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NAS CECIL FIELD
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LETTER AND U S NAVY RESPONSE TO U S EPA COMMENTS TO TECHNICAL MEMORANDUM FOR SUPPLEMENTAL SAMPLING OPERABLE UNITS 1, 2 AND 7 SEPTEMBER 1992 NAS CECIL FIELD FL
6/8/1993
NAVFAC SOUTHERN

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DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
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NORTH CHARLESTON, S.C. 29419-9010

PLEASE ADDRESS REPLY TO THE COMMANDING OFFICER, NOT TO THE SIGNER OF THIS LETTER. REFER TO:
5090
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08 JUN 1993

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. James Hudson
U.S. Environmental Protection Agency
345 Courtland Street, N.E.
Atlanta, GA 30365

FILE COPY
Job # CTO-35
File # 2.1.1
Date :

Subj: RESPONSE TO USEPA COMMENTS ON TMSS
NAS CECIL FIELD

Dear Mr. Hudson:

Enclosed are the response to your comments received by this Command on 8 April 1993, regarding the Technical Memorandum for Supplemental Sampling (TMSS) for OU's 1, 2 and 7 of September 1992. Since this is not a primary document and work has already begun, this document will not be modified. However, both the USEPA's and FDER's comments and our responses will be part of the Administrative Record.

In addition, you will find enclosed a Draft copy of the Navy's plan for managing Investigation Derived Waste at NAS Cecil Field. The Navy requests both the EPA's and FDER's review and comment on this document. Note this document is neither a primary or secondary document as identified in the SMP, and therefore, will not follow the same protocol.

Sincerely,

Clifton C. Casey

CLIFTON C. CASEY
Remedial Project Manager

Encl:
(1) Response to USEPA Comments
(2) Investigation Derived Waste Managerment Plan

Copy to:
FDER (Eric Nuzie)
NAS Cecil Field (Code 20IR)

Blind copy to:
ABB (Barry Lester)

RESPONSE TO GENERAL COMMENTS
FROM UNITED STATES ENVIRONMENTAL PROTECTION AGENCY (USEPA)
FOR TECHNICAL MEMORANDUM FOR SUPPLEMENTAL SAMPLING
AT OPERABLE UNITS (OUs) 1, 2, AND 7,
NAVAL AIR STATION (NAS) CECIL FIELD, JACKSONVILLE, FLORIDA
CONTRACT NO. N67467-89-D-0317

Comment 1: The Navy should describe in better detail the techniques that will be used to collect soil and ground water samples and how the integrity of the confining zones will be maintained to prevent cross contamination between water bearing zones.

Response: The collection of soil and groundwater samples for screening purposes will be completed as follows. Split-spoon sampling will be performed from the land surface to the water table at each screening location. Two soil samples from above the water table will be selected from each boring based upon the criteria stated in Section 7 of the Technical Memorandum for Supplemental Sampling (TMSS) at OUs 2 and 7. These samples will be submitted for laboratory analysis in a mobile onsite laboratory for USEPA Methods 8010 and/or 8020 analysis and total petroleum hydrocarbon (TPH). Groundwater samples will be collected using the Aqua-Probe (discussed below) at 5-foot intervals from the water table to a depth of 20 feet below land surface (bls). Below 20 feet bls, groundwater samples will be collected on approximately 10-foot intervals until the maximum depth of contamination has been determined based on the analytical results.

Each borehole installed for screening purposes will be located within the 40 by 40 foot grid cells as shown in TMSS Figures 7-2 through 7-6. Should site-specific conditions prohibit the installation of the borehole in the center of the grid cell, the borehole will then be moved to the nearest suitable location.

The Aqua-Probe is a tool that allows for the collection of *in-situ* groundwater samples without the installation of a monitoring well. A 4-foot-long section of 0.010 slotted stainless-steel screen is attached to the drive point. The Aqua-Probe consists of a drive point and an outer casing that are flush with respect to outer diameter. The outer casing is retractable and can be moved upward while leaving the drive point and screened section in place. Hollow-stem augering (HSA) is advanced to within 1 to 2 feet above the desired groundwater sampling interval. The Aqua-probe is then lowered into the temporary auger casing and "driven", as a split spoon is driven, to the desired sampling interval. The groundwater sample is then collected with a bailer and delivered to the onsite laboratory for analysis.

The method currently being employed to complete the groundwater screening has a low potential to cause cross-contamination of water-bearing zones. The boring and collection of groundwater screening samples are completed as quickly as possible to limit the time available for vertical migration to occur. As the augers are being advanced, the auger itself acts as a casing and the material being forced up the annulus of the borehole on the

auger flights minimizes vertical flow of groundwater and contaminants. Following the completion of a screening boring, the borehole is grouted to the land surface.

In the event that an apparent aquitard (based on lithology) is encountered, a determination will be made in the field by the Field Operations Leader (FOL) regarding how to proceed. This determination will be made using available information. If screening information from the borehole, historical information, and/or the results of the analyses by the onsite laboratory indicate that the area is contaminated and a screening sample below the aquitard is necessary, standard geological and engineering controls are employed to prevent cross contamination of water-bearing units.

