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From: Commander, Western Division, Naval Facilities Engineering Command  
To: Distribution

Subj: DRAFT TANK AND SUMP REMOVAL SUMMARY REPORT AT NAS  
MOFFETT FIELD

Ref: (a) Draft Tank and Sump Removal Summary Report with Appendicies

Encl: (1) Response to Comments, Phase I Tank and Sump Removal and Well Installation  
Work Plans

1. Reference (a) has been provided to you under separate cover on 30 April 1991 from our contractor for your review. Please provide any comments no later than 30 May 1991. This submittal fulfills the FFA Attachment 4 "Summary Report for Tank and Sump" schedule requirement. Enclosure (1) is forwarded for your information and review.

2. If you should have any questions regarding this matter, the point of contact is Commander, Western Division, Naval Facilities Engineering Command (Attn: Mr. Stephen Chao, Code 1813SC, (415) 244-2552).

Sincerely,

original signed by:

RICHARD SERAYDARIAN  
Head, Installation Restoration Section

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**NAS MOFFETT FIELD TANK AND SUMP REMOVAL  
RESPONSE TO COMMENTS ON PHASE I TANK AND SUMP  
REMOVAL FIELD WORK PLAN, APRIL 27, 1990**

**INTRODUCTION**

This report presents point-by-point responses to comments received from regulatory agencies for the phase I tank and sump removal field work plan dated April 27, 1990 and the well installation activity memorandum dated August 13, 1990 for Naval Air Station (NAS) Moffett Field in Mountain View, California. Comments on the phase I tank and sump removal field work plan were received from Mr. Lewis Mitani of the U.S. Environmental Protection Agency (EPA) in a letter dated July 2, 1990 and from Ms. Lynn Nakashima of the California Department of Health Services (DHS) in a letter dated May 24, 1990. Comments on the well installation activity memorandum were received from Ms. Lynn Nakashima of DHS in a letter dated September 24, 1990. It should be emphasized that these comments relate to field activities that have already been completed. In general, responses refer to the draft tank and sump removal summary report dated April 30, 1991, for supporting information.

Comments from Mr. Lewis Mitani, U.S. Environmental Protection Agency

**GENERAL COMMENTS:**

Comment Number 1. Section 1.0 appears to be missing.

*Response: Section 1.0 of the field work plan, which discussed removal action objectives and report organization, was inadvertently omitted. Section 1.1 of the draft tank and sump removal summary report discusses removal action objectives.*

Comment Number 2. The tank removal process appears to have two phases. Phase I involves pit excavation, removal of tank contents, and tank removal. Phase II involves contaminant monitoring, soil excavation, and soil removal. The introduction and Sections 3.0 and 4.0 of the work plan should clearly present this two phase approach.

*Response: Although field work was done in steps, the work did not involve distinct phases. Field activities included removal of tank contents, excavation around the tank, tank and piping removal, soil and ground water sampling, additional excavation and sampling (if appropriate), backfilling, installation*

*and sampling of ground water monitoring wells, and site closure. Operations, in general, proceeded continuously from initial excavation activities to site closure. Individual subsections within Section 3.0 of the draft tank and sump removal summary report present the sequence of activities at each tank and sump.*

Comment Number 3. The draft work plan prepared by PRC Environmental Management, Inc. (PRC) is not consistent with the removal action plan (RAP) for Tanks 2, 14, 43, 53, 67, 68, and Sump 66, prepared by International Technology Corporation (IT). Page 4-5 of the RAP states that soil samples will be analyzed for volatile organic compounds (VOCs), pH, total petroleum hydrocarbons (TPH), metals, and semivolatile organic compounds (SVOCs). The draft work plan based analyte selection (for soil and ground water sampling) on the reported use of the tanks and analytical results for soil and ground water near the tanks. Soil and ground water in the vicinity of the tanks and sump should be analyzed for the parameters reported on page 4-5 and Table 32 of the RAP. This information should be included in the PRC tank removal work plan.

