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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

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

April 12, 1995

4WD-FFB

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Ms. Katherine Landman
Department of the Navy - Atlantic Division
Naval Facilities Engineering Command
Code 1823
Norfolk, Virginia 23511-6287

SUBJ: MCB Camp Lejeune
Draft Feasibility Study
Operable Unit No. 7 - Sites 1, 28,

Dear Ms. Landman:

The Environmental Protection Agency (EPA) has partially completed its review of the above subject document. Comments are enclosed.

If you have any questions or comments, please call me at (404) 347-3016 or voice mail, (404) 347-3555, x-6459.

Sincerely,

Gena D. Townsend
Senior Project Manager

Enclosure

cc: Patrick Waters, NCDEHNR
Neal Paul, MCB Camp Lejeune

1.0 GENERAL COMMENTS

The Draft FS Report provides a comprehensive evaluation of potential remedial alternatives that may be appropriate for treating contaminated groundwater at Site 1 and contaminated soil and groundwater at Site 28. Based upon results of the Draft RI Report, the Navy concluded that an FS was not required for Site 30.

1. According to the Guidance for Conducting Remedial Investigation and Feasibility Studies under CERCLA, evaluation criteria for effectiveness of action alternatives include reduction of toxicity, mobility, and volume through treatment (EPA, 1988). Thus, the amounts of hazardous materials which are destroyed or treated, and the amount remaining onsite after the treatment need to be assessed, along with the degree of expected reduction in mobility, toxicity, or volume (EPA, 1988). This report does not assess the amount of contaminants, the COCs, which will be destroyed or treated nor the amount remaining onsite after the treatment. Thus, the evaluations of the effectiveness of remedial action alternatives in this report do not meet the EPA criteria.

2. The report does not present calculations of cleanup time, volume of contaminant, and pumping rate for some of the remedial action alternatives. The 30 years of remedial operation time is assumed without support by the calculations. The report does not estimate the size of TCE plume which is the area of concern (AOC) at Site 1.

3. This report does not present adequate technical data for sizing the equipment in the remedial action alternative (RAA No. 3, No. 4, and No. 5). The capacities of the equipment are very important to the cost estimate in evaluations of the remedial action alternatives. Without knowing the capacities of the equipment, capital costs and O&M costs can not be well determined.

4. It is important to consider the accuracy of costs developed for detailed analysis of remedial action alternatives. The report does not indicate a percentage of the accuracy of the cost estimate. According to EPA Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA, costs developed with accuracies other than -30 to +50 percent should be identified in the feasibility study.

5. The report does not use consistent terminology or always define an acronym or abbreviation when used initially.

6. The summary of groundwater process option evaluations shows that neutralization and precipitations are eliminated.

However, those process options are retained by the evaluation for Site 1 based on the same concern of contamination of manganese. The neutralization by pH adjustment is important for the process of precipitation. A reaction pH above 9.4 is required to achieve significant manganese reduction by precipitation (Eckenfelder, 1989). The text should explain the reason for which the neutralization precipitation processes are not necessary for the groundwater primarily contaminated with manganese at Site 28, but would be necessary at Site 1 with the same contamination.

7. Apart from manganese, the other groundwater remediation goal at Site 28 is set for lead. Lead can also be effectively precipitated at a pH 9.0 to 9.5, and pH adjustment is important for the precipitation process. Since lead is one of the COCs in the groundwater for Site 28, at the evaluation of the neutralization and precipitation process options, the text should also address whether such processes would be necessary for the groundwater contaminated with lead.

8. The nature and extent of contamination at site 28 has not been adequately determined. Dynamac's review indicated that the soil, surface water and sediment sample spacing at Site 28 was too large to detect potential hot spots that may exist at the site as a result of past disposal activity. In addition, based on the groundwater contour map of the surficial aquifer presented in the Draft RI Report, there are no downgradient monitoring wells along the southern portion of the site. Until the nature and extent of contamination at Site 28 is determined, the feasibility of the proposed remedial alternatives cannot be evaluated.

9. The Draft FS Report eliminates a potentially feasible, cost-effective groundwater treatment technology that is generally referred to as passive treatment systems. The Draft FS Report states that the passive treatment system was eliminated as a Remedial Action Alternative (RAA) because the technology is only in pilot-scale testing and is not currently available. However, the Superfund Innovative Technology Evaluation Program: Technology Profiles Sixth Edition, identifies a specific passive treatment system which has been chosen as part of the selected remedy for a Superfund project in EPA Region I. Therefore, the Draft FS Report should not eliminate passive treatment technologies as an RAA on the basis that the technology has not been implemented.

2.0 Specific Comments

1. Executive Summary, Page ES-5, Paragraph 1:
The text states that trichloroethylene and toluene were detected at very low concentrations in subsurface soil samples. The range of concentrations detected should be presented to substantiate this claim.

