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Baker

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January 10, 1994

Commander
Atlantic Division
Naval Facilities Engineering Command
1510 Gilbert Street (Building N-26)
Norfolk, Virginia 23511-2699

Attn: Ms. Linda Berry, P.E.
Navy CLEAN, District III
Contract Task Order (CTO) 0177
Draft RI Report for Operable Unit No. 1 (Sites 21, 24, and 78)
MCB, Camp Lejeune, North Carolina

Dear Ms. Berry:

Baker Environmental, Inc. (Baker) is pleased to submit for your review two copies of the Draft Remedial Investigation (RI) Report for Operable Unit (OU) No. 1 - Sites 21, 24, and 78. Two copies of this report have been forwarded to Mr. Neal Paul at MCB, Camp Lejeune. Please note that the reduced number of copies is per your verbal request on December 28, 1993. As with the Preliminary Draft RI, the Draft RI is being submitted as five volumes. For the three-volume appendices, only copies of the new covers and spines along with revised appendix flysheets have been included (see the transmittal letter).

The Draft RI Report reflects the comments received by LANTDIV and the Activity on the Preliminary Draft RI, in addition to additional revisions noted by Baker. LANTDIV's comments were received via telefax on December 20, 1993 (comments from Mr. William Mullen, P.G. and Ms. Sherri Eng, Chemist). Comments from the Activity (Mr. Walt Haven, Geologist) were received via telefax on December 27, 1993. The response letters for the comments received by LANTDIV are attached. The Activity's comments were mainly editorial; therefore, no formal response letter has been prepared.

Submittal of this report is one day later than the target deliverable date of January 10, 1994 since the comments were received after December 13, 1993. A schedule modification request letter will be submitted to Ms. Beth Hacic for this change. In accordance with the project schedule included in the Final IP/FP dated June 24, 1993, comments on this report are needed no later than March 11, 1994 so that the Draft Final RI Report can be submitted by April 11, 1994.

Baker

If you have any questions regarding this submittal, please contact me at (412) 269-2023 or Mr. Raymond Wattras (Activity Coordinator) at (412) 269-2016.

Sincerely,

BAKER ENVIRONMENTAL, INC.

Tammi A. Halapin
Project Manager

cc: Ms. Beth Hacic, Code 02231 (letter only)
Ms. Lee Anne Rapp, Code 183 (letter only)
Mr. Neal Paul, MCB Camp Lejeune (2 copies)

ATTACHMENT A

Response to Comments Submitted by LANTDIV on the Preliminary Draft RI Report for Sites 21, 24, and 78 (Operable Unit No. 1), MCB Camp Lejeune, North Carolina
Comment Letter by Mr. William Mullen, P.G.

Received by Baker Environmental, Inc. via Fax on 12-20-93

Response to General Comments

1) Baker agrees that the RI report tends to be hard to read especially since Operable Unit No. 1 includes three sites. LANTDIV's comment suggested that each site be broken out as a separate volume or section so that all of the RI for Site 21 is discussed sequentially and the FS for Site 21 follows the RI discussion. The report format can not be changed for a couple of reasons. First, the basis of the operable unit concept is to combine sites and not to have separate RI/FS reports for every site. In addition, the contamination in the groundwater aquifer would be difficult to separate into individual sites. Separate FS reports or volumes for each site would mean identifying separate technologies and alternatives for each site. This would result in a lot more repetition.

2) Baker agrees that groundwater contaminants have migrated into the deep water-bearing zone (i.e., Castle Hayne Aquifer). At this time, Baker does not think that it is necessary to install any additional deep monitoring wells given the limited degree of contamination as well as the number of supply wells in the area, which have been sampled and can also serve as additional deep aquifer data points. Once the interim remedial action is implemented for the shallow aquifer, contaminant levels and the extent of the contaminant plume in the shallow water-bearing zone should be reduced, and thus, limit further vertical migration. Subsequently, by reducing the migration of contaminants, the need for additional deep wells would not exist. It might be best to evaluate USEPA's and the State's view on the deep contamination before recommending additional wells which are costly and may not provide data which would support the Final Record of Decision, which may be long-term monitoring of the deep aquifer.

3) Pages 3-1 and 3-2 will be supplied in the Draft RI Report for review.

Response to Specific Comments - Section 3.0 (Comments 1 through 14)

1) No revisions to the text required -

   Water levels were recorded, as displayed on Table 3-6, for the monitoring wells shown on Figures 3-4 and 3-5. Only the water levels recorded on August 2, 1993 are shown on Figures 3-4 and 3-5. Water levels measured in the other wells were recorded on August 3, 1993 and, therefore, are not shown.

