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MCAS EL TORO
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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

October 9, 1996

Joseph Joyce
BRAC Environmental Coordinator
Environment and Safety (Code 1AU)
MCAS El Toro
P.O. Box 95001
Santa Ana, CA 92709-5001

Dear Mr. Joyce:

EPA has finished review of the "Draft Final Phase II Remedial Investigation Reports-Operable Unit 2B (Sites 2 and 17)." The reports are acceptable without revision, however, the attached comments (Enclosure A) should be addressed in a technical memorandum and many are applicable to future reports completed for MCAS El Toro. These comments were not sufficiently addressed in the response to comments. Additionally, the comments from the technical reviewer are included for the Site 2 Feasibility Study. If you have any questions regarding these comments, I can be reached at 415/744-2368.

Sincerely,

Bonnie Arthur

Bonnie Arthur
Remedial Project Manager
Federal Facilities Cleanup Office

cc: Tayseer Mahmoud, DTSC
Larry Vitale, RWQCB
Bernie Lindsey, Southwest Div.

Enclosure A

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

October 9, 1996

MEMORANDUM

SUBJECT: Review of El Toro Draft Site 2
Draft Final RI and the Draft FS Ecological Risk Assessment

FROM: Clarence A. Callahan, Ph.D.
Biologist, Technical Support Section

TO: Bonnie Arthur, Remedial Project Manager
Navy Section

I have compared the response to comments with the new material to determine if the responses are adequate or provide sufficient explanation for the observed data and expected risk based on the risk assessment. I have also looked at the Draft Phase Feasibility Study Report -Site 2 and comments are provided.

Review of Draft Final Phase II, RI Report Operable Unit 2B, Site 2.

1. Section T.1.1, Chemicals of Potential Ecological Concern.
   Response is satisfactory.

2. Same par, second bullet, what was 2-methyl-4-chlorophenoxyproprionic acid
   Response is satisfactory.

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.

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

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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?

Where did the soil ingestion rates come from as the Beyer et al (1994) paper reports less than 2% for the white footed mouse and 5500mg/day seems high? From Beyers'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.

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 pp7-23 through 7-40). From section 7.4, p7-22, "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.

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 2.5mg/kg/day is the appropriate toxicological NOAEL based on 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 alterations 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. 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.

4. pT-6, Receptor Exposure Intake Factors, second paragraph; coyote, forage area; ingestion of incidental soil. The Navy concurs.

5. Table T-4, Screening Criteria for Soil COPECs. 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.

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 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 2.5mg/kg/day is the appropriate toxicological NOAEL based on 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 alterations 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

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<u>NOAEL conversion, the final TRV should be 2.5mg/kg/day.</u>

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:

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 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."

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The Navy's response appears to be sufficient.

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.

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.

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 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?

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.

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 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?

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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.

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

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:

Option1 - 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).

Option 2 - Institutional controls; This option is essentially the same as Option 1 with regard to the risks to ecological resources, basically no protection.

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 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.

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.

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 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 uncertainty discussion, especially how the range of the uncertainty introduced when transferring an LOAEL to a 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.

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 need for data collection for the Feasibility Study. The Navy was aware of 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.

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, fluoranthene, 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.

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.