



## NATIONAL GUARD BUREAU

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March 9, 2023

Mr. Colin Mitchell  
Governmental Hazardous Waste Branch  
Alabama Department of Environmental Management  
1400 Coliseum Boulevard  
Montgomery, Alabama 36110-2400

Dear Mr. Mitchell:

Enclosed for your review is the Risk Assessment Report Revision 2 for Organizational Maintenance Shop 28 (OMS 28), located in Mobile, Alabama. This Risk Assessment Report Revision 2, dated March 2023, replaces the previous Risk Assessment Report Revision 1, dated May 2022 2019. The Revision 2 report addresses your review comments provided in your letter dated October 12, 2022 and your additional review comments provided in your email on January 11, 2023. We responded to your review comments informally in our emails dated December 19, 2022 and January 23, 2023, and you informally accepted the responses in your email dated February 17, 2023. This revision incorporates the informally approved responses to your comments.

Two hard copies and two CDs containing the Risk Assessment Report Revision 2 are provided for your use. A redline/ strikeout version of the text will be emailed to you to assist you in your backcheck of comment incorporation.

If you have questions or require assistance, please contact me at 703-607-7955, [queenie.m.mungin-davis.civ@army.mil](mailto:queenie.m.mungin-davis.civ@army.mil).

Sincerely,

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Enclosures

**U.S. Army National Guard (ARNG) Responses provided March 9, 2023 to  
Alabama Department of Environmental Management (ADEM) Comments dated October 12, 2022 on  
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**ADEM COMMENT 1.** Section 3.6: This section states: “USEPA [U.S. Environmental Protection Agency] recognizes a generally acceptable cumulative excess cancer risk range (i.e., total risk to a given receptor) of between  $1 \times 10^{-6}$  and  $1 \times 10^{-4}$ .” Section 3.6.3 uses an acceptable risk of  $1 \times 10^{-4}$  to screen each potential receptor. However, Section 6.7.1 of the Alabama Risk-Based Corrective Action Guidance Manual states that any receptor with a cumulative risk greater than  $1 \times 10^{-5}$  should be carried forward into the development of risk-based target levels (RBTLs). This discrepancy in acceptable cumulative risk has excluded several receptors from the development of RBTLs. Please revise the document to use a cumulative risk of  $1 \times 10^{-5}$  instead of  $1 \times 10^{-4}$ .

**ARMY RESPONSE TO ADEM COMMENT 1.** The document has been revised to acknowledge the Alabama Risk-Based Corrective Action Guidance Manual cumulative risk threshold of  $1 \times 10^{-5}$  and state the impact of applying the cumulative risk threshold of  $1 \times 10^{-5}$  for each receptor at each parcel. The information will not replace the current text but rather has been added to the discussion for comparison purposes.

- Alabama Risk-Based Corrective Action (ARBCA) Guidance Manual cancer risk threshold of  $1 \times 10^{-5}$  and noncarcinogenic HI of 1 discussed in Section 3.6.
- Summary of applying USEPA guidance in conjunction with ARBCA guidance for each parcel is presented in Section 3.6.3 under the subheadings Parcel A through Parcel H.
- Table 18 is updated to include Future Resident Adult as a receptor for TCE in groundwater at Parcel B because although total cancer risk for the adult is  $2 \times 10^{-5}$ , which is within the acceptable cumulative cancer risk range using USEPA guidance, it is above the cancer risk threshold of  $1 \times 10^{-5}$  based on ARBCA guidance. Text in Section 3.7 updated to include ARBCA cancer risk threshold of  $1 \times 10^{-5}$ .
- Table 19 is updated to include carcinogenic and noncarcinogenic site-specific screening levels (SSSLs) for the Future Resident Adult on Parcel B for TCE in groundwater (ingestion, dermal, inhalation, and vapor intrusion).
- Section 3.8 updated to include TCE in groundwater for a Future Resident Adult at Parcel B.
- ARBCA added to the Acronym List.
- ARBCA Guidance Manual had to References in Section 5.0.

