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Response to Comments
Draft Ecological Risk Assessment for Site 7
Naval Amphibious Base Little Creek, Virginia Beach, Virginia
Dated December 2002

This document responds to comments from the Virginia Department of Environmental Quality (letter dated 11 April 2003) and the U.S. Environmental Protection Agency (letter dated 26 June 2003) on the draft ecological risk assessment for Site 7, Naval Amphibious Base Little Creek, Virginia Beach, Virginia (December 2002). 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. General Comment: When assessing the risk associated with surface water chemical data collected from a site, the screening values used should never exceed the Virginia Water Quality Standard (VWQS) for the parameter being assessed. For example, in Tables 3-13, 3-16, 4-6, 4-7, 4-8, and 4-9, the screening value for mercury (1.10 or 0.94 µg/l) exceeds the aquatic life-saltwater-chronic VWQS (0.025 µg/l). Those tables should be amended to reflect this and any other changes to the screening values upon considering the VWQS. Any changes to the screening values resulting from the incorporation of appropriate VWQS should be carried through all phases of this ERA.

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 mercury) 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 mercury) were not used if a final chronic value from another suitable source was available. This explanation will be added to the text.

2. General Comment: The assertion that groundwater flows north to Little Creek Cove may not be entirely correct. The presence of the perennial canal along the western edge of site 7 provides a conduit for groundwater. In the vicinity of the canal, groundwater would be expected to flow east or west to the canal unless there is an impermeable barrier along the canal slope and bottom. Absent such a barrier, there is an interface between the groundwater in the vicinity of the canal and the canal itself. In fact, a tidal wedge (that may project from the canal) has been observed at other coastal NPL facilities where tidal fluctuations were documented in water table wells as far as 200 feet inland. Please amend the report, and Figure 3-1 in particular, to address this concern or provide additional data showing that this type of groundwater movement is not happening at site 7.

As shown on Figure 3-1, the groundwater contours near the drainage canal bend towards the canal, indicating that there is likely at least some groundwater discharge to the canal from areas adjacent to the canal. Figure 3-1 will be revised to more clearly show this. However, the primary groundwater flow direction at the site is north towards Little Creek Cove.

3. General Question, Figure 3-1: What data supports the solid line depiction of the 2.0, 2.5, and 3.0 foot "Lines of Equal Groundwater Elevation" absent any monitoring wells in the middle of the site? The absence of wells between MW03 and the wells along Little Creek Cove indicates that every "Line of Equal Groundwater Elevation" between MW03 and Little Creek Cove wells, as shown on Figure 3-1, should be dashed as they could only be inferred. If groundwater elevations were measured in this middle area, please include this data in the report or provide a reference as to where it may be found. Otherwise, please amend Figure 3-1 to show the 2.0, 2.5, and 3.0 foot "Lines of Equal Groundwater Elevation" as dashed lines.

The groundwater contour lines on Figure 3-1 will be revised, as appropriate, in the revised report.

4. General Question: Why were no sub-surface soil samples collected? Please provide additional explanation to address this data gap.

Subsurface soil samples have been collected at the site. However, the depth strata sampled were not appropriate for the exposures expected to ecological receptors (generally within 24 inches of the ground surface) based upon the site conceptual model. Thus, these data were not appropriate for use in evaluating ecological exposures and risks, and were not used in the ERA. This was discussed in the uncertainty section of the document.

5. Section 3.2.2, Page 3-8: Food web exposures to groundwater should be considered in this ERA because the dissolved phase of several metals were shown to be elevated in the down-gradient wells and may be available to receptors at the interface between groundwater, sediment, and surface water. Without groundwater quality data from the central areas of site 7 it is impossible to determine if there is a contaminant plume beneath the site that may be migrating toward the periphery wells and may pose a risk to ecological receptors. The wells currently in place along the periphery of the site may be used to assess groundwater quality near the interface zone. However, not knowing what may be migrating to those sites makes it impossible to completely exclude groundwater from this ERA. Unless adequate justification for not doing so is provided in other reports, it is recommended that additional monitoring wells be installed in the middle of site 7 in order to determine the presence/absence of a contaminant plume.

