

February 4, 1994



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Western Division (WESTDIV)
Naval Facilities Engineering Command
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Subject: Response to Comments on Naval Air Station (NAS) Moffett Field Operable Unit 1 (OU1) Draft Feasibility Study Report and Proposed Plan

Dear Camille and Stephen:

Enclosed are PRC Environmental Management, Inc.'s (PRC's) responses to comments by the U.S. Environmental Protection Agency (EPA), Regional Water Quality Control Board (RWQCB), and Silicon Valley Toxics Coalition (SVTC) on the NAS Moffett Field Draft Feasibility Study (FS) Report and Proposed Plan, dated April 27, 1993. The comments have been incorporated into the OU1 Draft Final FS Report and Proposed Plan, submitted February 1, 1994. For ease of reference, the enclosure provides each comment followed by a PRC response.

If you have any questions, please call us at (303) 295-1101.

Sincerely,

Thomas J. Peters
Project Engineer

For Joshua D. Marvil
Project Manager

TJP/tjp

cc: Michael Gill, EPA (4 copies)
Elizabeth Adams, RWQCB
Joseph Chou, DTSC
Kenneth Eichstaedt, URS
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NAVAL AIR STATION MOFFETT FIELD OU1 FS

RESPONSE TO COMMENTS DRAFT FEASIBILITY STUDY REPORT

1.0 INTRODUCTION

This report provides PRC Environmental Management Inc.'s (PRC's) responses to U.S. Environmental Protection Agency (EPA) comments, Regional Water Quality Control Board (RWQCB) comments, and Silicon Valley Toxics Coalition (SVTC) comments on the Operable Unit 1 (OU1) Draft Feasibility Study (FS) Report and Proposed Plan dated April 27, 1993. The comments are incorporated into the Draft-Final OU1 FS Report and Proposed Plan, dated February 1, 1994. The draft FS report developed remedial alternatives that address landfill refuse and landfill gas for the two landfills at OU1. Any groundwater contaminated by the landfills was previously included under OU5 remedial investigation and feasibility study (RI/FS) activities (OU5 is defined as the east side aquifers). However, the Draft-Final FS now addresses groundwater surrounding the landfills, as well as landfill refuse, leachate, and landfill gas.

2.0 RESPONSE TO COMMENTS ON THE DRAFT FS REPORT

2.1 Comments from Elizabeth Adams, RWQCB

GENERAL COMMENTS

Comment 1: The fact that soil, leachate and groundwater at the landfill sites have been separated into two different operable unit remedial investigation (RI) and feasibility study (FS) reports makes it very difficult for the Regional Water Quality Control Board (RWQCB) staff to successfully evaluate the conditions of the landfill. We cannot accept this FS for the soils at operable unit (OU) 1 because it has not been sufficiently proven to our agency, through a comprehensive and technical evaluation of all the available data, that the leachate is not impacting groundwater. Until this question is successfully answered, we will not approve the suggested design of a two foot loam cap for the landfills at Sites 1 and 2, and passive gas collection at Site 1.

Response: OU1 has been redefined to include surrounding groundwater. This allows OU1 documents to be comprehensive and address all potentially contaminated media

resulting from the landfills. The draft final FS includes a technical evaluation of groundwater data from monitoring wells around the perimeter of Sites 1 and 2, as well as adjacent surface water and sediment. The technical evaluation includes information obtained during a FS field investigation conducted in September 1993, as well as data from previous RI reports.

Comment 2: Infiltration has the potential to increase mounding in the landfill forcing leachate to move radially and vertically which can potentially impact surrounding groundwater.

Response: *One of the goals of the additional field investigation was to further investigate the apparent mounding at Site 1. The results are included in the Additional OUI Field Investigation Technical Memorandum. To summarize, the investigation concluded that elevated water levels did exist in a few leachate wells. However, historical data indicates that the leachate in these areas is perched and isolated in the refuse and not hydraulically connected to the surrounding leachate or aquifer. The leachate in these areas is merely suspended in refuse and not increasing hydrostatic pressure at landfill boundaries and causing outward and downward migration. In addition, upward vertical gradients have been observed at Site 1. These results and conclusions have been incorporated into the draft final OUI FS.*

Comment 3: An additional concern is that a loam cap will not protect ecological receptors, both deep rooted plants and the burrowing animals which have been documented to reside in these areas from potential contact with contaminated soils. Any cap designed for these landfills should restrict rodents and burrowing owls from attaining access to the contaminated soils below.

Response: *Information from the draft site-wide ecological assessment (SWEA) has been incorporated into the OUI FS. Burrowing will be discouraged through O&M, but, if necessary, the cap design can include a "biotic barrier" to impede burrowing animals or deep rooted plants. The SWEA underway will provide the justification for including this layer. The layer could be added during the remedial design for OUI.*

Comment 4: There needs to be a technical discussion of the potential for contaminants in the soils to leach into the saturated zones of the fill. Infiltration from the surface will tend to increase the likelihood for contaminants to further leach from the soil. Has there been any modeling or geochemical evaluation of the leachate characteristics, the soil contamination and annual rainfall and other surface water sources which would affect the mobility of contaminants in the soil?

Response: *A quantitative technical discussion of the potential for contaminants in the soil to leach into the saturated zones of the fill has not been included. Modeling leaching potential based on contaminants found in landfill soils has little practical use because an underlying assumption has to be made that the landfill refuse is accurately characterized, which is questionable assumption at best. The heterogeneity of*

contaminant distribution and types makes accurate characterization of landfill refuse an impractical and virtually impossible task. Landfill investigations typically focus on evaluating contaminant releases outside landfill boundaries (for example, into surrounding groundwater).

The draft final FS, however, includes modeling to determine relative amount of water that infiltrates into refuse as a function of cap design. Local precipitation, temperature, and solar radiation data are used in the model. This modeling was conducted to assist in comparing remedial alternatives based on NCP evaluation criteria.

