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FISC WILLIAMSBURG
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LETTER AND ATTACHED U S EPA REGION III COMMENTS ON THE DRAFT REMEDIAL INVESTIGATION REPORT FOR AREA OF CONCERN 6 (AOC 6) TNT SUBAREAS FISC WILLIAMSBURG VA
02/09/2015
U S EPA REGION III PHILADELPHIA PA

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

February 9, 2015

Mr. Scott Park
NAVFAC MIDLANT, Building N-26, Room 3208
Attention: Code OPHE3, Mr. Scott Park
9742 Maryland Avenue
Norfolk, VA 23511-3095

Subject: Draft Remedial Investigation Report for AOC 6 TNT Subareas, Naval Weapons Station Yorktown Cheatham Annex, Williamsburg, Virginia, November 2014

Mr. Park:

Thank you for the opportunity to review the subject document. Attached are EPA's comments on the document. If you have any questions, please contact me at 215-814-2077.

Sincerely,

Gerald F. Hoover

Gerald F. Hoover, RPM
NPL/BRAC Federal Facilities Branch

cc: Wade Smith, VDEQ

Hydro Comment:

The concentrations of arsenic and iron in the up-gradient monitoring wells MW-06 and MW-02 are not a sufficient line of evidence to demonstrate that the arsenic and iron concentrations in groundwater at the site are attributable to background conditions. The Navy should explain in more detail, and should provide additional data, that can clearly demonstrate that the concentrations of arsenic and iron in groundwater are indeed attributable to naturally occurring background conditions.

BTAG Comments:

1. Table 2-2 Groundwater and Penniman Lake Surface Water Elevations: According to this table the groundwater elevations ranged from 4.39 to 6.35 feet above mean sea level (amsl) and the Penniman Lake surface water elevation was 8.06 amsl. This report does not indicate how deep Penniman Lake is, therefore, it seems reasonable that there is a direct connection between groundwater and the lake and the lake could be gaining or losing depending on conditions. The connection between groundwater and Penniman Lake should be clarified.

2. Figure 2-1 AOC 6 TNT Subareas RI Sample Locations: This figure identifies a berm to the north of the TNT Graining House and Catch Box Ruins. The text should explain the purpose and origin of the berm and why no samples were collected from it. The original topography of the area appears to be about 16 feet and the current top of the berm is approximately 30 feet (Figure 3-1) [see also Appendix J Ecological Risk Assessment, Section J.2.1]. The berm appears to be approximately 60 feet by 100 feet.

3. Figure 2-1: Previous comments identified the need for additional samples (surface water, sediment, and porewater) in King Creek adjacent to this site (e.g., Section 3.5.4 of this document also supports this position) and in the drainage feature from the dam to the creek, including the creek.

4. Figure 2-1: No samples were collected from the graining house or the sump. Even if these were constructed of concrete, the integrity of the floor may have been compromised and allowed contaminants to escape to an area that has not been sampled. These contaminant concentrations may still be in the migration pathway. An explanation should be provided on why samples were not collected from these areas.

5. Section 6.3 on page 6-2 states that since Penniman Lake has now received a site designation (AOC 9), any further evaluation of surface water and sediment offshore of the AOC 6 TNT Subareas has been deferred to the Penniman Lake Site Inspection (SI). This approach would be acceptable if sediment sampling as part of the Penniman Lake SI was sufficient to characterize the nature and extent of explosives at AOC 6. However, sediment sampling in Penniman Lake adjacent to AOC 6 is limited (only one sample) and additional sampling as part of the Penniman Lake SI is recommended. Any additional sampling needs to consider the fact that activity at AOC 6 predates

construction of the dam which likely results in different migration pathways than those present today.

6. Page 6-4, Section 6.5.2 Aquatic Habitats: The potential for risk from contaminants to ecological receptors (e.g., groundwater to surface water) has existed at this site since World War I. This means the contaminants may have already reached Penniman Lake or King Creek and may be different than the contaminants found in the groundwater during this study. This supports the need to assess the historical groundwater contaminant migration pathway, potentially including the collection sediment samples for use in the ecological risk assessment.

Appendix J Ecological Risk Assessment

7. Page J-15, Section J.4.1 Medium-Specific ESVs: For both soil and surface water the text indicates that when more than one ESV (ecological screening value) was available, "…the lowest of these values was typically selected." Please identify which contaminants did not have the lowest ESV selected and state the reasons why this approach was used.

