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TO: Contracting Officer
Naval Facilities Engineering Command
Southwest Division
Mr. Richard Selby, Code 57CS.RS
Building 127, Room 112
1220 Pacific Highway
San Diego, CA 92132-5187

DATE: September 5, 1997
CTO #: 076
LOCATION: MCAS El Toro

FROM: D. J. Tedaldi, Ph.D., P.E., Project Manager

DESCRIPTION: Discussion of Modifications to Draft Final RI Reports, Sites 2, 3, 5, and 17 Landfills, Marine Corps Air Station El Toro, California and Response to Comments on the Draft final RI Reports - DTD September 5, 1997

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CLEAN II Program
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September 5, 1997

Contracting Officer
Naval Facilities Engineering Command
Southwest Division
Mr. Richard Selby, Code 57CS.RS
Building 127, Room 112
1220 Pacific Highway
San Diego, CA 92132-5187

Attention: G. Steinway, Code 56MC.GS

Subject: Discussion of Modifications to Draft Final RI Reports, Sites 2, 3, 5, and 17 Landfills, Marine Corps Air Station El Toro, California and Response to Comments on the Draft final RI Reports

Dear Mr. Selby:

It is our pleasure to submit this copy of the discussion of modifications to the Draft Final Remedial Investigation (RI) Reports for Sites 2, 3, 5, and 17 and Response to Comments Draft Final RI Reports for the Marine Corps Air Station (MCAS) El Toro, California, prepared under Contract Task Order (CTO) 0076 and Contract No. N68711-92-D-4670.

The purpose of the discussion of modifications to the Draft Final RI reports is to primarily present changes that occurred in the RI reports based on groundwater sampling results from November-December 1996, in particular hexavalent chromium, radon, and strontium results, and the changes to the risk assessment based on the hexavalent chromium results. The discussion also presents changes to site boundaries as discussed in meetings with the BRAC Cleanup Team.

The Response to Comments document present the final responses to California DTSC comments on the mobility of metals and U.S. EPA comments on the ecological risk assessment.

These modifications and response to comments do not alter the conclusions and recommendations in the RI reports nor change the remedial alternative analysis in the Feasibility Studies for these sites.

We have submitted the appropriate number of copies of this report to individuals listed on the attached transmittal.

We appreciate the opportunity to be of service to you on this project. If you have any questions or would like further information, please contact Tim Latas at (619) 687-8848, or myself at (619) 687-8780.

Sincerely,

Dante J. Tedaldi, Ph.D., P.E.
Project Manager

DJT/sp

Enclosure: Response to Comments Draft Final Phase II Feasibility Study Reports
Operable Unit 2B and 2C - Sites 2, 3, 5 and 17

DISCUSSION OF MODIFICATIONS TO DRAFT FINAL RI REPORTS SITES 2, 3, 5, AND 17 LANDFILLS MARINE CORPS AIR STATION EL TORO, CALIFORNIA

The draft final Remedial Investigations (RI) reports for MCAS El Toro Sites 2, 3, 5, and 17 (landfill sites) were revised after the last regulatory agency review and prior to public review, currently scheduled for November 1997. The revisions were made to:

- incorporate agency comments on the strikeout versions of the draft final RI reports from October and November 1996;
- make the documents consistent with the draft final FS reports that were issued in February and March 1997; and,
- incorporate information obtained since the FS reports were issued.

These changes have been discussed with the BRAC Cleanup Team in meetings or were presented in the draft final FS reports. These revision do not change the findings or conclusions reached in the draft final version of these reports, rather they provide a summary of recent analytical data which support the original findings and conclusions.

Groundwater

The RI reports have been revised to include the results of the two rounds of groundwater sampling performed in January-February 1996 and November-December 1996. These sampling rounds included analyses for hexavalent chromium and the radionuclides radon and strontium. A discussion of the results of hexavalent chromium sampling and a discussion of the relation between radon/gross alpha and strontium/gross beta at each site has been included.

The November-December 1996 round of groundwater sampling found that concentrations of hexavalent chromium were primarily below detection limits, or if it was detected, slightly above the detection limits. Hexavalent chromium was detected at 2 wells at Site 2 (02_UGMW25 at 0.002μg/L; 02NEW6 at 0.004μg/L) and 1 well at Site 3 (04_UGMW66 at 0.003μg/L). The detected hexavalent chromium at the 2 landfills are near the detection limit (0.002μg/L) and will not have any significant impact on the human risk assessment results except that the risks will be reduced.

The results of the radon and strontium analyses were used to assess whether these radionuclides are sources of gross alpha and beta activity in groundwater, respectively. The relation of gross alpha and beta to radon and strontium were assessed using a correlation coefficient and plotting the results on line charts. Conclusions of this exercise are:

- Moderate positive correlation (0.57 to 0.83) exists for gross alpha to radon in Sites 2 and 3 while a moderate negative correlation (-0.38) exists in Site 5; no correlation was completed for Site 17.
- Very low to low/moderate correlation (-.03 to 0.54) exists for gross beat to strontium in Sites 2, 3, and 5; no correlation was completed for Site 17.

These findings will not have a impact on the RI conclusions.

