7/1/03-00550

Response to Comments
Draft Ecological Risk Assessment for Site 8
Naval Amphibious Base Little Creek, Virginia Beach, Virginia
Dated February 2003

This document responds to comments from the Virginia Department of Environmental Quality (letter dated 29 May 2003) and the U.S. Environmental Protection Agency (letter dated 10 June 2003) on the draft ecological risk assessment for Site 8, Naval Amphibious Base Little Creek, Virginia Beach, Virginia (February 2003). These responses include the results of discussions that occurred as part of the 30 July 2003 Tier 1 partnering meeting (USEPA/BTAG comments), as documented in the final meeting minutes, and that occurred during a conference call with VDEQ on 6 August 2003 (VDEQ comments).

I. Virginia Department of Environmental Quality

1. Table 2-6: Move the "Coastal Plain Slimy Salamander" listed in the "Frogs and Toads" section to the "Salamanders" section of the table.

The requested change will be made.

2. Section 3.1.3.3, Page 3-5: Amphibians should be considered in this ERA as there may be possible exposure pathways and routes on Site 8. The freshwater canal leading from Lake Bradford is a permanent fresh water body adjacent to Site 8 that may provide sufficient habitat for amphibians. Also, the red-backed salamander listed in Table 2-6 is a terrestrial amphibian and does not have an aquatic larval stage. Please include amphibians as a possible receptor group given the presence of a fresh water source adjacent to the site and the possible presence of an amphibian that does not require fresh water during its larval stage.

As described in Section 3.1.1.1, the portion of the drainage canal adjacent to Site 8 is saline, not fresh (measured salinities of 18 to 19 ppt). The canal does not become fresh until the weir near Nider Boulevard, approximately 1,750 feet upgradient of Site 8; this will be added to Section 2.2.1.4 of the revised document. The two ponds on Site 8 are also saline to brackish water bodies. Thus, amphibians are not likely to be a significant component of the faunal community on or near Site 8. However, as the red-backed salamander may be present on the site, based upon habitat preferences, amphibians will be added as a potential receptor group for terrestrial habitats. It should be noted that the limited amount of amphibian toxicological data available for most chemicals will require that the other taxa already evaluated in the ERA be used as surrogates to evaluate terrestrial amphibians.

3. Section 3.2.2: The fresh water canal leading from Lake Bradford does not lie within the boundaries of Site 8 and is not likely to be adversely impacted by the contaminants present at the site. However, it does offer a freshwater source to species that may be present on the site. Please amend the first paragraph of this section to address this viable freshwater drinking source.

Please see the response to VDEQ Comment 2. The salinities in the portion of the canal adjacent to Site 8 exceed the 15 ppt threshold for use as drinking water.

4. Section 3.2.2: Certain prey species may be exposed to groundwater in the sediment layer. Groundwater flows up through the sediment into the surface water. Possible groundwater exposure pathways may exist at this interface and should be considered or properly discounted in this section.

Chemicals that may be present in sediment at the groundwater/surface water interface would generally be better represented by bulk sediment samples, not groundwater samples, for the purposes of determining potential exposures to ecological receptors, particularly upper trophic level receptors from food web exposures. Sediment pore water is typically assumed to have characteristics common to the surrounding bulk sediment primarily because of its physical proximity and the equilibrium formed between water and sediment chemistry based upon partitioning. This is particularly applicable to non-ionic organic chemicals, whose partitioning tends to be mediated largely by the organic carbon content of the sediments. A comparison of sediment concentrations with equilibrium partitioning-based values was included in the ERA, where available data permitted, for organic chemicals that exceeded their sediment screening values. Equilibrium partitioning has typically not been quantitatively applied to metals as the chemistry of metals tends to be more complex and the water solubility of most metals is relatively low. Most metals tend to accumulate and persist in sediments, and concentrations are typically correlated with physical factors such as grain size and total organic carbon. The properties of the Site 8 sediments (e.g., mean TOC of approximately 1.5 percent) suggest that these sediments would likely retain groundwater (pore water) related contaminants. Thus, bulk sediment samples would be representative of these potential exposures. It should be noted that the sediment screening values used in the ERA were typically based upon studies that correlated bulk sediment concentrations with a measure of biological effects (which would include the pore water component) in field-collected samples. Groundwater data were also reviewed in the ERA for surface water and sediment Chemicals of Concern (COCs) to qualitatively evaluate potential contributions from this pathway to aquatic receptors. A more quantitative evaluation of the groundwater data will be included in the final report.

