RESPONSES TO EPA COMMENTS DATED 18 SEPTEMBER 2003, INCLUDING CLARIFICATION, ON THE QAPP FOR ADDITIONAL SEDIMENT SAMPLING AND CHARACTERIZATION FOR PHASE II REMEDIAL INVESTIGATION IR PROGRAM SITE 16 OF AUGUST 2003 NAVAL CONSTRUCTION BATTALION CENTER DAVISVILLE NORTH KINGSTOWN, RHODE ISLAND

GENERAL COMMENTS

Comment 1: The information provided in this plan is very limited in documenting the rationale for the sampling locations chosen and how the data collected will relate to past Site 16 operational practices, current marina activities, and current/past contributions from storm water discharges to the Allen Harbor. While there may have been a more thorough analysis of historic sediment depositional patterns in the development of this work plan, that thought process is not detailed in this plan. For instance, the plan states that the sample locations were selected randomly. It is not clear what this means. If there was a statistically based model for selecting the sampling locations presented it should be referenced and discussed, at least briefly. The three sampling areas that were designated appear to be drawn somewhat arbitrarily, or at least there is no supporting documentation to justify the configuration.

Response— The rationale for selection of the three sampling areas in Allen Harbor are presented on Page 8-1. The outside extent of sampling is drawn along the Class SB established in RIDEM (2002). The small area immediately adjacent to Site 16 is representative of the area within immediate proximity to the site and, therefore, most likely to have received discharge from the site. The intermediate area contains potential sources not directly associated with Site 16 (marina discharges), but relatively close to the site. As stated in this same paragraph, 30 ft x 30 ft grids were established in the outer two zones, and 10 ft x 10 ft grids established in the area closest to Site 16 (shown in Figure 8-1). The below text regarding grid cell selection will be added to the text.

> *Grid cells in each of the three sampling zones were identified with consecutive integers beginning with the number 1. Sample locations were then chosen by randomly selecting integers from a uniform distribution using Microsoft Excel's RANDBETWEEN() worksheet function. In order to mitigate the effects of spatial covariance among clumped sample locations, once a sample location was selected, its grid cell, along with its adjacent grid cells, were eliminated from the sampling pool for determining the location of additional samples.*

Comment 2: It would be useful to substitute two additional non-random samples in the area closest to the seep and outfall on a gradient away from (offshore from) the seep

and outfall so that it can be determined if concentrations decrease away from these potential sources. These non-random samples should be placed to the east-northeast of the seep and the north-northwest of the outfall.

Response— As recommended, two non-random samples will be collected from areas leading away from the seep and outfall.

Comment 3: Two additional non-random samples should be taken for XRF analysis to determine if elevated metals are associated with the dark sandy material that was discovered during a field trip along the shore opposite and east of the marina. This area is where the shore curves to the northwest. This material is similar to sand-blasting grit. The two samples should be comprised of one sample of the dark sandy material and one sample of sediment directly offshore in the low intertidal or subtidal zone.

Response— The location where the dark sandy material was present is not on Navy property; however, during field sampling two sediment samples of the material will be collected from the vicinity directly offshore for XRF and immunoassay analysis. No onshore samples will be collected in the area of the suspect sand-blast grit. Fingerprinting of this sediment sample is not advised since it is anticipated that the dark sandy material will more likely consist of metals rather than PAHs. If the material contains PAHs and has significantly migrated from the onshore to the sediment, then a gradient or halo would be determined from other sediment samples already planned in the southeastern portion of Allen Harbor.

Comment 4: There appears to be little consideration for area or temporal sediment depositional patterns relative to sample collection. Specifically, it would appear that the most significant contribution to harbor sediments occurred approximately 30 to 40 years ago. During that time the Site 16 area was apparently not vegetated and the area was heavily trafficked with significant earth moving activities. As a result, there was a higher potential for erosion of soil with deposition into the harbor. After that time there was likely additional sediment deposited over the ensuing 30 to 40 years. There is no mention of what the expected thickness of "newer" sediment might be. If only the upper shallow sediment zone is sampled, there may be a bias as to the actual degree of contamination in the harbor sediments. It may reflect only the most recent possible contributions, most likely the marina activities and off-site storm water runoff. It is quite common for deposition of sediments to accumulate in harbor or channel area as evidenced by periodic dredging of sediments for many marine facilities. Thus, the plan, as written, leaves open the possibility that only the most recently deposited sediment will be sampled.

Response— These data are to be used in the Phase 2 SLERA to determine if potential discharge from Site 16 and other sources may be contributing to unacceptable risk to ecological receptors. These receptors are exposed to the material closest to the sediment surface and are not routinely exposed to deeper sediment, hence

the use of Ponar or Van Veen surface sediment samplers, collecting to approximately 6–9 inches in sediment depth. Additionally, the area adjacent to Site 16 is subject to prop backwash from boats leaving the marina adjacent to Site 16. This resuspends sediment in this area, tending to mix deeper (and presumably older) sediment with newer, less deep sediment. The sample depth proposed for this study is consistent with the depth collected during the Allen Harbor Study (Science Applications International Corporation. 1996. *Allen Harbor Landfill and Calf Pasture Point Marine Ecological Risk Assessment Report: Volume I Technical Report*). A reasonably large volume of sediment sample will need to be collected from each location to send samples to all participating laboratories; consequently, it has been decided to use a Van Veen sediment sampler for this assessment. The Van Veen sampler collects a larger sample volume relative to Ponar samplers. The text will be changed to reflect this change.