The following procedure is used to collect a groundwater screening sample from below an aquitard. The hollow-stem auger is firmly fixed into the aquitard and acts as a temporary auger casing. The top-head drive is outfitted for mud rotary drilling and the aquitard is penetrated through the bottom of the temporary casing. A well point is installed below the aquitard. The well point consists of a slotted (0.010 inch) section of PVC pipe encased in a sandpack and sealed with 2 feet of bentonite chips. The well point is developed (between 300 and 600 gallons) to facilitate communication with the aquifer. A sample is collected and sent to the onsite laboratory for analysis.

Following the collection of the groundwater sample, the well point is removed and the filter pack and grout are circulated out of the borehole. The borehole then is grouted through the drill pipe from the bottom of the borehole to the land surface using the mud pump on the drilling rig until the filter pack materials are observed at the surface. The temporary surface casing is then removed with grout being added to the interior of the casing. The boring is grouted to the surface.

Comment 2: The Navy fails to present methods of handling and disposing of investigative-derived wastes (soil cuttings, purge and development waters, used personal protective equipment, etc.).

Response: The handling of investigation-derived wastes will be accomplished in accordance with procedures described in the Field Sampling and Analysis Plan for the Remedial Investigation/Feasibility Study (RI/FS) at OUs 1, 2, and 7 (Navy, May 1990, prepared by Brown and Caldwell) as revised and updated in the Draft Investigation-Derived Waste Management Plan (Navy, July 1992, prepared by ABB-ES). A draft copy of this document is provided along with these responses.

Comment 3: The Navy fails to mention Quality Assurance/Quality Control samples (duplicates, field blanks, trip blanks, rinseate blanks) that should be collected during the RI/FS.

Response: Quality Assurance/Quality Control (QA/QC) procedures were described in the original Workplan for OUs 1, 2, and 7 and the Sampling and Analysis Plan (SAP) for OUs 1, 2, and 7. These documents were approved by USEPA and FDER in September, 1991. The Technical Memorandum for Supplemental Sampling (TMSS) was an addendum to this Workplan and, as such, is subject to the same QA/QC procedures described and approved.

Comment 4: Once water level measurements are collected for each site, a potentiometric surface map for the surficial aquifer and the secondary artesian aquifer for each site should be presented in the text.

Response: The Navy agrees that potentiometric surface maps will be presented in the text of the next document summarizing the field activities. In addition, the Navy plans to use the monthly RPM meeting as a forum to present a summary of the latest field activities and their findings. The latest water level measurements would be presented at these meeting.

Comment 5: A method for determining soil action levels that are protective of ground water should be proposed. Soil partitioning coefficients should be determined to evaluate soil cleanup goals that are protective of ground water. The methods and sources utilized to establish these parameters should be provided.

Response: The Risk Assessment will evaluate exposure routes, including migration to groundwater, before proposing a soil cleanup goal for each contaminant of concern. The Feasibility Study will review the proposed soil cleanup goals and remedial alternatives before proposing a cleanup level. All Federal Facility Agreement (FFA) parties must agree to the cleanup level before any remedial actions are taken.

An approximate partitioning coefficient value can be estimated by multiplying the octanol/water partitioning coefficient by the ratio of organic carbon found in the soil. The octanol/water partitioning coefficient values are available from the literature for each chemical of concern. The TMSS included total organic carbon (TOC) (USEPA method 9060) analysis in the analytical parameter list for both soil and water samples as an aid in empirically estimating the partitioning coefficient and the organic content.

The soil partitioning coefficient is only one of the parameters that will be needed to accurately model contaminant movement. The following is a list of other parameters that were included in the TMSS:

- Vertical hydraulic conductivity (USACE method EM1110-2-19060);
- Horizontal hydraulic conductivity (slug test);
- Grain size analysis;

- Bulk density (ASTM E12-70);
- Cation/anion;
- Cation exchange capacity (SW9081);
- pH, and
- Filtered and unfiltered metals.

Since no single model is capable of accurately describing all situations, the final selection of a model or models will not be completed until the source area and contaminant plumes are delineated chemicals of concern and chemical transport pathways are identified. The Navy is considering either the Multi-media Model or the Seasonal Soil Compartment Model (SESOIL), both of which were developed by USEPA, to describe contaminant partitioning and migration in the unsaturated soils and in groundwater.

Once the physiographic conditions and the chemical distributions at the site are identified, the Navy requests a meeting with USEPA and FDER to discuss which models are acceptable to both agencies.

Comment 6: At several of the sites (3, 4, 5, 17, and 16) the Navy proposed that soil and ground water screening will be conducted to determine the extent of contamination in each media. This is a good approach for determining the extent of contamination in a time and cost effective fashion. However, very little explanation is provided that describes the equipment that will be used to collect the samples. For example, will some type of direct push technology be administered to collect the ground water samples? If so, this equipment should be described. For many of the sites it is stated that "...at a depth of 20 feet bls ground water screening will proceed by sampling 10 foot intervals until the maximum depth of contamination has been determined..." Does this mean the Navy will collect samples until a 'clean zone' is encountered? What is the maximum depth the field equipment can penetrate? If samples are to be collected below competent confining zones, what measures will be taken to prevent cross contamination between water bearing zones?

Response: The Navy agrees that the screening approach currently being employed is time and cost effective. The equipment to be used during the screening program for the collection of soil and groundwater samples is discussed in the Response to Comment 1. The use of direct-push technology has been shown to not be effective at Site 3 (see Response to Comment 12). The technique to be used for the collection of groundwater screening samples (direct-push versus HSA with Aqua-Probe) is based on an analysis of the historical sampling results, the results of the first round of sampling from onsite monitoring wells, and the anticipated depth to which contamination is present. Hollow-stem auger techniques have been used at Site 3 and will be used at Sites 5, 16, and 17.

