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CLEAN Contract No. N62474-88-D-5086
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**Subject: Moffett Federal Airfield Operable Unit 1 (OU1) Draft Ecological Assessment
Technical Memorandum (EATM)**

Dear Messrs. Chao and Chan:

Enclosed are PRC Environmental Management, Inc.'s (PRC's) responses to comments by the U.S. Environmental Protection Agency (EPA), California Regional Water Quality Control Board (RWQCB), California EPA Department of Toxic Substances Control (DTSC) and Silicon Valley Toxics Coalition (SVTC) on the Moffett Federal Airfield (MFA) Draft Ecological Assessment Technical Memorandum (EATM) dated June 1994. The comments are incorporated into the draft final EATM to be submitted October 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,

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Enclosure

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MOFFETT FEDERAL AIRFIELD OUI
RESPONSE TO COMMENTS
ON DRAFT ECOLOGICAL ASSESSMENT TECHNICAL MEMORANDUM

1.0 INTRODUCTION

This report provides PRC Environmental Management Inc.'s (PRC's) responses to U.S. Environmental Protection Agency (EPA), California Regional Water Quality Control Board (RWQCB), California EPA Department of Toxic Substances Control (DTSC) and Silicon Valley Toxics Coalition (SVTC) comments on the Operable Unit 1 (OU1) Draft Ecological Assessment Technical Memorandum (EATM) dated June 1994. The comments are incorporated into the draft final EATM to be submitted October 1994.

2.0 RESPONSE TO EPA COMMENTS

GENERAL COMMENTS

Comment 1a: A theoretical qualitative approach was used to evaluate virtually all the objectives of the EATM. Many of the objectives ask for a prediction of environmental response to some future action at OU1 (for example, what the potential is for recovery following capping or to evaluate the potential for uptake of chemicals by plants following capping). It is important for the EATM to present available field data from the site in order to make a decision about the cap.

Response: The EATM has been revised as suggested. Conclusions in the EATM are based on available site-specific data. Nonetheless, predicting accurate and complete environmental responses to an action is nearly impossible. However, reasonable assumptions and conclusions can be drawn from available data.

Comment 1b: The EATM used an exposure modeling approach to evaluate impacts. This is a screening level approach which is believed to be conservative (that is, ecological impacts will not be underestimated) and is widely applied in ecological risk assessment work. Typically, a screening level evaluation is initially conducted and if impacts are estimated, then biological investigations (for example, population studies, tissue chemical analysis, or toxicity testing) may be warranted to confirm results of the screening level assessment. Since the EATM concluded that there was no ecological impact from chemicals occurring in soil at OU1, further evaluation using biological approaches is unnecessary. However, as Comment 9 suggests, the

conclusions of the exposure modeling presented in the EATM may be flawed and require recalculation. Depending upon the results of the revised modeling, biological tests may be required.

Response: *Biological tests can be used if appropriate. However, evaluating chemical exposure from the landfills to environmental receptors should not be necessary based on the revised conclusions. See response to Comment 7.*

Comment 2: Comments from all three regulators on pages 5 and 6 of the EATM identified the assessment of potential ecological impacts to surface water bodies adjacent to the landfills from chemicals migrating from the landfills as a major data gap in the draft final feasibility (FS) report. Ecological impact to the surface water bodies adjacent to the landfills needs to be addressed in the objectives of the ecological assessment.

Response: *Ecological impacts to adjacent surface waters can potentially occur through leachate migration into surface waters or through landfill surface soils migrating into the surface water through runoff or wind transport. Monitoring data show that adjacent surface water bodies have not been affected by leachate. Surface water quality measurements taken during the remedial investigation (RI) and the recent quarterly sampling events have not shown any impacts from the landfills. In addition, data from the groundwater monitoring wells located between the landfills and surface water bodies do not show that leachate is migrating from the landfills. Potential future impacts will be addressed by continued monitoring and corrective actions if waste discharge limits (ambient water quality criteria for aquatic life [marine waters]) are exceeded in groundwater. The Navy will present a groundwater monitoring plan and a corrective action contingency plan in the revised draft final FS report to be submitted December 1994. The revised draft final FS report will also evaluate and compare the extent that each remedial alternative minimizes ecological impacts to adjacent surface water bodies, including the potential for contaminant migration through runoff.*

Comment 3: Several sections of the EATM seem unnecessary and should be removed. Section 2.1 (Human Health Risk Assessment [HHRA]) explains that a human health risk assessment was performed at OU1 during the remedial investigation and concluded that there was no unacceptable risk to humans from drinking the groundwater. The relevance of this information to the EATM is unclear and no attempt is made to integrate it into the EATM. Section 3.1 (Evaluate Habitat Destruction from Proposed Remedial Action at OU1) begins with approximately 6 pages describing theoretical aspects of population biology. This information seems irrelevant and is not integrated into the other sections of the EATM.

Response: *These sections have been deleted as suggested.*

Comment 4: Limited information is presented concerning the present status of the ecosystem at and adjacent to OU1 (for example, storm water retention ponds). An introductory section should be included that summarizes information provided in the Phase I Site-wide Qualitative Habitat and Receptor Characterization Naval Air Station (NAS)

Moffett Field and elsewhere so the reader can understand the extent of the ecosystem on and adjacent to OU1.

Response: An introductory section has been added to the EATM which describes current site conditions, habitats, and ecosystems at OU1.

Comment 5: The EATM suggests that the proposed remedial action (for example, capping) and subsequent maintenance regime (for example, periodic mowing) will create a habitat incapable of supporting the ecosystem currently occupying OU1. The EATM needs to take a proactive position in answering the question, "Why not enhance the habitat quality as part of the remedial action?" It would be a rather simple and cost-effective effort to incorporate elements into the remedial design that would enhance the habitat for animals if the presence of these organisms would not interfere with the future use at NAS Moffett Field.

Response: The potential for habitat enhancement through remedial action will be discussed in the draft final EATM and revised draft final FS report.