   The pH measured in well 78GW24-1, which ranged between 5.97 and 6.15 s.u., was within the range of natural waters. The presence of peaty soils appears to have not lowered the pH of the groundwater which can adversely affect the overall groundwater chemistry.

2) No revisions to the text required -

The limestone unit reported by ESE was encountered in two deep borings as shown on Figure 3-7. In boring 78GW31-3, the limestone was noted between approximately 70 and 80 feet below ground surface and in boring 78GW32-3 the limestone was noted between approximately 30 and 50 feet below ground surface. Please refer to Figure 3-7 for further information. PLEASE NOTE THAT BAKER NEEDS TO TALK TO MR. WILLIAM MULLEN REGARDING THIS COMMENT. RICH BONELLI HAS BEEN TRYING TO CONTACT MR. MULLEN SEVERAL TIMES OVER THE LAST WEEK. NO CHANGES HAVE BEEN MADE TO THE TEXT.

3) No revisions to the text required -

As stated on Figure 2-9, the deep monitoring wells are existing wells which were installed by ESE. Please refer to the 1992 ESE report for a possible explanation as to why the deep wells were installed along a lateral line.

Based on the drilling logs provided by ESE, the intermediate wells are installed within the same stratigraphic/ hydrogeologic unit as the shallow wells and, therefore, the hydraulic properties of the intermediate and shallow water-bearing zones are expected to be similar. According to the USGS professional paper 89-4096, the shallow geologic unit is referred to as the "Undifferentiated" Formation and the hydrogeologic unit is referred to as the surficial aquifer. The deep monitoring wells are installed within the geologic unit known as the Castle Hayne Formation. The Castle Hayne aquifer is considered a member of this formation. The values of the aquifer parameters (e.g., transmissivity) for the deeper water-bearing zone are different than those of the shallow water-bearing zone.

4) No revisions to the text required -

Water levels were only measured in a few existing wells on May 18 (Figure 3-8) at the start of the field program at Site 78. At that time, Baker had not installed all of the new wells (78GW33 through 78GW39) or the staff gauges. Additionally, because of the large number of wells sampled at this site (over 30), it was not possible to collect a full round of water levels at the time of sampling. A sufficient number of wells were monitored for establishing groundwater flow direction. The direction of groundwater flow estimated by Baker is consistent with previous reports.

5) No revisions to the text required -

Because surface water levels were not obtained from the upper portion of Cogdels Creek or Beaver Dam Creek, it is difficult to assess the affect of these surface water bodies on the groundwater gradient. In the lower portion of Cogdels Creek, the creek appears to have an overall influence on the groundwater gradient (and direction of groundwater flow). This conclusion is supported by the staff gauge reading obtained in SG4 (refer to Figure 3-9). Based on these findings, it is likely that the upper portions of Cogdels Creek and Beaver Dam Creek also have a localized affect on the groundwater gradient.

6) No revisions to the text required -

A contour map was not generated for the deep water-bearing zone because the deep wells were installed in a lateral line. Three reference points are required, arranged in a triangular manner, to affectively establish a groundwater flow direction.

7) The presentation of the data will be changed.

8) The paragraph will be revised to include a discussion on the affect of evapotranspiration on the shallow water-bearing zone.

9) No revisions to the text required -

Stream elevations were only measured in staff gauge SG4 which is located in the lower portion of Cogdels Creek. The stream elevation recorded on August 2 was lower compared to the groundwater elevation measured in a nearby monitoring well (78GW39) as shown on Figure 3-9. The data suggests that groundwater levels correspond to stream levels. Subsequently,a decline in the water table would correspond to decline in the stream level.

10) No revisions to the text required -

Contaminant migration may be affected by the upward movement of groundwater from the deeper to shallower water-bearing zones. It may be possible for contaminated groundwater within the deeper water-bearing zone to impact the shallower water-bearing zone if a strong upward head occurs. Based on the groundwater analytical data from Site 78, however, the shallow water-bearing zone is more contaminated than the deeper. Accordingly, the upward movement of deeper groundwater at Site 78 does not appear to be impacting the shallower water-bearing zone.

11) No revisions to the text required -

The downward gradient identified near the northeastern portion of Site 78 may be affecting the movement of contaminants. In addition, some of the contaminants identified at the site are more dense than water (e.g., TCE) which may further contribute to vertical migration. Based on the groundwater analytical results, however, the shallow water-bearing zone is significantly more impacted compared to the deeper water-bearing zone.

12) No revisions to the text required -

As stated in the text, the aquifer pump test conducted by Baker was performed within the surficial silty-sands. The well screen of the pumping well was placed at a depth between 10 and 25 feet.