The groundwater screening will proceed until "clean" intervals are encountered. This determination will be made based on the results of sample analyses from the onsite

laboratory and screening results at the borehole. In areas where aquitards are encountered and the collection of screening samples from below the aquitard is necessary, screening samples will be collected as discussed in Comment 1.

Comment 7: For most of the sites where additional wells will be installed, a soil sample will be collected from the screen interval of each monitoring well installed at each site. These samples will be submitted for grain size analysis only. EPA recommends that these samples be analyzed for TCL/TAL group of possible contaminants to provide supplementary data on the soil/water partitioning coefficients.

Response: The Navy concurs with USEPA desires to collect the types and quantity of information needed to accurately model contaminant movement. However, the collection and analyses of the samples proposed by USEPA were not included in the TMSS because past experience indicated such data were inconclusive and misleading. Our evaluation has raised several questions regarding data accuracy. These questions include the following.

A. How can a soil sample be collected and returned to the surface for analysis without the sample becoming contaminated with the overlying water?

B. How will the water be removed from the soil without affecting the soil sample's integrity?

C. How would the analysis differentiate between contaminants found on the soil and those contaminants derived from water attached to the surface of the soils?

Comment 8: Additional wells will be installed at many of the sites to delineate the extent of contamination. According to the text, the location and depths of these well will be determined by the Navy once the screening data is obtained. However, the Navy fails to propose a total number of wells to be installed at each site. The number of wells proposed appears to be arbitrary. Justification for the additional number of wells should be provided. The Navy should note that the total number of additional wells necessary to delineate the extent of contamination may need to be revised depending on the screening data results and the next round of ground water samples.

Response: The proposed "total number of wells to be installed at each site" is presented in Table 7-3 for Sites 1 and 2, Table 7-6 for Site 3, Table 7-8 for Site 4, Table 7-11 for Site 5, Table 7-14 for Site 17, and Table 7-17 for Site 16. The total number of monitoring wells proposed for each site is based on an evaluation of the data existing for that site and recognition of the need to (1) bound the area(s) potentially affected by contaminants migrating in the groundwater, (2) identify the area(s) most heavily contaminated by site-related contaminants, and (3) provide sufficient data for the comple-

tion of the Risk Assessment and the Feasibility Study. Detailed justification for the exact placement of monitoring wells would be premature prior to completion of the screening program and the collection of additional groundwater samples. The Navy agrees that the number of groundwater monitoring wells needed to delineate the extent of contamination is variable and may require revision based on findings of the screening program and the results of groundwater sampling.

Comment 9: For many of the sites (3, 5, 17, and 16) three soil borings triangulated over each site will be installed for lithologic control to determine site specific lithology. Sampling for vertical migration of DNAPLs will be conducted in adjacent boreholes immediately above clay zones or lenses. The proposed investigative borings will be located in areas where DNAPL concentration is expected to be greatest. This approach for locating DNAPLs in ground water may cause more DNAPL problems in the ground water than already exist. By drilling these investigative borings in the high DNAPL concentration areas, the possibility exists that these constituents will be carried to deeper intervals in the aquifer(s), especially if the borings are drilled across confining zones. Many of the sites already have a fairly detailed description of the site lithology based on drill cuttings from installation of existing wells (Appendix B, Soil Boring Log Data and Well Construction Details). EPA recommends that if these exploratory borings are drilled, they should not penetrate any confining zones described in Appendix B.

Response: The Navy believes that an understanding of the lithology at Sites 3, 4, 16, and 17 is very important to the characterization of groundwater contamination. Lithologic control borings will be installed if the planned screening program fails to adequately characterize the site's subsurface. DNAPL sampling will be completed only if site conditions indicate that the presence of separate phase liquid is likely and that the sample can be successfully collected.

The Navy also recognizes that the installation of deep borings always carries the potential for bringing contamination to deeper intervals at the site. In order to prevent vertical cross contamination, standard engineering and geological precautions will be taken. For lithologic control borings these will include (1) completing the boring as quickly as possible and (2) immediately grouting to the land surface upon completion of the boring.

If horizons are identified for DNAPL sampling and an adjacent boring is completed, standard engineering practices will again be employed to prevent cross contamination of deeper intervals. Borings will be advanced to the desired depth and the sample will be collected. If only a shallow sampling interval is selected, the borehole will then be grouted to the land surface following sample collection. If a deeper interval is selected for sampling, the first aquitard encountered will be cased-off using a temporary surface casing before continuing to deeper intervals. This process is discussed in the response to Comment 1.

Comment 10: The background history for the sites fail to mention disposal of heavy metal wastes. EPA recommends that the groundwater monitoring wells be carefully resampled to avoid entraining sediments in the samples, and reanalyzed to check the validity of the reported metals data.

Response: The Navy agrees that verification of metals concentrations reported during the first round of sampling is necessary. In order to better identify wells where elevated metals are the result of turbid samples, the Navy has proposed to sample all of the wells for filtered and unfiltered inorganics analysis.

