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CERTIFIED MAIL RETURN RECEIPT REQUESTED

North Carolina Department of Environment,
Health, and Natural Resources
Attn: Mr. Patrick Watters
P.O. Box 27687
401 Oberlin Road
Raleigh, North Carolina 27611

Re: MCB Camp Lejeune; Draft Remedial Investigation and
Feasibility Study for Operable Unit Number 4

Dear Mr. Watters:

Enclosed are the responses to the comments dated November 23,
1994, January 3, 1995 and February 22, 1995 on the referenced
reports. The responses have been incorporated into the Draft
Final RI/FS reports for Operable Unit Number 4.

The LANTDIV point of contact for this project is Ms. Linda
Saksvig, who may be reached at (804) 322-4793.

Sincerely,

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

Enclosures

Copy to:
U.S. EPA (Ms. Gena Townsend)
MCB Camp Lejeune (Mr. Neal Paul)

Blind copy to:
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~~1823~~ (LGS) (2 copies w/encls)
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18S, frepaou4.lgs

**RESPONSES TO NORTH CAROLINA DEHNR COMMENTS
ON DRAFT FEASIBILITY STUDY (FS)
OPERABLE UNIT NO. 4, MARINE CORPS BASE, CAMP LEJEUNE, NC
(Comment Letter Dated January 3, 1995)**

Responses to General Comments

1. Text discussing the metals results has been revised to distinguish if the total (unfiltered) or dissolved (filtered) results are being referred to in the discussion. In accordance with policies set forth by USEPA Region IV and NC DEHNR, the total metals results were used in the estimation of health risks and for comparison to groundwater and surface water criteria and standards.
2. A discussion of the substantive aspects of 15A NCAC 2L.0106 has been incorporated into the FS under the various groundwater treatment alternatives. This regulation has also been added to the ARAR table (Table 2-4).
3. The concerns over the selection of COPCs in the Draft RI were addressed in the Response to Comments on the Draft RI Report. The specific action taken to address these concerns does not alter the findings of the risk assessment; therefore, the Remedial Goal Options and Remediation Levels developed for the COPCs in the Draft FS are applicable.
4. The text of the Executive Summary, Section 1.5, and Section 1.7 states that there are no current risks to base personnel associated with groundwater use since the groundwater is currently not being used at the sites. The text does indicate that there would be unacceptable risks associated with exposure to groundwater under a future scenario (i.e., where groundwater is used as a potable water supply).
5. A sentence will be added to Alternative 69GW-3 noting that treated groundwater would be subject to NPDES permitting requirements under the groundwater treatment alternatives.
6. Text has been added to the Executive Summary and to Section 4.0 discussing the requirements of 15A NCAC 2L.0106(m) with respect to termination of groundwater treatment under Alternatives 69GW-3 and 41GW-4. Note that these alternatives will be presented in separate FSs.
7. Sequesterants inhibit iron and manganese precipitation by binding up iron and manganese ions. Therefore, sequesterants should not react with suspended solids in groundwater. The addition of an acid could increase dissolved iron and manganese concentrations by dissolving suspended solids to some extent. However, suspended solid concentrations are expected to be low under sustained pumping conditions. If suspended solids did become a problem in the treatment system, then a filtration step could be added to the process prior to acid addition. These points will be added to the FS for Site 69. If some form of groundwater extraction is selected as the preferred alternative, then the various design considerations associated with metals removal would need to be further evaluated.
8. A cap was considered for Site 74 but was not developed into an alternative for the same reasons as for Site 41 (effectiveness and implementability concerns). A sentence has been added to the Executive Summary as well as Section 5.0 explaining this point.
9. Due to its proximity and similar potential contaminants, Site 74 was initially grouped within Operable Unit #5 along with Site 2 (Former Nursery School/Day Care Center). However, during a review of the Administrative Record, one internal memorandum reported that drums, which were initially to be taken to Site 69 for disposal, instead were disposed at the grease disposal area at Site 74. The pesticide

disposal area remained part of the site so that this site would not be broken up into two distinct investigations under different Operable Units. The text has been revised to clarify that the pesticide disposal area is not considered a Class 4 CWM site.

