



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
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September 17, 2007

Mr. Thomas Macchiarella, Code 06CA. TM
Department of the Navy
Base Realignment and Closure
Program Management Office West
1455 Frazee Road, Suite 900
San Diego, CA 92108-4310

**Re: Review of the Draft Feasibility Study Report, IR Site 32, Northwestern
Ordnance Storage Area, Alameda Point, Alameda, California, June 2007**

Dear Mr. Macchiarella:

The U.S. Environmental Protection Agency (EPA) Region 9 has received the Draft Feasibility Study Report, IR Site 32, Northwestern Ordnance Storage Area, Alameda Point, Alameda, California, dated June 19, 2007. We have reviewed the aforementioned document and our comments are enclosed.

If there are any questions, please feel free to contact me at (415) 972-3002.

Sincerely,

A handwritten signature in black ink that reads "Xuan-Mai Tran". The signature is fluid and cursive, with a long, sweeping underline.

Xuan-Mai Tran
Remedial Project Manager
Federal Facilities and Site Cleanup Branch

cc: Frances Fadullon, BRAC PMO, West
Dot Lofstrom, DTSC Sacramento
Angela Singh, DTSC Sacramento
John West, SFRWQCB
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**Review of the Draft Feasibility Study Report,
IR Site 32, Northwestern Ordnance Storage Area
Alameda Point, Alameda California, June 2007**

GENERAL COMMENTS

1. The text of the Draft Feasibility Study Report, IR Site 32, Northwestern Ordnance Storage Area (the FS) states that only groundwater at IR Site 32 will be addressed. However, several contaminants are present in IR Site 32 soils above residential or industrial exposure limits, as detailed in Table 2-8. Since these contaminants will be left in place and will not degrade significantly over time (PAHs and PCBs) or will not degrade (arsenic), the text in Section 2.8.1, Conclusions, should be expanded to include detailed justification explaining why NFA for soil is appropriate. For each of the contaminants detected at concentrations above residential PRGs, please provide support in the text explaining why it does not pose a significant risk to human health (e.g., number of soil samples (and the percentage) reported at concentrations above residential PRGs out of the total number of soil samples, the depths where the contaminants were detected, whether it is one of the risk drivers (if not, why not), the exposure pathway, etc.) While EPA believes that NFA is appropriate for soil at IR Site 32, a more detailed justification will help any reader unfamiliar with the site to understand the reasoning behind the conclusion.
2. The FS refers to previous successful in-situ chemical oxidation (ISCO) projects at Alameda Point, but no details are provided. A more specific description of ISCO implementation at one or more sites similar to IR Site 32 may provide a stronger basis for supporting the evaluation of this technology. Please include a brief summary of the approach and degree of success in attaining remedial action objectives at a similar Alameda Point site.
3. The FS states that Alternative 4, anaerobic in-situ bioremediation (ISB), has been successful for vinyl chloride and TCE “at sites with geology and contaminants similar to IR Site 32,” but it is unclear if this technology would be effective for chlorobenzene and a treatability or pilot test for chlorobenzene is only briefly discussed. It is also unclear if a single round of injections would be sufficient to remediate the chlorobenzene plume. Please identify sites with lithology and contaminant concentrations similar to IR Site 32 where ISB was successful in remediating chlorobenzene, provide an outline of the testing necessary to determine if chlorobenzene can be successfully treated with ISB at IR Site 32, and clarify whether a single round of ISB injections is likely to be sufficient to treat chlorobenzene or revise the text and cost estimate to include a second round of ISB injections.

SPECIFIC COMMENTS

1. **Executive Summary, Page ES-2, second full paragraph:** This paragraph is confusing. The sentence, “Therefore, the only exposure to groundwater for the residential receptor is

through vapors,” does not follow logically from the previous sentence about homegrown produce and domestic use of groundwater. Please clarify.

