

## DEPARTMENT OF TOXIC SUBSTANCES CONTROL

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SUBMIT  
CODE 18  
25 JUN 96 01 07

June 19, 1996

Mr. Joseph Joyce  
BRAC Environmental Coordinator  
U.S. Marine Corps Air Station - El Toro  
P. O. Box 95001  
Santa Ana, California 92709-5001

**COMMENTS ON DRAFT PHASE II REMEDIAL INVESTIGATION REPORT FOR THE ORIGINAL  
LANDFILL, SITE 3, OPERABLE UNIT 2C, MARINE CORPS AIR STATION (MCAS) EL TORO**

Dear Mr. Joyce:

The California Environmental Protection Agency (Cal/EPA) has completed the review of the above subject document dated April 19, 1996, prepared by Bechtel National, Inc. The report presents the results of Remedial Investigation (RI) conducted at Site 3, the Original Landfill. Site 3 is one of two sites in Operable Unit 2C for the MCAS El Toro.

This letter is to transmit the enclosed Department of Toxic Substances Control (DTSC) comments (and the California Integrated Waste Management Board comments). The Regional Water Quality Control Board comments will be submitted by DTSC by the end of the month. The report is well written. A few clarifications and modifications are needed as outlined in the enclosed comments. Please incorporate the agreed upon comments, where appropriate, and send us a response to comments along with a revised document.

Thank you for your cooperation. If you have any questions, please call me at (310) 590-4891.

Sincerely,

*Roy Yeam*  
for Tayseer Mahmoud  
Remedial Project Manager  
Base Closure Unit  
Office of Military Facilities

Enclosures

cc: See Next Page



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*Mr. Joseph Joyce*  
*June 19, 1996*  
*Page 3*

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*Mr. Joseph Joyce*  
*June 19, 1996*  
*Page 4*

bcc: Mr. Roy Yeaman  
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Base Closure Unit  
Office of Military Facilities

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Base Closure Unit  
Office of Military Facilities

Mr. Tayseer Mahmoud  
Base Closure Unit  
Office of Military Facilities

**DEPARTMENT OF TOXIC SUBSTANCES CONTROL**  
**Comments on**  
**Draft Phase II Remedial Investigation Report For Site 3, OU-2C**  
**Marine Corps Air Station-EI Toro**  
**Dated April 1996**

**GENERAL COMMENTS:**

**SPECIFIC COMMENTS:**

**1. Executive Summary, Remedial Investigation Scope, Figure ES-1**

Show location of Unit 3, solvent spill area on Figure ES-1.

**2. Executive Summary, Nature and Extent of Contamination, page ES-6, last paragraph**

It is mentioned in the report that accedence of drinking water maximum contaminant levels (MCLs) for benzene appears to be derived from Tank Farm No. 5. Please show location of Tank Farm No. 5 on Figure ES-1.

Top of page ES-7: Provide a statement that gross alpha and beta exceed MCLs if so.

**3. Executive Summary, Conclusions, page ES-10**

For groundwater contamination decision, it is mentioned that the remedial design will not need to address benzene contamination. Please discuss the mechanism that will be used to address the benzene contamination. Also, when will the Navy submit such proposals to the regulatory agencies.

**4. Section 1.1.1, Guidance and Agreement, Figure 1-3**

Revise Figure 1-3 to add the Remedial Design step before Remedial Action. Also, add Certification step after Operation and Maintenance.

Reference to Department of Health Services now being California Environmental Protection Agency (Cal/EPA) is not accurate. The correct reference is Department of Toxic Substances Control (DTSC). Both DTSC and California Regional Water Quality Control Board (RWQCB) are under the umbrella of Cal/EPA.

Rewrite the sentence regarding FAA signatory agencies as follows: "The BCT consists of representatives from SWDIV, U.S.EPA, and Cal/EPA (DTSC & RWQCB)."

**5. Section 1.1.2, Remedial Investigation Approach**

Reference to Cal/EPA should be changed to DTSC.