SPECIFIC COMMENTS

Comment 6: Evaluate whether capping will jeopardize species currently residing on OU1.

This objective is addressed in Section 3.1.1 (pages 12 through 14) for species currently occurring on OU1 and in Section 3.1.2 for threatened and endangered (T&E) species. Section 3.1.1 used a subjective qualitative approach for determining impacts of remedial action on animals occurring on OU1 and concluded that the proposed capping will result in habitat destruction that is unacceptable to current terrestrial populations residing at OU1. This conclusion is based on the rationale that capping will cause some animals to migrate into adjacent areas of increased competition or will eliminate organisms unable to avoid capping. While it is clear that the physical act of placing a 36 inch soil cap will cause the migration and elimination of organisms from OU1, the primary issue is whether capping will jeopardize populations of animals that occur in the area (for example, black-tailed hare, California ground squirrel, Botta's pocket gopher, California vole, red fox, domestic cat) as described on page 16 of the EATM. No evidence is presented that suggests that OU1 provides a unique habitat that following modification from capping would cause the elimination of a species from the area. On the contrary, animals listed in the EATM as occurring on OU1 are common to the region and undoubtedly occur on adjacent areas. These animals could readily reoccupy OU1 following capping if provided suitable habitat. Although the approach to meeting this objective is appropriate, the conclusion that habitat destruction resulting from capping is unacceptable to current terrestrial animal populations residing at OU1 should be substantiated. The kind of data that is needed to show that the cap shouldn't be constructed is a measure of the size of the small mammal population and the raptors that feed on them. This will tell us if temporary loss of the area of OU1 would adversely affect the biotic community. Field data on body-burdens of

the COCs is necessary. This might also include some bioassays, such as the P450 test of the soils, to determine if levels of planar organics (polychlorinated biphenyls [PCBs], polynuclear aromatic hydrocarbons [PAHs]) are sufficiently high to possibly affect reproduction in the animal populations.

Section 3.1.2 states that no T&E species were observed inhabiting OU1 but that if they did occur on OU1, capping would jeopardize these species. It should be defined whether OU1 provides habitat on which T&E species depend for part or all of the year, which would make it a sensitive area in need of protection. If no T&E species occur on OU1, it would be sufficient to say that they would not be impacted by capping.

Response: *The draft final EATM has been modified to evaluate whether temporary loss of the area at OU1 will adversely affect the biological community. It also evaluates whether T&E species depend on habitat at OU1 all or part of the year.*

Comment 7: Evaluate whether capping will unacceptably alter the habitat and ecology at OU1.

Sections 3.1 and 3.1.1 contain some qualitative and subjective verbiage about the effects that capping would have to the habitat on the site. The first sentence on page 12 states, "The placement of a 36-inch deep cap on OU1 will destroy the existing terrestrial habitat." In addition, maintenance practices following capping (for example, mowing) will limit recolonization of OU1. It is clear that the physical act of placing a 36-inch soil cap will cause the migration or elimination of organisms from OU1. However, the EATM should discuss whether OU1 will revert back to the same or improved quality of habitat as was present prior to capping. This topic is discussed further in Comment 8. While the displaced animals may not be able to find suitable habitat nearby, is it likely that the nearby populations could recolonize the area once the remediation took place. Field data may be necessary to answer these questions. In Section 3.1.1 (p. 13), the text states that the vegetation structure is an important component in determining the size and species composition of bird communities. That is true. Is the existing vegetation structure at OU1 of sufficient complexity to support a very complex bird community? Would a native grass/shrub community support a more complex bird community? These questions should be investigated.

Response: *The conclusion presented in the draft EATM has been revised. Initial habitat destruction will occur, however, temporary destruction of the habitat at OU1 is not expected to have any long-term effects on the environment. This conclusion is based on the following factors.*

- 1. The habitat provided by OU1 is not unique. OU1 is surrounded by over 15 acres of similar habitat.*
- 2. There is an abundance of similar species in surrounding habitats.*
- 3. OU1 does not provide a unique habitat that T&E species depend on.*

4. *Many animal species have the ability to emigrate during cap construction and re-establish territories the following season.*
5. *Habitat and animal population rejuvenation will occur rapidly because of the overall high reproductive rate of commonly occurring species and due to short gestation periods and larger litter sizes.*
6. *Recovery time can be shortened through active, assisted revegetation (expected to be no more than 5 years based on recovery rates exhibited in historical photographs).*

Comment 8: Evaluate the potential for habitat recovery following capping at OU1.

This objective was addressed in Sections 3.1 and 3.1.1 in a very terse, subjective manner. Since maintenance practices following capping (for example, mowing) will limit recolonization of OU1 by natural plant and animal populations, it is concluded that it is unlikely that a diverse terrestrial ecosystem will re-establish itself at OU1. Substantiated evidence should be presented to support this position. If we agree that habitat destruction at OU1 is unacceptable to the current terrestrial populations residing at OU1, it seems that field data would be necessary to provide the information about what species actually live there, rather than relying on modeling. It seems unlikely that temporary destruction of the ruderal grassland will result in a devastating effect on the shrew small mammal population. Field data are needed to prove or disprove these theories. Performing P450 bioassays on the soil or capturing the shrews living on site and looking at their P450 levels may determine if bare ground has an adverse effect and the cap is needed. There are also many other ways to approach this through actual field sampling. As stated in comment 5, it would be a simple matter to incorporate elements into the remedial design that would enhance the habitat at OU1 (for example, eliminate mowing, establish a diverse assemblage of indigenous plant species with native grasses and bushes such as Coyote bush to add vertical dimension to the cap, increase topographic diversity, create artificial surface water bodies). In fact, if mowing was eliminated from the maintenance, most assuredly the endemic plant community and native fauna would reestablish itself on OU1 given time. If a water-proof, biotic barrier were installed under the native soil cap, the watering requirements to revegetate the cap might be less of an issue, and the necessity for mowing the cap might be reduced if the proper mix of annual and perennial grasses and shrubs were planted. In addition, with proper storm water and infiltration controls, the problems associated with increased leaching due to watering the cap could be avoided. OU1 is itself a highly disturbed area that has evolved into a diverse terrestrial habitat with established animal populations in residence. Therefore, the conclusion presented in the EATM for this objective is too simplistic and largely inappropriate.

