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MCRD PARRIS ISLAND
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LETTER REGARDING U S EPA REGION IV CONDITIONAL APPROVAL OF FINAL DRAFT
REMEDIAL INVESTIGATION WORK PLAN ADDENDUM PHASE 2 FOR SITE 27 WITH
ATTACHMENTS MCRD PARRIS ISLAND SC
9/29/2008
U S EPA REGION IV



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4**

**Atlanta Federal Center
61 Forsyth Street, SW
Atlanta, Georgia 30303-8960**

September 29th, 2008

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

4SD-FFB

Naval Air Station, JAX
Navy Facilities Engineering SE
Installation Restoration, SC IPT
Attn: Charles Cook
PO Box 30
North Ajax Street, Bldg 135
Jacksonville, FL 32212-0030

And

Commanding General
Marine Corps Recruit Depot
Natural Resources & Environmental Affairs
Attn: Heber Pittman
PO Box 5028
Parris Island, SC 29905-9001

SUBJ: EPA Review of the Final Draft RI WP Addendum for Site 27 - Phase 2 (July 2008)

Dear Sirs:

The U.S. Environmental Protection Agency (EPA) understands this document applies to OUs 7, 8, 9, and 10 (Sites 9, 16, 27, and 55 respectively.) EPA also understands the work proposed in this Remedial Investigation Work Plan Addendum (Addendum) has already been conducted when the Navy / Marine Corps Recruit Depot (MCRD) proceeded at risk without review and approval of the document by the regulators. Based on EPA's review of this document, it was determined that the document is not approvable as-is. Scoping, review and comments, and negotiation and comment resolution are all critical parts of the CERCLA process as outlined by the Federal Facilities Agreement (FFA), by design and for a purpose. The main purpose is to facilitate agreements between the FFA parties so that the regulatory Agencies can agree to the data obtained from investigation efforts, therefore making it easier to agree to the findings and conclusions which come from the analysis of that data in the form of an approvable document.

Due to the deficiencies noted during this review, the Navy/MCRD has put themselves in the position of potentially needing to fund once again and repeat a majority of the field work conducted at risk under this Draft RI Work Plan Addendum. Additionally, the Navy/MCRD has caused additional delays in order to 1) determine a pathforward for resolution, 2) resolve these issues and deficiencies noted, and 3) potentially repeat the sampling event for the analysis omitted. If the Navy/MCRD had not already proceeded at risk, these differences could probably have been resolved via some change pages to critical pieces of this document after a short period of response to comments and negotiation.

However, at this point, a justification for the Navy's failure to fully address and resolve EPA and DHEC concerns, along with a review of data collected and associated results, followed by a negotiation session amongst team members may or may not allow these differences to be resolved without repeating the sample collection and conducting the analysis eliminated in this version of the Addendum. The main concern to be addressed would be the failure of the Navy/MCRD to address EPA/DHEC comments pertaining specifically to analysis of the samples taken. By limiting the analyte list without EPA/DHEC approval, given previous discussions and specific Agency comments to the contrary, and in light of the presence of an unidentified apparent LNAPL, the Navy/MCRD have created apparent data gaps. Other deficiencies are noted in the enclosed comments, which would need to be addressed and resolved with submission of a D2 Rev 2 Addendum document and/or in the RI Report, as specified per comment. Additionally, EPA has reviewed the comments submitted by the state of South Carolina Department of Health and Environmental Control (DHEC). In general, EPA agrees with the comments and incorporates them herein by reference, but disagrees with the path forward proposed by DHEC for resolution of the concerns associated with sampling and analysis.

Rather than delay resolution to the point of reviewing a Remedial Investigation Report (RI Report) as DHEC has suggested, which could potentially be developed using data which EPA and/or DHEC may not accept, EPA would recommend a presentation of the justification for limiting the analyte list, accompanied by a description of the sampling and analytical methodologies used to sample the LNAPL and preliminary results from the LNAPL waste sample, followed by resolution of EPA and DHEC concerns, which may or may not result in a requirement to repeat the sampling event and implementation of the omitted analysis. If sampling and analysis is required, this should be completed PRIOR TO drafting and issuing an RI Report.

Therefore, the best EPA can offer at this point is a Conditional Approval to the document, in that the document was adequate for its intended purpose of proceeding at risk to investigate these OUs, accompanied with a minimal set of comments to be addressed (limited to those comments which will help to move the project forward in light of the conditions to be met and result in an approvable RI Report.) No attempt was made to provide a full set of comments. The Conditions for Approval are listed below. Comments to be address are also attached. While the conditions for approval are specific, their resolution could take multiple pathways and will need to be determined as negotiations proceed. The comments are specific, and each comment specifies resolution either within a D2 Rev 2 document (mostly via change pages) or within the RI Report.

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7
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YESTERDAY

CONDITIONS FOR APPROVAL:

1) The Navy/MCRD should present their justification for elimination of analytes from the previously approved sampling and analysis plan in the Approved Site 27 RIWP – Phase 1 document prior to completion of the investigation while knowing there was evidence of a previously unidentified floating fuel type material on top of the water at the Fiber Optic Vault.

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2) The Navy/MCRD should sample the LNAPL fuel-type material and identify it. Sample locations, as well as sampling procedures and analytical methods used when sampling and analyzing this waste material must be approved by EPA and DHEC.

