



Tetra Tech EM Inc.

1099 18th Street, Suite 1960 ♦ Denver, CO 80202 ♦ (303) 295-1101 ♦ FAX (303) 295-2818

June 17, 1999

Messrs. Stephen Chao and Hubert Chan
Department of the Navy
Engineering Field Activity West
Naval Facilities Engineering Command
900 Commodore Drive, Building 210
San Bruno, California 94066-5006

CLEAN Contract Number N62474-94-D-7609
Contract Task Order 226

**Subject: Response to Comments from RWQCB Regarding Draft Remaining
UST Sites Investigation Work Plan, Moffett Federal Airfield,
California**

Dear Messrs. Chao and Chan:

Attached are two copies of the subject document for your internal review. A copy has also been sent to Mr. Donald Chuck for his review. This document addresses comments from Mr. Joseph Chou of the California Regional Water Quality Control Board, San Francisco Bay Region (RWQCB), dated May 10, 1999, in response to the Draft Remaining Underground Storage Tank (UST) Sites Investigation Field Work Plan dated February 15, 1999 for Moffett Federal Airfield (MFA).

We anticipate conducting this field work in August and would, therefore, appreciate your comments as soon as possible so that this work can be scheduled and executed in a timely manner. Please call Tisha Conoly at 303-312-8855 with any comments or questions.

Sincerely,

A handwritten signature in black ink, appearing to read 'Tisha Conoly'.

Tisha Conoly
Project Geologist

A handwritten signature in black ink, appearing to read 'Timothy Mower'.

Timothy Mower
Project Manager

TC/tem

Enclosure

cc: Mr. Donald Chuck, EFA WEST

**RESPONSE TO COMMENTS
DRAFT REMAINING UST SITES INVESTIGATIONS FIELD WORK PLAN
MOFFETT FEDERAL AIRFIELD**

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD,
SAN FRANCISCO BAY REGION**

This document addresses comments from Joseph Chou of the California Regional Water Quality Control Board, San Francisco Bay Region (RWQCB), dated May 10, 1999, in response to the Draft Remaining UST Sites Investigation Field Work Plan dated February 15, 1999 for Moffett Federal Airfield (MFA). Comments have not been received from the U.S. Environmental Protection Agency (EPA).

GENERAL COMMENTS

Comment 1: In 1994, the State and the Navy had reached consensus on petroleum cleanup levels in groundwater and soil at MFA. The cleanup levels were set for total petroleum hydrocarbons (TPH) and individual petroleum constituents. The groundwater cleanup goals were set at the maximum contaminant levels (MCLs) for the constituents of concern; for individual benzene, toluene, ethylbenzene, and xylene (BTEX) cleanup levels in soils, the risk-based EPA Preliminary Remediation Goals (PRGs) for industrial sites were selected (Cal/EPA 1994). The subject document renamed the 1994 MFA cleanup levels as "screening levels." However, it is more appropriate to compare the 1994 cleanup levels with the risk-based screening levels (RBSLs) under the risk-based corrective action (RBCA) Tier 1 evaluation. Indeed, the MFA cleanup levels were derived from site specific, non-site specific, and regulatory standards. Through the proposed field work, more site-specific information will be collected to establish the site-specific target levels (SSTLs) and points of compliance. If the concentrations of chemicals of concern are above the RBSLs or SSTLs at the points of compliance or source area, remediation may be warranted.

Response: In the Final Basewide Petroleum Site Evaluation Methodology Technical Memorandum (TM) (TtEMI 1998), Tetra Tech EM Inc. (TtEMI) established the methodology for addressing petroleum contamination in soil and groundwater at MFA. The 1994 cleanup levels are addressed in Section 1.1 of the TM. An excerpt is included below:

"In 1994, the California Environmental Protection Agency (Cal/EPA), including the Department of Toxic Substances Control (DTSC) and RWQCB, and the Navy negotiated cleanup levels (action levels) for petroleum contamination in groundwater and soil at MFA. The action levels were set for individual petroleum constituents for which the State of California had established risk values, and for TPH (Cal/EPA 1994). Constituent-specific action levels for groundwater contamination follow drinking water standards promulgated by the State of California for benzene, toluene, ethylbenzene, and xylenes (collectively known as BTEX) and selected polynuclear aromatic hydrocarbons (PAHs). Groundwater and soil action levels are separated into two main categories: purgeable-phase TPH as gasoline (TPH-p) and extractable-phase TPH (TPH-e) as diesel fuel or jet petroleum (JP)-5."

