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MCB CAMP LEJUENE
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LETTER REGARDING COLLECTED FISH AND CRAB SAMPLES AND VOC CONCENTRATIONS IN THE SURFACE WATER AND SEDIMENT SAMPLES AT SITES 65 AND 73 MCB CAMP LEJEUNE NC

11/25/1997

BAKER ENVIRONMENTAL INC

CTO-0312

Baker

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

(412) 269-6000
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November 25, 1997

State of North Carolina
Department of Environment, Health, and Natural Resources
Division of Epidemiology
P.O. Box 29601
Raleigh, NC 27626-0601

Attn: Ms. Luanne K. Williams, Pharm.D., Toxicologist

Dear Ms. Williams:

In May 1995, Baker Environmental, Inc., (Baker) collected fish and crab samples from two sites at MCB Camp Lejeune: Site 65 (Engineer Area Dump) and Site 73 (Amphibious Vehicle Maintenance Facility). Several of the tissue samples had elevated detections of several volatile organic compounds (VOCs) including acetone, 2-butanone, methylene chloride, and toluene. These contaminants are not believed to be related to contamination at the site for the following reasons. The concentrations of the VOCs in the surface water and sediment samples were very low and were detected infrequently. In addition, VOCs typically do not bioconcentrate in fish and crab tissues as noted by their relatively low bioconcentration factors (acetone-0.69; methylene chloride-3.75; and toluene-10.7). Therefore, it is more likely that the VOCs were introduced in the laboratory although the exact procedure whereas the VOCs were introduced cannot be determined.

However, because of the elevated VOC levels, Baker is submitting the following documents to you for your information and review:

- List of composite fish and crab samples that were sent to the laboratory for chemical analysis along with the length and weight of the fish in each sample.
- Tables identifying the fish and crab species in each sample
- The positive detection analytical results and statistical summaries for the fish and crab samples.
- Location maps for the Site 65 and Site 73 sampling events.

If I can be of further assistance, please give me a call at (412)269-6090 or Baker's Project Manager, Dan Bonk at (412)269-2063.

Sincerely,

BAKER ENVIRONMENTAL, INC.

Aaron Bernhardt
Environmental Scientist

AMB/lq
Enclosures

cc: Ms. Gena Townsend, U.S. EPA
Mr. David J. Lown, L.G., P.E., NC DENR
Mr. Neal Paul, MCB Camp Lejeune
Ms. Katherine Landman, LANTDIV, Code 18232

SUMMARY OF SAMPLES SENT TO LABORATORY FOR CHEMICAL ANALYSIS
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJEUNE, NORTH CAROLINA

Sample Number	Species	Sample Analysis	Trophic Level
65-FS04-BG01W	Bluegill	Whole Body	Insectivore
65-FS04-BG01F	Bluegill	Fillet	Insectivore
65-FS04-RS01W	Redear Sunfish	Whole Body	Insectivore
65-FS05-LB01W	Largemouth Bass	Whole Body	Piscivore
65-FS05-LB01F	Largemouth Bass	Fillet	Piscivore
65-FS05-RS01W	Redear Sunfish	Whole Body	Insectivore
65-FS05-RS01F	Redear Sunfish	Fillet	Insectivore
65-FS05-BG01W	Bluegill	Whole Body	Insectivore
65-FS05-BG01F	Bluegill	Fillet	Insectivore

SUMMARY OF SAMPLES SENT TO LABORATORY FOR CHEMICAL ANALYSIS
SITE 73-AMPHIBIOUS VEHICLE MAINTENANCE FACILITY
REMEDIAL INVESTIGATION CTO-0312
MCB CAMP LEJEUNE, NORTH CAROLINA

Sample Number	Species	Sample Analysis	Trophic Level
73-FS01-BC01F	Blue Crab	Edible Portion	Omnivore
73-FS01-BC02F	Blue Crab	Edible Portion	Omnivore
73-FS01-BF01F	Bluefish	Fillet	Piscivore
73-FS01-PF01W	Pinfish	Whole Body	Omnivore
73-FS01-SF01W	Southern Flounder	Whole Body	Piscivore
73-FS01-SF01F	Southern Flounder	Fillet	Piscivore
73-FS02-BC01F	Blue Crab	Edible Portion	Omnivore
73-FS02-BC02F	Blue Crab	Edible Portion	Omnivore
73-FS02-YM01W	Yellowfin Menhaden	Whole Body	Planctivore
73-FS02-SF01W	Southern Flounder	Whole Body	Piscivore
73-FS02-SF01F	Southern Flounder	Fillet	Piscivore
73-FS02-SS01F	Spotted Sea Trout	Fillet	Piscivore
73-FS02-SPM01F	Spanish Mackeral	Fillet	Piscivore
73-FS02-PF01W	Pinfish	Whole Body	Omnivore
73-FS03-BC01F	Blue Crab	Edible Portion	Omnivore
73-FS03-BC02F	Blue Crab	Edible Portion	Omnivore
73-FS03-AC01F	Atlantic Croaker	Fillet	Omnivore
73-FS03-SF01F	Southern Flounder	Fillet	Piscivore
73-FS03-SM01F	Stripped Mullet	Fillet	Planctivore
73-FS03-YM01W	Yellowfin Menhaden	Whole Body	Planctivore

FISH SAMPLE TISSUE LOG
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJEUNE, NORTH CAROLINA

Date	Collection Time	Sample Number	Length (cm)	Weight (grams)	New Sample Number	Sample Analysis
5-18-95	1000	73-FS01-BC01	15.0	200	73-FS01-BC01F	Edible Portion
5-18-95	1000	73-FS01-BC02	16.0	200		
5-18-95	1000	73-FS01-BC03	16.0	200		
5-18-95	1000	73-FS01-BC04	17.0	230		
5-18-95	1000	73-FS01-BC05	18.0	250		
5-18-95	1000	73-FS01-BC06	16.5	225		
5-18-95	1000	73-FS01-BC07	15.0	150		
5-18-95	1000	73-FS01-BC08	14.0	145		
5-20-95	1800	73-FS01-BC11	14.0	150		
5-20-95	1800	73-FS01-BC10	14.0	155		
		Minimum	14			
		Maximum	18			
		Min/Max	0.78			
		Average	15.6			
		Count	10			