3) Preliminary results should be presented to EPA and DHEC for consideration.

4) The Navy/MCRD should present information to EPA and DHEC for review and approval which convinces the regulatory agencies that:

- I) sufficient samples of the waste material were taken;
- II) proper procedures were followed when sampling and analyzing the waste material;
- III) no questions remain as to what the material is and what contaminants should be looked for in the groundwater and soils; and
- IV) based on the results of the waste material analysis there was no need to analyze for any of the analytes eliminated without regulatory approval.

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V) Otherwise the Navy/MCRD should submit a plan for revising the Addendum based on regulatory comments and reimplementing the affected portions of the investigation (final details of which are to be approved by the regulatory agencies as well).

This should all be accomplished PRIOR TO drafting an RI Report.

EPA is available for any questions regarding this letter, the conditions to be met, or the comments to be addressed, and in general what the Navy/MCRD needs to do to meet with final approval. If there are any questions, please do not hesitate to contact me at (404) 562-9969.

Sincerely,

Lila Llamas
Senior RPM

cc: Meredith Amick, SCDHEC
Sommer Barker, SCDHEC
Mark Sladic, TtNUS

**EPA TECHNICAL REVIEW OF THE RESPONSE TO COMMENTS
RI WORK PLAN ADDENDUM D2 FOR
EQUIPMENT PARADE DECK – SITE 27
JULY 2008**

**MARINE CORPS RECRUIT DEPOT
PARRIS ISLAND, SOUTH CAROLINA**

GENERAL COMMENTS:

All responses provided by the Navy / Marine Corps Recruit Depot (MCRD) Parris Island on the RI Work Plan Addendum for Equipment Parade Deck - Site 27 dated July 2008 (Work Plan Addendum) [MCRD responses], and changes made to the referenced document have been reviewed for technical adequacy and completeness, and for compliance with United States Environmental Protection Agency (EPA) guidance and with team agreements. The following section documents the technical review of the responses to comments and the document changes:

1. EPA General Comment 2:

In the text, also include additional facility history information for the buildings and concrete pads in question near the source areas.

Response: The boundaries of the SWMUs will be placed on the Figures. Additional information on surrounding buildings and concrete pads is not available.

Adequacy of Response: The response is adequate, however, without historic information regarding surrounding facilities the Navy/MCRD may be asked to do a more extensive investigation in order to determine the source of the LNAPL. Previous comments regarding the need for subsurface investigation equipment may come in to play in additional rounds of investigation. Additionally, please indicate if your historical searches have included oil water separators. If oil water separators are in the area of any of these OUs, please identify them by mentioning them in the historical information text and by adding them to the Site maps in D2 Rev 2 change pages. Otherwise, no change is needed to the Phase 2 Addendum, but there may be a need for a Phase 3 investigation.

2. EPA General Comment 4:

It appears to a degree some proposed well locations are placed at distances much removed from COC contour lines / plume edges. At this phase of the investigation locations should be selected foremost for the purpose of determining the nature and extent of contamination. Currently, the distances of some of the proposed wells to the inferred COC plume boundaries indicate there is a level of uncertainty in where the actual plume boundaries are located. If the Navy is fearful of incurring additional costs attempting to delineate the extent of contamination, EPA suggests an additional round of temporary well data be collected to more tightly constrain the plume boundaries. The

new temporary well data would be used to target the permanent well placement and installation. See specific comments regarding proposed well placement and data gaps.

Response: The locations of the proposed wells were selected to answer questions that the existing data present. Once the proposed sampling has been completed, existing data, along with the newly generated data, will be used to the extent possible to define the nature and extent of contamination and to calculate risks associated with exposure to contaminated media. See responses to specific comments regarding proposed well placement and data gaps.

Adequacy of Response: The response is adequate; however, an additional round of investigation may be needed to further refine the nature and extent of the LNAPL source area. In order to determine potential approaches to remediate an LNAPL a more detailed estimate of the area is needed. The timing of the needed information will be determined by whether or not the LNAPL is addressed as in interim Removal, or selected as a Remedy in the ROD. However, the earlier this information is obtained, the easier it will be to decide when and how to address it. No change is needed to the Phase 2 Addendum but there may be a need for a Phase 3 investigation.

3. EPA General Comment 5:

As discussed, an additional geotechnical investigation may or may not be necessary at some point in the CERCLA process in order to determine the existence, or lack thereof, of a confining layer. At this point, it will be acceptable to include the Public Works Geotechnical results in the RI Report, to make what conclusions you can about the area's geology/hydrogeology, and to propose additional geotechnical investigation if warranted. Such data can be gathered in support of the FS stage. However, if the Navy feels there is a cost benefit to doing such additional investigation while crews are in the field during Phase 2, then details of that investigation and its' intended purpose should be included in the revised Phase 2 WP and subject to review and comment/approval.

Response: We would expect to include the Public Works Geotechnical results in the RI Report. However, since the Geotechnical Report has not become available to date, if it does not become available prior to demobilization, then the field crew may elect to DPT probe the clay unit beneath the deep wells (at approximately 35 feet) to confirm the unit is at least several feet thick. Any penetration will be abandoned when complete consistent with SCDHEC requirements.

In the Phase I sampling at Site 27, the intermediate temporary wells were screened just above an olive grey silty sandy clayey layer, which was noted at about 25 feet bgs. Temporary well 46D was drilled to a total depth of 35 feet. The olive grey silty sandy clayey layer was found to be about 1 foot thick at this location (between 24 and 25 ft bgs).

