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DRAFT NAVY RESPONSE TO COMMENTS FROM SOUTH CAROLINA DEPARTMENT OF
HEALTH AND ENVIRONMENTAL CONTROL FOR DRAFT ZONE E RESOURCE
CONSERVATION AND RECOVERY ACT FACILITY INVESTIGATION RECOVERY CNC
CHARLESTON SC
3/8/1999
NAVFAC SOUTHERN

DRAFT ZONE E RFI REPORT

COMMENTS/RESPONSES

**Response To Comments from Charles B. Watson — SCDHEC
for Draft Zone E RCRA Facility Investigation Report
Charleston Naval Complex**

General Comment

The Zone E RFI submittal uses industrial RBC's as part of the determination of contamination. And in some cases, an inappropriate industrial RBC was referenced. Sampling results need to be compared to residential RBC values. Therefore, it is requested that all sampling results be re-evaluated based upon residential RBC's from the latest EPA Region III RBC Table. In addition, it is requested that comparison be made in the same units as the table. Based upon review of the RFI as submitted, only AOC's 571 and 592 are recommended for NFA classification.

Response to General Comment

The screening of analytical results for Zone E had been previously discussed in Project Team meetings. It was agreed upon by the Project Team, including SCDHEC representatives, that Zone E data be screened using industrial RBCs. This approach was again submitted in the pre-submittal review for the Draft Zone E RFI Report and the Project Team again had a chance to comment and were fine with the approach. Residential and industrial RBCs were used in the risk assessment to select COPCs for the site worker and residential scenarios. Both residential and industrial RBC comparisons are presented in the CPSS tables in the site-specific risk assessments of the Draft Zone E RFI Report. In the final Zone E RFI Report the reader will be referred to the appropriate sections for comparisons to residential RBCs.

Site-Specific Comments and Responses

SWMU 23/63, AOC 540/541/542/543

Comment 1

Page 10.4-1. The report accounts for operations at AOC 541 from 1909 to 1939 and demolition in 1970; however, no information exists for the operation between 1939 and 1970. The Navy should investigate the history of the building.

Response 1

The history of the building will be further investigated and included in the Final Zone E RFI Report.

SWMU 65, AOC 544/546

Comment 2

Page 10.6-33 (Table 10.6.6.2). Lead exceeded industrial soil RBC (1,300 mg/kg) with 3,130 mg/kg. More sampling is required for this area.

Response 2

The sample referred to is a sediment sample collected from a catch basin (storm drain) at AOC 546. The catch basin was cleaned during interim measures conducted by the Environmental Detachment Charleston. Details of the cleaning can be found in the Closure Report for AOC 699 Storm Drain Cleaning prepared on March 8, 1999.

Comment 3

Page 10.6-4, states that since free product was discovered in 065SB006, an additional soil boring (065SB00603) was installed. The location of this boring has not been included on location maps. In soil boring 065SB0063, the soil was described as "fine sand with oily stains in laminations". Analyses were performed but data was not presented. The RFI states that two VOC's, TPH-GRO, and fifteen metals were detected. The data should be presented and a determination made as to the full extent of the impact.

Response 3

The text states "During drilling, free product was noted in soil boring 065SB006, prompting the collection of an additional soil sample (065SB00603)." An additional soil boring was not installed. The last 2 digits of the sample identification refer to the interval at which the sample was collected. The location of soil boring 065SB006 is shown on Figure 10.6.1, the same location from which sample 065SB00603 was collected. Refer to Section 3 of this report for the sample identification system. None of the detected concentrations exceeded their respective SSLs. Analytical results are included in Appendix H of this report. The source of the free product has been identified as a UST, which has been removed and is now part of the UST program. The responsibility of delineating the extent of contamination has fallen under the jurisdiction of the UST program. SCDHEC may want to discuss this site with Mr. Paul Bristol of the Departments UST program.

SWMU 70, AOC548/549

Comment 4

The extent of contamination of the soil around 549SB010 should be fully characterized for lead.

Response 4

The extent of lead contamination has been determined on the east, west, and south sides of 549SB010 with borings 549SB001, 549SB008, 549SB009, and 549SB012. Due to the thickness of the concrete floor and the equipment in place in Building 3 along the northern perimeter of AOC 549, soil samples were not collected in this area. The closest accessible area to the site is approximately 120 feet to the north inside Building 3, which would not have been a representative sample for the site.

SWMU 81

Comment 5

The previous building located at this site had a wooden floor which could have allowed spills to reach soil underneath the building. What determined that the soils underneath the pad and around the pad did not need to be sampled?

Response 5

The less-than-90-day accumulation area was not a building, but a sheltered area with a wooden platform for storing drums and containers. The wooden platform sat on the concrete foundation of the area adjacent to the seawall, thus any spillage would have been onto the concrete, therefore areas of stained concrete were sampled rather than soil. The Final Zone E RFI Report will be clarified to include this information.

SWMU 97

Comment 6

Arsenic, beryllium, and chromium were above residential RBC for surface soil and should be evaluated.

Response 6

Arsenic, beryllium, and chromium were addressed in the site-specific risk assessment which identified the fact that each of these elements were well below their respective background reference concentrations.

SWMU 100

Comment 7

Arsenic and beryllium were above residential RBC for surface soil and should be evaluated.

Response 7

Arsenic and beryllium were addressed in the site-specific risk assessment which identified the fact that each of these elements were well below their respective background reference concentrations.

SWMU 102

Comment 8

The Navy should investigate the level of cleanup conducted in 1969 for the mercury spill. The information should assist with the determination of contamination and exact location of the spill.

Response 8

Intense scrutiny by the Project Team resulted in an expanded investigation of this site. All available records were researched and interviews of former employees were conducted in order to determine where the spill occurred. The area of investigation was expanded several times to cover the entire building area after the initial investigation revealed no source. All results were documented and reviewed by the Project Team for several consecutive months and it was agreed upon by the Team that all investigative efforts had been exhausted. The Final Zone E RFI Report will be revised to reflect the level of effort put forth to investigate this site.

Comment 9

The report indicates that the mercury release was discovered inside the central portion of the building; however, samples 102SB0101 and 102SB011, and 102SB012 (located along southwest edge of building) were sampled for mercury vapor. The navy should sample in locations closer to the approximate release area. Also, the Navy must sample for mercury in the lower soil interval.

Response 9

Mercury vapor samples (see Section 10.14.5) were collected at each of the soil sample locations shown on Figure 10.14.1. Lower-interval soil samples were collected at 39 of the 46 proposed locations. These results are presented in Section 10.14.2.

SWMU 170/171

Comment 10

Aroclor-1260 was detected above the residential RBC in boring 171SB0012 and 171SB0013. The vertical and horizontal extent of contamination should be determined.

Response 10

The area around boring 171SB013 has been delineated vertically and horizontally. Additional upper and lower-interval samples will be collected along the western edge of 171SB012 to complete delineation of Aroclor-1260 at this location.

AOC 525

Comment 11

Arsenic and beryllium were detected above the residential RBC in surface soil. The vertical and horizontal extent of contamination should be determined.

Response 11

Arsenic and beryllium were addressed in the site-specific risk assessment which identified the fact that each of these elements were well below their respective background reference concentrations.

AOC 528

Comment 12

Benzo(a)pyrene equivalents, arsenic, and beryllium were detected above the residential RBC in surface soil and should be evaluated. Sediment samples from 528M0001 exhibited levels of BEQs, pesticides and metals above the residential RBC and should be evaluated.

Response 12

Benzo(a)pyrene equivalents were detected in one sample at a concentration above its residential RBC but well below its industrial RBC. Arsenic and beryllium were detected at concentrations above their respective RBCs but were well below their respective background reference concentrations. The sediment sample from the catch basin did exhibit elevated concentrations of metals, pesticides, and BEQs, however, this catch basin was cleaned during interim measures conducted by the Environmental Detachment Charleston. Details of the cleaning can be found in the Closure Report for AOC 699 Storm Drain Cleaning prepared on March 8, 1999.

AOC 530

Comment 13

The Department recommends adding Lead to the list of Contaminants of Concern in the soils. The report indicates elevated levels in the southwest area. Also, soil borings should be installed closer to the northeast area of AOC 530 if possible.

Response 13

Lead was detected in all 11 surface soil samples, however, the mean detected concentration for AOC 530 was 336 mg/kg, below its residential clean up level, and no sample exceeded the industrial cleanup level of 1,300 mg/kg. Samples were collected from the closest accessible locations adjacent to AOC 530.

AOC 531

Comment 14

Site history reveals the existence of electric transformers and Aroclor-1260 was detected in the first round of soil sampling. The Department therefore recommends the addition of Aroclor-1260 as a Contaminant of Concern.

Response 14

Aroclor-1260 was detected in 2 surface soil samples but each of these were well below their respective industrial RBCs. These samples were collected in locations where the old PCB-containing transformer were located and where the highest concentrations would be detected.

Comment 15

The first round of soil samples were analyzed for VOCs, SVOCs, PCBs, metals, and pH; however, the second round was analyzed for only SVOCs, metals, and pH. The Department recommends that CMS samples include VOCs and PCBs.

Response 15

Additional sampling will be conducted for VOCs and PCBs.

AOC 538/539

Comment 16

Line 12 on page 10.23-2 states "AOC 538 will not include soil samples from 538002 and 538003. The Department does not agree with this exclusion. Please include this information in the revision and also include their locations on the site map.

Response 16

Please refer to Section 10.4.1, Figure 10.4.1, page 10.4-3 in Volume III of this report. Sample locations 542SB002 and 542SB006 for AOC 542 are the same locations which were proposed for sample locations 538SB002 and 538SB003 for AOC 538. Therefore, due to the proximity of these 2 sites, these locations were designated with an AOC 542 identification. Analytical results from these 2 locations were taken into consideration during the interpretation of nature and extent of contamination at AOC 538. The Final Zone E RFI Report will be revised to clarify this statement.

AOC 555

Comment 17

The area of former Building 29 has not been sampled. The Department recommends collection of a minimum of one soil sample for DQO Level III for metals and PCBs.

Response 17

The location of former Building 29 is on the edge of Pier D, an area built on pilings and over water. The only media samples which could be collected were sediment and surface water,

therefore sediment samples were collected. A surface water sample would not have been representative due to the time elapsed since the facility was in service.

AOC 558

Comment 18

An explanation is needed as to why concrete core samples were not collected in the middle of the building.

Response 18

Concrete samples were collected from the concrete pads associated with the switchgear located outside the building to investigate possible releases of dielectric fluid. Wipe samples were collected from the several areas within the transformer vault and included any stained areas inside the building to detect any possible migration pathway of released dielectric fluid.

Comment 19

The Navy should collect soil samples around building 77 for DQO Level III for the standard suite of parameters which includes VOCs, SVOCs, pesticides/PCBs, metals, and cyanides

Response 19

An attempt will be made to collect soil samples from around Building 77 for the standard suite of parameters.

AOC 567

Comment 20

Arsenic, antimony, beryllium, and chromium were detected in soil above their residential RBC values. The vertical and horizontal extent of contamination needs to be determined.

Response 20

Arsenic, beryllium, and chromium were addressed in the site-specific risk assessment which identified the fact that each of these elements were well below their respective background reference concentrations. Antimony was above its residential RBC and background reference concentration, however, it was well below its industrial RBC.

AOC 569/570/578

Comment 21

The site map shows a former building 1199 in the center of AOC 570 but the report did not mention its former existence or usage.

Response 21

Information regarding Building 1199 will be researched and included in the Final Zone E RFI Report.

AOC 580

Comment 22

In the conclusions of the report, lead was noted to be at its highest concentrations along the northern and eastern walls of Building 10. These areas should be investigated thoroughly as part of the RFI.

Response 22

Lead was detected in all 9 surface soil samples, however, the mean concentration for AOC 580 was 314 mg/kg, below its residential clean up level of 400 mg/kg, and no sample exceeded the industrial cleanup level of 1,300 mg/kg. Additional samples will be collected along the northern and eastern edges of Building 10 to assure that the site has been delineated.

AOC 583

Comment 23

N-Nitroso-di-n-propylamine and pentachlorophenol were detected at concentrations above their respective SSLs and should be confirmed by resampling as part of the RFI.

Response 23

Additional sampling will be conducted in the area of 583SB006 to confirm the presence of these 2 compounds and assure that the site has been delineated.

AOC 590

Comment 24

Section 10.43.7 reports "two storm sewer inlets" exists at the AOC. Only one sewer inlet was sampled for the investigation. Please verify the existence or absence of the other inlet. Also, has the Navy performed an interim measure on the sediment to date?

Response 24

Only one storm drain was present at the site during the investigation. It appeared that the other drain had been paved over, therefore a sample could not be collected. The existing catch basin was cleaned during interim measures conducted by the Environmental Detachment Charleston. Details of the cleaning can be found in the Closure Report for AOC 699 Storm Drain Cleaning prepared on March 8, 1999.

Comment 25

On page 10.43-20, the word arsenic has been improperly used in the first paragraph for acetone.

Response 25

This correction will appear in the Final Zone E RFI Report.

AOC 598/599

Comment 26

Soil samples identified exceedances for lead in several areas of AOC 598 and AOC 599. Page 10.47-36 states that "soil samples collected for the AOC 597 RFI define the extent of lead in soil to the north of sample location 598SB005, it is unclear whether the extent has been adequately defined to the west of sample location 598SB005". The Department recommends additional boreholes in the western area. Also, additional boreholes should be located near the center of AOC 598.

Response 26

Additional samples will be collected in the area west of 598SB005 to assure that the site has been delineated.