Also, the draft work plan is not consistent with the RAP for sampling the contents of the tanks and sump. On page 4-10 of this RAP a description of waste characterization of tank contents is given. The RAP states that tank contents will be analyzed for VOCs, SVOCs, pH, metals, specific conductivity, ions, total dissolved solids (TDS), and TPH. However, the text of the work plan does not mention waste characterization or describe sampling and analysis procedures for analyzing tank contents. This information should be presented in Section 4.2.2 of the draft work plan.

*Response: Soil, ground water, and other samples, including tank and sump liquids and sludges, were analyzed for a variety of constituents. The complete analyte list included all the compounds contained on page 4-5 of the RAP, with the exception of pH. Each sample was not analyzed for the complete analyte list. Each sample was analyzed for one or more of the analytes depending on the characteristics unique to each tank or sump. Decisions to reduce the suite of analytes at an individual tank or sump were based on discussions with NAS Moffett Field personnel and existing information concerning tank and sump contents and operating practices. Samples from tank and sump removal areas were not analyzed for pH because pH is useful only as a screening parameter*

*prior to waste disposal. Because all soil and water transported off-site was further analyzed for appropriate characteristics to ensure proper disposal, inclusion of pH in the analyte suite for all tank and sump samples was not necessary.*

*Specific conductance, ion content, and TDS of tank and sump contents were considered necessary only as screening parameters for disposal of liquids to a publicly owned treatment works (POTW). All tank and sump liquids were transported off-site and were further analyzed for appropriate characteristics to ensure proper disposal. Therefore, inclusion of specific conductance, ion content, and TDS in the analyte suite for all tank and sump liquid samples was not necessary.*

*Individual subsections within Section 4.0 of the draft tank and sump removal summary report contain a description of the soil and ground water sample analysis suite for samples from each tank and sump removal area. Sections 4.5, 4.10, and 4.11 also present the analysis suite for waste liquid and sludge samples collected from tanks and sumps.*

**SPECIFIC COMMENTS:**

Comment Number 1. Page 10, Paragraph 2, Section 2.3.1. This paragraph states that the volume of Tank 67 is 20,000 gallons. However, the RAP prepared by IT states that the volume of Tank 67 is 2,000 gallons. Which volume is correct?

*Response: The volume of Tank 67 was 20,000 gallons (see Section 3.6 of the draft tank and sump removal summary report).*

Comment Number 2. Page 18, Paragraph 1, Section 3.0. If waste characterization of tank contents will be performed, a description of the process should be included in this section. Results of the characterization should also be included in the draft and final interim summary report.

*Response: Sections 4.5, 4.10, and 4.11 of the draft tank and sump removal summary report contain analytical results for samples of tank and sump contents.*

Comment Number 3. Page 19, Paragraph 1, Section 3.1. Section 3.1, paragraph 2, page 18 of the work plan describes the minimum soil samples to be collected after tank removal and pit excavation. Paragraph 1, on page 19, describes two more samples will be collected at the ends of the excavation.

What is the definition of "ends," sides only or also the bottom of the excavation? Collection of soil samples after tank removal, pit excavation, and soil removal should include sampling the sides as well as the bottom of the excavation.

*Response:* *Individual subsections within Section 3.0 of the draft tank and sump removal summary report describe sample collection activities at each tank and sump removal area. Soil samples were collected from the walls of each excavation and, where possible, from the bottom of each excavation. However, the bottoms of many excavations were not sampled because of the presence of ground water. Sample locations were chosen based on worst-case, most-contaminated locations as determined by visual observations and photo-ionization detector (PID) measurements.*

Comment Number 4. Page 21, Table 2. This table should include the total depth and screened interval of each well. This information can be obtained from KJC reports and IT quarterly reports for NAS Moffett Field.