**6. Section 1.2.2.2, Recent Station Operations**

Revise the 1st sentence in the 2nd paragraph to read as follows: Currently, hazardous materials/wastes are managed under appropriate Federal, State, local, and DoN requirements.

Also, reference to on-Station RCRA-Interim-Status Storage Facility is not accurate because the term Interim-Status refers to temporary authorization until a final permit is received from the regulatory agencies. Please note that MCAS El Toro was issued a RCRA Hazardous Waste Storage Permit in August 1993. DTSC terminated the permit on March 8, 1996 after we accepted the closure certification for Building 673-T3. MCAS El Toro is allowed to store hazardous waste at generator accumulation areas for periods less than ninety (90) days.

**7. Section 1.2.3.1, Phase I Remedial Investigation Results, page 1-3**

The text references soil and groundwater samples collected at Site 4. Please show location of Site 4 on Figure 1-4 for clarifications.

**8. Section 2.13, Investigation-Derived Waste**

Soil generated during the Phase II RI field procedures was containerized, sampled, and moved to Site 5 for storage. We like to point out that if the investigation-derived waste meets the hazardous waste criteria, MCAS El Toro is allowed to store it at Site 5 for periods less than ninety (90) days. Also, it must be managed under appropriate Federal, State, local, and DoN requirements.

**9. Section 3.1, Surface Features, page 3-1**

The list of DQO decisions should include the following to be added:

Identify the limits of exposed and buried landfill waste.

**10. Section 4.5.1, Volatile Organic Compounds, page 4-118, last sentence**

It is the opinion of the authors of this report that it is not clear whether the source of benzene contamination is due to the landfill, the tank farm, and/or Agua Chinon Wash. In other parts of the report it is mentioned that the contamination appears to be derived from Tank Farm No. 5. The discussion needs to be enhanced, clarified, and consistent throughout the report.

**11. Section 4.5.8, Radionuclides, page 4-141**

Total gross alpha measured in groundwater downgradient of the landfill at monitoring well 03-DGMW64 measured 28 pCi/L. This value exceeds U.S. EPA MCL of 15 pCi/L and it is twice the gross alpha (14.5 pCi/L) measured at the upgradient monitoring well 03-UGMW26. Total gross alpha does not help too much in determining whether or not there is an actual release from the landfill. I suggest that you conduct isotopic analysis for Radium-226, K-40, etc., and anything that might have been disposed in the landfill. Compare the numbers to background to determine what is making the higher reading. When you generate the information, please send an additional copy to:

Ms. Darice Bailey  
California Department of Health Services  
Environmental Management Branch  
601 North 7th Street, MS 396  
P.O. Box 942732  
Sacramento, California 94234-7320  
(916) 324-2209

Please correct the typographical error in the last sentence of the 2nd paragraph.

**12. Section 5.1.3.3, Migration in Groundwater, page 5-10**

Please discuss the mechanism that will be used to address the benzene contamination. Also, when will the Navy submit such proposals to the regulatory agencies.

**13. Section 5.3.3.1, Volatile Organic Compounds in Groundwater, page 5-25**

Reference to benzene concentration in groundwater being 5 µg/L is a typographical error. The correct reference is 21 µg/L.

**14. Section 6, Human-Health Risk Assessment**

See attached Memorandum dated June 7, 1996 from DTSC staff Toxicologist,  
Dr. John Christopher.

