N00221_001215
MARE ISLAND
SSIC NO. 5090.3.A

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

August 21, 2003

Mr. Jerry Dunaway
Southwest Division, Naval Facilities Engineering Command
1220 Pacific Highway
San Diego, CA 92101-8517

RE: Draft Remedial Investigation for Investigation Area F2, Mare Island, Vallejo California (April, 2003)

Dear Mr. Dunaway:

EPA has reviewed the above referenced documents regarding the former ordnance manufacturing area and offers the following comments.

GENERAL COMMENTS

1. The sampling approach is described in only very general terms, and it is very difficult from the presentation to tell what constituents were analyzed for in which locations. It appears that only a statistical summary of data is presented. Please provide a more complete description of the field work and findings in the next version.

2. The storm drains and outfalls in area F2 need to be investigated. Please include these along with the investigation of storm drains and outfalls that we previously requested for area F1.

3. There are PCB sites in this parcel that need to be addressed. Please include all of the PCB data in the RI report. We encourage the Navy to clean up these sites to eliminate any burdensome documentation should property transfer occur.

4. It does not appear that hexavalent chromium was analyzed for; considering the high total chromium concentrations found, additional sampling should be conducted to evaluate this data gap.

5. Please include a discussion of any radiological investigations or data collected pertaining to the greensand in this area.

<u>General Comments on the Human Health Risk Assessment</u>

1. We do not agree with the presentation of a "dual-tracking" risk assessment in which toxicity

values developed by EPA are used in one risk characterization, with another risk characterization presented using toxicity criteria developed by the California Department of Toxic Substances Control (DTSC) when the California value is four times more protective than the EPA-developed values. As Mare Island is a closed based located in California, the Navy will be required to comply with DTSC requirements before any property is transferred. We recommend that the "dual tracking" be eliminated and the more health-protective of the EPA or DTSC-developed toxicity criteria be used in the risk characterization. If the Navy wishes, the overall effects on the risk characterization can be discussed in the uncertainty analysis.

2. The risk assessment refers to the EPA memorandum regarding the role of the baseline risk assessment in Superfund remedy selections "to aid in interpretation of the results of the risk assessment." EPA's policy for risk characterization (1995) states that risk assessors "are charged with (1) generating a credible, objective, realistic, and balanced analysis; (2) presenting information on hazard, dose-response, exposure and risks; and (3) explaining confidence in each assessment by clearly delineating uncertainties and assumptions along with the impacts of these factors...on the overall assessment. They do not make decisions on the acceptability of any risk level for protecting public health or selecting procedures for reducing risks." Within the risk assessment itself, there is no need for additional information to aid in interpreting the results other than the information described in EPA's risk management policy. In addition, whether any residual risk level in excess of 10^{-6} constitutes an acceptable risk represents a risk management decision that should necessarily take into account additional factors such as cost, technical feasibility, and public acceptance. Hence, discussions of "acceptable risk" should be reserved for the conclusions of the report and subsequent documents as appropriate (i.e., the feasibility study, proposed plan, and record of decision). Accordingly, before approval of the risk assessment for Investigation Area F2 is possible, the references to acceptable risk levels must be deleted from the risk assessment.

3. The exposure point concentrations (EPCs) for evaluating inhalation of vapors volatilized into indoor air shown in Tables I-3.1 through I-3.6 and I-8.1.1 through I-8.4.5 do not directly correspond with the calculated EPCs for volatile organic compounds (VOCs) in indoor air used in the risk assessment. The EPCs for VOCs are presented in these tables as either soil concentrations with units mg/kg, or concentrations in groundwater with units of ug/L. However, as noted in Tables I-4.1 through I-4.4, the EPCs for constituents of potential concern (COPCs) in air should be expressed in units of mg/m^3. The calculated doses for inhalation presented in Tables I-8.1.1 through I-8.4.5 do not correlate with the EPCs provided in the respective tables, although they do appear to correlate with the indoor air concentrations calculated using the Johnson & Ettinger model described in Attachment I4. Please revise the EPCs presented in the tables for indoor air to represent the actual calculated indoor air concentrations.

4. Due to the presence of shallow groundwater the Johnson & Ettinger model may not be appropriate for estimating indoor air concentrations. Soil gas data would be more appropriate to use and should be collected. Please discuss the limitations of the Johnson & Ettinger model in assessing risk under shallow groundwater conditions and limitations in it's use for making land use decisions.

<u>Specific Comments on the Human Health Risk Assessment</u>

1. **Section 5.0, Data Evaluation, Page I-5:** There is a discrepancy between the method described here and in Appendix H for evaluating censored (non-detect) data in statistical calculations. According to this section, a proxy value of one-half the sample quantitation limit (SQL) was used for censored data, while the text in Appendix H states that censored data were replaced either by estimated values or one-half the method detection limit (MDL). EPA guidance (2002a) recommends a number of simple substitutions related to the MDL for non-detects when calculating exposure point concentrations, and the method described in Appendix H satisfies the requirements discussed in EPA's 2002 guidance. If the method described in Appendix H was in fact used, please revise the text in Sections 5 and 11.2.3 to correctly describe the methodology. If the method described in Appendix H was not used, the risk assessment should be revised in accordance with the methods presented in Appendix H.