AOC 602

Comment 27

Soil boring 602SB004 exhibited detections of Aroclor 1254 and Aroclor 1260 above residential RBC values. The surface soil around 602SB004 should therefore be investigated for PCB.

Response 27

Additional samples will be collected in the area around 602SB004 to assure that the site has been delineated.

**Responses To Comments from Eric F. Cathcart — SCDHEC
for Draft Zone E RCRA Facility Investigation Report
Charleston Naval Complex**

General Comments

Comment 1

Soil and groundwater sample blanks for several areas of investigation contained detectable contaminants. These detections were noted in the volatile, semivolatile, and metals methods.

In accordance with the Environmental Protection Agency, *Standard Operating Procedures* for sample collection, trace contaminants in field, trip, equipment, and distilled water blanks may indicate a problem with either decontamination procedures and/or cross contamination of samples during collection or transport. The RFI report should fully explain the existence of trace contaminants in blanks. Please revise the text to include this/these explanation(s).

Response 1

The Navy agrees with SCDHEC's statement that trace contaminants in field, trip, equipment, and distilled water blanks may indicate a problem with either decontamination procedures and/or cross contamination of samples during collection or transport. Every effort has been made to reduce cross contamination at CNC in order to eliminate possible COPCs. As part of the RFI process at CNC all Level III and IV data collected went through independent data validation. According to EPA guidelines, blank contamination is allowed to be above certain levels, described in detail in Section 4 of the Zone E RFI Report. If consistent detections occur that would indicate a chronic problem, it enables the Navy to correct the problem. Sporadic detections which are not indicative of chronic problems enable the Navy to use this information in an appropriate validation. Section 4 will be revised in the Final RFI Report to include all contaminants found in the blanks to date, but attempting to fully explain the existence of trace contaminants in each blank would involve speculation which would serve little purpose.

Comment 2

The RFI report should include groundwater maps specific to the SWMU and/or AOC. The groundwater maps should ideally represent each quarter of groundwater levels collected.

Response 2

Quarterly water level measurements have been collected and will be reviewed. Site-specific sample location figures will be revised to include average groundwater flow directions in the Final Zone E RFI Report, based on the average flow direction over four quarters. Zone-wide contour maps will also be provided for each of the quarterly groundwater monitoring events.

Comment 3

The report should also integrate the grid well locations and data into the standard SWMU or AOC well networks. The Navy should avoid overlooking the data from adjoining grid wells while investigating a site.

Response 3

Data from adjoining grid wells will be reviewed and included in the zone-wide contour maps and in the site-specific figures.

Site-Specific Comments

SWMU 5,18, AOC 605

Comment 4

Page 10.1-39 (line 10) Data from the first quarter sampling event were used to assess groundwater exposure pathways. It would be useful to use data from other quarterly sampling events. The navy should explain the exclusive use of first quarter data.

Response 4

The point is well founded, however, considering that the project as a whole was on a “fast track” and due to the vast amount of data going into the report, only the first quarter of validated groundwater data was used to assess the exposure pathway. Nonetheless, all four quarters of validated groundwater data were reviewed and taken into consideration prior to the submittal of the report. If any significant changes occurred in subsequent quarterly sampling events, these changes were considered and are reflected in the risk assessment summaries, the recommendations, and conclusions. Groundwater summary tables providing results from all quarterly sampling events are provided in Appendix H, part 1 of the draft report. All results, including the data qualifiers and non-detections for validated data will be provided Appendix H, part 2, in the Final Zone E RFI Report.

SWMU 21/54

Comment 5

Page 10.2-50 The report states that “combined SWMU 21 monitoring wells are no longer usable following interim measures removal actions.” Have replacement wells been installed to date? If so, the Navy should update the site map with the new well locations. If replacement wells have not been installed, the Navy should inform the Department of plans for monitoring the site.

Response 5

Prior to the interim action, metals detections in groundwater were sporadic and generally less than MCLs. These wells were not replaced after the detachment conducted the soil removal, because the source of contamination was eliminated. Discussions are ongoing pertaining to the widespread presence of inorganics in groundwater and how to interpret the significance of that data. A technical memo was submitted to the Project Team to review several months ago and it was briefly discussed at a meeting with SCDHEC in June. At that meeting SCDHEC indicated their review of the memo was not complete and that further discussion should be deferred until that review was complete. There are no plans to re-install monitoring wells at this site.

SWMU 22/25, AOC 554

Comment 6

Figure 10.3.2 should be followed by a groundwater contour map representing each quarter of groundwater level data.

Response 6

Please see response to comment 2.

SWMU 23/63, AOC 540/541/542/543

Comment 7

Figure 10.4.2 should be followed by a groundwater contour map representing each quarter of groundwater level data.

Response 7

Please see response to comment 2.

Comment 8

Page 10.4-26 Please indicate the “evaluated migration pathways”.

Response 8

Please see page 10.4-22, lines 16 and 17.

SWMU 65, AOC 544/546

Comment 9

Free product was reported in 065SB006. The Navy needs to locate the source of the free product. The utility map seems to identify a likely pathway for free product to travel very near the soil boring. Page 10.6.1, states that “until 1974, spent pickling bath solution was discharged via the storm drain into the Cooper River.” More assessment should be performed around storm drain system.

Response 9

The source of the free product has been identified as a UST, which has been removed and is now part of the UST program. The responsibility of delineating the extent of contamination has fallen under the jurisdiction of the UST program. SCDHEC may want to discuss this site with Mr. Paul Bristol of the Departments UST program.

Comment 10

Deep well (NBCE06504D) reported a TCE value of 8.00 ug/L (MCL=5 ug/L) and vinyl chloride value of 6.00 ug/L (MCL=2.0 ug/L). DCE was also detected, but below the MCL. The horizontal and vertical extent of organics in the lower aquifer should be determined.

Response 10

Organics were also detected in elevated concentrations in shallow groundwater. Prior to the installation of additional shallow wells, the UST program will be consulted to determine if they have already installed additional shallow wells in response to the previous comment #9. Additional deep monitoring wells will be installed in the area around SWMU 65 for further delineation of these contaminants.

Comment 11

Shallow wells have exceedances for MCL of metals. Additional deep wells should be installed to adequately delineate the vertical extent of contamination in the deep aquifer. In addition to the installation of additional deep wells, both shallow wells and existing deep wells should be resampled to monitor the concentrations of metals.

Response 11

Discussions are ongoing pertaining to the widespread presence of inorganics in groundwater and how to interpret the significance of that data. A technical memo was submitted to the Project Team to review several months ago and it was briefly discussed at a meeting with SCDHEC in June. At that meeting SCDHEC indicated their review of the memo was not complete and that further discussion should be deferred until that review was complete. Deep and shallow groundwater at this site have been recommended for CMS and long-term monitoring.

SWMU 70, AOC 548/549

Comment 12

Chromium was detected in extremely high amounts in NBCE07001D at 52,500 ug/L, exceeding the MCL of 100 ug/L. The Navy should present the percentage of the Chromium detected in the hexavalent form?

Response 12

Discussions are ongoing pertaining to the widespread presence of inorganics in groundwater and how to interpret the significance of that data. A technical memo was submitted to the Project Team to review several months ago and it was briefly discussed at a meeting with SCDHEC in June. At that meeting SCDHEC indicated their review of the memo was not complete and that further discussion should be deferred until that review was complete. In

that memo it was noted that an additional sample was collected at this well NBCE07001D using a low flow method and the level of chromium dropped an order of magnitude. NBCE07001D will be resampled and analyzed for hexavalent chromium and results will be provided in the Final Zone E RFI Report.

Comment 13

Page 10.8-19 (line 11) states “No MCL has been established for chlorobenzene”. The Department has informed the Navy in previous reviews that an MCL of 100 ug/L has been established for Monochlorobenzene. The report should be revised to reflect the proper information.

Response 13

The Final Zone E RFI Report will be revised to reflect this information.

Comment 14

The report indicates that shallow wells NBCE070002 and NBCE549003 had pH values of 1.82 and 2.27 respectively. Since the materials of concern lists acids the Department is concerned about this pH. The Navy has failed to define the horizontal and vertical extent of the acidic conditions in the shallow aquifer. The Navy should resample the wells and consider the installation of additional wells if the exceedances continue.

Response 14

As a result of this comment, the Navy has researched the pH discrepancy and has determined the following. Results from shallow wells NBCE070002 and NBCE549003 indicated a very low pH and results from deep well NBCE07001D, at the same site and analyzed during the same quarterly sampling event, indicated a very high pH. Based on field measurements recorded in a legal binding log book, the pH results collected from these same wells, during the same quarterly sampling event, and in the subsequent rounds of sampling, indicated very different results. The field notes indicated the pH measurement of all shallow and deep wells at this site ranged from 5 to slightly greater than 7, during each quarterly sampling event. Based on field notes, and the fact that there was such a wide contrast in pH results provided by the laboratory, it appears the laboratory errantly analyzed for pH out of sample containers which had previously been preserved for metals with nitric acid and for cyanide with sodium hydroxide, rather than from unpreserved samples. Wells at this site will continue to be monitored in the future, including for pH, which will be measured in the field to confirm this determination.

Comment 15

The report indicates that deep well NBCE07001 had a pH value of 13.10. The Navy has failed to define the horizontal and vertical extent of the basic conditions in the deep aquifer. The Navy should resample the well and consider the installation of additional wells if the exceedances continue.

Response 15

The well referenced is actually NBCE07001D, which will continue to be monitored and the pH measured. Please see response to comment 14.

Comment 16

Page 10.8-27 The second paragraph refers to a groundwater flow divide called anomaly A, as discussed in Section 2.3.2. Mr. Paul Bergstrand has informed me that the suspected cause of this anomaly, the storm drain line, has been repaired. The potential effects to the overall flow of the groundwater in this area may be significant. The Navy should re-evaluate the groundwater flow direction using a minimum of four quarters of new water level data. This data should be included in the revised RFI report.

Response 16

This comment suggest that the Navy delay submittal of the report for one year while four quarters of water level measurements are collected. This is not practical. Groundwater levels have been measured for four continuous quarters and will be evaluated. One additional round of measurements will be collected and evaluated along with the previous data and new groundwater contour maps will be submitted in the Final Zone E RFI Report.

Comment 17

Page 10.8-47 "Suggestion that a localized Chromium plume exists in the area of SWMU 25 and SWMU 70." The Navy should provide a groundwater map and an isoconcentration map to assist in the horizontal and vertical determination of contamination migration.

Response 17

A piezometric map and isoconcentration map will be provided in the Final Zone E RFI Report. Color-coded concentration maps provided in Appendix K will also assist in determining the extent of chromium contamination.

SWMU 83/84, AOC 574

Comment 18

The upper interval soil boring 083SB010 (1,400 mg/kg) exceeded the lead industrial RBC of 1,300 mg/kg and the lead background RC of 265 mg/kg. The RFI states that a soil cleanup/screening level for lead of 1,300 mg/kg was calculated for the Zone H RFI using the

Adult Lead Model. The RFI states that only one surface soil sample exceeded this limit; however, the mean surface soil concentration for combined SWMU 83 is 231 mg/kg and falls below the USEPA both child and adult cleanup/screening levels. The Navy has calculated the mean lead value and has therefore concluded no further action. The Department recommends that the Navy install additional sampling points of the area surrounding 083SB010. The horizontal and vertical extent of the lead contamination should be determined. In summary, the Department does not accept that localized elevations of lead should be diluted with analytical values from surrounding sample points that may be below detection limits.

Response 18

As shown on Figure 10.10.11, the horizontal extent has been defined to the east by 083SB001, to the west by 084SB001, and to the south by 083SB009. An additional soil boring will be installed to delineate the northern edge.

Comment 19

Data reveals that Arsenic may be a key COC at this area for both the soils and the groundwater. The Department agrees with the Navy's recommendation for CMS. The Department would also recommend the formation of an isoconcentration map and integration of potential sensitive receptors that may mobilize contaminants.

Response 19

Arsenic was identified as a COC in both soil and deep and shallow groundwater, which have been recommended for CMS at this site. The site will undergo further evaluation during the CMS, at which time the proper alternative for remediation will be selected. Isoconcentration maps will also be included in the Final Zone E RFI Report. The Navy does not understand the comment "integration of potential sensitive receptors that may mobilize contaminants", therefore a response cannot be submitted.

Comment 20

Groundwater data reports that Thallium was detected at levels above the MCL (.002mg/l) for four wells during the second, third, and fourth quarters of groundwater sampling. The horizontal and vertical extent of thallium concentrations in the area must be determined.

Response 20

A significant number of wells throughout Zone E have shown Thallium concentrations exceeding its MCL of 2 $\mu\text{g/L}$ and its Tap Water RBC of 2.9 $\mu\text{g/L}$. Discussions are ongoing pertaining to the widespread presence of inorganics in groundwater and how to interpret the significance of that data. A technical memo was submitted to the Project Team to review several months ago and it was briefly discussed at a meeting with SCDHEC in June. At that meeting SCDHEC indicated their review of the memo was not complete and that further discussion should be deferred until that review was complete.

Comment 21

Page 10.6-42 States that "PAHs are not of concern because most chemicals from group are not particularly mobile in soil or groundwater." The Department does not agree with this comment and recommends delineating the horizontal and vertical extent of PAHs in the area.

