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RESPONSE TO SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL  
CONTROL COMMENTS ON DRAFT CORRECTIVE MEASURES STUDY ZONE H SOLID  
WASTE MANAGEMENT UNIT 159 AND AREA OF CONCERN 653 DATED 17 JUNE 1999  
CNC CHARLESTON SC  
2/1/2000  
ENSAFE INC.

COMPREHENSIVE LONG-TERM  
ENVIRONMENTAL ACTION NAVY  
CHARLESTON NAVAL COMPLEX,  
NORTH CHARLESTON, SOUTH CAROLINA  
CTO-029



RESPONSE TO SOUTH CAROLINA DEPARTMENT  
OF HEALTH AND ENVIRONMENTAL CONTROL  
COMMENTS ON DRAFT CORRECTIVE MEASURES  
STUDY ZONE H SWMU 159/AOC 653  
DATED JUNE 17, 1999

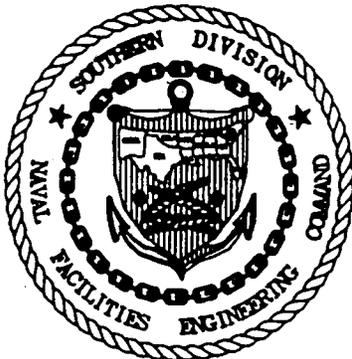
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Prepared for:

DEPARTMENT OF THE NAVY  
SOUTHERN DIVISION  
NAVAL FACILITIES ENGINEERING COMMAND  
NORTH CHARLESTON, SOUTH CAROLINA

Prepared by:

ENSAFE, INC.  
5724 SUMMER TREES DRIVE  
MEMPHIS, TENNESSEE 38134  
(901)372-7962



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Release of this document requires the prior notification of the Commanding Officer of the Southern Division, Naval Facilities Engineering Command, Naval Base Charleston, South Carolina.

**SOUTH CAROLINA DEPARTMENT OF  
HEALTH AND ENVIRONMENTAL CONTROL  
RESPONSE TO COMMENTS ON THE DRAFT CORRECTIVE MEASURES STUDY  
(CMS) REPORT FOR SWMU 159 AND AOC 653; LOCATED IN ZONE H OF THE  
CHARLESTON NAVAL COMPLEX (CNC), SCO 170 022 560, DATED JUNE 17, 1999.**

**General Comments on both SWMU 159 and AOC 653**

**Comments of Paul M. Bergstrand**

**Comment 1:**

The Project Team agreed to finalize the RFI Document and complete the delineation of contamination in the CMS process. Three new wells were installed and 8 additional wells were sampled at both sites after the Zone H RFI process was complete. The Navy, however, has not included the analytical data reports and chain of custody forms in this CMS Report. This CMS Report cannot be considered a complete document without the submittal of all data. The CMS Report without the supporting data could be considered to be a technical inadequacy as pertaining to the Appendix C, II. B of the Permit.

**Response 1:**

**The CMS Reports for both sites will be revised to provide the information requested above. Analytical Data Reports, Validation Reports, and Chain of Custody documentation will be provided in the appendix of the revised CMS Reports.**

**Comment 2:**

The interim measures performed at these two sites did not follow the 16 July 1996 Department recommendation regarding confirmation sampling. In addition, the "Soil/Groundwater Remediation Guidance" document referenced in the IM Reports was not followed regarding confirmation sampling. This results in severe limitations on the use of the IM Report to support the conclusions of the CMS Report. A copy of the Department correspondence is attached. Additional sampling, revision of figures, data evaluation, and data sheet submittals may be necessary to resolve these issues for the CMS.

**Response 2:**

**The IM was performed with DHEC approval. The September 1996 Project Team minutes verifies that TPH was the original cleanup objective. This was later changed by Project Team consensus to use specific constituents of the "Soil/Groundwater Remediation Guidance" document. In lieu of analyzing for TPH, the specific analytes agreed upon were BTEX, naphthalene, and PAHs.**

## **Specific Comments on SWMU 159**

### **Comments of Mihir Mehta, SCDHEC**

#### **Comment 1:**

The contents of the referenced report appears to achieve the goals and objective of RFI report (i.e., delineate nature and extent and develop final COCs for further evaluation) and not the CMS report where the problem/characterization is already defined and applicable technologies are evaluated. The Department acknowledges the previous decision of the project team to complete the RFI work during the CMS process. Please reference this concept in the introduction section of the document.