Date	Collection Time	Sample Number	Length (cm)	Weight (grams)	New Sample Number	Sample Analysis
5-20-95	800	73-FS01-BC09	18.0	200	73-FS01-BC02F	Edible Portion
5-20-95	1800	73-FS01-BC12	16.0	235		
5-21-95	1815	73-FS01-BC15	14.0	170		
5-21-95	1815	73-FS01-BC16	16.0	195		
5-21-95	1815	73-FS01-BC17	15.0	165		
5-21-95	1815	73-FS01-BC18	14.0	150		
5-22-95	815	73-FS01-BC19	17.0	220		
5-22-95	815	73-FS01-BC20	16.0	230		
5-23-95	815	73-FS01-BC21	15.5	225		
5-23-95	815	73-FS01-BC22	15.5	255		
		Minimum	14			
		Maximum	18			
		Min/Max	0.78			
		Average	15.7			
		Count	10			

Date	Collection Time	Sample Number	Length (cm)	Weight (grams)	New Sample Number	Sample Analysis
5-20-95	750	73-FS01-BF01	37	500	73-FS01-BF01F	Fillet
5-22-95	800	73-FS01-BF02	28.5	200		
		Minimum	28.5			
		Maximum	37			
		Min/Max	0.77			
		Average	32.8			
		Count	2			

FISH SAMPLE TISSUE LOG
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJEUNE, NORTH CAROLINA

Date	Collection Time	Sample Number	Length (cm)	Weight (grams)	New Sample Number	Sample Analysis
5-20-95	1800	73-FS01-PF01	20	100	73-FS01-PF01W	Whole Body
5-21-95	800	73-FS01-PF02	18	110		
5-21-95	1800	73-FS01-PF03	14.5	60		
5-22-95	800	73-FS01-PF04	18	90		
		Minimum	14.5			
		Maximum	20			
		Min/Max	0.73			
		Average	17.6			
		Count	4			

Date	Collection Time	Sample Number	Length (cm)	Weight (grams)	New Sample Number	Sample Analysis
5-21-95	1800	73-FS01-SF02	24	170	73-FS01-SF01W	Whole Body
5-22-95	800	73-FS01-SF03	26	200		
5-22-95	800	73-FS01-SF05	22.5	135		
		Minimum	22.5			
		Maximum	26			
		Min/Max	0.87			
		Average	24.2			
		Count	3			

Date	Collection Time	Sample Number	Length (cm)	Weight (grams)	New Sample Number	Sample Analysis
5-21-95	1800	73-FS01-SF01	34	475	73-FS01-SF01F	Fillet
5-23-95	800	73-FS01-SF06	27	230		
5-22-95	800	73-FS01-SF04	26	220		
		Minimum	26			
		Maximum	34			
		Min/Max	0.76			
		Average	29			
		Count	3			

FISH SAMPLE TISSUE LOG
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJEUNE, NORTH CAROLINA

Date	Collection Time	Sample Number	Length (cm)	Weight (grams)	New Sample Number	Sample Analysis
5-20-95	845	73-FS02-BC01	15	210	73-FS02-BC01F	Edible Portion
5-20-95	845	73-FS02-BC03	14.5	180		
5-20-95	845	73-FS02-BC04	16	225		
5-20-95	1845	73-FS02-BC06	16	200		
5-20-95	1845	73-FS02-BC07	15	150		
5-20-95	1845	73-FS02-BC08	16	170		
5-21-95	845	73-FS02-BC09	17.5	260		
5-21-95	845	73-FS02-BC10	15	150		
5-21-95	845	73-FS02-BC11	16	210		
5-22-95	845	73-FS02-BC17	18	300		
		Minimum	14.5			
		Maximum	18			
		Min/Max	0.81			
		Average	15.9			
		Count	10			

Date	Collection Time	Sample Number	Length (cm)	Weight (grams)	New Sample Number	Sample Analysis
5-22-95	845	73-FS02-BC13	16	200	73-FS02-BC02F	Edible Portion
5-21-95	845	73-FS02-BC12	15	200		
5-22-95	845	73-FS02-BC14	15	210		
5-22-95	845	73-FS02-BC15	14	180		
5-22-95	845	73-FS02-BC16	18	250		
5-23-95	845	73-FS02-BC18	15	235		
5-23-95	845	73-FS02-BC19	17.5	295		
5-23-95	845	73-FS02-BC20	16.5	315		
5-23-95	845	73-FS02-BC21	15.5	225		
		Minimum	14			
		Maximum	18			
		Min/Max	0.78			
		Average	15.8			
		Count	9			

Date	Collection Time	Sample Number	Length (cm)	Weight (grams)	New Sample Number	Sample Analysis
5-21-95	1830	73-FS02-YM01	20	120	73-FS02-YM01W	Whole Body
5-21-95	1830	73-FS02-YM02	21	110		
		Minimum	20			
		Maximum	21			
		Min/Max	0.95			
		Average	20.5			
		Count	2			

FISH SAMPLE TISSUE LOG
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJEUNE, NORTH CAROLINA

Date	Collection Time	Sample Number	Length (cm)	Weight (grams)	New Sample Number	Sample Analysis
5-20-95	830	73-FS02-SF01	26	200	73-FS02-SF01W	Whole Body
5-20-95	830	73-FS02-SF02	27	225		
5-21-95	1830	73-FS02-SF03	25	180		
5-22-95	830	73-FS02-SF07	27	250		
5-22-95	830	73-FS02-SF08	22.5	150		
		Minimum	22.5			
		Maximum	27			
		Min/Max	0.83			
		Average	25.5			
		Count	5			

Date	Collection Time	Sample Number	Length (cm)	Weight (grams)	New Sample Number	Sample Analysis
5-21-95	1830	73-FS02-SF04	27.5	230	73-FS02-SF01F	Fillet
5-23-95	830	73-FS02-SF09	27.5	235		
5-22-95	830	73-FS02-SF05	28.5	270		
5-23-95	830	73-FS02-SF10	32	390		
		Minimum	27.5			
		Maximum	32			
		Min/Max	0.86			
		Average	28.9			
		Count	4			

