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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET, N.E.
ATLANTA, GEORGIA 30365

JAN 28 1992

4WD-FFB

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Ms. Laurie A. Boucher, P.E.
Remedial Project Manager
Department of the Navy - Atlantic Division
Naval Facilities Engineering Command
Code 1822
Norfolk, Virginia 23511-6287

RE: MCB Camp Lejeune NPL Site
Camp Lejeune, North Carolina

Dear Ms. Boucher:

I have reviewed the Draft Final Remedial Investigation Report and the Baseline Risk Assessment for the Hadnot Point Shallow Soils/Deep Groundwater. Enclosed are the comments resulting from my review.

The most significant comments are the following:

The Baseline Risk Assessment must be revised.

The threat posed by the contaminated soils to the shallow aquifer must be addressed.

The Baseline Risk Assessment must be conducted without consideration of any institutional controls.

More information is necessary to completely characterize the site.

If you have any questions concerning these matters, please call me at (404) 347-3016.

Sincerely,

Michelle M. Glenn

Michelle M. Glenn
Senior Project Manager

Enclosure

cc: Jack Butler, NCDEHNR
George Radford, MCB Camp Lejeune

EPA Review of the Draft Final
Remedial Investigation Report for
the Shallow Soils/Deep Aquifer
at the Hadnot Point Industrial Area
December 1991

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GENERAL COMMENTS

1. The document does not conform to current guidance. While overall a rather minor point, it seems odd that a document prepared in December 1991 under the Federal Facilities Agreement does not conform with guidance published in 1988. Many of the sections provide only a cursory overview of activities while not adequately addressing the substantive requirements of a Remedial Investigation Report. This is not minor.

2. The overall conclusion reached in review of this document is that insufficient information is available to reach decisions concerning the horizontal and vertical extent of contamination in the shallow soils and deep aquifer at the subject site. The information gathered on the shallow aquifer contamination is currently provided in an RI report to support an Interim action and, therefore, is irrelevant except to demonstrate a possible source of deep aquifer contamination and to demonstrate the source action of the soils to the shallow aquifer. Additional information must be collected on the shallow soils and deep aquifer. In light of this, EPA recommends this document be considered an initial report with a plan to collect the additional information and produce a "final" remedial investigation report when the contamination has been characterized to determine the horizontal and vertical extent sufficiently to reach a decision.

3. Many of the discussions provided in Chapter Five would be greatly simplified by a more liberal use of tables. The current presentation is difficult to follow and it is difficult to visualize the areas affected.

4. The exclusion of areas within the site from the Remedial Investigation (RI) is acceptable. However, these areas must be addressed prior to the approval of the Risk Assessment document.

5. The RI states that the RA shows no ecological threat. This is due to exclusion of significant sources is the BRA. The BRA is inadequate for the purposes of assessing environmental risk.

6. Raw aquifer test data should be submitted to EPA for review. This data includes raw draw-down and recovery data, draw-down versus time and draw-down versus distance plots, matches made with theoretical curves, and a description of conditions during the test, i.e., fluctuations in pumping rate, weather conditions, etc.

7. Several wells are not plotted on figures 2-1 and 3-4. These wells include HPGW17-3 and water supply wells 603, 637, and 652. All monitoring and water supply wells should be plotted in a figure for the final draft.

8. The following intermediate wells contained contaminants above MCLs. These wells include HPGW30-2 (vinyl chloride 0.012 mg/L, 1,2 DCE 0.012 mg/L); HPGW32-2 (benzene 0.027 mg/L); and HPGW9-2 (1,2 DCE 0.011 mg/L). Additional intermediate monitoring wells should be installed in the Hadnot Point Industrial Area to delineate the extent of the contaminant plume in the Castle Hayne Aquifer.

SPECIFIC COMMENTS

1. Page ES-1, 2nd paragraph - The sentence "...As a result of Marine operations and activities, wastes that contain hazardous and toxic organic compounds are generated at the base..." is misleading. Several samples indicated the presence of elevated concentrations of inorganic elements such as lead and chromium. Please revise the sentence.

2. Page ES-1, 2nd paragraph - The last part of the last sentence should be deleted.

3. ES-1, 3rd paragraph - This paragraph is an appropriate location to provide the reader with the specific areas/media covered in this RI report.

