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FINAL TECHNICAL MEMORANDUM RESPONSE TO COMMENTS ON DRAFT FEASIBILITY
STUDY AT SITE 47 NSWC INDIAN HEAD MD

10/17/2008
CH2MHILL

Response to Comments on Draft Feasibility Study Report Site 47, Mercuric Nitrate Distribution Area, NSF-IH, Indian Head, MD

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DATE: October 17, 2008

Below please find responses to comments received on the referenced document. Comments are presented as received followed by CH2M HILL's responses.

Comments from Mr. Joe Rail/NAVFAC Washington (January 9, 2008)

- Comment:** Page 1-1, first paragraph, last sentence- Add a space between "Program" and "being."

Response: A space will be inserted as suggested.
- Comment:** Figure 3-1- In the legend, should "terachloride" be "tetrachloride?"

Response: The legend of Figure 3-1 will be revised to say "tetrachloride."
- Comment:** Page 4-5, last paragraph on page, second sentence- Insert "with" after "associated."

Response: The word "with" will be inserted after "associated" as suggested.
- Comment:** Page 4-14, first paragraph, last sentence- "reason" should be "reasons." And in the last paragraph, the reference to Appendix H should be Appendix G.

Response: The word "reason" will be revised to "reasons." The reference will be changed to Appendix G.
- Comment:** Page 4-16, Section 4.5, third sentence- Change "uses" to "used."

Response: The word "uses" will be changed to "used" in the third sentence as suggested.

6. Comment: Page 5-3, first paragraph, last sentence- How do you get 53 injection points: 39 full-scale + 7 shallow + 7 deep points?

Response: The 53 injection points are as stated: 39 full scale + 7 shallow+ 7 deep points. The number of injection points, however, will be increased to 62; as described in the response to MDE Comment #2, the square footage of the Source Area and the Inferred Residual DNAPL Area have increased to account for the elevated concentrations of carbon tetrachloride previously detected in the direct push technology samples IS47GW30 through IS47GW39. The sentence will be revised to read: "As shown on Figure 5-1, approximately 62 injection points, which consist of 48 injection points to be installed during the full-scale remedy, and 7 shallow and 7 deep injection wells to be installed during the pilot study, are planned for the source area."

7. Comment: Page 5-3, section 5.1.2.4- General comment- I have concerns for the performance (or effectiveness) of the proposed remedial alternative and the lengthy long-term monitoring of 52 years. See comment #12.

Response: The response is the same as the response to Comment #12. A preliminary screening model was used as the basis for estimating life-cycle costs associated with the alternatives. The model estimated a timeframe of 52 years to achieve the RAOs for the selected alternative. After the inferred DNAPL area is treated, data demonstrating the performance of in situ chemical oxidation (ISCO), and the expected performance of natural attenuation processes to serve as the long-term remedial strategy, will be collected and evaluated. The new data and a detailed/non-screening model will be used to refine the projected timeframe for remediation. If the newly projected timeframe is determined to be unreasonable, the results of the modeling can be used to support the case for technical impracticability, if necessary.

8. Comment: Page 5-4, last line of text on page- Reference to Figure 5-4 should be Figure 5-2.

Response: The reference to Figure 5-4 will be revised to Figure 5-2.

9. Comment: Figure 5-1- Why does there need to be a soil vent (SV08) located so far downgradient from the injections?

Response: The proposed location of SV08, which is 90 feet downgradient of the assumed injection impact area, will provide a conservative and complete assessment of the potential gas evolution of the technology because elevated LEL readings are not anticipated at this location.

10. Comment: Page 6-2, section 6.1.4- The last sentence doesn't make sense; check for typos.

Response: The last two sentences of the paragraph will be modified to read "Alternative 2 is considered to be the most aggressive scenario, in terms of the reduction of toxicity, mobility, and volume of contamination through treatment, because this alternative would actively treat the COC mass within the source area. Following the active treatment, Alternative 2 uses NA processes as a polishing step for the entire COC plume."

11. Comment: Table 6-1- Under Alternative 2, short-term effectiveness- "2 year" should be "2 years."

Response: The change will be made as recommended.

12. Comment: Appendix H, Cost Estimate- General comment- the costs are in order with the remedial alternatives presented. However, I would have concerns for remediating this site due to the cost of over \$3 mil and over 50 years of LTM. I understand that we

may be required to do "something" at the site, but what could be a potential exit strategy? What if the remedy isn't performing well based on LTM results? At what point can we cite a technical impracticability to address the site?