Comment 5: From the data available from the OU1 and OU5 RI, it is evident that the leachate at these landfills are contaminated. The leachate will continue to act as a source which potentially can impact surrounding groundwater, therefore the San Francisco Bay Regional Water Quality Control Board will require adequate corrective actions in accordance with Chapter 15, Title 23, California Code of Regulations. The corrective action which should be considered in the FS is a containment system including a cap which prevents infiltration and hydraulic control and treatment of the leachate. The remedial design and implementation of this landfill closure will require the groundwater, leachate and soils at the landfills to be reviewed and evaluated together. It is common to dewater the waste prior to placing a cap on a landfill because the weight of the cap will potentially force leachate into surrounding groundwater. Dewatering the waste will also allow the fill material to compress and thus reduce the potential for future differential settlement. As part of the hydraulic control the water level should be kept low to create a separation between the waste and the groundwater. The bottom of the landfills are probably not a homogeneous layer of clay due to the nature of the sand, silt and gravel lenses and channels throughout the subsurface. It is important to determine the hydrology of the areas before a remedial design is implemented. Do the wells surrounding either landfill show any tidal fluctuations? What is the impact of the adjacent diked marsh and surface water on the hydrology of the landfills? Is there a gradient upwards from the A-2 aquifer to the A-1? These are technical issues which need to be addressed in choosing the correct type of cap and the necessary containment system.

Response: The draft final FS has been revised to include an evaluation of leachate impacts on surrounding groundwater. The evaluation includes data analysis, hydrogeology discussion, surface water influences, vertical gradients, applicable or relevant and appropriate requirements (ARARs), risk assessment, and hydrologic modeling. The remedial action selection process considers all the above input.

SPECIFIC COMMENTS

Comment 6: Page 1, Paragraph 1: Please specify what is meant by "landfill contents." Does this include leachate?

Response: The text has been revised and does not refer to landfill content as a media. Landfill refuse and leachate are discussed.

Comment 7: Page 3, Paragraph 2: As discussed in the general comments, the scope of the OU1 FS can not be separated from the evaluation of pathways between the landfill soils and contents and the surrounding groundwater. The type of cap will depend on the containment measures necessary to isolate leachate contamination from the surrounding groundwater.

Response: The scope of the FS has been expanded to include surrounding groundwater.

Comment 8: Page 32, Paragraph 3: Polychlorinated biphenyls (PCBs) were detected in the sediment samples collected in the Navy Channel near the outfall from Building 191. The presence of PCBs in this area may be due to the proximity of the Site 2 landfill and the infiltration of groundwater and sediments into the storm sewer system. These data are contrary to the statements in the text that no PCBs have been found in sediment samples.

Response: The text in the Draft-Final FS has been revised to state that PCBs have been detected in sediments in the Navy Channel. In addition, one of the goals of the additional investigation conducted during September of 1993 was to evaluate the Site 2 landfill as a potential source of the PCBs found in Navy Channel sediment. The conclusions of the investigation have been incorporated into the FS.

Comment 9: Page 37, Paragraph 2: The existence of a surface water body to the west does not minimize the potentially adverse effects of the methane migration from Site 1. In addition, the surface water body is seasonal and may not always be a barrier.

Response: The text has been revised to state that, when present, the surface water body will impede gas migration. In addition, surface water bodies preclude the existence of structures where gas can accumulate.

Comment 10: Section 1.4: The use of an occupational exposure scenario for the landfills has not been formally accepted by the regulatory agencies. As the present economic turmoil in our country unfolds it does not seem wise to count on the continued operation of government facilities, especially a primarily research facility such as NASA, for even the next ten years. In addition, evaluation of the risk at these landfills based on only potential exposures to humans is inappropriate due to the location of these landfills. There are many more ecological receptors in these areas than there are human. And though a fence can keep out humans it is impossible to control the migration of borrowing animals into the landfill areas. Any remedial design for these landfills should be protective of both human health and the environment.

Response: Using a residential exposure scenario for landfill refuse instead of an occupational exposure scenario would have no impact on the remedial alternative selected for landfill refuse. The landfill caps combined with deed restrictions would effectively reduce risks in either scenario.

For surrounding groundwater, total dissolved solids (TDS) levels preclude residential use. The risk assessment included in the draft final FS assumes the groundwater could be used for irrigation, even though aquifer characteristics, probable land use, and past problems with shallow aquifer pumping dictate otherwise.

Information from the draft SWEA has been incorporated into the OUI FS. Burrowing will be discouraged through O&M, but, if necessary, the cap design can include a "biotic barrier", to impede burrowing animals or deep rooted plants. The SWEA currently being conducted will provide the justification for the inclusion of this layer.

Comment 11: Page 39, Paragraph 1: The inconsistencies between the constituents detected in the soil gas and the contaminants found in the soil and leachate seems to indicate that further investigative work should be conducted. Is the Navy satisfied with the results of the past sampling effort? Will there be any confirmatory sampling during the remedial design phase?

Response: The Navy does not agree that inconsistencies between constituents detected in leachate, refuse, and landfill gas warrant further investigation due to the inherent heterogeneity associated with landfills. No confirmatory sampling is planned for the remedial design phase due to constituent inconsistencies. These data are not required to design a containment system for the landfills.

Comment 12: Page 44, Paragraph 2: The last ARAR waiver described in this section is applicable to EPA fund financed sites only, not to federal facilities.

Response: The above-referenced ARAR waiver has been deleted from the text.

Comment 13: Page 45, Paragraph 3: Chemical-specific State ARARs do exist for hazardous waste classification in Title 22. However, even if waste is classified below these threshold values, the landfill contents can still be classified as designated wastes under Title 23, Chapter 15.

Response: The text has been revised to include these potential ARARs. However, waste classification will not be necessary unless excavation, treatment, and disposal of refuse occurs. Therefore, these are potential action-specific ARARs and are listed in the FS as potential action-specific ARARs.

