. (1984) or Bechtel Jacobs (1998a). For organic chemicals without literature based BCFs, soil-to-plant BCFs were estimated using the algorithm provided in Travis and Arms (1988):

$$log\ B_v = 1.588 - (0.578)\ (log\ K_{ow}) \qquad \text{(Equation K-1)}$$

where:

B_v = Soil-to-plant BCF (unitless; dry weight basis)

K_{ow} = Octanol-water partitioning coefficient (unitless)

The log K_{ow} values used in the calculations were obtained primarily from USEPA (1995) and are listed in Table K-2. The soil-to-plant BCFs used in the conservative evaluation are summarized in Table K-3.

Earthworms. Tissue concentrations in soil invertebrates (earthworms) were estimated by multiplying the maximum measured surface soil concentration for each bioaccumulative ECOC by chemical-specific conservative (e.g., maximum or 90th percentile) BCFs or BAFs obtained from the literature. BCFs are calculated by dividing the concentration of a chemical in the tissues of an organism by the concentration of that same chemical in the surrounding environmental medium (in this case, soil) without accounting for uptake via the diet. BAFs consider both direct

exposure to soil and exposure via the diet. Since earthworms consume soil, BAFs are more appropriate values and were used in the food web models when available. BAFs based on depurated analyses (soil was purged from the gut of the earthworm prior to analysis) were given preference over undepurated analyses when selecting BAF values since direct ingestion of soil is accounted for separately in the food web model. The specific BAFs used were those reported by the references cited on Table K-3.

The BCF/BAF values are based on the ratio between dry-weight soil and dry-weight earthworm tissue. Literature values based on the ratio between dry-weight soil and wet-weight earthworm tissue were converted to a dry-weight basis by dividing the wet-weight BCF/BAF by the estimated solids content for earthworms (16 percent [0.16]; USEPA 1993). For bioaccumulative ECOCs without available measured BAFs or BCFs, an earthworm BAF of 1.0 was assumed. The soil-to-invertebrate BCFs/BAFs used in the conservative evaluation are summarized on Table K-3.

Small Mammals. Whole-body tissue concentrations in small mammals (omnivores) were estimated using one of two methodologies. For chemicals with literature-based soil-to-small mammal BAFs, the small mammal tissue concentration was obtained by multiplying the maximum measured surface soil concentration for each chemical by a chemical-specific conservative (e.g., maximum or 90th percentile) soil-to-small mammal BAF. The BAF values used were based on the ratio between dry-weight soil and whole-body dry-weight tissue. Literature values based on the ratio between dry-weight soil and wet-weight tissue were converted to a dry-weight basis by dividing the wet-weight BAF by the estimated solids content for small mammals (32 percent [0.32]; USEPA 1993). BAFs for shrews were those reported in Sample et al. (1998b) for insectivores (or for general small mammals if insectivore values were unavailable), for voles were those reported for herbivores, and for mice were those reported for omnivores. The soil-to-small mammal BAFs used in the conservative evaluation are summarized in Table K-4.

For those chemicals without soil-to-small mammal BAF values, an alternate approach is used to estimate whole-body tissue concentrations. Because most chemical exposure for these small mammal species is via the diet, it is assumed that the concentration of each chemical in the small mammal's tissues is equal to the chemical concentration in its diet, that is, a diet to whole-body

BAF (wet-weight basis) of one is assumed. Resulting tissue concentrations (wet-weight) are then converted to dry weight using an estimated solids content of 32 percent (see above).

The use of a diet to whole-body BAF of one is likely to result in a conservative estimate of chemical concentrations for chemicals that are not known to biomagnify in terrestrial food chains (e.g., aluminum). For chemicals that are known to biomagnify (e.g., PCBs), a diet to whole-body BAF value of one will likely result in a realistic estimate of tissue concentrations based on reported literature values. For example, a maximum BAF (wet weight) value of 1.0 was reported by Simmons and McKee (1992) for PCBs based on laboratory studies with white-footed mice. Menzie et al. (1992) reported BAF values (wet-weight) for dichlorodiphenyltrichloroethane (DDT) of 0.3 for voles and 0.2 for short-tailed shrews. Reported BAF (wet-weight) values for dioxin are only slightly above one (1.4) for the deer mouse (USEPA 1990).

Aquatic Plants. Tissue concentrations in the vegetative portion of aquatic plants were estimated using the same methodologies as described above for terrestrial plants except that maximum sediment (not soil) concentrations were used in the calculation.

Aquatic Invertebrates. Tissue concentrations in aquatic invertebrates were estimated by multiplying the maximum sediment concentration for each bioaccumulative ECOC by chemical-specific conservative (e.g., maximum or 90th percentile) sediment-to-invertebrate BAFs obtained from the literature. The BAF values were based on the ratio between dry-weight sediment and dry-weight invertebrate tissue. BAFs based on depurated analyses (sediment was purged from the gut of the organism prior to analysis) were given preference over undepurated analyses when selecting BAF values since direct ingestion of sediment was accounted for separately in the food web model.

Literature values based on the ratio between dry-weight sediment and wet-weight invertebrate tissue were converted to a dry-weight basis by dividing the wet-weight BAF by the estimated solids content for aquatic invertebrates (21 percent [0.21]; USEPA 1993). For chemicals without literature based sediment-to-invertebrate BAFs, a BAF of 1.0 is assumed. The sediment-to-invertebrate BAFs used in the conservative evaluation are summarized in Table K-5.

Fish. Tissue concentrations in whole-body fish were estimated by multiplying the maximum measured sediment concentration for each bioaccumulative ECOC by chemical-specific

conservative (e.g., maximum or 90th percentile) sediment-to-fish BAFs obtained from the literature. The BAF values used were based on the ratio between dry-weight sediment and dry-weight fish tissue. Literature values based on the ratio between dry-weight sediment and wet-weight fish tissue were converted to a dry-weight basis by dividing the wet-weight BAF by the estimated solids content for aquatic invertebrates (25 percent [0.25]; USEPA 1993). For chemicals without literature based sediment-to-fish BAFs, a BAF of 1.0 was assumed. The sediment-to-fish BAFs used in the conservative evaluation are summarized in Table K-5.

K.3.2 Dietary Intakes

Dietary intakes for each upper trophic level receptor species was calculated using the following formula (Equation K-2) modified from USEPA (1993).

$$DI_x = \frac{[[\sum_i [(FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)] + [(WIR)(WC_x)]][AUF]}{BW}$$

where:

DI_x	=	Dietary intake for chemical x (mg chemical/kg body weight/day)
FIR	=	Food ingestion rate (kg/day, dry-weight)
FC_{xi}	=	Maximum concentration of chemical x in food item i (mg/kg, dry weight)
PDF_i	=	Proportion of diet composed of food item i (mg/kg, dry weight basis)
SC_x	=	Maximum concentration of chemical x in soil/sediment (mg/kg, dry weight)
PDS	=	Proportion of diet composed of soil/sediment (dry weight basis)
WIR	=	Water ingestion rate (L/day)
WC_x	=	Maximum concentration of chemical x in surface water (mg/L)
BW	=	Body weight (kg, wet weight)
AUF	=	Area Use Factor (unitless)

Conservative life history information and receptor-specific exposure parameters (maximum food ingestion rates, maximum water ingestion rates, and minimum body weights) and dietary compositions are provided in Table K-6. It is noted that many of the values in this table were provided by the EPA's Wildlife Exposure Factor Handbook (USEPA 1993). In some cases (e.g., eastern screech owl) receptors were not listed specifically in the handbook; however, allometric

equations for food and water ingestion provided in the handbook (e.g., for birds) were used to estimate exposure parameters presented on the table.

Often, food and water ingestion rates are reported in the literature in units of gram of water per gram of organism per day or kilogram of food per kilogram of organism per day. Water ingestion rates are converted to units of liters of water per day by dividing the reported value by 1000 (1 liter of water equals 1000 grams of water) and multiplying by a maximum estimate of body weight for that species (Equation K-3):

WIR (g H_2O/g animal/day) * (1 L H_2O/1000 g H_2O) * BW (g animal [maximum]) = WIR (L/day)

Likewise, food ingestion rates are converted to units of kilograms of food per day by multiplying the reported value by a maximum estimate of body weight for the species in question (Equation K-4):

FIR (kg food/ kg animal/ day) * BW (kg animal [maximum]) = FIR (kg food/day)

It is noted that maximum body weights are used in these unit conversion so as to provide the most conservative estimates (i.e., maximum values) of food and water ingestion for a given species. Conversely, minimum body weights are used in the conservative dose estimate in the denominator of equation K-2.

To estimate maximum food and water ingestion rates, For each upper trophic level receptor, an AUF of 1.0 was assumed (i.e., each receptor is assumed to spend 100 percent of its time within the site). As such, receptor-specific home ranges were not considered in the estimation of dietary intakes.

K.3.3 Ingestion-Based Screening Values

Ingestion-based screening values for dietary exposures were derived for each receptor species and bioaccumulative ECOC. Toxicological information from the literature for wildlife species most closely related to the receptor species was used, where available, but was also supplemented by laboratory studies of non-wildlife species (e.g., laboratory mice) when necessary. The ingestion-

based screening values are expressed as milligrams of the chemical per kilogram body weight of the receptor per day (mg/kg-BW/day).

Growth and reproduction are emphasized as assessment endpoints since they are the most relevant, ecologically, to maintaining viable populations and because they are generally the most studied chronic toxicological endpoints for ecological receptors. If several chronic toxicity studies were available from the literature, the most appropriate study is selected for each receptor species based on study design, study methodology, study duration, study endpoint, and test species. No Observed Adverse Effect Levels (NOAELs) based on growth and reproduction were utilized, where available, as the screening values. When chronic NOAEL values were unavailable, estimates were derived or extrapolated from chronic Lowest Observed Adverse Effect Levels (LOAELs) or acute values as follows:

- When values for chronic toxicity were not available, the median lethal dose (LD_{50}) was used. An uncertainty factor of 100 was used to convert the acute LD_{50} to a chronic NOAEL (i.e., the LD_{50} was multiplied by 0.01 to obtain the chronic NOAEL).

- An uncertainty factor of 10 was used to convert a reported LOAEL to a NOAEL (USEPA 1997).

Ingestion screening values for birds and mammals are summarized in Tables K-7 and K-8, respectively. It is noted that the ingestion-based screening values summarized in Tables K-7 and K-8 are based on toxicological studies with avian or mammalian species other than those selected as receptor species for this investigation. For the conservative evaluation, NOAEL and LOAEL values were not adjusted to reflect differences in body weights between test species and receptor species.

K.3.4 Risk Calculation

For a given bioaccumulative chemical, an HQ value was calculated by dividing the maximum exposure dose by the corresponding ingestion-based screening value. HQs greater than or equal to 1.0 indicate the potential for risk since the dose (exposure) exceeds the screening value (effect). It is noted that exposure doses are derived using intentionally conservative assumptions

(maximum media concentrations, maximum ingestion rates, and minimum body weights) such that HQs greater than or equal to 1.0 do not necessarily indicate that risks are present or impacts are occurring. Rather, they identify chemical-pathway-receptor combinations requiring further evaluation. Following the same reasoning, HQs less than one indicate that risks are very unlikely, enabling a conclusion of no unacceptable risk to be reached with high confidence.

K.4 More Realistic Evaluation

The preceding sections presented a conservative approach that was used to conduct the exposure estimate and risk calculation for upper trophic level receptors. A less conservative, more realistic evaluation, designed to be more representative of actual risks that may exist at the site, was also conducted using refined exposure assumptions. The specific assumptions and methods that were modified for use in the more realistic evaluation are identified below, along with justification for each modification.

- Maximum chemical concentrations were replaced by average (arithmetic mean) chemical concentrations. Arithmetic means were calculated assuming concentrations of one-half the detection limit for non-detected chemicals. If the mean concentration was greater than the maximum detected concentration for a given detected chemical, the maximum detected concentration was used. For individual upper trophic level receptor species, average chemical concentrations provide a better estimate of the likely level of chemical exposure because each receptor would be expected to forage in several different areas of the site, and, in many cases, off-site.

- Literature-based BCFs and BAFs based on, or modeled from, central tendency estimates (e.g., mean, median, midpoint) were used in place of maximum or high-end (e.g., maximum or 90th percentile) estimates for many chemicals. The statistical distribution of the data set from which the literature value was estimated was considered when selecting appropriate BCFs and BAFs. For example, if the data were normally distributed an arithmetic mean may be selected for use in the more realistic evaluation, whereas if the data were lognormally distributed a geometric mean may be selected. An assumed BCF/BAF of 1.0 was still used for those chemicals lacking a literature-based BAF/BCF. A summary of the surface soil-to-terrestrial plant BCFs and surface soil-to-terrestrial invertebrate BAFs, surface soil-

to-small mammal BAFs, and sediment-to-invertebrate and sediment-to-fish BAFs used in the more realistic evaluation are summarized in Tables K-9, K-10, and K-11, respectively.

- Central tendency estimates (e.g., mean, median, midpoint) for body weight, surface water ingestion rate, and food ingestion rate (see Table K-12) were used to develop exposure estimates for upper trophic level receptors rather than the minimum body weights and maximum ingestion rates used in the conservative evaluation. Conversion of food ingestion rates and water ingestion rates, as described in the conservative evaluation, were calculated using central tendency (e.g., mean) estimates of receptor body weights. The use of central tendency exposure parameter estimates is more realistic because they represent the characteristics of a greater proportion of the individuals in the population. The evaluation of food web exposures still assumed an AUF of 1.0.

- Although body-weight scaling factors are typically used for interspecies extrapolation among mammals to account for differences between receptor and test organism body weights (Travis and White 1988 and Travis et al. 1990), the ingestion-based screening values summarized in Table K-8 were not adjusted in the conservative evaluation. Differences in body weights between the mammalian test species and mammalian receptor species was accounted for in the more realistic evaluation by converting the test species NOAEL and LOAEL to receptor-based values. Using the NOAEL as an example, this was accomplished by the following scaling equation (Sample et al. 1996):

$$NOAEL_w = NOAEL_t\ (BW_t / BW_w)1/4 \quad \text{(Equation K-5)}$$

where:

$NOAEL_w$	=	NOAEL of wildlife species (mg/kg/day)
$NOAEL_t$	=	NOAEL of test species (mg/kg/day)
BW_w	=	Body weight of wildlife species (kg)
BW_t	=	Body weight of test species (kg)

Sample et al. (1996) consider a scaling factor of 1.0 most appropriate for interspecies extrapolation between birds. Therefore, the literature-derived

NOAEL and LOAEL values summarized in Table K-7 were not adjusted to reflect differences in body weight between avian test species and receptor species.

K.5 UNCERTAINTIES

The procedures used in this evaluation to assess risks to upper trophic level ecological receptors, as in all such assessments, are subject to uncertainties because of the limitations of the available data and the need to make certain assumptions and extrapolations based on incomplete information. The major sources uncertainties associated with food web modeling are presented and discussed below.

Field sampling. The analytical data used in the ERA were derived from abiotic media that were collected in manner such that likely areas of contamination were preferentially sampled. This directed sampling effort would tend to provide a relatively accurate estimation of maximum exposure point concentrations, but an overestimation of exposure point concentrations at the population level. This uncertainty was reduced through the use of mean media concentrations in the refined risk evaluation. Conversely, the field sampling program may not have adequately characterized the extent and nature of contamination at a given site. This scenario would result in an underestimation of potential risks.

Exposure Point Concentrations. The maximum measured contaminant concentration provides a conservative estimate for immobile biota or those with a limited home range. The most realistic exposure estimates for mobile species with relatively large home ranges and for species populations (even those that are immobile or have limited home ranges) are those based on the mean chemical concentrations in each medium to which these receptors are exposed. This is reflected in the wildlife dietary exposure models contained in the Wildlife Exposure Factors Handbook (USEPA 1993), which specify the use of average media concentrations. Given the mobility of the upper trophic level receptor species used in the ERA, the use of maximum chemical concentrations (rather than mean concentrations) to estimate the exposure via food webs is very conservative. The use of mean media concentrations in the refined risk evaluation eliminated this uncertainty associated with use of maximum concentrations.

Ingestion-Based Screening Values. Data on the toxicity of many chemicals to the receptor species were sparse or lacking, requiring the extrapolation of data from other wildlife species or from laboratory studies with non-wildlife species. This is a typical limitation for ecological risk assessments because so few wildlife species have been tested directly for most chemicals. The uncertainties associated with toxicity extrapolation were minimized through the selection of the most appropriate test species for which suitable toxicity data were available. The factors considered in selecting a test species to represent a receptor species included taxonomic relatedness, trophic level, foraging method, and similarity of diet.

A second uncertainty related to the derivation of ingestion screening values applies to metals. Most of the toxicological studies on which the ingestion screening values for metals were based used forms of the metal (such as salts) that have high water solubility and high bioavailability to receptors. Since the analytical samples on which site-specific exposure estimates were based measured total metal, regardless of form, and these highly bioavailable forms are expected to compose only a fraction of the total metal concentration, this is likely to result in an overestimation of potential risks for these chemicals.

A third source of uncertainty associated with the derivation of ingestion screening values concerns the use of uncertainty factors. For example, LOAELs were extrapolated to NOAELs using an uncertainty factor of ten. This approach is likely to be conservative since Dourson and Stara (1983) determined that 96 percent of the chemicals included in a data review had LOAEL/ NOAEL ratios of five or less. The use of an uncertainty factor of 10, although potentially conservative, also serves to counter some of the uncertainty associated with interspecies extrapolations, for which a specific uncertainty factor was not used.

A fourth uncertainty associated with ingestion-based screening values applied to chromium. The mammalian ingestion-based screening value used for chromium was derived from a study that used hexavalent chromium as the test material. This is likely to result in an overestimation of risks because hexavalent chromium is more toxic that trivalent chromium, and analyses at the site measured total chromium (a mixture of hexavalent and trivalent forms). For birds, the only ingestion-based screening value available from the literature was based on a study that used trivalent chromium as the test material. The use of this screening value for birds may result in an underestimation of potential risks if hexavalent chromium is present at the site.

Use of NOAEL-Based Screening Values. The use of NOAEL-based screening values in risk calculations for upper trophic level receptors is extremely conservative since they give no indication as to how much higher a concentration must be before adverse effects are observed. For this reason, HQs calculated based on LOAELs are also provided in the risk summary tables.

Chemical Interactions. The conclusions of the risk evaluation to upper trophic level receptors are based on independent effects of chemicals. The potential does exist for multiple chemicals in environmental media to interact. Much uncertainty is involved with the interpretation of chemical interactions due to the complexity of potential effects and due to varying toxicities of compounds in different species. For these reasons, cumulative effects are not addressed in this ERA. This could result in an underestimation of risk if there are additive or synergistic effects among chemicals or an overestimation of risks if there are antagonistic effects among chemicals.

Food Web Exposure Modeling. In the screening-level ERA, chemical concentrations in terrestrial and aquatic food items (plants, earthworms, small mammals, aquatic invertebrates, fish, and frogs) were modeled from maximum measured media concentrations and were not directly measured. The use of generic, literature-derived exposure models and bioaccumulation factors introduces some uncertainty into the resulting estimates. The values selected and the methodology employed were intended to provide a conservative estimate of potential food web exposure concentrations. This uncertainty was reduced in the refined risk evaluation, where mean media concentrations and mean or median BAFs/BCFs were used to estimated chemical concentrations in upper trophic level food items.

A second source of uncertainty associated with the food web models applies to the use of default assumptions for exposure parameters such as bioconcentration and bioaccumulation factors (BCFs/BAFs). Although BCFs or BAFs for many bioaccumulative chemicals were readily available from the literature and were used in the conservative and more realistic risk evaluations, the use of a default factor of 1.0 to estimate the concentration of some chemicals in receptor prey items is a source of uncertainty. For most chemicals, the assumption that the chemical body burden in the prey item is at the same concentration as in soil or sediment is conservative, particularly for many metals, including aluminum, iron, and manganese, which are known not to bioaccumulate to any significant degree.

The use of literature-based BAF and BCFs to estimate contaminant concentrations in aquatic invertebrates and fish also adds uncertainty to the risk assessment. Site specific sediment conditions, including acid volatile sulfides, total organic carbon, and sediment grain size can significantly influence the bioavailability of certain compounds. Although it is common for aquatic assessments to be conducted without such site-specific sediment information, especially at the screening level, the lack of this information adds considerable uncertainty to the risk assessment, and may result in an under or overestimation of actual risks at the site.

A third source of uncertainty associated with the food web models is the use of unrealistically conservative exposure parameters in the conservative evaluation. The use of maximum ingestion rates and minimum body weights result in a conservative estimate of exposure. In addition, area use factors were assumed to equal one. This is a conservative assumption since a significant percentage of each upper trophic level receptor species time could be spent foraging off-site or in unimpacted areas. This uncertainty was eliminated in the refined risk evaluation, where mean body weights and mean ingestion rates were used to estimate dietary intake doses.

K.6 REFERENCES

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TABLE K-1

ASSESSMENT ENDPOINTS, RISK HYPOTHESES, MEASUREMENT ENDPOINTS, AND RECEPTOR SPECIES
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
REMEDIAL INVESTIGATION, CTO - 0219
MCB CAMP LEJEUNE, NORTH CAROLINA

Assessment Endpoint	Risk Hypothesis	Measurement Endpoint	Receptor Species
TERRESTRIAL HABITAT			
Protection of carnivorous mammals to ensure that ingestion of contaminants in soil and prey does not have a negative impact on growth, survival, and reproduction	Are levels of site contaminants in surface soils and/or surface water sufficient to cause adverse effects on the growth, survival, and reproductive success of carnivorous mammals using the site?	Comparison of dietary HQs to a reference of 1.0. Dietary HQs are calculated for individual chemicals by dividing an estimated level of exposure by an ecotoxicity value that is associated with a NOAEL. A reference HQ of 1.0 represents a dietary dose that is equal to the NOAEL ecotoxicity value.	Red Fox
Protection of insectivorous mammals to ensure that ingestion of contaminants in soil and prey does not have a negative impact on growth, survival, and reproduction	Are levels of site contaminants in surface soils and/or surface water sufficient to cause adverse effects on the growth, survival, and reproductive success of insectivorous mammals using the site?	Comparison of dietary HQs to a reference of 1.0. Dietary HQs are calculated for individual chemicals by dividing an estimated level of exposure by an ecotoxicity value that is associated with a NOAEL. A reference HQ of 1.0 represents a dietary dose that is equal to the NOAEL ecotoxicity value.	Short-tailed shrew
Protection of herbivorous mammals to ensure that ingestion of contaminants in soil and vegetation does not have a negative impact on growth, survival, and reproduction	Are levels of site contaminants in surface soils and/or surface water sufficient to cause adverse effects on the growth, survival, and reproductive success of insectivorous mammals using the site?	Comparison of dietary HQs to a reference of 1.0. Dietary HQs are calculated for individual chemicals by dividing an estimated level of exposure by an ecotoxicity value that is associated with a NOAEL. A reference HQ of 1.0 represents a dietary dose that is equal to the NOAEL ecotoxicity value.	Meadow Vole
Protection of omnivorous mammals to ensure that ingestion of contaminants in soil, vegetation, and prey does not have negative impacts on growth, survival, and reproduction	Are levels of site contaminants in surface soil and/or surface water sufficient to cause adverse effects on the growth, survival, and reproductive success of herbivorous mammals using the site?	Comparison of dietary HQs to a reference of 1.0. Dietary HQs are calculated for individual chemicals by dividing an estimated level of exposure by an ecotoxicity value that is associated with a NOAEL. A reference HQ of 1.0 represents a dietary dose that is equal to the NOAEL ecotoxicity value.	White-footed Mouse

TABLE K-1 (Continued)

ASSESSMENT ENDPOINTS, RISK HYPOTHESES, MEASUREMENT ENDPOINTS, AND RECEPTOR SPECIES
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
REMEDIAL INVESTIGATION, CTO - 0219
MCB CAMP LEJEUNE, NORTH CAROLINA

Assessment Endpoint	Risk Hypothesis	Measurement Endpoint	Receptor Species
Protection of insectivorous birds to ensure that ingestion of contaminants in soil or food items does not have negative impacts on growth, survival, and reproduction	Are levels of site contaminants in surface soils and/or surface water sufficient to cause adverse effects on the growth, survival, and reproductive success of insectivorous birds using the site?	Comparison of dietary HQs to a reference HQ of 1.0. Dietary HQs are calculated for individual chemicals by dividing an estimated level of exposure by an ecotoxicity value that is associated with a NOAEL. A reference HQ of 1.0 represents a dietary dose that is equal to the NOAEL ecotoxicity value.	American Robin
Protection of carnivorous birds to ensure that ingestion of contaminants in soil or food items does not have negative impacts on growth, survival, and reproduction	Are levels of site contaminants in surface soils and/or surface water sufficient to cause adverse effects on the growth, survival, and reproductive success of carnivorous birds using the site?	Comparison of dietary HQs to a reference HQ of 1.0. Dietary HQs are calculated for individual chemicals by dividing an estimated level of exposure by an ecotoxicity value that is associated with a NOAEL. A reference HQ of 1.0 represents a dietary dose that is equal to the NOAEL ecotoxicity value.	Eastern Screech-owl Red-tailed Hawk
AQUATIC HABITAT			
Protection of birds that feed on aquatic organisms from toxic effects of site-related chemicals present in surface water or sediment	Are levels of site contaminants in surface water and/or sediment sufficient to cause adverse effects on the growth, survival, and reproductive success of avian species using the site?	Comparison of dietary HQs to a reference HQ of 1.0. Dietary HQs are calculated for individual chemicals by dividing an estimated level of exposure by an ecotoxicity value that is associated with a NOAEL. A reference HQ of 1.0 represents a dietary dose that is equal to the NOAEL ecotoxicity value.	Great Blue Heron
Protection of insectivorous birds to ensure that ingestion of contaminants in sediment or food items does not have negative impacts on growth, survival, and reproduction	Are levels of site contaminants in sediment and/or surface water sufficient to cause adverse effects on the growth, survival, and reproductive success of insectivorous birds using the site?	Comparison of dietary HQs to a reference HQ of 1.0. Dietary HQs are calculated for individual chemicals by dividing an estimated level of exposure by an ecotoxicity value that is associated with a NOAEL. A reference HQ of 1.0 represents a dietary dose that is equal to the NOAEL ecotoxicity value.	Marsh Wren

TABLE K-1 (Continued)