Comment 11: Section 5.1, Paragraphs 5-1 to 5-11. The submitted data shows that groundwater downgradient of Sites 1 & 2 is contaminated in three zones, the top of the surficial aquifer, the lower portion of the surficial aquifer and the secondary artesian aquifer. The submitted figures show that all sampled wells are east of Rowell Creek. It should be determined whether or not Rowell Creek is acting as a local groundwater divide for these aquifers. This could be determined quickly using the hydrocone, piezocone and inexpensive piezometers. If it is a divide, the scope of the ground water remediation for these areas would be known. A small number of permanent monitoring wells could be installed west of the creek later to provide long term monitoring of this area.

Response: Proposed monitoring well locations selected for OU 1 are shown in Figure 7-1. No monitoring well locations are currently sited on the east side of Rowell Creek. Groundwater in the surficial aquifer is assumed to be discharging into Rowell Creek. This assumption is based on discussions presented in the IAS (NEESA, 1985) and the RFI (Harding Lawson and Associates, 1988) and on the results of field observations. These field observations include (1) the topography surrounding Rowell Creek (i.e., the level to which the creek is incised relative to the surrounding land), (2) the control that topography exerts on local groundwater flow in the surficial aquifer, (3) observed level of baseflow in Rowell Creek, and (4) evaluation of potentiometric data from monitoring wells adjacent to Rowell Creek that indicate water levels in the surficial aquifer adjacent to the creek are generally above the level of the water flowing in the creek.

Trace levels of organic constituents have been observed in the analysis of ground water samples collected along Rowell Creek. Lead and chromium in unfiltered samples are present at levels above regulatory limits; ambient background levels for metals in groundwater have not yet been established at OU 1 to evaluate whether these concentrations are above background.

Further evaluation of the interaction between groundwater flow in the surficial aquifer and surface water bodies at NASCF is currently being completed by the U.S. Geological Survey (USGS). In light of this on-going investigation by the USGS, the Navy's commitment to the protection of human health and the environment, and the probability that Rowell Creek is a point of discharge for the surficial aquifer, the decision has been

made to tighten the spacing of groundwater monitoring wells along the western side of Rowell Creek. The current ground water monitoring network on the western side of Rowell Creek will be tightened as a result of the disparity between historical reports of the types and quantities of materials placed in the landfill (Site 1) and the results of groundwater sampling that has been completed.

In order to quantify the interaction between the surficial aquifer and Rowell Creek, the installation of piezometers, as suggested by the USEPA, or monitoring wells would be necessary. Implementation of this investigative process would, however, require the construction of a road to access the eastern side of Rowell Creek. Questions regarding ground water quality issues on the east side of Rowell Creek will be addressed during the investigation of Site 10.

The Navy believes that the detection of potential ground water contamination leaving OU 1 and affecting Rowell Creek is of primary importance to human health and the environment and believes that the proposed configuration of ground water monitoring wells will detect the potential movement of contaminants offsite. If ground water contamination potentially affecting Rowell Creek is found at OU 1 the Navy will take the measures needed to answer remaining questions concerning this surface water body.

Comment 12: Section 5.2.1, Paragraphs 5-11 to 5-35. The submitted data shows the surficial groundwater sample headspace data to be in general agreement with samples analyzed in the fixed-base laboratory. This surficial ground water contaminant plume is probably characterized sufficiently to begin initiating the feasibility study. The secondary artesian aquifer should be further characterized. EPA recommends a piezocone and hydrocone study of the top of this unit, followed by installation of permanent monitoring wells.

Response: The Feasibility Study will be performed concurrently with the Remedial Investigation. Thus, there will be no delay to the RI/FS schedule by performing a complete evaluation of the site as proposed in the TMSS. Section 7.2.1 (page 7-8) of the Technical Memorandum for Supplemental Sampling presents a discussion of proposed soil and groundwater screening for Site 3 of OU 2. Preliminary results of this site screening indicate that, to date, the groundwater contaminant plume at Site 3 is not sufficiently characterized. Screening results indicate that groundwater contamination, possibly attributed to Site 3, extends as far as 300 feet east of monitoring well CEF-3-4S (previously assumed to represent the eastern portion of Site 3).

The Navy agrees that the secondary artesian aquifer needs to be fully characterized. Current groundwater screening efforts are evaluating contamination to a depth of over 100 feet bls, which includes the top of the secondary artesian aquifer. Thus far, contamination has not been found to extend to the secondary artesian aquifer in the vicinity of Site 3.

A piezocone survey was attempted during the first round of field work at Site 3 (discussed on page 5-16); the maximum depth of penetration attainable was 59 feet bls. As mentioned above, contamination is now known to extend to depths in excess of 59 feet. The technology being used in the groundwater screening, Aqua-Probe, is capable of achieving greater depths at Site 3 than direct-push technology (either hydrocone or piezocone).

The Navy recognizes the possibility that the current number of groundwater monitoring wells proposed for Site 3 (Table 7-6) may not be sufficient to characterize the contaminant plume in either the surficial or the secondary artesian aquifers. An evaluation of the need to install wells, in addition to those proposed in Table 7-6, will be completed at the end of the groundwater screening program. Justification for the installation of any additional wells will be provided to the USEPA at a monthly RPM meeting prior to monitoring well installation.

Comment 13: Section 5.2.2, Paragraphs 5-35 to 5-48. As stated previously, the submitted data shows the surficial groundwater sample headspace data to be in general agreement with samples analyzed in the fixed-base laboratory. The fence diagrams indicate that a small sand unit may be located immediately beneath the screens of the two sampled surficial wells. This unit should be characterized (hydrocone and piezocone) and monitored. If this small sand unit is not significantly contaminated, this site may require no further action.