5. Section 4.2.4.1: In the first paragraph, please clarify which metals and compounds detected in the upland areas were retained as PCOCs.

The text will be clarified. The PCOCs identified in this paragraph are aluminum, chromium, iron, vanadium, zinc, 4,4'-DDT, Aroclor-1254, fluoranthene, and pyrene.

6. Section 4.2.5: Was mercury retained?

No since the LOAEL-based HQ was less than one for all receptors. This will be clearly stated in the text of the final report.

7. Table 4-6: The screening value for toxaphene should be 0.0002 μg/l as this is the chronic aquatic saltwater standard in Virginia.

For surface water, the screening values for chemicals known to bioaccumulate in aquatic food webs (e.g., chemicals with screening values based upon final residue values, such as toxaphene) were based upon the final chronic value (rather than the final residue value) as per USEPA (1996, 2002) and Suter and Tsao (1996). The use of final chronic values is intended to protect aquatic receptors from direct exposures to chemicals in surface water, rather than from exposure via food webs. Potential risks to upper trophic level receptors from food web exposures (tissue residues) were evaluated separately using food web models

and ingestion-based screening values. Thus, VWQSs that are based upon final residue values (such as toxaphene) were not used if a final chronic value from another suitable source was available. This explanation will be added to the text.

8. Table A-1: This table is missing the even numbered pages.

This was the result of an error introduced during document production. It will be corrected in the final version of the report.

II. U.S. Environmental Protection Agency Comments

1. On page iii, the Executive Summary identifies common reed (Phragmites australis) as a non-native invasive species. No information is provided in this document documenting if the species found at the site is the non-native or the native form.

Based upon the results of the wetland delineation, which are summarized in Section 3.1.1.1, the common reed present on the site is non-native.

2. On page iv, the Executive Summary states, "However, the screening values for these chemicals were based on effects to terrestrial flora (zinc) or on background (4,4'-DDT and Aroclor 1254)." These last two chemicals are anthropogenic in nature and the relationship between an effects-based concentration and the background concentration should be clearly documented in the text. While the case may be made for the pesticide concentrations being attributed to historical spraying activities and not the site, this same argument will not apply to the PCBs.

Agreed. In these instances, "background-based" screening values are typically detection limits. The text will be modified to reflect this.

3. On page 3-1, Section 3.1, Screening Problem Formulation, states, "Assessment endpoints, measurement endpoints, and risk hypotheses are then selected to evaluate those receptors for which complete and significant exposure pathways are likely to exist." The use of the phrase, "...and significant..." is not appropriate here. In fact, the significance of the exposure pathways would be determined by the results of the ecological risk assessment (ERA) and should not be concluded before the ERA is completed.

This language was derived from the final screening ERA report and was arrived at following discussions with the Region III BTAG. The term is intended to distinguish between pathways that are technically complete but inconsequential versus those that are complete and likely to contribute meaningfully to exposures and thus potential risks. This definition will be added to the report. Section 3.4 of USEPA ERA guidance (USEPA 1997) uses the term "critical exposure pathways" which is basically defined as "exposure pathways that might lead to significant ecological effects". The text and conceptual model figures will be modified by replacing "significant" with "critical".

4. On pages 3-3 and 3-4, Section 3.1.2, Summary of Available Analytical Data, indicates, in the SI, subsurface soil samples were collected at depths of three or more feet. This paragraph on the SI data should clarify which depth and interval (6, 12, 18, or 24 inches) were used for subsurface soil samples.

None of the SI subsurface soil samples were used in the ERA (see Table 3-1). For the RI data, depth strata used included 6 to 12 and 12 to 24 inches, as noted in the subsequent paragraph.

5. On page 3-6, Section 3.1.3.3, Exposure Pathways and Routes, states, "direct ingestion of drinking water is not considered in this ERA since surface water bodies present on or adjacent to the site are brackish to saline." Since brackish to saline conditions were identified as being between 10 and 25 parts per thousand and "Direct ingestion of drinking water is only considered when the salinity is below 15 parts per thousand..." it appears that drinking water needs to be included in this ERA as an exposure route.