ASSESSMENT ENDPOINTS, RISK HYPOTHESES, MEASUREMENT ENDPOINTS, AND RECEPTOR SPECIES
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
REMEDIAL INVESTIGATION, CTO - 0219
MCB CAMP LEJEUNE, NORTH CAROLINA

Assessment Endpoint	Risk Hypothesis	Measurement Endpoint	Receptor Species
Protection of mammals feeding on aquatic organisms from toxic effects of site-related chemicals present in surface water or sediment	Are levels of site contaminants in surface water and/or sediment sufficient to cause adverse effects on the growth, survival, and reproductive success of mammals that eat aquatic organisms and use the site?	Comparison of dietary HQs to a reference HQ of 1.0. Dietary HQs are calculated for individual chemicals by dividing an estimated level of exposure by an ecotoxicity value that is associated with a NOAEL. A reference HQ of 1.0 represents a dietary dose that is equal to the NOAEL ecotoxicity value.	Mink Raccoon

TABLE K-2
BIOACCUMULATIVE CHEMICALS LIST AND LOG Kow VALUES
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
REMEDIAL INVESTIGATION, CTO - 0219
MCB CAMP LEJEUNE, NORTH CAROLINA

Chemical	Log K_{ow} Range	Selected log K_{ow}	Reference	Evaluate for Food Web Exposures? [1]
Semivolatile Organics				
Acenaphthene	3.77 to 4.49	3.92	USEPA 1995	YES
Anthracene	3.45 to 4.80	4.55	USEPA 1995	YES
Benzo(a)anthracene	4.00 to 5.79	5.70	USEPA 1995	YES
Benzo(a)pyrene	5.98 to 6.42	6.11	USEPA 1995	YES
Benzo(b)fluoranthene	5.79 to 6.40	6.20	USEPA 1995	YES
Benzo(g,h,i)perylene	6.63 to 7.05	6.70	USEPA 1995	YES
Benzo(k)fluoranthene	6.12 to 6.27	6.20	USEPA 1995	YES
Chrysene	5.41 to 5.79	5.70	USEPA 1995	YES
Dibenz(a,h)anthracene	6.50 to 6.88	6.69	USEPA 1995	YES
Fluoranthene	4.31 to 5.39	5.12	USEPA 1995	YES
Fluorene	4.04 to 4.40	4.21	USEPA 1995	YES
Indeno(1,2,3-cd)pyrene	6.58 to 6.72	6.65	USEPA 1995	YES
Phenanthrene	4.28 to 4.57	4.55	USEPA 1995	YES
Pyrene	4.76 to 5.52	5.11	USEPA 1995	YES
Pesticides/PCBs				
4,4'-DDD	4.73 to 6.65	6.10	USEPA 1995	YES
4,4'-DDE	5.63 to 6.96	6.76	USEPA 1995	YES
4,4'-DDT	3.98 to 7.01	6.53	USEPA 1995	YES
Alpha-BHC	3.75 to 3.81	3.80	USEPA 1995	YES
Alpha-Chlordane	5.80 to 6.41	6.32	USEPA 1995	YES
Aroclor-1248	Not reported	6.20	Jones et al. 1997	YES
Aroclor-1254	Not reported	6.50	Jones et al. 1997	YES
Aroclor-1260	Not reported	6.80	Jones et al. 1997	YES
Dieldrin	3.63 to 6.20	5.37	USEPA 1995	YES

TABLE K-2 (continued)
BIOACCUMULATIVE CHEMICALS LIST AND LOG Kow VALUES
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
REMEDIAL INVESTIGATION, CTO - 0219
MCB CAMP LEJEUNE, NORTH CAROLINA

Chemical	Log K_{ow} Range	Selected log K_{ow}	Reference	Evaluate for Food Web Exposures? [1]
Pesticides/PCBs (Continued)				
Endosulfan I	3.83 to 3.85	3.83	USEPA 1995	YES
Endrin	2.92 to 5.20	5.06	USEPA 1995	YES
Gamma-Chlordane	5.80 to 6.41	6.32	USEPA 1995	YES
Heptachlor	4.93 to 6.26	6.26	USEPA 1995	YES
Heptachlor epoxide	3.50 to 5.40	5.00	USEPA 1995	YES
Methoxychlor	3.31 to 5.60	5.08	USEPA 1995	YES
Inorganics				
Chromium	NA	NA	NA	YES
Copper	NA	NA	NA	YES
Lead	NA	NA	NA	YES
Mercury	NA	NA	NA	YES
Zinc	NA	NA	NA	YES

Notes:
[1] If "YES" the compound was identified as an "important bioaccumulative compound" in USEPA 2000.
NA = Not Applicable

TABLE K-3
SOIL BIOCONCENTRATION/BIOACCUMULATION FACTORS USED FOR PLANTS AND SOIL INVERTEBRATES
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
REMEDIAL INVESTIGATION, CTO - 0219
MCB CAMP LEJUENE, NORTH CAROLINA

Chemical	Soil-Plant BCF (dry weight)		Soil-Invertebrate BAF (dry weight)	
	Value	Reference	Value	Reference
Inorganics				
Chromium	0.0075	Baes et al. 1984	3.162	Sample et al. 1998a
Copper	0.625	Bechtel Jacobs 1998a	1.531	Sample et al. 1998a
Lead	0.468	Bechtel Jacobs 1998a	1.522	Sample et al. 1998a
Mercury	5	Bechtel Jacobs 1998a	20.63	Sample et al. 1998a
Zinc	1.82	Bechtel Jacobs 1998a	12.89	Sample et al. 1998a
Pesticides/PCBs				
4,4'-DDD	0.0115	Travis and Arms 1988	2	Menzie et al. 1992
4,4'-DDE	0.0048	Travis and Arms 1988	10.6	Menzie et al. 1992
4,4'-DDT	0.0065	Travis and Arms 1988	0.7	Menzie et al. 1992
alpha-BHC	0.2464	Travis and Arms 1988	1	--
alpha-Chlordane	0.0089	Travis and Arms 1988	3	Menzie et al. 1992
Aroclor-1248	0.0101	Travis and Arms 1988	15.91	Sample et al. 1998a
Aroclor-1254	0.0068	Travis and Arms 1988	15.91	Sample et al. 1998a
Aroclor-1260	0.0045	Travis and Arms 1988	15.91	Sample et al. 1998a
Dieldrin	0.0305	Travis and Arms 1988	8	Beyer and Gish 1980
Endosulfan I	0.2367	Travis and Arms 1988	1	--
Endrin	0.0461	Travis and Arms 1988	1	--
Gamma-Chlordane	0.0086	Travis and Arms 1988	3	Menzie et al. 1992
Heptachlor	0.0093	Travis and Arms 1988	10	Roberts and Dorough 1985
Heptachlor Epoxide	0.0499	Travis and Arms 1988	10	Roberts and Dorough 1985
Methoxychlor	0.0448	Travis and Arms 1988	1	--

TABLE K-3 (continued)
SOIL BIOCONCENTRATION/BIOACCUMULATION FACTORS USED FOR PLANTS AND SOIL INVERTEBRATES
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
REMEDIAL INVESTIGATION, CTO - 0219
MCB CAMP LEJUENE, NORTH CAROLINA

Chemical	Soil-Plant BCF (dry weight)		Soil-Invertebrate BAF (dry weight)	
	Value	Reference	Value	Reference
Semivolatile Organics				
Acenaphthene	0.21	Travis and Arms 1988	0.3	Beyer and Stafford 1993
Anthracene	0.0908	Travis and Arms 1988	0.32	Beyer and Stafford 1993
Benzo(a)anthracene	0.0197	Travis and Arms 1988	0.27	Beyer and Stafford 1993
Benzo(a)pyrene	0.0114	Travis and Arms 1988	0.34	Beyer and Stafford 1993
Benzo(b)fluoranthene	0.0101	Travis and Arms 1988	0.21	Beyer and Stafford 1993
Benzo(g,h,i)perylene	0.0052	Travis and Arms 1988	0.15	Beyer and Stafford 1993
Benzo(k)fluoranthene	0.0101	Travis and Arms 1988	0.21	Beyer and Stafford 1993
Chrysene	0.0197	Travis and Arms 1988	0.44	Beyer and Stafford 1993
Dibenz(a,h)anthracene	0.0053	Travis and Arms 1988	0.49	Beyer and Stafford 1993
Fluoranthene	0.0425	Travis and Arms 1988	0.37	Beyer and Stafford 1993
Fluorene	0.1428	Travis and Arms 1988	0.2	Beyer and Stafford 1993
Indeno(1,2,3-cd)pyrene	0.0056	Travis and Arms 1988	0.41	Beyer and Stafford 1993
Phenanthrene	0.0908	Travis and Arms 1988	0.28	Beyer and Stafford 1993
Pyrene	0.0431	Travis and Arms 1988	0.39	Beyer and Stafford 1993

TABLE K-4
SOIL BIOACCUMULATION FACTORS USED FOR SMALL MAMMALS
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
REMEDIAL INVESTIGATION, CTO - 0219
MCB CAMP LEJEUNE, NORTH CAROLINA

Chemical	Soil-Mouse BAF (dry weight)		Soil-Vole BAF (dry weight)		Soil-Shrew BAF (dry weight)	
	Value	Reference	Value	Reference	Value	Reference
Inorganics						
Chromium	0.349	Sample et al. 1998b	0.309	Sample et al. 1998b	0.3333	Sample et al. 1998b
Copper	0.554	Sample et al. 1998b	1.29	Sample et al. 1998b	1.117	Sample et al. 1998b
Lead	0.286	Sample et al. 1998b	0.187	Sample et al. 1998b	0.339	Sample et al. 1998b
Mercury	0.13	Sample et al. 1998b	0.192	Sample et al. 1998b	0.192	Sample et al. 1998b
Zinc	2.7822	Sample et al. 1998b	2.3168	Sample et al. 1998b	2.9011	Sample et al. 1998b
Pesticides/PCBs						
4,4'-DDD	--	see text	--	see text	--	see text
4,4'-DDE	--	see text	--	see text	--	see text
4,4'-DDT	--	see text	--	see text	--	see text
alpha-BHC	--	see text	--	see text	--	see text
alpha-Chlordane	--	see text	--	see text	--	see text
Aroclor-1248	--	see text	--	see text	--	see text
Aroclor-1254	--	see text	--	see text	--	see text
Aroclor-1260	--	see text	--	see text	--	see text
Dieldrin	--	see text	--	see text	--	see text
Endosulfan I	--	see text	--	see text	--	see text
Endrin	--	see text	--	see text	--	see text
Gamma-Chlordane	--	see text	--	see text	--	see text
Heptachlor	--	see text	--	see text	--	see text
Heptachlor Epoxide	--	see text	--	see text	--	see text
Methoxychlor	--	see text	--	see text	--	see text

TABLE K-4 (Continued)
SOIL BIOACCUMULATION FACTORS USED FOR SMALL MAMMALS
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
REMEDIAL INVESTIGATION, CTO - 0219
MCB CAMP LEJEUNE, NORTH CAROLINA

Chemical	Soil-Mouse BAF (dry weight)		Soil-Vole BAF (dry weight)		Soil-Shrew BAF (dry weight)	
	Value	Reference	Value	Reference	Value	Reference
Semivolatile Organics						
Acenaphthene	--	see text	--	see text	--	see text
Anthracene	--	see text	--	see text	--	see text
Benzo(a)anthracene	--	see text	--	see text	--	see text
Benzo(a)pyrene	--	see text	--	see text	--	see text
Benzo(b)fluoranthene	--	see text	--	see text	--	see text
Benzo(g,h,i)perylene	--	see text	--	see text	--	see text
Benzo(k)fluoranthene	--	see text	--	see text	--	see text
Chrysene	--	see text	--	see text	--	see text
Dibenz(a,h)anthracene	--	see text	--	see text	--	see text
Fluoranthene	--	see text	--	see text	--	see text
Fluorene	--	see text	--	see text	--	see text
Indeno(1,2,3-cd)pyrene	--	see text	--	see text	--	see text
Phenanthrene	--	see text	--	see text	--	see text
Pyrene	--	see text	--	see text	--	see text

TABLE K-5
SEDIMENT BIOACCUMULATION FACTORS USED FOR AQUATIC INVERTEBRATES AND FISH
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
REMEDIAL INVESTIGATION, CTO - 0219
MCB CAMP LEJEUNE, NORTH CAROLINA

Chemical	Sediment-Invertebrate BAF (dry weight)		Sediment-Fish BAF (dry weight)	
	Value	Reference	Value	Reference
Inorganics				
Chromium	0.186	Bechtel Jacobs 1998b	0.038	Krantzberg and Boyd 1992
Copper	7.957	Bechtel Jacobs 1998b	0.1	Krantzberg and Boyd 1992
Lead	0.326	Bechtel Jacobs 1998b	0.07	Krantzberg and Boyd 1992
Mercury	1.735	Bechtel Jacobs 1998b	4.58	Cope et al. 1990
Zinc	4.759	Bechtel Jacobs 1998b	0.147	Pascoe et al. 1996
Pesticides/PCBs				
4,4'-DDD	0.5	Oliver 1987	2.61	Oliver and Niimi 1988
4,4'-DDE	4.3	Oliver 1987	20.39	Oliver and Niimi 1988
4,4'-DDT	0.5	Oliver 1987	9.11	Oliver and Niimi 1988
alpha-BHC	1	--	1	--
alpha-Chlordane	1	--	1	--
Aroclor-1248	21.89	Bechtel Jacobs 1998b	11.24	Oliver and Niimi 1988
Aroclor-1254	21.89	Bechtel Jacobs 1998b	11.24	Oliver and Niimi 1988
Aroclor-1260	21.89	Bechtel Jacobs 1998b	11.24	Oliver and Niimi 1988
Dieldrin	1	--	1	--
Endosulfan I	1	--	1	--
Endrin	1	--	1	--
Gamma-Chlordane	1	--	1	--
Heptachlor	1	--	1	--
Heptachlor Epoxide	1	--	1	--
Methoxychlor	1	--	1	--

TABLE K-5 (continued)
SEDIMENT BIOACCUMULATION FACTORS USED FOR AQUATIC INVERTEBRATES AND FISH
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
REMEDIAL INVESTIGATION, CTO - 0219
MCB CAMP LEJEUNE, NORTH CAROLINA

Chemical	Sediment-Invertebrate BAF (dry weight)		Sediment-Fish BAF (dry weight)	
	Value	Reference	Value	Reference
Semivolatile Organics				
Acenaphthene	2.04	Maruya et al. 1997	1	--
Anthracene	0.271	Maruya et al. 1997	1	--
Benzo(a)anthracene	1.4	Maruya et al. 1997	1	--
Benzo(a)pyrene	0.191	Maruya et al. 1997	1	--
Benzo(b)fluoranthene	0.16	Maruya et al. 1997	1	--
Benzo(g,h,i)perylene	0.295	Maruya et al. 1997	1	--
Benzo(k)fluoranthene	0.421	Maruya et al. 1997	1	--
Chrysene	0.335	Maruya et al. 1997	1	--
Dibenz(a,h)anthracene	1	--	1	--
Fluoranthene	0.312	Maruya et al. 1997	1	--
Fluorene	1.13	Maruya et al. 1997	1	--
Indeno(1,2,3-cd)pyrene	0.355	Maruya et al. 1997	1	--
Phenanthrene	0.652	Maruya et al. 1997	1	--
Pyrene	0.803	Maruya et al. 1997	1	--

TABLE K-6
CONSERVATIVE EXPOSURE PARAMETERS FOR UPPER TROPHIC LEVEL ECOLOGICAL RECEPTORS
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
REMEDIAL INVESTIGATION, CTO - 0219
MCB CAMP LEJEUNE, NORTH CAROLINA

Receptor	Body Weight (kg)		Water Ingestion Rate (L/day)		Food Ingestion Rate (kg/day - dry)	
	Value	Reference	Value	Reference	Value	Reference
Birds						
American robin	0.0635	USEPA 1993	0.01442	USEPA 1993	0.0086154	Levey and Karasov 1989
Great blue heron	2.1	Butler 1992	0.1125	USEPA 1993	0.11025	USEPA 1993
Eastern screech-owl	0.145	Dunning 1993	0.02159	USEPA 1993	0.02191	USEPA 1993 (Nagy)
Marsh wren	0.00975	Dunning 1993	0.00365	USEPA 1993	0.0027636	USEPA 1993
Red-tailed hawk	0.957	USEPA 1993	0.07039	USEPA 1993	0.04352	Sample and Suter 1994
Mammals						
Meadow vole	0.03	Silva and Downing 1995	0.01334	USEPA 1993	0.00334	USEPA 1993
Mink	0.564	Silva and Downing 1995	0.10879	USEPA 1993	0.03934	USEPA 1993
Raccoon	4.2	USEPA 1993	0.6806	USEPA 1993	0.14557	Conover 1989
Red fox	3.17	Silva and Downing 1995	0.41395	USEPA 1993	0.14763	Sample and Suter 1994
Short-tailed shrew	0.0155	USEPA 1993	0.00479	USEPA 1993	0.00192	USEPA 1993
White-footed mouse	0.0141	Silva and Downing 1995	0.0058	USEPA 1993	0.00073	Sample and Suter 1994

TABLE K-6 (Continued)
CONSERVATIVE EXPOSURE PARAMETERS FOR UPPER TROPHIC LEVEL ECOLOGICAL RECEPTORS
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
REMEDIAL INVESTIGATION, CTO - 0219
MCB CAMP LEJEUNE, NORTH CAROLINA

Receptor	Dietary Composition (percent)							Soil/ Sediment Ingestion (percent)	
	Terr. Plants	Soil Invert.	Small Mammals	Fish/ Frogs	Aquatic Plants	Aquatic Invert.	Reference	Value	Reference
Birds									
American robin	33.6	58	0	0	0	0	USEPA 1993	8.4	Sample and Suter 1994
Great blue heron	0	0	0	100	0	0	USEPA 1993; Sample and Suter 1994	0	Sample and Suter 1994
Eastern screech-owl	0	28	70	0	0	0	Johnsgard 1988	2	Assumed based on diet
Marsh wren	0	0	0	0	0	95	USEPA 1993	5	Assumed based on diet
Red-tailed hawk	0	0	100	0	0	0	USEPA 1993; Sample and Suter 1994	0	Sample and Suter 1994
Mammals									
Meadow vole	95.6	2	0	0	0	0	USEPA 1993	2.4	Beyer et al. 1994
Mink	0	0	6	89	1	4	USEPA 1993	0	Sample and Suter 1994
Raccoon	0	0	0	11 *	36	43.6	USEPA 1993 (MD)	9.4	Beyer et al. 1994
Red fox	7	2.8	87.4	0	0	0	USEPA 1993 (MD)	2.8	Beyer et al. 1994
Short-tailed shrew	4.7	82.3	0	0	0	0	USEPA 1993; Sample and Suter 1994	13	Sample and Suter 1994
White-footed mouse	54	44	0	0	0	0	USEPA 1993	2	Beyer et al. 1994

* Frogs only

TABLE K-7
INGESTION SCREENING VALUES FOR BIRDS
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
REMEDIAL INVESTIGATION, CTO - 0219
MCB CAMP LEJEUNE, NORTH CAROLINA

Chemical	Test Organism	Body Weight	Duration	Exposure Route	Effect/Endpoint	LOAEL (mg/kg/d)	NOAEL (mg/kg/d)	Reference
Inorganics								
Chromium	American black duck	1.25	10 months	oral in diet	reproduction	5	1	Sample et al. 1996
Copper	chicks	0.534	10 weeks	oral in diet	growth/mortality	61.7	47	Sample et al. 1996
Lead	Japanese quail	0.15	12 weeks	oral in diet	reproduction	11.3	1.13	Sample et al. 1996
Lead	American kestrel	0.13	7 months	oral in diet	reproduction	38.5	3.85	Sample et al. 1996
Mercury	Japanese quail	0.15	1 year	oral in diet	reproduction	0.9	0.45	Sample et al. 1996
Mercury	mallard	1	3 generations	oral in diet	reproduction	0.064	0.0064	Sample et al. 1996
Zinc	chicken	1.935	44 weeks	oral in diet	reproduction	131	14.5	Sample et al. 1996
Pesticides/PCBs								
4,4'-DDD	mallard	1.134	chronic	oral	reproduction	5.2	0.52	Stickel 1973
4,4'-DDD	American kestrel	0.115	2 years	oral	reproduction	0.5	0.05	McLane and Hall 1972
4,4'-DDE	brown pelican	3.5	chronic	oral	reproduction	1.31	0.131	Beyer et al. 1996
4,4'-DDE	American kestrel	0.115	2 years	oral	reproduction	0.5	0.05	McLane and Hall 1972
4,4'-DDT	mallard	1.134	chronic	oral	reproduction	1.04	0.104	Davison and Sell 1974
4,4'-DDT	American kestrel	0.115	2 years	oral	reproduction	0.5	0.05	McLane and Hall 1972
alpha-BHC	Japanese quail	0.15	90 days	oral in diet	reproduction	2.25	0.56	Sample et al. 1996
alpha-Chlordane	red-winged blackbird	0.064	84 days	oral in diet	mortality	10.7	2.14	Sample et al. 1996
Aroclor-1248	ring-necked pheasant	1	17 weeks	oral	reproduction	1.8	0.18	Sample et al. 1996
Aroclor-1254	ring-necked pheasant	1	17 weeks	oral	reproduction	1.8	0.18	Sample et al. 1996
Aroclor-1260	ring-necked pheasant	1	17 weeks	oral	reproduction	1.8	0.18	Sample et al. 1996
Dieldrin	barn owl	0.466	2 years	oral in diet	reproduction	0.77	0.077	Sample et al. 1996
Endosulfan I	gray partridge	0.4	4 weeks	oral in diet	reproduction	100	10	Sample et al. 1996
Endrin	mallard	1.15	>200 days	oral in diet	reproduction	3	0.3	Sample et al. 1996
Endrin	screech owl	0.181	>83 days	oral in diet	reproduction	0.1	0.01	Sample et al. 1996

TABLE K-7 (continued)
INGESTION SCREENING VALUES FOR BIRDS
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
REMEDIAL INVESTIGATION, CTO - 0219
MCB CAMP LEJEUNE, NORTH CAROLINA

Chemical	Test Organism	Body Weight	Duration	Exposure Route	Effect/Endpoint	LOAEL (mg/kg/d)	NOAEL (mg/kg/d)	Reference
Pesticides/PCBs (Cont.)								
Gamma-Chlordane	red-winged blackbird	0.064	84 days	oral in diet	mortality	10.7	2.14	Sample et al. 1996
Heptachlor	quail	0.191	5 days	oral in diet	mortality	4.05	0.405	Hill et al. 1975
Heptachlor Epoxide	quail	0.191	5 days	oral in diet	mortality	4.05	0.405	Hill et al. 1975
Methoxychlor	quail	0.191	5 days	oral in diet	mortality	4050	405	Hill and Camardese 1986
Semivolatile Organics								
Acenaphthene	chicken	1.5	34 days	oral in diet	reproduction	395	39.5	Rigdon and Neal 1963
Anthracene	mallard	1.043	7 months	oral in diet	hepatic	228	22.8	Patton and Dieter 1980
Benzo(a)anthracene	chicken	1.5	34 days	oral in diet	reproduction	395	39.5	Rigdon and Neal 1963
Benzo(a)pyrene	chicken	1.5	34 days	oral in diet	reproduction	395	39.5	Rigdon and Neal 1963
Benzo(b)fluoranthene	chicken	1.5	34 days	oral in diet	reproduction	395	39.5	Rigdon and Neal 1963
Benzo(g,h,i)perylene	chicken	1.5	34 days	oral in diet	reproduction	395	39.5	Rigdon and Neal 1963
Benzo(k)fluoranthene	chicken	1.5	34 days	oral in diet	reproduction	395	39.5	Rigdon and Neal 1963
Chrysene	chicken	1.5	34 days	oral in diet	reproduction	395	39.5	Rigdon and Neal 1963
Dibenz(a,h)anthracene	chicken	1.5	34 days	oral in diet	reproduction	395	39.5	Rigdon and Neal 1963
Fluoranthene	chicken	1.5	34 days	oral in diet	reproduction	395	39.5	Rigdon and Neal 1963
Fluorene	chicken	1.5	34 days	oral in diet	reproduction	395	39.5	Rigdon and Neal 1963
Indeno(1,2,3-cd)pyrene	chicken	1.5	34 days	oral in diet	reproduction	395	39.5	Rigdon and Neal 1963
Phenanthrene	chicken	1.5	34 days	oral in diet	reproduction	395	39.5	Rigdon and Neal 1963
Pyrene	chicken	1.5	34 days	oral in diet	reproduction	395	39.5	Rigdon and Neal 1963

Notes:

? = Information not provided in reference.

