



Opportunity
Ahead

June 17, 1999

Mr. Joseph Joyce
BRAC Environmental Coordinator
U.S. Marine Corps Air Station - El Toro
AC/S, Environmental (1AU)
P.O. Box 95001
Santa Ana, California 92709-5001

Dear Mr. Joyce:

Thank you for the opportunity to comment on the March 15, 1999 Draft Record of Decision (ROD) for landfill Sites 3 and 5 prepared by and on behalf of the Department of Navy, U.S. Marine Corps (DON/USMC). Our comments and proposed revisions to various sections of the Draft ROD are attached for your review and consideration. The proposed revisions are intended to reflect our understanding of recent discussions between LRA staff and DON/USMC. Inclusion of the proposed revisions to the Final Draft ROD will be necessary in order for the LRA to support the selected remediation for landfill Sites 3 and 5.

However, in light of recent information provided by the DON/USMC concerning Historical Radiological Assessment dated May 25, 1999, and the Groundwater Monitoring plan dated June 1999, we strongly recommend that DON/USMC submit another version of the Draft ROD so that any new information can be taken into consideration in the evaluation of selected remediation for these landfill sites.

Again, thank you for your consideration of our proposed revisions to the Draft ROD. We look forward to working with you on this and other environmental remediation issues at the MCAS El Toro.

Sincerely,

Courtney C. Wierciuch, Manager
MCAS El Toro Master development Program

Attachment

cc: Members, Board of Supervisors
Jan Mittermeier, CEO
Tayseer Mahmoud, DTSC
Glenn Kistner, USEPA
Patricia Hannon, RWQCB
Peter Janicki, TWMB
Steve Sharp, LIA



received
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**COMMENTS ON AND PROPOSED REVISIONS TO
THE MARCH 15, 1999 DRAFT ROD
SITES 3 AND 5, MCAS TORO**

Submitted By

The County of Orange Local Redevelopment Authority

Outlined below are the Orange County Local Redevelopment Authority's ("LRA's") preliminary comments and proposed revisions to the March 15, 1999 Draft ROD for Sites 3 and 5 ("Draft ROD") that was prepared by and on behalf of the Department of The Navy, U.S. Marines Corps (DON/USMC").

A. DECLARATION: DESCRIPTION OF REMEDY

1. Temporary Security; 3rd bullet

Reference is made to the installation of temporary fencing, signs and locks in advance of the development of the sites. The text is unclear as to the meaning of the term "development." With the possible exception of Section 10.4, this issue is not discussed elsewhere in the Draft ROD. The LRA therefore recommends that the text of this bulleted item be revised as follows:

Prior to the installation of the single-barrier landfill caps, the Department of the Navy will install temporary fencing, signs and locks to restrict access to the sites.

The LRA further recommend that the reference to maintenance of a fence in Section 10.4 be deleted.

2. Land-use Restrictions; 4th bullet

Reference is made in this bulleted item to preventing the use of groundwater. This restriction is not presented elsewhere in the Draft ROD, including in other sections describing institutional controls associated with the selected remedy.

In addition, DON indicates elsewhere in the Draft ROD that the natural attenuation of contaminants in groundwater no longer is proposed as a part of the remedy. (See, e.g., Section 11 of the Draft ROD.) This is contrary to DON's findings, as set forth in the Feasibility Studies for Sites 3 and 5, and in the Proposed Plan for Sites 3 and 5. See, e.g., Site 3 Feasibility Study at 2-4, 2-48 to 2-53 and Table 3-2; Site 5 Feasibility Study at ES-13, 2-11, 2-30 to 2-234, 3-5 and Table 3-2; Proposed Plan at 5. These and related statements give rise to a number of questions and issues, include the following:

- Is the proposed land use restriction still appropriate? Necessary?
- Do the regulatory agencies concur in DON/USMC's findings?
- Does DON/USMC believe that non-metal inorganic compounds, metals, and/or organic compounds (including perchlorate) and radionuclides originating from the landfills have impacted groundwater at Sites 3 and/or 5? If so, how does DON/USMC intend to remediate such impacts?
- What are the implications of DON/USMC's decision to revise the proposed remedy for Sites 3 and 5 to eliminate the natural attenuation of contaminants in groundwater?
- Is DON/USMC's determination consistent with the finding that the landfills, in fact, have affected underlying groundwater (See, e.g., Draft ROD at 1-6)?
- How does DON/USMC's determination affect the scope and content of proposed institutional controls?

On June 14, 1999, DON/USMC provided the LRA with a report titled, "Draft Final CERCLA Groundwater Monitoring Plan -- MCAS El Toro (June 1999)." The LRA has not had adequate time to review this report, which may warrant the preparation of additional comments and/or proposed revisions to the Draft ROD. In light of this, the LRA will analyze and provide comments on this report to DON/USMC under separate cover. The LRA believes this is appropriate, given the short timeframe provided for review of this report.