4. Page ES-2, 3rd paragraph - Spell out NACIP.

5. Page ES-4, 1st paragraph - Please remove this paragraph. It is subjective and is more appropriately discussed in the risk assessment where supporting information is available to the reader.

6. Page ES-4, 3rd paragraph - The conclusions presented in this paragraph should be removed or revised in accordance with the revised baseline risk assessment.

7. Page 1-3, Section 1.3, last paragraph - This RI report is not "final".

8. Page 1-4, top of page - Why were no background wells installed?

9. Page 1-4, Section 1.4 - Why doesn't this report follow the published RI/FS guidance? Information provided in this format is repetitive without providing significant new information.

10. Page 3-1, Section 3.0 - The record search is part of the scoping for the RI/FS work plan not a field investigation.

    This section should describe any deviations from the Region IV SOP and/or the work plans. It should also describe any unusual results or situations encountered during the field work.

11. Page 3-2, top of page - Why weren't any samples collected from the pits and tanks during this investigation? These would seem to be obvious starting points for determining sources and the full range of contaminants present at the sites.

12. Page 3-3, Section "Soil Gas Sampling Grids" - Were the "initial samples" screening or confirmatory samples?

    Page 3-3 - What was the rationale for collecting soil gas samples at 4-foot depths?

13. Page 3-4, Section 3.2.3 - What depth is considered "shallow"? This information is critical and should be provided when discussing the sampling.

14. Page 3-5, 2nd paragraph - The variation to the water table is extremely significant. Some information as to where the 1.5 feet occurred as to the 14 feet and as to the trend should be included.

15. Page 3-5, 3rd paragraph - Were the samples also analyzed for the Target Analyte List (TAL)? If not, why not? Why wasn't the TCLP run on organics is the levels are high enough?

16. Page 3-6, Section 3.3 - More information should be provided on the geology in the HPIA. Failure to provide this information when discussing the locations and depths of these wells renders it somewhat meaningless.

17. Figure 3-4 - Separate maps showing wells installed in different water bearing zones would go a long way toward simplifying what is obviously a complex hydrogeologic situation.

18. Page 3-8, List of samples - What happened to the investigation derived wastes?

    The decontamination procedure given here was not as per the ECB SOPQAM. The correct procedure is given in the ECB SOPQAM Appendix E, Section E.9.

    The drilling mud, unchlorinated water, bentonite, etc. used in the borehole should have been sampled to insure that these materials were not a possible source of contaminants.

19. Page 3-9, Section "Drilling Techniques" - Were the intermediate wells and deep wells in different depths of the same water bearing zone? Please provide more information for clarification.

20. Page 3-11, "Well Construction" - Considering that organics are of primary concern for this site, why was PVC chosen over more inert materials for well casing/screen? In the 2-11-91 ESD memo, it was recommended that a more inert material be used instead of PVC.

    Was a sieve analysis performed to chose the correct sand pack size?

    How long was the bentonite allowed to hydrate?

21. Page 3-13, Section 3.3.3 - Full TCL/TAL scans are necessary for the baseline risk assessment. It will be necessary to collect these during the supplemental RI.

22. Page 3-13, "Supplemental Characterization" - The depth of the supply wells should be included to determine how they relate to the additional wells.

23. Page 3-14, 2nd paragraph - Were the samples also analyzed for the Target Analyte List?

24. Page 3-14, "Sampling Procedures" - pH, conductivity and temperature should be monitored constantly during well purging and recorded. Stabilization of these parameters can be an important indicator of adequate purging. Were total depths of the wells measured?

25. Page 3-16, 4(a) - PVC bailers should not be used to sample wells. All future plans should require teflon or stainless steel.

    (b) - How were the pump and hoses decontaminated between uses?

26. Page 3-17, (g) - Please remove the sentence beginning "...While this may result...".

27. Page 3-19, top of page - These two water level measurements would not provide significant data as to variations in water level. Water levels should also be measured in June/July during peak rainfall variations.

    It is necessary that water levels be collected during the wet and the dry season so that local trends of ground-water flow and changes in the vertical and horizontal hydraulic gradients may be determined.

    Also what impact, if any, is tidal influence believed to have on water levels? Water levels in the semi-confined Castle Hayne Aquifer should be measured over a 24 hour period to determine if the water levels are affected by tidal fluctuations.

