

Responses to EPA Comments on the Draft Expanded Remedial Investigation Report for Site 2, St. Juliens Creek Annex, Chesapeake, Virginia (CH2M HILL, October 2005)

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Overall Response:

It should be noted that this Expanded Remedial Investigation (ERI) Report is an addendum to the Remedial Investigation/ Human Health Risk Assessment/ Ecological Risk Assessment for Site 2 (RI) (CH2M HILL, February 2004). Data collected during the RI is not duplicated in the ERI Report; however, a summary of COPCs by media is provided in Section 7 of the ERI Report. The SJCA Project Management Team is currently planning a data gap investigation to further delineate chlorinated volatile organic compounds (CVOCs) at the site. The results of the additional investigation activities, along with changes resulting from comments on the draft, will be incorporated into a Draft Final ERI Report for review.

HHRA

EPA Comment 1. Section 2.2. The second paragraph discusses open burning of refuse at the site. Since this was the case, was dioxin analysis conducted? Table 2-6 list dioxin as a chemical when summarizing risk however, it is unclear if dioxin was evaluated for human health risk? The report should clearly indicate if analysis of dioxin was conducted to evaluate human health risk.

Response to EPA Comment 1: Dioxin data for soil (for combined surface and subsurface soil) and sediment were screened in the RI. Dioxin congeners did not exceed RBCs for either of these media, and therefore dioxin was not retained as a human health COPC.

EPA Comment 2: Section 2.4.2. The third paragraph discusses how Site 17 data was compared to the HHRA conducted during the RI (February 2004) and how additional COPCs were identified for the trespasser, industrial work, and resident. Please explain why the identified COPCs differ based on the receptor? All contaminants should have been screened against EPA's RBC table for residential soil therefore; all identified receptors should have the same COPC. In addition, the paragraph does not clearly identify the media that is being discussed (soil, groundwater)? Finally, the identified qualitative evaluation for Site 17 appears to be weak and non-defensible therefore; EPA recommends using the Streamlined Risk Evaluation to determine if additional risk is being contributed to this area by Site 17. In addition, the streamlined risk evaluation will provide risk information necessary to help determine contaminant remediation goals if additional contaminants are identified at Site 17 that were not identified at Site 2. Please apply the following streamlined risk equations:

Noncarcinogens: $HQ = C_{max}/RBC$

$$HI = \sum HQ$$

where;

HQ = Hazard Quotient

C_{max} = maximum detected concentration (mg/kg, ug/L)

RBC = Risk-based Concentration (mg/kg, ug/L)

HI - Hazard Index

*Hazardous Index should not exceed 0.5 to account for dermal and inhalation pathways not considered in the Region III, RBC Table.

Carcinogens: $ICR = \sum (C_{max}/RBC) \times 10^{-6}$

where;

ICR = Incremental Lifetime Cancer Risk

C_{max} = maximum detected concentration (mg/kg, ug/L)

RBC = Risk-based Concentration (mg/kg, ug/L)

10^{-6} = Risk Assessment Point of Departure

*Cumulative Excess Cancer Risk should not exceed 5E-05 to account for the dermal and inhalation pathways not considered in the Region III, RBC Table.

Response to EPA Comment 2. Different COPCs were identified for different receptors since residential soil RBCs were used to screen for residential scenarios and industrial RBCs were used to screen industrial and trespasser scenarios. As this was an update of a previous risk assessment, the same screening methodology was used, and residential RBCs were not used to screen for all scenarios, as is typically done now. The previous two paragraphs indicate that the medium addressed in the Site 17 SI (the results of which are discussed in this section) is surface soil. This will be clarified in this paragraph. Human health risk associated with Site 17 will be quantitatively evaluated using the equations provided, or RAGS D methodology, and presented in the Draft Final ERI Report for review.

EPA Comment 3. Section 3.1.3. Please explain why Figure 7-5 indicates the collection of 8 surface water samples but the section and Table C-6 only discusses and provides raw data for two surface water samples? Since Figure 7-5 provides a listing of COPCs detections in surface water, all raw data for surface water should be included in the report.

Response to EPA Comment 3. Surface water (samples SW02 through SW09) at Site 2 was evaluated as part of the Remedial Investigation (March 2003). Figure 7-5 summarizes the COPCs resulting from the RI surface water sampling, and the raw data associated with the samples can be found in the RI report. Additional storm water and surface water (SW10 and SW11) data were collected during the Expanded Remedial Investigation to assess the potential impact of upgradient sources and the associated raw data is provided in Appendix C.