3. Land-use Restrictions; 5th bullet

For clarity, the LRA recommends that the fifth bullet in this section be revised as follows:

Soil gas and vadose zone will be monitored to detect any migration of contaminants such as landfill gas, gas condensate, or leachate from the landfills.

4. Statutory Determinations

Reference is made here and elsewhere in the Draft ROD (e.g., Section 10.4) to DON/USMC's finding that the excavation and "clean closure" of the landfills is precluded due to the heterogeneity and volume of buried material, and the fact that there are no onsite hot spots that represent major sources of contamination. It is not clear that clean closure of Sites 3 and 5 in fact is statutorily precluded as a remedial alternative. Nonetheless, the LRA notes that DON/USMC's decision to select Alternative 4d as its preferred remedy for Sites 3 and 5 minimizes the need for the parties to resolve outstanding differences concerning various remedial alternatives.

B. SECTION 1: SITE NAME, LOCATION AND DESCRIPTION

1. Section 1.3 -- Site Description

Reference is made to existing concrete and asphalt surfaces on portions of Site 3. There is no discussion in the Draft ROD concerning removal of these surfaces in connection with the installation of the selected remedy (Alternative 4d). DON/USMC indicates in its response to the LRA comments on the Proposed Plan for Sites 3 and 5 that concrete and asphalt surfaces will be removed at Site 3 in connection with the construction of the landfill caps. In light of DON/USMC's response, the LRA recommends that the following clarification be provided in the Draft ROD. The clarification may be included in Section 1.3, Sections 7.4 and/or 7.4.1, and Section 9.1 of the Draft ROD.

Prior to installation of the landfill cap, DON will remove existing concrete and asphalt surfaces presently located at Site 3.

2. Section 1.5 -- Surface Hydrology

Reference is made to the fact that the portion of Agua Chinon Wash contained within Site 3 is unlined, that the wash shows evidence of erosion upstream of Site 3 and that if the wash were to erode existing cover soils, landfill materials could become exposed. (See Sections 5.2.1 and 10.1 of the Draft ROD for similar comments.). The LRA understands that DON/USMC will address the necessary improvements to Agua Chinon Wash at the design stage of remedy implementation. As such, the LRA recommends that the following additional text be added to the Draft ROD concerning the Agua Chinon Wash. The text may be used in Section 1.5, Sections 7.4, 7.4.1 and/or 7.4.4, and Sections 9 and/or 9.1.

The Agua Chinon Wash, which traverses Site 3 will be lined, at a minimum, with a low-permeability layer designed to reduce

infiltration into the sides of landfill and to control erosion. The low-permeability layer will be protected from puncture or cracking and covered with aggregate to control erosion, as needed. Alternatively, surface water may be conveyed through Site 3 through the grading of the inside of the Aqua Chinon Wash and the construction of a culvert or a concrete lined open channel. The culvert or open channel would be designed to carry a 100-year/24-hr storm event. With a culvert, soil would be added above the crown of the culvert until the soil surface on top of the wash is at the same elevation as surrounding grade (i.e., to the same grade as each of the two landfill cells of Site 3). This design would bridge the two cells of Site 3 and create a single uninterrupted surface across Site 3. Installation of uninterrupted liner, drainage and cover layers may improve the integrity of the landfill cap across the entire site, and enhance post-remediation reuse of the site. Consideration of these additional designs will be undertaken by DON, regulatory agencies and the County of Orange during the remedial design phase.

C. SECTION 5: SUMMARY OF SITE CHARACTERISTICS

In the Draft Historical Radiological Assessment prepared by the Supervisor of Shipbuilding, Portsmouth, Virginia and dated May 1999 (hereafter the "Draft HRA") DON/USMC states, that "[b]ecause of the type of work undertaken at MCAS El Toro, there is a low potential for radiologically contaminated areas." Draft HRA at 57. Nonetheless, the DON/USMC recommends in the Draft HRA that further investigations be conducted at Sites 3 and 5, including radiological surveys and possibly radiological sampling. *Id.* DON/USMC further recommends in the Draft HRA that "[i]f necessary, radiological remediation should be performed prior to an impacted area being unconditionally released radiologically for unrestricted use." *Id.* The findings and conclusions contained in the Draft HRA regarding the potential for radiological contamination at Sites 3 and 5 were not addressed in the Draft ROD. These findings and conclusions give rise to a number of questions and issues that we believe the LRA should discuss with DON/USMC and, possibly, regulatory agencies. Questions to discuss include the following:

- Do the regulatory agencies concur in Draft HRA's findings and conclusions concerning the potential presence of and risks associated with radiological contamination at Sites 3 and 5?
- What are the implications of potential radiological contamination at Sites 3 and 5 on the anticipated reuse of these sites?

- How do the Draft HRA's findings and conclusions concerning the potential presence of and risks associated with radiological contamination at Sites 3 and 5 affect the scope and content of the institutional controls proposed for these sites?

