



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

May 5, 1993

Mr. Stephen Chao
Naval Facilities Engineering Command
Western Division
900 Commodore Way, Bldg. 101
San Bruno, CA. 94066

Re: Draft West Side Aquifers Field Investigation
Technical Memorandum, dated March 16, 1993

Dear Mr. Chao,

The U.S. Environmental Protection Agency (EPA) has reviewed the subject document. The technical review was performed by Scott Kinderwater, SAIC/TSC soil scientist.

Of major concern is the absence of an explanation as to why the objectives, as stated in the April 9, 1992, Operable Unit 4 (OU4), Field Investigation Work Plan were not met. Scott Kinderwater discussed this deficiency with Timothy Mower of PRC Environmental Management, Inc. on April 1, 1993. Mr. Mower stated that since a feasibility study was no longer required for OU4, the investigation or interpretation of all data gaps, as described in the work plan, was no longer necessary. EPA recommends that the Navy clarify in the introduction of the report what the objectives of the field investigation were (as stated in the work plan) and why not all objectives were deemed necessary to be met. EPA does not recommend a complete interpretation of the results of the field investigation as would have been expected if the Navy were still obligated to conduct a feasibility study for the west side aquifers. What is important to convey to all parties (Navy, MEW Companies, consultants) is that while additional information regarding the west side aquifers has been presented, not all data gaps were investigated nor was a comprehensive interpretation of the results of this investigation performed. Call me at 415-744-2383 if you have any questions.

Sincerely,

A handwritten signature in cursive script that reads "Michael D. Gill".

Michael D. Gill
Remedial Project Manager
Federal and Technical Programs Branch

cc: Elizabeth Adams (RWQCB), Josh Marvil (PRC) (Fax),
Fred Molloy (SAIC), Cyrus Shabahari (DTSC)

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**TECHNICAL REVIEW OF
DRAFT
WEST SIDE AQUIFERS
FIELD INVESTIGATION
TECHNICAL MEMORANDUM**

GENERAL COMMENTS

The Navy does not explain why the original objectives of the West Side Aquifers Field Investigation were not met in this draft of the technical memorandum.

Two objectives were stated in the Field Investigation Work Plan (work plan) that preceded this document. These objectives were: "1) to provide data necessary to complete the feasibility study (FS) for Operational Unit 4 (OU4), the west side aquifers, and 2) to help define the conceptual model of the west side aquifers and support evaluations of the Navy's contribution to the nature and extent of OU4 contamination for future cost recovery activities."

The areas requiring investigation that would satisfy the two stated objectives were summarized as follows in the work plan:

Operable Unit (OU4) Feasibility Study (FS)

- a. Investigation of the lithology and extent of contamination on the east side of OU4. This information is important because preferential flow zones (channels) may extend beneath Hangar 1 and allow contaminants to migrate northeast from Site 9.
- b. Investigation of the hydraulic control from the Building 191 lift station. The runway drain system leading to the Building 191 lift station appears to have a significant impact on the potentiometric surfaces of the A1 and A2 zones. Because similar passive groundwater collection systems may be considered during the OU4 FS, the operating characteristics of this in-place system may provide valuable, site-specific information about the effectiveness of passive drains.
- c. Investigation of the presence of dense nonaqueous phase liquids (DNAPLs) in the A2 permeable zone at the south end of OU4. The presence of DNAPLs could significantly alter the types of appropriate technologies and would increase the scope of activities considered during the OU4 FS.
- d. Investigation of the solubility of chlorinated volatile organic compounds (VOCs) in groundwater at NAS Moffett Field. The actual solubility of chlorinated VOCs in NAS Moffett Field groundwater affects the probability that DNAPLs are present.

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Conceptual Model and Cost Recovery

- e. Correlation of NAS Moffett Field remedial investigation (RI) data with data from the Middlefield-Ellis-Whisman (MEW) study area south of NAS Moffett Field. This area, approximately located between Building 88 and U.S. Highway 101, is upgradient from identified Navy sources and contains a large portion of the regional VOC plume migrating onto NAS Moffett Field from the MEW area. There are few investigative data for the south area. Characterization of the south area will help estimate the mass of contaminants entering OU4 and locate potential subsurface migration pathways.
- f. Correlation of RI data with data collected during the inferred source (IS) 8 and 9 investigations. This area, roughly located between Site 9 and the previous IS 8 and 9 investigation area, contains much of the western edge of the regional VOC plume. Additional data will help delineate the lithologic and chemical characteristics of this area.
- g. Investigation of the National Aeronautics and Space Administration Ames Research Center (NASA Ames) property between Sites 8 and 9. Few investigative data exist in the north area. Characterization of the north area will help define preferential pathways for contaminant migration northward from Site 9.

In October 1992, prior to the drafting of the West Side Aquifers Field Investigation Technical Memorandum, EPA determined that the west side aquifers (OU4) and the OU2 sites that overlie the regional groundwater plume or are within the regional study areas are addressed by the 1989 ROD for the MEW Study Area. At that point, EPA decided that the Navy was no longer required to submit the OU4 deliverables, including the RI/FS.