EPA Comment 4. Section 4.2.5. The paragraph discusses the collection of 3 sediment samples with the detection of 9 VOCs including a detection of vinyl chloride at 9,800 ug/kg

and 7,700 ug/kg. In addition, cis-1,2-dichloroethene was detected at 2,300 ug/kg. Since these contaminants exceed EPA's screening criteria but were not quantitatively evaluated for risk, please explain how mediation goals will be determined for vinyl chloride and cis-1,2-dichloroethene in sediment?

Response to EPA Comment 4. Vinyl chloride and cis-1,2-dichloroethene in sediment will be quantitatively evaluated to assess human health risk in the Draft Final ERI Report, along with additional data collected during upcoming CVOC delineation. Remediation goals will be established for COPC's found to be a potential risk in the ERI report.

EPA Comment 5. Section 7.2. The report states, "Because there are no unacceptable human health risks based on CT exposure to soil and potential remedies under consideration will mitigate potential ecological risks, there are no COCs or COPCs that warrant remedy consideration." Remedial decisions should not be based solely on CT risk results but instead should take into consideration both RME and CTE risk.

Response to EPA Comment 5. Agree, the sentence is a risk management consideration. The partnering team will discuss the path forward for addressing any soil risks and risk management decisions made will be included in the Draft Final ERI.

EPA Comment 6. Section 7.3. The report indicates VOCs as contaminants of concern but does not provide the actual chemical name of the COC VOCs. Please provide the actual chemical name of each VOC COC as this information is extremely relevant for the Administrative Record.

Response to EPA Comment 6. The VOCs were not listed, due to the large number of VOCs; however, they will be added to the text in Section 7.3.

RAGS D Tables

EPA Comment 7. Table 1.0. The conceptual site model should include indoor air vapor intrusion to residents as a potential future exposure pathway.

Response to EPA Comment 7. Agree. Will include the indoor air vapor intrusion pathway on Table 1. The risk will not be quantified because it is assumed there will be a problem due to the very high concentrations and this will be explained in the Draft Final report.

EPA Comment 8. Tables 2.1, 2.2, 5.1. The toxicity value for toluene has changed. The most recent tap water RBC is 2.3E+02.

Response to EPA Comment 8. Agree. The RfD for toluene has changed since the draft report was prepared. The RfD will be updated in the draft final submission, but will not result in toluene being changed to a COPC (still below RBC).

EPA Comment 9. Table 2.1. The toxicity values for barium have changed. The most recent tap water RBC is 7.3E+02.

Response to EPA Comment 9. Agree. All toxicity values and RBCs will be updated with the most recent values.

EPA Comment 10. Table 5.1. The toxicity values for 2,6-dinitrotoluene should be included in the table.

Response to EPA Comment 10. The toxicity values for 2,6-dinitrotoluene are included on Table 5.1

EPA Comment 11. Table 5.2. The inhalation RfDi for methylene chloride is 3E-01.

Response to EPA Comment 11. The inhalation RfD for methylene chloride will be updated to the current value used by EPA Region III of 0.3 mg/kd-day.

EPA Comment 12. Table 6.1. The toxicity values for 1,1,2-trichloroethene, and 1, 4-dichlorobenzene should be included in the table.

Response to EPA Comment 12. The toxicity values for 1,1,2-TCE and 1,4-DCB will be added to Table 6.1

EPA Comment 13. Table 7.0. RME risk should be presented before CTE risk.

Response to EPA Comment 13. Appendix J will be changed so that all RME tables for each set of tables are before the CTE tables for that set of tables (i.e. all Table 3s RMEs will be before all Table 3s CTEs)

EPA Comment 14. Table 7.1, RME. Since inhalation of volatiles while showering is not calculated for the child resident, the carcinogenic risk for the adult resident exposure to volatiles while showering should be presented.

Response to EPA Comment 14. This calculation is included on the lifetime resident Table 7.3 for the adult resident.

EPA Comment 15. Table 7.1, RME. RAGS E now recommends 95th percentile value for showering. (adult shower, 30 minutes, child bath, 60 minutes). Therefore, EPA Region III recommends the following parameter changes for the Foster & Chrostowski model;

Shower Room Volume (SV) = 12 m³ (based on professional judgement)

Droplet drop time (ts) = 0.5 sec (CPF Associates, 2003. Integrated Human Exposure Model, Version 2 (IHEM2) for Volatile Compounds)

Shower flow rate = 10 L/min (professional judgment, considering maximum mean flow rates reported in EPA's 1997 Exposure Factors Handbook).

Shower time (Ds) = 30 minutes (EPA, 1997; Draft PRA; RAGS E)

Total time in shower room (Dt) = 60 min (EPA, 1997; Draft PRA)

Response to EPA Comment 15. Agree. The parameters will be updated.