Response: The EATM has been revised to discuss the likelihood that OU1 to return to a similar or improved quality of habitat following capping. In addition, the ability to incorporate elements to enhance the habitat during remedial design is discussed.

Comment 9: If ecological impacts from capping are unacceptable, evaluate whether chemicals at OU1 pose potential adverse impacts to ecological receptors under current conditions.

This objective was addressed in Section 3.3 using an exposure modeling approach. Exposure modeling is a standard screening level approach for estimating potential impacts of chemical releases on plants and animals. In ecological risk assessment, it is wise to conduct a screening level evaluation, such as exposure modeling, prior to conducting biological investigations (for example, population studies, tissue chemical analyses, or toxicity testing). However, the exposure modeling that was presented in the EATM appears flawed. The conclusion of the assessment is that a shrew weighing 7 grams and consuming 2.5 grams of food per day would not be impacted by ingesting 0.2 grams of mercury, 23.07 grams of lead, 4.69 grams of PCBs, and 1.87 grams of PAHs per day. This conclusion is unreasonable. Additional issues that need to be revised include:

- a) Although a shrew is an appropriate target species for exposure modeling, no evidence is presented that shows that soil chemical concentrations that are protective of the shrew are protective to other animals.
- b) The selection of chemicals of potential concern (COPCs) is presented on pages 22 through 24. What were the criteria for selecting COPCs? Although the COPCs detected in the EATM appear reasonable, a complete summary of chemicals detected in soil at OU1 (that is, a summary table containing number of observations, frequency of detection, mean concentration, maximum and minimum detected concentration, and maximum and minimum nondetected concentration) is required for the reader to determine if the proper chemicals were selected as COPCs. Why were only mercury and lead considered as COCs? What about the concept of additive effects from exposures to multiple COCs?
- c) Assumption 4 on page 25 states that J-coded data were not used in determining average concentrations of PAHs and PCBs. This is contrary to EPA guidance.
- d) The average concentration of COPCs in soil was used to estimate exposure and potential impacts to the shrew. Standardized risk assessments include an evaluation of the reasonable maximum exposure (RME) concentration. The average does not represent the RME which is more appropriately calculated as the upper 95 percent confidence limit.
- e) The only route of exposure used for the shrew is the ingestion of prey. Evidence must be presented for elimination of the ingestion of soil, dermal, or inhalation routes of exposure. Incidental ingestion of soil particles could occur if the shrews were preening or licking moisture (fog) off grass blades for water. There aren't any references presented that would support the idea that "they don't drink the water." There wasn't any mention of leachate potentially leaving the landfill. This could be a pathway of concern since the

landfill is adjacent to the salt ponds. No direct toxicity was considered, only food chain pathway. Inhalation occurs when they burrow or stay in burrows where volatiles occur. Shouldn't volatile organic compounds (VOCs) be part of the COC list?

- f) The calculation of exposure presented in Section 3.3.1.1 on pages 24 through 26 does not explain how chemical concentrations were determined in prey items for the shrew. Apparently, a factor of 1 is used to estimate concentrations of chemicals in prey from concentrations of chemical in soil. Although this may be conservative for some chemicals, it may not be conservative for chemicals that bioaccumulate, such as PCBs, which have been estimated empirically at 20. The method for determination of bioaccumulation factors in prey items of the shrew should be clearly stated and substantiated.
- g) Section 3.3.1.3 presents toxicity values that are supposed to be representative of "no effects levels." These toxicity values are based upon acute lethal dietary concentrations and do not take into account chronic exposure and sublethal effects that can impact the health of a population by reducing reproductive potential. Toxicity values representing chronic "no effects levels" should be obtained from the literature. Also, the calculation of the "environmental no effect level in the diet" is flawed and should be recalculated.
- h) There is no comparison between the exposure presented in Section 3.3.1.1 and the no effect levels presented in Section 3.3.1.3. A summary table should be presented summarizing the numbers and presenting the calculated ratios.

Response: As stated in the response to Comment 7, the environmental impact from capping is not expected to be significant. Therefore, an evaluation of chemical exposure from landfill refuse is not necessary because the landfill will be capped.

Comment 10: If chemicals do pose an adverse ecological impact under current conditions, compare the relative magnitude of these impacts to impacts from capping.

Since Section 3.3 concluded that there is no adverse effect to animals from chemicals detected in soil at OU1, then according to Figure 2-3, a comparison of effects was not necessary. This objective was correctly omitted from the EATM. However, since the conclusions in Section 3.3 are in doubt, this objective may need to be evaluated in the future if unacceptable risks are associated with chemical exposure to animals on OU1.

Response: As stated in Comment 7, an evaluation of chemical exposure and associated comparisons are not necessary.

Comment 11: If capping does not unacceptably alter the habitat, assess the potential for burrowing animals to be exposed to chemicals following capping.

According to Figure 2-3, this objective should not be addressed in the EATM if capping resulted in an unacceptable alteration in the habitat. Section 3.1 concluded that capping would result in an unacceptable alteration in the habitat at OU1. Therefore, Section 3.2.1, which assesses whether a 36-inch native soil cap is protective of burrowing animals, is unnecessary.

Response: *The section that evaluates the potential for burrowing animals to be exposed to landfill refuse is now necessary based on the revised conclusions (see Comment 7) and is retained in the draft final EATM.*

Comment 12: If animals can be exposed to chemicals by burrowing through the cap, assess the potential adverse impacts to these receptors.

According to Figure 2-3, this objective should not be evaluated in the EATM if capping resulted in an unacceptable alteration of the habitat or if animals are not exposed to chemicals following capping.

