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State of North Carolina
Department of Environment, Health, and Natural Resources
512 North Salisbury Street • Raleigh, North Carolina 27604

James B. Hunt, Jr., Governor | Division of Solid Waste Management (919) 733-2801 | Jonathan B. Howes, Secretary

July 30, 1993

RETURN RECEIPT REQUESTED

Commander, Atlantic Division
Naval Facilities Engineering Command
Code 1822
Attention: MCB Camp Lejeune, RPM
Ms. Linda Berry, P.E.
Norfolk, Virginia 23511-6287

Commanding General
Attention: AC/S, Environmental Management
Building 1, Marine Corps Base
Camp Lejeune, NC 28542-5001

SUBJECT: Draft RI/FS for Operable Unit #2, Sites 6,9, and 82
MCB Camp Lejeune, Jacksonville, Onslow County, NC

Dear Ms. Berry:

The NC Superfund Section has completed our review of the referenced document. Our comments are attached.

If you have any questions please contact me at (919) 733-2801.

Sincerely,

E. Peter Burger

E. Peter Burger, P.E.
Environmental Engineer
Superfund Section

Attachment

cc: Michelle Glenn, US EPA Region IV
Richard Schiever, NC DEM Wilmington
Neil Paul, MCB Camp Lejeune

DRAFT REMEDIAL INVESTIGATION
SITES 6,9, and 82
MCB CAMP LEJEUNE
Prepared by:
NC SUPERFUND SECTION
July 1993

SPECIFIC COMMENTS

Executive Summary

ES.1 Page ES-4 Please provide site history for Site 82.

ES.2 Page S-9 2nd paragraph. Surface water classification is Class SB NSW (Nutrient Sensitive Waters). Correct this throughout the document).

ES.3 Page ES-16 4th paragraph. Groundwater Quality has been impacted. Total chromium is 103 ppb. The NC Groundwater Standard is 50 ppb. If these levels are within background levels, so note it.

ES.4 Page ES-17 1st paragraph. Please indicate the principal constituent of PAH contamination. The maximum level of 2,000 ppb would probably present a risk for some PAH's such as Benzo(a)pyrene.

ES.5 Page ES-18 4th paragraph. Same comment as ES.4.

ES.6 Page ES-20 Last paragraph. The term "shallow" in place of "surficial" groundwater seems more appropriate - your choice.

ES.7 Page ES-21 Ravine Area. No indications of groundwater quality in the Ravine Area is noted. Please reference other area of report or provide some text describing groundwater quality in this area.

ES.8 Page ES-23 Please indicate the primary constituents of the PAH at boring 9GW4 and if there is any threat that should be investigated further or remediated.

ES.9 Page ES-24 Wallace Creek. 2nd paragraph. Please note that TCE at 98 ppb in surface water exceeds the NC Surface Water Standard of 92.4 ppb. Correct last sentence as required. Please correct this throughout the RI/FS.

ES.10 Page ES-25 2nd paragraph. Is it possible to draw the same conclusions from "upstream" and "downstream" sampling in a tidal influenced area as opposed to a non-tidal area. Please provide justification for this, otherwise the upstream/downstream conclusions are not valid.

ES.11 Page ES-26 Site 6, Lot 201. Last Bullet. Please note that the allowable risk range of 10^{-4} to 10^{-6} cannot be fully evaluated by the State of North Carolina until final acceptance by the State of the Base Line Risk Assessment.

ES.12 Page ES-26 Site 6, Lot 201. Please provide additional bullet noting that low levels of TCE are present in groundwater below NC Groundwater Standards. The comment applies to each area discussed in conclusions section.

ES.13 Page ES-28 Site 6, Lot 203. (7th bullet). Indicate that TCE and PCE are below NC Groundwater Standards.

ES.14 Page ES-28 Site 6, Lot 203. Add bullets indicating that chromium in groundwater is at 103 ppb which exceeds NC Groundwater Standard of 50 ppb.

ES.15 Page ES-28 Site 6, Wooded Area. 3rd bullet. Please note that chloroform is present at levels above NC Groundwater Standards.

ES.16 Page ES-28 Site 6, Wooded Area. 4th bullet. Add chlorophenol to list of VOCs.

ES.17 Page ES-29 Site 82, 3rd bullet. Indicate that VOC contamination exceeds NC Groundwater Standards and Federal MCL's.

ES.18 Page ES-30 Site 9. Please add bullet that indicates lead and chromium are present at levels exceeding NC Groundwater Standards and Federal MCL's. Also note, if appropriate, source of elevated metals. Are elevated levels naturally occurring or is there a source.

