Basewide Remedial Investigation/Feasibility Study
Fort Ord, California

Volume VI - Response to Comments

Response to Agency Comments

Prepared for

Department of the Army
Corps of Engineers
Sacramento District
1325 J Street
Sacramento, California 95814-2922

HLA Project No. 23366 041731

Edward J. Ticken, GP 922
Associate Geophysicist

Elizabeth J. Hawkins
Principal Environmental Toxicologist

Donald R. Smallbeck
Principal Environmental Scientist

Margaret L. Stemper
Project Engineer

Bethany P. Flynn
Senior Geologist

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Harding Lawson Associates
Engineering and Environmental Services
105 Digital Drive, P.O. Box 6107
Novato, California 94948 - (415) 883-0112

Basewide Remedial Investigation/Feasibility Study
Fort Ord, California

CONTENTS

1.0 INTRODUCTION

Volume VI contains written responses to the regulatory agency comments received on the draft final version of the Basewide Remedial Investigation/Feasibility Study, Fort Ord, California, dated December 1994. It also contains replacement pages for incorporation into the draft final versions of the Remedial Investigation (Volume II), the Baseline Human Health Risk Assessment (Volume III), and the Baseline Ecological Risk Assessment (Volume IV).

Point by point responses to comments received from the U.S Environmental Protection Agency (EPA) and the California Environmental Protection Agency's Department of Toxic Substances Control and Regional Water Quality Control Board are provided as Attachment A.

Replacement pages for incorporation into Volumes II, III, and IV are provided as Attachment B. Replacement pages are not provided for Volumes I and V because they have been reproduced in their entirety. It is intended that the replacement pages provided in Attachment B be placed in the appropriate sections of each draft final volume. Title pages, summary sheets indicating which pages have been modified, and Summary Table of Contents have been provided and should be inserted at the beginning of each volume and or binder as appropriate. The replacement pages should be inserted either before or after the modified pages as appropriate. Where entire sections have been replaced, the previous version should be removed.

Response to Agency Comments
Draft Final Basewide Remedial Investigation/Feasibility Study
Fort Ord, California

The following are the Army's responses to the comments of the regulatory agencies on the Draft Final Basewide Remedial Investigation/Feasibility Study. All comments and the associated responses pertaining to the Basewide Remedial Investigation/Feasibility Study are provided below.

I. U.S. Environmental Protection Agency General Review Comments

General Comments

Comment 1: Unexploded Ordnance (UXO) - **The Army's responses to EPA Draft RI/FS comments relating to unexploded ordnance issues were unsatisfactory. The Army, for the most part, was silent on the issue, not responding to EPA's assertion that the RI/FS Report should discuss the time critical removal action currently underway outside the impact range, as well as include a feasibility study for the impact range itself. In addition, no response was given to EPA's September 7, 1994 letter. For this reason, EPA initiated dialogue with the Department of the Army in order to receive some form of response and to avoid entering into a formal dispute under Section 12 of the Fort Ord Federal Facility Agreement (FFA). Since mid-February, four conference calls have occurred with the Army and the State and progress is being made. On March 31, EPA received a position paper from the Department of the Army (DA) proposing that the cleanup of UXO at Fort Ord be conducted "in a manner consistent with a CERCLA removal action and in accordance with the pertinent provisions of the National Contingency Plan (NCP)." We are reviewing this letter and plan on discussing the issue with DA soon. We reserve the right to further comment on this issue and enter into the formal dispute resolution process of the FFA until May 5, 1995, or a later date if agreed to by all FFA parties, if this issue to not resolved to our satisfaction. Once again, it appears that we are moving closer to resolving this issue by addressing UXO at Fort Ord as a CERCLA action, thus involving EPA, the State, and the public in the development of a UXO remediation strategy.**

Response 1: A discussion of the Time Critical Removal of UXO from areas outside the Impact Range has been included in Section 1.2.4 of Volume I.

A feasibility study for chemical contamination in the soil within the Impact Range (Site 39) was presented in Volume V of the Draft Final RI/FS.

The cleanup of UXO within the Impact Range at Fort Ord will be conducted as a concurrent program separate from the Basewide RI/FS. The Army's position concerning the cleanup of UXO at Fort Ord was presented in the March 31, 1995 letter to the EPA. In this letter, the Army proposes that the UXO cleanup be conducted in a manner consistent with the pertinent provisions of the National Contingency Plan (NCP) including a preliminary assessment, an engineering evaluation/cost analysis (EE/CA), community relations and preparation of an administrative record file. This proposal for cleanup was specific to Fort Ord and is not Department of the Army (DA) policy. The issue of UXO Cleanup at Fort Ord will be resolved between the Department of the Army and EPA and will not be included in the Final Basewide RI/FS. In addition, the Huntsville Division of

the Army Corps of Engineers has issued a Request for Proposals, dated 1/14/95, to locate, identify and dispose of ordnance and explosive waste (OEW) at Fort Ord, California (particularly the Impact Area). The RFP states that the response shall be performed consistent with CERCLA, other applicable laws and regulations, and the NCP.

Comment 2: **Ecological Risk Assessment - EPA has identified a number of ecological risk assessment issues that need to be addressed further (particularly those related to Site 3), and it is still not clear what impacts unreported data may have on the assessment and the RI/FS as a whole. Specific comments on Volume IV - Baseline Ecological Risk Assessment appear below.**

Response 2: Comment acknowledged. Specific comments to Volume IV will be addressed later in this volume.

Comment 3: **Proposed Future Land Uses - Page C3 response to EPA General Review comment 2e, and Executive Summary Section 3.3. Please ensure that the reuse scenarios contained in the FORA Base Reuse Plan of October 14, 1994 (which is what the Draft Final RI/FS was based on), are consistent with those in the final plan dated December 12, 1994, and that any more recent changes are also taken into account. For instance, after meeting with California State Parks, it appears that the FORA Plan may not adequately reflect the range of reuse options still being considered for the areas west of Highway 1. The State Parks believe that the entire area may be used for a State Park that does not include an aquaculture facility or a desalinization plant, which are included in the FORA Plan. The RI/FS, including the baseline risk assessment, should discuss this and consider the most conservative reuse scenario.**

Response 3: The Final RI/FS will use reuse scenarios contained in the FORA Plan dated December 12, 1994, except for the State Park Parcel west of Highway 1, which will use the scenarios proposed by California State Parks.

Comment 4: **Cleanup level for lead - The response to EPA BRA comment 5 was only partially addressed. The threshold level of concern for lead should be further reduced to ensure that it is sufficiently protective. See specific comments on Volume III below. The manner in which a lower threshold soil concentration is applied to the cleanup (i.e., at Site 3) is a risk management decision that the BRAC Cleanup Team (Fort Ord, EPA, and the State) must address.**

Response 4: Comment acknowledged. Specific comments to Volume III will be addressed later in this volume.

Comment 5: **Potential Impacts to Monterey Bay - The response to EPA General Review Comment 2c (Vol I, p. C3) is not responsive to EPA's comment that the RI/FS is incomplete with respect to an assessment of the marine environment. The Enhanced Preliminary Assessment of Monterey Bay (Enhanced PA) should be summarized in the RI/FS Report and conclusions and data gaps, or next steps, should be discussed. EPA emphasizes that the evaluation of potential impacts to Monterey Bay from storm and sanitary sewer discharges, as well as from hazards associated with any unexploded**

ordnance on the seafloor, are issues which must be addressed in the Superfund process and in this RI/FS document. EPA is pleased by the Army's initial efforts, through the Enhanced PA, to obtain information on Fort Ord activities in and around Monterey Bay, but the Enhanced PA and other information such as the dilution modeling are not conclusive or persuasive enough at this point with regard to the preliminary conclusion that no further action, such as sampling, is needed. (See specific comments below on Volume IV - Baseline Ecological Risk Assessment (Appendix H - Bay Dilution Modeling)).

Given the complex system involving currents, sediment inputs, and potential sources of contaminants (i.e., Ft. Ord, Salinas River, municipalities) in the near shore areas of Monterey Bay in the vicinity of Fort Ord, it is not clear what an individual, focussed effort by Fort Ord would be or could achieve. Fortunately, as Fort Ord is aware, the USGS and NOAA are planning a joint, federally sponsored sampling effort in cooperation with EPA as part of its Environmental Monitoring and Assessment Program, to obtain geophysical and sediment sampling data in the Monterey Bay National Marine Sanctuary. EPA requests that Fort Ord participate with its federal partners in a portion of this study, namely in areas where geophysical and sampling data could help address questions about the potential impact to the near shore area of Monterey Bay near Fort Ord from activities of Fort Ord. This effort, if properly planned, could be supported by all Natural Resource Trustees and Regulatory Agencies in an attempt to answer pertinent questions about the potential impact. Such planning could give the Army the confidence that the purposes of the effort, the list of contaminants of concern, and intended use of the data are established and agreed on by all parties beforehand. We are pleased with the Army's recent coordination with EPA and USGS on this issue, and hope that the Army will participate.

With regard to the intended use of the data, it is EPA's position that the data from this effort will provide information for defining the status of the condition of the near shore area of Fort Ord, rather than attempting to determine the source of the contaminants at this time. The source of the contaminants, for that matter, may be something that may be difficult to ever "nail down", but initial studies, including geophysical information, may be useful for establishing ambient levels of constituents and possibly some information on fate and transport. Following this effort, a technical meeting between the USGS, NOAA, EPA, and the Army would be arranged to discuss the next step(s), if any. The group could decide that next step(s), if warranted, may or may not involve Fort Ord and/or other potential dischargers in the Monterey Bay Area.

Once again, EPA recognizes that Fort Ord is only one of the many dischargers to the Bay --the Salinas River, industry, and municipalities being others. Nevertheless, EPA feels that Fort Ord's participation in this joint, federal effort is crucial and will help to: 1) establish ambient levels of chemical constituents and the presence of UXO in the southern Monterey Bay near Fort Ord, 2) bring this Superfund issue closer to a conclusion that the Regulatory Agencies and the Natural Resource Trustees can all agree to, and 3) demonstrate to the public that the Army is as good an environmental steward regarding potential impacts to Monterey Bay as it is with potential impacts to land.

Regarding timing, a final Army response as to its intent to participate in this activity is needed as soon as possible, since the NOAA vessel has departed and samples will be

available for analysis soon. In addition, participation in this effort is critical with regard to having data available to make a more informed decision regarding any impacts to the Bay prior to the Basewide Proposed Plan and Record of Decision.

Response 5: A brief summary of the Draft Enhanced Preliminary Assessment of Monterey Bay will be included in Section 4.9 of Volume I of the RI/FS. The Draft Final will be issued upon receipt of regulatory agency comments.

The Army has met with the EPA, NOAA, and the USGS to discuss participation in the NOAA survey of Marine Sanctuary. The Army's support may include analysis of sediment samples in Monterey Bay as well as side-scan sonar and magnetometer surveys. The results of the survey will be presented in a separate report which will support the basewide proposed plan and record of decision.

Specific Comments

Volume I - Background and Executive Summary

Comment 6: **Page C7, response to EPA Technical Review General Comment 1. The response that a brief summary or abstract of the Executive Summary is not feasible due to the complexity of RI/FS is not valid. A summary as outlined below could be easily accommodated in fewer than ten pages. An abstract would be quite useful to citizens, members of FORA, and others who wish to get a sense of what the RI/FS is about, without having to wade through 110 pages of Executive Summary text. Please consider preparing this for the final RI/FS. A possible approach is as follows:**

First Page

- **First paragraph to summarize the information in Sections 1.1, 2.1, and 2.2. The remaining subsections in 1.0 and 2.0 contain too much detail that is not appropriate for an abstract.**
- **Second paragraph to summarize the information in Sections 3.0, 4.0, 5.0, and 6.0. Minimal detail on these subjects as they are not the main focus of the RI/FS and are not included as separate sections in Volume II.**
- **Third paragraph to summarize Basewide Hydrogeologic Characterization.**
- **Fourth paragraph to summarize other Basewide Investigations. Primarily a documentation that such investigations were conducted. Leave detail for Executive Summary, Volume II and Volume IV.**
- **Fifth paragraph to summarize general information in Sections 8.1 and 8.2 and to list No Action Sites and Interim Action Sites. Details from Subsections 8.1.1 through 8.1.18 and 8.2.1 through 8.2.16 are not needed in an abstract.**

Second Page

- **Sixth paragraph to summarize Sites 2 and 12 background and results of remedial investigation from Sections 9.1.1 and 9.1.2.3. Do not include the details of the RI field activities in the abstract.**

- **Seventh paragraph to summarize Sites 2 and 12 risk assessment.**
- **Eighth paragraph to summarize Sites 2 and 12 feasibility study from Sections 9.1.4.1 and 9.1.4.5.**
- **Ninth paragraph to summarize Sites 16 and 17 background and results of remedial investigation from Sections 9.2.1 and 9.2.2.3.**
- **Tenth paragraph to summarize Sites 16 and 17 risk assessment.**
- **Eleventh paragraph to summarize Sites 16 and 17 feasibility study from Sections 9.2.4.1 and 9.2.4.5.**

Third Page

- **Twelfth paragraph to summarize Site 3 background and results of remedial investigation from sections 9.3.1 and 9.3.2.3.**
- **Thirteenth paragraph to summarize Site 3 risk assessment.**
- **Fourteenth paragraph to summarize Site 3 feasibility study from sections 9.3.4.1 and 9.3.4.5.**
- **Fifteenth paragraph to summarize Site 31 background and results of remedial investigation from Sections 9.4.1 and 9.4.2.3.**
- **Sixteenth paragraph to summarize Site 31 risk assessment.**
- **Seventeenth paragraph to summarize Site 31 feasibility study from Sections 9.4.4.1 and 9.4.4.5.**

Fourth Page

- **Eighteenth paragraph to summarize Site 39 background and results of remedial investigation from Section 9.5.1 and results subsections.**
- **Nineteenth paragraph to summarize Site 39 risk assessment.**
- **Twentieth paragraph to summarize Site 39 feasibility study from Sections 9.5.4.1 and 9.5.4.5.**
- **Do not include summary of Quality Assurance Program. Detail too specific for an abstract.**
- **Twenty-first paragraph to summarize Community Relations Program.**

Response 6: Comment acknowledged. Based on the volume of information presented in this document, the Army does not believe that a condensed version (i.e., 10 pages) would provide the reader with an adequate understanding of the RI/FS report. If the remedial investigation, risk assessment and feasibility study for the Fort Ord facility is condensed into three paragraphs as suggested, the reader could easily misinterpret the conclusions related to the identified site conditions.

Comment 7: **Section 1.2.4, page ES 3, and Page C4, response to EPA Vol I (Executive Summary) comment 5. The discussion of time-critical removal actions should also include the removal action addressing UXO outside the impact range.**

Response 7: Section 1.2.4 has been modified.

Comment 8: **Section 5.5 Future RCRA/CERCLA Integration Activities, page ES 23. EPA understands that the Army has recently initiated an additional SWMU investigation. Please provide EPA with the scope of this effort, as well as the projected timing of your survey report.**

Response 8: The Army has initiated a review of the 58 previously identified SWMUs to determine the present status and condition. In addition, existing data will be reviewed and site visits will be conducted to identify any additional SWMUs at Fort Ord. The updated SWMU Report will include both the 58 known SWMUs and any new SWMUs identified as part of this investigation. This report will be prepared prior to the preparation of the Basewide ROD.

Comment 9: **Section 8.1.1, page ES 36, and Section 8.1.13, page ES 43. These sections should note that while no action is planned for Sites 1 and 32 (and Site 36), the Army will remove any drying bed sludges that remain at these sites as a maintenance procedure before the land is transferred.**

Response 9: Sections 8.1.1, 8.1.13 and 8.1.14 have been modified to address what actions, if any, are necessary for the sludge beds.

Comment 10: **Section 8.1.2, Site 4, page ES 37. This site does not meet the No Action criteria and the reference to the Basewide study should be made in another section and considered an administrative "fix" rather than no action.**

Response 10: Section 8.1.2 has been modified.

Comment 11: **Section 8.1.6 Site 18. Since the TCE detections in MW-18-03 have been consistent, what is the next step? Additional wells are likely to be necessary.**

Response 11: Section 8.1.6 has been modified. At this time additional wells are not anticipated.

Comment 12: **Site 2. Alternatives should include the removal of drying bed sludges.**

Response 12: The Army has determined that material in the sludge beds is not a CERCLA waste and requires no action under CERCLA. The Army is in the process of sampling and evaluating the sludge bed material at Site 2 and will determine whether it is necessary to remove the material before transfer of the property in accordance with local, state, and federal regulations. If it is determined after sampling and evaluation that the sludge should be removed from the site it would be disposed in the OU 2 landfill.

Comment 13: **Section 9.3.4 Site 3 FS. With respect to the storm drain outfalls that were referenced in the Enhanced Preliminary Assessment for Monterey Bay, alternatives for Site 3 (as well as the Basewide Storm Drain Outfall Report) should note that while no action is required for the drains under CERCLA, monitoring of future discharges is required under other State and/or Federal authorities (ie, NPDES). Also note that the decision as to whether or not these storm drains will be eliminated and/or diverted will be resolved between the Army and the reusers of the land.**

Response 13: The text has been revised in Section 9.3.4 as suggested to clarify how the outfalls will be addressed.

Comment 14: **Site 39 Section 9.5.4.2 Soil Remedial Unit 1 does not discuss the specific concerns at Range 36A. In addition, the discussion in Section 6.2.1.2 Site 39 of Volume V indicates that Site 36A is not a part of any remedial unit at this time. Please clarify.**

Soil Remedial Unit 2 - The lead cleanup here is based on information obtained from Site 3. Will areas of moderate distribution of lead be remediated? Site 3 risk assessment indicates that these areas are of concern.

Response 14: Range 36A is not part of a soil remedial unit at this time because it is still in use as a UXO detonation/disposal area. Upon closure of the disposal area in the future, samples will be collected and the site will be remediated, if necessary, based on the risk assessment for Site 39.

Areas of moderate distribution, per se, are not targeted for remediation. However, when areas of heavy distribution are remediated, a sidewall confirmation sampling will be performed to determine whether the health-based level of concern of 1,860 mg/kg is exceeded. Additional soil from areas bordering heavy/moderate distribution will be removed if confirmation sampling indicates an exceedance of 1,860 mg/kg.

The Site 3 BRA indicated that if a local offsite resident spent all their time in the areas of moderate bullet distribution for two hours a day, up to 97 days per year for 30 years at Site 3, the associated HI would be 2.0 (EPA's threshold level of concern is 1.0). For Site 39, it is unlikely that an individual working or visiting who would be trespassing at the site, would spend all their time in this one area, and land use scenarios for Site 39 would not allow unlimited access to the public. The most common potential site user in the area of the Small Arms Ranges would be a ranger for the BLM, and it would be unlikely that they would spend as much time in one area of Site 39 as is assumed spent at Site 3.

Comment 15: **Plate 1A.**

a. **Include time-critical removal actions for UXO.**

b. **No Action Sites - Indicate Proposed Plan, as was done prior to ROD for OU's 1 and 2. Show approval point after ROD, as that is where plug-in occurs.**

c. **Interim Action Sites - Indicate Proposed Plan and ROD prior to approval and confirmation reports.**

Response 15: Plate 1A has been modified.

Comment 16: **Page C4, response to EPA Executive Summary comment 8. EPA requests that the removal of USTs 4495 and 4512 be completed prior to the Basewide Proposed Plan in the event that it is necessary to propose additional work for the tanks under CERCLA. In addition, please provide information regarding the scope of the ongoing work at Tank 2754 at Site 2. Can this be accomplished in the same timeframe?**

Response 16: USTs 4495 and 4512 are scheduled for removal in June 1995 which will be prior to the preparation of the Basewide Proposed Plan. Tank 2754 has been removed and the characterization of the soil contamination at the site has been completed and excavation of contaminated soil at the site has been recommended.

Comment 17: **Page C8, response to EPA Technical Review Specific comment 5. This response is not true and does not respond to the comment. Section 7.1 does not summarize geology, only hydrogeology. A reader expecting to find a summary of stratigraphy, structure, or depositional history for the Fort Ord area will be disappointed.**

Response 17: The reference to the summary of geology in Section 7.1 has been removed from Section 2.6.1.

Comment 18: **Page C9, response to EPA Technical Review Specific comment 9. Although the response explains why not all AREEs are listed in Tables 6 and 7, it does not address the original comment on Section 4.2.2. The statement that "...not all AREEs were covered under CERCLA..." should be added to Section 4.2.2.**

Response 18: Section 4.2.2 has been modified.

Comment 19: **Page C10, response to EPA Technical Review Specific comment 19. Although the response is adequate, no change was made in the text. The text should be amended to explain that the eight documented spills were not investigated as part of the RI "...based on the nature of the spills and site conditions..." as "...agreed upon...with the regulatory agencies during the planning stages."**

Response 19: Section 8.1.10 has been modified.

Comment 20: **Page C15, response to EPA Technical Review Specific comment 39a. The groundwater remedial unit should initially include all contaminants that exceed groundwater PRGs, not MCLs.**

Response 20: According to CERCLA RI/FS guidance, a remedial unit is only developed for contaminants of concern after initial consideration of all chemicals of interest (e.g. PRGs). Chemical concentrations were initially compared to promulgated standards such as PRGs; however, for the chemicals in the remedial unit

considered in the BRA, MCLs were found to be health protective in the post-remediation risk assessment.

Volume II - Remedial Investigation

Basewide Hydrogeologic Characterization Appendixes: Appendix D

Comment 21: **Page F9, response to EPA General Comment 1 and all other EPA comments on this appendix. Despite the concern expressed in Comment 1 regarding the poor presentation of information in Appendix D, no text changes have been made to this appendix. In fact, even when new or clarifying information has been provided in the Response to Comments section, no revisions have been made to Appendix D.**

Response 21: The groundwater flow modeling description in Appendix D is considered to be clear and well organized based on industry standards. The technical nature of groundwater flow modeling and the esoteric nature of the modeling process description warranted presentation in an Appendix. Groundwater flow modeling is a dynamic process which evolves as new information becomes available. The groundwater model originally described in Appendix D has been further refined and described during the design analysis of the groundwater portion of the OU 2 remedial unit in *Draft Design Analysis, OU 2 Groundwater Remedy, Fort Ord, California* dated February 24, 1995. Groundwater flow modeling is an on going process and as such must be described in multiple sequential reports. The specific comments and responses from EPA were not added to the report text. However, the comments and responses are included in Appendix F and are considered to be part of the Draft Final report.

Basewide Surface Water Outfall Investigation

Comment 22: **Attached please find Attachment A, which includes EPA comments dated February 24, 1995, provided by Mr. Jeffrey Paull, EPA Regional Toxicologist. Regarding his general comment, EPA has made this same comment with regard to screening risk evaluations in Site Characterization Reports several times over the past year, and it has not yet been satisfactorily addressed.**

Response 22: The responses to comments found in Attachment A are included under Subheading III, U.S. Environmental Protection Agency Technical Review Comments, Surface Water Outfall Investigation.

Comment 23: **Pages F6 and F7, responses to EPA Specific Comments 15, 16, 18, and 20. These responses do not address the point of these comments concerning possible under-reporting of benzo(a)pyrene and other PAHs, and Aroclor 1248 and other pesticides and PCBs.**

(a) The text has not been changed and continues to mislead the reader by suggesting that the analytical data are adequate to ascertain the presence or absence of all parameters at concentrations at or below the PRGs. This is not true due to elevated detection limits. The text should clarify the information provided in the

bullet on Page 13 that describes the presence of PAHs. The following is a suggested addition:

"Because of elevated PAH detection limits attributed to the presence of extractable petroleum hydrocarbons that interfere with PAH analysis, the absence of PAHs at concentrations above PRGs cannot be confirmed in some samples. In particular, 37 samples in which benzo(a)pyrene was not detected had elevated detection limits (100 to 1,100 μg/kg) that were at or above the PRG for benzo(a)pyrene (100 μg/kg). At the locations represented by these samples, non-detection of benzo(a)pyrene is not an adequate measure of the presence or absence of above-PRG concentrations of this compound."

and

"Because of elevated PCB detection limits attributed to the presence of extractable petroleum hydrocarbons that interfere with PCB analysis, the absence of PCBs at concentrations above PRGs cannot be confirmed in OF-01 samples. In particular, samples in which Aroclor 1248 was not detected had elevated detection limits (340 to 6,900 μg/kg) that were above the PRG for Aroclor 1248 (20 μg/kg). At OF-01, nondetection of Aroclor 1248 is not an adequate measure of the presence or absence of above-PRG concentrations of this compound."

(b) There may be mitigating factors to compensate for the uncertain PAH and PCB levels caused by the inevitable matrix interference due to extractable petroleum hydrocarbons. Perhaps the direct relationship of elevated PAH detection limits and the presence of extractable unknown hydrocarbons can be put to use as follows:

"All of the 37 samples with benzo(a)pyrene detection limits elevated above PRGs, and all of the OF-01 samples with elevated Aroclor 1248 detection limits, contained detected concentrations of extractable unknown hydrocarbons. These hydrocarbon concentrations ranged from 12 mg/kg to 26,000 mg/kg for the samples with elevated PAH detection limits and from 140 mg/kg to 10,000 mg/kg for elevated PCB detection limits. Even if elevated levels of benzo(a)pyrene or Aroclor 1248 have been masked by the presence of other hydrocarbons, these other hydrocarbons can be used an indicator of the limited extent of (or limited exposure potential for) soils and sediments which could contain elevated, but undetectable, concentrations of benzo(a)pyrene or PCBs."

or (if true)

"The elevated PAH and PCB detection limits for some samples are directly related to the presence of extractable hydrocarbons. Even if elevated levels of benzo(a)pyrene or other PAHs or PCBs have been masked by the presence of these hydrocarbons, remedial actions to mitigate the hydrocarbons may also be expected to mitigate the presence of PAHs and, possibly, PCBs."

Response 23: Comment acknowledged. Additional text has been added to Section 3.5.2.2 as requested.

Comment 24: **Pages F8, F9, and F10, response to EPA Specific Comments 24, 25, 27, 28, 29, 31, 36, 37, 38, 39, 40, and 41. The discussions in the responses to these comments contain valuable information and should be included in Tables 11, 15, 17, 19, etc. These discussions support the conclusions that these outfalls do not need further characterization. The discussion of lack of sources with respect to investigated upgradient sites reinforces the conclusion that moderately elevated (above background, but below PRGs) metals concentrations are not an indication (or the leading edge) of a serious upgradient source of contaminants. In the case of Outfall 01, if no PCBs have been detected at Site 2, then concern with matrix interference in PCB analysis is reduced.**

Response 24: Comment acknowledged. Text describing the lack of source areas upgradient of the outfalls discussed in the response to EPA Specific Comments 24, 25, 27, 28, 29, 31, 36, 37, 39, 40, and 41 have been added to Tables 11, 17, 19, 23, 27, 39, 45, 47, 49, 51, 53, and 57 as requested.

Comment 25: **Pages F9 and F10, responses to EPA Specific Comments 30, 32, and 33. The response that elevated metals concentrations that do not appear to be related to the outfall will not be evaluated further may be appropriate for the scope of the outfall investigation report. However, please clarify what steps, if any, are planned as part of the RI outside of the outfall investigation in order to evaluate potential sources of contamination related to elevated cadmium, mercury, or lead concentrations at, but not related to, these outfall locations.**

Response 25: No other investigative activities are planned for these outfall locations. No potential sources of contamination have been identified upgradient of Outfalls OF-8 and OF-13. Additionally, although concentrations of mercury and lead were detected above background concentrations, these metals were below PRGs. Cadmium was detected in one surface sample 20 feet downgradient of OF-12 at a concentration above its PRG. However, cadmium was not detected in samples collected at the outfall or below the surface and therefore is not considered to be related to the outfall. Information regarding historical activities at the site does not suggest a source of cadmium. This isolated area of elevated cadmium concentrations could be addressed as part of the interim action at Site 22.

Comment 26: **While no further action under CERCLA may be necessary for storm drains outfalls to the Monterey Bay, Salinas Rivers, or other waterways or wetlands onsite, please state which outfalls require monitoring of future discharges under other State and/or Federal authorities (ie, NPDES) to ensure that the effluent meets the appropriate standards. To demonstrate that an appropriate type of monitoring is planned, please provide EPA with Fort Ord's Surface Water Outfall Sampling Plan, identifying the outfalls to be sampled, the list of analytes, the test methods and detection limits, and the frequency of sampling. Fort Ord should work with the EPA, the Regional Water Quality Control Board, and the appropriate Natural Resource Trustees to make sure that the plan is sufficient. Also, describe for the reader how the decision to eliminate and/or divert the beach storm drains will be made.**

Response 26: A Storm Water Pollution Prevention Plan and a Monitoring Plan for Fort Ord under the General Industrial Stormwater Permit are under preparation by the Army and are scheduled for submittal to the RWQCB in the summer of 1995. EPA has requested a draft copy and the Army will provide one to the EPA. The

draft plan does not identify specific outfalls to be monitored but has identified 12 collection or sampling points at Fort Ord. Information regarding other NPDES issues can be obtained from the Army or Adam White (the Storm Water Program contact for the Central Coast Region of the RWQCB) at (805) 549-3147.

Basewide Background Soil Investigation

Comment 27: **Pages B2 through B3, responses to EPA Specific Comments 1, 4, 5, and 7. These comments were a request to clarify the information presented and, therefore, reduce the need for the reader to refer to other documents. However, the response only referenced the ongoing process in which the agencies were fully involved.**

Response 27: The response to EPA Specific comments 1, 4, 5, and 7 on the Draft report refers to the original Background Soil Investigation Report and the process undertaken to estimate soil background chemistry concentrations. The agencies previously indicated that the clarity of the original report was adequate and acceptable during the original report comment process.

Comment 28: **Page B2, response to EPA General Comment 3. The response is technically adequate, though poorly stated. However, it has not been incorporated into the text of the document. Specifically, Section 5.2.4.1 should include an explanation such as:**

"As shown in Table 14, certain metals were not detected in any sample for some soil subgroups (i.e., antimony in Shallow NQTP, and Shallow and Deep QTP soil subgroups; cadmium in Shallow NQTP and Deep QTP; mercury in Deep NQTP and Shallow QTP; selenium in Shallow and Deep NQTP; silver in Deep QTP; and thallium in Shallow and Deep QTP). Consequently, no detectable maximum background concentration was available for these metals in these subgroups. Therefore, the detection limit was used as the maximum background concentration in these instances."

