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State of North Carolina
Department of Environment,
Health and Natural Resources
Division of Solid Waste Management

James B. Hunt, Jr., Governor
Jonathan B. Howes, Secretary
William L. Meyer, Director

August 6, 1997

Commander, Atlantic Division
Naval Facilities Engineering Command
Code 1823
Attention: MCB Camp Lejeune, RPM
Ms. Katherine Landman
Norfolk, Virginia 23511-6287

Commanding General
Attention: AC/S, EMD/IRD
Marine Corps Base
PSC Box 20004
Camp Lejeune, NC 28542-0004

RE: Comments on the Draft Remedial Investigation Report
Operable Unit No. 9 (Site 73)
Marine Corps Base Camp Lejeune, North Carolina

Dear Ms. Landman:

The referenced document has been received and reviewed by the North Carolina Superfund Section and my comments are attached. The comments of David Lilley on the human health and ecological risk assessments are also attached. Please call me at (919) 733-2801, extension 278 if you have any questions.

Sincerely,

David J. Lown, LG, PE
Geological Engineer
Superfund Section

Attachment

cc: Gena Townsend, US EPA Region IV
Neal Paul, MCB Camp Lejeune
Diane Rossi, DEHNR - Wilmington Regional Office

North Carolina Superfund Comments
Draft Remedial Investigation Report
Operable Unit 9 (Site 73) MCB Camp Lejeune

General comments:

1. Region III Soil Screening Levels were used to evaluate the impact of soils on groundwater. Soil Screening Levels based on North Carolina groundwater standards must also be considered.

2. An USEPA procedure for handling possible lab contaminants is applied indiscriminately. Justification, other than a value is less than 10 times the sample blanks, should be considered before dismissing sampling results as lab contamination.

3. The stratigraphy of the site is poorly defined. The cross-sections and conceptual hydrogeologic model of the site should be refined. The distribution of the paleo-channel should be mapped and its impact on contaminant transport fully discussed.

Specific comments:

4. Page 1-5, Section 1.4.4, Second bullet. Where is building A-3 located?

5. Figures 3-5 and 3-6. Cross-sections do not match in the third dimension. Specifically the stratigraphy for boring 73-DW-06 on cross-section A-A' does not match the stratigraphy the same boring on cross-section C-C'. As a result, the Castle Hayne semi-confining unit is not the same unit on both cross-sections.

6. Pages 3-2 through 3-4, Section 3.3.2. Several references are made to the Belgrade and the River Bend formations. If correlation to these formations is important, then these units should be identified on the cross-sections. If the correlation is not important, site-specific units should be used in the text. Also, the identification of the Castle Hayne Semi-Confining unit on the cross-sections does not appear to be necessary. The only semi-confining unit identified at the site is the clay unit in the surficial aquifer. Referring to a sand, beneath a clay as a semi-confining unit is confusing.

7. Page 3-4, last paragraph, continuing on page 3-5. The paleo-channel is said to erode away the clay unit in the vicinity of boring 73-DW12 and 73-GW04. According to the boring logs, the samples from both of these holes starts below the zone where the clay unit is expected. We agree that the paleo-channel has the potential to influence the movement of contaminants at Site 73. Its distribution and relation to groundwater contamination should be shown on a maps and cross-sections.

8. Section 4.0. A reference list for the citations found in this section is missing.

9. Page 4-2, Section 4.2.1, second paragraph. The described EPA procedure for handling false positives caused by laboratory contaminants essentially sets the detection limits above the regulatory level. These limits should be used judiciously. If a contaminant is suspected to be present at the site, for example toluene at a former UST site, explaining away a hit as a lab contamination is not justified.

10. Page 4-7 and Table 4-4. The Region III Soil Screening Levels are used as a Comparison Criteria. These levels were calculated using Federal MCLs. The EPA Soil Screening Guidance (EPA/540/R95/128 and Publication 9355.4-23) documents a procedure for calculating Soil Screening Levels using appropriate groundwater standards. This procedure was followed in the preparation of the Draft *North Carolina Risk Analysis Framework*. The Soil Screening Levels contained in the *Framework* can be used for comparisons. Either the Region III or the NC Soil Screening Level, whichever is more stringent, will apply.

11. Page 4-11, Paragraphs 3 and 4. The BTEX compounds are present in the aquifer. Toluene is probably not due to lab contamination.

12. Page 4-12, paragraph 5. Bis (2-ethylhexyl) phthalate was detected in several soil and groundwater samples. Half the soil and all the groundwater was attributed to lab contamination; additional justification of this conclusion is probably warranted.

13. Page 4-13, Section 4.4.2.2., Lowermost Portion of the Surficial Aquifer. There is no reason to separate this data, and its discussion, from the uppermost Castle Hayne aquifer data. These data sets should be combined and reconsidered.