10. These tables reflect the total metals results, the NCWQs, and MCLs in order to present a qualitative assessment. Table 1-2 was presented in the Draft FS to show how the total metals results decreased significantly during the low-flow sampling round. The comparison suggests that the high total metals results in the initial round were largely a result of turbidity in the well associated with the sampling technique. A revised and expanded discussion of total (unfiltered) metals versus dissolved (filtered) metals sampling results has been added to the text. In addition, an expanded evaluation of the data presented in the groundwater tables has been added to the FS.
11. An explanation of how the background information was developed has been added to the text.
12. The data in this table are presented for information purposes. The filtered metals results are presented to explain that total metal concentrations exceeding criteria and standards may be associated with suspended particulate or colloidal matter in the water rather than present as dissolved species. Metals present in suspended or colloidal forms (i.e., insoluble forms) are generally not considered to be bioavailable to aquatic organisms. The text has been revised to clarify these points.
13. The text has been corrected to read "practical quantitation limit."
14. Although the U.S. Army highly recommended that CWM at any of the O.U. No. 4 sites not be removed because of the health risks it would pose, a specific written policy concerning removal of buried CWM has not been developed. The text has been revised to clarify this point.
15. The 1000-foot radius potable water exclusion zone was included in the Draft FS as an example of a type of institutional control that could be implemented for the site. Since development of the Draft FS, North Carolina regulations have been evaluated to determine if TBC-type regulatory criteria exist on which to base an exclusion zone. Under the Corrective Action section of the North Carolina Drinking Water and Groundwater Standards (15A NCAC 2L.0107(a)), the compliance boundary for disposal systems permitted prior to December 30, 1993 is 500 feet from the waste boundary or at the property boundary, whichever is closer to the source. In addition, under the Siting and Design Requirements section of North Carolina Solid Waste Rules (15A NCAC 13B.0503(f)), a 500-foot minimum buffer between disposal areas and private dwellings/wells must be maintained for new sanitary landfills. Based on these TBC-type criteria, the 1000-foot radius referred to in the Draft FS under the Institutional Control alternatives has been revised to 500 feet.
16. See response to Comment 6.
17. See response to Comment 15.

**Response to Comments submitted by NCDEHNR
on the Draft RI/FS Report for CTO-0212
Operable Unit No. 4
MCB Camp Lejeune, North Carolina
(Comment letter by Mr. Patrick Watters dated November 23, 1994)**

