STATE OF CALIFORNIA — ENVIRONMENTAL PROTECTION AGENCY

DEPARTMENT OF TOXIC SUBSTANCES CONTROL

Region 4
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(310) 590-4858

June 18, 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 COMMUNICATION STATION LANDFILL, SITE 5, 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 1996, prepared by Bechtel National, Inc. The report presents the results of Remedial Investigation (RI) conducted at Site 5, the Perimeter Road Landfill. Site 5 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 dated June 3, 1996 on the report. The Regional Water Quality Control Board comments will be submitted by DTSC before the end of the month. 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 Yeaman

for Tayseer Mahmoud
Remedial Project Manager
Base Closure Unit
Office of Military Facilities
Southern California Operations

Enclosures

cc: See Next Page

cc: Ms. Bonnie Arthur
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Lt. Hope Katcharian
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DEPARTMENT OF TOXIC SUBSTANCES CONTROL
Comments on
Draft Phase II Remedial Investigation Report For Site 5, OU-2C
Marine Corps Air Station El Toro
Dated April 1996

GENERAL COMMENTS:

The report presents the results of the Remedial Investigation (RI) conducted at Site 5, the Perimeter Road Landfill, to support decisions regarding the need for and scope for future remediation at the site. Data to support the landfill extent includes visual mapping, surface geophysics, trenching, soil borings, topographic and base maps, aerial photograph review, and interviews with MCAS El Toro personnel. The report contains data and results from the Phase II RI. In addition, the report presented previous investigations such as the Phase I RI and Air SWAT. To determine the nature and extent of contamination, the report described the sampling activities performed in air, soil gas, soil, and groundwater as follows:

Air Sampling: Four types of air sampling were conducted: instantaneous surface sampling over the entire landfill; 25-minute integrated surface samples from the landfill surface; 24-hour ambient air samples at the landfill perimeter; and isolation flux chamber samples from the landfill surface. Fifteen air samples were collected during the Phase II RI, including three integrated air samples, six ambient air samples and six isolation flux chamber samples. In addition, instantaneous surface sampling for methane was conducted over the entire landfill. Air sampling indicated that volatile organic compounds (VOCs) and methane are being emitted from the surface of the landfill. VOCs and methane were also detected in air samples during an Air SWAT in 1990.

Soil Gas: During a 1990 Air SWAT, five soil gas samples were collected at depths from eight to fifteen feet below ground surface (bgs) and analyzed for ten specific VOCs. Four VOCs were detected: Methylene chloride, chloroform, tetrachloroethane (PCE), and trichloroethane (TCE). During Phase II RI, twenty-one shallow soil gas samples were collected at seventeen locations from depths ranging between eight and fifteen feet bgs. Three of the seventeen soil gas samples detected 1,1,2-Trichlorotrifluoroethane (F-113) at concentrations of 1,1, and 2 µg/L and TCE at concentrations of 5, 7, and 10 µg/L. Ten deep soil gas samples were obtained from three locations at depths ranging from 81 to 95 feet bgs. TCE was detected at one of the three locations and toluene was detected at two of the three locations. The maximum TCE and toluene concentrations detected was 5 and 15 µg/L, respectively.

Perimeter Landfill Gas Migration Sampling: Three perimeter landfill gas migration samples were collected at three sampling stations inside the perimeter of the landfill during the Air SWAT. The air samples were analyzed for TOC as methane. No methane was detected in these samples. Eleven perimeter landfill soil gas samples were collected from three sampling locations during the Phase II RI. Samples were collected at depths ranging from 10 to 80 feet bgs. The samples were analyzed for VOCs and methane. The analyses of the samples detected methane in nine of the eleven samples. At one of the sample locations, TCE and Freon 113 were also detected.

Soil Sampling: Five surface soil samples were collected from five sampling locations during the Phase I RI. Two additional samples were collected at depths of five and ten feet bgs. The analyses

Soil Sampling: Five surface soil samples were collected from five sampling locations during the Phase I RI. Two additional samples were collected at depths of five and ten feet bgs. The analyses detected the VOC toluene, petroleum hydrocarbons, the pesticides 4,4'-DDT, and methoxychlor and the herbicides 2,4,5-TP (Silvex) and MCPP, and metals. Of the COPCs detected, MCPP exceeded the corresponding residential PRG and lead exceeded the MCAS El Toro background calculation.

