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

March 12, 1997

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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 IAS Treatability Study Report
Operable Unit 10 - Site 35

Dear Ms. Landman:

The Environmental Protection Agency (EPA) 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: Dave Lown, NCDEHNR
Neal Paul, MCB Camp Lejeune

1.0 GENERAL COMMENTS

1. Section 2.2, Page 2-1, discusses limitations of the In-Situ Air Sparging (IAS). However, the text does not discuss the effect of site geology on IAS. Site geology is of paramount importance. IAS is generally more effective in coarse grained soil (Marley, Hazebrouck, Walsh, 1992). The effect of site geology should be included in the discussion of IAS limitations.

2. Section 2.3, Page 2-3, Paragraph 0, Sentence 3, states that RAA4 was not selected because of the high water table conditions in the capture zone area along Brinson Creek. However, this statement is confusing because IAS is a part of RAA4, according to this report. The text should be revised and clarified accordingly.

3. Section 2.3, Page 2-3, Paragraph 3, Sentence 3, states that groundwater data (Figure 2-2) show BTEX levels associated with Plume A attenuate rapidly in the downgradient direction, suggesting biodegradation. However, attenuation of BTEX compounds may result from volatilization due to the proximity of the water table to the ground surface and the average temperature of the site. In a previous section (page 2-2, paragraph 0) the text states that groundwater surface is generally within three feet of the ground surface throughout the year. The text should include a discussion on the plausibility of volatilization.

4. Section 2.3, Page 2-3, Paragraph 3, Sentence 3, states that BTEX levels associated with Plume A attenuate rapidly in the downgradient direction as depicted in Figure 2-2. However, this sentence contradicts the data shown on Figure 2-2 as it relates to Plume A. For example, MW-20 measured 1570 μg/L. Well 35GWD-4 which is about 50 feet downgradient of MW-20 had a concentration of 0.4 μg/L. Well MW-25 which is about 25 feet downgradient of 35GWD-4 had a concentration of 967 μg/L of total BTEX compounds. It is unclear why Well 35GWD-4 which is between MW-20 and MW-25 had a BTEX concentration for less than both of the aforementioned wells, when attenuation should have been taking place in a downgradient direction. The text should discuss how attenuation affected the BTEX levels in the wells.

5. Section 3.0, Page 3-1, presents the Treatability Study objectives. However, performance goals have not been provided and should be included according to EPA guidance (EPA, 1992). The performance goals that are based on established cleanup criteria for the site or contaminant levels that are protective of human health and the environment should be added to this section.

6. Section 5.1.1, Page 5-1, Paragraph 4, Sentence 3, states that air samples were analyzed for oxygen and volatile organic compounds as indicated in Table 5-1. However, no analysis was done for the carbon dioxide level. Since the carbon dioxide level in soil vapor indicates biological activity and should be measured before, during and after testing (Angell, 1992), the text should explain why the carbon dioxide level was not measured.

7. Section 6.5, Page 6-5, Paragraph 4, Sentence 3, states that the potential for adverse health effects to occur from benzene exposure during the operation of an IAS treatment system would be unlikely. However, this conclusion is questionable because benzene concentration exceeded the air RBC once during the Treatability Study. Consequently,

there may be a health concern for workers during the highway construction. The text should explain what provisions would be made for these workers.

8. Section 7.2, Page 7-2, Paragraph 1, Sentence 1, states that an IAS system where air is injected horizontally along the top of the semi-confining layer is preferable to conventional vertical air injection. However, this recommendation was based on a study that was conducted for an insufficient time period (one week). Thus, the applicability of this remedial alternative cannot be determined. The Treatability Study should be done for an extended period of time before a determination can be made on the applicability of the IAS system.

2.0 SPECIFIC COMMENTS

1. **Figure 1-3**.
Figure 1-3 depicts detected organics in the upper portion of the surficial aquifer. However, the figure presents semivolatiles (SVOCs) as a single constituent instead of a group of organics. Like VOCs, each detected organic in SVOCs should be presented. A total concentration of SVOCs does not provide information about the concentration of each organic detected in the SVOC group. The figure should present all detected SVOC data.

2. **Figures 1-3 and 1-4**.
Figure 1-3 and 1-4 show organic contaminant concentrations detected in the upper and lower portions of the surficial aquifer. However, an isoconcentration map contouring the horizontal distribution of contamination should be provided for clarity. These maps would clearly define the study area's plume migration route.

3. **Section 2.3, Page 2-3, Paragraph 2, Sentence 7**.
The text refers to Plume D as a fourth hypothetical plume. However, the location of the plume is not shown on any of the figures. The location of Plume D should be shown on a figure.

4. **Figure 2-2**.
Figure 2-2 is a summary of surficial aquifer contamination in Treatability Study Area Site 35. However, similar symbols are used in the legend for monitoring wells installed under CS (1986) and monitoring wells installed under RI (1994). Also, contaminants on the figure are given as total BTEX and total Chlorinated Hydrocarbons (CHC), but not given as each detected organic. A total concentration of BTEX and CHC does not provide information about the concentration of each organic detected. The symbols for monitoring wells installed under CS and RI should be different. Also, the figure should present all detected organics along with their concentrations.

5. **Section 4.1.1, Page 4-1, Paragraph 4**.
The text lists monitoring wells where soil samples were collected during well installation. However, the monitor well numbers used in the text are inconsistent with those used in the figures. This discrepancy should be resolved accordingly.

6. **Section 4.3.1, Page 4-4, Paragraph 4, Sentence 3**.
The text states that the groundwater flow in Plume B area is to the northwest towards Brinson Creek. However, this statement contradicts the flow direction of groundwater depicted on Figure 1-5. Groundwater is shown moving in a northeasterly direction. The discrepancy should be resolved.

This comment also applies to Page 4-6, Paragraph 1, Sentence 4.

7. **Section 5.3, Page 5-3, Paragraph 3, Sentence 1**.
The text states that post-study sampling was conducted for a duration of 24 hours following the commencement of the study. However, this statement is confusing. The text should be revised and clarified accordingly.