Response: The Navy agrees with the suggestions put forth in this comment regarding sandy horizons in the subsurface at Site 4 and also agrees with the potential for no further action at Site 4. However, based on the analysis of recently obtained aerial photographs, the Navy believes that in order to achieve the objectives of the Remedial Investigation, the area that should be considered at Site 4 is larger than the area that was previously evaluated. Evidence of activity as much as 400 feet east of the Site 4's eastern boundary, as shown on Figure 5-13, has been obtained from aerial photographs. The nature of these activities is not currently known.

For the aforementioned reasons, the expanded grid area shown on Figure 7-3 has been chosen for site screening as discussed in Section 7.2.2. Additionally, passive soil gas has been selected as the initial site-screening technology to provide maximum data yield (volatiles and some semi-volatiles) from this large area. If potential areas of contamination are found by the soil gas survey, these areas will be screened by hydrocone or similar method.

Comment 14: Section 5.2.3, Paragraphs 5-48 to 5-63. It should be determined in the next round of field work whether or not the tributary to Rowell Creek south of the site acts as a groundwater discharge point. As stated previously, EPA recommends the use of the hydrocone, piezocone and inexpensive piezometers. If it is a discharge point for the contaminated plume

(which the data available so far indicates that it is not), the scope of the groundwater problem for this site would be known.

Response: The Navy agrees that further characterization of the Rowell Creek tributary located on the south side of Site 5 is important to the evaluation of the nature and extent of contamination for this site. Therefore, the soil and groundwater screening discussed in Section 7.2.3 and the locations presented on Figure 7-4 have included this tributary in the screening grid. The screening grid can easily be expanded based on the results of sampling in the southern part of the site. Also, to confirm the results of surface water and sediment sampling previously completed in the tributary (Tables 5-17 and 5-18), four additional surface water and sediment sampling stations have been included along this tributary.

Comment 15: Section 5.2.4, Paragraphs 5-63 to 5-73. Because the only significant contaminants detected were in the down gradient well, EPA recommends that groundwater samples be collected 150 to 200 feet down gradient of this sample point. If shallow groundwater samples from this area show no significant contamination, this site should be considered for no further action in regards to groundwater remediation, although the site description indicates that soil remediation is needed. These groundwater samples should be collected from the poorly graded sand, if possible.

Response: The Navy agrees with the assessment of potential groundwater contamination at Site 17 and also agrees that downgradient contaminant characterization in the surficial aquifer is necessary. To assess the nature and extent of potential soil and groundwater contamination at Site 17 and downgradient of the site (particularly for groundwater), the soil and groundwater screening program outlined in Section 7.2.4 and presented in Figure 7-5 will be completed. As shown in Figure 7-5, the soil and groundwater screening grid has been extended well beyond the site boundary (200 feet to the southeast of monitoring well CEF-17-6S) to the south and east of Site 17 to provide for the characterization of potential downgradient migration of site-related contaminants. Additionally, the size and configuration of the screening grid can easily be enlarged based on the findings of the screening program. The Navy believes that screening followed by monitoring well placement provides for the most effective placement of groundwater monitoring wells to meet the objectives of the RI and FS for Site 17.

Comment 16: Section 5.3, Paragraph 5-73 to 5-88. Site 16 will require considerably more groundwater monitoring work. In addition, the exact location of the former pit should be established, if at all possible. EPA recommends the following strategy for locating the pit (given that it cannot be identified on aerial photographs). First, mow the grass in the area close to the ground and see if some of the tip row of blocks used to construct the pit are still visible. Next, clearly mark all underground utilities (water, sewer, electrical, gas, telephone, etc.). Then cover the area closely with a sensitive metal detector such as the PipeSeeker by Compass. If this does

not delineate the boundaries of the pit, grid the area closely (20 feet by 20 feet) and take readings with a geophysical instrument such as the EM-31 (allowing for the marked utilities). The instrument response should be closely watched even as the instrument is moved from grid to grid for sharp spikes that may indicate the edge of the pit. Once the pit is located, it should be surveyed to a permanent marker. In addition, EPA recommends that the lithology in this area be carefully studied (piezocone) and samples taken (hydrocone) to characterize the extent of the plume. In particularly, the poorly graded sand described in the text should be monitored (lithology and chemical analysis).

Response: The Navy concurs with USEPA's comments. Since September 1992, when the TMSS was submitted for USEPA review, the Navy has proceeded with the screening portions of the field program outlined in TMSS; field screening began in early February, 1993. During this period the Navy has performed the following activities at Site 16: an EM-31 survey, a magnetometer survey, collection and analysis of soil samples, and delineation of the seepage pit. The plume delineation and the lithology characterization proposed in the TMSS are scheduled to begin late this summer.

Comment 17: Page 7-22. The Navy should specify the depths of the soil gas screening borings and the proposed analytical suite for the "ten percent laboratory analysis" of the soil samples collected from these borings.

Response: The TMSS proposed soil and groundwater sampling at Site 16, but not a soil gas screening at this site. As discussed on page 7-22 of the TMSS, the soil sample from each boring collected from immediately above the water table will be submitted for laboratory analysis: the second soil sample will be selected based upon elevated organic vapor analyzer (OVA) readings, visible evidence of contamination, or, in the case that neither of the above-mentioned is conclusive, a sample arbitrarily selected by the field geologist from mid depth of the borehole.

