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April 20, 2000

Ms. Roberta Blank
U.S. Environmental Protection Agency Region 9 SFD-8-2
75 Hawthorne Street
San Francisco, California 94105

**Subject: Response to Comments on the May 1999 and August 1999 Quarterly Reports
Moffett Federal Airfield, California**

Dear Ms. Blank:

Attached please find a copy of the response to regulatory comments on the May 1999 and August 1999 quarterly reports for Moffett Federal Airfield. The response to comments is being sent to you per the request of Mr. Edward Dias from the Southwest Division of the Department of the Navy. Please provide any additional comments or input before the remedial project manager meeting on May 18, 2000.

Please call me at (303) 312-8874 with any questions or comments.

Sincerely,

A handwritten signature in black ink, appearing to read 'Timothy E. Mower', written in a cursive style.

Timothy E. Mower
Project Manager

TSW/jed

Enclosures

cc: See attached distribution list

**MAY 1999 and AUGUST 1999 DRAFT QUARTERLY REPORT RESPONSE TO COMMENTS
MOFFETT FEDERAL AIRFIELD**

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**RESPONSE TO COMMENTS
MOFFETT FEDERAL AIRFIELD
DRAFT MAY 1999 QUARTERLY GROUNDWATER MONITORING REPORT
DATED OCTOBER 4, 1999, AND
DRAFT AUGUST 1999 QUARTERLY GROUNDWATER MONITORING REPORT
DATED DECEMBER 30, 1999**

This document presents responses to U.S. Environmental Protection Agency (EPA) comments on the two above-referenced reports. Comments were received from Ms. Roberta Blank in letters dated January 6 and February 1, 2000. General comments listed below were discussed at a meeting between the Navy and EPA held on February 17, 2000. The responses presented below consider the discussions at the meeting. At the meeting, the Navy and EPA agreed to revise future quarterly reports, but not the May 1999 and August 1999 reports.

DRAFT MAY 1999 QUARTERLY REPORT

GENERAL COMMENTS

Comment 1: The May 1999 Draft Quarterly Groundwater Monitoring Report (Report) provides only minimal evaluation and discussion of groundwater monitoring results. In addition, only limited displays of water quality trends are attempted (Figures A-3 through A-12), although not all target analytes are assessed in these limited displays. In accordance with the *Final Quality Assurance Project Plan, Long-Term Groundwater Monitoring* [(QAPP) Tetra Tech EM Inc., 1997], the Report should provide documentation that *all* analytical results for *all* wells have been assessed to determine whether the sampling efforts should be expanded, reduced, or modified in any manner. Please, revise the Report to include the required documentation.

Response: As discussed in the February 17, 2000 meeting between the Navy and EPA, evaluation and discussion of water quality trends will be the primary subjects of the annual report. However, quarterly reports will be modified to more completely present all groundwater sampling data, including minor constituents, in summary tables to minimize the need to reference the lengthy data summary tables in the appendices to the report. The limited trend graphs included in the May 1999 report will be continued to provide a rough tracking mechanism. More detailed evaluation of chemical trends and recommendations for any modifications to the sampling plan will be presented in the annual evaluation report.

Comment 2: The Report does not provide any statistical analysis of groundwater monitoring results. Although statistical analysis is not specifically required by the QAPP, the statistical analysis of groundwater monitoring results would provide a valid, objective method of assessing groundwater trends within and between groundwater wells. As is indicated in Figures A-3 through A-12, groundwater results exhibit significant temporal variation within wells. Therefore, claims made in the Report, based only on visual examination of trends may not be statistically accurate when the variation between sampling events is statistically evaluated. It is therefore recommended that applicable EPA guidance on the statistical analysis of groundwater monitoring results (EPA, 1989; 1992), in addition to other relevant statistical texts (for example, Gilbert, 1987), be utilized in assessing whether the sampling efforts should be expanded, contracted, or modified in any manner.

Response: Statistical analysis of groundwater monitoring results will be used as appropriate in the annual report to supplement the data evaluation. Key constituents in sampling results for a limited number of monitoring wells may be analyzed using statistics to add to the evaluation of plume migration. The Navy will review the suggested guidance and include statistical analyses that are useful for the level of detail appropriate for the annual evaluation report.

Comment 3: The Report provides limited discussion and assessment of monitoring results obtained for wells in the west-side aquifer treatment system (WATS) and the east-site aquifer treatment system (EATS). As stated above, no statistical analysis of groundwater results was performed on any of this data. In addition, the Report is not clear on whether the limited presentation and evaluation is to serve as the only documentation for groundwater results in the WATS and EATS. Specifically, the Report does not clarify whether the presentation of data is provided to meet specific reporting requirements for the WATS and EATS operation and maintenance (O&M) plans and/or groundwater monitoring plans. In the event that a complete presentation of results for the WATS and EATS is presented in other documents, this fact should be noted in the Report. In the event that the Report represents the only documentation of well data for the WATS and EATS, please revise the Report to provide complete references for the appropriate plans under which the groundwater monitoring is being performed, and document complete adherence to the plans in the Report.