2. Page ES-11, Paragraph 4, Sentence 3.
The text states that the TCE concentration exceeded its RL of 2.8 ug/l. The text also indicates that manganese and mercury exceeded their RLs, but the respective RLs and detected concentrations are not given. The text should offer both the detected concentrations and RLs of manganese and mercury.

3. Page ES-12, Paragraph 1, Sentence 1.
The text states that the following COCs exceeded a remediation goal and will be retained as COCs for Site 28. The statement is confusing. The text should state "the following **contaminants** exceeded a remediation goal and will be retained as COCs for Site 28".

4. Page ES-13, Paragraph 4, Sentence 1.
The text states "under no action RAA...". The text should read "Under RAA No. 1, ..."

5. Page ES-15, Paragraph 1, Sentence 1.
The text states "the following soil RAAs...". The text should read "the following **surface soil** RAAs..."

6. Table ES-1.
The table should list a column for the medium (see Table ES-2) to indicate that the groundwater at Site 1 needs the remediation.

7. Table ES-3.
At the end of the table, the cost should be identified as present worth value.

8. Section 2.8.1, Page 2-7, Paragraph 5:
The text states that based on a comparison of base-specific background levels, positive detections of inorganic constituents at Site 1 do not appear to be the result of past disposal practices and that the inorganic constituent levels at the site are similar to background levels. A comparison table should be included which compares the inorganic contaminant levels for Site 1 with the background levels.

9. Section 2.8.2, Page 2-7, Paragraph 6:

This section of the text discusses inorganic contaminants detected in the groundwater at Site 1. Iron and manganese, which were detected at concentrations exceeding the North Carolina Water Quality Standards (NCWQS), are discussed in this section. However, arsenic, which was detected at levels exceeding groundwater ingestion risk-based action levels established for carcinogenic substances, is not discussed. Arsenic should be discussed in this section.

10. Section 2.8.2, Page 2-7, Paragraph 6.
The text only states detected VOCs and SVOCs and their concentrations, but it does not indicate whether the concentrations of those VOCs and SVOCs exceeded MCL and NCWQS standards. Thus, the statement is incomplete.

11. Section 2.9, Page 2-8, Paragraph 3, Sentence 1.
The text states that manganese exceeded federal and state groundwater criteria. However, federal does not have groundwater criteria for manganese. The text should be revised accordingly.

12. Section 3.0, Page 3-1, Paragraph 1, Sentence 1.
The text should read "this section presents the remediation goal options, remediation **levels**, and remediation objectives for Site 1 in Operable Unit No. 7."

13. Section 3.4, Page 3-9, Paragraph 3, Sentences 3 and 4.
The text states that TCE plume was delineated as shown on Figure 3-1 and that the TCE plume is an AOC at the site. However, the text does not estimate the size of the TCE plume (ft x ft). Without knowing the size of the TCE plume, the volume of contamination can not be determined. Figure 3-1 should give the estimated size of the TCE plume.

14. Section 3, Figure 3-1.
The legend shows Hg 0.15 ug/l concentration exceeding the mercury RL. The mercury RL is 1.1 ug/l so the legend should make a correction to change Hg 0.15 to Hg 1.1.

15. Section 3, Figure 3-1.
For manganese, it is inappropriate to list the Secondary Maximum Contaminant Level (Note No. 5) under the column of Federal MCL. Federal MCL standards are for the National Primary Drinking Water Standards regulated under the Safe Drinking Water Act (SDWA). The Secondary Maximum Contaminant Level (SMCL) is a recommended level by EPA and it is not enforceable. Thus, manganese under Federal MCL really should be NE which means **No Criteria Established**. The Note No. 5 should be deleted. The above comment should also apply to Table 3-8.

16. Section 3, Figure 3-1.

In Section 3.4 the text does not clearly define the plume boundaries as depicted on Figure 3-1. The area extent of contamination should be defined before calculating the estimated cleanup time and the cost of the project. In addition, the area of the extent of contamination should be defined on the map.

17. Section 4, Table 4-3.
The text in the column "Description" indicates that Reverse Osmosis (RO) is performed by "using high pressure to force water through **carbon column**". This statement should be revised to indicate that RO is performed by "using high pressure to force water through **RO memberanes**".

18. Section 4, Table 4-5.
The evaluation results of this table are clearly indicated as **Retained** or **Eliminated**; however, the **reason** for the process option being retained or eliminated is not clearly expressed. The table should be revised to provide a clear explanation for why a process was retained or eliminated (e.g. retained - typically used for polishing gas effluent from air stripping towers).

The table indicates that process option-reverse osmosis has been eliminated; however, the text of the report should note that RO may be used to treat effluent from an identified extraction well which experiences high levels of heavy metals which may cause the treatment system to violate any discharge permits.