Response 28: Comment noted and accepted. The paragraph recommended will be added to the end of Section 5.2.4.1.

RI - Sites 2 and 12

Comment 29: **Attached please find Attachment B, which includes EPA comments dated March 24, 1995, on data validation. These comments were prepared by Ms. Lisa Hanusiak, EPA Region 9 Chemist.**

Response 29: The response to comments found in Attachment B are included under subheading II, U.S. Environmental Protection Agency Data Validation Comments.

Comment 30: **Appendix H, Pages 4 and 5, response to EPA Technical Review Specific Comment 13. This response is valid when it states that low levels of bis(2-ethylhexyl)phthalate in soil samples may be attributed to laboratory contaminants. "Low level" usually means concentrations less than 5 to 10 times the detection limit. However, it does not address concentrations which are at least 100 times the detection limit. The presence**

of bis(2-ethylhexyl)phthalate as an environmental contaminant should be given consideration at two locations:

a) Concentrations of bis(2-ethylhexyl)phthalate ranged from 33 to 3,600 μg/kg for samples from Trench TR-12-01-C in the Lower Meadow. This maximum concentration does not qualify as a low level. Further, the persistent detection of this compound in samples from Trench TR-12-01-C suggests that bis(2-ethylhexyl)phthalate is most likely present in soil at this location. Plastics in debris could be the source of phthalate compounds. This should be addressed in the text.

b) Bis(2-ethylhexyl)phthalate was detected at a concentration of 9.9 mg/kg (9,900 μg/kg) in the shallow sample from Boring SB-12-32 in the Cannibalization Yard. As stated in the final paragraph of Section 4.3.4, this compound could have been associated with the contents of former tanks. Phthalates are also found in hydraulic fluids. Because of the broad range of contaminants which appear to be present in soil in the Cannibalization Yard, more credence should be given to the possibility that bis(2-ethylhexyl)phthalate is present as an environmental contaminant at the location of Boring SB-12-32.

Response 30: The text on pages 29 and 32 in Volume II, Sites 2 and 12 - Text, Tables and Plates has been modified to include additional discussion of bis(2-ethylhexyl) phthalate.

Comment 31: **Section 7.2 Data Limitations, and Section 7.3 Recommendations and Future Activities, page 51. Please provide your latest plans for further evaluating the extent of the 1,1,1-TCA plume to the north of Site 2.**

Response 31: The text on page 51 in Volume II, Sites 2 and 12 - Text, Tables and Plates has been modified to include a description of future activities.

RI - Sites 16 and 17

Comment 32: **Page G3, response to EPA Technical Review Specific Comment 1. Although the response is adequate, no change was made in the text. The first paragraph of the response that describes current activities at Sites 16 and 17 should be added to the text.**

Response 32: The text on page 2 in Volume II, Sites 16 and 17, has been modified to include current uses of the yard.

Comment 33: **Page G5, response to EPA Technical Review Specific Comment 6. Although the response is adequate and provides valuable information, no change was made in the text. The paragraph response describing estimated vertical hydraulic gradients at Sites 16 and 17 could be added to the text.**

Response 33: The text on page 19 in Volume II, Sites 16 and 17 has been modified to include a discussion of the vertical gradient at Site 17.

Comment 34: **Page G5 and G6, response to EPA Technical Review Specific Comments 8 and 9. Although the response is adequate and provides valuable information, no change was made in the text. The paragraph response explaining why paved areas were not investigated as potential sources at the DOL Maintenance Yard could be added to the text.**

Response 34: The text on page 21 in Volume II, Sites 16 and 17 has been modified to include a discussion of the paved areas.

Comment 35: **Pages G8 and G9, response to EPA Technical Review Specific Comment 19. The second paragraph of this response provides valuable information on the rationale for CCD/CCFs sampling and analysis, but no change was made in the text. This paragraph response should be added to the text.**

Response 35: The text on page 11 in Volume II, Sites 16 and 17 has been modified to include a discussion of the rationale for analyzing one sample for dioxin.

RI - Site 31

Comment 36: **Pages F3 and F4, response to EPA Technical Review General Comment 4. This response, which disagrees with EPA's comment and states that no relevant revisions have been made, is inadequate as well as inaccurate. Despite the statement in the response that no changes to the text were made, the text has been amended appropriately in Section 4.4.2 to include an explanation of how metals background threshold values were used. In addition, the response to EPA's Technical Review General Comment 5 states that inconsistencies related to background issues have been revised throughout the report.**

Response 36: The Army disagreed with the statement in the original comment that the "Criteria established for background levels of inorganics (metals) in soil are being used inappropriately or are being disregarded." The criteria were used correctly, but were not clearly or accurately explained. The text of the draft final report was modified to more clearly and adequately explain how the background concentrations were used. No revisions to the draft final text are necessary.

Comment 37: **Page F9, response to EPA Technical Review Specific Comment 13. This response, which disagrees with EPA's comment and states that no relevant revisions have been made, is inadequate as well as inaccurate. Despite the statement in the response that no changes to the text were made, the text has been amended appropriately in Section 4.4.2 to include an explanation of how metals background threshold values were used and to eliminate the phrase "..no maximum background concentration for surface soil is established..." for cadmium, etc. In addition, this response contradicts the response to EPA's General Comment 5, which states that inconsistencies related to background issues have been revised throughout the report.**

Response 37: See response to Comment 36 above.

RI - Site 39

Comment 38:

Page G7, response to EPA Technical Review Specific Comment 13. This response misses the point of the comment. The original concern of this comment was that the site may not have been adequately characterized in terms of petroleum hydrocarbons. The response to EPA's comment does not resolve this issue.

The analytical methods for total petroleum hydrocarbons as diesel (TPHd) and total petroleum hydrocarbons as gasoline (TPHg) are adequate only for fresh diesel or fresh gasoline in soil. These methods do not report petroleum hydrocarbons such as lubricant oils. The analytical method which should be employed to determine whether petroleum hydrocarbons are present is EPA Method 418.1 - total recoverable petroleum hydrocarbons (TRPH). TRPH analysis is non-specific, but covers the analytical gap represented by TPHd and TPHg analyses alone and provides a tool for quantification of total petroleum hydrocarbons in samples.

The TPHd and TPHg methods compare the chromatograms for diesel and gasoline, respectively, against the chromatogram for the sample. If the sample chromatogram does not match either the diesel or the gasoline chromatogram, then the sample is non-detect for diesel or gasoline, respectively. However, diesel or gasoline in soil will weather, losing light fractions over time. As a result, the chromatogram for weathered diesel or gasoline will not match the chromatogram for fresh diesel or gasoline. Additionally, chromatograms for other petroleum hydrocarbons, e.g., lubricant oils or Stoddard solvent, will not match those for diesel and gasoline. Therefore, if petroleum hydrocarbons other than fresh gasoline or diesel are present in soil samples, TPHg and TPHd analyses (EPA method 8015 modified) will not identify these contaminants.

The presence of tentatively identified compounds (TICs) resulting from EPA Method 8270 analysis is an indicator of the possible presence of petroleum hydrocarbons. Use of TICs to quantify petroleum hydrocarbons is not the intent of EPA's comment. For example, the presence of a decane TIC at 2,010 µg/kg in sample SB-R33-03-0.0 should be an indicator to suggest further characterization is necessary to rule out petroleum hydrocarbon lubricant oils in this sample. In a similar instance, a dodecane TIC at 4,800 µg/kg in sample SB-09-12-0.0 at Range 40A is an indicator that lubricant oils may be present as well as the unknown hydrocarbon reported in the TPHd analysis.

Response 38:

The Army does not agree that the site may not have been adequately characterized in terms of petroleum hydrocarbons. A review of both the results of the TPH as gasoline and TPH as diesel analyses and the Tentatively Identified Compounds (TICs) detected by EPA Method 8270 show that in samples where the largest number and the highest concentrations of TICs were detected, total petroleum hydrocarbons were also detected in either the diesel or gasoline range or both. In most cases the laboratory reported TPH as unknown TPH within either the diesel or gasoline range. This indicates that a match to the chromatogram for fresh gasoline or diesel could not be made, but that the hydrocarbons were within the range expected for gasoline or diesel. The presence of unknown decane and dodecane as TICs may be the result of diesel contamination because these compounds fall within the range of hydrocarbons measured by the TPH as diesel analysis and therefore, do not indicate lubricant oils.

In addition, heavy hydrocarbons such as lubricant oils would not be expected at high concentrations at the site because they were not reported to have been used

as part of the training activities at the site. The training activities at Range 40A involved using a gelatinous mixture of gasoline which was detonated to eject the burning material. Activities at Range 33 involved using diesel in conjunction with ammonium nitrate.

Also, the semivolatile compounds (SOCs) analytical results do not indicate a need for further investigation of hydrocarbons at the site because the SOC results indicate that the more toxic components of diesel are not present at the site. In addition, compounds quantified as unknown TPH are found at concentrations less than 500 mg/kg (TPH target cleanup goal) which has been determined to be protective of human health environment.

In summary, the Army agrees that TICs may indicate the presence of petroleum hydrocarbons as is shown by a comparison of the TIC and TPH results, but does not agree that the site requires further characterization for petroleum hydrocarbons.

Comment 39: **Page G8, response to EPA Technical Review Specific Comment 14. This response compounds the concern of the original EPA comment. The original concern of this comment was <u>not</u> the use of TICs to quantify contaminants, but that persistent detection of TICs in surface soil samples is an indicator that the site may not have been adequately characterized in terms of petroleum hydrocarbons. The response to EPA's comment and the text revisions do not resolve this issue, but rather they hide this concern from the casual reader.**

Response to 14a. The removal of the word "several" further obscures the fact that what is meant is <u>5 to 18 TICs in every surface sample</u>.

Response to 14d. Eliminating the concentrations from the text does not eliminate the fact that, estimated or not, TIC concentrations are usually at least an order of magnitude greater than routine parameter concentrations. This should be a red-flag indicator that further characterization is needed to rule out the presence of petroleum hydrocarbons other than gasoline and diesel.

Response 39: See response to comment 38 above. In addition, the text on page 25 of the Site 39 Remedial Investigation was modified to include a discussion of the potential relationship between the TICs and potential petroleum hydrocarbon contamination.

Comment 40: **Page G11, response to EPA Technical Review Specific Comment 22. The response rejected the suggestion that 10 percent of the hundreds of samples with qualified results should be resampled and reanalyzed to verify that extensive qualification of data is unlikely to affect its usability. This includes 252 samples analyzed for 1,3,5-TNB, 292 samples analyzed for tetryl, 427 samples analyzed for metals that had high spike recoveries, 301 samples analyzed for metals that had low spike recoveries, and 114 samples analyzed for metals that did not meet precision criteria. EPA would like to further discuss this issue with the Army so that we may come to a consensus as to whether this very large number of qualified data (qualified as estimated) truly meets data quality objectives for the overall Site 39 investigation.**

Response 40: The Army contends that the data, although qualified as estimated, are usable. J qualified data are considered usable in the Baseline Human Health Risk Assessment as recommended by EPA guidance (*EPA, 1989b*) and were used in the risk assessment. As stated in the data validation summary, the chance of false non detects is very low for all qualified data. In most cases, concentrations that might pose an unacceptable risk are significantly (greater than 10 times the detection limit) greater than the detection limit, therefore the low spike recoveries and estimated concentrations should not affect the usability of the data.

The high spike recoveries reported for some of the metals analyses could result in false positives and or higher concentration estimations; however review of the data does not indicate that this is a concern. All of the metals data in which concentrations exceeded maximum background concentrations were posted on plates and evaluated in terms of potential sources and distribution. This evaluation of the data indicated that antimony, arsenic, lead, chromium, copper, and zinc are generally found above background concentrations in high use areas indicating that potential high estimates have not affected the use of the data. Thallium was not detected in any samples. Only 1 of 13 positive results for selenium was qualified for high spike recovery indicating that the high spike recovery did not significantly effect the selenium results by causing false positives.

Volume III - Baseline Human Health Risk Assessment

Comment 41: **Attached please find Attachment C, which includes EPA comments dated February 9, 1995, provided by Mr. Jeffrey Paull, EPA Regional Toxicologist.**

Response 41: The responses to comments found in Attachment C are included under Subheading IV, U.S. Environmental Protection Agency Technical Review Comments, Volume III - Baseline Human Health Risk Assessment.

Volume IV - Baseline Ecological Risk Assessment

Comment 42: **Attached please find Attachment D, which includes EPA comments dated March 24, 1995, provided by Mr. Clarence Callahan, EPA Region 9 Biologist.**

Response 42: The responses to comments found in Attachment D are included under Subheading V, U.S. Environmental Protection Agency Technical Review Comments, Volume IV - Baseline Ecological Risk Assessment.

Volume V - Feasibility Study

FS General Comments

Comment 43: **Applicable or Relevant and Appropriate Requirements (ARARs). Attached please find Attachment E, which includes EPA comments dated April 6, 1995, on ARARs, provided by Ms. Lisa Castañon, EPA Assistant Regional Counsel.**

Response 43: The responses to comments found in Attachment E are included under Subheading VI, U.S. Environmental Protection Agency Technical Review Comments, Volume V - ARARs.

Comment 44: **EPA draft FS general comment 28. EPA requests that the TCL for lead be lowered in order to provide a greater level of protection. Please see attached EPA comments on Volume IV - Baseline Human Health Risk Assessment for more details.**

Response 44: The TCL for lead was calculated to meet an acceptable blood lead level of 10 μg/dl for the exposure scenarios considered. Please see Responses to Comments on Volume III under Subheading IV and VIII which follow.

Comment 45: **EPA draft FS general comment 29. Your response was adequate but the change to the text was not made. The TCLs section might best be moved to follow the ARARs and RAOs sections, particularly when many of the TCL sections introduce cleanup levels, such as ones for TPH in soils and for VOCs in groundwater, that are either based on ARARs that have not yet been presented or on performance standards that are necessary because an ARAR is not available to provide the appropriate level of protection (See EPA draft FS general comment 30). When such a level is presented before ARARs are even discussed, it is less clear what the basis is for the TCL.**

Response 45: The text has been revised in each of the FSs to provide TCL discussions following RAOs as suggested.

FS Site-Specific Comments

FS - Sites 2 and 12

Comment 46: **Section 2.1.4.3 Site 12 Soil. The significance of the volumes of soil exceeding 500 mg/kg is not given until later sections.**

Response 46: The text has been revised in Section 2.1.4.3 to eliminate references to soil volumes.

Comment 47: **Section 2.1.5.3 Post Groundwater Remediation Risk Assessment, Section 2.1.5.5 TCLs, and Table 2.1. Chemicals of interest should be those that have exceeded groundwater PRGs, not MCLs, since many MCLs present risks in the 10^{-5} range. A chemical concentration between the PRG and the MCL should be considered in the post-remediation additive risk calculation to ensure that the conditions at remediation are protective.**

Once again, Section 2.1.5.5 TCLs might best follow the RAOs section. See general FS comment.

Response 47: EPA's groundwater PRGs were considered for planning purposes for chemicals of interest in groundwater at Sites 2 and 12. However, the MCLs are calculated based on risk and therefore would be protective of human health as was confirmed by the post-remediation risk assessment.

The TCL section was moved as suggested to follow the discussion of RAOs.

Comment 48: **EPA Draft FS Comment 36 regarding Section 2.2.4. The revision discussed was not made in the text for this site and for Section 4.2.4 of the Site 3 FS.**

Response 48: The text in Sections 2.2.4 and 4.2.4 has been revised as suggested.

Comment 49: **Table 2.1 Footnote 5. Please be more specific regarding discharges to areas overlying the groundwater plume. Does this apply to discharges to surface water as well as to reinjected water?**

Response 49: The table has been revised to clarify that treated water will only be reinjected below ground surface and will not be discharged to surface waters.

Comment 50: **Section 2.2.1 RAOs, page 18, and Section 2.1.5.5 TCLs. A <u>soil</u> RAO should be established that ensures that COPCs in soil are reduced to levels that do not adversely impact groundwater above a risk or ARARs based value. The risk-based value would be PRGs for groundwater, and the ARAR-based level could be MCLs or background, depending on the ARARs analysis. The TCL section might best be moved to follow the RAO section in order to more clearly show the basis for the soil cleanup level (ie, how risk, ARARs, or TBC based values were considered in the selection of the final TCL).**

Response 50: The text has been revised in Section 2.2.1 to clarify the discussion of RAOs for soil, groundwater, and debris.

Comment 51: **Section 2.1.4.2 Site 2 Soil page 3. Data on the sludge from the drying beds is summarized here. Either the remedial alternatives need to include a commitment by the Army to remove the sludge before land transfer, even as a maintenance activity, or additional surface soil samples need to be taken to demonstrate that the sludge is safe to human health and the environment if left in place. How will the sludge be disposed of?**

Response 51: See Response to EPA Comment 12. The text in Section 2.1.4.2 has been revised to clarify how the sludge will be handled.

Comment 52: **Section 2.1.3 Proposed Reuse, and Section 2.1.5 Summary of Baseline Human Health and Target Cleanup Levels. As discussed in general RI/FS comments, the future use of Site 2 still appears to be "up in the air" with respect to whether the site will be used for aquaculture or as part of the State Park used for the risk assessment at Site 3. The risk assessment for Site 2 should be adjusted to consider the more conservative future exposure to contaminants from a park or an aquaculture facility scenario. If Site 2 is to be part of the park, then it should be considered whether receptors at Site 2 will also be exposed to contaminants at Site 3, and vice versa. In addition, if under a park scenario the park ranger and his family live over the groundwater plume, the groundwater exposure pathway would need to be added to the soil exposure.**

Response 52: Risks associated with Site 2 were evaluated under the most current reuse scenario in the BRA which includes an aquaculture facility. The exposure scenario for the facility is more conservative than use of Site 2 as an open space area. Therefore, it would present an exposure scenario that was already conservatively estimated in the BRA.

Comment 53: **Section 2.1.5.1. The RME HI should also be listed in this section.**

Response 53: The text has been revised in Section 2.1.5.1 as suggested.

Comment 54: **Section 2.1.5.4 Results of ERA at Site 2, page 8. The ERA for Site 2 needs to be revisited to determine the affects on the endpoints if the site became a park and the sewage plant works were removed, thus creating more habitat and possibly creating greater exposure to COPCs at the site.**

Response 54: Please see Response to Comment 52, above.

Comment 55: **Section 2.1.4.1 Sites 2 and 12 Groundwater, and Section 2.2.1.2 Description of the Groundwater Remedial Unit. The Army should discuss how it intends on addressing the 1,1,1-TCA plume that extends beyond the northern boundary of the remedial unit.**

Response 55: The Army believes that the detection of 1,1,1-TCA is not part of the groundwater plume at Sites 2 and 12 as discussed in the RI (Volume II). In addition, the monitoring well where it was detected is within the capture zone of the extraction and treatment system designed for Sites 2 and 12. After further information is collected in this area, the Army will determine what action, if any, will be necessary to address the 1,1,1-TCA in groundwater.

Comment 56. **Section 2.2.1. This section should also present RAOs for soil.**

Response 56: The text has been revised in Section 2.2.1 as suggested.

Comment 57: **Section 2.2.4, page 26, and similar sections in Sites 16 and 39 FSs. While the FOSTA may be an appropriate place to treat soils from sites 12, 16, and 39, does the Army intend on using the basewide RI, FS, and ROD, rather than an IA Approval Memo, as the decision process justifying the need to take action at these sites? See related comment in attached ARARs Comments.**

Response 57: In the interest of maintaining an accelerated cleanup schedule the Army intends to excavate and treat soil from the RI/FS sites at the FOSTA under the Basewide ROD. However, the Army is willing to process the soil under whatever appropriate mechanisms (such as the Interim Action ROD) are available if the Basewide ROD is not signed at the time remedial actions are implemented.

Comment 58: **Section 2.3 and all Remedial Alternatives. The alternatives which include groundwater extraction should contain contingency plans to describe what options are available in the event that the groundwater extraction system takes in saltwater. Would the VOCs be treated then the saltwater reinjected or discharged directly to the ocean by NPDES permit? Or, should pumping be scaled back and natural attenuation take care of portions of the plume closest to the ocean? Under Alt. 2, will the POTW accept saltwater? For Alts. 3 and 4, will the saltwater have an affect on the GAC treatment system?**

Response 58: A discussion of saltwater intrusion and its impact on the system and mitigation measures will be discussed in the final design after results of the current pilot study are evaluated.

Comment 59: **Section 2.3.3 Remedial Alt. 3, and Table 2.2, Title 23 CCR Chapter 15. Soil Remedial Unit 1. With regard to the debris and the limits of CERCLA jurisdiction, why would the substantive requirements of Chapter 15 apply to an area that is primarily a construction debris and road construction debris site (not CERCLA substances). While this area was reportedly used as a waste disposal area, the extensive RI that used geophysical surveys, excavation of test pits, a soil gas survey, soil borings, and installation of a monitoring well confirmed that the site contains primarily construction debris, and that there was no impact to groundwater, with the exception of possibly a limited spot where TPH was detected (570mg/kg) slightly above the basewide groundwater protectiveness default value of 500mg/kg for TPH. In addition, the BRA showed that neither the TPH nor other contaminants detected at the site pose a threat to human health. Thus, alternatives considered for SRU 1 should include no action for debris, and only selective excavation, treatment, and**

onsite disposal of TPH-affected soils. Capping and deed restrictions are not necessary for SRU 1 under CERCLA, but may be required under other State or local authorities. See ARARs Comments for related information.

In addition, the Title 23 CCR Chapter 15 discussion from the Site 31 FS, page 14, seems to apply to the situation at Site 12.

Response 59: Please see Response to Overall FS Comment regarding CERCLA Jurisdiction For Debris under Subheading IV - U.S. Environmental Protection Agency Technical Review Comments, Volume V - ARARs.

Comment 60: **Sections 2.3.3 and 2.3.4 Remedial Alts 3 and 4. The NPDES discharge to the storm drain system would have to be further explored with the future reuser of the area, California State Parks.**

Response 60: Discharge under an NPDES permit to the storm drain system is the most feasible, unobtrusive and practical option for disposal of treated groundwater for the duration of system operation. Final determination of the chosen disposal option will be addressed in the ROD after consideration of comments from interested parties such as the State Park Department.

Comment 61: **Section 2.5.1 Detailed Analysis of Alt. 1, Compliance with ARARs, and Table 2.9 The remedial goal for TPH is not ARAR related. In addition, why is the Lower Meadow considered a waste disposal site? See earlier comment.**

Response 61: The text has been revised in Section 2.5.1 as suggested to eliminate discussion of TPH under ARARs. Regarding the status of the Lower Meadow as a waste disposal site, please see Response to Overall FS Comment regarding CERCLA Jurisdiction For Debris under Subheading IV - U.S. EPA Technical Review Comments, Volume V - ARARs.

FS - Sites 16 and 17

Comment 62: **Section 3.1.3 Proposed Reuse and Section 3.1.5.1 Baseline Human Health Risk Assessment (BRA). Questions about the BRA and potential receptors relative to the Proposed Reuse are raised in EPA BRA comments (Comment 19).**

Response 62: Comment acknowledged. As discussed in the May 4, 1995 meeting, the current plans for the reuse of Sites 16 and 17 have been received from Mr. David Salazar of CSUMB Planning Office. Site 17 will be used for workshops (i.e., artists, etc.) and most of Site 16 will be paved and landscaped or used for corporation yards. No student or faculty residents will be occupying either of the sites. However, as agreed in the 5/4/95 meeting, the BRA will be modified to address the most current reuse receptors.

Comment 63: **Section 3.1.5.1 Baseline Human Health Risk Assessment. EPA BRA Comment 43 indicates that the HI needs to be reevaluated. If the recalculated HI exceeds one, the remedial units and the alternatives for Sites 16 and 17 may need to be reevaluated,**

and some of EPA's comments below, as well as some ARARs comments, would need to be reconsidered.

Response 63: Comment acknowledged. The multipathway HI estimates resulting from exposure to groundwater in the A-aquifer are correct. Inhalation exposures from domestic use of groundwater (i.e., showering) were evaluated using a generic EPA model which assumes that the dose obtained from inhalation of VOCs while showering is equal to the dose resulting from the ingestion of 2 liters per day of the same water. Therefore, "inhalation" doses based on "inhalation" exposure assumptions and chemical concentrations in air were not calculated. Instead, groundwater chemical concentrations and ingestion intake assumptions were incorporated into the inhalation scenario to estimate a dose identical to the groundwater ingestion value. Inhalation-specific toxicity values where then used to characterize potential health risks and noncancer health effects resulting from inhalation exposure. For this reason, any attempts to "backcalculate" an inhalation rate for example, will yield incorrect values.

Comment 64: **EPA Draft FS comment 44 response to comment. Section 3.3.4 Alternative 4, Section 3.5.4 Detailed Analysis of Alt 4 (Overall protection..., Long-Term Effectiveness, Community Acceptance), Section 3.6, and Section 3.7. It is not clear that the future exposure scenarios and resultant risk calculations for the site allow for unrestricted use of the site (ie, no deed restrictions needed). Please provide the post-remediation risk calculation based on unrestricted use to support this assertion.**

Response 64: The BRA (Volume III) and ERA (Volume IV) determined that chemical concentrations present at Sites 16 and 17 pose only a slight (2×10^{-6}) risk to commercial workers based on current exposure scenarios. Therefore, if contaminated soil and debris are removed, unrestricted use of the sites for the future exposure scenarios is acceptable, and a post-remediation risk assessment is unnecessary.

Comment 65: **EPA Draft FS comment 50 response to comment. Alternative 4 - Based on the Army's own guidance for a site to be suitable for unrestricted use, UXO would have to be cleared to a depth of 10 feet. Please clarify.**

Response 65: The text in Section 3.3.4 has been revised to clarify UXO clearance procedures at the sites.

Comment 66: **Section 3.2.1 RAOs, second paragraph. The BRA indicates that soils are within the acceptable risk range and therefore no remediation is necessary, yet the $1x10^{-6}$ RAO is not met. The RAO should maybe be 10^{-5} to 10^{-6}.**

RAOs, third paragraph, item 2. It is outside the scope of this CERCLA action to use Title 23 CCR Chapter 15 to address the remediation of debris that is not a CERCLA hazardous substance. We consider UXO a CERCLA hazardous substance, and are currently reviewing whether or not medical debris is considered a CERCLA hazardous substance.

Response 66: The text has been revised in Section 3.2.1 as suggested to address RAOs. Please see Response to Overall FS Comments on CERCLA Jurisdiction Over Debris under Subheading VI - U.S. Environmental Protection Agency Technical Review Comments, Volume V - ARARs in regards to debris at the sites.

Comment 67: **Section 3.1.6.2 ARARs-Chemical Specific, page 10. Soil cleanup levels. It should be made clear that the TBC for TPH is not needed for health protectiveness here, only for impact to groundwater.**

Response 67: The text has been revised in Section 3.1.6.2 as suggested.

Comment 68: **Table 3.8. Compliance with ARARs. Once again, the TPH TCL is not related to ARARs.**

Response 68: Table 3.8 has been revised as suggested.

Comment 69: **Table 3.8. Alt. 4. NPV Cost does not agree with cost in text.**

Response 69: The NPV cost of $5,158,000 appears to be the same in both Section 3.5.4 and Table 3.8.

Comment 70: **Section 3.5.4 Detailed Analysis Alt. 4 Compliance with ARARs paragraph 3, page 27. "This alternative would meet the TBC for TPH". Please delete from this criteria, as it is more appropriately discussed in Reduction of Toxicity, Mobility, and Volume ... category, and/or in Protection of the Environment category (for groundwater protection).**

Response 70: The text in Section 3.5.4 has been revised as suggested.

FS - Site 3

Comment 71: **Section 4.1.3 Proposed Reuse, and Section 4.1.5.1 Baseline Human Health Risk Assessment. As discussed in earlier comments, the future use of Sites 1 and 2 may not follow the current FORA Plan. They may become part of the State Park, and thus the risk assessment for Site 3 may need to be revisited. Please contact State Parks or DTSC to obtain the latest information as to where the camp sites and the Ranger family house will be located, then meet with EPA and the State to discuss the final approach.**

While these new risk assessment considerations may not affect the overall remedial approach for Site 3, they may result in more stringent cleanup levels in localized areas where camping and Park Ranger housing is to be located.

Response 71: The Army has received and reviewed the current maps from the Department of Parks and Recreation's General Plan. Family campgrounds were located on the maps in areas of bullet coverage ranging from none (<1%) to heavy (>10%). The size of the campgrounds (presently capable of accommodating 150 families), as

well as many other factors, may be subject to revision based on public comments made at the public meeting held in Monterey on May 17, 1995, where the General Plan was presented and discussed. However, if the size and location of the campgrounds remain the same as presented after further review of the Plan, a portion of the three camping "pods" would be located in areas of moderate (1 to 10% surface coverage) distribution. The draft final version of the BRA calculated a noncancer HI of 2.0 for an individual spending all of their time only in the areas of moderate distribution at least 2 hours a day, 97 days each year for 30 years. This HI is above the EPA's threshold of concern of 1.0. If an individual were to camp at these areas 7 days each year as assumed in the BRA, they would most likely spend their time using the entire recreational area and not spend all their time in one place. All other areas the individual would spend time in (95% of the site) would have no associated noncancer risks (91% of the site contains <1% bullets requiring no remediation, and 4% of the site would be remediated in areas of heavy deposition). In addition, the DPR has extensive plans for boardwalks to be built outside camping areas to limit contact with sensitive species (and indirectly soil). The DPR also plans to landscape the individual campsites which would minimize contact with bare soil. For these reasons, the Army does not anticipate having to recalculate cleanup levels for the campground areas, but will engage in further discussions as appropriate when the DPR's General Plan is finalized.

Comment 72: **Section 4.1.5.3 TCLs. Please move section after the RAO section and consider combining with Section 4.2.1.1 Chemicals of Interest.**

Response 72: The text regarding TCLs in Section 4.1.5.3 has been moved to Section 4.2.1 as suggested.

