4/18/01 - 3055

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5090.5
Ser EP4340/ 11549
18 APR 2001

From: Commanding Officer, Navy Environmental Health Center
To: Commanding Officer, Atlantic Division, Naval Facilities Engineering Command (Kirk Stevens), 1510 Gilbert Street, Norfolk, VA 23511-2699

Subj: REMEDIAL INVESTIGATION PROJECT PLANS REPORT REVIEW, OPERABLE UNIT NO. 19 (SITE 84), MARINE CORPS BASE CAMP LEJEUNE, CAMP LEJEUNE, NC

Ref: (a) Baker Environmental, Inc. Transmittal ltr of 13 Mar 01

Encl: (1) Subject Medical Review
(2) Medical/Health Comments Survey

1. Per reference (a), we have completed a review of the subject document and forward our comments to you as enclosure (1).

2. Please complete and return enclosure (2) as your comments are needed to continually improve our services to you.

3. We are available to discuss the enclosed information by telephone with you and, if you desire, with you and your contractor. If you require additional assistance, please call Mr. Kenneth Gene Astley at (757) 462-5541 or Mr. David McConaughy at (757) 462-5557. The DSN prefix is 253. The e-mail addresses are: astleyg@nehc.med.navy.mil and mcconaughyd@nehc.med.navy.mil.

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By direction

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MEDICAL REVIEW OF
DRAFT REMEDIAL INVESTIGATION/FEASIBILITY STUDY
PROJECT PLANS SITE 84/BUILDING 45 AREA
MARINE CORP BASE CAMP LEJEUNE, NORTH CAROLINA

Ref: (a) Risk Assessment Guidance for Superfund, Vol. 1, Part A: Human Health Evaluation Manual, Dec 1989 (EPA 540/1-89/002)

General Comments:

1. The document entitled "Draft Final Remedial Investigation/Feasibility Study Project Plans Site 84/Building 45 Area Marine Corp Base Camp Lejeune, North Carolina," was provided to the Navy Environmental Health Center (NAVENVIRHLTHCEN) for review on 4 May 2000. A set of figures for this report was provided on 20 March 2001. The reports were prepared for the Atlantic Division, Naval Facilities Engineering Command by Baker Environmental, Inc. This review covers both the original draft and the set of figures.

2. The text does not indicate what sampling cycle will be used. The ideal sampling strategy incorporates a full annual sampling cycle. If this strategy cannot be accommodated in the investigation, at least two sampling events should be considered. These sampling events should take place during opposite seasonal extremes.

Review Comments and Recommendations:

1. New Figure 2-4, "Estimated Area of Concern Detected PCBs Greater Than 320 mg/kg"

Comment: The Figure 2-4 uses "ND" to indicate nondetects but does not give the actual numerical value. It is also important that the data summary tables contain the necessary information for efficient risk assessment and regulatory review.

Recommendation: The text should list the actual numerical value of nondetects or include footnotes listing the sample quantitation limits at the bottom of the sample summary figure.

2. New Figure 2-6, "Organics Detected in Groundwater"

Comment: Figure 2-6 does not include the numerical units of the sample results listed.

Recommendation: Figure 2-6 should include the numerical units of the sample results listed.

3. Pages 4-4 through 4-7, Section 4.6.1, "Human Health Evaluation Process"

Comments:

a. The report does not contain a schematic of a site conceptual model (SCM) to include both current and future potential exposure pathways applicable for this site. This would help to identify the potential residual risks remaining from migration of site-related chemicals to various media to include nearby surface waters, etc.

b. The text states on Page 4-5 that "The arithmetic or geometric mean and the upper 95 percent confidence limit of that mean will be used in the summary of potential chemical data." However, the text states on Page 4-7 that "The upper 95 percent upper confidence limits of the means will be used throughout the risk assessment."

c. An EPA Deputy Administrator memorandum dated 26 February 1992 entitled "Guidance of Risk Characterization for Risk Managers and Risk Assessors" indicates that a single number used to represent the health risk to an individual or population may hamper the risk manager's ability to make an informed decision. Additionally, risk estimates should present both the upper bound reasonable maximum exposure (RME) and average case, or central tendency (CT).

d. Although the geometric mean is a convenient term for describing central tendencies of log-normal distribution, it is not considered an appropriate basis for estimating the concentration term used in exposure assessments. Unlike the arithmetic mean, the geometric mean of a set of sampling results bears no logical connection to the cumulative intake that would result from the long-term contact with site contaminants. The geometric mean may differ appreciably from, and be much lower than, the arithmetic mean.

Recommendations:

a. Include a schematic of a SCM that depicts both the current and the future potentially completed exposure pathways.

b. Provide quantitative risk estimates for the arithmetic or geometric mean and the upper 95 percent confidence limit of that mean.

c. Do not compare data representing a geometric mean with data representing an arithmetic mean.

4. Page 4-1, "Sampling Locations"

Comments:

a. The text states on Page 3-7 that ten percent of the surface soil and soil boring samples will be submitted to an off-site laboratory for confirmatory PCB [polychlorinated biphenyl] analysis.

b. Reference (a) Section 4.6.2 states that "Although areas of concern are established purposively (e. g., with the intention of identifying contamination), the sampling locations within the areas of concern generally should not be sampled purposively if the data is to be used to provide defensible information for a risk assessment." Risk estimates calculated from sampling data collected from locations expected to have the highest concentrations almost always overestimate the risk. The text should clearly state how analytical data from "purposively selected sample locations" would be used in a human health risk assessment.

Recommendation: The text should clearly state if analytical data from purposively selected sample locations will be used in a human health risk assessment to estimate human health exposure.

5. Page 6-9, Section 6.4.1, "Groundwater Samples Collected from Monitoring Wells"

Comments:

a. The text states on Page 6-9 "Samples collected for dissolved metals will be filtered in the field prior to being submitted for analysis."

b. We recommend using both filtered and unfiltered groundwater samples in the health risk assessment. Although the regional EPA guidance requires use of data from unfiltered sample results in the quantitative health risk assessment (HRA), if risk estimates for both filtered and unfiltered samples are developed, both values can be discussed in the HRA. The difference between the risk estimates from filtered and unfiltered sampling results can be large. Providing comparison values can therefore be very useful in demonstrating that the risk estimates from filtered groundwater samples are less conservative.

Recommendation: Develop risk estimates for both filtered and unfiltered ground water samples, and discuss both values in the HRA.