The only salinity measurements below 15 parts per thousand (ppt) were from Pond 2 (about 10 ppt) and these indicated brackish conditions. Since the low berm on this pond allows water to enter from the adjacent tidal wetlands (salinities of 19 to 31 ppt) during high tide, it is expected that the salinity in this pond will usually be higher than 15 ppt. The samples were collected during the rising tide. Thus, inclusion of drinking water exposures is not warranted at this site.

6. On page 3-6, Section 3.1.3.4, Receptors, lists the upper trophic level receptor species that were chosen for exposure modeling in the ERA. Because of its higher sensitivity, the belted kingfisher should be used in future risk assessments to evaluate risk to piscivorous birds instead of the great blue heron.

The belted kingfisher will be considered in future assessments. However, inclusion of the belted kingfisher would not alter the conclusions of the Site 8 ERA.

7. On page 3-7, Section 3.1.3.4, states, "Since freshwater habitats do not occur on, or adjacent to, Site 8, amphibians were not evaluated in the ERA." There are terrestrial amphibian species which will need to be discussed in this section. This may lead to amphibians being included as an ecological receptor species.

As described in the response to VDEQ Comment 2, amphibians will be added as a potential receptor group for terrestrial habitats.

8. On page 3-7, Section 3.1.3.4 indicates that fish and benthic macroinvertebrates "...were not chosen as receptor species because of the limited information available for specific species and because aquatic biota are dealt with on a community level via a comparison to surface water and sediment screening values." Fish and benthic macroinvertebrates need to be included as ecological receptors in this ERA.

As discussed in Section 3.1.3.4, fish and macroinvertebrates were included as receptors in the ERA (see Table 3-8) but were included as receptor groups, that is, individual species were not chosen to represent these receptor groups as was done for birds and mammals for the reasons outlined in the text. The text will be reworded to make this clearer.

9. On page 3-7, Section 3.1.3.5, Endpoints and Risk Hypotheses, states, "Effects on individual organisms are important for some receptors, such as rare and endangered species; population- and community-level effects are typically more relevant to ecosystems." This section needs to acknowledge that chemical concentrations that cause chronic survival, growth, and/or reproduction effects have population or community level effects.

This is acknowledged in the third paragraph of this section.

10. On page 3-8, Section 3.2.1, Selection Criteria for Analytical Data, states, "In cases where one result was a detection and the other a non-detect, the detected value was used in the assessment." This section also needs to identify if any reporting limit of non-detect values were higher than the detected concentration and determine which value would be used in the assessment.

This methodology was per the final screening ERA. The value used in the ERA was always the detect when one result was a detect and the duplicate was a non-detect, regardless of whether or not the non-detected value was higher. In these cases, the use of the detect has less uncertainty since it represents an actual measured value (versus an upper limit bound) and the two samples will have identical or similar reporting limits. This will be added to the uncertainty section.

11. On page 3-9, Section 3.2.1 indicates the subsurface soil data from the 6 to 24 inch depth interval would be qualitatively considered. Since ecological receptors are found in this depth interval, this section needs to clearly state why these data would not be quantitatively considered, including the uncertainty with averaging data over an eighteen inch depth interval.

It is expected that the highest exposures for most ecological receptors would be to the surface soil layer (0 to 6 inches). The objective of the subsurface soil evaluation was to determine if chemical concentrations in the subsurface layers (6 to 24 inches) were higher or not, that is, to determine if the surface soil evaluation represented the most conservative exposure estimate. A qualitative evaluation was adequate to meet this objective. The text will be clarified in the document.

12. On page 3-9, Section 3.2.2, Exposure Estimation, needs to clearly indicate that groundwater will be evaluated as a potential source of contaminants to surface water and sediment.

This will be added to the text of Section 3.2.2. Note that this was indicated previously in the conceptual model (e.g., Section 3.1.3.2).

13. On page 3-10, Section 3.2.2.1, Screening Exposure Point Concentrations, under Soil Invertebrates, needs to acknowledge the range of lipid content that is found in soil invertebrates. This section needs to show that the lipid content of earthworms is appropriate for all soil invertebrates.

This discussion will be added but is more appropriate to the uncertainty evaluation. Thus, it will be added to Section 5.