Response: The quarterly reports will be modified to include a brief discussion of the performance of WATS and EATS in achieving the desired capture of the Navy's portion of the regional volatile organic compound (VOC) plume. The quarterly reports also will include reference to the long-term groundwater monitoring plans for WATS and EATS and the degree to which any sampling conducted met the objectives of the monitoring plans. Please refer to the responses to general comments 1 and 2 for discussion of the detailed evaluation of groundwater monitoring results and statistical analysis.

Comment 4: The Report does not provide documentation that the groundwater analytical data has been reviewed, verified, and validated according to QAPP requirements. For completeness, please revise the Report to provide documentation that the analytical data has been reviewed, verified, and validated. Applicable quality control summary Reports (QCSRs) should be referenced accordingly.

Response: The data included in the May 1999 report were collected by International Technology Corporation (IT). Tetra Tech EM Inc. (TtEMI) did not have access to the quality control portion of the data and therefore could not include discussion of the data validation.

Comment 5: The Report does not provide any tables of field measurements (for example, pH, conductivity) collected during the sampling effort. According to the QAPP, field measurements were to be collected during groundwater sampling efforts. For completeness, please revise the Report to provide documentation that field measurements were collected during groundwater sampling efforts and include results indicating that the water quality parameters had stabilized prior to sampling.

Response: The quarterly reports will be modified to include tables of data on field parameters, and copies of field sampling data sheets will be included to document that parameters had stabilized before samples were collected.

Comment 6: Analytical data from previous sampling efforts are provided in Figures A-1 through A-12. However, the respective sampling reports for these analytical data are not referenced in Section 5.0. For completeness, please revise the Report to provided references for all analytical data presented in the Report.

Response: References to the data included on the graphs in Figures A-1 through A-12 will be included in future quarterly reports.

SPECIFIC COMMENTS

Comment 1: Section 2.2, Page 8: The Report describes various activities performed during the current quarter. However, not enough information is provided regarding those activities. For example, the Report states that an additional soil and groundwater investigation was performed at four locations using GeoProbe technology at the eastern side of AOI 3. However, the Report does not indicate what the purpose of this investigation was, whether an approved work plan was followed and where the results of this investigation will be documented. The same insufficient information was provided for activities performed at AOI 5. For completeness, please revise the Report to discuss activities performed at the Site in more detail, reference an approved work plan and provide information on where the results of these activities will be documented.

Response: Quarterly reports will no longer discuss activities at National Aeronautics and Space Administration (NASA) areas of interest (AOIs). This information is already provided, in greater detail, at the monthly remedial project managers meetings.

Comment 2: Section 2.3, Page 9: The Report describes the sodium dithionite pilot test, however not enough background information is provided to evaluate the testing activities. For completeness, please revise the Report to provide background information on why the dithionite pilot test is being performed, reference an approved work plan and provide information on where the results of these activities will be documented.

Response: In general, quarterly reports will no longer discuss activities that are not related to quarterly sampling. Other activities, such as the sodium dithionite pilot test, will be discussed only to the extent that they influence the results presented in the quarterly reports. For example, an aquifer pumping test at the pilot test site that created anomalous groundwater elevations noted in a quarterly report would be described in the quarterly report.

Comment 3: Section 4.1.3, Page 13: The Report discusses outliers of water elevation measurements. The text states that "it is likely either that survey data for these wells are incorrect, the water level measurement reference point has been modified, or localized conditions are not representative of regional trends." However, the Report does not suggest how to either remedy the situation (if the survey data are incorrect or the reference point has been modified) or to explain why localized conditions differ from regional trends. To make the collected data meaningful, please revise the Report to indicate whether the wells in question will be re-surveyed, how the new water level measurement reference points compare to the previously used points, or discuss the difference in hydrologic regime between localized and regional conditions.

Response: Quarterly reports will be modified to more completely discuss outliers noted in groundwater elevation measurements. The reports will be expanded to describe methods to modify incorrect data (such as resurveying reference points) or to more completely explain local variations in hydrologic conditions.

Comment 4: **Figures 3 through 16:** The figures lack clarity in the display of Site buildings and streets. While the well identifications and locations are clearly legible, the underlying base map is not clearly displayed. Since the location of monitoring wells relative to existing buildings and streets is important for the evaluation of groundwater elevation and quality data, please revise the Report to include figures that clearly show the underlying base map of the Site.

