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CERTIFIED MAIL RETURN RECEIPT REQUESTED

Waste Management Division  
United States Environmental Protection Agency,  
Region IV  
Attn: Ms. Michelle Glenn  
345 Courtland Street, N.E.  
Atlanta, Georgia 30365

Re: MCB Camp Lejeune; Responses to EPA Region IV Comments on  
the Draft Final Treatability Study Report for the Shallow  
Aquifer at Hadnot Point Industrial Area MCB Camp Lejeune,  
North Carolina

Dear Ms. Glenn:

We have received the EPA Region IV comments (letter dated  
May 7, 1993) to the subject draft final document. The  
Navy/Marine Corps responses to these comments are enclosed.

Any questions concerning these responses should be directed to  
Ms. Linda Berry at (804) 445-8637.

Sincerely,

L. A. BOUCHER, P.E.  
Head  
Installation Restoration Section  
(South)  
Environmental Programs Branch  
Environmental Quality Division  
By direction of the Commander

Encl:

Response to EPA Region IV Comments on the Draft Final  
Treatability Study for the Shallow Aquifer at Hadnot Point  
Industrial Area MCB Camp Lejeune, North Carolina

Copy to:

NC DEHNR (Mr. Peter Burger)

MCB Camp Lejeune (Mr. Neal Paul)

Blind copy to:

1823 (LGB) (2 copies w/encls), 18S, LGBDoc:wp30res

## ENCLOSURE

### RESPONSES TO USEPA REGION IV'S COMMENTS ON THE DRAFT FINAL TREATABILITY STUDY FOR THE HADNOT POINT INDUSTRIAL AREA

#### GENERAL COMMENTS

##### Response to Comment No. 1

Monitoring well locations were shown on Figure 3-1 of the draft Treatability Study Report. These well locations will also be incorporated on Figure 1-3, "Approximate Area of Groundwater Contamination in the Shallow Aquifer" for the Draft Final submittal. The final location of the recovery wells shall be determined during actual construction of the system.

##### Response to Comment No. 2

Oil and grease is not a common analytical parameter to characterize a site, and as noted in the comments was not previously analyzed for during past investigations. Oil and grease is, however, a good parameter for evaluating the performance of free phase product separation in an oil/water separator, and was selected for this purpose, not because of a suspicion of oil and grease contamination. The justification for performing bench scale oil/water separation testing is the need for data to support the design of oil/water separation equipment. This is clarified in Section 4.2.1.2 of the Final Report.

##### Response to Comment No. 3

The Final Treatability Study Report recommends polymer addition and a settling tank for the full scale system (Section 6.1.1). The 90% design submittal package for the Interim Remedial Design for the Shallow Aquifer at the Hadnot Point Industrial Area also includes a polymer addition system to aid in the flocculation of suspended metals.

##### Response to Comment No. 4

Continuous monitoring of water levels for an extended period prior to initiation of the aquifer test was omitted from the test procedure. However, continuous monitoring of water levels over a 24-hour period at a nearby site (Site 6) showed minimal change in water level (.06 feet). Also, all potable water supply wells in the Hadnot Point Area were closed several years ago.

Based on EPA and State concerns about the applicability of the pump test results for use in the design of the extraction system at the Hadnot Point area, Baker will recommend that the design package for the full scale system specify that an aquifer test be conducted as part of the recovery well installation and that an option to install a limited quantity of additional recovery wells based on the results of the aquifer test be provided.

#### Response to Comment No. 5

Based on previous investigations, Baker believes that the maximum sustainable pumping rate of 1.5 gpm which was obtained during the pump test is typical for the shallow aquifer. Pump tests conducted at the Hadnot Point Fuel Farm (Site 22) produced pumping rates of 2 to 3 gpm. Pump tests conducted at other sites at Camp Lejeune (e.g., Geiger Fuel Farm) produced similar results.

#### Response to Comment No. 6

A review of the air quality impact of the proposed air strippers has been performed. It will be included as Appendix O in the Final Treatability Study Report. The strategy for addressing air emissions is being studied base-wide currently.

#### Response to Comment No. 7

Sludge produced by the treatment systems will be pumped to a sludge storage tank and dewatered with a plate press. The dewatered sludge will be sampled and analyzed for full TCLP and disposed of accordingly. The sludge disposal is addressed in the 90% Interim Remedial Design for the Shallow Aquifer at HPIA.

