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LETTER OF TRANSMITTAL AND U S EPA REGION IV COMMENTS ON DRAFT FEASIBILITY STUDY REPORT FOR OPERABLE UNIT 9 (OU 9) SITE 36 CONTROL TOWER TRICHLOROETHYLENE PLUME REVISION 1 NAS CECIL FIELD FL
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UNITED STATES ENVIRONMENTAL PROTECTION A
REGION 4

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May 12, 2000

4WD/FFB

Commander
Attn: Mark Davidson
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Subject: Draft Feasibility Study Report for Site 36 - Control Tower TCE Plume and Site, Operable Unit 9, Naval Air Station Cecil Field, Jacksonville, Florida; Revision 1

Dear Mr. Davidson:

The U.S. Environmental Protection Agency (EPA) has completed its review of the subject report. As has been discussed by the BRAC Cleanup Team, remedial alternatives have been added to this version and groundwater modeling has been added. EPA appreciates the effort that has gone into revising this document, however, we still have several concerns regarding some of the alternatives discussed and the ultimate containment/remediation of the groundwater plume. Details are in our attached comments.

Please feel free to contact me if you have any questions at 404/562-8539.

Sincerely,

Deborah A. Vaughn-Wright

Deborah A. Vaughn-Wright
Remedial Project Manager

cc: Scott Glass, SOUTHDIV
Mike Deliz, FDEP
Marl Speranza, TTNUS
Norm Hatch, CH2M Hill

U.S. Environmental protection Agency Comments on the Draft Feasibility Study Report for Operable Unit 9, NAS Cecil Field; Revision 1, March 2000.

1. PRE Procedure:
   a. In all preliminary risk evaluations presented in the FS, carcinogens and noncarcinogens were presented together. Carcinogens and noncarcinogens should be separated in the PRE so that hazard indices and multiple chemical cancer risks can be presented.
   b. The term "screening concentration" in the PRE tables is confusing. The term "maximum detected concentration" should be used instead. "Screening concentration" could easily be mixed up with a risk-based level such as GCTLs.
   c. The tables should indicate whether an industrial or residential receptor was chosen to develop the risk ratio. The choice of an industrial receptor is clear from inspection, but for completeness, the table should be labeled appropriately.

2. Ecological Risk Assessment: Food chain modeling is generally most appropriate for bioaccumulative chemicals. Here, modeling was performed for all chemicals. For Arochlor 1260, food chain modeling and the suggested additional sampling seems appropriate.

3. Page 2-12, Section2.1.4.2.: Double check with the State as to whether Manganese should be dropped. Since site activities deposited the chlorinates solvents and it is the degradation process that causes manganese to precipitate out, then manganese could be considered as related to site activities.

4. Double check the PRG's listed from section 2.2.2.
   Toluene, ethylbenzene, xylenes, 1,1-dichloroethane, 2-methylphenol. Where exactly did you get these values.

5. Page 3-8, Section 3.2.2.1: Institutional controls would not be effective for ecological receptors. Please correct section.

6. Page 4-35, Section 4.3.2.1, monitoring: Text implies that Sal Taylor Creek is the sentinel monitoring point. That is not correct. The BCT decided that 400 feet down gradient of the current plume boundaries a series of sentinel wells would be installed.

   The Environmental Protection Agency's guidance on monitored natural attenuation (OSWER Directive 9200.4-17p) and EPA guidance on remedial actions generally allow for considerable flexibility in remedial time frames for attainment of ARARs. However, EPA does strongly discourage remedial actions that result in a significant expansion of contaminant plumes into previously uncontaminated areas. The EPA as a partner on the BCT agreed to the use of 400 feet for placement of sentinel wells.

However, after further consideration, EPA is recommending an alternative to this scenario. To wait until the plume reaches 400 ft past the current leading edge, may cause the plume to actually move further while a contingency remedy is being evaluated and funding obtained. EPA would like to recommend that the contingency remedy be phased. For example, If the plume does expand greater than 200 feet past the current leading edge of the plume, remedial alternatives will be evaluated which would control further migration and groundwater modeling be conducted based on the most current data. If modeling continues to show plume expansion, the Navy will then be prepared to initiate active remediation if the plume does indeed migrate 400 feet.