Comment 73: **Section 4.1.5.3 Target Cleanup Levels, and Section 4.2.1.1 Chemicals of Interest. A TCL of 1860 mg/kg for lead is not sufficient. See EPA Baseline Human Health Risk Assessment comments.**

In addition, since antimony and copper may be co-located with the high levels of lead and thus excavated with the lead, cleanup levels for antimony and copper may need to be presented, depending on where they will be disposed of.

Response 73: As discussed in the May 4, 1995 meeting with Mr. Jeffrey Paull, EPA Region IX, and Dr. John Christopher (DTSC), adequate justification has been provided in regards to evaluating a resident exposure scenario at all Fort Ord sites. Therefore, no additional receptors to those already considered in the Draft Final BRA will be evaluated. However, alternate receptors will be evaluated at Site 16/17 (pp 47-57 of BRA), as agreed to at the May 4, 1995 meeting.

Antimony and copper will be removed with the lead and therefore, do no require separate TCLs. Concentrations acceptable for various disposal options will be evaluated using TTLC/STLC test methods.

Comment 74: **Section 4.1.6.2 Identification of ARARs, and Sections 4.3.2 and 4.3.3 Remedial Alts 2 and 3. These sections must address the designation of this site as a Corrective Action Management Unit (CAMU). See attached ARARs comments for further comments on the CAMU.**

Response 74: The text in Sections 4.1.6.2, 4.3.2, and 4.3.3 has been revised as suggested.

Comment 75: **Section 4.2.1 RAOs and EPA Draft RI/FS Comments 60 and 62. The text was not revised as indicated in response. Table 4.3 includes an RAO for the protection of humans from UXO/OEW hazards. Include this discussion in Section 4.2.1. Also, please discuss any hazards associated with exposure to live ammunition in areas left unremediated?**

Response 75: The text in Section 4.2.1 has been revised as suggested.

Comment 76: **EPA Draft RI/FS Comment 67. The text was not revised as indicated in response. Section 4.5 Detailed Analysis of Remedial Alternatives, Compliance with ARARs. For each alternative, what is the rationale for discussing the TCL for lead under this criteria when it appears that it is not associated with an ARAR. The TCL for lead relates to the "Overall protection of human health and the environment" and/or "Reduction of Toxicity, Mobility,..." criteria.**

Response 76: The text in Section 4.5 has been revised to delete references to TCLs under these headings in the Detailed Analysis.

Comment 77: **Section 4.2.1.2 Surface Water Remedial Unit. The FS should further discuss the Storm Drain Outfalls, indicating that the removal of these storm drains is not required under CERCLA, but that monitoring of future discharges is required under other State and/or Federal authorities (ie, NPDES) to ensure that the effluent meets the appropriate standards. Any impacts to Monterey Bay from historic discharges are being evaluated through the Enhanced Assessment and additional work planned, as discussed in a new section of the RI/FS Report, as requested in the General Comments section. Also, so the reader knows the whole story, note how the decision to eliminate and/or divert the beach storm drains will be made. See related comment on Volume II - Basewide Surface Water Outfall Investigation.**

Response 77: The text in Section 4.2.1.3 has been revised as suggested.

Comment 78: **Section 4.2.1.2 Soil Remedial Unit (SRU). As described in the first paragraph of Section 4.3.2 Remedial Alt 2, this remedial unit may include limited remediation in other areas. "Soil outside areas of HD or to depths of greater than 2 feet will be remedied if ... The determination will be based on (1)...(2)..." Also, please provide additional information from a risk management perspective to support why this remedial unit does not include all the 1 to 10 percent lead distribution areas that also exceed the TCL (i.e., overall risk reduction from addressing HD areas, limited access to 1 to 10 percent areas based on future park design). However, after addressing EPA BRA comments on the lead TCL, the SRU may need to be reconfigured.**

Response 78: The text in Section 4.2.1.3 has been revised as suggested to clarify risk management decisions.

Comment 79: **Sections 4.5.2 and 4.5.3 Detailed Analysis of Remedial Alt 2 and 3.**

- **Overall Protection of Human Health and the Environment. Indicate the degree of risk reduction, particularly since all areas of lead exceeding TCL will not be remediated (i.e., 1 to 10 percent areas).**
- **Compliance with ARARs. Once again, the lead TCL is not associated with an ARAR.**
- **Short-term effectiveness. This section should also indicate that excavation and other intrusive activities associated with this alternative may also have adverse environmental impacts to sensitive ecological habitat, but that mitigation will occur.**

Response 79: The degree of risk reduction was not calculated because the draft final BRA provided risks associated with each area.

All areas of heavy distribution (HD) associated with the highest noncaner risks will be remediated to background levels of lead. Areas of moderate distribution (1 to 10% surface coverage) have an associated HI of 2.0 for a conservative exposure scenario assuming an individual would spend all their time in this one area. This HI is not significantly above the EPA's threshold level of concern of 1.0. It is actually more likely that an individual would spend portions of their time in: (1) <1% areas (no risk), (2) 1 to 10% areas (HI of 2.0 only if the offsite resident spent 114 hours a year in this one area), and (3) remediated >10% areas (that no longer have associated risks). In addition, the surface area of Site 3 containing 1 to 10% bullet distribution is only 4% of the total site.

The text has been revised in Section 4.5, *Compliance with ARARs*, as suggested.

The text in Sections 4.5.2 and 4.5.3 has been revised to clarify the detailed analysis as suggested.

FS - Site 31

Comment 80: **Section 5.1.4.3 Chemical data, page 4, second column, paragraph regarding surface water; and Section 5.1.6.2 Chemical Specific ARARs, page 9, paragraph 2. The statement is made that over 40 years contaminants have migrated little, despite the fact that the 45 degree slope of the ravine is categorized in Section 5.2.1.2 Soil Remedial Unit as "loose, unstable geology". What affect, qualitatively, has the recent rains had on the mobility of Site 31 surface soils. EPA is concerned that the contaminants remaining after remediation (of lead) may migrate down the ravine over time. Please confirm whether the efforts planned under Alternative 2 are sufficient, or whether further surface water controls, as discussed and screened out in Section 5.2.4, should be considered.**

Response 80: The Army believes that the alternative, which includes placement of a stability-enforcing geotextile fabric in excavated areas to prevent erosion, is adequate to address surface migration of contaminants. Recent rains are not expected to have a significant impact on contaminant migration at the site. The site has experienced 40 years of erosion and rain, and no contaminants have been detected downgradient of the site.

Comment 81: **Section 5.1.5.1 Baseline Human Health Risk Assessment, page 6, lead. The lead cleanup level of 1860 mg/kg may not provide an adequate level of protection. See EPA comments on the BRA.**

Response 81: Please see Response to Comment 73.

Comment 82: **Section 5.1.5.3 TCLs. Please move section after the RAO section, particularly since it references RAOs. TCLs section could possibly be combined with Section 5.2.1.1 Chemicals of Interest.**

Response 82: The section discussing TCLs has been moved to Section 5.2.1 as suggested.

Comment 83: **Section 5.5 Detailed Analysis of Remedial Alternatives, Long-term Effectiveness. Since the future use does not include unrestricted use and deed restrictions will be necessary to ensure that this area is not used for residential development, how will the Army ensure the long-term effectiveness of deed restrictions.**

Response 83: When the property is transferred, use restrictions will become part of the permanent record of the title to the land. At any time that the property is considered for transfer or sale by the owner, a title search will be performed and restrictions on the site will be described to the potential buyer or transferee.

Comment 84: **Section 5.5.1 Detailed Analysis of Remedial Alt 1. Compliance with ARARs, page 25. Once again, TCLs for lead are not related to ARARs.**

Response 84: The text in Section 5.5.1 has been revised as suggested.

Comment 85: **Section 5.5.3 Detailed Analysis of Remedial Alt 3, Compliance with ARARs. Does this alternative comply with 23 CCR Chapter 15, with respect to the excavation and placement of the lead in a new disposal unit?**

Response 85: If Alternative 3 were implemented, it would be designed to be in compliance with Chapter 15 requirements.

FS - Site 39

Comment 86: **Responses to EPA General Review Specific Comments 78, 79, 84, and 88, pages 12 - 14. It does not appear that any revision to text has been made in response to EPA's comments concerning unexploded ordnance (UXO) or the "time-critical removal**

action addressing UXO" or even that a reference has been made in the text to the "companion documents" that address these issues. In addition, no discussion of clearance procedures and disposal of UXO in remedial alternatives 3 and 4 was added to the text. See general RI/FS comment on UXO.

Response 86: Please see Response to General Comment 1 regarding references to UXO and companion documents. The text in Sections 6.3.3 and 6.3.4 contained descriptions of UXO clearance procedures that have been revised for clarification, as suggested.

Comment 87: **Section 6.1.5.3 TCLs. Why is the commercial/worker scenario and the beryllium soil TCL based on a target risk of $1x10^{-5}$, rather than $1x10^{-6}$? The target risk of $1x10^{-6}$ should be used unless the Army can provide EPA with a significant reason not to.**

Response 87: It is common practice to use 1×10^{-5} as an acceptable risk level for the commercial worker that may be exposed to beryllium during soil removal activities.

Comment 88: **Section 6.2.4 discussion of FOSTA, and Section 6.3.3. Remedial Alt 3. While the IAROD and the Section 6.2.4 do not specifically discuss treating explosives-contaminated soils (ie, RDX) at the FOSTA, Alternative 3 indicates that soil containing RDX would be treated at the FOSTA by ex situ biodegradation with additional aeration and amendment with carbon-rich nutrients. Further justification should be provided in Section 6.3.3 Remedial Alt 3 to substantiate why soil containing RDX should be treated at the FOSTA (ie, FOSTA is designed for biodegradation, preferred treatment process for RDX is biodegradation).**

Response 88: The text has been revised in Section 6.2.4 for clarification as suggested.

Comment 89: **Section 6.3.1 Remedial Alternative 1. No Action generally means no deed restrictions, meaning that any existing restrictions do not need to be enforced under CERCLA. Even though deed restrictions may be currently imposed, EPA is not convinced that the existing fence and signage will provide a sufficient level of protection in the future. Thus, no action should be considered not protective.**

Response 89: The text in Section 6.3.1 stated that the no action alternative related to chemicals would not be protective.

Comment 90: **Section 6.3.3 Remedial Alt 3. Please provide additional information regarding the ability of the various Site 3 bench scale technologies to treat beryllium.**

Response 90: The text in Section 6.3.3 has been revised as suggested.

Comment 91: **Sections 6.3.3 and 6.3.4 Alts 3 and 4. As stated in EPA Draft RI/FS comment 89, deed/access restrictions are needed for these alternatives since cleanup is not protective of unrestricted use for exposure to chemicals or UXO. Controls need to be in place so unrestricted use does not occur.**

Response 91: The alternatives are based on current reuse scenarios that would not allow for unrestricted public use and limit access to BLM rangers who would be aware of any UXO and chemical hazards remaining at the site. The Army will retain the deed to the land. Any land transfer will be between federal agencies and not a deed transfer. The land transfer will be conducted in a phased approach. Land outside the Impact Area with no chemical or UXO issues will be transferred first. Land inside the Impact Area will be transferred second after chemicals associated with UXO and the UXO concerns are mitigated.

Comment 92: **Sections 6.5.3 and 6.5.4 Detailed Analysis of Remedial Alts 3 and 4. Compliance with ARARs. The removal of soils from the site is based on risk and groundwater protectiveness, not specifically on chemical specific ARARs.**

Response 92: The text in Sections 6.5.3 and 6.5.4 has been revised as suggested.

II. U.S. Environmental Protection Agency Data Validation Comments

Data Validation Comments

Comment 1: (EPA Comment 1)[Volume II (Sites 2 and 12), Appendix F, Data Validation, Section F2.1, Organic Analyses, EPA Test Method 8010 - Halogenated Volatile Organics; Section F2.2, EPA Test Method 8020 - Aromatic Volatile Organics; Section F2.5, Modified EPA Test Method 8080 - Polychlorinated Biphenyls (PCBs)] Based on the information presented in Sections F2.1, F2.2, and F2.5, it was not possible to determine whether second column confirmation analyses were performed on samples with positive results. Second column confirmation analyses are generally required for all gas chromatography (GC) methods to reduce the possibility of reporting false positive results. If second column confirmation analyses were performed, it is recommended that the discussion presented in Sections F2.1, F2.2, and F2.5 be expanded to address these analyses. If positive results were not confirmed, these results should be considered tentative and the analytes to be presumptively identified.

The response to this comment states that second column confirmation was performed on all samples with positive results, and that results for these analyses were reviewed as part of the detailed data validation. The response also includes a proposal from HLA to added a statement regarding the acceptability of second column confirmation analyses in the data validation reports. This proposal is considered to be a reasonable response to this comment.

Response 1: No response necessary.

Comment 2: (EPA Comment 2)[Volume II (Sites 2 and 12), Appendix F, Data Validation, Section F2.3, Organic Analyses, EPA Test Method 8240 - Volatile Organic Compounds (VOCs)] It is unclear why separate criteria were applied in qualifying analyte results on the basis of method blank contamination problems and field-generated (e.g., equipment, source water, and trip) blank contamination problems from compounds considered to be common laboratory contaminants. Sample results for methylene chloride and acetone were qualified if the concentration of these contaminants was less than 10 times the concentration in the associated method blank. However, sample results for methylene chloride were qualified if the methylene chloride concentration was less than 5 times the concentration in the associated field-generated blanks. Generally, it is recommended that a uniform approach be applied in qualifying results based on blank contamination, regardless of the type of blank involved. Based on the approach used in the RI/FS report, it is possible that certain sample results for methylene chloride were reported without qualification when actually these results could have been attributed to contamination problems. Since the sample delivery group (SDG) identification numbers, which were used to identify the sample results associated with the contaminated field-generated blanks, were not included with the results listed in Appendix G (Tables of Organic and Inorganic and Chemicals

Detected in Samples), results for methylene chloride that were possibly affected could not be determined.

This comment has been satisfactorily addressed. The response to this comment states that a uniform approach (i.e., 10 times rule) for qualifying environmental sample results on the basis of problems with blank contamination was applied during data review. The RI/FS report, which stated that a "5 times rule" was applied for sample results associated with field blank contamination, has been corrected accordingly.

Response 2: No response necessary.

Comment 3: **(EPA Comment 3)[Volume II (Sites 2 and 12), Appendix F, Data Validation, Section F2.5, Organic Analyses, Modified EPA Test Method 8080 - PCBs; Section F3.2, EPA Test Method 6010, TCLP (Toxicity Characteristic Leaching Procedure) Lead] The discussions of data validation presented in Sections F2.5 and F3.2 do not address instrument calibration. Instrument calibration verification is listed in Section 2.0 of the Introduction to Volume II as part of the detailed validation that was to be performed on 10% of the data, but not as part of the routine validation that was to be performed on 100% of the data. Based on the information provided in Sections F2.5 and F3.2, it was not possible to determine whether a detailed validation was performed on a portion of the data for PCBs and TCLP lead.**

The response to this comment states that a detailed validation was not performed on PCB and TCLP lead data. The data for detailed validation were selected on a sample delivery group (SDG) basis. Since samples from the selected SDGs were not analyzed for PCBs and TCLP lead, a detailed review of data for these parameters was not performed.

It is unclear whether detailed validation of a portion of the PCB and TCLP lead data is considered to be important from a decision-making standpoint. If excluding the PCB and TCLP lead data from the detailed validation is considered to be acceptable, a justification for this exclusion should be provided. If further quality assessment of the PCB and TCLP lead data is considered to be necessary, it is recommended that the scope of the detailed validation be expanded.

Response 3: The purpose of performing detailed data validation for the Fort Ord project was to assess overall data quality as a function of detailed data validation review on a portion of the total amount of data collected. As specified in the Fort Ord Quality Assurance Project Plan (*HLA, 1991b*), detailed data validation was performed on approximately 10 percent of the total number of SDGs collected for the Fort Ord RI/FS program. Results from a detailed data validation effort are important from a decision making standpoint when there are deficiencies noted during the detailed data validation effort. Absence of detailed data validation on infrequently requested analyses, or on samples collected from relatively small site investigations (e.g., less than 50 samples) is not expected to affect decisions made on the data.

When identifying SDGs for detailed data validation for samples collected at a particular site, an effort was made to select SDGs that contained representative analyses from the site. During the period August 1993 through December 1994, only one sample was submitted from Fort Ord Sites 2 and 12 for analysis using EPA Test Method 8080. Consequently, it was not considered appropriate to

subject the SDG that contained this one sample to detailed data validation. Alternatively, SDGs from other Fort Ord sites were subjected to detailed data validation for EPA Test Method 8080. Results of detailed data validation efforts on SDGs from other Fort Ord sites showed that the laboratory was capable of producing valid and usable results for EPA Test Method 8080. Therefore, the Army assumes that results for EPA Test Method 8080 generated for the Sites 2 and 12 investigation are also valid and usable. Detailed data validation on an SDG that contained samples for analysis of lead following a TCLP extraction was not performed because detailed data validation is of little value when reviewing TCLP extraction procedures. Alternatively, detailed data validation was performed on an SDG from Sites 2 and 12 that contained a full suite of metals analysis.

Comment 4: **(EPA Comment 4)[Volume II (Sites 2 and 12), Appendix F, Data Validation, Section F2.5, Organic Analyses, Modified EPA Test Method 8080 - PCBs; Appendix G, Tables of Organic and Inorganic and Chemicals Detected in Samples] The header for Section F2.5 indicates that PCBs were the only target analytes for EPA Method 8080 analyses. However, the data presented in Appendix G includes results for 4,4'-DDT. This discrepancy should be clarified.**

This comment has been adequately addressed. The error in this header has been acknowledged.

Response 4: No response necessary.

General Comment

Comment 1: **(EPA Comment 15) Based on discussions with the State, there exists some uncertainty regarding hexavalent chromium analyses. Please substantiate the validity of these data, discussing test methods used, holding times, and other quality assurance and quality control data.**

Discussion of Hexavalent Chromium Data: The response to this comment focuses on the problems encountered with recovering chromium (VI) in soil samples from the site. HLA feels that although matrix spike (MS) recoveries for chromium (VI) were poor, the laboratory was able to demonstrate satisfactory performance by recovering chromium (VI) in blank spike (BS) samples. HLA attributes the poor MS recoveries to the reduction of chromium (VI) to chromium (III), which is a well documented phenomenon. As a result, the chromium (VI) data have not been qualified, and it has been suggested that the data are usable for demonstrating that the site conditions do not favor the formation or stability of chromium (VI).

It is the reviewer's opinion that although the conclusion concerning the stability of chromium (VI) at the site probably is valid, the data are insufficient to support this conclusion. Concerns exist regarding the integrity of the analytical procedure that was followed and the qualification of the chromium (VI) data.

It is recommended that the possibility that the data quality problems associated with chromium (VI) results may be due to a fundamental flaw in the analytical method, that is unrelated to laboratory performance, be considered. To allow for a full evaluation of the chromium (VI) data, more information regarding the BS sample preparation procedure and the sample digestion procedure is necessary. Problems

associated with these procedures are possible sources of method unreliability. For example, an aqueous matrix or sand may have been used for the BSs, rather than a more representative laboratory standard matrix (such as one containing organic matter). The use of such a matrix may have resulted in artificially high spike recoveries that did not reflect the actual efficiency of the digestion procedure.

Additionally, the sample preparation procedure that was used for chromium (VI) analysis should be evaluated. Historically, the SW-846 Method 3060 procedure has been followed for sample preparation. However, the Method 3060 procedure, which involves water leaching, has proven to be ineffective for many sample matrices, and, due to a lack of availability of alternative preparation procedures, its use has continued. If this procedure was used for preparing samples from Fort Ord, it is possible that the water leaching procedure was more effective on the laboratory standard matrix (i.e., BS samples) than on the native soil (i.e., MS samples), therefore, yielding the observed results.

Data Qualification for Hexavalent Chromium Data: The discussion of chromium (VI) results states that the "N2" (not qualified) code was applied to the data. It is strongly recommended that another qualifier be used that more accurately conveys the severity of the analytical problems associated with these data to the data user. Generally, all data for an inorganic sample batch are rejected (flagged "R") if matrix spikes are not recovered. The N2 qualifier will imply that the data, as presented, are usable, which, in the opinion of the reviewer, they are not.
However, this opinion is based on the information reviewed concerning the chromium (VI) data. If additional information is available to demonstrate that a laboratory standard matrix sufficiently representative of the native sample matrix was used for BS sample preparation, rejection of the chromium (VI) data may not be required. Such information would validate the integrity of the chromium (VI) method.

Discussion of Explosive Compound Data: The response to this comment discusses problems encountered with recovering nitroguanidine and picric acid from MS samples, and tetryl from BS and MS samples. Since project specific criteria for accuracy and precision were not defined in advance, default acceptance criteria were applied in determining the quality of analytical results during data validation. In many instances, BS and MS recoveries fell outside of these default acceptance criteria.

It is recommended that the determination of whether the nitroguanidine, picric acid, and tetryl data are of sufficient quality to permit their use in decision making be based on the objectives for data collection and the applicable regulatory levels, such as preliminary remediation goals (PRGs). For example, if the PRGs for these compounds in soil are significantly greater than the laboratory reporting limits (e.g., 3 times or more), and these compounds either were not detected or were detected at concentrations near the reporting limits, the data are probably usable for demonstrating the absence of these analytes at concentrations exceeding the PRGs, even when the matrix spike recoveries of 30% are taken into account. However, if the PRGs are closer to the laboratory reporting limits, and analyte concentrations approaching the PRGs were reported, the data may not be of sufficient quantitative quality to demonstrate the absence of these analytes.

The response to this comment does not indicate whether surrogate compounds were used to monitor extraction efficiency on a sample specific basis. If surrogate spikes were used, they could provide additional information on data usability.

Data Qualification for Explosive Compound Data: **The discussion of nitroguanidine, picric acid, and tetryl data results states that the N2 (not qualified) code was applied to the data. It is recommended that the "J" qualifier, which indicates that the reported concentrations or analyte quantitation limits are estimated, be used instead. Generally, organic data are not flagged on the basis of matrix spike recoveries alone. However, this approach is most appropriate for situations in which additional data quality indicators, such as surrogate spike recoveries, are available for evaluation. The reviewer concurs with HLA that the nitroguanidine, picric acid, and tetryl data are usable for qualitative purposes.**

Response 1: **Discussion of Hexavalent Chromium Data**

Blank spike analyses for analytical batches containing soil samples from Fort Ord for Cr(VI) analysis were prepared on a deionized water matrix. This fact was not discovered by the Army until after Cr(VI) analyses had been completed. Therefore, the Army requested that the laboratory (Quanterra) perform a blank spike study for Cr(VI) using a sand matrix in lieu of a deionized water matrix. The results of this study showed that the analytical procedure followed by Quanterra was able to recover Cr(VI) from a solid matrix. The Army believes that the results of the blank spike study on sand to verify that the Cr(VI) method used on Fort Ord soil samples was capable of recovering Cr(VI) from a solid matrix independent of matrix effects caused by the presence of organic matter or other material capable of reducing Cr(VI) to trivalent chromium.

The Army does not agree that blank spike analyses should be performed on a matrix that contains organic matter or any other constituents that may interfere with the analysis; the purpose of a blank spike is to assess whether the method can recover the analyte(s) of interest independent of sample matrix effects. Samples collected for the Fort Ord RI/FS project were extracted for Cr(VI) analysis using an alkaline digestion procedure as referenced in EPA Test Method 3060. Although EPA Test Method 3060 is no longer an approved EPA SW-846 test method, at the time Cr(VI) analyses were performed on Fort Ord samples, there were no approved alternative methods. The Army recognizes that when using EPA Test Method 3060, "the stability of the chromium oxidation state once solubilized in either acid or base media is matrix dependent and cannot be predicted in environmental samples" (*USEPA, 1986*). However, as acknowledged by the EPA in Comment 1 listed above, reduction of Cr(VI) in environmental samples is a well documented phenomenon. Based on the information available, we cannot be certain whether poor spike recoveries are due to reduction of Cr(VI) caused by sample matrix effects, or may be due to loss of analyte (i.e., method failure) during sample preparation.

Although EPA functional guidelines for inorganic data review indicate that when matrix spike samples show poor recovery, data should be rejected, this procedure was written to apply to the analysis of total metals following aggressive acid digestion procedures of samples followed by instrumental methods of analysis (e.g., EPA Contract Laboratory Program metals analysis or EPA Test Method 3050/6010). EPA data validation guidelines were not written to accommodate the possibility that poor matrix spike results may be due to a loss of analyte as a result of matrix effects that alter the valence state of the target analyte.

No sources or releases of Cr(VI) have been identified at Fort Ord. Therefore, adopting a highly conservative data qualification approach (i.e., reject all Cr(VI) results) is not justified considering the available analytical data coupled with our knowledge of site history. Rejection of Cr(VI) results would effectively result in an absence of Cr(VI) information for performing risk assessment. In the absence of Cr(VI) analytical data, risk-based assumptions will result in an unjustified PRG exceedance for Cr(VI) at many Fort Ord sites. The Army maintains that potential subsequent remedial action on a chemical that has not been used at the site, nor shown to exist in samples collected at the site, is an unacceptable alternative to accepting Cr(VI) data with an acknowledged level of uncertainty.

Response to Comment on Explosive Results

The following table lists EPA Region IX PRGs in soil and reporting limits for the compounds nitroguanidine and tetryl. EPA Region IX has not established a PRG for picric acid (also known as trinitrophenol); the compound that is chemically most similar to trinitrophenol for which there is a PRG, is the compound dinitrophenol. Therefore, the PRG for dinitrophenol has been used in place of a PRG for picric acid.

COMPOUND	EPA REGION IX PRG	REPORTING LIMIT
Nitroguanidine	6500 mg/kg	0.5 mg/kg
Tetryl	650 mg/kg	0.25 mg/kg
Dinitrophenol	130 mg/kg	NA
Picric Acid	NA	2.0 mg/kg

PRGs are greater than ten times the reporting limit for the three explosive compounds that exhibited poor method performance during analysis of samples collected at Fort Ord Site 39. Therefore, as requested by EPA, the Army has shown that the data is of sufficient quantitative quality to demonstrate the absence of these analytes at levels that could pose a health risk.

The version of EPA Test Method 8330 used by Quanterra for analysis of explosive compounds did not specify the use of surrogate compounds. According to Quanterra, at the time Fort Ord Site 39 samples were analyzed, no appropriate surrogate compounds were available that didn't interfere with the analysis of explosive target analytes. Given the absence of surrogate compound recovery information, a greater reliance must be placed on matrix spike recovery results, and the usual procedure of not qualifying data based on matrix spikes alone should be reconsidered. Consequently, the Army believes that the use of a qualifier other than J3 (result estimated due to spike recovery exceedance) is warranted. Therefore, data for the explosive compounds nitroguanidine, tetryl, and picric acid have been given a unique qualifier (N2) to indicate the quantitative uncertainty and qualitative acceptability of affected sample results.

III. U.S. Environmental Protection Agency Technical Review Comments, Basewide Surface Water Outfall Investigation

General Comments

Human Health SRE Results, and Comparison of Maximum Soil Concentrations to Preliminary Remediation Goals, Tables 11-66: The last column in these tables presents ratios of the Maximum Site-Related Concentrations (MSRCs) to the Preliminary Remediation Goals (PRGs). The individual ratios for each chemical are also summed in the table, to provide a total MSRC/PRG ratio. Chemicals with PRG values based on carcinogenic endpoints, are not separated from those with PRGs based on noncarcinogenic endpoints.

The problem with this approach is that summed MSRC/PRG ratios for carcinogens and noncarcinogens mean quite different things. For carcinogens, the total MSRC/PRG ratio indicates the excess cancer risk relative to a baseline risk of 10^{-6}. Therefore a total MSRC/PRG of 10 for chemicals having PRGs based on carcinogenicity, indicates a cancer risk of 10^{-5}, which is in the acceptable risk range of 10^{-6} to 10^{-4}.

For noncarcinogens, the total MSRC/PRG ratio indicates the excess noncancer risk relative to a Hazard Index of 1.0. Therefore, a total MSRC/PRG of 10 for chemicals having PRGs based on noncancer effects, indicates that the summed risk exceeds the corresponding Reference Dose by a factor of 10, indicating the potential for adverse noncancer health effects to occur. For these reasons, the MSRC/PRG ratios for carcinogens and noncarcinogens should be calculated and summed separately.

It is also important to note that a total multipathway hazard index (HI) of >1 indicates the potential for adverse health effects to occur under RME conditions, regardless of the source of exposure. There should be no "correction" made for background by subtracting the exposure to the background concentration from the total exposure to arrive at the "site-related" MSRC. It is important for the risk manager to recognize that a person might receive a dose of a chemical in excess of the threshold for toxicity, regardless of the fact that some fraction of the dose arises from background concentrations.

Response: The method used to evaluate potential health risks at outfalls was developed for evaluating potential health risks at the 41 sites at Fort Ord. The method was agreed upon at a meeting among EPA, DTSC, RWQCB, COE, and Fort Ord on September 9, 1992, and is documented in the *Draft Final Technical Memorandum, Preliminary Remediation Goals, Fort Ord, California*, dated June 24, 1994. In discussions with the Army on May 4, 1995, Mr. Paull indicated that the approach presented in the Draft Final RI/FS can be used for making risk management decisions at the subject outfalls. No changes were made in the report in response to this comment. Outfalls where the detected concentrations could present

potential risks to human health will be remediated in accordance with the IAROD or monitored under the Operation and Maintenance Program.

Specific Comments

The summing of MSRC/PRG ratios for carcinogens and noncarcinogens, and the subtraction of background concentrations from total site exposures for noncarcinogens in Tables 11-66 has resulted in an significant underestimation of noncancer health risk at various surface water outfall locations. Although a complete check of every outfall location was not performed, the following provide representative examples:

Comment 1: **Table 28, OF-11: The total MSRC/PRG ratio sum is 2.43, all but 0.122 of which is associated with antimony, beryllium, cadmium, and lead. The cadmium PRG was based on cancer, and noncancer health risks for cadmium were not quantified. The USEPA residential soil PRG for cadmium, which is based on noncancer effects, is 38 mg/kg. The noncancer MSRC/PRG ratio for lead and arsenic alone is 1.5 (site-related), and 2.1 without subtracting background (total). Including the noncancer effects of cadmium would further increase the ratio to 2.3 [2.1 + (7.3÷38)]. The possibility for adverse effects at this site should be considered.**

Response 1: See response to the General Comments above.