Response 21

In accordance with carcinogenic polynuclear aromatic hydrocarbon (cPAH) guidance, BEQs were calculated for cPAHs at this site. At issue seems to be whether or not it would be feasible to continue sampling when constituents are so wide-spread and samples have already been collected from all across the zone. Due to the high number of potential point sources close to one another and the shallow depth of groundwater, contribution of contaminants may or may not be attributable to any one site or source. The majority of second round soil sampling was conducted on the basis of arsenic and BEQs detected in the initial round of sampling and for the purpose of determining whether or not these constituents were wide-spread across Zone E. Results of second round sampling indicate that BEQ is wide-spread across Zone E, as well as NAVBASE Charleston in general, and the feasibility of additional sampling is questionable.

Comment 22

Figure 10.6.7, Well #6 is listed as No COPCs detected, yet free product has been reported for this well. The figure should be revised.

Response 22

The figure will be revised to include the SVOCs detected in the free product sample collected at NBCE065006. The figure will be included in the Final Zone E RFI Report after the risk has been re-calculated.

SWMU 87/172, AOC 564

Comment 23

Page 10.11-16, The first paragraph states “No MCL has been established for chlorobenzene”. The Department has informed the Navy in previous reviews that an MCL of 100 ug/L has been established for Monochlorobenzene. The report should be revised to reflect the proper information.

Response 23

The Final Zone E RFI Report will be revised to reflect this information.

SWMU 97

Comment 24

Antimony and arsenic were above residential RBC for shallow groundwater. Their nature and extent should be evaluated. The RFI is therefore incomplete.

Response 24

Antimony, although considered a COPC, was reported only in the original first-quarter sample and was not reported at a concentration above a detectable limit during the second, third, or fourth quarters of sampling. Arsenic was detected in concentrations greater than its corresponding background reference concentration only in the first two quarterly sampling events. However, the last two sampling events yielded concentrations less than the reference concentration and/or detection limit. A comparison of the maximum reported concentrations of antimony and arsenic at nearby wells indicates that antimony was not detected in any groundwater samples, and arsenic did not exceed its reference concentration. All arsenic detections were less than the maximum reported concentration of 31.5 mg/L at SWMU 97.

Neither antimony nor arsenic exceeded their respective MCLs, therefore it appears that the risk and hazard posed by antimony and arsenic have been overestimated. Discussions are ongoing pertaining to the widespread presence of inorganics in groundwater and how to interpret the significance of that data. A technical memo was submitted to the Project Team to review several months ago and it was briefly discussed at a meeting with SCDHEC in June.

At that meeting SCDHEC indicated their review of the memo was not complete and that further discussion should be deferred until that review was complete.

SWMU 100

Comment 25

Arsenic was above residential RBC for shallow groundwater. The nature and extent should be evaluated. The RFI is therefore incomplete.

Response 25

Arsenic was detected at concentrations exceeding its corresponding background reference concentration in the first two quarterly sampling events only. It did not exceed its reference concentration in the last two quarterly sampling events and did not exceed its MCL in any sampling event. Therefore it appears that the risk and hazard posed by arsenic have been overestimated. Discussions are ongoing pertaining to the widespread presence of inorganics in groundwater and how to interpret the significance of that data. A technical memo was submitted to the Project Team to review several months ago and it was briefly discussed at a meeting with SCDHEC in June. At that meeting SCDHEC indicated their review of the memo was not complete and that further discussion should be deferred until that review was complete.

SWMU 102

Comment 26

Page 10.14-13. Line 11 states "Gasoline (TPH-GRO) was detected." Additional samples should be collected in the effected well for petroleum constituents.

Response 26

TPH, as a single component, was not considered a COPC for two reasons: 1) the TPH analysis was used as a screening tool for subsequent specific analysis; and 2) because TPH did not have an RBC value specifically assigned to it. But because TPH is composed of numerous organic compounds, commonly called surrogate compounds, the toxicity of TPH can be evaluated when reviewing VOC and SVOC data. The SCDHEC Risk-Based Corrective Action For Petroleum Releases document (June 1995) has identified certain VOCs and SVOCs (Table 8; RBSLs for Ingestion or Dermal Contact with Surficial Soil) found in TPH which pose a toxicity risk. Specifically to Section 10.14.2, four of the SVOC compounds were identified as exceeding their respective RBC values. After evaluating the results, calculating the BEQs, and going through the toxicity assessment, BEQs were identified as both a Human Health Risk COPC and as a COC at SWMU 102 for surficial soil. BEQs were identified as needing further evaluation as part of the CMS process. Please refer to the memorandum attached to the Zone C CMS Work Plan entitled "Use of TPH and TIC Analytical Results for RFI Evaluation at CNC." The Navy feels that the specific components of TPH and their subsequent evaluation of them have been adequately addressed in the RFI report, therefore, no additional samples will be collected for TPH.

Comment 27

Soil data for Arsenic on page 10.14-14 should be summarized in an isoconcentration map.

Response 27

There appears to be a sufficient number of sample points at this particular site, therefore, isoconcentration maps for arsenic will be presented in the Final Zone E RFI Report.

Comment 28

The reason for the particular well locations is not clear. The current locations may not be monitoring the area of mercury release. The Department recommends installation of additional wells.

Response 28

The Navy will collect additional soil samples at several locations which exceeded generic SSLs. These samples will be analyzed for the constituents which exceeded their respective SSLs according to the Synthetic Precipitation Leaching Procedure (SPLP), and for TOC content. Results will be reviewed and the need for additional monitoring wells will be determined.

Comment 29

Page 10.14-20 states “the current soil-groundwater equilibrium is protective of the surficial aquifer.” The location of the well is not specific to the location of the contaminant. The Department recommends placing a well in the area of the maximum reported concentration.

Response 29

Please see response to Comment 28.

Comment 30

Page 10.14-23. The Navy has installed an inadequate number of wells to support the statement, “the current distribution of mercury concentration in soil appears to be protective of groundwater at the site”.

Response 30

Please see response to Comment 28.

Comment 31

Page 10.14-36. Were the sample depths for 102CB004 and 102SB041 the same?

Response 31

Yes, surface soil samples were collected from the 0- to 1-foot interval at each location.

Comment 32

The investigation of Dry Dock #3 would benefit greatly through the collection of a sediment sample from the drain. The Navy should collect a sediment sample if possible.

Response 32

A representative sediment sample will be collected from the drain of Dry Dock #3, if possible.

Comment 33

Section 10.15.3 states that existing grid wells NBCEGDE03D and NBCEGDE03 will be used rather than installing additional wells; however, no data from the wells exists in the report. Please provide.

Response 33

Soil and groundwater analytical results which exhibited concentrations exceeding reference concentrations, RBCs, and MCLs in these grid wells, are presented the nature and extent writeups in Section 10.50. Soil and groundwater results for all grid wells can be found in Appendix H, part 1 of the draft report. The Final Zone E RFI Report will be amended to include the results for grid wells NBCEGDE003 and 03D in Section 10.15.

Comment 34

Aerial photographs reveal the existence of relict tidal creeks in the area of Dry Dock #3 trending from the Cooper River to the southwest. The Department therefore recommends the installation of one well pair along the southwest border of Dry Dock #3. High soil contaminant values at 603SB003 supports a well in this area.

Response 34

Grid well pair NBCEGDE001/01D are located to the south of Dry Dock #3, but are approximately 200 feet from the southwest edge. The Navy will collect additional soil samples at several locations which exceeded generic SSLs. These samples will be analyzed for the constituents which exceeded their respective SSLs according to the Synthetic Precipitation Leaching Procedure (SPLP), and for TOC content. Results will be reviewed and additional monitoring wells will be installed in this area, if necessary.

Comment 35

Section 10.15.5.1 Four organic compounds were detected in 106SB003. The report states that “none of the four compounds was detected in groundwater samples, indicating that the current soil-groundwater equilibrium is sufficiently protective of the surficial aquifer.” The Department disagrees. Soil boring 106SB003 is located more than 200 feet from well NBCE10601 and will not support this statement. The Department therefore recommends the installation of an additional well directly next to soil boring 106SB003.

Response 35

The Navy will collect additional soil samples at several locations which exceeded generic SSLs. These samples will be analyzed for the constituents which exceeded their respective SSLs according to the Synthetic Precipitation Leaching Procedure (SPLP), and for TOC content. Results will be reviewed and additional monitoring wells will be installed in this area, if necessary.

Comment 36

Figure 10.15.6 did not include grid wells NBCEGDE03 and NBCEGDE03D. Please revise.

Response 36

Figure 10.15.6 will be revised to include both grid well pairs NBCEGDE003/03D and NBCEGDE001/01D. These will be included in the Final Zone E RFI Report.

AOC 525

Comment 37

Manganese was detected above the residential RBC in shallow groundwater. The nature and extent should be evaluated. The RFI is therefore incomplete.

Response 37

While it's true that manganese was detected at a concentration (905 $\mu\text{g/L}$) exceeding its tap water RBC, this detection was well below its background reference concentration of 2,560 $\mu\text{g/L}$.

AOC 530

Comment 38

The RFI report identifies Thallium as "detected in third quarter samples collected from all four monitoring wells at concentrations above its MCL". The Department understands that Thallium exceedances will be addressed in a base wide study.

Response 38

A significant number of wells throughout Zone E have shown Thallium concentrations exceeding its MCL of 2 $\mu\text{g/L}$ and its Tap Water RBC of 2.9 $\mu\text{g/L}$. Discussions are ongoing pertaining to the widespread presence of inorganics in groundwater and how to interpret the significance of that data. A technical memo was submitted to the Project Team to review several months ago and it was briefly discussed at a meeting with SCDHEC in June. At that meeting SCDHEC indicated their review of the memo was not complete and that further discussion should be deferred until that review was complete.

Comment 39

The report states on page 10.21-3 that sample data from 531SB001 will be incorporated in the AOC 530 investigation “due to their close proximity” with AOC 531. Figures should be revised to show the location of 531SB001.

Response 39

Figures in Section 10.21 will be revised to include soil boring 531SB001 in the Final Zone E RFI Report.

AOC 531

Comment 40

The report states on page 10.22-3 that sample data from 530SB006 will be used in the AOC 531 investigation “due to their close proximity” with AOC 530. Figures should be revised to show the location of 530SB006.

Response 40

Figures in Section 10.22 will be revised to include soil boring 530SB006 in the Final Zone E RFI Report.

Comment 41

The report notes that “a 1986 UST Registration document reports the presence of a 20,000-gallon fuel oil tank”. Has the UST and associated piping been removed? The location of the UST should be indicated on the figure.

Response 41

The Navy was unable to verify whether the UST had been removed prior to and during the implementation of field work. The presence of the UST will be researched and verified and the location will be provided in the Final Zone E RFI Report.

Comment 42

The second and third paragraphs on page 10.22-25 make reference to AOC 530 instead of AOC 531. Please make the necessary revisions.

Response 42

The revisions will be made and provided in the Final Zone E RFI Report.

AOC 538/539

Comment 43

The first paragraph on page 10.23-1 makes note of a “quench oil tank”. Please describe the tank and its’ function (ie., size, capacity, leak detection system). The sampling parameters should be evaluated to determine if they can detect a release from the tank.

Response 43

The dimensions of the tank are not known but it was used a dip tank for cooling hot steel and it did not have a leak detection system. Sample locations were placed in areas surrounding the tank. The analytical parameters for samples at this site included VOCs and SVOCs, which would have detected a wide range of materials stored, including petroleum-based oils.

Comment 44

Line 19 on page 10.23-10 states “One shallow well proposed for AOC 538 was identified as an AOC 542 monitoring well (NBCE542002)” and was therefore not included in this section. The Department does not agree with this exclusion. Please include the information from well NBCE542002 in the revisions and also include the location on the site map.

Response 44

Analytical results from this well were taken into consideration when evaluating the nature and extent of constituents at AOC 538. The analytical results from well NBCE542002, along with its location will be provided in this section of the Final Zone E RFI Report.

Comment 45

During a site visit on May 13, 1999, Department personnel noted the existence of a monitoring well in the area east of AOC 538. The Department recognizes the benefits to data collected in this area and the absence of such in this RFI section. Please include the data from this well and locate the well on Figure 10.23.2.

Response 45

This is the same monitoring well (NBCE542002) referred to in Comment 44. Please see the response to Comment 44.

AOC 550

Comment 46

Section 10.24.3 notes that one well was omitted from installation “due to the close proximity of the grid-based deep and shallow well pair”. The Department agrees with these revisions; however, the report does not include data from the grid-based shallow well (NBCEGDE022).

Response 46

Analytical results from this shallow well were taken into consideration when evaluating the nature and extent of constituents at AOC 550. The analytical results from well NBCEGDE022, along with its location, will be provided in this section of the Final Zone E RFI Report.

AOC 551

Comment 47

Grid wells around AOC 551 have revealed elevated levels for tetrachloroethene, chlorobenzene, dichloroethylene, and trichloroethene in past sampling events. This data should be included in the RFI report. Also, the local groundwater flow regime has not been fully represented. The Department recommends collection of a minimum of four consecutive quarters of groundwater data and the production of associated flow maps. The Navy has not successfully delineated the nature and extent of the contamination at the area.

Response 47

Grid well NBCEGDE17D indicated detectable concentrations of several of the constituents mentioned, however, these constituents did not exceed their respective MCLs in groundwater samples collected at AOC 551. The Navy has delineated the nature of contamination in this area, however, in order to define the extent of contamination, the installation of several additional monitoring wells to the north and west of AOC 551 and grid well NBCEGDE17D may be required. These particular constituents have been identified at elevated concentrations at several sites and in grid wells throughout the northern portion of Zone E. Analytical results from this area will be evaluated and additional well locations determined. Please refer to responses to comments 2 and 16, regarding groundwater flow maps. Also, please refer to Appendix H, part 1 for summarized results of each quarterly sampling event.