Responses to Comments from Mr. David Lilly

1. The reviewers comment that given the concentration of methylene chloride in two sample concentrations exceeded the 10 times rule is correct. Additionally, the 5 percent rule of thumb was exceeded given that 25 surface soils were obtained and 2 samples results could not be attributed to blank contribution (8%). However, the following rationale supports the professional judgement that the methylene chloride detected in samples is not representative of site contamination: (1) methylene chloride is a known lab contaminant which is evident from its presence in 15 of the 25 samples; (2) this contaminant would not be present in surface soil over such a long period of time; and (3) site history does not indicate that this contaminant should be detected at the site it. Therefore, it was not retained as a COPC. The text will be revised to reflect the additional rationale for elimination of this contaminant as a COPC.
2. The blank concentrations for these contaminants are based on an aqueous sample results. The criteria for elimination of these contaminants has been adjusted to provide for the variances in the analytical detection limits between solids and aqueous. For semivolatile contaminants, the correction factor for soils is 33 times that of the aqueous detection limit. Therefore, in order to compare aqueous blank levels to soil, the evaluation was based on the concentration in the blank $\times 10 \times 33$ to adjust for the variance in the analytical detection limits. Using this rationale, the concentration at which bis(2-ethylhexyl)phthalate and di-n-butylphthalate would need to be reported would be 1320 ug/kg or 660 ug/kg in order to be retained as COPCs.
3. Given that the concentration of 45,000 ug/kg exceeds 10 times the concentration detected in the blanks, this concentration should be considered a positive value. However, the presence of elevated levels of acetone are likely associated with the decontamination procedures. The cold weather conditions hampered the drying of sampling equipment after decontamination. It is believed that residual 2-propanol on the sampling equipment was responsible for the acetone in the sampling results. The 2-propanol is pesticide-grade, and contains a large percentage of acetone. Baker Environmental has contacted EPA's Athens, Georgia office to discuss this problem. The contact at EPA indicated that during the winter months, this problem is more prevalent based on EPA's own experience. Additional detail will be provided in the text to explain the elimination of acetone as a COPC.
4. Refer to comment response No. 2
5. The inconsistency may be in the explanation not in the application. The inorganics chromium and manganese were frequently detected and exceeded $2 \times$ the background value. As for the other inorganics, although the 5% rule cannot be applied, they were infrequently detected (1 or 2 detects) and of these few detections only 1 exceeded $2 \times$ the background value. Given the nature of the media (soil), it was judged that inorganics other than manganese and chromium should not be retained. The text will be revised to include this additional rationale.
6. Although vinyl chloride was not retained as a COPC for risk purposes, it was retained as a COPC for comparison to standards and criteria as evidenced on Table 6-5. Two detections out of fourteen samples does not warrant the retention of this contaminant as a COPC for risk purposes. However, the retention

of vinyl chloride for comparison to standards and criteria enables it to be carried through the FS along with the other volatile organic contaminants.

7. Table 6-28 presents a list of COPCs for biota.
8. The text will be revised to indicate that 2-methylphenol and di-n-octylphthalate were detected in the biota samples. Additionally, the text will address the retention or elimination of these contaminants as COPCs.
9. These pages were inadvertently left out of the report. These pages will be inserted into the Draft Final RI report.
10. The frequency of bis(2-chloroethyl)ether is greater than 5% in the surface soil samples. Therefore, this justification cannot be used for elimination of this contaminant as a COPC. However, this contaminant was not retained for the following reasons: this contaminant was detected at a concentration less than the CRQL (330 ug/kg); the contaminant is not likely associated with past practices at the site; the contaminant was not detected in other media; and the contaminant has little known toxic potential. As for di-n-butylphthalate the levels reported in the blank (2 ug/l) can be used to eliminate this contaminant as a COPC. Using $2 \text{ ug/L} \times 10 \times 33(\text{difference in QLs}) = 660 \text{ ug/kg}$. Given that the maximum concentration is 126 ug/kg all detects for this compound should be considered as blank related. Additional text will be include in the Draft Final report to discuss the elimination of these contaminants as COPCs.
11. In the frequency of detection determination, the computerized database retained the detected sample points for the purpose of consistency in the number of samples taken (represented by the denominator). However, if a sample result was rejected during validation, it is not to be considered a positive result. Therefore, the frequency of detect must be corrected manually by subtracting the rejected positive values. Through this exercise, the frequency of the contaminants endrin and endosulfan would be reduced to less than 5% and consequently not retained as COPCs.
12. The other inorganics (i.e., sodium, magnesium, potassium) are salts or essential nutrients that have demonstrated low toxic potential, except for individuals with diabetes. Therefore, the concentration of this risk assessment was based on the heavy metals with potential carcinogenic and noncarcinogenic potential. Text will be added to the Draft Final report to eliminate the rest of the metals.
13. The first sentence will be revised per the comment.
14. Refer to comment response No. 2
15. The first two sentences state "The pesticides heptachlor, 4,4'-DDE, 4,4'-DDD, and 4,4'-DDT were prevalent in the subsurface soil at greater than five percent. Due to their toxic potential and association with site history, these pesticides were retained as COPCs." No additional action is required for this comment.
16. Lead should not be retained as a COPC in the subsurface soil. The text will be revised to provide the rationale that the lead concentrations are less than 2x the average background concentration.
17. Acetone was eliminated as a COPC based on the analytical findings compared to the blank contamination. This comparison allowed for the elimination of all the acetone results except for the

6,000 ug/kg result. The elimination of these results reduces the prevalence of this contaminant to less than 5%, therefore, providing the rationale for removal of this contaminant as a COPC.