## DEPARTMENT OF TOXIC SUBSTANCES CONTROL

Region 4  
245 West Broadway, Suite 425  
Long Beach, CA 90802-4444



## MEMORANDUM

TO: Mr. Tayseer Mahmoud  
Office of Military Facilities  
Region 4

FROM: Sherrill Beard, RG *Sherrill Beard*  
Geological Services Unit  
Region 4

Concur: Karen Baker, CHG *Karen Baker*  
Geological Services Unit  
Region 4

DATE: 13 June 1996

SUBJECT: Comments on "Draft Phase II Remedial Investigation Report Operable Unit 2C  
- Site 3, Marine Corps Air Station El Toro, California"

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As requested by the Office of Military Facilities, the Geological Services Unit (GSU) of the Department of Toxic Substances Control (DTSC) has reviewed the document entitled Draft Phase II Remedial Investigation Report Operable Unit 2C - Site 3, Marine Corps Air Station (MCAS) El Toro, California (the Report), dated April 1996. The document was prepared by Bechtel National, Inc. (Bechtel) for Southwest Division Naval Facilities Engineering Command (Navy).

This review focuses on geology and hydrogeology of the Report, in particular, Section 4 - Nature and Extent of Contamination, Section 5 - Fate and Transport, and Section 7 - Conclusions and Recommendations. Overall, the Report reflects the proposed field investigation, in addition to discussions and decisions resulting from the weekly technical meetings. The Report contains a great deal of the data collected during the field investigation, however, more discussion of landfill boundaries and water quality interpretation is needed. Specifically, regarding DQO decisions number one, "identify limits of exposed and buried waste", and number 5, "determine if leachate is impacting soil or groundwater." The Report does not clearly outline the foundation to support the "inferred" bottom boundary of the landfill, therefore, in the final draft report the discussion should reflect the uncertainty of the boundary interpretation. More significant, the Report presentation needs to clearly identify if the landfill leachate is impacting groundwater. There is inconsistency in the discussion included in Section 7 about the landfill leachate and the impact to



soil and the groundwater. Furthermore, when evaluating the presumptive remedy with regard to groundwater, the existing wells should be evaluated in terms of adequately being able to detect a release from the landfill and additional monitoring wells should be installed, if needed. Due to the nature of the investigation, it was not determined if there may exist a reservoir of contaminants within the unsaturated section. Therefore, a contingency plan should be developed if, the currently low levels of contaminants in groundwater, show elevated concentrations in the future.

### Specific Comments

1. **Executive Summary, Remedial Investigation Scope, Figure ES-1;** Show former Site 3 boundaries on Figure ES-1 and provide an explanation why site boundaries were reevaluated and expanded. This information will support the reasons why the scope of the investigation was increased.
2. **Executive Summary, Figure ES-1, Figure 1-2 and other applicable maps;** All maps showing the boundaries of Site 3 should be revised to show consistency throughout the Report.
3. **Executive Summary, Nature and Extent of Contamination, page ES-6;** The estimation for the volume of waste should be revised to reflect recent information collected during the Phase II investigation.

Soil gas results should not be compared to California Air Resources Board (CARB) values. Values generated from the CARB study are intended for the comparison of surface air samples not subsurface soil gas samples.

4. **Executive Summary, Human-Health Risk Assessment, page ES-8 and Section 6.3.8, Toxicity Criteria for Chromium, page 6-16;** Total chromium values, instead of hexavalent chromium values, for groundwater should not be used for risk-assessment. This approach will result in an over estimation of risk. Samples should be collected and speciated for hexavalent chromium and analysis of risk should be determined based on concentrations actually detected at the site and not on the assumption that concentrations of hexavalent chromium in groundwater are low, as describe in Section 6.3.8.
5. **Section 1.2.2.3, History of Site 3 Landfill Operations, forth bullet, page 1-18;** Prior to referencing Site 4, the Ferrocene Spill Area, a description of Site 4 should be provided in Section 1.2 or Section 1.2.1.1.
6. **Section 2.7, Leachate Sampling, page 2-29;** Prior attempts at sampling the lysimeters have proven unsuccessful, therefore, it is recommended to limit future sampling efforts.