Chemicals that may be present at the groundwater/sediment/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. 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 revised report.

In accordance with the preamble of the NCP, "groundwater remediation levels should generally be attained throughout the contaminated plume or at and beyond the edge of the waste management area when waste is waste in place". The latter portion of this statement describes the approach taken at Site 7 by the Tier 1 Partnering Team. The existing monitoring wells, which bound the approximate extent of the waste in place in the primary direction of groundwater flow, are part of the final long-term monitoring plan that has been in place at the site since 1998. Ten rounds of groundwater data (in addition to surface water and sediment data) have been collected to date as part of the long-term monitoring program.

6. Section 3, Tables: Please add the appropriate table header information to pages 7 through 12, following Table 3-3, Page 6 of 12.

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

7. Section 6.0: There is insufficient groundwater data to support the conclusion listed in the opening paragraph of this section. Not knowing what COCs may be migrating to the near-shore areas from beneath site 7 make arguments supporting the conclusion difficult. In order to be able to fully support the conclusion, additional groundwater quality data is needed from the mid-portion of site 7.

Please see the response to VDEQ Comment 5.

II. U.S. Environmental Protection Agency Comments

1. On page 3-1, Section 3.1.1, Environmental Setting, states, "Open burning was halted in 1984...." This statement indicates that dioxins may be a potential contaminant at this site. Appendix A (analytical data) does not indicate that dioxins were included in the analytical parameters. This potential data gap needs to be addressed.

Dioxins and furans were not included as analytes in site samples. As indicated in Section 3.1.1, hazardous materials were not burned at the site, only scrap wood and vegetation. Thus, dioxin and furans are not expected to be chemicals of concern at the site. In addition, any ash that resulted from these practices, which appeared to last for less than two years, would be contained under the soil cover and would not be directly accessible to ecological receptors.

2. On page 3-4, Section 3.1.3.2, Transport Pathways and Exposure Media, refers to Figure 3-3, the preliminary diagrammatic conceptual model. It would be helpful if the conceptual site

model also included a table that contains the following information: Assessment Endpoint, Surrogate Ecological Receptor, Exposure Pathway, SLERA Evaluation, and SLERA COPCs.

Some of the requested information (assessment endpoints and receptors) is summarized in Table 3-7. Endpoints, receptors, and exposure pathways are also discussed in Sections 3.1.3.5, 3.1.3.4, and 3.1.3.3, respectively. COPCs are discussed in Section 3.4.1. As discussed during the July 2003 partnering meeting, no changes to the document will be made in response to this comment. Future documents will consider incorporating the requested table if a suitable example is provided.

3. On page 3-5, Section 3.1.3.3, Exposure Pathways and Routes, indicates that direct ingestion of drinking water is not considered in this SLERA because the salinity of Little Creek Cove exceeds 15 ppt. However, it is not clear from this section if the drainage channel that originates from off-site could be used for drinking water.

As discussed in Section 3.1.1, the portion of the canal adjacent to Site 7 is tidally influenced and measured salinities also exceeded 15 ppt.

4. On pages 3-5 and 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 used in place of the great blue heron in the revised Site 7 ERA.

5. On page 3-11, Section 3.3.1, Medium-Specific Screening Values, lists "alternate screening values approved for use at Little Creek." The referenced alternate screening was not approved by EPA Region III BTAG. The Navy has been provided with, and has concurred, with the procedures to be followed in instances where 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 approved approach for screening of contaminants should be followed and the contaminants of concern (COCs) revised as appropriate.

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 7 ERA but the citation to the technical memorandum will be removed and the screening values will not be referred to as "approved".

6. On page 3-12, Section 3.3.1 indicates that Dutch soil standards were used for certain organic chemicals and that the default minimum of 2% TOC was used because soils at NABLC have less than this default minimum value. The impact of the use of this default minimum on the uncertainty must be discussed.