Seventeen subsurface soil samples (samples greater than ten feet bgs) were collected from four locations during the Phase I RI. Eight additional subsurface soil samples were collected during the Phase II RI soil borings and installation of lysimeters and monitoring wells (four locations). The following COPCs were detected in one or more of the subsurface soil samples: acetone, TRPH, TPH as motor oil, TPH as diesel, bis(2-etlhexyl)phthalate, butylbenzylphthalate, butylbenzylphthalate, MCPP, and thallium. Of the COPCs, MCPP exceeded the U.S. EPA residential PRGs and thallium exceeded MCAS El Toro background concentrations. TPH as diesel was detected at concentrations as high as 21,800 mg/kg at sample location 05_DGMW67. The maximum detected activities for gross alpha and gross beta were 17.6 and 21.3 picocuries per gram (pCi/g), respectively.

Leachate: Three lysimeters were installed, however, due to technical difficulties, no samples were collected.

Groundwater: Groundwater contamination was identified during the Phase I RI based on samples collected from four monitoring wells. During the Phase II RI, one additional monitoring well was installed. VOCs, SVOCs, metals, petroleum hydrocarbons and gross alpha and beta activity have been detected in groundwater samples. The VOCs methylene chloride, benzene, chlorobenzene, chloromethane, PCE, toluene, and TCE were detected at concentrations below U.S. EPA MCLs. TPH as motor oil was detected at 0.22 mg/L from one sample collected from monitoring well 05_UGMW27. The SVOCs bis(2-ethylhexyl)phthalate, diethylphthalate, and di-n-butylphthalate were detected. The herbicide 2,4,5-trichlorphenoxyacetic acid (2,4,5-T) was detected, however, it was also detected at the same concentration in the blank sample. The metals manganese, nickel, and thallium were detected in one or more samples at concentrations above U.S. EPA MCLs. The maximum detected activities for gross alpha and gross beta were 24.9 and 53 picocuries per liter (pCi/L), respectively.

SPECIFIC COMMENTS:

1. Executive Summary, Conclusions, page ES-7

There is a discrepancy in the reported groundwater gradients. For example, page ES-7 and the middle of page 3-16 contain the statement that the gradient ranges from 0.005 to 0.0025 feet per foot. However, on the bottom of page 3-16, the report states that the overall gradient through the center of Site 5 is 0.05 feet per foot. Please clarify the discrepancy in the reported groundwater gradient.

2. Executive Summary, Conclusions, page ES-9

The Data Quality Objectives decision "Are landfill gases migrating out of the landfill at ground surface or in the subsurface" should include a discussion of the perimeter soil gas sample analyses. Six of eight perimeter soil gas samples detected methane and one sample detected F-113 and 1,1-DCE. Two of the samples that detected methane are listed in Table 12 of Appendix F as ambient air samples. Is there a possibility that the perimeter soil gas samples are actually within the boundary of the landfill?

3. 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 the 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)."

4. Section 1.1.2, Remedial Investigation Approach

Reference to Cal/EPA should be changed to DTSC.

5. Section 1.2.2.2, Recent Station Operations, page 1-17

Revise the first sentence in the second 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.

6. Section 1.2.3.1, PHASE I REMEDIAL INVESTIGATION RESULTS, page 1-21

Please clarify whether the metal concentrations were compared to residential or industrial PRGs.

7. Section 1.2.3.1, PHASE I REMEDIAL INVESTIGATION RESULTS, page 1-23

The fourth bulleted item under the subsection titled "Subsurface Soil," states that the concentration of TPH-diesel is less than 12.7 to 21.8 mg/kg. However, on page 4-51, the report states that "TPH as diesel was reported in one sample at concentrations of 17,800 mg/kg and 21,800 mg/kg in two samples collected at sample location 05_DGMW67." Please explain this discrepancy.