Risk Assessment

The risk assessments for all four sites have been revised to reflect the results of hexavalent chromium analyses. Since groundwater analyses performed during the RI did not include speciation of chromium, it was necessary to assume that all chromium present in groundwater was present in the hexavalent state even though geochemical data indicated otherwise. This assumption was believed to have resulted in an overestimate of risk due to chromium when using Cal-EPA cancer toxicity factors.

Using the results of the hexavalent chromium, risks from chromium in groundwater in the trivalent state rather than the hexavalent state resulted in the following changes:

- At Site 2, cancer risks for an adult resident were reduced from 5.7×10^{-4} to 3.2×10^{-4} using Cal-EPA toxicity factors. The hazard index for a child resident was reduced from 6.6 to 6.1.
- At Site 3, cancer risks for an adult resident were reduced from 2.0×10^{-4} to 6.1×10^{-6} using Cal-EPA toxicity factors. The hazard index for a child resident was reduced from 1.9 to 1.5.
- At Site 5, cancer risks for an adult resident were reduced from 1.3×10^{-3} to 8.1×10^{-5} using Cal-EPA toxicity factors. The hazard index for a child resident was reduced from 5.8 to 3.2.
- At Site 17, cancer risks for an adult resident were reduced from 7.1×10^{-4} to 3.0×10^{-4} using Cal-EPA toxicity factors. The hazard index for a child resident was reduced from 6.9 to 6.1.

Natural Resources and Land Use

Discussions of recent wetlands, archaeological, and historical resource reports have been added to each RI report.

A discussion of the proposed reuse of each site has been added to the RI reports as follows:

- The area containing Sites 2 and 17 is proposed to be reused as part of a 998-acre habitat reserve;
- Site 3 is proposed to be reused for research and development and light industrial/commercial; and,
- Site 5 is proposed to be reused for recreation (golf).

Site Boundary Revisions

The boundaries of Site 2 have been revised to reflect the results of an aerial photographic review that showed that operational landfill activities were limited to the northern portion of the Phase II RI site study area. Landfill debris found elsewhere on site appears to be the result of unauthorized dumping. In particular, piles of construction material and other landfill debris which were located off-Station are not the result of Marine Corps activity because vehicular access from the operational landfill to this area was limited by a fence and by trees.

The boundaries of Site 5 have been revised to incorporate only the operational landfill area and not the area of investigation-derived waste that is being temporarily stored over a portion of the landfill.

Previous revisions of the Site 3 RI noted that early Station drawings (from the 1940s) showed a large rectangular area that crossed the site diagonally. This area was not identified, but included land on the east and west sides of Agua Chinon Wash. Since Site 3 was known to be a landfill

site, it was assumed that this rectangular area could represent a landfill trench and, therefore, geophysical surveys and sampling were performed throughout the area. As part of a design document review being performed for another contract task order at MCAS El Toro, personnel located additional historical drawings for Site 3. These drawings showed the same rectangular area and identified it as a bore sighting range (presumably a sighting range for large weapons). In a later drawing, the portion of the rectangle west of Agua Chinon Wash is no longer shown, and the eastern portion is identified as a pistol range. The discussion of the review of maps and blueprints been revised accordingly.

Overall, these changes enhance the RI reports but do not affect the findings or conclusions of the RI reports nor do they change the types or magnitude of remedial actions proposed at each site.

RESPONSE TO COMMENTS
DRAFT FINAL PHASE II REMEDIAL INVESTIGATION REPORT
FOR SITE 17, OU-2B
MCAS EL TORO, CALIFORNIA

Originator: John E. Scandura, Chief Cal/EPA **To:** Joseph Joyce, BRAC Environmental Coordinator MCAS El Toro **Date:** 07 October 1996	**CLEAN II Program** **Contract No. N68-711-92-D-4670** **CTO-0076** **File Code: 0222**
SPECIFIC COMMENTS	***RESPONSES TO SPECIFIC COMMENTS***
1. **Section 5.3.3.3, Inorganics, Page 5-32 - This section has been added to include a discussion regarding the dissolution and precipitation of metals as a result of change in groundwater environment (i.e., aerobic vs. Anaerobic zones). The report used the difference in the iron to manganese ratios from three groundwater monitoring wells samples to support a theory that an anaerobic (reducing) condition may exist under the landfill and an aerobic (oxidizing) condition may exist down gradient from the landfill. However, the report did not discuss how nickel reacts as it passes from an anaerobic to an aerobic condition. Is there an Eh-pH diagram that shows why nickel would not precipitate out in an aerobic environment? Is there a possibility that other target metals may not precipitate out? There is a need to show that nickel supports the conceptual model, since only one round of groundwater sampling was used to make the aerobic/anaerobic assumption.**	**RESPONSE 1:** The discussion of the mobility of nickel occurs on page 5-28, last paragraph and on page 5-30, first paragraph. This discussion points out that nickel is likely to be more mobile and migrate further downgradient than other metals that co-precipitate with aluminum and iron oxyhydroxides. Eventually nickel and many other metals will precipitate in an aerobic environment when equilibrium is reached. Rather than rely on using nickel to support the conceptual site model, other data on redox conditions as discussed on pages 5-19 through 5-23 which are used to assess the mobility of other metals at the site.