**ADEM COMMENT 2.** Section 3.6.3: This section states, “Significant contribution to risk is defined by USEPA Region 4 as...a chemical-specific hazard quotient (HQ) of 0.1 or greater contributing to a noncarcinogenic hazard index (HI) greater than 1.” Table E-2 lists a HQ of 0.2 for tetrachloroethene (PCE) in subsurface soil, contributing to an overall HI of 240 for Future Construction Worker (Parcel A). However, tetrachloroethene is not listed as a contaminant of concern (COC) in Table 18 for the Future Construction Worker (Parcel A), Subsurface Soil. Please address.

**ARMY RESPONSE TO ADEM COMMENT 2.** Tetrachloroethene (PCE) has been added as a COC for subsurface soil for the Future Construction Worker (Parcel A) in Table 18. Text in Section 3.6.3 has also been updated accordingly.

- Section 3.6.3, Parcel A has been updated to include PCE in subsurface soil as a COC for a Future Construction Worker.

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- Table 18 is updated to include PCE in subsurface soil as a COC for a Future Construction Worker at Parcel A.
- Table 19 is updated to include carcinogenic and noncarcinogenic SSSLs for the Future Construction Worker at Parcel A for PCE in subsurface soil (ingestion and inhalation).
- Section 3.8 updated to include PCE in subsurface soil for a Future Construction Worker at Parcel A.

**ADEM COMMENT 3.** Section 4.3.3.1 and Table 23: A bioaccumulation equation for tetrachloroethene was not identified in the Table 23 reference (USEPA, 2003 Attachment 4-1, Guidance for Developing Ecological Soil Screening Levels (Eco-SSLs), Exposure Factors and Bioaccumulation Models for Derivation of Wildlife Eco-SSL. OSWER Directive 92857-55. Please clarify if a surrogate chemical for tetrachloroethene was used in the calculation of the Bioaccumulation Factor from Soil to Invertebrate ( $BAF_{inv}$ ) in both Section 4.3.3.1 and Table 23. If so, please revise the text and table to indicate that a surrogate was used.

**ARMY RESPONSE TO ADEM COMMENT 3.** *Attachment 4-1, Guidance for Developing Ecological Soil Screening Levels (Eco-SSLs), Exposure Factors and Bioaccumulation Models for Derivation of Wildlife Eco-SSL* (USEPA, August 2003) provides on Page 7 of the Guidance, “an overall model for estimation of BAFs for earthworms.” The equation provided is shown in the footnotes of Table 23:

$BAF_{inv} = [10^{(\log Kow - 0.6)}] / [foc \times 10^{(0.983 \log Kow + 0.00028)}]$ , where

Foc (fraction of organic carbon) is conservatively set to 1% (0.01), as shown in the guidance.

The log Kow of PCE was substituted into the equation to calculate the  $BAF_{inv}$  for PCE. A surrogate compound was not used.

**ADEM COMMENT 4.** Section 4.3.3.2 and Table 25: Please revise Section 4.3.3.2 and Table 25 to include a note stating that 1,1,2,2-tetrachloroethylene was used as a surrogate for the PCE toxicity reference factor.

**ARMY RESPONSE TO ADEM COMMENT 4.** The chemical name (1,1,2,2-tetrachloroethylene) used in the toxicity value source document was a synonym for tetrachloroethene, also known as perchloroethene (PCE). The compound tested in the toxicity study was PCE. A surrogate compound was not used.

**ADEM COMMENT 5.** Section 4.3.5.1: This section states, “SQLs [Sample Quantitation Limits] and reps generally are 5 to 10 times the MDL (Method Detection Limit)...” Please define the word “reps” or correct the typographical error.

**ARMY RESPONSE TO ADEM COMMENT 5.** This typographical error has been corrected by replacing “reps” with “RLs.”

- Refer to text correction in Section 4.3.5.1.

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**PREVIOUS COMMENTS**

**ADEM PREVIOUS COMMENT 4.** Section 4.3.3.2 and Table 25: Please revise Section 4.3.3.2 and Table 25 to include a note stating that 1,1,2,2-tetrachloroethylene was used as a surrogate for the PCE toxicity reference factor.