Date	Collection Time	Sample Number	Length (cm)	Weight (grams)	New Sample Number	Sample Analysis
5-20-95	1830	73-FS02-SS01	40	1600	73-FS02-SS01F	Fillet
5-21-95	830	73-FS02-SPM01	49	750	73-FS02-SPM01F	Fillet

Date	Collection Time	Sample Number	Length (cm)	Weight (grams)	New Sample Number	Sample Analysis
5-21-95	830	73-FS02-PF01	14	55	73-FS02-PF01W	Whole Body
5-21-95	1830	73-FS02-PF02	20	100		
5-22-95	830	73-FS02-PF03	21.5	125		
		Minimum	14			
		Maximum	21.5			
		Min/Max	0.65			
		Average	18.5			
		Count	3			

FISH SAMPLE TISSUE LOG
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJEUNE, NORTH CAROLINA

Date	Collection Time	Sample Number	Length (cm)	Weight (grams)	New Sample Number	Sample Analysis
5-20-95	945	73-FS03-BC01	15	200	73-FS03-BC01F	Edible Portion
5-20-95	945	73-FS03-BC04	14	165		
5-20-95	945	73-FS03-BC05	14.5	140		
5-20-95	945	73-FS03-BC06	15	160		
5-20-95	945	73-FS03-BC07	17	220		
5-20-95	1915	73-FS03-BC08	16	200		
5-21-95	915	73-FS03-BC12	14	200		
5-20-95	1915	73-FS03-BC10	16	200		
5-21-95	915	73-FS03-BC15	13	145		
		Minimum	13			
		Maximum	17			
		Min/Max	0.76			
		Average	14.9			
		Count	9			

Date	Collection Time	Sample Number	Length (cm)	Weight (grams)	New Sample Number	Sample Analysis
5-20-95	1915	73-FS03-BC11	14	155	73-FS03-BC02F	Edible Portion
5-20-95	1915	73-FS03-BC09	17	230		
5-21-95	915	73-FS03-BC13	15	200		
5-21-95	915	73-FS03-BC14	16.5	280		
5-21-95	915	73-FS03-BC16	14	160		
5-21-95	915	73-FS03-BC17	17	250		
5-23-95	1015	73-FS03-BC19	17	270		
5-20-95	945	73-FS03-BC02	13	145		
5-20-95	945	73-FS03-BC03	13	150		
		Minimum	13			
		Maximum	17			
		Min/Max	0.76			
		Average	15.2			
		Count	9			

Date	Collection Time	Sample Number	Length (cm)	Weight (grams)	New Sample Number	Sample Analysis
5-20-95	930	73-FS03-AC01	27.5	300	73-FS03-AC01F	Fillet
5-21-95	830	73-FS02-AC01	24	150		
		Minimum	24			
		Maximum	27.5			
		Min/Max	0.87			
		Average	25.8			
		Count	2			

FISH SAMPLE TISSUE LOG
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJEUNE, NORTH CAROLINA

Date	Collection Time	Sample Number	Length (cm)	Weight (grams)	New Sample Number	Sample Analysis
5-20-95	1900	73-FS03-SF01	33	425	73-FS03-SF01F	Fillet
5-21-95	900	73-FS03-SF02	34.5	500		
5-21-95	900	73-FS03-SF03	34	450		
5-23-95	1000	73-FS03-SF04	26	150		
		Minimum	26			
		Maximum	34.5			
		Min/Max	0.75			
		Average	31.9			
		Count	4			

Date	Collection Time	Sample Number	Length (cm)	Weight (grams)	New Sample Number	Sample Analysis
5-20-95	1900	73-FS03-SM01	30.5	300	73-FS03-SM01F	Fillet
5-21-95	900	73-FS03-SM02	33.5	425		
		Minimum	30.5			
		Maximum	33.5			
		Min/Max	0.91			
		Average	32.0			
		Count	2			

Date	Collection Time	Sample Number	Length (cm)	Weight (grams)	New Sample Number	Sample Analysis
5-23-95	1000	73-FS03-YM01	36	425	73-FS03-YM01W	Whole Body

FISH SAMPLE TISSUE LOG
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJEUNE, NORTH CAROLINA

Date	Collection Time	Sample Number	Length (cm)	Weight (grams)	New Sample Number	Sample Analysis
5-17-95	900	65-FS04-BG02	11.5	105	65-FS04-BG01W	Whole Body
5-17-95	900	*	11.6	*		
5-17-95	900	*	11.5	*		
5-17-95	900	*	10.5	*		
5-19-95	1130	65-FS04-BG04	12.7	210		
5-19-95	1130	*	12.2	*		
5-19-95	1130	*	12.4	*		
5-19-95	1130	*	12	*		
5-19-95	1130	*	12	*		
5-19-95	1130	*	12.3	*		
5-19-95	1130	*	11	*		
5-19-95	1130	*	12	*		
5-22-95	1500	65-FS04-BG09	13	150		
5-22-95	1500	*	12	*		
5-22-95	1500	*	12.5	*		
5-22-95	1500	*	12.5	*		
5-22-95	1500	*	11	*		
5-22-95	1500	65-FS04-BG11	12	120		
5-22-95	1500	*	12	*		
5-22-95	1500	*	12.5	*		
5-22-95	1500	*	11	*		
		Minimum	10.5			
		Maximum	13			
		Min/Max	0.81			
		Average	11.91			
		Count	21			

Date	Collection Time	Sample Number	Length (cm)	Weight (grams)	New Sample Number	Sample Analysis
5-17-95	900	65-FS04-BG01	17	65	65-FS04-BG01F	Fillet
5-18-95	1600	65-FS04-BG03	14	50		
5-22-95	1500	65-FS04-BG06	18	60		
5-22-95	1500	65-FS04-BG07	14	50		
5-22-95	1500	65-FS04-BG08	15	50		
5-22-95	1500	65-FS04-BG10	12	120		
5-22-95	1500	*	12.3	*		
5-22-95	1500	*	12	*		
5-22-95	1500	*	12.8	*		
		Minimum	12			
		Maximum	18			
		Min/Max	0.67			
		Average	14.1			
		Count	9			