RESPONSE TO COMMENTS
DRAFT FINAL RI AND THE DRAFT FS ECOLOGICAL
RISK ASSESSMENT FOR SITE 2
MCAS EL TORO, CALIFORNIA

Originator: **Clarence A. Callahan, Ph.D., Biologist** **U.S. EPA** **To:** **Bonnie Arthur, Remedial Project Manager** **U.S. EPA** **Date:** **09 October 1996**	**CLEAN II Program** **Contract No. N68-711-92-D-4670** **CTO-0076** **File Code: 0222**
ENCLOSURE A	
REVIEW OF DRAFT FINAL PHASE II, RI REPORT OPERABLE UNIT 2B, SITE 2	***RESPONSES TO COMMENTS***
1. **Section T.1.1, Chemicals of Potential Ecological Concern.** **Response is satisfactory.**	**RESPONSE 1:** Comment noted.
2. **Same para, second bullet, what was 2-methyl-4-chlorophenoxyproprionic acid.** **Response is satisfactory.**	**RESPONSE 2:** Comment noted.
3. **Bottom of page T-2, with soil representing 100 percent ... contact rate (CM). Confirmation or validation samples can be performed to reduce the uncertainty in these predictions.**	**RESPONSE 3:** This initial step in the ecological risk assessment was to further reduce the number of COPECs to be carried through the risk assessment. Because a large number of organic chemicals were detected just above the detection limits, an initial screening process was used to eliminate from further consideration those chemicals that do not pose significant hazard to ecological receptors (different from the human health risk assessment process, determination of the list of COPECs for the ecological risk assessment also used a toxicity criterion, as indicated in the work plan, to further reduce the number of COPECs). The screening process assumed that the receptor will consume 100% of its diet as soil over a lifetime. This conservative assumption is used only in the screening process for the determination of COPECs for the predictive ecological risk assessment. Later, a more realistic incidental soil ingestion rate as reported by Beyer et al. (1994) is used in the food chain modeling for the predictive ecological risk assessment. The screening criteria was derived by multiplying the selected NOAEL with the animal's body weight and dividing this by the animal soil ingestion rate (basically, a backward hazard calculation). The resulting soil concentration

Originator: Clarence A. Callahan, Ph.D., Biologist U.S. EPA **To:** Bonnie Arthur, Remedial Project Manager U.S. EPA **Date:** 09 October 1996	**CLEAN II Program** **Contract No. N68-711-92-D-4670** **CTO-0076** **File Code: 0222**
	represents the soil concentrations that is not expected to result in adverse impacts to ecological receptors if the receptor consumes all of its dietary needs as COPECs in soil. This is an unrealistic assumption because ecological receptors do consume on average anywhere between less than 1% to 10 % soil. If, however, the derived soil concentrations for the COPECs is above the ambient concentration for any specific chemical in soil, then it is reasonable to assume that the ambient soil concentration will not adverse impact the ecological receptor.
The confirmation samples from Sites 2, 17 and the reference site should be used to estimate the potential risk or be an integral part of this presentation rather than to rely strictly on the modeling. The "standard" mouse body weights, I believe were an average (p. T-21) of those reported in EPA (1993), the Wildlife Exposures Handbook, however, the average that I obtain for the deer mouse (22, 20, 15.7, 14.8, 22.3, 21.1, 19.6, 20.3, 31.5, 24.5; mean = 21.12; p. 2-295). This difference of 29.4% could have a substantial difference on the estimated daily intake. Was the calculation completed as follows: **NOAEL/soil intake rates = safe soil concentration:**	COPEC levels derived from site-specific sampling were used in two ways in the predictive ecological risk assessment. First, chemical levels in soil, plant and deer mice tissues were used as site specific information in the food chain modeling for those receptors exposed to specific media (i.e., coyotes and hawks consuming deer mice, or avian receptors consuming plant parts, all receptors incidentally consuming soil). The food chain model included site-specific information with modeled data (i.e., COPEC uptake by invertebrates). Secondly, deer mouse daily doses were also estimated in the food chain model. From the modeling, a number of COPECs had HQs greater than one. We concur with the reviewer that the body weights obtained from captured deer mice should have been used in the modeling and might have altered the results. Nevertheless, information derived from site-specific information regarding deer mice revealed that deer mice at all three sites were healthy and reproducing (i.e., several age classes were trapped, pregnant females were also captured and released, no gross abnormalities were observed in the captured mice), which would indicate that deer mice were potentially not impacted by the presence of COPECs at the sites. If the modeling indicated a number of potential impacts to small mammals at the sites, site-specific data does not reveal the same which could indicate that COPECs are not as bioavailable as was assumed in the food chain model (i.e., 100%). Furthermore, concentrations of COPECs in deer mice tissue data were significantly lower than data reported for deer mice captured at reference or