Adequacy of Response: The response is adequate. However it should be noted that the Remedial Investigation (RI) Report should include not only the Public Works

Geotechnical results but also discuss whether additional direct push technology (DPT) probing of the clay beneath the deep wells at approximately 35 feet was performed. **If so the results of the DPT effort (e.g., probe boring details such as lithologic logs, etc.) should be included in the RI Report.**

4. EPA General Comment 7:

The Conceptual Site Model needs to be further refined to include all potential pathways, receptors, etc. After the RI data has been gathered, the results should allow the Conceptual Model to be further refined, to explain how and where the contaminants were released, the nature, extent and magnitude of those contaminants, and which pathways are confirmed potential pathways.

Response: At this time, the only known contamination is in the groundwater. Consequently, only exposure to groundwater is shown on the CSM. If the proposed sampling shows contamination in surface and/or subsurface soil, the CSM will be revised to show additional exposure routes.

Adequacy of Response: The response is not adequate as the Work Plan Addendum has not included a discussion or figure illustrating all components of the conceptual site model (CSM). The CSM should discuss and illustrate the following: 1) known contaminant sources and releases 2) chemical migration pathways and receiving media 3) exposure points and receptors and 4) potential exposure routes (e.g., ingestion, dermal, inhalation) as a basis for identifying potentially completed exposure pathways to be included in the risk assessment. For example, the CSM does not address the vapor intrusion (VI) exposure pathway as result of an LNAPL and contaminated groundwater impacting indoor air in existing/future building structures. Nor does it address the construction exposure to the LNAPL in the subsurface soils/on top of the groundwater. Delineation of the extent of the LNAPL source and volatile organic compound (VOC) groundwater plume needs to be defined in order to determine the degree to which current/potential VI pathways and construction pathways exist from the subsurface soils. Furthermore, it may be determined that contaminants exist in the surface soils as well. **The VI pathway, subsurface soils, and potentially surface soils should be fully evaluated in the RI Report and be included in the CSM. If a Phase 3 investigation is needed, the CSM should be updated at that time as well.**

5. EPA General Comment 8:

Water level measurements are pertinent data points in this investigation due to vapor intrusion concerns. Since the site is reportedly tidally influenced to some degree, water level measurements should be taken at high tide, and as close to Spring High Tide as possible.

Response: During the next round of groundwater sampling, two rounds of water level measurements will be made – one during high tide and one during low tide. The seasonal tidal charts will be evaluated to determine when in the tidal cycle the

groundwater sampling is occurring (Seasonal High Tide, etc.). Weather conditions (raining, etc.) will also be noted when collecting the water level measurements.

Adequacy of Response: This response may or may not be adequate, depending on how close to Spring High Tide the measurements are taken. Additional measurements may be required as a result. Since the measurements have already been taken, please notify EPA immediately of the water level results so a determination can be made in a timely manner.

6. EPA General Comment 9:

Since floating fuels were a concern at one point in this investigation, please provide the well construction data for wells in the areas of high VOC concentrations in surficial wells. Compare screen placement with low and high tide water level measurements.

Response: Well construction sheets will be provided in the RI Report for the existing monitoring wells. Since the RI Report is not expected immediately, the well construction sheets will be placed on the FTP site soon. Screen placement will be compared to available water level measurements.

Adequacy of Response: The response is inadequate. It should be noted that the groundwater elevations presented for the shallow wells depicted in Figure 2-9, Cross - Section B - B' Site 27, are located above and at a shallower depth than the screened interval of the respective shallow wells illustrated in the figure. In order to determine whether light non-aqueous phase liquids (LNAPL) are present in the subsurface, the screened interval of the shallow monitoring wells must be constructed so that they intersect the static water table elevation. Groundwater contaminant data measured in shallow monitoring wells where the screened interval is located below the static water table elevation may not be representative of the true groundwater quality and will not allow for the determination of LNAPL. The Navy should ensure that the new shallow monitoring wells will be installed so the well screen interval intersects the static water table. In the interim, the Navy should produce a Table which compares well screen placement with water level measurements and predictions of tidal influence on water levels (low and high tides). [In areas where clay lenses are encountered additional analysis of well screen placement may be necessary due to Artesian Well type responses.] From this comparative analysis determine which wells can be used in refinement of the extent of LNAPL and which should be limited to only groundwater dissolved phase contaminant reporting. This table should be submitted as a change page for the D2 Rev 2 document. It can simply be inserted as an Appendix for simplicity (and referenced in the Table of Contents), since the field work has already been done, its usefulness will more likely be for use in a potential Phase 3 Work Plan and to determine what data should be included for which specific pieces of analysis in the RI Report.

7. EPA General Comment 10:

Assuming well screens are properly placed to allow for floating fuel detections, during Phase 2 sampling, be sure to use an oil/water interface probe or similar equipment before the wells are disturbed, to determine if floating fuels, etc. may be present. If free-phase product is detected, a static water sample should be collected and analyzed.

Response: Field procedures during the Phase 2 sampling will be conducted so that floating fuels are recognized, if present.

