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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
CARIBBEAN ENVIRONMENTAL PROTECTION DIVISION
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JUL 1 3 2004

Ms. Yarissa A. Martinez Leon
Vieques and Culebra Affairs Coordinator
Puerto Rico Environmental Quality Board
PO Box 11488
Santurce, Puerto Rico 00910

Re: Comments on Draft Remedial Investigation Report Solid Waste Management Unit for 7 Former Naval Ammunition Support Detachment Vieques, Puerto Rico April 2004

Dear Ms. Martinez:

The United States Environmental Protection Agency has completed the review of the Draft RI Report for SWMU 7, Former Naval Ammunition Support Detachment, Vieques, Puerto Rico, submitted on April 2, 2004. Enclosed you will find our comments on the RI Report.

If you need additional information or clarification, please feel free to call me at (787) 671-9879.

Cordially,

Daniel Rodríguez
Vieques Remedial Project Manager
Enforcement and Superfund Branch

Enclosure

**EPA's Comments**
**Draft Remedial Investigation Report**
**Solid Waste Management Unit (SWMU) 7**
**Former Naval Ammunition Support Detachment**
**Vieques Island, Puerto Rico**

General Comments:

1) The exposure pathways evaluated in the ERA included direct exposure of wildlife to contaminants in the soil, as well as soil contaminants potentially accumulating in the onsite food web. The Step 3 refinement process indicated that there were low risk estimates for site-related chemicals and therefore no additional ecological studies or sampling are recommended for SWMU 7. While we do not disagree with these conclusions, it is our recommendation that if the final RI concludes there are questions or concerns regarding the future stability of that material, it should be removed and properly disposed.

2) It appears that the soil sample locations were chosen using a judgmental approach, concentrating on the perimeter of the dumping area. Since the results of this sampling event were used to make decisions affecting the entire site, it should be noted that this approach is not statistically valid. As stated in EPA QA/G-9, *Guidance for Data Quality Assessments: Practical Method for Data Analysis*, EPA/600/R-96/084, July 2000: "...This type of [judgmental] sampling should only be considered when the objectives of the investigation are not of a statistical nature, for example, when the objective of a study is to identify specific locations of leaks, or when the study is focused solely on the sampling locations themselves. Generally, conclusions drawn from authoritative samples apply only to the individual samples and aggregation may result in severe bias and lead to highly erroneous conclusions..." An explanation should be given detailing how these sampling locations can be used for determining the risk for the entire study area.

3) It is mentioned in the report that the data used to determine the potential risk posed by this site was collected in two separate sampling events, one taking place in 2000 and another in 2003. These results were then combined into one data set. The report should provide a discussion on the possible limitations using data collected with such a time lag.

4) The Data Quality Assessment (DQA) provided in this report does not provide enough evidence that the data used to answer the project's principal question (which appears to be whether or not the site poses an unacceptable risk to Human Health and the Environment) was subjected to a thorough analysis to ensure that the question could be answered within an acceptable degree of error. The report does not address or define what degree of error is considered acceptable, nor does it provide the process that was used to determine that error. A complete Data

Quality Assessment should be performed that accomplishes the goals mentioned before. It is recommended that the guidance provided by EPA QA/G-9, be followed. This document can be found at http://www.epa.gov/quality1/qs-docs /g9-final.pdf.

5) Sediment samples should have been analyzed for total organic carbon (TOC) and grain size. This information is important in determining the depositional nature of the sample locations for sediments collected from the mangrove area. These samples would be expected to be more organic-rich than the soil samples collected from the dry area of the ditch. Information regarding TOC and grain size would allow for better interpretation of the sediment chemistry data and assist in the determination of the need to conduct any additional sediment sampling. (In the event that sediment samples were not collected from depositional areas, we may request that additional sediment samples be collected.)

Specific Comments:

6) Page ES-2: Paragraph 1 states that pesticides, PCBs, and explosives were not detected above their applicable screening criteria in soil. However, Paragraph 2 states that 2 pesticides (DDT and DDE) were identified in surface soil exceeding the screening criteria. Please correct this inconsistency.

7) PageES-2: Paragraph 3 sentence 1 - states several inorganic chemicals were detected in unfiltered samples. Sentence 2 proceeds to list metals found above MCLs and/or RBCs in filtered samples. The metals found in unfiltered samples should also be listed and a brief explanation as to how metal results compare to one another (filtered vs. unfiltered).