14. On page 3-12, Section 3.3.1, Medium-Specific Screening Values, indicates that the screening values used in this ERA were based on EPA Region III BTAG values, "...alternate screening values approved for use at Little Creek (CH2M HILL, 2000b)...," and other values available from the literature. This section needs to clearly indicate the order in which these screening values were selected. Regarding the use of the alternate screening values developed by CH2M Hill, these values were not approved by BTAG for use at this or any other Navy facility. Therefore, the values that appear in Table 3-14 would need to be rechecked and changed, as appropriate. If BTAG values are not available for certain chemicals, other values will be considered as long as supporting documentation is provided to BTAG for review. The use of these alternate values will significantly change the conclusions of the ERA and the contaminants of concern (COC) that are developed.

Per the consensus statement developed during the July 2003 partnering meeting, the Little Creek screening values listed in the referenced technical memorandum will be used in the Site 8 ERA but the citation to the technical memorandum will be removed and the screening values will not be referred to as "approved".

15. On page 3-12, Section 3.3.1 also identifies that some surface soil screening values were based on Dutch soil standards. These Dutch soil standards are based on ecotoxicological effects above which 50 percent of potentially present species and processes may experience negative effects. The concentrations which could negatively affect 50 percent of potentially present species and processes are likely too high to represent chronic effects and would thereby result in underestimating risk. This issue needs to be adequately discussed in this section.

As indicated in follow-up discussions after the July 2003 partnering meeting, the Tier 1 Partnering Team agreed to disagree on this issue since it will not impact the conclusions of the assessment. No changes will be made to the document as related to this comment.

16. On Figure 3-2, Previous Locations of Debris Piles, there is a gap between the estimated landfill boundary and the edge of the water feature. In previous meetings, this area was described as having a bulkhead. If this bulkhead was placed here to restrict the landfill encroachment on the water feature, then it makes sense that the landfill boundary may extend to this bulkhead. If this is the case, then additional samples would be needed in this gap area. This issue should be discussed further.

There is a low berm in at least part of this area on the northern edge of the landfill (e.g., by Pond 2). While there is no "bulkhead" feature present, portions of this berm contain chunks of concrete embedded in the bank, which serve as shore stabilization. Also, there were bulkhead-type pilings in some of the surface debris piles in this general area but their dispersed arrangement did not suggest that a constructed bulkhead was created anywhere on Site 8. These surface debris piles were removed in January-February 2002. However, the embedded chunks of concrete were not removed because it was thought that the removal of this inert material could possibly destabilize the bank and lead to erosion, as discussed during project scoping. Figure 3-2 will be revised to show the revised landfill boundary and indicate which debris piles have been removed based upon information from the Site 8 Construction Close-out Report.

17. On page 4-1, Section 4.1, Refinement of Conservative Screening Assumptions, states, "In addition, the re-evaluation may include consideration of other factors such as background data, the frequency at which chemicals were detected, and chemical-specific bioavailability." This section needs to clearly determine which of these three other factors will be used in this Step 3A "Baseline Ecological Risk Assessment." If the frequency of detection factor is used it needs to be tied in with other information, including, but not limited to, spatial scale, and co-location of contaminants. The use of background data is not part of the ecological risk assessment process, but can be included in risk management decisions. This needs to be clearly documented. Chemical specific bioavailability needs to be clearly site related and not based on non-site related literature values.

Frequency of detection was not considered because of sample sizes. Facility-specific soil and groundwater background data were considered in the risk evaluation that followed the Step 3A risk characterization. Bioavailability considerations (e.g., effect of TOC on chemical

bioavailability for non-ionic organic chemicals in sediment) were based upon site-specific factors. The use of background and bioavailability are described in Section 4.1 of the ERA report. In addition, the Navy *Policy For Conducting Ecological Risk Assessments* (CNO 1999) specifically states that "reevaluation of exposure assumptions [in the Tier 2 BERA] may include considerations of background, sample detection frequency, bioavailability, and realistic exposure scenarios."

As indicated in follow-up discussions after the July 2003 partnering meeting, the Tier 1 Partnering Team agreed to disagree on these issues since they will not impact the conclusions of the assessment. No changes will be made to the document as related to this comment.