7. **Section 2.8.1, Monitoring Well Development and Dedicated Pump Installation, page 2-32**; Prior to installation or replacement of additional dedicated pumps, BCT approval should be obtained. Many of the dedicated pumps installed in 1992 and 1993 are no longer functional, somewhat due to the corrosive nature of the groundwater. Therefore, it would be prudent to utilize temporary pumps for future groundwater sampling events.
8. **Section 3.5.2, Regional Occurrence and Movement of Groundwater, Figure 3-6, page 3-19**; In the legend of this figure, the explanation for the groundwater divide depicted near Site 2 should be revised to read "Groundwater Divide Location and Trend Inferred."
9. **Section 3.6.2, Site 3 Aquifer Hydraulic Properties and Section 3.6.3, Site 3 Aquifer Geotechnical Properties, page 3-25**; Provide a discussion comparing the differences between hydraulic and geotechnical aquifer permeabilities. The permeability values reported are different by several orders of magnitude. Additionally, it should be noted in the discussion that the samples collected for the aquifer geotechnical properties are from the lysimeter locations, therefore, the soil samples were collected from the vadose zone and not from the aquifer. Also please cross-check the geotechnical results in Appendix K with the values reported in Table 3-3. Data reported for specific samples in Appendix K are reported for different samples in Table 3-3. For example, percent moisture for sample 76C0008 is reported as 9.4 in Table 3.3 but in Appendix K sample 76C009 is reported as having a percent moisture of 9.4. There are several other discrepancies of this nature between Table 3.3 and Appendix K.
10. **Section 3.6.4.1, Surface Water Quality, page 3-26**; Note: the sixth line of first paragraph, change 03SW1 to 03SW3.
11. **Section 3.6.4.2, Groundwater Quality, page 3-28**; Please edit and delete the appropriate paragraphs in this section.

Most of the reasoning discussed as to why iron and manganese results are inconclusive with regard to potential degradation of groundwater from leachate of the Site 3 landfill are due to sample collection (high turbidity values) and laboratory duplicate results (not within control limits). If the laboratory duplicate results were not within control limits the sample lot should have been rerun. Since, it is assumed by the reviewer, that the samples were not rerun, it is suggested to use past data, including results from the most recent groundwater sampling event that occurred in January and February of 1996 (collected by CDM Federal Programs Corporation and reported in the draft quarterly groundwater monitoring report dated April 18, 1996) to interpret the iron and manganese analytical data.

The discussion about major cations and anions is unclear as to its purpose. The discussion leads the reviewer to assume that groundwater beneath Site 3 may be impacted by groundwater that has migrated beneath Sites 2, 5, and 17. Additionally, there is no support provided in the Report showing that Sites 2, 5, and 17 are upgradient, except perhaps Figure 3-6, which shows all relevant groundwater contours as inferred. Furthermore, if this section is going to state that Stiff and Piper diagrams generated from Site 3 data are similar to diagrams generated from data collected at other landfills located at MCAS El Toro, then the significance of the comparison should be addressed.

12. **Section 4, page 4-2, forth bullet, and Section 4.4, page 4-36;** See the attached toxicologist's comment, number 1.
13. **Section 4, Nature and Extent of Contamination, page 4-2, second full paragraph;** Please clarify "other agency standards". Provide a list of the standards that are used to identify COPCs.
14. **Section 4.1.6, Aerial Photograph Review, page 4-8, first paragraph;** Please show the disturbed area and the several stained areas located east and southeast of the existing site boundaries, as shown on the 1958 aerial photograph. Also provide an explanation for the existence of such features.
15. **Section 4.1.7, Interviews with MCAS El Toro Personnel, page 4-8, third bullet;** If available, provide the location of the 3,000 cubic yards of excavated soil that contained waste.
16. **Section 4.4.1.2, Subsurface Soil, Table 4-17 and Table 4-18;** In addition to U.S. EPA Region IX Residential PRGs, please provide background concentrations presented in Appendix L, Table L-4.
17. **Section 4.4.2.1, Shallow Soil, page 4-69, sixth paragraph;** Please provide further discussion about the statement "...the laboratory noted that the chromatograph patterns for these analyses were not typical for these fuels."
18. **Figure 4-12, page 4-137;** Please show the boundaries of Tank Farm No. 5. Section 4.5.1, Volatile Organic Compounds, indicates benzene detects in monitoring wells 04\_DBMW40 (20 ug/l) and 04\_DGMW63 (5 ug/l) may be the result of activities at Tank Farm No.5, therefore it is relevant to show the geographic relationship of the tank farm to Site 3.

