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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET, S.W.
ATLANTA, GEORGIA 30303-3104

January 30, 1998

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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 Focused Remedial Investigation
Operable Unit No.16-Sites 89 & 93

Dear Ms. Landman:

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

If you have any questions or comments, please call me at (404) 562-8538

Sincerely,

Gena D. Townsend
Senior Project Manager

Enclosure

cc: David Lown, NCDEHNR
Neal Paul, MCB Camp Lejeune

1.0 GENERAL COMMENTS

1. Figure 1-2 shows the site plan for Site 89. However, landmarks such as Building STC-867 are not shown on the figure. The figures in this report should identify important landmarks and be enlarged.

2. Section 2.0, Page 2-1, Paragraph 1, Sentence 5 states that the field activities comprise mainly subsurface soil and groundwater investigations. However, the text does not give the rationale for excluding surface soil sampling from the investigation. Surface soil sampling should have been done because one of the sites was a motor pool. As a consequence, spills could have easily reached the soil. The text should give the rationale for not conducting surface soil sampling at the site.

3. Section 2.2.2, Page 2-3, Paragraph 0 lists the various parameters that were analyzed for Sites 89 and 93. However, the text does not show TPH as one of the parameters that was analyzed. Since one of the sites used petroleum-based solvents, the TPH should have been included as a parameter. The text should give the rationale for excluding TPH from the analytical effort.

4. Section 2.3.2, Page 2-5, Paragraph 3 states that shallow monitoring wells were screened across the water tables. Section 1.3 and 1.3.2 state that at Sites 89 and 93 several chlorinated solvents and oil and grease contaminants were detected at these sites. However, Table 2-6 and Figures 3-3 through 3-6 indicate that the shallow monitoring wells are not screened to investigate the shallow aquifer. The EPA SOPQAM states that the shallow monitoring wells should be screened 2-3 feet above the water table to monitor NAPL constituents and seasonal fluxuation. The shallow monitoring wells at Sites 89 and 93 are below the water table and may not reflect the constituents being investigated. The text should explain why these wells were not installed according to the Region IV SOPQAM.

5. Section 2.3.7, Page 2-8, Paragraph 6 shows that at Site 89 nineteen groundwater samples were collected for TCL volatiles during the Phase II investigation. However, in the following paragraph (page 2-9) the text states that during the Phase II investigation, 18 groundwater samples were collected from Site 89. In addition, only one sample at Site 89 was analyzed for TCL pesticide/PCBs. No rationale for such an approach is given. This discrepancy should be resolved and the rationale for analysis of one sample for pesticide/PCBs should be presented accordingly.

6. Section 4.3.1, Pages 4-2 and 4-3 present a number of organics as common laboratory contaminants and uses the 10x rule from the 1989 EPA guidance for such contaminants. One example is the detection of chloroform. However, according to the guidance chloroform is not listed as a common lab contaminant. Therefore, the use of the 10x rule should not be applied to chloroform. Chloroform should be removed from the common lab contaminants.

7. Section 4.5.1.1, Page 4-7, Paragraph 3, Sentence 8 states that the distribution and extent of disulfide compounds are not discussed in detail because they are not considered to be site related. However, because these disulfide compounds were detected during the RI, they should be fully addressed. All analytical results should be presented in full for the public to review and explained within the body of the text and conclusions.

8. Section 4.5.1.1, Page 4-7, Paragraph 5 states that monitoring well IR89-MW05 and IR89-MW03 are the wells where the majority of detections were present in samples. Well cluster IR89-MW05 is approximately 800 feet west of the former UST (one of the source area for the existing volatile contamination) and well cluster IR89-MW03. The text concludes that these two wells are in close proximity. However, the text does not explain in this section or in Section 8 (the conclusion) how monitoring well IR89-MW05 which is upgradient of the one identified source area is connected to Site 89.

9. Section 4.6.2.2, Page 4-17, Paragraph 1, Sentence 7 states that monitoring well IR93-TW07 is located 650 feet west of the former UST. However, the text does not explain the relationship between the upgradient monitoring well from the former UST and how the constituents from the UST impacted monitoring well IR93-TW07 since groundwater migration is toward the southeast. The text should explain in this section and in Section 8 the relationship of VOC migration in the shallow aquifer.

10. Figure 4-3 depicts the boundary of volatile organic compounds at Site 89. However, well MW05 which had the majority of detections is upgradient at Site 89 and also across the drainage divide. As such, analysis results from the well are not representative of Site 89 and may indicate contamination at a different area. The text should explain how well MW05 is connected to Site 89.