FISH SAMPLE TISSUE LOG
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJEUNE, NORTH CAROLINA

Date	Collection Time	Sample Number	Length (cm)	Weight (grams)	New Sample Number	Sample Analysis
5-17-95	900	65-FS04-RS01	17.5	70	65-FS04-RS01W	Whole Body
5-17-95	900	65-FS04-RS02	17	65		
5-17-95	900	65-FS04-RS03	12	25		
5-22-95	1500	65-FS04-RS04	12	80		
5-22-95	1500	*	13	*		
5-22-95	1500	*	12.5	*		
		Minimum	12			
		Maximum	17.5			
		Min/Max	0.69			
		Average	14			
		Count	6			

Date	Collection Time	Sample Number	Length (cm)	Weight (grams)	New Sample Number	Sample Analysis
5-16-95	1600	65-FS05-LB01	22	150	65-FS05-LB01W	Whole Body
5-17-95	1000	65-FS05-LB03	28.5	300		
5-17-95	1000	65-FS05-LB04	27	225		
		Minimum	22			
		Maximum	28.5			
		Min/Max	0.77			
		Average	25.8			
		Count	3			

Date	Collection Time	Sample Number	Length (cm)	Weight (grams)	New Sample Number	Sample Analysis
5-17-95	1000	65-FS05-LB02	41	1200	65-FS05-LB01F	Fillet

Date	Collection Time	Sample Number	Length (cm)	Weight (grams)	New Sample Number	Sample Analysis
5-16-95	1600	65-FS05-RS01	14.2	55	65-FS05-RS01W	Whole Body
5-16-95	1600	65-FS05-RS02	15	70		
5-18-95	1500	65-FS05-RS07	17	100		
5-18-95	1500	65-FS05-RS10	16.5	70		
		Minimum	14.2			
		Maximum	17			
		Min/Max	0.84			
		Average	15.7			
		Count	4			

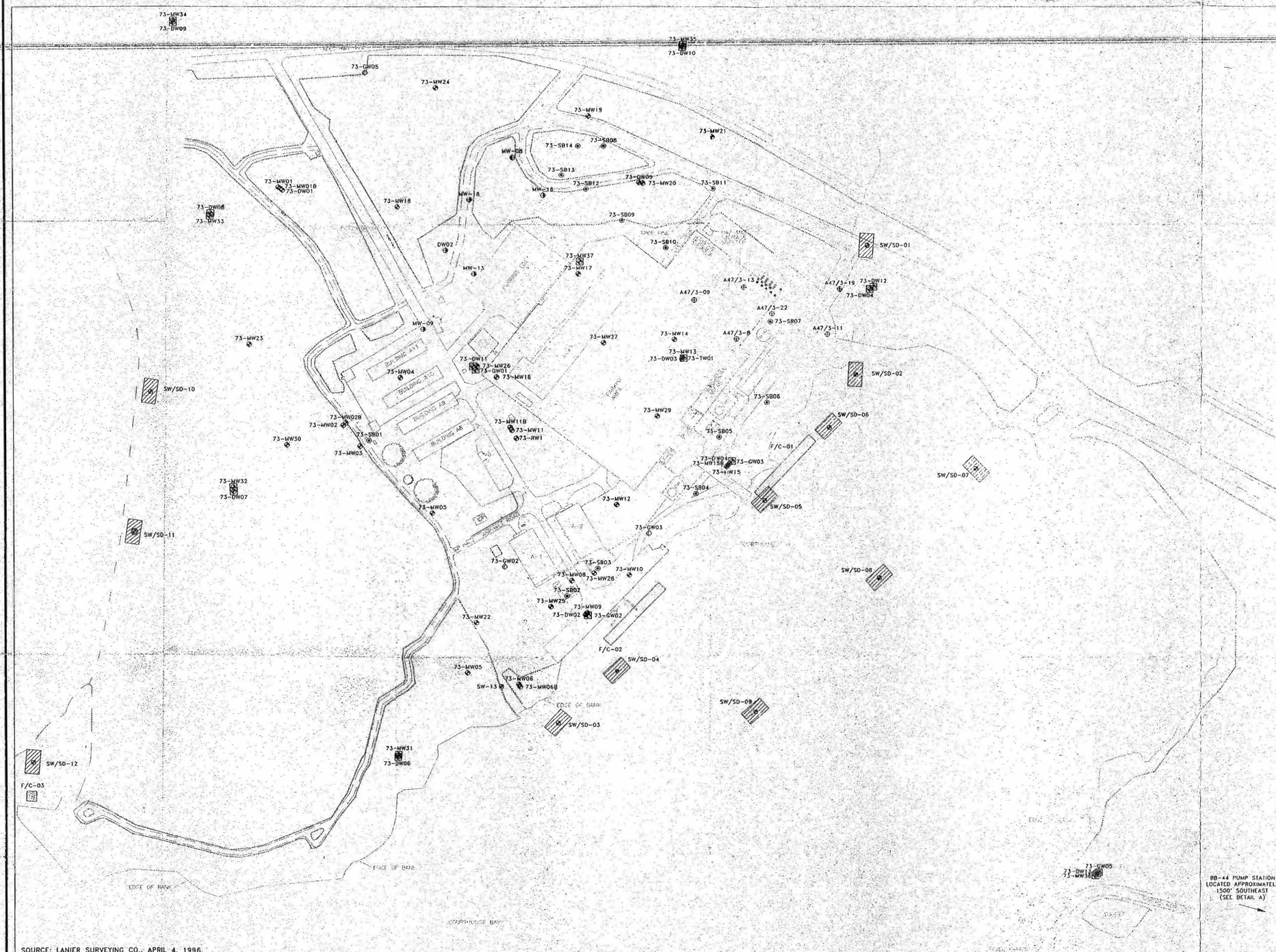
FISH SAMPLE TISSUE LOG
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJEUNE, NORTH CAROLINA