Comment 5: Insufficient detail is provided on the sediment sampling procedure to be followed. While the sampling methodology lists a "Ponar sampler" as the mechanism for collection of the samples, there is no discussion of the merits of the sampling interval (0 to 6 inches is given on Table 9-1) or what interval of that sample will be used for the screening analysis. There is no specific mention as to whether the upper three inches or lower three inches, etc. would be used for analysis. There is also no mention, depositional patterns aside, of how the relative depths of the sediment affect the risk posed by the sediment. Is the biotic risk limited to a discrete upper zone? If so, will there be dilution of the sample if too large a segment of the sediment column is sampled? Also, if only the upper sediment is of present concern, will future dredging of Harbor sediment create problems in the future as deeper sediment contamination (if it is present) is then released to the water column?

Additionally, the plan also does not provide rigorous procedures for uniform sample collection. Since there is no specific rationale for determining the upper "surface" of the sediment, there is concern is that different sample intervals may be sampled at different locations within and across each of the three designated zones. The work plan leaves open the possibility that very shallow sediment samples may be collected from certain locations and somewhat deeper samples collected from other locations within the harbor.

A Standard Operating Procedure (SOP) for Sediment Sampling should be added as an attachment to this document. Specific areas that need to be addressed within this SOP to follow EPA guidance document requirements are detailed under Specific Comments.

Response— The surface layer of sediment is that layer to which the majority of ecological receptors are exposed, as stated in the response to Comment 4. In addition, sediment in the immediate vicinity of Site 16 has been resuspended by boat props, resulting in the mixing of sediment from deeper depths to the surface. As

noted in the response to Comment 4, a Van Veen sediment sampler will be used to collect these samples to assure the appropriate volume of sediment. Section 9.1, Sampling Procedures, is meant to provide the necessary guidance for the collection of sediment samples. As stated in this section, the sediment sampler device (in this write up, a Ponar sample, to be changed to a Van Veen sampler) is dropped, closed shut, and brought to the surface. As mentioned in the response to Comment 4, these samplers typically collect a 6- to 9-inch depth of sediment.

As stated in Section 9.1, once brought on board, AVS-SEM sample aliquots will be collected from the sampler. It is noted that the sampling of Target Compound List VOCs has not been mentioned in the draft document. These samples will be collected at the same time as the AVS-SEM samples. Section 9.1 will be changed to reflect the collection of VOC samples prior to homogenization of the balance of sample. Sediment (entire depth of sample) is then collected from the interior of the Van Veen sampler (to avoid potential contamination with the sampler) and homogenized in a stainless steel bowl for placement into the appropriate sample containers. Consequently, outside of AVS-SEM and VOCs (which would be affected by the homogenization process) these samples will reflect the entire depth of sample. Section 9.1 will be modified to reflect these details.

The depth to which the Ponar and Van Veen samplers go reflects the general depth to which aquatic organisms are exposed; consequently, use of these samplers is appropriate for the purpose of this study.

Comment 6: Actual deposition of sediment within the harbor area is not likely to be delineated by the linear boundaries depicted on Figure 8-1. In particular, the potential contribution of contaminants to harbor sediment from the storm drain outfall would appear to potentially extend further out into the second zone referred to (Marina area). During periods of high runoff, with associated high discharge velocities, suspended sediments are likely to be carried further out into the harbor area, not just be deposited at the outfall. This is particularly true of the fine soil particles most likely to retain the contaminants of concern such as silts and clays. If there is justification for the boundaries shown they it should be presented and discussed.

Response— It is agreed that there is the potential for transport of sediment from the storm drain out beyond the area immediately adjacent to Site 16, resulting in possible deposition of these fine grains in the marina area; however, samples are to be collected from both of these areas. Dependent upon the results of the screening analysis, it is expected that there will be some samples from the marina area that will be assessed for fingerprinting, thus allowing differentiation of this source. The delineation of boundaries was stated in the response to Comment 1.

Comment 7: In addition, there is no discussion of the impacts, if any, of currents within the harbor and the potential for erosion and deposition of sediments created by those currents. This is a concern since there are fewer samples planned for a larger area of the third designated zone north of the marina. The movement of tidal currents has the potential to transport suspended sediments deposited by both overland flow directly from immediately adjacent portion of the Site 16 area and storm water discharges from wherever the outfalls may be. If the deposition of sediments in Allen Harbor is not impacted by tidal fluctuations or currents, that variable should be discussed in this plan also in order to justify the fewer samples in the third zone.

Response— The outer sampling zone is in excess of 200 feet from Site 16. While there may be movement of suspended sediment from the various sources (Site 16, marina, outfall) into this outer zone, all the sediment will be well mixed at that point, quite possibly making it impossible to differentiate sources. Sufficient samples will be collected from this zone to allow a qualitative assessment of this pathway. The purpose of these outer area samples is to assess this issue. The screening level ecological risk assessment will only be performed on those samples in the marina area and the area immediately adjacent to Site 16.