2. **Executive Summary, Page ES-2, second and third full paragraphs:** Please explain why the risks from radium in the soil are being excluded (i.e., radium contamination is being remediated through a TCRA). Please include a summary on this TCRA.
3. **Executive Summary, Page ES-2, next-to-last paragraph:** This paragraph states that there is a HI rating of 6. It appears that soil and groundwater risks are combined, but this is not clear. Please clarify. Also, please explain why it’s appropriate to exclude background risk when calculating cumulative risk? This comes up throughout the document (i.e., page 2-35, etc.)
4. **Executive Summary, Page ES-6, Alternative 2 - ICs, third bullet:** Why is the prohibition on extraction of groundwater and installation of new groundwater wells limited to non-federal entities? We recommend the IC would be put in place to prohibit “extraction of groundwater and installation of new groundwater wells other than monitoring or remediation wells” without limiting the prohibition to non-federal entities. Same question and comment for page 5-4, and elsewhere in the document.
5. **Executive Summary, Page ES-6, Alternative 2 - ICs:** In addition to saying that the duration is estimated at 30 years for costing purposes, it would be helpful to indicate how long the Navy actually expects ICs would have to be in place. Same comment for page 5-4 and elsewhere in the document.
6. **Executive Summary, Page ES-6, Alternative 3 - MNA and ICs:** Why is the duration of MNA expected to be 30 years? Is this for costing purposes? Or is that how long the MNA is actually expected to take? If the 30 years is for costing purposes, we recommend indicating the actual estimated time-frame for the MNA. Same comment and questions for page 5-4 and elsewhere in the document.
7. **Executive Summary, Page ES-7, Alternative 5 - ISCO, Enhanced Anaerobic ISB, and ICs:** The discussion of this alternative is confusing. (a) It would be helpful to discuss whether the ISB and ISCO would take place simultaneously. (b) It would be helpful to the reader if there were a short explanation of why ISCO plus ISB takes so much longer than either alternative alone.
8. **Executive Summary, Page ES-8:** It is misleading to state in the last paragraph that all the groundwater alternatives met the threshold criteria “for current and anticipated future land uses.” It should be simply stated that the no-action alternative does not meet the protectiveness criterion.
9. **Table ES-3:** We disagree that alternative 1 meets the overall protectiveness criterion, as it neither allows for unrestricted use nor includes actions to prohibit unrestricted use. Also, for compliance with ARARs, alternative 1 should be “NA” rather than “yes.”

10. **Section 2.5.3.2, Groundwater Use and Potential Beneficial Uses, Page 2-16:** In the first paragraph after the bullets on page 2-16, the document states that dermal exposure to groundwater would be limited by restrictions on excavation on areas that are now part of IR Site 32. Was dermal exposure analyzed in the risk assessment? Is it taken into consideration in establishment of the RGs? Where are the prohibitions on excavation? Unless there are ICs prohibiting excavation, it is necessary to ensure that the RGs are adequately protective against any unacceptable risk of dermal exposure.
11. **Section 2.6.1.2, Groundwater, Page 2-33:** The statement in the middle of the last paragraph on page 2-33 that CTR criteria are not ARARs is incorrect since CTR is in fact included as ARARs on page 3-6 and in the ARARs table.
12. **Section 2.7.1, Human-Health Risk assessment, Page 2-35:** The discussion of ingestion of homegrown produce in the third paragraph is of concern. Even if residential use is unlikely, so long as it is not prohibited, it should be considered in the risk analysis. Under an unrestricted use scenario, what is the risk for ingestion of homegrown produce? Is it at a level that needs to be addressed?
13. **Section 2.7.2, Ecological Risk Assessment, Page 2-36, first paragraph:** The statement that the future use of the site is expected to be “recreational rather than ecological” is troubling. The ecology needs to be protected regardless of the reuse. Same comment regarding sentence at the end of page 2-40, Section 2.8.2.
14. **Section 2.8.2, Recommendations, Page 2-40:** The first statement, “The RI Report recommended no further investigation of soil or groundwater at IR Site 32 because the nature and extent of contamination in soil and groundwater have been adequately characterized,” appears to contradict text in Section 2.8, which discusses data gaps and states that the data gaps will be addressed “prior to or during the remedial design.” The text in Section 2.8 also clarifies that the data were sufficient “to perform risk assessments and to proceed with this FS.” For accuracy and completeness, please revise the recommendations to include the need to delineate data gaps before or during the remedial design.
15. **Section 3.2, Potential Receptors and Exposure Pathways, Page 3-2:** The section indicates that a residential use scenario is evaluated to evaluate the feasibility of unrestricted land use, and to evaluate alternatives that reduce or destroy contaminants to the maximum extent feasible. Thus, inhalation of vapors is evaluated. It is not clear, however, whether dermal contact, accidental ingestion of groundwater, and inhalation of vapors from showering were considered in setting the IC termination criteria. All of these activities could pose potential risks in an unrestricted land use scenario.
16. **Section 4.3.2, Institutional Controls, Page 4-5, second bullet at the top:** It appears that the parenthetical excluding FFA signatories from this prohibition is designed to enable installation of new wells for monitoring or as part of a remedy. As written, however, it leaves open the possibility that FFA signatories could install drinking water wells. This should be clarified.