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.

7. Table 3-7 lists the assessment endpoints. It is not clear why amphibians are not included in this table.

Amphibians will be added to the endpoint table (Table 3-7) for terrestrial habitats, the associated text will be revised accordingly, and a discussion will be added to the uncertainty section (Section 5) related to habitat issues.

8. Table 3-8 lists chemicals that are bioaccumulative. This table should indicate that all the bioaccumulative chemicals listed in the February 2000 EPA publication, Bioaccumulation Testing And Interpretation For The Purpose of Sediment Quality Assessment, Status and Needs (EPA-823-R-00-001), are included in Table 3-8.

All of the chemicals listed in Table 4-2 of USEPA (2000) that were analyzed for at Site 7 were included in Table 3-8, as indicated in Section 3.2.2.

9. On page 4-1, Section 4.1, Refinement of Conservative Screening Assumptions, states, "While effects on individual organisms might be important for some receptors, such as rare and endangered species, population- and community-level effects are typically more relevant to ecosystems." This statement implies that individuals are not important to populations or communities. Considering that populations and communities are composed of individuals, this implication is not supported and this ecological risk assessment should include impacts to individuals and the resultant effect on the respective population and community.

As discussed at 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.

10. On page 4-1, Section 4.1, Refinement of Conservative Screening Assumptions, 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 7, the home range for certain receptors (about one acre for the shrew) may be much smaller than the size of the site (38 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.

11. On page 4-1, Section 4.1, Refinement of Conservative Screening Assumptions, 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. It should be noted that remedial decisions should be based on reasonable maximum exposures, rather than central tendency estimates.

The spatial distribution of the chemical concentrations was considered during the risk evaluation 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.

12. On page 4-2, Section 4.1 indicates if a chemical were detected in less than 5 percent of the samples in a medium, it was not considered a COC for that medium. The citation for this assumption is an EPA 1989 "Risk Assessment Guidance for Superfund, Volume I. Human Health Evaluation Manual." This citation does not pertain to ecological risk. Therefore, this assumption is inappropriate in this baseline ecological risk assessment. The justification to eliminate chemicals based on low frequency of detection should be based on the spatial extent of risk. Using frequency of detection alone is inappropriate for sites that are very large (i.e., Site 7), where one sample represents a significant area of the site. Therefore, frequency of detection should not be used to eliminate chemicals at Site 7. Since this assumption was used to eliminate chemicals, these chemicals will need to be put back in the list of COCs. This comment also applies to the final bullet in the Uncertainties Section (5.0).

The Navy acknowledges that the cited criterion is derived from human health, and not ecological, risk guidance. However, this frequency of detection criterion is appropriate for ERAs if it is used judiciously. Frequency of detection was used only when samples sizes were adequate ($n \geq 20$) and spatial distribution was considered in a qualitative manner. During the 30 July 2003 partnering meeting, it was agreed that this criterion could be used, along with a consideration of spatial distribution, as a line of evidence (rather than an absolute criterion) in the risk evaluation.

13. On page 4-2, the fourth assumption indicates upgradient groundwater concentrations were obtained from a single monitoring well (MW-03). If comparisons or conclusions are being developed using this single data point ($N = 1$) then the uncertainty associated with these comparisons and conclusions needs to be adequately discussed.

While only a single upgradient well was available, it was sampled eight times over a four-year period (as of December 2002). Thus, the sample size for chemical concentrations was eight ($n = 8$), which is an adequate sample set for the given conclusion. Discussion will be added to the uncertainty section related to the use of a single well sampled over an extended period of time.

14. On page 4-2, Section 4.1, Refinement of Conservative Screening Assumptions, states, in the 5th bullet, 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 4-9). 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.