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	control sites in several mining districts, as reported in the literature.
Where did the soil ingestion rates come from as the Beyer el al (1994) paper reports less than 2% for the white footed mouse and 5500mg/ day seems high? From Beyer's paper (p. 379), daily food consumption for the white footed mouse in lab trials was reported as 350mg, 350mg 350mg, 390mg, and 380mg with a mean value of 364mg/day for various percentages of soil in the food. The soil ingestion rate of 2% or 0.02 times 364mg = 72.8mg/day, which is the average ingestion rate of the white footed mouse.	See first paragraph in this response.
The reference to "confirmation sampling of plants and deer mice for Site 2 and 17" in the response to this comment suggests that more details will be provided in the Risk Characterization section (7.5 pp 7-23 through 7-40). From section 7.4, p. 7-22, "Biological Effects Assessment" states that the "toxicity benchmarks" the NOAELs is found in Appendix T. From Table T-15, the "Final NOAEL" is shown in the second to last column on the right, however, there are no literature citations as to how these were derived. This is a critical omission. The references and data must be evaluated and without the citations this cannot be done.	The title for this table should have been labeled to indicate the toxicological studies that were used to derive the surrogate toxicity benchmarks. The final benchmark refers to the NOAEL that was derived from the study which was used in the present risk assessment to derive the surrogate toxicological benchmarks for the selected receptors (Table T-12) with additional discussion and references in Section T3.1.2.
For instance, Methoxychlor for the "rat" in Table T-15, shows a NOAEL of 4 (and I assume the units are mg/kg body weight/day) whereas, I suggest that 2.5 mg/kg/day is the appropriate toxicological NOAEL based n the study of "L. Earl Gray, Jr., J. Ostby, J. Ferrell, G. Rehnberg, R. Linder, R. Cooper, J. Goldman, V. Slott, and J. Lasky, 1989. A dose-response analysis of methoxychlor-induced alternations of reproductive development and function in the rat. Fundamental and Applied Toxicology 12.92-108. This paper shows that reproductive impact was observed at a dose of 25mg/kg/day (Table 2A p99) and an uncertainty of 10 was applied because of a LOAEL to a NOAEL conversion, the final TRV should	The toxicological information presented in this risk assessment was obtained from one of the more complete reviews of the toxicological data base for wildlife by one of the leading groups in this field (i.e., ORNL). Due to the very nature of ecological risk assessment and the condition of the wildlife data base, changes to the toxicological values are inevitable as new information become available.

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be 2.5mg/kg/day. A reading of Table T-15 indicates that others should be changed as well. **Even with the material presented on T-93, it is difficult to see the number was derived for the site receptor, the deer mouse from the data presented for the rat. My calculations indicate that the NOAEL is 2.5mg/kg/day as explained above. When comparing this TRV to the site specific receptor data, the calculations are not shown for the conversion using the formula on p T-27, and I can't understand the mechanics without these calculations in tabular form on the same page. I cannot easily locate the data for the weights of the laboratory mice and the literature data for the mouse used in the calculations for the formula in section T3.1.1.**	The approach is described in Section T3.1.1 with additional information given in the toxicological descriptions for each COPEC.
4. **<u>PT-6, Receptor Exposure Intake Factors, second paragraph</u>; coyote, forage area; ingestion of incidental soil. The Navy concurs.**	**RESPONSE 4:** Comment noted.
5. **<u>Table T-4, Screening Criteria for Soil COPECs</u>. Insufficient details provided; "Jacobs Engineering" does not indicate the source of these data nor how they were derived; "Opresko et al, 1995" does not provide any page numbers to direct the reader to how these data were derived. The same is true for "Stevens and Sumner, 1991"; "HSDB, 1996"; "Topping et al, 1994"; and "ACGIH, 1991" all of which should be referenced by page numbers for each data entry. Please provide page numbers for each data entry from the citations as stated above.**	**RESPONSE 5:** It is not customary to provide the exact paragraph and page number for the toxicity information. The risk assessment followed usual and customary protocol by providing a brief description of the toxicity benchmark, a detailed discussion on the derivation of the surrogate toxicity benchmarks for each of the COPECS and receptors, and a complete citation for all COPECs as referenced in the Reference Section of the risk assessment. Information requested by the reviewer is presented for each COPEC in the toxicity information, including the approach used to derive the surrogate toxicity benchmarks.
The Navy has not provided page numbers for these citations and data. In addition, the toxicity reference values, TRVs are not shown and supported by citations, nor calculations in tabular form. These data are critical to the interpretation of the potential and actual effects and without supporting citations are essentially not	The reader is referred to the original ecological risk assessment performed by Jacobs Engineering as part of the Phase I RI effort at MCAS El Toro in the first reference. Data for the Phase I RI was presented in the Phase I RI technical memorandum.