Comment 8: It is not entirely clear what is intended by the statement that the storm drain "catch basin" sampling will be representative of "routine" parking lot storm water characteristics. Current operations in the Site 16 area appear to be significantly different from those that were present during the time frame of highest activity at Site 16. Sampling of a storm drain catch basin or outfall at the present time is likely to be representative of only the most recent site activities, i.e. the paving of the drainage area and use of large portions of Site 16 for vehicle parking/storage. However, past operations within Site 16 appeared to include large areas without pavement and different usage patterns.

Response— The storm drain from which this catch basin sample is to be collected drains the parking area adjacent to Site 16; it does not catch Site 16 runoff. Because the storm drain collects water from this parking area, it should be consistent with parking lot storm water characteristics.

Comment 9: The additional sediment sampling proposed in the QAPP provides an adequate follow-up to the October 2001 Screening Level Ecological Risk Assessment (SLERA) and addresses the major concerns EPA had with the SLERA. The general proposed approach for the expanded SLERA is sound and remains adequately conservative. The additional ecological receptors are appropriate to determine risk from bird and mammal exposure to contaminants in harbor sediments.

Response— Comment noted.

Comment 10: The XRF and Immunoassay techniques provide a valid cost-effective method to focus the collection of samples for a full suite of analyses. There may be a problem, however, in determining the best sample location for all COPC. For example, only copper and lead are proposed for the XRF analysis in Table 9-1 (see Specific Comment for Table 8-1). Unless evidence can be provided showing that high concentrations of copper and lead can be used to accurately track high concentrations of the other inorganic COPC, it will not be possible to know if the areas with the highest hits of other inorganic COPC are adequately covered. Further, PCBs and pesticides area also COPC at this site. The RSC method does not determine the best locations for sampling for these COPC. Please discuss how these apparent limitations will be addressed.

Response— The screening XRF analysis will include multiple metals (including arsenic, barium, chromium, lead, nickel, selenium, silver, and zinc) although correlations between XRF and fixed-lab analyses for some elements (i.e., chromium and nickel) may not be good. There will be many samples for which both XRF and fixed-lab analyses will be performed. Correlations between these two analyses will be assessed and included in the report. Table 9-1 and Appendix B will be changed to reflect the many elemental analyses. The initial screening level ecological risk assessment did identify some pesticides and Aroclor 1260 as COPCs. Pesticides and PCBs will be analyzed in a subset of XRF (at least seven samples from the area immediately adjacent to Site 16) in addition to TAL metals, VOCs, and PAHs. The physical and chemical characteristics of PCBs and pesticides are similar to PAHs for which screening will be performed. Both are hydrophobic and will be associated with sediment particles and organic matter; therefore, the transport of PCBs and pesticides should be similar to the PAHs.

Comment 11: The random sampling of sediments provides generally good coverage of the three sections in the harbor. There appears to be a spatial gap, however, between the outfall and the rest of the samples and the seep and the rest of the samples in the southern section. It may be useful to add a couple samples closer to the outfall and the seep in order to gain more resolution on any contamination gradient which might occur at those locations.

Response— Samples will be added between the outfall and the seep, and the rest of the samples. Please see the response to Comment 2.

Comment 12: Please clarify if the duplicate samples will be true duplicates (aliquots from the same homogenized grab sample) or from duplicate grab samples from the same area.

Response— Duplicate samples will be true duplicates collected as aliquots from the same homogenized grab sample. This will be added to Sampling Procedures, Chapter 9.

Comment 13: It is stated in Section D-5 of Appendix D that COPC concentrations will be compared to reference (i.e. background) concentrations using NAVFAC Guidance for Environmental Background Analysis, Volume II. Sediment (NAVFAC, 2003). Methods for determining whether COPC concentrations at the site are different from natural and/or anthropogenic background must be consistent with U.S. EPA background guidance. Currently, there is no background data set for sediments that conform to either Navy or EPA requirements. In addition, EPA reiterates that according to national EPA and EPA Region I guidance, COPCs should not be eliminated based on background prior to screening against toxicity benchmarks.

Response— Constituents of Potential Concern (COPCs) will not be eliminated based on background prior to screening against toxicity benchmarks during Step 2 (i.e., Tier I of Navy ERA Process) of the ERAGS Process. The background comparison will be completed as part of the refinement step (i.e., Step 3a, as shown in Figure D-1) of the SLERA and stated in risk characterization, subsequent to screening and food-web calculations. The collection of reference samples from Wickford Cove, Little Allen Harbor, and Prudence Coggeshall Cove is meant to develop the sediment background (or, more appropriately, reference) dataset for comparison to site data.

Comment 14: In order to expedite decision-making concerning the need for a BERA, Navy should consider discussing in the uncertainty section of the SLERA the relationship between any NOAEL-based hazard quotient greater than one to what its LOAEL-based hazard quotient would be if the assessment proceeded to a BERA.

Response— Agreed. This topic will be added to the uncertainty discussion.

SPECIFIC COMMENTS

Comment 15: **Page 2-7, Section 2.1:** The text states that a QAPP Addendum will be prepared for any additional risk assessment activities to be performed for the project. The text should refer the reader here to Appendix D of this document, the Screening-Level Ecological Risk Assessment Work Plan.

Response— Agreed.

Comment 16: **Page 5-1, Section 5.2:** This section lists the COPC determined in the SLERA. Please add the chemicals for which there was no screening value available (e.g., vanadium, cobalt, benzo(b)fluoranthene). It was agreed during the 12/19/01 meeting that these chemicals would be considered COPC along with those chemicals with concentrations exceeding screening values.