Response: Street names and building numbers will be added to the maps presented in the quarterly reports to the extent possible without confusing the presentation of the mapped data.

DRAFT AUGUST 1999 QUARTERLY REPORT

GENERAL COMMENTS

Comment 1: The August 1999 Draft Quarterly Report (Report) does not include an executive summary. To facilitate the review process, please add an executive summary to the Report.

Response: An executive summary will be added to future quarterly reports.

Comment 2: The Report states that Moffett Federal Airfield (MFA) has installed a sodium dithionite pilot test system to evaluate the feasibility of a In-Situ Abiotic Redox Manipulation (ISRM) system as a replacement for the pump-and-treat groundwater remediation systems at MFA. However, the Report does not indicate when the injection test is scheduled to be performed and whether a work plan has been submitted to the regulatory agencies for review. Therefore, please revise the Report to provide an injection test schedule and a reference to an approved work plan.

Response: In general, quarterly reports will no longer discuss activities that are not related to quarterly sampling. Other activities, such as the ISRM pilot test, will be discussed only to the extent that they influence the results presented in the quarterly reports. For example, if an aquifer pumping test at the ISRM pilot test that created anomalous groundwater elevations noted in a quarterly report would be described in the quarterly report

Comment 3: The Report refers to field work performed at the Petroleum Sites and the Northern Channel Corridor. However, the Report does not provide a reference to approved work plans or background information regarding this work. Therefore, please revise the Report to include background information regarding the field work performed at the Petroleum Sites and the Northern Channel Corridor or a reference to approved work plans.

Response: See the response to general comment 2 for the August 1999 report.

Comment 4: The Report does not discuss the status of the Stanford study which was supposed to be performed at MFA. Since the Enhanced Natural Attenuation of Commingled Plumes technology requires the injection of compounds into groundwater that are themselves pollutants and may not provide hydraulic capture of the contaminant plumes, it is essential that the regulatory community be updated on the progress of the study. Therefore, please revise the Report to include information regarding the status of the Stanford study.

Response: See the response to general comment 2 for the August 1999 report.

Comment 5: The Report makes a distinction between monitoring West-Side Aquifers Treatment System (WATS), East-Side Aquifer Treatment System (EATS) and the remaining Comprehensive Long-term Environmental Action Navy (CLEAN) program wells, but does not elaborate on why the remaining CLEAN program wells are monitored. WATS and EATS wells were monitored in June 1999. The remaining CLEAN program wells were monitored in August 1999. In addition, the data presentation is separated into EATS, WATS and CLEAN program wells. For clarity, please revise the Report to clearly state that CLEAN well results refer to the data collected from monitoring wells that are not part of the WATS and EATS and what the objectives are for monitoring these CLEAN program wells.

Response: Future reports will more clearly identify the sampling objectives for wells monitored for WATS and EATS and for other wells monitored under the CLEAN program. Presentation of the data from these activities will likewise be more clearly segregated to minimize confusion.

Comment 6: The Report (Section 3.0, Page 9 and Section 4.4, Page 13) refers to Table 5 as presenting a list of monitoring wells sampled in August 1999. Tables 1 and 2 present monitoring well analyses for the WATS and EATS monitoring wells. Since the wells listed in Table 5 are not part of the EATS or WATS and only the monitoring objectives for the EATS and WATS are discussed in the Report, it is unclear what the sampling objectives for the wells listed in Table 5 are. For clarity, please revise the Report to indicate the objectives for the August 1999 sampling event as opposed to the June 1999 (EATS and WATS) sampling event.

In addition, the Report should refer to Tables 1 and 2 as presenting monitoring well analyses for the WATS and EATS aquifers monitoring wells, respectively, rather than just calling them the monitoring wells sampled in June 1999. For clarity, please revise the Report to more accurately describe the information presented in Tables 1, 2, and 5.

Furthermore, the Report (Section 3) incorrectly states that Table 5 includes the aquifer zone monitored. Please revise the Report to eliminate the reference to aquifer zones on the bottom of Page 9.

Response: Future reports will more clearly identify the sampling objectives for other wells monitored under the CLEAN program that are not related to WATS and EATS. Tables of analyses for samples from each well will also be more clearly identified.

Table 5 should have included a note indicating that all wells listed on the table were screened in the A1-aquifer zone. Similar tables in future reports will be checked to ensure the aquifer designation is included.