17. **Section 4.3.2, Institutional Controls, Page 4-5:** Potential lease restrictions “that the Navy can use” include appropriate limits on excavation or other disturbance of the subsurface, but the potential restrictions are not specified or referenced to particular contaminated areas. Please provide a definite commitment to restrict excavation or other activity that may result in exposure of workers or others to contaminants that remain in soil at elevated concentrations, and specifically list the areas where industrial or residential exposure limit exceedance zones are located.
18. **Table 4-4, Oxidant Effectiveness for Chemicals of Concern in Groundwater:** This table is not very useful because it does not identify which oxidants are more effective for each of the listed chemicals. Please revise the table to specify the degree of effectiveness of the listed oxidants for each chemical.
19. **Table 4-5, Considerations for *In Situ* Treatment of Groundwater with ISCO:** The impact of soluble or insoluble organics that may present in soil and groundwater on each of the oxidants was not included in this table. Since organics can consume reagents like permanganate and Fenton’s reagent, the presence of organics should be a consideration. Please revise Table 4-5 to consider whether the presence of organics will impact the listed oxidants.
20. **Section 5.1.5, Alternative 5: ISCO, Enhanced Anaerobic ISB, and ICs, Page 5-6 and Section 5.1.6, Alternative 6: ISCO and ICs, Page 5-7:** It is unclear why in situ chemical oxidation (ISCO) with an injection point spacing of 10 feet was proposed for the chlorobenzene plume in Alternative 5, but ISCO with a injection point spacing of 30 feet was proposed for Alternative 6. Please revise the text to provide detailed justification for the 30 foot spacing in Alternative 6 or revise this alternative and the associated costs for ISCO injections at 10 foot spacing.
21. **Section 6.2.2.1, Overall Protection of Human Health and the Environment, Page 6-6:** There should be a clear statement that the no-action alternative is not protective of human health and the environment. Unless an alternative either allows for unrestricted use or includes controls prohibiting it, it cannot be considered to meet this threshold criterion. Same concern on page 7-2, Section 7.1.
22. **Section 6.3, Alternative 2 -ICs, Pages 6-7 through 6-11 and Section 6.4, Alternative 3 - MNA and ICs, Pages 6-11 through 6-14:** Both alternatives assume a 30-year period will be required to reach termination criteria, without supporting data or analyses. Groundwater data are available from several years of monitoring. The data should be analyzed to determine if natural attenuation is occurring at a rate that may reach termination criteria in 30 years for the vinyl chloride and trichloroethylene (TCE) plumes. However, chlorobenzene (the maximum concentration is 1500 micrograms per liter [ug/L]) is unlikely to degrade, so appears that MNA would not be effective for the chlorobenzene plume. Further, the source of chlorobenzene is unknown, so MNA is not an appropriate alternative for this contaminant. Please revise the text to include a brief summary of the time rates of decay for TCE and vinyl chloride and specify the number of

years that would be required for these contaminants to attenuate. For chlorobenzene, please revise the text to state that the source of the chlorobenzene plume is not known and include a discussion of the recalcitrance of chlorobenzene (i.e., clarify that chlorobenzene is not amenable to MNA).