19. Section 5.1.2, Page 5-1, Paragraph 6, Sentence 2.
The text states that eight wells, which are identified in Figure 5-1, will be analyzed for VOCs and manganese. However, after examining Figure 5-1, it is found that the well 1-GW15 (notated in blue) is omitted from the text. Either the text or Figure 5-1 should be revised accordingly.

20. Section 5.1.5, Page 5-3, Paragraph 7, Sentence 1.
The text states under RAA No. 5 that three shallow extraction wells are shown in Figure 5-6. However, Figure 5-6 is not found in the report.

21. Section 5.0, Figure 5-1.
The legend identifies shallow and deep monitoring wells as circles and crosses with portions of the circle filled. In addition, the legend should also identify the type of wells which have a circle and cross symbol without any of the circle filled (i.e. 1-GW0A on Figure 5-1). The same comments should also apply to Figures 5-2 and 5-4.

22. Section 5.0, Figure 5-2.

The legend indicates that wells notated in blue would be monitored for VOCs and manganese. However, well 1-GW15 appears in blue on Figure 5-2 and in black on Figure 5-1. One of the figures should be revised accordingly.

23. Section 5.0, Figure 5-3.
The flow diagram does not show a destination of discharge from the Plate and Filter Press. The filter press will generate a significant amount of effluent in the sludge dewatering process. Such effluent should be collected and discharged to a sewer for further treatment. Also, the amount of solid cakes from the filter press (40% solids) needs to be disposed. The flow diagram should indicate the type of solid disposal for the solid cakes.

In addition, the air stripping tower should be shown at the beginning of the process train instead of at the end.

24. Section 6.1, Page 6-3, Paragraph 1, Sentence 3.
The text states that the accuracy of each cost estimate depends upon the assumptions made and availability of costing information. EPA guidance requires that an accuracy of cost estimate should be in a range of -30 to +50 percent (otherwise identified). The text does not indicate the accuracy of the cost estimate.

25. Section 6.2.2, Page 6-6, Paragraph 8.
The text states that ***O&M Costs*** of $45,000 per annum are projected for 14 wells. The text should indicate average O&M costs for the type of well, if the costs for shallow and deep wells vary. In addition, "Cost" should be in bold and italic letters as it appears in other sections.

26. Section 6.3.7, Page 6-15, Paragraph 4:
The text references the net present worth value for remedial action alternative No. 5 as $693,000. Based on cost estimates provided in Appendix C for remedial action alternative No. 5, the correct amount should be $1,499,000.

27. Section 6.2.3, Page 6-8, Paragraph 2.
The text states that the alternative will result in toxicity, mobility, and volume reduction. However, the reduction is not quantified. The text does not assess amounts of contaminants destroyed or treated by RAA No. 3, nor the amount of residual remaining onsite. Without the assessments, the quantity of remedial groundwater would not be known. Thus, it would be difficult to size the equipment for this alternative. The same comment applies to the RAA No. 4 (Section 6.2.4) and RAA No. 5 (Section 6.2.5).

28. Section 6.2.3, Page 6-8, Paragraph 9.

The capital cost associated with RAA No. 3 should be estimated based on capacities of the equipment. Since the report does not present any data for the capacities, it is unclear how the capital cost is determined. The text should also indicate an accuracy of the cost estimate. Typically, study estimate costs provide an accuracy of -30 to +50 percent. (EPA, 1988).

29. Section 6.2.5, Page 6-10.
The section title should be in bold letters.

30. Section 6.2.5, Page 6-12.
After "Implementability" and at the end of this section, there should be the "Cost" for RAA No. 5, but this part is missing. The text should present the cost for RAA No. 5.

31. Section 6, Table 6-1.
At the end of the table, the costs should be identified as present worth value.

32. Appendix B, Sheet 2 of 5.
The final part of the text is missing and unreadable. Since this part contains very important information, the text should be made legible.

33. Appendix B, Table B-1.
At the column of Total Annual O&M Costs, the text should indicate "Assuming 30 years of operation". At the column of Present Worth Value, the text should indicate a discount rate.

34. Appendix C, Table C-2, Page 2 of 4.
The table should present technical date of the aeration system in RAA No. 4. At the column of Present Worth Value, the text should indicate a discount rate.

35. Appendix C, Table C-3, Page 2 of 4.
The table should present technical data of the extraction systems in RAA No. 5. At the column of Present Worth Value, the text should indicate a discount rate.

36. Section 7.2, Page 7-1, Paragraph 4, Sentence 2.
The text needs to spell out **STP** as **Sewage Treatment Plant.** Also, Figure 7-1 should be coordinated with the text (e.g. Hadnot Point Wastewater Treatment Plant should be called **Hadnot Point Sewage Treatment Plant (STP).**

37. Section 7.4.2, Page 7-2, Paragraph 5, Sentences 1 and 3.
The text should clearly state the meaning of an acronym when it is initially used in the text (e.g. VOCs = Volatile Organic Compounds and O&G = Oil and Grease).