ES.19 Page ES-31. Wallace Creek, 2nd bullet. Indicate that pesticides are also present in sediments at Wallace Creek.

ES.20 Page ES-31 Wallace Creek, 3rd bullet. Same comment as ES.10.

ES.21 Page ES-31 Wallace Creek, 4th bullet. TCE exceeds NC Surface Water Standards. Please correct.

ES.22 Page ES-33 3rd Recommendation, Recommendations. Fencing of Site 82 may be more than is actually required on a military base.

ES.23 Page ES-33 5th Recommendation. Perhaps recreational fishing in both Wallace Creek and Bear Head Creek should be restricted.

Section 3.0 Physical Characteristics

3.1 Page 3.4 Section 3.3, 3rd paragraph. Surface water in this area should be identified as Class SB NSW (Nutrient Sensitive Waters).

Section 3.9.1.3 Other Sensitive Environments

4th bullet, Page 3-34

3.1 Correct Acronym to just CAMA, not NC CAMA.

3.2 Last sentence. It must be determined if the esturine waters at Operable Unit #2 are regulated by CAMA. Please contact Mr. Charles Jones, NC DEHNR, at (919) 726-7021, ext. 263 to assist in making this determination.

5th bullet, Page 3-35

3.3 It must be determined if migratory pathways or feeding areas of anadromous fish are affected. Please contact Mr. Richard Carpenter, NC DEHNR, at (919) 395-3900 to assist in making this determination.

Section 4 Nature and Extent of Contamination

4.1 Page 4-6 EPA Region IV and the State of North Carolina require that groundwater samples be unfiltered. Please address this requirement.

4.2 Page 4-15 2nd paragraph. Same comments as page 4-12.

4.3 Page 4-24 The table presented on this page and elsewhere in this section identifies contaminants present in groundwater above Federal MCL's and NCWQS. Please note that any contaminant, for which a NCWQS has not been established, shall not be permitted in detectable concentrations.

4.4 Page 4-30 Bear Head Creek. Please provide some explanation for your conclusion that the SVOC's found in surface water are the result of laboratory contamination.

4.5 Page 4-42 2nd paragraph. The statement in the second to last sentence regarding the source of SVOC is contradictory to the 3rd paragraph, page 4.4.

Section 6 Public Health Assessment

6.1 The problems with the Section 6.2.2 "Selection of Potential Contaminants of Concern" are too numerous to list. General comments are listed below:

a. A chemical not being historically associated with the site is not a valid reason to drop it from the list of chemicals of concern.

b. For organic chemicals that are believed to be laboratory related, the concentration in the lab blank, the concentration in the sample, and the parameters used to determine a significant difference between the two must be given.

c. For inorganic chemicals that are believed to be attributable to background concentrations, the background concentration, the concentration in the sample, and the parameters used to determine a significant difference between the two must be given.

d. If chemicals are excluded from the list of chemicals of concern because their concentrations do not warrant they be included, the levels detected and quantitative parameters by which they are excluded must be given.

e. When excluding chemicals because of infrequent detection, "infrequent" needs to be defined and used consistently throughout the selection procedure. If it is not, a justification must be included with the exceptions.

6.2 Page 6-7, second paragraph under "Site 9". 1,1,1-trichloroethene does not exist. In the first sentence, it is mentioned that tetrachloroethane was detected, but in the second sentence this is changed to tetrachloroethene. Is this a typo or are you referring to two different chemicals?

6.3 Bottom of page 6-17, top of page 6-18. It is stated that off-site receptors would not be exposed to concentrations much lower than those detected in on-site air samples. Why are individuals living off-site not listed as receptors on Table 6-17?

6.4 Page 6-20. The heading reads "Incidental Ingestion of Surface Soil", but the first line mentions subsurface soil. Is this a typo?

6.5 Page 6-22. C = Contaminant concentration in subsurface soil?

6.6 Page 6-22. It is stated that during construction activities, there is a potential for base personnel to absorb COCs by dermal contact. This route of exposure was not retained in Table 6-17.

6.7 Page 6-25. The next to last sentence makes no sense.

6.8 Page 6-30. A summary of exposure factors for on-site residents' exposure to sediments is presented in Table 6-25, not Table 6-28 as stated.