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acceptable. **The following is an example of the documentation that is requested, copied from a comment above:** **For instance, Methoxychlor for the "rat" in Table T-15, shows a NOAEL of 4 (and I assume the units are mg/kg body weight/day) whereas, I suggest that 2.5 mg/kg/day is the appropriate toxicological NOAEL based n the study of "L. Earl Gray, Jr., J. Ostby, J. Ferrell, G. Rehnberg, R. Linder, R. Cooper, J. Goldman, V. Slott, and J. Lasky, 1989. A dose-response analysis of methoxychlor-induced alternations of reproductive development and function in the rat. Fundamental and Applied Toxicology 12.92-108. This paper shows that reproductive impact was observed at a dose of 25mg/kg/day (Table 2A p99) and an uncertainty of 10 was applied because of a LOAEL to a NOAEL conversion, the final TRV should be 2.5mg/kg/day.**	Unless there are direct quotations in the text, the specific pages in references are not included. The request by the US EPA is extraordinarily unusual. The reader is referred to specific citations for the data and many of these citations are relatively short papers given in technical journals.
6. **P7-23, Uncertainty Analysis - There are a couple of statements made that need clarifying . . .** **The Navy refers to Table 7-6 where "measurement endpoints" is the title of the table, leaving me to make my own assumptions about where uncertainty lies in the process. There are many levels of the risk assessment where uncertainty enters the process, the raw data, the conversion factors, the uptake factors, the receptor species, the life history characteristics of the receptors, none of which is clearly identified by the Navy. From the table, under the column heading "ease of measurement" the following areas of uncertainty should be addressed:**	**RESPONSE 6:** Comment noted. These uncertainties have been addressed in Table 7.9 and in the Appendix. The assumptions identified by the reviewer have also been addressed in one form or another in the risk assessment. The statement "are data sufficient to represent the conditions at the site" has been addressed under selection of COPECs, sufficient samples taken to characterize media, and COPEC concentrations. Prediction of dietary intake "from predicted prey concentrations" has been addressed under assumptions regarding prey/predator intake factors and other exposure assumptions. The "toxicological information that is not available for receptor species" has been

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1. are data sufficient to represent the conditions at the site? **2. Prediction of dietary intake "from predicted prey concentrations;"** **3. toxicological information that is not available for receptor species;** **4. uptake predictions into plant and animal prey items;** **5. relevancy of toxicity data alone to complete the ecological risk assessment;** **6. relevancy of robin for the California blue-gray gnatcatcher because of the difference in feeding habits;** **Actually, there is a fairly good description of the potential sources of uncertainty on ppT-98 and 99, however, there is no discussion of how these areas of uncertainty potentially impact the results. These are some of the uncertainties that I believe should be discussed, otherwise the risk assessment is unfinished. The most important of these areas of uncertainty is that involved with limiting the ecological risk assessment to the use of toxicity data rather than completing the process with a discussion of the ecological effects or at least the implications for using toxicity data only. This is**	addressed under availability of toxicity information and chemical form present at the site may be different. The "uptake predictions into plant and animal prey items" has been addressed under a number of assumptions regarding invertebrate and plant and biotransfer factors. For the fifth assumption, the ecological risk assessment did not rely entirely on toxicological data but included information regarding the small mammal populations at the two sites, the number of animals caught, pregnant females, no observed gross abnormality, mice captures of different weights revealing a complex age structure for the resident deer mouse populations. Finally, for the sixth assumption, the risk assessment used the robin to evaluate potential impacts for the California gnatcatcher. Because the gnatcatcher is primarily an insectivore, we used the robin model, also an insectivore, consuming soil invertebrates to address this issue. During several field outings at both sites, several gnatcatchers were seen and heard. Based on available information, the density of gnatcatchers on the 1200 acres is quite high compared to the surrounding areas due to ever increasing urbanization. Furthermore, these populations are known to be successfully reproducing.

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particularly troublesome because many of the species did not have toxicity data so a surrogate species was used to estimate the toxicological impact on the receptor. Then this information was used to suggest a certain result for "ecological" endpoints for the site receptors and the site setting. This level of extrapolation requires a great leap of faith without more documentation.	
7. **Tables T-11, 12, 13 and 14 - The formula shown for estimating the daily dose for each receptor should not use any "modifiers."** **The Navy's response appears to be sufficient.**	**RESPONSE 7:** Comment noted.
8. **Section 7, p7-19, Hazard Quotient Discussions... - The strategy used i.e., comparing the estimated HQ for each receptor at Site 2 to an estimated HQ at the reference site to determine the potential "risk" for the selected receptors is not acceptable.** **The Navy has not presented a satisfactory response to the comment. The only response provided might be described, at best, as repeating the proposed approach. The decision for the selection of a reference site based on the material presented is highly suspect because of the contaminant levels observed in the samples collected and presented as representative of the reference area.**	**RESPONSE 8:** With regard to the reference site, although the COPEC levels are not significantly different from Sites 2 and 17, this does not imply that the reference site is unacceptable because the COPEC levels are not low enough. The reference site was chosen because of the close proximity to the sites in question (i.e., same climatic conditions, same soil conditions, similar vegetation cover and wildlife) without the obvious chemical releases that occurred at the two sites. Results from the risk assessment show that COPEC exposures at Sites 2 and 17 are not significantly different from COPEC exposures at the reference site which would indicate that potential chemical releases that occurred at the two sites may not be relevant for ecological receptors (i.e., receptors may not be in direct contact with potential chemicals releases that may have occurred at Sites 2 and 17). The selection of the reference site was discussed with the BRAC Cleanup Team at the time of the ecological sampling. In fact, a DTSC representative was present throughout this sampling effort and at no time did the BCT recommend changes to the reference site location. The presence of metals in the reference site soils is expected. In addition, statistical analysis using the 95th percentile test, Wilcoxon Rank Sum test and the Quantile Test were used