13) The text will be revised accordingly.

14) No revisions to the text required -

According to information received from Camp Lejeune personnel, as well as background information, it is presumed that the source of the contamination detected in the supply wells is directly related to previous activities conducted at Hadnot Point.

Section 4.0 (Comments 15 through 31)

15) Please refer to General Comment Number 1.

16) No revisions to the text required -

Blank data should be compared with results from samples with which the blanks are associated. It is often impossible, however, to determine the association between certain blanks and data. In this event, the blank data should be compared with results from the entire sample data set. For this investigation, the 5X or 10X rule has applied to the maximum contaminant concentration detected in the blanks, and this concentration was then used to evaluate the sample concentrations for the entire data set. Blanks used to evaluate this sample set included: trip blanks (volatiles only), field blanks, equipment rinsates, and laboratory method blanks. Analytical finds, with the exception of the laboratory method blanks, are presented in the Appendix of the report.

17) No revisions to the text required -

Although numerous site investigations have been conducted at MCB Camp Lejeune, many of the so called "background" wells are actually situated near potential contamination source areas. Accordingly, it would not be appropriate to estimate groundwater background quality based on the existing wells.

18) The text does not state that Federal or State regulations are considered background for inorganics. The text, however, states that only those inorganic parameters with concentrations exceeding applicable state or federal regulations will be addressed. The last sentence in the paragraph will be deleted.

19) The text will be revised accordingly.

20) The reference to elevated manganese concentrations at MCB Camp Lejeune pertains to samples collected from potable water supply wells and not specifically background samples. The paragraph on page 4-4 will be revised.

21) No revisions to the text required -

Although numerous surface water samples have been collected at MCB Camp Lejeune, very few samples have been obtained from representative background locations. Many of the so called "upstream" or background surface water samples collected at the base have indicated levels of both organic and inorganic contamination. Accordingly, it would be inappropriate to estimate background surface water quality based on previous samples.

22) The comment was incomplete; no changes to the text have been made. PLEASE NOTE THAT BAKER NEEDS TO TALK TO MR. WILLIAM MULLEN REGARDING THIS COMMENT. RICH BONELLI HAS BEEN TRYING TO CONTACT MR. MULLEN SEVERAL TIMES OVER THE LAST WEEK. NO CHANGES HAVE BEEN MADE TO THE TEXT.

23) The word "only" will be deleted from the text.

24) No revisions to the text required -

As stated in the text, several of the subsurface samples exhibited inorganic concentrations an order of one magnitude or higher above base-specific background levels. The inorganics detected above an order of one magnitude are presented for discussion purposes only in this section. Inorganics which may pose a risk to human health or the environment are discussed in Section 6.0 of the RI.

25) PLEASE NOTE THAT BAKER NEEDS TO TALK TO MR. WILLIAM MULLEN REGARDING THIS COMMENT. RICH BONELLI HAS BEEN TRYING TO CONTACT MR. MULLEN SEVERAL TIMES OVER THE LAST WEEK. NO CHANGES HAVE BEEN MADE TO THE TEXT.

26) The sentence will be revised. Of the five monitoring wells not located, three were shallow (78GW01, 78GW09-1, and 78GW18), one was intermediate (78GW30-2), and one was deep (78GW30-3).

27) The paragraph will be revised. Please refer to Response Number 26.

28) No revisions to the text required -

Additional rounds of groundwater sampling may be required for the deep monitoring wells to evaluate the vertical migration of contamination. As stated in the report, previous groundwater analytical data (1991) from the deep wells did not reveal the presence of volatile compounds. Samples collected during the Baker investigation, however, did exhibit low concentrations of volatile compounds, namely benzene and TCE. Accordingly, additional samples may be needed to further evaluate the migration of volatile compounds in the deep water-bearing zone.

29) Upon further evaluation of the available data, the conclusions presented in the paragraph are not supported by sufficient information. Accordingly, the paragraph will be deleted from the text.

30) No revisions to the text required -

Although PCB-laden transformers were on site and may have been cleaned out, there is no record of solvent usage at the site. Accordingly, this information cannot be presented in the report because it is unsupported by facts.

Based on water level data collected at Sites 21 and 78, the groundwater flow direction is toward the southwest which supports the conclusion that an off-site contaminant source is impacting Site 21.