8. Page J-19, Section J.5.3.2 Terrestrial Food Web Exposures: The text states "…although chemicals that exceeded the MATC, but not the LOAEL, were discussed for possible risk management considerations." The results of this discussion including the possible risk management consideration need to be included in this section.

9. Page J-21, Section J.5.4 Aquatic Habitats: The use of mean site concentrations are not appropriate for determining risk to ecological receptors that are immobile or have a limited home range. Maximum concentrations must also be considered when assessing risk to lower trophic level receptors.

10. Page J-22, Section J.5.5.2 Aquatic Habitats: The text states "…groundwater is not a significant transport medium for site-related constituents to Penniman Lake or King Creek, and site-related constituents that might reach these water bodies via groundwater would not pose an unacceptable risk to aquatic biota." Knowing when the dam was installed would help support or refute the first portion of this quote. Because no sampling has occurred in King Creek and only one sediment sample is located in Penniman Lake adjacent to this site, support for this position is not sufficient.

11. Page J-25, Section J.6 Uncertainties: Assessing ecological risk to lower trophic level receptors needs to consider maximum, not just mean, concentrations. The Wildlife Factors Handbook does not evaluate lower trophic level ecological receptors that are immobile or have a limited home range nor does it "specify" the use of average media concentrations. Citing this document to support using mean versus maximum concentrations for lower trophic level receptors is not appropriate.

12. Page J-26, Section J.7 Risk Summary and Conclusions: The text states "Based on the results of this evaluation, groundwater is not a significant transport medium for site-

related constituents to Penniman Lake or King Creek, and site-related constituents that might reach these water bodies via groundwater would not pose an unacceptable risk to aquatic biota." Based on this report, groundwater may discharge to both of these surface water bodies. Depending on how long the dam has been operational compared with AOC 6 TNT being constructed, groundwater flow may have been different than today (e.g., more flow toward Penniman Lake [or the wetland that was present before the lake]). The text does indicate that groundwater tends to flow toward King Creek. This means that additional sediment samples may be warranted from King Creek adjacent to (in the groundwater discharge area), upstream, and downstream of this site. In addition, more sediment samples need to be collected in Penniman Lake near this site in the groundwater discharge area. These would be in addition to Penniman Lake sediment sample CAA06-SD01.

Tox Comments:

Overall, the methodologies to complete the human health risk assessment appear appropriate; however, the following comments and recommendations must be considered as the draft RI is finalized.

Major Concerns:

1. Agree with the recommendations on page 8-2 in Section 8.2, except for the recommendation #3. For groundwater, the comparison to background should include a more robust statistical analysis than comparing the range of two background wells (one of which is debatable, see comment under Section 4 below) to the range of constituent concentrations at monitoring wells. The iron and arsenic concentrations in the monitoring wells may be attributable to naturally occurring background levels; however, the current analysis does not definitively support this conclusion. Recommend including groundwater as needing further action unless background analysis is improved.
2. Lead was not identified as a COPC in Section H.6.2. Risk Assessment Results. This determination is correct using the mean concentration in soil and subsurface soil and the exposure parameters described in the Table 4s; however, the highest concentration observed, 1,100 mg/kg, was from a subsurface soil sample from within the Catch Box Ruins and was identified as an outlier using ProUCL 5.0. The next highest concentration, 580 mg/kg, was from a surface soil sample also within the Catch Box Ruins. Section H.6.4 addresses the possibility of lead as a hot spot but fails to provide a strategy moving forward. Recommend calculating human health risk of exposure to lead in surface and subsurface soils using concentrations within Catch Box Ruins (using sample Stations CAA06-SO01 and SO26).

Nature and Extent of Contamination (Section 4)

- Page 4-1, 3rd paragraph – disagree with selection of MW-6 as a source of background concentrations for groundwater. This well, while outside the arbitrary TNT Subareas Study boundary, is more similar and closer in location to MW-2 than MW-1 (the other background source well).