Adequacy of Response: The response is inadequate. While the wording in this comment may have been somewhat misleading, the intent was to sample the free product floating on top of the static water column. There was no plan for taking this sample in the D2. However, since the work has been completed it is now known that an LNAPL exists at the site and a sample must be taken. Since there was no plan, there was no approved SOPs for taking and analyzing the sample. Since it has been reported the sample has already been taken, the conditional approvals have been worded to account for an explanation and justification for accepting or rejecting the data. The sampling may or may not need to be repeated. **This comment will be addressed via the Conditions for Approval**

8. EPA General Comment 11:

For purposes of analysis of these samples taken in Phase 2, it is assumed the same scans and methodologies as required by the Phase I RIWP will be performed.

Response: Since the first phase of sampling included VOCs, SVOCs, PAHs, Pesticides, and PCBs and only VOCs and pesticides have been identified as potential chemicals of concern, the proposed samples will be analyzed for VOCs and pesticides.

The constituents that the groundwater and soil samples will be analyzed for were identified in Sections 3.2.1 and 3.2.2 and on Table 8-2. Groundwater samples will be analyzed for VOCs, pesticides, TDS, TOC, and alkalinity (laboratory) and DO, temperature, salinity, specific conductivity, turbidity, pH, and ORP (field). Soil samples will be analyzed for VOCs, pesticides, TOC, and pH (laboratory).

Adequacy of Response: The response is inadequate. The Navy proceeded at risk without approval from EPA and DHEC to eliminate analytes. A decision to limit analytes should be made on a case by case basis and should have regulatory approval prior to implementation. In some circumstances it may be reasonable after repeated sampling at the same location to limit analytes based on historical results when the source of contamination is known. But in this case, this is only the second RI round of sampling at some locations, and the first round of sampling at other locations, in an area where there is no information as to the exact nature of the source(s) or original distribution of that source material. Reportedly there is little known information about what happens to an LNAPL over time in the subsurface with respect to degradation and dispersion. Historically unknown LNAPLs have been proven to contain a mixture of products with a range of contaminants. However, since the Navy has proceeded at risk, within the

Conditions For Approval EPA has provided a chance for the Navy/MCRD to make a case, based on samples of the LNAPL, starting with getting approval for the sampling procedures and analytical methods used, then making a case for limiting analytes based on their results if acceptable procedures were used. **This comment will be addressed via the Conditions for Approval.**

9. EPA General Comment 12:

A schedule for this sampling round should be submitted in advance of field start, with sufficient time for EPA oversight to be planned (at least 2 weeks advance notice.)

Response: The field mobilization is currently scheduled to start 4 August. Due to frequent Navy/EPA/SCDHEC conference calls, we expect that EPA will have more than two weeks advance notice.

Adequacy of Response: The response is inadequate. The Navy/MCRD failed to provide the two weeks notice necessary, much less any additional time. While EPA's contractor was able to attend to perform oversight, it was not an ideal situation, in that the EPA RPM was not able to attend, no time had been provided to review the final work plan, no final work plan was approved, and schedules of the EPA contractor had to be adjusted to accommodate the oversight. Therefore, the level of oversight provided was limited. EPA will not be so accommodating in the future and will reject the data gathered when insufficient notice is given. **In the future, the EPA requires at least 2 weeks notice be provided.**

10. EPA Specific Comment 13:

Add additional soil samples and/or disperse proposed samples to include soil investigations in the area of the following locations: For pesticides - in addition to those proposed address TW46S and TW30S. For VOCs - in addition to those proposed address FDP12, FDP04, TW26S, FDP02, FDP17, FDP22, and FDP05. Please explain if all soil samples will be analyzed for both pesticides and VOCs, or if each sample will be a single analysis (the purpose of many could cross over, but maybe not all.)

Response: The four extra samples noted in Table 3 will be placed in the areas requested above (see new figure in Addendum showing soil sample locations). The field crew will also be directed to collect soil samples at any location where visible signs of contamination are noted.

Adequacy of Response: The response is partially adequate. EPA requested installation of a soil boring and soil samples to be collected from the location of monitoring wells PAI-27-TW-46S and PAI-55-FDP17. However, the proposed sample locations indicated on Figure 2-4, Soil Sampling Locations Sites 27 and 55, do not include a soil boring at the location of wells PAI-27-TW-46S and PAI-55-FDP17. **Justify your response immediately to address why a sample was not taken at these locations. As a result of EPA's acceptance or rejection of your justification, these samples may or may not still**

need to be taken. Ensure that all the soil boring locations are shown on the final figure presented in the RI Report.

11. EPA Specific Comment 14:

Please include the new proposed soils samples on the map.

Response: A new figure showing the proposed soil sample locations will be provided in the Addendum.

Adequacy of Response: The response is adequate. However, it should be noted that in an email to the Navy dated August 4, 2008 EPA requested three more soil boring sample locations in addition to the soil boring locations indicated in the comment. Ensure that all the soil boring locations are shown on the final figure presented in the RI Report.

12. Additional Comment:

The Navy failed to address or justify locations of all wells for purposes of determining plume boundaries, and proposed in several responses to resample for verification, which may result in additional samples, wells, etc. Present preliminary data so EPA can determine if data gaps still exist. As a result, additional investigations and wells may be needed to fill data gaps PRIOR TO drafting the RI Report.