14. Page 4-13, paragraph 5. Fe and Mn are elevated at the site. We agree that this may be due to background levels at the Base. However, elevated levels of these metals may be due to the degradation of chlorinated solvents. The Air Force *Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Groundwater* recommends that these metals be monitored and mapped to assist evaluating the biodegradation of chlorinated solvents.

15. Page 5-6, Section 5.2.6 Groundwater Discharge to Surface Water. The groundwater to surface water model contained in the Draft *North Carolina Risk Analysis Framework* should be used to evaluate the possible impact of the groundwater contamination on surface waters at the site.

State of North Carolina
Department of Environment,
Health and Natural Resources
Division of Waste Management

James B. Hunt, Jr., Governor
Jonathan B. Howes, Secretary
William L. Meyer, Director

DEHNR

July 25, 1997

TO: David Lown

FROM: David Lilley DBC

RE: Comments prepared on Section 6.0 (Baseline Human Health Risk Assessment) contained in the Remedial Investigation Report, OU9, Site 73, MCB Camp Lejeune, NC
November, 1996

After reviewing the above mentioned document, I offer the following comments:

1. Table 6-6: There are no North Carolina Water Quality Standards for cis-1,2-Dichloroethene and trans-1,2-Dichloroethene. Please explain where these numbers came from.

2. Table 6-6: The North Carolina Water Quality Standard for Acenaphthene is 80 ug/L, not 800 ug/L as listed.

3. Table 6-6: Bis(2-ethylhexyl)phthalate was detected at 50 ug/L, which exceeds the NCWQS, MCL, and Region III RBC. It was not selected as a COPC because of blank contamination. The blank these samples were compared to was the phase II blank and is not applicable in this phase I sampling. Bis(2-ethylhexyl)phthalate should be retained as a COPC.

4. Table 6-6: The MCL listed for Copper should be 1,000 ug/L, not 1,300 ug/L.

5. Table 6-9: It is recommended that the Region 4 Waste Management Division Sediment Screening Values from the Supplemental Guidance to RAGS, Ecological Screening Values, Bulletin No. 2, November, 1995 be used in place of the outdated 1992 values used in this table. After this is done, 4,4'-DDE, bis(2-ethylhexyl)phthalate, copper, and nickel should be added to the list of COPCs.

6. Table 6-9: It is unclear to the reader why every hit of endrin, 4,4'-DDD, and lead exceeded the ER-L Concentration, yet none of these chemicals were retained as COPCs. Please explain.

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7. The Region III RBC for manganese is 180 mg/kg, not 190 mg/kg as listed.

8. Table 6-8: On July 23, 1997, I spoke with Diane Reed {(919)733-5083, ext. 568}, Surface Water Quality Standards Coordinator, Water Quality Section, NC Division of Water Quality. Following are the NC Water Quality Standards for Courthouse Bay and the two unnamed tributaries:

Chemical	NCWQS (ug/L)
Acetone	500
Toluene	200,000
Chloroform	470
Aluminum	87
Antimony	4,300
Barium	1,400
Manganese	100
Silver	0.1
Zinc	86

Silver and Zinc should be retained as COPCs.

9. Table 6-12, Phase I Groundwater: Chloroform should not be listed as a COPC. 1,2-Dichloroethane should be listed as a COPC.

10. Table 6-15: Under "Fraction Ingested" (fish/crab tissue), a value of 0.1 is listed for the adult and child. Please explain why a factor of 0.1 was chosen, or use 1.0 for this factor.

11. Table 6-18: The toxicity data for 1,2-Dichloroethane should be included in this table since it was retained as a COPC in Phase I groundwater.

12. Table 6-18: There is no RfDi in IRIS for benzene as claimed.

13. Table 6-18: There is no RfDi in IRIS for barium as claimed.

14. Table 6-18: There is no RfDi in IRIS for cadmium as claimed.

15. Appendix S: Groundwater in the RI was evaluated using the 95% UCL in the risk calculations. According to the Supplemental Guidance to RAGS, Human Health Risk Assessment Bulletin No. 3, page 3-3, the groundwater exposure point concentration should be the arithmetic average of the wells in the highly concentrated area of the plume, not the 95% UCL.

16. Appendix U, Subsurface Soil Dermal Contact, Future Construction Worker: The dermal adjusted slope factor listed for 4,4'-DDD is listed in Appendix U as 1.2 $(mg/kg-day)^{-1}$, but the dermal slope factor is listed in Table 6-18 as $4.8 \times 10^{-1} (mg/kg-day)^{-1}$. Please correct this inconsistency.

