UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

3 May 1996

Ms. Teresa Bernhard
NAVFACENCOM
Engineering Field Activity West
900 Commodore Drive
San Bruno, CA 94066-2402

Re: PROTOCOL FOR CONTAMINANT FATE AND TRANSPORT MODELING, NAVAL AIR STATION, ALAMEDA, ALAMEDA CALIFORNIA, MARCH 29, 1996

Dear Teresa:

The U.S. Environmental Protection Agency (Agency) has completed its review of the subject document. I requested that Mr. Matthew Hagemann, a hydrogeologist in our Technical Support Section, provide comments on the document. The Agency's comments are discussed in the attachment.

Should you have any questions regarding the Agency's review comments or require additional information, please contact Barbara M. Smith at (415) 744-2366, or me at (415) 744-2402.

Sincerely,

Barbara M. Smith for

James A. Ricks, Jr.
Project Manager

cc: B. Smith (EPA)
N. Black (EPA)
T. Lanphar (CAL EPA/DTSC)
G. Kathuria (CAL EPA/RWQCB)
LCDR M. Petouhoff (NAS Alameda)

ATTACHMENT 1

The protocol is well-written and generally follows applicable guidance. The conceptual model is nicely diagrammed and supports the documented model selection criteria.

The following are suggestions the Navy may wish to consider.

1. The intrinsic bioremediation of the groundwater should be explicitly assessed in the selection of a fate-and-transport model if the Navy believes it is a viable process for remediation. BIOPLUME III was recently released, and is capable of simulating aerobic and anaerobic biodegradation of fuel hydrocarbons. The potential for natural attenuation of fuel hydrocarbons, including aerobic and anaerobic biodegradation, may be assessed through the use of the recently released model, BIOSCREEN.

2. After review of the chemical analyses reported in the RI/FS Data Transmittal Memo (7/95), there appears to be a medium potential for DNAPL at sites 1 and 4, a high potential for a DNAPL at site 16, and confirmed LNAPL at site 13. (Probabilities for the presence of DNAPL were assigned according to protocol in EPA guidance Evaluation of the Likelihood of DNAPL Presence at Superfund Sites, EPA540-R-93-073.) Thus, selection of a model capable of simulating the flow and dissolution of NAPLs should be considered.

3. The criteria for selection of a model to simulate groundwater flow should address the need to model in three dimensions and in more than one layer, particularly in the central region of the facility, where VOCs have been documented in the second water-bearing zone. The potential presence of a DNAPL also suggests a need to model in three dimensions. A model such as MODFLOW would be capable of representing three dimensional groundwater flow.

4. Representation of field-scale, natural and anthropogenic heterogeneities (including sand channels, storm drains, and sewer lines) should be considered in the selection of both the flow and fate-and-transport models. The design and alignment of the grid, regardless of model choice, should be reflective of sources and sinks associated with identified heterogeneities.

5. The influence tidal fluctuation on groundwater flow direction and gradient has not yet been quantified. Prior to representing the Bay as a constant-head boundary, it will be important to construct groundwater contour maps showing variations in flow directions relative to tidal stage. Variation or reversal in groundwater flow directions because of tidal fluctuation may profoundly affect the flux of contaminants to the Bay.

6. The viability of calibrating and validating each of the prospective models to field data should be considered in the selection process.

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