28. Page 3-19, Section 3.4 - This section states that part of the objective of the aquifer test was to determine the interconnection between the Castle Hayne and surficial aquifers. However, the text does not indicate that observation wells that penetrate the surficial aquifer were monitored during the aquifer test. The shallowest observation well monitored was 90 feet deep. The surficial aquifer is only 25 feet deep. All wells monitored during the aquifer test should be clearly listed.

    More details on the 4-87 pumping test should have been included in the text. The depth of the pumping well and the screen interval should be provided in the aquifer test discussion.

29. Page 3-20, Section 3.5 - PVC bailers are not in accordance with EPA Region IV's SOP.

    As stated previously, the drilling mud, unchlorinated water, bentonite, etc. used in the borehole should have been sampled to insure that these materials were not a possible source of contaminants - not just the drilling mud.

30. Page 3-21, top of page - Were samples also analyzed for the TAL?

    I believe the Region IV SOP requires "organic-free" water for use in decontamination. Only organic-free water is acceptable for blanks.

31. Page 3-23, Table 3-2 - Does "Full TCL" mean TCL/TAL?

My copy of this report begins Chapter 4 on page 4-5. Comments on Chapter 4 will assume this is corrected in the revised document.

32. Figure 4-1 - The North arrow is pointing South.

33. Page 4-2, top of page - Can't an estimate of average annual runoff be calculated?

34. Page 4-2, 3rd paragraph - How do these classifications affect the ARARs for these areas? What about federal ambient water quality criteria?

35. Figure 4-2 - Please identify the source areas on this map.

36. Page 4-3, top of page - The relationship of these 10 aquifers to the studies underway should be more completely explained.

37. Page 4-3, Section 4.2.2 - Is the Castle Hayne aquifer the aquifer directly underlying the shallow aquifer? If so, this should be clearly stated.

38. Figure 4-3 - This figure would be a great deal more helpful if some information as to the different depths of these formations were also included on the figure.

39. Page 4-4, top of page - Please provide the names of the aquifers described here.

40. Page 4-4, Section 4.3.1, 3rd paragraph - Is this also true for the formations underlying HPIA?

41. Figure 4-5 - Where are the wells in the upper regions of the surficial aquifer (1.5-14 feet)?

42. Page 4-5, Section 4.3.2, 3rd paragraph - If "seasonal water level fluctuations range from 1 to 4 feet", why were water levels collected in January and February? Wouldn't a wider distribution have provided better information?

43. Figure 4-6 - Are all the wells depicted here screened in the same interval in the aquifer?

44. Page 4-8, top of page - What samples were collected in this drainage feature? What might have potentially drained into this feature that could also be a source for additional groundwater contamination?

45. Page 4-9, 2nd paragraph - This conclusion should be stated as being very preliminary and the additional information to be collected will provide a better estimate of the gradient in these zones.

46. Page 4-9, third paragraph - If water levels in the Castle Hayne aquifer fluctuate with the tides then the vertical hydraulic gradients should be calculated during high and low tide.

47. Page 4-9, 4th and 5th paragraphs - Don't these paragraphs contradict one another as to the upward or downward gradient in cluster 24?

48. Page 4-10, Section 4.3.4, 2nd paragraph - Could this information be used to estimate the volume of contaminated water to be remediated?

49. Page 4-10, third paragraph. The units given for transmissivity and storage coefficient values are incorrect. It is assumed that the value for transmissivity is 9600 gpd/ft and the storage coefficient is 0.00088.

50. Page 5-2, top of page - All of these potential sources should have been sampled as part of this investigation. These should definitely be included in the supplemental RI work plan.

51. Page 5-2 and throughout the following pages - All sample results should be provided in tabular form. Not only does this simplify the RI report and makes the information readily available for inclusion in the Record of Decision. Another useful method of simplifying sample results would be maps projecting isoconcentration lines.

52. Page 5-4 - EPA concurs that these areas warrant further study.

53. Figure 5-2- This map is very hard to read. Perhaps overlays or some other method of simplification can be employed to provide the reader with a better picture of the results.

54. Page 5-5, "Bldgs. 1709 and 1710" - The status of these "waste" tanks must be determined in the supplemental study.

    The situation described in the last paragraph must be resolved.

55. Page 5-6, 3rd paragraph - Were the samples also analyzed for the Target Analyte List? Also, I believe the author is referring to the "Target Compound List" here.