17. Appendix U, Groundwater Dermal Contact (Phase I) Future Residential Child: The dermal adjusted reference dose listed for aluminum is listed in Appendix U as 8.0×10^{-1} mg/kg-day, but the dermal reference dose is listed in Table 6-18 as 2.0×10^{-1} mg/kg-day. Please correct this inconsistency.

18. According to Appendix U, the carcinogenic risk from dermal contact with sediment for an adult fisherman is 3.3×10^{-7}, not 2.3×10^{-7} as listed in Table 6-22. Please correct this inconsistency.

19. According to Appendix U, the carcinogenic risk from sediment ingestion for a future child resident is 1.5×10^{-6}, not 2.4×10^{-7} as listed in Table 6-24. Please correct this inconsistency.

20. According to Appendix U, the carcinogenic risk from dermal contact with sediment for a future child resident is 9.0×10^{-8}, not 1.4×10^{-8} as listed in Table 6-24. Please correct this inconsistency.

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State of North Carolina
Department of Environment,
Health and Natural Resources
Division of Waste Management

James B. Hunt, Jr., Governor
Jonathan B. Howes, Secretary
William L. Meyer, Director

July 30, 1997

TO: David Lown

FROM: David Lilley DBL

RE: Comments prepared on Section 7.0 (Baseline Ecological Risk Assessment) contained in the Remedial Investigation Report, OU9, Site 73, MCB Camp Lejeune, NC
November, 1996

After reviewing the above mentioned document, I offer the following comments:

1. Table 7-2: On July 23, 1997, I spoke with Diane Reed {(919)733-5083, ext. 568}, Surface Water Quality Standards Coordinator, Water Quality Section, NC Division of Water Quality. Following are the NC Water Quality Standards for Courthouse Bay and the two unnamed tributaries:

Chemical	NCWQS (ug/L)
Acetone	500
Toluene	200,000
Chloroform	470
Aluminum	87
Antimony	4,300
Barium	1,400
Manganese	100

2. Table 7-3: It is recommended that the Region 4 Waste Management Division Sediment Screening Values from the Supplemental Guidance to RAGS, Ecological Screening Values, Bulletin No. 2, November, 1995 be added to this table. After this is done, chromium, copper, and nickel should be added to the list of COPCs.

3. Table 7-4: The concentration range for toluene found in fillet samples should be 520J to 580J.

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4. Table 7-4: The concentration range for barium found in crab samples should be 0.054J to 0.094J.

5. Table 7-6: The references for the sources of the bioconcentration factors make no sense. Reference 3, which cites the Supplemental Guidance to RAGS: Region 4 Bulletins Ecological Risk Assessment does not contain bioconcentration factors. Reference 4 in Table 7-6 reads "USEPA, 1995b (Region III). In the "Reference" section of this report, 1995b is from Region IV, not Region III. Please cite the correct references in this table.

6. Table 7-6: The most cited reference (ref. 5) for the Organic Carbon Partition Coefficient is not correct in the references section. The EPA number cited (EPA/540/1-86/060) is actually the Superfund Public Health Manual. Which source did the information come from? It is recommended that all the references in the Ecological Risk Assessment be checked against the references in the "References" section of this document and inconsistencies corrected.

7. Table 7-6: Reference 6 is cited as SCDM, 1991. It is recommended that the updated version of this reference be used.

8. Page 7-7, Section 7.3.2.1: According to Table 7-1, 2,4-dinitrotoluene was not retained as a COPC, 2,4-dinitrophenol was. Please correct this inconsistency.

9. Page 7-8, Crab Samples: According to Tables 7-4 and 7-5, di-n-butylphthalate was retained as a COPC, but it does not appear on the list of COPCs on page 7-8. Please correct this inconsistency.

10. Page 7-16, Section 7.8.1, first paragraph: Chloroform does not have a SWSV listed on Table 7-2, therefore, it cannot exceed the SWSV as claimed. Toluene does not have a SWSV listed on Table 7-2, therefore, it cannot be below the SWSV as claimed. Please correct these inconsistencies.

11. Page 7-17, Section 7.8.3.1: It is claimed one VOC (toluene) was retained as a COPC in fish fillet samples. According to Table 7-4, methylene chloride was retained as a COPC for fillet and crab samples. There are numerous additional inconsistencies and omissions between sections 7.8.3.1/ 7.8.3.2 and Tables 7-4/7-5. Please correct.

12. Table 7-19: It is unclear to the reader why manganese and zinc are the only two COPCs to appear on this table. According to Table 7-5, there were 5 COPCs for the aquatic receptor, and 7 for the terrestrial receptor. Please explain.

13. Table 7-21: It is unclear to the reader why carbon disulfide, aluminum, cobalt, and vanadium appear on Table 7-5 but not on this table. Please explain.