AOC 555

Comment 48

Sediment samples from the Cooper River revealed eight metals above their sediment screening values. Additional samples should be collected to confirm the presence or absence of these metals.

Response 48

The intent was to sample point sources to determine the presence of contaminants. These results will be addressed in the Zone J RFI for evaluation of the overall significance.

AOC 559/560/561

Comment 49

The amount of contaminant detections in this area are overwhelming and should be summarized in map form with isoconcentration maps.

Response 49

Isoconcentration maps will be included in the Final Zone E RFI Report.

Comment 50

Data presented in the report indicates the need for additional wells to fully characterize the nature and extent of contamination. One area in particular is between building 391 and 32.

Response 50

Grid well pair NBCEGDE014/14D is located in the area between Buildings 391 and 32. Analytical results from this well pair will be included in this section of the Final Zone E RFI Report.

Comment 51

Page 10.29-24, the third paragraph states "No MCL has been established for chlorobenzene".

The Department has informed the Navy in previous reviews that an MCL of 100 ug/L has been established for Monochlorobenzene. The report should be revised to reflect the proper information.

Response 51

The Final Zone E RFI Report will be revised to reflect this information.

Comment 52

The last sentence in the second paragraph on page 10.29-30 lists the organics that are commonly found in dielectric fluid. The paragraph should be revised to include N-nitroso-methylethylamine. This compound may be used in condensers to increase dielectric constant.

Response 52

The sentence refers only to these organics detected in shallow groundwater which are also commonly found in dielectric fluid. It is not a list of all organics commonly found in dielectric fluid, only those detected in shallow groundwater at the site. N-Nitroso-methylethylamine was detected in soil at the site, but not in shallow groundwater.

Comment 53

Section 10.29.8.2 COPC Identification should be revised to include the following compounds as COPCs: Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(a)pyrene, Dibenz(a,h)anthracene, and Indeno(1,2,3-cd)pyrene.

Response 53

Because these are polynuclear aromatic hydrocarbons (PAHs), they are included in the COPC list as benzo(a)pyrene equivalents (BEQs), a sum of PAHs detected in the samples.

AOC 563

Comment 54

Trichloroethene in shallow groundwater at AOC 563 has not been fully delineated both horizontally or vertically. Additional groundwater samples should be proposed.

Response 54

The Navy recognizes the TCE problem in shallow groundwater at this site. However, analytical results for shallow monitoring wells to the west at AOCs 569 and 570 do not indicate significant concentrations of TCE. Also, results from shallow wells to the south at AOCs 572 and 573 and from wells to the east at SWMUs 83, 84 and AOC 574 do not indicate elevated concentrations of TCE. Elevated concentrations of TCE have been detected in deep groundwater to the west at AOC 570 (NBCE57003D), consistently exceeding its MCL, but as previously mentioned, this particular constituent has been identified at elevated concentrations at several sites and in deep grid wells throughout the northern portion of Zone E. Analytical results from this area will be evaluated and the Navy will discuss additional well locations with the Project Team.

Comment 55

The first sentence in the third paragraph on page 10.31-18 should be revised. 1,2-Dichloroethene (total) was also detected in shallow groundwater at a concentration exceeding its corresponding tap water RBC.

Response 55

This sentence will be revised to include 1,2-Dichloroethene in the Final Zone E RFI Report.

AOC 566

Comment 56

Thallium was detected in the fourth quarter groundwater sample collected from well NBCE566001 at a concentration of 5.8 ug/L, which is above its MCL of 2 ug/L. The Department therefore recommends adding thallium to the list of contaminants of concern for the shallow well.

Response 56

A significant number of wells throughout Zone E have shown Thallium concentrations exceeding its MCL of 2 µg/L and its Tap Water RBC of 2.9 µg/L. Discussions are ongoing pertaining to the widespread presence of inorganics in groundwater and how to interpret the significance of that data. A technical memo was submitted to the Project Team to review several months ago and it was briefly discussed at a meeting with SCDHEC in June. At that meeting SCDHEC indicated their review of the memo was not complete and that further discussion should be deferred until that review was complete. Analytical results from this area will be evaluated and the Navy will discuss additional well locations with the Project Team.

AOC 569/570/578

Comment 57

The data presented in this section should be presented in an isoconcentration map form whenever possible. At this time, the Department is unable to determine if the extent of contamination has been fully characterized.

Response 57

Isoconcentration maps will be provided in the Final Zone E RFI Report.

Comment 58

The Department recommends the installation of additional groundwater points from areas around the existing well network in an effort to determine the vertical and horizontal extent.

Response 58

Grid-based well pair NBCEGDE030/30D are located to the west of the site and indicated no significant VOC or metals contamination. Additional monitoring wells will be placed to the northwest, south, and southwest of the site to help determine the extent of contaminants.

Comment 59

On page 10.34-24, the report indicates that “the elevated aluminum concentration in the sample from well NBCE570002 indicates that suspended clay particles affected the analytical results”. The Navy may opt to collect future samples as filtered versus non-filtered in an attempt to validate this statement.

Response 59

As part of the ongoing evaluation of inorganics in groundwater, the Navy will continue to collect samples using the “low flow” method, which appears to have eliminated the need for filtered samples. Samples are also being analyzed for TSS. If turbidity appears to persist, samples will be filtered.

AOC 573

Comment 60

Information contained in the Zone E RFI Presubmittal review for AOC 573 states that the site has been recommended for interim measures for the removal of sediment from the catch basins based on results of the sediment samples. If the sediment removal has been performed, confirmatory samples should be collected and reported to evaluate post-interim measure conditions and understanding residual contamination, if any, left in place.

Response 60

The catch basin was cleaned during interim measures conducted by the Environmental Detachment Charleston. Cleaning removed all sediment from the catch basin, therefore, there is nothing left to sample for confirmation. Details of the cleaning can be found in the Closure Report for AOC 699 Storm Drain Cleaning prepared on March 8, 1999. These results will be summarized in the Final Zone E RFI Report.

AOC 576

Comment 61

Organic compounds detected in first quarter groundwater samples from the deep well include 1,2-Dichloroethene (total). This compound may be a degradation product of trichloroethylene or tetrachloroethane. This RFI has not defined the horizontal or vertical extent of this contaminant. It has also failed to reveal the source.

Response 61

1,2-Dichloroethene was detected in monitoring well NBCE57602D. However, concentrations were below its RBC and MCL and the detection was not confirmed by nearby grid well NBCEGDE13D. Based on review of data from surrounding deep monitoring wells, the Navy feels it has delineated the extent of DCE contamination in this area. TCE and PCE have been identified in elevated concentrations in deep groundwater at several sites and grid wells throughout the northern portion of Zone E, therefore, DCE could very well be from the degradation of TCE and/or PCE. Due to the high number of potential point sources close to one another, contribution of contaminants may not be site-attributable. Analytical results from this area will be evaluated and the Navy will discuss additional well locations with the Project Team.

Comment 62

Organic compounds detected in first quarter groundwater samples from the shallow wells include pentachlorophenol above the MCL. Pentachlorophenol is a compound that is commonly used in the manufacturing of insecticides, algicides, herbicides, fungicides, and

bactericides; wood preservatives. Soil data does not include pentachlorophenol or bromodichloromethane. The Department recommends the collection of additional soil samples to include these parameters.

Response 62

Soil samples collected from soil borings installed at the locations of shallow monitoring wells were analyzed for SVOCs, and thus would have indicated pentachlorophenol and bromodichloromethane had they been detected. There were no detections of either of these compounds in soil.

AOC 580

Comment 63

Figure 10.40.6 which illustrates the distribution of lead in surface soil could be presented in an isoconcentration map to better understand the distribution of the contaminant. At this time, the Department is unable to determine if the extent of contamination has been fully characterized

Response 63

An isoconcentration map will be provided for lead distribution at AOC 580 in the Final Zone E RFI Report.

AOC 583

Comment 64

The following SVOCs exceeded their industrial RBCs in the lower soil interval in addition to Benzo(a)pyrene and chrysene:

	<u>Value</u>	<u>RBC</u>
B(a)P Equivalent	5,990	780
Benzo(a) Pyrene	3,700	780
Dibenzo(a,h) anthracene	1,300	780

The second paragraph on page 10.41-10 should be revised to include the above.

Response 64

Lower-interval soil samples were not compared to RBCs, but instead were compared to soil screening levels (SSLs) for groundwater protection. Based on the comparisons to SSLs, BEQs, benzo(a)anthracene, and chrysene exceeded their respective SSLs, as stated in the text on page 10.41-10.

Comment 65

The report should provide the exact locations of all USTs on the site and update the site map.

Response 65

An attempt will be made to identify the exact locations of the USTs and figures will be revised for AOC 583 to include these locations in the Final Zone E RFI Report.

AOC 590

Comment 66

Five soil samples were submitted to be analyzed for TPH due to elevated OVA readings and petroleum odor in samples. The Navy reported levels of TPH-gasoline detected in one upper-interval soil sample. Additional sampling should be conducted to identify the source of the gasoline.

Response 66

TPH, as a single component, was not considered a COPC for two reasons: 1) the TPH analysis was used as a screening tool for subsequent specific analysis; and 2) because TPH did not have an RBC value specifically assigned to it. But because TPH is composed of numerous organic compounds, commonly called surrogate compounds, the toxicity of TPH can be evaluated when reviewing VOC and SVOC data. The SCDHEC Risk-Based Corrective Action For Petroleum Releases document (June 1995) has identified certain VOCs and SVOCs (Table 8; RBSLs for Ingestion or Dermal Contact with Surficial Soil) found in TPH which pose a toxicity risk. Specifically to Section 10.14.2, four of the SVOC compounds were identified as exceeding their respective RBC values. After evaluating the results, calculating the BEQs, and going through the toxicity assessment, BEQs were identified as both a Human Health Risk COPC and as a COC at AOC 590 for surficial soil. BEQs were identified as needing further evaluation as part of the CMS process. Please refer to the memorandum attached to the Zone C CMS Work Plan entitled "Use of TPH and TIC Analytical Results for RFI Evaluation at CNC." The Navy feels that the specific components of TPH and their subsequent evaluation of them have been adequately addressed in the RFI report, therefore, no additional samples will be collected for TPH.

Comment 67

The occurrence of lead in surface soil around 590SB006 should be delineated further in attempt to characterize the nature and extent of lead contamination.

Response 67

Additional soil samples will be collected to the north, south, and west of soil boring 590SB006 to delineate the extent of lead. The area to the east has been defined by soil boring 590SB002

AOC 596

Comment 68

Table 10.45.6.2 shows arsenic and BEQ equivalent compounds contributing to risk and hazard for AOC 596 surface soil, with the highest concentrations of BEQ equivalents reported in surface soil samples 596SB006 and 596SB013. This area of AOC 596 is absent of both grid wells and site wells. The Department recommends the installation of an additional well to clarify the presence or absence of contaminants in the groundwater. Soil samples should also be collected during well installation. The Department therefore considers the RFI incomplete for AOC 596.

Response 68

Monitoring wells NBCE596001/01D were installed less than 100 feet from these soil borings. However, piezometric maps indicate that groundwater flows more northward, rather than directly toward the well pair. The concentrations of arsenic and BEQs do appear to be significant in soil at these locations, therefore, an additional deep and shallow well pair will be installed in the location of soil boring 596SB013.

Comment 69

The report indicates that only one round of groundwater data was collected for this site. The Department recommends that the Navy collect additional rounds of groundwater samples.

Response 69

Four rounds of groundwater sampling were conducted and will be presented in the Final Zone E RFI Report. Please see the response to Comment 4.

Appendix H (part 1)

Groundwater-Summary Table

Comment 70

The data is missing for AOC 559, AOC 560 and AOC 561. Please include the data in the revised report.

Response 70

Groundwater summary tables for AOCs 559, 560, and 561 will be included in the Final Zone E RFI Report.

Comment 71

The summary table should be revised to include an MCL of 100 ug/l for chlorobenzene. Sample 172GW001 from SWMU 172 reported a value above the MCL.

Response 71

Summary tables will be revised to include an MCL of 100 µg/L for chlorobenzene in the Final Zone E RFI Report.

Comment 72

VOCs were not sampled for rounds 2, 3 or 4 in AOC 530 (530GW001). Please explain.

Response 72

Results for VOCs was obviously omitted in the groundwater summary tables in Appendix H. These samples were analyzed for VOCs during the 2nd, 3rd, and 4th rounds of sampling and this data will be included in the Final Zone E RFI Report.

Comment 73

Semi-volatiles were not sampled for rounds 2, 3 or 4 in AOC 538 (538GW001 and 538GW01D). Please explain.

Response 73

Groundwater samples were analyzed for SVOCs in the 1st and 2nd rounds but were not in the 3rd and 4th rounds of sampling. Additional samples will be collected and analyzed for SVOCs and these results will be included in the Final Zone E RFI Report.

Comment 74

The MCL for bis(2-Ethylhexyl)phthalate (BEHP) should be corrected as 6 ug/l, not NA.

Response 74

The MCL for bis(2-ethylhexyl)phthalate (BEHP) is not listed in the EPA Drinking Water Regulations and Health Advisories, but is listed as Di(2-ethylhexyl)phthalate with an MCL of 6 µg/L. This value will be included in the Final Zone E RFI Report.

