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LETTER OF TRANSMITTAL AND U S NAVY RESPONSES TO U S EPA REGION I AND RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT COMMENTS ON DRAFT FEASIBILITY STUDY FOR SITE 19 MARINE SEDIMENT OPERABLE UNIT 5 (OU 5)
FORMER DERECKTOR SHIPYARD NS NEWPORT RI
8/15/2013
TETRA TECH

TETRA TECH

C-NAVY-03-13-5256W

August 15, 2013

Project Number 112G02747

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Reference: CLEAN Contract No. N62470-08-D-1001
Contract Task Order No. WE61

Subject: Response to Comments, Draft Feasibility Study,
IR Site 19 Marine Sediment (OU5), Former Derecktor Shipyard,
Naval Station Newport, Newport RI

Dear Ms. Keckler, Ms. Crump:

On behalf of Mr. Dominic O'Connor, US Navy NAVFAC Mid-Atlantic, I am providing to you responses to comments to the Draft Feasibility Study for the marine sediment portion of Site 19 (OU5), which is located in Middletown and Newport RI, and is part of the Naval Station Newport, formerly the Naval Education and Training Center at Newport RI.

These responses have been prepared in response to comments we received from you on May 8, 2013 (EPA) and June 24, 2013. Comments from NOAA are acknowledged and the Navy will continue to keep them informed as the project moves forward.

If you have any questions, please do not hesitate to contact me at 978-474-8434.

Very truly yours,

Stephen S. Parker, LSP
Sr. Project Manager

Enclosures

c: D. Barclift, NAVFAC (w/encl.)
K. Finkelstein, NOAA (w/encl.)
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P. Steinberg, Mabbett Associates (w/encl.)
M. Horton, Tetra Tech (w/encl.)
D. Ward, NAVSTA (w/encl.)
RDM Data Manager, Site File (w/encl. – hardcopy and CD)
File 112G02747-8.0 (w/encl.), 3.1 (w/o encl.)

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NAVY RESPONSES TO COMMENTS
DRAFT FEASIBILTY STUDY
FOR SITE 19 – FORMER DERECKTOR SHIPYARD MARINE SEDIMENT
NAVAL STATION NEWPORT, RHODE ISLAND

The U.S. Navy (Navy) is pleased to provide responses to the May 8, 2013 comments from US Environmental Protection Agency (EPA) and the June 24, 2013 comments from the Rhode Island Department of Environmental Management (RIDEM) on the Draft Feasibility Study (FS) for Site 19 – Derecktor Shipyard Marine Sediment at Naval Station (NAVSTA) Newport in Newport, Rhode Island. This response to comments (RTC's) document is organized by both general and specific technical review comments. Regulatory comments are presented first (italics font), followed by the Navy's responses.

EPA Comments Dated 5/8/13

EPA General Comment 1: *EPA agreed to consider the proposal to focus remediation on grid cells that exceed any PRG and to remediate those cells so that their surface-weighted average concentration (SWAC) and their volume-weighted average concentration (VWAC) would achieve the PRGs. Achieving the goal of having the SWACs and VWACs satisfy the PRGs to a depth of four feet would allow unrestricted use of the site. If this condition is not satisfied with reasonable certainty, restrictions and monitoring will be required throughout the site to provide a protective remedy.*

Navy Response: Alternative 4 will be revised to assure that VWAC and SWAC goals are met based on the data collected during the Supplemental Sediment Investigation (SSI). As discussed during the 5/22 conference call, the EPA agreed that achieving VWAC concentrations would rely on the removal and replacement of the indicated volume of sediment at the target locations.