Date	Collection Time	Sample Number	Length (cm)	Weight (grams)	New Sample Number	Sample Analysis
5-17-95	1000	65-FS05-RS03	20.5	200	65-FS05-RS01F	Fillet
5-17-95	1000	65-FS05-RS04	20	140		
5-18-95	1500	65-FS05-RS05	25	300		
5-18-95	1500	65-FS05-RS06	22.5	220		
5-18-95	1500	65-FS05-RS08	19	120		
5-18-95	1500	65-FS05-RS09	19	130		
		Minimum	19			
		Maximum	25			
		Min/Max	0.76			
		Average	21			
		Count	6			

Date	Collection Time	Sample Number	Length (cm)	Weight (grams)	New Sample Number	Sample Analysis
5-16-95	1600	65-FS05-BG01	15.5	65	65-FS05-BG01W	Whole Body
5-17-95	1000	65-FS05-BG03	14.5	65		
5-17-95	1000	65-FS05-BG05	13.5	55		
5-18-95	1500	65-FS05-BG10	15	60		
5-18-95	1500	65-FS05-BG11	14.5	60		
		Minimum	13.5			
		Maximum	15.5			
		Min/Max	0.87			
		Average	14.6			
		Count	5			

Date	Collection Time	Sample Number	Length (cm)	Weight (grams)	New Sample Number	Sample Analysis
5-17-95	1000	65-FS05-BG04	17	120	65-FS05-BG01F	Fillet
5-17-95	1000	65-FS05-BG02	16.5	100		
5-18-95	1500	65-FS05-BG06	18.1	125		
5-18-95	1500	65-FS05-BG07	20	120		
5-18-95	1500	65-FS05-BG08	19.3	145		
5-18-95	1500	65-FS05-BG09	17	110		
		Minimum	16.5			
		Maximum	20			
		Min/Max	0.83			
		Average	18.0			
		Count	6			

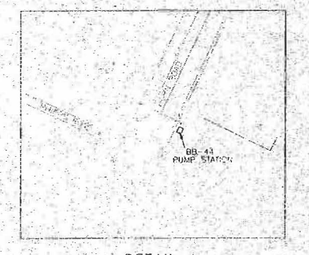
* Fish were measured individually but weighed as a group



SOURCE: LANIER SURVEYING CO., APRIL 4, 1996.

LEGEND

73-SB01	SOIL BORINGS ADVANCED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE I (APRIL-MAY, 1995)
73-MW01	MONITORING WELLS INSTALLED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE I (APRIL-MAY, 1995)
73-MW31	MONITORING WELLS INSTALLED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE II (FEBRUARY-MARCH, 1995)
A47/3-8	MONITORING WELLS INSTALLED DURING UST INVESTIGATION BY GSI AND LAW-CATLIN AND ASSOCIATES (1993)
MW-18	MONITORING WELLS INSTALLED BY BAKER DURING UST INVESTIGATION (1992 AND 1993)
MW-08	MONITORING WELLS INSTALLED DURING A UST INVESTIGATION BY ATEC AND ASSOCIATES (1991)
73GW-02	MONITORING WELLS INSTALLED BY ESE DURING CONFIRMATORY SAMPLING (1990)
SW/SD-01	SURFACE WATER/SEDIMENT LOCATION SAMPLED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE I (APRIL-MAY, 1995)
F/C-01	FISH/CRAB LOCATION SAMPLED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE I (APRIL-MAY, 1995)



DETAIL A

REVISIONS		NORTH		SITE 73 - AMPHIBIOUS VEHICLE MAINTENANCE FACILITY REMEDIAL INVESTIGATION, CTO-0312 MARINE CORPS BASE, CAMP LEJEUNE NORTH CAROLINA	Baker Baker Environmental, Inc.	SAMPLE LOCATION MAP (RI PHASE I AND PHASE II)	FIGURE NO: 2-1
	DRAWN WJH REVIEWED JSC S.O.# 62470-312-0000-07000 CADD# 312509PP			BAKER ENVIRONMENTAL, Inc. Coraopolis, Pennsylvania		SCALE 1" = 150' DATE NOVEMBER 1996	

312038RI

SNEADS FERRY ROAD (N.C. ROUTE 172)

TANK TRAIL

OPEN AREA

65SB-12

65MW-03

65SB-09

HEAVY EQUIPMENT TRAINING AREA

OPEN AREA

WOODED AREA

WOODED AREA

65DW-04

65MW-04

BURN AREA

65MW-01

65TP-07

65DW-01

SCATTERED DEBRIS

65SB-10

65SB-11

65MW-07

BUILDING

WOODED AREA

65TP-04

65TP-05

DEBRIS PILES

65TP-01

65SB-06

65TP-06

65TP-02

65SB-08

65SB-07

HARDWOODS PINES &

65MW-06

65SD/SW/BN-04

SG02

COURTHOUSE BAY POND

POWERLINE POND

65SD/SW/BN-05

65MW-05

65MW-02

65DW-02

BUILDING

DIRT ROAD

OPEN AREA

WOODED AREA

WOODED AREA

OPEN AREA HEAVY EQUIPMENT STORAGE AREA

DIRT ROAD

200 0 100 200

1 inch = 200 ft.

Baker

Baker Environmental, Inc.

LEGEND

65MW-01	MONITORING WELL LOCATION
65DW-01	DEEP MONITORING WELL LOCATION
65SB-07	SOIL BORING LOCATION
65TP-02	TEST PIT LOCATION
SG02	STAFF GAUGE LOCATION
65SD/SW/BN-04	SURFACE WATER, SEDIMENT AND BENTHIC SAMPLE LOCATION

SOURCE: BRENT A. LANIER, SURVEYING AND PLANNING, MAY 1995

FIGURE 2-1
SAMPLE LOCATIONS
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA

TABLE 4-39
DETECTED VOLATILES IN EDIBLE PORTIONS OF BLUE CRABS
VIA METHOD 8240
SITE 73 - AMPHIBIOUS VEHICLE MAINTENANCE FACILITY
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJEUNE, NORTH CAROLINA

LOCATION	73-FS01-BC01F	73-FS01-BC02F	73-FS02-BC02F	73-FS03-BC01F	73-FS03-BC02F
METHOD	8240	8240	8240	8240	8240
VOLATILES (ug/kg)					
METHYLENE CHLORIDE	17000 J	48000 U	4800 U	1300 J	4800 U
ACETONE	290000	200000	2500 J	40000 J	38000 J
TOLUENE	48000 U	48000 U	4800 U	580 J	4800 U

QUALIFIER DEFINITIONS
J = Analyte present. Reported value may not be accurate or precise.
U = Not detected. The associated number indicates approximate sample concentration necessary to be detected.