**Responses To Comments from Susan K. Byrd — SCDHEC
for Draft Zone E RCRA Facility Investigation Report
Charleston Naval Complex**

General Comments

Comment 1

Section 6.2.1, Page 6-18, Line 6: The text states that the greater of the background reference values for surface soil and subsurface soil was used as the screening alternatives to SSLs for

inorganics. Using the highest background reference value does not seem to be a conservative approach for background comparison. An explanation should be given to support the statement that the higher background value is always relevant. Also, the approach of comparing surface soils to subsurface soils is not supported due to the influence to “naturally occurring” surface soils from the Naval activities such as land covering with dredge materials. To resolve comparing “apples to oranges”, compare surface soil background levels solely to surface soil samples and subsurface soil background levels to subsurface samples.

Response 1

The text will be modified to clarify that only SSLs will be used for the initial fate and transport screening. Because the water infiltrating through soil pore space in the vadose zone is exposed to background concentrations of soil constituents at each level, the only relevant background concentration for fate and transport comparisons is the greater of the surface soil or subsurface soil values. The surficial soil (less than 5 feet bgs) throughout Zone E is an extremely heterogeneous composite of native soil and dredge spoil and other fill materials. It would not be feasible to accurately identify, characterize and determine background concentrations for each soil type encountered.

Comment 2

Section 10.0, Page 10.1-1, Lines 18-21: The text states that first round groundwater data were used to produce the summary tables. Subsequent rounds of quarterly groundwater results were reviewed before making decisions regarding risk, corrective measures, and conclusions and recommendations. Subsequent groundwater data are discussed to confirm the presence of constituents where appropriate. If the subsequent data do not impact the recommendation for the site, it is not discussed in the text. These statements are somewhat unclear in how the additional data was utilized, and clarification is needed. It would be helpful to have information regarding groundwater concentration fluctuations in the subsequent sampling rounds whether the data impacts the recommendations for the site or not. Increased concentrations in the subsequent sampling could potentially effect the risk at the various sites. This information is important before making risk management decisions.

Response 2

Please see Appendix H, part 1 of the Draft Zone E RFI Report, which provides summary tables for all quarterly groundwater sampling events. Analytical summary tables which provide all detections above MCLs for all groundwater quarterly sampling events are also provided in Appendix K. All rounds of groundwater data will be included in Appendix H, part 2 of the Final Zone E RFI Report.

Comment 3

Each unit evaluation in Section 10 has a table that shows the number of samples exceeding RBCs. The table only shows a comparison to industrial RBCs. Since the Risk Assessments compare to residential RBCs, they should be included in the tables. Also SSL's should be included in the table for comparison to the lower-interval soils.

Response 3

The Project Team which includes the EPA, SCDHEC and the Navy, agreed that industrial RBCs would be used for risk and hazard screening in the Zone E RFI. Further, both industrial and residential RBCs were used in the risk assessment to select COPCs for the site worker and residential scenarios. The fate and transport sections already include comparisons to SSLs. The comparisons to residential RBCs are included in the CPSS tables in the site-specific risk assessments, and the SSL comparisons are included in the site-specific fate and transport summary tables in each section. The Final Zone E RFI Report will refer to the appropriate sections for comparisons to residential RBCs and SSLs.

Comment 4

SCDHEC acknowledges EPA's target risk range of 1E-04 to 1E-06; however, as stated in the text, the department has selected to use the more conservative risk value of 1E-06 in both residential and industrial scenarios. When risk falls above 1E-06, the department may require corrective action. Decisions regarding corrective action will be made on a site by site basis.

Response 4

Both residential and industrial risk assessment scenarios are presented in the Draft Zone E RFI Report. The industrial scenario and a target risk of 1E-06 were used to determine if a site should be considered in the CMS.

Comment 5

Section 10.0, Page 10.1-2, Line 6: The text states that results for upper-interval samples were compared to industrial soil ingestion screening values in the USEPA Region III RBC table.

The results should be compared to the more conservative residential soil ingestion screening values. A discussion of this comparison should be included in the Corrective Measures Considerations section of each unit or combined unit summary in Section 10.

Response 5

Please see the response to General Comments #3 and #4.

Comment 6

Section 7.2.3, Page 7-25, Line 22: The text states that because Zone E is part of the Base Closure and Realignment Act, future site use cannot be assumed with any certainty. This

statement contradicts many of the statements throughout Section 10 that emphasize that the base reuse plans are industrial and residential use is not expected.

Response 6

The text will be modified to read “because Zone E is part of BRAC, future site use cannot be assumed with absolute certainty; however, the Project Team has made a risk management decision that future use of all Zone E sites will be industrial.”

Comment 7

Section 7.2.6, Page 7-25, Lines 21-25: The text states that parameters not having RBC values were not included in the CDI calculation data. EPA Risk Assessment Guidance for Superfund recommends alternative measures when toxicity values are not available. An alternative measure should be implemented in order to prevent deleting values from the calculations.

Response 7

The comment references the text on page 7-25, lines 21 -25; however, this comment seems to be referring to the text on page 7-46, lines 21-25. As explained in Section 7 of the Zone A RFI Report, the toxicity assessment uses the following references to compile a list of quantitative toxicity data for chemicals identified in Zone E media: IRIS, HEAST, and ATSDR. After exhausting these sources, the risk assessment concluded that there was not enough data to complete a quantitative risk assessment for those chemicals. The Navy will gladly review any additional sources of quantitative toxicity data to which EPA or SCDHEC have access.

Comment 8

Several SWMUs and AOCs contained contaminant levels above industrial RBCs but below background Rcs. In RAGS Section 5.7, Page 5-18, it states that if background risk might be of concern, it should be calculated separate from site-related risk. Samples above RBCs but below background may be contributing risk at the Navy Base; therefore, a background risk assessment should be conducted.

Response 8

In this comment, SCDHEC seems to be indicating that a background risk assessment would be useful for making risk management decisions at the CNC. It would be in the Project Team’s best interest to outline the goals and details prior to conducting a background risk assessment.

Comment 9

A DAF value of 10 was applied to generic SSLs throughout Zone E. A vague description was given for the justification of the DAF value used; however, a more thorough explanation as to

why the DAF value of 10 was selected, including site specific parameter, should be discussed in this section. A table showing the comparative site specific values should be included.

Response 9

The comment does not reference a specific section of the report. Pages 6-14 and 6-15 of Section 6.2.1 present a general discussion of the use of a DAF of 10, as well as a reference to Section 6.3 for a comparison of site-specific conditions to fate and transport screening assumptions. Item 4 of Section 6.3 is a detailed discussion of Zone E DAFs. Table 6.3.1 presents calculated DAFs for 20 sites, with values ranging from 14 to 237. Considering that the “DAFs” account only for dilution and ignore attenuation effects, the choice of a DAF of 10 for Zone E is considered extremely conservative.

Comment 10

Section 10.23 - 11.3, Page 10.23-39, Lines 4-6: Numerous locations throughout the text indicate that site constituents pose no threat to human health or the environment (Cooper River). The term “no threat” should be eliminated from all locations within the text. Sampling at the site can give an indication of the potential risk associated with the site; however, the actual threat to human and health and the environment is assumed or estimated. If contamination is not detected in a round of sampling, it should not be stated that the site poses no threat. A threat could potentially be present at locations that have not yet been sampled at the site. The term “no threat” should be modified or deleted from the text.

Response 10

The term “no threat” will be eliminated from the text in the Final Zone E RFI Report.
Specific Comments

Comment 1

Section 7.2.1, Page 7-4, lines 15 and 16: The text states that the lesser of the two values ($\frac{1}{2}$ U or $\frac{1}{2}$ J) was used as the best estimate of the concentration that was potentially below the estimated quantitation limit. Thereafter of the two values would be a more conservative value and should be used.

Response 1

Because of the large difference between SQLs (“U” flagged values) and reported estimated (“J” flagged) values, using one-half the reported SQL value as an estimate for a nondetected constituent would yield an unrealistically high result. In reality, sample concentrations much lower than the SQLs are detected and reported as J-flagged values. Using one-half of the lowest J-flagged value as an estimate for a nondetect provides a more unbiased value.

Comment 2

Section 7.3, Page 7-49, Lines 4-12: The text states that three site groupings require full baseline HHRAs. A detailed explanation should be given as to why these three groups require full baseline HHRAs while all others were evaluated using the FRE method.

Response 2

These three sites required full HHRAs due to the exposure potential as determined by evaluation of surface (land) coverage. Each of these sites contained large areas which were not covered by either asphalt or concrete. Figures 7.2.1 through 7.2.11 provide detailed photos of the specific land cover for each AOC or SWMU, and the lack of exposure potential based on coverage.

Comment 3

Section 8.3, Page 8-7, Lines 13-15: The text states that based on numerous factors such as tidal flow, the parameter concentrations detected at one location will be used to assess near shore ecological conditions along the entire Zone E coast. This statement is confusing, and it is unclear as to why only one location was used to assess the entire Zone E coast. A more thorough explanation of this statement should be given.

Response 3

The Final Zone E RFI Report will be revised to state that due to the constant and dynamic flux of the benthos along the Zone E coastline, both the maximum and mean concentration of each parameter detected in the offshore samples will be used as the concentration representative of Zone E nearshore sediments. While this isn't necessarily the conservative approach for such a preliminary assessment, it results in an overestimation of risk.

Comment 4

Figure 8.3, Page 8-8: The note at the bottom of the page indicates what all symbols represent except for the shaded circles. An explanation of the meaning of the circle symbol should be provided.

Response 4

The figure's legend will be revised to include the representation of all symbols.

Comment 5

Section 10.1.7, Page 10.1-100, Lines 8 and 9: The text refers to an interim action removal at SWMUs 5, 18, and AOC 605 that has eliminated the associated risk. No information was provided to support this assumption. More detail should be given regarding post removal contaminant levels or confirmation sampling. Based on remaining levels of contaminants, it may be necessary to conduct a post removal risk assessment.

Response 5

The risk assessment for this site was based on data collected prior to an IM conducted by the Detachment. Section 10.1.7, page 10.1-100, lines 8 and 9 will be changed to read “The Navy conducted an interim action which resulted in the excavation and offsite disposal of the upper and lower soil interval.” The IM Report will be reviewed and a determination will be made as to whether a separate risk assessment will be conducted for this site using post IM sample results.

Comment 6

Section 10.2.9, Page 10.2-84, Line 17: The text states “corrective measures from may be appropriate.” It appears that a word or words are missing from the text; therefore the statement should be revised.

Response 6

An editorial change will be made and the word “from” will be eliminated from the text.

Comment 7

Section 10.3.11, Page 10.3-33, Lines 22-24 and Section 10.3.11, Page 10.3-43, Lines 1-4: The text states that the generic SSL for hexavalent chromium was not applied to chromium. The reason was that hexachrome was not detected in the only sample at combined SWMU 22 with hexachrome analysis and hexachrome as detected in only four of 59 surface soil samples from Zone E. According to the text, only one sample was analyzed for hexachrome at combined SWMU 22; therefore, it is not conservative to assume that hexachrome is not present at other locations within combined SWMU 22. Additional analysis of hexachrome should be collected at combined SWMU 22 before this assumption can be made.

Response 7

Combined SWMU 22 samples will be screened assuming the presence of hexachrome.

Comment 8

Section 10.6.11, Page 10.6-74, Lines 17-20: The text refers to dieldrin, aldrin, and BEQ contributing to the risk estimates above 1E-06; however, the text also states no further action is recommended for soil, since the risk estimate is above 1E-06, a more thorough explanation should be given to defend the recommendation of no further action. Potential alternative corrective measures should be included in Table 10.6.11.1.

Response 8

Under the industrial scenario only two points marginally exceeded the 1E-06 trigger that SCDHEC recommends for triggering CMS. Under the residential scenario only six out of twelve points marginally exceeded the 1E-06 trigger. Using both the industrial and the residential scenarios, point risks fell within the EPA's acceptable risk range. Furthermore, based on the fact that all points are currently covered by an asphalt or a concrete cap, exposure potential at this site is minimal. Therefore, the Navy feels that NFA is the appropriate designation for soil at this site. This will be reflected in the text of the Final Zone E RFI Report

Comment 9

Section 10.8.7, Page 10.8-60, Lines 8 and 9 and Section 10.14.9, Page 10.14-50, Lines 8-10: The text states that risk for the upper soil interval is diminished due to the site being capped with concrete and asphalt, and direct exposure is unlikely. The text should be revised to state current risk and current direct exposure are diminished. Previous text stated that future use of the base is known; therefore, it is not feasible to say that future risk will be diminished due to the site being capped.

Response 9

The text will be revised to state that current risk and current direct exposure are diminished due to the asphalt and concrete land cover.

Comment 10

Table 10.9.7.1, Page 10.9-12: Sediment samples at SWMU 81 detected contamination of arsenic and copper above their respective SSVs. Therefore, potential corrective measures or interim measures should be listed in the table.

Response 10

NFA will be removed from Section 11. Data will be considered as part of the Zone J RFI Report.

Comment 11

Section 10.11.11, Page 10.11-53, Lines 10-15: The soil pathway exposure risk ranges from 1E-05 to 2E-04. This range is above DHEC's more conservative risk value of 1E-06. Other corrective measures besides no further action should be listed for soil due to the elevated residential risk. Table 10.11.11.1 should also be modified.

Response 11

The final Zone E RFI Report will recommend SWMU 87, SWMU 172, and AOC 564 for CMS. Section 10.11.11 of the Draft Zone E RFI Report errantly recommended NFA; however,

surface soil was recommended for CMS in Section 11 of the Draft Zone E RFI Report. The text in Section 10.11.11 and Table 10.11.11.1 will be corrected in the final report.

