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



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

June 16, 1995

Commander, Atlantic Division  
Naval Facilities Engineering Command  
Code 1823-1

Attention: MCB Camp Lejeune, RPM  
Ms. Linda Saksvig, P. E.  
Norfolk, Virginia 23511-6287

Commanding General

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

RE: Draft Treatability Study Work Plan for Operable  
Unit 14 (Site 69), MCB Camp Lejeune.

Dear Ms. Saksvig:

The referenced document has been received and reviewed by the North Carolina Superfund Section. Our comments are attached. Also attached are comments provided by the Division of Environmental Management - Wilmington Regional Office on the above referenced document. Please call me at (919) 733-2801 if you have any questions about this.

Sincerely,

*Patrick Watters*

Patrick Watters  
Environmental Engineer  
Superfund Section

Attachment

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

North Carolina Superfund Comments  
Draft Treatability Study Work Plan  
Operable Unit 14 (Site 69), MCB Camp Lejeune

1. General

The text and figures (4-2 and 4-5) provided in the Work Plan show that the UVB and KGB wells are placed within each other's expected radius of influence. Please explain how each technology can be accurately and independently evaluated under this type of test condition. If the UVB and KGB tests are done separately, how will you know that dye tracer detected in the second test does not contain any dye tracer used in the first test. The same question applies if somehow both tests are conducted at the same time. The UVB and KGB test wells need to be located far enough apart such that one test is not influenced or biased by the other.

2. Page 4-4, Section 4.2.6

This section states that the pilot borehole will be used to determine if geologic conditions are "favorable" with regard to using the UVB/KGB technology. Please provide more information in the Work Plan to describe what are considered favorable and unfavorable geologic conditions for this technology. Also, since results of this study are to be applied to Site 35, we assume that a similar assessment will be conducted to determine if the geologic conditions are favorable at Site 35.

3. Page 4-11, Section 4.4

With regard to the use of dye tracer tests for groundwater, this would be considered as an "injection well" and therefore subject to the substantive requirements of the North Carolina Administrative Code; Title 15; Chapter 2; Subchapter 2C; Section .0200, entitled "Criteria and Standards Applicable to Injection Wells".

These wells appear to fall under the category of "Wells used in experimental technologies" (Type 5E) as noted in Section .0209 of the injection well regulations. Other relevant sections of these regulations include:

Section .0206 "Corrective Action"

Section .0211 "Permits"

Section .0213 "Additional Criteria and Standards Applicable to Class V"

Section .0214 "Abandonment"

4. Page 4-11, Section 4.4.3

This section states that background samples will be collected to determine if there are any constituents in groundwater that could create problems for the dye tracer tests. Please elaborate on the types of constituents that could cause problems.

5. Page 4-13, Section 4.6  
If possible, the State would like to receive a copy of the Weekly Progress Reports.
  
6. Page 6-13, Section 6.2.2.1  
The fifth bullet indicates that the PID readings are in ppm. Since a PID (OVA) reading is in terms of meter units, we assume that the ppm values are determined by using chemical specific calibration curves to convert the meter unit reading to a ppm value.

**NORTH CAROLINA DIVISION OF ENVIRONMENTAL MANAGEMENT**  
**Groundwater Section**  
**Wilmington Regional Office**

**MEMORANDUM TO:** Arthur Mouberry

**THROUGH:** Rick Shiver *RSS*

**FROM:** Charlie Stehman *CS*

**SUBJECT:** Treatability Study Work Plan  
Site 69  
Operable Unit No. 14  
Marine Corp Base  
Camp Lejeune  
Onslow County

**DATE:** June 14, 1995

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Charles Stehman with the Groundwater Section of the Wilmington Regional Office provided the comments that are offered below for your consideration. The review involves documents relating to a Treatability Study Work Plan for Site 69 at Camp Lejeune. The proposed remediation which is being evaluated utilizes innovative technologies patented by IEG Technologies Corp., referred to as UVB and KGB, respectively. It is important to recognize the importance of this treatability study to responsible parties at Camp Lejeune who, in addition to evaluating an innovative technology specifically for Site 69, are hoping to gain information which will allow a decision on the overall effectiveness and applicability of IEG systems at other sites on the base.