Because of the complexity of the site, the Navy has modified the original proposed analytical plan and will analyze all samples using USEPA Methods 8020 and 418.1 (Sites 3 and 16 will use USEPA Method 8010) instead of 10 percent of samples being sent to a laboratory as originally proposed. The site-screening analysis will be conducted at an on-site mobile laboratory equipped to conduct purge and trap extraction, gas chromatograph (GC), and infra-red (IR) analysis. This screening will include benzene, toluene, xylene, ethylbenzene, and total petroleum hydrocarbons. After the sites have been delineated by the site-screening program, the source and plume delineation will be confirmed by the second phase of investigation. During the second phase, or confirmational phase, permanent wells will be installed and groundwater and surface soil samples will be collected for use in the Risk Assessment. This second phase will ensure that the site screening data accurately characterize the site.

Comment 18: Page 7-40. The Navy proposes that a total of 15 surface soil samples, 15 soil borings, and 9 ground water samples will be collected for background samples from three locations. Justification should be provided for such a large number of background samples. EPA recommends that one sample from each media be collected at each location. Therefore, a total of 3 surface soil samples, 3 soil borings, and 3 ground water samples should be collected for background control.

Response: The TMSS was designed as a comprehensive study to establish background ranges for the entire 23,000 acres covered by NAS Cecil Field. The background study will be used as a comparison for all 18 Remedial Investigative Sites; the seven sites currently under investigation and the remaining eleven PSC sites. Because NAS Cecil Field is a very large facility with a variety of media, the Navy believes the number of background samples are justified.

Comment 19: Page 7-42. Five reference or background surface water/sediment locations are proposed for the Ous, EPA recommends that one background sample be collected from each stream of concern, i.e. Yellow Water Creek, Rowell Creek, and Sal Taylor Creek. The Navy describes the locations of surface water/sediment samples that will be collected but does not offer explanation or justification for sample locations. For example, why are 4 samples proposed adjacent to site 5.

Response: The Navy agrees that reference locations for surface water and sediment sampling need to be selected from each stream of concern. Table 7-20, page 7-47, describes the reference locations that have been selected; sampling locations in Yellow Water Creek, Rowell Creek, and Sal Taylor Creek are included.

As discussed in Section 7.5.1 of the TMSS, the rationale for the surface water and sediment sampling proposed is to identify contaminant migration from potential sources of contamination (PSCs) into the watersheds. An understanding of contaminant migration is necessary for the evaluation of potential ecological effects associated with all waste sites within the respective watersheds. Justification for the selected sampling locations is provided by the need to identify which of the sites along a particular watershed is contributing contaminants to that watershed. Toward this objective, sampling locations have been selected (1) upgradient of sites in each watershed (the reference samples), (2) between sites and creeks, (3) in various parts of the creeks, and (4) downgradient of the sites in each watershed.

Four samples have been proposed adjacent to Site 5 because of the presence of polychlorinated biphenyls (PCBs) detected both on the site in soil borings (Table 5-19) and downstream of the site in a sediment sample (Table 5-18). Three of the four proposed locations are downstream of the site. The remaining location proposed for surface water and sediment sampling is west of the perimeter road in an attempt to characterize upstream conditions.

Specific Comments

OU 1, Sites 1 and 2

Some of the proposed locations for additional monitoring wells at sites 1 and 2 appear to be unwarranted. For example, the Navy states (page 704) that a total of six wells will be installed a OU1 to supplement the existing monitoring well network. However, justification for additional monitoring wells has not been provided. Page 7-2, Figure 7-1 illustrates where additional monitoring wells will be installed. Two of the proposed locations appear to be justified. Proposed well location CEF-2-17D is necessary for collection of background ground water samples in the basal portion of the surficial aquifer. Proposed location CEF-1-15S is necessary to delineate the extent of contamination in the surficial aquifer.

Four (4) other proposed locations for ground water monitoring seem inappropriate unless historical ground water data not included in this document indicate additional contaminated ground water in the surficial and secondary artesian aquifers. Based on the ground water data provided by the Navy, proposed wells CEF-2-17DD and CEF-1-12D are not necessary because past ground water samples collected from this aquifer in other locations are 'clean' or below the MCLs for TCL/TAL group of possible contaminants. Also, at both of the locations proposed, the overlying surficial aquifer wells are 'clean' indicating that deeper zones have not been contaminated. Before well CEF-1-14D is installed, monitoring well CEF-1-2D should be sampled. If CEF-1-2D is 'clean', then an additional well at this depth in this locality will not be necessary. If DNAPLs were of concern OU 1, then the additional deep well locations proposed would be warranted. However, only lead, chromium and methylene chloride have exceeded MCLs. Therefore, further investigation of deeper zones, other than from the deep wells that exist, is not necessary. A shallow well, CEF-1-13S, has been proposed south of the site. Before CEF-1-13S is installed, shallow well CEF-1-1S (located off site) should be sampled. If there is a reason this well cannot be sampled, the Navy should explain this in the document. Otherwise this well should be sampled rather than installed CEF-1-13S.

Page 7-7. The Navy states "... ground water samples will be collected from the completed monitoring well network..." Is this the completed monitoring well network includes existing and new well at OU 1?