2.0 SPECIFIC COMMENTS

1. <u>Figure 1-3</u>.
Figure 1-3 shows the site plan of OU 16 (Site 93). However, the green wavy line on the figure is not shown on the legend. The line should be included in the legend.

This comment also applies to Figures 2-2 and 2-6.

2. Section 2.5, Page 2-12, Paragraph 2, Bullet 1.
The text states that a "total of duplicate samples" were collected. However, the number of samples collected is not stated. The total number of samples should be added to the report.

3. Tables 2-1 and 2-2.
Tables 2-1 and 2-2 summarize soil sampling at Sites 89 and 93, respectively. However, some of the sampling parameters including TCL volatiles, TCL semi-volatiles, TCL pesticide/PCBs and TAL metals were not conducted on all of the samples collected. The text should give the rationale for not including the aforementioned parameters in analyzing all of the samples.

This comment also applies to Tables 2-13, -14, -15, and -17.

4. Tables 2-7 through 2-10.
Tables 2-7 through 2-10 summarize groundwater sampling water quality parameters. However, the units for the volume of the wells are missing. The units should be included in the table.

5. Figure 2-1.
Figure 2-1 depicts the sample locations at OU16 (Site 89). However, the yellow line on the figure is not included in the legend. The legend should be revised accordingly.

6. Figure 2-3.
Figure 2-3 is a typical temporary monitoring well construction diagram. However, the figure is missing dimensions. The pertinent dimensions should be included on the figure.

This comment also applies to Figures 2-7 and 2-8.

7. Figure 3-1.
Figure 3-1 shows the surface topography for Site 89. However, the 15-foot contour line that transects Edward Creek does not follow the laws of contouring. Edward Creek is flowing uphill while crossing a 10-foot contour line. The figure should be corrected.

8. Figure 4-2.
Figure 4-2 shows sampling locations for Site 93. However, the sample locations on the figure are not named. All sampling locations should be identified.

RISK ASSESSMENT

1.0 GENERAL COMMENTS

1. Section 6.2.2, Page 6-2, Paragraph 4 states that the groundwater VOC analyses were conducted by two different laboratories (mobile lab and fixed lab). However, the differences in methodology between the two labs and the comparability of data from the two labs are not discussed. Before both sets of data can be used in the risk assessment, the two data sets should be comparable. Therefore, discussions on comparability should be added to the text. **Note: Screening data should not be used in the risk assessment, (mobile lab data). If the data was used in the assessment it should be recalculated. If the data was not used, it should be stated in the text.**

2. Section 6.2.3, Page 6-3 presents criteria for selecting COPCs. However, the Region 4 guidance does not include historical information, prevalence, persistence, mobility, and all state and federal standards as criteria (EPA, 1995). Specifically, MCLs are not allowed to be used as screening criteria in risk assessments. In addition, secondary MCLs or other secondary standards are not recognized as screening criteria for risk assessments because these standards are not risk-based standards. Although these standards may have had little impact on the screening, the text should be revised to follow the Region 4 guidance in COPC selection.

3. Section 6.2.4 discusses the selection of COPCs by media. However, surface soil is not included in the sampling program. It is not clear why the surface soil is excluded from the sampling, although these are industrial areas where most of the land surface may be covered with pavement and buildings. The rationale for excluding surface soil should be presented.

4. Section 6.2.4.1, Page 6-8, Paragraph 1 discusses the VOC detections in the subsurface soils. However, it is not clear from the wording if the VOCs mentioned in the paragraph were the only VOCs detected and it is not clear if no VOCs were selected as COPCs. The text should be clarified.

   This comment also applies to other media discussions such as sediments.

5. Section 6.2.4.1, Page 6-8, Paragraph 6 discusses why bis-(2-ethylhexyl)phthalate (BEHP) was not selected as a COPC because of blank correction. However, since the maximum blank concentration was 120 ug/L, this means that only BEHP

concentrations which have to be higher than 1200 ug/L will be selected as a COPC. This blank value is a very high concentration as the RBC for BEHP is only 4 ug/L. It was noted that BEHP was detected in 4 out of 14 samples for Site 83 and in 4 out of 11 samples for Site 93. Therefore, there may be a problem in using the maximum blank concentration in the correction of all data. This problem should be investigated further.