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	to select COPECs, as discussed thoroughly with John Christopher at DTSC.
9. **One area that is certainly missing and already mentioned by the Navy in other correspondence is the assessment of the potential risk to the California gnatcatcher.**	**RESPONSE 9:** Based on information collected for the gnatcatcher by the Navy, gnatcatchers do not appear to be affected by chemicals or investigation activities. There is one breeding territory at least partially on Site 2 which has been used in 1995 and 1996. California gnatcatcher home ranges have been found to be 2-20 ha. during the breeding season and 70% larger during the non-breeding season. The home ranges tend to be smaller on the coast and larger inland, such as MCAS El Toro. Also gnatcatchers are commonly observed perching or foraging on Sites 2 and 17 during the fall and winter. The gnatcatcher population at MCAS El Toro has reportedly increased in the past few years; there may be as many as 70 breeding pairs at MCAS El Toro out of a possible 2,000 estimated breeding pairs in California, possibly as a result of an influx of birds escaping from nearby new developments.
The heavy emphasis on toxicity at the preliminary phase is expected, however, to continue this toxicity emphasis throughout the risk assessment process carries a large amount of uncertainty concerning the potential impact to the overall success or failure of this special status species at this site. Some observations that are suggested are available nest sites, egg viability, hatching success, fledgling success all of which relate to an evaluation of population growth and overall success of this special status species. Some related questions that should be addressed include: What is the relationship between the available food supply and the contaminant concentration and distribution? What is the relationship between the vegetation that provides nest sites and the contaminant concentration and distribution? Can the contaminant concentrations and distribution be expected to impact the nesting success of this species? Have the number of nest sites increased, decreased or stayed the same? Has	The gnatcatcher's diet, as its name implies, consists largely of insects, but may also contain a few spiders and occasional seeds. They commonly feed among the branches of coastal sage scrub by hovering or gleaning leaves and stems for insects. They nest in large shrubs in the spring and typically lay 3-5 eggs which they incubate for about 14 days. The young will fledge about 15 days after hatching. Until recently, the California gnatcatcher was considered as the same species as the black-tailed gnatcatcher which ranges to Arizona and Mexico. Ornithologists have recognized that the coastal population in California has a distinctive call, somewhat different plumage, and habitat (coastal sage scrub) than the black-tailed gnatcatcher. Some referred to the California gnatcatcher as the plumbeous gnatcatcher (i.e., lead-metal colored). When the taxonomy was somewhat settled in the early 1990's, the U.S. Fish and Wildlife Service accepted a petition to list the California gnatcatcher as threatened because of

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this species expanded into new areas of the site? Where is this species feeding? Where is this species nesting, especially after the cap is in place?	its declining habitat. The California Department of Fish and Game Commission has twice declined to protect the species under the state endangered species act citing the protection given by the federal act and also relying on protection of the species by the Natural Communities Conservation Program in southern California. Based on the number of California gnatcatchers present in and around Sites 2 and 17, suitable habitat is present and is being used by the gnatcatchers.
The field surveys, basic distribution of adults, pairs, nests, feeding areas, etc. could be presented to justify the taking of the breeding area when this site will be capped. If other areas of the base are expected to provide more suitable breeding habitat when the present habitat is taken, this should be discussed. The monitoring plan should include a description for tracking the success of these drastic changes for the gnatcatcher.	Based on the results of the risk assessment and other available information, the California gnatcatcher has been using the undeveloped 1200 acres to nest, forage, and breed. The reviewer does offer appropriate suggestions for the continuing monitoring of the species at MCAS El Toro, however, the monitoring plan of the gnatcatcher will need to be addressed in consultation with the USFWS. As discussed above, the Navy plans to implement the U.S. EPA presumptive remedies for municipal and military landfills at the two sites, thus severing exposure pathways to ecological receptors. The Navy has been and is in current dialogue with the U.S.F.W.S to provide effective protection for the California gnatcatcher during any construction activities. In addition, the Navy conducts periodic surveys of the gnatcatcher locations and has confirmed that the gnatcatcher continues to be viable at these sites.
10. I would request that the Navy provide a strategy for reducing the uncertainty at Site 2 for the estimate of ecological risk. **Although I did see much more toxicity information about the samples for Site 2, the potential risk to these receptors were not shown in any distributional pattern for this site. When a risk is estimated for a particular receptor, e.g., the deer mouse, where the total risk estimate by hazard quotient was reported to be 52 for site 2, the important questions are, "Where is risk the highest? Does the high**	**RESPONSE 10:** This information was not presented because we believe that there is little to no potential for adverse impacts to the receptors at the site. Comparison (see response to comment 8 above) with the reference site indicates that COPEC exposures for the receptors are not significantly different from the reference site. In addition, with the information generated by trapping deer mice at the site, whole body COPEC levels are not different from reference or control sites in other areas. These results indicate that although hazard quotients are greater than one, the bioavailability of COPECs