2. **Section 5.0, Data Evaluation, Page I-5:** Surface soil is defined here as 0 to 2.25 feet below the ground surface (bgs). Typically, surface soil is defined as less than 6 inches bgs for purposes of evaluating potential exposure, and no information is provided to justify the conclusion that certain receptors (e.g., recreational visitors) would be exposed to soils as deep as 2.25 feet bgs. Please revise the report to provide justification for the assumption on depth of surface soil presented in this section.

3. **Section 6.1, Identifying Chemicals of Potential Concern, Soil, Page I-7:** EPA policy (EPA. 2002a) no longer supports the elimination of metals from the risk assessment based solely on a comparison to background or ambient levels. In order to provide a more complete characterization of potential risks associated with exposures at the site, metals that exceed risk-based screening concentrations should not be excluded from quantitative consideration in the risk assessment. The contribution to the overall risk due to metals with high background concentrations should be discussed in the risk characterization. Please revise the selection of COPCs to include those metals currently excluded on the basis of ambient levels and revise the risk characterizations as necessary.

4. **Section 6.1.1, PRGs, Page I-8:** The text here which states that the residential preliminary remediation goal (PRG) is more conservative than the industrial PRG because it accounts for childhood exposure is incorrect. Residential PRGs are more conservative because on-site residents are presumed to have a greater potential for prolonged exposure than would occupational receptors who would only be expected to be present at the site for some portion of the day and week (as is noted on page I-11). Inclusion of childhood exposures serves to increase the conservativeness of residential PRGs to some degree, but a residential PRG that evaluated only adult receptors would still be more conservative than an industrial RPG. Please revise the text in this section to correctly note this distinction.

5. **Section 7.3.1, Exposure Points and Exposure Point Concentrations, Soil, Pages I-12 to I-13:** The report states that EPCs were calculated following 1992 EPA Guidance. This guidance is outdated, and the method described in it for calculating the 95 percent upper confidence limit (UCL) on the arithmetic mean has been superceded by EPA, 2002a , which should be cited here. In addition, although the report states that soil EPCs were calculated as the 95 percent UCL for evaluating reasonable maximum exposure (RME) and the arithmetic mean for evaluating central tendency exposures (CTE), the cited guidance states that the average concentration should be used to evaluate both CTE and RME. However, because of the uncertainty associated with

estimating the true average concentration at a site, the 95 percent UCL should be used for this variable. Revise the risk assessment to use the 95 percent UCL as the concentration term for CTE evaluations as well as in the RME evaluations. Alternately, the CTE evaluations may be deleted.

6. **Section 7.3.3, VOCs in Air from Soil, Page I-14:** The report states that outdoor air EPCs of particulates and volatile compounds were calculated using a particulate emission factor (PEF) and a chemical-specific volatilization factor (VF). Although the report references the 2002 Region 9 PRG table, the PEF and chemical-specific VFs, along with an explanation of their derivation should be presented in the risk assessment. In addition, the PEF included in the PRG derivations addresses only dust particles arising due to wind, and does not address dust generated via intrusive operations or vehicular traffic, and thus is not appropriate to use when evaluating construction workers. A methodology for developing a PEF for assessing inhalation exposures reflective of a construction or utility worker may be found in the Supplemental Guidance for Developing Soil Screening Levels (EPA, 2001). Please revise the risk assessment to include a presentation of the derivation of the PEFs and VFs, and revise the calculation of risk and hazard for construction workers accordingly.

7. **Table I-5.1.EPA, EPA Non-cancer Toxicity Data-Oral/Dermal, and I-6.1.EPA, EPA Cancer Toxicity Data-Oral/Dermal:** The reference doses (RfDs) and cancer slope factors (SFs) for evaluating dermal exposure presented in these tables have been adjusted to account for gastrointestinal (GI) absorption (to account for the fact that RfDs and SFs are expressed as an administered dose, whereas exposure estimates for the dermal pathway are expressed as an absorbed dose). Footnote 1 of this table references EPA, 2001b as the basis for this extrapolation and refers to Section 8 for additional information. However, the text in Section 8.3 simply states that oral RfDs and SFs were used to quantify dermal exposures, and no information is provided regarding this extrapolation. EPA, 2001b recommends that adjusting oral toxicity values to account for GI absorption not be performed when the GI absorption rate is greater than 50 percent or is unknown. Specifically, adjustment to reflect GI absorption is recommended only for certain metals and not for any organic compounds. Revise the dermal RfDs and SFs to correspond with the recommendations provided in EPA, 2001b, and revise the risk and hazard estimates accordingly.

Errata

1. The text on page I-1 states that the five subareas are shown on Figure I-1. However, this figure is actually a conceptual site model.

