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Baker

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March 31, 1994

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

Attn: Ms. Linda Berry, P.E.
Code 1823

Re: Contract N62470-89-D-4814
Navy CLEAN, District III
Contract Task Order (CTO) 0174
Results of Recent Field Activities
RI for Operable Unit No. 5
MCB, Camp Lejeune, North Carolina

Dear Ms. Berry:

This correspondence summarizes the results of recent additional field investigation activities in association with the above-referenced CTO. In response to EPA comments on the Draft RI report, Baker installed two additional monitoring wells on-site in order to better define the extent of shallow groundwater contamination. Baker discussed the locations of these additional monitoring wells with Ms. Gena Townsend, EPA Senior Project Manager. Groundwater samples were collected from the two newly-installed wells as well as a second round of samples from the 9 existing wells.

Results of Second Round Groundwater Sampling

The second round of groundwater samples was collected in order to provide additional information to characterize shallow groundwater contamination. The analytical results were not submitted for data validation and will not be incorporated into the human health or ecological risk assessments.

Results of the groundwater sampling are included in in Attachment A. The results are graphically presented (along with Round 1 results) on the figures included in Attachment B.

In general, the results of the second round of groundwater sampling confirm the results of the first round. Please note the following points of interest:

- The newly installed monitoring well 2GW10 is located downgradient of the Mixing Pad Area (the most highly contaminated area on-site). The only organic contaminant detected in the sample collected from this monitoring well was

4,4'-DDT at 0.1J µg/l. This concentration is less than the concentrations of pesticides detected in samples collected from the background well (2GW9). This provides strong evidence that contaminants have not significantly migrated from the Mixing Pad Area.

- Volatile organic contaminants in groundwater are still limited to the Former Storage Area (Monitoring Well 2GW3).

- As with the first round results, no organic contaminants exceed Federal MCLs. Ethylbenzene xylenes (total) exceeded NCWQS.

- TCE was not detected in the deep monitoring well, 2GW3D. This contaminant was detected at low concentration (5 µg/l) in the groundwater sample collected from this well during round 1.

- Semivolatile organic contaminants naphthalene and 2-methylnaphthalene were detected in low concentrations (below MCLs and NCWQS) in samples collected from monitoring well 2GW1 during both rounds of sampling. 2-methylnaphthalene was also detected in the groundwater sample collected from the newly installed monitoring well 2GW11. Both of these monitoring wells are in the Mixing Pad Area. These contaminants were also detected in soil samples collected from this area.

  A similar group of semivolatile organic contaminants (naphthalene, 2-methylnaphthalene and 2,4-dimethylphenol were also detected in monitoring well 2GW3 during both rounds of sampling. This monitoring well is located in the Former Storage Area.

  Semivolatile organic contaminants in groundwater appears to be limited to two discrete areas (Mixing Pad Area and Former Storage Area).

- Some inorganic compounds that were detected above Federal and State standards during round 1 sampling were not detected during round 2. Conversely, some inorganic compounds that were detected above Federal and State standards during round 2 had not been detected during round 1. Inorganic compounds in groundwater do not appear to be related to site activities but are rather due to the presence of these compounds as naturally occurring elements in site soil.

The results of the second round of groundwater sampling are being incorporated into the Draft Final RI Report. This report will be submitted to LANTDIV on April 5, 1994.

Baker appreciates the opportunity to provide service to LANTDIV on this important project. If you have any questions, or would like further information, please do not hesitate to contact me at (412) 269-2038, or Mr. Raymond P. Wattras (Activity Coordinator) at (412) 269-2016.

Sincerely,

BAKER ENVIRONMENTAL, INC.