13. Additional Comment:

Since the Navy has proceeded at risk prior to regulatory approval of this document, EPA did not comment on specific details related to new text provided. Of significant importance is Section 2.5 DQOs – problem statement, decision rules, action levels, and the CSM, Section 3 - including the investigation rationale, summary, groundwater and soil sampling, as well as Section 4 – Field Operations, and Section 5 – Environmental Sampling. Therefore, acceptance of the data, analysis of the data, and conclusions drawn from that data without resolution and agreement to these items may make reaching consensus on what is needed and a pathforward difficult. The Navy/MCRD should take the Conditions for Approval very seriously.

14. Additional Comment:

In Figure 2-2, Proposed Sample Location and Pesticide Concentrations ($\mu\text{g/L}$) in Groundwater Sites 27/55, and Figure 2-3, Proposed Sample Location and VOC Concentrations ($\mu\text{g/L}$) in Groundwater Sites 27/55, a select number of monitoring wells have been highlighted in the shadow boxes presented in each figure. However, the legends of each figure do not define the meaning of the highlighting. It is assumed the highlighted wells are existing wells that will be re-sampled during phase 2 sampling. Revise the legend in each figure to explain why some wells have been highlighted and submit the associated change page.

15. Additional Comment:

Revise the Table of Contents in the Phase 2 Work Plan based on the changes made necessary herein and submit the associated change page TOC for a D2 Rev 2 document.

16. Additional Comment:

All documents are supposed to have the comments and responses included in the front of the Draft Final document. This is especially important for this document. In order to capture for the administrative record the unusual status of this document, this entire letter should be placed in the front of the document along with DHEC's letter and the first round of comments and responses for both agencies. Please submit change pages for a D2 Rev 2 document.

EPA

GENERAL COMMENTS:

1. No text was provided with the submitted pages. **This amendment cannot be approved without the text discussed and agreed to.** Be sure to address the history that lead to Phase 2 data needs, describe the general purpose and rationale for the additional samples, etc. Be sure to include change page insertion instructions.

Response: The Work Plan Addendum has been submitted detailing the information requested.

2. In the text, also include additional facility history information for the buildings and concrete pads in question near the source areas.

Response: The boundaries of the SWMUs will be placed on the Figures. Additional information on surrounding buildings and concrete pads is not available.

3. No Phase 1 soil sample results were included with the provided change pages. Please include that data on a site map, and state whether soils have been delineated on and around the parking lot, or whether additional soil samples will be needed in these areas. If so, provide the proposed locations and sampling rationale. Be sure to include the proposed locations on the revised maps. Please recognize that additional comments may be submitted based on this new data and information.

Response: The Phase 1 soil sample results are included in the Addendum. The results show that there are some elevated concentrations of PAHs in 2 surface soil samples (SS12 and SS13), but these are mostly likely attributable to the asphalt parking lot. Pesticides were detected in a number of the samples at concentrations lower than human health risk screening numbers, but higher than ecological risk screening numbers. The wide-spread detection of pesticides is most likely attributable to the historical wide-spread application of pesticides, especially near marshy areas. No additional soil samples are proposed for this area. The Phase 1 soil sample locations will be shown on the Figures.

4. It appears to a degree some proposed well locations are placed at distances much removed from COC contour lines / plume edges. At this phase of the investigation locations should be selected foremost for the purpose of determining the nature and extent of contamination. Currently, the distances of some of the proposed wells to the inferred COC plume boundaries indicate there is a level of uncertainty in where the actual plume boundaries are located. If the Navy is fearful of incurring additional costs attempting to delineate the extent of contamination, EPA suggests an additional round of temporary well data be collected to more tightly constrain the plume boundaries. The new temporary well data would be used to target the permanent well placement and installation. See specific comments regarding proposed well placement and data gaps.

Response: The locations of the proposed wells were selected to answer questions that the existing data present. Once the proposed sampling has been completed, existing data, along with the newly generated data, will be used to the extent possible to define the nature and extent of contamination and to calculate risks associated with exposure to contaminated media. See responses to specific comments regarding proposed well placement and data gaps.

5. As discussed, an additional geotechnical investigation may or may not be necessary at some point in the CERCLA process in order to determine the existence, or lack thereof, of a confining layer. At this point, it will be acceptable to include the Public Works Geotechnical results in the RI Report, to make what conclusions you can about the area's geology/hydrogeology, and to propose additional geotechnical investigation if warranted. Such data can be gathered in support of the FS stage. However, if the Navy feels there is a cost benefit to doing such additional investigation while crews are in the field during Phase 2, then details of that investigation and its' intended purpose should be included in the revised Phase 2 WP and subject to review and comment/approval.

Response: We would expect to include the Public Works Geotechnical results in the RI Report. However, since the Geotechnical Report has not become available to date, if it does not become available prior to demobilization, then the field crew may elect to DPT probe the clay unit beneath the deep wells (at approximately 35 feet) to confirm the unit is at least several feet thick. Any penetration will be abandoned when complete consistent with SCDHEC requirements.

In the Phase I sampling at Site 27, the intermediate temporary wells were screened just above an olive grey silty sandy clayey layer, which was noted at about 25 feet bgs. Temporary well 46D was drilled to a total depth of 35 feet. The olive grey silty sandy clayey layer was found to be about 1 foot thick at this location (between 24 and 25 ft bgs).

6. If TDS and salinity data is gathered, it should be gathered at all levels of the investigation (S, I and D) and at a variety of locations.