15. On page 4-3, Section 4.2.1, Data Groupings, identifies five samples in the cove, two samples in the wetland, six samples in the canal (adjacent areas), and six samples in the canal (upgradient areas). Yet, the final paragraph in this section indicates there were 28 surface water and 29 sediment samples from the cove, six surface water and sediment samples from the wetland, 16 surface water and 18 sediment samples from the adjacent canal, and 17 surface water and 20 sediment samples from the upgradient canal. It is not clear from this section if these numbers are inconsistent. This needs to be more completely explained.

The text will be clarified to differentiate between the number of sampling locations and the number of samples collected. Since most of the sampling locations are part of the long-term monitoring program, they have been sampled numerous times over the past four years (see Table 3-1 and Section 3.1.2).

16. On page 4-4, Section 4.2.2.1, Cove, states, regarding surface water, "Mean HQs (based upon the mean of one-half of the sample reporting limits) for these chemicals were generally less than five...." The phrase, "...generally less than five" is problematically vague. It is also not clear if the author actually means the HQs were between 1 and 5. In fact the significance of an HQ of 5 is not clear. The conclusion of this section is that these chemicals with reporting limits exceeding the screening values were not retained as PCOCs. This conclusion is inaccurate by virtue of violating the generally accepted interpretation of an HQ greater than one meaning potential ecological risk exists. This type of statement is repeated frequently (in relationship to the cove, wetlands, canal, and surface soils) in this document and needs to be addressed further in each instance.

Because these comparisons are of reporting limits (not detected concentrations) to screening values, the term "HQ" may not be fully descriptive. The quoted phrase means that the ratio of the reporting limit to the screening value ("HQ") is usually between zero and five for that particular set of data. The value of five 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 5" 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.

17. On page 4-9, Section 4.3.1.1, Cove, the risk evaluation for the cove states, "...site specific work at several naval facilities in the Norfolk area (including NAB Little Creek) suggests

that current marine ambient water quality criteria (AWQC) values for copper may be overprotective in marine/estuarine water bodies on or adjacent to these facilities.... Based on the wording by the author, the reference to the Strum et al. 1989 article is only suggestive of the position stated and does not conclusively support this position. Therefore, copper in surface water should be retained as a COC.

The text will be reworded as the cited reference, and the adjusted copper criterion, are based upon quantitative data (Water Effect Ratio study).

18. On page 4-10, Section 4.3.1.1 makes the statement about beryllium and thallium in sediments, "...that these metals are present at background concentrations and thus do not represent an unacceptable risk to ecological receptors." The relationship between a background concentration and risk to ecological receptors has not been established or quantified in this document. Therefore, the final phrase in this quote should be deleted. This comment relates to more than one section in this document.

The phrase will be edited as requested in the comment.

19. On page 4-10, Section 4.3.1.1, the last sentence in this section should change to: "There were no HQs greater than one (based upon LOAELs) for aquatic-based food web exposures." This comment applies to more than one section.

The text will be changed as requested in the comment.

20. Generally, in the Risk Evaluation, Section 4.3, there are numerous phrases like the mean HQs were low (less than two) or were marginally over one. The use of the terms "low" or "marginally" is misleading in this ecological risk assessment because neither have been defined. In fact, the only definition that has been incorporated into this ecological risk assessment regarding HQ values is that if the HQ value is equal to or greater than one, the potential for risk is present. Since this is the case, terms like "low" and "marginally over" should be deleted from this document.

The text will be edited as requested in the comment.

21. On page 4-13, Section 4.3.1.4, Canal - Upgradient Areas, infers that the source of the PAHs "...may have been a remnant of an oil spill that occurred in Little Creek Cove in October of 1999...." The source of these PAHs may also be the landfill at Site 7. Since the writeup has not disproved the landfill as the source of PAHs, this should also be stated.

The text will be edited as requested in the comment.

22. The Risk Evaluation section does not address whether or not mercury in aquatic receptors, from food web exposures (see page 4-8) should be a COC. The food web NOAEL based HQs for the great blue heron for the cove, wetland, canal - adjacent, and the canal - upgradient were 1.15, 2.74, 1.37, and 1.71 respectively. The food web LOAEL based HQs for the great blue heron were all less than one. Since mercury is an important bioaccumulative compound and the HQs range from less than one to greater than one (for LOAEL and NOAEL respectively), this chemical should be retained 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. On a site-wide basis, the HQ for mercury and the heron based upon the MATC would be below one. 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.

