03.01-12/15/94-01346

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET, N.E.
ATLANTA, GEORGIA 30365

December 15, 1994

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

4WD-FFB

Ms. Linda Saksvig
Department of the Navy - Atlantic Division
Naval Facilities Engineering Command
Code 1823
Norfolk, Virginia 23511-6287

SUBJ: MCB Camp Lejeune - OU4
Draft Feasibility Study

Dear Ms. Saksvig:

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

If there are any questions or comments, please call me at (404) 347-3016 or 347-3555, vmx-6459.

Sincerely,

Gena D. Townsend
Senior Project Manager

Enclosure

cc: Mr. Neal Paul, MCB Camp Lejeune
Mr. Patrick Watters, NCDEHNR

1.0 General Comments

1. Risk-based Remedial Goal Options (RGOs) for individual chemicals are derived based on only a single target risk and/or hazard quotient (HQ). Region IV Office of Health Assessment prefers that RGOs be presented for carcinogenic risks of 1E-6, 1E-5, and 1E-4, and for HQs of 0.1, 1.0, and 10. The remedial level should then be selected from all the RGOs by the risk manager and should be the object of the FS. In this document, the target carcinogenic risk selected is 1E-4, which will potentially allow the cumulative risk to be greater than 1E-4.

2. The Draft FS Report evaluates three alternatives for groundwater remediation, but omits a potentially feasible, cost effective group of technologies generally referred to as passive systems. The technologies evaluated include operation- and maintenance-intensive treatment technologies such as pump and treat, air sparging and air stripping.

   The Draft FS Report should also include passive treatment technologies which are characterized by relatively low operation and maintenance costs, and typically utilize cutoff walls to direct groundwater under natural flow conditions to insitu treatment cells or walls containing either biological or inorganic materials.

   The Superfund Innovative Technology Evaluating (Site) Program: Sixth Edition, identifies a specific passive treatment system which has been chosen as part of the selected remedy for a Superfund project in EPA Region I. EnviroMetal Technologies, Inc., utilizes insitu metal-enhanced abiotic degradation of dissolved halogenated organic compounds in groundwater by using existing groundwater flow characteristics to move contaminants through the system instead of pumping, sparging or stripping contaminants. This passive treatment technology has significant application potential as a groundwater remediation alternative for Site 69 and should be included for evaluation. Long-term cost savings are generally realized when compared to the more aggressive treatment alternatives 69-GW-3, 69-GW-4 and 69-GW-5 presented in the Draft FS Report.
   THIS IS A COMMENT THAT CAN BE EVALUATED FOR FUTURE PROJECTS. IT IS NOT RECOMMENDED TO ADD NEW ALTERNATIVES THIS FAR INTO THE PROCESS. THE SYSTEM ABOVE IS BEING TESTED ON PCE AND TCE CONTAMINATION (INFO IS ATTACHED).

3. The Appendix B Remedial Alternative Cost Estimates for sites 41 and 69 have two direct cost breakdown divisions which need additional cost itemization. The Special Requirements

Division and the Division 1 - General Requirements both have excessively high unit costs. The costs are supported only by a reference/source backup listed as "estimated - previous project." The requested information will provide a better understanding of cost estimating and profit margin calculations for the particular tasks in question.

4. Additional cost itemization is requested to back up the referenced manpower rate of $240/hr to calculate the cost for Line Item C of the direct cost breakdown - special requirements division. This particular line item, which seems excessively high, occurs in both sites 41 and 69. The manpower rate should be addressed to insure proper cost estimating and profit margin multipliers are being used to estimate the cost of remedial alternative implementation.

5. The text discusses the common phenomenon of groundwater remediation technologies where groundwater contaminant concentrations reach asymptotic levels which may exceed Applicable or Relevant and Appropriate Requirements (ARARs). In this case the ARARs are the North Carolina Water Quality Standards (NCWQS). The end result of the non-attainment of NCWQS is referenced in the text as being a reevaluation of cleanup goals. The text should discuss the factors affecting the cost estimating for alternatives 69-GW-3, 69-GW-4 and 69-GW-5 if this cleanup goal reevaluation should occur. An explanation of how reevaluation of cleanup goals will compare to ARARs established for site 69 should also be provided.