TABLE K-8
INGESTION SCREENING VALUES FOR MAMMALS
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
REMEDIAL INVESTIGATION, CTO - 0219
MCB CAMP LEJEUNE, NORTH CAROLINA

Chemical	Test Organism	Body Weight (kg)	Duration	Exposure Route	Effect/Endpoint	LOAEL (mg/kg/d)	NOAEL (mg/kg/d)	Reference
Inorganics								
Chromium	rat	0.35	3 months	oral in water	mortality	13.14	1.314	Sample et al. 1996
Copper	mink	1	357 days	oral in diet	reproduction	15.14	11.7	Sample et al. 1996
Lead	rat	0.35	3 generations	oral in diet	reproduction	80	8	Sample et al. 1996
Mercury	rat	0.35	3 generations	oral in diet	reproduction	0.16	0.032	Sample et al. 1996
Mercury	mink	1	93 days	oral in diet	mortality/weight loss	0.025	0.015	Sample et al. 1996
Zinc	rat	0.35	GD 1-16	oral in diet	reproduction	320	160	Sample et al. 1996
Zinc	mink	1	25 weeks	oral	reproduction	208	20.8	ATSDR 1992a
Pesticides/PCBs								
4,4'-DDD	rat	0.35	2 years	oral in diet	reproduction	4	0.8	Sample et al. 1996
4,4'-DDD	dog	10	2 generations	oral	reproduction	5	1	ATSDR 1992b
4,4'-DDE	rat	0.35	2 years	oral in diet	reproduction	4	0.8	Sample et al. 1996
4,4'-DDE	dog	10	2 generations	oral	reproduction	5	1	ATSDR 1992b
4,4'-DDT	rat	0.35	2 years	oral in diet	reproduction	4	0.8	Sample et al. 1996
4,4'-DDT	dog	10	2 generations	oral	reproduction	5	1	ATSDR 1992b
alpha-BHC	rat	0.35	4 generations	oral in diet	reproduction	3.2	1.6	Sample et al. 1996
alpha-Chlordane	mouse	0.03	6 generations	oral in diet	reproduction	9.16	4.58	Sample et al. 1996
Aroclor-1248	mouse	0.03	5 weeks	oral in diet	immunological	13	1.3	ATSDR 1995a
Aroclor-1248	rhesus monkey	5	14 months	oral in diet	reproduction	0.1	0.01	Sample et al. 1996
Aroclor-1254	oldfield mouse	0.014	12 months	oral in diet	reproduction	0.68	0.068	Sample et al. 1996
Aroclor-1254	mink	1	4.5 months	oral in diet	reproduction	0.69	0.14	Sample et al. 1996
Aroclor-1260	oldfield mouse	0.014	12 months	oral in diet	reproduction	0.68	0.068	Sample et al. 1996
Aroclor-1260	mink	1	4.5 months	oral in diet	reproduction	0.69	0.14	Sample et al. 1996
Dieldrin	rat	0.35	3 generations	oral in diet	reproduction	0.2	0.02	Sample et al. 1996
Endosulfan I	rat	0.35	30 days	oral (intubation)	reproduction	1.5	0.15	Sample et al. 1996
Endrin	mouse	0.03	120 days	oral in diet	reproduction	0.92	0.092	Sample et al. 1996
Gamma-Chlordane	mouse	0.03	6 generations	oral in diet	reproduction	9.16	4.58	Sample et al. 1996
Heptachlor	mink	1	181 days	oral in diet	reproduction	1	0.1	Sample et al. 1996
Heptachlor Epoxide	mink	1	181 days	oral in diet	reproduction	1	0.1	Sample et al. 1996
Methoxychlor	rat	0.35	11 months	oral in diet	reproduction	8	4	Sample et al. 1996

TABLE K-8 (continued)
INGESTION SCREENING VALUES FOR MAMMALS
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
REMEDIAL INVESTIGATION, CTO - 0219
MCB CAMP LEJEUNE, NORTH CAROLINA

Chemical	Test Organism	Body Weight (kg)	Duration	Exposure Route	Effect/Endpoint	LOAEL (mg/kg/d)	NOAEL (mg/kg/d)	Reference
Semivolatile Organics								
Acenaphthene	mouse	0.03	13 weeks	oral (gavage)	reproduction	3500	350	ATSDR 1995b
Anthracene	mouse	0.03	13 weeks	oral (gavage)	reproduction	10000	1000	ATSDR 1995b
Benzo(a)anthracene	mouse	0.03	GD 7-16	oral (intubation)	reproduction	10	1	Sample et al. 1996
Benzo(a)pyrene	mouse	0.03	GD 7-16	oral (intubation)	reproduction	10	1	Sample et al. 1996
Benzo(b)fluoranthene	mouse	0.03	GD 7-16	oral (intubation)	reproduction	10	1	Sample et al. 1996
Benzo(g,h,i)perylene	mouse	0.03	19 to 29 days	oral in diet	reproduction	1330	133	ATSDR 1995b
Benzo(k)fluoranthene	mouse	0.03	GD 7-16	oral (intubation)	reproduction	10	1	Sample et al. 1996
Chrysene	mouse	0.03	GD 7-16	oral (intubation)	reproduction	10	1	Sample et al. 1996
Dibenz(a,h)anthracene	mouse	0.03	GD 7-16	oral (intubation)	reproduction	10	1	Sample et al. 1996
Fluoranthene	mouse	0.03	13 weeks	oral (gavage)	hepatic	1250	125	ATSDR 1995b
Fluorene	mouse	0.03	13 weeks	oral (gavage)	hematological	1250	125	ATSDR 1995b
Indeno(1,2,3-cd)pyrene	mouse	0.03	GD 7-16	oral (intubation)	reproduction	10	1	Sample et al. 1996
Phenanthrene	mouse	0.03	19 to 29 days	oral in diet	reproduction	1330	133	ATSDR 1995
Pyrene	mouse	0.03	19 to 29 days	oral in diet	reproduction	1330	133	ATSDR 1995

Notes:

? = Information not provided in reference.

TABLE K-9
SOIL BIOCONCENTRATION/BIOACCUMULATION FACTORS USED FOR PLANTS AND SOIL INVERTEBRATES
LESS CONSERVATIVE RISK SCENARIO - OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
REMEDIAL INVESTIGATION, CTO - 0219
MCB CAMP LEJEUNE, NORTH CAROLINA

Chemical	Soil-Plant BCF (dry weight)		Soil-Invertebrate BAF (dry weight)	
	Value	Reference	Value	Reference
Inorganics				
Chromium	0.0075	Baes et al. 1984	0.32	Sample et al. 1998a
Copper	0.123	Bechtel Jacobs 1998a	0.468	Sample et al. 1998a
Lead	0.0377	Bechtel Jacobs 1998a	0.307	Sample et al. 1998a
Mercury	0.344	Bechtel Jacobs 1998a	1.186	Sample et al. 1998a
Zinc	0.358	Bechtel Jacobs 1998a	2.482	Sample et al. 1998a
Pesticides/ PCBs				
4,4'-DDD	0.0115	Travis and Arms 1988	2	Menzie et al. 1992
4,4'-DDE	0.0048	Travis and Arms 1988	10.6	Menzie et al. 1992
4,4'-DDT	0.0065	Travis and Arms 1988	0.7	Menzie et al. 1992
alpha-BHC	0.2464	Travis and Arms 1988	1	--
alpha-Chlordane	0.0089	Travis and Arms 1988	3	Menzie et al. 1992
Aroclor-1248	0.0101	Travis and Arms 1988	4.297	Sample et al. 1998a
Aroclor-1254	0.0068	Travis and Arms 1988	4.297	Sample et al. 1998a
Aroclor-1260	0.0045	Travis and Arms 1988	4.297	Sample et al. 1998a
Dieldrin	0.0305	Travis and Arms 1988	8	Beyer and Gish 1980
Endosulfan I	0.2367	Travis and Arms 1988	1	--
Endrin	0.0461	Travis and Arms 1988	1	--
Gamma-Chlordane	0.0086	Travis and Arms 1988	3	Menzie et al. 1992
Heptachlor	0.0093	Travis and Arms 1988	10	Roberts and Dorough 1985
Heptachlor Epoxide	0.0499	Travis and Arms 1988	10	Roberts and Dorough 1985
Methoxychlor	0.0448	Travis and Arms 1988	1	--

TABLE K-9 (Continued)
SOIL BIOCONCENTRATION/BIOACCUMULATION FACTORS USED FOR PLANTS AND SOIL INVERTEBRATES
LESS CONSERVATIVE RISK SCENARIO - OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
REMEDIAL INVESTIGATION, CTO - 0219
MCB CAMP LEJEUNE, NORTH CAROLINA

Chemical	Soil-Plant BCF (dry weight)		Soil-Invertebrate BAF (dry weight)	
	Value	Reference	Value	Reference
Semivolatile Organics				
Acenaphthene	0.21	Travis and Arms 1988	0.3	Beyer and Stafford 1993
Anthracene	0.0908	Travis and Arms 1988	0.32	Beyer and Stafford 1993
Benzo(a)anthracene	0.0197	Travis and Arms 1988	0.27	Beyer and Stafford 1993
Benzo(a)pyrene	0.0114	Travis and Arms 1988	0.34	Beyer and Stafford 1993
Benzo(b)fluoranthene	0.0101	Travis and Arms 1988	0.21	Beyer and Stafford 1993
Benzo(g,h,i)perylene	0.0052	Travis and Arms 1988	0.15	Beyer and Stafford 1993
Benzo(k)fluoranthene	0.0101	Travis and Arms 1988	0.21	Beyer and Stafford 1993
Chrysene	0.0197	Travis and Arms 1988	0.44	Beyer and Stafford 1993
Dibenz(a,h)anthracene	0.0053	Travis and Arms 1988	0.49	Beyer and Stafford 1993
Fluoranthene	0.0425	Travis and Arms 1988	0.37	Beyer and Stafford 1993
Fluorene	0.1428	Travis and Arms 1988	0.2	Beyer and Stafford 1993
Indeno(1,2,3-cd)pyrene	0.0056	Travis and Arms 1988	0.41	Beyer and Stafford 1993
Phenanthrene	0.0908	Travis and Arms 1988	0.28	Beyer and Stafford 1993
Pyrene	0.0431	Travis and Arms 1988	0.39	Beyer and Stafford 1993

TABLE K-10
SOIL BIOACCUMULATION FACTORS USED FOR SMALL MAMMALS
LESS CONSERVATIVE RISK SCENARIO - OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
REMEDIAL INVESTIGATION, CTO - 0219
MCB CAMP LEJEUNE, NORTH CAROLINA

Chemical	Soil-Mouse BAF (dry weight)		Soil-Vole BAF (dry weight)		Soil-Shrew BAF (dry weight)	
	Value	Reference	Value	Reference	Value	Reference
Inorganics						
Chromium	0.092	Sample et al. 1998b	0.1249	Sample et al. 1998b	0.0939	Sample et al. 1998b
Copper	0.1107	Sample et al. 1998b	0.109	Sample et al. 1998b	0.5017	Sample et al. 1998b
Lead	0.0548	Sample et al. 1998b	0.0406	Sample et al. 1998b	0.1478	Sample et al. 1998b
Mercury	0.0731	Sample et al. 1998b	0.0672	Sample et al. 1998b	0.0672	Sample et al. 1998b
Zinc	0.5092	Sample et al. 1998b	0.2929	Sample et al. 1998b	0.862	Sample et al. 1998b
Pesticides/ PCBs						
4,4'-DDD	--	see text	--	see text	--	see text
4,4'-DDE	--	see text	--	see text	--	see text
4,4'-DDT	--	see text	--	see text	--	see text
alpha-BHC	--	see text	--	see text	--	see text
alpha-Chlordane	--	see text	--	see text	--	see text
Aroclor-1248	--	see text	--	see text	--	see text
Aroclor-1254	--	see text	--	see text	--	see text
Aroclor-1260	--	see text	--	see text	--	see text
Dieldrin	--	see text	--	see text	--	see text
Endosulfan I	--	see text	--	see text	--	see text
Endrin	--	see text	--	see text	--	see text
Gamma-Chlordane	--	see text	--	see text	--	see text
Heptachlor	--	see text	--	see text	--	see text
Heptachlor Epoxide	--	see text	--	see text	--	see text
Methoxychlor	--	see text	--	see text	--	see text

TABLE K-10 (continued)
SOIL BIOACCUMULATION FACTORS USED FOR SMALL MAMMALS
LESS CONSERVATIVE RISK SCENARIO - OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
REMEDIAL INVESTIGATION, CTO - 0219
MCB CAMP LEJEUNE, NORTH CAROLINA

Chemical	Soil-Mouse BAF (dry weight)		Soil-Vole BAF (dry weight)		Soil-Shrew BAF (dry weight)	
	Value	Reference	Value	Reference	Value	Reference
Semivolatile Organics						
Acenaphthene	--	see text	--	see text	--	see text
Anthracene	--	see text	--	see text	--	see text
Benzo(a)anthracene	--	see text	--	see text	--	see text
Benzo(a)pyrene	--	see text	--	see text	--	see text
Benzo(b)fluoranthene	--	see text	--	see text	--	see text
Benzo(g,h,i)perylene	--	see text	--	see text	--	see text
Benzo(k)fluoranthene	--	see text	--	see text	--	see text
Chrysene	--	see text	--	see text	--	see text
Dibenz(a,h)anthracene	--	see text	--	see text	--	see text
Fluoranthene	--	see text	--	see text	--	see text
Fluorene	--	see text	--	see text	--	see text
Indeno(1,2,3-cd)pyrene	--	see text	--	see text	--	see text
Phenanthrene	--	see text	--	see text	--	see text
Pyrene	--	see text	--	see text	--	see text

TABLE K-11
SEDIMENT BIOACCUMULATION FACTORS USED FOR AQUATIC INVERTEBRATES AND FISH
LESS CONSERVATIVE RISK SCENARIO - OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
REMEDIAL INVESTIGATION, CTO - 0219
MCB CAMP LEJEUNE, NORTH CAROLINA

Chemical	Sediment-Invertebrate BAF (dry weight)		Sediment-Fish BAF (dry weight)	
	Value	Reference	Value	Reference
Inorganics				
Chromium	0.09	Bechtel Jacobs 1998b	0.038	Krantzberg and Boyd 1992
Copper	0.919	Bechtel Jacobs 1998b	0.1	Krantzberg and Boyd 1992
Lead	0.129	Bechtel Jacobs 1998b	0.07	Krantzberg and Boyd 1992
Mercury	1.022	Bechtel Jacobs 1998b	3.25	Cope et al. 1990
Zinc	0.954	Bechtel Jacobs 1998b	0.147	Pascoe et al. 1996
Pesticides/ PCBs				
4,4'-DDD	0.5	Oliver 1987	1.66	Oliver and Niimi 1988
4,4'-DDE	4.3	Oliver 1987	15.88	Oliver and Niimi 1988
4,4'-DDT	0.5	Oliver 1987	6.56	Oliver and Niimi 1988
alpha-BHC	1	--	1	--
alpha-Chlordane	1	--	1	--
Aroclor-1248	1.92	Bechtel Jacobs 1998b	8.64	Oliver and Niimi 1988
Aroclor-1254	1.92	Bechtel Jacobs 1998b	8.64	Oliver and Niimi 1988
Aroclor-1260	1.92	Bechtel Jacobs 1998b	8.64	Oliver and Niimi 1988
Dieldrin	1	--	1	--
Endosulfan I	1	--	1	--
Endrin	1	--	1	--
Gamma-Chlordane	1	--	1	--
Heptachlor	1	--	1	--
Heptachlor Epoxide	1	--	1	--
Methoxychlor	1	--	1	--

TABLE K-11 (continud)
SEDIMENT BIOACCUMULATION FACTORS USED FOR AQUATIC INVERTEBRATES AND FISH
LESS CONSERVATIVE RISK SCENARIO - OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
REMEDIAL INVESTIGATION, CTO - 0219
MCB CAMP LEJEUNE, NORTH CAROLINA

Chemical	Sediment-Invertebrate BAF (dry weight)		Sediment-Fish BAF (dry weight)	
	Value	Reference	Value	Reference
Semivolatile Organics				
Acenaphthene	2.04	Maruya et al. 1997	1	--
Anthracene	0.191	Maruya et al. 1997	1	--
Benzo(a)anthracene	0.358	Maruya et al. 1997	1	--
Benzo(a)pyrene	0.127	Maruya et al. 1997	1	--
Benzo(b)fluoranthene	0.15	Maruya et al. 1997	1	--
Benzo(g,h,i)perylene	0.215	Maruya et al. 1997	1	--
Benzo(k)fluoranthene	0.232	Maruya et al. 1997	1	--
Chrysene	0.198	Maruya et al. 1997	1	--
Dibenz(a,h)anthracene	1	--	1	--
Fluoranthene	0.212	Maruya et al. 1997	1	--
Fluorene	0.481	Maruya et al. 1997	1	--
Indeno(1,2,3-cd)pyrene	0.173	Maruya et al. 1997	1	--
Phenanthrene	0.294	Maruya et al. 1997	1	--
Pyrene	0.435	Maruya et al. 1997	1	--

TABLE K-12
REFINED EXPOSURE PARAMETERS FOR UPPER TROPHIC LEVEL ECOLOGICAL RECEPTORS
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
REMEDIAL INVESTIGATION, CTO - 0219
MCB CAMP LEJEUNE, NORTH CAROLINA

Receptor	Body Weight (kg)		Water Ingestion Rate (L/day)		Food Ingestion Rate (kg/day - dry)	
	Value	Reference	Value	Reference	Value	Reference
Birds						
American robin	0.0773	USEPA 1993	0.01082	USEPA 1993	0.0064604	Levey and Karasov 1989
Great blue heron	2.23	Quinney 1982	0.10035	USEPA 1993	0.098343	USEPA 1993
Eastern screech-owl	0.181	Dunning 1993	0.01877	USEPA 1993 (Nagy)	0.01913	USEPA 1993 (Nagy)
Marsh wren	0.01125	Dunning 1993	0.00304	USEPA 1993	0.0015834	USEPA 1993
Red-tailed hawk	1.126	Sample and Suter 1994	0.06418	USEPA 1993	0.03488	Sample and Suter 1994
Mammals						
Meadow vole	0.0428	Silva and Downing 1995	0.00749	USEPA 1993	0.00209	USEPA 1993
Mink	0.777	Silva and Downing 1995	0.08159	USEPA 1993	0.02704	USEPA 1993
Raccoon	5.98	USEPA 1993	0.49036	USEPA 1993	0.10488	Conover 1989
Red fox	4.06	Silva and Downing 1995	0.3451	USEPA 1993	0.12308	Sample and Suter 1994
Short-tailed shrew	0.0183	USEPA 1993	0.00408	USEPA 1993	0.00163	USEPA 1993
White-footed mouse	0.0208	Silva and Downing 1995	0.00395	USEPA 1993	0.00050	Sample and Suter 1994

Notes:

Refined exposure parameters represent measurments of central tendency

TABLE K-12 (Continued)
REFINED EXPOSURE PARAMETERS FOR UPPER TROPHIC LEVEL ECOLOGICAL RECEPTORS
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
REMEDIAL INVESTIGATION, CTO - 0219
MCB CAMP LEJEUNE, NORTH CAROLINA

Receptor	Dietary Composition (percent)							Soil/ Sediment Ingestion (percent)	
	Terr. Plants	Soil Invert.	Small Mammals	Fish/ Frogs	Aquatic Plants	Aquatic Invert.	Reference	Value	Reference
Birds									
American robin	33.6	58	0	0	0	0	USEPA 1993	8.4	Sample and Suter 1994
Great blue heron	0	0	0	100	0	0	USEPA 1993; Sample and Suter 1994	0	Sample and Suter 1994
Eastern screech-owl	0	28	70	0	0	0	Johnsgard 1988	2	Assumed based on diet
Marsh wren	0	0	0	0	0	95	USEPA 1993	5	Assumed based on diet
Red-tailed hawk	0	0	100	0	0	0	USEPA 1993; Sample and Suter 1994	0	Sample and Suter 1994
Mammals									
Meadow vole	95.6	2	0	0	0	0	USEPA 1993	2.4	Beyer et al. 1994
Mink	0	0	6	89	1	4	USEPA 1993	0	Sample and Suter 1994
Raccoon	0	0	0	11 *	36	43.6	USEPA 1993 (MD)	9.4	Beyer et al. 1994
Red fox	7	2.8	87.4	0	0	0	USEPA 1993 (MD)	2.8	Beyer et al. 1994
Short-tailed shrew	4.7	82.3	0	0	0	0	USEPA 1993; Sample and Suter 1994	13	Sample and Suter 1994
White-footed mouse	54	44	0	0	0	0	USEPA 1993	2	Beyer et al. 1994

Notes:

Refined exposure parameters represent measurments of central tendency

* Frogs only

APPENDIX J
ECOLOGICAL CHEMICAL PROFILES OF ECOLOGICAL CONTAMINANTS OF CONCERN BASED ON STEPS 1 AND 2

APPENDIX J
ECOLOGICAL CHEMICAL PROFILES OF ECOLOGICAL CONTAMINANTS OF CONCERN BASED ON STEPS 1 AND 2

INORGANICS

Aluminum

Aluminum occurs naturally and makes up about eight percent of the earth's crust. In the environment, aluminum binds to air particles; dissolves in lakes, streams, and rivers depending on water quality; and can be taken up into plants from soil. The direct toxic potential of aluminum is low compared to that of many other metals (Scheuhammer 1987). The toxicity of aluminum has been shown to vary widely with water hardness and pH (Ingersoll et al. 1990; Woodard et al. 1989). The chronic toxicity of orally ingested aluminum in birds and mammals is probably more a function of its disruptive effects on calcium and phosphorus homeostasis than direct cytotoxicity of aluminum itself (Scheuhammer 1987). High levels of aluminum in the diet may cause decreased growth rates, bone abnormalities, and muscle weakness concurrent with marked disturbances of calcium and phosphorus metabolism. Studies using high levels in mice and rabbits show that aluminum may cause delays in skeletal and neurological development in young animals (ATSDR 1992). Studies of the possible aetiologic role of aluminum in breeding impairment of wild passerines reported severe eggshell defects, reduced clutch sizes, and high incidence of mortality in pied flycatchers and other species of small passerines nesting by the shore of an acid-stressed Swedish lake (Nyholm and Myhrberg 1977; Nyholm 1981). The source of the dietary ingestion of aluminum was thought to be the emergent insect biomass utilized as a food source by the shore-nesting flycatchers.

A literature search was conducted on the toxicological effects of aluminum ingestion to mammals. A 390-day reproductive study conducted on mice indicated a chronic oral toxicity dose of 193 mg/kg/day of aluminum (Ondreicka et al. 1966). The dose was considered to be a chronic LOAEL because there were no effects on the number of litters or number of offspring per litter, but the growth of generations 2 and 3 was significantly reduced. A chronic NOAEL of 19.3 mg/kg/day was estimated by multiplying the chronic LOAEL by an uncertainty factor of 0.1 (ATSDR 1990). A six-month reproductive study with dogs (ATSDR 1990) indicated a chronic LOAEL of 600 mg/kg/day. A chronic NOAEL of 60 mg/kg/day was estimated by multiplying the chronic LOAEL by an uncertainty factor of 0.1.

A literature search was conducted on the toxicological effects of aluminum to birds. A 4-month reproductive study conducted with ringed doves indicated no chronic oral toxicity at a dose of 1000 ppm (Carriere et al. 1986). This dose was considered to be a chronic NOAEL because no significant differences were observed at the 1000 ppm dose level and the study considered exposure over 4 months including a critical life stage (reproduction). The dose was converted to a final NOAEL of 109.7 mg/kg/day (Sample et al. 1996). A chronic LOAEL of 1097 mg/kg/day was estimated by multiplying the chronic NOAEL by an uncertainty factor of 10.

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Antimony

Antimony is a silvery-white metal that is found in the earth's crust. Antimony ores are mined and then mixed with other metals to form antimony alloys or combined with oxygen to form antimony oxide. Antimony is released to the environment from natural sources and from industry. Most antimony ends up in soil, where it attaches strongly to particles that contain iron, manganese, or aluminum. Antimony is found at low levels in some rivers, lakes, and streams.

A literature search was conducted on the toxicological effects of antimony ingestion to mammals. A one year study conducted on the effects of antimony on the growth, survival, and tissue levels in mice indicated a chronic oral toxicity dose of 5 ppm (Schroeder et al. 1968). This dose was converted to 1.25 mg/kg/day and considered a chronic LOAEL because median life span was reduced among female mice exposed to the 5 ppm dose level (Sample et al. 1996). A chronic NOAEL of 0.125 mg/kg/day was estimated by multiplying the chronic LOAEL by an uncertainty factor of 0.1.

A 6-week study with northern bobwhites, conducted during a critical life stage (reproduction), showed chronic oral toxicity at a dose of 47400 mg/kg/day (Opresko et al. 1993). This dose was considered a chronic LOAEL. A chronic NOAEL of 4740 mg/kg/day was estimated by multiplying the chronic LOAEL by an uncertainty factor of 0.1.

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Barium

Barium occurs in nature combined with other chemicals such as sulfur, or carbon and oxygen. Some barium compounds dissolve easily in water and are found in lakes, rivers, and streams. Barium is found in most soils and foods at low levels. Fish and aquatic organisms accumulate barium in their tissues (ATSDR 1992). Studies on animals have shown that ingesting low levels of barium over the long term causes increased blood pressure and heart changes (ATSDR 1992). A 16-month study conducted with barium administered orally in water to rats was used to derive a chronic NOAEL (endpoints were growth and hypertension) of 5.1 mg/kg/day, while a second study with rats (endpoint was mortality) was used to derive a chronic LOAEL of 19.8 mg/kg/day (Sample et al. 1996).

In a study conducted by Johnson (1960) over a 4-week period, chicks were exposed to eight barium dose levels in their diet. Exposures of up to 2000 ppm produced no mortality. Chicks in the 4000 to 32000 ppm groups experienced 5 to 100 percent mortality, respectively. The 2000 and 4000 ppm doses were considered the chronic NOAEL and LOAEL, respectively. These dietary concentrations were converted to a chronic NOAEL of 208 mg/kg/day and a chronic LOAEL of 417 mg/kg/day (Sample et al. 1996).

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Beryllium

In nature, beryllium can be found, in compounds with other elements, in mineral rocks, coal, soil, and volcanic dust. It can enter water from rocks, soil, and industrial waste. Most beryllium compounds do not dissolve in water and settle to the bottom as particles. Fish are not known to accumulate beryllium in their bodies from the surrounding water to any great extent (ATSDR 1993). Based on animal studies, beryllium compounds may be considered carcinogens (ATSDR 1993).

A literature search was conducted on the toxicological effects of beryllium ingestion to mammals. A study conducted on the effect to longevity and weight loss from beryllium given orally in water to rats (lifetime exposures) indicated a chronic no effect level of 5 ppm, the only dose tested (Schroeder and Mitchner 1975). Exposure to 5 ppm beryllium in water did not reduce longevity, but weight loss by male rats was observed in the second and sixth month. Because weight loss was not considered an adverse effect, the 5 ppm dose level was considered to be a chronic NOAEL. The 5 ppm dietary concentration was converted to a daily dose of 0.66 mg/kg/day (Sample et al. 1996), which was considered the chronic NOAEL. A chronic LOAEL of 6.6 mg/kg/day was estimated by multiplying the NOAEL by an uncertainty factor of 10.
No dietary information was found on the toxicological effects of beryllium to birds.

References

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Chromium

Chromium is a naturally occurring element. Chromium compounds are used in the chemical industry for metal finishing, manufacture of pigments, leather tanning, and water treatment. Chromium has been widely studied and its effects are well known.

A 3-month study on the effects of chromium on survival in rats indicated adverse effects at a dose of 131.4 mg/kg/day. This dose was considered to be a chronic LOAEL (Sample et al. 1996). A chronic NOAEL of 13.14 mg/kg/day was estimated by multiplying the chronic NOAEL by an uncertainty factor of 0.1.

A literature search was conducted on the toxicological effects of chromium ingestion to birds. A study conducted with American black ducks indicated that dietary levels of 5.0 mg/kg/day of chromium caused reduced duckling survival. This dose was considered a chronic LOAEL (Sample et al. 1996). A dose of 1.0 mg/kg/day was considered a chronic NOAEL because no adverse reproductive effects were observed at this level.