#### Response to Comment No. 8

Graphical presentation of aquifer test results are presented in Appendix J.

#### Response to Comment No. 9

Section 5.2.1.3 provides an analysis of the aquifer test results, with raw data and graphs in the appendices. The heading "3.3, Monitoring Results" has been deleted from the Final Report.

## SPECIFIC COMMENTS

### Specific Comment No. 1

Data that represents the worst-case scenario have been used as a basis for the 90% Design. The data collected in January 1991 by ESE produced the maximum concentrations of contaminants recorded at an individual well in the Hadnot Point Industrial Area, but on average were lower than the concentrations identified in earlier studies. The January 1991 results are presented in the Treatability Study because it is the most recent data prior to the Treatability Study and the most comprehensive sampling event conducted in the HPIA area. These results were used to select a location for the recovery well for the treatability study which was in a historically "hot" area in order to increase the chances that the treatability study would evaluate the treatment systems at the maximum concentrations that may be encountered. The intent of this work is not to recap the past findings at Hadnot Point, but instead this study is design to analyze the data obtained during this endeavor.

### Specific Comment No. 2

Based on previous investigations, Baker believes that the maximum sustainable pumping rate of 1.5 gpm which was obtained during the pump test is typical for the shallow aquifer. Pump tests conducted at the Hadnot Point Fuel Farm (Site 22) produced pumping rates of 2 to 3 gpm.

Based on EPA and State concerns about the applicability of the pump test results for use in the design of the extraction system at the Hadnot Point area, Baker will recommend that the design package for the full scale system specify that a aquifer test be conducted as part of the recovery well installation and that an option to install a limited quantity of additional recovery wells based on the results of the aquifer test be provided.

### Specific Comment No. 3

Information on the referenced aquifer test was sent to USEPA on April 22, 1993, and is included in Appendix P of the Final Report.

### Specific Comment No. 4

The calculation of radius of influence for the extraction wells has been performed as part of the Interim Remedial Design for the Shallow Aquifer at Hadnot Point Industrial Area. Although the Theis equation is based on a confined aquifer, it is common practice to apply it to unconfined aquifer systems to provide a simple calculation for determining radius of influence. In this case, the results of the Theis equation were found to be conservative as compared to the radius of influence derived from the Capture Zone Method, developed by Keely and Tsang for a confined aquifer system.

The interim remedial design for the HPIA shallow aquifer has been conducted in accordance with the Record of Decision for this area, which addresses the surficial aquifer and does not address the deeper Castle Hayne Aquifer. Baker does not recommend oversizing the treatment system for the shallow aquifer based on the information to date.

Specific Comment No. 5

This comment addresses the 30% Interim Remedial Design. The recovery wells have been repositioned in the 90% design submittal.

Specific Comment No. 6

The treatment of VOCs was addressed in the pilot scale study. The purpose of the Bench Scale Test, as stated in paragraph 4.1 was to provide data to support the design of pretreatment components (e.g., metals removal, oil separation).

Specific Comment No. 7

In general, the polymers are long chain molecules that are positively or negatively charged. The specific composition of the polymers is proprietary to the companies that manufacture them.

Specific Comment No. 8

See response to specific Comment No. 2.

Specific Comment No. 9

See response to specific Comment No. 2.

Specific Comment No. 10

The oil and grease analyses conducted during the bench scale testing was performed to detect any fuels that may be present in the groundwater.

Specific Comment No. 11

Based on previous sampling results, the RI did not list semivolatile organic compounds as contaminants of concern, and therefore were not considered in the Treatability Study.

Specific Comment No. 12

Baker will recommend that polymer-aided flocculation, settling and filtration be incorporated into the design.

Specific Comment No. 13

Due to varying residence times in the treatment equipment, apparent increases across the treatment units may not be caused by the equipment but may represent fluctuations in influent concentrations. This is clarified in Section 5.2.1.2 of the Final Report.

Specific Comment No. 14

The values of T and S have been checked and corrected on page 5-29 of the Treatability Study Report.

Specific Comment No. 15

Baker will recommend that polymer-aided flocculation, settling and filtration be incorporated into the design.