To streamline the evaluation of petroleum sites, TtEMI has used the 1994 cleanup levels as the first level of evaluation. If petroleum constituent concentrations do not exceed the 1994 cleanup levels, further action is not required.

For petroleum sites where soil or groundwater sample results exceed the 1994 cleanup levels, a Tier 1 RBCA evaluation will be conducted using RBSLs. If the Tier 1 RBCA evaluation indicates an acceptable level of risk to human health, no further evaluation is required. A Tier 2 evaluation is conducted if additional assessment is required. The Tier 2 RBCA evaluation uses SSTLs.

Comment 2:

Pursuant to Health and Safety Code 25299.37.1, testing for methyl tertiary butyl ether (MTBE) is required for all underground storage tank sites before RWQCB or a local agency may issue a closure letter. This requirement applies to ALL underground storage tanks, regardless the installation date of the tank(s). The California State Water Resources Control Board (SWRCB) recommended that EPA method 8020A (or 8021B) be used to detect BTEX and MTBE compounds in leaking underground fuel tanks (LUFT) groundwater samples (SWRCB, August 1996). In the same guidance, SWRCB also recommended that one sample per site which is positive for MTBE by EPA method 8020A (or 8021B) be analyzed by EPA method 8240B (or 8260B) to verify the correct identification of MTBE.

Response:

TtEMI will amend the work plan to indicate that one MTBE sample will be collected downgradient from each tank site during Mobilization 1. Mobilization 1 MTBE samples will be analyzed by EPA method 8021B. If the MTBE sample result is above 80 percent of the screening level of 13 micrograms per liter ($\mu\text{g/L}$) - in other words, 10 $\mu\text{g/L}$ - four quarters of groundwater samples will be collected from the downgradient well during Mobilization 2. The first of the four samples will be analyzed by EPA method 8260B to verify that MTBE has been correctly identified; subsequent samples will be analyzed according to EPA method 8021B.

SPECIFIC COMMENTS

Comment 1:

Page 3, Last Paragraph; Section 3.2.1 Regulatory Framework. The section should read as "In 1994, California/EPA, including DTSC and RWQCB, and the Navy had reached consensus on petroleum cleanup levels in groundwater and soil at MFA. The cleanup levels were set for TPH and individual petroleum constituents. The groundwater cleanup goals were set at the MCLs for the constituents of concern; for individual BTEX cleanup levels in soils, the risk-based EPA PRGs for industrial sites were selected (Cal/EPA 1994)".

Response:

This paragraph has been changed to reflect the above comment.

Comment 2:

Page 6, 1st Bullet; Section 3.2.2 Evaluation Approach. Please note that the California drinking water action level for MTBE is 13 micrograms per liter, established in March 1999. The California Department of Health Services (DHS) action level addresses concerns about the potential for cancer, based on the carcinogenic effects of MTBE observed in laboratory animals. The current action level replaced the 35 parts per billion (ppb) action level,

established by DHS in 1991 and based on MTBE's noncarcinogenic effects. DHS is developing a primary MCL for MTBE. Once a primary MCL is adopted, the action level will be no longer used.

Response: The referenced bullet has been removed. Instead, the following paragraph has been added following the bullet list.

"In addition, the California Department of Health Services (DHS) established an action level for methyl tertiary butyl ether (MTBE) in March 1999. The California drinking water action level for MTBE is 13 micrograms per liter ($\mu\text{g/L}$)."

Comment 3: Page 6, Last Paragraph; Section 3.2.3 Selection of Additional Petroleum Sites. The Navy should provide the existing data of the mentioned nine tank sites to RWQCB for review. Closure should be proposed only after it's demonstrated that there is no remaining pollution.

Response: The intent of this paragraph was to explain how the 12 tank sites addressed in the work plan were selected. At this time, the Navy is not requesting closure for the tank sites. Instead, TtEMI will prepare additional appendices to the Basewide Petroleum Sites Methodology Technical Memorandum (TtEMI 1998) to address these sites. These appendices will be submitted to RWQCB when closure is requested.