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Cobalt

Rats exposed to cobalt in the diet for 69 days showed impaired reproduction at 50 mg/kg/day; this dose is considered a chronic LOAEL. A chronic NOAEL of 5 mg/kg/day was estimated by multiplying the chronic LOAEL by an uncertainty factor of 0.1 (ATSDR 1992). Chickens exposed to cobalt in the diet for 14 days showed impaired growth at 14.7 mg/kg/day; this dose is considered a chronic LOAEL (Diaz et al. 1994). A chronic NOAEL of 1.47 mg/kg/day was estimated by multiplying the chronic LOAEL by an uncertainty factor of 0.1.

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Copper

Excess ingestion of copper leads to accumulation in tissues, mainly in the liver. When concentrations in the liver exceed a certain level, the metal is released into the blood causing hemolysis and jaundice. High levels of copper also inhibit essential metabolic enzymes (Demayo et al. 1982). Toxic symptoms appear when the liver accumulates 3 to 15 times the normal level of copper (Demayo et al. 1982).

Ruminants are the most sensitive mammalian species to the toxic effects of copper. Young animals retain more dietary copper than older animals and are more sensitive to copper toxicity (Venugopal and Luckey 1978). Copper is known to have adverse effects on aquatic organisms, but is dependent upon pH and hardness. Copper tends not to accumulate in most organisms or to biomagnify in food chains.

A 357-day study on the effects of copper on the reproduction of mink indicated increased mortality of mink kits at oral doses of 50, 100, and 200 ppm (Aulerich et al. 1982). The 50 ppm dose was converted to a chronic LOAEL of 15.14 mg/kg/day. A chronic NOAEL of 11.7 mg/kg/day was determined from the 25 ppm dietary concentration at which no adverse reproductive effects were observed.

A 10-week study on the effects of copper on the growth and mortality of day old chicks indicated reduced growth and increased mortality at a dietary concentration of 749 ppm (Mehring et al. 1960). This concentration, considered to be a chronic LOAEL, was converted to a daily dose of 61.7 mg/kg/day (Sample et al. 1996). No adverse effects were observed at a dietary concentration of 570 ppm. This concentration, considered to be a chronic NOAEL, was converted to a daily dose of 47 mg/kg/day.

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Iron

Iron can have effects on plants. Chlorosis, the yellowing or dropping of leaves, can occur when iron, within alkaline soils, becomes insoluble and unavailable for uptake. At extremely high concentrations, iron has been reported to be toxic to livestock.

A literature search was conducted on the toxicological effects of iron ingestion to mammals and birds. The maximum tolerable level of iron for sheep and rabbits is 500 mg/kg/day (NAS 1980). The maximum tolerable level of iron for poultry is 1,000 mg/kg/day (NAS 1980). In the literature, "maximum tolerable level" is defined as that dietary level that, when fed for a limited period, will not impair animal performance (NAS 1980). Therefore, 500 mg/kg/day and 1,000 mg/kg/day were used as chronic LOAELs for mammals and birds, respectively. A chronic NOAEL was estimated by multiplying each LOAEL by an uncertainty factor of 0.1.

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Lead

Organic forms of lead are more bioavailable than inorganic forms, but microorganisms in streams are capable of transforming inorganic lead into organic forms. Soluble lead is toxic to all aquatic plant phyla. In plants, lead inhibits growth by reducing photosynthetic activity, mitosis, and water absorption. In the terrestrial environment, lead has been demonstrated to be toxic to birds, mammals, reptiles, and amphibians. Lead poisoning in birds is particularly well documented, but most lead poisoning in wild birds results from ingestion of lead pellets. In contrast, lead poisoning of birds, such as raptors, from biologically incorporated lead is considered unlikely. Lead is known to be toxic to mammalian species, but information on the effects on wild species is very limited. Toxic effects include mortality, reduced growth and reproduction, alterations of blood chemistry, lesions, and behavioral changes. Terrestrial vegetation also may be affected by elevated lead concentrations. Demonstrated effects include reduced photosynthesis, mitosis, and water absorption. Lead, however, appears to bind tightly to moist soil, and substantial amounts of lead typically need to accumulate before effects on plants are observed. Lead does not biomagnify to a great extent in food chains, although bioaccumulation in plants and animals has been extensively documented (Wixson and Davis 1993, Eisler 1988).

A study on three generations of rats fed lead acetate indicated a chronic NOAEL of 8 mg/kg/day (Azar et al. 1973). Rats fed this dose level were not observed to exhibit any adverse reproductive effects. Rats fed 80 mg/kg/day were observed to have reduced offspring weights and kidney damage in the young. This dose was considered to be a chronic LOAEL.

A 7-month study on the toxicological effects of lead ingestion in American kestrels found that an oral dose of 3.85 mg/kg/day did not cause any adverse reproductive effects (Sample et al. 1996); this dose was considered a chronic NOAEL. A chronic LOAEL of 38.5 mg/kg/day was estimated by multiplying the chronic NOAEL by an uncertainty factor of 10. A 12-week study with Japanese quail found that oral exposures to lead acetate in the diet did not have any adverse

reproductive effects at doses of 1.13 mg/kg/day (chronic NOAEL) although adverse effects were observed at a dose of 11.3 mg/kg/day (chronic LOAEL; Sample et al. 1996).

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Manganese

Manganese is a vital micronutrient in plants and animals. Plant leaves will turn yellow when manganese is not present is sufficient quantities. Manganese can be toxic to plants if irrigated with water and pH values are less than 6.0. Because it is an essential nutrient, plants likely have a wide range of tolerance to manganese.

A literature search was conducted on the toxicological effects of manganese ingestion to mammals. A study was conducted on the reproductive effects of manganese on rats (Laskey et al. 1982). The rats were fed three dose levels of manganese: 400, 1100, and 3550 ppm. A dose of 3550 ppm caused reduced pregnancy and fertility and was therefore considered a chronic LOAEL. The chronic LOAEL was converted to a daily dose of LOAEL of 284 mg/kg/day (Sample et al. 1996). No effects were observed at lower exposure levels. A chronic NOAEL of 1100 ppm was converted to a daily dose of 88 mg/kg/day (Sample et al. 1996).

A literature search was conducted on the toxicological effects of manganese ingestion to birds. A 75-day study conducted on growth and behavioral effects of manganese on Japanese quail indicated a chronic NOAEL of 977 mg/kg/day (Laskey and Edens 1985) because no reduction in growth was observed but aggressive behavior declined. A chronic LOAEL of 9770 mg/kg/day was estimated by multiplying the chronic NOAEL by an uncertainty factor of 10.

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Mercury

Mercury is persistent in the environment and may cause significant effects on ecological receptors. A variety of adverse biological effects have been attributed to mercury. Mercury is a known teratogen, mutagen, and carcinogen. Mercury has been documented to adversely effect reproduction, growth and development, behavior, blood and serum chemistry, motor coordination, vision, hearing, histology, and metabolism at relatively low concentrations in birds and mammals. The reproduction, growth, metabolism, blood chemistry, and oxygen exchange of marine and freshwater organisms also is adversely affected by relatively low concentrations of mercury. The form of mercury most readily assimilated by biota is methylmercury. Once incorporated in tissues, methylmercury is very slow to depurate. The rate of bioaccumulation of methylmercury is species- and site-specific.

A three-generation study on the effects of mercury (administered orally as methyl mercury chloride) on the reproduction of rats indicated a LOAEL of 0.16 mg/kg/day because reduced pup

viability was observed (Verschuuren et al. 1976). A chronic NOAEL of 0.032 mg/kg/day was determined because no adverse reproductive effects were observed at this level.

A 93-day study conducted on mink indicated that a dose of 1.8 ppm (administered orally as methyl mercury chloride) caused mortality, weight loss, and behavioral abnormalities (Wobeser et al. 1976). No adverse effects were observed at 1.1 ppm so this dose was considered a chronic NOAEL. These values were converted to a daily dose of 0.25 mg/kg/day (chronic LOAEL) and 0.15 mg/kg/day (chronic NOAEL).

A literature search was conducted on the toxicological effects of mercury ingestion to birds. A one-year study conducted on Japanese quail indicated that an oral dose of 0.9 mg/kg/day (as mercuric chloride) caused reduced fertility and egg hatchability (Sample et al. 1996). This dose was considered a chronic LOAEL. No adverse reproductive effects were observed at a dose of 0.45 mg/kg/day. This dose was considered a chronic NOAEL.

Mallards fed methyl mercury during a 3-generation study showed significant reproductive effects (reduced egg and duckling production) at a daily dose 0.064 mg/kg/day (Sample et al. 1996). This dose was considered a chronic LOAEL. A chronic NOAEL of 0.0064 mg/kg/day was estimated by multiplying the chronic LOAEL by an uncertainty factor of 0.1.

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Vanadium

Vanadium enters the environment primarily from natural sources and from the burning of fuel oils. It is an essential element in certain animals, but may induce toxic effects in sufficient quantities. Young rats fed 92 and 194 ppm vanadium lost body weight and exhibited gross pathological symptoms, and 56 percent of those fed 368 ppm vanadium died (Daniel and Lillie 1938). In a study with mallard ducks, vanadium accumulated in the bone, kidney, and liver. Hens fed 100 ppm accumulated vanadium in the bone to about five times the levels in drakes (White and Dieter 1978). Several studies have shown contradictory effects of vanadium on lipid metabolism in birds and mammals. Responses were dependent on species, age, and diet composition. The alterations in lipid metabolism caused by vanadium were considered biologically significant because they were demonstrable in ducks that had absorbed and accumulated only minute tissue concentrations of the metal (White and Dieter 1978).

A literature search was conducted on the toxicological effects of vanadium ingestion to mammals. A 60-day study was conducted on the reproductive effects of vanadium to rats. The rats were fed three dose levels of sodium metavanadate: 5, 10, and 20 mg/kg/day. Significant differences in reproductive parameters (e.g., number of dead young, litter size) were observed at all dose levels. Therefore, the lowest dose was considered to be a chronic LOAEL. The LOAEL of 5 mg/kg/day was converted to an elemental vanadium dosage of 2.1 mg/kg/day (Sample et al. 1996). A chronic NOAEL (0.21 mg/kg/day) was estimated by multiplying the chronic LOAEL by an uncertainty factor of 0.1.

A literature search was conducted on the toxicological effects of vanadium ingestion to birds. A study conducted on mortality, body weight, and blood chemistry effects of vanadium to mallards indicated a chronic NOAEL of 11.4 mg/kg/day (White and Dieter 1978). The mallards were fed three dose levels of vanadium in food over a 12-week period and no effects were observed at any dose level. The maximum dose was considered the chronic NOAEL. A chronic LOAEL (114 mg/kg/day) was estimated by multiplying the chronic NOAEL by an uncertainty factor of 10.

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Zinc

Zinc, like many other metals, is essential in cell growth and enzymatic formation. Ceriodaphnia, a genus of aquatic invertebrates, are the most sensitive of 35 genera tested, but some aquatic plants are three times as sensitive to zinc. Zinc toxicity can result in destruction of gill epithelium and tissue hypoxia in fish. In terrestrial species, chronic exposure to zinc can result in softening of bone, anemia, enteropathy, and kidney damage. Zinc is not known to magnify in food chains because the body regulates it and excess zinc is eliminated.

A study conducted with rats indicated that a dose of 320 mg/kg/day of zinc caused adverse reproductive effects in pregnant rats (Sample et al. 1996). This dose was considered a chronic LOAEL. A chronic NOAEL of 160 mg/kg/day was determined since no adverse effects were observed at this dose. Mink exposed to zinc in the diet for 25 weeks did not exhibit any adverse reproductive effects at a daily dose of 20.8 mg/kg/day (ATSDR 1992).

Reproduction in chickens exposed to zinc in the diet for 44 weeks was not adversely affected at a daily dose of 14.5 mg/kg/day but was adversely affected at 131 mg/kg/day. These doses are considered chronic NOAEL and LOAEL values, respectively (Sample et al. 1996).

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POLYCHLORINATED BIPHENYLS (PCBs)

Aroclor 1016, 1221, 1232, 1242, 1248, 1254, and 1260

PCBs are a group of manufactured organic chemicals that were banned in the United States in 1977 because of their proven adverse environmental effects. PCBs occur in a variety of different formulations consisting of mixtures of individual compounds such as Aroclor 1016, 1248, 1254, and Aroclor 1260. The Aroclor formulations vary in the percent chlorine, and generally, the higher the chlorine content the greater the toxicity. PCBs elicit a variety of biologic and toxic effects including death, birth defects, reproductive failure, liver damage, tumors, and a wasting syndrome (Eisler 1986). PCBs are known to bioaccumulate and to biomagnify within the food chain. PCBs in water accumulate in fish and marine mammals and can reach levels thousands of times higher than the levels in water (ATSDR 1996). Toxicity data for white-footed mice, oldfield mice, and mink show that their reproductive systems and developing embryos were adversely affected by both acute and chronic exposures (McCoy et al. 1995).

An 18-month study conducted on the effects of Aroclor 1016 on the reproduction of mink indicated that 25 ppm in the diet reduced kit growth (Aulerich and Ringer 1980). This dose was considered a chronic LOAEL and was converted to a daily dose of 3.43 mg/kg/day. The10 ppm dose was considered to be a chronic NOAEL because no adverse effects were observed at this dosage. The chronic NOAEL was converted to a daily dose of 1.37 mg/kg/day.

A seven-month study on the effects of Aroclor 1242 on the reproduction of mink indicated that doses of 5, 10, 20, and 40 ppm caused complete reproductive failure (Bleavins et al. 1980). The 5 ppm dose (chronic LOAEL) was converted to a daily dose of 0.69 mg/kg/day. A chronic NOAEL of 6.9 mg/kg/day was estimated by multiplying the chronic LOAEL by an uncertainty factor of 0.1.

A study conducted on the effects of Aroclor 1242 on the reproduction on two generations of screech owls indicated that a 3 ppm dose had no observed effects (McLane and Hughes 1980). This dose (chronic NOAEL) was converted to a daily dose of 0.41 mg/kg/day. A chronic LOAEL of 4.1 mg/kg/day was estimated by multiplying the chronic NOAEL by an uncertainty factor of 10.

A 5-week study on the effects of Aroclor 1248 on immune function in mice indicated a dose of 13 mg/kg/day to be a chronic LOAEL (ATSDR 1996). A chronic NOAEL of 1.3 mg/kg/day was estimated by multiplying the chronic LOAEL by an uncertainty factor of 0.1.

A year-long study conducted on oldfield mice indicated that 5 ppm of Aroclor 1254 in the diet reduced the number of litters, offspring weights, and offspring survival (McCoy et al. 1995). This dose was considered a chronic LOAEL and converted to a daily dose of 0.68 mg/kg/day (Sample et al. 1996). A chronic NOAEL of 0.068 mg/kg/day was estimated by multiplying the chronic LOAEL by an uncertainty factor of 0.1.

A study conducted by Aulerich and Ringer (1977) exposed mink to 3 dose levels of Aroclor 1254 for a 4.5-month period. Exposure to 5 and 15 ppm in the diet reduced the number of offspring born alive. A dose of 1 ppm caused no adverse effects. The 5 ppm dose was considered to be a chronic LOAEL and was converted to a daily dose of 0.69 mg/kg/day (Sample et al. 1996). The 1 ppm dose was considered to be a chronic NOAEL and was converted to a daily dose of 0.14 mg/kg/day.

A study conducted on ring-necked pheasants indicated that a dose of 1.8 mg/kg/day in the diet for 17 weeks caused significantly reduced egg hatchability (Dahlgren et al. 1972). This dose was considered a chronic LOAEL. A chronic NOAEL of 0.18 mg/kg/day was estimated by multiplying the chronic LOAEL by an uncertainty factor of 0.1.

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PESTICIDES

4, 4'-DDD, 4, 4'-DDE, and 4, 4'-DDT

DDT is a synthetic organochlorine compound that has been used extensively for insect control. DDD and DDE are metabolites of DDT. Both of these two breakdown products and DDT are often found together in the environment and are referred to collectively as total DDT. DDT was banned in the United States in 1972, primarily due to its environmental effects, but is very persistent in the environment and is still detected in many biochemical and geochemical surveys. The USEPA's Aquatic Information Retrieval Toxicity database (AQUIRE) for DDT contains more than 40 acute toxicity values for various aquatic organisms. These range from 0.36 µg/L for Daphnia pulex to 1230 µg/L for the planarian Polycellis felina (USEPA 1984).

Historical studies of terrestrial invertebrates have found that earthworms are much more tolerant of organochlorine pesticides than arthropods (Davis 1971). The storage of total DDT in earthworms can lead to harmful effects in higher trophic-level organisms including birds and mammals.

The toxicity and accumulation of DDT in fish are correlated with age, fat content, and body length. Signs of toxicity are similar to those exhibited by insects (Ellgaard et al. 1977). Exposure to lethal concentrations of DDT results in increasing levels of irritability or excitability followed by muscular spasms, complete loss of equilibrium, convulsions, and eventually death. Toxic effects on amphibians and reptiles include uncoordinated behavior, loss of equilibrium, restricted development, weight loss, and death (Russell et al. 1995).

The toxicity and accumulation of DDT and its metabolites are of primary concern in birds. These chemicals can accumulate in fat after even brief, low-level exposures. In general, birds that feed on fish or other birds have greater tissue residues than those that feed on vegetation or seeds, and DDE is more common than either DDT or DDD in bird tissues (Stickel 1973). Adverse effects resulting from DDT poisoning in birds include reproductive impairment, reduced fledging success, and eggshell thinning. DDE produced significant eggshell thinning in three major groups of birds: the orders Strigiformes (owls), Falconiformes (all other raptors), and Anseriformes (most common waterfowl).

Studies of DDT toxicity to mammals have been generally limited to laboratory mammals. Liver, neurological, developmental, reproductive, and carcinogenic effects after exposure to DDT have also been noted for mice, rats, shrews, hamsters, monkeys, dogs, and bats. Laboratory studies with wild mammals have indicated that big brown bats are much more sensitive to DDT than other mammals (Stickel 1973).

A literature search was conducted on the effects of 4, 4'-DDD, 4, 4'-DDE, 4, 4'-DDT ingestion to mammals and birds. A study conducted on the reproductive effects of DDT on rats indicated a chronic NOAEL of 0.8 mg/kg/day and a chronic LOAEL of 4 mg/kg/day (Fitzhugh 1948). The rats ingested three dose levels over a 2-year period. Consumption of 4 mg/kg/day caused a reduction in the number of young produced. No adverse effects were observed at the 0.8 mg/kg/day dose level.

Dogs fed DDT for two generations showed reproductive effects at an oral dose of 5 mg/kg/day but not at 1 mg/kg/day. These values are considered the chronic LOAEL and chronic NOAEL, respectively (ATSDR 1994).

A 2-year reproductive study with American kestrels resulted in estimated chronic NOAEL and LOAEL values of 0.05 and 0.5 mg/kg/day, respectively, for DDE. Chronic oral exposures of mallards with DDT and DDD resulted in chronic NOAEL and LOAEL values (reproductive endpoints) of 0.104 and 1.04 mg/kg/day, respectively, for DDT, and 0.52 and 5.2 mg/kg/day, respectively for DDD (Stickel 1973). Brown pelicans exposed to DDE showed no chronic reproductive effects at 0.131 mg/kg/day (Beyer et al. 1996).

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Aldrin and Dieldrin

Aldrin and dieldrin are insecticides that do not occur naturally in the environment. From 1950 to 1970, aldrin and dieldrin were popular pesticides for crops like corn and cotton. Because of concerns about damage to the environment and the potential harm to human health, USEPA banned all uses of aldrin and dieldrin in 1974 except to control termites. In 1987, USEPA banned all uses (ATSDR 1993).

Aldrin is easily converted to dieldrin in the environment, and after being ingested and absorbed in animals. Aldrin is found in the blood only after very high doses. Dieldrin binds tightly to soil and slowly evaporates to the air. Dieldrin breaks down very slowly in the environment. Plants uptake and store dieldrin from the soil. In animals, dieldrin accumulates in fatty tissues and leaves the body very slowly. The major acute toxic effects are on the central nervous system. Studies in animals also indicate that dieldrin may reduce the body's ability to resist infection. Mice given high amounts of dieldrin developed liver cancers (ATSDR 1993).

A three-generation study on the effects of dieldrin on rat reproduction indicated that a chronic dose of 2.5 mg/kg (Treon and Cleveland 1955) caused a reduction in the number of pregnancies. This dose was considered a chronic LOAEL and converted to a daily dose of 0.2 mg/kg/day. A chronic NOAEL of 0.02 mg/kg/day was determined by multiplying the chronic LOAEL by an uncertainty factor of 0.1.

A two-year study of the effects of dieldrin on the reproduction of barn owls indicated a chronic NOAEL of 0.077 mg/kg/day (Mendenhall et al. 1983). A slight reduction in the eggshell thickness was observed, but no effects on the number of eggs laid per pair, number of eggs hatched per pair, percent of eggs broken, or embryo and nestling mortality were observed. A LOAEL of 0.77 mg/kg/day was estimated by multiplying the NOAEL by an uncertainty factor of 10.

Rats exposed to aldrin for three generations showed adverse reproductive effects at a daily dose of 1 mg/kg/day, but not at a dose of 0.2 mg/kg/day. These doses are considered the chronic LOAEL and NOAEL, respectively (Sample et al. 1996). Chronic NOAELs and LOAELs for mallards exposed to aldrin in the diet have been estimated at 0.5 and 5 mg/kg/day based on data from Tucker and Crabtree (1970).

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Tucker, R.K. and D.G. Crabtree. 1970. Handbook of toxicity of pesticides to wildlife. U.S. Fish and Wildlife Service Research Publication 84. 131 pp.

Alpha-, Beta-, and Delta-BHC

A literature search was conducted on the toxicological effects alpha-, beta-, and delta-BHC ingestion to animals. A 4-generation rat study with mixed BHC isomers indicated adverse reproductive effects at 3.2 mg/kg/day (chronic LOAEL) but not at 1.6 mg/kg/day (chronic NOAEL; Sample et al. 1996). Rats exposed to beta-BHC for 13 weeks exhibited growth and systemic effects at 20 mg/kg/day (chronic LOAEL) but not 4 mg/kg/day (chronic NOAEL; Sample et al. 1996). Japanese quail exposed to mixed BHC isomers BHC for 90 days exhibited reproductive effects at 2.25 mg/kg/day (chronic LOAEL) but not 0.56 mg/kg/day (chronic NOAEL; Sample et al. 1996).

References

Sample, B.E., D.M. Opresko, and G.W. Suter II. 1996. Toxicological benchmarks for wildlife: 1996 revision. Environmental Restoration Division, ORNL Environmental Restoration Program. ES/ER/TM-86/R3.

Chlordane

Chlordane is a manufactured chemical that was used as a pesticide in the United States from 1948 to 1988. Chlordane is not a single chemical, but is actually a mixture of pure chlordane mixed with many related chemicals. It does not occur naturally in the environment. Chlordane adsorbs to soil particles and can remain in the soil for over 20 years. Most chlordane leaves soil by evaporation to the air. It breaks down very slowly and does not dissolve easily in water. It bioaccumulates in the tissues of fish, birds, and mammals (ATSDR 1994).

Chlordane affects the nervous system, the digestive system, and the liver in animals. Acute ingestion-based exposure of high levels of chlordane can cause mortality and convulsions in animals. Chronic exposure caused harmful effects in the liver of test animals. Animals exposed before birth or while nursing developed behavioral effects (ATSDR 1994).

A study on the effects of chlordane on the reproductive systems of six generations of mice indicated a chronic NOAEL of 4.58 mg/kg/day (WHO 1984) because no adverse effects were observed. The study indicated a chronic LOAEL of 9.16 mg/kg/day because of observations of decreased viability and reduced abundance of offspring in the test mice.

A ten-week study on the effects of chlordane on the mortality rates in red-winged blackbirds indicated a chronic NOAEL of 2.14 mg/kg/day because no adverse effects were observed at this dose level (Stickel et al. 1983). A chronic LOAEL of 10.7 mg/kg/day was determined based on a 26 percent mortality rate at this dose.

These chronic NOAEL and LOAEL values were used for both alpha- and gamma-chlordane.

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Endosulfan I, Endosulfan II, and Endosulfan Sulfate

Endosulfan occurs in two isomeric forms, endosulfan I and endosulfan II. The ratio of these two forms varies depending on the environmental media from which the samples are collected. Air tends to have the highest ratio of endosulfan I to endosulfan II. Air/water partitioning experiments were conducted with the technical mix of endosulfan and with the individual isomers. The partitioning in these experiments resulted in a ratio of endosulfan I to endosulfan II similar to what was observed in the environment. The results of this experiment suggest that endosulfan II is being converted to endosulfan I as it transfers across the air/water interface. This has important implications to modeling the fate of these materials in the environment (ATSDR 1993). Endosulfan sulfate results from the oxidation of endosulfan in nature (Coleman and Dolinger 1982).

A literature search was conducted on the toxicological effects of endosulfan ingestion to mammals and birds. Form-specific information was not available therefore toxicity studies on total endosulfan were used for endosulfan I, endosulfan II, and endosulfan sulfate. A 30-day study conducted on male and female rats indicated that 1.5 mg/kg/day of endosulfan in the diet did not cause adverse reproductive effects (Dikshith et al. 1984). This dose was considered a chronic NOAEL. A chronic LOAEL of 15 mg/kg/d was estimated by multiplying the chronic NOAEL by an uncertainty factor of 10.

A literature search was conducted on the toxicological effects of endosulfan ingestion to birds. A study conducted by Abiola (1992) on gray partridges indicated that 5, 25, and 125 ppm of endosulfan in the diet did not cause adverse reproductive effects. The maximum dose of 125 ppm

(10 mg/kg/d) was considered a chronic NOAEL because exposure occurred during reproduction (Sample et al. 1996). A LOAEL of 100 mg/kg/d was estimated by multiplying the NOAEL by an uncertainty factor of 10.

References

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Agency for Toxic Substances and Disease Registry (ATSDR). 1993. Toxicological profile for 1,4-endosulfan. U.S. Public Health Service, U.S. Department of Health and Human Services, Atlanta, GA.

Coleman, P.F. and P.M. Dolinger. 1982. Endosulfan monograph number four: environmental health evaluations of California restricted pesticides. Prepared by Peter M. Dolinger Associates, Menlo Park, CA. Sacramento, CA: State of California Department of Food and Agriculture.