6. Section 6.2.4.1, Page 6-9, Paragraph 7, Sentence 5 states that six carcinogenic PAHs were detected and that benzo(a)pyrene was found at a concentration above the RBC. It was the only PAH retained as a COPC. However, it is good risk assessment practice to select all carcinogenic PAHs when one is selected because the PAHs are at least additive in their effects and may be synergistic. Although this approach has not been established in the Region 4 guidance, it is a preferred practice.

   This comment also applies to Site 93.

7. Section 6.3.1, Page 6-11 presents the receptors proposed for the sites. However, it does not include two potential receptors which are the maintenance worker and recreational users. It is likely that some form of continuing maintenance will be performed on the drainage ditches and streams. In addition, if the area is not used for residential purposes, it could be used for recreational uses. Addition of these two receptors would provide the risk mangers with more information to make their decisions.

8. Section 6.0 presents the risk assessment. However, it does not include a presentation of the RGOs as stated in the Region IV guidance (EPA, 1995). This should be added to the risk assessment.

9. Section 7.1.3, Page 7-4, Paragraph 7 states that pesticides detected in the sediment at Site 89 are not site-related contaminants. However, first, the rationale supporting this statement must be added to the text. Second, while pesticides may have been applied base-wide, the risk presented by pesticides at this site must be addressed. The text should be revised accordingly.

10. Section 7.1.4, Page 7-5, Paragraph 1 lists one assessment endpoint and this endpoint only deals with direct toxicity.

However, the text should be amended to add an appropriate assessment endpoint for bioaccumulation, especially since pesticides were detected at the site.

11. Section 7.1.4, Page 7-5, Paragraph 3 states that the measurement endpoint for the selected assessment endpoint is the ecological health of the benthic macroinvertebrate and fish communities. However, this endpoint is too vague and should be rewritten. Specifically, this document should refer to the EPA Process Document published in 1997 for more information on the development of measurement endpoints. In addition, a second measurement endpoint should be developed to address bioaccumulation.

Section 7.1.4, Page 7-6, Paragraph 1 provides a description of the exposure pathway conceptual model. However, this model should be expanded to include a figure outlining potential complete and incomplete exposure pathways. In addition, the text and figure should include pathway(s) which address bioaccumulation.

Section 7.1.4, Page 7-6, Paragraph 1, Numbers I and II list the pathways evaluated in the report. However, the criteria used for these pathways are not, in fact, pathways, but are more appropriate measurement endpoints. The text should be revised accordingly.

Section 8.0, Page 8-3, Paragraphs 10 and 11 summarize the ecological risk present at the site. However, the text should be revised to discuss any potential risk due to bioaccumulation, after this risk has been calculated.

SPECIFIC COMMENTS

1. Executive Summary, Page ES-8.
In the Soil Section, the text should state "Human Health Region III RBCs" instead of just stating Region 3 RBCs.

This comment also applies to other sections of the text where Region III RBCs are cited.

2. Section 4.3.1, Page 4-2, Paragraph 3.
This paragraph discusses the chloroform contamination in potable water and the subsequent contamination of temporary well samples. However, if the final rinse during decontamination of equipment used deionized water (as is described in the Region 4 protocols), then the chloroform would be rinsed away and the well samples would

not be contaminated. A similar problem was noted in the review of a Camp Lejeune RI Report (OU 17) and the apparent source of chloroform contamination was in the mobile lab. Therefore, this issue should be investigated further as there may be a systematic problem with the mobile lab data. In addition, chloroform is not on the list of common laboratory contaminants issued by EPA guidance. Therefore, any reference to chloroform as a common lab contaminant in this document should be corrected.

3. Section 4.3.1, Page 4-2, Paragraph 5, Sentence 1.
This sentence states that the maximum concentration in any blank will be used as the blank correction factor. However, data validation protocol states that the blank correction will be applied on an analytical batch basis, because the degree of blank contamination in a laboratory will vary for each preparation batch and each analytical batch. There will also be variations in the trip and field blanks according to sample handling. In addition, the blanks from the mobile laboratory should be handled separately. Therefore, the data set should be revised by performing the correct blank correction.

This comment also applies to the same issue in Section 6.2.2.3.

4. Section 5. This section discusses the fate and transport of the chemicals detected at OU 16. However, the text does not include the screening of soil contaminants with Soil to Groundwater SSLs in the Soil Screening Guidance. This screening should use a DAF factor of 1.0 because of the shallow depth to groundwater.

5. Section 6.2.2, Page 6-2, Paragraph 4, Sentence 8.
This sentence states that a more detailed discussion on sampling procedure can be found in Section 3.0. However, the discussion on sampling procedures is found in Section 2.0. This discrepancy should be corrected.