Comment 12

Section 10.15.7, Page 10.15-44, Lines 10-13: The site is recommended for no further action for soil since the site is covered with asphalt. The soil exposure residential risk range is above SCDHEC's recommended value of 1E-06; therefore, alternative corrective or interim measures should be included in the text.

Response 12

The Final Zone E RFI Report will recommend SWMU 106 and AOC 603 for CMS. Section 10.15.7 of the Draft Zone E RFI Report errantly recommended NFA; however, surface soil was recommended for CMS in Section 11 of the Draft Zone E RFI Report. The text in Section 10.15.17 will be corrected in the final report.

Comment 13

Section 10.21.7, Page 10.21-47, Line 2: The text states "the upper and soil intervals". The term "lower" should be added before "soil".

Response 13

The text will be corrected to read "upper and lower soil intervals".

Comment 14

Section 10.24.5.2, Page 10.24-14, Lines 19 and 20: The text states that relatively high arsenic concentrations were detected in groundwater samples at SWMU 65, but were determined not to be a threat to surface water in the Cooper River. Justification should be given as to why the contamination is not impacting the Cooper River.

Response 14

The text will be revised to read "relatively high arsenic concentrations were also detected in groundwater samples at nearby SWMU 65, but were determined not to significantly impact surface water in the Cooper River." Please refer to Section 10.6.9.6, Table 10.6.9.2; maximum groundwater concentration does not exceed the Adjusted Eco/HH Groundwater RBC for arsenic.

Comment 15

Section 10.26.4, Page 10.26-6 and Section 10.27.6, Page 10.27-25: The text states that a formal risk assessment was not conducted since only sediment samples were collected. A statement

should be included regarding the potential for human contact with the sediment contamination.

Response 15

Text will be added stating “Potential for human contact with contaminated sediment from the Cooper River is highly unlikely.”

Comment 16

Section 10.37.7.4, Page 10.37-22, Lines 4-5: The text states that it is unlikely that constituents in surface soils are a source of contamination in the catch basin sediment since the ground surface is paved. If the surface was recently paved, the soil contamination could have historically influenced the catch basin via overland run-off. A statement should be added to clarify when the pavement was applied in relationship to when the release to surface soil occurred.

Response 16

Text will be added stating “The spill occurred in 1989 and the site was paved prior to 1989.”

Comment 17

Section 10.43.6, Page 10.43-20, Line 3: The term “arsenic” should be replaced with “acetone”.

Response 17

The text will be revised to read “The detected concentration did not exceed the acetone industrial soil RBC.”

**Responses To Comments from Dynamac/Gannett Fleming
for Draft Zone E RCRA Facility Investigation Report
Charleston Naval Complex**

General Comments

Comment 1

The Zone E RFI Report does not include significant portions of the information relevant to the investigation of Zone E and to the preparation of the HHRA and ERA. The missing information includes data on the characteristics affecting the fate and transport for various groups of chemicals. Instead, the Zone E RFI Report states that this information is available in the Zone A RFI Report. Given the size and complexity of the respective RFI reports, referring the reader from the Zone E RFI Report to the Zone A RFI Report to obtain

information needed for interpretation of the Zone E RFI is unnecessarily cumbersome. The Zone E RFI Report should include all information relevant to the Zone E HHRA and ERA.

Response 1

Reduced versions of Sections 7 and 8 in the Draft Zone E Report is consistent with the desire of the Project Team and was done in order to cut down the amount of repetitive information provided in the series of reports for each zone.

Comment 2

The HHRA does not include an assessment of the exposure pathways for contact with subsurface soil. At many of the SWMUs or AOCs, contaminants have been identified in subsurface soil that exceed screening criteria. The exposure scenarios should be expanded, where applicable, to consider the potential for construction workers, utility workers, and other to come into contact with contaminants in subsurface soil.

Response 2

The HHRA concluded that direct exposure to subsurface soil was an unlikely pathway. Future construction events are not expected to penetrate the 3 to 5 foot soil interval, mainly due to the shallow water table. Instances where construction or maintenance activities would penetrate the 3 to 5 foot interval are likely to be very short in duration. Subsurface soil was considered in the fate and transport section that evaluated indirect exposure pathways through soil to groundwater migration (SSLs) with discharge to the Cooper River.

Comment 3

The ERA for Zone E was limited to a preliminary assessment of offshore sediment and surface water adjacent to Zone E. Impacts of surface water contaminants on ecological receptors and on the fate and transport of contaminated catch-basin sediments were not evaluated in the Zone E RFI, but will be addressed in the Zone J and Zone L RFI Reports. A thorough evaluation of the ecological risk associated with Zone E cannot be done until all Zone E data are assimilated with data from the Zone J and Zone L RFI Reports.

Response 3

The intent was only to determine the presence of contaminants in Zones E and L. Data from the Zone E RFI and Zone L RFI will be assimilated in the Final Zone J RFI.

Comment 4

For many of the sites, compounds identified as COCs in the Corrective Measures Considerations section for each site (Section 10) do not match the list of compounds selected as COCs in the Potential Corrective Measures Table for a particular site. For example, for the

combined site, SWMUs 5 and 18 and AOC 605 (page 10.1-100), zinc was identified as a COC in the upper soil interval. However, zinc is not listed in the Potential Corrective Measures Table for that site (Table 10.1.7.1, page 10.1-101). Also, antimony was identified in the text (page 10.1-101) as a COC in shallow groundwater, but was not included in the Potential Corrective Measures Table. The conclusions in the text and tables for each site must be in agreement.

Response 4

These inconsistencies will be addressed, and revisions will be included in the Final Zone E RFI Report.

Comment 5

The process that was used to identify the chemicals that are driving the risk in each affected medium at each site were not adequately described in Section 10. Chemicals identified as COCs for each site in Chapter 10 do not match the risk drivers identified for each site in Section 11. At some point in the selection process, chemicals referred to as “COCs” were called “risk-driving chemicals” in the Section 10 site discussions. It appears that several steps were omitted from this RFI report in the discussion of the chemical selection process. An explanation should be provided in this RFI report as to how the information provided in the Corrective Measures Consideration section for each site in Section 10 was used to derive the conclusions presented for each site in Section 11. All steps of the chemical selection process, including why certain chemicals qualified as risk-drivers and others did not, must be clearly explained in the Zone E RFI Report.

Response 5

Site-specific Corrective Measures Considerations (Section 10) were based on chemicals driving risk and hazard in an industrial reuse scenario, where as recommendations and conclusions in Section 11 were based on a residential reuse scenario. This may help explain the difference in the specific chemicals listed in each section. Nonetheless, the process of selecting COCs will be reviewed and clarified (industrial vs. residential; 1E-06 vs 1E-04; surface cover; etc.) in the Final Zone E RFI Report. Section 11 will be revised to be based on an industrial scenario.

Comment 6

The uncertainty section of the HHRA for each site focuses on highly protective exposure assumptions that tend to overestimate exposure. Little or no discussion of sources of uncertainty that could result in an underestimation of risk was provided. For example, the lack of toxicity values and information concerning the effects of chemical interactions could result in underestimation of risk. The uncertainty section of the HHRA for each site should be

expanded to include a discussion of toxicity- and risk-characterization uncertainties, as well as general sources of uncertainty and their potential effects on the magnitude of estimated risks.

Response 6

In the Final Zone E RFI Report, the risk assessment uncertainty sections will include discussions of the potential for underestimating risk. A site-specific discussion will be added regarding the lack of toxicity values. Section 7 provides a general discussion of the uncertainty associated with the lack of toxicity values.

Comment 7

In the Conclusions and Preliminary Recommendations section (Section 11), a Summary of Risk and Hazard-based COCs Table should be added to each section for each site. The table should include a list of all evaluated chemicals, and explanations as to why certain chemicals were retained as COCs whereas others were eliminated from consideration as COCs.

Response 7

Tables for Point Estimates of Risk and Hazard are provided in the site-specific risk assessments of Section 10 and provide which chemicals were evaluated and their overall contribution to the risk or hazard at the site. The site-specific risk summaries (at the end of each site-specific risk section) provide an explanation as to why certain chemicals were retained as COCs, while others were eliminated.

Comment 8

Dust was not included as a potential exposure pathway for inorganics in the HHRA. Inhalation of chemicals entrained in fugitive dust can be a potential exposure pathway in the transport of inorganics such as arsenic and beryllium. The uncertainty section of the HHRA should include a discussion of fugitive dust as a potential exposure pathway for inorganics.

Response 8

The soil-to-air pathway was concluded to be insignificant in the fate and transport section, due to the fact that nearly all of Zone E is either paved or covered by a building.

Comment 9

The acronyms, "HQ" and "HI" are used interchangeably and often incorrectly throughout the text and tables. "HQ" (Hazard Quotient) refers to hazards from exposure to a specific chemical and "HI" (Hazard Index) refers to the sum of the HQ values. The terms should be used correctly throughout the document.

Response 9

The Navy does understand the difference between the two acronyms and made every effort to use them in their proper context. It is possible that the two acronyms were inadvertently switched on occasion. The Final Zone E RFI Report will be revised, as necessary, to account for the appropriate use of these acronyms.

Comment 10

Soil screening levels (SSLs) were not included in the tables and were not consistently cited in the text when compared to the concentration of a particular COPC in lower-interval soil samples. In contrast, the industrial risk-based concentration (RBC) was reported for each COPC in the tables and text, so that the constituent concentration could easily be compared to the respective industrial RBC value. It would be helpful if the lower-interval SSL values were included in the text and tables for ease of comparison with constituent concentrations.

Response 10

SSL comparisons were included in the site-specific Fate and Transport Summary text and corresponding tables. They were only referred to in the nature and extent text if detected concentrations in lower-interval samples exceeded their respective SSLs. Nature and extent tables will be amended to include SSLs in the Final Zone E RFI Report.

Comment 11

The statement that no chemicals exceeded a particular screening value (i.e. AWRCL, RBC, RC), used throughout the document, is misleading. The statement implies that no chemicals were potential risks. It does not account for those chemicals that lack screening values but may pose potential risks. The text should be revised to specify those chemicals with a particular group (VOCs, SVOCs, inorganics) that have screening values, and those that do not. In addition, the uncertainty section of the HHRA should include a brief discussion of the potential underestimation of risk from COPCs that were eliminated from further consideration because they lack screening values. The uncertainties associated with eliminating a chemical as a COC from a specific site because it lacks screening values should be discussed for each site.

Response 11

In the Final Zone E RFI Report, the risk assessment uncertainty sections will include discussions of the potential for underestimating risk. A site-specific discussion will be added regarding the lack of toxicity values. Section 7 provides a general discussion of the uncertainty associated with the lack of toxicity values.

Comment 12

The Zone E RFI Report makes repeated references to Appendix IX analytical parameters. Appendix IX was not located in any of the volumes for Zone E. All appendices for Zone E have alphabetical designations. The text should be corrected.

Response 12

The term “Appendix IX” refers to a specific expanded list of analytical parameters found in Appendix IX of 40 CFR, part 264. In accordance with the Comprehensive Sampling and Analysis Plan (CSAP), samples were analyzed for the Appendix IX list of parameters at a frequency of 10 percent of the total number of samples.

Specific Comments

Comment 1

All Tables: Many of the tables did not have page numbers, so that comparing information presented in the tables and text was often time-consuming, particularly when a table was comprised of numerous pages. It would be helpful if the tables were assigned page numbers to expedite comparison of information presented in the text and tables.

Response 1

Tables will be assigned page numbers in the Final Zone E RFI Report.

Comment 2

All Tables: Throughout the document, the abbreviations, “NA” and “ND” are not always defined in the tables. All abbreviations should be defined in footnotes to the tables.

Response 2

Tables will be revised to include all abbreviations

Comment 3

Section 6.2.2, Page 6-19, Line 12: The text states that “other than ant AOC 556, surface water was not sampled as part of the Zone E RFI... potential impacts on surface water were evaluated by comparing groundwater constituent concentrations to surface water screening standards.” Since surface waters may be impacted through routes other than groundwater, establishing that groundwater is not impacting surface water does not imply that there are no risks associated with the surface water. The text should be revised to state that potential impacts on surface water by groundwater were evaluated by comparing groundwater constituent concentrations to surface water screening standards, but that since no surface water samples were analyzed, potential risks from surface water are uncertain.

Response 3

The text will be revised to reflect this information in the Final Zone E RFI Report.

Comment 4

Section 7.2.2, Page 7-9, Line 8 The text states that iron was eliminated from consideration as a contaminant of potential concern (COPC) based upon its characterization as an essential nutrient. Region IV guidance does not include iron as a nutrient that may be eliminated based upon an essential nutrient designation. Therefore, iron should be evaluated as a COPC in the HHRA. In addition, a discussion of the results should be included in the uncertainty section of the Zone E RFI Report, given the substantial uncertainty regarding the iron toxicity screening values.

Response 4

Accordingly, iron will not be eliminated from consideration in the HHRA due to its status as an essential nutrient and will be included in the Final Zone E RFI Report.

Comment 5

Section 8.0, Page 8-1, Line 11: The discussion of the zone rationale is confusing and incomplete. The physical relationship between the Ecological Study Areas (ESA) and the Areas of Ecological Concern (AEC) and Zone E is not clear from the text or Figures 8-1 and 8-2. Specifically, there is no explanation as to how the AECs fit within the ESA; the AEC are briefly mentioned, but never defined or located on maps. The locations of the AEC in relation to Zone E and the ESA are not shown in either figure. The confusion is compounded by the statement that basewide, zone configurations were based on SWMU or AOC locations and therefore, do not necessarily parallel ESA boundaries (line 18). Figures 8-1 and 8-2 should be modified to clearly delineate the boundaries of Zone E, the ESAs, and the AECs.