23. **Section 6.3, Alternative 2, ICs:** Text in Section 6.3.1.1 indicates that a groundwater investigation would be conducted to verify the lateral and vertical extent of volatile organic compounds (VOCs) in groundwater and Section 6.3.1.3 indicates that a limited groundwater sampling program would be necessary to verify that IC termination criteria had been met, so this alternative is not simply ICs. Further, text in Section 6.3.2.4 describes biodegradation and other passive natural attenuation processes, so Monitored Natural Attenuation (MNA) has been assumed. It appears that this alternative as described is actually ICs and MNA with limited groundwater monitoring. Please revise the title and description of this alternative to clarify that this alternative consists of ICs and MNA with limited groundwater monitoring.
24. **Section 6.3.2.1, Overall Protection of Human Health and the Environment, Page 6-9:** (a) The second sentence is confusing, as ICs are a type of remedial action. It should be changed to "...risk management decision makers will conclude that an active remedy is not warranted at this site." (b) The third sentence is also confusing, as Alternative 2 would not use ICs to prevent unacceptable exposure under a residential scenario. Rather, it would use ICs to prevent unacceptable exposure by prohibiting residential use (and other ICs).
25. **Section 6.3.2.3, Long-Term Effectiveness and Permanence, Page 6-10:** Second sentence is misleading, as it implies that only the regulatory agencies, and not the Navy, are responsible for maintaining and enforcing the ICs.
26. **Section 6.3.2.3, Long-Term Effectiveness and Permanence, Page 6-10.** Since Section 6.4.2.3 acknowledges the uncertainty that chlorobenzene will degrade, it is unclear why this information is not included in Section 6.3.2.3. Please revise the discussion of long-term effectiveness and permanence to clarify that chlorobenzene is unlikely to attenuate, so ICs would be required in perpetuity.

Further, although it is appropriate for *cost estimating* purposes to assume 30-year duration for the alternative, the discussion of long-term effectiveness and permanence should include an estimate of the time it will take for each plume to attenuate. This is necessary in part for an effective comparative analysis of alternatives. Please revise this section to include an estimate of the time it would take for each plume to attenuate.

27. **Section 6.4.1, Description of Alternative, Page 6-11:** It is unclear why the text focuses on the degradation of TCE and 1,2-dichloroethene but does not discuss whether the vinyl chloride is degrading. Further, the text does not discuss the recalcitrance of chlorobenzene to natural attenuation. Please revise this section to discuss whether vinyl chloride has been observed to be degrading and to discuss the recalcitrance of

chlorobenzene to natural attenuation.