8. Section 4.4.1, Shallow Soil, page 4-42

a. In the first paragraph of page 4-42, the report states that the detected concentration of TRPH at sampling location 05_UGS was 877 mg/kg. Sample location 05_UGS is located outside the Phase II study area and represents an "upgradient" sampling site for soil and groundwater (05_UGMW27) samples. The report should discuss the possible origin of the petroleum hydrocarbon. The detected TRPH may indicate a newly discovered release or that the boundary of Site 5 extends out to the sampling point.

b. Also in the first paragraph is the statement, "TPH-gasoline was detected using a different analytical method in one of the eight samples ...." Please explain why a different analytical method was used for that one sample.

9. Section 4.4.2, Subsurface Soil, page 4-51

In the fourth paragraph on page 4-51 is the statement that TPH as diesel was reported at concentrations of 17,800 mg/kg and 21,800 mg/kg in two soil samples collected in 1992 from 05_DGMW67 at a depth of 185 feet bgs. Figure 3-7 on page 3-22 shows that the groundwater level has been rising during the last three years. On page ES-7, the report mentions that the depth to groundwater is currently 160 to 170 feet bgs. This indicates that the soil samples collected at 185 feet bgs are now beneath the groundwater table. Table 4-19 and 4-20 indicate that groundwater samples were analyzed for TPH-motor oil. Did the 8015-M analysis detect diesel in the groundwater sample, or was the analysis speciated only for motor oil?

10. Section 4.5.2, Total Petroleum Hydrocarbons, page 4-68

a. The report states that TPH as motor oil was detected in a groundwater sample at a concentration of .22 mg/L in monitoring well 05_UGMW27, which is upgradient of Site 5. The report speculated that the source of the TPH in the groundwater may have originated in the agricultural area northeast of the site. Please elaborate on the type of activity that may have contributed to the petroleum hydrocarbon.

b. As noted in comment number 9 above, soils that had detectable concentrations of diesel are now in the saturated zone. According to Table 4-20, all the groundwater samples, including 05_DGMW67 were analyzed for TPH as motor oil. Since gasoline and diesel were detected in soil samples, were the groundwater samples also analyzed for gasoline and diesel?

11. Section 4.5.7, Radionuclides, page 4-83

The total gross alpha measured in four of the eleven downgradient groundwater samples collected during the RI exceeded the U.S. EPA MCL of 15 pCi/L. The maximum gross alpha activity reported was 27 pCi/L. The total gross alpha does not provide sufficient information for determining whether or not there is an actual release from the landfill. I suggest that you conduct isotopic analysis for Radium-226, Radium-228, etc. Compare the numbers to background to determine what is responsible for the higher reading. When you generate the information, please send an additional copy of the findings 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

12. Section 5, FATE AND TRANSPORT

The report fails to mention the potential for TPH to leach into the groundwater. As mentioned in comment number 9, subsurface soil samples (05_DGMW67) that contained measurable concentrations of TPH are now in the saturated zone. TPH is leaching into the groundwater as been migrating downward and the groundwater table has been rising. The fate and transport of TPH leaching into the groundwater should be discussed.

13. Section 6, HUMAN HEALTH RISK ASSESSMENT

Please see attached memo from Mr. John Christopher regarding the human health risk assessment.

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY PETE WILSON, *Governor*

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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: 12 June 1996

SUBJECT: MCAS El Toro: Draft Remedial Investigation Report for Site 5
PCA: 14740 Site: 400055-45

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 5 is a landfill located near the southeast border of the base. During its years of operation, this landfill received industrial waste, including 55 gallon drums of solvents. Frequent burning of wastes occurred at Site 5. 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

The report is well organized and well presented. The risk assessment is quite good. The risk assessment can be made acceptable upon adequate response to the specific comments below.

Specific Comments

1. **Use of Upper Tolerance Limits for Selecting Chemicals of Potential Concern (COPC), Appendix N, Sec. N.2.1:** The Navy selected the 95% upper tolerance limit on the 95th percentile ($UTL_{95,95}$) to represent 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 that comparison of a simple estimate of a percentile to the highest detected concentrations at a site 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 N:** We find it surprising that metals found at high frequencies of detection failed tests for either normality or lognormality (Table N-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 N-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. **Table 4-14:** Toluene in shallow soil is reported at concentrations of 4 mg/kg, whereas in Table 4-13 this is given as 4 µ/kg. Please correct this discrepancy.

4. **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.