EPA Comment 16. Table 7.5RME and 7.5RME Supplement. An incorrect Duration of Event, event time (t) was used to calculate risk. Table 7.5RME Supplement indicates e 8 hours was used to calculate risk. However, the results could not be duplicated when this t (time) value was applied. Please recheck these risk results.

Response to EPA Comment 16. The calculations will be checked and revised as appropriate.

EPA Comment 17. The RAGS D Tables do not include Table 8.0's?

Response to EPA Comment 17. RAGS D table 8 is not included because there are no radiological constituents at the site.

ERA

EPA Comment 18. Section 6.1-4 presents a summary of the toxicity tests performed to evaluate risk to benthic dwelling organisms in the adjacent wetlands. Collocated sediment samples were also collected for chemical analysis. It is unclear from the summary if there was any attempt to develop site-specific effect concentrations that could be used in the feasibility study (FS) as risk-based remediation goals (RGs). An explanation should be provided stating if this evaluation was performed, and if not, how RGs would be developed.

Response to EPA Comment 18. The primary focus in the ERA was to determine if there are potential risks to benthic-dwelling organisms. An evaluation of site-specific concentrations that will be used for remediation goals will be established as part of the FS. This will also be clarified in the document.

EPA Comment 19. Section 6.2.2 on page 6-7 provides a summary of risks to avian piscivores and reptiles. It is unclear why only modeling was performed and there was no attempt to collect site specific fish tissue concentrations to estimate risk to avian piscivores. This would have reduced uncertainty and resulted in a more accurate estimate of risk. An explanation should be provided stating why site-specific fish tissue was not collected at this site.

Response to EPA Comment 19. Although mercury indicated a potential for adverse effects to avian piscivores and reptiles, the concentrations that were detected in sediment and evaluated as part of the RI (up to 0.79 mg/kg) are lower than the 95 percent upper tolerance limit (UTL) for reference samples collected from adjacent areas (1.4 mg/kg; See Appendix F of the ERI). While it is possible that activities at Site 2 could have contributed some mercury to the Site 2 sediment, the comparison of the RI sediment to reference data suggests that mercury levels at Site 2 are generally consistent with, and even lower than those detected in the nearby non site-impacted areas. ERI resources were focused on collecting additional samples to provide a more spatially robust characterization of sediment-associated mercury concentrations, and to confirm that the concentrations detected during the initial RI sampling event accurately represent the range of mercury concentrations throughout the Site 2 sediments. The additional ERI sediment data confirmed that mercury concentrations in Site 2 sediments (up to 0.94 mg/kg) are consistent with those detected during the RI. The consistency in detected concentrations confirms that mercury levels in the Site 2 sediments approximate those detected in nearby non site-impacted areas, and that the low level of risk for avian piscivores and reptiles at Site 2 is not significantly increased by historic Site 2 activities. Therefore, fish tissue residue measurements are unnecessary.

EPA Comment 20. Section 7.6 summarizes the chemical concentrations in surface water at the site. The section states that due to the transient nature of surface water at the site, no further action is recommended for the low potential ecological risks associated with surface water. The low risk from surface water is not supported by the conclusion in the screening ecological risk assessment (ERA) and baseline ERA which is summarized in Section 6 on page 6-1. This section states that these reports indicated potential risk for aquatic life from the presence of inorganic chemicals and carbon disulfide in inlet surface water. In addition, the impact of volatile organic compounds (VOC) was not evaluated in the ERA. While a remedial action would not be performed for surface water directly, contaminants in surface water would be indirectly reduced by controlling contaminants in groundwater

and stormwater discharging to the wetland (i.e., VOCs) and reducing the contaminant levels in sediment. Therefore, surface water should be addressed as part of the FS.

EPA Comment 21. Section 7.8 on page 7-5 states that an FS is recommended to evaluate potential remedial alternatives to mitigate unacceptable human health and ecological risks in soil, groundwater, and sediment at Site 2. BTAG supports this recommendation, however, as stated above, surface water should also be evaluated as part of the FS since these other media directly impact contaminant levels in surface water.

Response to EPA Comments 20 and 21. VOCs in surface water were evaluated during the ERA, and only carbon disulfide (HQ = 1) was identified as a COPC. Although concentrations detected in surface water (evaluated during the RI) indicate the presence of low concentrations of VOCs, there is a potential for VOCs in groundwater to represent a potential risk if groundwater discharges to surface water. The groundwater/surface water interface will be characterized during the planned additional CVOC plume delineation activities and included in the Draft Final report. In addition, and as BTAG has already suggested, the focus of the risk evaluation and subsequent future actions is on the primary sources of contamination to the SW in order to eliminate/reduce this exposure pathway.