#### **Response 1:**

**The introduction section of both CMS Reports will be revised to include reference to the project team decision to complete the RFI work during the CMS process.**

#### **Comment 2:**

The entire report should be revised to provide appropriate maps and figures to illustrate the pre and post interim measure contaminant condition and how it relates to the applicable remedial goals (residential goals for no further action). This will allow the reviewer to understand whether there is any residual contamination left in place or not, which is very important in granting the no further action (NFA) decision. (For example the figures should indicate SWMU boundary, groundwater flow direction, and other pertinent information). As presented, the Department cannot conclude whether the contamination has been completely delineated nor evaluate the post interim measure conditions.

Please establish, as deemed appropriate, that the existing contaminant concentration (if any) does not pose a threat to human health and the environment (i.e., show that the risk is below remedial goal for surficial risk and ecological benchmarks, no leachability concern, and no groundwater risk). It appears that the referenced report tried to demonstrate the above stated issues but the information is incomplete or not formatted in a manner which the Department could interpret in order to agree or not with the proposed no further action. With appropriate maps, figures, and explanatory text, necessary information from interim measure completion reports, and the remedial goal illustration the stated concern could be addressed. Please revise all pertinent sections of the referenced document.

**Response 2:**

The CMS report will be revised to include a more detailed presentation of the site data via maps and figures. Site maps will be revised to provide the degree of detail that is consistent with the figures being produced for RFI reports currently being revised. Site details such as SWMU boundary, adjacent sites, surface features, groundwater flow direction, underground utilities and other site specific information will be provided on the revised drawings.

The revised figures will show the distribution of the COCs that were detected at the site. The results of the DET IM confirmation sampling will be presented on the revised CMS figures. The IM confirmation sample results will be compared to the remedial goal options (RGOs) presented in the baseline risk assessment to document the effectiveness of the cleanup actions. The Navy intends to provide sufficient figures and text to document that an NFA determination is appropriate for this site.

**Comment 3:**

Section 2.1. General; page 2-1.

The last line indicates that there is a presence of tidal marsh land adjacent to the referenced SWMU. The referenced report does not evaluate the ecological concerns for the marsh land as they could be impacted by the release of contamination from this unit. Please revise the document to address this concern.

**Response 3:**

The tidal marsh referred to is approximately 100 feet to the southwest of the site. The area directly adjacent to SWMU 159 is part of Ecological Subzone H-2 described in Section 7 of the Final RCRA Facility Investigation Report (RFI) for Zone H. Subzone H-2 is a 45-acre densely forested transitional zone between the upland areas and the littoral zone north of Shipyard Creek. SWMU 159 is only one of several sites that are adjacent to Subzone H-2 that was evaluated in a screening level ecological risk assessment (ERA) as part of the RFI. The ERA concluded on pages 7-108 and 7-109 of the RFI that the risk to aquatic receptors was low and, if necessary, the potential risk would be assessed during the Zone J RFI. It should also be pointed out that the highest concentrations of petroleum hydrocarbons detected at this site were found in sediment where effluent from the stormwater drainage system empties into a drainage ditch adjacent to the site. The storm sewer receives runoff from parking lots to the north of the site which is unrelated to releases from a SWMU or AOC. The Navy believes these petroleum hydrocarbons are non-point source related and do not warrant further assessment as part of the RFI. During the scoping meeting that is to be held on February 9, 2000 input will be received from all of the natural resource trustees on the current status of Zone J. Based on the outcome of that meeting, the Zone J work plan will be revised to meet the requirements of the new ERA Process document. The Navy believes

**that this evaluation will adequately address any potential ecological concerns for the adjacent wetlands.**

**Comment 4:**

Section 2.2.1. Soil; page 2-1.

Please define the “upper-interval” and “lower-interval” samples with respect to source term and exposure pathway analysis.

**Response 4:**

**Upper interval soil samples were taken from the 0- to 1-foot depth. The upper interval samples are utilized to evaluate site risk via the dermal and injection routes. Lower interval soil samples were taken from the 3- to 5-foot depth. The lower interval samples are utilized to evaluate the potential for contaminant transport from soil to groundwater. The report will be revised to present this information.**

**Comment 5:**

Section 2.2.4. Surface Water; page 2-8.

The last line states that, “Surface water risk was not formally assessed at SWMU 159. Surface water will not be further evaluated in the CMS.” Please provide justification for not conducting this analysis. Ecological impacts from the SWMU 159 on the adjacent surface water bodies are considered a part of the RFI process and therefore, should be evaluated during the RFI for SWMU 159. Please revise the document to address this concern.