> Response: A discussion of the selected locations for monitoring well installation is provided. Monitoring wells are proposed (1) to characterize ambient background conditions in the secondary artesian aquifer (CEF-2-17DD), the lower part of the surficial aquifer (CEF-2-17D and CEF-1-12D), and the upper part of the surficial aquifer (CEF-1-13S); (2) to fully complete the groundwater monitoring network for the secondary artesian aquifer and the lower and upper parts of the surficial aquifer; and (3) to assist in the development and evaluation of potentiometric data for the secondary artesian, lower surficial, and shallow surficial aquifer intervals. Monitoring well CEF-1-15S and CEF-1-14D are proposed, as discussed in response to Comment 11, to tighten

the groundwater monitoring network on the western side of Rowell Creek for the purpose of characterizing the nature and extent of contamination (if contamination is present).

The integrity of the previously installed wells was questioned during the first round of field work. Monitoring well CEF-1-2D was not sampled during the first round of field work at OU 1 because of the manner in which the well was constructed. CEF-1-2D is screened from 7.7 feet bls to 37.7 feet bls. The Navy believes that this length of screen (30 feet) positioned in this portion of the surficial aquifer possibly covers more than one horizon within the aquifer, and that the purging of the well (prior to sampling) may induce vertical flow of contaminants within the surficial aquifer, which would not otherwise occur. For these reasons, monitoring wells CEF-1-2D and CEF-2-2 were not sampled during the previous round of groundwater sampling. Additionally, these wells will be considered a part of a facility-wide study designed to locate wells that may require abandonment.

The Navy agrees that monitoring wells CEF-1-1, located beyond the southeast corner of Site 1, should be sampled. Sampling of groundwater from monitoring well CEF-1-1 will be completed during the proposed round of field activities after the integrity of the well has been determined (see Response to Specific Comments for Site 3). Groundwater from this well will be analyzed for the full suite of chemical analyses presented in Table 7-3.

The Navy strongly feels that well CEF-1-13S is very important to groundwater network. FDER requested two additional groundwater monitoring wells be installed at Site 1. One of these additional wells will be located approximately half way between proposed wells CEF-1-12D and CEF-1-13S (Figure 7-1) on the west side of the road that forms the current perimeter of Site 1. This well will be referred to as CEF-1-17S, as it will be screened in the shallow surficial aquifer. The other well will be located in the immediate vicinity of existing monitoring well CEF-1-10S (Figure 5-1) and will be screened at a depth of approximately 20 to 30 feet bls. This well will be referred to as CEF-1-16S (as it is completed in the shallow aquifer). Groundwater from these wells will be analyzed for the full suite of chemical analyses presented in Table 7-3.

Therefore, the completed monitoring well network to be sampled at OU 1 will consist of collecting groundwater samples from the monitoring wells specified in Table 7-3 for the parameters indicated and additional sampling locations as summarized below. Existing monitoring well CEF-1-1 will be sampled to characterize the surficial aquifer in the southeastern part of Site 1. Proposed monitoring wells CEF-1-16S and CEF-1-17 will also be included in the groundwater monitoring network.

OU 2, Sites 3, 4, 5 and 17

Site 3

Page 7-8. Sufficient surface soil samples (11) have been proposed for site 3. However, only 3 sample locations are proposed within the boundary of the site, and these locations are at the site boundary. EPA suggests that 2 or 3 surface soil samples be collected across the center of the site or at stained areas or areas of stressed vegetation on the site.

Monitoring wells CEF-3-1 and CEF-3-2 have not been sampled and are not proposed for sampling during the next round. These wells should be sampled, or an explanation should be provided why they will not or cannot be sampled.

Based on contaminant concentrations detected in well CEF-3-3S and CEF-3-6S, EPA recommends that additional wells be installed that will monitor a deeper interval of the surficial aquifer.

Response: The Navy agrees that additional surface soil samples should be collected at Site 3. A minimum of three additional surface soil samples will be collected in the central part of Site 3 (Figure 7-2). However, no stained soils or stressed vegetation have been observed within this part of Site 3 during any of the site visits or field work. The three additional surface samples will, therefore, be collected from equally spaced locations within the central part of the site as shown on Figure 7-2.

The Navy also believes that, based on the preliminary results of the site-screening program in progress at Site 3, the collection of additional surface soil samples may be warranted to fulfill the objectives of the RI/FS. These additional samples would be collected, if necessary, from areas to the east of Site 3 where subsurface soil-screening data indicate the presence of contaminants in the soil column above the water table. At this time, the total number of additional surface soil samples required cannot be determined with the available information.

Monitoring wells CEF-3-1 and CEF-3-2 were not sampled during the previous round of field work because of questions regarding the integrity of the wells. These questions arise from the construction techniques employed during installation of the wells. Specifically, these wells were installed using a 0.020-inch slot screen. Also, the procedures by which the wells were originally developed and the amount of silting of the wells that has occurred since their installation in '1987 are not known. Finally, monitoring well CEF-3-2 is screened from 10 to 40 feet bls and may intercept more than one hydraulic zone. Purging of this well may induce vertical migration of contaminants that might not otherwise occur. For these reasons, monitoring well CEF-3-2 will not be sampled during the sampling activities currently proposed. Monitoring well CEF-3-1 is screened from 20 to 30 feet bls. Well CEF-3-2 is being considered for abandonment.