Comment 2: **Table 36, OF-15: The total MSRC/PRG ratio sum is 4.77, all but 0.86 of which is associated with arsenic, dieldrin, and lead. The noncancer MSRC/PRG ratio for lead is 1.26 (site-related), and 1.28 without subtracting background (total). The USEPA residential soil PRG for arsenic, based on noncancer effects, is 22 mg/kg. Including the noncancer effects of arsenic would further increase the ratio to 1.46 [1.28 + (3.9÷22)]. The possibility for adverse effects at this site should be considered.**

Response 2: See response to the General Comments above.

Comment 3: **Table 38, OF-16: The total MSRC/PRG ratio sum is 8.35, all but 0.14 of which is associated with antimony, arsenic, cadmium, and lead. The noncancer MSRC/PRG ratio for antimony and lead is 2.78 (site-related), and 3.03 without subtracting background (total). Including the noncancer effects of arsenic and cadmium would further increase the ratio to 3.98 [3.03 + (5.1÷22)+(27.3÷38)]. The possibility for adverse effects at this site should be considered.**

Response 3: See response to the General Comments above.

Comment 4: **Table 54, OF-25: The total MSRC/PRG ratio sum is 34.7, all but 2.72 of which is associated with arsenic, cadmium, chlordane, and lead. The noncancer MSRC/PRG ratio for lead is 3.52 (site-related), and 3.74 without subtracting background (total). Including the noncancer effects of arsenic and cadmium would further increase the ratio to 4.89 [3.74 + (5÷22)+(33.2÷38)]. The possibility for adverse effects at this site should be considered.**

Response 4: See response to the General Comments above.

Comment 5: **Table 56, OF-26: The total MSRC/PRG ratio sum is 4210, all but 10.5 of which is associated with PCBs (Aroclor 1248). The MSRC/PRG ratio for Aroclor 1248 of 4200**

indicates a cancer risk in excess of the 10^{-3} range. The possibility for adverse effects at this site should be considered.

In addition, an explanation is needed for the statement "The MSRC/PRG ratio for Aroclor 1248 exceeds the criterion of 100 used for PCBs." Is there a criterion for this ratio?

Response 5: Section 6.0 describes actions to be taken by the Army to remove PCB-containing sediment from OF-26 as a part of base operations and maintenance. Table 55 indicates that: (1) the chemical concentrations exceeding PRGs are related to the sediments in the pipe and are unrelated to the outfall, and (2) no unacceptable outfall-related health risks associated with the site-related chemicals were identified. Health risks attributable to the outfall are therefore expected to be acceptably low following sediment removal. No changes were made in the document in response to this comment.

The MSRC/PRG ratio criterion of 100 used to evaluate PCBs at the outfalls was identified in Section 4.2 of the report text. The criterion was selected because: (1) it represents the upper range of the 10^{-4} to 10^{-6} cancer risk range identified in the National Contingency Plan (*EPA, 1990f*), and (2) it is consistent with *Guidance on Remedial Actions for Superfund Sites with PCB Contamination* (*EPA 1990g*), which recommends soil action levels of 1 mg/kg for residential soils and 10 to 25 mg/kg for industrial soils. No changes were made in the document in response to this comment.

Comment 6: **Table 64, OF-34: The total MSRC/PRG ratio sum is 115, all but 0.7 of which is associated with PCBs (Aroclor 1254 and 1260). The MSRC/PRG ratio for Aroclor 1254 and 1260 of 114 indicates a cancer risk in excess of the 10-4 range. The possibility for adverse effects at this site should be considered.**

Response 6: Please see response to Comment 6 above. EPA (*1989b*) recommends that risk estimates be rounded to one significant figure, as reflected in footnotes /a/ and /j/ for Table 64. Footnotes /a/ and /j/ indicate that the ratios and ratio sums are presented with greater precision to facilitate verifying calculations, not to reflect the precision of the analysis. The identified MSRC/PRG ratio sum for PCBs of 114 rounds to 100, which meets the criterion used to evaluate PCB concentrations. Additionally, Table 63 states that exposure at the outfall location is expected to be much lower than the hypothetical residential exposure upon which the PRG is based because of the depth at which PCBs were detected and the continued use of the FAAF as an airport. No changes were made in the document in response to this comment.

Comment 7: **Table 66, OF-35: The total MSRC/PRG ratio sum is 11.5, all but 0.64 of which is associated with arsenic, cadmium, and lead. The noncancer MSRC/PRG ratio for lead is 6.03 (site-related), and 6.25 without subtracting background (total). Including the noncancer effects of arsenic and cadmium would further increase the ratio to 7.37 [6.25 + (3.3÷22)+(37÷38)]. The possibility for adverse effects at this site should be considered.**

Response 7: See response to the General Comments above.

IV. U.S. Environmental Protection Agency Technical Review Comments, Volume III - Baseline Human Health Risk Assessment

General Comments

Comment 1: **Selection of Receptors and Exposure Pathways: As noted under our specific comments, the potential future receptors considered at each site, are very narrowly defined based upon very specific reuse plans. There is a concern that where reuse plans are subject to change, the risk assessment may not account for all possible receptors and pathways. In particular, the residential setting is the customary default exposure scenario for baseline risk assessments at Superfund sites, and should always be considered wherever reuse plans for a site have not been finalized. The risk assessment should be flexible enough to allow for different types of receptors, and for future changes in reuse plans.**

Response: This comment has been partially addressed in the Draft Final BRA. A residential scenario was conservatively evaluated for most of the sites in which there was not definitive future land use information indicating that the unrestricted land use scenario would not apply, but there are still several sites where questions regarding future reuse remain, and where the residential scenario was not specifically addressed (see Response under Comment 19 below).

Response 1: Comment acknowledged. As discussed in the May 4, 1995 meeting with Mr. Jeffrey Paull (EPA Region IX) and Dr. John Christopher (DTSC), adequate justification has been provided against evaluating a resident exposure scenario at some Fort Ord sites. Therefore, no additional receptors to those already considered in the Draft Final BRA will be evaluated. However, alternate receptors are evaluated at Sites 16/17 (pp. 47-57 of BRA), as agreed to at the May 4, 1995 meeting.

Comment 2: **Site Conceptual Models: The inclusion of diagrams of conceptual models which illustrate exposure sources would greatly clarify the site descriptions and data tables provided in the risk assessment.**

Response: This comment has been adequately addressed by the inclusion of conceptual site models (Tables 1.1 through 1.5) to the Draft Final BRA.

Response 2: No response necessary.

Comment 3: **Site Characterization: We strongly recommend that the target ranges be characterized separately from the rest of Site 3, and that human health risk be assessed independently for them. Their unique topographical features, deposits of spent ammunition, high lead surface soil concentrations, restricted access, and sensitive ecological habit make them qualitatively different from the rest of the site.**

Response: This comment has been adequately addressed by revising the BRA to provide separate risk estimates for areas with varying amounts of bullet cover, in addition to the evaluation of the weighted surface area exposures.

Response 3: No response necessary.

Comment 4: **Hazard Identification/Data Analysis: There are many references in the text and tables to samples analyzed for hexavalent chromium, but the results of these analyses were not presented in the document. In order to evaluate total chromium as the trivalent form, representative monitoring and analytical data for hexavalent chromium, with the corresponding limits of detection, are required.**

Response: This comment has been partially addressed by revising the statistical summary tables for each site to include the available data for hexavalent chromium. However we are not sure why for hexavalent chromium designations of non-detection were made as footnotes to the tables, whereas non-detects for other substances were made as direct entries (ND) in the data tables. In addition, the footnotes in several of the tables (Tables 6.2b through 6.3c) erroneously refer to total chromium rather than to hexavalent chromium.

Response 4: Comment acknowledged. To satisfy an earlier agency request, information regarding the non-detect values for CrVI was provided as a footnote in each of the statistical data summary tables. This is not inconsistent with the presentation of non-detect data for other chemicals. In fact, non-detect values for other chemicals that were never detected (e.g., chromium VI) were not made as direct entries (ND) in the statistical data summary tables. Chemicals the were analyzed for but never detected do not appear in the statistical data summary tables. As discussed in the May 4, 1995 meeting, Cr VI data will remain in the footnotes because this is merely a formatting issue. Additionally, in response to this comment, the error in footnote "a" of Tables 6.2b-6.3c has been corrected.

Comment 5: **Health-Based Soil Threshold Level for Lead: The health-based soil threshold level of concern of 1,925 mg/kg estimated for the resident child is significantly higher than the USEPA Region IX Pre-Remedial Goal (PRG) for lead of 400 mg/kg, and appears to be the result of non-standard inputs into the UBK lead exposure model.**

Response: This comment was partially addressed by developing a revised health-based threshold soil concentration for the resident receptor of 1860 mg/kg for lead. However this level is still significantly above both the USEPA Region IX residential (400 mg/kg) and industrial PRGs(1200 mg/kg), and may not be sufficiently protective. New information concerning the toxicity of lead is resulting in the adoption of stricter exposure standards, and the new USEPA PRGs for lead are likely to be even lower. Lead levels in soil above 1000 ppm are becoming increasingly difficult to defend, particularly where children are potentially exposed. We recommend a re-examination of the site-specific exposure assumptions used to run the UBK and LeadSpread models, to bring the health-based soil threshold level for lead more in line with USEPA guidance levels.

Response 5: Comment acknowledged. As discussed in the May 4, 1995 meeting with Mr. Jeffrey Paull, EPA Region IX, and Dr. John Christopher, DTSC, the health-based level of concern (HBLC) of 1860 mg/kg was based on the most conservative scenario presented for Site 3, and on currently available accepted

methods of evaluating lead toxicity. Therefore, this level will not be modified. However, as agreed upon, additional text has been provided in Section 5.9 (page 67) specifically stating that the HBLC was developed for the Feasibility Study (FS) and clarifying its use.

Comment 6: **Background Concentrations and Risk Characterization: The risk assessment utilizes background concentrations in the process of screening for chemicals of potential concern (COPCs), and in estimating the site-related contribution to health risk. However, it is inappropriate to subtract background when characterizing the probability of non-cancer toxicity. Doing so could lead to erroneous conclusions about the potential for adverse health effects to occur.**

Response: This comment was adequately addressed by revising the text and tables so as to not subtract out background for characterizing non-cancer toxicity.

Response 6: No response necessary.

Specific Comments

Comment 1: **Table 2.9, Reference Doses and Slope Factors for Chemicals of Potential Concern: A random check of the values listed in this table revealed numerous departures from current USEPA Region IX toxicity values. The current USEPA toxicity values are listed in Table 1. The last column in the table indicates that the current EPA toxicity values will result in the calculation of a decreased cancer risk for most substances, but an *increased risk* for bis(2-ethylhexyl)phthalate, and pentachlorophenol.**

Please consult and use current USEPA toxicity values, available on-line, and updated monthly, from the USEPA Integrated Risk Information System (IRIS) Database. Where current Cal/EPA toxicity values are more conservative (result in higher calculated risks) they should be used in place of USEPA values. The reference and date for the toxicity values used, whether USEPA, or Cal/EPA, should be specified in the document. Risks for all chemicals of potential concern (COPCs) should be calculated using the most current toxicity values.

Response: This comment was partially addressed by incorporating toxicity values in the Final Draft BRA that are consistent with the recommendations made in this comment. Ingestion Reference Doses (RfDs) have been used in the document in place of Inhalation Reference Concentrations (RfCs) when no USEPA or Cal/EPA toxicity value is available. However, these RfD values do not appear to have been dosimetrically adjusted for cross-route extrapolation, a necessary adjustment, if they are to be applied in this manner.

Response 1: Comment acknowledged. As discussed in the May 4, 1995 meeting with Mr. Jeffrey Paull, EPA Region IX and Dr. John Christopher, DTSC, RfDs have been compared to doses, not concentrations, and therefore were used correctly. Dosimetric adjustments to account for route-to-route extrapolations are therefore unnecessary and will not be incorporated into the BRA.

Comment 2: **Soil to Skin Adherence Factor, Sec. 2.2.5.3, p. 13: As noted in the document, EPA's dermal absorption guidance recommends a soil-to-skin adherence factor of 1.0 mg/cm^2-day for upper-bound exposures. The adherence factor of 0.4 mg/cm^2-day utilized in the risk assessment is inconsistent with this guidance, and with the default**

value of 1.0 used for estimating alternative PRGs for Fort Ord (Second Addendum to the Technical Memorandum Preliminary Remediation Goals, Alternate PRGs for Site 33, HLA, April 7, 1994). When alternative exposure factors are utilized in place of standardized EPA default exposure assumptions, particularly in the RME scenario, the document needs to present supporting documentation, and reference(s) to the literature which supports the proposed value.

Response 2: This comment was adequately addressed by the development of a well-supported site-specific soil-to-skin adherence factor, with citation of appropriate references.

Response 2: No response necessary.

Comment 3: Methods for the Uptake Biokinetic Model, Sec. 2.2.9.1, p. 18: Certain default values selected as inputs to the UBK model appear to be incorrect, resulting in an underestimate of blood-lead concentrations, and an overestimate in the health-based soil threshold level of concern (see comment on Lead Model Output, Appendix F).

Response: This comment has been partially addressed. The UBK modeling and associated text have been revised, but the residual risk at the resultant health-based soil threshold level for lead still appears to be too high (see our responses under General Comment 5 above, and Specific Comment 29 below).

Response 3: Comment acknowledged. See Response to EPA General Comment #5.

Comment 4: Data Evaluated, Site 2, Sec. 3.2.1, p. 24: The text states that the following 13 metals were detected in at least one soil surface sample: antimony, arsenic, beryllium, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, thallium, and zinc. However, as shown in Table 3.1a., there were only three analyses for each of these metals, and for 7 of them, they were detected in only one sample. The document did not offer an explanation as to why so few surface soil samples were taken for these metals, or relate the sampling locations back to the site conceptual model.

To find an explanation for this lack of monitoring data, Volume II of the Remedial Investigation was examined. Based on the description presented in Sec. 2.1.2.2, p. 13, of that document, it appears that the two soil samples were collected from within the sludge of one sludge bed, and immediately below the asphalt liner of the other sludge bed. The third surface sample appears to have been collected near the drain pipe outlet in the southeast corner of the site. Apparently no surface soil samples were collected from either of the two ponding areas.

The limited number of monitoring sites, and distribution of the surface soil monitoring data appears to be insufficient to adequately represent Site 2 surface soil concentrations, particularly in the presence of significant background concentrations of many these metals.

Response: This comment was adequately addressed by the incorporation of additional surface soil sampling data, and recalculation of potential health risks for Site 2.

Response 4: No response necessary.

Comment 5: **Selection of Chemicals of Potential Concern (COPCs), Soil, Sec. 3.3.1, p. 25: The document states that the maximum concentration of each metal was first compared to the depth-specific Fort Ord NQTP soil background concentration for the metal, and eliminated as COPCs if their concentrations did not exceed background. However, it may be statistically inappropriate to compare the maximum detected value from limited monitoring consisting of 3 samples, with either the maximum concentration, or the 95% UCL of the mean concentration from more extensive background monitoring, as is done in Table 3.5 of the risk assessment.**

An explanation of how background concentrations were determined needs to be incorporated into the document. This explanation should present the number of samples analyzed at each depth, and for each soil type, and descriptive statistics for soil sample background concentrations, including the frequency of detection, sample mean, standard deviation, variance, and 95% upper tolerance limit. If this data is presented elsewhere, it should be referenced, and clearly summarized in the document.

Response: This comment was inadequately addressed in the revised BRA. HLA has presented the argument that calculating an upper 95% confidence level for a set of three samples is statistically inappropriate, and that using the maximum detected background concentration in such small sample sets is conservative.

We do not agree with HLA's analysis on this point, and would prefer that upper 95% confidence levels for small data sets be at least calculated, and compared to maximum concentrations, before drawing the conclusion that this procedure would not produce meaningful or useful concentration estimates. In addition, the data regarding background concentrations requested in the above comment still needs to be incorporated into the BRA.

Response 5: Comment acknowledged. As discussed in the meeting on May 4, 1995, it is standard risk assessment practice to use the maximum concentration as an exposure point concentration if the 95 percent upper confidence limit exceeds the maximum concentration. We therefore believe that the comparison of the maximum site metal concentration to the maximum background metal concentration is conservative and justified in that:

(a) Even if the 95 percent upper confidence limit had exceeded the maximum concentration, we would still have used the maximum concentration, as that is standard risk assessment practice

(b) As stated in the response to comments on the Draft BRA, calculating a 95 percent upper confidence limit for a small data set is inappropriate; and

(c) It is also standard practice when comparing site concentrations to background concentrations to compare "like" to "like", i.e., maximum to maximum or mean to mean concentrations.

Comment 6: **Leaching, Sec. 3.4.1.4, p. 28: The document states that "the chemicals identified as COPCs in soil at sites 2 and 12 have limited water solubilities and high soil sorption tendencies." Supporting data for this statement should be presented.**

Response: This comment was adequately addressed by revising the text to identify the basis for statements concerning chemical mobility, although the supporting data is contained in another document (Volume II of the RI/FS).

Response 6: No response necessary.

Comment 7: **Possible Noncancer Health Effects, Site 12, Sec. 3.6.1.2, p. 30: The total multipathway hazard index (HI) of 2 for a resident child, indicates the potential for noncarcinogenic health effects under RME conditions. There should be no "correction" made for background by subtracting the multipathway RME HI for exposure to the background concentration of arsenic in soil. It is important for the risk manager to recognize that a child might receive a dose of arsenic in excess of the threshold for toxicity at Site 12, regardless of the fact that some fraction of the dose arises from background arsenic.**

Response: This comment has been adequately addressed by removing the discussion of correcting hazard indices to account for background exposures from the text throughout the document.

Response 7: No response necessary.

Comment 8: **Statistical Data Summary of Chemicals Detected in Surface Soil, Subsurface Soil, Deep Soil, and Groundwater, Tables 3.1, 3.2, 3.3, and 3.4: These data tables do not indicate which chromium samples were analyzed for hexavalent chromium. Note (f) to Table 3.5 states that chromium was evaluated as chromium III and that chromium VI was not detected, but nowhere in the document are the sampling results for chromium VI presented. Without this data, chromium VI cannot be eliminated as a COPC.**

Response: This comment has been adequately addressed in the revised Draft Final BRA.

Response 8: No response necessary.

Comment 9: **Possible Cancer Risk, Site 12, Sec. 3.6.2.2, p. 31: It is not clear why, in characterizing the risk associated with carcinogenic PAH, only data for two surface samples analyzed by EPA Method 8310 were used, and why the data from 35 surface soil samples analyzed by EPA Method 8270 were rejected. Although the detection limit for the Method 8270 samples is higher, these 35 sample results (using one-half the detection limit of 0.3 mg/kg for non-detects) provide a better statistical representation of actual site PAH concentrations than does the single data point of 1.25 mg/kg detected using the 8310 method.**

Response: This comment has been adequately addressed by changing the text and tables to reflect a dataset including PAH analyses from both EPA Methods 8310 and 8270.

Response 9: No response necessary.

Comment 10: **Uncertainty Analysis, Sec. 3.7, p. 31: This section refers to maximum intake rates for drinking water (i.e., 2 liters per day for adults) as unrealistic, and that it "most likely overestimates actual exposure, particularly in light of the probability**

distributions for tap water ingestion rates recently presented in peer-reviewed literature." Although there is no need to present reference(s) to the literature which support this assertion, since 2 liters/day is used in the RME scenario, in the absence of such references, this assertion stands as an unsupported editorial comment, and should be deleted.

Response: This comment has been adequately addressed in the revised Draft Final BRA.

Response 10: No response necessary.

Comment 11: **Groundwater, Sec. 4.2.6, p. 38: In evaluating the groundwater data, the criteria used to select the dataset collected from August 1993 to February 1994, as representative of current groundwater conditions, needs to be explicitly stated.**

Response: This comment has been partially addressed in the revised BRA. The rationale for excluding groundwater samples prior to 1993 remains very similar to that of the preliminary BRA. The statement that "concentrations do not appear to be consistent, and may be decreasing over time" was presented in the preliminary BRA, and without additional justification or analysis, still does not provide an adequate basis for eliminating the 1992 dataset.

Response 11: Comment acknowledged. As discussed in the May 4, 1995 meeting, the rationale used to exclude groundwater data collected and analyzed prior to 1993 is acceptable. Therefore, reestimation of potential health effects at Site 16/17 using previously excluded groundwater data will not be performed.

Comment 12: **DOL Maintenance Yard, Sec. 4.3.1, p. 38: An explanation is needed for why no surface soil samples were collected in this area, particularly when 16 chemicals were detected in subsurface soil. Without data for surface soil samples, it is inappropriate to omit this area from the quantitative risk evaluation.**

Response: This comment was adequately addressed by the incorporation of additional surface soil sampling data, and recalculation of potential health risks for the DOL Maintenance Yard.

Response 12: No response necessary.

Comment 13: **Pete's Pond, Surface Soil, Sec. 4.3.2.1, p. 39: Beryllium, which exceeded surface soil background concentrations, was eliminated as a COPC based on noncancer risk. This is not consistent with EPA cancer risk assessment guidelines, which considers beryllium potentially carcinogenic through the oral as well as the inhalation route, with an oral slope factor of 4.3 $(mg/kg\text{-}day)^{-1}$.**

A random check of the toxicity screen evaluation, using standard EPA exposure assumptions for residential soil, as listed in the Region IX Preliminary Remediation Goals (PRGs) showed that two metals detected above background concentrations in surface soil, copper and mercury, exceeded the screening hazard quotient of 0.01, and should be retained as COPCs.

Response: This comment has been adequately addressed by including oral exposure to beryllium in the toxicity screen analysis, and subsequent risk estimates.

Response 13: No response necessary.

Comment 14: **Pete's Pond Extension, Sec. 4.3.3, p. 40: A random check of the toxicity screen evaluation, using standard EPA exposure assumptions for residential soil, as listed in the Region IX PRGs showed that two metals detected above background concentrations in surface soil, cadmium and mercury, exceeded the screening hazard quotient of 0.01, and should be retained as COPCs.**

Response: This comment has been adequately addressed by retaining cadmium as a COPC. Mercury, which upon re-analysis no longer exceeds a health index of 0.01 in the Final Draft BRA, was not retained as a COPC.

Response 14: No response necessary.

Comment 15: **Site 17 Disposal Area, Subsurface Soil, Sec. 4.3.4.2, p. 41: As indicated in Table 4.11b, copper, with a calculated screening hazard quotient of 0.01, should be retained as a COPC.**

Response: This comment has been adequately addressed by retaining copper as a COPC.

Response 15: No response necessary.

Comment 16: **Site 17 Disposal Area, Groundwater, Sec. 4.3.5, p. 42: Toluene, detected at a maximum concentration of 1.1 mg/liter in the A-aquifer, exceeds the USEPA Region IX PRG of 0.72 mg/liter. This indicates that the use of standard EPA exposure assumptions would result in a hazard quotient exceeding 1.0, and that toluene should be retained as a COPC.**

Response: This comment has been adequately addressed by correcting the concentration units for toluene that had been erroneously reported in mg/l.

Response 16: No response necessary.

Comment 17: **Exposure Assessment, Chemical Vapors, Sec. 4.4.1.1, p. 43: As noted in the comment on Section 3.4.1.4 above, rather than making general statements concerning the physical properties of each COPC, specific data, including solubility, molecular weight, vapor pressure, Henry's Law constant, and organic carbon partition coefficient should be provided in a table, and a screening risk calculation for a representative COPC (e.g., TCDD-TE) should be performed, before the volatilization pathway is eliminated for all COPCs detected.**

Response: This comment has been adequately addressed by performing screening calculations for TCDD (in the Draft Final RI Volume II) which demonstrate that the volatilization pathway would not result in cancer risk estimates greater than 10^{-6}.

Response 17: No response necessary.

Comment 18: **Potential Receptors and Exposure Pathways, DOL Maintenance Yard, Sec. 4.4.2.1, p. 44: As noted in the comment on Section 4.3.1 above, the lack of any surface soil samples for the DOL Maintenance yard is a serious data omission, particularly in view of the fact that possible future onsite receptors include construction workers.**

The statement that no COPCs were identified in subsurface soils does not provide adequate justification for not quantitatively evaluating exposures of potential future receptors in the DOL Maintenance Yard, particularly when 16 chemicals were detected in subsurface soil, and the potential for leaching is considered to be low (as stated on the same page of the document, in Section 4.4.1.4). Without data for surface soil samples, it is inappropriate to omit this area from the quantitative risk evaluation in the Baseline Risk Assessment.

Response: This comment was adequately addressed by the incorporation of additional surface soil sampling data, and recalculation of potential health risks for the DOL Maintenance Yard.

Response 18: No response necessary.

Comment 19: **Potential Receptors and Exposure Pathways, Site 17 Disposal Area, Sec. 4.4.2.4, p. 46: The assumption that student residents are likely to be on campus more frequently and for longer periods of time than other potential receptors is subject to doubt. Faculty and administrative staff may be present on campus over periods of time that spans decades, while students average five years or less. It is also entirely possible that some faculty and administrative staff, like some students, would choose to live in on-campus housing. The potential receptors for Site 17 should therefore include resident faculty and their families; account for exposure to sensitive subgroups (e.g., pregnant women, infants, children); and include the relevant exposure pathways (e.g., breast milk, homegrown vegetables).**

Response: This comment was inadequately addressed in the Final Draft BRA. Although Site Reuse Plans indicates that unrestricted residential development of the site is unlikely, in our view, faculty and staff are still more appropriate receptors than are students under the RME scenario. We are also somewhat confused by the evaluation of the student *resident* as a receptor, if the site in unsuitable for residential development.

Response 19: Comment acknowledged. As discussed in the May 4, 1995 meeting, reuse plans for Sites 16 and 17 have been received from Mr. Paul Salazar of CSUMB Planning Office. Site 17 will be used for workshops (i.e., artists, etc.) and most of Site 16 will be paved and landscaped or used for corporation yards. No student or faculty residents will be occupying either of the sites. However, as agreed in the May 4, 1995 meeting, Section 4.4.2 and subsequent sections will be modified to address more realistic receptors.

Comment 20: **Potential Receptors and Exposure Pathways, Groundwater, Sec. 4.4.2.5, p. 46: See comment on Section 4.4.2.4 above. In addition, the statement, "Other groundwater COPCs exceed either the screening HQ or the cancer screening risk, but not both" is not an adequate explanation for why only carbon tetrachloride is mentioned for evaluation as a COPC in the upper 180-foot aquifer, and not the other two COPCs, tetrachloroethylene, and trichloroethylene that were detected there.**

Response: This comment was inadequately addressed. Although the text has been modified to clarify the COPC selection process for groundwater at Sites 16 and 17, it appears that the estimated multipathway HIs for exposures to groundwater in the A-aquifer and soil at the Site 17 Disposal Area may have been incorrectly calculated (see Additional Comments, Appendix E).

Response 20: Comment acknowledged. The multipathway HI estimates resulting from exposure to groundwater in the A-aquifer are correct. As noted in Section 2.2.4.4 of the Draft Final BRA (page 12), inhalation exposures from domestic use of groundwater (i.e., showering) were evaluated using a generic EPA model which assumes that the dose obtained from inhalation of VOCs while showering is equal to the dose resulting from the ingestion of 2 liters per day of the same water. Therefore, "inhalation" doses based on "inhalation" exposure assumptions and chemical concentrations in air were not calculated. Instead, groundwater chemical concentrations and ingestion intake assumptions were incorporated into the inhalation scenario to estimate a daily dose identical to the groundwater ingestion dose value. Inhalation-specific toxicity values were then used to characterize potential health risks and noncancer health effects resulting from inhalation exposure. For this reason, any attempts to "backcalculate" an inhalation rate "for example" will yield incorrect values.

Comment 21: **Exposure Scenarios, Student Resident, Sec. 4.4.3.1, p. 47: The basis for the assumption that student residents spend only 2.5 hours per day outdoors should be provided. For students who engage in sports, or other outdoor activities (e.g.; bicycling, hiking, jogging) this estimate would appear to be low.**

Response: This comment was adequately addressed by revising the analysis to include a student resident receptor with an exposure time of 20 hours per day.

Response 21: No response necessary.

Comment 22: **Exposure Scenarios, Construction Worker, Sec. 4.4.3.3, p. 48: The soil ingestion rate of 50 mg/day suggested as the upper-bound value for the commercial/industrial worker in Section 2.2.5.1, is not appropriate for the construction worker that is directly exposed to soil while working on-site. For this exposure scenario, a soil ingestion rate of 480 mg/day should be used (Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Factors, OSWER Directive 9285.6-03, March, 1991).**

Response: This comment was adequately addressed by revising the BRA to use the recommended RME soil ingestion rate of 480 mg/day.

Response 22: No response necessary.

Comment 23: **Exposure Point Concentrations, Sec. 4.4.4, p. 49: The exposure point concentrations (EPCs) used for the utility worker at Pete's Pond Extension, and the construction worker at the Site 17 Disposal Area should include the COPC concentrations detected in soil at the surface (0 to 2 bgs) as well as the subsurface (2 to 10 bgs) depths. In addition, the average and RME EPC calculated for TCDD-TE at Pete's Pond is highly uncertain because only one sample was analyzed for CDDs and CDFs.**

Response: This comment was adequately addressed by revising the analysis, text, and tables of the BRA to include all soil data collected to a depth of 10 feet, and by incorporating the results of additional soil sample data, which included additional dioxin and furan analyses.

Response 23: No response necessary.

Comment 24: **Data Evaluation, Sec. 5.2, p. 54: We do not approve of the method of "surface area weighing" the concentrations of chemicals detected at Site 3, in proportion to the surface areas of Study Areas 1 and 2 having different percentage of bullet cover. This is a non-validated, subjective, and unreliable method of treating the data, and cannot be substituted for representative soil monitoring data. Since the target areas represent exposure areas of potential concern to future receptors, particularly children, the soil concentration data should be evaluated separately from the rest of site 3, and EPCs should be derived specifically for the target areas. We also view as inappropriate, the presentation of surface area weighted chemical concentrations, rather than the actual concentrations detected, in Table 5.3.**

Response 24: This comment was partially addressed by evaluating risks for each target area separately, in addition to evaluating the weighted surface area exposures. Although this procedure does not avoid the subjectivity involved in defining the bounded areas by percentage of bullet cover, we do see the purpose for having a mechanism to account for variations in potential exposure that a receptor is likely to encounter on site, and accept the surface area weighted concentrations as one method (although not necessarily the best one) for doing this.