Comment 4: Page 9, 3rd Paragraph; Section 4.0 Investigation Approach. As mentioned in our general comment, the MFA petroleum sites cleanup levels (1994) may be considered as Tier 1 evaluation, since part of the information used was not site specific and the Summer's vadose zone model was not strictly site specific either.

Response: As stated in the response to the general comment, the 1994 cleanup levels are not intended to replace the Tier 1 evaluation; instead, the 1994 cleanup levels are intended to streamline the petroleum evaluation process. Sites with concentrations below the 1994 cleanup levels do not require further action or evaluation. If the concentration of one constituent exceeds screening levels, a complete Tier 1 evaluation will be conducted.

Comment 5: Page 10, 1st Paragraph; Section 4.0 Investigation Approach. The downgradient soil borings and groundwater monitoring wells should be drilled within 10 feet of the tank location, not 50 feet.

Response: Two groundwater samples are collected in the downgradient range at most tank sites. For each tank site, one of the proposed downgradient groundwater sample locations will be moved to within 10 feet of the tank location. The fourth bullet has been changed and a fifth bullet has been added:

- (4) Approximately 10 feet from the tank location in the anticipated downgradient direction, or as close as possible to this distance where there are obstructions.

- (5) Approximately 50 feet from the tank location in the anticipated downgradient range, or as close as possible to this distance where there are obstructions.

The locations of wells installed during Mobilization 2 will be selected based on analytical results from Mobilization 1.

Comment 6:

Page 10; Section 4.1 Mobilization 1. In addition to TPH as gasoline (TPH-g), BTEX, and MTBE, for tanks that contained gasoline, tests for tetraethyl lead and ethylene dibromide (EDB) may be required for both soil and groundwater analysis.

Response:

Sampling for tetraethyl lead and EDB are recommended in RWQCB guidance documents. Therefore, the closest downgradient sample for tanks that contained gasoline will be analyzed for tetraethyl lead and ethylene dibromide (EDB). In addition, this sample will be analyzed for MTBE. This paragraph will reflect these changes:

“Soil and groundwater analyses at each tank site will also be selected based on historical tank contents. For tanks that contained gasoline, soil and groundwater samples will be analyzed for TPH-g and BTEX. The closest downgradient sample will also be analyzed for MTBE, tetraethyl lead, and EDB.”

Comment 7:

Page 10; Section 4.1 Mobilization 1. Please see General Comment 2.

Response:

As discussed above, one MTBE sample will be collected from all tanks that contained gasoline. This change has also been made for tanks that contained fuel oil or diesel. This first and second paragraphs on page 11 will read:

“Soil and groundwater samples from sites with tanks that contained fuel oil or diesel will be analyzed for TPH as diesel (TPH-d). Soil samples will be analyzed for PAHs if there is either visible staining or if volatile organic compounds (VOCs) are present as indicated by photoionization detector (PID) screening. The closest downgradient groundwater sample will be analyzed for MTBE. Groundwater will be sampled and analyzed for PAHs during the second mobilization.

“When previous investigations indicated other chemicals of concern (COCs) above detection limits, samples will also be analyzed for those constituents. When tank contents are unknown, soil and groundwater samples will be analyzed for TPH-d, TPH-g, BTEX, VOCs, and PAHs. The closest downgradient groundwater sample will be analyzed for MTBE.”

In addition, the table presented in Section 4.2 Mobilization 2 will include MTBE and its cleanup level.

Comment 8:

Page 11; Section 4.2 Mobilization 2. Please explain the vertical extent of petroleum contamination at each site. How do we know if the A2 groundwater aquifer is not affected? The concern of vertical transport of

MTBE and other oxygenates is particularly true when a downward gradient is created by pumping activity.

Response:

During the MFA quarterly groundwater elevation monitoring event conducted in November 1998, water levels were measured in four well pairs in the A1- and A2-aquifer zones. Measurements from the four well pairs generally indicate an upward gradient from the A2- to the A1-aquifer zone (TtEMI 1999): of four A1/A2 aquifer zone well pairs, three indicated an upward gradient. The one pair exhibiting a downward vertical gradient is located on the southern end of MFA, approximately 500 feet west of Tank 89.