18. On page 4-1, Section 4.1, states that since upper trophic level species are highly mobile, they would be expected to effectively average their exposure over time as they forage within the area defined by their home range. The section further states that average prey concentrations are most appropriately estimated using mean estimates of media concentrations and accumulation factors. The media concentration used to estimate tissue concentrations should be based on the home range of the receptor being evaluated, since for Site 8, the home range for certain receptors (about one acre for the shrew) are smaller than the size of the site (five acres).

While it is true that the home range size for several of the upper trophic level receptors evaluated in the ERA is less than the size of the site, home range sizes apply to individual organisms. Average exposures are still relevant for populations, on which the assessment endpoints are based. Also, the area of suitable habitat present on the site, not the total site size, is the relevant factor. During the 30 July 2003 partnering meeting, it was agreed that both maximum and average exposure estimates would be presented in the ERA but that average exposure estimates were generally more applicable to upper trophic level receptor populations.

19. On page 4-1, Section 4.1, states that in cases where adequate spatial sampling coverage exists, mean concentrations are appropriate for evaluating potential risks to populations of lower trophic level receptors because the members of the population are expected to be found throughout the site. This assumption does not consider the size of the site being evaluated (area represented by a single sample), and ecological risk from localized areas of contamination (hot spots). It would be more appropriate to evaluate risk in terms of area of the site where potential risk to lower trophic level receptors would be predicted. Once the area of risk if presented, the significance of this area relative to the population at the site could be discussed. Using only means to eliminate contaminants from further consideration without discussing these issues is unacceptable.

The spatial distribution of the chemical concentrations was considered during the risk evaluation (Section 4.3) to avoid overlooking potential localized areas of contamination. During the 30 July 2003 partnering meeting, it was agreed that both reasonable maximum and average exposures would be integrated in the risk evaluation.

20. On page 4-2, Section 4.1, states that since high levels of suspended solids and sediment-adsorbed metals could result in overstating bioavailable surface water concentrations, filtered metal concentrations were also evaluated by comparing screening values to dissolved metal fraction. This statement would only be true for aquatic organisms

exposed to surface water only, and does not consider exposure through the diet. Invertebrates that filter feed organic matter from the water column would have increased exposure to metals. Therefore, the comparison of both total and dissolved concentrations in surface water should be used to evaluate risk since they represent two separate exposure pathways for aquatic invertebrates.

Both total and dissolved comparisons are included in the ERA (see Section 4.2.2 and Tables 4-6 through 4-8). It should be noted that in the most recent AWQC summary document (USEPA 2002), most of the AWQC values for metals are based solely upon the dissolved fraction.

21. On page 4-4, Section 4.2.2.1, Tidal Wetlands, discusses the uncertainty associated with the screening value for benzo(a)pyrene. The text goes on to suggest that an acute marine surface water screening value of 300 μg/L should have an uncertainty factor of 100 applied which would result in an estimated chronic screening value of 3 μg/L. This estimated chronic value is comparable to one half the reporting limit (2.5 to 3 μg/L). Because this is the case, then the HQ for this chemical, using one half the reporting limit would be approximately 1. Therefore, benzo(a)pyrene would represent potential risk to aquatic biota, rather than "...it is unlikely that benzo(a)pyrene would constitute a risk to aquatic biota." This type of comment applies to other sections, as well.

Please see the response to USEPA Comment 23.

22. On page 4-5, Section 4.2.3.1, Tidal Wetlands, indicates for chemicals with HQ values equaling or exceeding one, the magnitude of these exceedances were low. This section needs to clearly indicate how this designation of "low" was determined and how it relates to the potential for risk to ecological receptors. This is particularly important as the definition of ecological risk using the HQ method is HQ values equal to or greater than 1.0 indicate potential risk to ecological receptors. This same comment applies to other sections, as well.

The text will be edited to remove the use of terms such as "low" in this context.

23. On page 4-5, Section 4.2.3.1 indicates no "...undetected chemicals were retained as PCOCs in sediment" even if maximum reporting limits exceeded screening values and resulting HQ values were "...almost always less than 10." With this type of information it is difficult, at best, to determine if these chemicals are present at concentrations that could pose a risk to ecological receptors. Therefore, these chemicals need to be retained as PCOCs. They may be able to be eliminated as a PCOC using another line or lines of evidence, but this additional information is not included in this ERA. This type of comment applies to other sections of this report.