Section 3.1 concluded that capping would result in an unacceptable alteration in the habitat at OU1. This objective was correctly omitted from the EATM.

Response: *A section that evaluates chemical exposure to burrowing animals from landfill refuse is not necessary. As stated in the EATM, burrows are not expected to exceed 3 feet below ground surface (bgs). Therefore, the exposure pathway is incomplete.*

Comment 13: Evaluate the potential for uptake of chemicals by plants following capping.

This objective was addressed in Section 3.2.2 subjectively evaluating the potential for plant to penetrate the 36-inch cap. The EATM concluded that the grass vegetative cover established following capping would not contact the underlying landfill material. However, the basis for this conclusion is unclear. The first paragraph in Section 3.2.2 states that WESCO estimated root depths of grasses and forbs native to the area to be less than 5 feet. Section 3.2.2 later states that an unknown grass species will be established on the site following capping and provides a reference that states that several grass species typically have a root depth more than 1 foot. This information is contradictory and requires further substantiation before a conclusion can be made. Information on the rooting depth of the grass species to be used for revegetation should be obtained for the particular soil and climatic conditions found at the site. Furthermore, it is highly likely that plant species indigenous to the area will invade OU1 in time no matter what maintenance regime is used. Plant species endemic to the area (for example, hare barley, ripgut brome, wild oat, sweet clover, yellow star thistle, Russian thistle, black mustard, and fireweed) have an annual life habit and are primarily species of recent exotic introductions that can be considered weeds. As such, they are aggressive colonizers that would most certainly invade OU1 following establishment of the grass cover. Therefore, rooting depth of these plants should be considered in the evaluation.

Response: The EATM has been modified to reflect the above-mentioned concerns. Section 6.2 of the draft final EATM discusses the potential for chemical uptake by vegetation, the associated applicability of biotic barriers for OUI, and the role of the remedial design.

Comment 14: If there is a potential for plants to accumulate chemicals following capping, evaluate the potential impacts to animals foraging on those plants.

Since Section 3.2.2 concluded that plant roots will not come into contact with the landfill contents following capping, this objective should not have been added and was not addressed in the EATM. However, if as suggested in Comment 13, the root depth issue is reevaluated and it is determined that rooting depth may exceed 36 inches, then this objective will have to be addressed. An exposure model approach that estimates the amount of chemical moving from the soil into the plant and subsequent exposure to an herbivorous animal (that is Black-tailed hare, California ground squirrel, Botta's pocket gopher, California vole) would be appropriate.

Response: An evaluation of effects on animals foraging on plants that contain landfill chemicals has not been included in the EATM. The exposure pathway will be eliminated through incorporating a biotic barrier or through a careful evaluation of appropriate plant species for the cap during the RD. Section 6.0 of the draft final EATM discusses the rationale in detail.

Comment 15: Page 6: Revise text to read, "jeopardize any species..."

Response: The text has been revised as suggested.

3.0 RESPONSE TO DTSC COMMENTS

GENERAL COMMENTS

Comment 1: The technical memorandum does not address the impact of the "no action" alternative, that is, contaminant migration via leachate to off-site locations. Therefore, it provides an inadequate presentation of the potential ecological impacts of the proposed remedial alternatives.

Response: See the response to EPA General Comment 2. The revised draft final FS report will evaluate and compare the extent that each remedial alternative will minimize leachate migration to groundwater and adjacent surface water bodies. To address leachate migration, the FS report will present waste discharge limits (ambient water quality criteria for aquatic life [marine waters]) that are protective of ecological receptors. Migration from runoff will also be compared for each alternative in the revised draft final FS report.

Comment 2: The calculation of contaminant impacts on terrestrial organisms contain several significant errors, and therefore does not adequately assess potential contaminant

effects on terrestrial organisms.

Response: As stated in response to EPA Specific Comment 7, the ecological impact from capping is not expected to be significant. Therefore, because the landfill will be capped, an evaluation of chemical exposure from landfill refuse is not necessary.

Comment 3: The technical memorandum fails to address the effects from exposure to multiple contaminants.

Response: As stated in response to EPA Specific Comment 7, the ecological impact from capping is not expected to be significant. Therefore, an evaluation of chemical exposure from landfill refuse is not necessary because the landfill will be capped.

SPECIFIC COMMENTS

Comment 1: Section 3.1.1. The general discussion on competition theory, while interesting, does nothing to provide site-specific data to support the conclusion that, "...the resulting loss of the physical structure, plant biomass, species diversity and richness, habitat destruction of OUI is unacceptable to the current terrestrial populations residing at OUI.

Data presented in the draft site-wide ecological assessment (SWEA) report (pages 7-1, 7-2) indicates "...the annual grassland/ruderal complex of Installation Restoration Program (IRP) Sites 1 and 2 are introduced exotic species that rapidly colonize disturbed upland substrates..." While the destruction of the landfill habitat undoubtedly will result in impacts on individuals in the immediate future, the potential for recolonization should be addressed.

Since the current assemblage is a result of the initial disturbance after the disposal at the landfill ceased, it would seem logical to assume then that a similar assemblage would rapidly colonize a disturbed area, such as the proposed cap. Further, the proposed remedial action which includes revegetating the site has the potential to enhance colonization (particularly if native plants are used), thereby minimizing any potential long-term impacts.

The landfills represent 2 out of 32 acres sitewide of this type of habitat, or about 6 percent of the total. It is not clear why these particular 2 acres are so important to this type of habitat.

Response: The EATM has been modified to discuss the potential for recolonization and the conclusions have been revised. The EATM concludes that long-term environmental impacts are not expected to occur from capping because the habitat provided by OUI is similar to the adjacent acreage, the expected short time-frames for recolonization, and the independence of T&E species relative to OUI. The EATM also discusses the potential that the habitat at OUI can be enhanced through capping.

Comment 2: Section 3.1.2. The technical memorandum also indicates there are no federal T&E species present at either landfill. It is indicated that a California Species of Special Concern, the burrowing owl, is not expected to inhabit OU1; the potential for other state-listed threatened or endangered, or species of special concern, must also be assessed.