An alternate method, and one that we would prefer, would be to use the site-specific soil concentrations, and rather than transforming the data prior to statistical analysis, adjust the non-transformed exposure point concentrations by the relative amounts of time spent in each contamination area or zone.

This would provide a time-weighted, rather than a surface area-weighted exposure point concentration, which is a more direct and standard way of calculating exposures that vary over time and/or space. It would also provide greater flexibility in adjusting exposure point concentrations were land use to change.

Response 24: Comment acknowledged. In response to EPA's comment on the Draft BRA regarding the "surface-area" weighting approach, potential health risks at Site 3 were reestimated assuming that exposure to site-related chemicals would result from sole exposure to only one of three bullet distribution areas. It was therefore agreed in the May 4, 1995 meeting that no additional reestimation of health risks using a "time-weighted" approach would be necessary.

Comment 25: **Potential Receptors and Exposure Pathways, Sec. 5.4.2, p. 57: Based on the reuse description for Site 3, utility and construction workers should also be considered as potential receptors, using the recommended soil ingestion rate of 480 mg/day for an excavation worker.**

Response: This comment was adequately addressed by revising the BRA to discuss utility and construction worker receptors at Site 3, using the recommended RME soil ingestion rate of 480 mg/day.

Response 25: No response necessary.

Comment 26: **Exposure Point Concentrations, Sec. 5.4.4, p. 59: As in the comment above, surface area-weighted soil concentrations should not be used to calculate EPCs; they should be calculated directly from site-specific soil concentrations.**

Response: This comment was partially addressed by evaluating risks for each target area separately, in addition to evaluating the weighted surface area exposures. As stated in our response under Comment 24 above, however, we prefer that time-weighted, rather than surface area-weighted exposure point concentrations be calculated directly from site-specific soil concentrations.

Response 26: Comment acknowledged. See Response to EPA Specific Comment #24.

Comment 27: **Toxicity Assessment, Sec. 5.5, p. 59: Although Inhalation Reference Concentrations (RfCs) have not yet been developed for either antimony or copper, the inhalation pathway should not be eliminated from consideration of noncancer effects resulting from inhalation of these two metals. RfCs, estimated from the ingestion RfDs, after making appropriate route-to-route dosimetric adjustments, may be employed.**

Response: This comment was partially addressed by incorporating toxicity values (RfDs) to represent the inhalation pathway for antimony and copper. However, as stated in our response under Comment 1 above, these RfD values were not dosimetrically adjusted for cross-route extrapolation. Unadjusted oral RfD values are not directly applicable to the inhalation route.

Response 27: Comment acknowledged. See Response to EPA Specific Comment #1.

Comment 28: **Possible Noncancer Health Effects, Sec. 5.6.1, p. 59: The multipathway HI for the RME of 30 years for the nearby resident receptor is very close to 1 (0.9), and with the recalculation of EPCs, as indicated above, could easily exceed 1. In addition, exposure assumptions for these receptors need modification--the park ranger receptor, or excavation worker would be expected to be more highly exposed to lead on the site than park visitors.**

Response: This comment was adequately addressed in the BRA. For both the onsite park ranger and nearby resident receptor, under the RME scenario, blood lead levels above the threshold level of concern, and multipathway HIs exceeding 1.0 were calculated, indicating that noncarcinogenic adverse health effects resulting from exposure to antimony, copper, and lead may occur as a result of exposure to medium and high bullet-density areas. We also noted that the method used to calculate HIs was changed in the Draft Final BRA, and no longer sums the individual age-range HIs for child receptors.

Response 28: No response necessary.

Comment 29: **Lead Exposure, Sec. 5.6.3, p. 60: The lead models (UBK and LeadSpread) needs to be re-run using the recalculated EPCs that are based on non-surface area-weighted soil concentrations.**

Response: As indicated in our response under Comment 5 above, this comment was partially addressed by developing a revised health-based threshold soil concentration

for the visitor/trespasser resident receptor of 1860 mg/kg for lead. However this level is still significantly above both the USEPA Region IX residential (400 mg/kg) and industrial PRGs(1200 mg/kg), and may not be sufficiently protective. We recommend a re-examination of the site-specific exposure assumptions used to run the UBK and LeadSpread models, to bring the health-based soil threshold level for lead more in line with USEPA guidance levels.

Response 29: Comment acknowledged. See Response to EPA General Comment #5.

Comment 30: **Uncertainty Analysis, Sec. 5.7, p. 60: We do not agree with the assumption that the uncertainty involving the methods used to weight the chemical concentrations by the distribution of spent ammunition at locations within Site 3 does not significantly add to the uncertainty of the BRA for Site 3--it is our view that it does.**

Response: This comment was partially addressed by evaluating risks for each target area separately, in addition to evaluating the weighted surface area exposures. However, in our view, time-weighted exposure point concentrations, calculated directly from site-specific soil concentrations would introduce less uncertainty than the surface area-weighted transformed data approach that was used (see our response under Comment 24 above).

Response 30: Comment acknowledged. See Response to EPA Specific Comment #24.

Comment 31: **Summary of the Baseline Risk Assessment for Site 3, Sec. 5.8, p. 60: For the reasons set forth in comments on Sections 5.2, 5.4.4, 5.5, 5.6.1, 5.6.3, and 5.7 above, we cannot agree with the conclusion that potential adverse health effects resulting from potential exposure to the COPCs at Site 3 are not expected.**

This comment was adequately addressed in the BRA. The BRA for Site 3 has undergone substantial revision, and estimated HIs and blood-lead levels for some receptors have been found to exceed USEPA threshold levels of concern (see our response under Comment 28 above).

Response 31: No response necessary.

Comment 32: **Possible Cancer Risks, North Slope, Site 31, Sec. 6.6.2.1, p. 71: We do not agree with the conclusion that the cancer risk estimated for B(a)P-TE for the RME scenario is not a valid result, representative of actual conditions, based on the finding that the arithmetic mean concentration exceeded the actual measured concentration in only one detected sample. It appears, from Table 6.1a, that the detection limits for B(a)P-TE were too high relative to the actual soil concentrations, and the single value reported of 0.2 mg/kg, may in fact, be representative.**

Response: This comment was partially addressed in the BRA. We would like additional clarification for the statement, "The detection limits for the PAHs were not substantially elevated in the analyses performed on Site 31 soil samples, but the maximum detected concentration was less than the reporting limit." In general, according to standard data quality (DQ) procedures, non-detects should not be eliminated from the data analyses, whether or not the detection limit exceeds the maximum detected concentration.

Response 32: Comment acknowledged. As discussed in the May 4, 1995 meeting with Mr. Jeffrey Paull, EPA Region IX and Dr. John Christopher, DTSC, the exclusion of "ND" PAH data at Site 31 is appropriate and in accordance with EPA RAGS guidance (page 5-10). Therefore, no changes will be incorporated into the BRA on the basis of this comment.

Comment 33: **Summary of Possible Cancer Risks, Sec. 6.6.2.4, p. 72: Because we do not agree with the conclusion drawn for B(a)P-TE cancer risk in the comment above, we do not agree with the conclusion drawn here, that the RME total cancer risk of 2×10^{-6} does not represent an actual elevated risk.**

Response: This comment was partially addressed in the Final Draft BRA. Re-calculation of cancer risks, using the PAH data with the elimination of non-detected values reflecting one-half the detection limit, resulted in cancer risks significantly below the 1×10^{-6} risk range. However, as stated above, this method of data analysis does not conform to standard DQ procedures.

Response 33: Comment acknowledged. As stated in the response to General Comment #32 above, the potential health risk estimates associated with exposure to PAHs at Site 31 are correct. As a result, no changes based on this comment will be made to the BRA.

Comment 34: **Summary of Baseline Risk Assessment for Site 31, Sec. 6.8, p. 73: The last sentence should be changed to read: "The results of the lead exposure evaluation, *and the cancer risk evaluation*, indicate that remediation based on possible human health effects is required for Site 31.**

Response: This comment was adequately addressed in the Draft Final BRA. Revised cancer risk estimated for Site 31 no longer exceed 10^{-6}.

Response 34: No response necessary.

Comment 35: **Physical Setting, Site 39, Sec. 9.1.1, p. 1: Please provide a more complete explanation for why no chemical data were collected from the 17 small arms ranges.**

Response: This comment was adequately addressed in the Final Draft BRA, with the revision of Section 7.1.1 of the document.

Response 35: No response necessary.

Comment 36: **Data Evaluation, Sec. 9.2, p. 3: Please provide a more complete explanation for why the analytical data for 24 soil samples from Range 36A were not included in the BRA.**

Response: This comment was adequately addressed in HLA's Response to USEPA's comment, indicating that data for these 24 samples were not included in the BRA because complete validation by HLA was not possible.

Response 36: No response necessary.

Comment 37: **Groundwater, Sec. 9.2.2, p. 4: Please provide a more complete rationale for the statement: "Results of the groundwater sampling indicate that groundwater beneath Site 39 does not appear to have been impacted by site activities."**

Response: This comment was adequately addressed in the Final Draft BRA, with the revision of Section 7.2.2 of the document.

Response 37: No response necessary.

Comment 38: **Selection of Chemicals of Potential Concern, Soil, Sec. 9.3.1, p. 5: Please provide data on environmental stability, transformation, and degradation rates for the three explosives (nitroglycerin, 4-nitrophenol, and PETN) which could not be evaluated in the toxicity screen.**

Response: This comment was adequately addressed in the Final Draft BRA, with the revision of Section 7.3.1 of the document, which presents data regarding the stability and persistence of nitroglycerin, 4-nitrophenol, and PETN.

Response 38: No response necessary.

Comment 39: **Potential Exposure Pathways, Sec. 9.4.3, p. 9: This is another site in which additional future receptors, and exposure pathways should be considered; for example, the hypothetical offsite resident exposed to chemicals in surface soil via inhalation of dust, may also be exposed via ingestion, dermal absorption, and inhalation on site, as a visitor/trespasser.**

Response: This comment was adequately addressed in the Final Draft BRA, with the revision of Section 7.4.3 of the document, which indicates that exposure to COPCs at Site 39 by visitors is not expected because contaminated areas are located within the interior of the site, which HLA has determined has a low probability of access due to unexploded ordnance in the area.

Response 39: No response necessary.

Comment 40: **Toxicity Screen Evaluation, Appendix C, p. C1: The risk assessment assumes that ingestion represents the most significant exposure route, and therefore toxicity screens did not evaluate either inhalation or dermal contact. Although it is unlikely that either of these routes drive the overall risk, the inhalation route, particularly for the carcinogenic metals, and the dermal route, particularly for the semivolatiles, such as PAHs, should be included in the toxicity screen. In addition the toxicity screening evaluation should be conducted for the most sensitive receptor (i.e., the child) for noncancer endpoints.**

For the purpose of conducting toxicity screening evaluations, we recommend the use of USEPA Region IX PRGs, which incorporate the appropriate exposure pathways and receptors, and have been approved for this purpose by Cal/EPA.

Response: This comment was partially addressed in the Final Draft BRA. Toxicity screening methods have been revised in the BRA to include evaluation of potential inhalation exposures for carcinogenic metals. However for potential exposure to carcinogens, in exposure scenarios in which the child was selected as a potential receptor, we recommend the use of age-adjustment factors. Their use (described in RAGS, Part B) are especially important for soil ingestion exposures, which are higher during childhood, and decrease with age.

Response 40: Comment acknowledged. It is true that child-specific toxicity screens were not conducted. However, the toxicity screening criteria used in the BRA retained site-related chemicals as a potential COPC if either the cancer risk or the HQ or HI exceeded a conservative threshold level of 1×10^{-6} or 0.01, respectively. These threshold levels are two orders of magnitude below agency levels of concern for noncancer effects and two-to-four orders of magnitude below the upper and lower end bounds typically recognized for cancer risk (i.e., 10^{-4} to 10^{-6}). Therefore, conducting child-specific toxicity screens as an additional level of public health protection is overly conservative and not necessary. As a result, no changes based on this comment will be made to the BRA.

Comment 41: **Lead Model Output, Appendix F, Tables F-1 & F-2: We do not understand the use of the term sediment in the tables. Does this value refer to outdoor soil concentrations? We also do not understand the zero exposure assumption for house dust. This value would not be supportable for any residential scenario on site, and would result in a significant underestimate of blood lead concentrations in the output of the model. The health-based soil threshold level of concern of 1,925 mg/kg estimated for the resident child is significantly higher than the USEPA Region IX Pre-Remedial Goal (PRG) of 400 mg/kg, and appears to be the result of non-standard inputs into the UBK lead exposure model. All departures from standard default values for the UBK lead model must be well-supported by specific data, and thoroughly documented.**

Response: This comment was partially addressed in the Final Draft BRA by the inclusion of exposures from lead in house dust to the model, and by developing a revised health-based threshold soil concentration for the visitor/trespasser resident receptor of 1860 mg/kg for lead. However, as stated in our responses under General Comment 5 and Specific Comment 29 above, this level is still significantly above both the USEPA Region IX residential (400 mg/kg) and industrial PRGs(1200 mg/kg) for lead, and may not be sufficiently protective. We recommend a re-examination of the site-specific exposure assumptions used to run the UBK and LeadSpread models, to bring the health-based soil threshold level for lead more in line with USEPA guidance levels.

Response 41: Comment acknowledged. See Response to EPA General Comment #5.

Additional Comments on the Final Draft Baseline Risk Assessment

Comment 42: **Dermal Absorption of Dioxins, Sec. 2.2.6, p. 16: Cal/EPA DTSC has recommended 3% as a default for dermal absorption of chlorinated dibenzo-p-dioxins (CDDs) and chlorinated dibenzofurans (CDFs), based on data in *Dermal Exposure Assessment: Principles and Practice* (USEPA, 1992). HLA, in evaluating the same data, has suggested a dermal absorption factor of 1%. In our view, a reasonable case can be made supporting the use of either of these two values, and given the limitations in the underlying data set, they are not significantly different. However, given the high toxicity and carcinogenic potency of the CDDs and CDFs, we recommend that the 3% value be used for estimating the reasonable maximum exposure (RME).**

Response 42: Comment acknowledged. We also agree that a reasonable case can be made to support either a 1 or 3 percent dermal absorption factor (DAF) for dioxin which was selected as a COPC only at Sites 16/17 and 31. We performed some screening calculations to determine whether the use of a 3% DAF would have

affected the conclusions of the BRA. Cancer risks associated with dermal exposure to TCDD-TE were minimal at Sites 16 and 17 (i.e., 2.55×10^{-11} to 3.31×10^{-9}) and Site 31 (i.e., 7.5×10^{-12} to 1.58×10^{-8}); multiplying these risks by a factor of 3 did not impact the results of the BRA. As a result, no changes based on this comment will be made to the BRA.

Comment 43: **Risk Assessment Data Management and Reporting System (RADMARS) Output, Appendix E: A random check of the intake factors listed in Tables E1 through E63 showed certain intake factors to be much smaller in magnitude than would be expected using standard USEPA default exposure assumptions, or those presented in Table 2.5 of the BRA.**

To provide a specific example, Table E15--Hazard Quotient and Index Detail, Student Resident-RME Scenario, Sites 16 and 17, cites an intake factor of 2.35×10^{-2} (l/kg-day). Assuming a body weight of 70 kg., this equates to a drinking water ingestion rate of 1.65 liters/day. This value appears to be correct, given the 0.8 Intake Fraction value cited in Table 4.14, since 0.8 multiplied by the USEPA standard drinking water ingestion rate of 2.0 liters/day = 1.6 liters/day.

However, in what appears to be a typographical error, Table E15 presents the *same value* of 2.35×10^{-2} (m^3/kg-day) as the inhalation intake factor. Again, assuming a 70 kg. body weight, this equates to an inhalation rate of 1.65 m^3/day, which is far less than the standard USEPA inhalation rate of 20 m^3/day for residential exposure, under the RME scenario. Adjusting the intake factor for the exposure time (20 hours/day) and exposure frequency (300 days/year) cited in Table 4.14, equates to a value of 13.7 m^3/ day, which is still more than a factor of 8 times greater than the inhalation intake factor of 1.65 m^3/day presented in Table E15.

Table E15 was selected as the example for this comment because it is one where the total Hazard Quotient calculated in the table already stands at 1.0. Any upward adjustment of intake rates will result in the calculation of a *Hazard Index that exceeds 1.0, resulting in the potential for adverse health effects at Sites 16 and 17.*

Because of the importance of the selection of appropriate intake rates, and their potential effect on the calculation of cancer risks, hazard quotients, and therefore on the overall conclusions of the BRA, it is essential that the intake rates be appropriately calculated, and documented. To facilitate QA/QC assurance of this critical parameter, we recommend that all intake rates that are used in the risk calculations be summarized, and presented in one table, including the site-specific exposure assumptions which support each different intake rate.

Response 43: Comment acknowledged. There is no error in the estimation of the intake factor or dose from inhalation of VOCs in groundwater at Sites 16/17. See response to EPA Specific Comment #20. Documentation of the methods and assumptions used in estimating intake rates and doses for all receptors is presented in Section 2.2.4 of the BRA, and in Tables 2.4 and 2.5. Additional receptor-specific assumptions are presented in five tables: 3.8, 4.14, 5.5b, 6.7, and 7.7. As a result, no changes based on this comment will be made to the BRA.

V. U.S. Environmental Protection Agency Technical Review Comments, Volume IV - Baseline Ecological Risk Assessment

Specific Comments:

Comment 1: **p2, Purpose and Objectives. According to the first of three bullets, HLA initiated this process of endpoint selection with the "development of a conceptual site model to identify endpoints" when actually this activity was parallel and iterative with other activities in the problem formulation phase. This should be clarified as the document should avoid the appearance of not following the EPA guidance material. HLA should further clarify the statement, "...that the measurement and assessment endpoints depends upon characteristics of the identified stressors or as stated the chemicals of potential concern and indicator species..." which, as stated is not clear that the identification and selection of assessment and measurement endpoints is an iterative process that involves, in part, the identification of stressors and resident species. Also, it should be clearly stated that most of the efforts presented are toxicological in nature because the primary stressors are chemicals.**

Response 1: Comment acknowledged. Text has been revised in Sections 1.2, 1.3, and 1.4.3 to clarify.

Comment 2: **EPA Program Approach. (i.e., Materials and Methods). Why would there be any "preliminary assessment" performed in the problem formulation phase?**

Response 2: The preliminary hazard assessments (PHA1 and PHA2) are part of the iterative process of the problem formulation phase of an ERA that includes "... identification and preliminary characterization of the stressor, the ecosystem potentially at risk, and the ecological effects" as stated in Norton et al. (*1992*). This approach was taken so that sites that were of no concern as far as ecological impacts due to the lack of complete exposure pathways could be eliminated early in the process and to identify the chemical and ecological characterization data needed to complete the conceptual model. These preliminary assessments, which previously existed as separate deliverables, were included basically unchanged in the document to maintain consistency across deliverables.

Comment 3: **pp2,3, If the results of risk estimation and risk description are used to, interpret the ecological significance of the results, evaluate the identified risks in the context of the assessment endpoints and link risks estimation to risk communication" then,**

3a, Where and in what form are toxicological results translated to ecological meaning?

The adequacy of the site characterization data for soil is discussed in Volume II, Remedial Investigation. Sampling plans were previously submitted to and approved by the agencies.

The text has been revised in Section 1.4.3.2 to clarify that a hazard quotient of 1.0 was the decision point for both the plant and the mammal assessments.

Comment 6: **p9, Assumptions Used in the ERA. How were the "historical" data used to develop a site conceptual model?**

Response 6: Historical data, which included site-specific and basewide chemical and biological data, were used to identify the characteristics of the stressors (i.e., chemicals of potential concern), the habitats present and the species potentially at risk, and potential ecological effects. This information, along with any newly collected data, were used to select assessment and measurement endpoints and to develop the conceptual site model, as recommended by EPA (*1992j*) and Norton et al. (*1992*). The data were also used in Preliminary Hazard Assessment 1 (Section 3.0) to screen out sites lacking complete exposure pathways and in Preliminary Hazard Assessment 2 (Section 4.0) to characterize sites with potentially complete exposure pathways.

Comment 7: **p10, Problem formulation. Formulation of conceptual models and endpoint identification.**

7a, Coastal sites. What is the rationale for selecting endangered species as receptors species?

7b, Please provide citations that show the characteristics of the western fence lizard that relate to the legless lizard.

7c, Please provide more explanation to relate the feeding characteristics, reproductive impacts and general habitat requirements of the fence lizard as a surrogate species for the legless lizard?

Response 7: Special-status species, as such, have an inherent "value" at sites as stated by EPA (*1992j*) and Suter et al. (*1993*). Since the purpose of the assessment is to evaluate the extent to which chemicals are impacting flora and fauna at the site either currently or in the future, and since the endpoints were selected to evaluate impacts on the species of value, special-status species were considered appropriate to use as receptor species. In addition, it was assumed that if there were no impacts to individuals of a special-status species, there would be no impacts to populations of other species.

The western fence lizard was not selected as an indicator species representing the black legless lizard. As stated in Section 2.4.3, no lizards were evaluated as part of this assessment. Only the analysis of the litter community was used to assess potential impacts to the black legless lizard. The example in Section 2.2.2 simply uses the western fence lizard as a surrogate for the black legless lizard to illustrate how surrogate species could be used to extrapolate to potential effects

on special-status species. If lizards had been successfully sampled, the requested information would have been pertinent to include.

Comment 8: **p14, Inland Sites. The statement that "other natural populations on the same trophic level" are expected to be represented by the species of concern for the inland sites is not clear, please provide more explanation?**

Response 8: Comment acknowledged. Text has been revised in Section 2.2.3 to clarify. Also, see response to EPA Specific Comment 7.

Comment 9: **p16, Indicator species selection. What data are available for reproduction and development of young of the year as an endpoint. This is a time period when parental feeding would limit the distribution of the species to the area of concern?**

Response 9: In developing TRVs for mammals, available literature was searched for the most sensitive chronic NOAEL; the literature search included reproductive and developmental endpoints, where available. No toxicological data were available for lizards. A literature search was conducted for reproductive effects data of lead on doves or other birds. The results of this search have been incorporated into the text in Section 6.5.1.2.

Comment 10: **p22, Data evaluation.**

10a, Are more data awaiting to be evaluated?

10b, What are the implications of the statement, "Data collected and validated on or before December 31, 1993, were available for use in this assessment."?

Response 10: Additional data not available in December 1994 when the Draft Final ERA was submitted are presented in Appendix K, the Ecological Risk Assessment Addendum. The statement in Section 3.1.2 referring to data collected and validated on or before December 31, 1993 is applicable only to the PHA1 portion of the assessment. Since these sites were screened out early in the process, the data available at that time were used to assess whether complete exposure pathways existed for these sites and whether additional data needed to be collected to evaluate these sites.

Comment 11: **p22, Identification of complete exposure pathways. Are habitat characteristics evaluated for all species that are found there, those that could be found there, or rather, only for the receptors and the surrogate species?**

Response 11: In identifying potentially complete exposure pathways in the PHA1 portion of the assessment, habitat characteristics were evaluated for all species found or likely to be found at the site. In general, sites that were evaluated as lacking suitable habitat were sites that were mostly paved or highly disturbed with little or no vegetation. Any vegetated area at these sites were confined to isolated patches surrounded by pavement.

Comment 12: **p37, Preliminary hazard assessment 2. p43, What is the basis for considering the presence/absence of the legless lizard to be due only to the presence of leaf litter?**

Response 12: Comment acknowledged. The text in Section 6.1.1.5 has been revised to specify why litter was sampled only at certain sites, and to identify leaf litter and other habitat requirements of the legless lizard.

Comment 13: **Quantitative ecological risk assessment. p134, Characterization of exposure.**

13a, What are the uncertainties related to the selection of chemicals of potential concern as only those chemicals that occur in small animal tissue, when samples were taken in one species at one time during the annual cycle?

13b, How thorough and accurate is the "ecosystem characterization" defined as an evaluation of "..spatial and temporal distribution of biota and considers characteristics that influence the distribution and nature of the stressors" when in fact the "...temporal distributions of biota were not evaluated due to time constraints"?

Response 13: Comment acknowledged. The text in Section 6.4.1.1 has been modified to clarify that chemicals detected in mammal tissue that had not been selected as COPCs in soil or plant tissue were added as COPCs. To address the uncertainties related to sampling only once during the annual cycle, an additional analysis of body burdens by age class was conducted and is presented in Appendix K.

It is not possible, without actually characterizing the temporal distributions of biota, to state "how thorough and accurate" the ecosystem characterization performed in this assessment was. However, because the quantitative screening assessment presented in Section 5.0 assumed that the biota spent their entire lifetimes exposed to the COPCs at the sites evaluated and did not spend any time off these sites exposed to lower (e.g. background) concentrations of the COPCs, it was assumed that actual temporal exposures would be less than those calculated for the screening assessment. In addition, for the quantitative assessment presented in Section 6.0 for mammals, considerations such as food preferences and time spent off site were taken into account because actual chemical concentrations in mice were used. The text in Section 6.4.1.1 has been revised to clarify that the assessment was more appropriately based on habitats rather than ecosystems given the constraints associated with this project.

Comment 14: **p135, Dioxins.**

14a, What is the concentration of dioxins on a lipid basis?

14b, What is the amount of lipid in the mice on a weight basis, rather than percent basis? Please clarify the use of TEQs, as the material here is confusing to me. NOTE: I have attached a copy of a relevant dioxin paper for HLA at their request.

14c, Table 6.16 does not show a comparison to mice collected from reference sites, nor does it show the comparison to any biological benchmarks.

14d, What are the measurement and assessment endpoints that are being assessed here?

Response 14: Table 6.16 has been revised to correctly identify the second column as the average lipid-based mouse concentration using an average lipid content of 6.53 percent (raw data provided on Table G33). The lipid content can be calculated by multiplying the percent lipid by the mouse body weight, which ranged from approximately 10 to 30 grams for mice collected in this assessment.

TEQs come from experiments with different dioxin congeners on rats. They reflect the relative toxicity of the different congeners on specific endpoints. Both whole-animal reproductive and *in vitro* binding affinity studies were used as the basis for the TEQs. The findings of these studies indicate that dioxin and furan toxicity represents receptor-mediated responses (*EPA, 1989n*). EPA (*1989n*) also states that "estimated exposure levels potentially resulting in reproductive and carcinogenic effects are similar." It has been assumed by EPA (*1989n*) that the relative order of toxicity of individual congeners does not change across species. Because TEQs are considered valid by EPA when extrapolated across Orders (i.e., rats to humans), they are also considered valid for extrapolation within an Order (i.e., rats to deer mice), where uncertainty associated with the extrapolation should be less. Therefore, TEQs are considered appropriate for use in evaluating potential impacts to deer mice.

Dioxins were not analyzed in mouse tissue from the reference sites because of a lack of sufficient tissue in those samples. Table 6.16 has been revised to include background deer mouse tissue concentrations of TCDD and TCDF from the literature (*Thiel et al., 1989*). The text in Section 6.4.1.1 was revised to discuss this data. Because background data are available for deer mice, the discussion of background levels in humans was no longer necessary and has been deleted from the text. In addition, benchmark concentrations are compared to tissue concentrations in calculating hazard quotients (Section 6.4.2).

The assessment and measurement endpoints addressed by this analysis are C13 and I10 (Tables 2.1 and 2.2, respectively).

Comment 15: **p139, Characterization of ecological effects. This should be labelled ...toxicological effects.**

15a, By definition, toxicological effects is the relationship "of how much contaminant (i.e., concentration) results in how much response (i.e., measurement endpoint)." This relationship is most often demonstrated by a stressor-response relationship. Please provide more clarity for the use of chemical potency as the suggested relationship to the interpretation of stressor response relationships.

15b, Table 5.6 does not clearly show the relationship between stressor, site receptor and measurement endpoints.

15c, p139, Please define the term, "exposure profile."

15d, p139, Please define the term, "stressor-response relationship."

15e, p139, Please explain how the expected "ecological effects" will be accomplished using extrapolations between the chemical and measurement endpoint and substituted species with only toxicological data that are extrapolations from sources other than site specific data?

15f, p139, Please explain how two quantitative assessments can be completed in the screening phase and only a qualitative assessment is possible for this phase?

Response 15: This section is labeled "characterization of ecological effects" to correspond to the Section 3.2 in the framework document (*EPA, 1992j*); the methodologies used follow those described in the framework.

The text has been revised in Section 6.4.1.2 to clarify the definition and use of the stressor-response profile.

A footnote has been added to Table 5.6 to identify the endpoints addressed by the development of the TRVs.

"Exposure profile", as defined by EPA in the framework (*EPA, 1992j*) is "the product of characterization of exposure in the analysis phase of ecological risk assessment" and "summarizes the magnitude and spatial and temporal patterns of exposure for the scenarios described in the conceptual model". Note that the quantitative assessment did not evaluate the temporal patterns of exposure because of the short time frame in which the study was required.

"Stressor-response relationship", as defined by EPA in the framework (*EPA, 1992j*) is "the product of characterization of ecological effects in the analysis phase of ecological risk assessment" and "summarizes the data on the effects of a stressor and the relationship of the data to the assessment endpoint". Note that mainly toxicological endpoints were used in the effects assessment; these effects were extrapolated to ecological effects where appropriate in Section 7.0.

The methodologies discussed in the framework (*EPA, 1992j*) were used in the characterization of ecological effects. In the evaluation of relevant effects data, the effects of the stressors (chemicals of potential concern) on the ecological component under evaluation (e.g. rodents) were identified from the literature. In this case, the effects data available on the COPCs were from exposures of laboratory test rodents. In order to use these toxicological effects to characterize potential ecological effects at Fort Ord, a number of extrapolations were necessary. These extrapolations, as discussed by EPA (*1992j*), included extrapolation between taxa (both the laboratory test organism and the measurement endpoint are rodents), from laboratory to field organisms, between responses (e.g. from a LOAEL to a NOAEL), from individual test organisms to higher levels of organization (e.g. populations), and analysis of spatial and temporal scales.