**Response 5:**

**The only surface water present that is immediately adjacent to the site is storm water runoff that accumulates in a drainage ditch along the southwestern boundary of the site. Additionally, low lying portions of the wooded area are periodically inundated after periods of heavy rainfall and are slow to drain due to the lack of topographical relief. During the RFI a surface water sample was taken from the drainage ditch where a storm sewer outfall is located. The results of the water sample taken did not indicate the presence of any contaminants that would require further investigation. As a result there was no reason to suspect that water entering the ditch would adversely impact a marsh area that ultimately receives runoff from the ditch.**

**Comment 6:**

Section 2.3. Interim Stabilization Measures; page 2-10.

The referenced section should provide more detailed information and illustration of the post interim action to understand how much contamination has been excavated with respect to the remedial goal for the proposed no further action. Please revise the referenced section to address this concern.

**Response 6:**

**The CMS figures will be revised to present the results of the IM. The extent of soil excavation and the confirmatory sample locations will be presented on the revised figures.**

**Comment 7:**

Section 7.0; Public Involvement Plan; page 7-1.

The referenced section does not conclude or suggest the administrative pathforward for SWMU 159. The Department believes that a public notice and public comment period is necessary as the RCRA permit would be modified to change the status and document the corrective action decision for this SWMU. A public hearing could be arranged if there is a request from the public during the public comment period. Please revise the referenced section to clarify the proposed pathforward.

The statement of basis public involvement plan should be scoped (for its format and content) with the Department prior to its submittal in order to expedite the review and approval time.

**Response 7:**

**The Navy concurs that a public notice and a public comment period is appropriate for this site. The Public Involvement Plan section of the report will be clarified to indicate that these actions will be completed for this site.**

**The Statement of Basis (SOB) public involvement plan has been generally outlined in Section 7.4 of the CMS report. In early Spring of 1999, the Navy reviewed SOB guidelines issued by both DHEC and the USEPA. In addition, example and preferred SOBs were presented by DHEC to the Navy for review during this time. It was agreed during a project team meeting shortly thereafter that SOBs for the Charleston Naval Complex will consist of elements from guidelines presented by DHEC and the RCRA Branch of the USEPA, in addition to standard industry practices. Furthermore, the project team noted that the DHEC and USEPA SOB guidelines were similar and no major differences were noted.**

**Comments of Paul M. Bergstrand**

**Comment 1:**

Page 2-1; GENERAL

The boundaries of the satellite accumulation area (SAA) are not indicated on any Map/Figure of this CMS Report. Furthermore, there are no figures representing the location of the AST, the can crusher, the debris pile, the surficial topography, the direction of surficial runoff, groundwater flow or the marsh. This CMS Report cannot be considered a complete document without the submittal of this information. Please revise.

**Response 1:**

**The maps and figures of the CMS Report will be revised to present the information referenced above.**

**Comment 2:**

Page 2-1; GENERAL

This CMS Report does not include an adequate history of the SWMU or the period of operation. This CMS Report cannot be considered a complete document without the submittal of this basic information. Please revise.

**Response 2:**

**The CMS Report will be revised to present additional information concerning the history of the SWMU. The EBS checklist for Building 665 states that the building was constructed in 1975 for use as a base package liquor store. The building was used for that purpose until 1992 when it was converted into a storage building for the SeaBees (a naval civil engineering unit). Later the site was used for recycling operations. Former site features of particular significance to the RFI include a can crusher, a satellite accumulation area, and an above ground diesel fuel tank.**

**Comment 3:**

Page 2-1; RFI/CMS RESULTS

The TCE soil contamination increases from soil boring 11 towards soil boring 10. The ground surface slopes towards the marsh and no additional downgradient soil samples were collected or proposed. Grid soil sample 90, which is in the marsh, reported detections of toluene and TCE. The contaminant detections of Grid soil sample 90 were not incorporated in the data evaluation. This CMS Report has not determined the source or extent of the TCE or Lube oil contamination. This CMS Report cannot be considered a complete document. Please revise.