19. **Section 4.5.6, Metals, page 4-140;** The discussion regarding elevated concentrations of nickel being attributed to naturally occurring processes needs further support. There is insufficient data presentation to support this conclusion.
20. **Section 5.3.2.1, Volatile Organic Compounds, page 5-23;** Support should be provided either in this section or in prior sections detailing the conclusion that benzene detects in groundwater are a result of the adjacent tank farm. Due to the limited nature of the investigation, relative to the size of the site, it is difficult to conclude that the occurrence of benzene in groundwater exclusively is a result of the tank farm area.
21. **Section 5.3.3, Groundwater Transport, page 5-25;** Change upstream and downstream to upgradient and downgradient.
22. **Section 5.3.3.1, Volatile Organic Compounds in Groundwater, page 5-25;** This section should state that the maximum benzene concentration reported in groundwater for the Site 3 monitoring wells is 5 ug/l, additionally it should state 20 ug/l of benzene was detected at monitoring well 04\_DBMW40.
23. **Section 7, Conclusions and Recommendations, Table 7-1, page 7-3;** The "Nature and Extent" entry for DQO Decision 5 should be reevaluated. Low levels of SVOCs were detected in 21 of 21 groundwater samples collected and analyzed from Sites 3 and 4, yet it is stated that water quality parameters indicate that the landfill contents have not leached to groundwater. Please provide rationale for this interpretation.

The "Fate and Transport" entry for DQO Decision 6 should be revised to read "Landfill constituents are not predicted to leach to groundwater." In future documents, it is recommended to avoid using relative descriptors such as "significantly" without providing supporting data. It is difficult for the reviewer to interpret the impact a landfill may have to groundwater based on the statement "Landfill constituents have not significantly leached to groundwater."

24. **All Appendices;** It was our understanding that the primary reason each landfill site was submitted as an individual report was to make report writing and reviewing more manageable. Therefore, it is recommended that data included in the Appendixes are data that is applicable to the subject site of the report. Some appendixes, such as Appendix K, include data from other landfill sites.

**DEPARTMENT OF TOXIC SUBSTANCES CONTROL**

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**MEMORANDUM**

**TO:** Tayseer Mahmoud  
Office of Military Facilities (OMF)  
Southern California, Long Beach

**FROM:** John P. Christopher, Ph.D., D.A.B.T.  
Staff Toxicologist  
Office of Scientific Affairs (OSA)  
Human and Ecological Risk Section (HERS)

**DATE:** 7 June 1996

**SUBJECT:** MCAS El Toro: Draft RI Report for Site 3  
PCA: 14740 Site: 400055-45

A handwritten signature in cursive script, reading "John P. Christopher".

**Background**

Southern California Region 4 has asked OSA for continuing support on issues regarding risk assessment at Marine Corps Air Station (MCAS) El Toro, a closing base in Orange County which is also designated a Federal Superfund site. Remedial activities at this base are being directed by Naval Facilities Engineering Command, Southwest Division (SWDIV).

Site 3 is a landfill located to the east of the flight lines. During its several decades of operation, this landfill received various municipal, industrial, and construction waste. Future development for Site 3 is expected to be industrial in nature, but residential development could be located nearby.

**Document Reviewed**

We reviewed "Draft Phase II Remedial Investigation Report, Operable Unit 2C - Site 3, Marine Corps Air Station El Toro, California, CTO 0076/0135". This report, dated 12 April 1996, was prepared by Bechtel National, Inc., contractors to SWDIV. The request for OSA to review this report is dated 22 April 1996.