**ARMY RESPONSE TO ADEM COMMENT 4.** The chemical name (1,1,2,2-tetrachloroethylene) used in the toxicity value source document was a synonym for tetrachloroethene, also known as perchloroethene (PCE). The compound tested in the toxicity study was PCE. A surrogate compound was not used.

**ADEM EVALUATION.** ADEM notes that while 1,1,2,2-tetrachloroethylene and PCE are chemically similar, they have different CAS numbers, compound formula, EPA RSLs, slope factors, etc. The referenced document, Toxicological Benchmarks for Wildlife: 1996 Revision, ES/ER/TM-86/R3, does not state that 1,1,2,2-tetrachloroethylene is considered a synonym for PCE. Please clarify.

**ARMY RESPONSE TO ADEM EVALUATION OF PREVIOUS COMMENT 4.** There are multiple synonyms for PCE: 1,1,2,2-tetrachloroethylene = tetrachloroethene = perchloroethene = perchloroethylene. The statement that 1,1,2,2-tetrachloroethylene and PCE have different CAS numbers, compound formulas, EPA RSLs, slope factors, etc. is incorrect. Perhaps the reviewer was consulting the EPA RSL table, which lists tetrachloroethylene next to 1,1,2,2-tetrachloroethane. These two compounds do have different CAS numbers, compound formulas, EPA RSLs, slope factors, etc. In Toxicological Benchmarks for Wildlife (Sample, Opresko, and Suter 1996), the study cited as the basis for the toxicity benchmark used for 1,1,2,2-tetrachloroethylene is titled "Delineation of the role of metabolism in the hepatotoxicity of trichloroethylene and perchloroethylene: a dose-effect study" (Buben and O'Flaherty 1985). Thus, the study used the name perchloroethylene, while Sample, Opresko, and Suter (1996) in presenting the results of that study used the synonym 1,1,2,2-tetrachloroethylene. This clarifies that a surrogate compound was not used in the ERA.

**NEW COMMENTS**

**NEW ADEM COMMENT 1.** Section 3.0: Please revise this section to state that the human health risk assessment (HHRA) follow the ADEM guidance and add the guidance to the list of documents.

**ARMY RESPONSE TO NEW ADEM COMMENT 1.** The requested text has been added up front to Section 3.0 and the Alabama Risk-Based Corrective Action (ARBCA) Guidance Manual, Revision 3.0 (February 2017) was added to the list of documents.

- Refer to text corrections in third paragraph of Section 3.0.

**NEW ADEM COMMENT 2.** Section 3.6.3, Parcel A: For consistency with other revisions in Section 3.6.3, please add "using USEPA and ARBCA guidance: at the end of the sentence discussing the hazard index (HI) of 22 for the future industrial worker.

**ARMY RESPONSE TO NEW ADEM COMMENT 2.** The requested text has been updated.

- Requested text has been added to the third paragraph under Parcel A.

**NEW ADEM COMMENT 3.** Section 3.6.3, Parcel A, Future resident: The revised sentence states "The total cancer risk for the adult is  $7 \times 10^{-4}$ , which is within the acceptable risk range using USEPA guidance...". Please revise the sentence to state "which is above the acceptable risk range using both USEPA and ARBCA guidance".

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**ARMY RESPONSE TO NEW ADEM COMMENT 3.** The text has been changed as requested.

- Requested text change has been made in the fourth paragraph under Parcel A.

**NEW ADEM COMMENT 4.** Section 3.6.3, Parcel C, Construction worker: Please add that the HI of 2 is above the noncancer benchmark. Also, please add in the appropriate guidance to be consistent with the discussions for the other receptors/parcels.

**ARMY RESPONSE TO NEW ADEM COMMENT 4.** The text has been changed as requested.

- Requested text change has been made in the second paragraph under Parcel C. Additional text related to the appropriate guidance added to fourth paragraph under Parcel C.

**NEW ADEM COMMENT 5.** Section 3.6.3, Parcel D, Construction and industrial workers: Please add in the appropriate guidance to be consistent with the discussions for the other receptors/parcels.