Response— Agreed.

Comment 17: **Page 6-1, Second Paragraph, First Bullet:** What inorganic constituents will be detected by the X-ray fluorescence spectrometry (XRF) screening method? Previous text describes several metals of concern. Will this method address all of those inorganic constituents or will one or more be used as indicators? Will this be limited to copper, lead, nickel and zinc as listed on Page 4 of 6 in Appendix B?

Response— Please see the response to General Comment 10. The screening XRF analysis will include multiple metals (including arsenic, barium, chromium, lead, nickel, selenium, silver, and zinc). Appendix B and Table 9-1 will be modified to reflect this.

Comment 18: **Page 6-6, Table 7-1:** Please include Project Action Limits and/or Project Required Detection Limits for TOC and SEM-AVS in the final version of this addendum.

Response— PALs and PRDLs will be added to Table 7-1 for TOC and SEM-AVS.

Comment 19: **Page 7-1, Section 7.2:** The first sentence states that analytical results will be needed from 95% of the planned quantitative samples. Please explain this statement in the text. It is not clear why analytical results will not be needed from 100% of the samples.

Response— The 95% success of data from this study is designed to be the Measurement Performance Criteria (MPC) for "Completeness." It is less than 100% to allow for broken sample containers and other potential problems. It is expected that data will be obtained from 100% of the samples, but 95% will be necessary to answer the objectives of this study.

Comment 20: **Page 8-1 of 8-3:** Additional information should be provided to support the rationale for the establishment of the sampling grid. This paragraph makes no reference as to how the sample locations were selected other than to state that they were chosen "randomly". The methodology to accomplish this should be provided to verify that a statistically valid mechanism was use to determine the locations. It appears that this approach may have been followed. However, the lack of description of the process suggests that the locations were not randomly selected in a scientific manner. Additionally, there is no discussion in the text as to the likely past site depositional history. In particular, do currents within the harbor, generated by tidal or other mechanisms affect the migration and deposition of the sediments eroded into the harbor?

What is the rationale for demarking the boundary between Area One and Area Two? Discharge from Site 16 is likely to have extended out into the area east of the marina in the area now designated as Area Two. This area would likely have been impacted from stormwater discharges from areas of Site 16 during times when the surface conditions were different than at present. During high runoff,

storm water would likely flow further out into the harbor and deposit finer-grained sediment. The text contained in this plan appears to assume that the contaminant contributions from this location are represented by present day conditions only, primarily from the large areas of pavement and vehicle storage. However, past site usage was apparently considerably different. During that time eroded sediment retaining contaminants would have entered the storm drain at various catch basin locations and through loose connections between storm drain pipe sections. Therefore, past sediment deposition from the storm drain outfall may have significantly different characteristics.

Description of Area Two notes a storm drain outfall draining the automotive storage area at the east end of this zone. Review of Figure 8-1 does not show this outfall. The outfall appears to be located in Area One. Is there an additional storm drain outfall that should be depicted on Figure 8-1? Also, the intent to sample from the catch basin may not be totally appropriate since the catch basin is most likely to trap and hold the coarser fraction of sediment eroded or washed from the drainage area. The finer fractions since as silt-sized material is more likely to flow through. The fine fraction will also have the potential to retain the contaminants of concern. Those sediments are likely to be deposited at various distances from the outfall. Review of Figure 8-1 indicates only one location close to the one outfall shown (red square).

Response— Please see the response to Comment 1: 30 ft x 30 ft grids were established in the outer two zones, and 10 ft x 10 ft grids established in the area closest to Site 16 (shown in Figure 8-1). The below text regarding grid cell selection will be added to the text.

> *Grid cells in each of the three sampling zones were identified with consecutive integers beginning with the number 1. Sample locations were then chosen by randomly selecting integers from a uniform distribution using Microsoft Excel's RANDBETWEEN() worksheet function. In order to mitigate the effects of spatial covariance among clumped sample locations, once a sample location was selected, its grid cell, along with its adjacent grid cells, were eliminated from the sampling pool for determining the location of additional samples.*

The past depositional history of Allen Harbor is unknown because no deposition studies have been performed in this area. It should not be necessary to perform a depositional study for this assessment, unless a baseline ecological risk analysis becomes necessary. Sufficient samples have been planned for to complete a supplemental SLERA. Because of the combination of both non-random and random samples, potential sources may well be identified.

The demarcation between Area 1 (immediately adjacent to Site 16) and Area 2 (marina area) is to differentiate the areas most likely impacted by marina influences from those adjacent to Site 16. As noted earlier, and as stated in your

comment, these areas are subject to constant mixing, not only from currents, but also by boat backwash. Additionally, the creosote that is characteristic of the historical use of Site 16 is also likely to be found in the wharves and moorings in the marina. Because of these influences, it is quite likely that the sediment in Areas 1 and 2 will be similar. The use of PAH fingerprinting will help to isolate potential sources of contaminants in these two areas.

It is true that the outfall is actually located in Area 1, not Area 2. It is possible that during storms, fine particles from the outfall could influence both Areas 1 and 2. The text will be modified to reflect that Area 1 is characteristic primarily of the marina influences, and that the outfall could have impacted both Areas 1 and 2. As stated above, the PAH fingerprinting will hopefully "tease" out these various influences.