28. **Section 6.4.2.3, Long-Term Effectiveness and Permanence, Pages 6-13 and 6-14:** This section should include an estimate of the time for each plume to achieve IC termination criteria. Please revise the text to include this information.
29. **Section 6.6, Alternative 5 - ISCO, Enhanced Anaerobic ISB, and ICs, Page 6-20 and following:** The section on Alternative 5 does not discuss potential incompatibilities between the ISB and ISCO technologies that are mentioned in the discussion of Alternative 6 on page 6-26. We recommend that this potential problem also be noted in Section 6.6.
30. **Section 7.3, Long-Term Effectiveness and Permanence, Page 7-3 and Table 7-1, Summary of Cost Estimates for IR Site 32 Remedial Alternatives:** The timeframe for attenuation of each of the three contaminants to concentrations below tie IC termination criteria should be included in the text of this section and the longest timeframe should be included in Table 7-1. In addition, since chlorobenzene is recalcitrant and is not likely to attenuate, Alternatives 2 and 3 should be rated low for this criterion. It is not acceptable to assume a “medium” effectiveness when the current attenuation rate for chlorobenzene is not known, since this chemical is known to be recalcitrant. Please revise the text to include an estimate of the natural attenuation time for each of the three chemicals for Alternatives 2 and 3 and revise Table 7-1 to include the longest time in the “Duration of Alternative” column. Also, please change the rating of Alternatives 2 and 3 to “low” because of the recalcitrance of chlorobenzene to natural attenuation.
31. **Section 7.4, Reduction of Toxicity, Mobility, or Volume Through Treatment, Page 7-3:** It would be helpful to have a short statement of why Alternative 6 would be more effective in reducing toxicity, mobility and volume through treatment than would Alternatives 4 and 5.
32. **Section A2.1.4, Air ARARs Conclusions, Page A2-2:** This section states that potential air ARARs associated with ISCO are discussed in Section A4.4. However, they are not there (although they are included in Table A4-1).
33. **Section A3.2.3.1, Federal ARARs, Page A3-7, ESA:** We recommend also discussing Section 9 of the ESA (prohibition on take). Same comment on Table A3-1, page 4.
34. **Table A2-1, Page 2, first row:** The first potential ARAR, which appears to refer to MCLs, is confusing. The citation to CERCLA is inappropriate: CERCLA is not an ARAR, but a requirement that cleanups comply with ARARs. Here, it isn't CERCLA 121 that is being evaluated as an ARAR, it's MCLs. EPA agrees that MCLs are not ARARs here, but instead of the general citation to the NRWQC, we'd recommend a more specific citation to the federal MCLs (40 CFR Part 141, Subpart G). (Also, we agree that here the NRWQC are not ARARs, but the reason is because there are water quality standards in effect (as stated in the second row), not because the groundwater is not a potential source of drinking water.)

35. **Table A2-1, Page 2, second row:** We are fine with the more general explanations concerning WQS and NRWQC in the second row, but we recommend removing the reference to CERCLA for the reasons discussed above. It is also unclear what is the purpose of the citation to 64 Fed. Reg. 19781 in both the first and second rows.
36. **Table A2-2, page 3, second row:** Are SIP 1.3 and 1.4 in fact considered applicable due to the potential migration of groundwater to surface water, or is it because wastewater generated in the remediation process may be discharged to surface waters?
37. **Table A4-1:** Why are various RCRA requirements considered to be applicable rather than relevant and appropriate?
38. **Table A4-1:** If there is potential for wastewater generated in the remediation process to be discharged to surface waters, as discussed on page A2-13, the FS should include substantive NDPES requirements as potential ARARs.
39. **Table A4-2, Page 1:** In comments column, please replace the last sentence with the following: "USEPA considers the following portions of Cal. Code regs, title 22 Sec. 67391.1 to be relevant and appropriate for IR Site 32: Cal. Code Regs. tit. 22 Sec. 67361.1(a)(1), (a)(2), (d), (e)(1) and (e)(2)."
40. **Appendix C, Cost Development Summaries, Table C-4:** Initial Alternative 4 costs could be substantial if design and implementation plans were prepared prior to or concurrent with chlorobenzene treatability testing. Treatability testing should be performed first, before substantial investments in design or mobilization.
41. **Appendix C, Tables C-1, C-4, C-5 and C-6:** Costs for one five-year review for Alternatives 4 and 6 and two five-year reviews for Alternative 5 should be included. A five year review is needed for sites that have been completed within the five year period to document that the remedy is protective. In addition, it appears that groundwater monitoring will continue beyond the issuance of the closeout report to evaluate whether rebound occurs, so the results of this monitoring should be documented in a five-year review. Please revise the assumptions and cost estimates to include one five-year review for Alternatives 4 and 6 and two five-year reviews for Alternative 5.