Comment 7: As shown in Table 3, many of the detection limits were above the regulatory cleanup levels for the detected compounds. However, the Report does not discuss this fact with respect to data usability. In addition, Figures 5 through 12 are based on the data presented in Table 3. Due to the elevated reporting limits for many of the compounds shown in the figures, it appears appropriate that instead of depicting the results in the figures as not detected for these compounds, that these data points not be used for contouring. If an estimated concentration can be determined from the laboratory data, the estimated concentration should be used. Otherwise, the plume shape should resemble the plume shape depicted in previous monitoring reports. Please revise the Report to discuss the usability of the data where elevated reporting limits had to be used and revise Figures 5 through 12 to eliminate data points for which the reporting limit exceeded the regulatory cleanup level or use the laboratory estimated concentrations whenever possible. In case not enough data points can be used for contouring, please depict the same plume shape as shown in previous monitoring reports.

Response: All available data, including estimated values, are used in preparing the chemical concentration maps presented in the quarterly reports. Elevated detection limits are inevitable for samples that contain high levels of VOCs unless uncommon (and expensive) analytical methods are applied. However, future reports will consider high-level nondetect data more carefully, but plume shapes will not be modified from previous versions based on the nondetect values unless the data clearly warrant the change. Any such change made to a map will be highlighted in the report to alert the reader.

Comment 8: As shown in Table 3, the regulatory cleanup levels were exceeded for 1,1-DCA [1,1-dichloroethane], 1,1-DCE [1,1-dichloroethene] and trans-1,2-DCE [trans-1,2-dichloroethene]. However, no concentration contours are provided for these compounds. Since these compounds exceeded regulatory levels in groundwater, please revise the Report to include the rationale for not providing concentration contours for these compounds or add concentration contours to the Report.

Response: As discussed in the February 17, 2000, meeting between the Navy and EPA, maps for minor constituents will not be included in quarterly reports but will, instead, be included in the annual evaluation report.

Comment 9: The Report only discusses the analytical results of the August 1999 samples in Section 5.4 which is entitled "Summary of Organic Constituents". However, a summary of organic constituents should also discuss the VOC sampling results for samples collected in June 1999. Since there is no discussion provided regarding the VOC sampling results for the June 1999 sampling event in Section 5.4, please revise the Report to include a discussion of June 1999 sampling results or reference Sections 2.1.1 and 2.1.2 for this information.

Response: The August 1999 report should have included a reference to Sections 2.1.1 and 2.1.2 for the discussion of VOC results for the WATS and EATS samples collected in June 1999. Future reports will more clearly discuss the sample results for wells monitored for WATS and EATS and for other wells monitored under the CLEAN program.

Comment 9a: In addition, the Report does not provide a discussion or data tables for the organic lead, PAHs [polynuclear aromatic hydrocarbons] and MTBE [methyl tertiary butyl ether] analysis results from the August 1999 sampling event. For completeness, please revise the Report to include a discussion of the organic lead, PAHs and MTBE analyses results from the August 1999 sampling event and provide data tables for these compounds, if appropriate.

Response: Additional data tables or explanatory notes will be added to future quarterly reports to address all data collected. In this case, all the analyses noted yielded no detections. However, a note to this effect should have been added to the data summary tables already included in the report.

Comment 10: In order to facilitate the review process, please revise the Report to add the regulatory cleanup levels to Tables 3, 4 and 13.

Response: Regulatory cleanup levels will be added to these data summary tables in future reports.

Comment 11: In order to facilitate the review of the groundwater contour and capture zones maps, the Report should include a table listing the average monthly groundwater pumping rate for each extraction well shown in Figures 18, 19 and 21. Therefore, please revise the Report to include such a table.

Response: Average monthly groundwater pumping rates will be added to the appropriate potentiometric surface maps in future reports.

Comment 12: As discussed during the last Remedial Project Managers (RPM) meeting, insufficient data points are available to draw reliable "estimated capture zones" around the extraction wells as presented in Figures 18, 19 and 21. For example, the southwest corner of the Figure 19 capture zone has been arbitrarily drawn. The closest monitoring well is located 250 feet away. Therefore, it is recommended that dashed lines be used in the areas where insufficient information exists rather than drawing an arbitrary capture zone.

In addition, since there is no discussion in the Report regarding the lack of data points to draw reliable “estimated capture zones”, please revise the Report to indicate that the installation of additional groundwater monitoring points are planned to better define the extent of the capture zones around each extraction well. See also Specific Comments 10, 11 and 12.

Response: As discussed in the February 17, 2000, meeting between the Navy and EPA, these maps represent the Navy’s interpretations of conditions at MFA. Statements acknowledging limitations of the interpretations and the existence of alternative interpretations will be added to the report, but the maps will not be modified.

Comment 13: Figures 5 and 9 show vinyl chloride concentration contours for concentrations over 100 µg/l [micrograms per liter]. However, since the regulatory cleanup level (MCL [maximum contaminant level]) for vinyl chloride is 0.5 µg/l, it may be appropriate to include in the figures a contour depicting the extent of vinyl chloride concentrations exceeding the regulatory cleanup level.