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risk for the deer mouse overlap with other receptors? What is the significance i.e., meaning for the hazard quotient at the reference site being above 42? Is the hazard quotient sensitive enough to discern real differences for these chemicals, endpoints, and receptors with the data that were used? Is this reference site appropriate when every receptor had a demonstrated hazard quotient above 1.0, a value that suggests that a significant risk is potentially present?	at the sites and reference site is probably much less than the assumed value for 100%. It is unlikely that COPECs present in soil would be at their most bioavailable or soluble form in nature. The bioavailable fractions of COPECs are likely to be several orders of magnitude lower than assumed in the risk assessment. Results from a similar ecological risk assessment in a wetland revealed that the bioavailable fraction of 5 metals in soil and sediment were less than 0.1 percent for small mammal receptors (as referenced in the RI to Pascoe et al., 1994). Distributional analysis of risk quotients is beyond the agreed upon ecological risk assessment work plan for these sites. Considering that the presumptive remedy of capping will include consolidation of wastes and a cap covering many acres, the distributional analysis is a not an appropriate consideration.
Risk characterization should not be a repeat of the hazard quotient results but a comprehensive comparison and contrasting of the estimated effects and the distribution of contaminant concentrations that are observed at the site. The risk characterization should place risk estimates in the context of the types and extent of anticipated effects which may be evaluated in context of several variables: **1. the nature and magnitude of effects;** **2. the spatial and temporal patterns of effects;** **3. the duration of effects, and** **4. the potential for the system or species to recover from the effects**	**RESPONSE:** The risk characterization discussion presented information derived from the risk calculation in addition to the data generated from field activities (i.e., small mammal trapping and ecologically relevant soil sampling). The risk estimates were then compared with those risk estimates derived from the reference site. The reference site was selected because it was ecologically relevant for the risk assessment of the two sites: identical climate, identical geological formations, similar vegetative cover, and no history of chemical releases. Based on the results on the risk assessment, it is unlikely that adverse impacts to ecological receptors would be associated with the landfills.

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I don't believe that the Navy has provided an adequate risk characterization that addresses the above four points.	

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ENCLOSURE A	
DRAFT PHASE II FEASIBILITY STUDY REPORT, SITE 2	
p2-58, Ecological Risk Assessment - The material presented in this section is a recap of the estimation of the hazard quotient and hazard index from the RI document. The feasibility study as is presented is incomplete because there are no estimates of the risk or changes in risk provided with each remedial option. **My review of each option and the impact to the ecological resources at the site as reported by the Navy are as follows:**	**RESPONSE:** The draft final FS for the Site 2 includes a discussion of risk reduction in Section 5 of the FS and Tables ES-3 and 6-4 as part of the summary of the effects of the alternatives on the overall protection of human health and the environment. Therefore, the Navy believes this comment has been addressed.
Option 1 – The no action option; offers no protection of ecological resources from the contaminants as discussed in what is called the "baseline" risk assessment as all of the hazard indices were above "one" indicative of potential problems, none of which were sufficiently verified (p7-26, Table 7-7).	**RESPONSE:** This is stated in Section 5 and Tables ES-3 and 6-4.
Option 2 – Institutional controls; this option is essentially the same as Option 1 with regard to the risks to ecological resources, basically no protection.	**RESPONSE:** Comment noted.
Option 3 through Option 5, all parts – Will have the same effects on the ecological resources of the site. Although, a cap/barrier/cover will eliminate the exposure route from the surface soils to the ecological resources, this remedy will essentially destroy the breeding grounds of the gnatcatcher and probably destroy the feeding grounds as well, thus, can hardly be a benefit to this important ecological resource. Option 5a-d as shown on pES-7, Table ES-3, makes misleading statements, "Allows reinvasion of coastal sage" and a statement that these options "Provide a net gain in gnatcatcher habitat" when in fact the cap will destroy the only breeding territory without any statements much less evaluation of the	**RESPONSE:** The Navy considers that severing exposure pathways by capping is an effective method to protect the California gnatcatcher. The disruption to the habitat is a short-term impact that is out-weighed by the long-term benefits of providing a more natural environment than current conditions. Any impacts to the California gnatcatcher are and will continue to be discussed with the USFWS as part of the consultation with this agency.

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time required for regrowth (i.e., "re-invasion") of the vegetation for nest sites.	
Figure 2-6 - Shows the California gnatcatcher territory and vegetation types within the site boundary, an interesting figure because the breeding territory is not within the coastal sage scrub, but in the riparian wash area. Figure 2-9 shows the Phase 1 sample results for shallow soil where one sample (sample 02_SA3) was collected close if not in the breeding area of the gnatcatcher. Figure 2-10 shows the Phase 2 sample results for shallow soil where one sample (sample 02BS14) was collected slightly above the breeding area of the gnatcatcher. The contaminant lists are very close to the same with TPH being dominant in the Phase 1 sample and PAHs and pesticides dominating the Phase 2 sample. The Feasibility Study did not sample in any areas close to the breeding area of the gnatcatcher, thus the distribution of contaminants are expected to extend through the breeding area of the gnatcatcher based on the data presented.	**RESPONSE:** On Figure 2-11, a surface soil sample was collected within the breeding area (02SB1). No contaminants were detected in this sample, therefore only the location is shown in the FS report. Sample 02SB14 was taken from the landfill and was expected to have detectable levels of contaminants. Sample 02_SA3 was collected in the wash and, for this sample, the concentrations of petroleum hydrocarbons are derived upstream of the landfill. Therefore, to make an assertion that distribution of contaminant levels extend throughout the breeding area can not be supported on actual site conditions.
The ecological risk assessment information presented in this document was based entirely on the RI results, summarized in this document, as there were no further data collections for the Feasibility Study. As stated above, this strategy does not provide any assessment of the level of protection or correction that any of the remediation alternatives would provide. Most important, the risk assessment as presented in the RI is flawed in that it stops at the predictive phase for the most part rather than providing data to validate the predictions to reduce uncertainty.	**RESPONSE:** It is correct to say that the FS summarizes the RI findings. However, the reduction of risks is presented in Tables ES-3 and 6-4 and in Section 5.
Following this strategy (of not verifying the predictions), the Navy is forced to provide explanations for predicted risk that are greater than one, which includes all of the receptors for site 2. The use of a reference site in this ecological risk assessment is flawed, because all of the hazard indices are above 1.0 at the reference site, which suggests that the reference site is not representative of the local area (i.e., an area similar	**RESPONSE:** As discussed above, the location and sampling activities at the reference site had concurrence from the BCT. It is not unusual to have hazard quotients greater than 1 due to metals where naturally occurring metal concentrations are high. All sampling locations for the ecological risk assessment were concurred with by the BCT.