NOTES
ug/kg = micrograms per kilogram.

TABLE 4-40
DETECTED SEMIVOLATILES IN EDIBLE PORTIONS OF BLUE CRABS
VIA METHOD 8270
SITE 73 - AMPHIBIOUS VEHICLE MAINTENANCE FACILITY
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJEUNE, NORTH CAROLINA

LOCATION	73-FS03-BC01F	73-FS03-BC02F
METHOD	8270	8270
SEMIVOLATILES (ug/kg)		
DI-N-BUTYL PHTHALATE	2000	2200

QUALIFIER DEFINITIONS
U = Not detected. The associated number indicates approximate sample concentration necessary to be detected.

NOTES
ug/kg = micrograms per kilogram.

TABLE 4-41
DETECTED INORGANICS IN EDIBLE PORTIONS OF BLUE CRABS
VIA METHOD CLP
SITE 73 - AMPHIBIOUS VEHICLE MAINTENANCE FACILITY
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJEUNE, NORTH CAROLINA

LOCATION	73-FS01-BC01F	73-FS01-BC02F	73-FS02-BC01F	73-FS02-BC02F	73-FS03-BC01F	73-FS03-BC02F
METHOD	CLP	CLP	CLP	CLP	CLP	CLP
INORGANICS (mg/kg)						
ARSENIC	3.1 J	3.9 J	4.3 J	2.9 J	3.3 J	4.6 J
BARIUM	0.094 J	0.054 J	0.07 U	0.035 U	0.07 U	0.094 U
CALCIUM	1820 J	1060 J	1130 J	549 J	1330 J	1060 J
COPPER	4.4	5.7	5	4.4	4.5	6.6
IRON	6.4 J	7.1 J	4.5 J	5.6 J	4.8 J	6.6 J
LEAD	0.055 U	0.062 B	0.06 U	0.054 U	0.06 U	0.08
MAGNESIUM	456 J	416 J	438 J	378 J	423 J	430 J
MANGANESE	0.46 J	0.22 J	0.26 J	0.15 J	0.22 J	0.26 J
MERCURY	0.04 U	0.04 UJ	0.05 J	0.04 UJ	0.042 J	0.05 J
POTASSIUM	2130 J	2580 J	2650 J	2410 J	2490 J	3090 J
SELENIUM	0.28	0.29	0.31	0.28	0.3	0.44
SILVER	0.12	0.19	0.24	0.094 U	0.19	0.25
SODIUM	4860	4500	4660	4780	3880	3400
ZINC	23.6 J	29 J	35.4 J	29.2 J	29.2 J	39.1 J

QUALIFIER DEFINITIONS
J = Analyte present. Reported value may not be accurate or precise.
U = Not detected. The associated number indicates approximate sample concentration necessary to be detected.
UJ = Not detected. Quantitation limit may be inaccurate or imprecise.
B = Constituent also detected in a blank(s). The result is considered a non-detect.

NOTES
mg/kg = milligrams per kilogram.
NA = not analyzed.

TABLE 4-42
DETECTED VOLATILES IN WHOLE BODY FISH SAMPLES
VIA METHOD 8240
SITE 73 - AMPHIBIOUS VEHICLE MAINTENANCE FACILITY
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJEUNE, NORTH CAROLINA

LOCATION	73-FS01-SF01W	73-FS02-PF01W	73-FS02-SF01W	73-FS02-YM01W	73-FS03-YM01W
METHOD	8240	8240	8240	8240	8240
VOLATILES (ug/kg)					
ACETONE	540000	11000	26000	22000	60000 B

QUALIFIER DEFINITIONS
B = Constituent also detected in a blank(s). The result is considered a non-detect.

NOTES
ug/kg = micrograms per kilogram.

TABLE 4-43
DETECTED INORGANICS IN WHOLE BODY FISH SAMPLES
VIA METHOD CLP
SITE 73 - AMPHIBIOUS VEHICLE MAINTENANCE FACILITY
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJEUNE, NORTH CAROLINA

LOCATION	73-FS01-SF01W	73-FS02-PF01W	73-FS02-SF01W	73-FS02-YM01W	73-FS03-YM01W
METHOD	CLP	CLP	CLP	CLP	CLP
INORGANICS (mg/kg)					
ALUMINUM	3.1 U	9.2 J	3.4 U	119 J	0.85 U
ARSENIC	0.4 J	1.8 J	1.4 J	2.4 J	0.88 J
BARIUM	0.19 U	0.65 J	0.34 J	1.5 J	0.02 U
CALCIUM	13500 J	15500 J	18300 J	12300 J	334 J
CHROMIUM	0.46 U	0.46 U	0.6 U	0.71	0.011
COPPER	0.68 U	1.1	0.66 U	1.3	0.02 U
IRON	9.9 J	38.3 J	9.5 J	137 J	1.1 U
LEAD	0.054 U	0.06 U	0.054 U	0.27	0.27
MAGNESIUM	518 J	506 J	550 J	515 J	10.1 J
MANGANESE	2 J	4.4 J	2.1 J	4.6 J	0.15 J
MERCURY	0.04 UJ	0.044 J	0.04 UJ	0.04 UJ	0.04 UJ
POTASSIUM	3140 J	3290 J	3340 J	3040 J	46.8 U
SELENIUM	0.34	0.69	0.35	0.5	0.46
SODIUM	1370	1580	1360	1370	50.5
THALLIUM	0.11 U	0.12 U	0.11 U	0.11 U	0.12
VANADIUM	0.12 U	0.12 U	0.12 U	2.3	0.022
ZINC	16.4 J	26.6 J	18.4 J	17.3 J	0.51 J
MOLYBDENUM	0.12 U	0.22	0.15	0.12 U	0.0024 U

QUALIFIER DEFINITIONS
J = Analyte present. Reported value may not be accurate or precise.
U = Not detected. The associated number indicates approximate sample concentration necessary to be detected.
UJ = Not detected. Quantitation limit may be inaccurate or imprecise.