Comment 14: Pages 46-47: Conclusions as to how the Bay Area Air Quality Management District

(BAAQMD) will respond to the Air SWAT report is premature. The Navy should attempt to contact the agency to find out the results of their review before a final design is chosen. According to BAAQMD testing guidelines, any migration of methane gases offsite above 5%, as seen in one of the gas monitoring wells, needs to be reported to the State Integrated Waste Management Board.

Response: The text was revised to state that the Navy contacted BAAQMD and they indicated that no action will likely be recommended for the landfills. All gas concentrations have been reported to the BAAQMD.

Comment 15: Pages 48 and 49, Table 1: The following location-specific ARARs should be added to this list: Water Quality Control Plan San Francisco Bay Basin Region 2, California Enclosed Bays and Estuaries Plan, California Inland Surface Waters Plan, State Board Resolution 68-16 "Statement of Policy with Respect to Maintaining High Quality Waters in California: and California Water Code, Division 7, Section 13000, the Porter-Cologne Water Quality Control Act.

Response: Water Quality Control Plan San Francisco Bay Basin Region 2, State Board Resolution 68-16, and 23 California Code of Regulations (CCR), Division 3, Chapter 15 are included in the FS as potential chemical-specific ARARs. The California Enclosed Bays and Estuaries Plan and California Inland Surface Waters Plan are included in the FS as action-specific ARARs.

Comment 16: Page 51, Section 1.5.3: Other State requirements for landfill closures which should be included in the ARAR list is Title 23, California Code of Regulations, Division 3, Chapter 15 and State Board Resolution 92-49 which establishes policies and procedures for clean up of all waste discharged and restoration of affected water to background conditions, in effect to water quality that existed before the discharge.

Response: The potential ARARs listed above have been added to the FS and are evaluated.

Comment 17: Page 58, Paragraph 4: What is the rationale for concluding that the gas migration from Site 1 will not increase?

Response: Refuse decomposition, and therefore gas generation and migration, is dependent on refuse makeup, moisture content, temperature, and landfill age. If moisture content is not altered significantly (that is, the refuse is not dewatered), decomposition will gradually decrease as landfill age increases, and so will landfill gas generation. The text has been revised to include this rationale.

Comment 18: Page 66, Paragraph 4: This agency does not concur with the opinion that minimizing infiltration and leachate migration are not remedial action objectives.

Response: The remedial action objectives (RAOs) have been revised to reflect the addition of surrounding groundwater into the scope of OUI. Minimizing infiltration and migration is listed as an RAO in the draft final FS.

Comment 19: Page 77, Paragraph 1: The loam cap will not protect deep rooted plants or borrowing animals from the methane gas or the contaminants in the soil.

Response: Methane gas is not currently affecting the vegetation at the OUI landfills. Burrowing will be discouraged through O&M or, if necessary, through the inclusion of a biotic barrier in the landfill cap design.

Comment 20: Page 80, Paragraph 4: Where will the methane monitoring wells be placed? Please include a figure which shows their locations.

Response: Permanent gas monitoring wells will be located at the landfill boundary. The lateral spacing will not exceed 1,000 feet, as specified in 14 CCR 17783. The exact locations will be determined during the remedial design phase.

Comment 21: Page 86: Reduction in contaminant mobility is a criteria which applies to these landfills contrary to what is stated here. The RWQCB is concerned about the potential for infiltration through the loam cap to impact groundwater, and this FS report states in Section 2.1 that reducing erosion and mobility of soil contaminants through rain and wind is a remedial objective.

Response: This section refers to EPA's preference toward reduction in contaminant mobility through treatment. Since landfill refuse will be contained, not treated, this preference is not relevant to this FS.

Comment 22: Page 103, Paragraph 2: What other types of long term operations and maintenance (O&M) will be required to keep the vegetation alive? Periodic watering of the vegetation will add to the infiltration rate if a permeable cap is in place.

Response: Native vegetation will be planted so that frequent watering will not be required. In addition, thick soil caps can store moisture to help sustain vegetation through dry periods. Any erosion that does occur can be addressed through cap O&M. Additionally, vegetation is currently sustained at the landfills without periodic watering.

Comment 23: Page 103, Paragraph 2: With Alternative 2, the cap without the gas venting layer, the Navy will need to finance additional soil layers, grading and reseeded of vegetation forever. Does the Navy really want to finance long term O&M since this is a closing Base.

Response: The comment has been noted. Currently, methane is not adversely affecting vegetation growth.

Comment 24: Page 104: The choice of Alternative 2 (loam soil cap and trench vent) is not acceptable to this agency until further evaluation of the leachate and groundwater contamination is concluded. The contaminants presently found within the leachate are significant enough to require a containment system, which would mandate an impermeable cap, dewatering of the waste and a leachate collection system.

Response: The draft final FS has been revised to include a detailed evaluation of leachate impact on surrounding groundwater. The evaluation includes data analysis, hydrogeology discussion, surface water influences, vertical gradients, ARARs, risk assessments, and hydrologic water balance modeling. The remedial action selection process considers all the above input.

2.2 Comments from Michael Gill, EPA

GENERAL COMMENTS

Comment 25: The ARAR analysis fails to identify and analyze distinct action-specific ARARs. The OU1 FS report fails to specifically identify and analyze the requirements applicable to landfill capping and landfill gas collection. These ARARs will form the regulatory design requirements which must be addressed in the remedial design.

Response: The detailed ARAR analysis has been included as suggested in Appendix J of the draft final FS.

Comment 26: An industrial scenario was assigned for the future use of Moffett Field. As discussed at the Moffett RPM meeting of 5/28/93, EPA feels that performing both residential and industrial scenario remedy analyses is cost effective in the long run for projects of this size. These analyses are necessary before final remedy selection can be made. No one can realistically predict what the long term future use of the station will be and if residential cleanup goals can be met without greatly increased costs, then that remedy may be considered.