Dikshith, T.S.S., R.B. Raizada, M.K. Srivastava, and B.S. Kaphalia. 1984. Response of rats to repeated oral administration of endosulfan. Ind. Health. 22:295-304.

Sample, B.E., D.M. Opresko, and G.W. Suter II. 1996. Toxicological benchmarks for wildlife: 1996 revision. Risk Assessment Program, Health Sciences Research Division. Oak Ridge, Tennessee.

Endrin, Endrin Aldehyde, and Endrin Ketone

Endrin was used in the United States as a pesticide and rodenticide but the use of endrin was banned in 1984. Endrin does not easily dissolve in water and is more likely to be found in sediments. Endrin breaks down slowly in the environment (ATSDR 1989). Endrin can bioaccumulate in aquatic animals from 1450 to 10000 times the concentration in water (USEPA 1980).

Little information is known about the properties of endrin aldehyde. It is not commercially used but is found as an impurity and breakdown product of endrin. It is not known what happens to

this substance once it is released to the environment (ATSDR 1989). Endrin ketone might be found in the environment as a breakdown product of endrin. Little information is known about the properties of endrin ketone (ATSDR 1996).

A dietary dose of 0.92 mg/kg/day of endrin over 120 days caused significant reproductive effects in mice including reduced parental survival, litter size, and number of young (Good and Ware 1969). This dose was considered a chronic LOAEL. A chronic NOAEL of 0.092 mg/kg/day was estimated by multiplying the chronic LOAEL by an uncertainty factor of 0.1.

A study conducted by Fleming et al. (1982) exposed screech owls to a dietary dose of 0.75 ppm (0.1 mg/kg/day) of endrin over 10 weeks to assess reproductive effects. Egg production and hatching success was reduced. This dose was considered a chronic LOAEL. A chronic NOAEL of 0.01 mg/kg/day was estimated by multiplying the chronic LOAEL by an uncertainty factor of 0.1. Mallards exposed to endrin in the diet for 200+ days showed no adverse reproductive effects at 0.3 mg/kg/day (the highest dose tested). This dose is considered a chronic NOAEL (Sample et al. 1996). A chronic LOAEL was estimated by multiplying the chronic NOAEL by and uncertainty factor of 10.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1996. Endrin ketone. U.S. Public Health Service, U.S. Department of Health and Human Services, Atlanta, GA.

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United States Environmental Protection Agency (USEPA). 1980. Ambient water quality criteria for endrin. Washington, D.C. Office of Water Regulations and Standards. EPA-440/5-80-047. NTIS No. PB81-117582.

Heptachlor and Heptachlor Epoxide

Heptachlor is a manufactured chemical that does not occur naturally. Heptachlor does not dissolve easily in water, adheres strongly to soil particles, and evaporates slowly to air. Plants and animals can change heptachlor ($C_{10}H_5Cl_7$) to heptachlor epoxide ($C_{10}H_5Cl_7O$) by means of oxidation. Heptachlor epoxide can remain in the soil and water for many years. Plants can uptake heptachlor from the soil. Heptachlor and heptachlor epoxide have been shown to bioaccumulate in the tissues of fish, bivalves, and cattle (ATSDR 1993).

Most of what we know about the health effects of these pesticides comes from studies on mice and rats fed heptachlor and heptachlor epoxide. Acute studies using high levels of heptachlor damaged the livers of rats and the livers and adrenal glands of mice. Mice also had trouble walking and rats developed tremors. Animals that ingested heptachlor or heptachlor epoxide before and/or during pregnancy had smaller litters or were unable to reproduce. Some of the offspring had cataracts and others died shortly after birth (ATSDR 1993).

A literature search was conducted on the toxicological effects of heptachlor ingestion to mammals and birds. An 181-day study on the effects of heptachlor on the reproduction of mink indicated a chronic LOAEL of 6.25 ppm (Crum et al. 1993) which was converted to a daily dose of 1.0 mg/kg/day. Minks given this dose were observed to have reduced kit weights at 3 and 6 weeks as compared to controls. A chronic NOAEL of 0.1 mg/kg/day was estimated by multiplying the chronic LOAEL by an uncertainty factor of 0.1. Studies with quail (Hill et al. 1975) result in estimated chronic NOAELs and LOAELs of 0.405 and 4.05 mg/kg/day, respectively.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1993. Toxicological profile for heptachlor. .S. Public Health Service, U.S. Department of Health and Human Services, Atlanta, GA.

Crum, J.A., S.J. Bursian, R.J. Aulerich, P.Polin, and W.E. Braselton. 1993. The reproductive effects of dietary heptachlor in mink (*Mustela vison*). Arch. Environ. Contam. Toxicol. 24:156-164.

Hill, E.F., R.G. Heath, J.W. Spann, and J.D. Williams. 1975. Lethal dietary toxicities of environmental pollutants to birds. U.S. Fish and Wildlife Service Special Scientific Report - Wildlife No. 191, Washington D.C.

Methoxychlor

Methoxychlor is a man made insecticide used to kill flies, cockroaches and mosquitoes. Methoxychlor is released to the environment from chemical plants that produce it and from hazardous waste sites. Methoxychlor remains in the atmosphere for under a month. Methoxychlor does not dissolve in water but instead binds to sediments where it is degraded. It bioaccumulates in some aquatic species but not in mammalian species due to high metabolism and elimination.

Methoxychlor is a structural analogue of the pesticide DDT. Renal nephrosis was observed in rats administered methoxychlor in their diets. In pigs fed methoxychlor, cytic tubular nephropathy and elevated blood urea nitrogen was observed (ATSDR 1992).

In an 11-month study on the effects of methoxychlor on the reproduction of rats, no significant effects were observed at doses of 50 ppm (Gray et al. 1988). This exposure level was considered to be a chronic NOAEL and was converted to a daily dose of 4 mg/kg/day. A dose of 100 ppm caused significant reduction in the fertility and litter size of the rats. This dose (8 mg/kg/day) was considered a chronic LOAEL. Mortality studies with quail indicate estimated chronic LOAEL and NOAEL values of 4050 and 405 mg/kg/day, respectively (Hill and Camardese 1986).

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1992. Toxicological profile for methoxychlor. U.S. Public Health Service, U.S. Department of Health and Human Services, Atlanta, GA.

Gray L.E., J.S. Ostby, and J.M. Ferrell. 1988. Methoxychlor induces estrogen-like alterations of behavior and the reproductive tract in the female rat and hamster: Effects on sex behavior, running wheel activity, and uterine morphology. Toxicol. Appl. Pharmacol. 96:525-540.

Hill, E.F. and M.B. Camardese. 1986. Lethal dietary toxicities of environmental contaminants and pesticides to Coturnix. U.S. Fish and Wildlife Service Technical Report 2.

SEMIVOLATILE ORGANICS

2-Methylnaphthalene

Mice exposed to 2-methylnaphthalene in the diet for 81 weeks showed systemic effects at a dose of 1437 mg/kg/day (the chronic LOAEL; ATSDR 1995). A chronic NOAEL was estimated by multiplying the chronic LOAEL by an uncertainty factor of 0.1. Information on the toxicity of 2-methylnaphthalene on birds was not available in the literature.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1995. Toxicological profile for polycyclic aromatic hydrocarbons (PAHs). August.

Bis(2-ethylhexyl)phthalate

Bis(2-ethylhexyl)phthalate (DEHP) is used in the production of polyvinyl chloride, where it is added to plastics to make them flexible. Acute animal tests, such as the LD_{50} test in rats, have shown DEHP to have low acute toxicity from oral exposure (RTECS 1993). Oral exposure animal studies indicate that DEHP has adverse effects on the liver, kidney, weight gain and food consumption, and can cause liver tumors in rats and mice. Tests on rats and mice demonstrated

that DEHP can cause developmental and reproductive toxicity, such as birth defects, decrease in testicular weights, and tubular atrophy (ATSDR 1993).

A literature search was conducted on the effects of bis(2-ethylhexyl)phthalate ingestion to mammals and birds. A 105-day study conducted on mice indicated that 1000 mg/kg of bis(2-ethylhexyl)phthalate in the diet caused significant reproductive effects (Lamb et al. 1987). The 1000 mg/kg dose was considered the chronic LOAEL. No adverse effects were observed among the 100 mg/kg dose group; this value was considered the chronic NOAEL. These dietary concentrations were converted to a daily doses of 183.3 mg/kg/day (LOAEL) and 18.3 mg/kg/day (NOAEL; Sample et al. 1996).

A 4-week study conducted on the reproductive effects of bis(2-ethylhexyl)phthalate to ringed doves indicated a chronic NOAEL of 10 ppm (Peakall 1974). No significant reproductive effects were observed among doves on diets containing 10 ppm of bis(2-ethylhexyl)phthalate. This dietary concentration was converted to daily dose (NOAEL) of 1.1 mg/kg/day (Sample et al. 1996). A chronic LOAEL was estimated by multiplying the chronic NOAEL by an uncertainty factor of 10.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1993. Toxicological profile for bis(2-ethylhexyl)phthalate. U.S. Public Health Service, U.S. Department of Health and Human Services, Atlanta, GA.

Lamb, J.C., IV, R.E. Chapin, J. Teaque, A.D. Lawton, and J.R. Real. 1987. Reproductive effects of four phthalic acid esters in a mouse. Toxicol. Appl. Pharmacol. 88:255-269.

Peakall, D.B. 1974. Effects of di-n-butylphthalate and di-2-ethylhexylphthalate on the eggs of ring doves. Bull. Environ. Contam. Toxicol. 12:698-702.

Registry of Toxic Effects of Chemical Substances (RTECS). 1993. Online database. U.S. Department of Health and Human Services. National Toxicology Information Program, National Library of Medicine. Bethesda, MD.

Sample, B.E., D.M. Opresko, and G.W. Suter II. 1996. Toxicological benchmarks for wildlife: 1996 revision. Risk Assessment Program, Health Sciences Research Division. Oak Ridge, Tennessee.

Polycyclic Aromatic Hydrocarbons (PAHs)

PAHs are virtually ubiquitous in nature, primarily as a result of natural processes such as forest fires, microbial synthesis, and volcanic activity. They have been detected in animal and plant tissues, sediments, soils, air, surface water, drinking water, and groundwater. Anthropogenic sources of PAHs in the environment include high temperature combustion of organic materials typical of processes used in the steel industry, heating and power generation, and petroleum refining.

Environmental concern has focused on PAHs, which range in molecular size from two-ring structures to seven-ring structures. The number of rings on the molecule strongly affects its biochemical interactions in the environment. Consequently, the fate, transport, and toxicity of PAHs correlate strongly with the size of the specific PAH molecule.

Relatively little information is known on the fate and transport of specific PAH compounds. Information on PAHs as a group is largely inferred from information on benzo(a)pyrene and mixtures of PAHs.

PAHs are moderately persistent in the environment and therefore may potentially cause significant effects to vegetation, wildlife and fish. The carcinogenicity of individual PAHs differs. Some lower weight compounds such as naphthalene, fluorene, phenanthrene, and anthracene exhibit acute toxicity and other adverse effects to some organisms, but are non-carcinogenic. In contrast, the higher molecular weight compounds are significantly less acutely toxic, but many are demonstrably carcinogenic, mutagenic, or teratogenic to a wide variety of organisms, including fish and other aquatic life, amphibians, birds, and mammals.

Acute and chronic exposure to carcinogenic PAHs have been shown to cause tumors in the stomach, lung, and skin. PAHs also have been associated with the destruction of hematopoietci and lymphoid tissues, ovatoxicity, adrenal necrosis, changes in intestinal and respiratory epithelia and immunosuppression.

The environmental effects of most non-carcinogenic PAHs are poorly understood. Available information suggests that these PAHs are not very potent teratogens or reproductive toxins. Effects include damage to the liver and kidney, and external effects of sebaceous gland ulceration.

Studies on PAH toxicity in birds indicated no mortality or visible signs of toxicity when fed 4,000 mg total PAH per kilogram of body weight for seven months. Another study reported acute oral effect levels for the red-winged blackbird and house sparrow and acenaphthene, phenanthrene and anthracene LD_{50}values exceeded 100 mg/kg of body weight for these species.

Few ingestion-based studies have been conducted on mammals using PAHs. Neal and Rigdon (1967) conducted a study on mice for the development of forestomach tumors. Mice were fed between 0.13 mg/kg/day and 32.5 mg/kg/day of PAH for 110 days. The highest dose produced tumors in 90 percent of the mice. The NOAEL was calculated at 1.3 mg/kg/day and the LOAEL was 2.6 mg/kg/day (4 percent occurrence of tumors) (Charters et al. 1996).

A study conducted on nestling European starlings indicated that a dose of 100 mg/kg/day of 7,12-dimethylbenz(a)anthracene caused an 11 percent reduction in mean body weight, a 16 percent reduction in mean hemoglobin concentrations, and a 90 percent reduction in lymphocyte proliferation (Trust et al. 1993). A dose of 10 mg/kg/day caused no adverse effects to nestling birds. Adult starlings dosed as high as 300 mg/kg/day showed no adverse effects.

References

Charters, D.W., N.J. Finley, and M. Huston. 1996. Draft report, preliminary ecological risk assessment, Avtex Fibers Site, Front Royal, Virginia. U.S. Environmental Protection Agency, Environmental Response Team Center, Office of Emergency and Remedial Response.

Neal, J. and R.H. Rigdon. 1967. Gastric tumors in mice fed benzo(a)pyrene: a quantitative study. Tex. Rep. Biol. Med. 25:553-557.

Trust, K.A., A. Fairbrother, and M.J. Hooper. 1993. Effects of 7,12-dimethylbenz(a)anthracene on immune function and mixed-function oxygenase activity in the European starling. Environ. Toxicol. and Chemistry. 13:821-830.

Acenaphthene

Mice fed acenaphthene orally for 13 weeks showed adverse reproductive effects at a dose of 3500 mg/kg/day (ATSDR 1995). This dose was considered a chronic LOAEL. A chronic NOAEL of 350 mg/kg/day was estimated by multiplying the chronic LOAEL by an uncertainty factor of 0.1. For birds, data for benzo(a)pyrene was applied to this chemical.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1995. Toxicological profile for polycyclic aromatic hydrocarbons (PAHs). August.

Anthracene

Mice fed anthracene orally for 13 weeks showed adverse reproductive effects at a dose of 10,000 mg/kg/day (ATSDR 1995). This dose was considered a chronic LOAEL. A chronic NOAEL of 1,000 mg/kg/day was estimated by multiplying the chronic LOAEL by an uncertainty factor of 0.1.

Mallards fed anthracene orally for 7 months showed adverse effects to the hepatic system at a dose of 228 mg/kg/day (Patton and Dieter 1980). This dose was considered a chronic LOAEL. A chronic NOAEL of 22.8 mg/kg/day was estimated by multiplying the chronic LOAEL by an uncertainty factor of 0.1.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1995. Toxicological profile for polycyclic aromatic hydrocarbons (PAHs). August.

Patton, J.F. and M.P. Dieter. 1980. Effects of petroleum hydrocarbons on hepatic function in the duck. Comp. Biochem. Physiol. 65C:33-36.

Benzo(a)anthracene

Information regarding benzo(a)anthracene was not available in the literature. Data for benzo(a)pyrene was applied to this chemical for both birds and mammals.

Benzo(a)pyrene

Female mice were fed benzo(a)pyrene during pregnancy. Adverse reproductive effects were found at a dose of 10 mg/kg/day (Sample et al. 1996). This dose was considered a chronic LOAEL. A chronic NOAEL of 1 mg/kg/day was estimated by multiplying the chronic LOAEL by an uncertainty factor of 0.1.

Mice fed benzo(a)pyrene orally for 19 to 29 days showed adverse reproductive effects at a dose of 1330 mg/kg/day (ATSDR 1995). This dose was considered a chronic LOAEL. A chronic NOAEL of 133 mg/kg/day was estimated by multiplying the chronic LOAEL by an uncertainty factor of 0.1.

Chickens were fed benzo(a)pyrene for 34 days. Adverse reproductive effects were found at a dose of 395 mg/kg/day (Rigdon and Neal 1963). This dose was considered a chronic LOAEL. A chronic NOAEL of 39.5 mg/kg/day was estimated by multiplying the chronic LOAEL by an uncertainty factor of 0.1.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1995. Toxicological profile for polycyclic aromatic hydrocarbons (PAHs). August.

Rigdon, R.H. and J. Neal. 1963. Fluorescence of chickens and eggs following the feeding of benzpyrene crystals. Texas Reports on Biology and Medicine 21(4):558-566.

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Benzo(b)fluoranthene

Information regarding benzo(b)fluoranthene was not available in the literature. Data for benzo(a)pyrene was applied to this chemical for both birds and mammals.

Benzo(g,h,i)perylene

Information regarding benzo(g,h,i)perylene was not available in the literature. Data for benzo(a)pyrene was applied to this chemical for both birds and mammals.

Benzo(k)fluoranthene

Information regarding benzo(k)fluoranthene was not available in the literature. Data for benzo(a)pyrene was applied to this chemical for both birds and mammals.

Carbazole

Information regarding carbazole was not available in the literature.

Chrysene

Information regarding chrysene was not available in the literature. Data for benzo(a)pyrene was applied to this chemical for both birds and mammals.

Dibenz(a,h)anthracene

Information regarding dibenz(a,h)anthracene was not available in the literature. Data for benzo(a)pyrene was applied to this chemical for both birds and mammals.

Dibenzofuran

Dibenzofuran is a polynuclear aromatic compound that may be found in coke dust, grate ash, fly ash, and flame soot. It has been listed as a pollutant of concern to EPA's Great Waters Program due to its persistence in the environment, potential to bioaccumulate, and toxicity to the environment.

A literature search was conducted on the toxicological effects of dibenzofuran ingestion to mammals and birds. Studies measuring the toxicological effects of dietary dibenzofuran were not available.

Fluoranthene

Mice fed fluoranthene orally for 13 weeks showed adverse effects to the hepatic system at a dose of 1250 mg/kg/day (ATSDR 1995). This dose was considered a chronic LOAEL. A chronic NOAEL of 125 mg/kg/day was estimated by multiplying the chronic LOAEL by an uncertainty factor of 0.1. For birds, data for benzo(a)pyrene was applied to this chemical.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1995. Toxicological profile for polycyclic aromatic hydrocarbons (PAHs). August.

Fluorene

Mice fed fluorene orally for 13 weeks showed adverse hematological effects at a dose of 1250 mg/kg/day (ATSDR 1995). This dose was considered a chronic LOAEL. A chronic NOAEL of 125 mg/kg/day was estimated by multiplying the chronic LOAEL by an uncertainty factor of 0.1. For birds, data for benzo(a)pyrene was applied to this chemical.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1995. Toxicological profile for polycyclic aromatic hydrocarbons (PAHs). August.

Indeno(1,2,3-cd)pyrene

Information regarding indeno(1,2,3-cd)pyrene was not available in the literature. Data for benzo(a)pyrene was applied to this chemical for both birds and mammals.

Naphthalene

Mice fed naphthalene orally for 13 weeks showed adverse reproductive effects at a dose of 1400 mg/kg/day (ATSDR 1995). This dose was considered a chronic LOAEL. A chronic NOAEL of 140 mg/kg/day was estimated by multiplying the chronic LOAEL by an uncertainty factor of 0.1.

Mallards fed naphthalene orally for 7 months showed adverse effects to the hepatic system at a dose of 228 mg/kg/day (Patton and Dieter 1980). This dose was considered a chronic LOAEL. A chronic NOAEL of 22.8 mg/kg/day was estimated by multiplying the chronic LOAEL by an uncertainty factor of 0.1.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1995. Toxicological profile for polycyclic aromatic hydrocarbons (PAHs). August.

Patton, J.F. and M.P. Dieter. 1980. Effects of petroleum hydrocarbons on hepatic function in the duck. Comp. Biochem. Physiol. 65C:33-36.

Phenanthrene

Information regarding phenanthrene was not available in the literature. Data for benzo(a)pyrene was applied to this chemical for both birds and mammals.

Pyrene

Information regarding pyrene was not available in the literature. Data for benzo(a)pyrene was applied to this chemical for both birds and mammals.

VOLATILE ORGANICS

2-Butanone

2-butanone is a manufactured chemical but it is also present in the environment from natural sources. It is used in paints, glues, and as a cleaning agent. 2-butanone is also produced naturally

by some trees and is found in some fruits and vegetables in small amounts (ATSDR 1992). It is also known as methyl ethyl ketone (MEK).

2-butanone enters the air during production, use and transport, and from hazardous waste sites. It dissolves in water and is broken down to a simpler chemical form in about 2 weeks. It does not adsorb to soil, therefore it is highly mobile and can infiltrate to the groundwater. It is not known to bioaccumulate in fish or animal tissues and does not biomagnify in the food chain (ATSDR 1992).

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1990. Toxicological profile for 2-butanone. U.S. Public Health Service, U.S. Department of Health and Human Services, Atlanta, GA.

Acetone

Acetone is a manufactured chemical that is also found naturally in the environment. Acetone is used to make plastic, fibers, drugs, and other chemicals. It is also used to dissolve other substances. It occurs naturally in plants, trees, volcanic gases, forest fires, and as a product of the breakdown of body fat. Industrial processes contribute more acetone to the environment than natural processes (ATSDR 1994).

Acetone is transported from the atmosphere into surface water and soil by rain and snow. It also moves quickly from soil and water back to air. Acetone does not bind to soil or bioaccumulate in animals and is broken down by microorganisms in soil and water (ATSDR 1994).

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1994. Toxicological profile for acetone. U.S. Public Health Service, U.S. Department of Health and Human Services, Atlanta, GA.

Carbon Disulfide

The chief uses of carbon disulfide are for the manufacture of rayon and for regenerated cellulose film. Acute and chronic exposure to carbon disulfide affects the central nervous system.

Chloromethane

Chloromethane is a clear colorless gas that is produced naturally in the oceans and by microbial fermentation, and by industry to create other chemicals. Chloromethane evaporates into the air where it can remain for up to two years. If present in a landfill, it can leach through the soil and infiltrate groundwater.

Ethylbenzene

Ethylbenzene occurs naturally in coal tar and petroleum and is also found in many man-made products including paints, inks, and insecticides. Gasoline contains about 2 percent (by weight) ethylbenzene. Ethylbenzene is a colorless liquid that smells like gasoline. It evaporates at room temperature and burns easily. Ethylbenzene is most commonly found as a vapor because it evaporates easily into the air from water and soil. Once in the air, other chemicals help break down ethylbenzene into chemicals found in smog. This breakdown happens in about 3 days with the aid of sunlight. In surface water such as rivers and harbors, ethylbenzene breaks down by reacting with other compounds naturally present in water. In soil, bacteria break down ethylbenzene. It can also infiltrate groundwater since it does not readily bind to soil (ATSDR 1990).

A chronic study on the effects of ethylbenzene on rats showed adverse effects to the liver and kidney at a dose of 971 mg/kg/day (Wolf et al. 1956). This dose is considered a chronic LOAEL. A chronic NOAEL of 97.1 mg/kg/day was estimated by multiplying the chronic LOAEL by an uncertainty factor of 0.1. No data were found on the toxicological effects to birds from ingestion exposures.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1990. Toxicological profile for ethylbenzene. U.S. Public Health Service, U.S. Department of Health and Human Services, Atlanta, GA.

Wolf, M.A., V.K. Rowe, D.D. McCollister, R.L. Hollinsworth, and F. Oyen. 1956. Toxicological studies of certain alkylated benzenes and benzene. Arch. Ind. Health. 14:387-398.

Trichloroethene

A study on the effects of trichloroethene on rats showed adverse reproductive effects at a dose of 10,000 mg/kg/day (Coulston and Kolbye 1994). This dose is considered a chronic LOAEL. A chronic NOAEL of 1,000 mg/kg/day was calculated by multiplying the chronic LOAEL by an uncertainty factor of 0.1. No data were found on the toxicological effects to birds from ingestion exposures.

References

Coulston, F. and A.C. Kolbye, Jr. (eds). 1994. Interpretive review of the potential adverse effects of chlorinated organic chemicals on human health and the environment. Regulatory Toxicology and Pharmacology. 20:S1-S1056.

Xylenes

Xylene is primarily a man-made chemical that is produced from petroleum and coal. Xylene also occurs naturally in petroleum and coal tar, and is formed during forest fires. There are three forms or isomers of xylene including *meta*-xylene, *ortho*-xylene, and *para*-xylene.

Xylene evaporates and burns easily. Xylene does not mix well with water, however, it does mix with alcohol and with many other chemicals. Xylene is a liquid and it can leach into soil, surface water (creeks, streams, and rivers), and groundwater where it can remain for 6 months or longer before it is broken down into other chemicals. Because it evaporates readily, most xylene is transported to the air, where it lasts for several days and is broken down by sunlight into other kinds of chemicals.

Results of studies with animals indicate that large amounts of xylene can cause changes in the liver and adverse effects on the kidney, lung, heart, and nervous system. Short-term exposure to high concentrations of xylene causes death in some animals, as well as muscular spasms, incoordination, hearing loss, changes in behavior, changes in organ weights, and changes in enzyme activity. Long-term exposure to low concentrations of xylene has not been well studied in animals (ATSDR 1990).

A study on the effects of xylene on the reproduction in mice indicated a chronic LOAEL of 2.6 mg/kg/day (Marks et al. 1982). A dose of 2.6 mg/kg/day showed significantly reduced fetal weights and increased the incidence of fetal malformations. While the xylene exposure studies were of a short duration, they occurred during a critical lifestage. The highest dose that produced no adverse effects (2.1 mg/kg/day) was considered to be a chronic NOAEL.

Quail exposed to xylene in the diet showed chronic effects at an estimated dose of 405 mg/kg/day (Hill and Camardese 1986). A chronic NOAEL of 40.5 mg/kg/day was estimated by multiplying this chronic LOAEL by an uncertainty factor of 0.1.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1990. Toxicological profile for xylene. U.S. Public Health Service, U.S. Department of Health and Human Services, Atlanta, GA.

Hill, E.F. and M.B. Camardese. 1986. Lethal dietary toxicities of environmental contaminants and pesticides to Coturnix. U.S. Fish and Wildlife Service Technical Report 2.

Marks, T.A., T.A. Ledoux, and J. A. Moore. 1982. Teratogenicity of a commercial xylene mixture in the mouse. J. Toxicol. Environ. Health. 9:97-105.