In addition, since vinyl chloride was detected at 140 µg/l at EA1-6 and at 102 µg/l at EA2-2 (see Figure 5), a “100 µg/l” concentration contour should be drawn around these two wells. Therefore, please revise the figures to include “100 µg/l” contours around EA1-6 and EA2-2. Furthermore, please add a “0.5 µg/l” contour to Figures 5 and 9. Similarly, please add contours depicting the respective regulatory cleanup level to all of the concentration figures in the Report.

Response: Chemical concentration maps will include a contour representing the cleanup level for that chemical. For example, a 0.5 µg/L contour will be included on a vinyl chloride concentration map. However, future vinyl chloride concentration maps will be presented only in annual reports.

Comment 14: A significant decrease in TCE [trichloroethene] concentrations between May and August 1999 was observed at wells W9-33 and W9-8 (concentrations at these wells detected in May 1999 were 3,420 µg/l and 879 µg/l, respectively and less than 50 µg/l in August 1999). Such a drastic decrease in concentrations in such a short period of time is surprising. Possible explanations may be that the samples were mislabeled or that the wrong wells were sampled, but no reason for this rapid decrease is given in the Report. Therefore, the data should be validated, historical TCE concentrations for these wells should be reviewed and discussed in the Report and the significant TCE decreases should be explained. It is recommended that future Groundwater Monitoring Reports contain tables of historical groundwater quality so that significant changes can easily be identified as Appendix A of the Report does not include historical data for W9-33 and W9-8. In the meantime, the TCE data for W9-33 and W9-8 should not be used for drawing TCE plume isoconcentration contours in Figure 11.

Response: As discussed in the February 17, 2000, meeting between the Navy and EPA, historical TCE trends in samples collected at wells W9-33 and W9-8 indicate that the decrease in concentrations may not be anomalous. However, future reports will consider nondetect data more carefully, but plume shapes will not be modified from previous versions based on the nondetect values unless the data clearly warrant the change. Any such change made to a map will be highlighted in the report to alert the reader. Historical data will not be included in future reports; however, reference to the location of such data will be included.

Comment 15: The Report does not address planned improvements to either the EATS or WATS. For example, to improve groundwater extraction and the development of a capture zone around well EA1-1, further improvements are planned. However, the Report does not discuss these improvements are planned. For completeness, please revise the Report to include a discussion of planned improvements to the EATS and WATS.

Response: The annual report will evaluate whether the groundwater extraction system is performing adequately or whether changes to system operations are necessary. The evaluation may include whether the extraction well system is adequately capturing the appropriate portion of the contaminant plume, whether the water level or chemical concentration monitoring system is adequate, or whether changes in the treatment system are necessary.

SPECIFIC COMMENTS

Comment 1: Section 2.1.1, Page 7, Table 3 and Figures 5 through 12: The text of the Report and the table state that "Analytical results for prevalent organic constituents on the west side of the runways" are listed in Table 3. However, it is unclear what is considered a "prevalent" organic constituent. The organic constituents what were detected at concentrations in excess of the respective laboratory method reporting limits should be listed in Table 3 and Figures 5 through 12. For clarity, please revise the Report to explain which criteria were use to define a "prevalent" constituent and revise the table and figures, if necessary, to include all concentrations detected above the respective laboratory method reporting limits or groundwater cleanup level, whichever is lower. The same should be done for Table 4 and Figures 13 through 16 with respect to the organic constituents detected on the east side of the runways.

Response: Data tables in future quarterly reports will be modified to address all organic compounds detected. However, as discussed in the February 17, 2000, meeting between the Navy and EPA, maps for minor constituents will not be included in quarterly reports but will, instead, be included in the annual evaluation report.

Comment 2: Section 4.3, Page 12 and Table 6: The Report states that depth to water measurements were conducted at 462 monitoring wells. However, according to Table 6, depth to water measurements were conducted at only 433 wells. Please revise the Report to eliminate this discrepancy. If fewer than 462 measurements were taken, please explain what prevented the collection of water level data from the remaining wells.

Response: Groundwater elevation measurements were taken at all 462 monitoring wells, but only 433 results were presented in Table 6 because reference point elevations have not yet been surveyed at the remaining wells.

Comment 3: Section 4.4.1, Page 13 and Table 7: The Report states that "Table 7 summarizes the percent completion of field samples..." and Table 7 lists the percent fulfillment of the sampling objectives. However, the Report does not explain what the sampling objectives are, which parameters are evaluated and why the percent fulfillment for the TPH-P [total petroleum hydrocarbons purgeable] analysis was only 62 percent. For clarity, please revise the Report to address these issues.