**Scope of Review**

The document was reviewed for scientific content. Minor grammatical or typographical errors that do not affect the interpretation have not been noted. However, these should be corrected in any future version of the document. We assume that sampling of environmental media, analytical chemistry data, and quality assurance procedures have been examined by regional personnel. If inadequacies in this regard for the purposes of risk assessment were encountered, they are noted. Any future changes or additions to the document should be clearly identified.

### **General Comments**

This is a thorough and especially well organized report. The risk assessment is well presented and adequate for the purposes of risk managers. We have some comments to which the Navy should respond, especially regarding chromium, but none of these should prevent the Navy from proceeding to finalize the RI report.

### **Specific Comments**

- 1. Use of Upper Tolerance Limits for Selecting Chemicals of Potential Concern (COPC), Appendix L, Sec. L.2.1:** The Navy selected the 95% upper tolerance limit on the 95th percentile ( $UTL_{95,95}$ ) as its comparator for the upper range of ambient concentrations of those metals found to be either normally or lognormally distributed; the maximum concentration detected ( $C_{MAX}$ ) was selected for the remaining metals. We do not accept the UTL as a comparator for the purposes of identifying COPC, because the method can be defeated with small sample sizes. With adequate sample populations, we favor the use of a simple estimate of a percentile for this purpose. We have expressed this to the Navy on numerous previous occasions.

At a meeting in San Francisco on 22-23 May 1996, the Navy presented convincing evidence the "percentile test" which we favor suffers from increasing probability of Type I error (*i.e.* wrongly deciding a metal is present above background concentrations) as the number of samples from the site and the number of comparisons against the percentile both increase. The Navy proposed that the "percentile test" be used in conjunction with other statistical tests of hypotheses, such as the Wilcoxon rank sum test, to permit formal estimates of Type I and Type II errors. We believe this approach is a good one and we recommend it for MCAS El Toro and other Navy bases.

- 2. Background Concentrations of Metals, Appendix L:** We find it surprising that metals found at high frequencies of detection failed tests for either normality or

lognormality (Table L-4). In particular, we are surprised at the results for As, Ca, Cd, Mn, Ni, and possibly Th. High frequencies of detection usually lead to easily recognizable distributions, unless multiple populations and/or contamination are present. Because the Navy did not provide plots of cumulative probability vs. concentration, we are unable to determine what these distributions look like. Please supply these plots for all 23 metals analyzed, as described on page L-2, to aid in performing the task in Figure L-1 labeled "Remove outliers or possibly contaminated data". For instance, the highest detected value of cadmium, 11.4 mg/kg is approximately ten times higher than we would expect to see for soils in Orange County. If this value does not belong with the background data set, exclusion of this bioaccumulative and very highly toxic metal as a COPC could be made in error.

3. **Hexavalent Chromium, Sec. 4.4:** Were analyses for hexavalent chromium performed? If so, where are the results? If analyses were not performed, please explain. In the absence of such analyses, chromium must remain a COPC in both soil and groundwater and be considered to be 100% in the hexavalent state. Some discussion of the treatment of hexavalent chromium can be found in the risk assessment in Section 6.3.8, but we found no mention of this in the site characterization in Chapter 4.
4. **Table 4-36:** Values for organic chemicals are given as mg/kg, whereas Tables 4-34 and 4-35 report these results as µg/kg. Please correct the discrepancy.
5. **Sediment and Surface Water, Secs. 4.6-4.7:** The data reported in these sections were collected in Augua Chinon Wash. We were under the impression that the drainage channels comprised Site 25. Will these data be reported again?
6. **Ecological Risk Assessment:** We do not find any mention of risks to non-human receptors. At the very least, a screening assessment is required to determine if any ecologically important habitat or chemicals of potential ecological concern are present.
7. **Groundwater Pathway, Sec. 6.2.2, p. 6-8:** Will risks and hazards upon exposure to groundwater be combined in any way with the assessment previously submitted for Operable Unit 1, the regional groundwater?
8. **Benzene in Groundwater, Table 6-1:** Benzene is reported as a detected analyte in groundwater in Table 4-31, but it does not appear as a chemical to be considered in Table 6-1. Please correct this error and include benzene as a COPC. This will affect estimates of risk for potential future off-site receptors.