*Response:* *A summary table showing the well construction details of relevant existing wells near each tank location is presented along with figures showing the existing well locations in the phase I tank location well installation activity memorandum, dated August 13, 1990. Section 2.3 of the draft tank sump removal summary report presents well construction details for the 11 wells installed as part of the tank and sump investigations.*

Comment Number 5. Page 22, Paragraph 4, Section 3.3. Tank 2 is reported to be a hazardous waste tank. All hazardous waste tanks should be analyzed for the full suite of analytes presented on Table 2. Historical disposal practices on military installations are reported to have been haphazard, and mixtures of chemicals were indiscriminately disposed of down sumps, underground tanks, drains, etc. Analysis of Tank 2 samples should include priority pollutant metals.

*Response:*

*Individual subsections within Section 4.0 of the draft tank and sump removal summary report describe analysis suites for samples at each tank and sump removal area. Soil and ground water samples from Tanks 2, 43, and 68 and Sumps 60, 61, and 66 were analyzed for a full suite of analytes, including VOCs, SVOCs, TPH extractable as diesel, TPH purgeable as gasoline, and metals.*

Comment Number 6. Page 30, Paragraphs 1, 2, 3, and 4, Section 3.4. Ground water and soil samples from the area near Tank 53 (a former underground gasoline storage tank) should be analyzed for lead in addition to VOCs; benzene, toluene, ethylbenzene and xylene (BTEX); and TPH nonextractables.

It is recommended that samples for Sump 66, Tank 67, and Tank 68 be analyzed for SVOCs and metals. These tanks and sump were used for waste storage. Other wastes, besides the ones reported may have been disposed into these units. Analyses of tank contents would assist in determining the appropriate analytes for soil and ground water sampling. Without specific knowledge about the waste stored inside the tanks and sump, soil and ground water samples should be analyzed for all analytes presented in Table 2.

*Response:*

*Organic lead was not found at detectable levels in soil samples below Tank 53. However, soil and ground water samples from this area were tested for organic lead.*

*Soil and ground water samples taken during new well installation and ground water sampling near Tanks 2, 43, 67, and 68 were analyzed for metals. Samples from Tanks 2, 43, and 68 were analyzed for SVOCs. SVOCs were not tested for in samples near Tank 67 because they were not detected during tank removal activities. Sections 4.1, 4.3, 4.8, and 4.9 of the draft tank and sump removal summary report contain analytical results for soil and ground water samples from Tanks 2, 43, 67, and 68, respectively.*

Comment Number 7. Page 32, Paragraph 2, Section 4.2.1. The first sentence assumes surface material covering the top of tanks is uncontaminated. A rationale for this statement should be presented. In many instances fill pipes are exposed near the surface of underground storage tanks and visible evidence of surface contamination is present.

*Response:* Tank removal operations at NAS Moffett Field included visual and PID screening of materials covering and surrounding tanks and associated piping.

Comment Number 8. Page 32, Paragraph 3, Section 4.2.2. Will tank contents be sampled? How will sampling be performed and what analytes will be analyzed? Waste characterization will be required for proper disposal and/or treatment. Also see general comment 2.

*Response:* Tank contents were screened prior to disposal. Tank contents were sampled by lowering a Teflon bailer into the tank or by collecting a sample from the discharge hose as tank contents were pumped out. Sections 4.5, 4.10, and 4.11 of the draft tank and sump removal summary report list analyses performed on samples collected from tank and sump contents.

Comment Number 9. Page 32, Paragraph 5, Section 4.2.4. How will clean material be differentiated from contaminated material, this procedure should be described in this paragraph.

*Response:* Contaminated and uncontaminated materials were segregated into separate piles based on visual observations and PID measurements.

Comment Number 10. Page 33, Paragraph 4, Section 4.3. The volume of backfill used to bring the excavation up to grade should be included in the draft and final interim action summary report. This information will be required for soil volume estimates to be presented in the feasibility study. This information is important, especially if any soil contamination remains after the completion of this interim action.

*Response:* Sections 3.1, 3.2, 3.3, 3.5, and 3.6 of the draft tank and sump removal summary report describe the volume of material used to fill excavations for Tanks 2, 14, 43, 56A through 56D, and 67, respectively.