2. The first sentence in Section 6.2 (page I-9) appears to be missing portions of the text.

General Comments on the Ecological Assessment:

1. We strongly suggest the Navy provide the results of the SLERA before proceeding to the BERA (Section 5.0). Presentation of conservative screening results (no background or ambient subtracted out, HQs derived using the ORNL benchmark for plants and invertebrates, the ER-L

for aquatics or the TRV low divided into the soil/sediment maximum concentration for the vertebrates) would help a great deal to focus attention in the proper areas prior to attempting to refine the exposure estimates.

2. BAFs calculated from non site-specific data are not acceptable in a SLERA. As section 6.4.1 Tissue Residue Data notes, no plant or animal tissue data was collected on this site. If they are required based on the advancement of specific COPECs to the BERA, data should be collected on site to support them.

3. The lack of a receptor such as a vole or a shrew for the upland area is a major omission. This is the basis for developing the entire food chain for upper trophic level receptors.

4. A map must be included which relates specifically to the conclusions section. At present, it is not possible to be sure exactly which areas the Navy is proposing to remediate.

5. Why hasn't the Navy presented the results of the bioassay data available for this site?

Specific Comments on the Ecological Risk Assessment:

1. **Page J-9, COPEC Selection**: EPA Region 9 strongly recommends against eliminating COPECs on the basis of background or "ambient" during the screening process. Any contaminant that exceeds screening levels should be addressed in the BERA.

2. **Page J-16, bullet 1**: HQs for aquatic invertebrates in the SERA should have been calculated using the ER-L. This also applies to invertebrate HQs on page J-44. Screening against the ER-M is contrary to the function of the SERA which is intended to identify all contaminants of possible concern which is defined as all those which have any potential for adverse effect (>HQ1 using the most conservative screening value). Please present HQs based on the ER-L.

3. **Page J-17, 3.0 Exposure and Effects Assessment and Risk Characterization for Plants** - as discussed above in (1), all COPECs should be screened against benchmarks--not just the ones above "ambient".

4. **Page J-40, 4.0 Exposure and Effects Assessment and Risk Characterization for Invertebrates** - see (1) and (3) above.

5. **Page J-80, 5.2.1 Toxicity Reference Values**: The Region 9 BTAG does not recommend allometric scaling in ecological risk assessment due to high uncertainty associated with the proposed values. A careful reading of the Sample and Arenal (1999) paper makes it clear that the use of non-chemical specific scaling factors is problematic at best, They also note that the scaling factors they present are most appropriate for acute toxicity data. The low TRV used in the SLERA is predicated on the NOAEL--not the LOAEL. Therefore, the use of allometric scaling in this excercise is not warranted.

6. **Page J-100** - It does not appear that the Navy is aware the BTAG lead TRV has been changed. See HERD Eco Note 5.

6. **Page J-118, 8.1 Risk Refinement for Plants** - a number of COPECs have been eliminated that are found at high percentages across the sites and/or at levels well above the benchmark. That is not acceptable, particularly when that decision is partly based on comparison to an "average" HQ. Given the number of these contaminants across the sites, it would be better and conservative to carry these COPECs into the BERA and assess the cumulative risk from these COPECs. With regard to contaminants such as antimony, lack of information does not support the deletion of the metal from the BERA. It should be carried through and addressed under the uncertainty discussion.

7. **Section 8.2 Risk Refinement for Invertebrates** - it is not acceptable to screen toxicity against the ER-M only. It would be much more useful to the risk characterization process if a range of values from the ER-L to the ER-M was developed and presented. The ranges would present actual values for the "grey" area between the ER-L and the ER-M where adverse effect is uncertain and future risk management decisions could take the ranges into consideration when setting cleanup levels.

8. **Section 8.2.5 Upland Habitat (Other Upland Subarea)** - COPECs which exceed the ORNL benchmark must be carried through to be discussed in the risk characterization section of the BERA. This is the point at which background or ambient can be brought into the picture.

9. **Page J-139, Section 8.3 Risk Refinement of Vertebrates** - bioavailability factors developed for other parts of Mare Island do not necessarily translate to this area given the wide range in soil texture and metals content associated with the fill prevalent on Mare Island. The Navy must provide site-specific information in the BERA.

10. **Page J-140, Section 8.3.1 Average Doses** - this is not an acceptable technique. We want to look at the range of variability across the site, not an "average". We don't remediate "averages"--we remediate soil, sediment and water on sites.

11. **Page J-140 Section8.3.2 Bioavailability Adjustments** - no adjustments for bioavailability can be made without site-specific information. The high metals levels on this site absolutely require this data to arrive at fully informed decisions.

12. **Page J-145 Section 8.3.3 Refinement of Avian COPECs and Section 8.3.4 Refinement of Mammalian COPECs** - the deletion of COPECs must be revisited when site-specific bioavailability information is available. This is most particularly the case when addressing an endangered species like the salt marsh harvest mouse.

Thank you for the opportunity to review this report. If you have any questions, please call me at (415) 972-3150 or Emily Roth at (415) 972-3175.

Sincerely,

Carolyn d'Almeida

Carolyn d'Almeida
Remedial Project Manager

cc: Emily Roth, EPA
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