Some of these extrapolations are discussed in Sections 5.3.2.2 and 6.4.1.2. For example, because the most sensitive toxicological endpoint for laboratory organisms was selected for this assessment, no additional stressor-response profiles were developed. Also, because the most sensitive toxicological endpoint for an individual was selected, it was assumed that this level would also be protective of higher levels of organization (e.g., populations). Further discussion

of potential ecological effects associated with COPCs at Fort Ord are discussed in Section 7.0. This section contains the risk description as described by EPA (*1992j*) and Norton et al. (*1992*). Section 7.1 provides the risk summary, and Sections 7.2 through 7.5 provide the ecological interpretation of these potential risks. These sections provide the integration between the toxicological effects discussed here and the overall evaluation of potential ecological effects of the COPCs at Fort Ord.

The statement in Section 6.4.1.2 alluding to a "qualitative discussion" refers only to the evaluation of causal evidence. Since no field studies were conducted to develop site-specific stressor-response relationships and the data used to develop the TRVs came from the literature, the evaluation of causality was restricted to a qualitative discussion. There was no discussion of causality in the screening assessment. Quantitative assessments were completed in both the screening assessment (Section 5.0) and the quantitative risk assessment (Section 6.0). The screening assessments used models and highly conservative exposure assumptions. The quantitative assessments combined modeling with the results of field data on biota.

Comment 16: **p139, Risk estimation. Please explain how this phase can be defined as the integration of stressor-response and exposure profiles with expectations to be completed when in the previous section the statement, "...stressor-response analysis was not conducted." What data will be used in place of the stressor-response data?**

Response 16: Comment acknowledged. The text has been revised in Section 6.4.1.2 to clarify this issue.

Comment 17: **p140, Integration of stressor-response and exposure profiles. The "scale" for interpreting the HIs should be based on current practice in EPA as cited in the Framework document and as practiced in Region 9.**

Response 17: According to EPA's framework document *(EPA 1992j)*, a hazard quotient of greater than one may indicate impacts. In both the screening (Section 5.0) and the quantitative assessment (Section 6.0), all sites with hazard indices greater than one estimated for a given receptor were designated as needing further investigation. Sites with hazard indices estimated for all receptors less than one were considered to be of "no concern" because of the conservative assumptions of the assessment. A further classification of sites with hazard indices greater than one estimated for a given receptor was used only to further classify sites as of "possible concern" (>1 to 10) and of "probable concern" (>10). Both sets of sites were further evaluated, consistent with current practice in EPA (*1992j*) and practiced in Region 9.

Comment 18: **p145, Uncertainties. Monte Carlo simulation. What is the basis for the decision points for the MCS of 1 and 10? Where are the data to support these decision points?**

HLA has agreed to rework this section to standardize their application of the technique e.g., 2000 runs of the model, instead of both 1000 and 2000, and to

incorporate a more comprehensive discussion of the results. This discussion will include more interpretation of the meaning of the results for risk and more definitive implications of the results with regard to management options and the resultant effects on the resources.

Response 18: The text in Section 6.4.2 has been revised to clarify the decision points for the Monte Carlo analysis.

The Monte Carlo analysis has been rerun consistently using 2000 iterations. The results of this analysis and a comprehensive discussion of the results can be found in Appendix K.

Comment 19: **p151, Lizard assessment. What is the overall value of this effort if no surrogate specimen were collected, no litter samples were evaluated and the resultant assessment was a qualitative discussion?**

Response 19: Even though trapping of lizards was unsuccessful across all sites, leaf litter was collected at several of the inland sites and was used to evaluate possible impacts to lizards. See the response to EPA Specific Comment 12 for justification of which sites were evaluated using litter samples. Because no litter could be collected at the coastal sites (Sites 2 and 3), only a qualitative evaluation could be presented using information on the habitat requirements of the lizards and site information. The qualitative evaluation includes a discussion of the possible impacts to the lizard due to remediation. This discussion is further expanded in relation to ecological impacts in Section 7.2.

Comment 20: **p152, Characterization of exposure. This information appears to be "results" rather than interpretation of what these data mean, this is a deficiency. There seems to be some contradictory statements, for instance, on page 152, compare the statement, "In general, chemical concentrations in leaf litter were greater than in the respective soil samples" with the statement on p153, "Only lead and zinc were graphed because other chemicals were detected in soil at levels consistent with background, and therefore leaf litter concentrations were not considered to be site-related." What are the levels related to?**

Response 20: The characterization of exposure includes results of exposure estimation. The interpretation of these results is discussed in Section 6.6.2, risk estimation. The statement on page 152 is based on a comparison of soil and litter concentrations. Soil concentrations were then compared to background soil values to evaluate whether the chemical concentrations were site-related. Appendix K includes a comparison of background litter concentrations to site litter concentrations.

Comment 21: **p154, Risk estimation. I have doubts about the adequacy of the effort performed because of several statements including, "A decrease in numbers and diversity of organisms was seen for lead and zinc in the CMC habitat at the only location with concentrations above background in soil. However, given the variability of the data, changes at this one location cannot be considered to represent evidence that the community is being affected by soil concentrations above background." And I am confused by the statements such as, "For lead, although fewer organisms were seen in**

the same (sic) sample with a concentration above background, no organisms were present in a sample collected from the upland ruderal habitat with a soil concentration less than 10mg/kg. Therefore, this apparent decrease at a higher lead level is not considered to indicate an impact to the litter community."

21a, The relationship between organism counts and presence and absence of certain taxa is not clearly interpreted, in my opinion, for instance, "Some insects and other invertebrates (e.g., woodlice) have been shown to accumulate lead and zinc above levels seen in litter (Martin et al., 1976)." There are no data to show comparative concentrations for either insects or woodlice at the sites and reference areas.

The interpretation of possible relationships would be more relevant if the concentration data were compared to these numbers in a manner that summarizes the insect data for numbers and function i.e., role so that more of the potential impacts of chemicals are evaluated. The number of taxa were similar at sites and reference locations, but the role of insects may be significantly different with a result that the primary food for the lizards is impacted. Numbers of taxa often change across many kinds of gradients, however, structure as represented by numbers, is not the only important character, but function of the species should be evaluated.

Although, the number of organisms was not shown to be related to chemical concentrations because soil concentrations were similar between reference and site treatments, numbers may not be the key component, but the species function or composition may be most important.

Response 21: Comment acknowledged. The text has been revised in Section 6.6.2 to clarify these issues, and an evaluation of chemical impacts on the functional composition of the taxa is presented in Appendix K.

Comment 22: **p154, Although, the presence of a species is a good indication that the species is supported by the conditions at the location, I do not agree that "Because they (black legless lizard) are present at the site, it is unlikely that significant impacts are occurring due to concentrations of chemicals in soil." In my opinion, reduced population numbers due to stress from concentrations was not adequately evaluated or the data presented lacks complete embellishment.**

Response 22: Comment acknowledged. This statement has been deleted from the text in Section 6.6.2.

Comment 23: **What is the statement about the possible impact to the lizard due to remediation of the site based on, because a full evaluation of remedial options is not presented?**

Response 23: A full evaluation of the remedial options for Site 3 is presented in Volume V, Site 3 Feasibility Study.

Comment 24: **Appendix H. Bay Dilution Modelling.**

Although, I recognize that HLA used many conservative assumptions for this effort, I believe that more work must be performed. As you know, we are now negotiating

with several parties to obtain samples that will address the questions raised about the potential impact to the Bay. Because of this, I have suggested that HLA spend only as much time as required to clarify any apparent misunderstandings in my comments.

The objectives as stated are: "... to identify the contribution of ocean outfall discharges to the water and sediment budgets of Monterey Bay; and ... to evaluate whether the concentrations of COPCs found in the storm water or sediment discharges from the ocean outfalls present a problem to organisms in Monterey Bay.

There are several reasons why the description of this effort falls short to meet the stated objectives of the effort: (1) The analysis covers only a single year and does not consider the cumulative effects, for example, the amount of water estimated to have entered the Bay on an annual basis, although is based on the normalized rainfall (from U.S.G.S.) one year's data was used in the calculation, whereas the concern for impact to the Bay includes many years in the past; (2) because the concern for impact to the bay is primarily toxicity to the receptors, there needs to be an estimate of the concentrations for estimating the possible impact. The runoff from the storm water does not include a concentration component for the contaminants; (3) it is unreasonable to expect that the runoff from the base will be mixed with the entire volume in the restricted zone, therefore, the estimation of the dilution factor may not be accurate; (4) the sediment loads that were estimated are not reasonable estimates based on the use of the Universal Soil Loss Equation and the Salinas River as a model. It is not reasonable to expect erosion from the largely agricultural area drained by the Salinas River to be representative of Fort Ord which is not considered agricultural; and (4) like the "water model" the sediments may in fact carry sediments that are contaminated producing an actual impact in localized areas where the sediments will settle out.

In a conversation with Dr. Walter Frick of the USEPA Newport, OR laboratory, who reviewed the material presented for the "Dilution Model" he stated that he had several concerns with the information. It is his opinion that the approach taken by HLA is unusual in that he questions the lack of a concentration component in the water and sediment reaching the Bay; the calculations for the dilution factors are difficult to follow and there is an error in the dilution factor as shown for the OF-04 Watershed Daily Dilution; the value shown is 0.016 and should be 0.16; the calculations for the volume of Bay water appears to be arbitrary as related to the use of a tidal "prism" in the calculations; the idea of an unknown impact from "osmotic shock" is pure speculation; and that there are other approaches that would be more suitable. Further, for well designed discharge situations, the ratio of dilution is about 100:1 and even the ratio of dilution estimated in this situation, is about 40:1, a dilution ratio that is far from optimum.

These other approaches include the use of surface discharge models (Cormix-3) that can be used to estimate the amount of discharged sediment, how far it might be dispersed in the surf, and where it might be deposited.

Walt also suggested that two people in Region 9 Water Division who have worked with "outfall" work are Dave Stuart and Terry Flemming. Also, a private consultant, Tareah Hendricks 619/753-9201 might be called.

Response 24: Comment acknowledged. Further work is currently being conducted to better characterize historical activities in and impacts to Monterey Bay. This includes new information from literature searches and personal communications to be presented in the *Draft Final Enhanced Preliminary Assessment of Monterey Bay* (EnPA) as well as data forthcoming from sediment sampling and side-scan sonar and magnetometer surveys in Monterey Bay conducted by the U.S. Geological Survey (USGS).

It was assumed that there would be little or no cumulative effects as residence time of water in Monterey Bay is relatively short (3-8 days; Smethie, 1973, *Some Aspects of Temperature, Oxygen, and Nutrient Distributions in Monterey Bay, California*, Moss Landing Marine Laboratories, Technical Publication 73-1). It is not possible to predict the cumulative effects of sediments since sediment dispersion patterns in Monterey Bay are quite complex and not fully understood (EnPA).

Even though there is no concentration term in the dilution model, concentration was taken into consideration when evaluating whether the calculated dilution factors would result in no impacts to the bay (Section 6.7.1.3). It would have been difficult to include a concentration term as there were several chemicals detected in both sediment and stormwater at varying concentrations at each outfall. Stormwater dilution factors were compared to the lowest NOEC; if the dilution factors would dilute the stormwater effluent to concentrations less than the lowest NOEC value, no impacts from stormwater were expected. Sediment dilution factors were compared to the chemicals with the highest exceedances of ER-L values for each outfall; if the dilution factors would dilute the sediment to concentrations less than ER-L values, no impacts from sediment were expected.

In the dilution model, runoff from the entire base was mixed into the restricted zone whereas outfall-specific runoff was mixed into a tidal prism. It was conservatively assumed that all rainfall was available as surface water runoff. The sediment loads estimated using the Universal Soil Loss Equation (USLE) were not specific for agricultural areas but were specific to Fort Ord as the parameters for soil type and cover used were specific to Fort Ord. The sediment loads were actually overestimates and the comparisons of the dilution factors to chemical concentrations assumed that 100% of the sediment was contaminated at the highest chemical concentrations detected in outfall sediment.

The text in Section 6.7.1.3, Table 6.41, and text and tables in Appendix H have been changed to show that the dilution factor for OF-04 is 0.16, not 0.016. The sentence discussing effects of "osmotic shock" has been removed from the text.

The use of a "tidal prism" was arbitrary, but conservative in nature. Since there was no well-defined mixing zone, the "prism" was used as a way to reasonably estimate potential mixing. The prism is the average volume of the surf zone between high tide, when the outfalls discharge directly into the water and low tide, when the runoff discharges onto the beach. Daily longshore transport was used to determine the length of the prism along the shoreline.

There are no standard dilution ratios, such as 100:1, specified for effluent discharges. Even some "well-designed" discharges achieve 10:1 or less dilution due to tidal influences and currents. The dilution ratio required for Fort Ord,

rather than being construed as an "optimum" ratio, is simply the dilution ratio capable of diluting sediment/stormwater such that chemical concentrations and toxicity are below levels of concern based on ER-Ls and toxicity test results. In addition, since most of the assumptions made for the Fort Ord dilution models were highly conservative, the range of outfall-specific dilution factors (38-fold to 63-fold for stormwater and 556-fold to 71,400-fold for sediment) are likely to be underestimates.

The models used for this assessment were highly conservative. Therefore, more sophisticated discharge models such as Cormix-3 were not used and modeling experts were not consulted. In addition, as noted in the first paragraph of Comment 24, because the USGS is collecting samples to address potential impacts to the bay, no additional work will be conducted to determine dilution factors in the bay.

VI. U.S. Environmental Protection Agency Technical Review Comments, Volume V - ARARS

I. Overall FS Comments

CAMU Designation

Once a Corrective Action Management Unit ("CAMU") is designated, then placement of remediation waste into or within a CAMU does not constitute land disposal of hazardous waste, nor does consolidation or placement of remediation waste into or within a CAMU constitute creation of a unit subject to minimum technology requirements. The FS needs to more clearly define the scope of the CAMU to be designated. If lead-contaminated soil will be excavated and treated at Site 3, and lead-contaminated soil will also be transported from Sites 31 and 39 for treatment at Site 3, then the scope of the CAMU can be limited to Site 3 such that Land Disposal Restrictions ("LDRs") are not triggered. However, if treated soil will be backfilled at Site 31 and/or Site 39, then these site need to be designated CAMUs as well. Currently, the text does not cite the CAMU regulations, except in the Site 31 FS. (Given the limited excavation at Site 31, it does not seem likely that treated soil will be used as backfill at Site 31 and the CAMU regulations probably should not be included in the FS for Site 31.)

The FS also needs to more clearly explain the rationale for the CAMU designation. See 40 CFR § 264.552(c) list of 7 factors: 1) the CAMU shall facilitate the implementation of a reliable, effective, protective, and cost effective remedy; 2) waste management activities associated with the CAMU shall not create unacceptable risks to humans or to the environment; 3) the CAMU shall include uncontaminated areas of the facility, only if including such areas for the purpose of managing remediation waste is more protective than management of such wastes at contaminated areas; 4) areas within the CAMU, where wastes remain in place after closure, shall be managed and contained so as to minimize future releases, to the extent practicable, etc.

The CAMU regulations also specify that the requirements for a CAMU include: the aerial configuration of the CAMU, etc. See 40 CFR 264.552(e).

CERCLA Jurisdiction for Debris

It is not clear under what authority the cleanup of debris at Site 31, Site 2/12, and Site 16/17 is being undertaken. CERCLA jurisdiction extends to the release of CERCLA hazardous substances that threaten human health or the environment. The Site 16/17 FS states for example that "Debris at Sites 16 and 17 was not evaluated in the BRA because it is not associated with chemical risks." (pg 8) The text goes on to note that ARARs are driving the cleanup. First, I don't believe that there are any such ARARs. Second, ARARs are not generally analyzed until CERCLA remedial action is required in light of the jurisdictional trigger.

Sites Where Remedial Alternative Includes Soil Treatment at FOSTA

Site 12 (Lower Meadow), Site 16 (DOL Maintenance Yard, Disposal Area, etc.), Site 17 (Disposal Area), and Site 39 discuss remedial alternatives that include excavation of contaminated soil and transport to the FOSTA for treatment on-site. Initially it seemed that it may be more appropriate and remediation may occur more quickly if these areas were addressed under the IA ROD rather than the base-wide FS. However, given the risk assessments already completed and presented in the RI/FS, it also may be too complicated to pull out these areas from the base-wide document. Assuming these areas remain in the RI/FS, Ft Ord should think through the interplay between these two RODs and treatment at the FOSTA. For example, although similarly contaminated soil will be likewise treated at the FOSTA, it does not seem necessary that these areas be processed through the mechanism established in the IA ROD, ie, approval memo, etc.

Identification of the Preferred Alternative

All of the FSs identify the preferred remedial alternative in the last section of the text. Generally, the preferred alternative is not identified until the Proposed Plan is issued. The FS is intended to be a presentation of the alternatives. I recommend deleting these sections. (I have noted the preferred alternatives before the discussion of each FS below in order to keep a focus for ARARs, etc.)

Response: CAMU Designation - The text in Sections 4.1.6.2, 5.1.6.2, and 6.1.6.2 have been revised to clarify the CAMU designation at Site 3, and for soil from Sites 3, 31, and 39.

CERCLA Jurisdiction for Debris - The RWQCB has indicated that Chapter 15 requirements are action-specific ARARs that apply to debris at Fort Ord sites as wastes discharged to land (See Section XI, Specific Comment 2 from the RWQCB). In addition, there is a potential that further contamination intermixed with debris may be detected during exploratory excavations. For example, at Sites 2 and 12 there may be contaminated soil beneath concrete foundations that have not been vertically delineated and will be further defined during exploratory investigations planned for debris removal. For these reasons, the Army will consider the handling, further characterization, and proper disposal of debris along with other contamination in the FSs.

Sites Where Remedial Alternative Includes Soil Treatment at FOSTA - Please see Response to EPA Comment 57.

Identification of the Preferred Alternative - The Army agrees that a preferred alternative is not usually identified until the Proposed Plan is issued. However, the Army included selection of preferred alternatives for each of the FSs at the request of the State.

II. Sites 2 & 12

Preferred Remedial Alternative:

1. **Soils - Excavation, Treatment at FOSTA, and Placement at OU2 Landfill;**
2. **Groundwater - Extraction, Treatment and Disposal by Discharge/Reuse/Injection**

A. General Comments

Comment 1: **Remedial Action Objectives**

The discussion under section 2.2.1 Remedial Action Objectives (pg 18) indicates a misunderstanding of the concepts of MCLs, ARARs and RAOs. Under this section, the text states: "MCLs as RAOs need to meet ARAR requirements." and "Further discussion of the technological and economic feasibility of achieving background levels verses MCLs is presented below to demonstrate that MCLs meet ARARs."

First, MCLs are ARARs for groundwater remediation. It makes no sense to state that "MCLs must meet ARARs." Second, a discussion of Resolution 92-49, and the economic and technical analysis by which a cleanup standard is set above background, should not be included under the section discussing RAOs. Rather, the 92-49 analysis should be included in the ARARs section 2.1.6.2 or preferably a separate tech memo. The purpose of such analysis is to demonstrate that a cleanup standard set at the MCL (in and of itself an ARAR) would satisfy the requirements of 92-49 given that 92-49 allows a cleanup standard to be set between background and the MCL.

I recommend deleting the sentence "Specific groundwater RAOs are discussed below." under section 2.2.1 and deleting the separate "Groundwater" RAOs discussion in its entirety because it is inaccurate and confusing. The first paragraph under section 2.2.1 is sufficient. (Also, why have a separate groundwater RAO discussion when there is no separate Soils RAO discussion?)

Response 1: The text has been revised in Sections 2.1.6.2 and 2.2.1 to clarify the discussion of MCLs, ARARs, and RAOs.

Comment 2: **ARARs and Protectiveness**

There seems to be some confusion regarding the relationship between complying with ARARs and being protective. Under section 2.1.6 ARARs (pg 10), a sentence reads: "Protectiveness implies complying with ARARs." This sentence is inaccurate. Once a remedial action is undertaken (the threshold trigger is generally based on risk), then these two separate requirements must be met; it is confusing as currently written that protectiveness implies complying with ARARs.
The first sentence of section 2.1.6 should be revised as follows: "Under CERCLA, remedial actions must be protective of human health and the environment and comply with federal or more stringent state applicable or relevant and appropriate requirements (ARARs), unless waived."

Response 2: The text has been revised in Section 2.1.6 to clarify the discussion of ARAR compliance and protectiveness.

B. Specific Comments

Comment 1: **Pg 1, section 2.1.1. Are the two references to Plate 2.2 (Distribution of TCE in Groundwater) accurate for this section?**

Response 1: The text has been revised in Section 2.1.1 to clarify use of the Plate as referenced in this section and later sections.

Comment 2: **Pg 11, section 2.1.6.2. Delete the heading "EPA Safe Drinking Water Act" citation and replace with "National Primary Drinking Water Standards." (The regs contain the cleanup standard; the Act is simply the source.) I would revise the first sentence to read: "These regulations, promulgated under the Safe Drinking Water Act and found at 40 CFR Part 141, establish maximum contaminant levels (MCLs) permissible for a public water system." (The cite, as currently noted, is inaccurate.) Additionally, in the description, I recommend deleting the last sentence beginning "MLCs are currently the cleanup goals at the adjacent OU2 Landfill..." because it is inaccurate. (The MCLs are not the cleanup standards for all of the COC in the OU2 ROD.) It is also confusing to reference the OU2 cleanup standards. (The ARAR driving the cleanup standard in the OU2 ROD is Chapter 15, not necessarily the MCLs).**

Response 2: The text has been revised in Section 2.1.6.2 to clarify the discussion of ARARs.

Comment 3: **Pg 12, section 2.1.6.2. Delete the heading "California Water Quality Standards" and replace with "State Primary Drinking Water Standards." I don't think that the Title 22, chapter 15 cite is correct. Check with DTSC for correct cite.**

Response 3: The text has been revised in Section 2.1.6.2 to clarify the discussion of ARARs.

Comment 4: **Pg 12, section 2.1.6.2. The discussion of the RCRA requirements should be revised because presently they are somewhat confusing and redundant.**

I recommend limiting the heading and discussion to "Identification and Listing of Hazardous Waste." Delete the reference to "Standards for the Management of Hazardous Waste" in the heading. (The provisions for Owners and Operators of Hazardous Waste Treatment, Storage and Disposal Facilities, CCR Title 22, Div 4.5, Chapter 14, are already listed in pp 15-17 under the action-specific ARARs.) I would delete the discussion of LDRs -- specifically the two sentences beginning "Placement of untreated characteristic waste into a land disposal unit is prohibited..." (These regs are already included on pg 17.) I would also delete the discussion of Generators and permits -- specifically the last two paragraphs entirely beginning "When chemical-bearing soil containing hazardous levels..." (Generator regs are already included on pg 17 and there is no need to discuss Title 22 Chapter 20 (permits) or the Cal. Health and Safety Code (permit waiver) because CERCLA, not the Cal. Code, is the authority by which permits are waived at a Superfund site.)

Response 4: The text has been revised in Section 2.1.6.2 to clarify the discussion of ARARs.

Comment 5: **Pg 13, section 2.1.6.2. When considering Chapter 15 as an ARAR for the soil or groundwater (not necessarily debris), the Army should begin its analysis with section 2511(d), the exemption for actions taken by public agencies. If waste is being removed from the place of release, then the Army needs to comply with Article 2 (Waste Classification and Management). If waste is being contained, then Chapter 15 is applicable to the extent feasible. Therefore, with respect to the removal alternatives for soil, Article 2 is the only ARAR. With respect to the capping**

alternatives for soil, then Article 8 and 9 are relevant and appropriate. See comments on ARARs Table.

The RWQCB previously submitted comments (see comment 4) note that section 2510(g) of Chapter 15 should be listed as an ARAR. I would disagree because it is not more stringent than what is required under CERCLA.

Response 5: The text has been revised in Section 2.1.6.2 to clarify the discussion of Chapter 15 requirements. The Army agrees that CERCLA requirements are more stringent and has cited them accordingly in the text.

Comment 6: **Pg 15, section 2.1.6.2. The October 1994 comments noted deletion of the Migratory Bird Conservation Act from the ARARs table. It should also be deleted from the text.**

Response 6: The text has been revised in Section 2.1.6.2 as suggested.

Comment 7: **Pg 17, section 2.1.6.2. Delete reference to Chapter 5. (It is redundant; chapter 15 is already discussed more fully at pp 13-14.)**

Response 7: The text has been revised in Section 2.1.6.2 as suggested.

Comment 8: **Pg 17, section 2.1.6.2. Delete the reference to "State Water Resources Control Board" in the headings for Resolution 88-63, 92-49, and 68-16 and replace with reference to the actual resolutions.**

I would delete portions of the current description of 92-49 and replace with the actual language contained in the resolution: "Dischargers are required to cleanup and abate the effects of discharges in a manner that promotes attainment of either background water quality, or the best water quality which is reasonable if background levels of water quality cannot be restored, considering all the demands being made and to be made on those waters and the total values involved, beneficial and detrimental, economic and social, tangible and intangible." If this is the case, I would also add: "The Army has undertaken an economic and technical feasibility analysis pursuant to 92-49 and has determined that cleanup to the MCLs is reasonable and satisfies this requirement."

Response 8: The text has been revised in Section 2.1.6.2 as suggested.

Comment 9: **Pg 18, section 2.1.6.2. In the description of the Underground Injection Control Program, delete last sentence after "MCLs." (The last portion of the sentence deals with concepts under Resolution 68-16, not UIC.)**

Response 9: The text has been revised in Section 2.1.6.2 as suggested.

Comment 10: **Pg 22, section 2.2.1.1. Under the Contaminants in Soil section, delete reference of RAOs to Site 2 because no soils remedial action is being taken at Site 2.**

Response 10: The text has been revised in Section 2.2.1.1 to clarify RAOs for soil and debris.

Comment 11: **Pg 39, section 2.7. Please add a discussion of the soils remedial unit in the Identification of the Preferred Remedial Alternative. (Currently, only the groundwater alternative is described.)**

Response 11: The text has been revised in Section 2.7 to include a description of the preferred soil remedial alternative.

Comment 12: **Table 2.2 ARARs**

Pg 1 of 6. National Primary Drinking Water Standards. Delete "EPA" from the Safe Drinking Water Act cite in the Source column.

Pg 1 of 6. State Primary Drinking Water Standards. Check with DTSC regarding proper cite for Source column, it may be the State Safe Drinking Water Act. Check with DTSC regarding proper cite for the State Primary Drinking Water regulations. Delete reference to State MCLGs in the Description column.

Pg 1 of 6. Title 23 CCR, Div 3, Chapter 15, Article 2. Delete Standards for the Management of Hazardous Wastes in the Source column and replace with Porter Cologne Act. Article 2 should not be identified as an ARAR for carbon vessels, etc. Title 22 CCR RCRA regulations are usually cited, especially given that Chapter 15 relies on repealed section of Title 22 for the definition of hazardous waste. Delete the discussion in the Comments column and replace with discussion of Article 2's application to the excavation alternative for the soils remediation.

Pg 2 of 6. Title 23 CCR, Div 3, Chapter 15, Articles 1, 5, 8, 9. I would limit the identification of Chapter 15 to Articles 8 and 9. These may be relevant and appropriate for the capping remedial alternative for soil (not necessarily debris). Under Article 8, the Army should decide whether it would be most appropriate to use the Landfill Closure Requirements (section 2581) or the Surface Impoundment Closure Requirements (section 2582) or the Waste Pile Closure Requirements (section 2583) and then cite these in the Description column and discuss how they would be relevant and appropriate to the capping alternative.
Article 5 may be relevant and appropriate for groundwater cleanup alternatives; however Resolution 92-49 is applicable and is discussed at pg 5 of 6. I would delete.

Pg 3 of 6. Migratory Bird Conservation Act. Delete.

Pg 5 of 6. For Resolutions 88-63 and 92-49, delete the SWCB from Source column and replace with Porter Cologne Act currently listed in the next column.

Pg 6 of 6. Resolution 68-16. Delete. This regulation is not applicable. The remedial alternatives for groundwater do not include a discharge, ie, reinjection to high quality waters.

Pg 6 of 6. UIC. In the last sentence, delete after "MCL."

Response 12: Table 2.2 has been revised to clarify ARAR designations as suggested.

III. Sites 16 and 17

Preferred Remedial Alternative:
1. Soil - Excavation and treatment of TPH-contaminated soil at the FOSTA (then where does soil go--backfill or landfill layer?); excavation and treatment of debris and placement at OU2 landfills as foundation layer.
2. Groundwater - none.

A. General Comments

Comment 1: **ARARs**

There is no groundwater remediation expected for Sites 16 and 17 pursuant to this FS. Therefore, there should not be any groundwater ARARs (eg, Chapter 15, Resolution 92-49) in the text or table. (see specific comments.)

Response 1: The text has been revised in Section 3.1.6.2 and Table 3.3 as suggested.

B. Specific Comments

Comment 1: **Pg 4, section 3.1.4.4 The Disposal Area in Site 17 is presented here (Nature and Extent of Contamination) for the first time. Is there a reason why it is not discussed previously as part of Area 17 in section 3.1.1 (Physical Description) 3.1.1.2 (Site 17) or 3.1.2 (Site History) 3.1.2.2 (Site 17)?**

Response 1: The Site 17 Disposal Area was not described under Site History or Physical Description because it is not a recorded or recognizable feature at the site, but was later discovered during investigative activities. The text has been revised in Section 3.1.4.4 for clarification.

Comment 2: **Pg 8, section 3.1.5.3. See overall comments regarding Debris.**

Response 2: See Response to Overall Comments regarding debris.

Comment 3: **Pg 8, section 3.1.6. Revise the first sentence to read: "Under CERCLA, a remedial action must be protective of human health and the environment and comply with federal or more stringent State ARARs." In the second paragraph, delete the sentence: "The TCLs are then used to evaluate each potential remedial alternative's ability to meet TCLS and other ARARs."**

Response 3: The text of Section 3.1.6.2 has been revised as suggested.

Comment 4: **Pg 10, section 3.1.6.2. The proper citation for LDRs is: Title 22 CCR, Div. 4.5, Chapter 18.**

Response 4: The text of Section 3.1.6.2 has been revised as suggested.