Comment Number 11. Page 33, Bullet 2. How will the PID be used to discern between source materials?

*Response:* PID measurements were not used to distinguish different source materials, but rather to determine if different source areas were present in the vicinity of an

*excavation. For example, PID measurements increasing away from a tank during continued excavation would indicate the presence of another contaminant source.*

Comment Number 12. Page 35, Section 4.6. Who will approve that gross contamination has been removed and that the excavation can be backfilled? This information should be reported in this section.

*Response: Representatives of the Santa Clara County Health Services Department approved backfilling of excavations. Mr. Wayne Yip and Ms. Nicole Jakoby observed tank excavation activities. Individual subsections within Section 3.0 of the draft tank sump removal summary report contain information concerning backfilling operations.*

Comment Number 13. Page 38, Paragraph 3, Section 4.9. If no immiscible fluids are observed, will a ground water sample be collected? This paragraph should be revised to clarify that floating product will be sampled in addition to sampling ground water from the aquifer formation.

*Response: No immiscible fluids were found during sampling of ground water monitoring wells installed near tank and sump removal areas. No samples of floating product were collected.*

Comment Number 14. Page 41, Section 4.11. Samples IDs should indicate where in the excavation (e.g. north wall, south wall, bottom, etc.) the soil samples will be collected.

*Response: Excavation soil samples were identified to indicate both the location within the excavation (direction and whether an excavating wall or floor sample) as well as the sample collection depth in feet below land surface (BLS). Section 4.11 of the field work plan describes the sample identification convention.*

Comments from Ms. Lynn Nakashima, California Department of Health Services

Comment Number 1. Section 1.0 is missing.

*Response: Section 1.0 of the field work plan, which discussed removal action objectives and report organization, was inadvertently omitted. Section 1.1 of the draft tank and sump removal summary report discusses removal action objectives.*

Comment Number 2. Page 20, Section 3.2.1.1. Well screen lengths should not exceed 10 feet unless approval is obtained from the regulatory agencies.

*Response: Table 1 of the draft tank and sump removal summary report lists screened intervals for monitoring wells installed near tank and sump removal areas. Only wells W56-1(A1) and W56-2(A1) have screens longer than 10 feet. Because of the high petroleum hydrocarbon concentrations measured in samples from the excavations for Tanks 56B, 56C, and 56D, screens for wells W56-1(A1) and W56-2(A1) were extended to include the saturated/unsaturated zone interface to allow monitoring for floating product. Wells W56-1(A1) and W56-2(A1) have screens which are 15 feet long. Well construction practices followed California state and Santa Clara Valley Water District guidelines.*

Comment Number 3. Page 21. Individual companies should be contacted if the depth of the wells cannot be determined from a literature search.

*Response: Well depth data are available from the IT phase I characterization report or recent IT quarterly reports for NAS Moffett Field. This issue does not affect the current well installation design. The comment is noted for future site activities.*

Comment Number 4. Page 22, Section 3.3, Paragraph 2. Eagle-Picher Environmental Services is not certified in the State of California to do TPH analysis. A California-certified lab must perform the work.

*Response: Eagle-Picher was certified by the state of California to do TPH analysis prior to receiving samples requiring TPH analysis.*

Comment Number 5. Page 35, Section 4.5. How will the free water in the open pits be sampled? How long after excavation of the tank will the sample be obtained?

*Response:* Section 4.5 of the field work plan and Section 2.2 of the draft tank and sump removal summary report discuss the methods used to sample ground water in open excavations. Ground water samples were usually collected within 24 hours of tank removal.

Comment Number 6. Page 19, Paragraph 2. The protocol for field screening the samples should be described.

*Response:* Field screening criteria included visual observation of discoloration, PID measurements, and presence of odor. Section 4.4 of the field work plan discusses screening criteria for soil samples.