**Response 3:**

The concentration of TCE in surface soil does increase very nominally from boring 11 (15 ppb) to boring 10 (21 ppb) which is in a low lying area that receives runoff from the site. The sediment sample 159M0002, which is depicted in the wrong location on the site map, is in a contiguous portion of this same low area and was noted as containing 17 ppb of TCE. If a release from the site had occurred, it is reasonable to assume that a significant increase in the concentration of TCE would have been noted at boring 10 and the sediment sample location because this is where the release would have accumulated. The minimal increase in concentration does not suggest that a larger, undiscovered problem exists. When the data for the site are viewed as a whole, the TCE concentrations are conspicuously uniform, as if the backfill used when this area was filled in the 1970s was contaminated. This same observation is generally true for the TPH concentrations. Regardless, the intent of the investigation was to collect samples biased toward areas most likely suspected to be potential sources or areas which would have been impacted from a release such as the low lying areas. The Navy feels this objective was accomplished and does not believe additional sampling will produce any additional insight with respect to a source. The Navy instead believes that a revision of the maps (and accompanying text) to show locations of potential sources such as the can crusher and the diesel AST, an accurate representation of site topographic features, correctly showing sampling locations, and a graphical presentation of the analytical results will provide sufficient documentation that the site has been adequately characterized. The intent of collecting samples for TPH analysis was for screening purposes only since TPH as a whole does not have any significance with respect to assessing potential risk to human health and the environment. The detection of TPH simply indicates that more compound specific analyses need to be performed because TPH is composed of hundreds of hydrocarbon compounds. The Risk Based Corrective Action (RBCA) standards for petroleum releases focuses on a few "indicator" compounds which are prevalent and which have toxicity data available to assess risk (Appendix A of the Zone C CMS Work Plan provided a detailed discussion of TPH and how the data is being used for assessment purposes at the Charleston Naval Complex). In addition to TPH, a full volatile organic compound and semi-volatile organic compound scan was performed on each of the samples to search for these indicator compounds. PAHs were detected at significant levels (above screening concentrations) in two locations, the low lying area which receives storm water runoff from the parking areas and where the former diesel fuel AST was located. The soil where the AST was located was removed during the IM and as noted in response to Comment #3 above, the significance of PAHs in the drainage ditches should be discussed as part of the Zone J scoping. Again the Navy believes an improved presentation of the available data will provide the necessary information to support a NFA decision for this site.

**Comment 4:**

Page 2-5; Table 2

The sample ID code for 159-G-WC01-01 is not understood and is not explained in this report. Please explain.

**Response 4:**

The sample code refers to samples that were taken during the CMS for this site. The report will be revised to include this explanation.

**Comment 5:**

Page 2-6

This section of the Report discussed the detection of Methylene Chloride (MC) in groundwater and attempts to determine if the detection was a lab artifact or was a actual contaminant. The text states that "a possible source was not located.....". Because this site was a SAA and the CMS Report introduction of the site clearly stated that paints were accumulated at this SWMU, this means the SAA is the possible source. Please revise.

**Response 5:**

The report will be revised to indicate that the SAA was a possible source for the single detection of methylene chloride in the groundwater. However, the Navy also intends to provide a more thorough evaluation of the data to support the belief that the single detection is more consistent with an artifact associated with sampling or analysis.

To date, DHEC has been reluctant to acknowledge that certain compounds are common artifacts of the sampling and analysis process. A review has been performed on all of the blank data from Zone H to provide a basis for the Navy and EnSafe repeated assertion that methylene chloride is frequently seen as an artifact. A total of 187 field blank samples were considered from Zone H. There were 64 detections of methylene chloride in the field blank samples, ranging from 1.1 J to 68  $\mu\text{g/L}$ . There were 35 detections at or greater than the MCL value of 5  $\mu\text{g/L}$ . A total of 85 lab blank samples were also considered from Zone H. There were 14 detections of methylene chloride in the lab blank samples ranging from 1J to 22  $\mu\text{g/L}$ . There were 9 detections at or greater than the MCL value of 5  $\mu\text{g/L}$ .

The data was also evaluated on a smaller scale by focusing on the blank data for the entire month of CMS sampling, when the methylene chloride detection occurred. The following two tables provide the field and laboratory blank results. The first table presents the field blank data from August of 1998, and the second table presents the laboratory blank data for the same period. The single detection of methylene chloride that we are analyzing occurred in a sample that was taken on 08/13/98 and then analyzed on 08/18/98.

For the other field blank sample that was taken on this same date, the results were ND. It is interesting to note that for one of the other two field blank samples that were analyzed on the same date, methylene chloride was detected with no data qualifier, at 26 µg/L. (The detection we are trying to “explain away” was a 24 J detection.) The laboratory blanks for this period are all ND.

**Field Blanks in August of 1998**

Sample Number	Sample Date	Analysis Date	Methylene Chloride
009-F-W024-01	08/10/98	08/10/98	5 U
009-T-W024-01	08/10/98	08/12/98	5 U
009-E-W24D-01	08/10/98	08/12/98	5 U
009-T-W021-01	08/11/98	08/13/98	5 U
009-T-W030-01	08/12/98	08/18/98	26
017-T-W007-01	08/14/98	08/18/98	5 U

**Laboratory Blanks in August of 1998**

Sample Number	Analysis Date	Methylene Chloride
BLK-0-5007-13	08/12/98	5 U
BLK-0-5210-2	08/13/98	5 U
BLK-0-5210-13	08/14/98	5 U
BLK-0-5210-14	08/17/98	5 U
BLK-0-5210-15	08/18/98	5 U
BLK-0-5269-07	08/18/98	5 U
BLK-0-5271-06	08/18/98	5 U

While the frequency of detection of methylene chloride during the month of August 1998 was lower than that for Zone H as a whole, the fact remains that it was detected in one of the blanks during this time period at a concentration similar to that reported in the groundwater sample. This information will be included in the report to support the Navy’s position.