2.0 Specific Risk Comments

1. <u>Section 1.5.1, pg 1-15</u>:
The ICR values stated for Site 69 future residential child and adult do not agree with corresponding values from Table 6-47 of the RI report. Address this discrepancy.

2. <u>Table 1-3, Groundwater data summary</u>:
For bromoform, the frequency of detection is stated as "1/18"; the No. of detects above NCWQS is shown as "3". Address this discrepancy.

3. <u>Table 1-5, Federal Health AWQCs</u>:
For **chlorobenzene**, the current value for consumption of water & organisms is 680 ppb. For **DDT**, both current health AWQC values are 0.00059 ppb. For **barium** the current value for water & organisms is 2000 ppb.

4. <u>Section 2.3.1.1, pg 2-3, Chemical-Specific ARARs</u>:
The Region III soil RBCs are not ARARs. There are no ARARs for soil.

5. Section 2.3.2, pg 2-6; Tables 2-6, 2-7:
Risk-Based Remedial Goal Options. EPA Region IV Office of Health Assessment (OHA) recommends that RGOs be presented for carcinogenic risks of 1E-6, 1E-5, and 1E-4, and for HQs of 0.1, 1.0, and 10. This allows the remedial level to be selected from all the RGOs by the risk manager.

6. Section 2.7, pgs 2-10 to 2-13:
The statement is made for all 3 sites in OU4 that unacceptable health risks may result from future potential exposure to the site soil. This statement is not supported by the results of the baseline risk assessment. Unacceptable risks for OU4 are driven by potential residential use of the groundwater, and hence RGOs are not calculated for site soil. Please address this discrepancy.

7. Table 2-7: Noncarcinogenic RGOs for groundwater.
The RGOs values shown for beryllium, cadmium, nickel, and manganese are not reproducible from the exposure assumptions listed on Table 2-5 and the RfDs used in the risk spreadsheets in
Appendix S of the RI. Check these calculations and make corrections elsewhere in the document where appropriate.

3.0 SPECIFIC COMMENTS

1. Page 2-9, Paragraph 3:
The text references the maximum concentration of chromium in groundwater at site 41 as 159 micrograms per liter (ug/l) while Table 2-8 indicates the maximum chromium concentration is 244 ug/l. This discrepancy should be corrected.

2. Page 2-9, Paragraph 5:
The text references the maximum concentration of barium in groundwater at site 69 as 2,000 ug/l while Table 2-8 indicates the maximum barium concentration is 8.5 ug/l. This discrepancy should be corrected.

3. Page 5-23, Paragraph 7:
The cost estimate evaluation of the net present worth (15-year period) should be provided for the insitu air stripping system application of alternative 69-GW-5. This technology has the same potential for decreased remediation time due to aggressive contaminant removal processes as the dual phase vapor extraction (69-GW-4) and should be subject to the same cost evaluation criteria.

ENVIROMETAL TECHNOLOGIES, INC.
(In Situ Metal Enhanced Abiotic Degradation of Dissolved Halogenated Organic Compounds in Groundwater)

TECHNOLOGY DESCRIPTION:

This remedial technology, developed by the Waterloo Center for Groundwater Research and EnviroMetal Technologies, Inc., removes aqueous-phase halogenated organic compounds from groundwater by using an in situ permeable wall installed across a contaminated plume. As the water passes through the wall, the halogenated organics are degraded, thus preventing further downstream migration of contaminants.

Recent research has indicated that certain zero-valence metals, notably iron, can promote degradation of a wide variety of dissolved halogenated solvents. The permeable reaction wall contains a specially prepared mixture of iron and an inert support material. Observed rates of degradation are several times higher than those reported for natural abiotic degradation processes.

In most in situ applications of the technology, groundwater moves through the permeable wall naturally or is directed through the wall by flanking impermeable sections such as sheet piles or slurry walls. This passive method of remediation is a cost-effective alternative to conventional pump-and-treat method. Because contaminants are degraded in situ and not transferred to another medium, this process eliminates the need for treatment or disposal of wastes. Future applications are expected to include aboveground reactor vessels, which may be used as a replacement for, or an addition to, conventional pump-and-treat systems.