Comment Number 7. Page 36, Section 4.7, Paragraph 2. Where will the decontamination of drilling augers and sampling equipment be done?

*Response:* Decontamination of augers and drilling equipment was performed at a centralized location determined after coordination with NAS Moffett Field personnel. The drilling equipment decontamination pad is located at the southern end of NAS Moffett Field near Building 146. Sampling equipment was decontaminated at each drilling site. All decontamination wastes were containerized for characterization and disposal.

Comment Number 8. Page 36, Section 4.8. All monitoring well locations must be surveyed and tied into the California Coordinate System.

*Response:* Monitoring well locations were surveyed and tied in to the California Coordinate System.

Comment Number 9. Page 36, Section 4.8. How will the drill cuttings be stored?

*Response:* Drill cuttings were stored in 55-gallon drums. Soil boring sample analysis results were used to determine proper disposal methods.

Comment Number 10. Page 36, Section 4.8. What type of drill rig will be used and what size hole and wells will be installed?

*Response:* A Central Mining Equipment (CME) series 55 hollow stem auger rig was used to drill and install all monitoring wells except slant well W68-1(A1). A CME series 75 hollow stem auger rig was used for well W68-1(A1). Appendix B of the draft tank and sump removal summary report contains boring and well diameter data for all monitoring wells installed as part of tank and sump removal activities.

Comment Number 11. Page 37, Paragraph 1. Explain why 0.020 inch (20 slot) screened casing is being used.

*Response:* Well screens with 0.01-inch slots (10 slot) were used for all monitoring wells because fine grained materials were present in the screened interval. Appendix B of the draft tank and sump removal summary report contains screen slot size data for all monitoring wells installed as part of tank and sump removal activities.

Comment Number 12. Page 37, Paragraph 2. Explain why a number 3 silica sand filter pack was chosen.

*Response:* Number 3 silica sand was used for sand filter packs in all monitoring wells because fine grained materials were present in the screened interval. Appendix B of the draft tank and sump removal report contains filter pack data for all monitoring wells installed as part of tank and sump removal activities.

Comment Number 13. Page 37, Paragraph 2. The annulus above the silica sand filter pack must be sealed with a 3 to 5 foot thick bentonite seal and not 1 to 2 feet.

*Response:* The shallow depth of the wells prevented use of a 3- to 5-foot thick bentonite seal. To place a minimally adequate 4-foot thick grout surface seal a 1- to 2-foot thick bentonite seal was used. Appendix B of the draft tank and sump removal summary report contains bentonite seal data for all monitoring well installed as part of tank and sump removal activities.

Comment Number 14. Page 37, Paragraph 4. Wells should not be developed by swabbing as that could lead to casing collapse or damage.

*Response:*                    *Monitoring wells were developed by surging followed by either bailing or pumping using an electric submersible pump. Section 2.3 of the draft tank and sump removal summary report discusses well development procedures.*

Comment Number 15. Page 38, Section 4.9, Paragraph 2. Explain why a porosity of 0.3 was assumed.

*Response:*                    *A porosity of 0.4 was assumed for filter pack materials. A value of 0.4 is based on published porosity ranges for unconsolidated sand (Freeze and Cherry, 1979, p. 37).*

Comment Number 16. Page 39. Will trip blanks be used as stated on page 57 of the quality assurance project plan (QAPJP)?

*Response:*                    *Trip blanks were used for ground water sample shipments.*

Comment Number 17. Page 42, Sample Labels. Change NSC Oakland to NAS Moffett Field.

*Response:*                    *Comment noted and incorporated.*

Comment Number 18. Page 43, Paragraph 4. Black electrical tape cannot be used to seal the cap to the sample container as sample contamination may occur.

*Response:*                    *No additional sealing materials (including black electrical tape) were used to seal ground water sample containers.*

Comment Number 19. Page 53, Table 4. What type of HNu tip will be used?