Response: *A preliminary screening model was used as the basis for estimating life-cycle costs associated with the alternatives. The model estimated a timeframe of 52 years to achieve the RAOs for the selected alternative. After the inferred DNAPL area is treated, data demonstrating the performance of in situ chemical oxidation (ISCO), and the expected performance of natural attenuation processes to serve as the long-term remedial strategy, will be collected and evaluated. The new data and a detailed/non-screening model will be used to refine the projected timeframe for remediation. If the newly projected timeframe is determined to be unreasonable, the results of the modeling can be used to support the case for technical impracticability, if necessary.*

Comments from Mr. Dennis Orenshaw/EPA Region III (September 11, 2008)

Comment: I have reviewed the Draft Groundwater Feasibility Study for Site 47 at the Naval Support Facility, Indian Head. I have no comments and recommend that the Study be finalized. Thank you for the opportunity to review this document.

Response: *Noted.*

Comments from Mr. Curtis DeTore/MDE (October 15, 2008 and via e-mail on October 16, 2008¹)

Specific Comments

1. **Comment:** Page 1-3, Section 1.5.1, last paragraph, last sentence
This sentence directs the reader to Figure 1-3 to view the slope of the shoreline at the Potomac River. However, Figure 1-3 does not include the Potomac River. Please reactivity this error.

Response: *Figure 1-3 will be enlarged to show the topography near the Potomac River and the river itself.*

2. **2Comment:** Page 3-6, Section 3.4.4, fifth paragraph, fourth sentence & Table 3-4
This sentence states that the volume of contaminated groundwater in the Area of Attainment is approximately 4.8 million gallons. Table 3-4 states that the volume of contaminated groundwater in the Area of Attainment is approximately 3.4 million gallons. Please clarify.

Response: *The sentence has been modified to be consistent with Table 3-4. The square footage of the Source Area and the Inferred Residual DNAPL Area in Table 3-4, however, have increased to account for the elevated concentrations of carbon tetrachloride previously detected in the direct-push technology samples IS47GW30 through IS47GW39. The revised areas are shown below:*

¹ The e-mail removed Comment #2 from the comments described in the letter dated October 15, 2008.

² Because of Footnote #1 above, the numbering of the MDE Comments #2 through #7 in this document is off by one compared to the original comments described in the October 15, 2008 MDE letter.

TABLE 3-4
 Area and Volume of Area of Attainment
Site 47 Feasibility Study
NSF-IH, Indian Head, Maryland

	Total SRG Exceedance Area (AA)	Inferred Residual DNAPL Area¹	Source Area (CT>500 µg/L)
Area (SF/Acres) ⁵	215,400 / 4.94	19,350 / 0.44	50,000/1.15
Contaminated zone thickness (ft) ²	12	12	12
Contaminated soil (CF/kg) ³	2.6M / 135.4M	232,000 / 12.2M	600,000 / 31.5M
Contaminated groundwater (gallons) ⁴	5.8M	521,000	1.35M

Notes:

¹ Primarily interpolated based on CT concentrations because CT is the most recalcitrant constituent.

² Assumed based on the vertical interval of 6 to 18 feet below ground surface.

³ Assuming bulk density of 1.85 kg/L

⁴ Assuming effective porosity of 0.3

⁵ Includes pilot study area

3. **Comment:** Page 4-12, Section 4.3.5 (Calcium Polysulfide)
 Please include a recommendation at the end of the discussion on Calcium Polysulfide as was done for the other in-situ chemical reduction technologies.

Response: The following sentence will be added into the end of the last paragraph of Section 4.3.5: "Because the effectiveness of CaSx for treating CT is unknown, CaSx was not considered further for Site 47."

4. **Comment:** Page 4-14, Section 4.4, fifth paragraph, last sentence
 This sentence should be revised to read "...are documented in Appendix G."

Response: The sentence will be modified as suggested.

5. **Comment:** Page 4-15, Section 4.4, first paragraph, first sentence
 This sentence references Section 4.6. There is no Section 4.6 in this document. Please correct this oversight.

Response: The sentence will reference Section 4.3.

6. **Comment:** Appendix B, Page 2, Groundwater Sampling, second paragraph, third sentence
 This sentence should be revised to read "Wells IS47MW01, IS47MW06, and... ."

Response: The sentence will be modified as suggested.

7. **Comment:** Appendix E, Table E-1 and Table E-2
 Please add the acronym COMAR and its definition to the legend of each of these tables.

Response: COMAR acronym and its definition will be added to the legend of Table E-1 and Table E-2 in Appendix E.