Comment 5: **Pg 10, section 3.1.6.2. Given that groundwater ARARs are not at issue, many of the provisions currently included under Chapter 15 should be deleted. Chapter 15 is instructional in that it contains provisions that may be relevant and appropriate to the capping alternative for soil (not necessarily debris). The Army should decide whether it would be most appropriate to use the Landfill Closure Requirements (section 2581) or the Surface Impoundment Closure Requirements (section 2582) or the Waste Pile Closure Requirements (section 2583). The discussion of Chapter 15 should then be revised as follows: "Title 23 CCR, Div 3, Chapter 15 may be relevant and appropriate to the capping remedial alternative. These provisions are contained in Article 8 (Closure and Post-Closure Maintenance) and Article 9 (Compliance Procedures):**

Section 2581 Landfill Closure requirements... (select
Section 2582 Surface Impoundments...one of Section 2583 Waste Pile...three)

Section 2597..."

Delete discussion of 2510(d) (no need to discuss definition of "existing" WMU). Delete discussion of 2510(g). (groundwater not an issue, see OU2 ROD). Delete discussion of 2580(c) (2581 contains the substantive requirements). Delete discussion of 2580(d) and (e). Delete discussion of Article 5 and 2550(a), 2550.1, and 2550.2 (no groundwater monitoring required, see OU2 ROD; no WDR required).

Response 5: The text of Section 3.1.6.2 has been revised as suggested.

Comment 6: **Pg 12, section 3.1.6.2. Given that groundwater ARARs at not at issue, Resolution 92-49 and the discussion of the OU2 remedy should be deleted.**

Response 6: The text of Section 3.1.6.2 has been revised as suggested.

Comment 7: **Pg 12, section 3.1.6.2. Delete Construction Safety Orders. Like OSHA requirements, these are not ARARs.**

Response 7: The text of Section 3.1.6.2 has been revised as suggested.

Comment 8: **ARARs Table 3.3**

Pg 1 of 2. Add a separate Chapter 15 provision as follows: (Source) Standards for Discharges of Waste to Land -- (Regulation) Title 23 CCR, Div. 3, Chapter 15, Article 1, section 2511(d) and Article 2 -- (Description) Exempts from Chapter 15 any actions taken by a public agency to cleanup waste, provided that waste removed from the place of release shall be discharged according to Article 2 -- Applicable -- (Comment) If soil from Sites 16 and 17 is excavated, then the provisions in Article 2 dealing with waste classification and management will be complied with. Placement of the soils in the OU2 Landfill as part of the cap is allowed Article 2.

Pg 1 of 2. Title 23 CCR, Div 3, Chapter 15. Because groundwater is not an issue in this FS, delete Article 5 from current Chapter 15 cite and retain Articles 8 and 9. Revise Description to read: "Provides closure requirements for landfills, surface

impoundments or waste piles." [select one]. Delete "Applicable" and replace with "Relevant and Appropriate." Delete last sentence in the Comments section regarding transfer of soil. (This should be cited separately, see above).

Pg 1 of 2. Because groundwater is not an issue in this FS, delete Resolution 92-49 from the table.

Pg 1 of 2. Delete Construction Safety Orders from the table.

Response 8: Table 3.3 has been revised as suggested to include a discussion of waste pile requirements.

IV. Site 3

Preferred Remedial Alternative:
1. Soil - Excavation; Mechanical Separation of Spent Ammunition from Soil; Transportation of Spent Ammunition off-site to Scrap Metal Dealer for Cleaning and Recycling; Treatment of Soil by Stabilization, Soil Washing or Asphalt Batching at Site 3 CAMU.
2. Groundwater - None.

A. General Comments

Comment 1: **CAMU Designation**

See Overall Comments above.

Response 1: Please see Response to Overall FS comments.

Comment 2: **ARARs and TCLs**

The Target Cleanup Levels ("TCLs") for lead at Site 3 (1,860 mg/kg) are based on the UBK and LEADSPREAD, which are protective. This standard is not driven by ARARs. The discussion of ARARs should be revised to more accurately reflect how this cleanup standard is actually being determined.
Therefore, I recommend deleting the third, fourth and fifth sentence in the second paragraph of the section on ARARs (pg 7, section 4.1.6). Delete: "Chemical-specific ARARs are identified and used to develop TCLs." because this is not accurate, given that there are no chemical-specific ARARs for lead contaminated soil. Additionally, delete: "However, when ARARs are not protective of human health, more stringent cleanup goals are established such that residual health risks after remediation fall within acceptable ranges." because it is confusing. (It is not that ARARs are "not protective", rather there are no ARARs; and it is not that we need to find a "more stringent cleanup goal" than ARARs, rather we simply need to establish one.)

I would replace these sentences with the last paragraph in section 4.1.6.1 ("If ARARs are not available...") because it more clearly explains how the cleanup level is determined and the relationship to ARARs and TCLs. I recommend adding a sentence to this paragraph as was done in the FS Site 31: "

Response 2: The text has been revised in Section 4.1.6.1 to clarify the discussion of ARARs. TCLs are discussed in Section 4.2.1.2.

Comment 3: **ARARs and Protectiveness**

There seems to be some confusion regarding the relationship between complying with ARARs and being protective. Under section 4.1.6 ARARs (pg 7), a sentence reads: "Protectiveness implies complying with ARARs." This sentence is inaccurate. Once a remedial action is undertaken (the threshold trigger is generally based on risk), then these two separate requirements must be met; it is confusing as currently written that protectiveness implies complying with ARARs.
The first sentence of section 4.1.6 should be revised as follows: "Under CERCLA, remedial actions must be protective of human health and the environment and comply with federal or more stringent State applicable or relevant and appropriate requirements (ARARs), unless waived."

Revise the last sentence of this paragraph as follows: "Each remedial alternative (delete "potential") is then evaluated for its ability to meet ARARs (delete reference to TCLs)."

Response 3: The text of Section 4.1.6 and Table 4.2 have been revised as suggested.

B. Specific Comments

Comment 1: **Pg 8, section 4.1.6.1. In the last paragraph of this section, delete the following portion of the first sentence: "... or if ARARS are not sufficient to protect human health and the environment..." for the reasons discussed in the General Comment regarding ARARS and TCLs.**

Response 1: The text has been revised in Section 4.1.6 as suggested.

Comment 3: **Pp 8-9, section 4.1.6.2. Correct the cite in the first paragraph to read: "Title 22 CCR, Division 4.5, Chapter 11." This section inappropriately includes discussion of designated waste, which is already included in the Title 23 section.**

Response 3: The text has been revised in Section 4.1.6 as suggested.

Comment 4: **Pg 9, section 4.1.6.2. In the first full paragraph on this page, delete the last half of the paragraph beginning: "A designated waste is one that..." This discussion is not suitable for the RCRA Identification and Listing section because it deals with Chapter 15. Perhaps the deleted information may be incorporated into the following discussion re Chapter 15.**

Response 4: The text has been revised in Section 4.1.6 as suggested.

Comment 5: **Pg 9, section 4.1.6.2. Correct the cite: Title 23 CCR, Div 3, Chapter 15, Article 2 Waste Classification and Management, section 2522.**

Response 5: The text has been revised in Section 4.1.6 as suggested.

Comment 6: **Pg 11, section 4.1.6.2. In the first paragraph of the discussion on Use and Management of Containers, the initial cite includes sections 66264.171-178. The rest of the text, however, excludes a description of section 66264.176 (Special Requirements for Ignitable or Reactive Waste) and section 66264.177 (Special Requirements for Incompatible Waste). If it is intended that these two sections be excluded, revise the first sentence to read: "Title 22 CCR, Div 4.5, Chapter 14, Article 9, Use and Management of Containers, as listed below, establish..." (Note: Use and Management heading refers to Article 9 and should be placed after Article 9, not after Chapter 14.) If it is intended that these two sections be included, then add brief description to the text. (See Site 39 FS, pg 11 which includes brief descriptions.)**

Response 6: The text has been revised in Section 4.1.6 as suggested.

Comment 7: **Pg 12. section 4.1.6.2. The discussion of LDRs should explain that these requirements do not apply to hazardous waste placed within the CAMU, and are triggered only if soil is disposed of off-site or on-site outside the CAMU area.**

Response 7: The text has been revised in Section 4.1.6 as suggested.

Comment 8: **Pg 12, section 4.1.6.2. Title 23 CCR. Delete. This requirement is already discussed on pg 9.**

Response 8: The text has been revised in Section 4.1.6 as suggested.

Comment 9: **Pg 14, section 4.2.4. Delete "regulatory agency permitted" from description of FOSTA because it is confusing, primarily because of the term "permitted." Site 39 FS uses the term "regulatory agency-approved" which is less confusing.**

Response 9: The text has been revised in Section 4.2.4 as suggested.

Comment 10: **Pg 21, section 4.5.2. Under Compliance With ARARs discussion, is listed 40 CFR Parts 107, 171-177. These would not be ARARs, however, because they refer to activity off-site.**

Response 10: The text has been revised in Section 4.5.2 as suggested.

Comment 11: **ARARs Table**

Pg 1 of 4. Title 22 CCR, Div 4.5, Chapter 11. Revise citation as shown.

Pg 1 of 4. Title 23, Div. 3, Chapter 15, Article 2. Delete "Standards for the Management of Hazardous Waste" in the Source column; this is a Title 22 heading. The RWQCB would probably prefer Porter-Cologne in the Source column. Delete the reference to hazardous waste in the Description and Comments; this is covered by Title 22.

Pg 2 of 4. Title 22 CCR Div. 4.5, Article 9, Use and Management of Containers. See Specific Comments.

Pg 3 of 4. Title 22 CCR Div. 4.5, Chapter 12. Are there substantive portions of Chapter 12 (Generators)? If not, delete.

Pg 4 of 4. Title 22 CCR, Div 4.5, Chapter 18. Note in the Comments that the LDR regulations to not apply to placement within a CAMU.

Pg 4 of 4. Title 23 CCR Div 3, Chapter 15. Delete. It is confusing to list this requirement as applicable and then state in the Comments that it does not apply. Moreover, Chapter 15, Article 2 is already included on pg 1.

Pg 4 of 4. Monterey Bay Unified Air regs. Delete. Redundant; already included on pg 1 of 4.

Response 11: Table 4.2 has been revised as suggested.

Comment 12: **Plate 4.5.**

Revise the Process Flow Diagram as follows: "Transportation and disposal at off-site landfill if treatment infeasible." (so as not to confuse with OU2 Landfill) Why doesn't the diagram address the disposition of the treated soil, whether it be at OU2 Landfill or as backfill where initially excavated, etc? Pg 18 notes that the excavated areas will be backfilled with the treated soil if lead concentrations are below the TCL. (Plate 6.6 in FS for Site 39 includes disposition options.)

Response 12: Plate 4.5 has been revised as suggested and includes disposal options as referred to on Plate 6.6 for Site 39.

V. Site 31

Preferred Remedial Alternative:
1. Soil - Excavation of Debris and Lead-Contaminated Soil; Transport of Soil to Site 3 for Treatment at CAMU; Rinsing of Separated Debris and Placement in OU2 Landfill or Disposal Off-Site
2. Groundwater - None.

A. General Comments

Comment 1: **ARARs and TCLs**

The Target Cleanup Level ("TCL") for lead (1860 mg/kg) is based on a risk assessment. This standard is not driven by ARARs. The discussion of ARARs should be revised to more accurately reflect how this cleanup standard is actually being determined.

Therefore, in the second paragraph of the section on ARARs (pg 8, section 5.1.6), I recommend deleting the third, fourth and fifth sentences and replacing them with the entire last paragraph of section 5.1.6.1 ("If ARARs are not available...") which more clearly explains how the cleanup level is determined and its relationship to TCLS and ARARs.

Additionally, it would be useful to add the following sentence as was done in the Site 31 FS: "This approach was used to establish soils TCLs in Volume III Baseline Risk Assessment and Volume V Ecological Risk Assessment because no ARARs are available for soil cleanup levels at Site 31."

Response 1: The text has been revised in Section 5.1.6 as suggested.

Comment 2: **ARARs Table**

Site 31 needs to include an ARARs Table.

Response 2: The Draft and Draft Final versions of the Site 31 FS included an ARARs table as Table 5.3. Perhaps the EPA did not receive this table in their copy of the report. As comments were not received on this table, the Army made similar changes to the table based on ARAR-related comments to the text and ARARs tables of the other FSs.

B. Specific Comments

Comment 1: **Pg 8, section 5.1.6. The current cite for CERCLA is inaccurate. To maintain consistency with other FSs, simply state: "Under CERCLA, remedial actions must..."**

Response 1: The text has been revised in Section 5.1.6 as suggested.

Comment 2: **Pg 9, section 5.1.6.2. Identification and Listing of Hazardous Waste. Revise cite: Title 22 CCR, Div 4.5, Chapter 11. This section should not include discussions of designated waste under Chapter 15.**

Response 2: The text has been revised in Section 5.1.6.2 as suggested.

Comment 3: **Pg 10, section 5.1.6.2. Waste Classification and Management. Title 23 CCR, Div 3, Chapter 15, Article 2, section 2522. Delete last sentence.**

Response 3: The text has been revised in Section 5.1.6.2 as suggested.

Comment 4: **Pg 13, section 5.1.6.2. Title 22 CCR, Div 4.5, Chapter 15. There is no need to cite the CAMU regulations here if Site 31 will not be included within the CAMU designation. See Overall Comments.**

Response 4: The text has been revised in Section 5.1.6.2 as suggested.

Comment 5: **Pg 13, section 5.1.6.2. Title 22 CCR, Div 4.5, Chapter 18. The discussion of LDRs should explain that these requirements do not apply to hazardous waste placed within a CAMU, and are triggered only if soil is disposed of off-site or on-site outside the CAMU area. See Overall Comments -- will excavated soil from Site 31 after treatment at Site 3 be backfilled at Site 31, such that it will also be considered within the scope of the CAMU?**

Response 5: The text has been revised in Section 5.1.6.2 as suggested. Site 31 soil will not be backfilled, but will be disposed at the OU 2 landfill.

VII. DEPARTMENT OF TOXIC SUBSTANCES CONTROL GENERAL REVIEW COMMENTS

Comments: **Enclosed are comments on the subject document from the Department of Toxic Substances Control and the Regional Water Quality Control Board. Comments from the California Coastal Commission were sent to you by letter dated March 6, 1995.**

In addition, a memorandum from the Department of Health Services is enclosed which presents comments on the radiological survey referenced in Remedial Investigation/Feasibility Study (RI/FS) Volume I, Page ES-19.

In providing the enclosed, please note that comments provided by the Fort Ord Restoration Advisory Board (RAB) Water Committee and by the RAB's Habitat Restoration and Preservation Committee (received March 16, 1995 via telecopy) were considered in the generation of the enclosed.

While the Army has made considerable progress to address comments provided on the Draft Basewide RI/FS, unresolved issues remain. Most notably:

1) **The Army's refusal to address unexploded ordnance (UXO) as part of the Superfund cleanup effort.**

2) **Uncertainty whether discharges from Fort Ord have impacted Monterey Bay and future data collection needs.**

3) **The reliance on an outdated re-use plan to establish proposed clean up criteria.**

The deadline to invoke dispute pursuant to Sections 7.8 and 12 of the Federal Facility Agreement has been extended to May 5, 1995. The Base Closure Team agreed to this date in consideration of the Army's commitment to provide by March 31, 1995 a response to U.S. Environmental Protection Agency's (USEPA) September 7, 1995 letter regarding UXO. USEPA's letter of March 1, 1995 also discussed this agreement.

In closing, I want to stress that the State, like all others involved with this project, is anxious to proceed with finalization of the RI/FS. However, it is our position that finalization cannot proceed until comments are satisfactorily addressed and resolution of issues has been achieved.

Response: 1) General Comments

Comments received on the radiological survey documents referenced in Volume I of the Draft Final RI/FS Report will not be included in this document and should be incorporated in subsequent versions of those individual documents addressed in the comments.

2) Unresolved issues

a) UXO within the Impact Area will be considered as an issue separate from the Basewide RI/FS Report. The Army's position was stated March 31, 1995 letter to the EPA. As stated in the letter, the proposal for cleanup was specific to Fort Ord and is not Department of the Army (DA) policy. The issue of UXO cleanup at Fort Ord will be resolved between the DA and EPA and will not be included in the Final Basewide RI/FS.

In addition, the Huntsville Division of the Army Corps of Engineers has issued a Request for Proposals, dated April 14, 1995, to locate, identify, and dispose of ordnance and explosive waste (OEW) at Fort Ord, California (particularly the Impact Area). The response shall be performed in compliance with CERCLA, other applicable laws and regulations, and the NCP.

b) The Army has met with the EPA and the USGS to discuss participation in the NOAA survey of Marine Sanctuary. The Army's support may include analysis of sediment samples in Monterey Bay as well as side-scan sonar and magnetometer surveys. If available, the results of the survey will be present with the basewide proposed plan.

c) The Army did not use an outdated reuse plan as stated in the comment. The Draft Final RI/FS Report used the most up to date reuse plan available which was the Fort Ord Reuse Plan dated October 14, 1994. The Final RI/FS will use reuse scenarios contained in the Fort Ord Reuse Plan dated December 12, 1994, except for the State Park Parcel west of Highway 1, which will use the scenarios proposed by California State Parks. The reuse plan dated December 12, 1995 was not available for the Draft Final RI/FS Report dated December 1, 1994.

VIII. Department of Toxic Substances Control Technical Review Comments, Baseline Human Health Risk Assessment

General Comments

The baseline risk assessment is improved form the previous version, but it is not yet acceptable. Responses to many of our comments lead to improvements in the document. However, several issues remain. We made strong recommendations which were not heeded regarding adherence of soil to skin, dermal absorption of dioxins, and uptake of lead into home-grown vegetables. Many risks and hazards must still be recalculated. The risk assessment continues to be overly dependent on the risk management decisions associated with the reuse plan for the base. We recommend that the Army become more flexible in which exposures it assess, so that future users of the property may be adequately protected.

Many other responses were adequate, even without change to the text. The items discussed below are those where we found the Army's responses inadequate.

Specific Comments

A. Appendix H: Response to Agency Comments

Comment 1: Response to General Comment 1, Reliance on the Reuse Plan: The Army convinced us on the meeting at USEPA Region IX on 5 October 1994 that the residential setting was not needed for Sites 31 or 39. Regarding Sites 16 and 17. However, the Army continues to design the risk assessment to the risk management plan, i.e. the reuse plan. The Army's willingness to accept restrictions on future use of the base is laudable, but it does not resolve the problem. The Department must have a basis for such a restriction before it can be imposed. For example, if estimated risks are deemed unacceptable for a given exposure setting, such as future residential use, then the Department might have justification for impose a restriction against such future use of a parcel. On the other hand, if risks have never been estimated for the residential setting, then no basis would exist for such a restriction.

In fact, the current baseline risk assessment presents no information which could be used as a basis for restricting future land use, based on considerations of potential adverse health effects. By this we mean that no risks estimates are presented that fall into the range usually considered unacceptable. If risks and hazards were estimated for a conventional residential setting and these showed unacceptable levels, then the Department might choose to select potential adverse health effects as a basis for a restriction of future land use.

The Army states that it may reevaluate health risks if the reuse plan changes significantly in the future. We believe this to a waste of resources. All the required data are assembled at the present time. A contractor is in place who is familiar with

these data. The State and Federal regulatory agencies have offered their guidance regarding exposure scenarios they believe should be assessed. The time and place to perform this task is now and in the current document. Postponing this evaluation to an uncertain future time does a disservice to future users of the property, none of whom are likely to be as familiar with the risks and hazards as the Army is now.

We are aware of at least one instance in which changed reuse renders the current risk assessment inadequate. This involves Site 3 and the intended reuse as a State park. The exposed population of greatest interest in the Army's assessment was the resident park ranger. The exposure point concentration for this receptor to lead was based on a weighted average of areal coverage of the site with spent ammunition. We have learned that the California Department of Parks and Recreation intends to have a campground on the site of former firing ranges for small arms, which are the areas of greatest areal coverage with bullets. It is not at all clear that the resident ranger scenario with its weighted average concentration of lead will be adequate for describing risks or hazards attending use of this area as a campground.

Once again, we urge the Army to broaden its use of risk assessment as a tool in health-protective risk management.

Response: Comment acknowledged. See response to U.S. Environmental Protection Agency Technical Review Comments, Volume III - Baseline Human Health Risk Assessment General Comment #1.

Comment 2: **Response to Specific Comment 5, Soil-to-Skin Adherence Factor: Both the Department (DTSC, 1992) and USEPA (1992) have issued guidance on the subject of adherence of soil to skin. Both agencies recommend a default value of 1 mg/cm^2 to represent an upper bound. Because the exposure setting under consideration is a hypothetical future resident, default values are appropriate for use. Therefore, all dermal intakes in this risk assessment are underestimated by a factor of 1/0.4 or 2.5. We recommend that all dermal intakes be recalculated according to Department guidance.**

We have carefully examined and considered the Army's very interesting presentation in the response to our comment (Section 2.2.5.3). We conclude that the Army disagrees with the interpretation of USEPA guidance published in Preliminary Endangerment Assessment Guidance Manual (PEA; DTSC, 1994). We might be able to accept the Army's interpretation if site-specific information were offered to show how exposures at Fort Ord might differ from the a typical hypothetical future resident. However, the Army has presented no site-specific information to justify the replacement of the Department's recommended default value. No information is presented to show that soils at Fort Ord adhere to skin to a greater or lesser extent than those tested in the studies cited in the USEPA guidance document. The value of 1 mg/cm^2 is in use in risk assessments at all other military facilities in California of which we are aware. Therefore, we see no reason to depart from the Department's recommended value of 1 mg/cm^2. We recommend all dermal intakes be recalculated.

Response: Comment acknowledged. We also agree that a reasonable case can be made to support either a 0.4 or a 1.0 mg/cm^2-day soil adherence factor (SAF). Therefore we conducted some screening calculations to determine whether the use of a 1.0 mg/cm^2-day SAF would have affected the conclusions of the BRA. As

recommended in this comment, we multiplied RME daily intake values for all chemicals except TCDD-TE by a factor of 2.5. To satisfy an earlier EPA comment (specific comment #42) TCDD-TE intake values were also multiplied by a factor of 7.5 (2.5 x 3 (DAF)). In general, the HIs or cancer risks due to dermal exposure were minimal and therefore increasing the daily intake values by a factor of 3 or 7.5 did not impact the results of the BRA. At Site 16 and 17 for example, multiplying the cancer risk estimated for a commercial worker receptor exposed to arsenic and TCDD-TE by an additional factor of 3 and 7.5, respectively, increased the total multipathway risk from 7×10^{-7} to 9×10^{-7} - still below the EPA-defined threshold level of concern. However, the multipathway HI for a nearby resident exposed to Site 3 related chemicals in the 1 to 10 percent bullet distribution area only, increased from (1.0), to 2.2. Although this value is above the EPA defined level of concern (1.0), it is based on the unlikely assumption that a receptor would be exposed only to that single area.
As a result, no changes based on this comment will be made to the BRA.

Comment 3: **Response to Specific Comment 6, Dermal Absorption of Dioxins: Guidance from this Department and from USEPA is very clear on this subject. In the absence of any site-specific information which might modify the opinion expressed in the guidance document on dermal exposure from USEPA (1992), the default value to be used for dermal absorption of chlorinated dibenzo-p-dioxins and chlorinated dibenzofurans is 3% for the reasonable maximum exposure (RME). Dermal absorption of chlorinated dioxins and furans is underestimated by a factor of three and should be recalculated. When the proper value for the soil-to-skin adherence factor is used in this recalculation, estimated dermal intakes of this class of chemicals will rise approximately eightfold.**

We have carefully examined and considered the Army's very interesting presentation in the response to our comment (Section 2.2.6). We conclude that the Army disagrees with the interpretation of USEPA guidance published in the Department's PEA guidance (DTSC, 1994). We find no reason to reject the Department's published interpretation of USEPA guidance (USEPA, 1992) regarding dermal absorption of dioxins.

We are more than a little surprised that the Army rejected the guidance from the PEA regarding dioxins, while choosing to accept the guidance from this same source for other chemicals, as indicated in its response to Specific Comment 14.

Response: Comment acknowledged. See response to U.S. Environmental Protection Agency Technical Review Comments, Volume III - Baseline Human Health Risk Assessment Specific Comment #42.

Comment 4: **Response to Specific Comment 9, LEADSPREAD: When using the Department's spreadsheet model for estimating the impact of environmental lead on blood lead in residential settings, plant uptake of lead should be set to "ON" or "1". This reviewer knows from personal experience that resident students do eat a great deal of produce grown in gardens on-campus. We recommend all intakes of lead in residential settings be recalculated to include uptake into plants and consumption of home-grown produce.**

Response: Comment acknowledged. Although blood-lead levels in the Draft BRA were estimated assuming that ingestion of lead-impacted homegrown produce would not occur, the Draft Final BRA assumed that ingestion of produce would occur. The option to consider ingestion of plants exposed to site-related lead was "turned on" in the LEADSPREAD model. Changes to estimates of the blood-lead levels were included in the Draft Final BRA (December, 1994).

Conclusions and Recommendations

The risk assessment is improved from the prior draft, but it is not yet adequate. The Army has allowed the assessment of potential risks and hazards which attend future use of the base to depend too much on the specifics of the current version of the reuse plan. We strongly recommend that the Army follow Department guidance regarding adherence of soil to skin, dermal absorption of chlorinated dioxins and furans, and uptake of lead from soil into home-grown produce.

Response: See responses to comments above.

IX. Regional Water Quality Control Board Comments

General Comments

Comment 1: **We encourage the Army to select remedial alternatives that remove all contaminated debris and soils from Fort Ord sites. To the extent feasible and appropriate, waste materials may become part of the Operable Unit 2 (OU2) landfill closure (cover foundation layer). We believe the public will be better served if wastes and contaminated soils are appropriately placed in a central repository. Proper centralized disposal should provide long-term water quality protection, should protect future users when new development is undertaken, reduces the Army's long term liability and expense, and enhances long-term monitoring efficiency. Furthermore, the availability of the OU2 landfill provides the Army with a cost efficient site for contaminated soils and debris disposal generated during remedial activities.**

Response: Comment acknowledged.

Comment 2: **Future land use has not been finalized and is subject to change. As such, the proposed remedial actions may not fully consider actual or potential future site use. The Report should carefully evaluate reuse proposals presented by and to the Fort Ord Reuse Authority. Remedial measure selection must provide adequate human health and environmental protection based on anticipated reuse proposals.**

Response: The Final RI/FS will incorporate reuse scenarios contained in the FORA Plan dated December 12, 1994, except for the State Park Parcel west of Highway 1, which will use the scenarios proposed by California State Parks.

VOLUME II: BASEWIDE HYDROGEOLOGIC REPORT

Comment 1: **Section 5.6, Page 31: Seawater intrusion in the Upper 180-foot Aquifer needs to be further evaluated. Based on the recent pilot test results at Sites 2/12 and basewide monitoring, seawater intrusion may be greater than previously identified. Additional wells should be installed in the lower portion of the Upper 180-foot Aquifer and geophysical studies should be undertaken to further define seawater intrusion. The ground water modeling results may be flawed with respect to seawater intrusion extent. Flawed results may cause the Army to select inadequate remedial alternatives and may increase seawater intrusion.**

Response: This comment implies that seawater intrusion is taking place in the Upper 180-foot aquifer on a basewide scale previously unrecognized due to inadequate well placement. The Army disagrees with this comment and maintains that the groundwater monitoring system currently in place is capable of detecting a seawater intrusion phenomenon occurring at a basewide scale. Localized areas of seawater intrusion at Site 2 have been recognized and have been reported as such.

Seawater intrusion in the Upper 180-foot aquifer is currently being further evaluated in the area of Sites 2 and 12 as part of the groundwater treatment system pilot study. This evaluation consists of a geophysical investigation and the collection of groundwater chemistry data from existing wells and piezometers during a long-term aquifer pumping test. The results of the seawater intrusion investigation portion of the pilot study will be presented as part of the Sites 2 and 12 design analysis. One of the purposes of the Sites 2 and 12 groundwater treatment pilot study is to evaluate and document the seawater intrusion associated with groundwater withdrawal and calibrate the Fort Ord groundwater flow model with this transient data. The groundwater model will then be used to assist the Army in the selection of the appropriate remedial alternative.

The installation and sampling of additional wells for the specific purpose of investigating seawater intrusion on a basewide scale is not considered warranted or appropriate given the limited extent of seawater intrusion presently recognized. Basewide annual monitoring of groundwater total dissolved solids and chloride levels is being conducted to specifically evaluate trends in seawater intrusion.

VOLUME IV: BASELINE ECOLOGICAL RISK ASSESSMENT

Comment 1: **Section 2.2.5, Page 15: The Report states that river currents are likely to disperse chemicals rapidly, diluting them to non-toxic levels before reaching potential aquatic organisms. Toxic chemicals often attach to sediments. Sediments will be deposited in the Salinas River Estuary. We believe that all contaminant pathways to the Salinas River must be eliminated.**

Response: Potential impacts to the Salinas River are discussed as part of the aquatic assessment in Sections 3.3.3 and 5.6.3. These studies included an evaluation of the suspended soil ("sediment") likely to be present in the stormwater runoff. A summary of these studies is presented in Section 5.8.21.1. No outfalls with stormwater that was toxic to freshwater organisms (i.e., NOEC less than 100 percent) were shown to produce runoff likely to reach the Salinas River.

Therefore, a more comprehensive evaluation of the dilution of stormwater and sediment in the Salinas River is not necessary.

Comment 2: **Section 5.6.3.1, Page 101, Aquatic Assessment Site 16, Pete's Pond: Pete's Pond has been a stormwater runoff basin for years. It's possible that water in Pete's Pond may become more toxic with each storm event. As the water evaporates and percolates, contaminants will become more concentrated. [For example, when the pond dries, contaminants will stay in the sediment. The next storm event may bring more contaminants to be added to those in the pond sediment.] Core sample analyses could provide a good record of past discharges. The Army should evaluate soil samples to determine if sediments in Pete's Pond could be used to determine the nature and extent of stormwater discharges at other areas, including Monterey Bay.**

Response: Visual inspection of soil samples collected at Pete's Pond did not indicate a distinct difference between the sediment and the soil therefore, distinguishing sediment from the soil would be difficult. Evaluation of soil/sediment samples from areas adjacent to the outfall locations was conducted as part of the Basewide Surface Water Outfall Investigation. On the basis of this evaluation, the matrix does not appear to be substantially concentrating chemicals compared to other samples from the site. Even if the sediment could be distinguished from the soil at Pete's Pond evaluating possible impacts at other stormwater discharge locations would be difficult because other areas including Monterey Bay may drain a much larger area of the base, the dilution could be much greater and in the case of Monterey Bay, sediment could be transported by long shore currents.

