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Ms. Dawn Hayes
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6500 Hampton Boulevard
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subject: Response to Comments on Draft Remedial Investigation/Human Health **Risk** Assessment/Ecological **Risk** Assessment for Sites 3, 4, 5, & **6** - St. Juliens Creek Annex, Chesapeake, Virginia
CTO-0027

Dear Ms. Hayes:

CH2M HILL has prepared the following responses to USEPA Region III comments of February 25 and June 14,2002 on the Draft Remedial Investigation/Human Health Risk Assessment/Ecological **Risk** Assessment for Sites 3, 4, 5, & 6, St. Juliens Creek Annex, Chesapeake, Virginia. Responses to comments are addressed herein.

Response to BTAG Comments

1. **Comment:** The presumptive remedy and associated feasibility study, remedial action and remedial design that will address the risk related to the terrestrial exposure pathways need to address the following issues related to the ERA:

   - Potential impacts of a presumptive remedy to wetland habitats needs to be identified and delineated so that appropriate avoidance and mitigation measures can be developed.

   - Preliminary remedial goals are needed to address contamination in the drainage channels and migration pathways that may be outside the limits of the presumptive remedy and pose risk from direct exposure and/or further migration to aquatic habitats. Small-scale removals may be required.

   - Monitoring associated with the presumptive remedy, if contaminants are left in place, should address subsurface/ shallow groundwater migration pathways.

Response: The feasibility study and associated remedial design will develop levels that are protective of potential ecological risk from both direct exposure and potential migration to aquatic habitats. Potential impacts of the presumptive remedy to wetland habitats will be identified and the need for monitoring will be discussed as appropriate based on the final presumptive remedy design.

2. **Comment:** Risks from aquatic based pathways associated with Blows Creek are proposed for further evaluation in a baseline ERA. The conceptual model for the site(s) suggests that contaminant migration may also occur to the Elizabeth River. This should be included in the problem formulation and BERA.

   Response: Text was added to the Baseline ERA Problem Formulation section (Section 8.4) and several other sections of the ERA to acknowledge the possibility that chemicals may be transported from Site 3 to the Southern Branch of the Elizabeth River via Blows Creek. However, emphasis of the follow-on investigation will be on Blows Creek, to determine if chemicals originating from Sites 3, 4, and/or 5/6 have impacted this water body and to evaluate the potential for chemical movement to the Southern Branch of the Elizabeth River.

3. **Comment:** Section **8.2.2.1** indicates that screening values other than BTAG values (i.e., Little Creek screening values) were used in the screening level ERA. Region III BTAG currently recommends that only BTAG values be used. If no value is available, other values will be considered. As preparation of the preliminary draft of this document was initiated prior to Navy concurrence on this issue, this comment is provided for future reference.

   Response: Future documents will focus on using the Region III BTAG values for the initial data screening steps. Other screening values will be used when Region III BTAG values are not available. However, these alternate screening values will be discussed with the Region III BTAG prior to their use in the ERA.

4. **Comment:** Section **8.2.3.3** on Page 8-15 states that based on its highly ephemeral nature, surface water at Site 3 is not expected to provide a viable source of drinking water thus surface water ingestion was not included in the food web models. It should be noted that surface water is available within a likely foraging range at Sites 4, 5, and 6 thus the exposure pathway should be included. Future documents should address how the presumptive remedy and baseline ERA will address this exposure pathway.

   Response: Surface water ingestion was included in the food web models for Sites 4, 5, and 6, as we concur this is a viable exposure pathway for these sites. Surface water was also included in the Site 3 food web models to provide a conservative estimate of exposure, although it is unlikely to represent a viable source of drinking water because of its ephemeral nature. The text was modified as follows: "Exposure via drinking water was included in the food web models at Sites 4 and 5/6, the only sites evaluated with a consistent potential source of freshwater for drinking. Based on its highly ephemeral nature, surface water at Site 3 is not expected to provide an important source of drinking water to terrestrial life. However, for the purposes of estimating risk under a

conservative scenario, exposure to chemicals from the ingestion of surface water at Site 3 was *also* included in the food web model."

5. **Comment:** Section **8.2.5.1,** Exposure Assumption Refmements, on page **8-18** states that average concentrations were used in Step 3A instead of maximum concentrations. This is an oversimplification of a refinement of exposure. As there are plans to conduct a presumptive remedy and to conduct an aquatic BERA, the overall impact on the ERA may not be significant. For future reference, to refine an exposure estimate an analysis of the spatial extent of contamination relative to the sample design and other factors such as preferential habitat should be evaluated.

   Response: As requested, future ERAs will provide additional justification when selecting an appropriate exposure concentration for use in the food web models.

6. **Comment:** Section **8.3** has no discussion of potential risk to reptiles and amphibians despite statements of risk for their respective surrogate species (birds and fish). Further discussion should be provided.