7. EPA also recommends that the need for initiating the contingency remedy be based on the Federal MCL of 5 ppb for Benzene rather than the Florida GCTL of 1 ppb. Remedial action may be triggered by the State MCL of 1 ppb, but the initiation of the contingency remedy evaluation can be triggered by the Federal MCL of 5 ppb. This option will need to be discussed by the BCT.

8. Related to comments 6 and 7, EPA has identified statement presented in various parts of the FS Report regarding the monitoring component of the potential ground-water remedial actions. The statement indicates that if the contaminant plumes threatens to impact Sal Taylor Creek, contingency remedies would be implemented to prevent such an occurrence. While impacts to the creek should be prevented, an additional concern is that expansion of the plume into uncontaminated areas is also a concern. EPA has traditionally not considered acceptable a proposed remedial action where there is significant expansion into previously uncontaminated groundwater, regardless of any specific threats to receptors. This point needs to be kept in mind in wording of both the FS.

9. Florida Groundwater Cleanup target levels are being used as benchmarks for ground-water protection and for soil remedial goals for ground-water protection. Florida Groundwater Cleanup Target levels are being taken from Chapter 62-777, F.A.C. According to that regulation, Section 777.150, Applicability:

> This chapter provides criteria in tables and figures that apply only to the cleanup of contamination at sites that are governed by the terms of a brownfield site rehabilitation agreement pursuant to Chapter 62-785, F.A.C., and to the program specific contaminants of concern for sites being addressed under Chapter 62-770, F.A.C., Petroleum Contamination Site Cleanup Criteria, and Chapter 62-782, F.A.C., Drycleaning Solvent Cleanup Criteria; and to the treatment of soil at facilities permitted pursuant to Chapter 62-713, F.A.C., Soil Treatment Facilities.

The revised FS Report uses the secondary standards as benchmarks for setting remedial goals, and to cite 62-777 F.A.C. as a regulation appropriate to the site remedial strategy. While some contamination at Sites 36 and 37 may be or may in essence fall under the definition of "program specific contaminants of concern for sites being addressed under Chapter 62-770, F.A.C., Petroleum Contamination Site Criteria", other ground-water contamination being addressed at these sites clearly do not meet that definition. As such, the PRGs should be based, where possible, on the more universally applicable Florida

primary drinking-water standard ARARs.

10. On page ES-7, the report lists as an ex-situ physical/chemical treatment option for soil "Crushing/Grinding/Shredding." These actions are not a soil treatment option, although they would have a possible side benefit of enhancing contaminant volatilization from soils. Since they are a part of a package of ex-situ processes (reference Table 3-1), the format of the tabulation on page ES-7 should be revised such that it does not appear to the reader that these physical/ chemical actions are a "stand alone" form of soil treatment. The same statement applies to the tabulation on page 3-7 of the report.

11. Under the heading **Sites 36 and 37 Groundwater** on page ES-15, the last sentence in the second paragraph closes with a statement that appears inconsistent with the first sentence. Unacceptable migration of contaminants in ground water is probably not a condition that is protective of human health and the environment. Are you trying to say that unacceptable migration is not taking place?

12. In the second paragraph of Section 1.1, the last sentence includes some wording that appears inconsistent. The first part of this sentence indicates that contaminants in the ditches are at least partly attributable to Sites 36 and 37, whereas the last part of the sentence implies that Sites 36 and 37 are not associated with the ditch contaminants. If that latter statement is inaccurate or misleading, it should probably be removed from the sentence, rather than revised, as an appropriate revision would only restate the first part of the sentence.

13. In the fourth paragraph of Section 1.2.7, the discussion of the "Upper Zone of Hawthorne" is inconsistent with the introductory part of this section which refers to the intermediate aquifer system. Some additional text is needed here to connect the two discussions of the intermediate aquifer/confining unit. However, if reference is being made to the lower part of the surficial aquifer (as indicated by the discussion in Section 1.2.7.3), then the discussion of the Upper Zone of Hawthorne needs to connect that discussion to the aquifer materials at the base of the surficial aquifer.