Human Health Risk Assessment (Section 5)

- Page 5-3 – the COCs identified appear appropriate
- Page 5-3, last paragraph – replace "were found to" with "may," such that the arsenic and iron concentrations in soil "may be" attributable to naturally occurring background conditions. For a more definitive conclusion, a statistical comparison of estimated background concentrations with observed site concentrations is needed.
- Page 5-3 – please add text discussing risks associated with exposures to chromium VI to Appendix H, Section H.8, HHR Summary.
- Page 5-4, first paragraph – delete comparison of iron ingestion for on-site receptor to recommended daily allowance and conclusion that iron ingestion from on-site ground water would be below the recommended daily allowance (RDA). This statement ignores that the iron intake from the ground water is not the sole source of iron and would be combined with regular dietary intake. The combined dietary intake, from ground water and diet, may be greater than the RDA; unfortunately, the text does not provide a quantitative comparison of the RDA with a combined iron intake, diet and on-site ground water, for any of the receptors.

Chemical Fate and Transport (Section 7)

- Page 7-5, top of page – The sentence that only 3 inorganic constituents were identified as COCs in surface soil is followed by a sentence that indicates that lead was one of the 3 inorganic COCs. Lead was also labeled as a COC on page 7-7, first bullet. However, lead is not included as a COC in Section 5 or identified as such in Appendix H. Please clarify that lead was a COC in the ecological RA. A table outlining the COCs in each assessment at the beginning of Section 7 would be helpful.
- Page 7-7, last bullet – Definitively attributing arsenic and iron concentrations in soil to naturally occurring background is not possible given the information available and lack of statistical analysis. Arsenic and iron may be attributed to background. Replace "are" with "may be."

Conclusions and Recommendations (Section 8)

- Page 8-1, 1st paragraph – The comparison to background should include a more robust statistical analysis than comparing the range of two background wells (one of which is debatable) to the range of constituent concentrations at monitoring wells. The iron and arsenic concentrations in the monitoring wells may very well be attributable to naturally occurring background levels; however, the current analysis does not definitively support this conclusion. Recommend including groundwater as needing further action unless background analysis is improved.
- Page 8-2, Section 8.2 – Recommendations
    1. FFS for TNT and lead in soil → Agree.
       No further action for arsenic and chromium VI in soil → Agree.
        - Provide reference to source of background analysis. A table may be beneficial comparing the 95% UTL for surface soil and for subsurface soil against the observed arsenic and chromium concentrations. This is the only place in document that this comparison is made and a transparent explanation is beneficial.

2. No further action for 2-nitrotoluene in soil → Agree.
3. No further action for arsenic and iron in groundwater → Disagree. Background comparison not sufficient to make this determination.

Laboratory Analytical Data (Appendix G)

- Table G-3 – Table heading incorrectly labels the data as Raw Surface Soil. The data in the table are for groundwater.

Draft Human Health Risk Assessment (Appendix H)

- Page H-4, Section H.3.2 – Selection of COPCs – Disagree with utilization of MW-6 as source of background groundwater concentrations. In addition, the comparison to background should rely on a more robust statistically significant analysis than comparing maximum constituent levels.
- Page H-5, Section H.4.1 – Conceptual Site Model for Human Health – Recommend including brief explanation, such as that included in Section 5.2, as to why the inhalation route is not a complete exposure pathway prior to bulleted list of current receptors and complete exposure routes.
- Page H-12, Section H.6.2.3 – Current Child Recreational User (as well as other relevant areas of document) – Recommend removing phrase "conservatively used to evaluate recreational exposure to soil," as this statement fails to provide meaningful information to the bullets. More appropriate in uncertainty section or not included in document at all, due to inherent 'conservatism' in risk assessment.
- Section H.7:
    - Page H-15, Section H.7.1, 4th paragraph – Delete: "Therefore, it is possible that some of the risk associated with exposure to arsenic in soil is from background conditions." This statement is misleading, as there were arsenic concentrations that exceeded the 95% UTL from the CAX/Yorktown background and contributed to the risk calculation.
    - Page H-16, Section H.7.2, 1st paragraph – Recommend: "… generally conservative and reflect ~~worst-case,~~ or upper bound~~,~~ assumptions for the exposure." The exposure factors are upper bound assumptions and the 'worst-case' descriptor is undefined.
    - Page H-16, Section H.7.2, 3rd paragraph – Delete: "During many construction projects, clean fill material… after any construction activities." The information provided by these 3 sentences is conjecture and does not present substantive information critical to the risk assessment.
    - Page H-16, Section H.6.3, 1st paragraph – Delete: "The noncarcinogenic toxicity factors are most likely an overestimate of actual toxicity." Conjecture.
    - Page H-16, Section H.6.3, 2nd paragraph – Delete: "…however, most of the experimental studies indicate the existence of a threshold value." Incorrect. A threshold for carcinogenicity cannot be determined by a single experimental study, and the statement that 'most' experimental studies support a threshold is not supported.
    - Page H-16, Sectoin H.6.3, 2nd paragraph – Rewrite: "Uncertainty is also associated with the application of the ~~MMOA~~ADAFs for chromium due to its mutagenic MOA; this may overestimate or underestimate risks.