Based upon a discussion of these and related questions with DON/USMC and, possibly, regulatory agencies, additional comments and/or proposed revisions to the Draft ROD may be warranted. At a minimum, we recommend that this section be revised to include the pertinent information and recommendations contained in the Draft HRA concerning radiological contamination at Sites 3 and 5.

1. Section 5 -- Summary of Site Characteristics

Add the following text after the fourth full paragraph on p. 5-1, as a new paragraph. Similar revisions to Sections 6 (Site Risks), Section 7 (Description of Alternatives), and Section 9 (Selected Remedy) of the Draft ROD may be warranted.

Because of the type of work undertaken at MCAS El Toro, there is a low potential for radiologically contaminated areas. Nonetheless, the Phase II Remedial Investigation, and additional groundwater sampling conducted between September 1992 and April 1997 indicate that radioactive materials are present in the soils and groundwater at Sites 3 and 5 at levels that exceed background.

Therefore, as recommended in Draft Historical Radiological Assessment prepared by the Supervisor of Shipbuilding, Portsmouth, Virginia and dated May 1999 ("Draft HRA"), DON will conduct additional radiological surveys and sampling at Sites 3 and 5 to further delineate the potential presence of and risks associated with radiological contamination at these sites. These additional radiological surveys and sampling will be completed prior to commencing design and construction of the remedy for Sites 3 and 5.

If, based on the results of these additional surveys and sampling, radiological contamination is discovered at Sites 3 and 5 that presents a risk to human health or the environment or that materially impedes reuse of these sites, DON will take appropriate steps to fully remediate such contamination.

2. Section 5.2.2.3 -- Soil

Add the following text to the appropriate subsection discussing the sampling that was conducted by DON/USMC at Units 1, 3 and 4 of Site 3:

Soil samples were collected from 3 deep bore holes and 10 shallow bore holes at Site 3. An average of 10 samples was collected from the deep bore holes; an average of 4 samples was collected from the shallow bore holes. Samples collected were screened to determine whether radioactive material was present and, if present, whether amount detected was significant. Eight samples from the deep bore holes were above background, with the highest four samples at 1.6X background. 13 samples from the shallow bore holes were above background, with the highest sample at 1.6X background.

As appropriate, Figures 5-3 and 5-4 also should be updated to reflect this radiological sampling.

3. Section 5.2.2.4 -- Groundwater

Insert the following text as a new paragraph between the existing 2nd and 3rd paragraphs of this section:

Analyses for gross alpha and beta particle activity were performed as part of Remedial Investigation conducted at Site 3. Groundwater samples were collected from each of six different wells located near Site 3. Results of this sampling indicated that one downgradient sample exceeded the state and federal maximum contaminant level ("MCL") of 15 pCi/L for gross alpha in drinking water. Similarly, groundwater samples were collected between September 1992 and October 1997 from various monitoring wells at the Station and were analyzed for gross alpha and beta activity, strontium-89/90, radium 226/228 and radon. A total of 38 well samples were analyzed at Site 3, with 12 samples exceeding the state and federal MCL of 15 pCi/L for gross alpha.

As appropriate, Figures 5-5 also should be updated to reflect this radiological sampling.

4. Section 5.3.2.3 -- Soil

Insert the following text between the 3rd and 4th paragraphs of this section:

Soil samples were collected from three 100-foot bore holes and from one 210-foot bore hole at Site 5. An average of 10 samples were collected from each 100-foot bore hole; an 38 samples were collected from the 210-foot bore hole. Samples collected were screened to determine whether radioactive material was present and, if present, whether amount detected was significant. Nine samples from the 100-foot bore holes were above background, with two samples at 1.6X background. Two samples from the 210-foot bore hole were above background, at 1.2X background.

As appropriate, Figures 5-10 and 5-11 also should be updated to reflect this radiological sampling.

5. Section 5.3.2.4 -- Groundwater

Insert the following text as a new paragraph between the existing 2nd and 3rd paragraphs of this section:

Analyses for gross alpha and beta particle activity were performed as part of Remedial Investigation conducted at Site 5. Thirteen groundwater samples were collected from each of three different wells located near Site 5. Results of this sampling indicated that one downgradient sample exceeded the state and federal MCL of 15 pCi/L for gross alpha in drinking water. Similarly, groundwater samples were collected between September 1992 and October 1997 from various monitoring wells at the Station and were analyzed for gross alpha and beta activity, strontium-89/90, radium 226/228 and radon. A total of 29 well samples were analyzed at Site 5, with 14 samples exceeding the state and federal MCL of 15 pCi/L for gross alpha. One sample also exceeded the state and federal MCL of 50 pCi/L for gross beta, but this appears to be anomaly.

As appropriate, Figures 5-12 also should be updated to reflect this radiological sampling.

D. SECTION 6: SUMMARY OF SITE RISKS

See Sections A(2) and C(1)-(5) of this attachment for comments concerning groundwater and quality issues and the potential for radiological contamination at Sites 3 and 5, respectively. Revisions to this section may be warranted based upon further discussions with DON/USMC and, possibly, regulatory agencies.