56. Page 5-7, "Building 902" - Once again, presenting the results in tabular form would be more effective.

    Full TCL/TAL scans should be collected in the supplemental RI study.

    EPA concurs with the implied recommendation that additional work will be necessary to determine the horizontal and vertical extent of contamination.

57. Page 5-8, "Building 1202" - The contamination identified at a depth of 8-10 feet illustrates the need for an assessment of the soils continuing threat to the shallow aquifer.

58. Page 5-8, last sentence - "4 to 4 feet"? This must be a typographical error.

59. Page 5-10, 2nd paragraph - Were these pesticides evaluated in the baseline risk assessment?

60. Page 5-10, Section 5.3 - Samples must also be analyzed for the Target Analyte List. Is the reference here to the Target Compound List?

61. Table 5-1 - This table is "busy" and difficult to read and interpret. Reorganization by sampling date and interval sampled will simplify the data and provide good tables for use in the Record of Decision.

    Are the "MCL"s listed here federal or state standards? This should be clarified in the footnotes and the missing standards should be included.

62. Page 5-13, Table 5-1 - What is "T Smpld"?

63. Page 5-14, top of page - Is this a reference to the TCL/TAL?

64. Page 5-14, 3rd paragraph - Tabulating these results would be much more effective.

65. Page 5-14, last paragraph - Care must be used in discussing the appropriateness of unfiltered samples. MCLs and risk assessments are based on unfiltered samples. This discussion may confuse the reader as to the usefulness of the data. This discussion should be revised to reflect the use of the data.

66. Page 5-15, Section 5.3.1 - The aquifer use classification is extremely important and should be included here.

67. Page 5-15, "Hadnot Point Fuel Tank Farm" - Was the TAL also included?

68. Page 5-16, 3rd paragraph - Once again, a tabular representation of the data is recommended.

69. Page 5-17, 3rd paragraph - What is the source for the conclusions reached in this paragraph? What is meant by "adjusted for drinking water only"? What is the source of the conclusion of risk level?

70. Page 5-18, 1st paragraph - When the text refers to the "applicable water quality standard/guideline" what is the source? Federal and State guidelines should be presented in a clear and forthright manner.

71. Page 5-25, 1st paragraph - Here and everywhere else in the document where data is presented, EPA recommends a tabular format.

72. Page 5-27, Section 5.3.2 - The Castle Hayne Aquifer has not been adequately characterized to reach any conclusions as to the horizontal and vertical extent of contamination. These data gaps must be addressed in the supplemental RI work plan.

73. Page 5-28, 4th paragraph - Carbon disulfide appears to be a legitimate contaminant. Has this compound been evaluated as a threat in the baseline risk assessment?

74. Page 5-29, 2nd paragraph- What are the state and federal ARARs pertaining to these compounds?

"Deep Wells" - What about the TAL?

75. Page 5-35, Table 5-4 - Where these wells really screened in eleven different intervals? If so, where is the discussion of the potential impact of the information received about contamination in relation to the many potential "zones" of contamination?

76. Page 5-37 - The equipment blanks with the cyanide, high sodium, zinc and other metals contamination indicate a severe QA/QC problem either in the field and/or the lab. How will this QA/QC problem be rectified before future sampling/analytical work is to be performed?

77. Page 5-39 - The DI water blanks analyses indicate that this is not an acceptable source for preparing blanks.

78. Page 5-40 - The error in collecting the drilling mud sample is noted.

79. Page 5-42 - Considering the problems with the pump test of 4-13-87, will another pumping test be performed to determine the hydrogeologic properties of the Castle Hayne aquifer as it is now, five years later?

80. Page 6-3 - The "conclusions" reported here are based on very limited data and should be discussed with that in mind. EPA does not concur that soil contamination is not "heavily contaminated". Data reported in this document do not really support this contention. In addition, no clays or other "clean" soils were analyzed to support the conclusion that the metals detected were indicative of soil conditions.

81. Page 6-5, Section 6.3.3 - If the extent of contamination has been delineated in the shallow aquifer, why is an "interim action" being proposed, instead of the final remedy?

82. Page 6-6, 3rd paragraph - The discussion concerning the metals present in groundwater is conjecture and should be removed. Any metals above primary or secondary drinking water standards must be considered for remediation.

83. Page 6-6, "Castle Hayne Aquifer" - EPA does not believe sufficient information is available to draw any conclusions concerning this aquifer.