APPENDIX K
ENDPOINTS, EXPOSURE ESTIMATE, AND RISK CALCULATION FOR UPPER TROPHIC LEVEL RECEPTORS

APPENDIX K
ENDPOINTS, EXPOSURE ESTIMATE, AND RISK CALCULATION FOR UPPER TROPHIC LEVEL RECEPTORS

The sections that follow present the methodology used to conduct the conservative and more realistic exposure estimate for upper trophic level receptors. Assessment and measurement endpoints, as well as the specific receptors selected to represent the endpoints are also presented and discussed.

K.1 Endpoints and Hypotheses

Two types of endpoints, assessment endpoints and measurement endpoints, are defined as part of the ERA process as are risk hypotheses or risk questions (USEPA 1997). An assessment endpoint is an explicit expression of the environmental component or value that is to be protected. A measurement endpoint is a measurable ecological characteristic that is related to the component or value chosen as the assessment endpoint. The considerations for selecting assessment and measurement endpoints are summarized in USEPA (1997) and discussed in detail in Suter II (1989, 1990, and 1993). Risk hypotheses are testable hypotheses about the relationship among the assessment endpoints and their predicted responses when exposed to contaminants.

Endpoints in the risk assessment process define ecological attributes that are to be protected (assessment endpoints) and a measurable characteristic of those attributes (measurement endpoints) that can be used to gauge the degree of impact that has or may occur. Assessment endpoints most often relate to attributes of biological populations or communities, and are intended to focus the risk assessment on particular components of the ecosystem that could be adversely affected by chemicals attributable to the site (USEPA 1997). Assessment endpoints contain an entity (e.g., great blue heron population) and an attribute of that entity (e.g., survival rate). Individual assessment endpoints usually encompass a group of species or populations (the receptor) with some common characteristic, such as specific exposure route or chemical sensitivity, with the receptor then used to represent the assessment endpoint in the risk evaluation.

Assessment and measurement endpoints may involve ecological components from any level of biological organization, from individual organisms to the ecosystem itself (USEPA 1992). Effects on individuals are important for some receptors, such as rare and endangered species.

Population- and community-level effects are typically more relevant to ecosystems. Population- and community-level effects are usually difficult to evaluate directly without long-term and extensive study. However, measurement endpoint evaluations at the individual level, such as an evaluation of the effects of chemical exposure on reproduction, can be used to predict effects on an assessment endpoint at the population or community level.

Assessment endpoints, risk hypotheses, and measurement endpoints selected for the evaluation of upper trophic level receptors are summarized in Table K-1. It is noted that these endpoints are selected as part of Step 3a to evaluate potential upper trophic level risks contributed by site contaminants. These endpoints are distinct from those that would be selected in Steps 3b and 4. As evidenced by Table K-1, the assessment endpoints selected were based on survival, growth, and reproduction. These population traits of interest for each of the assessment endpoints represent components of a healthy population. Failure or impairment of survival, growth, or reproduction will adversely affect the ability of the population to be healthy and viable and fill its appropriate role in an ecosystem.

K.2 Selection of Upper Trophic Level Ecological Receptors

Because of the complexity of natural systems, it is generally not possible to directly assess the potential impacts to all upper trophic level ecological receptors present within an area. Therefore, specific receptor species (e.g., great blue heron) are often selected as surrogates to evaluate potential risks to larger components of the ecological community (e.g., piscivorous birds) that were selected to represent the assessment endpoints (e.g., survival, growth, and reproduction of piscivorous birds). Selection criteria typically include those species that:

- Are known to occur, or are likely to occur, at the site;
- Have a particular ecological, economic, or aesthetic value;
- Are representative of taxonomic groups, life history traits, and/or trophic levels in the habitats present at the site for which complete exposure pathways are likely to exist;
- Can, because of toxicological sensitivity or potential exposure magnitude, be expected to represent potentially sensitive populations at the site; and

- Have sufficient ecotoxicological information available on which to base an evaluation.

The upper trophic level receptor species listed below have been chosen for dietary exposure modeling based on the criteria listed above, the general guidelines presented in USEPA (1991), and the assessment endpoints presented in Table K-1.

Terrestrial species:

- American robin (*Turdus migratorius*) (avian omnivore)
- Easter screech owl (*Otus asio*) (avian carnivore)
- Red-tailed hawk (*Buteo jamaicensis*) (avian carnivore)
- Meadow vole (*Microtus pennsylvanicus*) (mammalian herbivore)
- Short-tailed shrew (*Blarina carolinensis carolinensis*) (mammalian insectivore)
- White-footed mouse (*Peromyscus maniculatus nubiterrae*) (mammalian omnivore)
- Red fox (*Vulpes vulpes*) (mammalian carnivore)

***Aquatic species*:**

- Great blue heron (*Ardea herodias*) (avian piscivore)
- Marsh wren (*Cistothorus palustris*) (avian insectivore)
- Raccoon (*Procyon lotor*) (semi-aquatic mammalian omnivore)
- Mink (*Mustela vison*) (semi-aquatic mammalian carnivore [piscivore])

With the exception of the red-tailed hawk, the upper trophic level receptors listed above were identified in the RI Work Plan. The red-tailed hawk was added to the list of upper trophic level receptors because this avian carnivore was observed during a site visit conducted in July 2001.

K.3 Conservative Evaluation

Upper trophic level receptor exposures to chemicals in surface soil, surface water, and/or sediment were determined by estimating the concentration of each chemical in each relevant dietary component using uptake and food web models. Ingestion of surface soil, surface water, and/or sediment was included when calculating the total exposure.

Not all surface soil, surface water, and sediment ECOCs were evaluated for food web exposures. The specific chemicals evaluated were limited to those ECOCs identified as important bioaccumulative chemicals by the USEPA (2000). Bioaccumulative chemicals are identified in Section 7, Tables 7-9 through 7-14.

Dietary items for which tissue concentrations were modeled included terrestrial plants, soil invertebrates (earthworms are the standard surrogate), small mammals (meadow vole, short-tailed shrew, and white-footed mouse), aquatic plants, aquatic invertebrates, and fish. The methodologies used for estimation of tissue concentrations are outlined in the following section. The uptake of chemicals from the abiotic media into these food items is based (where available) on conservative (e.g., maximum or 90th percentile) Bioconcentration Factors (BCFs) or Bioaccumulation Factors (BAFs) from the literature. A default BCF/BAF value of 1.0 was used for those bioaccumulative ECOCs lacking literature-based values.

K.3.1 Exposure Point Concentrations

Exposure point concentrations for upper trophic level terrestrial and aquatic dietary items were estimated using BAF/BCF models and maximum measured media concentrations. The methodology and models used to derive these estimates are described below. A BCF indicates the degree to which a chemical may accumulate in organisms coincident with the concentration of the chemical in the surrounding media. They are calculated by dividing the concentration of a chemical in the tissue of organisms by the concentration in the surrounding media. In the absence

of tissue data for aquatic life, BCF values for organic chemicals can be estimated from their log K_{ow} value. BCF values do not account for the uptake of chemicals from dietary exposures. BAF values consider both direct exposures to the surrounding media, as well as uptake from dietary exposures.

Terrestrial Plants. Tissue concentrations in the aboveground vegetative portion of terrestrial plants were estimated by multiplying the maximum measured surface soil concentration for each Bioaccumulative ECOPC by chemical-specific conservative (e.g., maximum or 90th percentile) soil-to-plant BCFs obtained from the literature. The BCF values used were based on root uptake from soil and on the ratio between dry-weight soil and dry-weight plant tissue. Literature values based on the ratio between dry-weight soil and wet-weight plant tissue were converted to a dry-weight basis by dividing the wet-weight BCF by the estimated solids content for terrestrial plants (15 percent [0.15]; Sample et al. 1997).

The BCFs for terrestrial plants were those reported in Baes et al. (1984) or Bechtel Jacobs (1998a). For organic chemicals without literature based BCFs, soil-to-plant BCFs were estimated using the algorithm provided in Travis and Arms (1988):

$$log\ B_v = 1.588 - (0.578)\ (log\ K_{ow}) \qquad \text{(Equation K-1)}$$

where:

B_v = Soil-to-plant BCF (unitless; dry weight basis)

K_{ow} = Octanol-water partitioning coefficient (unitless)

The log K_{ow} values used in the calculations were obtained primarily from USEPA (1995) and are listed in Table K-2. The soil-to-plant BCFs used in the conservative evaluation are summarized in Table K-3.

Earthworms. Tissue concentrations in soil invertebrates (earthworms) were estimated by multiplying the maximum measured surface soil concentration for each bioaccumulative ECOC by chemical-specific conservative (e.g., maximum or 90th percentile) BCFs or BAFs obtained from the literature. BCFs are calculated by dividing the concentration of a chemical in the tissues of an organism by the concentration of that same chemical in the surrounding environmental medium (in this case, soil) without accounting for uptake via the diet. BAFs consider both direct

exposure to soil and exposure via the diet. Since earthworms consume soil, BAFs are more appropriate values and were used in the food web models when available. BAFs based on depurated analyses (soil was purged from the gut of the earthworm prior to analysis) were given preference over undepurated analyses when selecting BAF values since direct ingestion of soil is accounted for separately in the food web model. The specific BAFs used were those reported by the references cited on Table K-3.

The BCF/BAF values are based on the ratio between dry-weight soil and dry-weight earthworm tissue. Literature values based on the ratio between dry-weight soil and wet-weight earthworm tissue were converted to a dry-weight basis by dividing the wet-weight BCF/BAF by the estimated solids content for earthworms (16 percent [0.16]; USEPA 1993). For bioaccumulative ECOCs without available measured BAFs or BCFs, an earthworm BAF of 1.0 was assumed. The soil-to-invertebrate BCFs/BAFs used in the conservative evaluation are summarized on Table K-3.

Small Mammals. Whole-body tissue concentrations in small mammals (omnivores) were estimated using one of two methodologies. For chemicals with literature-based soil-to-small mammal BAFs, the small mammal tissue concentration was obtained by multiplying the maximum measured surface soil concentration for each chemical by a chemical-specific conservative (e.g., maximum or 90th percentile) soil-to-small mammal BAF. The BAF values used were based on the ratio between dry-weight soil and whole-body dry-weight tissue. Literature values based on the ratio between dry-weight soil and wet-weight tissue were converted to a dry-weight basis by dividing the wet-weight BAF by the estimated solids content for small mammals (32 percent [0.32]; USEPA 1993). BAFs for shrews were those reported in Sample et al. (1998b) for insectivores (or for general small mammals if insectivore values were unavailable), for voles were those reported for herbivores, and for mice were those reported for omnivores. The soil-to-small mammal BAFs used in the conservative evaluation are summarized in Table K-4.

For those chemicals without soil-to-small mammal BAF values, an alternate approach is used to estimate whole-body tissue concentrations. Because most chemical exposure for these small mammal species is via the diet, it is assumed that the concentration of each chemical in the small mammal's tissues is equal to the chemical concentration in its diet, that is, a diet to whole-body

BAF (wet-weight basis) of one is assumed. Resulting tissue concentrations (wet-weight) are then converted to dry weight using an estimated solids content of 32 percent (see above).

The use of a diet to whole-body BAF of one is likely to result in a conservative estimate of chemical concentrations for chemicals that are not known to biomagnify in terrestrial food chains (e.g., aluminum). For chemicals that are known to biomagnify (e.g., PCBs), a diet to whole-body BAF value of one will likely result in a realistic estimate of tissue concentrations based on reported literature values. For example, a maximum BAF (wet weight) value of 1.0 was reported by Simmons and McKee (1992) for PCBs based on laboratory studies with white-footed mice. Menzie et al. (1992) reported BAF values (wet-weight) for dichlorodiphenyltrichloroethane (DDT) of 0.3 for voles and 0.2 for short-tailed shrews. Reported BAF (wet-weight) values for dioxin are only slightly above one (1.4) for the deer mouse (USEPA 1990).

Aquatic Plants. Tissue concentrations in the vegetative portion of aquatic plants were estimated using the same methodologies as described above for terrestrial plants except that maximum sediment (not soil) concentrations were used in the calculation.

Aquatic Invertebrates. Tissue concentrations in aquatic invertebrates were estimated by multiplying the maximum sediment concentration for each bioaccumulative ECOC by chemical-specific conservative (e.g., maximum or 90th percentile) sediment-to-invertebrate BAFs obtained from the literature. The BAF values were based on the ratio between dry-weight sediment and dry-weight invertebrate tissue. BAFs based on depurated analyses (sediment was purged from the gut of the organism prior to analysis) were given preference over undepurated analyses when selecting BAF values since direct ingestion of sediment was accounted for separately in the food web model.

Literature values based on the ratio between dry-weight sediment and wet-weight invertebrate tissue were converted to a dry-weight basis by dividing the wet-weight BAF by the estimated solids content for aquatic invertebrates (21 percent [0.21]; USEPA 1993). For chemicals without literature based sediment-to-invertebrate BAFs, a BAF of 1.0 is assumed. The sediment-to-invertebrate BAFs used in the conservative evaluation are summarized in Table K-5.

Fish. Tissue concentrations in whole-body fish were estimated by multiplying the maximum measured sediment concentration for each bioaccumulative ECOC by chemical-specific

conservative (e.g., maximum or 90th percentile) sediment-to-fish BAFs obtained from the literature. The BAF values used were based on the ratio between dry-weight sediment and dry-weight fish tissue. Literature values based on the ratio between dry-weight sediment and wet-weight fish tissue were converted to a dry-weight basis by dividing the wet-weight BAF by the estimated solids content for aquatic invertebrates (25 percent [0.25]; USEPA 1993). For chemicals without literature based sediment-to-fish BAFs, a BAF of 1.0 was assumed. The sediment-to-fish BAFs used in the conservative evaluation are summarized in Table K-5.

K.3.2 Dietary Intakes

Dietary intakes for each upper trophic level receptor species was calculated using the following formula (Equation K-2) modified from USEPA (1993).

$$DI_x = \frac{[[\sum_i [(FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)] + [(WIR)(WC_x)]][AUF]}{BW}$$

where:

DI_x	=	Dietary intake for chemical x (mg chemical/kg body weight/day)
FIR	=	Food ingestion rate (kg/day, dry-weight)
FC_{xi}	=	Maximum concentration of chemical x in food item i (mg/kg, dry weight)
PDF_i	=	Proportion of diet composed of food item i (mg/kg, dry weight basis)
SC_x	=	Maximum concentration of chemical x in soil/sediment (mg/kg, dry weight)
PDS	=	Proportion of diet composed of soil/sediment (dry weight basis)
WIR	=	Water ingestion rate (L/day)
WC_x	=	Maximum concentration of chemical x in surface water (mg/L)
BW	=	Body weight (kg, wet weight)
AUF	=	Area Use Factor (unitless)

Conservative life history information and receptor-specific exposure parameters (maximum food ingestion rates, maximum water ingestion rates, and minimum body weights) and dietary compositions are provided in Table K-6. It is noted that many of the values in this table were provided by the EPA's Wildlife Exposure Factor Handbook (USEPA 1993). In some cases (e.g., eastern screech owl) receptors were not listed specifically in the handbook; however, allometric

equations for food and water ingestion provided in the handbook (e.g., for birds) were used to estimate exposure parameters presented on the table.

Often, food and water ingestion rates are reported in the literature in units of gram of water per gram of organism per day or kilogram of food per kilogram of organism per day. Water ingestion rates are converted to units of liters of water per day by dividing the reported value by 1000 (1 liter of water equals 1000 grams of water) and multiplying by a maximum estimate of body weight for that species (Equation K-3):

WIR (g H_2O/g animal/day) * (1 L H_2O/1000 g H_2O) * BW (g animal [maximum]) = WIR (L/day)

Likewise, food ingestion rates are converted to units of kilograms of food per day by multiplying the reported value by a maximum estimate of body weight for the species in question (Equation K-4):

FIR (kg food/ kg animal/ day) * BW (kg animal [maximum]) = FIR (kg food/day)

It is noted that maximum body weights are used in these unit conversion so as to provide the most conservative estimates (i.e., maximum values) of food and water ingestion for a given species. Conversely, minimum body weights are used in the conservative dose estimate in the denominator of equation K-2.

To estimate maximum food and water ingestion rates, For each upper trophic level receptor, an AUF of 1.0 was assumed (i.e., each receptor is assumed to spend 100 percent of its time within the site). As such, receptor-specific home ranges were not considered in the estimation of dietary intakes.

K.3.3 Ingestion-Based Screening Values

Ingestion-based screening values for dietary exposures were derived for each receptor species and bioaccumulative ECOC. Toxicological information from the literature for wildlife species most closely related to the receptor species was used, where available, but was also supplemented by laboratory studies of non-wildlife species (e.g., laboratory mice) when necessary. The ingestion-

based screening values are expressed as milligrams of the chemical per kilogram body weight of the receptor per day (mg/kg-BW/day).

Growth and reproduction are emphasized as assessment endpoints since they are the most relevant, ecologically, to maintaining viable populations and because they are generally the most studied chronic toxicological endpoints for ecological receptors. If several chronic toxicity studies were available from the literature, the most appropriate study is selected for each receptor species based on study design, study methodology, study duration, study endpoint, and test species. No Observed Adverse Effect Levels (NOAELs) based on growth and reproduction were utilized, where available, as the screening values. When chronic NOAEL values were unavailable, estimates were derived or extrapolated from chronic Lowest Observed Adverse Effect Levels (LOAELs) or acute values as follows:

- When values for chronic toxicity were not available, the median lethal dose (LD_{50}) was used. An uncertainty factor of 100 was used to convert the acute LD_{50} to a chronic NOAEL (i.e., the LD_{50} was multiplied by 0.01 to obtain the chronic NOAEL).

- An uncertainty factor of 10 was used to convert a reported LOAEL to a NOAEL (USEPA 1997).

Ingestion screening values for birds and mammals are summarized in Tables K-7 and K-8, respectively. It is noted that the ingestion-based screening values summarized in Tables K-7 and K-8 are based on toxicological studies with avian or mammalian species other than those selected as receptor species for this investigation. For the conservative evaluation, NOAEL and LOAEL values were not adjusted to reflect differences in body weights between test species and receptor species.

K.3.4 Risk Calculation

For a given bioaccumulative chemical, an HQ value was calculated by dividing the maximum exposure dose by the corresponding ingestion-based screening value. HQs greater than or equal to 1.0 indicate the potential for risk since the dose (exposure) exceeds the screening value (effect). It is noted that exposure doses are derived using intentionally conservative assumptions

(maximum media concentrations, maximum ingestion rates, and minimum body weights) such that HQs greater than or equal to 1.0 do not necessarily indicate that risks are present or impacts are occurring. Rather, they identify chemical-pathway-receptor combinations requiring further evaluation. Following the same reasoning, HQs less than one indicate that risks are very unlikely, enabling a conclusion of no unacceptable risk to be reached with high confidence.

K.4 More Realistic Evaluation

The preceding sections presented a conservative approach that was used to conduct the exposure estimate and risk calculation for upper trophic level receptors. A less conservative, more realistic evaluation, designed to be more representative of actual risks that may exist at the site, was also conducted using refined exposure assumptions. The specific assumptions and methods that were modified for use in the more realistic evaluation are identified below, along with justification for each modification.

- Maximum chemical concentrations were replaced by average (arithmetic mean) chemical concentrations. Arithmetic means were calculated assuming concentrations of one-half the detection limit for non-detected chemicals. If the mean concentration was greater than the maximum detected concentration for a given detected chemical, the maximum detected concentration was used. For individual upper trophic level receptor species, average chemical concentrations provide a better estimate of the likely level of chemical exposure because each receptor would be expected to forage in several different areas of the site, and, in many cases, off-site.

- Literature-based BCFs and BAFs based on, or modeled from, central tendency estimates (e.g., mean, median, midpoint) were used in place of maximum or high-end (e.g., maximum or 90th percentile) estimates for many chemicals. The statistical distribution of the data set from which the literature value was estimated was considered when selecting appropriate BCFs and BAFs. For example, if the data were normally distributed an arithmetic mean may be selected for use in the more realistic evaluation, whereas if the data were lognormally distributed a geometric mean may be selected. An assumed BCF/BAF of 1.0 was still used for those chemicals lacking a literature-based BAF/BCF. A summary of the surface soil-to-terrestrial plant BCFs and surface soil-to-terrestrial invertebrate BAFs, surface soil-

to-small mammal BAFs, and sediment-to-invertebrate and sediment-to-fish BAFs used in the more realistic evaluation are summarized in Tables K-9, K-10, and K-11, respectively.

- Central tendency estimates (e.g., mean, median, midpoint) for body weight, surface water ingestion rate, and food ingestion rate (see Table K-12) were used to develop exposure estimates for upper trophic level receptors rather than the minimum body weights and maximum ingestion rates used in the conservative evaluation. Conversion of food ingestion rates and water ingestion rates, as described in the conservative evaluation, were calculated using central tendency (e.g., mean) estimates of receptor body weights. The use of central tendency exposure parameter estimates is more realistic because they represent the characteristics of a greater proportion of the individuals in the population. The evaluation of food web exposures still assumed an AUF of 1.0.

- Although body-weight scaling factors are typically used for interspecies extrapolation among mammals to account for differences between receptor and test organism body weights (Travis and White 1988 and Travis et al. 1990), the ingestion-based screening values summarized in Table K-8 were not adjusted in the conservative evaluation. Differences in body weights between the mammalian test species and mammalian receptor species was accounted for in the more realistic evaluation by converting the test species NOAEL and LOAEL to receptor-based values. Using the NOAEL as an example, this was accomplished by the following scaling equation (Sample et al. 1996):

$$NOAEL_w = NOAEL_t\ (BW_t / BW_w)1/4 \quad \text{(Equation K-5)}$$

where:

$NOAEL_w$	=	NOAEL of wildlife species (mg/kg/day)
$NOAEL_t$	=	NOAEL of test species (mg/kg/day)
BW_w	=	Body weight of wildlife species (kg)
BW_t	=	Body weight of test species (kg)

Sample et al. (1996) consider a scaling factor of 1.0 most appropriate for interspecies extrapolation between birds. Therefore, the literature-derived

NOAEL and LOAEL values summarized in Table K-7 were not adjusted to reflect differences in body weight between avian test species and receptor species.

K.5 UNCERTAINTIES

The procedures used in this evaluation to assess risks to upper trophic level ecological receptors, as in all such assessments, are subject to uncertainties because of the limitations of the available data and the need to make certain assumptions and extrapolations based on incomplete information. The major sources uncertainties associated with food web modeling are presented and discussed below.

Field sampling. The analytical data used in the ERA were derived from abiotic media that were collected in manner such that likely areas of contamination were preferentially sampled. This directed sampling effort would tend to provide a relatively accurate estimation of maximum exposure point concentrations, but an overestimation of exposure point concentrations at the population level. This uncertainty was reduced through the use of mean media concentrations in the refined risk evaluation. Conversely, the field sampling program may not have adequately characterized the extent and nature of contamination at a given site. This scenario would result in an underestimation of potential risks.

Exposure Point Concentrations. The maximum measured contaminant concentration provides a conservative estimate for immobile biota or those with a limited home range. The most realistic exposure estimates for mobile species with relatively large home ranges and for species populations (even those that are immobile or have limited home ranges) are those based on the mean chemical concentrations in each medium to which these receptors are exposed. This is reflected in the wildlife dietary exposure models contained in the Wildlife Exposure Factors Handbook (USEPA 1993), which specify the use of average media concentrations. Given the mobility of the upper trophic level receptor species used in the ERA, the use of maximum chemical concentrations (rather than mean concentrations) to estimate the exposure via food webs is very conservative. The use of mean media concentrations in the refined risk evaluation eliminated this uncertainty associated with use of maximum concentrations.

Ingestion-Based Screening Values. Data on the toxicity of many chemicals to the receptor species were sparse or lacking, requiring the extrapolation of data from other wildlife species or from laboratory studies with non-wildlife species. This is a typical limitation for ecological risk assessments because so few wildlife species have been tested directly for most chemicals. The uncertainties associated with toxicity extrapolation were minimized through the selection of the most appropriate test species for which suitable toxicity data were available. The factors considered in selecting a test species to represent a receptor species included taxonomic relatedness, trophic level, foraging method, and similarity of diet.

A second uncertainty related to the derivation of ingestion screening values applies to metals. Most of the toxicological studies on which the ingestion screening values for metals were based used forms of the metal (such as salts) that have high water solubility and high bioavailability to receptors. Since the analytical samples on which site-specific exposure estimates were based measured total metal, regardless of form, and these highly bioavailable forms are expected to compose only a fraction of the total metal concentration, this is likely to result in an overestimation of potential risks for these chemicals.

A third source of uncertainty associated with the derivation of ingestion screening values concerns the use of uncertainty factors. For example, LOAELs were extrapolated to NOAELs using an uncertainty factor of ten. This approach is likely to be conservative since Dourson and Stara (1983) determined that 96 percent of the chemicals included in a data review had LOAEL/ NOAEL ratios of five or less. The use of an uncertainty factor of 10, although potentially conservative, also serves to counter some of the uncertainty associated with interspecies extrapolations, for which a specific uncertainty factor was not used.

A fourth uncertainty associated with ingestion-based screening values applied to chromium. The mammalian ingestion-based screening value used for chromium was derived from a study that used hexavalent chromium as the test material. This is likely to result in an overestimation of risks because hexavalent chromium is more toxic that trivalent chromium, and analyses at the site measured total chromium (a mixture of hexavalent and trivalent forms). For birds, the only ingestion-based screening value available from the literature was based on a study that used trivalent chromium as the test material. The use of this screening value for birds may result in an underestimation of potential risks if hexavalent chromium is present at the site.

Use of NOAEL-Based Screening Values. The use of NOAEL-based screening values in risk calculations for upper trophic level receptors is extremely conservative since they give no indication as to how much higher a concentration must be before adverse effects are observed. For this reason, HQs calculated based on LOAELs are also provided in the risk summary tables.

Chemical Interactions. The conclusions of the risk evaluation to upper trophic level receptors are based on independent effects of chemicals. The potential does exist for multiple chemicals in environmental media to interact. Much uncertainty is involved with the interpretation of chemical interactions due to the complexity of potential effects and due to varying toxicities of compounds in different species. For these reasons, cumulative effects are not addressed in this ERA. This could result in an underestimation of risk if there are additive or synergistic effects among chemicals or an overestimation of risks if there are antagonistic effects among chemicals.