NOTES
mg/kg = milligrams per kilogram.
NA = not analyzed.

TABLE 4-44
DETECTED VOLATILES IN FISH FILLET SAMPLES
VIA METHOD 8240
SITE 73 - AMPHIBIOUS VEHICLE MAINTENANCE FACILITY
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJEUNE, NORTH CAROLINA

LOCATION	73-FS01-BF01F	73-FS01-SF01F	73-FS02-SF01F	73-FS02-SPM01F	73-FS02-SS01F	73-FS03-AC01F
METHOD	8240	8240	8240	8240	8240	8240
VOLATILES (ug/kg)						
METHYLENE CHLORIDE	4800 U	48000 U	48000 U	4800 U	4800 U	1100 J
ACETONE	17000	96000	140000	90000	74000 J	28000 J
TOLUENE	4800 U	48000 U	48000 U	4800 U	4800 U	580 J

QUALIFIER DEFINITIONS
J = Analyte present. Reported value may not be accurate or precise.
U = Not detected. The associated number indicates approximate sample concentration necessary to be detected.

NOTES
ug/kg = micrograms per kilogram.
NA = not analyzed.

TABLE 4-44
DETECTED VOLATILES IN FISH FILLET SAMPLES
VIA METHOD 8240
SITE 73 - AMPHIBIOUS VEHICLE MAINTENANCE FACILITY
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJEUNE, NORTH CAROLINA

LOCATION	73-FS03-SF01F	73-FS03-SM01F
METHOD	8240	8240
VOLATILES (ug/kg)		
METHYLENE CHLORIDE	4800 U	4800 U
ACETONE	62000 J	6400
TOLUENE	520 J	4800 U

QUALIFIER DEFINITIONS
J = Analyte present. Reported value may not be accurate or precise.
U = Not detected. The associated number indicates approximate sample concentration necessary to be detected.

NOTES
ug/kg = micrograms per kilogram.
NA = not analyzed.

TABLE 4-45
DETECTED SEMIVOLATILES IN FISH FILLET SAMPLES
VIA METHOD 8270
SITE 73 - AMPHIBIOUS VEHICLE MAINTENANCE FACILITY
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJEUNE, NORTH CAROLINA

LOCATION	73-FS03-AC01F
METHOD	8270
SEMIVOLATILES (ug/kg)	
DI-N-BUTYL PHTHALATE	4400

QUALIFIER DEFINITIONS
U = Not detected. The associated number indicates approximate sample concentration necessary to be detected.

NOTES
ug/kg = micrograms per kilogram.

TABLE 4-46
DETECTED PESTICIDES/PCBS IN FISH FILLET SAMPLES
VIA METHOD 8080
SITE 73 - AMPHIBIOUS VEHICLE MAINTENANCE FACILITY
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJEUNE, NORTH CAROLINA

LOCATION	73-FS01-BF01F	73-FS02-SPM01F	73-FS02-SS01F	73-FS03-AC01F	73-FS03-SM01F
METHOD	8080	8080	8080	8080	8080
PESTICIDE/PCBS (ug/kg)					
ENDRIN	9.9 UJ	9.9 UJ	9.8 J	9.9 UJ	9.9 UJ

QUALIFIER DEFINITIONS
J = Analyte present. Reported value may not be accurate or precise.
U = Not detected. The associated number indicates approximate sample concentration necessary to be detected.

NOTES
ug/kg = micrograms per kilogram.

TABLE 4-47
DETECTED INORGANICS IN FISH FILLET SAMPLES
VIA METHOD CLP
SITE 73 - AMPHIBIOUS VEHICLE MAINTENANCE FACILITY
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJEUNE, NORTH CAROLINA

LOCATION	73-FS01-BF01F	73-FS01-SF01F	73-FS02-SF01F	73-FS02-SPM01F	73-FS02-SS01F	73-FS03-AC01F
METHOD	CLP	CLP	CLP	CLP	CLP	CLP
INORGANICS (mg/kg)						
ARSENIC	1.2 J	2.5 J	3.3 J	2.4 J	0.17 J	2.9 J
BARIUM	0.066 U	0.094 U	0.19 U	0.034 U	0.079 U	0.15 U
CALCIUM	1520 J	183 J	2310 J	202 J	562 J	4540 J
COPPER	1.1	0.55 U	0.9	1.1	0.94	0.86
IRON	9 J	2.3 U	3.2 U	9 J	5 J	4.4 J
LEAD	0.07	0.06 U	0.054 U	0.054 U	0.054 U	0.054 U
MAGNESIUM	330 J	318 J	365 J	424 J	307 J	376 J
MANGANESE	0.18 J	0.1 J	0.36 J	0.11 J	0.82 J	0.57 J
MERCURY	0.11 J	0.063 J	0.04 UJ	0.18 J	0.04 UJ	0.094 J
POTASSIUM	3850 J	4030 J	4400 J	4790 J	4480 J	3920 J
SELENIUM	0.59	0.23	0.3	0.44	0.47	0.35
SODIUM	1030	663	642	544	641	706
ZINC	12.4 J	8.2 J	10.3 J	7.1 J	4.2 J	9.2 J

QUALIFIER DEFINITIONS
J = Analyte present. Reported value may not be accurate or precise.
U = Not detected. The associated number indicates approximate sample concentration necessary to be detected.
UJ = Not detected. Quantitation limit may be inaccurate or imprecise.

NOTES
mg/kg = milligrams per kilogram.
NA = not analyzed.