Response: Salinity measurements will be collected during groundwater purging. TDS analysis will be performed on all groundwater samples collected during Phase II of the RI investigation.

7. The Conceptual Site Model needs to be further refined to include all potential pathways, receptors, etc. After the RI data has been gathered, the results should allow the Conceptual Model to be further refined, to explain how and where the contaminants were released, the nature, extent and magnitude of those contaminants, and which pathways are confirmed potential pathways.

Response: At this time, the only known contamination is in the groundwater. Consequently, only exposure to groundwater is shown on the CSM. If the proposed

sampling shows contamination in surface and/or subsurface soil, the CSM will be revised to show additional exposure routes.

8. Water level measurements are pertinent data points in this investigation due to vapor intrusion concerns. Since the site is reportedly tidally influenced to some degree, water level measurements should be taken at high tide, and as close to Spring High Tide as possible.

Response: During the next round of groundwater sampling, two rounds of water level measurements will be made – one during high tide and one during low tide. The seasonal tidal charts will be evaluated to determine when in the tidal cycle the groundwater sampling is occurring (Seasonal High Tide, etc.). Weather conditions (raining, etc.) will also be noted when collecting the water level measurements.

9. Since floating fuels were a concern at one point in this investigation, please provide the well construction data for wells in the areas of high VOC concentrations in surficial wells. Compare screen placement with low and high tide water level measurements.

Response: Well construction sheets will be provided in the RI Report for the existing monitoring wells. Since the RI Report is not expected immediately, the well construction sheets will be placed on the FTP site soon. Screen placement will be compared to available water level measurements.

10. Assuming well screens are properly placed to allow for floating fuel detections, during Phase 2 sampling, be sure to use an oil/water interface probe or similar equipment before the wells are disturbed, to determine if floating fuels, etc. may be present. If free-phase product is detected, a static water sample should be collected and analyzed.

Response: Field procedures during the Phase 2 sampling will be conducted so that floating fuels are recognized, if present.

11. For purposes of analysis of these samples taken in Phase 2, it is assumed the same scans and methodologies as required by the Phase I RIWP will be performed.

Response: Since the first phase of sampling included VOCs, SVOCs, PAHs, Pesticides, and PCBs and only VOCs and pesticides have been identified as potential chemicals of concern, the proposed samples will be analyzed for VOCs and pesticides.

The constituents that the groundwater and soil samples will be analyzed for were identified in Sections 3.2.1 and 3.2.2 and on Table 8-2. Groundwater samples will be analyzed for VOCs, pesticides, TDS, TOC, and alkalinity (laboratory) and DO, temperature, salinity, specific conductivity, turbidity, pH, and ORP (field). Soil samples will be analyzed for VOCs, pesticides, TOC, and pH (laboratory).

12. A schedule for this sampling round should be submitted in advance of field start, with sufficient time for EPA oversight to be planned (at least 2 weeks advance notice.)

Response: The field mobilization is currently scheduled to start 4 August. Due to frequent Navy/EPA/SCDHEC conference calls, we expect that EPA will have more than two weeks advance notice.

SPECIFIC COMMENTS:

13. Add additional soil samples and/or disperse proposed samples to include soil investigations in the area of the following locations: For pesticides - in addition to those proposed address TW46S and TW30S. For VOCs - in addition to those proposed address FDP12, FDP04, TW26S, FDP02, FDP17, FDP22, and FDP05. Please explain if all soil samples will be analyzed for both pesticides and VOCs, or if each sample will be a single analysis (the purpose of many could cross over, but maybe not all.)

Response: The four extra samples noted in Table 3 will be placed in the areas requested above (see new figure in Addendum showing soil sample locations). The field crew will also be directed to collect soil samples at any location where visible signs of contamination are noted.

14. Please include the new proposed soils samples on the map.

Response: A new figure showing the proposed soil sample locations will be provided in the Addendum.

15. Please provide additional detail regarding soil sample depths, intervals, etc. Describe soil sample depth in relation to water table levels.

Response: Two soil samples (surface and subsurface) will be collected from each proposed soil sample location. As per the Phase I sampling, surface soil samples will be collected from the 0- to 1-foot bgs interval beneath the surface cover (root zone or asphalt subbase). Subsurface soil samples will be collected from the interval showing signs of contamination (stains or oil, obvious odor, and/or elevated PID readings). If the subsurface soil does not exhibit signs of contamination, the subsurface soil sample will be collected from the interval just above the water table.

16. Please clarify the map legend with respect to health concern indicators (H).

Response: As noted on the figures, contaminant concentrations that exceed the Region 9 tap water PRG for that contaminant are flagged with an "H", indicating an exceedence of a human health criteria.

17. The locations of many of the shallow and intermediate permanent monitoring wells proposed for installation during the next phase of the remedial investigation (RI) are

situated some distance from the current interpretation of the volatile organic compound (VOC) and pesticide plume boundaries. For example, the proposed location of intermediate well PAI-27-MW61I is approximately 400 feet downgradient of the VOC and pesticide plume boundaries, and wells PAI-27-MW51S and PAI-27-MW52I are located approximately 200 feet upgradient from the VOC and pesticide plume boundary. Additionally, wells PAI-27-MW55S and PAI-27-MW56I are located 200 feet from the pesticide plume boundary and 500 feet from the VOC plume boundary. As such, uncertainty in the representativeness and overall quality of the well data comes into question when the well locations are some distance from the plume boundaries. Revise the MCRD Parris Island Site 27 Remedial Investigation Phase 2 Work Plan dated March 2008 (Phase 2 Work Plan) to provide additional justification and rationale for the distance of the proposed permanent monitoring well locations relative to the current interpretation of the VOC and pesticide plume boundaries.

