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MCRD PARRIS ISLAND
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LETTER AND ATTACHED U S EPA REGION IV CONDITIONS FOR APPROVAL AND NOTES
TO FILE ON THE DRAFT FINAL FEASIBILITY STUDY REPORT OPERABLE UNITS 7, 8, 9,
AND 10 (OU 7, 8, 9, AND 10) AND SITES 9, 16, 27, AND 55 MCRD PARRIS ISLAND SC

06/07/2013

U S EPA REGION IV ATLANTA GA



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

June 7, 2013

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Naval Air Station, JAX
Navy Facilities Engineering SE
Installation Restoration, SC IPT
Attn: Mr. Dan Owens
PO Box 30
North Ajax Street, Bldg 135
Jacksonville, Florida 32212-0030

AND

Commanding General
Marine Corps Recruit Depot
Natural Resources & Environmental Affairs Office
Attn: Mr. Tim Harrington
PO Box 5028
Parris Island, South Carolina 29905-9001

Dear Mr. Owens and Mr. Harrington:

The U.S. Environmental Protection Agency (EPA) has completed its review of the Draft Final OU 7/8/9/10 Sites 9/16/27/55 Feasibility Study Report (FS), Marine Corps Recruit Depot (MCRD), Parris Island, South Carolina (April 2013). The review resulted in the attached Conditions for Approval and Notes to the File. In this letter, the conditions, and notes to the file reference to "the Navy" means the Navy and MCRD.

During scoping and review of earlier drafts of the FS EPA clarified to the Navy that the alternatives being evaluated as groundwater alternatives were not being applied as a groundwater remedy. They are being used to address source material, but not discussed or evaluated as uses for the treatment of higher concentrated portions of the contaminated groundwater plume or to be applied in a manner specific to address/treat/remediate groundwater. The Navy stated that there would be significant revision to change the basic foundation of the report to address this. EPA agreed to allow the Navy to continue as they had done simply to minimize the rewrite, but allow for evaluation and cost estimates for the alternatives as called for in an FS.

Containment and removal of source material as applied in this FS are not acceptable technologies for groundwater restoration. There should be treatment technologies (both in-situ and ex-situ such as in-situ chemical oxidation or pump and treat) with a plan for applying it to the groundwater plume. The text

should have been revised accordingly to reflect that these actions are for source (soils and Light Non-Aqueous Phase Liquid (LNAPL) including some that is considered Principle Threat Waste (PTW).

There has not been a complete evaluation of Monitored Natural Attenuation (MNA) as an alternative in accordance with EPA guidance and there is insufficient data and evidence to support the selection of MNA as a groundwater remedy at this time. MNA and LUCs might be reliable for highly dissolved groundwater contamination but is not suitable for high-concentration groundwater contamination and where there is LNAPL present that is not sufficiently removed or treated. Per EPA guidance on MNA, there should be enough groundwater monitoring data that provides multiple lines of evidence that natural attenuation processes are taking place at rates that would enable the groundwater to be restored to drinking water levels in a reasonable timeframe.

Furthermore, there is no specified clean-up level proposed for these source material alternatives evaluated as groundwater alternatives. Had there been a concentration of source material contaminants in the unsaturated and saturated soils determined to be sufficient to reach groundwater cleanup goals in concert with MNA, some combination of technologies applied to soils, source, and groundwater may have allowed the Navy to address all media in one PP and Record of Decision (ROD).

The lack of supporting data and the evaluation thereof for MNA and the lack of specific performance measures relating soil/source material to groundwater remediation will likely result in EPA's inability to select MNA as a groundwater remedy component. Consequently either 1) groundwater will be deferred to another action; or 2) the Navy will have to specify a plan for active treatment options for groundwater and a remedial goal for source removal. A pathforward can be discussed as we negotiate the Proposed Plan (PP).

Furthermore, there is no definitive performance measure for remediation of the source material. The Navy will need to propose a definitive measure when the Pre-Design Investigation (PDI) is complete. Therefore, the PDI data should be obtained and evaluated prior to development of a Draft ROD.

Provided the Navy can effectively propose a pathforward given the issues highlighted in this letter and address the attached conditions for approval to EPA's satisfaction, the FS document can be considered sufficient for its intended purpose, and sufficient for providing a basis upon which to begin discussions of the preferred alternative, although the alternatives will need to be reworked somewhat to meet whatever pathforward is finally decided upon. Please feel free to contact EPA regarding any questions you may have with respect to these issues and conditions for approval. I can be reached at 404-562-9969.