31) No revisions to the text required -

Although a few of the samples collected at Buildings 1103 and 1502 exhibited somewhat higher concentrations (in comparison to concentrations detected at other buildings investigated), their levels were not elevated (maximum concentration of 29,000 ug/kg) when compared to samples collected at known pesticide disposal areas. Soil samples recently collected during a site investigation conducted at Site 2, which is a site known to have had pesticide mixing activities and disposal, exhibited pesticide concentrations as high as

3,000,000 ug/kg. Accordingly, based on the contaminant levels found at these two buildings, it appears that the pesticides are the result of spraying activities as stated in the report. In addition, there is no documentation or base records which indicate that the property surrounding the buildings was used for pesticide mixing or disposal.

Section 5.0 (Comments 32 through 35)

32) The groundwater velocity for the deeper water-bearing zone will be calculated. This information will be added to the text.

33) The sentence will be revised to state, "hundreds of meters".

34) The text will not be revised to state the PAHs are naturally occurring. This class of organic compounds may be more prevalent in areas where fuels are combusted or in areas where humic material has deposited. In general, comparison with naturally occurring levels is applicable only to inorganics, because the majority of chemicals found at "Superfund" sites are not naturally occurring (even though they may be ubiquitous).

35) It is believed that this question should be "why were Eh measurements not recorded as part of this RI?" If this is the case, this property was not examined as part of this investigation due to the belief that metals were not the major contaminants of concern at these sites. Regarding future investigations, this information may be useful information in determining metal retention and mobility.

ATTACHMENT B

Response to Comments Submitted by LANTDIV on the Preliminary Draft RI/FS Report for Sites 21, 24, and 78 (Operable Unit No. 1), MCB Camp Lejeune, North Carolina Comment Letter by Ms. Sherri R. Eng

Received by Baker Environmental, Inc. via Fax on 12-20-93

Response to Specific Comments - Section 1.0 (Comment 1)

1) The text will be revised to indicate that the surface water and sediment samples collected at Site 24 were obtained from Cogdels Creek.

Response to Specific Comments - Section 2.0 (Comments 2 through 6)

2) No revisions to the text required -

Decontamination procedures and QA/QC sampling activities are detailed in the soil gas survey report, which is presented in Appendix D.

A gas chromatograph equipped with an electron capture detector (GC/ECD), following modified EPA 601 methodology, was used to identify and quantify chlorinated compounds typically found in industrial solvents, while a flame ionization detector (GC/FID), following a modified EPA 602 methodology, was used for petroleum and other non-halogenated compounds. The modifications to the methods included the following changes:

- Direct injection of the vapor into the GC was used for sample introduction rather than purge and trap methodology.
- Flame ionization (FID) and electron capture detectors (ECD) were used in place of photo-ionization (PID) and electrolytic conductivity detectors (ELCD), respectively.
- A 3-point calibration curve with a linear regression correlation coefficient of 0.99 or better was used to calculate sample concentrations rather than an average response factor.
- The list of target analytes was modified to address the project objectives.

3) No revisions to the text required -

Concentrations of detected analytes did exceed the concentrations of calibration standards. The analysis did not require recalibration. Typically for soil gas analyses, the concentrations of the calibration standards range from a low standard at or below the reporting limit to a high standard of 10 ug/L or greater. Three-point least squares linear regression calibration curves are generated and the correlation coefficients are examined for each standardized analyte. Correlation coefficients must be greater than 0.99. This procedure supplies reasonable accuracy throughout the range of the detector with the greatest accuracy at the lowest concentrations. TARGET's procedures call for recalibration when the instrument responses to check standards are greater than

+ - 20 percent of the area response measured for the second level calibration standard. Samples are reanalyzed when the detector is saturated.

4) No revisions to the text required -

During the validation process and generation of the analytical database, a transcription error was discovered. The analytical data was corrected for the reporting process and in the computation of the 95th percent upper confidence limit.

5) No revisions to the text required -

MS/MSD samples were taken in the field at a frequency of 20 percent. A field blank water sample was collected from the source used for decontamination per the Naval Energy and Environmental Support Activity (NEESA) guidelines. Please refer to NEESA's guidance document entitled "Sampling and Chemical Analysis Quality Assurance Requirements for the Navy Installation Restoration Program".

6) The sentence will be revised to indicate that Method 524.2 was performed to obtain lower detection limits.

Response to Specific Comments - Section 4.0 (Comments 7 through 10)

7) No revisions to the text required -

Blank data should be compared with results from samples with which the blanks are associated. However, according to the USEPA Risk Assessment Guidance (RAGs) it is impossible to determine the association between certain blanks and data. In this case, the blank data should be compared with results from the entire data package.

8) The term "significantly exceeding" implies to inorganic contaminant levels above an order of magnitude (or 10 times) compared to base-specific background levels. This term will be defined in the text.

9) The statement suggesting that any contaminants detected below applicable State or Federal regulations is naturally occurring will be deleted.