Donald C. Shields
Project Manager

DCS/jc
Attachments

cc: Mr. Neal Paul
Ms. Lee Anne Rapp (w/o attachments)
Ms. Beth Hacic (w/o attachments)

GROUNDWATER POSITIVE DETECTION SUMMARY
ORGANIC CHEMICALS - ROUND 2
SHALLOW AND DEEP MONITORING WELLS
OPERABLE UNIT NO. 5 - SITE 2
REMEDIAL INVESTIGATION CTO 19174
MCB CAMP LEJEUNE, NORTH CAROLINA

SAMPLE NO.	2-GW01-02	2-GW03-02	2-GW03DW-02	2-GW06-02	2-GW07-02	2-GW08-02
UNITS	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
PESTICIDES/PCBS						
4,4'-DDD						5.4
4,4'-DDE						
4,4'-DDT						1.2 J
ENDRIN ALDEHYDE						1.7 J
VOLATILES						
CARBON DISULFIDE			1			
2-BUTANONE			5			
CHLOROBENZENE		2				
CHLOROFORM				17		
ETHHYLBENZENE		93 E				
TOULENE		7				
XYLENES(total)		510 E				
SEMIVOLATILES						
2,4-DIMETHYLPHENOL		5 J				
NAPHTHALENE	10	11				
2-METHYLNAPHTHALENE	8 J	8 J				

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Notes:
UG/L - microgram per liter
J - value is estimated

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GROUNDWATER POSITIVE DETECTION SUMMARY
ORGANIC CHEMICALS - ROUND 2
SHALLOW AND DEEP MONITORING WELLS
OPERABLE UNIT NO. 5 - SITE 2
REMEDIAL INVESTIGATION CTO 19174
MCB CAMP LEJEUNE, NORTH CAROLINA

SAMPLE NO.	2-GW09-02	2-GW10-01	2-GW11-01
UNITS	UG/L	UG/L	UG/L
PESTICIDES/PCBS			
4,4'-DDD			37 E
4,4'-DDE			0.84
4,4'-DDT		0.1	6.5
ENDRIN ALDEHYDE			
VOLATILES			
CARBON DISULFIDE			
2-BUTANONE			
CHLOROBENZENE			
CHLOROFORM			
ETHHYLBENZENE			
TOULENE			
XYLENES(total)			
SEMIVOLATILES			
2,4-DIMETHYLPHENOL			
NAPHTHALENE			
2-METHYLNAPHTHALENE			5 J

Notes:
UG/L - microgram per liter
J - value is estimated

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GROUNDWATER POSITIVE DETECTION SUMMARY
TAL METALS AND CYANIDE - ROUND 2
SHALLOW AND DEEP MONITORING WELLS
OPERABLE UNIT NO. 5 - SITE 2
REMEDIAL INVESTIGATION CTO-19174
MCB CAMP LEJEUNE, NORTH CAROLINA

SAMPLE NO. UNITS	2-GW01-02 UG/L	2-GW03-02 UG/L	2-GW03DW-02 UG/L	2-GW04-02 UG/L	2-GW05-02 UG/L	2-GW06-02 UG/L
ALUMINUM	4030	4200	346	1250	4220	15100
ARSENIC	3.5 B			3 B		
BARIUM	37 B	30 B	907	81 B	98 B	55 B
BERYLLIUM						2 B
CADMIUM						5
CALCIUM	23400	10300	321000	22600	19700	6960
CHROMIUM						
COBALT						42 B
COPPER	1 B	3 B	4 B	3 B	3 B	4 B
IRON	4460	3410	103	5660	13100	4760
LEAD	1.7 B	2.5 B	1.8 B	1.2 B	1 B	2.4 B
MAGNESIUM	4890 B	1300 B	53 B	2230 B	4360 B	5520
MANGANESE	47	10 B		18	43	140
NICKEL						40
POTASSIUM	1480 B	726 B	51500	875 B	1940 B	670 B
SELENIUM						
SILVER			3 B			4 B
SODIUM	3560 B	6000	60000	5300	8510	31100
VANADIUM	15 B	8 B	4 B	5 B	9 B	
ZINC	36				15 B	91

Notes:
UG/L - microgram per liter
B - Reported value is less than Contract Required Detection Limit (CRDL), but greater than Instrument Detection Limit (IDL).
J - Value is estimated.