Response: The potential for other state-listed T&E species will be addressed as suggested.

Comment 3: Section 3.2. The draft SWEA report (page 7-1, 7-2) indicates that Coyote brush has become established on Site 2 due to limited human disturbance. Does the proposed alternative include maintenance of the landfill cap to prevent shrubs and trees from becoming established? The addition of brush and tree species would undoubtedly enhance the habitat by providing additional cover and forage. It is suggested the grass used for hydroseeding be a mix of native grasses which would enhance the existing grassland communities.

Response: The specific mixture of native grasses, brush, and trees to be used for revegetation will be addressed in the remedial design. It is assumed that if capping is deemed appropriate for OU1, a suitable mixture of grasses can be selected to provide habitat and to function with minimal maintenance.

Comment 4: Section 3.3.1. The draft SWEA indicates avian species also utilize the existing annual grasslands. What was the reason for restricting the evaluation of potential chemical impacts to only burrowing mammals? The State agrees the vagrant shrew is an appropriate representative species; however we question whether its use as the sole species to evaluate the potential threat to ecological receptors is appropriate. The State also questions why incidental soil ingestion, inhalation, and dermal pathways for burrowing animals are eliminated.

The intent of the statement on page 22 regarding the vagrant shrew, "population level effects would be observable in a shortlived species" is not clear. Is it meant that the short-life span of this species would make it amenable to toxicity testing for reproduction effects? Or does it imply that the short life span would make the species amenable to field studies to detect changes in population? Or both?

Response: An assessment of chemical exposure is not necessary as stated in the response to EPA Specific Comment 7.

Comment 5: Section 3.3.1.1. Page 24. Page 24 lists the feeding rate of the common shrew which is used to represent the feeding rate for the vagrant shrew. If the feeding rate of the vagrant shrew cannot be found, then information must be provided which supports this substitution (for example, body weight of the vagrant shrew is similar to that of the common shrew).

Table 7-1 of the draft SWEA indicates several chlorinated pesticides were found in landfill 1 (chlordane, DDT and its metabolites, endrin), as well as VOCs. All inorganic contaminants in soil greater than the established background levels must be

included in the evaluation. The technical memorandum should clearly state the rationale for eliminating any chemicals of concern using criteria outlined in the May 6, 1994 letter from the California Regional Water Quality Control Board (Adams, Chou, Gill, 1994).

Response: *An assessment of chemical exposure is not necessary as stated in the response to EPA Specific Comment 7.*

Comment 6: Section 3.3.1.1. Page 25 states the average concentration of PAHs (1 sample) at a depth of 1 ft in surface soil at OU1 is 2.5 milligrams per kilogram (mg/kg)." This should read "For purposes of this assessment, it was assumed the average concentration of PAH was equivalent to the average concentration of phenol (Table 3-5)."

Response: *An assessment of chemical exposure is not necessary as stated in the response to EPA Specific Comment 7.*

Comment 7: Section 3.3.1.1. The calculations on page 26 are a misapplication of the equations from Maughan. The "Concentration of the COC" term is the concentration of the COC in the prey item, in this case snails/slugs, not the concentration in soil. It is not reasonable to assume that the concentration in the prey items is the same as the concentration in the soil without justification. For many organic compounds with high K_{ow} values (for example PCBs), such an assumption may significantly underestimate exposure. The bioaccumulation factors used must be explicitly stated and justified, and include assumptions made about water content of the prey items (since soil concentrations are generally expressed on a dry weight basis, whereas prey concentrations are generally expressed on a fresh weight basis).

Restricting the analysis to ingestion only of snails/slugs does not account for the other prey items which the shrew ingests which may also be contaminated. Either assume that 100 percent of the diet is snails/slugs and estimate the concentration in the snails/slugs, or fully account for the food ingestion pathway by estimating the contaminant concentration for each prey item then estimate the chemical intake for each prey item. On page 25, Assumption 7 indicates the shrew has a frequency of ingestion of the snails/slug of 30 percent, while the percent by volume is 14 percent. Since the calculation of contaminant intake are done on a mass basis, the 30 percent frequency value should not have been used. The percent ingested by weight of each prey ingested is needed, or must be calculated.

Response: *An assessment of chemical exposure is not necessary as stated in the response to EPA Specific Comment 7.*

Comment 8: Section 3.3.1.2. The calculations for contaminant intake from water includes the assumption that 100 percent of the prey is snails/slugs, which is inconsistent with the assumption used to calculate chemical intake from food ingestion. Further, the data presented earlier indicates only 14 percent by volume of the shrew's diet is from snails/slugs. Clearly then it is not reasonable to assume that 100 percent of the

shrew's water requirement is obtained from snails/slugs.

Response: An assessment of chemical exposure is not necessary as stated in the response to EPA Specific Comment 7.

Comment 9: Section 3.3.1.3. This section (Calculation of No Effects Level) contains several errors. First, Maughan is clear in the discussion on page 170 that the media for critical dose must be the same used for animal exposure to the contaminant. For example, if the critical dose is a dietary concentration, then the exposure level must also be as a dietary concentration. All calculations on pages 28 through 29 are incorrect in that a dietary concentration for the critical dose is used, but animal exposure is calculated in terms of mass of contaminant ingested per day.

The various Eisler citations, while good references to obtain a general overview of toxicity to wildlife species and as a starting point for references, should not be viewed as a complete reference. A full literature search should be conducted and the technical memorandum should include a section on toxicity assessment which describes in full the derivation of the "no effect level." As an example, the technical memorandum contains several errors in that toxicity data were inappropriately used to extrapolate from levels clearly demonstrating adverse effects to "no observed adverse effect levels" (NOAELs). For example:

- a) Eisler citation for the mink of 1 to 5 mg/kg in the diet indicates that 100 percent of the animals died when fed these dietary concentrations after 30 days to 2 months. Use of this dietary concentration to develop a "no effect level" is clearly inappropriate, as it does not represent a "no effect level."
- b) Eisler citation of adverse effects on rats results from a 3-week exposure. Extrapolation to a NOAEL must account for extrapolation from subchronic to chronic effects, and to account for extrapolation from effect levels to no-effect levels.
- c) Eisler citation for Aroclor 1254 is an adverse effect level, therefore it is not appropriate to use directly as a "no effect level."
- d) Eisler citation for PAHs is based upon only a five-day exposure; extrapolation to a chronic exposure value must be done to establish a "no effect level."