**ARMY RESPONSE TO NEW ADEM COMMENT 5.** The text has been changed as requested.

- Requested text changes have been made to the second and third paragraphs under Parcel D.

**NEW ADEM COMMENT 6.** Section 3.6.3, Parcel D, Future resident: Please add the superscript for the cancer risk level. For the HI discussion, please add in the appropriate guidance to be consistent with the other receptors/parcels.

**ARMY RESPONSE TO NEW ADEM COMMENT 6.** The text has been changed as requested.

Requested text change has been made in the second paragraph under Parcel C. Additional text related to the appropriate guidance added to fourth paragraph under

- Requested superscript change made in the fourth paragraph under Parcel D. Requested text change related to the HI discussion also made in the fourth paragraph.

**NEW ADEM COMMENT 7.** Section 3.6.3, Parcels E-H: Please add in the appropriate guidance to be consistent with the discussion for the other receptors/parcels.

**ARMY RESPONSE TO NEW ADEM COMMENT 7.** The text has been changed as requested.

- Requested text changes made to second, third, and fourth paragraphs under Parcel E.
- Requested text changes made to second, third, and fourth paragraphs under Parcel F.
- Parcel G required no text changes.
- Requested text made to the only paragraph under Parcel H.

**NEW ADEM COMMENT 8.** Section 3.8, Current Exposure Scenario:

- a. For consistency with the Future Exposure Scenarios discussion, please revise this section to include a discussion of potential exposure routes.
- b. Please revise this paragraph to state that the only risk estimates calculated under a current scenario were for current trespassers at Parcel A. All others were calculated under a future use scenario. Additionally, the text states that only one COPC (PCE on Parcel A) was identified based

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on exposure to surface and subsurface soils. However, this was for the future industrial worker, not the current worker. Please address.

- c. The text discusses the presence of a residential structure on Parcel H and states that risk and hazards were below target levels. The text for Parcel H only discusses a future resident. Please revise accordingly.

**ARMY RESPONSE TO NEW ADEM COMMENT 8a.** Potential exposure routes (pathways) have been added.

- Changes have been made in Section 3.8 in the first paragraph under Current Exposure Scenarios.

**ARMY RESPONSE TO NEW ADEM COMMENT 8b.** Under a current scenario, ***potential*** exposure pathways were ***considered*** for a trespasser at Parcels A through G, an industrial worker at Parcel E, and a resident living on Parcel H, but risk estimates were only ***calculated*** where COPCs were present. As a result-, risk estimates were calculated for both a trespasser at Parcel A and a resident adult and child (from vapor intrusion) at Parcel H. Risk for a resident at Parcel H is discussed in the third paragraph under “Current Exposure Scenarios.”

The statement “only one COPC (PCE on Parcel A) was identified based on exposure to surface and subsurface soils” is correct. While soil samples were collected at Parcels A, E, and F, risk estimates from exposure to soil were calculated only for Parcel A, because it was the only parcel on which a soil COPC (PCE in both surface and subsurface soil) was identified. Risk from exposure to soil was calculated for a current trespasser at Parcel A, but not for a current industrial worker, because there is no current industrial building on Parcel A. Risk from exposure to soil was calculated for a future trespasser, assuming conditions remain as they currently exist, and for a future construction worker, industrial worker, and resident at Parcel A based on potential future scenarios. Table 18 lists the COCs identified for each receptor evaluated at Parcel A.

- In addition to the explanation in the paragraph above, changes have been made in Section 3.8 in the first and second paragraphs under Current Exposure Scenarios.

**ARMY RESPONSE TO NEW ADEM COMMENT 8c.** The ADEM comment refers to Section 3.8 but no change is required to the text in Section 3.8 because risk for a current resident at Parcel H is discussed in the third paragraph of Section 3.8 under “Current Exposure Scenarios.” As a result of the ADEM comment, the text under the discussion of Parcel H in Section 3.6.3 has been revised from “future resident” to “current and future resident.” The risk calculated for the adult and child residents (Tables E-26 and E-27) and summarized on Table 18 is for both current and future scenarios as shown in the receptor descriptions on each of these tables.

- Changes have been made to Section 3.6.3 under Parcel H.