**Comment 6:**  
Page 2-6

The fact that MC was not detected in any of 19 SWMU soil samples (only 3 were subsurface) is not conclusive proof that MC was not released at the site. Please note, a spill of MC from the SWMU would be able to flow into the marsh. Marsh samples downgradient of the SWMU were not collected. Additional soil samples or diffusion samples in the marsh may help clarify this issue.

**Response 6:**

The Navy believes that 19 soil samples being non-detect for methylene chloride are adequate to assert a release has not occurred at this site. While these soil samples were not specifically taken to address the methylene chloride issue, the Navy believes that the use of this existing data more than adequately documents that the single methylene chloride groundwater detection was an isolated sampling or analysis QC issue, not a wider site issue. The fact that only 3 of the soil samples were subsurface should not be an issue since groundwater data is available for the site. Contrary to SCDHEC's comment, the sediment samples and one of the soil borings are directly downgradient of the site. The Navy disagrees with need for additional sampling on the basis that the soil/sediment samples collected were appropriately located to detect a release, yet no methylene chloride was found.

**Comment 7:**

Page 2-6

The CMS Report then evaluated data from eight Zone H grid soil samples to look for the "possible source". The problem with these grid soil samples is that they are all from 300 to 500 feet away from the SWMU and seven of the eight are upgradient to side gradient of the SWMU. Please revise. Additional soil samples or diffusion samples in the marsh may help clarify this issue.

**Response 7:**

The problem pointed out by this comment appears to be one of semantics rather than data points that were inappropriately located to look for a source. The use of data from sample points surrounding the site, but not necessarily in close proximity, was an attempt to show that there was not a larger scale problem in the area. Please refer to comment #6 above regarding the Navy's opinion with respect to the need for additional sampling.

**Comment 8:**

Page 2-6

This section of the Report discussed the detection of Methylene Chloride (MC) in groundwater and attempts to determine if the detection was a lab artifact or was an actual contaminant. Data from four grid wells was reviewed for this purpose. The main problem with these grid well samples is that three of the four wells are from 300 to 400 feet away from the SWMU and the hydrologic connection to the SWMU has not been proven. These wells, however, may be useful to characterize background conditions. Please revise. Additional wells may help clarify this issue.

**Response 8:**

Our response to this comment is similar to our response on Comment 7. Again, we just stepped out from the samples taken for our specific site to confirm that there is not a wider site issue. We acknowledge that the grid wells are not all in ideal locations with respect to

the site, but we still assert that the results can be used to further substantiate our position that the single methylene chloride detection is not the “tip of the iceberg” indicating a site wide issue. The Navy does not agree that additional wells are required. If it is just a semantical difference concerning the designation for these wells, the text will be revised to appropriately refer to the wells as background wells for the site. Groundwater flow maps will be provided to demonstrate the hydrogeologic relationship of these wells to the site.

**Comment 9:**

Page 2-6

The fourth well, 037-G-WHC2, is about 100 feet upgradient of the SWMU. Furthermore, it is not clear what program area well 037-G-WHC2 was installed under, the well construction details or the type and frequency of analysis that was performed. The hydrologic connection of this well to the SWMU has not been proven, however, the well may be useful to characterize background conditions. Please revise and provide this information.

**Response 9:**

SWMU 37 is the sanitary sewer lines for the base which were investigated as part of Zone L. The well construction details for this well were similar to all of the other RFI well installations and were documented in the Zone L RFI report. The report will be revised to include additional detail with respect to data collected from this well and how it plays a part in characterization of the site.

**Comment 10:**

Page 2-6

The sample ID code for 037-G-WC2 is not understood and is not explained in this report. Please revise.

**Response 10:**

The report will be revised to indicate that this is a groundwater sample from a SWMU 37 well that was also sampled during the CMS for this site.

**Comment 11:**

MC Detections

A review of other Zone H documents reveals the detections of MC in Grid wells 01D at 6 ppb and 11D at 5 ppb in first round. These detections were not included in this report and were not utilized as part of the data review to evaluate the MC detection in well 159-G-W001. Table 4 of this report implies that MC was not detected in any of the “area” wells. This appears to be a highly selective use of well data by the Navy. Please revise.