Because these comparisons are of reporting limits (not detected concentrations) to screening values, the term "HQ" may not be fully descriptive. The value of ten is a descriptor for that particular set of data; another descriptor (such as two or six) may be more appropriate for another data set depending upon the distribution of the ratios ("HQs"). Because these chemicals were not actually detected on the site (using agreed-to sampling methods and analytical procedures), a "HQ" exceeding one is more of an uncertainty than an indication of potential risk since it is uncertain that the chemical is even present on the site, much less present at concentrations that would indicate potential risk. During the 30 July 2003

partnering meeting, it was agreed that the "less than 10" statements would be removed from the text and the actual ratios would be presented in the uncertainty section. In addition, the potential risks/uncertainties associated with these chemicals were deemed acceptable if standard methods and reporting limits were used.

24. On page 4-6, Section 4.2.4.1, Upland Areas, states, "A number of chemicals were identified as COPCs in the SERA because maximum reporting limits exceeded screening values. Mean HQs (based upon the mean of one-half of the sample reporting limits) for these chemicals were less than two, making it unlikely that they are present at ecologically significant concentrations. None of these undetected chemicals are retained as PCOCs in surface soil." The relationship between a HQ of less than two and an ecological significant concentration has not been established. Again, these chemicals need to be retained as PCOCs. This type of comment applies to other sections of this report.

Please see the response to USEPA Comment 23.

25. On page 4-7, Section 4.2.5, Food Web Exposures, indicates that the great blue heron NOAEL HQ for mercury was 1.56 and the LOAEL HQ was less than one. In this instance, the source of mercury is reportedly known and there is no indication that this source of mercury was taken out of this site through the removal activity. Methyl mercury was not included in the chemical analysis at this site. Therefore, mercury needs to be included as a COC.

Mercury should not be a COC for this receptor/pathway since it did not meet the criterion outlined in Section 4.1. As discussed in Section 4.1, the actual threshold for an effect will be somewhere between the NOAEL and LOAEL. One common measure of this is the Maximum Acceptable Toxicant Concentration (MATC), which is the geometric mean of the NOAEL and LOAEL. The HQ for mercury and the heron based upon the MATC would be below one. Note that the avian ingestion screening value used for the heron was based upon methyl mercury but was applied to exposures based upon total mercury (a conservative methodology). As indicated in follow-up discussions after the July 2003 partnering meeting, the Tier 1 Partnering Team agreed to disagree on this issue since it will not impact the conclusions of the assessment. No changes will be made to the document as related to this comment.

26. On page 4-7, Section 4.3.1, Wetland Habitats, states, "Based upon the current site configuration following the removal of surface debris, current transport via surface runoff to these water bodies is likely to be minimal." Support for this statement needs to be provided in this section.

The statement will be removed from the ERA.

27. On page 4-8, Section 4.3.1.1, Tidal Wetlands, states, "The pesticide exceedances were scattered across the site, suggesting that they are the result of past spraying activities and not related to the landfill or surface debris." Another interpretation of these same data would be that out of a total of 21 sample locations: 1) detected concentrations of DDD were found at four sample locations, 2) detected concentrations of DDE were found at ten sample locations, 3) detected concentrations of DDT were found at one sample location, 4) detected concentrations of endrin aldehyde were found at one sample location, 5) detected concentrations of alpha chlordane were found at one sample location, and 6) detected

concentrations of gamma chlordane were found at three sample locations. This may suggest that pesticide concentrations are site related and not due to past spraying activities. This section needs to be re-written.

The interpretation of the data outlined in this comment says nothing about possible source attribution but rather supports the statement in the ERA that pesticides were scattered across the site (note that the ERA text discusses exceedances while the comment discusses detections). If the pesticide exceedances were site-related, some sort of spatial pattern would be expected relative to specific areas of the landfill or specific debris piles. No such pattern was observed based upon the available data. During the 30 July 2003 partnering meeting, it was agreed that the portion of the sentence that states "suggesting that they are the result of past spraying activities and not related to the landfill or surface debris" would be deleted.

28. On page 4-8, Section 4.3.1.1 states, "Concentrations of beryllium in sediments were relatively uniform across the site, as indicated by a coefficient of variation near one, suggesting that this metal is present at background concentrations and thus does not represent an unacceptable risk to ecological receptors." Without background data for comparison, it is not clear how a coefficient of variation near one indicates background conditions. Even if these data did represent background, it is also not clear how this is interpreted as not presenting unacceptable risk to ecological receptors. Finally, background is a risk management tool and not an ecological risk assessment tool.