Comment 21: **Page 8-2 of 8-3, Section 8-1, Reference Sample Locations:** Please note that in the 1991 field work by the Navy at Prudence Coggeshall Cove, high PAH toxicity was found from the sediment samples. This may not be a suitable reference location. NETC has used a different reference location. The BCT should discuss this issue prior to workplan implementation.

In addition, no use for reference locations has been detailed in this QAPP. Please clarify.

Response— The purpose of taking samples from three independent reference locations is to compare these data (i.e., absolute concentrations of VOCs, pesticides, PCBs, metals, PAHs, or detailed PAH fingerprinting) with those data from the various zones in Allen Harbor. For example, if marinas have added appreciable contamination to sediment, the PAH fingerprint should theoretically be similar at all marinas. The major goal of this study is to complete a refined SLERA for Allen Harbor for the potential contamination contributed from Site 16, as well as to hopefully "parse out" the many contributions of contamination to Allen Harbor. This is why the outfall has been designated as an area of investigation. Because there is a marina adjacent to Site 16, it is important that reference areas also reflect this source of contamination. The reference areas selected have similar influences, excluding the influence of Site 16. Consequently, it is appropriate that there be some level of marina and storm water influence in our reference areas.

Data from reference areas will be compared to the data from sediment adjacent to Site 16. For example, there is a marina adjacent to Site 16, from which a PAH signature will be obtained. This signature can then be compared to the PAH signature from the Wickford Cove marina. Assuming that the source of PAHs are similar in both marinas (i.e., petroleum hydrocarbons spilled from boats or perhaps creosote from pilings) the PAH signature should be similar in both marinas. Similarly, influence (contaminants) from the Providence River on Narragansett Bay is present at Prudence Coggeshall Cove. It is reasonable to

assume that contaminants in the Providence River migrate into Allen Harbor, possibly impacting the sediments adjacent to Site 16. As indicated above, a secondary goal of this study is to identify, to the best extent possible, potential sources of contaminants to sediments adjacent to Site 16. Varied sources are possible, including marinas, Providence River contaminants, creosote pilings, storm drains, and other sources.

Comment 22: **Page 8-3 of 8-3, Section 8-1, Second Paragraph:** The discussion of an outfall and catch basin sampling in this paragraph is confusing. The text and Figure 8-1 mention and describe an outfall in Area One that contributes storm water runoff to the harbor. However, this paragraph states that a catch basin will be sampled. Does this mean that the outfall will not be sampled? Review of Figure 8-1 appears to indicate that there are no sediment samples to be collected immediately down gradient of the outfall. It would appear that eroded sediment transported by the storm drain and deposited into the harbor would be most prevalent in this area. Also, where is this catch basin? It is not shown on Figure 8-1. Additionally, the assumption that sediment in the catch basin may be representative of present day "routine" runoff, how is sampling of present day sediment from the catch basin related to past deposition into the harbor from contributing areas draining into and through the catch basin during past Site 16 operations?

Response— Both the catch basin and the sediment area adjacent to the storm water outfall will be sampled. The outfall sample shown in Figure 8-1 represents the latter of these two samples. The catch basin sample is not shown on Figure 8-1 because it is a source area sample. As noted in the response to Comment 2, samples will be collected leading away from the outfall to determine if the outfall's influence extends significantly. The catch basin that will be sampled catches runoff from an area that has been a parking lot for years. Consequently, the collection of "present day 'routine'" samples should be similar to runoff for all of these years.

Comment 23: **Page 9-1, Section 9.1:** The turnaround times for the screening sample results are not clear in the text. The concern is that the PAH/fingerprint samples for quantitative analysis will not be identified soon enough to meet the holding time requirements. Please clarify how the screening results will be communicated to the labs performing the quantitative analyses.

Response— The Navy is very aware of the need to receive the results of the RSC analyses quickly so that decisions can be made regarding which samples receive quantitative analysis and PAH fingerprinting. This has been clearly stated on page 8-2 of the draft QAPP. The SPAWAR Systems Center in San Diego has previously performed this type of analysis, and delivered results in sufficient time to designate appropriate samples for quantitative analysis at a site in Connecticut. They have promised that this will also be the case for these samples. The screening results will not be reported directly to the laboratories

that will be performing the quantitative analyses; rather, the screening results will be assessed by the Navy and project chemist, and the decision about which sample numbers to quantitatively analyze will be communicated to the laboratories.

Comment 24: **Page 9-1, Section 9.1:** This section states that "Sufficient sample mass will be collected for the RSC analyses, complete quantification analyses, and forensic analysis of all samples." Please clarify how much sediment will be needed. Will one Ponar grab be sufficient? If not, how will the additional sample grabs be located and processed? What contingencies are in place for sediment samples with less than 75%, 50%, or 30% solids?

Response— As stated in the response to Comment 4, a Van Veen sampler will be used in lieu of a Ponar grab sample to assure that sufficient sample is obtained using one grab sample. The laboratories have been contacted, and it has been verified that the sample containers and sizes shown in Table 9-1 of the QAPP are adequate to address high percent moisture samples. The Navy and the laboratories associated with this project are aware of EPA Region I data validation guidance regarding percent moisture greater than 70% (30% solids), and, as noted in the response to Comment 26a, samples will be dewatered to assure that the data are not compromised. Occurrences where samples are less than 75% or 50% solids (25% or 50% water) are not impacted by Region I data validation guidance. These may impact the method detection limits (MDLs) or quantitation limits (QLs) shown in Table 7-1. However, examination of this table shows that even if these QLs are raised by higher percent moisture, the project required detection limits would be achieved at 75% or 50% solids.