**Response 11:**

The top of Page 2-7 of the current report states that we were evaluating if there were any MC detections in “other shallow groundwater monitoring wells.” The Navy did not imply that data for every well in the area was being evaluated. Well 01D is approximately 400 feet cross-gradient from the site and well 11D is approximately 300 feet upgradient, both in a deeper aquifer. There are no sites at the souther end of the CNC where we have seen migration of contamination through the confining layer between the shallow and deep aquifers. The marsh clay present beneath the shallow aquifer is a continuous unit around this area of the base and is typically at least 20-30 feet thick. In the case of well 01D, the marsh clay is continuous from a depth of 10 feet to the bottom of the well screen at a depth of 60 feet. In the case of well 11D, the marsh clay is continuous from a depth of 12 feet to the bottom of the well screen at a depth of 58 feet. In order for contamination to migrate to the deep zone, consistent, high levels of contamination in the shallow zone would have to be present. A single methylene chloride detection in a shallow well does not suggest the need to evaluate deep wells that are 300-400 feet away in a different hydrologic zone.

**Comment 12:**

Page 2-7

The CMS Report conclusion on Page 2-7 is that MC is only a Lab related artifact. The data review of MC has failed to include any of the Lab QC analysis in this document to support this argument. The explanation for the presence of MC is unsupported. Additional wells may help clarify this issue. Please revise.

**Response 12:**

Please refer to the response to comment #5 above.

**Comment 13:**

CMS and the Interim Measures Reports

The Draft CMS Report relies heavily on the IM Report to draw conclusions . There are, however, fundamental problems in using this IM report.

- The confirmation samples did not analyze for VOC, SVOC, Metals Etc. as recommended in the 19 July 1996 Department comments on the Draft Interim Measure Work Plans.
- The data sheets in the IM Report state matrix interference in three confirmation samples. The data sheets also indicate a increased dilution factor for PAH in 15 of the 24 samples. The matrix interference and the increased dilution factor has not been addressed in the IM Report. It is possible the interference was from TCE, MC or related daughter products. This can only be addressed by additional soil confirmation samples.

The end result is that the IM Confirmation Sampling is not conclusive and calls to question whether or not the IM has remediated the SWMU. Additional sampling and data submittals may be necessary to resolve these issues for the CMS.

**Response 13:**

**(A)** Samples collected during the RFI at SWMU 159 were analyzed for the suite of parameters listed in the comment. The sample results were evaluated to identify COPCs, determine if the extent of the COPCs was adequately defined, and to perform a risk assessment using the data. Previous responses have addressed the Navy's position regarding definition of the extent of contamination. The only COCs identified by the risk assessment were carcinogenic PAHs expressed as benzo(a)pyrene equivalents (BEQs). The RFI concluded that the site should be recommended for a CMS on the basis that TPH values exceeded the arbitrary screening value of 100 ppm and the presence of BEQs. SWMU 159 was identified as a site at which the Navy wished to perform an interim measure to mitigate the potential risk posed by the site. The IM work plan prepared by the Navy and which was approved by the project team, recognized TPH levels of <100 ppm as the cleanup objective. Subsequent to approval of the work plan, the Environmental Detachment Charleston (DET) recommended to the project team that the cleanup standard be changed to specific constituents found in the last paragraph on page 8 of the State Soil/Ground-Water Remediation Guidance Document in lieu of TPH. This meant that the confirmation samples would be analyzed for BTEX, naphthalene, and PAHs which would adequately address characterization of soil for the only COC identified for the site. The project team agreed to this recommendation by consensus at the September 1996 meeting.

Prior to backfilling the excavation, the confirmation sample results were presented to the project team. The results showed chrysene levels greater than residential RBCs at several sample locations yet the project team agreed to backfill the excavations. The focus of the CMS should be on the significance of the chrysene concentrations that remain at the site.