18. The frequency appears to be different because the rejected values were not reported in the numerator on Table 6-21. Due to the limitations in the analytical database the validated rejected values were retained in order to maintain consistency in the number of samples analyzed. However, by including these the frequency is misleading because the rejected values are counted as positive detects which must be manually removed for completion of the tables presented in the report. Consequently there is a discrepancy in the presentation of the frequencies. The frequencies presented in the report tables is accurate and accounts for the removal of rejected data.
19. The other metals were eliminated as COPCs because of their low toxic potential.
20. It is true that acetone levels reported in the soil are greater than ten times those found in the blanks. However, upon review of the data, specifically the TICs, it is evident that the acetone is due to poor decontamination procedures (i.e., not allowing the equipment to air dry). The presence of 2-propanol is an indication that the sampling equipment was not allowed to properly air dry prior to collection of the next sample. Without reviewing the raw analytical data, the reviewer has no way to see this demonstrated. However, additional clarification of this problem could be presented in the text.
21. Refer to comment response No. 2.
22. See comment response No. 19.
23. Benzene and bromoform were not retained as risk-based COPCs. These compounds were infrequently detected (1 of 18 samples). However, in order to evaluate the possibility of point source contamination these compounds were retained as criteria-based COPCs. Consequently, the presence of benzene and bromoform was not overlooked as a concern.
24. The contaminants identified for this comment will be presented on the appropriate tables.

**Response to Comments submitted by NCDEHNR
on the Draft RI/FS Report for CTO-0212
Operable Unit No. 4
MCB Camp Lejeune, North Carolina
(Comment letter by Mr. Patrick Watters dated November 23, 1994)**

Responses to General Comments

1. A better understanding of CWM is provided in the Executive Summary of the RI, and in Section 1 of the FS. The reference document is entitled "Non-Stockpile Chemical Material Program Survey and Analysis Report", prepared by the U.S. Army Chemical Material Destruction Agency in 1993.
2. The decontamination procedure is based on EPA Region IV guidance. It must be understood by the State that thousands of soil analyses have been performed for investigations at MCB Camp Lejeune. The number of samples which exhibited elevated levels of acetone due to the decontamination procedure is extremely low. Baker, as well as other contractors (including EPA based on discussions with EPA's Athens, Georgia office), have experienced problems when the sampling equipment is used to collect a sample before it is completely dry. When this happens, primarily during cold-weather, residual 2-propanol remains on the equipment, causing cross-contamination of the sample. The percentage of acetone (1.3%) was provided by the supplier.

Baker and LANTDIV do not consider this as acceptable. Baker is modifying the decon procedures to ensure that this does not happen on a frequent basis. (Dryers are being employed in the field.) In addition, Baker is communicating this problem to their field sampling personnel. Even with complete drying of the equipment, the presence of acetone in some samples is likely.

Baker and LANTDIV do not concur with the comment that some resampling needs to be performed for the following reasons: (1) although acetone was present in the soil sample, it is not possible that such a highly volatile constituent be present in surface or subsurface soil at any of the sites given the timeframe in which these soils have been exposed to the climatic conditions of the area (i.e. hot weather, rainfall, etc.); and (2) re-sampling would only show that acetone is not present at the previously detected concentrations, therefore, re-sampling would not be cost effective. In addition, the presence of acetone in the sample does not affect the integrity of the sample. For example, other constituents (including VOCs, pesticides, etc.) detected in samples which exhibited acetone are usable.