Comment 25: **Page 9-1 of 9-3, Section 9.1, First Paragraph:** A Sediment Sampling SOP is needed to provide further details of the sediment sampling procedure to be followed. For example, this paragraph does not provide sufficient detail as to what is being sampled. It mentions that grab samples will be collected using a "petite Ponar grab sampler". What does this mean in terms of sample depth? EPA Region I Sediment Sampling Guidance (September 1998) refers to a depth of 0 to 12 inches as the preferred sampling depth for sediment samples. While risk posed from sediment contamination may decrease with depth it is not clear that risks due to bioaccumulation, etc. are limited to very shallow depths. If the samples will all be collected from very shallow depths, they may bias the evaluation in terms of what has been most recently deposited to the harbor sediment. Site 16 operations were likely at a peak approximately 30 to 40 years ago. That is likely the time of maximum contribution of any potential contaminants to the harbor. Subsequent to that time there has likely been additional deposition of sediment. However, if recent sedimentary deposits do not bury the previous sediments to sufficient depths, those past sediments may still pose a risk through bioaccumulation mechanisms in benthic and/or aquatic life. Also, what is the potential for future release of potentially deeper buried

past contaminated sediment if there is to be dredging of the harbor? How will the sampling program address this risk?

Response— Section 9 of the QAPP is meant to provide sufficient detail for sampling procedures. It will be modified to reflect any changes as a result of these comments. Preparation of a separate sampling SOP appears to be redundant. Both the Ponar and Van Veen sediment samplers grab samples that are 6–9 inches deep. This depth represents the area to which the majority of ecological receptors are exposed. Concern about the deeper sediment is noted; however, as stated earlier, the sediment vicinity of Site 16 is regularly remixed by backwash of boats leaving the immediately adjacent marina, as well as by stormwater runoff and tidal currents. The current sample design should be able to answer the basic goals of this investigation, which are to:

1. Characterize the general spatial concentrations of contaminants within a limited area of Allen Harbor

2. Attempt to determine whether the PAH signatures in the sediment adjacent to Site 16 are reflective of PAHs from the site, or from other sources

3. Based on a refined SLERA, determine if a baseline ecological risk assessment is necessary.

Characterization of risks associated with potential dredging of the harbor is not a goal of the project.

Comment 26: **Page 9-1 of 9-3, Section 9.1, First Paragraph, 4th Sentence:** The text states that adequate sample volume will be collected for all analyses. Other information regarding sampling procedures should be included in a Sediment Sampling SOP, to address the issues of sediment dewatering and required sample volume listed below.

a. No mention is made in the text of sample dewatering, which is recommended by EPA Region I as a means to reduce sample moisture content and therefore better achieve dry sample weight and project quantitation limit requirements. Field dewatering using filter paper is recommended for all samples but those collected for VOC analysis. Further dewatering in the laboratory by freeze-drying for organic analyses or by oven-drying for inorganic analyses may be necessary based on the moisture content of samples after field dewatering. Laboratory dewatering is recommended if necessary to achieve a sample moisture content of less than 50 percent. EPA Region I Data Validation Guidelines require a sample to have greater than 30 percent solids in order for the resulting data to be acceptable. Since water provides interference for XRF screening, the percent moisture content of the samples collected for this analysis may be crucial. The text should be modified to address sample dewatering procedures.

Response— The Navy is aware of Region I data validation guidelines regarding percent moisture in samples. When Ponar or Van Veen samples are brought on-board the sampling vessel, overlying water flows out leaving, at worst, small "puddles" of water on the sample. Further field dewatering is not practical. Samples will be sent directly to each of the three laboratories involved in this project (SPAWARS, Ceimic, and Battelle), and arrangements have been made with each of these laboratories to examine the percent moisture of the samples and determine if further dewatering is necessary.

b. The amount of sample collected for each analysis is dependent upon the dry sample weight required to meet the dry sample weight requirements for each analytical method. EPA guidance suggests assuming that the sample contains 90 percent moisture and collecting an appropriate sample volume on that basis. After consulting the relevant EPA guidance, considering the necessary quantitation limits and consulting the laboratory on dry sample weight requirements, the text should be modified to reflect the actual sample volume required for each analytical method.

Response— As noted in earlier responses to comments, a Van Veen sampler will be used to assure that sufficient sample volume is collected from a single grab. Sufficient sample will be collected and provided to laboratories to assure that sample dewatering, if necessary, will not impact the analytical procedure detection limits.

Comment 27: **Page 9-1 of 9-3, Section 9.1, First Paragraph, 5th and 6th Sentences:** The text states that the Simultaneously Extracted Metals – Acid Volatile Sulfide (SEM-AVS) sample will be collected first prior to sample homogenization at each location, then the samples for the remaining analyses will be collected. This should be modified to also include collection of any samples for volatile organic compound analysis, as shown in Table 7-1, prior to sample homogenization.