Response: Using a residential exposure scenario for landfill refuse instead of an occupational exposure scenario would have no impact on the remedial alternative selected for landfill refuse (that is, capping and deed restrictions). The landfill caps combined with deed restrictions would effectively reduce risks in either scenario.

For surrounding groundwater, TDS levels preclude residential use. The risk assessment included in the draft final FS assumes the groundwater could be used for

irrigation, even though aquifer characteristics, probable land use, and past problems with shallow aquifer pumping dictate otherwise.

Comment 27: Odorous methane emissions are not discussed in the FS report. Selection of appropriate remedial actions for containing, collecting, and treating landfill gas should address odorous emissions.

Response: Methane is an odorless gas, although, it is possible that the gas can contain slight odor from refuse. However, odorous emissions have not been reported during field activities at the landfill. The text in the FS has been revised to state that odorous landfill gas emissions are not evident at the landfill and therefore, limiting odorous emissions is not an RAO.

Comment 28: "The OU1 RI results indicate that these characteristics are shared by the OU1 landfills" (page 54). The characteristics mentioned here refer to the assumption that National Priority List (NPL) landfill sites typically contain a combination of primarily municipal wastes and smaller amounts of hazardous wastes. This statement was used to justify the use of EPA guidance *Conducting RI/FS for CERCLA Municipal Landfill Sites*, for the OU1 landfills. It appears that large quantities of hazardous wastes were sent to these landfills; the quantities of solvents are not low. Is it not necessary to perform removals at the highest concentration areas? Even though landfill gas pathways apparently don't exist, the Navy may need to consider other pathways (e.g. soils).

Response: Soil chemical data and leachate chemical data do not suggest that large amounts of hazardous waste was disposed of in the landfill. The chemical data indicates that disposal amounts have been overestimated. In addition, borelogs from the landfills indicate that large amounts of construction debris exist at the landfills. No hot spots are apparent that would require excavation. The text has been revised accordingly.

Comment 29: "The draft OU5 RI report and the draft final OU1 RI report indicate that contaminant migration from the landfills is not significant and surrounding groundwater has not been affected. In addition, risks associated with groundwater contamination at Sites 1 and 2 are below acceptable ranges (page 56). These statements were used to justify the elimination of multi-layer capping as a containment process option. Groundwater monitoring should verify OU1 landfills are not contributing to groundwater contamination.

Response: The text clarifies that groundwater monitoring data has been included to evaluate the landfills impacts on surrounding groundwater.

Comment 30: "Methane was not detected in any other perimeter Site 1 landfill gas monitoring wells (LGMWs), including LGMW 1-2, which is south of LGMW 1-3. This indicates that

migration is limited in the western direction. In addition, the areas west and north of the landfill (and west of LGMW 1-3) consists of a storm water retention pond, a marsh area, and wetlands." (page 80) These statements were used to justify a trench vent only along the western boundary of the Site 1 landfill. Landfill gas monitoring of the Site 1 landfill should verify landfill gas is not migrating in any other direction.

Response: The text has been clarified to state that landfill gas monitoring well data has been used to verify that landfill gas is not migrating to the south and to the north. The landfill gas monitoring well spacing currently meets applicable gas monitoring regulations. However, more wells may be placed along the southern border of Site 1. Well positioning will be evaluated during the RD. Landfill gas monitoring is not required to the north or to the east due to the presence of large water bodies. There are no structures in these directions where methane could accumulate.

Comment 31: "Methane was not detected inside Site 2 landfill boundaries which indicates that Site 2 is no longer generating methane." (page 81) This statement was used to justify the elimination of Alternative 3 (soil cap, trench vent, and passive gas vent layer) at the Site 2 landfill. Landfill gas monitoring of the Site 2 landfill should verify landfill gas is no longer being generated in the Site 2 landfill.

Response: The text has been clarified to state that landfill gas monitoring well data has been used to verify that landfill gas is not migrating at Site 2.

Comment 32: It is mentioned at least 5 times throughout the text that the OU1 RI is not finalized (pages 17, 27, 75, 84, 104). It was finalized on June 7, 1993. Any RI changes affecting the FS should be incorporated in the FS.

Response: Any RI changes that impact the FS have been incorporated.

Comment 33: Pursuant to 40 Code of Federal Regulations (CFR) §300.430(e)(3)(i), a range of alternatives should be developed that includes "an alternative that removes or destroys hazardous substances, pollutants, or contaminants to the maximum extent feasible." These alternatives (e.g. excavation, more types of caps) need to be considered in the FS.

Response: The FS has been prepared in accordance with "Conducting RI/FS for CERCLA Municipal Landfill Sites" (EPA/540/P-191/001), which recommends a streamlined approach to landfill remedial alternative selection. The guidance states that it is not necessary to develop a large range of alternatives.

Comment 34: The Record of Decision on this OU should not be written until the groundwater problem at OU5 is defined. Although it appears that the soon to be adopted federal facilities agreement (FFA) amendment schedule covers this possibility, the Navy

should be aware of this as a potential problem. It is possible that OU1 source control measures may be necessary prior to the definition of a possible OU5 groundwater problem. It may also be that OU1 remedial action (e.g. installation of a cap) would have to be removed once the groundwater problems at OU5 are defined. Pursuant to 40 CFR §300.430(a)(1)(ii)(B), "Operable units, including interim action operable units, should not be inconsistent with, nor preclude implementation of the expected final remedy." A possible way to avoid inconsistency and unnecessary work may be to delay the OU1 ROD until the OU5 ROD is due.

Response: The scope of the FS has been expanded to include surrounding groundwater.