Response 5

Discussion concerning the interrelationship among the boundaries of ESAs, AECs, and Zone E itself will be revised. Independent of AOCs/SWMUs, the entire CNC was divided into eight large study areas based on land use to make the ecological assessment of the 1,400 acre base more manageable. Ecological surveys at some of the less industrial ESAs identified smaller, specific areas of ecological concern (AECs), such as isolated wetlands or undisturbed wooded areas that required further assessment. As noted in Section 8.1, no AECs were designated within Zone E.

Comment 6

Section 8.0, Page 8-1, Line 16: The text states that the survey method used for the Zone E RFI Report is also described in the Zone J RFI Work Plan.. Except for a brief discussion of the

zone rationale, the survey method is not described in the Zone E RFI Report. A complete discussion of the survey method should be included in the Zone E RFI Report.

Response 6

A reference to the USEPA's ERA Process Document will be added as the survey method used for the Zone E ERA. The reference to Zone J RFI Work Plan for details on the methods used for the Zone E habitat and biota surveys was included, because at the onset of the comprehensive RFI at the CNC, the Zone J RFI included ALL zone-specific ERAs and therefore contained the complete protocol for conducting the all zone-specific surveys. The scope for conducting ERAs has since been delegated to the zone-specific investigations.

Comment 7

Section 8.1, Page 8-4, Line 12: The text states that although Zone E has 23 identified outfalls along its shoreline, each a potential contaminant pathway to the Cooper River, sediment and surface water were collected only from outfalls associated with AOCs 555 and 556 and SWMUs 54 and 81. The rationale for this decision was that the Zone J RFI Report was specifically designed to assess the NAVBASE water bodies including the Cooper River. No rationale was provided as to why AOCs 555 and 556 and SWMUs 54 and 91 were selected for the preliminary assessment. An explanation of why these sites were selected to assess potential risk from sediment and water collected from Zone E outfalls should be added in this section.

Response 7

All outfalls to the Cooper River were designated for assessment in either the Zone J or Zone L RFI. During the Zone E investigation of AOCs 555 and 556, and SWMUs 54 and 81, the USEPA requested that the Navy include these specific outfalls in the Zone E RFI. This point will be clarified in the text.

Comment 8

Figure 8.3, Page 8-8: Direct ingestion of soil and ingestion of soil via food ingestion are identified (by shading the appropriate box) as selected exposure pathways for terrestrial wildlife in the contaminant pathway model (Figure 8-3). Similarly, direct contact with soil is identified as selected exposure pathways for terrestrial plants and terrestrial invertebrates. However, these exposure pathways and terrestrial species as ecological receptors were not considered in the Zone E ERA. It was stated that for the Zone E assessment, only exposure routes directly related to sediment and surface water pathways would be evaluated to determine the need for subsequent assessment during the Zone J RFI (page 8-7, line 3). Furthermore, only aquatic species were addressed in the Zone E ERA. Terrestrial species were not considered as ecological receptors in the Zone E ERA. Therefore, the text and figure should be modified to clearly identify those exposure pathways and ecological receptors that will be addressed in the Zone E ERA.

Response 8

Figure 8.3 will be revised to identify those pathways addressed by the Zone E ERA. Terrestrial exposure pathways to plants and invertebrates will be excluded, since no quality habitat exists for these species in Zone E.

Comment 9

Figure 8.3, Page 8-8: The definition of Aquatic Receptors included in the Contaminant Pathway Model includes invertebrates, plants, algae, amphibians, and fish. The text does not identify the specific groups of aquatic receptors, and it was uncertain if all of the listed groups were included in the model for Zone E. The groups of selected aquatic receptors for Zone E must be identified, and the model should be modified accordingly.

Response 9

The model for this screening-level ERA will be revised and will not specify particular guilds of aquatic receptors (plants, algae, invertebrates, etc.), but rather indicate that, if present in the Cooper River, a variety of aquatic receptors may be exposed to Zone E constituents.

Comment 10

Figure 8.3, Page 8-8: The Contaminant Pathway Model defines Aquatic Receptors as invertebrates plants, algae, amphibians, and fish. The exposure pathways for these organisms are not all identical. For example, plants would be exposed to water and sediment, whereas fish could also consume contaminated invertebrates, smaller fish, plants, and algae. The exposure model should be revised to reflect these different exposure pathways.

Response 10

Please see the response to Comment 9.

Comment 11

Section 8.4, Page 8-13: The impacts of groundwater contaminants on ecological receptors were not addressed. Shallow groundwater could reach the surface and become available to ecological receptors. Aquatic receptors in Zone nearshore environments could be exposed to contaminated groundwater via direct exposure. Aquatic plans could also be exposed via root uptake. The risks associated with groundwater must be included in the ERA exposure assessment, or a detailed justification as to why groundwater was not considered an exposure pathway must be provided.

Response 11

Potential impacts of contaminated groundwater to aquatic receptors will not be addressed in the Zone E RFI, but rather in the Zone J RFI, which is designed to assess impacts from comprehensive groundwater-to-surface water interaction from all RFI zones (Zones A, B, C, D, E, G, H, and I) rather than one zone at a time.

Comment 12

Section 8.4, Page 8-13, Line 1: This section is incorrectly titled “Contaminant Fate and Transport”. The section primarily addresses the toxicity of inorganics and organics. A discussion of the fate and transport of contaminants must address the movement of contaminants through various media (i.e., soil, sediment, groundwater) and exposure pathways. The information provided in this section deals primarily with the toxicity of inorganics and organics rather than a direct discussion of the fate and transport of chemicals. The toxicity information presented in this section should be addressed under a new heading that deals directly with the toxicity of inorganics and organics. Section 6.0 of the risk assessment, entitled “Fate and Transport”, provides some discussion of the chemical and physical properties of chemical constituents in relation to Zone E. It was stated that the Zone A RFI Report details characteristics that affect the fate and transport of specific groups of chemical (page 6-4). The detailed discussion in the Zone A RFI Report should be included in the Zone E ERA, as well as the Zone J ERA, since Zone E exposure pathways and aquatic receptors will be assessed in the Zone J ERA. Issues such as water solubility, the likelihood of complexing with soil, and the effects of pH and/or anaerobic conditions on each ECPC should be addressed, and should include discussion of site-specific data when available.

Response 12

Section 8.4 will be more appropriately titled “Stressor Characteristics”, and additional chemical-specific fate and transport items, such as water solubility and pH effects will be appended to Section 6.0 as applicable.

Comment 13

Section 8.4, Page 8-13, Line 20: The statement that cadmium has been implicated as the cause of severe deleterious effects on fish and wildlife is followed by the statement that birds and mammals are comparatively resistant to the biocidal properties of cadmium. The second statement implies that birds and mammals are not wildlife, which is incorrect. It is correct that on a comparison basis, birds and mammals are less susceptible than freshwater organisms. The text should be revised for clarify.

Response 13

The text will be revised to reflect aquatic organisms’ greater sensitivity to cadmium relative to its effect on birds and mammals.

Comment 14

Section 8.5, Page 8-16, Line 12: The text states that an assessment endpoint was selected that evaluates the aquatic community health with a measurement endpoint that predicts chronic

effects to aquatic community species. This statement is too general. The assessment endpoint, “aquatic community health”, must be defined in specific terms. The measurement endpoint that predicts “chronic effects” for each selected ecological receptor must be defined in specific terms “such as productivity or specific diversity). Also, “chronic effects” must be defined.

Response 14

The text will be revised to clarify the evaluation and assessment of exposure pathways. This screening-level risk assessment should not designate specific endpoint species, but rather compare point concentrations to appropriate screening-level benchmarks (USEPA’s SSV, NOAA’s ER-Ls, or Oak Ridge National Laboratory’s SCVs), to determine if the site could pose unacceptable risk.

Comment 15

Section 8.7, Page 8-17, Line 1: This section is entitled “Risk Characterization”, but is actually a preliminary risk assessment. Risk characterization integrates the results of exposure and effects analyses to evaluate the likelihood of adverse ecological effects associated with exposure to a stressor. The ecological significance of the adverse effects is discussed, including the types and magnitudes of the effects, their spatial and temporal patterns, and the likelihood of recovery. Chemicals determined to be ECPCs are identified, and problems associated with each ECPC, including the extent of the problems and possible interactions of ECPCs (i.e. additivity or synergism), are discussed. This section should be renamed “Preliminary Risk Assessment” and should include an introductory statement that an in-depth risk characterization of Zone E ERA will be provided in the Zone J RFI Report.

Response 15

This section will be renamed to better reflect its content. A statement will also be added to reference the Zone J RFI Report for an in-depth risk characterization of offshore risk, including the areas adjacent to Zone E.

Comment 16

Section 8.7, Page 8-17, Line 7: The reference to “published” surface water quality effects levels is confusing in that all effects levels reported in Table 8.3 are published values. The text should be modified to be more specific.

Response 16

The text will be revised and will state that the few parameters with applicable surface water effect levels were exceeded by the maximum concentrations detected in Zone E surface water samples.

Comment 17

Section 8.7, Page 8-17, Line 13: The text states that “the HQs for the remaining parameters were all below 1”, based on the mean constituent concentrations in surface water. This statement is incorrect. Based on the mean HQ values presented in Table 8.3 (page 8-11), HQs exceeded 1 for 4-chloro-3-methylphenol (3.33) and tributyltin (1,058). The text should be corrected.

Response 17

These omissions will be corrected in the Final Zone E RFI Report.

Comment 18

Section 8.7, Page 8-17, Line 14: The text states that overall...only a moderate risk to surface water quality exists. This conclusion is incorrect. Mean HQ values for BEHP (146.67) and tributyltin (1,058) indicate extreme risk. The text must be revised to state that risk to surface water quality is extreme for BEHP and tributyltin, and moderate for all other analytes.

Response 18

The text will be revised to reflect the higher risk from the organics BEHP and tributyltin.

Comment 19

Section 8.7, Page 8-17, Line 17: The text states that for sediment, “HQ values greater than 1 but less than 3 for copper, arsenic, chromium, nickel, lead, zinc, and pyrene were determined.” The statement is incorrect. Using the mean constituent concentrations, the HQ value exceeded 3 for copper (10.35), lead (3.04), and pyrene (9.14), and was less than 1 for chromium (0.83). Additional analytes with HQs between 1 and 3 that were not included in the discussion were the following: mercury, 4,4'-DDE, methoxychlor, acenaphthene, acenaphthylene, dibenz(a,h)anthracene, fluorene, and naphthalene. The text must be corrected to include only those analytes with HQ values between 1 and 3. Also, the statement should qualify that the mean (not the maximum) HQ values were used to determine which analytes had HQ values between 1 and 3.

Response 19

The text will be revised to reflect the HQs presented in the Table 8.2.

Comment 20

Section 8.7, Page 8-17, Line 21: The text states that “overall risk to aquatic receptors from sediment concentrations appears low.” This statement is incorrect. Based on Table 8.2 (page 8-9), mean HQ values exceeded 10 for copper (10.35), Aroclor-1260 (20.76), fluoranthene (14.03), and carbon disulfide (16.55), indicating moderate risk. The mean HQ

exceeded 100 for acetone (132.84), indicating extreme risk. The text must be revised to include a discussion of risks to aquatic receptors from analytes in sediment with Hqs exceeding 10 (moderate risk) and 100 (extreme risk).

Response 20

The text will be revised to reflect the HQs presented in the Table 8.2.

Comment 21

Section 8.8, Page 8-19, Lines 3 and 4: The text states that moderate risks from ECPCs in surface water and potential low-level risk from sediment ECPCs are predicted for aquatic wildlife. This statement is incorrect. For surface water, a mean HQ value for tributyltin (1,058) indicates extreme risk. For sediment, mean HQ values exceeded 10 for BEHP (37.78), copper (10.35), Aroclor-1260 (20.76), fluoranthene (14.03), and carbon disulfide (16.55), indicating moderate risk, and exceeded 100 for acetone (132.84), indicating extreme risk. The text must be revised to include a discussion of analytes in surface water and sediment that pose moderate (HI>10) to extreme (HI>100) risks to aquatic receptors.

Response 21

The text will be revised to reflect the HQs presented in the Table 8.2

SWMUs 23 and 63: AOCs 540, 541, 542, and 543

Comment 1

Section 10.4.4, Page 10,4-21, Line 8: The text states that aluminum and iron in shallow groundwater exceeded both their respective tap-water RBC and background shallow groundwater RC. This statement is incorrect. A background shallow groundwater RC was not available for iron. The text should state that a background shallow groundwater RC was not available for iron.

Response 1

As part of the Final Zone E RFI, iron background reference concentrations will be developed and used to screen iron data.

AOC 550

Comment 1

Section 10.24.4, Page 10.24-14, Line 18: The text states that the relatively high arsenic concentrations in groundwater samples at nearby SWMU 65 were not a threat to surface water in the Cooper River. The relationship between AOC 550 and SWMU 65 is not explained, or are “relatively high” concentrations defined. The significance of the arsenic groundwater data for SWMU 65 to surface water at AOC 550 must be explained. It must be explained why the

relatively high arsenic concentrations in SWMU 65 groundwater samples are not considered a threat to surface water in the Cooper River. Lastly, “relatively high” concentrations should be defined in quantitative terms.