Additionally, a separate procedure for the collection of samples to be analyzed for VOCs is not referenced in the text, other than collecting VOC samples first and putting them on ice after collection. According to relevant EPA Region I guidance (Region I, EPA-New England Sediment Sampling Guidance, Draft, September 1998), sediment samples for VOC analysis should be collected using plastic syringes which have been modified to allow standing water to decant during sample collection. The volume of the syringe (60 ml or 10 ml) and the preservative required (methanol or water containing sodium bisulfate) depends on whether a high level or low level analysis is required to meet the desired quantitation limits. The Navy should consult with the laboratory to determine the latest and most appropriate methods of collecting, managing, and analyzing sediment samples.

Will the VOC analysis be evaluated by the Navy to determine where to map the plume discharge area?

Response— As noted in the response to Comment 5, the taking of VOC samples prior to homogenization of the sample will be added to Section 9 of the QAPP. The citation for Region I sediment sampling procedures was obtained from Andy Beliveau, and will be referenced in the rewrite of Section 9.1. As stated elsewhere, these samples will be collected with a Van Veen sampler, the overlying water allowed to run out of the sample, and then a VOC sample collected. The analysis of VOCs is a secondary goal for the SLERA. Additionally, the detected VOC will be illustrated on a tag map and included in the report.

Comment 28: **Page 9-1, Section 9.1:** This section states that "Sufficient sample mass will be collected for the RSC analyses, complete quantification analyses, and forensic analysis of all samples." Please clarify how much sediment will be needed. Will one Ponar grab be sufficient? If not, how will the additional sample grabs be located and processed?

Response— Please see the response to Comment 24.

Comment 29: **Page 9-3 of 9-3, Section 9.5:** The text states that no field measurement equipment will be used. GPS coordinates for sampling locations are mentioned in Section 9.2 of the text. Are there any procedures that need to be followed to ensure the accuracy of the GPS readings provided on the sampling boat to locate the desired sampling areas?

Response— The only GPS procedure that is followed is a daily check on accuracy, i.e., taking GPS readings of a known location. This will be noted in the text.

Comment 30: **Page 15-3 of 15-3, Section 15.5:** Why has the Navy decided to neglect any evaluation of data and interpretation of results?

Response— As stated in the response to Comment 25, the project is designed to answer the basic goals of this investigation, which are to:

1. Characterize the general spatial concentrations of contaminants within a limited area of Allen Harbor

2. Attempt to determine whether the PAH signatures in the sediment adjacent to Site 16 are reflective of PAHs from the site, or from other sources

3. Based on a refined SLERA determine if a baseline ecological risk assessment is necessary.

Sediment screening results (RSC) are designed to isolate samples of greater interest that warrant quantitative analysis and/or PAH fingerprinting. This process will be stated in the report. In addition, each of the above project goals will be stated in the context of data generated by this sample session. Text to this effect will be added to Section 15.5.

Comment 31: **Figure 8-1:** This figure shows a storm water outfall located in Area One. However, the text describes a storm water outfall from the automobile storage area at the eastern edge of Area Two. Is there an additional storm water outfall at the Area Two location? Also, the text describes sampling from a catch basin, not an outfall. Where is this catch basin? It should be shown on this figure.

What is the rationale for the delineation of the Area One and Two boundaries? If the outfall described in the text is the one shown on this figure the Area One boundary should extend into the eastern portion of Area Two that is shown on this figure. It would also appear that marina contributions would be most strongly centered on the area of the docks. Why is Area Two delineated to extend to the east-southeast?

Response— There are two sources of discharge into Allen Harbor in this area. The first is the seep location, and the second is the outfall, both of which are shown in Figure 8-1. The catch basin that will be sampled for this study is located approximately 75 yards in from Allen Harbor in the parking lot. The parking lot can actually be seen in Figure 8-1 at the bottom of the figure. The rationale for delineating the Area 1 and 2 boundary is, as stated earlier, to separate the area closest to Site 16 from the area associated with marina contributions. By extending Area 2 over to the eastern shore, greater sample density is achieved in this area. While it is agreed that these area boundaries may be somewhat arbitrary, the study design should allow for isolation of the different sources of contamination to Allen Harbor sediment.

Comment 32: **Figure 8-2:** Where is the catch basin referred to in this figure? Is it in the referred to parking lot to the southeast of Site 16 or near the outfall shown on Figure 8-1?

Response— As stated in the response to Comment 32, the catch basin that will be sampled for this study is located approximately 75 yards in from Allen Harbor in the parking lot.

Comment 33: **Table 7-1:** This table lists Project Action Limits (PAL) in column three. These values match some of the ecological benchmarks used in the SLERA, but they don't match in all cases. Some of the PAHs do not have associated PALs listed, although they do have available ecological benchmarks. Please define the PAL and describe how the values were derived.

Response— The PALs listed in Table 7-1 were produced prior to completion of Table D-1 in Appendix D. Both tables will be modified to reflect similar screening values, which, by definition, become the project PALs. Sources will be clearly cited in Table D-1, and Table 7-1 will refer to this appendix table for the sources of PALs.

Comment 34: **Table 7-1:** Please provide in the footnotes the complete reference for MacDonald et al (2000) and Buchman (1999).

Response— The complete citations for MacDonald et al. (2000) and Buchman (1999) were inadvertently left off the reference list. They will be provided in the Final version of this document.

Comment 35: **Table 7-3, Pages 1 and 2:** The table states that 100% of critical data must be deemed acceptable. No mention is made of what the critical data points might be in the Section 7.0 text. Explain what data points are considered critical and why.