6.9 Page 6-33. The first sentence makes no sense.

6.10. Page 6-37. The i-1 term under the summation sign at the top of the page should be i=1.

6.11. Page 6-38. The risk accepted in the state of North Carolina is 1.0E-06.

6.12 Page 6-39. It is claimed the HI values for all potential human groundwater receptors did not exceed unity. According to the referenced table (Table 6-36), the HIs for child and adult resident exposure via the ingestion route does exceed unity.

6.13 Page 6-43, third paragraph. It is stated that groundwater sampled from monitoring wells cannot be considered representative of potable groundwater. Please explain. It is also stated that the use of total inorganic analytical results overestimates the potential human health risks. Please explain.

6.14 Page 6-44. The toxicological values for pyrene should be used for phenanthrene.

6.15. Table 6-17. The exposure of construction workers to subsurface soil needs to be accounted for.

6.16 Table 6-17. The potential ingestion of biota by children needs to be accounted for.

6.17 Page 6-41. It is claimed contract lab program methods have a precision of plus or minus 50%. Please cite a reference for this information.

6.18. Page 6-69. The PEF listed in the Risk Assessment Guidance for Superfund, Volume I - Human Health Evaluation Manual Part B, 1991 of 4.6E+09 m^3/kg should be used instead of the 5.0E-08 m^3/kg listed on this page.

6.19 "Input Parameter" Tables. It is recommended the page number be given with the references cited.

6.20. Page 6-69. The reader could not find the inhalation rate for a child of 0.43 m^3/hr in the cited reference.

6.21. Page 6-74. The reader could not find the sediment ingestion rate of 50 mg/day in the cited reference.

6.22 Page 6-75. For exposure to sediment while swimming, a whole body exposure of 23,000 cm^3 is recommended.

6.23 Page 6-76. The reader could not find the fish ingestion rate of 0.284 kg/day over 48 days/year in the cited reference. According to the cited reference, 6.5 grams/day as a fish consumption rate should be used with an exposure frequency of 365 days/year.

6.24 Throughout the document: Adult exposure, not that of a child or adolescent, needs to be used to determine the risk posed by carcinogens.

6.25 Pages 6-77 and 6-78. A spot check revealed the following problems:

a. The following toxicity values are not available on IRIS as claimed: Oral Reference Doses for 1,1,2,2-tetrachloroethane and zinc. Inhalation Reference dose for toluene. Oral slope factor for arsenic.

b. According to the cited document, the oral slope factor for dieldrin is 1.6E+01, not 1.6E-01.

c. According to the cited document, the oral reference dose for manganese is 1 E-01, not 5.0E-03.

d. The term AI in the WOE column needs to be defined.

e. It is unclear to the reader what the difference is between ND and -- for chemicals that have missing data.

Based on the above information, it is recommended all the data in Table 6-28 (pages 6-77 and 6-78) be double checked and corrected.

DRAFT FEASIBILITY STUDY
Sites 6, 9, and 82
MCB CAMP LEJEUNE
Prepared by:
NC SUPERFUND SECTION

GENERAL COMMENTS

1. Thermal on-site treatment of contaminated soils and treatment of groundwater will result in a release to the atmosphere of significant amounts of contaminants when considering the volume of media to be treated. Because of this the requirements of Air Permitting must be met when treating either or both media. Please note that MCB Camp Lejeune is divided into multiple Air Permitting Zones.

2. The large volume of groundwater to be treated a the site has raised a good deal of concern about the ecological effect on the tributaries to which the water will be discharged. Mr. Waynon Johnson, US EPA Region IV (919) 347-1586, may be of assistance in evaluating the impacts, in addition to representatives of the NC DEM Wilmington Region. Because of this, consideration should be given to land farming/spray irrigation or some other method of land application of treated groundwater.

3. It is noted that sediments in the tributaries have been contaminated with TCE, PCBs, and pesticides. The NC DEHNR has discussed remediation of these sediments and strongly agrees that remediation may create a worse situation.

4. The NC Wilmington Region Groundwater Section has reviewed the Groundwater Remedial Action Alternatives (RAA). The Region recommends the selection of RAA#6, Source Removal and Complete Remediation of Groundwater, as the only satisfactory alternative.

SPECIFIC COMMENTS

<u>Section 2 Development of Remedial Action Objectives</u>

2.1 Page 2-1 Contaminants of concern, lst paragraph. This section draws conclusions about risk levels in soils, surface water, sediment, and are based on the Risk Assessment presented in the Remedial Investigation. These conclusions cannot be made until the Risk Assessment is revised in response to comments made by both the State and EPA.