Response: The proposed location of intermediate well PAI-27-MW61I will be moved so that it is south of Building 864 (see revised figures in the Addendum).

Existing data near Building 405 shows that the upgradient groundwater has not been impacted. Proposed wells PAI-27-MW51S and PAI-27-MW52I are intended to confirm that groundwater upgradient of the existing data points has not been impacted. Monitoring well PAI-27MW64S was added north of building 405 to provide information on groundwater quality immediately upgradient of the plumes.

Although proposed wells PAI-27-MW55S and PAI-27-MW56I are somewhat removed from the VOC plume, the wells are intended to verify that groundwater to the west of the pesticide plume has not been impacted.

18. The downgradient extent of pesticide concentrations in groundwater northwest of shallow monitoring well PI027MW21 is not addressed by the currently proposed network of monitoring wells. The Remedial Investigation Work Plan (RI Work Plan) prepared for Site 27 dated September 2007 (TtNUS, September 2007) indicates if the concentrations at the plume boundary are less than the action levels, then the horizontal extent of groundwater contamination will be considered to have been determined (Page 2-13). According to the figures presented in the Phase 2 Work Plan, a data gap exists in the horizontal extent of pesticide concentrations exceeding human health screening criteria in the shallow aquifer zone downgradient of PI027MW21. Revise the Phase 2 Work Plan to describe how the horizontal extent of pesticide contamination in the shallow aquifer zone at the leading edge of the plume will be determined since no new wells downgradient of PI027MW21 have been proposed.

Response: The pesticide concentrations detected in monitoring well PI027MW21 are higher than the Region 9 tap water PRGs, but not as high as some of the other wells within the plume (PAI-27-TW-41S). The well will be resampled to confirm the concentrations of pesticides detected in the monitoring well. In addition, monitoring well PAI-27MW62S will be installed downgradient of PI027MW21.

19. The proposed sampling at Site 27 (Equipment Parade Deck Satellite Accumulation Area) as presented in Table 3 of the Phase 2 Work Plan does not address the data gap that exists in the horizontal extent of pesticide concentrations exceeding human health screening criteria in shallow groundwater downgradient of permanent monitoring well PAI-27-MW-16. The downgradient extent of pesticide exceedances in shallow groundwater in this area is constrained horizontally by results from temporary well PAI-27-TW-39S. However, permanent monitoring well results will be needed to verify the horizontal extent of pesticide contamination in the shallow groundwater as determined by the temporary well data. Shallow monitoring well PAI-27-MW58S is proposed to constrain the plume boundary in this area. However, the proposed well location is greater than 300 feet downgradient of PAI-27-MW-16 and greater than 150 feet from the estimated pesticide plume boundary. As such, it is recommended that a shallow permanent groundwater monitoring well be installed to constrain the horizontal extent of pesticide contamination exceeding human health screening criteria downgradient of PAI-27-MW-16 in the vicinity of Building 852.

Response: The pesticide concentrations detected in monitoring well PAI-27-MW-16 are slightly higher than the Region 9 tap water PRGs. The well will be resampled to confirm the concentrations of pesticides detected in the monitoring well. In addition, monitoring well PAI-27MW63S will be installed in the vicinity of temporary well PAI-27-TW-39S to define extent of contamination downgradient of PAI-27-MW16.

20. Exceedances of the action levels for both VOCs and pesticides were measured in the deep aquifer zone in well PI055MW08D and pesticides only in well PI055MW13D. Currently, the vertical extent of VOC and pesticide contamination exceeding the action levels presented in the RI Work Plan (TtNUS, September 2007) has not been determined. Although sampling of the deep wells is proposed for the next phase of the investigation, the vertical extent of contamination will still not be delineated if the sample results exceed the action levels. As a result, MCRD should provide for additional investigation, as necessary, to determine the full vertical extent of contamination in the deep aquifer zone. Revise the Phase 2 Work Plan to address this issue.

Response: The concentrations detected in monitoring wells PI055MW08D and PI055MW13D are slightly higher than the Region 9 tap water PRGs. The wells will be resampled to confirm the concentrations detected in the monitoring wells. If the concentrations are confirmed, additional future deeper monitoring wells may be required.

21. The greater than 1000 micrograms per liter ($\mu\text{g/L}$) chlorobenzene isoconcentration contour depicted in Figure 2, VOC Concentrations ($\mu\text{g/L}$) in Groundwater Sites 27/55, is located approximately 25 feet from Building 405. Currently, the upgradient extent of the chlorobenzene contamination immediately north of Building 405 is not known. The utilization of wells PAI-27-MW51S and PAI-27-MW52I has been proposed to determine the upgradient extent of contamination. However, the proposed well locations are approximately 200 feet upgradient of the interpreted VOC plume boundary. In order to

more closely constrain the VOC plume near Building 405 and to preliminarily assess the vapor intrusion potential, it is recommended wells PAI-27-MW51S and PAI-27-MW52I be located on the northern rather than southern side of Building 405. Revise the Phase 2 Work Plan to address this issue.