6. Section 6.3.3, Page 6-13, Paragraph 4, Sentence 3.
This sentence states the geometric mean is the best estimator of central tendency for a log-normal data set and cites a reference which is the EPA 1992 Supplemental Guidance to RAGS (Calculating the Concentration Term). However, this reference states that the geometric mean is a convenient parameter for describing central tendencies of log-normal distributions. In addition, this reference states that the geometric mean of a set bears no logical connection to the cumulative intake that would result from long-term contact with site contaminants. This paragraph should be re-written accordingly.

7. Section 6.3.3, Page 6-14, Paragraph 2, Sentence 2.
This sentence states that assuming all data sets derive from log-normal distributions ensures conservative CDI calculations. However, this statement is not true. The log-normal mean of a log-normal distribution and the accompanying UCL will always be lower than the normal mean and UCL of log-normal distribution. It is only when the sample distribution is not log-normal that the log-normal UCL is larger than the normal UCL. This happens in particular when the distribution is bimodal (i.e. there are two modes). This can occur when there is an area of high concentration and an area of low concentration. In general, when the UCL of the mean (either normal or log-normal) is greater than the maximum, it indicates that a wrong estimator is being used to characterize the data set. This sentence and paragraph should be re-written.

8. Section 6.3.3, Page 6-14, Paragraph 5, Sentence 2.
This sentence states that the maximum detected concentration of the COPCs was used for the groundwater concentration term. However, the Region 4 guidance states that the average concentration of the most contaminated area of the plume should be used as the concentration term (EPA, 1995). Although the maximum concentration is a more conservative approach, the risks will be over-conservative. This approach should be reviewed accordingly.

9. Section 6.3.4.2, Page 6-17, Paragraph 1, Sentence 2.
This sentence states that the total exposed surface area for the construction worker is estimated as 4,300 cm^2 because the head, arms and hands are exposed. However, the Dermal Guidance points out that dust particles often migrate under the clothes so that more of the skin is exposed to soils than that not covered by clothes (EPA, 1992). For this reason, the guidance recommends using 25% of the surface area. Therefore, the exposed skin area of the construction worker should be changed to 5,800 cm^2.

10. Section 6.3.4.4, Page 6-18, Paragraph 6.
This paragraph describes the use of the Foster and Chrostowski model for estimating exposures due to showering. However, the Region 4 guidance states that the preferred model for showering exposure is to assume that the showering exposure is equivalent to the ingestion of two liters of water per day (EPA, 1995). The value from the Region 4 guidance should be used.

11. Section 6.3.4.4, Page 6-19, Paragraph 2.
This paragraph states that small children (under 6 years old) do not usually take showers and therefore are not exposed to volatiles via the inhalation pathway. However, VOCs will be readily released

from the hot water of a bathtub, and sitting in a bathtub could be a valid exposure pathway. The method for estimating exposure to VOCs as stated in the Region 4 guidance should be used for small children, and the risks should be re-calculated accordingly.

12. Section 6.4.1, Page 6-23.
This section discusses the toxicological evaluations. However, the text does not reference Table 6-13 which presents toxicity factors. This relevant information should be included.

13. Section 6.5, Page 6-26, Paragraph 2, Sentence 1.
This sentence states that the noncarcinogenic risk calculations assume that noncarcinogenic compounds have threshold values for noncarcinogenic effects. However, the HI is not a risk number and does not imply a probability of an effect. This sentence should be re-written and the term non-carcinogenic risk should be removed from the document.

14. Section 6.5.1.1, Page 6-27, Paragraph 4.
This paragraph states that the total carcinogenic risk is 28 for groundwater exposure. Based on EPA guidance when the HI is greater than 1.0, the HI should be broken down according to organ effects and summarized (EPA, 1995). Therefore, this discussion of the elevated HIs should be re-written to include this concept.

This comment also applies to all sites.

15. Section 6.6.5, Page 6-31, Paragraph 4.
This paragraph discusses the derivation of the iron RfD. An additional reason for the iron uncertainty is that the provisional RfD is based on the RDA and not a toxic effect. For this reason, the iron RfD is very conservative and may not represent a toxic effect.

16. Table 6-10, Row: Ingestion Rate, Column: Units.
This table states that the units for surface water ingestion are L/day. However, the correct units are L/hour. In addition, the table displays the ingestion rate for an adult to be 0.05. However, the incidental ingestion rate for surface water for an adult is 0.01 L/hour. The unit should be corrected and the calculations should be re-checked for the correct units.