3. Eight shallow monitoring wells were resampled for OU No. 4. These included two wells at Site 69 (69-GW01 and 69-GW03) two wells at Site 74 (74-GW03A and 74-GW07), and four wells at Site 41 (41-GW02, 41-GW07, 41-GW10, and 41-GW11). The results of this sampling have been incorporated into the site analytical summary tables. These results are discussed in the groundwater sections of the RI Report. The low-flow sampling technique appears to have resolved the problem of suspended particulates in the samples.
4. The former pest control area is not associated with the disposal of CWM.
5. The glass vials located at Site 69 are actually chemical agent testing kits. These kits do not pose a hazard. They are used to detect the presence of agents during training. The test kits are onsite.

Specific Comments

6. The text has been corrected per the comment.
7. The text has been corrected per the comment.
8. The levels of trichloroethene and tetrachloroethane will be discussed in the Draft Final version of the RI report. Lower quantitation levels for benzene will be considered for long-term monitoring actions. It is not cost effective to re-sample the wells at this time, especially since the primary contaminants of concern are TCE and 1,2-DCE, and not benzene.
9. The text will be revised to indicate that PCE was detected above NCWQS groundwater standard.
10. The text will be revised to indicate that TCE exceeded NCWQS standards for surface water.
11. The text in Section 4.2.2.1 (Extent of Contamination in Soils) will be revised to indicate that due to the number of pesticides detected in the surface soils at Site 74, only those detected above 1 ug/Kg are shown on the figure. The detected concentrations of pesticides listed in the text will be checked against Figure 4-20.
12. This detection will not be noted in the Executive Summary because it does not play a significant role. In addition, the contaminant is a degradation product of "riot gas" and is most likely a result of training exercises in the area.
13. See Response No. 12.
14. The surface water sample designations for Site 41 will be added to the figures.
15. The field observations included ground surface depressions (2 to 3 feet deep, 5 to 10 foot diameter, and circular). The text provides this description.
16. Reviewing the metal concentrations at location 41-GW05, concentration levels are elevated, but below those detected in other areas of the site, particularly the central portion where metal concentrations were an order of magnitude higher. In addition, the concentrations detected in well 41-GW05 are similar to metal concentrations throughout MCB Camp Lejeune. Therefore, additional investigations of this area do not appear to be warranted.

**Response to Comments Submitted by the North Carolina DEHNR
the Draft RI Report for Operable Unit No. 4 (Sites 41, 69, and 74), MCB Camp Lejeune,
North Carolina
(Comment Letter Dated February 22, 1995)**

Response to Water Quality Section Comments

Site 69: Soil samples will be collected during the upcoming supplemental investigation at Site 69. These samples were not previously obtained mainly because no intrusive investigations were conducted within the landfill. This approach was approved by the EPA and the DEHNR.

Site 41: Based on additional sampling using a different purging and sample collection procedures to reduce the amount of turbidity within the sample, elevated levels of lead were only detected in one well (26 ppb in well 41GW11). Therefore, widespread lead contamination is no longer apparent and the reference to landfill contents being responsible for elevated lead levels has been revised.

Response to Groundwater Section Comments

Site 69: Isoconcentration maps for VOC contamination are difficult to prepare due to the limited extent of contamination at this site, and the relatively low number of sampling points. The information presented on the figures includes the VOC contaminants and corresponding concentrations above Federal or State standards. Since contamination is confined to only a few wells, this method of depicting groundwater contamination is sufficient.

The presence of heptachlor in well 69GW13 was not discussed in the conclusion section since no conclusion can be made based on a single round of sampling. The conclusion in this case may be "Pesticide contamination in the shallow aquifer appears to be limited to only one well; however, further confirmatory sampling is recommended." A confirmatory sample will be collected from this well during the next round of sampling (March or April 1995).