5. **Table 4-17:** Acetone is reported as being detected 3 times in 20 analyses. This is a 15% frequency of detection, but it is reported as 25%. Please correct this.

6. **Groundwater, Table 4-21:** Very few samples of groundwater were analyzed for Site 5. Just one sample was analyzed for some compounds, including benzene, a known human carcinogen. Benzene was detected in that single sample, but this is not an adequate amount of data to characterize potential exposures and risks due to benzene. How will the Navy rectify this problem?

7. **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.

8. **Benzene in Groundwater, Table 6-1:** Benzene is reported as a detected analyte in groundwater in Table 4-21, 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 R, 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.

11. **Risk Characterization, Sec. 6.4, pp. 6-14 ff.:** This section is well written and complete. Figures 6-2 through 6-7 are especially good. Risks and hazards are quantified adequately for risk managers, except for benzene. Please number the tables in Appendix R and refer to key tables in Sectoin 6.

    Risks drivers in groundwater requires more complete coverage. If the total risk is on the order of 1E-03 and 90% is due to hexavalent chromium, then risks in excess of 1E-04 must be present due to other chemicals. Risk managers would benefit from discussion of such risks at greater length.

12. **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. Section 7.1.4 should be strengthened with comparisons to the "background" risks and hazards calculated in Appendix R. Section 7.1.4 should include discussion of total risks across pathways.

Conclusions and Recommendations

The report is well organized and well presented. The risk assessment is quite good., It can be made acceptable upon incorporation of the following recommendations:

1. The Navy should address ecological risks at Site 5.

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 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.

Reviewer: Michael J. Wade, Ph.D., D.A.B.T.
Senior Toxicologist, HERS

cc: Mr. J. Paull, USEPA Region IX

Cal/EPA

California
Environmental
Protection
Agency

*Integrated
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JUN 0 3 1996

Pete Wilson
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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 5, 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 5 Landfill.

Based on our review we are providing the following comments:

1. The text mentions an area of disturbed ground in the southwestern portion of the landfill and surface impoundments in the northwestern area. Neither of these features are indicated on the subsequent site drawings. Also, the text does not make a reference to any site exploration data relevant to these areas.

   Depending on the location of these terrain features relative to the landfill, these areas may be potentially affected by closure activities on the landfill (grading, drainage system construction, final cover borrow areas, etc.). Thus, we recommend that these terrain features be shown on the site drawings. Also, any existing field exploration information relevant to these areas should be made available for review, if requested.

2. Section 2, Study Area Investigation lists surface geophysical survey and trenching as the field methods which were used to determine both the lateral and vertical extent of the landfilling area. However, it appears, as shown on the subsequent site drawings, that a portion of the landfill indicated as a "previously identified disposal trench" had been excluded from both the trenching and geophysical survey.

It is unclear if this excluded area and the area mentioned in the text as part of the Phase I Site Investigation area are equivalent. If this is the case, please unify the terminology or, otherwise, provide addtional information.

Also, it appears that the previously conducted investigation lacks a sufficient vertical landfill extent investigation component. Thus, we strongly recommend that the mentioned area be included in the geophysical survey. If a more complete site investigation exists, a less rigorous survey may be conducted in order to validate the existing survey interpretative methods.

3. Section 2.5.2, Perimeter Gas Migration Samples makes a reference to 14 CCR, Section 17783.5, as a guide for conducting a subsurface gas survey. The section provides the survey depths (10, 25, and 40-feet).

   It should be pointed out that the mentioned section 17783.5 provides regulatory guidelines for installing permanent landfill gas migration probes and specifies construction requirements. Neither the text nor the subsequent appendices provide a justification for the depths of the probes (needed are waste depth analyses for the specific probe locations) or construction details or construction quality for the well construction (design details should include screen lengths, materials used, etc.).

4. Based on the limited size of the landfill and information about negative impacts of the landfill on the environment (ground water contamination, gas migration, and soil contamination), an alternative addressing clean closure and/or waste consolidation should be considered for the purpose of the feasibility study. We have previously included a copy of Board's Advisory discussing the subject of clean closure which may be used as a guidance document in this matter. Please refer to our letter of April 30, 1996, regarding Unit 2B, Site 2.

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