   Response: Additional text was added to several sections of the ERA to clarify potential risk results for reptiles and amphibians. For example, the following text was added to Section **8.4.1.14** to characterize potential risk to reptiles and amphibians in Blows Creek: "As discussed in Section **8.2.1.4,** avian species were considered a surrogate indicator of the potential for adverse effects to reptiles while aquatic life was considered a surrogate indicator of the potential for adverse effects to amphibians. Based on the potential for adverse effects to avian piscivores from the presence of chemicals in the tidally-influenced drainages to Blows Creek and in the main Blows Creek channel, it is concluded there is the potential for adverse effects to reptiles foraging on aquatic life in this portion of the Blows Creek channel. This potential receptor/exposure pathway accordingly warrants further evaluation in the ERA." Similar text was added for evaluating risks for amphibians based on risk outcomes for aquatic life.

7. **Comment:** Section **8.4.1** - It should be noted that the maximum detected mercury concentration at Site **4** soil **(1.2** mg/kg) may reflect contaminated dredge fill at the site rather than a "background" value. Nonetheless, the presumptive remedy will address soils and mercury is a COC for the aquatic BERA.

   Response: As discussed in the fourth paragraph of Section **8.4.1.1,** dredge soils were used as reference soils for comparison to the site-related soils. Dredge soils were used because they represent the primary soil type at these sites. The objective of this comparison was to differentiate between site-related and non site-related levels of chemicals in soils, and not to compare with pristine background soils. We think the comparison with dredge soils is consistent with this objective. The following text in this section was modified as follows to clarify this point: "Although dredge fill soil will not represent chemical concentrations in pristine soils, it was selected for use in this comparison because it represents the dominant soil type in potentially site-impacted areas (see Section **8.1.2.3).** Use of dredge fill soil thus allows a differentiation to be made between chemicals resulting from site-related and non site-related activities."

8. **Comment:** Section 8.5 discusses the Baseline ERA problem formulation which will address aquatic based pathways. The document proposes that the Baseline ERA initially focus on sediment. The conceptual model and assessment endpoints should address surface water exposures, as there were relatively significant exceedances of screening criteria, primarily for inorganics (i.e., lead). Fish survival and reproduction should be included as an assessment endpoint. Piscivorous mammal survival, growth, and reproduction should also be added as an assessment endpoint. The ***mink*** is recommended as a surrogate receptor. For the proposed avian piscivorous receptor, the kingfisher is recommended as a surrogate receptor as it is generally more sensitive due to its smaller body size, higher ingestion rate, and smaller home range.

   Response: Surface water samples are planned for the Blows Creek investigation and the evaluation of surface water will be included in the BERA. The continued evaluation of potential risks to water column-dwelling aquatic life from the presence of chemicals in Blows Creek surface water was accordingly retained as an assessment endpoint for evaluation in the ERA. Text was added to the Assessment Endpoints and **Risk** Hypotheses/Questions sections of the Conceptual Model Revision section to clarify this point. Sediment was, however, identified as a focus of this assessment based on the propensity for sediments to be the repository for chemicals and on uncertainties associated with the transient nature of surface water.

   Mink has been added as an assessment endpoint and great blue heron was replaced by belted kingfisher for Sites **4** and 5/6 and Blows Creek. It should be noted, for these areas, adding the piscivorous mammals *(mink)* and replacing great blue heron with belted kingfisher does not change the risk outcomes or conclusions of Step **3.**

Response to Toxicological Comments

1. **Comment:** Table **7.11,** Site **3:** The reference dose for iron has recently changed from 0.3 to 0.6 mg/kg-day. This change will lower the **risk** from iron by half.

   Response: The reference dose for iron has been changed to 0.3 mg/kg-day (USEPA Region III RBC Table [April 2,200021). The risk-based concentrations, reference doses, and cancer slope factors were updated to the current values on IRIS and in USEPA Region III's RBC table. This resulted in the addition of a few COPCs, which were quantitatively evaluated in the risk assessment.

2. **Comment:** Table 8.5, Site 3: The risk from arsenic is overestimated by **3** orders of magnitude. I suspect that the wrong units were put into the equation. This is true for all arsenic tables in Sites 3 and 4.

   Response: The equations used to calculate the risk in deep groundwater associated with arsenic in all of the tables was corrected. Therefore, the risks associated with exposure to arsenic in deep groundwater have been reduced by three orders of magnitude, and the risks associated with Site **3** arsenic now fall within USEPA's target levels.

3. **Comment:** Table **8.9,** Site **3:** The risk from dioxin is overestimated by 3 orders of magnitude.

   Response: The dioxin concentration was incorrectly input as µg/kg. The concentration has been converted correctly to mg/kg and the calculated risk is therefore reduced by **3** orders of magnitude. The risk associated with exposure to the dioxins in soil is within USEPA's target levels. The text has been edited to reflect that dioxin is no longer a risk to Future Lifetime Residents at Site *3.*

4. **Comment:** Table 8.5, Site **4** The risk from arsenic is overestimated by 3 orders of magnitude. *Also,* on this same table the risk from DEHP and chloroform are similarly overestimated.

   Response: The equations used to calculate the risk in deep groundwater associated with arsenic, DEHP, and chloroform have been corrected. Of these three constituents, arsenic is the only constituent that still presents a risk above USEPA's target risk range in deep groundwater at Site 4.

If you have any questions concerning any of these comments, please call me (757)**460-3734,** extension 19.

Sincerely,

William J Friedmann Jr.

William J. Friedmann, Jr.
Activity Manager

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