Response: An assessment of chemical exposure is not necessary as stated in the response to EPA Specific Comment 7.

4.0 RESPONSE TO RWQCB COMMENTS

GENERAL COMMENTS

Comment 1: In general, the sections evaluating habitat destruction are highly theoretical and qualitative, and have not incorporated sufficient site-specific information with which to

evaluate the potential ecological impacts of the proposed capping alternative at OU1. The EATM does not provide a better understanding of the possible effects from altering the habitat to install a soil cap. Other approaches which could be useful to evaluate potential impacts are reviewing the outcome at other cleanup sites with similar conditions and a similar remedial action, or discussing how a long-term study of community recovery at OU1 could be utilized to focus on effects of habitat alteration.

Response: The above-mentioned suggestions will be considered for future OU1 remedial design and remedial action (RD/RA) activities.

SPECIFIC COMMENTS

Comment 1: Section 2.1, Human Health Risk Assessment, page 4, last paragraph: A point of clarification on the background summary relates to the statement that the HHRA concluded that remediation of the groundwater at OU1 is not necessary. Typically human health risk assessments do not present conclusions as to whether or not remediation is necessary, but the describes risk to the receptors by a given remedial action or no action alternative. Whether or not remediation is necessary for groundwater at OU1 depends on a number of factors, such as the National Contingency Plan nine criteria to evaluate proposed remedial alternatives listed on pages 2 and 3, and is a risk management, not risk assessment decision.

Response: Comment noted. The human health risk assessment summary was deleted from the document (see response to EPA General Comment 3).

Comment 2: Sections 2.2 and 3.0: Comments on the OU1 FS report from the agencies indicated concerns about ecological receptors in aquatic environments adjacent to the landfills. The pathway(s) from soil and/or groundwater in OU1 to adjacent surface water bodies was not addressed in this scope of work. The document should clearly state in what format this pathway will be addressed. If the soil/groundwater to surface water pathway is addressed separately, how will those activities fit into the decision making process for OU1 remediation?

Response: See the response to EPA General Comment 2. The revised draft final FS report will evaluate and compare the extent that each remedial alternative will minimize ecological impact to adjacent surface water bodies. Ecological impacts could occur through leachate migration into surface waters or through landfill surface soils migrating into the surface water through runoff and washout. To address leachate migration, the FS report will present waste discharge limits (ambient water quality criteria for aquatic life [marine waters]) that will be protective of ecological receptors. Migration from runoff will also be compared for each alternative in the revised draft final FS report.

Comment 3: Section 3.1: This section does not evaluate the potential habitat destruction from proposed remedial alternatives but merely presents discussion on various theories and models on community disturbance and recovery. Although a qualitative discussion is helpful, this section does not translate these theories as they might apply to the site. Although the paragraph beginning at the bottom of page 11 mentions OU1 remediation,

it is not specific to OU1 and could be applied to any disturbed habitat. At the least, this section could have utilized the specific information gathered during the Phase I SWEA habitat and wildlife surveys to discuss the likelihood or rate of recovery, based on species range, habitat requirements, rate of reproduction, or recolonization, and the like.

Response: This section has been revised and site-specific information has been incorporated as suggested in Sections 3.0, 4.0, and 5.0 of the draft final EATM.

Comment 4: Tables 3-2, 3-3, 3-4, and 3-5. There is a general discrepancy between the text, which states that the EATM evaluates receptors, habitat, and ecology at OU1 (page 6) while the tables and related discussions incorporate data for soils, sediments, and water at OU1 and surrounding areas. It appeared from Section 2.0 that the surrounding areas or pathways would not be addressed in this document, as noted in Comment 2 above.

In addition, Table 3-3 should clarify whether the word water in the heading refers to groundwater or surface water.

Response: An assessment of chemical exposure is not necessary as stated in the response to EPA Specific Comment 7.

Comment 5: Section 4.0, Page 29, Second Paragraph. The conclusion that the proposed cap will unacceptably alter the habitat and ecology, and the ecosystem at OU1 will not recover sufficiently to resemble the current diverse habitat is not supported with the information presented in Section 3.1 (see comment 3 above).

Response: Information to support conclusions has been added to the document in Sections 4.0 and 5.0.

5.0 RESPONSE TO SILICON VALLEY TOXICS COALITION COMMENTS

GENERAL COMMENTS

Comment 1: I am disappointed that the Navy released the draft EATM. Taken together with the meeting that the technical advisors to SVTC, (Peter Strauss and June Oberdorfer) had on July 25, 1994, the document serves as a justification for doing nothing more than monitoring the site for 30 years. This remedial option is a step backwards for the Navy. When I discussed this option with the Community Advisory Board (CAB), it was met with unanimous disapproval.

An important consideration in making the decision on the remedial action for this site is the quality of information that the Navy has on the contents of the landfill, and the hydrological connection between the landfills and surrounding groundwater and surface water. Although I am very pleased that the Navy has attempted to reconcile past reports of contamination with sampling results in its latest responses to our comments on the draft final FS report, I think we would all agree that the quality of information concerning the landfill contents is not very good. PRC also now recognizes that mounding is occurring at Site 1, and also recognizes that there is a possible hydrological

connection between the leachate and groundwater. Under these circumstances, prudence dictates that active remediation is needed to prevent the potential spread of contamination to the groundwater and the existing wetlands.