Comment 35: The authors failed to document whether or not the quality of laboratory data used in the risk assessment and comparison of remedial alternatives was known or considered before the recommendations presented in the FS were made. Section 2.4 of the RI documents that all data used in the site characterization were reviewed and considered valid for the purpose of site characterization. There is no mention in either the draft FS or in section 2.4 of the RI, however, as to whether the data used in the risk assessment were judged to be valid for risk assessment purposes.

Response: The OUI RI and the associated baseline risk assessment (BRA) have been approved.

SPECIFIC COMMENTS:

Comment 36: Section 1.2.3.2 (Remedial Investigations), Paragraph 3, Page 9: The statement that reads "remediation of the west side aquifers (formerly OU4) will be addressed by the MEW companies" should be reworded to read "remediation of the west side aquifers (formerly OU4) will be addressed according to the MEW ROD."

Response: The text has been reworded as suggested.

Comment 37: Section 1.4.2 (Identification of Exposure Pathways), Paragraph 2, page 39: Remove the sentence "Direct exposure pathways to landfill groundwater are considered incomplete for both current receptor populations because the landfill groundwater at Sites 1 and 2 is not extracted for use." Possible sources of drinking water need not be discussed here.

Response: The comment has been noted.

Comment 38: Section 1.5.2 (Location-Specific ARARs), Table 1: One additional location-specific ARAR should be included for completeness of this assessment. It is not very likely that this requirement is or will be applicable, but it should be included for completeness.

| Location | Requirement | Citation | Applicability |
|--|--|--|---|
| Within area where action may cause irreparable harm, loss, or destruction of significant artifacts | Action to recover and preserve artifacts | National Archaeological and Historical Preservation Act (16 USC Section 469); 36 CFR Part 65 | Should scientific, prehistorical, or historical artifacts be found at the site, this will become applicable |

Response: The potential location-specific ARAR has been included as requested.

Comment 39: Section 1.5.3 (Action-Specific ARARs), Paragraph 3, page 51: Resource Conservation and Recovery Act (RCRA) Subtitle C may be an ARAR if no excavation does occur. The Navy should further investigate whether closure requirements for hazardous waste units may be an ARAR for these sites. For example, how would a cap meet the listed ARARs? How would the gas emission system meet ARARs (e.g. Air Quality Management District regulations)?

Response: RCRA Subtitle C has been considered in the FS as an action-specific ARAR.

Comment 40: Section 1.5.3 (Action-Specific ARARs), Table 2: It is generally not acceptable to cite entire sections of state or federal regulations. Citing entire regulatory sections does not demonstrate a complete understanding of the specific requirements related to landfill capping and landfill gas collection and treatment.

This FS identifies EPA guidance Conduction RI/FS for CERCLA Municipal Landfill Sites as a reference. At a minimum, the ARAR analysis should start with the potential action-specific ARARs identified in Table 5-3 of this reference. Even if these potential action-specific requirements are not applicable or relevant and appropriate, the FS should explain why they are not ARARs at this site. The ARAR analysis should include the following actions: capping, closure with waste in place, gas collection, surface water control, and treatment.

Response: The ARAR analysis has been revised as suggested.

Comment 41: Section 1.5.3 (Action-Specific ARARs), page 53: Clean Air Act (CAA) Section 101 and 40 CFR 52 (preparation of fugitive and odor emission control plan) is a potential action specific ARAR for landfill gas. Please provide an analysis in the FS which evaluates the potential for odorous emissions and the need for this plan.

Response: Methane is an odorless gas, although, it is possible that the gas can contain slight odor from refuse. Odorous emissions have not been reported during field activities at the landfill. However, the text has been revised to include the above-referenced

potential ARAR.

Comment 42: Section 2.1 (Remedial Action Objectives), page 56: Methane gas venting to the atmosphere can also cause an odor problem. Controlling odorous emissions should be evaluated as a possible remedial action objective (RAO) for landfill gas.

Response: Methane is an odorless gas, although, it is possible that the gas can contain slight odor from refuse. However, odorous emissions have not been reported during field activities at the landfill. Therefore, the text has been clarified to explain that controlling odorous emissions is not an RAO.

Comment 43. Section 3.1.1.3 (Capping), page 66: A third type of cap should have been discussed, single barrier caps. The main functions of a single barrier landfill cap are to reduce surface infiltration, prevent direct contact, limit gas emissions, and control erosion (EPA 1991). Since native soil covers are not an effective barrier for gaseous emissions, single barrier caps should be included in this section. A discussion should be added in the section which addresses the need to control odorous emissions.

Response: A discussion has been added which addresses the need to control odorous emissions.

Comment 44: Section 3.1.2.3 (Active Gas Control Actions), page 71: One of the reasons active gas control actions were eliminated from further evaluation is that "no severe odors have been identified at NAS Moffett Field near Sites 1 and 2." Please quantify the term "severe." Please describe the non-severe odors at NAS Moffett Field near Sites 1 and 2.

Response: The text has been revised to state that no landfill gas odors have been reported at Sites 1 and 2.

Comment 45: Section 3.1.2.4 (Treatment Actions) pages 72 and 73: Landfill gas treatment actions are eliminated because "the preliminary screening level evaluation of risks included in the OU1 RI does not indicate that any potential risks to human health and the environment are associated with nonmethane organic compound (NMOC) emissions. In addition, calculations based on proposed rule identified in Federal Register (FR) 24503 concerning NMOC landfill gas emissions indicate collection and treatment will not be required." For OU1, the landfill gas of concern is methane. Methane is an odorous gas which may require treatment before discharge to the atmosphere. The need for process options to treat odorous methane emissions should be addressed.

Response: Methane is an odorless gas, although, it is possible that the gas can contain slight odor from refuse. However, odorous emissions have not been reported during field activities at the landfill. The text has been revised to state that odorous landfill gas emissions are not evident at the landfill and treatment options are not necessary to

eliminate odors.

Comment 46: Section 4.2 (Alternative 2; Soil Cap, Trench Vent), page 80: Landfill gas collection corrective actions should also be triggered by unacceptable odorous emissions.