10) No revisions to the text required -

The deep monitoring wells were not installed by Baker. Accordingly, there is no way to determine if the well was properly grouted during installation. The elevated pH may be the result of natural conditions since the soil/rock composition of the Castle Hayne Formation consists of calcareous deposits (i.e., limestone, limy mud). Note that the pH of the groundwater decreased and stabilized from the initial to the last reading as purging activities continued.

Response to Specific Comments - Section 6.0 (Comments 11 through 18)

11) Chemicals that infrequently detected may be artifacts in the data due to sampling, analytical, or other problems, and therefore may not be related to site conditions. Prevalence is used to eliminate a chemical as a contaminant of potential concern (COPC). Prevalence is defined in RAGs as: 1) when a chemical is detected infrequently in one or perhaps two environmental media, 2) a chemical

is not detected in any other sample media or at high concentrations, and 3) when there is no reason to believe the chemical is present.

12) In cases where blank contamination was the sole rationale for elimination of a contaminant as a COPC, the text will be revised to state the level of contamination found in the blank. However, in cases where several criteria were used for elimination, the blank levels will not be added to the text.

13) In the case where there is no agency adopted toxicological data (cancer slope factor or reference dose) a compound cannot be evaluated. However, lead was retained as a COPC in all media where it met criteria for retention. In addition, remediation goals are initially set on the contaminant-specific basis. A North Carolina Water Quality Standard (NCWQS) and a Federal Maximum Contaminant Level (MCL) have been published for lead and will be used as remediation goals before any risk-based concentration would be considered. Therefore, although lead is not addressed in the risk-based calculations it is evaluated as part of this risk assessment.

14) The text will be revised accordingly.

The name of the Region IV toxicologist, Mr. Kevin Koporec, will be added to the text.

15) Although it appears that pesticides were prevalent (4 of 44 samples), due to the selective (bias) sampling approach used at this site the prevalence of these contaminants is misleading. Statistically these compounds would not prove prevalent in this media and were therefore not retained as COPCs.

16) No revisions to text are required.

The "upper confidence interval" is defined in the text.

17) The child skin surface area (2,300 cm2) used in this scenario is an Agency published default value (Dermal Exposure Assessment: Principles and Applications (USEPA, 1992). The defaults are derived using the 50th and 95th percentile values for the ages of concern. Values are slightly lower but do not significantly affect the exposure values.

18) The fact that analytical data has a precision plus or minus fifty percent accuracy should and must be discussed as part of the uncertainty section. Therefore, the text will not be revised.

Data that has been qualified "B" or "R" are unusable in conducting the Baseline Risk Assessment (BRA). According to RAGs these data qualified "R" the result should be eliminated from the risk assessment, and not used in the determination of the 95th upper confidence level (UCL). Data qualified "B" during data validation should be considered as nondetects, and in accordance with EPA guidance, consider the blank-related concentration to be the quantitation limit for that sample.

Response to Specific Comments - Section 8.0 (Comment 19)

19) Baker agrees that no additional wells be installed at this time. LANTDIV's comment in this letter disagrees with General Comment No. 2 from Mr. William Mullen's comment letter.

A statement mentioning that limited soil remediation may be required for OU No. 1 will be added to the text. This will be evaluated in the Feasibility Study.

Response to Specific Comments - Appendices (Comments 20 through 22)

20) This is not necessary because maximum blank contamination has been evaluated on a case wide basis. If an individual wanted to cross-reference samples and blanks the chain-of-custodies provided in Appendix Q could be used. In addition, the laboratory blanks which are also used in the evaluation of blank contamination are not presented in the data base.

21) A fly sheet will provided explaining the sampling codes. The chain-of-custody forms provided in Appendix Q can be used to determine which samples were grouped with which blanks.

22) The chain-of-custody (COC) forms are the forms generated by Baker during the field investigation. In order to provide the COC forms with the laboratory signatures, each data package would need to be examined and COC forms removed. In many instances the COC forms in these packages are reproductions, and legibility is already jeopardized. Further reproduction of these forms would not be beneficial. In addition, if the COC forms, with all signatures, were required for legal purposes the originals, along with the complete COC record (during laboratory handling), could be obtained from the laboratory.

Response to Specific Comments - Grammatical Errors (Comments 23 through 29)

23) The spelling of "dalapon" on page 1-10 will be corrected.

24) The sentence on page 2-37 will be completed.

25) "Areal" extent of contamination is correct. No change will be made.

26) The sentence will be completed.

27) The change will be made per the comment.

28) The sentence will be completed.

29) The sentence will be completed.