Response: The EATM conclusions have been revised. Temporary destruction of the habitat at OUI is not expected to have any long-term effects on the environment. This conclusion is based on the following factors:

- 1. The habitat provided by OUI is not unique. OUI is surrounded by over 15 acres of similar habitat.*
- 2. There is an abundance of similar species in surrounding habitats.*
- 3. OUI does not provide a unique habitat that T&E species depend on.*
- 4. Many animal species have the ability to emigrate during cap construction and re-establish territories the following season.*
- 5. Habitat rejuvenation will occur rapidly because of the overall high reproductive rate of commonly occurring species, and due to short gestation periods and large litter sizes.*
- 6. Recovery time shortened through active, assisted revegetation (expected to be no more than 5 years based on recovery rates exhibited in historical photographs).*

As stated above, capping will destroy the current habitat, However, the Navy will minimize this disturbance to the greatest extent possible. The time period for remediation will be selected to minimize impacts. In addition, capping could occur in phases to minimize disturbances to OUI inhabitants. The specific measures to be taken to minimize disturbances will be determined during the RD phase.

Comment 2: The remedial action objectives (RAOs) which the Navy has agreed to, at the request of the RWQCB and the SVTC, would not be advanced by the option to monitor only. After the draft FS report, the Navy agreed that minimizing infiltration should be an RAO. Monitoring only would not advance this objective.

Response: The revised draft final FS report will evaluate the extent that the remedial alternatives meet RAOs. Alternatives that do not include a cap will not minimize infiltration, nor will they eliminate exposure pathways associated with landfill content. The revised draft final FS report will address these concerns.

Comment 3: The EATM concludes that "Although no T&E or protected status species have been observed at OUI, the proposed native-fill soil cap would jeopardize any T&E or protected status species if there were any at OUI." This is tantamount to saying that any ecosystem, no matter how perturbed, cannot be disturbed because a T&E species may use the site. Using this logic, no field could ever be plowed, and no reclamation activity could ever take place. While the local community (SVTC and the CAB) would

be very sensitive to compromises of the Endangered Species Act, this statement and the implication that follows is not within the spirit or the letter of the Act. I recommend that this conclusion be deleted.

Response: This conclusion has been deleted as suggested.

Comment 4: The EATM inexplicably does not address the effects of various remedies on the surrounding terrestrial and aquatic ecosystem. Comments from both the DTSC and the RWQCB, as cited on page 6 of the EATM, point to this concern. Therefore, I recommend that the final EATM contain a wider discussion on the impacts of a cap on adjacent ecosystems, and look at active ways of mitigating those impacts.

Response: See the response to EPA Specific Comment 2. The impacts from capping on adjacent ecosystems are discussed in the draft final EATM. Furthermore, each remedial alternative's ability to minimize ecological impacts to surrounding terrestrial and aquatic ecosystems will be evaluated and compared in the revised draft final FS report. Ecological impacts could occur through leachate migration into surface waters or through landfill surface soils migrating into the surface water through runoff and washout. To address leachate migration, the FS report will present waste discharge limits (ambient water quality criteria for aquatic life [marine waters]) that will be protective of ecological receptors. These waste discharge limits will also trigger corrective action. Migration from runoff will also be compared for each alternative in the revised draft final FS report.

Comment 5: The EATM concludes that the native fill cap will "unacceptably alter" the habitat and ecology of OU1, and that the ecosystem "will not recover sufficiently to resemble the current diverse habitat currently in place." I found that this conclusion is unsubstantiated and perhaps misleading. Several questions should be answered.

First, let us be clear: capping by definition is a severe alteration of a habitat, and I do not think anyone would deny it. However, the definition of "unacceptably alter" is not clear, and there is no quantitative support for this conclusion. Are we looking at alteration from the perspective of the flora and fauna which occupy the site, or from PRC/Montgomery Watson? If the former, we would always conclude that severe alteration of a habitat is unacceptable. If the latter, I take disagree with this conclusion, and it is unsupported by the EATM.

Second, while I recognize that I am trashing the ecosystem and habitat at OU1, they are not what I would consider especially diverse. At the very most, the OU1 area, especially Site 1, has a ecosystem that is unremarkable, and in no way has it been characterized as unique. No T&E species or special status species were observed at this location, and in many areas the vegetation is sparse and there is rubble lying around. So the question that needs to be asked is whether we want the ecosystem that evolves after remedial action to "resemble" the habitat currently in place. The conclusion noted above implies that we do.

Third, and more importantly, however, is that the Navy should be looking at ways in

which a maintenance regime on a capped landfill could be designed to promote a diverse and rich ecosystem. Mowing, as stated in the EATM would promote a mono-culture (although this is unsubstantiated). We recommend that this item be addressed in the next draft of the FS report.

Response: *The conclusions in the EATM have been revised as stated in the response to EPA Specific Comment 7. The cap vegetation can be designed to promote a variety of habitats and to function with minimal maintenance.*

Comment 6: The EATM at times tends to make lists of references, without explaining how those references support to preceding statements. Eyes tend to glaze over when too many references, especially those without any explanation, are used. While I am in support of using sound science, the authors should be make aware that the many references tend to lend an air of authority to conclusions which it is not clear are supported by the research itself.

Response: *The EATM has been revised as suggested. Explanations are provided to clarify how cited references support conclusions.*

SPECIFIC COMMENTS AND QUESTIONS

Comment 1: The EATM states that its focus is on the criterion of overall protection of human health and the environment. This criterion also assesses how effectively an alternative meets the remedial action objectives. First, I think that the EATM is overly broad when it focuses on the human health risk assessments. This information has already been set forth in the draft FS report, and it serves no purpose to introduce it again. I understood that the purpose of the EATM was to evaluate how ecological receptors responded to the various alternatives, and whether the remedial action could be designed to prevent destruction of unique habitats. Therefore, I believe that the discussion of human health risk should be removed. Furthermore, the EATM does not appear to address other parts of the criterion, such as how effective the remedy meets RAOs.