14. In Section 1.3.3.5.1, assuming that data from Table 1-1 was used to estimate the shallow ground-water velocity, only one value was used to estimate the hydraulic conductivity applied to the shallow zone at each of the sites. Because of this limited amount of data, the Section 1.3.3.5.1 text needs to state that the calculated ground-water velocity is a crude estimate of the average ground-water velocity for the shallow monitoring zone at each site.

    Section 1.3.3.5.1 needs to state that the ground-water velocity values represent an estimated average velocity for each zone discussed.

15. On page 1-55, the fourth paragraph reads as if the fact that soil concentrations in a sample

were below the NAS Cecil Field "Hi-Cuts" concentrations is evidence that concentrations of metals (perhaps a subset of the total suite of metals) detected in the nearby CEF-342-15S ground-water sample were a result of metals in the suspended solids fraction of the sample. The explanation that high metals in the ground-water sample were from the suspended solids fraction is a reasonable explanation. However, the relation of the soil sample to the "Hi-Cuts" concentrations is irrelevant to that explanation. A more valid discussion of metals in the ground-water sample would cite both the observed suspended solids concentrations and the overall context of ground-water contamination and contaminant sources at this OU to relate the metals in the sample to naturally occurring soil concentrations of metals.

16. In the summary discussion on page 1-108, the text in the next to last sentence of the first paragraph identifies ethylbenzene, toluene and xylenes as the other primary compounds of the two plumes. The paragraph needs a sentence or statement about the additional primary compounds of the plumes.

17. The last sentence in Section 1.4.2.2.2 does not make sense. Probably the reference should be to the potential for Site 37 soils to impact ground water quality.

18. The Section 2.1.1 "Statement of Remedial Action Objectives" presents objectives that do not entirely fit what EPA considers as appropriate remedial action objectives (RAOs) for the contaminated media of concern. For soils, the objective should be to prevent contaminant migration from soil to ground water at concentrations that result in unacceptable ground-water contaminant concentrations. For ground water, the RAO is not to solely prevent exposure to the contaminated ground water by human receptors, but also to restore ground-water quality to the degree that ARARs are attained. For ground-water discharge to surface water, the RAO should be to prevent contaminant migration at levels that would result in violation of surface-water quality standards or that have a potential to impact surface-water receptors at unacceptable levels. This position is consistent with EPA's guidance on development of RAOs in "Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA" (Interim Final; EPA/540/G-89/004, 1989). The statement of RAOs needs revision to make the points consistent with the objectives as they are presented in that referenced EPA guidance.

19. With regard to Table 2-1 in the FS Report, EPA's policy is to deem Safe Drinking Water Act MCLs as relevant and appropriate to remedial actions involving remediation of ground water (they are strictly applicable to circumstances where a public water system is affected; reference 40 CFR Part 141). For the secondary drinking water standards, the EPA policy is to not regulate those contaminants (reference 40 CFR Part 143 regarding the unenforceable nature of those regulations). Thus, the secondary standards are in the "to be considered" category.

20. With regard to Table 2-2, EPA has generally considers the Florida guidance

concentrations as "to be considered" numbers. The same position has been applied to Florida secondary standards (a position that is consistent with the non-enforceable nature of Federal secondary drinking-waster standards), along with being applied Florida's target cleanup goals presented in Chapter 62-777 F.A.C.

21. Because Section 3.2 is titled "DETAILED SCREENING OF SOIL TECHNOLOGIES AND PROCESS OPTIONS", the Section 3.2.2.1 discussion of the effectiveness of institutional controls needs to note that the institutional controls would not affect contaminant toxicity, mobility, or volume.

22. On page 3-13, the report states that the soil washing process is typically better suited for removal of SVOCs/PAHs than for light VOCs. This statement may be true in the sense that because a number of other ex-situ treatment technologies are available to deal with the VOCs, the soil washing process is relatively less favorable for VOCs, given that many other ex-situ technologies will not effectively remediate SVOCs/PAHs. However, given a uniform soil contaminated with either a low miscibility PAH compound or a higher miscibility VOC, the lighter compound should be more readily removed from that soil through soil washing. The statement on page 3-13 needs revision to indicate that the soil washing technique is potentially better suited for SVOCs/PAHs because of the general inapplicability of other ex-situ treatment technologies, rather than implying that soil washing is inherently inapplicable to removal of lighter molecular weight organics.

