Technical Memorandum
Comments on the Final Baseline Human Health Risk Assessment for the Gulfco Marine Maintenance Superfund Site Freeport, Texas
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Prepared for

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1.0 INTRODUCTION

This Technical Memorandum summarizes EA Engineering, Science, and Technology, Inc.'s technical review comments for the Final Baseline Human Health Risk Assessment (BHHRA) prepared by Pastor, Behling & Wheeler, LLC (PBW) for the Gulfco Marine Maintenance Superfund Site (site), located in Freeport, Texas, and submitted to the U.S. Environmental Protection Agency (EPA) on 08 February 2010. The technical review was conducted to assure that the Final BHHRA complies with guidance, to determine if calculations have been performed correctly, and whether appropriate conclusions were reached. For this review, source material used for modeling (e.g., toxicity values, exposure parameters, etc.) were examined to assure that the appropriate values were incorporated, verify calculations, and confirm consistency in the values that were carried from appendices into the main text tables.

General technical review comments pertaining to the Final BHHRA are provided in Section 2.0. Specific technical review comments associated with the body of the Final BHHRA, including the tables and figures, are provided in Section 3.0. Section 4.0 provides a summary based on the outcome of the technical review.

2.0 GENERAL TECHNICAL REVIEW COMMENTS

General Comment 1.

This comment further addresses Draft General Comment 3. Screening versus background was also used in the BHHRA. Chemicals detected at the site and deemed less than site background were not evaluated further in the BHHRA. Response to this comment indicated that the background discussion would follow EPA guidance. Background screening is a source of significant uncertainty in risk assessment; in particular in the manner in which it is conducted. Appropriate statistical methodologies were not employed (See Specific Comments 4 and 5). Applicable EPA guidance as indicated in the comment response should be employed.

General Comment 2.

Each medium is evaluated separately in the BHHRA. Total risks for each receptor are not summed across media with the exception of soil and vapor intrusion for the industrial worker; thus characterization of potential risk is not complete. Response to this original comment (General Comment 4) indicated that text and Table 20 would be added to address this comment. This text could not be located in the text and Table 20 does not provide rationale. Further discussion should be added to discuss why pathways were not added for other receptors. Risk across media should be performed (EPA 1989, 2002) to allow the assessment of potential risks for each receptor of concern.

3.0 SPECIFIC TECHNICAL REVIEW COMMENTS

The following technical review comments (Specific Comments 1 through 7) are associated with the body of the Final BHHRA, including the tables and figures.

1. **List of Acronyms, pages vi and vii**

   Some acronyms used in the report, notably QC, were not included in the list of acronyms. QC should be added to the list of acronyms.

2. **Section 2.2.1, page 11, paragraph 1**

   Previous comment on the draft (Specific Comment number 1) requested clarification of the screening process and the addition of a diagram to aid in explaining the process used in the BHHRA. Comment response indicated that Section 2.2.3 and Table 20 were added to the document to satisfy this comment. Section 2.2.3 is helpful in explaining the process however Table 20 presents an evaluation of exposure pathways and does not clarify the screening process. Based on the complicated nature of the screening conducted, further clarification of the process is warranted in tabular or figure format.

   Previous comment (Specific Comment number 10) asked for clarification for why the EPA Regional Screening Levels (RSLs) were not used. The comment response states that the values were not available for use in the screening process or as a resource for toxicity information. However, the RSLs were available starting September 2008 and the draft was submitted in August 2009. It is important that the BHHRA utilize the latest toxicity values endorsed by EPA to reduce the possibility that risks will be underestimated. Either risk estimates should be updated to incorporate the latest toxicity values or the toxicity values used in the BHHRA should be compared against those used to determine EPA RSLs (i.e., the most recent endorsed by EPA). It should be noted that this type of comparison is routinely performed prior to acceptance of decision documents and during the Five Year Review. It would be appropriate for the BHHRA to demonstrate that risk estimates were not underestimated by the use of potentially outdated toxicity values.