In addition, sampling of sediment in Monterey Bay may be completed in conjunction with NOAA and the U.S.G.S.; therefore, reducing the need to use data from Pete's Pond to evaluate the potential nature and extent of stormwater discharges to Monterey Bay.

Comment 3: **Reference Site: The limited testing done on the selected reference site found some toxicity. The Report identifies that this location may not be an appropriate reference site. We agree. The Army should find another site, not influenced by Army nor other sources of pollution, such as agriculture.**

Response: The stormwater sampling was conducted in January and March of 1994, and the sampling plan included collection of reference stormwater samples from three locations. All three locations were in the undeveloped areas east of Site 39 and are not associated with agricultural or any other known land uses. They were located in areas that drain small watersheds isolated from other potentially contaminated areas by topographic features. During the storm events in January and March 1994, insufficient volumes of stormwater were available from two of the three intended reference stations. The stormwater collected from the third location showed high concentrations of metals and toxicity and is most likely not appropriate for use as a reference sample. Since no adequate storms occurred during the remaining sampling period (May through September 1994) prior to submittal of the Draft Final RI/FS in December 1994, no work could be completed to identify a more appropriate reference site. The lack of appropriate reference sites, however, did not prevent the evaluation of stormwater outfalls that drained sites at Fort Ord. These evaluations are summarized in Section 5.8.21.1.

VOLUME V: SITES 2 AND 12 FEASIBILITY STUDY REPORT COMMENTS

Comment 1: **Section 2.1.5.3, Page 6: The use of MCLs as the target cleanup level (TCLs) is not acceptable and does not meet ARARs. For ground water TCLs, the Army must evaluate remediation to background water quality or best water quality if background cannot be restored as required by State Water Resources Control Board Resolution No. 92-49 and California Code of Regulations, Title 23, Chapter 15 (Chapter 15). Resolution No. 92-49 (part of the Basin Plan) is also an action-specific ARAR, requiring cleanup level establishment pursuant to Chapter 15, Section 2550.4. Resolution No. 92-49 requires cleanup and abate of discharges in a manner that promotes the attainment of either background water quality, or the best water quality that is reasonable if background water quality cannot be restored. Chapter 15 (Section 2550.4) clarifies required information in establishing cleanup levels greater than background. Resolution No. 92-49 applies to remedial action concentration levels for aquifer cleanup and from treatment system discharges.**

The fact that MCLs were used in past base cleanups is not an acceptable basis for selecting a current TCL. There is no substitution for background-based evaluations required by Chapter 15 (Section 2550.4) and Resolution No. 92-49. Resolution No. 92-49 was not an ARAR at the time past remediation levels were accepted; it is now.

Response: The text has been revised in Sections 2.1.5.3, 2.1.6.1, and 2.2.1.2 to provide additional discussion of MCLs and ARARs as they pertain to groundwater TCLs at Sites 2 and 12.

Comment 2: **Page 17: Resolution No. 92-49 applies to establishing ground water cleanup levels and the level of treatment for discharge. This comment remains applicable as the text only discusses ground water prior to discharge and not in situ concentration levels.**

Response: The text has been revised in Sections 2.1.6.1 to include a discussion of aquifer cleanup levels related to Resolution 92-49.

Comment 3: **Section 2.2.1, Page 21, Remedial Action Objectives Groundwater: An interesting discussion on the present understanding for pump and treat ground water remediation is provided. The economic feasibility section is based on preliminary results from the ground water model. The cost per mass of TCE values shown are incorrect. The Report does not address specific issues in Chapter 15, Section 2550.4 (d) necessary to make a finding that a cleanup concentration greater than background is warranted.**

Response: Please see Response to Comment 1 (above) pertaining to Chapter 15 requirements. Regarding the comment that cost per mass of TCE values are incorrect, the calculations of incremental concentrations appear to be correct; associated costs are also within the accuracy range for EPA Guidance on RI/FSs of +50/-30%.

Comment 4: **Ground Water Remedial Unit, Page 27, Sixth Bullet: The text indicates that the re-infiltration technology/process option was not selected due to high maintenance cost. We disagree with the text and the "response to comments" conclusions. The Regional Board is involved in numerous cleanups using vertical infiltration galleries (i.e., seepage pits) to recharge treated water. In many cases, vertical infiltration galleries have been very effective from both technical and cost perspectives. We encourage the Army to evaluate vertical galleries along with injection wells.**

Response: The text has been revised in Sections 2.2.4 and 2.3.3 to reflect that the Army will consider all types of reinjection/reinfiltration techniques in the Remedial Design stage, including vertical infiltration galleries.

VOLUME V: SITE 16/17 FEASIBILITY STUDY REPORT

Comment 1: **Section 3.3.4, Page 20: Debris used in the Operable Unit 2 landfill foundation must meet Chapter 15, Section 2581(a)1 requirements. Waste materials are allowed providing appropriate engineering properties are satisfied. The foundation layer must provide a stable base for construction of the low permeability layer. Debris used from Sites 16-17 must be appropriately compactable and must not contain decomposable material. Unacceptable material must be discharged to a permitted disposal facility. The text needs clarification.**

Response: The text has been revised in Section 3.3.4 to indicate that decomposable or other unsuitable material will be segregated out from debris that is acceptable for use as OU 2 foundation layer material under Chapter 15, Section 2581 (a) 1 requirements. Any unsuitable materials will be disposed separately at a sanitary (Class III) landfill.

VOLUME V: SITE 31 FEASIBILITY STUDY REPORT

General Comments

Comment: **As suggested in our Draft RI/FS Report comments, remedial actions should be expanded to include removal of all contaminated soils and debris including lead contaminated soils above the TCL. Contaminated soils and debris may be usable in the OU2 landfill closure foundation layer. Contaminated soils left on-site may pose a long term environmental problem and will require long term water quality and site closure monitoring. Complete removal will eliminate any long term monitoring requirements and potential future actions in the event that land use options change. The OU2 landfill may provide a cost effective alternative to off-site disposal or long-term monitoring. Use of appropriate excavated materials provides soil needed for the OU2 landfill closure.**

We disagree that removing all waste will cause more severe impacts to the environment than leaving the waste in place. The Army contends it will take several years for the natural habits to recover and will cost substantially more to excavate contaminated soils. We believe that long term monitoring cost and the potential reuse changes, thus future remediation, will cost the Army substantially more than remediating the site now to allow unrestricted use.

Response: A preferred alternative was selected for Site 31 at the request of the State. This alternative (Alternative 2) is health protective and includes excavation and remediation of soil containing contaminants above TCLs in areas that are accessible to removal equipment. The Army believes that the unstable geology, inaccessibility, steepness and difficult terrain of the ravine make the site unsuitable for future unrestricted use and therefore prefers a use restriction on the property. There would be no long term monitoring associated with this site because contamination would be removed. The use restriction would be a part of the permanent property transfer record and would warn any potential future users of the site of the presence of debris in the unlikely event that the site is considered for unrestricted use in the future.

Specific Comments

Comment 1: **<u>Section 5.1.5, Page 6:</u> As stated in our Draft RI/FS Report comments, we disagree with the statement, "Additional intrusive remedial actions needed to achieve ecological based TCL . . . would likely cause more ecological damage . . . than leaving such material in place." Although short term ecological damage will occur, as stated above, we believe total removal is prudent for long-term human health, ecological, and water quality protection.**

Response: Please see the Response to the General Comment above.

Comment 2: **<u>Section 5.1.6.2, Page 13, Action Specific Requirements:</u> Chapter 15 is correctly identified as an action-specific requirement. However, the conclusion on Chapter 15 applicability and proposed actions are incorrect. In particular, this section states "Chapter 15 does not apply to in-place soil and debris at Site 31." Chapter 15 does apply to Site 31 since waste was discharged to land.**

Response: The text has been revised in Section 5.1.6.2 regarding the applicability of Chapter 15 requirements.

X. U.S. EPA Additional Comments

General Comments

Comment 1: This letter addresses two remaining issues with respect to the above-referenced document, as discussed in EPA's July 17, 1995 letter to the Army on the RI.FS: the use of Corrective Action Management Units (CAMUs) and the Site 3 Ecological Risk Assessment. It is EPA's position that the RI/FS report may be finalized with the following considerations:

> CAMU - EPA, the Army, and the State have agreed that it is appropriate for the Feasibility Study to include an alternative that considers designating Site 3 and the Operable Unit 2 Landfills area as CAMUs. This alternative should also include an option to leave soils, particularly those contaminated with lead, under the OU2 landfill cap untreated (in the case of lead, any bullets would be sieved out). The FS should clearly explain the rationale for the CAMU designations, as well as properly designate the CAMUs according to the State ARAR.
>
> Site 3 Ecological Risk Assessment (ERA) - Attached please find EPA comments on the Site 3 ERA prepared by EPA Region 9 Biologist, Mr. Clarence Callahan. These issues were discussed with the Army and its consultant, Harding Lawson Associates, at a meeting on July 31, 1995. The Army acknowledged that many of the items discussed in the attachment do present data gaps in the Site 3 ERA. EPA agreed that many of these issues can be addressed by a remedial alternative that includes flexibilities to remediate areas of elevated lead soil concentrations found outside the areas of heavy surficial distribution of spent ammunition if existing or additional field surveys or data collection deem necessary. This approach would need to include provisions describing when remediation in such areas should not be undertaken if critical habitat would be negatively affected. The appropriate FS alternative should be revised to discuss such ecological considerations during the proposed remediation, while details of such an approach (particularly those identified in the attachment relating to the legless lizard and buckwheat) can be incorporated into the Remedial Design documentation. EPA requests that a meeting with the Natural Resource Trustees, the State Parks, the State, and EPA be arranged as soon as possible to discuss these issues in greater detail and to determine what additional pre-design field surveys or data collection are necessary to support the remedial design.

Please coordinate with EPA and the State on any final changes to the RI/FS as a result of these issues. As discussed in EPA's July 17 letter, with the resolution of these issues the RI/FS should be finalized because the general approaches outlined for the RI/FS sites are sufficient in content and detail for this stage in the Superfund process. The Army has agreed that specific minor details that remain, including those relating to ARARs, can be addressed in the proposed Plan and/or the ROD.

EPA notes that the issues of unexploded ordnance and potential impacts to Monterey Bay have not yet been addressed to the satisfaction of EPA and the State, but we are pleased with recent Army efforts on both counts. As discussed in our July 17 letter, EPA and the State maintain the ability to formally dispute these issues under Section 12 (Dispute Resolution) of the Fort Ord Federal Facility Agreement without regard to the August 25, 1995 deadline to dispute all other RI/FS issues. if you have any questions or comments, please feel free to contact me at 415-744-2387.

Response 1: Alternative 3 of the FS (excavation, screening, and disposal) has been revised to include an option for disposal of treated or untreated soil from Site 3 as a foundation layer at the OU 2 landfill under CAMU regulations.

Specific Comments, July 17, 1995 Letter

Vol I, Background and Executive Summary

Comment 1: **Section 4.9 Enhanced Preliminary Assessment of Monterey Bay - This section should indicate that the Army plans on analyzing sediment samples from the Bay and conducting side-scan sonar and magnetometer surveys to confirm some of the conclusions of the Enhanced Preliminary Assessment. The results of the survey will be presented in a separate report.**

Response 1: Comment acknowledged. The side scan sonar and magnetometer surveys are scheduled for November 1995. The sediment samples have been collected and are awaiting analysis.

Comment 2: **Plate 1A. Regarding Time-Critical Removal Actions for UXO, it is possible that although no additional work may be required for sites following the removal action, the site may not technically qualify for No Action if institutional controls (i.e., deed restrictions) are necessary.**

Response 2: Comment acknowledged. Plate 1A only covers the Time-Critical Removal Actions for the 2 chemical sites.

Vol V, Feasibility Studies, and
Vol VI, Response to Agency Comments

Comment 3: **Corrective Action Management Unit (CAMU) - The references to the use of the CAMU at OU2 and Site 3 in the text and the tables of the Feasibility Studies for Sites 3, 31, and 39 are not consistently used.**

Response 3: Comment noted. The text has been revised for clarification of the CAMU designation of Site 3 and OU 2.

Comment 4: **Total Petroleum Hydrocarbon (TPH) proposed cleanup level of 500 mg/kg. It is not clear that CERCLA would require cleanup of TPH-contaminated soils where a risk assessment shows that TPH at the site does not present an unacceptable risk to human health or the environment and when there is not a clear ARAR that requires cleanup. EPA agreed to the use of the 500 mg/kg TPH cleanup level for Interim Action and No Action sites because many of those petroleum hydrocarbon sites did not have SOC analyses available to be able to completely evaluate the risk. If the Army insists on this approach, EPA will not oppose its inclusion in the FS.**

Response 4: Comment noted. The Army proposes to apply the TPH cleanup level at RI sites for protection of groundwater quality in addition to risks related to site contaminants.

Comment 5: **Sites 2 and 12. Section 2.1.4.2, page 4. EPA disagrees with the Army that the Site 2 sludge is "not a CERCLA waste and requires no action under CERCLA." The Army may determine through sampling that the sludge contains CERCLA hazardous substances and thus may be subject to CERCLA. Nevertheless, we are pleased that the Army is proceeding with sampling of the sludges and feel it is acceptable for the Army to remove sludges, if necessary, as a maintenance procedure.**

Response 5: Comment noted.

Comment 6: **Site 2. Section 2.1.3 Proposed Reuse, and Section 2.1.5 Summary of Baseline Human Health Risk Assessment. EPA requests that the information contained in the response to EPA comment 52 on Page 20 of Vol VI be included in these sections. It is important to note the significance of the potential change in reuse at Site 2 from a proposed aquaculture facility to a park.**

Response 6: These sections have been revised to clarify that the risks estimated for Site 2 are protective of human health for either reuse scenario.

Comment 7: **Sites 2 and 12. Table 2.2, page 6 of 6. Underground Injection Control. The deletion made in the text of the FS regarding injecting water outside of the plume was not made in Comments column of the Table.**

Response 7: The table has been revised accordingly.

Comment 8: **Sites 16 and 17. Last paragraph of Section 3.2.1, page 13, TBC- and ARAR-related RAO item 2. As stated in EPA's previous ARARs comments, remediation of certain types of debris may go beyond the jurisdiction of CERCLA. While the debris may not have been previously disposed of in accordance with Title 23, Chapter 15, it may not be appropriate to set a CERCLA RAO that requires all debris to be remediated. Nevertheless, EPA recognizes that some non-CERCLA debris may be remediated in the course of removing CERCLA soils, but not as a primary objective of the CERCLA remedial action.**

Response 8: Comment noted.

Comment 9: **Sites 16 and 17. Response to EPA FS comment 64 in Vol VI. The text in Section 3.5.4 under the "Overall Protection of Human Health and the Environment" heading still states that this alternative "would allow for unrestricted use of the site". The referenced response to comment clarifies that the remedy proposed only allows for "unrestricted use of the site for the <u>future</u> exposure scenario ..."(emphasis added). The text should reflect this. It has not been shown through a post-remediation risk calculation, as the original comment suggests, that the site is suitable for "unrestricted" or <u>any</u> future use.**

Response 9: The text has been revised accordingly.

Comment 10: **Site 3. Section 4.2.1 RAOs and response to EPA Site 3 FS comment 75 in Vol VI. The Army's response was not complete. As discussed in Table 4.3, the text does not**

include the long-term RAO to protect future users of the park from UXO/OEW hazards. Also, the Army did not discuss the potential hazards associated with exposure to live ammunition left in areas unremediated.

Response 10: The text has been revised to reference protection of future onsite users from UXO/OEW and not just onsite workers as presented in the text of Section 4.2.1. UXO experts will be consulted by the Army during remediation of Site 3 as to residual hazards, and a management plan will be considered for unremediated areas in conjunction with other protective measures such as limited access to the public.

Comment 11: **Site 3. Second to last paragraph of Section 4.2.1.3, page 15. Because of the recent additions to this paragraph, the last sentence incorrectly defines the scope of remedial unit. "[T]hese areas" now refers to the areas of moderate surface coverage of bullets.**

Response 11: The text has been revised accordingly.

Comment 12: **Site 39. Section 6.1.6.2, Action-Specific Requirements, page 13. It is not necessary to include the CAMU description here because Site 39 is not proposed to be included in the CAMU itself.**

Response 12: The text has been revised accordingly.

Comment 13: **Site 39. Table 6.9, page 1 of 5. The Identification and Listing of Hazardous Wastes" requirement was incorrectly deleted and replaced with "Porter-Cologne Act". It seems that "Porter-Cologne Act" was meant to replace the next item, "Standards for the Management of Hazardous Waste".**

Response 13: The table has been revised accordingly.

Comment 14: **Response to EPA Comment No. 25. The Army's response to this comment explains why potential sources of metals contamination will not be investigated further. This is valuable information that should be included in relevant tables of the RI text.**

Response 14: Information indicating that no sources for metals contamination at OF-08 and potential sources for metals at OF-13 are provided in the relevant RI Tables.

Comment 15: **Basewide Surface Water Outfall Investigation. The method used to screen risks for these sites involved comparing Maximum Site-Related Concentrations (MSRCs) to USEPA Preliminary Remediation Goals (PRGs). Individual ratios for each chemical were summed to provide total MSRC/PRG ratios. In our memo of February 24, 1995, we indicated that appropriate use of this screening method requires the MSRC/PRG ratios for chemicals with PRG values based on carcinogenic endpoints be calculated separately from those with PRGs based on noncarcinogenic endpoints. As discussed in the meeting with HLA on May 4, 1995, we will allow an exception to this policy to be made for the Basewide Surface Water Outfall Investigation, since at the majority of outfalls, the recalculated ratios would not be significantly different, but we anticipate adherence to this policy in all future risk assessment documents.**

Response 15: Comment acknowledged. This policy will be adhered to in future risk assessment documents.

Specific Comments

Comment: The above report represents a large amount of effort on the part of the Army and Harding Lawson Associates (HLA). I have read and commented on much of this information at various stages of the risk assessment process. I do not feel that a line by line comment is necessary at this time. Thus, I am providing the following comments as I discussed with you at our last meeting with HLA and the Army to move us to the next phase of the effort -- the preparation for use of Site 3 by the California State Parks.

Overall, the soil data at this time is inadequate to define the distribution of contaminants of concern with respect to the special status species, this is especially true for the black and silver legless lizards and possibly for buckwheat as well. Mostly, the data are inadequate for establishing the distribution of the lizards and possibly some of the plants. An earnest indirect effort to assess the legless lizard species was not completed as the effort for collecting data for invertebrates on Site 3 was essentially absent. Litter samples at Site 3 for potential food impact were not completed and therefore not assessed.

Lizard tissue concentrations for the legless lizards can never be assessed by the techniques discussed and presented for all of the reasons cited in the text for selection criteria for indicator species on p16, therefore direct assessment of this species is not possible, which makes the efforts at indirect methods even more important.

The impact to the food source of Smith's blue butterfly is certainly important, however, oviposition sites as represented by the density and production of buckwheat is as important and was not identified nor assessed. The data collected and produced in laboratory studies for examining the relationship between lead and buckwheat was misinterpreted.

I believe that a more extensive effort should be made at Site 3 and at the other locations of the legless lizards to establish the range of the lizards and the conditions (particularly contaminants) that may impact their propagation. An adequate description of the soil concentration of the contaminants and the distribution of the lizards is not available. The potential impact of remediation at these sites involving the removal of lead, for instance, may be more harmful because of the lack of information on the distribution of the lizards.

In summary, I believe that we need more definitive information on soil concentrations with lizard and buckwheat distributions. I do not think that a good relationship was established between the bullet density and the concentration of lead in the soil, particularly in the areas of moderate surficial distribution of bullets, thus preventing an accurate delineation of the areas to be cleaned. This information, in my opinion, is necessary to establish the boundaries (in area and concentration of the contaminants) for the cleanup. As I have stated to you in the July 31st meeting with HLA, the emphasis should now be on determining what activities are needed to plan for the use of Site 3 by the State Parks. This, in my opinion, should include a

meeting with the Trustees, the State Parks, the Army, and EPA to define exactly what is needed to reach the goals for the State Parks use of Site 3.

Please call me at 744-2314 if you have any questions about my comments.

Response 1: Based on the above comments, and the emphasis on determining what additional activities should be conducted at Site 3, a meeting was held on September 14, 1995 at Fort Ord to discuss the Ecological Risk Assessment (ERA) for Site 3. The Natural Resource Trustees, the State Parks, the Army, and EPA attended and presented their concerns. The focus of the meeting was to determine what information is needed by the Park Service, what information is available now and what information needs to be gathered.

Data gaps with respect to the ability to determine potential effects to the legless lizard were identified. The discussion raised questions about what aspects of the life history of the legless lizard were important and for which data was required. Physical conditions, such as soil compaction, were also identified. Similar data gaps were identified with respect to buckwheat and the Smith's blue butterfly at Site 3. Results presented in the report did not indicate significant dose-response relationships between soil metal concentrations and growth, and it was noted that buckwheat were growing at locations on Site 3 with high soil metal concentrations.

The more extensive studies that are proposed in the above comments and were discussed in the initial meeting for Site 3 consist of long term research projects that are beyond the scope of the remedial investigation/feasibility study and could delay the transfer of Site 3 to the State Parks. It was agreed that there will be a continuing discussion between the Army, the Trustees, the State Parks, and EPA on additional data to be collected during remediation efforts. These data will be used to provide additional information about potential effects to endangered species and to adequately protect these species from substantial impacts during remedial activities.

XI Department of Toxic Substances Control Additional Comments

General Comments

Comment 1: The Department of Toxic Substances Control and the Regional Water Quality Control Board, (the State), have reviewed the subject document dated June 1, 1995. Our Comments are enclosed.

With the exceptions listed below, the State concurs with the findings of the report. We commend the Army in their efforts to accelerate remediation while pursuing innovative approaches such as the proposed designation of Operable Unit #2 (landfill) as a Corrective Action Management Unit.

With respect to finalization of the subject report, the State, at the August 25, 1995 Project Managers meeting, concurred with the Army and the United State Environmental Protection Agency (USEPA) that the deadline of August 25, 1995 to invoke dispute would not be extended. However, as we also discussed, and as presented in USEPA's July 17, 1995 letter to you, some issues remain to resolved. Consequently, we reserve the right to invoke dispute as provided in the Fort Ord Federal Facility Agreement (FFA) with regards to the following items which are still under discussion:

1) Unexploded Ordnance,

2) Potential impacts to Monterey Bay, and

3) Site #3 Ecological Assessment.

Please note that our reservation of right to dispute according to the FFA is not an indication that such a dispute will arise. We believe all parties are making a good faith effort to resolve these issues. The parties are also making a good faith effort to address concerns expressed by members of the Restoration Advisory Board.

If you have any question regarding this or other matters, please call me at (916) 255-3702.

Response 1: Comment acknowledged. See responses to specific comments below.

Specific Comments

Volume I - Background and Executive Summary

Comment 1: Section 4.7 Radiological Survey Program:

Please revise text specifying when the report on the survey of the remaining 138 buildings will be provided. The text should also indicate the report will be submitted to the California Department of Toxic Substances Control and the Department of Health Services, Environmental Management Program for review. Please also indicate that the report is not considered a part of the Basewide Remedial Investigation/Feasibility Study Report (RI/FS).

Response 1: The text has been revised to indicate that the report will be submitted to the California Department of Toxic Substances Control after completion.

Volume V - Feasibility Study

Comment 2: **Site 3:**

Please provide a detailed analysis for the proposed alternative which designates Operable Unit #2 as a Corrective Action Management Unit. Alternatives listed in the Draft RI/FS do not include the Army's proposal to use sieved soil from the high density areas of Site #3 as foundation material for the landfill cap.

Response 2: The text has been revised to clarify use of Site 3 and OU 2 as CAMUs.

XII Regional Water Quality Control Board Additional Comments

General Comment A: The Army proposed in its Basewide Feasibility Study (FS) dated November 25, 1994, that one of the options for lead-contaminated soil was landfill disposal. Details of the landfill disposal option were left open until after soil treatment studies had been completed. Subsequent to promulgation of the Basewide FS, the Army specifically proposed that the lead-contaminated soil at the Site 3 Beach Trainfire Ranges be screened for lead particulate contaminants and then used in a foundation layer for the Operating Unit 2 (OU2) cap construction. Soils placed in the cap would still contain lead at hazardous waste levels. The leachate study results supporting this proposal are contained in the Remedial Investigation (RI) for Site 3, dated November 18, 1994.

In order to better facilitate this proposal, the Army also proposed the use of Corrective Action Management Unit (CAMU) regulations. The CAMU regulations replace the RCRA Subtitle C requirements as ARARs for state superfund sites. California Code of Regulations, Title 23, Division 3, Chapter 15 is being used for landfill closure requirements.

Regarding the Army's proposal for the lead-contaminated soil at Beach Trainfire Ranges and how this proposal relates to state ARARs, we offer the following comments.

General Comments

The Regional Water Quality Control Board accepts the Army's proposed use of CAMU regulations regarding the treatment and transportation of lead-contaminated beach soil from Site 3 to the OU2 landfill cap for the following reasons:

1. Title 23, Chapter 15, Article 8, Section 2581 (a)(1) states in part that, "Closed landfills shall be provided with not less than two feet of appropriate materials as a foundation layer for the final cover. These materials may be soil, contaminated soil, incinerator ash, or other waste materials, provided that such materials have appropriate engineering properties to be used for a foundation layer. . . ."

   The Army has adequately demonstrated that the lead-contaminated Site 3 soils have appropriate engineering properties and, therefore, can be allowed in the landfill cap foundation.

2. Title 23, Chapter 15, Article 2, Section 2520 (a) (1) states in part that, "The waste classifications in this article shall determine whether waste may be discharged unless the discharger establishes to the satisfaction of the regional board, that a particular waste constituent or combination of constituents presents a lower risk of water quality degradation than indicated by classification according to this article. . . ."

   Although the soil from the Beach Trainfire Ranges contains lead at hazardous waste levels, the Army has adequately demonstrated that the Site 3 soil is not a significant threat to water quality if

placed in the landfill cap. The Army had made this demonstration through soil leachate testing and by collecting soil boring and ground water test results from the Beach Trainfire Ranges. These ranges test results offer the most convincing and reliable data, as they directly demonstrate that the lead-contaminated beach soil seldom leached significant amounts of lead to soil depths greater than two feet, and that ground water (approximately twenty to over one hundred feet below ground surface) was not adversely affected in two monitoring wells after up to 50 years of soil exposure.

Given the Army's demonstration that the lead-contaminated soils leached so little lead to any significant depths, Regional Board staff is convinced that this contaminated soil will constitute an even lesser threat (then it currently does) when placed in the foundation layer of the OU2 landfill cap. Placing the contaminated soil in the landfill cap also will reduce demands on limited class one landfill space, will aid in providing landfill foundation material needed (while reducing the need for other borrow sources and associated impacts), and will save approximately ten million federal tax dollars.

General Comment B:

The Regional Water Board provided similar comments at the June 23, 1995 Remedial Project Managers meeting. During the meeting we provided additional comments regarding typographical errors (identified during our review) which are not included herein. Many of our comments have been incorporated or addressed adequately, the following remain.

General Comments

Citations in the "Source" column of the Applicable or Relevant and Appropriate Requirements (ARAR) Tables are inconsistent. In particular, regulations such as Chapter 15 or State Water Resources Control Board Resolutions, should cite the law (e.g. California Water Code) in the source column. In the case of Chapter 15, the citation in the source column varies for each listing and should be consistent.

Specific Comments

Sites 2 and 12, Feasibility Study Report

Comment 1: Table 2.2, Page 1: Resolution No. 89-04 is the incorrect citation for the ARAR described. The correct citation is State Water Resources Control Board, Resolution No 88-63.

Response 1: The table has been revised accordingly.

Comment 2: Table 2.2, Page 6: Reference to State Water Resources Control Board, Resolution No. 68-16 must be added to the Table because it is applicable to the proposed remedial activities (ground water pump and treat and disposal).

Response 2: The table has been revised accordingly.

Sites 16/17, Feasibility Study and Report

Comment 1: **Section 3.1.6.2, Page 11: This section should be modified to state, "debris from Sites 16 and 17 would be properly disposed pursuant to Article 8 at the OU2 landfill." The last part of the sentence "soil would be treated." should be eliminated.**

Response 1: The table has been revised as suggested regarding disposal at the OU 2 landfill pursuant to Article 8; however, soil from the sites would be treated at the FOSTA prior to disposal as stated.

Comment 2: **Section 2583: This section provides an alternative for waste pile closure, either complete waste removal or closure as a landfill. Since closure as a landfill is allowed by Section 2583, and the text includes the reference to Section 2581, landfill closure should be included as an ARAR. Furthermore, Section 2583 allows closure as a landfill if all waste and waste contaminated soils can not be removed and the site is properly closed.**

Response 2: The text has been revised accordingly.

Comment 3: **Table 2.2, Page 3: The Chapter 15 citation should reference Article 8 and not Article 2 (which allows for excavated debris to be used as part of the landfill cap at Operable Unit 2).**

Response 3: Assuming the comment refers to Table 3.3 [2.2] for Sites 16 and 17 ARARs, Article 8 is cited on page 2.

VOLUME I

BACKGROUND AND EXECUTIVE SUMMARY

The Background and Executive Summary (Binder 1) has been revised and is reproduced in its entirety. No inserts are necessary.

VOLUME IV

BASELINE ECOLOGICAL RISK ASSESSMENT
APPENDIX K

Appendix K contains data not available for the draft final report and is reproduced in its entirety. No inserts are necessary.

VOLUME V

FEASIBILITY STUDY
SITES 2 & 12, SITES 16 & 17, SITE 3

Volume V has been revised and is reproduced in its entirety. No inserts are necessary.

VOLUME V

FEASIBILITY STUDY
SITES 31, SITE 39

Volume V has been revised and is reproduced in its entirety. No inserts are necessary.