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State of North Carolina
Department of Environment,
Health and Natural Resources
Division of Waste Management

James B. Hunt, Jr., Governor
Jonathan B. Howes, Secretary
William L. Meyer, Director

DEHNR

July 17, 1997

Commander, Atlantic Division
Naval Facilities Engineering Command
Code 1823
Attention: MCB Camp Lejeune, RPM
Ms. Katherine Landman
Norfolk, Virginia 23511-6287

Commanding General
Attention: AC/S, EMD/IRD
Marine Corps Base
PSC Box 20004
Camp Lejeune, NC 28542-0004

RE: Basis of Design for Phase I, Interim Remedial Action OU10, Site 35, Camp Geiger Area Fuel Farm, MCB Camp Lejeune

Dear Ms. Landman:

The referenced document has been received and reviewed by the North Carolina Superfund Section. A plan for evaluating the effects of increasing the oxygen levels in the groundwater, should be incorporated into the workplan. Apparently, the plumes at Site 35 are being naturally attenuated by the freshwater wetland surrounding Brinson Creek. (A similar system is described in detail by Lorah and Olsen (1997) at the Aberdeen Proving Ground, Maryland.) The attenuation probably involves anaerobic conditions. The introduction of air into the sparge trench will lead to saturation of the groundwater with oxygen. At Camp Lejeune this will most likely create two conditions that need to be evaluated during this study:

1) Introduction of oxygen to the system may retard the natural attenuation that is presently underway.

2) According to Pankow et al. (1993), "When the water of interest is anoxic, this may lead to the problematic precipitation of iron and manganese oxyhydroxides in, as well as downgradient of, the sparge zone."

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It is unknown how much of a problem item 1 will be; however, item 2 will probably be a major concern at Camp Lejeune. Pankow et al. (1993) recommend an approach described by Herrling et al. (1990) to avoid oxygenation of the aquifer. Whether or not this recommendation is incorporated into the design, the impact caused by oxygenation of the aquifer needs to be evaluated during the investigation.

Attached is a comment by David Lilley, Industrial Hygienist, on the design. Also attached are David Lilley's comments on the Baseline Human Health Risk Assessment contained in the Draft Supplemental Groundwater Investigation (SGI) Report for OU10. I am still reviewing this document and may have additional comments at a later time.

Please call me at (919) 733-2801, extension 278, if you have any questions.

Sincerely,

David J. Lown, LG, PE
Geological Engineer
Superfund Section

Attachments

cc: Gena Townsend, US EPA Region IV
Neal Paul, MCB Camp Lejeune
Diane Rossi, DEHNR - Wilmington Regional Office

References

Lorah, M.M., Olsen, L.D., and Smith, B.L., 1997, Natural Attenuation of Chlorinated Hydrocarbons in a Freshwater Wetland, *in*, Alleman, B.C. and Leeson, A., Symposium Chairs, Papers from the Fourth International In Situ and On-Site Bioremediation Symposium, New Orleans: Battelle Press, V.3, p.207-212.

Pankow, J.F., Johnson, R.L., and Cherry, J.A., 1993, Air sparging in gate wells in cutoff walls and trenches for control of plumes of volatile organic compounds (VOCs): Ground Water, v.31, no.4, p.654-663.

Herrling, B., Buermann, W., and Stamm, J., 1992, In-situ remediation of volatile contaminants in groundwater by a new system of "underpressure-vaporizer-wells," *in* Weyer, K.U., ed., Proceedings of the International Conference on Subsurface Contamination by Immiscible Fluids, Calgary, Canada, 18-20 April 1990, A.A. Balkema, Publisher, Brookfield, VT.

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July 16, 1997

TO: David Lown

FROM: David Lilley DBL

RE: Comments prepared on Table 2-1 of the Basis of Design for Phase I, Interim Remedial Action, OU 10, Site 35, MCB Camp Lejeune, NC
February 27, 1997

After reviewing the above mentioned table, I offer the following comment:

1. Since it is not mentioned in this table or the Baseline Risk Assessment where the risk-based RGO for 1,1,2,2-tetrachloroethane came from, it is assumed that the concentration came from the US EPA Region III Risk Based Concentration Table. If the RBC Table is the source of this number, the table was misread-the concentration listed (0.41 ug/L) is for 1,1,1,2-tetrachloroethane. The concentration corresponding to a 10^{-6} risk for 1,1,2,2-tetrachloroethane is 0.052 ug/L. Please make the necessary correction.

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July 16, 1997

TO: David Lown

FROM: David Lilley DBL

RE: Comments prepared on the Baseline Human Health Risk Assessment contained in the Draft Supplemental Groundwater Investigation Report, OU 10, Site 35, MCB Camp Lejeune, NC
November, 1996

After reviewing the above mentioned document, I offer the following comments:

1. Page 6-3, first sentence: Please prove this claim by example or delete the sentence.

2. Table 6-1: It is recommended that the sample ID numbers of the samples used to compile this table be listed in the table. Of all the samples listed on Tables 2-4 to 2-6 and 4-2, why were the 30 listed in Appendix O chosen to appear in Table 6-1?

3. Table 6-1: The MCL for tetrachloroethene has been withdrawn.

4. Page 6-7, first paragraph: According to the Supplemental Guidance to RAGS, Human Health Risk Assessment Bulletin No. 1, page 1-3, the **maximum** detected concentrations in groundwater are to be compared to ARARs, not the average concentration. Since the maximum concentration of lead was 15.4 ug/L and the North Carolina Water Quality Standard for lead is 15 ug/L, lead should be retained as a COPC.

5. Table 6-2: The Region III Tapwater RBC Value for manganese should be 84 ug/L, not 180 ug/L as listed.

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6. Page 6-7, last paragraph: Groundwater in the RI was evaluated using the 95% UCL in the risk calculations. According to the Supplemental Guidance to RAGS, Human Health Risk Assessment Bulletin No. 3, page 3-3, the groundwater exposure point concentration should be the arithmetic average of the wells in the highly concentrated area of the plume, not the 95% UCL.

7. Page 6-9: It is not necessary to evaluate dermal contact with groundwater. However, it is necessary to evaluate inhalation exposure to groundwater. The method for this can be found in the Supplemental Guidance to RAGS, Human Health Risk Assessment Bulletin No. 3, page 3-4.

8. Table 6-4: The RfD for manganese is 1.4E-01 mg/kg-day, the Dermally Adjusted Rfd is 2.8E-02 mg/kg-day, and the RfC is 5E-05 mg/m^3, not the values listed on this table.

9. Table 6-4: Since iron is a COPC, it should be listed on this table.