8) Page ES-3: In the first paragraph, the text discusses the results of the first round of perchlorate sampling. When discussing the most recent round of sampling, the text states that the sampling "did not indicate the presence of perchlorate... it can be concluded that perchlorate's presence in site media is questionable." How can this be said, when two rounds of data exist that contradict each other? The well should be resampled and reanalyzed using appropriate methods, and a downgradient well should also be sampled to see if perhaps the previous detection was the result of a "slug" of contamination that has moved past the original sampling location.

9) Page ES-4: Paragraph 2 states that the HI for soils was above the target risk range for a residential Adult and Child; list what the target risk range is.

10) Page 1-1: Please note that there are only two objectives not three.

11) Figure 2-5: A number of aspects of the cross-section are not clear. The area marked with blue stippling is noted as the saturated thickness, but the dashed blue line appears to be the water table. Is the stippling noting a change in lithology? It is not clear from the drilling logs in the appendix. However, if this is the case,

then MW-08 is in a separate unit and the water level is not comparable to the other wells. In fact, without split spoons or cores profiling the stratigraphy, it is difficult to definitively rule out that this is not tapping a different hydrogeologic horizon. Note also that if it is in a different unit, it is a poor background well for looking at concentrations in the more shallow unit.

12) Page 2-6: The text adopts an approach of stating that contaminants were "either not detected or detected below their applicable screening criteria." This leaves the issue ambiguous and is not appropriate. Please distinguish between compounds which were not detected and those that were detected below criteria. This comment has been offered on previous reports; please do not continue to present information in this way.

13) Figure 2-6: Leaving out well MW-08 which may be in a different unit, the groundwater elevation data show that the flow gradient is north to south, away from the shore. This is surprising and may be a transient feature, but should be noted in the text and on the figure.

14) Page 3-1: The section on MEC should be expanded to include some additional information, or note that such information is not available. Specifics on what materials or contaminants might be associated with the detected ORS items should be provided. Also, the text in Appendix A indicates that MEC avoidance was performed only in sampling and work areas. It further notes that 4 sampling locations were adjusted based on indications of metallic materials in the subsurface. Given the presence of ORS in some locations at the site and the necessity to relocate sampling points, there is a real possibility that additional ORS or MEC is present at the site. Subsequently, follow up work should be conducted to clear the area of all such materials.

15) Page 3-2, Section 3.2.2: The text states that perchlorate in soils was analyzed using the method for perchlorate in water. Please verify this method and QA/QC protocol with Region 2's Hazardous Waste Support Section for review and acceptability. The information that should be submitted for review would include the sensitivity, selectivity, precision, and accuracy of the modified method.

16) Page 3-2: Please note that future surface soil sampling should encompass the top 12" rather than the top 6". Data representing the top 0-6" may under- or overestimate actual risk to ecological receptors.

17) Page 3-5: No water level was collected from well MW-06A. Even though it is from a different depth horizon, the level should have been collected. It would provide valuable information on vertical flow and in the interpretation of water levels from MW-08. MW-08 was set deeper than other wells and has a significantly higher potentiometric surface. It seems quite possible that a more shallow well at MW-08 would have a potentiometric surface more in line with the other wells which were installed. While this comment does not require any amendment to the report, please be sure that in the future all wells at a site are

always gauged.

18) Page 3-4: Please indicate how the drill cuttings were disposed of, rather than only stating that the method was determined based on the IDW plan.

19) Page 3-5: Please indicate what model of Whaler Pump was used in MW-06 in order to demonstrate that it is appropriate for environmental sampling.

20) Figure 3-1: Please note that there are two sample locations indicated as NDW07SD03. The proper sample nomenclature should be noted.

21) Section 3.6 and Appendix H: Reading these portions of the report do not make the results and implications of the geophysics work very clear. A number of questions should be more directly addressed including: whether there appears to be material of concern or fill from dumping in the subsurface - or if surface materials appear to be the only concern; and what is the significance of the waste boundary which is shown extending northeast of the drainage feature and under the road? If the data is suggesting that there is an area of fill here, then this may require further investigation.

22) Section 4.1.4: As has been discussed in the past, all detections of anthropogenic contaminants should be included in summary tables and figures. This was agreed upon just after the document was submitted and should be incorporated in the final draft. Some of the specific comments below note this issue, but it applies to all sampling.