The portion of the referenced statement "and thus does not represent an unacceptable risk to ecological receptors" will be removed from the text. A low coefficient of variation indicates that there is low variability in the concentrations, suggesting fairly uniform concentrations (in all areas relative to the site) indicative of background conditions.

29. On page 4-8, Section 4.3.1.1 states, "Acetone is a common laboratory contaminant...." This may be true, but this statement does not adequately address the fact that acetone can also be a chemical that presents ecological risk at this site.

This statement will be removed from the text.

30. On page 4-9, Section 4.3.1.4, Non-Tidal Wetland Areas, indicates that five detected metals (Al, Cr, Fe, V, and Zn) exceeded screening values in wetland surface soils. "To evaluate the potential significance of these exceedances, on-site soil concentrations were compared to base-wide background surface soil concentrations...." There appears to be confusion as to whether these samples are soil or sediment. Because these are wetlands, it is inappropriate to compare these sediment chemical concentrations with background surface soil concentrations. Therefore, the statement that each of these five chemicals is consistent with surface soil background concentrations and they are not identified as COCs is also inappropriate.

These samples represent wetland soils not sediments. During the 30 July 2003 partnering meeting, it was agreed that the soil types in these areas of the site will be compared to the background soil types. If the soil types are comparable, the comparison will remain unchanged. If not, the differences, and their potential impact on the conclusions, will be discussed in the uncertainty section (Section 5).

31. On pages 4-9 and 4-10, Section 4.3.1.4 states, in relationship to 13 PAHs that the referenced alternate screening values for two PAHs (not part of the 13 PAHs) "...suggests that

toxicologically-based screening values based upon lower trophic level organisms for the 13 PAH PCOCs would likely be higher as well." This statement is an unsupported assumption which also suggests there is a data gap that needs to be filled. The uncertainty associated with this noted assumption and the identification of the data gap needs to be adequately discussed in this section.

Discussion of the uncertainties associated with the soil screening values for PAHs will be added to Section 5.

32. On page 4-10, Section 4.3.1.4 refers to the use of a "...generic effects-based screening value for total PAHs of 8,467 µg/kg (Table 3-14)...." According to Table 3-14, this screening value is generated from the Dutch methodology. Because of the issue raised in a previous comment above, this screening value likely underestimates risk to ecological receptors. This section will need to be re-written to take this concern into account. It may be helpful to note a range of screening values that would be compared to site values. This may lead to a different conclusion than the one listed ("...potential exposures and risks are low for these compounds").

As indicated in follow-up discussions after the July 2003 partnering meeting, the Tier 1 Partnering Team agreed to disagree on this issue since it will not impact the conclusions of the assessment. No changes will be made to the document as related to this comment.

33. On page 4-11, Section 4.3.1.5, Site-Wide Summary For Wetland Habitats, states, "Groundwater does not appear to be a significant source of site-related chemicals. There is no evidence that site-related chemicals are migrating to other areas in significant amounts via groundwater or surface flow." According to Table 4-9 (Screening Statistics - Sediment (Tidal Wetlands) -Step 3), the maximum concentrations of detected PCOCs are found at sample locations LS08-SD103, SD213, SD215, and SD216. All of these sample locations are within the Inlet to Little Creek Cove at the approximate midpoint of the estimated landfill and downgradient from this point. The chemicals found at these Inlet sample locations could be interpreted as having come from Site 8. Therefore, the indication that chemicals have not or are not migrating from the site may not be accurate.

The few chemicals with elevated concentrations (relative to background and/or screening values) in surface water, sediment, or wetland soils were found directly at potential source areas (with the exception of selenium in the sediments of the two ponds, and possibly the exceedances at SD103). This pattern suggests that these areas represent site-related contamination but that the contamination has not moved far from the source areas. The text will be revised to reflect this.

34. On page 4-11, Section 4.3.2, Terrestrial Habitats, states, in relationship to zinc concentrations, "Based upon qualitative surveys, the site is vegetated with a variety of herbivorous and woody plants, with no areas of stressed plants evident." It is not clear what criteria is being used to define" stressed plants." One interpretation of stressed vegetation is that acute concentrations of chemicals are present. Chronic concentrations of chemicals may not result in obviously" stressed plants." Therefore, this information does not support eliminating zinc as a potential chemical of concern for plants.