84. Page 6-7, "Deep Wells" - EPA does not believe sufficient information is available to draw any conclusions concerning this zone.

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GENERAL COMMENTS

1. This BRA is not a complete risk analysis of the Hadnot Point Industrial Area (HPIA). There is no discussion about the present or future uses of the surficial ground water. This ground water is a Class II-B, potential drinking water source, and is very heavily contaminated. This potential pathway must be evaluated in the BRA.

   The surficial aquifer was not considered a pathway in this BRA. It was qualitatively looked at in the Draft Interim Remedial Action RI dated November 19, 1991, but a quantitative risk assessment was never done. This BRA should include a quantitative risk analysis of the surficial aquifer since it is a Class II-B aquifer.

2. The BRA provides no information on the quality assessment/ quality control of the sampling data. No conclusions can be drawn from the BRA without knowing the quality of data used in the BRA.

SPECIFIC COMMENTS

1. Executive Summary, Page x, second paragraph - Should "has" stations be gas stations ?

2. Executive Summary, Page x, fourth paragraph - An adequate risk assessment cannot be prepared when potential source areas are exempted from the scope of the assessment. The transformer yard (Site 21), fuel tank farm (Site 22), industrial area fly ash dump (Study Area 24), and the Hadnot Point burn dump (Study Area 28) are not included in this document. Exemptions of source areas may underestimate the risks involved. EPA recommends that MCB CLEJ/DON use the concept of an overall ecological risk assessment for the entire reservation as an organizing methodology to evaluate ecological risks. As investigations are completed, information will be added to sections based on drainage or watershed units resulting in a final Ecological Baseline Risk Assessment document addressing the reservation.

3. Page 1-1, 1.0 Introduction - Limiting the investigation to on-site sampling and ignoring off-site effects may underestimate the risks involved with these sites. Although it appears ecological risks may be minimal, the statement is only conjecture until off-site effects are investigated.

4. Page 1-7, 1.2 Summary of Previous Site Studies - Assistent water quality criteria guidelines should be Ambient Water Quality Criteria. Region IV Water Quality Screening Values should be used in evaluating contaminant concentrations in surface water samples.

5. Page 5-14, 5.2 Nonhuman Risk Assessment - The failure to identify possible groundwater discharges may underestimate the ecological risk from the Hadnot Point Industrial Area. Therefore the ecological risk assessment is incomplete until this matter is addressed.

6. Page 2-12, Figure 2-5 - As stated in the comments on the draft baseline risk assessment, this figure only provides the locations of wells 601, 602, 608, and 634. The other five wells (referred to in Section 2.1.1.3) are not listed in the figure.

7. Page, 2-20, Table 2-7 - The last column states that MCLs/MCLGs are in Appendix D. Appendix D does not contain MCLs or MCLGs.

8. Page 2-22, Table 2-8 - The rationale for not collecting local background data should be presented.

9. Page 2-30, Section 2.2.5 - Table 2-12 is stated to contain the final list of COCs and the rationale in their selection. Section 2 does not include Table 2-12.

10. Page 2-30, Section 2.2.5.4 - Site 22 has not been sampled for surface soil contamination, therefore the BRA can not determine the total risk associated with the exposure to the soils in the HPIA.

11. Page 3-11, Figure 3-4 - Most of this figure is not legible.

12. Page 3-20, Section 3.3.1 - The word "investigation" in the first sentence of the second paragraph should be "ingestion".

13. Page 3-24, Table 3-5 - The ground-water data from Site 22 is not presented in this table.

14. Page 5-5, Table 5-1 - This table contains the following errors:

    (1) The total risk due to exposure to benzo(k)flouranthene in the soil does not equal the sum of the two pathways. This error should be corrected.

(2) The sub-total of the risks associated with the contaminated soils should be 2.6×10^{-5} not 2.6×10^{-7}.

15. Page 6-1, Section 6.0 - EPA's point of departure is 1×10^{-6} not 1×10^{-4}. EPA's acceptable risk range is 1×10^{-6} to 1×10^{-4}. This issue is a great deal more complex than just stating the numbers.

The Hadnot Point Industrial Area Operable Unit has not been thoroughly characterized at this time and the BRA has not addressed all of the potential pathways. EPA strongly recommends that more sampling data is needed for the soils and the surficial ground-water pathway needs to be evaluated before the BRA can indicate what the true present and future risks at the HPIA.

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