9. **Exposure Point Concentrations, Appendix P, Tables:**  $C_{MAX}$  is selected as the exposure point concentration for nearly every organic COPC at Site 3. We do not fault the reasoning which led to these selections. However, USEPA guidance (RAGS Part A, 1989) recommends a measure of central tendency for the exposure point concentration as part of its definition of a reasonable maximum exposure. We believe the systematic overuse of  $C_{MAX}$  might be misleading to risk managers. While we do not have a ready overall solution for this problem, we recommend that the Navy identify for risk managers those instances where estimates of risks are driven by  $C_{MAX}$  and thus could be overestimated.
10. **Toxicity Criteria for Dermal Exposure, Sec. 6.3.6, p. 6-16, and Table PII-3:** "Dermal Reference Doses" in Table PII-3 should be altered to reflect the values for dermal absorption recommended in Table 2 of Appendix A of *Preliminary Endangerment Assessment Guidance Manual* (DTSC, 1994). This will affect the values shown for arsenic (3% dermal absorption), cadmium (0.1%), chlorinated dioxins and furans (3%), chlorinated insecticides (5%), polycyclic aromatic hydrocarbons (15%), and polychlorinated biphenyls (15%). Employing these recommended values will lead to changes in some of the estimated risks and hazards for all the receptor groups. For instance, cancer risks for industrial use are driven principally by dermal exposure to 2,3,7,8-tetrachlorodibenzo-*p*-dioxin (Table 6-2). Applying a dermal absorption of 3% would apparently lower the estimates below 1E-06.
11. **Hexavalent Chromium, Section 6.3.8, p. 6-16:** We disagree with the Navy's assertion that only a small fraction of total chromium in groundwater is likely to be in the hexavalent state. Hexavalent chromium, as chromate, is so very much more water soluble than most forms of trivalent chromium, such as chromic oxide, that it seems more likely to us that any chromium detected in groundwater will be hexavalent. As mentioned above, the absence of data on speciation of chromium presents an important data gap, leading to significant uncertainties.
12. **Risk Characterization, Sec. 6.4, pp. 6-17 ff.:** This section is well written and complete. Figures 6-2 through 6-7 are especially enlightening. It would be useful to number the tables in Appendix P and to provide in Section 6 references to key tables in Appendix P. Risks and hazards are quantified adequately for risk managers.
13. **Off-Site Residents, Sec. 6.4.1.3, p. 6-25:** In addition to the possible misidentification of the valence state of chromium in groundwater, as discussed above, this section contains other errors and should be rewritten. California EPA

does not publish classifications of carcinogens; this is done by USEPA. Chromium is classified a Group A carcinogen only via the inhalation route. It would be useful to name the other contributors to estimated cancer risk in groundwater, because this section seems to read as though the estimated risk of  $1.9E-04$  should be dismissed by risk managers.

14. **Conclusions, Sec. 7:** Table 7-1 presents a very useful and informative summary of findings and recommendations in the framework of the data quality objectives which guided the investigation. We disagree with the third to last bullet on page 7-19, in which the Navy states that groundwater is not a significant pathway for fate and transport. Nearly all the estimated risk to potential off-site residents comes from groundwater and these estimates are higher than for any other group of receptors. Therefore, groundwater is a crucial transport medium, in our estimation. Section 7.1.4 should be strengthened with comparisons to the "background" risks and hazards calculated in Appendix P. Section 7.2.1 should mention the lack of data on speciation of chromium in groundwater, which creates a large uncertainty in the estimates of risk.