E. SECTION 7: DESCRIPTION OF ALTERNATIVES**1. Section 7 (Page 7-1)**

See C(1)-(5) for comments concerning the potential for radiological contamination at Sites 3 and 5. Revisions to this section may be warranted based upon further discussions with DON/USMC and, possibly, regulatory agencies.

2. Section 7 (Page 7-1)

Reference is made in Section 7 of the Draft ROD to landfill gas modeling performed by DON/USMC following the close of the public comment period on the Proposed Plan for Sites 3 and 5. The LRA submitted comments and questions concerning the landfill gas modeling performed by DON/USMC. To date, the LRA has not received a detailed response to its submittal. The LRA recommends that additional consideration be given to the installation (as part of the landfill caps) of a cost-effective infrastructure designed to support a gas collection system. Such a system generally would consist of a high-pneumatic permeability layer (gas collection layer) installed below the FML. Perforated pipes would be installed in the gas collection layer to collect and route gas to vents installed around the edge of the landfill. In the alternative, installation of additional gas monitoring probes along the perimeter of the landfills may be necessary. Consistent with the above, the LRA recommends the addition of the following text to relevant sections of the Draft ROD. The text should be included in Sections 7.4, 7.4.1 and/or 7.4.4 and Sections 9 or 9.1.

As deemed appropriate, or at the request of any of the LRA Signatories, CIWMB, the LEA or the County of Orange, DON will review with such entities the possible installation of a cost-effective gas collection and management system as a part of the landfill cap. (Such review would occur prior to or during the detailed design of the landfill caps.) At a minimum, such a system would consist of a network of interconnected, perforated pipes installed in the foundation layer immediately below the FML. The network of pipes would be designed to provide venting points for gas which may be present below the FML. This network of pipes would be

designed to reduce the potential for gas accumulation below the FML and to control lateral migration of landfill gas.

3. Section 7 (Page 7-1)

Reference is made to the elimination of Remedial Action Objectives ("RAOs") for groundwater. See Section A(2) of this memorandum for comments. Revisions to this section may be warranted based upon further discussions with DON/USMC and, possibly, regulatory agencies.

4. Section 7.2.1 -- Institutional Controls

As you know, the LRA provided DON/USMC and regulatory agencies with initial revisions to the Draft ROD concerning the issue of institutional controls. It is our understanding that DON/USMC generally finds the proposals acceptable and consistent with DON/USMC discussions with regulatory agencies. (For example, the LRA understands that DON/USMC found acceptable deletion of text requiring the development of institutional controls for structures located within 1,000 feet of the landfill perimeter.) Further discussions with DON/USMC is required to finalize the proposed text on institutional controls. (For example, the LRA feels that it important to discuss with DON/USMC the effect of the deletion of groundwater cleanup issues from the remediation of Sites 3 and 5 on the development of institutional controls.)

In addition, based on discussions with DTSC, the LRA believes that some changes to our initial revisions are warranted. To that end, the LRA recommends that Section 7.2.1 of the Draft ROD be revised as follows:

Institutional controls are required to maintain the integrity of the landfill by limiting excavations; minimizing infiltration of surface waters; preventing land uses that present unacceptable risk to human health due to residual contamination; protecting monitoring equipment; and preserving access to the sites and associated monitoring equipment for the DON and the LFA signatories. Such institutional controls shall consist of lease restrictions, deed restrictions, or other controls mutually agreed to, by the LFA signatories and the County of Orange. The DON shall notify the California Integrated Waste Management Board (CIWMB) and its designated Local Enforcement Agency (LEA) in the event of a transfer of Sites 3 and 5. Transferees of Sites 3 and 5 will be required to notify the LEA in the event of significant land-use change at Sites 3 and 5 so that issues related to post-remediation land use at Sites 3 and 5 are managed appropriately.

5. Section 7.2.1.1 -- Land-Use Control Restrictions

See Section E(3) for general comments regarding institutional controls. Section 7.2.1.1 describes institutional controls that would be used in connection with Alternative 2 and, possibly, Alternative 3. Since DON/USMC is not proposing the selection of either of these remedial alternatives, the LRA does not have comments or proposed revisions to this section of the Draft ROD.

6. Section 7.4 -- Alternative 4

See Section E(3) for general comments concerning regarding institutional controls. The LRA recommends that the fourth sentence of Section 7.4 (at page 7-8) be revised as follows:

Institutional controls are identical to Alternative 3 for Alternatives 4a and 4b. Institutional controls for Alternatives 4c and 4d are similar, but not identical, to those for Alternative 3. Differences in the proposed institutional controls are discussed below, in Section 7.4.5.

7. Section 7.4.1 -- Alternative 4a, Title 27 Prescriptive Cap

First, the LRA recommends that DON/USMC identify the standards pursuant to which it will evaluate the possible use of onsite soils for the foundation layer of the landfill caps. The LRA raised this issue in light DON/USMC's Proposed Plan for Sites 8, 11 and 12, in which it has proposed to use contaminated (nonhazardous) soils from the sites for a portion of the foundation layer of the landfills being remediated at Sites 2 and 17. The LRA opposes the use of contaminated soils as a part of the foundation layer at Sites 3 and 5.