Sincerely,



Lila Llamas, Senior RPM
Federal Facilities Branch
Superfund Division

Enclosure

cc: Ms. Meredith Amick, SCDHEC
Ms. Peggy Churchill, TtNus

**EPA CONDITIONS FOR APPROVAL
OF THE DRAFT FINAL FS FOR SITES 9/16/27/55 (April 2013)**

Conditions for Approval:

1. **Section 2.4.3 LNAPL (p. 2-16).** The first sentence states "*...LNAPL... has been weathered and effectively removed to the extent practicable through natural processes*". This phrase implies, or comes very close to implying, that LNAPL RAO No. 1 has already been attained, due to the similarity in language. RAO No. 1 was stated to be: "*LNAPL RAO No. 1: Remove LNAPL to the maximum extent practicable to limit the migration of LNAPL at the site and to limit the migration of COCs from the LNAPL to groundwater and soil.*" EPA does not agree with the initial statement in 2.4.3. LNAPL has been in the environment for some time and has certainly experienced weathering, to what degree it is unknown and may vary across the site.

This paragraph does go on to state, "*However, LNAPL residual and highly contaminated soils (e.g. sorbed contamination) will be removed to the maximum extent practicable to address LNAPL RAO No. 1 through removal and/or in situ treatment.*" **However, to prevent any potential contradiction and misunderstanding, please delete the phrase "*and effectively removed to the extent practicable*" from the first sentence.** EPA expects LNAPL RAO No. 1 to be fully addressed with a chosen alternative from the FS, or a modification of one to which EPA agrees. **Please address the changes in a manner such that only one page changes and submit that change page.**

2. **Section 2.5.2 Action-Specific Applicable or Relevant and Appropriate Requirements:** Table does not include ARARs for capping alternatives which would include SCDHEC (if more stringent) or federal regulations for final cover of RCRA Subtitle C or D landfill, along with limited post-closure care requirements to prevent disturbance of cap and any run-on/run-off system. **Update table accordingly and submit change pages.**

3. There are three Target Treatment Zones shown on Figure 4-1 that are not listed in the text where the Target Treatment Zones are discussed (Section 4.2.2.1 Description, Component 1: Surface Hotspot Soil Excavation and Component 2: Subsurface Hotspot Soil Excavation (p. 4-8). These three Target Treatment Zones are located at PAI-27-SO-22, PAI-27-SO-30, and PAI-55-SO-18. They are also not mentioned in Appendix C, Conceptual Design Calculations. It is not clear if these are intended to be excavated as target treatment zones. **This issue must be clarified prior to the ROD.**

4. Appendices A and B have not been changed between the Draft Final FS and the Final FS, although much discussion was held with regard to the information in these appendices, the associated uncertainty, and ultimately the impact to target treatment zone identification and delineation. These appendices present several different calculation methods to evaluate the presence of residual vs. mobile LNAPL, and the extent of the LNAPL-contaminated soil. They also provide several different calculations for estimating LNAPL mass and volume. There will always be some uncertainty in using these methods and in estimating specific LNAPL saturation levels, areas having LNAPL, and masses and volumes of LNAPL. Previous comments and discussions during conference calls have explored these issues. The consensus was that further refinement of the calculations using the existing data would not be fruitful, due to the uncertainties. Further refinement of LNAPL extent, saturation level, mass, and volume can be deferred until additional data is provided from the Pre-Design Investigation (PDI), however, **the PDI data and evaluation must be available prior to the Draft Final ROD, if not also the Draft Final Proposed Plan.** It will be very important to obtain soil analytical data during the PDI. The soil data, and the other lines of evidence regarding LNAPL extent mentioned in the FS, will be considered together

with the other PDI data, to help in finalizing the areas and volumes of saturated soil requiring excavation or other treatment. **A specific performance measure should result and be proposed. The PDI WP should be well scoped prior to submittal of the Draft workplan.**

5. **Section 2.2 Chemicals of Concern for Remediation, Page 2-2:** The definition of COPCs requires clarification. Suggest stating as follows (underline for emphasis) to more accurately differentiate COCs from COPCs:

COPCs contributing to cumulative risk estimates that exceed a risk level of 10^{-6} or an HI of 1 for the industrial worker are retained as COCs. Submit a change page.