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GROUNDWATER POSITIVE DETECTION SUMMARY
TAL METALS AND CYANIDE - ROUND 2
SHALLOW AND DEEP MONITORING WELLS
OPERABLE UNIT NO. 5 - SITE 2
REMEDIAL INVESTIGATION CTO-19174
MCB CAMP LEJEUNE, NORTH CAROLINA

SAMPLE NO.	2-GW07-02	2-GW08-02	2-GW09-02	2-GW10-01	2-GW11-01
UNITS	UG/L	UG/L	UG/L	UG/L	UG/L
ALUMINUM	6120	18100	71600	20600	124000
ARSENIC	2.1 B		13.8	9.7 B	16.6
BARIUM	75 B	52 B	469	127 B	309
BERYLLIUM		2 B	7		3 B
CADMIUM					
CALCIUM	23400	13800	26000	53700	37000
CHROMIUM	10		83	46	117
COBALT		78	41 B	11 B	26 B
COPPER	4 B	5 B	32	9 B	23 B
IRON	6000	3400	46600	23500	38900
LEAD	3.7	3.4	23.6	6.1	44.8
MAGNESIUM	3920 B	3200 B	14200	4360 B	8860
MANGANESE	43	415	747	92	190
NICKEL		85	69		54
POTASSIUM	1550 B	572 B	6830	2830 B	7750
SELENIUM					1.4 B
SILVER	3 B			3 B	
SODIUM	11000	28600	11800	10100	9950
VANADIUM	9 B		96	42 B	184
ZINC	9 B	232	172	38	132

Notes:
UG/L - microgram per liter
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J - Value is estimated.

GROUNDWATER POSITIVE DETECTION SUMMARY
DISSOLVED METALS - ROUND 2
SHALLOW AND DEEP MONITORING WELLS
OPERABLE UNIT NO. 5 - SITE 2
REMEDIAL INVESTIGATION CTO-19174
MCB CAMP LEJEUNE, NORTH CAROLINA

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SAMPLE NO. / UNITS	2-GW01D-02 UG/L	2-GW03D-02 UG/L	2-GW03DWD-02 UG/L	2-GW04D-02 UG/L	2-GW05D-02 UG/L	2-GW06D-02 UG/L
ALUMINUM	1720	124 B	178 B	73 B	1690	15400
ANTIMONY						
ARSENIC						
BARIUM	36 B	24 B	588	82 B	98 B	57 B
BERYLLIUM						2 B
CALCIUM	23400	10700	315000	24000	20200	7860
CHROMIUM						
COBALT	11 B					43 B
COPPER	1 B	1 B	4 B		1 B	4 B
IRON	2670	2580	149	2990	7640	4580
LEAD						
MAGNESIUM	4860 B	1180 B	33 B	2290 B	4390 B	6020
MANGANESE	46 B	7 B		19	45	156
NICKEL						50
POTASSIUM	1480 B	476 B	50600	922 B	1890 B	659 B
SILVER					11	
SODIUM	3680 B	6020	60000	5430	8360	33300
VANADIUM						
ZINC	20				7 B	97

Notes:
UG/L - microgram per liter
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J - Value is estimated.

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GROUNDWATER POSITIVE DETECTION SUMMARY
DISSOLVED METALS - ROUND 2
SHALLOW AND DEEP MONITORING WELLS
OPERABLE UNIT NO. 5 - SITE 2
REMEDIAL INVESTIGATION CTO-19174
MCB CAMP LEJEUNE, NORTH CAROLINA

SAMPLE NO.	2-GW07D-02	2-GW08D-02	2-GW09D-02	2-GW10D-01	2-GW11D-01
UNITS	UG/L	UG/L	UG/L	UG/L	UG/L
ALUMINUM	56 B	17200	13500	71 B	60 B
ANTIMONY			8.7 B		
ARSENIC				3.8 B	4.5 B
BARIUM	58 B	51 B	47 B	83 B	103 B
BERYLLIUM		2 B	5		
CALCIUM	22100	13300	27600	48900	30300
CHROMIUM					
COBALT		81	38 B		
COPPER		8 B	11 B	2 B	1 B
IRON	3000	2950	10200	8150	4460
LEAD		1.9 B	2.6 B		
MAGNESIUM	3600 B	3010 B	11700	3020 B	3500 B
MANGANESE	40	402	676	43	51
NICKEL		97	67		
POTASSIUM	1150 B	579 B	3140 B	968 B	1750 B
SILVER					
SODIUM	10800	27000	11700	9780	8930
VANADIUM					43 B
ZINC		228	138	22	12 B

Notes:
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Attachment B