EPA General Comment 2: *Review of the pre-construction drawings in Appendix B indicates that the original depth to the sediment surface beneath Pier 2 at its eastern end was as shallow as 11 feet. In the area of grid cell G29 the depth ranged from 11 to 17 feet and in the area of G25 it ranged from 17 to 26 feet. These data together with the sounding data from the sediment sampling event suggest that the thickness of accumulated contaminated sediment beneath Pier 2 at its eastern end may be much less than currently modeled. Furthermore, the original dredging at the eastern end of Pier 2 created a 2:1 slope along its sides beneath the footprint of the pier leaving a shelf only 100 feet wide at the eastern end increasing to 150 feet at the western end of grid cell G25. This information needs to be considered when estimating the amount of contaminated sediment under the eastern end of Pier 2 that needs to be managed. Further investigation of grid cells G25 and G29 could reveal that the scope and estimated costs for the alternatives would be significantly less.*

Navy Response: The methods used for estimating sediment volumes beneath Pier 2 are made consistently throughout the entire site; there is no data presently available that suggests the volume calculation method should be changed for a specific area. Additionally:

- Samples collected during the SSI indicated that benzo(a)pyrene levels at a depth of 2-4 feet exceed the PRG. The only way to reach a VWAC below the PRG for benzo(a)pyrene is to dredge this cell to a depth of 4 feet below its current sediment surface elevation. Furthermore, additional delineation of the distribution of COCs within cell G25 is irrelevant. Even in the event that additional investigation reveals the COC distribution within the cell to be smaller than that indicated by a single core, the technical and cost challenges of dredging under the pier are likely to be similar due to the fact that the elevated costs presented in the FS are due to safety and access issues that would not change significantly due to the smaller volume of sediment.

- The EPA has also made the argument that a more compact layer of sediment, not affected by COCs, is present at shallower depths within G25. This is based on a comparison of pre-construction (referring to Pier 2 construction) drawings to soundings collected during sampling; this comparison is inappropriate. Soundings recorded during sample collection represent depth during the time of sample collection, while the pre-construction depths represent depth at Mean Low Water.

- Lastly, the fact that the SSI core penetrated 4 feet into the sediment (Table 2-3 of the SSI) and field forms indicate that the entire core consisted of silt and shells, indicates that at the very least it's likely that the entire west side of G25 consists of unconsolidated sediment in the upper 4 feet (assuming that depth increases with distance from the shore).

EPA General Comment 3: *The silty nature of the sediment under the eastern end of Pier 2 and the poor recovery for those core samples suggests that attempting to cover this material with a granular material would likely result in significant mixing of the sediment and the cover material. The existing sediment will not easily support the cover material and will sink into it. To produce an effective cover of the desired thickness is likely to require significantly more cover material than estimated in this FS and therefore cost significantly more. Furthermore, the original 2:1 dredge slope along the sides of Pier 2 in this area will further complicate the effective capping of sediment in grid cells G25 and G29.*

Navy Response: The Navy understands that capping beneath the pier will be a challenge, but the technical and cost hurdles associated with capping are likely to be significantly less than those for dredging. Additionally, the extra 1 foot of material (design for 2 foot placement to ensure that a minimum of 1 foot cover achieved) is specified in anticipation of the type of issues described in the above comment.

EPA General Comment 4: *The silty nature of the sediment throughout the site, as evidenced by the sampling cores, suggests that the sediment bed is fragile and subject to disturbance from storm events and some vessel traffic. Although an attempt to evaluate the stability of the sediment was made in 2011, the conditions throughout the evaluation period were calm and therefore the stability of the sediment in disruptive conditions remains untested. Unless sediment contamination concentrations are reduced to less than the PRGs based SWACs and VWACs, the reliability of the remedy remains questionable and future failure needs to be described and costed for all alternatives that will leave contamination in place.*

Navy Response: It appears that this comment suggests that only alternatives 3, 4 and 5 could be protective. Selection of the remedy is not the role of the FS. Also, the sediment stability determination in 2011 relied not just on measurements of current velocity (which may be impacted by calm or stormy conditions), but also on the degree of cohesiveness or stability of the sediment bed itself based on sed-flume measurements (resistance to shear of the sediment material itself).

The Navy agrees with EPA that one measure of success for this site is to assure that VWAC and SWAC are below PRGs.