Consistent with the notes provided in Section E(1), the LRA recommends that revisions be made to the description of the foundation layer to include the possible installation of a gas collection system. The LRA recommends that the following text be added to the end of the first bulleted item in Section 7.4.1:

Installation of gas collection and management infrastructure in the foundation layer may prove useful in the future. Such a system would consist of a network of interconnected, perforated pipes designed to provide venting points for gas which may be present below the FML. This network of pipes would be designed to reduce the potential for gas accumulation below the FML, and to control lateral migration of landfill gas.

As you know, the LRA has recommended that a drainage layer be installed to avoid ponding of water on top of the barrier (FML) layer. It is our understanding that DON/USMC has agreed to install a drainage layer, and that regulatory agencies generally endorse this development. The drainage layer also may function to protect the barrier layer in the event shallow excavation activities are conducted onsite, in accordance with institutional controls. The LRA therefore recommends that the following text be added as a new third bullet to Section 7.4.1 to reflect these developments. Similar text should be included in Sections 9 and/or 9.1.

Drainage layer -- A drainage layer will be placed above the FML. The drainage layer will be designed to collect and laterally drain water that may accumulate on top of the barrier layer. The drainage layer also will be designed as a biotic barrier. In addition, the design and construction of the drainage layer will take into account the probable conduct of shallow excavation and revegetation activities, in accordance with institutional controls. The drainage layer could be composed, for example, of a 6 inch-thick gravel layer of sufficiently high hydraulic conductivity to drain water laterally. One or more geotextile layer will be used between the gravel layer and the FML to protect the FML from puncture by the gravel.

Finally, the LRA recommends that the existing third bulleted item (describing the protective soil layer) be revised to reflect DON/USMC's current position that 2.5 feet of soils should be installed on the uppermost layer of landfill caps:

Protective soil layer -- A minimum 2.5 feet of clean soil (from on-site or off-site locations) on top of the drainage layer. According to 27 CCR 21090(a)(3), the prescribed protective soil layer consists of a minimum 1-foot-thick soil cover intended to protect the barrier layer, control surface erosion, and provide a medium for vegetation.

8. Section 7.4.5 Institutional Controls for Alternatives 4c and 4d

See Section E(3) of this attachment for general comments regarding institutional controls. The following text would constitute an entirely new section of the Draft ROD. It is designed to reflect key concepts for the institutional controls associated with Alternative 4d. It has been revised since the LRA provided the initial revisions to DON/USMC for review.

Institutional controls for Alternatives 4c and 4d generally will consist of restrictions on future land-use, restrictions to protect the physical remedy, restrictions to protect monitoring equipment, and provisions for site access. The institutional controls for these two alternatives address such issues as the projected future uses of the sites (recreational and open space), and the nature of the physical remedy. Institutional controls for Alternatives 4c and 4d do not include a prohibition on the irrigation of or shallow excavation into the landfill cap. This decision reflects anticipated future uses (e.g., recreational and open space uses that involve irrigation, revegetation, and installation of structures associated with recreational uses), and the nature of the physical remedy (e.g., landfill caps that include geomembranes, which are effective in minimizing surface water infiltration, even under post-remediation scenarios that involve irrigation).

The institutional controls associated with Alternatives 4c and 4d generally shall provide the following:

- *Institutional controls will recognize that the anticipated post-remediation uses of the sites will be open space or recreational in nature. Any use of the site that is considered to be open space or recreational in nature, or that would support or be attendant to such uses, shall not be deemed to be a change in land use and shall not require the prior review and approval of the LEA or the LFA signatories. Examples of open space and recreational uses include, but are not limited to, irrigated and nonirrigated open space; open space with benches, tables, pathways, lighting and other similar structures; golf course and associated space; sports and athletic fields; recreational and play structures; etc.*

Institutional controls will prohibit the following post-remediation uses of the sites: residential and day care uses. In addition, the institutional controls will provide that a change in land use to one that would not be considered open space or recreational in nature, or that would not support or be attendant to such uses, may only be undertaken with the prior approval of the LEA.