*Response:*                    *An HNu PID with either a 10.2 or 11.7 electron volt (eV) lamp was used during tank and sump removal field activities.*

Comment Number 20. Page 63, Health and Safety Plan. Have work cycles been determined in order to avoid heat stress?

*Response:*                    *Work cycles during tank and sump removal field activities were scheduled to minimize the impact of heat stress on field personnel. Modifications to field operating procedures incorporating more frequent rest breaks and increased fluid intake were implemented when air temperatures exceeded about 80°F.*

Comment Number 21. Health and Safety Plan, Page 11. Citing that an EPA guidance will be followed during decontamination procedures is not adequate. The specific tasks that personnel are responsible for must be outlined, as well as the physical locations of the tasks (in which exclusion zone).

*Response: Decontamination procedures are described in detail in Section 4.12 of the field work plan. Exclusion zones were determined in the field for each drilling location, before activities commenced.*

Comment Number 22. Health and Safety Plan, Page 11. The protocol used for the wipe samples should be explained as well as how the results will be interpreted.

*Response: An error was made in the health and safety plan. No equipment wipe samples were taken.*

Comment Number 23. Health and Safety Plan, Page 13. El Camino Hospital is located on Grant Road, not Grand Road.

*Response: Comment noted and incorporated.*

**NAS MOFFETT FIELD TANK AND SUMP REMOVAL  
RESPONSE TO COMMENTS ON PHASE I TANK LOCATION WELL  
INSTALLATION ACTIVITIES MEMORANDUM, AUGUST 13, 1990**

Comments from Ms. Lynn Nakashima, California Department of Health Services

Comment Number 1. All monitoring wells should be inspected each time there is a sampling event, or at a minimum of one year intervals. Monitoring wells that are not constructed according to the specification outlined in the California DHS Decision Tree Manual should be subjected to frequent inspections.

*Response: Monitoring wells were constructed according to the specifications described in the California DHS Decision Tree Manual. All monitoring wells will be inspected during quarterly or semiannual sampling events.*

Comment Number 2. Since further sampling is proposed in this response, sample analyses from the tank removals should also be presented.

*Response: Individual subsections within Section 4.0 of the draft tank and sump removal summary report present results from analyses of tank and sump soil and ground water samples.*

Comment Number 3. Page 1, Paragraph 2. The statement that "soil samples from the sump area did not contain contaminants" needs to be clarified. Does this mean that the laboratory analyses were non-detectable?

*Response: Section 4.12 of the draft tank and sump removal summary report presents the analytical results of soil samples collected from the Sump 66 excavation. These results indicated low contaminant concentrations.*

Comment Number 4. Page 2, Paragraph 4. The rationale for proposing that the monitoring well near Tank 68 be installed at a 45 degree slant needs to be expanded. This should include explaining, at a minimum, why a vertical well downgradient would not provide the same information. In addition, a description of how the well will be installed should be included as well as how water level measurements will be obtained from a slanted well.

*Response:* Well W68-1(A1) was installed at a 45° angle to sample soils immediately beneath Tank 68 as well as monitoring ground water beneath the tank. A vertical well downgradient of Tank 68 would not allow investigation of potential soil contamination beneath Tank 68. In addition, the proximity of Building 88 to Tank 68 prevented installation of a vertical well downgradient of Tank 68. Water level measurements in well W68-1(A1) were made using the same equipment and procedures as the other wells installed near tank and sump removal areas.

Comment Number 5. Page 3, Paragraph 1. The location of the piping trench areas should be indicated on Figure 2.

*Response:* Figures 3 and 5 in the draft tank and sump removal summary report indicate the locations of piping trenches near Tanks 2 and 43.

Comment Number 6. Attachment 1, Response to DHS comment Number 18. It is unacceptable to seal sample containers with black electrical tape. Cross contamination has been known to occur when volatile aromatic organic compound (VOA) vials are sealed with electrical tape. The containers may only be sealed with custody tape for purposes of chain of custody.

*Response:* No additional sealing materials (including black electrical tape) were used to seal ground water sample containers.