Response: Future quarterly reports will be expanded to more completely describe the sampling objectives for all wells sampled. Percent fulfillment is a calculation of the number of wells proposed in sampling divided by the actual number of wells sampled.

Comment 3a: In addition, the percent fulfillment criterion is not discussed in the QAPP for the site. Instead, the criterion of completeness is discussed in the QAPP. Percent completeness is defined as “Number of useable sample results” divided by “Total number of sample results” multiplied by a factor of 100. However, the completeness criterion is not discussed in the report. The criterion of “fulfillment” as used in the report is not the same as “completeness.” Completeness is a measure of overall sampling program completion, whereas fulfillment takes into account only the fulfillment of QA/QC data collection requirements. Since completeness has not been discussed in the report, please revise the report to discuss the percent completeness achieved during the August 1999 sampling event.

Response: Future quarterly sampling reports will include a discussion of completeness.

Comment 4: **Section 4.4.1, Page 13:** The Report states that between June 21 and 24, 1999, “Fifty-seven samples were analyzed for VOCs...” However, Table 1 indicates that fifty-seven samples were analyzed for VOCs at the WATS and Table 2 indicates that forty-three samples were analyzed for VOCs at the EATS between June 21 and 24, 1999. For clarity please revise the Report to resolve this discrepancy.

Response: Section 4.4.1 should have indicated that a total of 100 samples were analyzed for VOCs.

Comment 5: **Section 5.2, Page 16:** The Report states that “An independent firm validated results to evaluate agreement with DQOs.” However, in the next paragraph it is stated that TtEMI “...completed full validation on 10 percent of the analytical data. One-hundred percent cursory validation was completed for the remaining VOC analyses.” A similar statement is made for the metals analyses on Page 16. On Page 17, the Report states that “For analytical results for metals, the independent firm completed the full and cursory validation...” It is unclear, which company performed the data validation, an independent firm or TtEMI as the Report states in Section 4.4.2 (Page 14) “The data packages were submitted to an independent validation firm.” Therefore, please revise the Report to clarify which company performed the data validation (include the name of the independent validation company) and clearly state which data deliverables were validated by which company.

Response: The full and cursory validation was completed by a third-party validation company. Future quarterly reports will include the name of the independent validation firm.

Comment 6: **Section 5.3.1.5, Page 20 and Table 11:** The Report states that “Table 11 summarizes the equipment rinsate results”. However, Table 11 only shows the results of one equipment rinsate (ERM-100). In addition, Table 11 shows that benzene, toluene and gasoline were detected in the rinsate blank. However, the Report does not address how detection of contaminants in the rinsate blank (and therefore presumably on the equipment used to collect a sample) can be avoided in the future. Therefore, please revise the Report to include all rinsate results in Table 11 and provide a discussion regarding how future contamination of equipment will be avoided.

Response: Table 11 shows only the compounds detected in the equipment rinsates. Future reports will include all equipment rinsate results, listed in Table 11, and a discussion of the results will be expanded to include a remedy on how to avoid future contamination.

Comment 7: **Section 5.4, Page 21:** The Report does not include a reference to the objectives of the August 1999 sampling event. For clarity, please revise the Report to indicate why the wells listed in Table 13 were sampled and what the analytical results will be used for.

Currently, the Report only references the samples listed in Table 13 by the sampling date which does not provide enough information regarding the evaluation criteria for these wells. For clarity, please revise the Report to indicate why the samples listed in Table 13 were collected as they are not part of the EATS or WATS monitoring program.

Response: Future reports will more clearly identify the sampling objectives for other wells monitored under the CLEAN program that are not related to WATS and EATS. Presentation of the data from these activities will likewise be more clearly segregated to minimize confusion.

Comment 8: **Tables 9 and 10:** Neither of these tables include results for the VOC analyses. Since VOCs are the main contaminants in groundwater at the Site, please revise the tables to include the QA/QC data evaluation for VOCs.

Response: The VOC data included in the August 1999 report were collected by International Technology Corporation (IT). TtEMI did not have access to the quality control portion of the data and could not discuss the quality of VOC data.

Comment 9: **Table 10:** The table lists "percentage of calculated RPDs [relative percent differences] greater than 25 percent" and lists 1% for PAHs and 50% of TPH-P. However, for PAHs only one of the 16 compounds was actually detected and, therefore, the RPD was only calculated for this one compound. As such, the entry in the column "percentage of calculated RPDs greater than 25 percent" should be 100% rather than 1%. Similarly, since only one of the two compounds was detected in the TPH-P analysis and, therefore, the RPD was only calculated for this compound, the entry in the column "percentage of calculated RPDs greater than 25 percent" should be 100% rather than 50%. Please revise Table 10 to correct this error. In addition, it would be helpful if Table 10 referenced Table 12 for additional information on the actual field duplicate concentrations and calculated RPDs. Therefore, please revise Table 10 to include a reference to Table 12.