Response: Methane is an odorless gas, although, it is possible that the gas can contain slight odor from refuse. However, odorous emissions have not been reported during field activities at the landfill. The text has been revised to state that odorous landfill gas emissions are not evident at the landfill and treatment options are not necessary to eliminate odors.

Comment 47: Section 4.3 (Alternative 3; Soil Cap, Trench Vent, Passive Gas Vent Layer), page 83: Landfill gas collection corrective actions should also be triggered by unacceptable odorous emissions.

Response: Methane is an odorless gas, although, it is possible that the gas can contain slight odor from refuse. However, odorous emissions have not been reported during field activities at the landfill. The text has been revised to state that odorous landfill gas emissions are not evident at the landfill and treatment options are not necessary to eliminate odors.

Comment 48. Section 5.0 (Detailed Analysis of Remedial Alternatives): Detailed analyses in sections 5.1, 5.2 and 5.3 may need to be revised due to modifications of the FS report resulting from comments provided above. Discussions on "Overall Protection of Human Health and the Environment" and "Compliance with ARARs" are the sections most likely to require revisions.

Response: The detailed analysis sections have been revised to reflect comments.

Comment 49. Section 5.0 (Detailed Analysis of Remedial Alternatives), page 84: Please provide an explanation of the differences that exist between the nine criteria. The text gives the idea that all are weighted equally, when in fact that is not true.

Response: The explanation has been provided as suggested.

Comment 50. Section 5.2 (Alternative 2; Soil Cap, Trench Vent), page 84: In the "Compliance with ARARs" section, the FS report states "several action-specific landfill closure requirements will be appropriate for Alternative 2, such as cap slope requirements, gas monitoring requirements, and vegetative layer thickness requirements." Please include these requirements in the ARAR analysis section.

Response: The ARAR analysis has been expanded as suggested in Appendix J.

Comment 51. Section 5.3 (Alternative 3; Soil Cap, Trench Vent, Passive Gas Vent Layer), page 96: This section states alternative 3 "is similar to Alternative 2 for Site 1 except that Alternative 3 includes passive gas control." This statement is incorrect. The trench vents (included in Alternative 2) are a form of passive gas control. Alternative 3 adds passive vertical gas control to reduce damage to the vegetative layer.

Response: The comment is noted.

Comment 52. Section 6.0 (Comparative Analysis of Selected Alternatives): This section may need to be revised due to modifications of the FS report resulting from comments provided above.

Response: The section has been revised to reflect comments.

Comment 53. Section 6.0 (Comparative Analysis of Selected Alternatives), Table 7: At Site 2, the cost for alternative 2 is higher than alternative 1 (no action). Therefore, the ranking scores should not be the same.

Response: The table has been revised as suggested.

Comment 54. Appendix A (Cost Estimate Worksheets): Please revise the worksheets for each alternative so that the cost for gas monitoring is the same. Small unexplained differences occur in capital and O&M costs. Alternative 1 for Site 1 has a cost of \$5,500 for capital cost and \$12,800 for O&M. Alternatives 2 and 3 for Site 1 have costs of \$5,440 for capital cost and \$12,790 for O&M. Alternative 1 for Site 2 has a cost of \$4,000 for capital cost and \$12,800 for O&M. Alternative 2 for Site 2 has a cost of \$4,030 for capital cost and \$12,790 for O&M.

Response: The costs have been revised.

2.3 Comments from Peter Strauss, SVTC Technical Advisor

GENERAL COMMENTS

Comment 55: I strongly agree with (and want to reiterate) most of the comments provided by Elizabeth Adams of the Regional Water Quality Control Board of June 25, 1993 and by Michael Gill of the U.S. EPA of June 18, 1993. In particular, I support the following concepts articulated by their comments:

It is inappropriate to develop a remediation strategy which does not take full account of existing and potential communication between the leachate in landfill material and

the groundwater under and around the landfills.

The remediation strategy articulated in the OU1 Draft FS does not take account of groundwater. I understand that since the OU1 Draft FS was issued, the strong negative response by regulatory agencies has caused the Navy to combine the soils and groundwater at the landfills, which makes common sense. However, it is unclear of the radius or depth of groundwater that is going to be considered. Please provide this information as soon as it is available.

Response: Leachate and any groundwater contamination outside the perimeter boundaries of the landfills is addressed in the draft final OUI FS.

Comment 56: Contaminated leachate within the landfills will in all likelihood eventually be a source of contamination for either the groundwater or surface water.

Based on Figure 5, it appears that the leachate at Site 1 actually drains into the Salt Flat to the north. Leachate levels at this site are barely below mean sea level. The landfills are also within a floodplain, and heavy rains could lead to elevation of the leachate beyond any protective clay or mud barriers which now contain it. Furthermore, these old protective barriers could leak from the bottom or the sides.

Response: Leachate migration is evaluated in the draft final OUI FS.

Comment 57: Minimizing infiltration should be a RAO. There is no reason to believe that leachate from the landfills will not eventually migrate. A strategy which minimizes infiltration slows down migration of leachate.

Response: Minimizing infiltration and migration is included as an RAO in the draft final OUI FS.

Comment 58: At the very least, a remediation strategy must include: minimizing infiltration; collecting and treating leachate until it is shown that it does not impair water quality; dewatering the fill material; and placing an impervious cap on the fill. (I would add that identification and removal of hot spots within the fill material should be an objective.

Response: Site-specific data do not justify the suggested remediation strategy. The Navy requests that more rationale be provided before considering such a strategy.

Comment 59: The Navy should delay choosing a remedy until the OU6 RI/FS and the Ecological Assessment are completed.