Response— Given the nature and goals for the project, none of the data qualify as "critical" data. The concept of "critical data" would apply if there were specific analytes for which the data were mandatory to achieve the project goals. For example, if it was known that a given chemical, such as chlordane, had been used at Site 16, and that there may have been transport of this chemical into Allen Harbor, then the assessment of chlordane would become a critical data point. Given that the purpose of this study is to examine TCL and TAL chemicals, as well as PAH fingerprinting, none of these data are what could be considered "critical." This term and the goal will be removed from Table 7-3, and the overall completeness of 95% will remain.

Comment 36: **Table 8-1:** The second column lists XRF analysis for lead. Table 9-1 lists XRF analysis for lead and copper. Please clarify this discrepancy.

Response— See the response to Comment 10. Multiple elements will be monitored using XRF, and will be documented in the revised QAPP.

Comment 37: **Tables 8-1, 9-1, and 12-1:** The metals listed for sediment screening samples in these tables vary. For example, Table 8-1 only has lead listed, while Table 9-1 has both lead and copper, and Table 12-2 has lead, copper , nickel, and zinc listed. Please revise these tables in the final addendum so that they are consistent with each other.

Response— As stated in the response to Comment 10, the list of elements that will be screened using XRF will be increased. These elements will be added to Tables 8-1, 9-1, and 12-2.

Comment 38: **Table 9-1, Page 1 of 3:** The table states that sediment samples are to be collected from a depth of 0 to six inches. EPA Region I Sediment Sampling Guidance (September 1998) refers to a depth of 0 to 12 inches as the preferred sampling depth for sediment samples. Justification should be provided in the text for the sample provided. See Specific Comment above.

Response— As stated earlier, Van Veen or Ponar sediment samplers collect sample depths ranging from 6 to 9 inches depending upon the nature of the sediment. These depths represent the depth to which the majority of ecological receptors may be exposed. Additionally, the sediment in the vicinity of Site 16 has been resuspended multiple times by boat propwash, mixing the top sediment with the deeper sediment. Language to this effect will be added to the text.

Comment 39: **Table 19-1:** Please include the data validator in the final version of the addendum.

Response— The data validator will be listed in the Final version of the addendum.

Comment 40: **Appendix A, Safety, Health, and Emergency Response Plan:** General boating safety topics are not addressed in this plan. For example, will the sample collection boat operator need to have particular licenses or certifications to operate the boat and participate in the sample collection activities? Will any inspection of the boat's engine, safety gear, or radio be done before leaving the dock each day to commence sampling? These topics should be addressed in the SHERP Plan text and Table 5-1, Task-Specific Activity Hazard Analysis, as appropriate.

Response— General boating safety topics are stated in detail in Attachment C of the SHERP.

Comment 41: **Appendix A, Safety, Health, and Emergency Response Plan, Page 5, Section 8:** Personal flotation devices (PFDs) are not mentioned as part of the Personal Protective Equipment (PPE) required for the sediment sampling task. PFDs should be required for work in a marine environment.

Response— The use of PFDs is stated in detail in Attachment C of the SHERP.

Comment 42: **Appendix A, Safety, Health, and Emergency Response Plan, Table 6-1:** The HAZWOPER annual training information appears to be out of date for several employees listed. Additionally, none of the employees listed appears to have been fit-tested for respirator use within the last year. These issues must be corrected and updated in this table.

Response— Table 6-1 will be updated to reflect the above issues; however, the use of respirators will not be required on this project.

Comment 43: **Appendix B, Quality Assurance Project Plan for Sediment Screening. Page 2, Section B.1.2:** The text states that approximately 20 grams of sample volume will be required for the sediment screening. No rationale is provided for this sample volume, and how it will fulfill the requirements of this screening method

Response— Twenty grams of sample is the volume required to perform both the XRF analysis and the PAH immunoassay. If this volume is provided, both screening analyses can be performed.

Comment 44: **Appendix B, Section B.1.3:** This section refers to several tables (e.g. A-2, A-6, etc.) which are not included in this appendix or in Appendix A (health and safety). Please provide these tables.

Response— These tables are referred to improperly. They should read B-2, B-6, etc. This will be corrected.

Comment 45: **Appendix B, Section B.1.3.1:** Please provide complete citations for EPA (1996) and EPA (1998a). Please provide Tables A-2 and A-4.

Response— Citations for EPA (1996) and EPA (1998a) will be provided. As noted in the response to Comment 44, what presently refers to Tables A-2 and A-4 should refer to Tables B-2 and B-4.

Comment 46: **Appendix D, Section D-3.1:** Please provide a complete citation for USEPA 1992 in the list of references.

Response— The complete citation for USEPA 1992 will be added to Appendix D.

Comment 47: **Appendix D, Section D-6:** Please provide a complete reference for USEPA (1992) which is cited in Section D-3.1. Please provide a complete reference for Swartz (1999), Long and Morgan (1995), and DiToro and McGrath (2000), all of which are cited in Table D-1.

Response— The noted citations will be added to Appendix D.

Comment 48: **Table D-2:** Please clarify that the home range for the herring gull is 10 km2, as opposed to 10 shoreline km.

Response— According to USEPA (1993) the foraging radius for the herring gull is 10 km. The term "foraging radius" will be added to Table D-2.