23. Once the above comments are incorporated into this ecological risk assessment, it is likely that the final list of COC chemicals will change from what is currently presented in the document.

Any required changes to the final list of COCs based upon the above responses will be incorporated into the document.

24. On page 4-15, Section 4.3.2, Terrestrial Habitats, states, in relationship to aluminum, iron, and chromium, "...these three metals can be considered consistent with background soil concentrations." This statement may hold for aluminum and iron, where either the 95 percent upper tolerance limits and/or the 95 percent confidence interval were not exceeded. It is not clear that it holds for chromium when both the background UTL and CL were exceeded by the maximum surface soil concentration.

The conclusion for chromium was based upon the low (1 of 7) frequency of UTL exceedance and the small (1.33 for urban soils) magnitude of the maximum UTL exceedance. 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.

25. The third paragraph in Section 4.3.2 appears to be an attempt to minimize the potential impacts of lead, vanadium, and zinc to plants based on the fact that plants are growing on the site and that the fauna screening values are much higher than the flora screening values. Neither of these points succeeds in dismissing the potential impacts to plants from these chemicals. A qualitative observation that plants are growing does not adequately address whether or not these plants are at risk from the chemicals present, nor does it address whether or not these are plants that would be expected in the absence of the contaminants or are just tolerant to these contaminants at the levels onsite. The relevance of the fact that the fauna screening values for these three chemicals is higher than the plant screening values, as it pertains to evaluating plant toxicity, is unclear.

Section 4.3.2 is not attempting to minimize the potential impacts of these metals to terrestrial plants but is rather providing a reasonable, site-specific interpretation of the relevance of exceeding these literature-based plant screening values. The plant community that covers most of the terrestrial portion of the site is the result of the initial planting of a rye grass mixture following completion of the soil cover and natural succession. The current presence of a dense and fairly diverse flora on the site is strong evidence that there are no adverse effects to plant communities on the site. Effects to plants was one of two assessment endpoints for lower trophic level receptors. The second, effects to soil invertebrates, is what the fauna screening values are intended to address. 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 4-15, Section 4.3.2 provides other toxicological values for Aroclor 1260 than the BTAG value of 100 ug/kg. The presentation of these other data needs to be more balanced than presented. The cited 40,000 ug/kg terrestrial plant value for Aroclor 1254 from Efroymson et al. (1997) has a low confidence because it is based on less than 10 values. In addition, it is not clear why the author has not addressed soil PCB concentrations and their potential impact on higher trophic level ecological receptors.

Given the rationale suggested in the comment, there is more confidence in the ORNL value (which is based upon three toxicologically-based studies) than on the BTAG value (which appears to be based upon a single background study). HQs for upper trophic level receptors did not exceed one for PCBs in soils (see Table 4-15). 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.

27. On page 4-16, Section 4.3.2 states, "With the exception of fluoranthene, phenanthrene, and pyrene, PAH concentrations in site surface soils were generally consistent with urban background concentrations (Table 4-26)." This table compares maximum and mean site concentrations with urban background concentrations and comes up with a ratio. Based on this ratio calculation technique, it appears that site concentrations of five PAHs exceed either or both the mean and maximum urban background concentrations. In addition, three additional PAHs have ratios close enough to 1.0 to suggest they may also really exceed the urban background values. This means there are potentially eight PAHs that are not within the urban background values.

The text will be revised to include a discussion of the two other PAHs (benzo[a]anthracene and benzo[a]pyrene) with mean or maximum ratios exceeding one.