2.2 Page 2-4 Last paragraph. Please note that the requirements and intent of the permit must be complied with.

2.3	Page 2-6	Table 2-2. 2-chloroethylvinyl ether has not been listed as a COC.
2.4	Page 2-14	First paragraph. It is the purpose of the Baseline Risk Assessment (BRA), not the Site-Specific Risk-based Action Levels, to determine areas of concern that will need to be addressed in the FS.
2.5	Page 2-14	Second paragraph. None of the three sentences contained in this paragraph make sense. The paragraph needs to be rewritten.
2.6	Page 2-15	It is claimed that section reviews the BRA. No evidence of this is presented.
2.7	Page 2-15	The risk accepted in the state of North Carolina is 1.0E-06.
2.8	Page 2-15	It is stated that according to 40 CFR Part 300, 1.0 E-04 is used as a "point of departure". This is not true, the above cited reference states 1.0E-06 will be used as a "point of departure".
2.9	Page 2-15	Section 2.3.3.1, Third sentence. There is no risk range stated in this sentence. The risk range mentioned in 40 CFR Part 300 is 1.0E-04 to 1.0E-06. Of the two, 1.0E-06 is the more conservative risk number, not 1.0E-04 as stated.
2.10	Page 2-15	Section 2.3.3.1, last line, first paragraph. According to the title of section 2.3.3, site-specific risk-based action levels, not cleanup standards are being calculated in this document.
2.11	Page 2-15	Section 2.3.3.1, second paragraph. The second and forth sentences make no sense. It is impossible to protect risk levels or unity values, you protect human health or the environment.
2.12	Page 2-15	Section 2.3.3.1, Third paragraph. This paragraph does not make sense. The paragraph must be rewritten.
2.13	Page 2-15	Last paragraph. The list of potential exposure pathways are incomplete. What about dermal and inhalation exposure to groundwater while doing dishes, laundry, and showering? What about exposure to surface water and sediment? Please address these questions.
2.14	Page 2-16	The information in the first four paragraphs contains many errors, is randomly arranged, poorly written, and conveys no meaningful information. A complete rewrite or deletion of this information will be necessary.

2.15 Page 2-16 Inhalation of Particulates. It is recommended that the EPA default value of 4.6E+09 be used for the Particulate Emission Factor.

2.16 Page 2-18 (Table 2-5). Exposure Time for base personnel is listed as 8 hours/day. Where do base personnel live? Do some of them live on-site? Please answer these questions.

2.17 Page 2-18 It is unnecessary to site a reference for the number of days there are in a year.

2.18 Page 2-18 The inhalation rate for children claimed on this page could not be found in the referenced document.

2.19 Page 2-18 The units for PEF are m^3/kg, not mg/kg as listed.

2.20 Page 2-19 The term CF needs to be defined.

2.21 Page 2-20 (Table 2-6): IR = Ingestion rate in this table, not inhalation rate.

2.22 Page 2-20 A reference for the ingestion rates for base employees needs to be cited.

2.23 Page 2-21 The units for the equation at the top of the page do not work out, some kind of conversion factor is needed.

2.24 Page 2-24 Summary of Site-Specific Risk-Based Action Levels: Nothing in this paragraph makes any sense, the paragraph needs to be rewritten.

2.25 Page 2-27 Inhalation of Particulates. The first paragraph does not give the reader any information. It needs to be rewritten or deleted.

2.26 Page 2-27 Second paragraph. It is unclear to the reader what information is presented in the mentioned Tables.

2.27 Page 2-27 Tables 2-10 to 2-15. The lack of scientific notation in these Tables makes them unreadable. The titles of the Tables makes no sense. Action levels do not have the potential to cause cancer or toxic effects.

2.28 Page 2-27 Tables 2-10 to 2-12. The use of a child in determining action levels for carcinogens is inconsistent with EPA methodology and this document, Page 2-16, second paragraph.

2.29 Page 2-29 (Table 2-11). Where was an inhalation reference dose of 5.0E-03 mg/kg-day for lead found? All the reference doses and slope factors in Appendix B need to be referenced.

2.30 Page 2-38 See comment 2.15.

2.31 Page 2-44 Uncertainty Analysis. See comment 2.15.

2.31 Page 2-45 The last paragraph on this page contradicts the last paragraphs on pages 2-38 and 2-49.

Section 3.0 Identification and Screening of Remedial Technologies

3.1 Page 3-2 Table 3-1. The Media "Groundwater" specifies only the Castle Hayne Aquifer as an Area of Concern. Shouldn't the shallow aquifer also be an Area of Concern?