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to the habitat of the potentially impacted site, without the site contaminants) or, the data and techniques used for the hazard quotient estimates are questionable, or both. Hazard indices, like hazard quotients, if less than one are generally considered to be low risk (with good data quality and low uncertainty) and any ratios above 1 are considered to suggest a likely risk that must be examined further i.e., validation. With the effort that went into producing the hazard quotient for all of the contaminants and the receptors, the Navy sort of dismisses the key decision point (i.e., ratio greater than one) that has been traditional for this approach with the statement, "However, a hazard index greater than one is not necessarily indicative of adverse effects associated for a given COPEC or ecological receptor because of the use of uncertainty factors used to derive toxicity criteria." None of these uncertainty factors are addressed in the transferring an LOAEL to an NOAEL. What is the range of risk, low and high for these kinds of manipulations? Ignoring the results of the HQ and HI results is well demonstrated as shown in the determination of the hazard index for Site 2: The deer mouse hazard index is 52; the total hazard index for the American robin is approximately 1,200; the total hazard index for the California quail is approximately 63; the total hazard index for the coyote at Site 2 is approximately 120; and the total hazard index for the red-tailed hawk is approximately 16. These are the results of the HQ approach used by the Navy and then disqualified because of high uncertainty and a general lack of data.	In the end, because the presumptive remedy of capping is the preferred alternative, this remedial alternative will sever exposure pathways and provide a reduction in risks, especially to the California gnatcatcher. In addition, the draft final RI includes a discussion of the ecological significance of the HI and HQ. The reasons for the high HQ values are discussed here and the reasons why these HQ values are not representative of site conditions are thoroughly discussed.
The hazard quotient approach is shown to be questionable in this presentation by the recognition of the lack of "toxicity" data, then, there is a reliance on the use of surrogate data instead of the site specific forms of the data. The argument that "estimated" risk values presented are really not significant because of the lack of data or comparable data only confirms the inappropriate use of the hazard quotient approach and the needs or data collection for the Feasibility Study. The Navy was aware of	**RESPONSE:** The risk characterization discussion presented the information derived from the risk calculation in addition to the data generated from field activities (i.e., small mammal trapping and ecologically relevant soil sampling). The risk estimates were then compared with those risk estimates derived from the reference site. The reference site was selected because it was ecologically relevant for the risk assessment of the two site: identical climate, identical geological formations, similar vegetative cover, and no history of

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the lack of toxicity data before the RI effort, however, the approach was continued. The use of an approach with insufficient data is illogical, however, stating that the results of the assessment is questionable because of the lack of data is inexcusable. The lack of data should have been addressed rather than completing a process with little or no data and then questioning the results because there are no data.	chemical releases. Based on the results on the risk assessment, it is unlikely that adverse impacts to ecological receptors would be associated with the landfills. The Navy does not feel that further consideration of the ecological risk assessment is appropriate. Surrogates were selected based on their similarity to the ecological receptors.
The use of the hazard quotient has become the standard for the predictive phase of ecological risk assessments, however with high uncertainty and the use of surrogates as presented here, validation of the predictions is always recommended. Even by the Navy's own estimates, the recommendations that are apparent here for verification include aluminum, antimony, cadmium, selenium, acenaphthene, benzo(e)pyrene, benzo(g,h,i)perlene, chrysene, fluorathene, MCPP, methoxychlor, phenanthrene, and pyrene. Surface samples are suggested for at least the area in and near the breeding area for the gnatcatcher or across the surface area of the landfill for the above contaminants to validate the predictions in their respective hazard quotients. This strategy would have provided an actual estimate for the no action option and with combined samples and observations on the gnatcatcher for distribution and nesting success, an estimate of what will be lost by capping the breeding area could have been made. Targeted sampling and chemical analyses would have been the most logical strategy to validate the risk predictions.	**RESPONSE:** The Navy does not concur with this comment. No further site characterization is required because the presumptive remedy of landfill capping severs the exposure pathway. Therefore, risk reduction is achieved.
Monitoring Plan. The Navy should describe the process that will be used to monitor the California gnatcatcher when the cap is in place resulting in a great disruption to the breeding area for this species.	**RESPONSE:** Monitoring of the California gnatcatcher will be negotiated with the USFWS as part of the consultation with this federal agency.