6. **In 2.3.1 Statement of Remedial Action Objectives, Page 2-6, Groundwater RAO No.1,** include **industrial worker** in this RAO since future potable use of groundwater by a worker should also be prevented. **Submit a change page.**

7. The results of the review identified several inconsistencies which are summarized in the Notes to the File. **These inconsistencies should be resolved prior to beginning work on the next document the inconsistencies may affect (possibly the PDI WP and/or the ROD or Remedial Design).**

Notes to the Administrative Record File:

The Final FS appears to have essentially incorporated all the technical changes requested in previous review comments and discussions. Additional text clarifies and/or expands some descriptions and discussions that had previously been inadequate or confusing. However, there are a number of instances where slight changes in wording could be made to make some potentially ambiguous sentences and phrases completely explicit and as EPA understands them to be, to prevent potential future misunderstandings or disagreements about a specific issue. These items do not appear to affect the technical adequacy of the Final FS, and for most of them, other sections of the Final FS do have unambiguous wording regarding the specific issue. These instances are provided below in the bulleted information.

- The Long-Term Monitoring design language and Land Use Control details are not to be considered final in the FS. They had to be specified in order to estimate costs. These details will be finalized in the appropriate document in the future.
- In Alternative G-3, the subsurface material to be remediated has been restated to be "*LNAPL and highly contaminated saturated soils*", as requested. This change was to have taken place throughout the document as appropriate. EPA did not check word for word if all instances were changed. EPA expects the intent to be carried forward in the Site work.
- Executive Summary (p. ES-2). A paragraph has been added, as requested, that defines all the forms and phases of the contamination to be addressed (i.e., highly contaminated saturated soil, soil with LNAPL, and adsorbed-phase contaminants). This paragraph is comprehensive and appropriately describes the materials to be remediated. EPA did not check word for word if all instances where similar language appears were changed. EPA expects the intent to be carried forward in the Site work.

- Section 2.4.3 LNAPL (pp. 2-16 to 2-17). This section has been expanded. It appears to adequately and appropriately discuss the conceptual model for LNAPL and the conceptual design for the PDI. However, there are other instances in the FS where there is contradictory language regarding LNAPL conditions on site, such as discussed in Condition #1 above. Also, for instance:
 - Section 2.7.3 Mass of Contaminant - LNAPL (p. 2-19). The second paragraph includes the text "*...it is believed that the minimal amount of LNAPL present would be immobile.*" EPA does not support the use of the word "*minimal*" in the text. It has connotations of there not being significant contamination at the site. It is a subjective interpretation, and should not have been used, as the FS itself indicates that there may be up to 4.1 tons of LNAPL at the site.
 - Table 3-2 (pp. 2 of 7 and 3 of 7). The screening comments for Vertical Barriers under the Containment GRA have been changed since the previous FS version. It would have been better to say "*it does not appear that there is mobile LNAPL*", to reflect less certainty for this conceptual model of site LNAPL, in place of "*there is no mobile LNAPL*". There has been mobile LNAPL in the vicinity of MW11 and the Fiber Optic Vault (FOV) in the past, and it is not possible to conclusively state that there is no mobile LNAPL. While it may be appropriate to eliminate the Vertical Barriers technology (as itemized under the Process Options) as a technology for the entire site, there will be the need around the FOV, and perhaps in other limited areas where excavation is not possible, for some equivalent technology (as a part of some other viable remedial technology) to contain or reduce migration of contaminant mass from the FOV source area, whether it be mobile LNAPL or dissolved LNAPL component COCs.

This clarification also applies to the Screening Comments for both Extraction and Trench Recovery under the GRA of Removal. The Screening Comment for Skimming does not need to be changed: it still indicates that "*mobile phase LNAPL is very limited*", which is a more reasonable statement given the uncertainties in determining the saturation levels reflecting mobile vs. residual LNAPL. The potential presence of small quantities of mobile LNAPL is mentioned elsewhere in the FS.