**Site Summary**

Site 69 is known as the Rifle Range Chemical Dump. This site was used as a chemical waste dump. PCB's, fire retardants, pentachlorophenol, pesticides, solvents, gas cylinders, calcium hypochlorite, HTH, drums containing gas and chemical agents (mustard gas, blister agents, etc.) and fired and unfired blank rifle cartridges reportedly were disposed of at this site. No soil samples have been collected at the site due to the nature of the waste materials. Groundwater contaminants found at the site include VOC's and some metals. One depression that contains surface water contains pentachlorophenol, solvents, and VOC's. Other surface waters have been sampled, showing some elevated inorganics.

## Groundwater Section Comments

### 1. Site Suitability

Figure 1-5 of the Treatability Study Work Plan details the existing groundwater conditions which are to provide the field laboratory for evaluation of the IEG systems. At this location groundwater contamination has been observed in a shallow and deep well at one location and a third shallow well approximately 200 feet east of the contaminated pair. Although the three contaminant parameters found in one of the wells (1,2 DCE -230 ppb, TCE - 10 ppb and Vinyl Chloride - 5 ppb) and the one parameter found in the other two wells (1,2 DCE - 8 ppb in each) are at levels which are above the state groundwater quality standards, their concentrations and presence at only three locations does not appear to justify cleanup without first considering the "no-action" options available under 15A NCAC 2L.0106(i).

The information which has been provided concerning groundwater contamination at Site 69 does not depict a well defined plume. It would be more appropriate to undertake a costly study of effectiveness at a site where the spatial influence of the innovative method on a well defined contaminant plume can be evaluated. Furthermore, the site selected for controlled study should present levels of contamination which will allow differentiation of the effects of treatment from processes of natural attenuation. The Groundwater Section suggests that a more suitable site be selected for a treatability study involving the IEG Technologies Corp. systems.

### 2. Treatability Study Evaluation Strategy

Although the arrays of monitoring wells, sampling program and tracer study proposed are in concept appropriate for evaluation of the innovative technology, many of the monitoring wells are positioned in areas where groundwater contamination is undefined and presumably nonexistent. As discussed earlier it is difficult to understand how this configuration, in areas lacking contamination, will provide an meaningful evaluation of the IEG systems ability to remediate contaminated groundwater.

### 3. Remediation Wells

The treatability study indicates the position of the KGB and UVB test wells will be essentially at the same location. This placement does not appear to allow a controlled situation for evaluation of each of the distinctly different innovative technologies, rather, the effects of each will be overlapped and difficult to differentiate.

### 4. Mathematical Basis for KGB and UVB

Mathematical calculations and predictive curves which have been included in the Treatability Study cannot be evaluated because the reference document provided in Appendix E contains several unexplained assumptions and derivations. The appended document references yet another publication or paper which presumably contains the mathematical basis of its mathematical assumptions and derivations. There is no list of references at the end of the appended document. Without the original

mathematical basis used for describing the theoretical influence of the KGB and UVB systems, review of the IEG systems in general and review of the Treatability Study Work Plan as well as evaluation of such systems use at Camp Lejeune cannot be completed.

### Air Quality Section Comments

The purpose of this study work plan for OU No. 14 is to determine if the technologies are effective, implementable, and economical for remediation and/or containment of contaminants of the shallow and upper Castle Hayne aquifers at site 69, and to provide engineering parameters and other design-related information necessary to design and implement a full scale UVB/KGB remediation system.

Since Marine Corps Base (MCB), Camp Lejeune was placed on the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) National Priorities List (NPL) on October 4, 1989 (54 Federal Register 41015, October 4, 1989), the selected alternative will Not require an air quality permit from the NC DEHNR, regardless of whether the selected alternative includes an air quality control device. However, regardless of the alternative selected, the use or absence of air pollution control equipment or MCB's NPL CERCLA listing, the project must be registered with the NC DEHNR, Wilmington Regional Office. Remediation project registration requires submittal of the following information:

- Name of company operating source
- Principal company contact
  
- Location of source [ADDRESS]
- Site diagram which shows streams, roads, homes, buildings
  
- Description of project -type(s) of systems
- Total flow (cfm\gpm) - stk ht - fuels ■ if part of system
  
- Total weight and kind of air pollutants released  
Calculations which determine daily emissions

Commitment to notify DEM in the event emissions increase  
Length of project [HOW LONG WILL IT LAST]

Questions concerning remediation project registration requirements may be directed to Mark Hedrick, NC DEM/AQS at 910 395-3900, extension 289.

**Water Quality Section Comments**

The Water Quality Section has no comments on the report.

If you have any questions, please do not hesitate to contact Bruce Reed or myself at (919) 395-3900.

cc: Patrick Watters, DSWM  
WiRO

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