TABLE 4-47
DETECTED INORGANICS IN FISH FILLET SAMPLES
VIA METHOD CLP
SITE 73 - AMPHIBIOUS VEHICLE MAINTENANCE FACILITY
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJEUNE, NORTH CAROLINA

LOCATION	73-FS03-SF01F	73-FS03-SM01F
METHOD	CLP	CLP
INORGANICS (mg/kg)		
ARSENIC	2.8 J	0.5 J
BARIUM	0.054 U	0.04
CALCIUM	734 J	326 J
COPPER	0.55 U	0.43
IRON	1.6 U	4.8 J
LEAD	0.06 U	0.06 U
MAGNESIUM	325 J	243 J
MANGANESE	0.15 J	0.08 J
MERCURY	0.04 UJ	0.04 UJ
POTASSIUM	4110 J	3060 J
SELENIUM	0.31	0.12 UJ
SODIUM	596	678
ZINC	8.3 J	7.2 J

QUALIFIER DEFINITIONS
J = Analyte present. Reported value may not be accurate or precise.
U = Not detected. The associated number indicates approximate sample concentration necessary to be detected.
UJ = Not detected. Quantitation limit may be inaccurate or imprecise.

NOTES
mg/kg = milligrams per kilogram.
NA = not analyzed.

TABLE 4-16

DETECTED ORGANICS IN FISH (FILLET)
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	65-FS04-BG01F	65-FS05-BG01F	65-FS05-LB01F	65-FS05-RS01F
METHOD	8240	8240	8240	8240
DATE COLLECTED	05/17/95	05/16/95	05/16/95	05/16/95
VOLATILES (ug/Kg)				
ACETONE	ND	5600 J	7900 J	ND
PESTICIDE/PCBS (ug/Kg)				
4,4'-DDD	5.7 J	ND	ND	ND

NOTES: ug/Kg - Microgram per kilogram
J - Value is estimated
ND - Not Detected
All samples were analyzed for TCL Organics per CLP Methods.
Only those parameters with positive detections are included on this table. For complete results refer to Appendix O.

TABLE 4-17

DETECTED METALS IN FISH (FILLET)
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, COT-0312
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID.	65-FS04-BG01F	65-FS05-BG01F	65-FS05-LB01F	65-FS05-RS01F
METHOD	CLP	CLP	CLP	CLP
DATE COLLECTED	05/17/95	05/16/95	05/16/95	05/16/95
ANALYTES (mg/Kg)				
ALUMINUM	ND	ND	0.99	ND
BARIUM	0.21 J	ND	ND	ND
CALCIUM	2100 J	560 J	399 J	385 J
COPPER	0.49	0.46	ND	ND
MAGNESIUM	298 J	299 J	290 J	293 J
MANGANESE	0.45 J	0.22 J	0.092 J	0.14 J
MERCURY	0.22 J	0.07 J	0.3 J	0.051 J
POTASSIUM	2700 J	3220 J	3540 J	3520 J
SELENIUM	0.22	0.15	0.16	0.14
SODIUM	869	708	441	620
THALLIUM	0.11	ND	0.11	0.11
ZINC	8.1 J	8.4 J	5.8 J	8.2 J

NOTES: mg/Kg - Milligram per kilogram
J - Value is estimated
ND - Not Detected
All samples were analyzed for TAL Metals per CLP Methods.
Only those parameters with positive detections are included in this table. For complete results refer to Appendix O.

TABLE 4-18

DETECTED ORGANICS IN FISH (WHOLE BODY)
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID.	65-FS04-BG01W	65-FS04-RS01W	65-FS05-BG01W	65-FS05-LB01W	65-FS05-RS01W
METHOD	8240	8240	8240	8240	8240
DATE COLLECTED	05/17/95	05/17/95	05/16/95	05/16/95	05/16/95
VOLATILES (ug/kg)					
METHYLENE CHLORIDE	ND	1000 J	ND	ND	ND
ACETONE	ND	ND	1400000 J	690000 J	27000
2-BUTANONE (MEK)	ND	ND	ND	ND	560 J
TOLUENE	ND	ND	ND	5000 J	ND
PESTICIDE/PCBS (ug/kg)					
4,4'-DDE	15 J	ND	ND	ND	ND
4,4'-DDD	40 J	6.9 J	ND	ND	ND

NOTES: ug/Kg - Microgram per kilogram
J - Value is estimated
ND - Not Detected
All samples were analyzed for TCL Organics per CLP Methods.
Only those parameters with positive detections are included in this table. For complete results refer to Appendix O.

TABLE 4-19

DETECTED METALS IN FISH (WHOLE BODY)
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, COT-0312
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID.	65-FS04-BG01W	65-FS04-RS01W	65-FS05-BG01W	65-FS05-LB01W	65-FS05-RS01W
METHOD	CLP	CLP	CLP	CLP	CLP
DATE COLLECTED	05/17/95	05/17/95	05/16/95	05/16/95	05/16/95
ANALYTES (mg/Kg)					
ALUMINUM	18.8 J	18 J	ND	9.6 J	ND
ANTIMONY	ND	1.5	1.1	1.4	1.1
ARSENIC	0.15 J	ND	ND	ND	ND
BARIUM	1.8 J	2.9 J	1.8 J	1.3 J	0.44 J
BERYLLIUM	ND	ND	0.028	ND	ND
CALCIUM	19600 J	42500 J	22600 J	22400 J	8840 J
COPPER	1.1	ND	ND	ND	8.6
IRON	22.9 J	24.4 J	7.8 J	26.1 J	11.8 J
LEAD	0.17	0.49	ND	ND	0.33
MAGNESIUM	557 J	951 J	538 J	593 J	370 J
MANGANESE	3.6 J	4.1 J	4.9 J	2.3 J	1 J
MERCURY	ND	0.11 J	ND	0.11 J	ND
POTASSIUM	2580 J	1850 J	2790 J	2860 J	2740 J
SELENIUM	0.42	0.17	0.16	0.33	0.32
SODIUM	1260	2400	1250	1160	992
THALLIUM	0.12	0.11	0.11	0.11	0.11
ZINC	26.2 J	31.5 J	26.6 J	14.8 J	23.3 J

NOTES: mg/Kg - Milligram per kilogram
J - Value is estimated
ND - Not Detected
All samples were analyzed for TAL Metals per CLP Methods.
Only those parameters with positive detections are included in this table. For complete results refer to Appendix O.