23) Page 4-4: It is unclear whether the drainage ditch is representative of a fresh water environment or a marine environment. If it is a fresh water environment than it is recommended that sediment samples should be screened against values provided in the Ontario Ministry of Environment 1993. *Guidelines for the Protection and Management of Aquatic Sediment Quality in Ontario* and Smith, S. L., D. D. MacDonald, K. A. Keenleyside, C. G. Ingersoll, and L. J. Field 1996. "A Preliminary Evaluation of Sediment Quality Assessment Values for Freshwater Ecosystems," *J. Great Lakes Res.* 22(3):624–638.

24) Page 4-7, Section 4.2.1.3: The document presents a methodology for reducing the number of COPCs by identifying those inorganics that are essential dietary nutrients. The only essential dietary nutrients that Region 2 recommends not be retained for the quantitative risk assessment are calcium, magnesium, potassium, and sodium. This method is not appropriate and should be removed.

25) Page 4-8, Section 4.2.2.1: This section states that leachability criteria were not available for 12 metals (aluminum, calcium, cobalt, copper, iron, lead, manganese, mercury, potassium, sodium, and thallium). Could site-specific leachability criteria be developed for these metals?

26) Page 4-10: The text states that 5 VOCs were detected in 13 surface soil samples and references Table 4-3. As per the previous comment, please indicate what VOCs were detected, as well as the attendant locations and concentrations.

27) Page 4-10: The section which describes SVOCs states that 16 SVOCs were detected, and that there were 12 PAHs and 3 phthalates. This adds up to 15 SVOCs. Please verify the number that were detected.

28) Results for explosives and perchlorate analyses in surface soils are not included in the discussion of results. A review of Appendix I shows that all samples were non-detect for these parameters. Please include this information in the text. For subsurface soils, please discuss the explosives results and provide the location and concentration of the perchlorate detection, as well as full details on the organic detections, giving contaminants, concentrations, and showing locations.

29) Page 4-11, Section 4.2.2.3: The text states that six monitoring wells were installed but only five were sampled. Please explain why all six were not sampled.

30) Page 4-12: The second paragraph states that screening criteria are not available for chromium and lead. Results are then screened against the chromium PRG and the action level for lead. Please amend and clarify.

31) Page 4-13: In the section that describes VOCs, the text states that no VOCs were detected above screening criteria in the groundwater. However, on Page 4-11, the text states that groundwater samples were not sampled for VOCs. Please clarify what chemicals were analyzed in the groundwater.

32) Chapter 4 Figures: It would have been useful to include separate figures for ecological exceedances and human health exceedances.

33) Table 4-5 - indicate MCL values/exceedances as well.

34) Table 4-7 - The calculated range and average for the contaminants found at the site are shown here, however, the standard deviation is not provided. The standard deviation is a very important statistic that provides information regarding the distribution of the data and can be used to quantify error, therefore, this number should be calculated and shown.

35) The executive summary and Section 5.1 note that drums and used batteries were disposed of at the site. Materials such as these could represent a potential for future releases and their removal and proper disposal needs to be considered. This comment is also relevant to Section 8.1.8.

36) Table 5-1 and the attendant text belong in Section 4. Please include ORP, pH, and temperature in the table.

37) Page 5-4: The text notes that high turbidity of unfiltered groundwater may have effected metals results. According to Table 5-1, all samples had quite low turbidity. If turbidity is thought to be influencing results, the data must be presented which proves the case. Show that the more turbid samples have a greater difference between total and dissolved concentrations. Based on the range of turbidities (1-7.4 NTUs), it seems unlikely that this is a valid conclusion.

38) Page 5-6: Please explain the purpose of the last paragraph in Section 5.4.2.2.

39) Page 5-10: It would have been useful to compare surface soil inorganic concentrations to screening values rather than just background concentrations. A discussion of the most downgradient sediment samples should be incorporated. It is noted that chemicals in the site soil may be transported by stormwater runoff to surface soil in the drainage ditch (**Section 5.3.2 Surface Runoff Pathway**, page 5-3) and subsequently to the ditch downstream. Therefore there appears to be a potential for on-site contaminants to be transported off-site.

40) Page 5-11: The text states that MW-04 is within the area where disposal occurred. On the figures, it is outside of the line drawn to indicate the waste boundary. Please resolve the conflict.

41) Page 5-11: In the first paragraph, the text states that there is high turbidity in the unfiltered samples. Is this turbidity measured or observed. If measured, the results should be presented in a table, along with the total and filtered metals results. If observed, the field report which notes the visible turbidity should be referenced.