- *[Prohibition on the use of groundwater [in the uppermost aquifer(s) underlying the sites] as a source of drinking water.]*

- *Limitations on landscaping. Landscaping activities involving the use of vegetation having a root depth that is not reasonably anticipated to extend to soils located less than one foot above the drainage layer shall not require the prior approval of the FFA Signatories or the I.E.A. Landscaping activities involving the use of vegetation having a root depth greater than that specified above shall be undertaken only with the prior approval of the I.E.A. Health and safety plans shall be submitted to the I.E.A for review and comment prior to the initiation of any significant revegetation programs.*
- *Limitations on excavations into the landfill cap. Shallow excavations may be required to support the post-remediation open space and recreational uses contemplated for the sites (e.g., to install irrigation systems, shallow footings for park benches or tables, lighting, pathways, new vegetation, etc.) Shallow excavations into the uppermost soil cover layer of the cap (but not the underlying drainage layer, geomembrane or foundation layers) shall not require the prior approval of the LEA or the FFA signatories. Other excavation activities may be undertaken only with the prior approval of the LEA. Health and safety plans shall be submitted to the LEA for review and comment prior to the initiation of any excavation activities.*
- *Limitations on the addition of soils to the landfill cap. An additional 2 feet of soil may be placed upon the uppermost layer of the landfill cap without the prior approval of the LEA or the FFA signatories. Such soil enhancement activities may be used, for example, to accommodate vegetation having a root depth greater than that which reasonably could be accommodated on the 2.5 foot soil layer or to accommodate the installation of utilities or other subsurface features consistent with open space and recreational use of the sites. More extensive soil enhancement activities may be conducted only with the prior approval of the I.E.A. As deemed appropriate, health and safety plans shall be submitted to the I.E.A for review and comment prior to the initiation of any significant soil enhancement projects.*
- *Prohibitions on the removal of or damage to security features (e.g., locks on monitoring wells) or to monitoring equipment and associated pipelines and appurtenances. Monitoring equipment and associated pipelines and appurtenances may be relocated with the prior approval of the LEA.*

F. SECTION 8: SUMMARY OF THE COMPARATIVE ANALYSIS OF ALTERNATIVES

In connection with the Proposed Plan, the LRA submitted to DON/USMC comments regarding a number of issues concerning DON/USMC's evaluation of various remedial alternatives for Sites 3 and 5 (e.g., applicable or relevant and appropriate requirements; long-term effectiveness and permanence; implementability; cost; and protection of human health and the environment). The LRA is not aware of any new information that would change its understanding of these issues, or that would require revision of its comments on the Proposed Plan. The LRA notes that DON/USMC's decision to select Alternative 4d as its preferred remedy for Sites 3 and 5 minimizes the need for the parties to resolve outstanding differences concerning various remedial alternatives. Accordingly, at this time, LRA chooses not to comment upon the matters addressed in Section 8 of the Draft ROD.

G. SECTION 9: SELECTED REMEDY

1. Section 9 -- Selected Remedy

See C:(1)-(5) for comments concerning the potential for radiological contamination at Sites 3 and 5. Revisions to this section may be warranted based upon further discussions with DON/USMC and, possibly, regulatory agencies.

2. Section 9.1 -- Design of Landfill Cap

The LRA recommends that a more detailed description of the final landfill cap be provided in Section 9.1 of the Draft ROD. Proposed revisions to Section 9.1 are set forth below. In addition, the LRA recommends that relevant text in Section 9 be revised to conform to the revised text of Section 9.1.

During the FS stage, a preliminary design was developed for each landfill cap (Figures 7-2 and 7-3). These designs are included in the FS reports for the landfill sites. Certain modifications to the preliminary designs are warranted, in light of the findings and conclusions reflected in this ROD. In addition, some modifications to the preliminary design may be necessary as a result of the remedial design and construction process. Detailed design specifications, performance evaluations, and schedule will be determined during the remedial design phase. Key regulatory agencies and the County of Orange will be consulted during the remedial design phase.

In preparation for and before installation of the landfill cap, any asphalt or concrete material present on the landfills will be removed and disposed of off-site. The sites then will be graded using clean soils to create positive drainage on the landfills. The site surfaces will be graded to generally blend with and be at the same elevation as surrounding land.

The Agua Chinon Wash, which traverses Site 3 will be lined, at a minimum, with a low-permeability layer designed to reduce infiltration into the sides of landfill and control erosion. The low-permeability layer will be protected from puncture or cracking and covered with aggregate to control erosion, as needed.

Alternatively, surface water may be conveyed through Site 3 through the grading of the inside of the Agua Chinon Wash and the construction of a culvert or a concrete lined open channel. The culvert or open channel would be designed to carry a 100-year/24-hr storm event. With a culvert, soil would be added above the crown of the culvert until the soil surface on top of the wash is at the same elevation as surrounding grade (i.e., to the same grade as each of the two landfill cells of Site 3). This design would bridge the two cells of Site 3 and create a single uninterrupted surface across Site 3. Installation of uninterrupted liner, drainage and cover layers may improve the integrity of the landfill cap across the entire site, and enhance post-remediation reuse of the site. Consideration of these additional designs will be undertaken by DON, regulatory agencies and the County of Orange (the entity to which Site 3 is expected to be transferred) during the remedial design phase.

The Alternative 4d cap generally will consist of the following layers or components:

Foundation layer - 2 ft of clean soil (from on-site or off-site locations). According to Title 27 CCR 21090(a)(1), the prescribed foundation will consist of a minimum 2-ft-thick layer of soil over the waste, compacted to provide an adequate structural substrate for successive layers. Consideration will be given to the installation of gas collection and management system in the foundation layer. Such a system would consist of a network of interconnected, perforated pipes designed to provide venting points for gas which may be present below the FML. This network

of pipes would be designed to reduce the potential for gas accumulation below the FML and to control lateral migration of landfill gas.