Response 1

The text will be revised to read “relatively high arsenic concentrations were also detected in groundwater samples at nearby SWMU 65, but were determined not to significantly impact surface water in the Cooper River. Please refer to Section 10.6.9.6, Table 10.6.9.2; maximum groundwater concentration does not exceed the Adjusted Eco/HH Groundwater RBC for arsenic.”

AOC 555

It was stated that a formal risk assessment was not conducted for this site. Conclusions and recommendations for sediment and surface water sampled from the Cooper River will be presented in the Zone J RFI Report.

Response

Correct.

AOC 556

It was stated that a formal risk assessment was not conducted for this site. Conclusions and recommendations for sediment and surface water sampled from the Cooper River will be presented in the Zone J RFI Report.

Response

Correct.

AOCs 559, 560, and 561

Comment 1

Figure 10.29.7, Page 10.29-70: A figure representing the Point Risk Estimates for Groundwater-Future Residential Scenario was not provided. The figure must be added to the page.

Response 1

This figure will be added in the Final Zone E RFI Report.

**Specific Comments Requiring Only Editorial
Changes To Correct The Document**

Comment 1

Figure 8.2, Page 8-3: The figure should be modified so that the numerical designations for the SWMUs and AOCs are legible. Also, it would be helpful if the legends were color-coded for ease of locating where a sediment or sediment and water sample was collected and the outfall locations within Zone E.

Response 1

A new Figure 8.2 will be generated so that SWMU and AOC designations are legible and sample and outfall locations are easier to recognize.

Comment 2

Figure 8.2, Page 8-8: The Contaminant Pathway Model uses solid circles and triangles to designate various receptors. A definition of the solid circle is not provided. A figure note should be added to explain what the solid circle represents. Also, the difference between the solid circle and solid triangle symbols should be included as a note to the figure.

Response 2

The legend to Figure 8.2 will be revised to include all symbols and their representations.

Comment 3

Table 8.3, Page 8-11: The Effect Level for 4-nitrophenol is reported as rather than the value of 82.8 reported as the chronic screening value listed in USEPA/SCDHEC Ambient Water Criteria (Region IV Bulletin). To conform with other screening values cited in the Region IV Bulletin, the exact effect level, rather than a rounded number, should be reported in the table.

Response 3

The Effect Levels in Table 8.3 will be revised so they are consistent with the Region IV Bulletin.

Comment 4

Table 8.3, Page 8-11: The Effect Level for bis(2-Ethylhexyl)phthalate (BEHP) is reported as 0.30 rather than <0.30 reported as the chronic screening listed in the USEPA/SCDHEC Ambient Water Criteria (Region IV Bulletin). The effect level should be corrected to conform with the other screening values cited in the Region IV Bulletin.

Response 4

The Effect Levels in Table 8.3 will be revised so they are consistent with the Region IV Bulletin.

Comment 5

Table 8.3, Page 8-12: The first note located at the bottom of the table states that chronic saltwater effect levels were used. This statement is incorrect. Chronic freshwater effect levels were used. The text should be corrected.

Response 5

The notes will be revised to cite the use of chronic freshwater effect levels.

Comment 6

Section 8.7, Page 8-17, Line 7: The text states that “the only five analytes with published surface water quality effects levels exceed those levels” is incorrect. In fact, six analytes exceeded those levels, based on Table 8.3 (page 8-11): aluminum, barium, iron, lead, thallium, and BEHP. The text should be corrected.

Response 6

The text will be revised to reflect the correct number of exceedances presented in Table 8.3.

Comment 7

FRE Summaries, Section 10: The FRE Summaries in Section 10 stated that Tables 7.3.1, 7.3.2, and 7.3.3 presented in Section 7 provide residential, industrial, and residential groundwater RGOs, respectively. This statement should be revised to state that Tables 7.3.1, 7.3.2, and 7.3.3 provide residential soil, industrial soil, and residential groundwater RGOs, respectively.

Response 7

This will be clarified and the revision will be made in the Final Zone E RFI Report.

SWMUs 5 and 18: AOC 605

Comment 1

Table 10.1.6.13, Page 10.1-87: “HI” is defined in a footnote to the table but is not used in the table. The last row in the table designated “Surface Soil Pathway Sum” should be renamed “Soil Surface Pathway Sum HI/ILCR”.

Response 1

Noted.

SWMUs 21 and 54

Comment 1

Table 10.2.8.1, Page 10.2-55: The definition of the double asterisk (“identified as an industrial COPC”) should be added as a note to the table.

Response 1

A footnote will be added to the table.

Comment 2

Section 11.2., Page 11-8, Line 2: The text states that SWMU 21 consists of a 20 by 80-foot concrete pad. The site consists of a 20 by 180-foot concrete pad, according to Section 10.2 (page 10.2-1). The text in Section 11.2 should be corrected.

Response 2

The text will be revised to reflect this correction.

SWMUs 23 and 63; AOCs 540, 541, 542, and 543

Comment

Section 10.4.2, Page 10.4-13, Line 13: The text states that 20 pesticides were detected in soil samples. The correct number is 21 pesticides. The text should be corrected.

Response

The text will be revised to reflect this correction.

SWMUs 83 and 84: AOC 574

Comment

Section 10.10.10.7, Page 10.10-64, Line 18: The text states that concentrations of manganese equate with a hazard quotient of nine. The concentrations of manganese equate with a hazard index of nine. The text should be corrected.

Response

The text will be revised to reflect this correction.

SWMU 102

Comment

Section 10.14.4, Page 10.14-17, Line 8: The text states that no metal in shallow groundwater samples exceeded its respective tap-water RBC. This statement is incorrect. Arsenic (5.10 $\mu\text{g/L}$) exceeded its tap-water RBC (0.0450 $\mu\text{g/L}$), according to Table 10.14.4.2 (page 10.14-17). The text should be corrected.

Response

The text will be revised to reflect this correction.

AOC 550

Comment 1

Section 10.24.2, Page 10.24-9, Line 13: The text refers to the industrial RBC of TEQs (dioxin equivalents) as 1,000 ng/kg. This statement is incorrect. The industrial RBC of TEQs is 43 ng/kg, according to Table 10.24.2.1 (page 10.24-6). The text should be corrected.

Response 1

The text will be revised to reflect this correction.

Comment 2

Section 10.24.4, Page 10.24-13, Line 3: The text states that only one metal (iron) in shallow groundwater exceeded its tap-water RBC. This statement is incorrect. Arsenic and manganese also exceeded their respective RBC, according to Table 10.,24.4.1 (page 10.24-12). The text should be corrected.

Response 2

The text will be revised to reflect this correction.

AOC 556

Comment

Section 10.27.2, Page 10.27-10, Line 5: The text states that ten SVOCs were detected above their respective SSV. This statement is incorrect. An additional chemical, anthracene, was also detected at concentrations that exceeded its SSV, according to Table 10.27.2.1 (page 10.27-7). The text should be corrected.

Response

The text will be revised to reflect this correction.

AOCs 559, 560, and 561

Comment

Section 10.29.4, Page 10.29-25, Line 13: The text states that only one metal (iron) in shallow groundwater exceeded its tap-water RBC. This statement is incorrect. Arsenic and manganese also exceeded their respective tap-water RBC, according to Table 10.29.4.4 (page 10.29-23). The text should be corrected.

Response

The text will be revised to reflect this correction.

AOC 562

Comment

Section 10.30.2, Page 10.30-4, Line 2: The text states that acetone and carbon disulfide were detected in two lower-interval samples. This statement is incorrect. Both VOCs were detected in one of two lower-interval samples, according to Table 10.30.2.1 (page 10.30-3). The text should be corrected.

Response

The text will be revised to reflect this correction.

AOCs 569, 570, and 578

Comment

Section 10.34.4, Page 10.34-22, Line 8: The text states that only one metal (thallium) in deep groundwater exceeded its tap-water RBC. This statement is incorrect. Arsenic and manganese also exceeded their respective tap-water RBCs, according to Table 10.34.4.4 (page 10.34-18). The text should be corrected.

Response

The text will be revised to reflect this correction.

AOC 572

Comment

Section 10.36.4, Page 10.36-13, Line 3: The text states that only one metal (iron) in shallow groundwater exceeded its tap-water RBC. This statement is incorrect. Arsenic and manganese also exceeded their respective tap-water RBC, according to Table 10.36.4.2 (page 10.36-12). The text should be corrected.

Response

The text will be revised to reflect this correction.

AOC 573

Comment 1

Section 10.37.4, Page 10.37-14, Line 3: The text states that only one metal (iron) in shallow groundwater exceeded its tap-water RBC. This statement is incorrect. Manganese also exceeded its tap-water RBC, according to Table 10.37.4.1 (page 10.37-13). The text should be corrected.

Response 1

The text will be revised to reflect this correction.

Comment 2:

Section 10.37.6, Page 10.37-18, Line 11: The text states that lead was detected above its industrial RBC in sediment. This statement is incorrect. Lead was detected at a maximum of 405 mg/kg, which was below the industrial soil RBC of 1,300 mg/kg, according to Table 10.37.6.2 (page 10.37-17). The text should be corrected.

Response 2

The text will be revised to reflect this correction.

AOC 580

Comment

Section 10.40.4, Page 10.40-15, Line 7: The text states that only one metal (iron) in shallow groundwater exceeded its tap-water RBC. This statement is incorrect. Arsenic and manganese also exceeded their respective tap-water RBC, according to Table 10.40.4.2 (page 10.40-13). The text should be corrected.

Response

The text will be revised to reflect this correction.

AOC 596

Comment 1

Section 10.45.4, Page 10.45-16, Line 6: The text states that one metal (iron) in shallow groundwater samples exceeded its tap-water RBC. This statement is incorrect. Arsenic also exceeded its tap-water RBC, according to Table 10.45.4.2 (page 10.45-14). The text should be corrected.

Response 1

The text will be revised to reflect this correction.

Comment 2

Section 10.45.4, Page 10.45-16, Line 11: The text states that two metals (arsenic and iron) in deep groundwater samples exceeded their respective tap-water RBC. This statement is incorrect. Manganese also exceeded its tap-water RBC, according to Table 10.45.4.3 (page 10.45-15). This text should be corrected.

Response 2

The text will be revised to reflect this correction.

Supplemental Sample Locations

Comment 1

Table 10.50.4.3, Page 10.50-19: The Reference Concentration ($\mu\text{g/L}$) for manganese is reported as "2560". For consistency within the tables, the concentration should be reported as "2,560".

Response 1

The concentration in the table will be revised to reflect this correction.

Comment 2

Section 10.50.4, Page 10.50-25, Line 4: The text states that antimony exceeded its tap-water RBC and shallow groundwater background RC. A shallow groundwater background RC is not available for antimony, based on Table.50.4.3 (page 10.50-18). The text should be corrected.

Response 2

The text will be revised to reflect this correction.

Comment 3

Section 10.50.4, Page 10.50-26, Line 8: The text states that chromium concentrations in two shallow groundwater samples exceeded the chromium tap-water TTAL of $18.0 \mu\text{g/L}$. However, in Table 10.50.4.3 (page 10.50-18), an asterisks is not marked for the chromium tap-water RBC to designate that the value is for TTAL. An asterisks should be added to the chromium tap-water RBC value in the table so that the text and table are in agreement.

Response 3

The text will be revised to read "tap-water RBC" rather than Tap-water TTAL.

Comment 4

Section 10.50.4, Page 10.50-26, Line 15: The text states that one shallow groundwater sample exceeded the manganese RC of $2,560 \mu\text{g/L}$. This statement is incorrect. The concentration of manganese in the sample was equal to the RC value ($2,560 \mu\text{g/L}$). The text and table should be in agreement.

Response 4

The text and table will be revised to reflect this correction.

Comment 5

Section 10.50.4, Page 10.50-26, Line 18: The text states that one shallow groundwater sample exceeded the vanadium RBC of 26.0 $\mu\text{g/L}$. This statement is incorrect. The concentration of vanadium in the sample was equal to the RBC value (26.0 $\mu\text{g/L}$). The text should be corrected.

Response 5

The text will be revised to reflect this correction.

Comment 6

Section 10.50.4, Page 10.50-27, Line 3: The text states that antimony exceeded its deep groundwater background RC. This statement is incorrect. A RC value is not available for antimony, based on Table 10.50.4.4 (page 10.50-20). The text should be corrected.

Response 6

The text will be revised to reflect this correction.

Comment 7

Section 10.50.4, Page 10.50-27, Line 15: The text states that the concentration of barium in one sample exceeded its deep groundwater background RC of 322 $\mu\text{g/L}$. This statement is incorrect. The concentration of barium in the sample was equal to the RC value (322 $\mu\text{g/L}$). The text should be corrected.

Response 7

The text will be revised to reflect this correction.

Comment 8

Section 10.50.4, Page 10.50-27, Line 3 and Page 10.50-28, Line 2: The text states that cadmium exceeded its tap-water RBC and deep groundwater background RC. This statement is incorrect. The concentration of cadmium in one sample was equal to the cadmium tap-water RBC of 1.8 $\mu\text{g/L}$. In addition, a deep groundwater background RC is not available for cadmium, based on Table 10.50.4.4 (page 10.50-20). The text should be corrected.

Response 8

The text will be revised to reflect this correction.

Comment 9

Section 10.50.4, Page 10.50-27, Line 3 and Page 10.50-28, Line 2: The text states that thallium exceeded its tap-water background RC. A tap-water background RC is not available for thallium, based on Table 10.50.4.4 (page 10.50-20). The text should be corrected.

Response 9

The text will be revised to reflect this correction.

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