- Page H-16 – H-17, Section H.6.3, 3rd paragraph – Delete. PPRTVs are supported by the Agency.
- Page H-16 – H-17, Section H.6.3, 4th paragraph – Delete. The 'true' cancer risk is unknown and cannot be predicted to be 'less' than the predicted value.
- Page H-16 – H-17, Section H.6.3, 5th paragraph – Delete. The interspecies uncertainty is captured in the interspecies uncertainty factor in the development of the RfD/RfC and is addressed in the toxicity assessment.

- Section H.78 – Human Health Risk Summary – The COCs identified appear appropriate.
- Section H.8 – Human Health Risk Summary – Delete text concluding that iron ingestion from on-site groundwater would be below the recommended daily allowance (RDA) (a reference for the RDA was not provided). This statement ignores that the iron intake from the groundwater is not the sole source of iron and would be combined with regular dietary intake. The combined dietary intake, from groundwater and diet, may be greater than the RDA; unfortunately, the text does not provide a comparison of the RDA with a combined iron intake, diet and on-site groundwater, for any of the receptors.

Draft Human Health Risk Assessment Tables (Appendix I)

- Reference EPA, 2014 → EPA, 2014c throughout Table 4s.
- Table 4.1.CTE (and elsewhere) – Recommend ingestion rate for child of 50 rather than convoluted time-weighted average for birth to <6 years.
- Table 4.2.RME (and elsewhere) – construction worker – Please justify/clarify exposure duration of 1 year for construction worker ingestion of surface and subsurface soil. Support for this parameter was not found in the reference provided.
- Table 4.2.RME – resident (child/adult) – The age-adjusted ingestion rate of soil is not generally used to calculate the lifetime cancer risk for a resident (child/adult). The cancer risk is calculated for the child and for the adult, individually, and the cancer risks are then summed. It is recommended that the parameters for the child/adult resident are removed.
- Table 4.2.RME – construction worker – the Exposure Factors Handbook recommends a soil to skin adherence factor of 0.3; compared to the 0.12 provided in the draft table. Please clarify or use 0.3 from EFH.
- Table 4.3.RME – adult base worker, tap water – ingestion rate of water – the footnote states that 1.25 is half the value from EPA, 1991, but the reference in the table is EPA, 2014. Please clarify or correct footnote.
- Table 4.3.CTE – adult base worker, tap water – ingestion rate of water – assumes half ingestion rate of adult resident from EF Handbook but the adult intake rate was updated to 2.5 from 2. Please clarify or use 1.25 L/day.
- Table 5.1 – insert footnote describing process for selecting RfDs for 2-amino-4,6-dinitrotoluene and 4-amino-2,6-dinitrotoluene, which do not have RfDs, based on 2,4-dinitrotoluene.
- Table 6.1 – Change column heading 'EPA Carcinogen Group' to 'Carcinogenicity Classification' – not all the carcinogenicity classifications are based on EPA documents.
- Table 6.1 – Is the source for the chromium VI carcinogenicity classification CalEPA? Could not locate NJDEP document on chromium VI.
- Table 7.6.CTE – The cancer risk for the ingestion route CTE in the future construction worker could not be verified. Agency calculated risks were:

	calculated by Agency	draft HHRA
24dinitrotoluene	3.4E-08	3.7E-09
246trinitrotoluene	4.3E-06	4.70E-07
2nitrotoluene	5.8E-07	6.50E-08
arsenic	4.9E-07	5.40E-08
chromium	2.6E-08	2.90E-09