23. In the first paragraph of Section 3.5.4, the second sentence should not contain the phrase "completed in overburden deposits". This paragraph is a generic discussion of the extraction well technology, and therefore, any such restrictive statements should be avoided.

24. In the second paragraph of Section 3.5.4, the second sentence should not contain the phrase "due to contaminant dispersion". There are several causes for decreasing effectiveness of extraction well systems over time, rather than one cause. Recommend expanding this discussion.

25. It would be beneficial in the second paragraph of Section 3.5.4 to cite the effectiveness of the extraction well technology at arresting the downgradient expansion of a ground-water contaminant plume.

26. At the top of page 3-36, the report states that the permeable reactive barrier technology is especially well suited to treatment of large contaminant plumes. This statement is not universally applicable, and in fact, EPA has considered the technology to generally be more suited to smaller, more concentrated plumes. Because the technology relies on the natural movement of ground water to transport contaminants through the treatment media, it may require a lengthy period to attain remedial objectives where the reactive material is emplaced near the toe of a large contaminant plume. In contrast, for less

extensive plumes, the technology can effectively contain the plume to the near source area (such as beneath a landfill). The point being made at the top of page 3-36 is essentially that the permeable reactive barrier is better suited to a large plume because of the cost and effort involved in implementing other remedial technologies. Cost may be a very important consideration under certain circumstances; however, cost has traditionally been considered a subordinate factor by EPA in the selection of a remedial technology to address ground-water contamination.

27. Under the heading "Component 1: Soil Vapor Extraction" in Section 4.2.3.1, the first paragraph includes a statement about the duration of operation of the SVE system. Either some basis for the specificity of that duration should be provided, or the time should be qualified as an estimate or approximation. The duration is identified as an approximation at the end of Section 4.2.3.1.

28. Ground-water Alternative 3A may result in the formation of vinyl chloride as a byproduct of the enhanced biological treatment of the chlorinated VOC "Hot Spots", as noted on page 4-47 under the heading "Reduction of Toxicity, Mobility, or Volume through Treatment". That possibility being a serious potential drawback to the alternative, it would seem that some statement should be made in the detailed analysis of the alternative about measures to address any significant conversion of more chlorinated compounds to vinyl chloride, if that is observed through the planned ground-water monitoring.

29. Ground-water Alternative 3B has the potential to adversely effect natural attenuation processes outside of the immediate area of "Hot Spot" remediation of chlorinated solvents through geochemical changes to the ground water. This being the case, the discussion of this alternative needs to include a statement about the possibility of such adverse consequences and the importance of monitoring to evaluate any such potential effects.

30. In the discussion of the ground-water extraction component of Alternative 4C on page 4-105 and the discussion of Alternative 4D on page 4-119, some mention needs to be made of the intent of the scope of ground-water extraction for these options. For example, the intent may be to fully capture all areas of ground-water contamination above PRGs, or to minimize the time required for complete remediation of the ground-water contamination.

31. Neither Alternative 4C nor Alternative 4D provide for an extraction well or well cluster to directly address the contamination at "Hot-Spot" 1. This omission seems to be at odds with the goal of ground-water remediation in a minimal time frame given the scope of each of these alternatives. Recommend adding a statement why Hot Spot 1 will not be addressed.

32. Review of Appendix B, Groundwater Modeling Report

a. In Section 6.0, a rationale for defining the spatial extent of the model domain needs to be presented.

b. In Section 6.0, there needs to be a discussion of the vertical hydraulic conductivity assigned to the various model layers and (horizontal) hydraulic conductivity zones (including a basis for any initial estimates of vertical hydraulic conductivity and any calibration adjustments to the vertical hydraulic conductivity model input).

c. Referring to Figure 5 through Figure 7, the blank area in the southwest corner of the model area needs to be explained.

d. Section 6.0 needs to include a discussion about the model grid spacings.

e. The flow model discussion needs to include information that describes in detail how the leaking storm drain near well CEF-342-6S was accounted for in the model input. The discussion in the first paragraph of Section 7.0 implies that drain cells were added to the model to account for the feature but details of that model input are not provided.

f. The appendix cites a previous Bioscreen model effort that included some of the input used in the more complex modeling described in the appendix. The report that includes the Bioscreen modeling results needs to be referenced in this appendix.