Response: The RPDs were derived by calculating all the compounds in an analysis group. However, future quarterly reports will be revised and RPDs will be calculated on detected compound pairs. Table 10 will be revised to include a reference to Table 12.

Comment 9a: It appears that none of the field duplicate results met the QAPP acceptance criterion. Since 100% of the data failed to meet the RPD requirements, please revise the Report to provide an explanation as to why the field duplicate results varied to such a high degree. It may be appropriate to collect field duplicate samples from monitoring wells that are more highly contaminated so the RPD can be calculated for more compounds.

Response: During future quarterly sampling events, if data are available, the wells with concentrations in samples above detection limits will be used for duplicates.

Comment 10: **Figure 11:** The TCE concentration contours show two separate plume "fingers". However, Figure 11 of the "May 1999 Draft Quarterly Monitoring Report" dated October 4, 1999 shows only one continuous plume. The reason for separating the plume into two "fingers" appears to be the analytical results from samples collected at W9-33 and W9-8, which indicated that TCE was not detected above the reporting limit of 50 µg/l. However, it is inappropriate to assume that the concentrations detected at W9-33 and W9-8 were also below 10 µg/l (concentrations at these wells detected in May 1999 were 3,420 µg/l and 879 µg/l, respectively). If one-half of the detection limit is used for contouring TCE concentrations, then the "10 µg/l" contour will include W9-33 and W9-8 and the plume will be shown as one continuous plume. Therefore, please revise the Report to show one continuous TCE plume.

Response: All available data, including estimated values, are used in preparing the chemical concentration maps presented in the quarterly reports. Elevated detection limits are inevitable for samples that contain high levels of VOCs unless uncommon (and expensive) analytical methods are applied. However, future reports will consider high-level nondetect data more carefully, but plume shapes will not be modified from previous versions based on the nondetect values unless the data clearly warrant the change. Any such change made to a map will be highlighted in the report to alert the reader.

Comment 10a: In addition, it appears that the “10 µg/l” contour in Figure 11 should be closed to the north (south of WU4-15) since the concentration detected at WU4-15 is 5.7 µg/l and should not be included in the “between 10 µg/l and 100 µg/l” area. Therefore, please revise the Report to show a closed “10 µg/l” contour to the north.

Response: The 10 µg/L contour should have been drawn east of well WU4-15, but closure of the contour is a matter of professional judgment. In this case, the contour was maintained open based on prior knowledge of TCE concentrations north of the mapped area.

Comment 11: Figure 18: The figure shows groundwater contours and estimated capture zones. The capture zones drawn around EA1-1 and EA1-6 appear to be too large. The pump rate at EA1-6 has in the past been approximately 1 gallon per minute (gpm). The pump rate at EA1-1 has been less than 1 gpm. In addition, the contours drawn near these two extraction wells do not indicate that there is much of an effect on groundwater flow around these wells. Therefore, please revise the figure to indicate that the estimated capture zones are smaller than currently depicted around extraction wells EA1-1 and EA1-6.

Furthermore, the estimated capture zone around EA1-3 is drawn too far to the west. The groundwater flow contours do not support extending the estimated capture zone that far west. It appears that the capture zone should not include wells W56-1 and W9-1. Please revise the figure to exclude wells W56-1 and W9-1 from the area of the estimated capture zone around EA1-3.

In addition, the estimated capture zone around EA1-5 appears to be drawn too far to the east. The groundwater flow contours do not support extending the estimated capture zone that far. WU4-24 should not be included in the capture zone and the capture zone should join the EA1-2 capture zone near the 16-foot contour. Please revise the figure to indicate a smaller capture zone around EA1-5 to the east.

Lastly, the estimated capture zone around EA1-4 appears to be drawn too wide. EA1-4 has been pumping at less than 2 gpm. The 4-foot contour should not be drawn with such a “peak” towards the south. This contour line takes into account the water level measured at well 90A. However, the water level at well 90A was measured to be 3.01 feet which does not fit into the 4-foot and 5-foot contour intervals as currently drawn. Therefore, the water level measured at well 90A should not be used for contouring. Eliminating this water level measurement will have an effect on the 4-foot contour. The 4-foot contour will not “peak” towards the south any more. Redrawing the 4-foot contour will have an effect on the estimated capture zone. The capture zone will be narrower. Therefore, please revise the figure to redraw the 4-foot groundwater contour line and the size of the estimated capture zone around EA1-4.