**(B)** The matrix interference seen in 15 of the 24 PAHs that resulted in Dilution Factors of "4" are most likely attributable to lower molecular weight petroleum hydrocarbons that are part of TPH, but not included as part of the semi-volatile analyte list. The basis of this statement are the obvious detections of elevated levels of TPH, yet there are relatively few detections of specific compounds (please refer to response to comment #3 above for additional background information regarding TPH). Regardless, it is highly unlikely that TCE or daughter products would cause matrix interference in SVOC sample analysis since the retention time for these compounds on a chromatograph do not coincide. To further confirm that TCE was not the cause of the matrix interference, the contract laboratory was also contacted to see if by chance they could retrieve the archived data for BTEX and naphthalene analyses. Even

**though the list of analytes report was limited to BTEX and naphthalene, the laboratory still has to run a complete volatile scan to obtain that data. When the chromatograph data was reviewed for sample number SPORT0164-4 (which had a dilution factor of “4” for the semi-volatile scan) it showed no traces of TCE.**

**Comment 14:**

Figure B-1A

The excavated area shown on Figure B-1A in the Draft CMS Report does not match the SWMU SSA area as shown on Figure A-2 of the IM Report. According to these figures it is not clear that the IM was able to excavate the “Hot spot”. Please confirm and revise as necessary.

**Response 14:**

**Figure B-1A does not exist in the CMS report. The figures referred to are both contained in the IM report and there is a slight discrepancy which will be corrected in the CMS report.**

**Comment 15:**

Page 3-1; Remedial Soil Objectives

This section of the CMS Report states “Since this point (159SB011) has been removed from the site, there is no longer any surface soil point risk above background in excess of 1E-06.” Without the appropriate data, accurate maps and figures, this conclusion is premature. Please confirm and revise as necessary.

**Response 15:**

**The report will be revised to contain all of the necessary data, figures and maps to provide confirmation of the conclusion regarding surface soil risk.**

**Comment 16:**

Page 3-1; Groundwater Remedial Objectives

This section of the CMS Report states “Since MCLs have been met for all parameters at the site, further groundwater remedial objectives are not required.” Without the appropriate data, the evaluation of available data, accurate maps and figures, this conclusion is premature. Additional sampling, revision of figures, data evaluation and data sheet submittals may be necessary to demonstrate that the Navy has meet adequate cleanup goals and has remediated the SWMU for the proposed NFA conclusion.

**Response 16:**

**The report will be revised to contain all of the necessary data, figures and maps to provide confirmation of the conclusion regarding groundwater remedial objectives.**

**Specific Comments on AOC 653**

**Comments of Mihir Mehta**

**Comment 1:**

Please revise this portion of the referenced document to reflect the changes due to the comments generated for SWMU 159.

**Response 1:**

**The appropriate portions of the document will be revised to reflect the changes required for SWMU 159.**

**Comment 2:**

Briefly discuss the conclusions that were approved during the RFI Report approval process that would facilitate the understanding of all media being cleaned up for the proposed no further action decision.

**Response 2:**

**The report will be revised to include additional background detail regarding the conclusions reached during the RFI process with respect to COCs which were identified and the media in which they were detected, and a brief discussion of RGOs that were calculated for the COCs and the various levels of risk to which each of the RGOs can be equated. This should provide sufficient information to allow the reviewer to compare the results of confirmation samples collected during the IM to determine whether or not a no further action decision is appropriate at this time.**

**Comment 3:**

Section 2.2.3 Sediment and Section 2.2.4 Surface water; page 2-8.

Line one states that "Sediment was not sampled at AOC 653" and "Surface water was not sampled at AOC 653". Please clarify whether these media were evaluated previously during the RFI process or they are not evaluated because they are not present in the vicinity of AOC 653. For granting no further action decision the Department has to verify that all impacted media are cleaned up to acceptable residential remedial goals. Please revise the document to address this concern.

**Response 3:**

**Sediment and surface water were not evaluated at AOC 653 because they are not present at this site. The report will be revised to indicate this fact.**

## Comments of Paul M. Bergstrand, SCDHEC

### Comment 1:

#### Wells

The original wells were destroyed during the IM Excavation. A new well, 653-003 was installed and Grid Wells 3, 3D, 6 and 6D were monitored for arsenic and VOCs. A review of the map shows wells 6 and 6D to be 600 feet away and wells 3 and 3D are 675 feet away. The wells at this extreme distance from the AOC have not been shown to be representative or hydrologically connected to this AOC. The grid wells may, however, be used as background data wells. There are monitoring wells near this AOC that were installed by other programs that may be utilized if they represent groundwater conditions at this AOC. If this is not the case additional wells may also be installed.