Food Web Exposure Modeling. In the screening-level ERA, chemical concentrations in terrestrial and aquatic food items (plants, earthworms, small mammals, aquatic invertebrates, fish, and frogs) were modeled from maximum measured media concentrations and were not directly measured. The use of generic, literature-derived exposure models and bioaccumulation factors introduces some uncertainty into the resulting estimates. The values selected and the methodology employed were intended to provide a conservative estimate of potential food web exposure concentrations. This uncertainty was reduced in the refined risk evaluation, where mean media concentrations and mean or median BAFs/BCFs were used to estimated chemical concentrations in upper trophic level food items.

A second source of uncertainty associated with the food web models applies to the use of default assumptions for exposure parameters such as bioconcentration and bioaccumulation factors (BCFs/BAFs). Although BCFs or BAFs for many bioaccumulative chemicals were readily available from the literature and were used in the conservative and more realistic risk evaluations, the use of a default factor of 1.0 to estimate the concentration of some chemicals in receptor prey items is a source of uncertainty. For most chemicals, the assumption that the chemical body burden in the prey item is at the same concentration as in soil or sediment is conservative, particularly for many metals, including aluminum, iron, and manganese, which are known not to bioaccumulate to any significant degree.

The use of literature-based BAF and BCFs to estimate contaminant concentrations in aquatic invertebrates and fish also adds uncertainty to the risk assessment. Site specific sediment conditions, including acid volatile sulfides, total organic carbon, and sediment grain size can significantly influence the bioavailability of certain compounds. Although it is common for aquatic assessments to be conducted without such site-specific sediment information, especially at the screening level, the lack of this information adds considerable uncertainty to the risk assessment, and may result in an under or overestimation of actual risks at the site.

A third source of uncertainty associated with the food web models is the use of unrealistically conservative exposure parameters in the conservative evaluation. The use of maximum ingestion rates and minimum body weights result in a conservative estimate of exposure. In addition, area use factors were assumed to equal one. This is a conservative assumption since a significant percentage of each upper trophic level receptor species time could be spent foraging off-site or in unimpacted areas. This uncertainty was eliminated in the refined risk evaluation, where mean body weights and mean ingestion rates were used to estimate dietary intake doses.

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TABLE K-1

ASSESSMENT ENDPOINTS, RISK HYPOTHESES, MEASUREMENT ENDPOINTS, AND RECEPTOR SPECIES
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
REMEDIAL INVESTIGATION, CTO - 0219
MCB CAMP LEJEUNE, NORTH CAROLINA

Assessment Endpoint	Risk Hypothesis	Measurement Endpoint	Receptor Species
TERRESTRIAL HABITAT			
Protection of carnivorous mammals to ensure that ingestion of contaminants in soil and prey does not have a negative impact on growth, survival, and reproduction	Are levels of site contaminants in surface soils and/or surface water sufficient to cause adverse effects on the growth, survival, and reproductive success of carnivorous mammals using the site?	Comparison of dietary HQs to a reference of 1.0. Dietary HQs are calculated for individual chemicals by dividing an estimated level of exposure by an ecotoxicity value that is associated with a NOAEL. A reference HQ of 1.0 represents a dietary dose that is equal to the NOAEL ecotoxicity value.	Red Fox
Protection of insectivorous mammals to ensure that ingestion of contaminants in soil and prey does not have a negative impact on growth, survival, and reproduction	Are levels of site contaminants in surface soils and/or surface water sufficient to cause adverse effects on the growth, survival, and reproductive success of insectivorous mammals using the site?	Comparison of dietary HQs to a reference of 1.0. Dietary HQs are calculated for individual chemicals by dividing an estimated level of exposure by an ecotoxicity value that is associated with a NOAEL. A reference HQ of 1.0 represents a dietary dose that is equal to the NOAEL ecotoxicity value.	Short-tailed shrew
Protection of herbivorous mammals to ensure that ingestion of contaminants in soil and vegetation does not have a negative impact on growth, survival, and reproduction	Are levels of site contaminants in surface soils and/or surface water sufficient to cause adverse effects on the growth, survival, and reproductive success of insectivorous mammals using the site?	Comparison of dietary HQs to a reference of 1.0. Dietary HQs are calculated for individual chemicals by dividing an estimated level of exposure by an ecotoxicity value that is associated with a NOAEL. A reference HQ of 1.0 represents a dietary dose that is equal to the NOAEL ecotoxicity value.	Meadow Vole
Protection of omnivorous mammals to ensure that ingestion of contaminants in soil, vegetation, and prey does not have negative impacts on growth, survival, and reproduction	Are levels of site contaminants in surface soil and/or surface water sufficient to cause adverse effects on the growth, survival, and reproductive success of herbivorous mammals using the site?	Comparison of dietary HQs to a reference of 1.0. Dietary HQs are calculated for individual chemicals by dividing an estimated level of exposure by an ecotoxicity value that is associated with a NOAEL. A reference HQ of 1.0 represents a dietary dose that is equal to the NOAEL ecotoxicity value.	White-footed Mouse

TABLE K-1 (Continued)

ASSESSMENT ENDPOINTS, RISK HYPOTHESES, MEASUREMENT ENDPOINTS, AND RECEPTOR SPECIES
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
REMEDIAL INVESTIGATION, CTO - 0219
MCB CAMP LEJEUNE, NORTH CAROLINA

Assessment Endpoint	Risk Hypothesis	Measurement Endpoint	Receptor Species
Protection of insectivorous birds to ensure that ingestion of contaminants in soil or food items does not have negative impacts on growth, survival, and reproduction	Are levels of site contaminants in surface soils and/or surface water sufficient to cause adverse effects on the growth, survival, and reproductive success of insectivorous birds using the site?	Comparison of dietary HQs to a reference HQ of 1.0. Dietary HQs are calculated for individual chemicals by dividing an estimated level of exposure by an ecotoxicity value that is associated with a NOAEL. A reference HQ of 1.0 represents a dietary dose that is equal to the NOAEL ecotoxicity value.	American Robin
Protection of carnivorous birds to ensure that ingestion of contaminants in soil or food items does not have negative impacts on growth, survival, and reproduction	Are levels of site contaminants in surface soils and/or surface water sufficient to cause adverse effects on the growth, survival, and reproductive success of carnivorous birds using the site?	Comparison of dietary HQs to a reference HQ of 1.0. Dietary HQs are calculated for individual chemicals by dividing an estimated level of exposure by an ecotoxicity value that is associated with a NOAEL. A reference HQ of 1.0 represents a dietary dose that is equal to the NOAEL ecotoxicity value.	Eastern Screech-owl Red-tailed Hawk
AQUATIC HABITAT			
Protection of birds that feed on aquatic organisms from toxic effects of site-related chemicals present in surface water or sediment	Are levels of site contaminants in surface water and/or sediment sufficient to cause adverse effects on the growth, survival, and reproductive success of avian species using the site?	Comparison of dietary HQs to a reference HQ of 1.0. Dietary HQs are calculated for individual chemicals by dividing an estimated level of exposure by an ecotoxicity value that is associated with a NOAEL. A reference HQ of 1.0 represents a dietary dose that is equal to the NOAEL ecotoxicity value.	Great Blue Heron
Protection of insectivorous birds to ensure that ingestion of contaminants in sediment or food items does not have negative impacts on growth, survival, and reproduction	Are levels of site contaminants in sediment and/or surface water sufficient to cause adverse effects on the growth, survival, and reproductive success of insectivorous birds using the site?	Comparison of dietary HQs to a reference HQ of 1.0. Dietary HQs are calculated for individual chemicals by dividing an estimated level of exposure by an ecotoxicity value that is associated with a NOAEL. A reference HQ of 1.0 represents a dietary dose that is equal to the NOAEL ecotoxicity value.	Marsh Wren

TABLE K-1 (Continued)

ASSESSMENT ENDPOINTS, RISK HYPOTHESES, MEASUREMENT ENDPOINTS, AND RECEPTOR SPECIES
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
REMEDIAL INVESTIGATION, CTO - 0219
MCB CAMP LEJEUNE, NORTH CAROLINA

Assessment Endpoint	Risk Hypothesis	Measurement Endpoint	Receptor Species
Protection of mammals feeding on aquatic organisms from toxic effects of site-related chemicals present in surface water or sediment	Are levels of site contaminants in surface water and/or sediment sufficient to cause adverse effects on the growth, survival, and reproductive success of mammals that eat aquatic organisms and use the site?	Comparison of dietary HQs to a reference HQ of 1.0. Dietary HQs are calculated for individual chemicals by dividing an estimated level of exposure by an ecotoxicity value that is associated with a NOAEL. A reference HQ of 1.0 represents a dietary dose that is equal to the NOAEL ecotoxicity value.	Mink Raccoon

TABLE K-2
BIOACCUMULATIVE CHEMICALS LIST AND LOG Kow VALUES
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
REMEDIAL INVESTIGATION, CTO - 0219
MCB CAMP LEJEUNE, NORTH CAROLINA

Chemical	Log K_{ow} Range	Selected log K_{ow}	Reference	Evaluate for Food Web Exposures? [1]
Semivolatile Organics				
Acenaphthene	3.77 to 4.49	3.92	USEPA 1995	YES
Anthracene	3.45 to 4.80	4.55	USEPA 1995	YES
Benzo(a)anthracene	4.00 to 5.79	5.70	USEPA 1995	YES
Benzo(a)pyrene	5.98 to 6.42	6.11	USEPA 1995	YES
Benzo(b)fluoranthene	5.79 to 6.40	6.20	USEPA 1995	YES
Benzo(g,h,i)perylene	6.63 to 7.05	6.70	USEPA 1995	YES
Benzo(k)fluoranthene	6.12 to 6.27	6.20	USEPA 1995	YES
Chrysene	5.41 to 5.79	5.70	USEPA 1995	YES
Dibenz(a,h)anthracene	6.50 to 6.88	6.69	USEPA 1995	YES
Fluoranthene	4.31 to 5.39	5.12	USEPA 1995	YES
Fluorene	4.04 to 4.40	4.21	USEPA 1995	YES
Indeno(1,2,3-cd)pyrene	6.58 to 6.72	6.65	USEPA 1995	YES
Phenanthrene	4.28 to 4.57	4.55	USEPA 1995	YES
Pyrene	4.76 to 5.52	5.11	USEPA 1995	YES
Pesticides/PCBs				
4,4'-DDD	4.73 to 6.65	6.10	USEPA 1995	YES
4,4'-DDE	5.63 to 6.96	6.76	USEPA 1995	YES
4,4'-DDT	3.98 to 7.01	6.53	USEPA 1995	YES
Alpha-BHC	3.75 to 3.81	3.80	USEPA 1995	YES
Alpha-Chlordane	5.80 to 6.41	6.32	USEPA 1995	YES
Aroclor-1248	Not reported	6.20	Jones et al. 1997	YES
Aroclor-1254	Not reported	6.50	Jones et al. 1997	YES
Aroclor-1260	Not reported	6.80	Jones et al. 1997	YES
Dieldrin	3.63 to 6.20	5.37	USEPA 1995	YES

TABLE K-2 (continued)
BIOACCUMULATIVE CHEMICALS LIST AND LOG Kow VALUES
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
REMEDIAL INVESTIGATION, CTO - 0219
MCB CAMP LEJEUNE, NORTH CAROLINA

Chemical	Log K_{ow} Range	Selected log K_{ow}	Reference	Evaluate for Food Web Exposures? [1]
Pesticides/PCBs (Continued)				
Endosulfan I	3.83 to 3.85	3.83	USEPA 1995	YES
Endrin	2.92 to 5.20	5.06	USEPA 1995	YES
Gamma-Chlordane	5.80 to 6.41	6.32	USEPA 1995	YES
Heptachlor	4.93 to 6.26	6.26	USEPA 1995	YES
Heptachlor epoxide	3.50 to 5.40	5.00	USEPA 1995	YES
Methoxychlor	3.31 to 5.60	5.08	USEPA 1995	YES
Inorganics				
Chromium	NA	NA	NA	YES
Copper	NA	NA	NA	YES
Lead	NA	NA	NA	YES
Mercury	NA	NA	NA	YES
Zinc	NA	NA	NA	YES

Notes:
[1] If "YES" the compound was identified as an "important bioaccumulative compound" in USEPA 2000.
NA = Not Applicable

TABLE K-3
SOIL BIOCONCENTRATION/BIOACCUMULATION FACTORS USED FOR PLANTS AND SOIL INVERTEBRATES
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
REMEDIAL INVESTIGATION, CTO - 0219
MCB CAMP LEJUENE, NORTH CAROLINA

Chemical	Soil-Plant BCF (dry weight)		Soil-Invertebrate BAF (dry weight)	
	Value	Reference	Value	Reference
Inorganics				
Chromium	0.0075	Baes et al. 1984	3.162	Sample et al. 1998a
Copper	0.625	Bechtel Jacobs 1998a	1.531	Sample et al. 1998a
Lead	0.468	Bechtel Jacobs 1998a	1.522	Sample et al. 1998a
Mercury	5	Bechtel Jacobs 1998a	20.63	Sample et al. 1998a
Zinc	1.82	Bechtel Jacobs 1998a	12.89	Sample et al. 1998a
Pesticides/PCBs				
4,4'-DDD	0.0115	Travis and Arms 1988	2	Menzie et al. 1992
4,4'-DDE	0.0048	Travis and Arms 1988	10.6	Menzie et al. 1992
4,4'-DDT	0.0065	Travis and Arms 1988	0.7	Menzie et al. 1992
alpha-BHC	0.2464	Travis and Arms 1988	1	--
alpha-Chlordane	0.0089	Travis and Arms 1988	3	Menzie et al. 1992
Aroclor-1248	0.0101	Travis and Arms 1988	15.91	Sample et al. 1998a
Aroclor-1254	0.0068	Travis and Arms 1988	15.91	Sample et al. 1998a
Aroclor-1260	0.0045	Travis and Arms 1988	15.91	Sample et al. 1998a
Dieldrin	0.0305	Travis and Arms 1988	8	Beyer and Gish 1980
Endosulfan I	0.2367	Travis and Arms 1988	1	--
Endrin	0.0461	Travis and Arms 1988	1	--
Gamma-Chlordane	0.0086	Travis and Arms 1988	3	Menzie et al. 1992
Heptachlor	0.0093	Travis and Arms 1988	10	Roberts and Dorough 1985
Heptachlor Epoxide	0.0499	Travis and Arms 1988	10	Roberts and Dorough 1985
Methoxychlor	0.0448	Travis and Arms 1988	1	--

TABLE K-3 (continued)
SOIL BIOCONCENTRATION/BIOACCUMULATION FACTORS USED FOR PLANTS AND SOIL INVERTEBRATES
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
REMEDIAL INVESTIGATION, CTO - 0219
MCB CAMP LEJUENE, NORTH CAROLINA

Chemical	Soil-Plant BCF (dry weight)		Soil-Invertebrate BAF (dry weight)	
	Value	Reference	Value	Reference
Semivolatile Organics				
Acenaphthene	0.21	Travis and Arms 1988	0.3	Beyer and Stafford 1993
Anthracene	0.0908	Travis and Arms 1988	0.32	Beyer and Stafford 1993
Benzo(a)anthracene	0.0197	Travis and Arms 1988	0.27	Beyer and Stafford 1993
Benzo(a)pyrene	0.0114	Travis and Arms 1988	0.34	Beyer and Stafford 1993
Benzo(b)fluoranthene	0.0101	Travis and Arms 1988	0.21	Beyer and Stafford 1993
Benzo(g,h,i)perylene	0.0052	Travis and Arms 1988	0.15	Beyer and Stafford 1993
Benzo(k)fluoranthene	0.0101	Travis and Arms 1988	0.21	Beyer and Stafford 1993
Chrysene	0.0197	Travis and Arms 1988	0.44	Beyer and Stafford 1993
Dibenz(a,h)anthracene	0.0053	Travis and Arms 1988	0.49	Beyer and Stafford 1993
Fluoranthene	0.0425	Travis and Arms 1988	0.37	Beyer and Stafford 1993
Fluorene	0.1428	Travis and Arms 1988	0.2	Beyer and Stafford 1993
Indeno(1,2,3-cd)pyrene	0.0056	Travis and Arms 1988	0.41	Beyer and Stafford 1993
Phenanthrene	0.0908	Travis and Arms 1988	0.28	Beyer and Stafford 1993
Pyrene	0.0431	Travis and Arms 1988	0.39	Beyer and Stafford 1993

TABLE K-4
SOIL BIOACCUMULATION FACTORS USED FOR SMALL MAMMALS
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
REMEDIAL INVESTIGATION, CTO - 0219
MCB CAMP LEJEUNE, NORTH CAROLINA

Chemical	Soil-Mouse BAF (dry weight)		Soil-Vole BAF (dry weight)		Soil-Shrew BAF (dry weight)	
	Value	Reference	Value	Reference	Value	Reference
Inorganics						
Chromium	0.349	Sample et al. 1998b	0.309	Sample et al. 1998b	0.3333	Sample et al. 1998b
Copper	0.554	Sample et al. 1998b	1.29	Sample et al. 1998b	1.117	Sample et al. 1998b
Lead	0.286	Sample et al. 1998b	0.187	Sample et al. 1998b	0.339	Sample et al. 1998b
Mercury	0.13	Sample et al. 1998b	0.192	Sample et al. 1998b	0.192	Sample et al. 1998b
Zinc	2.7822	Sample et al. 1998b	2.3168	Sample et al. 1998b	2.9011	Sample et al. 1998b
Pesticides/PCBs						
4,4'-DDD	--	see text	--	see text	--	see text
4,4'-DDE	--	see text	--	see text	--	see text
4,4'-DDT	--	see text	--	see text	--	see text
alpha-BHC	--	see text	--	see text	--	see text
alpha-Chlordane	--	see text	--	see text	--	see text
Aroclor-1248	--	see text	--	see text	--	see text
Aroclor-1254	--	see text	--	see text	--	see text
Aroclor-1260	--	see text	--	see text	--	see text
Dieldrin	--	see text	--	see text	--	see text
Endosulfan I	--	see text	--	see text	--	see text
Endrin	--	see text	--	see text	--	see text
Gamma-Chlordane	--	see text	--	see text	--	see text
Heptachlor	--	see text	--	see text	--	see text
Heptachlor Epoxide	--	see text	--	see text	--	see text
Methoxychlor	--	see text	--	see text	--	see text

TABLE K-4 (Continued)
SOIL BIOACCUMULATION FACTORS USED FOR SMALL MAMMALS
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
REMEDIAL INVESTIGATION, CTO - 0219
MCB CAMP LEJEUNE, NORTH CAROLINA

Chemical	Soil-Mouse BAF (dry weight)		Soil-Vole BAF (dry weight)		Soil-Shrew BAF (dry weight)	
	Value	Reference	Value	Reference	Value	Reference
Semivolatile Organics						
Acenaphthene	--	see text	--	see text	--	see text
Anthracene	--	see text	--	see text	--	see text
Benzo(a)anthracene	--	see text	--	see text	--	see text
Benzo(a)pyrene	--	see text	--	see text	--	see text
Benzo(b)fluoranthene	--	see text	--	see text	--	see text
Benzo(g,h,i)perylene	--	see text	--	see text	--	see text
Benzo(k)fluoranthene	--	see text	--	see text	--	see text
Chrysene	--	see text	--	see text	--	see text
Dibenz(a,h)anthracene	--	see text	--	see text	--	see text
Fluoranthene	--	see text	--	see text	--	see text
Fluorene	--	see text	--	see text	--	see text
Indeno(1,2,3-cd)pyrene	--	see text	--	see text	--	see text
Phenanthrene	--	see text	--	see text	--	see text
Pyrene	--	see text	--	see text	--	see text

TABLE K-5
SEDIMENT BIOACCUMULATION FACTORS USED FOR AQUATIC INVERTEBRATES AND FISH
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
REMEDIAL INVESTIGATION, CTO - 0219
MCB CAMP LEJEUNE, NORTH CAROLINA

Chemical	Sediment-Invertebrate BAF (dry weight)		Sediment-Fish BAF (dry weight)	
	Value	Reference	Value	Reference
Inorganics				
Chromium	0.186	Bechtel Jacobs 1998b	0.038	Krantzberg and Boyd 1992
Copper	7.957	Bechtel Jacobs 1998b	0.1	Krantzberg and Boyd 1992
Lead	0.326	Bechtel Jacobs 1998b	0.07	Krantzberg and Boyd 1992
Mercury	1.735	Bechtel Jacobs 1998b	4.58	Cope et al. 1990
Zinc	4.759	Bechtel Jacobs 1998b	0.147	Pascoe et al. 1996
Pesticides/PCBs				
4,4'-DDD	0.5	Oliver 1987	2.61	Oliver and Niimi 1988
4,4'-DDE	4.3	Oliver 1987	20.39	Oliver and Niimi 1988
4,4'-DDT	0.5	Oliver 1987	9.11	Oliver and Niimi 1988
alpha-BHC	1	--	1	--
alpha-Chlordane	1	--	1	--
Aroclor-1248	21.89	Bechtel Jacobs 1998b	11.24	Oliver and Niimi 1988
Aroclor-1254	21.89	Bechtel Jacobs 1998b	11.24	Oliver and Niimi 1988
Aroclor-1260	21.89	Bechtel Jacobs 1998b	11.24	Oliver and Niimi 1988
Dieldrin	1	--	1	--
Endosulfan I	1	--	1	--
Endrin	1	--	1	--
Gamma-Chlordane	1	--	1	--
Heptachlor	1	--	1	--
Heptachlor Epoxide	1	--	1	--
Methoxychlor	1	--	1	--

TABLE K-5 (continued)
SEDIMENT BIOACCUMULATION FACTORS USED FOR AQUATIC INVERTEBRATES AND FISH
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
REMEDIAL INVESTIGATION, CTO - 0219
MCB CAMP LEJEUNE, NORTH CAROLINA

Chemical	Sediment-Invertebrate BAF (dry weight)		Sediment-Fish BAF (dry weight)	
	Value	Reference	Value	Reference
Semivolatile Organics				
Acenaphthene	2.04	Maruya et al. 1997	1	--
Anthracene	0.271	Maruya et al. 1997	1	--
Benzo(a)anthracene	1.4	Maruya et al. 1997	1	--
Benzo(a)pyrene	0.191	Maruya et al. 1997	1	--
Benzo(b)fluoranthene	0.16	Maruya et al. 1997	1	--
Benzo(g,h,i)perylene	0.295	Maruya et al. 1997	1	--
Benzo(k)fluoranthene	0.421	Maruya et al. 1997	1	--
Chrysene	0.335	Maruya et al. 1997	1	--
Dibenz(a,h)anthracene	1	--	1	--
Fluoranthene	0.312	Maruya et al. 1997	1	--
Fluorene	1.13	Maruya et al. 1997	1	--
Indeno(1,2,3-cd)pyrene	0.355	Maruya et al. 1997	1	--
Phenanthrene	0.652	Maruya et al. 1997	1	--
Pyrene	0.803	Maruya et al. 1997	1	--

TABLE K-6
CONSERVATIVE EXPOSURE PARAMETERS FOR UPPER TROPHIC LEVEL ECOLOGICAL RECEPTORS
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
REMEDIAL INVESTIGATION, CTO - 0219
MCB CAMP LEJEUNE, NORTH CAROLINA

Receptor	Body Weight (kg)		Water Ingestion Rate (L/day)		Food Ingestion Rate (kg/day - dry)	
	Value	Reference	Value	Reference	Value	Reference
Birds						
American robin	0.0635	USEPA 1993	0.01442	USEPA 1993	0.0086154	Levey and Karasov 1989
Great blue heron	2.1	Butler 1992	0.1125	USEPA 1993	0.11025	USEPA 1993
Eastern screech-owl	0.145	Dunning 1993	0.02159	USEPA 1993	0.02191	USEPA 1993 (Nagy)
Marsh wren	0.00975	Dunning 1993	0.00365	USEPA 1993	0.0027636	USEPA 1993
Red-tailed hawk	0.957	USEPA 1993	0.07039	USEPA 1993	0.04352	Sample and Suter 1994
Mammals						
Meadow vole	0.03	Silva and Downing 1995	0.01334	USEPA 1993	0.00334	USEPA 1993
Mink	0.564	Silva and Downing 1995	0.10879	USEPA 1993	0.03934	USEPA 1993
Raccoon	4.2	USEPA 1993	0.6806	USEPA 1993	0.14557	Conover 1989
Red fox	3.17	Silva and Downing 1995	0.41395	USEPA 1993	0.14763	Sample and Suter 1994
Short-tailed shrew	0.0155	USEPA 1993	0.00479	USEPA 1993	0.00192	USEPA 1993
White-footed mouse	0.0141	Silva and Downing 1995	0.0058	USEPA 1993	0.00073	Sample and Suter 1994

TABLE K-6 (Continued)
CONSERVATIVE EXPOSURE PARAMETERS FOR UPPER TROPHIC LEVEL ECOLOGICAL RECEPTORS
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
REMEDIAL INVESTIGATION, CTO - 0219
MCB CAMP LEJEUNE, NORTH CAROLINA

Receptor	Dietary Composition (percent)							Soil/ Sediment Ingestion (percent)	
	Terr. Plants	Soil Invert.	Small Mammals	Fish/ Frogs	Aquatic Plants	Aquatic Invert.	Reference	Value	Reference
Birds									
American robin	33.6	58	0	0	0	0	USEPA 1993	8.4	Sample and Suter 1994
Great blue heron	0	0	0	100	0	0	USEPA 1993; Sample and Suter 1994	0	Sample and Suter 1994
Eastern screech-owl	0	28	70	0	0	0	Johnsgard 1988	2	Assumed based on diet
Marsh wren	0	0	0	0	0	95	USEPA 1993	5	Assumed based on diet
Red-tailed hawk	0	0	100	0	0	0	USEPA 1993; Sample and Suter 1994	0	Sample and Suter 1994
Mammals									
Meadow vole	95.6	2	0	0	0	0	USEPA 1993	2.4	Beyer et al. 1994
Mink	0	0	6	89	1	4	USEPA 1993	0	Sample and Suter 1994
Raccoon	0	0	0	11 *	36	43.6	USEPA 1993 (MD)	9.4	Beyer et al. 1994
Red fox	7	2.8	87.4	0	0	0	USEPA 1993 (MD)	2.8	Beyer et al. 1994
Short-tailed shrew	4.7	82.3	0	0	0	0	USEPA 1993; Sample and Suter 1994	13	Sample and Suter 1994
White-footed mouse	54	44	0	0	0	0	USEPA 1993	2	Beyer et al. 1994

* Frogs only

TABLE K-7
INGESTION SCREENING VALUES FOR BIRDS
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
REMEDIAL INVESTIGATION, CTO - 0219
MCB CAMP LEJEUNE, NORTH CAROLINA