   This section also states that the EPA screening values from a 2009 report are utilized in the screening but does not identify or reference the specific screening values. An appropriate reference specific to the screening values should be provided.

3. **Section 2.2.2, page 14, paragraph 1**

   The last paragraph should be edited to state: "COIs were retained…if they were measured in Site media at concentrations that were statistically different (higher) than background soils."

4. Section 2.2.2, page 14 and Appendix B

This comment relates to the Draft document Specific Comment 3 and refers to the background screening. The response to the comment indicates that the latest version of ProUCL was used for the background analysis. However, Appendix B presents the background analysis, which does not use ProUCL. It appears that a website (as referenced in Appendix B) was utilized to conduct a t-test, however these calculations could not be duplicated. The comment response should be revised to reflect the methodologies employed in the background analysis.

5. Section 2.2.2, page 14, paragraph 4

The text indicates that background comparisons were conducted in accordance with EPA's *Guidance for Comparing Background and Chemical Concentrations in Soil for CERCLA Sites* (EPA 2002) and that distribution tests were performed on the data and presented in Appendix B. Also, comment response response number three indicates that the background analysis was performed based on the calculation of the 95%UCLs (upper confidence limits) using ProUCL. However, Appendix B does not present distribution tests or ProUCL outputs. The methodologies employed in Appendix B could not be verified and are not specifically presented in the text. It appears that a normal distribution was assumed and t-test was conducted. It also appears that a website (as referenced in Appendix B) was utilized to conduct a t-test. These calculations could not be duplicated. Further, evidence of a distribution test to verify that a t-test is applicable was not found. The assumption that all datasets have a normal distribution is necessary prior to the application of the t-test. However, this is highly unlikely and is contrary to the distribution information presented in the EPC tables (see also Appenedix A). The background comparison should be revised to follow appropriate statistical methods as presented in EPA 2002 and 2009b, and the methodologies employed should be discussed specifically in the text.

6. Section 2.2.3, page 15, Bullet 1

This sentence should read: "Measured in more than five percent of the samples for a given medium."

7. Sections 3.2 and 3.3, Pages 19-21

These sections were added to address concerns raised in Draft Specific Comment 4 regarding the inhalation pathway. These sections address the comment except that the text should address the effect of climate and temperature variations on volatilization and fugitive dust generation.

8. Section 3.4.1, page 23

This section discusses the ProUCL program as used to determine the exposure point concentration. The text states that the program was used to calculate a distribution-free

95%UCL. However, the program was not used to calculate a distribution-free UCL. The program calculated several UCLs for various distribution fits of the data and recommended the UCL for the best fit distribution. The text should be revised to reflect the correct statistical methodologies employed.

9. Section 7.0, page 41

This comment addresses Draft Specific Comment 13. The document still does not provide adequate discussion regarding summation of pathways per receptor. As such, the conclusions of the document are incomplete.

10. Appendix A-1, Page 2 of 40

The ProUCL output for 4,4'-DDD has a double starred entry at the bottom indicating that the EPC was taken as the median per the ProUCL User Guide. Typically the maximum detected value is used when an appropriate UCL cannot be determined. Use of the median would bias the results low. The reference in the User Guide recommending the use of the median could not be found. The maximum detected value should be used for COPC EPCs that could not be approximated by a statistically significant UCL.

4.0 SUMMARY

In summary:

1. The BHHRA retains the use of screening against background which does not follow EPA guidelines for statistical comparison to background.

2. Several parameters used in the BHHRA are outdated and should be updated as noted in the General and Specific Comments.

3. The statistics as performed in this BHHRA for determination of EPCs for site data and for the background analysis should be revised and the text should more accurately reflect the statistics as performed.

Correction of these issues is unlikely to change the BHHRA conclusion that human health risks at the site are acceptable, based on the deed restrictions placed on the property. But they will place the conclusion in the appropriate regulatory context.

REFERENCES

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