### Response 1:

During the RFI, arsenic in groundwater was identified as the primary risk driver for AOC 653 in addition to elevated levels of TPH being detected even though none of the individual components of TPH considered "indicator" compounds were identified as COCs. The arsenic problem was believed to be isolated to one location which was the reason for one of the destroyed wells being replaced following the IM. The sole purpose of the CMS at this site was to evaluate the significance of the arsenic. During the scoping discussions held during the development of the CMS work the project team reached an understanding that the problem location would be monitored for a period of time and additional locations surrounding the site would be monitored to demonstrate that the arsenic in one well at AOC 653 was isolated. The following is a chronology of the scoping discussions:

In an April 27, 1997 e-mail from Mr. Jay Bassett of the EPA to the project team, he concurred that the existing wells at AOC 653, and the nearby grid wells 3/3D and 6/6D, should be monitored for arsenic as part of the CMS. During the July 9-11, 1997 project team meeting in Atlanta, Mr. Larry Bowers of EnSafe made a presentation to the project team during the CMS scoping of Zone H. It was agreed by the project team at this meeting that 1 new well would be installed in the center of the site. Furthermore, it was agreed by the project team that the new well and 4 nearby grid wells would be monitored for arsenic and used as part of the CMS for this site. During the March 4-5, 1998, technical subcommittee meeting in Columbia (DHEC, the Navy and EnSafe), DHEC requested that VOC analysis be added to the new well and the 4 grid wells for AOC 653. No concerns were expressed at any time over the use of the 4 grid wells as part of the overall site analysis.

The report will be revised to clarify the intentions of using data from the surrounding wells and additional hydrological data will be provided but the Navy does not believe additional wells or monitoring is required at this site before a risk management decision can be made.

**Comment 2:**

Page 2-8

Acetone was detected below the RBC in wells 03 shallow and 06 deep. The detection, however, was not addressed. Please revise.

**Response 2:**

The Navy does believe that the infrequent detection of acetone in deep grid wells has any relevance to assessing the significance of arsenic at AOC 653. Acetone was not identified as a COC at this site and the Navy has previously submitted a technical memorandum regarding sampling and laboratory artifacts which dealt specifically with acetone. If this issue needs to be revisited to address the acetone in the grid wells it should be done separately from the CMS process for this site.

**Comment 3:**

Page 3-1

This section of the Draft CMS Report states that "Arsenic was not present exceeding MCL." Without the appropriate laboratory data sheets and CoC forms in the Draft CMS Report, the detection of arsenic in groundwater cannot be compared to the Zone specific background or MCL values. Please revise.

**Response 3:**

The report will be revised to present the appropriate data sheets and CoC forms to document the conclusion concerning the groundwater remedial objectives.

**Comment 4:**

CMS and the Interim Measures Reports

The Draft CMS Report relies heavily on the IM Report to draw conclusions. There are, however, fundamental problems in using this IM report.

- The IM confirmation sampling was only for petroleum constituents (BTEX and 16 PAHs) and metals. The confirmation samples did not analyze for VOC, SVOC, etc., as recommended in the 19 July 1996 Department comments on the Draft Interim Measure Work Plans. Additional samples may be necessary.
- Sample data sheets were included in the IM report, however the corresponding sample location could not be identified.

- The data sheets in the IM Report state matrix interference in three confirmation samples. The data sheets also indicate a increased dilution factor for metals 16 of the 16 samples. The matrix interference and the increased dilution factor for metals has not been addressed in the IM Report. It is possible the interference was from solvents related daughter products. This can only be addressed by additional soil confirmation samples.
- The Trip blank data sheets were not included in the IM Report. This information should be provided.

The end result is that the IM Confirmation Sampling is not conclusive and calls to question whether or not the IM has remediated the AOC. Additional sampling, revision of figures, data evaluation and data sheet submittals may be necessary to demonstrate that the Navy has meet adequate cleanup goals and has remediated the AOC for the proposed NFA conclusion.

**Response 4:**

- (A) Please refer to the response to comment #13 on SWMU 159 above.
- (B) A site map is provided in the Completion Report listing the NBC #'s and a table titled "Confirmation Sampling" lists the NBC #'s and corresponding SPORT #'s. The table also lists the COPCs that exceeded an RBC.
- (C) From a practical perspective, the increased sample dilution due to matrix interference does not elevate the reportable limits high enough to affect the technical aspect of review i.e. reportable results are below residential RBC levels. From a technical perspective the assertion that TCE or daughter products could cause matrix interference in a laboratory analysis for metals is unfounded. The sample preparation method for metals involves heating the sample to a temperature capable of driving off liquid such as water and acid used in the extraction process. TCE has a boiling point less that than of water so, even it were present, it would volatilize away during the preparation process. Also, similar to the response to comment #13 for SWMU 159, the contract lab was asked to review the archived data to verify there were no solvents present. Full volatile scans were performed on samples NBCH653S003201, NBCH653002201 & NBCH653003001) which were analyzed for BTEX and naphthalene. There were no solvents present in any of the three samples.
- (D) Trip Blank data will be provided for completion report listed distribution.