There are 13 extraction wells at MFA. Eleven are screened in the A1-aquifer zone, and two are screened in the A2-aquifer zone. The 11 extraction wells in the A1-aquifer zone create an upward vertical gradient and therefore are not likely to facilitate vertical migration of MTBE. The two A2-aquifer zone extraction wells are located near Hangar 1; the closest well is approximately 500 feet north of the Tanks 1 and 32 and Tanks 85 and 85A areas.

Fourteen extraction wells at MFA are associated with the Middlefield, Ellis, and Whisman (MEW) plume. Eight of these wells are screened in the A1-aquifer zone, and six are screened in the A2-aquifer zone. None of the wells is located near a tank area that will be evaluated.

The question of vertical migration of MTBE may require evaluation for three tank areas: Tanks 1 and 32, Tanks 85 and 85A, and Tank 89. Tanks 1, 32, and 89 stored diesel fuel. Although an MTBE sample will be collected for these sites, as discussed in the response to Comment 2, it is unlikely that MTBE will be detected; therefore, MTBE will not be evaluated in the A2-aquifer zone.

Tank 85 stored aviation gasoline, and the contents of Tank 85A are unknown. This tank area will be evaluated for MTBE. If the MTBE result from the groundwater sample collected during Mobilization 1 exceeds the action level (13 µg/L), one groundwater sample will be collected during Mobilization 2, and analyzed from the closest downgradient A2-aquifer zone monitoring well (well PIC-10, approximately 250 feet downgradient).

Comment 9:

Page 11; Section 4.2 Mobilization 2. When tank contents are unknown, PAH analysis should be conducted for soil and groundwater samples.

Response:

If tank contents are unknown, soil samples collected during Mobilization 1 will be analyzed for PAHs. (See response to specific comment 7.) During Mobilization 2, groundwater samples will be analyzed for PAHs if (1) PAHs are detected in soil during Mobilization 1, or (2) TPH-d is detected in groundwater during Mobilization 1. The last paragraph in Section 4.2 has been changed to reflect these changes:

“Soil samples will not be collected during Mobilization 2. Groundwater analyses will be the same as Mobilization 1, with two exceptions. First, groundwater samples will be analyzed for PAHs if (a) TPH-d was detected in the groundwater sampled during the first mobilization, or (b) PAHs were detected in soil samples.

Screening levels for PAHs have not been identified; therefore, PAH groundwater results are not required during Mobilization 1. However, PAHs will be used in the Tier 1 screening; therefore, samples will be analyzed for PAHs during Mobilization 2. Second, if the tank contents are unknown, or if COCs were identified during previous investigations, only analytes that were detected during Mobilization 1 will be analyzed for during Mobilization 2.”

Comment 10: Page 11; Section 4.2 Mobilization 2. Please explain why the “80 percent of screening levels” was used to determine whether a groundwater well will be installed or not.

Response: This investigation is being conducted in two phases in order to identify sites that do not require further evaluation and therefore to streamline the data collection process. The data collected during Mobilization 1 will provide a “snapshot” of chemical concentrations in soil and groundwater at each tank site. With this approach, some tank sites will not require further evaluation, and closure may be requested. Resources will then be focused on a more extensive evaluation of the remaining tank sites.

Although this investigation has been designed to avoid collecting extraneous data that will not be required for tank closure, TtEMI and the Navy believe that a conservative position is warranted with respect to petroleum constituent concentrations in groundwater. For this reason, TtEMI and the Navy have proposed a more conservative approach instead of requesting site closure based on one groundwater sample with results less than the 1994 groundwater cleanup levels. If a groundwater constituent concentration is between 80 percent of the 1994 cleanup level and the cleanup level itself, four quarters of groundwater monitoring data will be collected. This conservative approach will allow for an increased level of confidence in groundwater constituent concentrations when closure is requested.

REFERENCES

- California Environmental Protection Agency, Department of Toxic Substances Control (Cal/EPA). 1994. Letter from Mr. C. Joseph Chou (Cal/EPA) to Mr. Stephen Chao (Navy) regarding concurrence of petroleum cleanup levels. July.
- Tetra Tech EM Inc. (TtEMI). 1998. Basewide Petroleum Site Evaluation Methodology Technical Memorandum, Moffett Federal Airfield, California. October 2.
- TtEMI. 1999. November 1998 Draft Quarterly Report, Moffett Federal Airfield, California. March.