There is the potential for communication between the area considered in the OU1 FS

(including the revised definition, as discussed above) and the wetland areas in OU6. The RI/FS for OU6 has not been completed, and important data regarding the effects of low levels of toxic materials on the wetland ecosystem is yet to be analyzed. Furthermore, the base-wide Ecological Assessment has not been completed. This report could also yield important data that would affect an environmental protection strategy. For example, these studies may conclude that stricter cleanup goals than those considered in the OU1 Draft FS area are necessary to protect endangered species habitat.

Since data suggests that there is not an immediate threat to human health or the environment, I suggest that the Navy delay a permanent remedy until these aforementioned studies are completed. However, I do recommend that a temporary remedy should be designed which limits contact between the new OU1 area, and OU6 and people. This may take the form of temporary fencing with some hydraulic controls and groundwater\leachate treatment.

Response: Delaying the OUI schedule should be discussed as an alternative strategy; however, it is likely that ecological concerns could be incorporated at the remedial design phase. The draft final OUI FS should be thoroughly reviewed before discussing schedule changes.

Comment 60: There is a disconnect between the amounts of hazardous materials detected in the OU1 RI/FS and the tons of liquid and solid hazardous materials that were reported in the Initial Assessment (IA).

Although I recognize that the IA was based on anecdotal information, I recommend that the Navy reconcile this disparate information in the FS. In addition, I would not dismiss these anecdotal reports merely because a few borings and wells have not shown heavy contamination. Other explanations could exist, including that these contaminants are now in the Bay or groundwater, that they have degraded, that they weren't located by the borings, or that they were disposed of at another landfill on the base. In fact, there is a third landfill located within the Golf Course that was identified by IT in 1988.

Response: The Navy does not agree that reconciliation of the past fate of landfill refuse is needed. These data are not needed for the FS and would be based on speculation.

Comment 61: The additional Golf Course landfill identified by IT in 1988 should be integrated with the new OU1 draft final FS.

Response: The additional landfill is undergoing characterization under site-wide RI/FS activities.

Comment 62: The Navy should investigate and consider other remedies for old landfills that abut the San Francisco Bay. Several landfills abutting the bay have been closed or are in the

closure process. These include: remediation of an old landfill at Oyster Creek in South San Francisco (remedy was capping with a slurry wall to prevent migration of leachate); remediation and bay restoration of the West Winton landfill in Hayward (clay cap, vegetative cover, groundwater monitoring, and leachate collection and treatment system); and the remediation of the Third Avenue Landfill in San Mateo (clay cap and shoreline reconstruction). Additionally, CalTrans is currently remediating and restoring the old Stinson Beach landfill (excavation, dewatering, segregation of hazardous and nonhazardous wastes, disposal, and restoration), as a mitigation project for restoring inter-tidal mud-flat habitat destroyed during reconstruction of Route 1; and, the KOFY landfill in Hayward is being closed. I understand that a landfill remedy is also being considered for Fort Hamilton in Novato.

Response: Remedy selection should be based on site-specific data. However, several of the alternatives mentioned above are part of the selected remedy for OUI.

Comment 63: The remedy selected in the OUI Draft FS would be inadequate under California's Title 14, Chapter 3, Article 7.8.

It is my understanding that if the RWQCB is not concerned about groundwater or surface water contamination, the California Integrated Waste Management Board requires, among other things: a two foot soil foundation and a one foot clay cap (10E-06 permeability); a leachate monitoring and control system (unless demonstrated that leachate does not have a deleterious effect on water quality); a 30-year postclosure groundwater monitoring plan; and, a proposed post-closure land use design (see Section 17796).

Response: Title 14 California Code of Regulations, Chapter 3, Article 7.8 is evaluated in detail as an action-specific ARAR for OUI.

Comment 64: The design of the old landfills needs to be better understood before a remedy is proposed.

Based on the data presented, it appears that the Navy does not know much about the initial design of these landfills. There is not an adequate description of the base material or the sides of the landfill to make a reasonable judgement pertaining to how these may contain the fill materials for long durations. In order to contain the landfill contents, as apparently expected by the minimal proposed remedial plan, it is essential that design characteristics of the existing landfill be well understood.

Response: No operating or disposal records were kept for either landfill. Therefore, it is impossible to understand the "design" of the OUI landfills. However, hydraulic conductivity of surrounding soils has been tested and evaluated.

Comment 65: The FS should contain milestones by which the success of the subsequent remediation can be evaluated. The remedy and the accompanying plan should contain firm commitments.

It is important for the community that the OU1 Draft FS and subsequent plans contain a measurable schedule and performance standards which can be verified. Broad commitments as to the timing of cleanup activities can and should be spelled out.

Response: Scheduling commitments are identified in the federal facilities agreement (FFA).

Comment 66: The OU1 Draft FS does not address questions that were raised or left unanswered in other reports, and is therefore inadequate.

The OU1 Technology Screening Report states that "Based on the preliminary risk assessment", potential chemicals of concern for the soil and water within the fill cannot be estimated. Please explain how this uncertainty stated in October 1992 was addressed and resolved by April 1993 (i.e. publication of the OU1 Draft FS).

The Solid Waste Assessment Test (SWAT) concluded that leachate contained elevated levels of organic compounds and metals, and that seepage could enter surface waters. Does a soil cap remedy this condition? If so, please explain in detail.

Additionally, the SWAT stated that although the A-aquifer was contaminated at this location, it was not contaminated by the same compounds found in the leachate, thereby suggesting that the A-aquifer at this location was contaminated by another source. It does not appear that the OU1 Draft FS addresses data which led to this conclusion. Please explain this oversight, and describe how this is to be reconciled in the OU1 draft final FS.

Response: The scope of the draft OUI FS did not include groundwater. The draft final OUI FS includes characterization and a comprehensive evaluation of all media potentially affected by the landfills at OUI.