42) Page 5-11: In the last paragraph, the text states that the first sample for perchlorate reported a concentration and the resample reported nondetect. The conclusions drawn from this are that the original reported value was a false positive. Is there any information to support that this is correct, and that the second result was a false negative?

43) Page 6-3, The text in Section 6.3 states that the land is zoned for low-density and tourism and resource conservation. However, in RAGS D Table 1, future land use is discussed as "not expected to be developed for residential use." Please provide further text to clearly explain this interpretation which is slightly inconsistent with the zoning. Suggested text is included in Comment 20.

44) Page 6-6: In the last paragraph of Section 6.5.1, please explain why another downgradient well was not sampled for perchlorate, and why there is not a recommendation to resample the well once a new method is approved.

45) Page 6-8, Section 6.6.1.3: The text states that industrial workers would be in direct contact with soils. Therefore, the soil ingestion rate should be 100 mg/day. The reference for this is the 2002 Soil Screening Guidance. The use of 50 mg/day

is typically used for those commercial workers whose duties are primarily located indoors.

46) Page 6-10, Section 6.6.2.5: The default PEF of 1.36E+9 $m^3$/kg was developed based on certain parameters such as area size and percent of bare soil at the site. Are these default parameters consistent with SWMU 7? Please provide a table of the default parameters and the site specific information so that EPA can determine if it is appropriate to use the default PEF.

47) Page 6-11, Section 6.6.3.2: This section references Region 3 guidance for evaluating filtered and unfiltered samples. However, this site is not in Region 3. Region 2 recommends quantifying risk using unfiltered samples, then discussing any differences between unfiltered and filtered samples in the uncertainty section.

48) Page 6-12, Section 6.7: Please reference the OSWER Directive 9285.7-53, "Human Health Toxicity Values in Superfund Risk Assessments".

49) Page 6-15, Section 6.9.3: Please revise this section to clarify whether the concern is with relative bioavailability or absolute bioavailability, and how, specifically, this factor might impact the results of the quantitative risk assessment.

50) Table 6-1:
    i. Why are SSLs not calculated for all COPCs?
    ii. What do the footnotes "*" and "**" mean?
    iii. Please clarify if the SSLs are based on migration to groundwater or direct contact.

51) Table 6-4: Please revise the "reason for selection or exclusion" for the residential scenarios to read, "The site is zoned for low-density residential use. Although this use may be unlikely, it is included here as part of the legally permitted land uses. This scenario is also likely to have the highest levels of exposure."

52) Table 6-6: Please include a column that lists the number of data points for each contaminant.

53) Table 6-9: Please clarify why ½ of the detection limit was not used for dissolved iron.

54) Page 7-1: It should be noted in the second paragraph that, as per ERAGs, at the conclusion of Step 2 it may be determined that not enough information is available to make a determination of whether risk exists, and therefore the ERA process would continue on to Step 3 (as noted in **Section 7.1.1 Objectives of the ERA**).

55) Page 7-11: Minimum adult body weights were not used in the SERA, as it is noted that body weights included in Table 7-8 (Step 2) were greater than body weights used in Table 7-15 (Step 3). These values should be corrected.

56) Tables 7-8 & 7-15: Please provide the appropriate reference(s) for the dietary values and body weights provided in this table.

57) Tables 7-12 & 7-18 *Summary of Hazard Quotients for Upper Trophic Level Receptors - Step 2 & Summary of Hazard Quotients for Upper Trophic Level Receptors - Step 3*: The calculations used to determine the dietary ingestion values to support this table, should be provided in an Appendix or in Section 7. Further, the area use factor used for the Step 3 calculations should also be provided.

58) Page 8-1: The ecological risk assessment section (Section 7) should have included data from the two downgradient sediment samples. As noted in Section 5.5, it may be possible for site contaminants to migrate downstream during storm events. An attempt should be made to see if there any patterns to the inorganics data in the sediments, soils, and groundwater.

59) Page 8-5: In the third paragraph, please provide a reference for the text that suggests that the analytical method for perchlorate is "prone to false positive detections".

60) Appendix L: The title for all of the RAGS D tables states that the site is a quebrada. Please revise this text to state that the area is either an intermittent stream or a drainage ditch.

61) Appendix L, Table 5.1: The oral absorption factor for cadmium in water is 5%, as provided in RAGS Part E, the dermal guidance.

62) Appendix, L, Table 6.2: Please clarify the footnote (1).