- Section 3.5.3.1 Excavation (p. 3-13). The first sentence states: "*...excavating in the areas with suspected LNAPL...and removing both the overlying unsaturated soil and the saturated soil that is highly contaminated or suspected to contain LNAPL.*" While this properly includes highly contaminated saturated soil as well as suspected LNAPL material, the first part of the sentence indicates that presumably only the areas with suspected LNAPL will be excavated. This excludes highly contaminated saturated soil that may be outside the boundary of LNAPL-contaminated soil as delineated in the PDI. Presumably, the PDI saturated soil characterization will have to identify some saturated soil that is highly contaminated yet does not contain LNAPL (otherwise a boundary of the LNAPL-contaminated area would not be able to be identified). The text should have read "*or highly contaminated saturated soil*" after the first usage of "*LNAPL*" in this sentence.
- Table 3-1 (p. 1 of 5). The remedial technology Monitoring, under the Limited Action GRA for soil has been changed from "Retain" to "Eliminate". If the focus was meant to be long-term monitoring, this appears acceptable. However, shorter-term sampling and analysis of soil for refinement of the delineation of target areas and for confirmation of unsaturated soil remediation

may still be necessary. Sampling and analysis for long-term monitoring most applies to ground water, not soil, for assessing the results and progress of the various remedial technologies that may be used (Monitoring is retained for ground water, as shown in Table 3-2). In this case, "and/or groundwater" should have been eliminated from the description in Table 3-1, so that it is not implied that ground-water sampling and analysis would be eliminated.

- Table 3-2 (p. 6 of 7 and 7 of 7). The GRAs of Ex-Situ Treatment (Groundwater) and Discharge/Disposal (Groundwater) were eliminated (as in previous FS versions). Since these GRAs are meant to describe an overall strategy using that particular GRA, elimination appears appropriate. However, it should be kept in mind that ex-situ ground-water treatment and discharge or disposal will or would be needed as a result of other technologies under other GRAs (such as skimming or excavation). This is noted in the FS on page 4-22: "*Recovered water from the excavation dewatering will be stored and treated for proper discharge.*"
- Section 4.2.2.1 Description, Component 1: Surface Hotspot Soil Excavation and Component 2: Subsurface Hotspot Soil Excavation (p. 4-8). This section describes a greater number, area, and volume of soil hot spot removals than was described in the Draft Final FS. The cost figures in Section 4.2.2.2 Detailed Analysis, Cost (p. 4-12) did not change. However, this is not an issue, since the greater number of hot spots had already been used in the Draft Final FS in Appendix C, Conceptual Design Calculations; and Appendix E, Cost Estimates.
- Section 4.2.3.1 Description, Component 1: Limited Hot Spot Removal (p. 4-12). This section describes a greater number, area, and volume of soil hot spot removals than was described in the Draft Final FS. The cost figures in Section 4.2.3.2 Detailed Analysis, Cost (p. 4-15) did not change. However, this is not an issue, since the greater number of hot spots had already been used in the Draft Final FS in Appendix C, Conceptual Design Calculations; and Appendix E, Cost Estimates.
- Appendix C, Conceptual Design Calculations. Appendix C has not been changed between the Draft Final FS and the Final FS, except for adding "ISCO" to the title of Alternatives G-3 and G-4. Alternative G-5 remained, although it had been eliminated from the text of the FS. However, Appendix C does contain the appropriate information for the new arrangements of Alternatives G-3 and G-4. The ISCO part of G-3 and G-4 is listed under G-5, but can apply to G-3 and G-4. It should be noted that Appendix E, Cost Estimates, does contain the correct arrangement and information reflecting the Alternatives, to provide correctly calculated costs.
- The latest version of the RTCs (RTC-EPA and RTC-SCDHEC) have few and minor changes. However, since the Final FS appears to have been revised to address EPA and SCDHEC concerns as expressed in conference calls and the RTCs, it is not clear if additional revision of the RTCs is needed.

The results of the review identified several inconsistencies which are summarized in the following specific comments:

- Section 1.2.4.1 Surface and Subsurface Soil, Page 1-14: The second to the last sentence in the summary of the pesticide results at Sites 27 and 55 states that total DDT concentrations exceed the USEPA Risk-Based Soil Regional Screening Level (RSL) for DDT of 67 µg/kg, however, this value listed in EPA's RSL table is actually referred to as a risk-based soil screening level

(SSL). To promote clarity, it is recommended that the reference to the RSL is actually the risk-based SSL as provided in EPA RSL table.