g. In the lengthy paragraph that begins Section 7.0, it should be clearly stated that Figure 10 shows the results for the final, calibrated model (assuming that is the case).

h. In the lengthy paragraph that begins Section 7.0, the text states that recharge was increased in areas south of the Site 37 plume to adjust inaccuracies in pathlines. The adjusted recharge value(s) need to be documented in the discussion of the modeling.

i. EPA has concerns about the ground-water flow model calibration. This concern may or may not translate to a practical problem in application of the flow modeling to the contaminant transport model. Specific points of concern regarding the flow model are enumerated as follows:

- The ratio of the root mean squared error (RMS error) to the total head loss in the modeled system is higher than that considered to represent a good match between observed and predicted heads. The RMS error is 1.2051 feet for a total head loss of some 9 feet (reference simulated water-level contours from Appendix B; also, observed water-level data show a head difference of 8.44 feet within the model domain). The ratio of the RMS error to total head loss is approximately 0.13 to 0.14. A well calibrated model would probably show a ratio of the RMS error to total head difference on the order of 0.05.
- Figure 10 indicates a distribution of residuals that is likely to be inversely correlated with the hydraulic head. This condition implies some fundamental error with the model. One possible problem is that the specified head boundaries set in the lower right margin of the

model are too high. This condition would in effect artificially "prop up" the hydraulic heads in the model simulation within the downgradient part of the model domain. A uniform linear progression of hydraulic head across the model domain should not be assumed. A conceptual model of ground-water flow would probably result in a higher hydraulic gradient as surface water or other discharge boundaries are approached. An example of this condition is provided by Figure 1-4 in the Annual Groundwater Monitoring Report for Operable Unit 8, Site 3 at Cecil Field (Tetra Tech NUS, Inc., November 1999).

- A detailed review of the Table 1 data indicates there is a more significant clustering of positive residuals for the deeper monitoring zone, compared to the distribution of residuals for the shallow and intermediate monitoring zones. Of the 18 Table 1 observations that are identifiable deep zone wells, 17 observations have positive residuals. This situation implies some fundamental problem with input specific to the deeper model layer. It is possible that there should be a progressively higher overall horizontal hydraulic conductivity from the upper to lower model layer, rather than having layers 2 and 3 have equivalent hydraulic conductivity values.
- For the shallow monitoring zone, a plot of residuals versus hydraulic head suggests a bimodal distribution of residuals. At lower hydraulic head (±65 feet or less), the residuals are all positive and generally higher than 1 foot. However, at higher hydraulic head (±67 feet or more) the residuals are generally negative (12 of 14 observations) and are generally well below the average error (11 of 14 observations are below the mean error; 13 of 14 observations are less than the RMS error). This observation further suggests a problem with the downgradient part of the model domain, such as a constant head boundary that is set too high.

j. Model input presented on pages B-7 and B-8 lists several variables with model input based on literature values. A specific literature source for these values should be cited in the appendix.

k. A rationale (and/or source of data) for selection of the bulk density and dispersivity values used in the transport modeling should be presented in the modeling report.

l. Information should be provided in the modeling report that shows the initial concentration of contaminants assigned to specific model rows, columns, and layers. Figures in the modeling report show the observed concentrations of contaminants at specific monitoring points, but it should be clearly shown how those site monitoring data were translated into model input for each of the modeled contaminants.

m. Either figures showing the morphologies of the various contaminant plumes at different times should be included for each of the transport modeling scenarios, or tabulations of model-predicted concentrations versus time at specific monitoring points (the locations of those points in 3-dimensional space need to be identified) should be included for each of the modeled remedial alternatives and different model runs use to evaluate each

alternative. This information will allow for visualization, or better visualization, of the relative effectiveness of each remedial alternative that is modeled.

n. The text in the FS Report as well as text in the modeling report indicates that modeled remedial time frames vary depending on model input. The Appendix B discussion of the model input therefore needs to document what variables other than decay constants might have been varied in the modeling analysis. If there are no other variables affecting remedial time estimates that were varied as model input, Section 6.0 of the appendix should state that is the case and an explanation should be provided for why only the degradation rate constants were varied when there is clearly some uncertainty in a representative or average value for a number of model input variables.