The plant community that covers most of the terrestrial portion of the site consists of relatively undisturbed mature forest. The plant species present in the understory are what

would be expected for this area and habitat type. This suggests there are no adverse effects to plant communities on the site and that the exceedance of the plant screening value for zinc is not indicative of any actual risks/impacts. Effects to plants was one of two assessment endpoints for lower trophic level receptors. The second was effects to soil invertebrates. The soil invertebrate-based screening value for zinc was not exceeded. As indicated in follow-up discussions after the July 2003 partnering meeting, the Tier 1 Partnering Team agreed to disagree on this issue since it will not impact the conclusions of the assessment. No changes will be made to the document as related to this comment.

35. On page 4-11, Section 4.3.2 states, "The screening value for 4,4'-DDT (100ug/kg) was a BTAG Region 3 value that is based upon Canadian background soil concentrations." According to the BTAG table, the screening value for 4,4'-DDT is based on a 96 hour LC50 for *Asellus brevicaudus*, a sowbug, which is part of the soil fauna. Therefore, based on this comment and a previous comment above, the concluding statement ("Thus, potential risks to terrestrial receptors from exposure to zinc and 4,4'-DDT are likely to be low and spatially restricted.") in this paragraph will need to be re-evaluated and likely changed.

The Navy believes that the BTAG table citation is incorrect and requests that BTAG provide the full citation for this reference so that the basis for this value can be confirmed. The BTAG soil values for pesticides match exactly the version of the NOAA screening value document that existed when the BTAG values were developed. This document is believed to be the source of these values, which are based upon Canadian background data. As indicated in follow-up discussions after the July 2003 partnering meeting, the Tier 1 Partnering Team agreed to disagree on this issue since it will not impact the conclusions of the assessment. No changes will be made to the document as related to this comment.

36. Section 5 (pages 5-1 through 5.4) identifies the uncertainties present within this ERA. Generally, while many uncertainties are identified, the effect of each uncertainty on the SERA/BERA (step 3A) is not clear, or in many instances addressed.

The uncertainty section will be expanded to clearly discuss the possible implications of each uncertainty on the conclusions of the ERA.

37. On page 5-1, Section 5, Uncertainties, in the first bullet states, "Reporting limits for some analytes exceeded applicable screening values in some media; these chemicals were not identified as COCs unless they were detected." If the reporting limits for non-detected chemicals exceeded the screening criteria, then these chemicals need to be retained as PCOCs (or COPCs) because their presence at concentrations exceeding the screening criteria, which represents risk, is uncertain.

Please see the response to USEPA Comment 23. The main point is that these chemicals are not known to be present on the site since they were not detected and are not expected based upon the known site history.

38. On page 5-1, Section 5, in the first bullet states, "In surface water, mean reporting limits for these chemicals were generally less than five times screening values." This statement is confusing. First, the constituents the phrase, "these chemicals" is referring need to be clearly defined. Second, the significance of reporting limits being "generally less than five times screening values" is not clear and appears an attempt to minimize potential risk to ecological receptors.

"These chemicals" refers to those chemicals whose reporting limits exceeded screening values. Please see the response to USEPA Comment 23.

39. On page 5-1, Section 5, in the second bullet, states, "In surface soil, mean reporting limits for undetected chemicals with screening values were less than three times the screening value, making it unlikely that they are present at ecologically significant concentrations." There is no support for this statements conclusion. It is also not clear if this "...unlikely ...present at ecologically significant concentrations" phrase also applies to the first sentence, about sediment, in this bullet. In fact, the meaning of this entire bullet is not clear when Table 3-14 shows all listed chemicals with a screening value for surface water, sediment, and surface soil.

Please see the response to USEPA Comment 23.

40. On page 5-3, Section 5, in the sixth bullet, states, "If site chemical concentrations were consistent with background levels, it was assumed that the concentrations were not site-related." The term "consistent" needs to be defined in order to determine if the conclusion of this statement is reasonable.

As indicated in follow-up discussions after the July 2003 partnering meeting, the Tier 1 Partnering Team agreed to disagree on this issue since it will not impact the conclusions of the assessment. No changes will be made to the document as related to this comment.

References

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