- Section 2.1 Media of Concern, Page 2-1: The last sentence of this section states that “no ecological receptors of concern for exposure to soil or groundwater have been identified at this time” however, this sentence does not address the potential indirect exposure of ecological receptors in the 3rd Battalion Pond as a result of ground water discharge to surface water. This last sentence should have stated that while no ecological receptors of concern have been identified for direct exposure to soil or groundwater, the potential exists for groundwater to impact aquatic and terrestrial receptors that may forage or inhabit the 3rd Battalion Pond. This clarification introduces the uncertainty on this ecological exposure pathway which will be addressed later by groundwater RAO No.4.
- 2.4.1 Soil, Site 27, Page 2-9, the last paragraph for Site 27 indicates that soil samples proposed for removal should target DDD, BaP, arsenic, and chromium however, there is no mention of alpha-BHC or beta-BHC. Clarify why the two pesticide COCs (alpha-BHC and beta-BHC) are not discussed. According to information presented in Appendix A which contains the human health risk assessment supporting documentation, it appears that these samples are co-located with samples already targeted for removal by other COCs; however, this is not explained in section 2.4.1. Please clarify.
- Section 2.4.1 Soil, Site 9/16, Page 2-10: The following comments were raised in this section:
 - a. The first paragraph states that the industrial cancer risk associated with exposure to subsurface soil is 4×10^{-6} however, according to Table 5b the risk is 3×10^{-6} .
 - b. Discrepancies are noted on which soil samples are proposed for removal to reduce industrial risks associated with exposure to surface soil to less than 10^{-6} . Most of the samples discussed in the text match those samples listed in Table 2-5A except for one sample. The first sample listed for removal for Site 9/16 on Page 2-10 is PI-009-02-33 however, Table 2-5A does not list this sample, rather, sample PAI-9-SB-02 is listed. Further, Appendix A Human Health Risk Supporting Documentation, Site 9/16 Table identifies the same samples as the text on page 2-10 except it also does not include PI-009-02-33; instead it lists two additional samples PAI-9-SB-01 and PAI-9-SB-02. The Navy should reconcile these discrepancies between the text, Table 2-5A and appendix A.
 - c. The paragraph following the bulleted sample locations indicate that the surface soil samples proposed for removal are to target BaP, arsenic, and chromium; however, there is no mention of alpha-chlordane or heptachlor. Appendix A indicates that samples containing elevated alpha-chlordane and heptachlor are co-located with samples already targeted for removal; however, this is not explained in Section 2.4.1. The Navy should provide clarification that addresses all the COCs with respect to samples identified for removal.
- 2.4.1 Soil, Page 2-11: The following comments pertain to the table at the top of page 2-11 which summarizes the post-remedial exposure point concentrations (EPCs) for surface soil and subsurface soil COCs:
 - d. Site 27 (subsurface soil): The table indicates the post-removal concentration for alpha-BHC is 0.0006 mg/kg however Table 2-3 lists 0.0005 mg/kg.
 - e. Site 9/16 (subsurface soil): The table indicates the post-removal concentration for arsenic of 2.4 mg/kg however Table 2-5B lists 1.1 mg/kg.

Please correct these discrepancies between the table on Page 2-11 with Tables 2-3 and 2-5B.

- Section 2.4.2, Groundwater, Page 2-14 and Table 2-1, Federal and State Chemical-Specific ARARs and TBCs, Page 2 of 2: These tables indicate that for COCs for which MCLs have not been established, risk-based Regional Screening Levels will be used. The Navy should be cautious with the use of tap water RSLs as default alternative cleanup goals in the absence of MCLs. The RSLs are intended to be conservative for screening data and identifying COPCs for risk assessments, however, as noted in the RSL user's guide, these values are not intended to be used as cleanup goals. Some RSLs rely on toxicity values that have not been formally adopted by EPA resulting in potentially more stringent cleanup goals than is warranted for a site. For example, the tap water RSL of 0.14 µg/L for naphthalene has been classified as a carcinogen by the California Environmental Protection Agency (CalEPA) for inhalation exposure. The EPA has identified uncertainties in the carcinogenic potential of naphthalene, and therefore, EPA Region 4 recommends using the noncancer RSL as a more appropriate level since the EPA has established noncancer toxicity values for this compound. Based on a noncancer hazard of 1.0, the EPA has calculated an RSL of 6.1 µg/L. EPA Region 4 also notes that the carcinogenic and noncancer-based default RSLs are developed using a stringent volatilization factor. If a more realistic volatilization factor of 0.13 is used in EPA's RSL calculator¹, the noncancer-based RSL is 21 µg/L; this value is in the acceptable ranges for both cancer and noncancer endpoints. In summary, please approach the tap water RSLs with caution and do not necessarily default to the RSLs without an understanding of the basis of the RSL.

¹ http://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search