The condition of well CEF-3-1 will be evaluated by sounding to determine the amount of silting that has occurred since the well's installation. Depending on the amount of silting that has occurred, the well may be redeveloped to assess the functioning of the well. If the well can be redeveloped and appears to be functioning properly, then a groundwater sample will be collected. The sample from monitoring well CEF-3-1, if collected, will be analyzed for the full suite of chemical parameters shown in Table 7-6.

The Navy agrees that characterization and monitoring of the deeper parts of the surficial aquifer are necessary. Two monitoring wells, CEF-3-12D and CEF-3-13D, are currently proposed (Table 7-6) for this purpose. Additional monitoring wells, completed in the deeper part of the surficial aquifer, will probably be necessary to fully characterize the extent of the contamination in the groundwater at Site 3. However, until completion of the groundwater screening program, currently in progress, and interpretation of the data gathered, the number of wells required and their locations cannot be determined. The justification for the placement of additional wells will be presented to the USEPA at an RPM meeting prior to installation.

Site 4

Page 7-17. The Navy fails to discuss the methodologies, number or locations of soil and ground water sample locations for screening events. The existing soil and ground water sample results for this site show contamination resulting from past waste disposal practices. As such, the soil and groundwater screening should be conducted, regardless of the results of the passive soil gas survey.

EPA recommends the Navy sample, during the next ground water sampling event, the four (4) existing wells that were installed by previous contractors. These wells include 4-1S, 4-2D, 4-3S and 4-4D.

Response: The Navy agrees that soil and groundwater screening should be completed at Site 4. The passive soil gas study was selected as an preliminary step to provide data from the larger area (22 acres) now under consideration at the site (see Response to General Comment 13). Information concerning the next phase of screening at Site 4 will be presented to the USEPA at the next RPM meeting.

Table 7-8 lists the existing monitoring wells at Site 4 that are scheduled for groundwater sampling. Figure 5-12 shows the locations of existing monitoring wells at Site 4. Only monitoring wells installed during the current investigation at Site 4 (CEF-4-1S and CEF-4-2S) have the "S" modifier in their well designation; the Navy assumes that this comment refers to wells located in the eastern part of the site (CEF-4-1, CEF-4-2, CEF-4-3, and CEF-4-4).

Two of the four wells referred to in the comment, CEF-4-1 and CEF-4-3, are already proposed for sampling during the next round of field work as listed on Table 7-8. Existing monitoring well CEF-4-4 has not been proposed for sampling during the next round of field activities because of its construction. CEF-4-4 is screened from 11 to 41 feet bls and may penetrate different hydraulic zones at the site. Purging of this well may induce vertical migration of contaminants that might not otherwise occur.

The last of the four wells referred to in the comment, CEF-4-2, is constructed as an open bedrock well. This indicates that the completion of the well did not include the installation of a screen, filter pack, or bentonite seal. In well CEF-4-2, casing was set to depth of 95 feet bls, below that depth the hole is "open" (i.e., no screen, no sand pack, and no bentonite seal) to a depth of 120 feet. Monitoring well CEF-4-2 was, therefore, not recommended for sampling as Section E.4.3 of the USEPA Region IV Standard Operating Procedures (SOPs) (February 1, 1991) indicates that sampling from a bedrock well of this construction is generally not acceptable for a Superfund site. The Navy will, however, include the well for sampling during the proposed field program to provide additional information on ground water quality at Site 4.

Site 5

EPA recommends the Navy to install a new background well at this site because existing background well 5-7S contained concentrations of lead and chromium at levels above MCLs. EPA recommends the existing wells 5-2D and 5-1D be sampled during the next round of ground water sampling also.

Results from the surface water/sediment sample at location 9 indicates that 4.6 ppb mercury was present in the surface water. This level is above the ambient water quality criteria. Figure 9 of the RI/FS Work Plan indicates that SW/SD 9 was located west of Perimeter Road. Figure 7-8 of the Supplemental Sampling Plan indicates that several surface water/sediment samples will be collected from this tributary, however, none of the sample locations are west of Perimeter Road. EPA recommends the Navy to collect a surface water/sediment sample further upstream than its proposed location.

Response: At least one new background well will be installed to provide for characterization of upgradient conditions at Site 5. The location of a background monitoring station or stations will be determined following the completion of the soil and groundwater screening program. Justification for the placement of background monitoring wells will be provided to the USEPA at a monthly RPM meeting prior to monitoring well installation.

Figure 7-4 of the TMSS shows the locations of surface water and sediment samples to be collected in addition to those shown on Figure 7-8. A sampling station is proposed

on the west side of perimeter road, SW/SD-11, to provide upgradient characterization of this tributary.

OU 7, Site 16

The well locations presented in Figure 7-6 are not the same locations presented in Figure 11 of the RI/FS Work Plan. If needed Figure 7-6 should be revised with the monitoring wells plotted correctly on the figure.

The most important issue to be resolved for the next phase of sampling is the technique for collecting ground water and soil sampling. Measures must be taken to prevent DNAPLs migration to lower zones.

Response: The monitoring well locations shown on Figure 7-6 of the TMSS are correct, based on the results of a survey completed at Site 16 following monitoring well installation.

The Navy agrees that the prevention of DNAPL migration to the lower parts of the aquifer at Site 16 is necessary. Responses to General Comments 1 and 9 outline the measures that will be taken to prevent DNAPL migration and cross contamination of water-bearing units during the execution of the proposed field activities (both screening and confirmation).