Response: A groundwater sample collected from monitoring well PAI-55-FD08 (north of Building 405) indicated that VOCs were not present in the groundwater in this area. The locations of proposed monitoring wells PAI-27-MW51S and PAI-27-MW52I were selected to confirm that groundwater further upgradient of Building 405 is free of contamination. Monitoring well PAI-27MW64S will be installed north of Building 405.

J. Sommer Barker, Hydrogeologist

Table 3 Proposed Sampling – Site 27

1. The Phase I RI work plan indicates monitoring well MW-06 was sampled during the July 2002 field screening and monitoring well installation event. Free product was observed at this monitoring well. However, the Phase II RI work plan recommends sampling MW-06 for pesticides only. The Navy should continue monitoring for free product during the Phase II RI monitoring event.

Response: The constituents that the groundwater and soil samples will be analyzed for were identified in Sections 3.2.1 and 3.2.2 and on Table 8-2. Groundwater samples will be analyzed for VOCs, pesticides, TDS, TOC, and alkalinity (laboratory) and DO, temperature, salinity, specific conductivity, turbidity, pH, and ORP (field). Soil samples will be analyzed for VOCs, pesticides, TOC, and pH (laboratory).

Figure 2 - VOC Concentrations (µg/L) In Groundwater

2. The Legend states that the symbol 'H' is defined as "Reported Concentration Exceeds The Region 9 Tap Water PRG". Figure 2 shows chlorobenzene detections at monitoring well PI055MW12I are listed with an H next to its detection; however, chlorobenzene has a maximum contamination level (MCL) of 0.1 mg/L. It is unclear as to why these constituents are being screened against preliminary remediation goal (PRG) instead of their known MCLs. MCRD should clarify this and respond to this comment.

Response: The Region 9 tap water PRG for chlorobenzene is 0.090 mg/L, which is lower than its MCL. The tap water PRGs are used for screening purposes to select potential chemicals of concern (COPCs), etc. in risk assessments. MCLs may be used to set site-specific PRGs once the risk assessments have been completed and chemicals of concern (COCs) have been identified.

Table 3 Proposed Sampling – Site 27 Page 2 of 3

3. Monitoring well installation is suggested (ex. PAI-27MW51S) proposed in sampling plan table. However, monitoring well approval cannot be written based on the specifications proposed in this work plan. More information should be provided, either within this workplan, or in a separate monitoring well approval request. In addition to the information provided in this work plan, the following information is also required (R.61-71.H.1.a):
- a) Proposed well locations on a scaled map or plot
 - b) Proposed well construction details
 - c) Well owner's name and mailing address
 - d) Property owner's name and mailing address (if different from the well owner)
 - e) Proposed parameters to be analyzed
 - f) Proposed drilling date

Response: Additional information provided in the Addendum and in a Monitoring Well Approval Request will contain the requested items.

ENGINEERING COMMENTS
Prepared by Meredith Amick
Marine Corps Recruit Depot (MCRD)
April 18, 2008

Specific Comments

1. Proposed soil locations should be labeled on the map. Additionally the location of all SWMUs within the area should be included on all maps.

Response: The proposed soil sample locations will be placed on a figure. A separate figure in the Addendum at a larger scale has been provided for the proposed soil samples.

2. Please discuss the depth of the proposed soil samples and the relation to the depth of the groundwater contamination.

Response: Two soil samples (surface and subsurface) will be collected from each proposed soil sample location. As per the Phase I sampling, surface soil samples will be collected from the 0- to 1-foot bgs interval beneath the surface cover (root zone or asphalt subbase). Subsurface soil samples will be collected from the interval showing signs of contamination (stains or oil, obvious odor, and/or elevated PID readings). If the subsurface soil does not exhibit signs of contamination, the subsurface soil sample will be collected from the interval just above the water table.

3. Please discuss the constituents for which the groundwater and soil samples will be analyzed.

Response: The constituents that the groundwater and soil samples will be analyzed for were identified in Sections 3.2.1 and 3.2.2 and on Table 8-2. Groundwater samples will be analyzed for VOCs, pesticides, TDS, TOC, and alkalinity (laboratory) and DO, temperature, salinity, specific conductivity, turbidity, pH, and ORP (field). Soil samples will be analyzed for VOCs, pesticides, TOC, and pH (laboratory).

4. On Figure 3-1 Surface Soil, Subsurface Soil, and runoff to Surface Water should also be evaluated for exposure routes.

Response: At this time, the only known contamination is in the groundwater. Consequently, only exposure to groundwater is shown on the CSM. If the proposed sampling shows contamination in surface and/or subsurface soil, the CSM will be revised to show additional exposure routes.

5. Please provide soil data obtained from the Phase I RI WP.

Response: The Phase 1 soil sample results are included in the Work Plan

Addendum. The results show that there are some elevated concentrations of PAHs in 2 surface soil samples (SS12 and SS13), but these are mostly likely attributable to the asphalt parking lot. Pesticides were detected in a number of the samples at concentrations lower than human health risk screening numbers, but higher than ecological risk screening numbers. The wide-spread detection of pesticides is most likely attributable to the historical wide-spread application of pesticides, especially near marshy areas. No additional soil samples are proposed for this area. The Phase 1 soil sample locations will be shown on the figures in the Addendum.