SPECIFIC COMMENTS

Comment 67: On page 13, it is noted that groundwater at Site 1 flows in the south-southeast direction, towards Building 191. It appears however, based on Figures 3, 4, and 5, that most soil sample points and groundwater wells that are located outside of Site 1 are found on the north side of the landfill. Additionally, Plate 1 and page 18 indicate that no samples were collected or analyzed from the borings and wells to the south-southeast of Site 1. If as noted above, groundwater moves to south-southeast at this site, this appears to be a major deficiency in the analysis. Please explain in detail.

Response: The additional field investigation field work plan, technical memorandum and draft-final OUI FS describe groundwater flow patterns at Site 1 in detail and the adequacy of the monitoring network.

Comment 68: Regarding the above two questions, does the Navy believe that there are enough monitoring points on the south-southeast side of Site 1? If the answer is yes, please provide a detailed description of how you arrived at this conclusion.

Response: There are four monitoring wells south and southeast of Site 1. The additional field investigation field work plan, technical memorandum, and draft-final OUI FS describe the adequacy of the groundwater monitoring network and groundwater flow patterns at Site 1.

Comment 69: It is not clear from the information regarding Site 2 that sufficient data was collected to arrive at a definitive conclusion regarding the migration of contaminants (see page 38). It appears that only one soil boring outside of the site was analyzed. Is this correct? If so, how can the Navy conclude that there is not a potential threat to human health and the environment? Please explain in detail.

Response: Several soil borings have been drilled outside of Site 2 and adequate soil characterization information has been obtained. Site 2 characterization information is included in the draft-final OUI FS and the selected remedy is based on these data.

Comment 70: Referring to page 54 and MHB general comment 6, it is unclear that Sites 1 and 2 share the same attributes as many of the municipal landfills on the NPL. In fact, attributes such as close proximity to a water body, saturated fill material, and the leachate level within the landfill is at the same level as the groundwater level outside the landfill, all suggest that these two landfills are somewhat unique.

Response: This rationale was used only to streamline the FS process and to narrow down the universe of remediation technologies to technologies associated with landfills. Remedy selection is based on site-specific characterization data.

Comment 71: In the OUI RI, methyl-ethyl-ketone (MEK) was detected above the maximum contaminant level (MCL). This contaminant is not mentioned elsewhere, nor is there any discussion concerning remediation. Please provide an explanation.

Response: Discussion concerning MEK, or 2-butanone, in groundwater was not included in the draft OUI FS because groundwater was not part of the scope. Groundwater has been included in the draft final submittal.

Comment 72: Please explain why groundwater diversion options were not considered. Also, please

indicate whether the existing storm water drainage system could be used for hydraulic control and possible leachate control.

Response: Discussion concerning groundwater diversion and hydraulic control was not included in the draft OUI FS because groundwater was not included in the scope of the document. Groundwater has been included in the draft final submittal.

Comment 73: Referring to page 93, please indicate the EPA source that states that treatment is impractical for low level threats. In addition, please explain the statement that "treatment options for landfill contents are not considered unless hot spots exist and present immediate and elevated threat to human health and the environment."

Response: The reference is included in the draft-final FS and explains the above-mentioned statements.

3.0 RESPONSE TO COMMENTS ON THE DRAFT PROPOSED PLAN

3.1 Comments from Michael Gill, EPA

GENERAL COMMENTS

Comment 1: As in the OUI Feasibility Study, an industrial (occupational) scenario of future use for Moffett Field is assumed and described here. This Proposed Plan should briefly describe the differences that exist between residential and industrial (occupational) scenarios of future use. If the FS is modified, this Proposed Plan will need to be rewritten to reflect the changes.

Response: The proposed plan has been revised to reflect changes in the FS.

SPECIFIC COMMENTS

Comment 2: Page 1, Paragraph 2. ". . . this plan will protect the public . . ." Define public to include residential once these calculations are complete.

Response: The plan was not revised. PRC believes that making the distinction between public and residential public is not appropriate in introductory sections. The Summary of Site Risks section states residential populations will be protected.

Comment 3: Page 1, Paragraph 3. The fact that the base is being transferred (after being closed) to NASA/Ames should be noted.

Response: Base transfer has been noted in the plan.

Comment 4: Page 2, Paragraph 1. The regulatory agencies are described as "support" agencies. Changes this designation to "oversight" agencies.

Response: The text has been revised as requested.

Comment 5: Page 2, Paragraph 7. ". . . not used as a source of water for NAS Moffett Field)." It should be clarified here whether anyone else does or does not use this aquifer as a water source.

Response: The text has been clarified as requested.

Comment 6: Page 4, Paragraph 3. Is it true that the storm water holding pond, the marsh and the wetlands provide a barrier to further westward migration of methane gas? How about migration through leaching? It needs to be briefly explained that OU5 will cover these pathways to groundwater.

Response: The text clarifies that groundwater has been included in OU1. In addition, methane has not been detected in groundwater and the saturated soil associated with surface waters blocks gas migration.

Comment 7: Page 4, "Summary of Site Risks." Include residential concerns in this section after modifying the OU1 FS.

Response: The text has been revised accordingly.

Comment 8: Page 4, Paragraph 9. It is stated that no structures are near the Runway landfill. Are there any structures near the Golf Course landfill?

Response: The plan states that methane has not been detected at Site 2 and is not a hazard.

Comment 9: Page 4, "Evaluation of Alternatives." This section will probably expand when residential criteria are considered.

Response: All FS changes have been incorporated into the plan.

Comment 10: Page 7, Paragraph 2. The statement is made "Once the gases escape to the atmosphere, they will no longer be hazardous." Mention that they follow local, state and federal air regulations.

Response: The statement has been revised as suggested.

Comment 11: Page 2, Paragraph 4. ". . . traffic control materials . . ." Is this referring to air traffic or automobile traffic? This makes a difference.

Response: The editorial change has been made as suggested.

Comment 12: Page 4, Paragraph 2. The word "groundwater" is not hyphenated.

Response: The editorial change has been made as suggested.