Response: As discussed in the February 17, 2000, meeting between the Navy and EPA, these maps represent the Navy’s interpretations of conditions at MFA. In statements acknowledging limitations of the interpretations and the existence of alternate interpretations will be added to the report, but the maps will not be modified.

Comment 12: Figure 19: The -3-foot contour is not adequately drawn in the vicinity of well WSW-6 (there are actually two -3-foot contour lines shown). The -3-foot contour should be drawn more realistically (and due to the lack of data) as a smooth curving line from the area near well W3-11 to WU5-23. Please revise the Report to more adequately depict the location of the -3-foot contour.

In addition, the contours shown in the figure do not appear to be affected by the presence of the extraction wells, with the exception of contours near EXW-1. It is extremely difficult to estimate capture zones if the groundwater contours are not or only slightly affected. It appears that if the groundwater contours are not affected, capture zones are small. However, the capture zones depicted on the figure show a large area of influence. The Report should be revised to indicate substantially smaller capture zones since groundwater contours are not or only slightly affected (except for contours and the capture zone around EXW-1). The capture zone to the east of EXW-1 is drawn too large and should not include W7-13.

Furthermore, although, due to well efficiency considerations, the water level measured at an extraction well does not accurately reflect the water table in the surrounding aquifer, it should be indicated on the figure that the groundwater table around an extraction well is lowered. Therefore, please add circular contours around all extraction wells where the groundwater surface at the extraction well is lowered to below the depicted contour interval (that is, EXW-5, -4, -3, -2, and -1).

Response: As discussed in the February 17, 2000, meeting between the Navy and EPA, these maps represent the Navy's interpretations of conditions at MFA. In statements acknowledging limitations of the interpretations and the existence of alternate interpretations will be added to the report, but the maps will not be modified.

Comment 13: Figure 21: The TCE concentration contour that is added to this figure as a green line does not reflect the TCE concentration contour depicted in Figure 11. Please revise the Report to add the correct TCE concentration contours to Figure 21.

Response: This contour was a typographical error. Figure 21 should have included the TCE concentration contours shown on Figure 11.

Comment 14: In addition, as indicated in the figure, none of the four water level measurements around well REG-10B1 were used for contouring, but a capture zone around REG-10B1 was drawn. For clarity, please explain why water levels for wells REG-10B1, 78B1, 111B1, and 77B1 were not used for contouring since, with the exception of the water level measured at 77B1, the measurements appear to be realistic relative to each other. In addition, since none of the water level measurements were used for contouring, please delete the estimated capture zone drawn around REG-10B1 since it is not based on any data. Alternately, please use the data from wells REG-10B1, 78B1, and 111B1 and keep the estimated capture zone drawing.

Furthermore, it is almost impossible to draw a capture zone around REG-5B1 since the groundwater contours are not affected by this extraction well. However, if a capture zone is to be drawn, it should be shown as being perpendicular to the groundwater contours, which would indicate a different orientation of the capture zone than currently depicted in the figure (that is, the orientation is more to the west southwest).

The capture zones shown in the figure have not been drawn following standard capture zone determination methods which include drawing capture zones perpendicular to groundwater contours. Especially the capture zones drawn for wells REG-8B1 and REG-6B1 and parts of the capture zones drawn around REG-7B1 and EA2-2 do not follow the procedure for capture zone determination. Please revise the figure to include a better capture zone estimation for these wells.

Response: These maps represent the Navy's interpretations of conditions at MFA in statements acknowledging limitations of the interpretations and the existence of alternate interpretations will be added to the report, but the maps will not be modified.

Minor Comments

Comment 1: **Table 10:** Footnote "a" in this table references Section 5.3.2.2. However, the correct reference is Section 5.3.1.1. Please revise the Report to provide the correct reference in footnote "a".

Response: The correct reference is Section 5.3.1.1.

Comment 2: **Figure 22:** The figure shows the -3-foot contour as being perpendicular to the -2-foot contour. Since groundwater flow in this direction is highly unlikely, please revise the location of the -3-foot contour in Figure 22.

Response: This contour is a typographical error. The -3 contour should be deleted from the figure.

Comment 3: **Appendix A:** The figures in the appendix do not have grid lines (like they did in the May 1999 Draft Quarterly Monitoring Report) which would facilitate the review of the figures. For ease of review, please revise the figures to include grid lines.

Response: Grid line will be added to similar figures in future reports.

References

U.S. Environmental Protection Agency, 1989. *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Final Guidance.*

U.S. Environmental Protection Agency, 1992. *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Draft Addendum to Interim Final Guidance.*

Gilbert, Richard. 1987. *Statistical Methods for Environmental Pollution Monitoring.* Van Nostrand Reinhold, New York.

Tetra Tech EM Inc. 1997. *Final Quality Assurance Project Plan, Long-Term Groundwater Monitoring.*