Based on the fact that the Navy would no longer complete the FS for OU4, this document did not fully address all of the objectives of the work plan as described above. The specified number of sampling points were investigated (ground penetrating radar, soil borings, cone penetrometer testing, monitoring well installation, and groundwater samples); however, no interpretations were drawn from the data to address the data gaps as stated in the objectives. For example, no isocontour maps of contaminants were prepared of the south area (just north of Highway 101) from groundwater data collected in June 1992 for this investigation. Such an exercise, along with discussion, would have responded to data gap e. (As stated above, no isocontour maps of trichloroethene (TCE) or tetrachloroethene (PCE) concentrations were presented in the draft technical memorandum. However, PRC has prepared isocontour maps of TCE in the A1 and A2 zones that are dated August 1992. The newly installed wells were included on these maps along with MEW/NASA monitoring wells. These isocontour maps were presented at a project managers' meeting held on March 29, 1993.)

To correct and clarify these data gaps, EPA recommends the following:

SPECIFIC COMMENTS

1. Section 1.0, Introduction

In the introduction section of the technical memorandum, EPA recommends explaining how the OU4 deliverables changed based on the determination that the west side aquifers are addressed in the 1989 ROD for the MEW Study Area. Please clarify how this decision changed the scope of work and deliverables as presented in this technical memorandum. Be specific as to which data gaps need interpretation and which data gaps no longer need interpretation and why.

2. Section 1.0, Introduction

It is important to state that most data as specified in the Navy's work plan, minus an interpretation, is presented in the technical memorandum. It is also important to state that, if needed, data gaps can be interpreted (in combination with existing data) by reviewing the additional data as presented in this technical memorandum.

3. Section 4.0, Results

Please include a brief discussion of the results of an experiment performed to measure the solubilities of TCE and PCE under different total dissolved solids concentrations detected in NAS Moffett Field groundwater. Although results were inconclusive, a summary of the experiment would add to the completeness of the technical memorandum.

4. Section 4.0, Results

Please include an interpretation of your investigation of the presence of DNAPLs in the A2 permeable zone at the south end of OU4 (termed the south area in the field work plan). Historical TCE concentrations in monitoring well MEW-4(A2) have shown detections as high as 100 mg/L. However, soil samples from this investigation detected TCE at relatively low concentrations in continuous 5-foot samples from nearby soil boring SBU4-6. TCE concentrations in this soil boring ranged from nondetect to 230 $\mu\text{g}/\text{Kg}$.

5. Section 4.0, Page 19

The elements of the 1991 Quality Assurance Project Plan were to have been followed during sample collection and laboratory analysis of samples. These procedures or deviations from these field and laboratory procedures were not described in Section 4.0 of the technical memorandum.

Please identify and discuss the following elements for report completeness:

- Analytical Data Treatment - analytical results were determined using methods described in the EPA contract laboratory program (CLP) statements of work. Please address internal validation of data performed by the contract laboratory and address third-party validation. Conclude whether or not data used in this report are considered valid for the purpose of site characterization. Based on the data review, formulate a statement on data quality.
- Field investigation QA/QC - Please discuss field blank and trip blank QC sample results. Present the results of any split sample programs.

6. Section 5.0, Page 46, 2nd paragraph

This section states that "two north-south cross sections across the study area (Plate 8) further illustrate the geologic interpretation presented in this report." On Plate 8, the lines dividing channel zones appear to be representational i.e., not exacting. For example, the boundary between Channel Zone 4 and the Deep A Aquifer is a clay/sand interface located at an elevation of -25 ft (msl) in boring WU4-6(A2), yet the same clay/sand interface is interpreted as being wholly within Channel Zone 4 in boring WU4-7(A2). In addition, the interpretation of the channel zones on Plate 8 is non-exacting, i.e., all lines dividing channel zones are shown as parallel lines rather than exacting connections between similar permeable units. Please comment on the noted interpretations.

7. Section 5.2, Page 51 , 3rd paragraph

The Navy states that it is desirable to incorporate the cone penetrometer test (CPT) information into the channel zone maps. CPT and estimated sand and gravel thicknesses are posted alongside respective sampling points on Plates 3, 4, 5, 6, and 7. How were individual mapped channel interpretations improved by comparing lithologic logs to corresponding CPTs? Include a table in the text identifying and comparing specific lithologic logs to corresponding CPTs.

In the text, please describe how the cross sections illustrated on Plate 8 were enhanced by comparing lithologic logs to corresponding CPTs.

8. Tables 12, 13, and 14

The sampling date is missing from Table 12. Please add the sampling date for completeness. Add sampling dates to Table 13 and Table 14.

9. Plate 3

A channel deposit is shown around a single data point, CPTU4-26, that is not connected with any other interpreted channel deposits. Indicating a channel deposit around one data point is questionable even when inferred. As drawn on Plate 3, a direction (trending north-south) is also inferred. Please discuss this.