Chemical	Test Organism	Body Weight	Duration	Exposure Route	Effect/Endpoint	LOAEL (mg/kg/d)	NOAEL (mg/kg/d)	Reference
Inorganics								
Chromium	American black duck	1.25	10 months	oral in diet	reproduction	5	1	Sample et al. 1996
Copper	chicks	0.534	10 weeks	oral in diet	growth/mortality	61.7	47	Sample et al. 1996
Lead	Japanese quail	0.15	12 weeks	oral in diet	reproduction	11.3	1.13	Sample et al. 1996
Lead	American kestrel	0.13	7 months	oral in diet	reproduction	38.5	3.85	Sample et al. 1996
Mercury	Japanese quail	0.15	1 year	oral in diet	reproduction	0.9	0.45	Sample et al. 1996
Mercury	mallard	1	3 generations	oral in diet	reproduction	0.064	0.0064	Sample et al. 1996
Zinc	chicken	1.935	44 weeks	oral in diet	reproduction	131	14.5	Sample et al. 1996
Pesticides/PCBs								
4,4'-DDD	mallard	1.134	chronic	oral	reproduction	5.2	0.52	Stickel 1973
4,4'-DDD	American kestrel	0.115	2 years	oral	reproduction	0.5	0.05	McLane and Hall 1972
4,4'-DDE	brown pelican	3.5	chronic	oral	reproduction	1.31	0.131	Beyer et al. 1996
4,4'-DDE	American kestrel	0.115	2 years	oral	reproduction	0.5	0.05	McLane and Hall 1972
4,4'-DDT	mallard	1.134	chronic	oral	reproduction	1.04	0.104	Davison and Sell 1974
4,4'-DDT	American kestrel	0.115	2 years	oral	reproduction	0.5	0.05	McLane and Hall 1972
alpha-BHC	Japanese quail	0.15	90 days	oral in diet	reproduction	2.25	0.56	Sample et al. 1996
alpha-Chlordane	red-winged blackbird	0.064	84 days	oral in diet	mortality	10.7	2.14	Sample et al. 1996
Aroclor-1248	ring-necked pheasant	1	17 weeks	oral	reproduction	1.8	0.18	Sample et al. 1996
Aroclor-1254	ring-necked pheasant	1	17 weeks	oral	reproduction	1.8	0.18	Sample et al. 1996
Aroclor-1260	ring-necked pheasant	1	17 weeks	oral	reproduction	1.8	0.18	Sample et al. 1996
Dieldrin	barn owl	0.466	2 years	oral in diet	reproduction	0.77	0.077	Sample et al. 1996
Endosulfan I	gray partridge	0.4	4 weeks	oral in diet	reproduction	100	10	Sample et al. 1996
Endrin	mallard	1.15	>200 days	oral in diet	reproduction	3	0.3	Sample et al. 1996
Endrin	screech owl	0.181	>83 days	oral in diet	reproduction	0.1	0.01	Sample et al. 1996

TABLE K-7 (continued)
INGESTION SCREENING VALUES FOR BIRDS
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
REMEDIAL INVESTIGATION, CTO - 0219
MCB CAMP LEJEUNE, NORTH CAROLINA

Chemical	Test Organism	Body Weight	Duration	Exposure Route	Effect/Endpoint	LOAEL (mg/kg/d)	NOAEL (mg/kg/d)	Reference
Pesticides/PCBs (Cont.)								
Gamma-Chlordane	red-winged blackbird	0.064	84 days	oral in diet	mortality	10.7	2.14	Sample et al. 1996
Heptachlor	quail	0.191	5 days	oral in diet	mortality	4.05	0.405	Hill et al. 1975
Heptachlor Epoxide	quail	0.191	5 days	oral in diet	mortality	4.05	0.405	Hill et al. 1975
Methoxychlor	quail	0.191	5 days	oral in diet	mortality	4050	405	Hill and Camardese 1986
Semivolatile Organics								
Acenaphthene	chicken	1.5	34 days	oral in diet	reproduction	395	39.5	Rigdon and Neal 1963
Anthracene	mallard	1.043	7 months	oral in diet	hepatic	228	22.8	Patton and Dieter 1980
Benzo(a)anthracene	chicken	1.5	34 days	oral in diet	reproduction	395	39.5	Rigdon and Neal 1963
Benzo(a)pyrene	chicken	1.5	34 days	oral in diet	reproduction	395	39.5	Rigdon and Neal 1963
Benzo(b)fluoranthene	chicken	1.5	34 days	oral in diet	reproduction	395	39.5	Rigdon and Neal 1963
Benzo(g,h,i)perylene	chicken	1.5	34 days	oral in diet	reproduction	395	39.5	Rigdon and Neal 1963
Benzo(k)fluoranthene	chicken	1.5	34 days	oral in diet	reproduction	395	39.5	Rigdon and Neal 1963
Chrysene	chicken	1.5	34 days	oral in diet	reproduction	395	39.5	Rigdon and Neal 1963
Dibenz(a,h)anthracene	chicken	1.5	34 days	oral in diet	reproduction	395	39.5	Rigdon and Neal 1963
Fluoranthene	chicken	1.5	34 days	oral in diet	reproduction	395	39.5	Rigdon and Neal 1963
Fluorene	chicken	1.5	34 days	oral in diet	reproduction	395	39.5	Rigdon and Neal 1963
Indeno(1,2,3-cd)pyrene	chicken	1.5	34 days	oral in diet	reproduction	395	39.5	Rigdon and Neal 1963
Phenanthrene	chicken	1.5	34 days	oral in diet	reproduction	395	39.5	Rigdon and Neal 1963
Pyrene	chicken	1.5	34 days	oral in diet	reproduction	395	39.5	Rigdon and Neal 1963

Notes:

? = Information not provided in reference.

TABLE K-8
INGESTION SCREENING VALUES FOR MAMMALS
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
REMEDIAL INVESTIGATION, CTO - 0219
MCB CAMP LEJEUNE, NORTH CAROLINA

Chemical	Test Organism	Body Weight (kg)	Duration	Exposure Route	Effect/Endpoint	LOAEL (mg/kg/d)	NOAEL (mg/kg/d)	Reference
Inorganics								
Chromium	rat	0.35	3 months	oral in water	mortality	13.14	1.314	Sample et al. 1996
Copper	mink	1	357 days	oral in diet	reproduction	15.14	11.7	Sample et al. 1996
Lead	rat	0.35	3 generations	oral in diet	reproduction	80	8	Sample et al. 1996
Mercury	rat	0.35	3 generations	oral in diet	reproduction	0.16	0.032	Sample et al. 1996
Mercury	mink	1	93 days	oral in diet	mortality/weight loss	0.025	0.015	Sample et al. 1996
Zinc	rat	0.35	GD 1-16	oral in diet	reproduction	320	160	Sample et al. 1996
Zinc	mink	1	25 weeks	oral	reproduction	208	20.8	ATSDR 1992a
Pesticides/PCBs								
4,4'-DDD	rat	0.35	2 years	oral in diet	reproduction	4	0.8	Sample et al. 1996
4,4'-DDD	dog	10	2 generations	oral	reproduction	5	1	ATSDR 1992b
4,4'-DDE	rat	0.35	2 years	oral in diet	reproduction	4	0.8	Sample et al. 1996
4,4'-DDE	dog	10	2 generations	oral	reproduction	5	1	ATSDR 1992b
4,4'-DDT	rat	0.35	2 years	oral in diet	reproduction	4	0.8	Sample et al. 1996
4,4'-DDT	dog	10	2 generations	oral	reproduction	5	1	ATSDR 1992b
alpha-BHC	rat	0.35	4 generations	oral in diet	reproduction	3.2	1.6	Sample et al. 1996
alpha-Chlordane	mouse	0.03	6 generations	oral in diet	reproduction	9.16	4.58	Sample et al. 1996
Aroclor-1248	mouse	0.03	5 weeks	oral in diet	immunological	13	1.3	ATSDR 1995a
Aroclor-1248	rhesus monkey	5	14 months	oral in diet	reproduction	0.1	0.01	Sample et al. 1996
Aroclor-1254	oldfield mouse	0.014	12 months	oral in diet	reproduction	0.68	0.068	Sample et al. 1996
Aroclor-1254	mink	1	4.5 months	oral in diet	reproduction	0.69	0.14	Sample et al. 1996
Aroclor-1260	oldfield mouse	0.014	12 months	oral in diet	reproduction	0.68	0.068	Sample et al. 1996
Aroclor-1260	mink	1	4.5 months	oral in diet	reproduction	0.69	0.14	Sample et al. 1996
Dieldrin	rat	0.35	3 generations	oral in diet	reproduction	0.2	0.02	Sample et al. 1996
Endosulfan I	rat	0.35	30 days	oral (intubation)	reproduction	1.5	0.15	Sample et al. 1996
Endrin	mouse	0.03	120 days	oral in diet	reproduction	0.92	0.092	Sample et al. 1996
Gamma-Chlordane	mouse	0.03	6 generations	oral in diet	reproduction	9.16	4.58	Sample et al. 1996
Heptachlor	mink	1	181 days	oral in diet	reproduction	1	0.1	Sample et al. 1996
Heptachlor Epoxide	mink	1	181 days	oral in diet	reproduction	1	0.1	Sample et al. 1996
Methoxychlor	rat	0.35	11 months	oral in diet	reproduction	8	4	Sample et al. 1996

TABLE K-8 (continued)
INGESTION SCREENING VALUES FOR MAMMALS
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
REMEDIAL INVESTIGATION, CTO - 0219
MCB CAMP LEJEUNE, NORTH CAROLINA

Chemical	Test Organism	Body Weight (kg)	Duration	Exposure Route	Effect/Endpoint	LOAEL (mg/kg/d)	NOAEL (mg/kg/d)	Reference
Semivolatile Organics								
Acenaphthene	mouse	0.03	13 weeks	oral (gavage)	reproduction	3500	350	ATSDR 1995b
Anthracene	mouse	0.03	13 weeks	oral (gavage)	reproduction	10000	1000	ATSDR 1995b
Benzo(a)anthracene	mouse	0.03	GD 7-16	oral (intubation)	reproduction	10	1	Sample et al. 1996
Benzo(a)pyrene	mouse	0.03	GD 7-16	oral (intubation)	reproduction	10	1	Sample et al. 1996
Benzo(b)fluoranthene	mouse	0.03	GD 7-16	oral (intubation)	reproduction	10	1	Sample et al. 1996
Benzo(g,h,i)perylene	mouse	0.03	19 to 29 days	oral in diet	reproduction	1330	133	ATSDR 1995b
Benzo(k)fluoranthene	mouse	0.03	GD 7-16	oral (intubation)	reproduction	10	1	Sample et al. 1996
Chrysene	mouse	0.03	GD 7-16	oral (intubation)	reproduction	10	1	Sample et al. 1996
Dibenz(a,h)anthracene	mouse	0.03	GD 7-16	oral (intubation)	reproduction	10	1	Sample et al. 1996
Fluoranthene	mouse	0.03	13 weeks	oral (gavage)	hepatic	1250	125	ATSDR 1995b
Fluorene	mouse	0.03	13 weeks	oral (gavage)	hematological	1250	125	ATSDR 1995b
Indeno(1,2,3-cd)pyrene	mouse	0.03	GD 7-16	oral (intubation)	reproduction	10	1	Sample et al. 1996
Phenanthrene	mouse	0.03	19 to 29 days	oral in diet	reproduction	1330	133	ATSDR 1995
Pyrene	mouse	0.03	19 to 29 days	oral in diet	reproduction	1330	133	ATSDR 1995

Notes:

? = Information not provided in reference.

TABLE K-9
SOIL BIOCONCENTRATION/BIOACCUMULATION FACTORS USED FOR PLANTS AND SOIL INVERTEBRATES
LESS CONSERVATIVE RISK SCENARIO - OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
REMEDIAL INVESTIGATION, CTO - 0219
MCB CAMP LEJEUNE, NORTH CAROLINA

Chemical	Soil-Plant BCF (dry weight)		Soil-Invertebrate BAF (dry weight)	
	Value	Reference	Value	Reference
Inorganics				
Chromium	0.0075	Baes et al. 1984	0.32	Sample et al. 1998a
Copper	0.123	Bechtel Jacobs 1998a	0.468	Sample et al. 1998a
Lead	0.0377	Bechtel Jacobs 1998a	0.307	Sample et al. 1998a
Mercury	0.344	Bechtel Jacobs 1998a	1.186	Sample et al. 1998a
Zinc	0.358	Bechtel Jacobs 1998a	2.482	Sample et al. 1998a
Pesticides/ PCBs				
4,4'-DDD	0.0115	Travis and Arms 1988	2	Menzie et al. 1992
4,4'-DDE	0.0048	Travis and Arms 1988	10.6	Menzie et al. 1992
4,4'-DDT	0.0065	Travis and Arms 1988	0.7	Menzie et al. 1992
alpha-BHC	0.2464	Travis and Arms 1988	1	--
alpha-Chlordane	0.0089	Travis and Arms 1988	3	Menzie et al. 1992
Aroclor-1248	0.0101	Travis and Arms 1988	4.297	Sample et al. 1998a
Aroclor-1254	0.0068	Travis and Arms 1988	4.297	Sample et al. 1998a
Aroclor-1260	0.0045	Travis and Arms 1988	4.297	Sample et al. 1998a
Dieldrin	0.0305	Travis and Arms 1988	8	Beyer and Gish 1980
Endosulfan I	0.2367	Travis and Arms 1988	1	--
Endrin	0.0461	Travis and Arms 1988	1	--
Gamma-Chlordane	0.0086	Travis and Arms 1988	3	Menzie et al. 1992
Heptachlor	0.0093	Travis and Arms 1988	10	Roberts and Dorough 1985
Heptachlor Epoxide	0.0499	Travis and Arms 1988	10	Roberts and Dorough 1985
Methoxychlor	0.0448	Travis and Arms 1988	1	--

TABLE K-9 (Continued)
SOIL BIOCONCENTRATION/BIOACCUMULATION FACTORS USED FOR PLANTS AND SOIL INVERTEBRATES
LESS CONSERVATIVE RISK SCENARIO - OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
REMEDIAL INVESTIGATION, CTO - 0219
MCB CAMP LEJEUNE, NORTH CAROLINA

Chemical	Soil-Plant BCF (dry weight)		Soil-Invertebrate BAF (dry weight)	
	Value	Reference	Value	Reference
Semivolatile Organics				
Acenaphthene	0.21	Travis and Arms 1988	0.3	Beyer and Stafford 1993
Anthracene	0.0908	Travis and Arms 1988	0.32	Beyer and Stafford 1993
Benzo(a)anthracene	0.0197	Travis and Arms 1988	0.27	Beyer and Stafford 1993
Benzo(a)pyrene	0.0114	Travis and Arms 1988	0.34	Beyer and Stafford 1993
Benzo(b)fluoranthene	0.0101	Travis and Arms 1988	0.21	Beyer and Stafford 1993
Benzo(g,h,i)perylene	0.0052	Travis and Arms 1988	0.15	Beyer and Stafford 1993
Benzo(k)fluoranthene	0.0101	Travis and Arms 1988	0.21	Beyer and Stafford 1993
Chrysene	0.0197	Travis and Arms 1988	0.44	Beyer and Stafford 1993
Dibenz(a,h)anthracene	0.0053	Travis and Arms 1988	0.49	Beyer and Stafford 1993
Fluoranthene	0.0425	Travis and Arms 1988	0.37	Beyer and Stafford 1993
Fluorene	0.1428	Travis and Arms 1988	0.2	Beyer and Stafford 1993
Indeno(1,2,3-cd)pyrene	0.0056	Travis and Arms 1988	0.41	Beyer and Stafford 1993
Phenanthrene	0.0908	Travis and Arms 1988	0.28	Beyer and Stafford 1993
Pyrene	0.0431	Travis and Arms 1988	0.39	Beyer and Stafford 1993

TABLE K-10
SOIL BIOACCUMULATION FACTORS USED FOR SMALL MAMMALS
LESS CONSERVATIVE RISK SCENARIO - OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
REMEDIAL INVESTIGATION, CTO - 0219
MCB CAMP LEJEUNE, NORTH CAROLINA

Chemical	Soil-Mouse BAF (dry weight)		Soil-Vole BAF (dry weight)		Soil-Shrew BAF (dry weight)	
	Value	Reference	Value	Reference	Value	Reference
Inorganics						
Chromium	0.092	Sample et al. 1998b	0.1249	Sample et al. 1998b	0.0939	Sample et al. 1998b
Copper	0.1107	Sample et al. 1998b	0.109	Sample et al. 1998b	0.5017	Sample et al. 1998b
Lead	0.0548	Sample et al. 1998b	0.0406	Sample et al. 1998b	0.1478	Sample et al. 1998b
Mercury	0.0731	Sample et al. 1998b	0.0672	Sample et al. 1998b	0.0672	Sample et al. 1998b
Zinc	0.5092	Sample et al. 1998b	0.2929	Sample et al. 1998b	0.862	Sample et al. 1998b
Pesticides/ PCBs						
4,4'-DDD	--	see text	--	see text	--	see text
4,4'-DDE	--	see text	--	see text	--	see text
4,4'-DDT	--	see text	--	see text	--	see text
alpha-BHC	--	see text	--	see text	--	see text
alpha-Chlordane	--	see text	--	see text	--	see text
Aroclor-1248	--	see text	--	see text	--	see text
Aroclor-1254	--	see text	--	see text	--	see text
Aroclor-1260	--	see text	--	see text	--	see text
Dieldrin	--	see text	--	see text	--	see text
Endosulfan I	--	see text	--	see text	--	see text
Endrin	--	see text	--	see text	--	see text
Gamma-Chlordane	--	see text	--	see text	--	see text
Heptachlor	--	see text	--	see text	--	see text
Heptachlor Epoxide	--	see text	--	see text	--	see text
Methoxychlor	--	see text	--	see text	--	see text

TABLE K-10 (continued)
SOIL BIOACCUMULATION FACTORS USED FOR SMALL MAMMALS
LESS CONSERVATIVE RISK SCENARIO - OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
REMEDIAL INVESTIGATION, CTO - 0219
MCB CAMP LEJEUNE, NORTH CAROLINA

Chemical	Soil-Mouse BAF (dry weight)		Soil-Vole BAF (dry weight)		Soil-Shrew BAF (dry weight)	
	Value	Reference	Value	Reference	Value	Reference
Semivolatile Organics						
Acenaphthene	--	see text	--	see text	--	see text
Anthracene	--	see text	--	see text	--	see text
Benzo(a)anthracene	--	see text	--	see text	--	see text
Benzo(a)pyrene	--	see text	--	see text	--	see text
Benzo(b)fluoranthene	--	see text	--	see text	--	see text
Benzo(g,h,i)perylene	--	see text	--	see text	--	see text
Benzo(k)fluoranthene	--	see text	--	see text	--	see text
Chrysene	--	see text	--	see text	--	see text
Dibenz(a,h)anthracene	--	see text	--	see text	--	see text
Fluoranthene	--	see text	--	see text	--	see text
Fluorene	--	see text	--	see text	--	see text
Indeno(1,2,3-cd)pyrene	--	see text	--	see text	--	see text
Phenanthrene	--	see text	--	see text	--	see text
Pyrene	--	see text	--	see text	--	see text

TABLE K-11
SEDIMENT BIOACCUMULATION FACTORS USED FOR AQUATIC INVERTEBRATES AND FISH
LESS CONSERVATIVE RISK SCENARIO - OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
REMEDIAL INVESTIGATION, CTO - 0219
MCB CAMP LEJEUNE, NORTH CAROLINA

Chemical	Sediment-Invertebrate BAF (dry weight)		Sediment-Fish BAF (dry weight)	
	Value	Reference	Value	Reference
Inorganics				
Chromium	0.09	Bechtel Jacobs 1998b	0.038	Krantzberg and Boyd 1992
Copper	0.919	Bechtel Jacobs 1998b	0.1	Krantzberg and Boyd 1992
Lead	0.129	Bechtel Jacobs 1998b	0.07	Krantzberg and Boyd 1992
Mercury	1.022	Bechtel Jacobs 1998b	3.25	Cope et al. 1990
Zinc	0.954	Bechtel Jacobs 1998b	0.147	Pascoe et al. 1996
Pesticides/ PCBs				
4,4'-DDD	0.5	Oliver 1987	1.66	Oliver and Niimi 1988
4,4'-DDE	4.3	Oliver 1987	15.88	Oliver and Niimi 1988
4,4'-DDT	0.5	Oliver 1987	6.56	Oliver and Niimi 1988
alpha-BHC	1	--	1	--
alpha-Chlordane	1	--	1	--
Aroclor-1248	1.92	Bechtel Jacobs 1998b	8.64	Oliver and Niimi 1988
Aroclor-1254	1.92	Bechtel Jacobs 1998b	8.64	Oliver and Niimi 1988
Aroclor-1260	1.92	Bechtel Jacobs 1998b	8.64	Oliver and Niimi 1988
Dieldrin	1	--	1	--
Endosulfan I	1	--	1	--
Endrin	1	--	1	--
Gamma-Chlordane	1	--	1	--
Heptachlor	1	--	1	--
Heptachlor Epoxide	1	--	1	--
Methoxychlor	1	--	1	--

TABLE K-11 (continud)
SEDIMENT BIOACCUMULATION FACTORS USED FOR AQUATIC INVERTEBRATES AND FISH
LESS CONSERVATIVE RISK SCENARIO - OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
REMEDIAL INVESTIGATION, CTO - 0219
MCB CAMP LEJEUNE, NORTH CAROLINA

Chemical	Sediment-Invertebrate BAF (dry weight)		Sediment-Fish BAF (dry weight)	
	Value	Reference	Value	Reference
Semivolatile Organics				
Acenaphthene	2.04	Maruya et al. 1997	1	--
Anthracene	0.191	Maruya et al. 1997	1	--
Benzo(a)anthracene	0.358	Maruya et al. 1997	1	--
Benzo(a)pyrene	0.127	Maruya et al. 1997	1	--
Benzo(b)fluoranthene	0.15	Maruya et al. 1997	1	--
Benzo(g,h,i)perylene	0.215	Maruya et al. 1997	1	--
Benzo(k)fluoranthene	0.232	Maruya et al. 1997	1	--
Chrysene	0.198	Maruya et al. 1997	1	--
Dibenz(a,h)anthracene	1	--	1	--
Fluoranthene	0.212	Maruya et al. 1997	1	--
Fluorene	0.481	Maruya et al. 1997	1	--
Indeno(1,2,3-cd)pyrene	0.173	Maruya et al. 1997	1	--
Phenanthrene	0.294	Maruya et al. 1997	1	--
Pyrene	0.435	Maruya et al. 1997	1	--

TABLE K-12
REFINED EXPOSURE PARAMETERS FOR UPPER TROPHIC LEVEL ECOLOGICAL RECEPTORS
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
REMEDIAL INVESTIGATION, CTO - 0219
MCB CAMP LEJEUNE, NORTH CAROLINA

Receptor	Body Weight (kg)		Water Ingestion Rate (L/day)		Food Ingestion Rate (kg/day - dry)	
	Value	Reference	Value	Reference	Value	Reference
Birds						
American robin	0.0773	USEPA 1993	0.01082	USEPA 1993	0.0064604	Levey and Karasov 1989
Great blue heron	2.23	Quinney 1982	0.10035	USEPA 1993	0.098343	USEPA 1993
Eastern screech-owl	0.181	Dunning 1993	0.01877	USEPA 1993 (Nagy)	0.01913	USEPA 1993 (Nagy)
Marsh wren	0.01125	Dunning 1993	0.00304	USEPA 1993	0.0015834	USEPA 1993
Red-tailed hawk	1.126	Sample and Suter 1994	0.06418	USEPA 1993	0.03488	Sample and Suter 1994
Mammals						
Meadow vole	0.0428	Silva and Downing 1995	0.00749	USEPA 1993	0.00209	USEPA 1993
Mink	0.777	Silva and Downing 1995	0.08159	USEPA 1993	0.02704	USEPA 1993
Raccoon	5.98	USEPA 1993	0.49036	USEPA 1993	0.10488	Conover 1989
Red fox	4.06	Silva and Downing 1995	0.3451	USEPA 1993	0.12308	Sample and Suter 1994
Short-tailed shrew	0.0183	USEPA 1993	0.00408	USEPA 1993	0.00163	USEPA 1993
White-footed mouse	0.0208	Silva and Downing 1995	0.00395	USEPA 1993	0.00050	Sample and Suter 1994

Notes:

Refined exposure parameters represent measurments of central tendency

TABLE K-12 (Continued)
REFINED EXPOSURE PARAMETERS FOR UPPER TROPHIC LEVEL ECOLOGICAL RECEPTORS
OPERABLE UNIT 19, SITE 84/BUILDING 45 AREA
REMEDIAL INVESTIGATION, CTO - 0219
MCB CAMP LEJEUNE, NORTH CAROLINA

Receptor	Dietary Composition (percent)							Soil/ Sediment Ingestion (percent)	
	Terr. Plants	Soil Invert.	Small Mammals	Fish/ Frogs	Aquatic Plants	Aquatic Invert.	Reference	Value	Reference
Birds									
American robin	33.6	58	0	0	0	0	USEPA 1993	8.4	Sample and Suter 1994
Great blue heron	0	0	0	100	0	0	USEPA 1993; Sample and Suter 1994	0	Sample and Suter 1994
Eastern screech-owl	0	28	70	0	0	0	Johnsgard 1988	2	Assumed based on diet
Marsh wren	0	0	0	0	0	95	USEPA 1993	5	Assumed based on diet
Red-tailed hawk	0	0	100	0	0	0	USEPA 1993; Sample and Suter 1994	0	Sample and Suter 1994
Mammals									
Meadow vole	95.6	2	0	0	0	0	USEPA 1993	2.4	Beyer et al. 1994
Mink	0	0	6	89	1	4	USEPA 1993	0	Sample and Suter 1994
Raccoon	0	0	0	11 *	36	43.6	USEPA 1993 (MD)	9.4	Beyer et al. 1994
Red fox	7	2.8	87.4	0	0	0	USEPA 1993 (MD)	2.8	Beyer et al. 1994
Short-tailed shrew	4.7	82.3	0	0	0	0	USEPA 1993; Sample and Suter 1994	13	Sample and Suter 1994
White-footed mouse	54	44	0	0	0	0	USEPA 1993	2	Beyer et al. 1994

Notes:

Refined exposure parameters represent measurments of central tendency

* Frogs only