Response: *The discussion about the human health risk assessment has been removed. In addition, the draft final FS report will discuss the extent that the remedial alternatives meet RAOs.*

Comment 2: Figure 2-3 appears to be outside the scope of the EATM, and presents a decision tree which is too simplistic and relies on subjective judgements. I believe using this model leads to a biased conclusion. For example, the conclusion from the first decision node (Is habitat destruction unacceptable or jeopardize T&E species?), as reported in the text of this report, is affirmative. As described above and below, I believe that Montgomery Watson's answers to both of these questions (unacceptable habitat destruction and jeopardizing T&E species) are incorrect and not supported by the evidence. Yet, the decision-tree process, after passing this node, does not consider a range of alternatives, such as how a remedy could be designed so that it could ameliorate or mitigate this effect. Also missing is any consideration of how the remedy may affect adjacent habitat, how could adverse effects be mitigated and still meet RAOs, and whether the alternative meets RAOs etc. For these reasons, I recommend that Figure 2-3 be

deleted, or be replaced with a more complex model.

Response: The flow chart has not been deleted from the EATM. The flow chart was prepared only to illustrate that several tasks may or may not be necessary depending on the results of previous tasks. It will not be used to restrict the range of alternatives that are available. In addition, the extent that the remedial alternatives affect adjacent habitats will be discussed in the revised draft final FS report.

Comment 3: The EATM, particularly Section 3.1, suffers from extreme "dissertation disorder," a disease afflicting many academics and consultants. (I must admit that I occasionally suffer from this disorder). For example, a sentence like "Ecosystems, therefore, vary in space and, at any given point in space, in time" is not meaningful in the context of this report and takes the place of real analysis. I recommend that this entire section be rewritten so that it is accessible and easily understood, and that the EATM concentrate on what is observed in the field, opposed to presenting us with often obscure and sometimes irrelevant theories.

Response: The section has been deleted. The EATM has been rewritten to focus on site-specific characteristics.

Comment 4: Section 3.1 spends 5 pages presenting attributes of several models of ecosystem progression, and concludes that "A pluralistic approach embracing all or parts of all of the theories...should be used when evaluating communities and ecosystems." This is followed by two paragraphs describing the ecosystem and the effects of a cap. It then reaches a major conclusion that is unlikely that a diverse terrestrial ecosystem will re-establish at OU1. This conclusion is unsupported by the preceding very general information and needs substantial further work.

Furthermore, an element missing from the discussion is the fact that we are dealing with an ecosystem that has already been greatly perturbed. Aerial photographs taken as recently as 1987 show that Site 1 was essentially barren. Therefore, the recuperative powers of this area need to be factored into the analysis.

Response: See response to EPA Specific Comment 7. The ability of the ecosystem to recover exhibited in photographs is discussed in the draft final EATM. In addition, the EATM indicates that the photographs depicts unassisted recuperation. Following any capping, the Navy may actively revegetate the area and accelerate the natural recovery process.

Comment 5: If we assume that leachate will migrate, a no action alternative is merely postponing the capping of the landfill, with all the negative affects that this may have. In addition, the spread of contaminants will destroy adjacent habitat, having a larger net effect.

Response: A comprehensive evaluation of all the advantages and disadvantages of the remedial alternatives will be presented in the revised draft final FS report.

Comment 6: The EATM should not be bound by assumptions about the nature and extent of maintenance activities, such as mowing. The conclusion of page 12 that it is "unlikely

that a diverse terrestrial ecosystem will re-establish at OU1 due to the proposed maintenance activities" points to the fact that the EATM should focus on designing maintenance activities that will encourage greater ecological diversity.

Response: Mowing will no longer be recommended in the OU1 FS report for cap maintenance. In addition, the remedial design will focus on promoting maintenance activities that will encourage greater ecological diversity.

Comment 7: The conclusion on page 12 that the named animals "probably will not find a suitable habitat to colonize nearby" is an over simplification and perhaps misrepresentation. There is a corridor from the southeastern end of Site 1 to Site 2 and the surrounding golf course. Although animals would have to cross roads to get there, we suspect that many animals listed, including the red fox, black-tailed hare, ground squirrels, and most birds cross these roads already. Also, the conclusion that displaced animals will have to "travel a considerable distance" is vague and unsupported. More importantly, however, is the fact that no special status species are listed.

Response: The EATM has been revised to consider displaced animals temporarily using adjacent land and any associated impacts that may develop.

Comment 8: At the top of page 13, there is a brief discussion of animals that may be incapable of fleeing during the placement of a cap (that is, insects, young animals, some snakes and lizards). However, the EATM does not report the time of year when there would be increased population of young animals, or mitigating measures by which placement of a cap could occur with the least amount of loss of animal life. Additionally, while the EATM goes into some detail on the variables which contribute to a habitat structure, it fails to identify other similar habitats on the site, and more importantly, species which are mobile and could survive this loss of habitat (for example, I suspect that many types of birds will survive. As noted below, no small mammals have been verified as residential species of OU1).

Response: The EATM has been revised to state that cap implementation can be scheduled to minimize disturbances to the habitat.

Comment 9: The conclusion on page 14 that habitat destruction is "unacceptable" to the current terrestrial populations residing at OU1 is self evident from the residents view point, but not self evident from the human view point. Some environmental impacts, such as loss of habitat, which will result from placing a soil cap are obvious, and nobody needs a dissertation to point this out. However, as described above, this habitat has been perturbed, no special status species have been observed, and is in no way unique. Therefore, I would find it acceptable to destroy this habitat.

Response: The conclusion has been revised as stated in the response to EPA Specific Comment 7.

Comment 10: Although ground squirrels have not been observed at OU1 (see page 14), they are listed as a resident species of OU1 on page 12.

Response: This discrepancy has been corrected in the draft final EATM.

Comment 11: On page 16 there is an unsupported assumption that although small mammals have not been verified as residential species of OU1, they are assumed to reside there. Importantly, the EATM is devoid of population information so that the reader is not aware whether this ecosystem is particularly rich.

Response: The EATM has been revised as suggested to include more site-specific information.