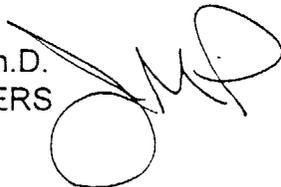
### Conclusions and Recommendations

The report is well organized and well presented. The risk assessment is quite good, but it can be made completely acceptable upon incorporation of our recommendations.

1. The Navy should address ecological risks at Site 3.
2. The Navy should present a complete characterization of ambient concentrations of metals, including cumulative frequency plots. The UTL should be discarded in favor of a simple estimate of a percentile, perhaps in conjunction with another statistical tool such as the Wilcoxon rank sum test.
3. Benzene should be addressed as a chemical of concern in groundwater.
4. When estimated risks are driven by the maximum concentrations detected instead of an estimate of central tendency, the uncertainty introduced should be clearly pointed out to risk managers in the risk characterization and conclusions.
5. Potential risks due to hexavalent chromium are dismissed with assertions about the low probability of finding hexavalent chromium in groundwater. We do not accept this. The Navy should perform the analysis and assess risks on the materials actually present.

Tayseer Mahmoud  
7 June 1996  
Page 6

Reviewer: James M. Polisini, Ph.D.  
Staff Toxicologist, HERS

A handwritten signature in black ink, appearing to be 'J.M.P.', written over a circular stamp or mark.

cc: Dr. M. Wade, HERS  
Mr. J. Paull, USEPA Region IX



Cal/EPA

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JUN 03 1996



Pete Wilson  
Governor

James M. Strock  
Secretary for  
Environmental  
Protection

Mr. Tayseer Mahmoud  
California Environmental Protection Agency  
Department of Toxic Substances Control  
Office of Military Facilities  
Southern California Operations  
245 W. Broadway, Suite 350  
Long Beach, California 90802-4444

Subject: Review of Draft Phase II Remedial Investigation Report for Operable  
Unit 2C - Site 3, Marine Corps Air Station, El Toro, California

Dear Mr. Mahmoud:

California Integrated Waste Management Board (Board) Closure and Remediation staff have reviewed the subject document (five volumes) dated April 1996, prepared by Bechtel National, Inc., on behalf of the Department of the Navy, for conformance with Title 14, California Code of Regulations (14 CCR), Division 7, Chapter 3, Article 7.8. These regulations consist of potential applicable or relevant and appropriate requirements for the Site 3 Landfill.

Generally, the environmental investigation appears to be fairly comprehensive and addresses all major issues which may be encountered at a waste disposal site. However, it should be pointed out that in order to provide a sound closure of the site, there are several concerns and limitations which should be noted. Specifically, we submit the following comments:

1. Since the landfill covers about 20 acres, it is recommended that differential settlement analyses be conducted. This may be accomplished by reviewing existing surveying records or by estimating based on the thickness, age and composition of wastes.
2. Surface and subsurface soil analyses indicated wide spread contamination with solvents, diesel fuels and other compounds. Because the text mentions relatively flat grades and ponding potential throughout the site, the issue of soil contamination and may be reevaluated depending on a proposed final grading plan if any earth material is to be moved around or off site.
3. While Figure 4-1 lists one of the map symbols as "1994 Blueprint Feature," the text refers to it as "the large rectangular area shown on the 1944 blueprint." Please explain this discrepancy. Also, please advise if more soil exploration information exists about that area.



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4. Section 3.1.4.3, Flood Discharge Estimates, mentions a flood-retarding basin as a discharge reducing measure which is to be implemented in June 1996. We request that this feature be shown on appropriate drawings.
5. Since the site is to be closed under the presumptive remedy approach, the extent of field investigation is satisfactory. However, should this site be affected by closure activities at other sites on the base (clean closure and/or landfill consolidation) or other than open, non-irrigated postclosure land use is proposed, further field explorations may be advisable.

Should you have any questions regarding this matter, please call me at (916) 255-1195.

Sincerely,



Peter M. Janicki  
Closure and Remediation South  
Permitting and Enforcement Division