Process residuals may include dissolved methane, ethane, ethene, hydrogen gas, and small amounts of chloride and dissolved ferrous iron.

WASTE APPLICABILITY:

The process was developed to treat dissolved halogenated organic compounds in groundwater. It has been shown to degrade a wide variety of chlorinated alkanes and alkenes, including vinyl chloride, 1,1,1,-trichloroethane, 1,2-dichloroethene, trichloroethene (TCE), and tetrachloroethene (PCE). Current studies indicate that other

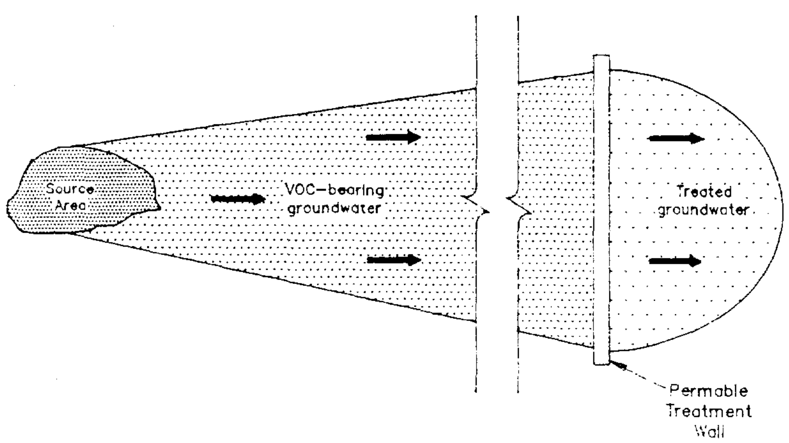

Figure 1: Schematic View of an In Situ Permeable Treatment Wall

organic contaminants, including Freon-113, ethylene dibromide, and n-nitrosodimethylamine are also degraded by the process.

STATUS:

A successful permeable in situ wall was installed at the Canadian Forces Base Borden test site in June 1991. Approximately 90 percent of TCE and PCE was removed from groundwater passing through the wall. Monitoring of a second wall installed in late 1992 is ongoing. Successful bench-scale feasibility tests that simulate flowing in situ conditions have been completed using groundwater from industrial facilities in California, Wisconsin, and New Jersey.

This technology was accepted into the SITE Demonstration Program in spring 1993. A pilot-scale demonstration of the technology is scheduled for fall 1993 at an industrial facility in New Jersey once construction issues are resolved. The overburden and shallow fractured bedrock beneath the facility contain dissolved TCE and PCE. The flow system prevents the installation of a "standard" in situ reactive wall; consequently, groundwater collected via trenches installed in the shallow bedrock will be passed through a treatment unit containing a high percentage of iron at a velocity of 5 feet per day. Groundwater discharge or disposal will be approved by New Jersey Department of Environmental Protection and Energy.

FOR FURTHER INFORMATION:

EPA PROJECT MANAGER:
Chien Chen
U.S. EPA
Risk Reduction Engineering Laboratory
2890 Woodbridge Avenue
Edison, NJ 08837-3679
908-906-6985
Fax: 908-321-6640

TECHNOLOGY DEVELOPER CONTACT:
John Quayle
EnviroMetal Technologies, Inc.
42 Arrow Road
Guelph, Ontario
Canada N1K 1S6
519-824-0432
Fax: 519-763-2378

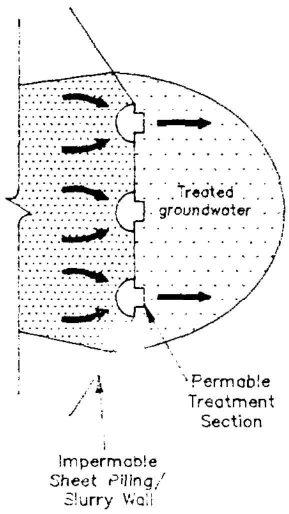

Figure 2: Schematic View of In Situ Permeable Treatment Section Installed in Conjunction with an Impermeable Barrier