28. On page 5-1, Section 5.0, Uncertainties, states, in the first bullet, "Reporting limits for some analytes exceeded applicable screening values in some media; these chemicals were not retained as COCs unless they were detected." Because the reporting limit exceeds the ecological risk screening value, it is uncertain the chemical is present at a concentration that exceeds the screening value but is less than the reporting limit. Therefore, the decision to not carry these chemicals forward as COCs may underestimate risk to ecological receptors.

Please see the response to USEPA Comment 16.

29. On page 5-1, Section 5.0 states, in the first bullet, "In surface water, mean reporting limits for these chemicals were generally less than five times screening values." The phrase "...generally less than five times screening values" needs to be more specifically discussed. In fact, the significance of five times screening values should be documented. This comment also applies to sediment.

Please see the response to USEPA Comment 16.

30. On page 5-1, Section 5.0 states, in the first bullet, "For the pesticides and PCBs, elevated reported limits occurred in a few samples. Discounting these samples, mean reporting limits were generally within an order of magnitude of screening values." The meaning of these two sentences and how this information relates to eliminating these chemicals from the list of COCs is not clear. Also, the significance of being "...generally within an order of

magnitude of screening values" needs to be adequately discussed. This comment also applies to sediment.

Please see the response to USEPA Comment 16.

31. On page 5-1, Section 5.0 states, in the first bullet, "Since benzo(a)pyrene was not actually detected (at a reporting limit of 10 ug/L), it is unlikely that benzo(a)pyrene would constitute a risk to aquatic biota." While this sentence makes sense based on the condition set forth in the first sentence of this first bullet, this statement does not make sense based on comment 26, above. Even one half the detection limit (5 ug/L) exceeds the author's suggested alternate screening value of 3 ug/L. Therefore, benzo(a) pyrene should be retained as a COC.

Please see the response to USEPA Comment 16.

32. On page 5-1, Section 5.0 states, in the first bullet, "In surface soil, mean reporting limits for undetected chemicals with screening values were less than twice the screening value, making it unlikely that they are present at ecologically significant concentrations." Information supporting this statement needs to be included in this bullet.

Please see the response to USEPA Comment 16.

33. On page 5-2, Section 5.0, regarding evaluation of soils, states, "However, the evaluation of surface soils in the 0 to 6 inch depth range is likely to result in a conservative assessment for this site." This statement is not supported in the text. This site is a landfill and chemical concentrations will not necessarily be at the present surface of the landfill depending upon when they were placed in the landfill. Also, the author states that subsurface soil data is not available from this site. The lack of soil data from the 6 to 24 inch depth appears to be a data gap which should be added to Section 7.2, Recommendations.

As stated in the text, areas containing landfill material have been covered by two or more feet of soil. In other areas, any releases would likely have occurred at the surface. The text also states that there were no <u>useable</u> subsurface soil data (in the 6 to 24 inch range). Note that the 2001 supplemental soil sampling that occurred at the site to fill data gaps was jointly scoped with BTAG and the Tier 1 Partnering Team.

34. On page 6-2, Section 6.0, Ecological Risk Assessment Conclusion, states that the available data suggests that potential exposures and risk to lower trophic level receptors are possible in the portion of the canal adjacent to the landfill, however the habitat value of this drainage canal is minimal so exposures are likely to be low. While BTAG agrees that the ditch would not provide significant habitat for intertidal species, it could provide significant habitat for open water species, particularly those that prefer lower salinity than is provided in Little Creek Cove. Based on the information provided, the conclusion of minimal habitat value is not supported, and this argument should not be used to minimize the potential for ecological risk in this canal.

At the July 2003 partnering meeting, the Tier 1 Partnering Team agreed to defer discussion of this comment response until the ERA addendum was reviewed by BTAG. Since BTAG had no comments on the ERA addendum, no changes will be made to the document as related to this comment.

References

Suter, G.W. II and C.L. Tsao. 1996. *Toxicological benchmarks for screening potential contaminants of concern for effects on aquatic biota: 1996 revision.* Environmental Restoration Division, ORNL Environmental Restoration Program, ES/ER/TM-96/R2. 54 pp.

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