Barrier layer - This layer is intended to act as a barrier to infiltration. This layer will be composed of a 40-mil (or thicker) FML. The FML will be designed and constructed in accordance with commonly practiced standards of the industry. Examples of FMLs include high-density polyethylene (HDPE) or low-density polyethylene (LDPE). The specific membrane material will be selected during remedial design. After compaction, grading, and surface preparation of the foundation layer, sheets of FML will be placed and fusion-welded together, followed by weld testing to assure the integrity of welded seams. A layer of geotextile material with sufficient thickness will be placed under and over the FML to provide additional protection to the liner against puncture or tearing resulting from settlement of or pressure from the underlying foundation layer or the overlying layer.

Drainage layer -- A drainage layer will be placed above the FML. The drainage layer will be designed to collect and laterally drain water that may accumulate on top of the barrier layer. The drainage layer also will be designed as a biotic barrier. In addition, the design and construction of the drainage layer will take into account the probable conduct of shallow excavation and revegetation activities, in accordance with institutional controls. The drainage layer could be composed, for example, of a 6 inch-thick gravel layer of sufficiently high hydraulic conductivity to drain water laterally. One or more geotextile layer will be used between the gravel layer and the FML to protect the FML from puncture by the gravel.

Protective soil layer - A minimum 2.5 ft of clean soil (from on-site or off-site locations) on top of the drainage layer. According to Title 27 CCR 21090(a)(3), the prescribed protective soil layer consists of a minimum 1 ft. thick soil cover intended to protect the barrier layer, control surface erosion, and provide a medium for vegetation. Clean soil for the vegetative layer would be imported from off-site borrow sources. The cap will be revegetated with native grasses, or such other vegetation as may be identified based upon discussions with the County of Orange (the entity to whom

Sites 3 and 5 are expected to be transferred). The purpose of the vegetative layer is to protect the clay layer from erosion, desiccation and cracking, burrowing animals, traffic, and roots. Although the regulations require only 1 ft of vegetative cover, the vegetative soil cover proposed will have a minimum thickness of 2.5 ft. to support the rooting depth of selected vegetation and to enhance its effectiveness in protecting a barrier layer. This layer will have a 3 to 4 percent slope to maximize runoff with minimal surface erosion.

The cap will be designed and constructed according to the commonly practiced standards of the industry and would require minimal maintenance. Standard and readily available construction equipment would be used.

3. Section 9.2.1 -- Engineering Controls Protected By Land-Use Controls

Consistent with our previous comments, the I.R.A recommends that this section be redrafted as follows:

The purpose of the caps for Sites 3 and 5 is to prevent direct contact with, minimize erosion of, and minimize infiltration into the contents of the landfill. The effectiveness of the cap will be monitored using groundwater monitoring wells installed at or near the downgradient edge of the landfills.

4. Section 9.2.2 -- Land-Use Control Objectives

See Section E(3) for comments regarding institutional controls. The I.R.A recommends that the text of Section 9.2.2 be revised as follows:

Institutional controls are required to maintain the integrity of the landfill by limiting excavations; minimizing infiltration of surface waters; preventing land uses that present unacceptable risk to human health due to residual contamination; protecting monitoring equipment; and preserving access to the sites and associated monitoring equipment for the DON and the FFA signatories. Such institutional controls shall consist of lease restrictions, deed restrictions, or other controls mutually agreed to by the FFA signatories and the County of Orange. The DON shall notify the CIMWB and the I.F.A in the event of a transfer of Sites 3

and 5. Transferees of Sites 3 and 5 will be required to notify the LFA in the event of significant land-use change at Sites 3 and 5 so that issues related to post-remediation land use at Sites 3 and 5 are managed appropriately.

5. Section 9.2.3 -- Land-Use Control Restrictions

See Section R(7) for comments regarding institutional controls. The LRA recommends that the text of Section 9.2.3 be revised as follows:

The institutional controls associated with Alternatives 4c and 4d generally shall provide the following:

- *Institutional controls will recognize that the anticipated post-remediation uses of the sites will be open space or recreational in nature. Any use of the site that is considered to be open space or recreational in nature, or that would support or be attendant to such uses, shall not be deemed to be a change in land use and shall not require the prior review and approval of the LFA or the FFA signatories. Examples of open space and recreational uses include, but are not limited to, irrigated and nonirrigated open space; open space with benches, tables, pathways, lighting and other similar structures; golf course and associated space; sports and athletic fields; recreational and play structures; etc.*

Institutional controls will prohibit the following post-remediation uses of the sites: residential and day care uses. In addition, the institutional controls will provide that a change in land use to one that would not be considered open space or recreational in nature, or that would not support or be attendant to such uses, may only be undertaken with the prior approval of the LFA.