38. Section 7.8.1, Page 7-6, Paragraph 2, Sentence 3.
The text should define data with "J".

39. Section 7.8.1, Page 7-6, Paragraph 2, Sentence 5
The text describes borings as 28-GW01DW and 28-W-SB12; however, the Figure 7-2 indicates them as 28W01DW and SB12, respectively. The text and Figure 7-2 should be coordinated.

40. Section 7.8.1, Page 7-6, Paragraph 3, Sentence 2
The text describes a boring as 28-GW07, and the Figure 7-2 indicates a boring as 28GW07. The text needs to be coordinated with Figure 7-2.

41. Section 7.8.2, Page 7-7, Paragraph 2, Sentence 3.
See the Comment above.

42. Section 7.8.3.1, Page 7-7, Paragraph 4, Sentence 2.
The text should reference a figure showing the location of sample 28-OP-SW02.

43. Section 7.8.4, Page 7-8, Paragraph 2, Sentence 2.
See the Comment above.

44. Section 7.9, Page 7-11, Paragraph 6, Sentence 1.
The text should indicate the definition of "UBK" in the "List of Acronyms and Abbreviations".

45. Section 8.3.4, Page 8-14, Paragraph 1.
For contaminant lead in the NCWQS column, the number should be 15 instead of 15(4), because the Note No. 4 is for the MCL. For contaminant lead in the Federal MCL column, the number should be a 15(4) instead of 50 (EPA, 1994). This correction should also apply to Table 8-18.

For manganese, it is inappropriate to list the Secondary Maximum Contaminant Level (Note No. 5) under the column of Federal MCL. Federal MCL is for the National Primary Drinking Water Standards regulated by Safe Drinking Water Act. The Secondary Maximum Contaminant Level (SMCL) is a recommended level by EPA and it is not enforceable. Thus, manganese under Federal MCL really should be NE which means **No Criteria Established**. The Note No. 5 should be deleted. This comment should also apply to Table 8-18.

46. Section 8, Table 8-15.
The definition of NA is missing in the notes.

47. Section 8, Figure 8-1.
The legend of Figure 8-1 should identify the type of wells with circle and cross symbol (e.g. 28-GW02). This comment also applies to Figures 8-2 and 10-1.

48. Section 9, Table 9-6, Process Option-Fencing.
The fencing process option for groundwater was eliminated; however, this process option for soil (Table 9-7) was retained. The tables appear to contradict each other.

49. Section 9, Table 9-6.
The summary of groundwater process option evaluations shows that neutralization and precipitations are eliminated. However, those process options are retained by the evaluation for Site 1 based on the same concern of contamination of manganese. The neutralization by pH adjustment is important for the process of precipitation. A reaction pH above 9.4 is required to achieve significant manganese reduction by precipitation (Eckenfelder, 1989). The text should explain the reason for which the neutralization precipitation processes are not necessary for the groundwater primarily contaminated with manganese at Site 28, but are necessary at Site 1 with the same contamination.

Apart from manganese, the other groundwater remediation goal at Site 28 is set for lead. Lead can also be effectively precipitated at a pH 9.0 to 9.5, and pH adjustment is important for the precipitation process. Since lead is one of the COCs in the groundwater for Site 28, at the evaluation of the neutralization and precipitation process options, the text should also address whether such processes are necessary for the groundwater contaminated with lead.

50. Section 10, Figure 10-1.
The legend should be revised to indicate that wells shown in purple are recommended for monitoring the groundwater for RAA No. 2. In addition, the legend should identify the type of wells with circle and cross symbols.

51. Section 11.1.1.2, Page 11-4, Paragraph 9.
The text states that capital costs associated with RAA No. 2 are approximately $429,000, but the text also states that there are no capital costs. The statements are contradictory. Table B-1 in Appendix B says that total capital costs for groundwater RAA No. 2 is zero and the present worth value is about $429,000. Thus, the text should read that the capital costs for RAA No. 2 is $0 and the NPW for RAA No. 2 is $429,000.

52. Section 11, Table 11-1.
At the end of this table, the cost should be identified as present worth value.

53. Section 11.2.1.1, Page 11-11, Paragraph 3, Sentence 9.

The text states that information suggests that the high lead concentration detected at 28-GW08 may be the result of suspended solids, and the total metals analysis is indicative of lead in the soil and groundwater, not just the amount of lead that is dissolved in the groundwater. If this is true, lead should not have been considered as the COC for any remedial actions at Site 28. The text should really address this concern earlier in "Section 8.0 Remediation Action Objectives".