- *[Prohibition on the use of groundwater [in the uppermost aquifer[s] underlying the sites] as a source of drinking water.]*
- *Limitations on landscaping. Landscaping activities involving the use of vegetation having a root depth that is not reasonably anticipated to extend to soils located less than one foot above the drainage layer shall not require the prior approval of the FFA Signatories or the LFA. Landscaping activities involving the use of vegetation having a root depth greater than that specified above may be undertaken only with the prior approval of the LFA. Health and safety plans shall be submitted to the*

LEA for review and comment prior to the initiation of any significant revegetation programs.

- *Limitations on excavations into the landfill cap. Shallow excavations may be required to support the post-remediation open space and recreational uses contemplated for the sites (e.g., to install irrigation systems, shallow footings for park benches or tables, lighting, pathways, new vegetation, etc.) Shallow excavations into the uppermost soil cover layer of the cap (but not the underlying drainage layer, geomembrane or foundation layers) shall not require the prior approval of the LEA or the FFA signatories. Other excavation activities may be undertaken only with the prior approval of the LEA. Health and safety plans shall be submitted to the LEA for review and comment prior to the initiation of any excavation activities.*
- *Limitations on the addition of soils to the landfill cap. An additional 2 feet of soil may be placed upon the uppermost layer of the landfill cap without the prior approval of the LEA or the FFA signatories. Such soil enhancement activities may be used, for example, to accommodate vegetation having a root depth greater than that which reasonably could be accommodated on the 2.5 foot soil layer or to accommodate the installation of utilities or other subsurface features consistent with open space and recreational use of the sites. More extensive soil enhancement activities may be conducted only with the prior approval of the LEA. As deemed appropriate, health and safety plans shall be submitted to the LEA for review and comment prior to the initiation of any significant soil enhancement projects.*
- *Prohibitions on the removal of or damage to security features (e.g., locks on monitoring wells) or to monitoring equipment and associated pipelines and appurtenances. Monitoring equipment and associated pipelines and appurtenances may be relocated with the prior approval of the LEA.*

6. Section 9.3 -- Monitoring

- a. The reference in Section 9.3 to Section 7.3.4 of the Draft ROD appears to be incorrect. (It doesn't exist.) The LRA recommends that DON/USMC identify and provide an appropriate cross-reference. (It may be to Section 7.3.3.)

b. For purposes of clarity, the LRA recommends that the following text be inserted as new second and third paragraphs in Section 9.3 (and any other appropriate sections) of the Draft ROD:

Perimeter soil gas migration monitoring probes will be installed at Sites 3 and 5 to detect any off-site migration of landfill gases. These probes will be designed and installed in accordance with Title 27 C.C.R. Section 20925 and as approved by the LEA considering the planned site reuse around the landfill. Remedial design documentation (e.g., engineering design reports, O&M manuals) will be submitted to DTSC and RWQCB for review in accordance with the FFA. Soil gas and leachate will be monitored at Site 5 using existing lysimeters (Section 2.2.2). At Site 3, two existing lysimeters (03LYS1 and 03LYS2) will be abandoned and replaced by three new lysimeters. The lysimeter probes will be designed and installed in accordance with Title 27 C.C.R. Section 21160 requirements. At Sites 3 and 5, groundwater monitoring will be performed using existing wells as described in Alternative 2 (Section 2.2.2). The locations of perimeter soil gas migration monitoring probes, lysimeters, and monitoring wells for Sites 3 and 5 are shown on Figures 7-2 and 7-3, respectively.

Monitoring cap integrity and the effectiveness of runoff controls and revegetation will take place quarterly following placement and after major storm events until the site stabilizes and complete revegetation occurs. Monitoring is necessary because of the potential for settlement. Settlement will be monitored by a visual inspection of the cover system for cracks, eroded areas, surface irregularities, and localized depressions and by surveying existing and new settlement monuments. The settlement monuments will be protected and maintained throughout the post-closure maintenance period. Annual mowing will be undertaken for the first five years to facilitate inspection of the cap and surface control features. Mowing will continue for 30 years after landfill closure. Alternative monitoring activities that do not involve mowing may be used on those portions of Sites 3 and 5 that are developed after construction of the landfill caps.

c. In the fourth paragraph of this section DON states that if, upon review of monitoring reports, contamination is confirmed, regulatory agencies would be notified and a remedial action program would be prepared and submitted. The LRA recommends that this text

be revised to clarify that these are DON/USMC's responsibilities. The LRA recommends the following revision to the second sentence of the fourth paragraph of this section:

If contamination is confirmed, DON immediately would notify U.S. EPA, RWQCB, CIWMB, DTSC, LEA, and the current property owner(s). In addition, DON promptly would prepare and submit a remedial action program to these entities.

H. SECTION 11: DOCUMENTATION OF SIGNIFICANT CHANGES

See Section A(2) for comments and questions concerning the groundwater component of the selected remedy.

In the second paragraph of this section should the reference to "natural precipitation" actually be to "natural attenuation"?