EPA General Comment 5: *While evaluation of remedies to account for sediment to a depth of four feet should be retained, some consideration of the effectiveness of the remedies in achieving the PRGs in the top two feet of sediment should also be evaluated. Only the most extreme situations would likely cause sediment bed disruption below the top two feet thereby changing contaminant concentrations in that zone. Consequently, proposed alternatives should be evaluated to determine the VWACs for contaminants of concern within the top two feet of sediment and only those that satisfy the PRGs in that situation should be considered for implementation. If this condition is satisfied, even if the top two feet of sediment were completely mixed the impact on potential receptors would not exceed the PRGs.*

Navy Response: What the EPA is suggesting is simply another benchmark by which to assess an already conservative approach. By including only those cells or prisms that exceed the PRG in these

calculations, the Navy has taken a conservative approach. Additionally, the EPA states that if 2 foot VWAC concentrations are below their respective PRGs for each COC, that disturbance down to a depth of 2 feet would be acceptable because the site would still be below PRGs for that 2 foot disturbance interval. This was the basis of the 4 foot VWAC calculations, so the same could be said for any alternative whose VWACs meet PRGs.

EPA General Comment 6: *The evaluation of the sediment contamination to assess the scope of the required remedial alternatives is based solely on chemical data collected in 2011. Chemical and toxicological data previously collected has not been directly included in the evaluation conducted for this FS nor has information related to the nature and location of historical activities been considered and discussed. Although the 2011 sampling event was comprehensive it should be recognized that only small portion of the site has actually been sampled. While the 2011 sampling results allow us to focus on areas that should be remediated, the results do not delineate those areas to any reasonable certainty. Further refinement of the areas subject to remediation should be implemented in a pre-design investigation. Because of the disruptive nature of dredging and capping in a silty sediment environment, confirmation sampling after remedial activities must be conducted.*

Navy Response: A comparison of areas where contamination was previously identified to areas identified during the SSI is presented in Section 1.5 of the Feasibility Study. Sections 1.3, 1.4 and 1.5 of the report discuss the links between previous and current investigations. The nature and location of historic site activities was appropriately considered during development of the SSI SAP, as well as other sampling plans that directed sediment sampling at Derecktor Shipyard; this ensured that areas of concern were sampled to determine the extent of the remedial action area.

EPA General Comment 7: *As EPA discussed with you on January 3, 2013, it is not clear that backfilling should be required for every area that is dredged. Rather than adding backfill to lower the surface- or volume-weighted averages when no contamination is present beneath the surface sediment layer, consider removing additional contaminated sediment from other locations at the site to achieve the lower averages instead. At dredged locations where no backfill is applied, the exposed sediment surface would be evaluated as surface sediment. The resources that would be used for backfilling cells where no contamination exists beneath the dredged depth could be used to offset the cost of additional dredging and disposal resulting in a more permanent remediation. We should meet to discuss options to achieve the remedial goals.*

Navy Response: These options were discussed during the 5/22 conference call and it was determined that the Navy would proceed following the VWAC and SWAC approaches as described in the FS. The Navy recognizes that backfill adds cost to a dredging program, but increasing use of backfill at other projects is recognition that PRGs cannot be met at most sites without using backfill even after multiple passes with a dredge. As the limitations of dredging become evident, the practice of backfilling dredged volumes to meet SWACs has been followed at many sites, including Pegan Cove, MA (closed with NFA status in 2011) and the EPA-managed Fox River and Green Bay Project, WI. At Pegan Cove, Fox River, and many other sites, backfilling was done to help meet SWACs less than PRGs after a single pass with the dredge. In fact, at Fox River, EPA is routinely dredging until residuals of 10 ppm PCB are encountered and then adding 6 inches of sand backfill to achieve the 1 ppm SWAC for PCBs in the benthic zone (top 6 inches of burrowing depth in the sediment). By comparison, the Navy's approach at Derecktor is more robust and involves much more backfill and much lower residuals.

Additionally, the cost savings in backfill avoidance are far outweighed by the cost of additional dredging required to achieve SWACs and VWACs that are below PRGs.

EPA General Comment 8: *In its May 23, 2012 letter on the draft Supplemental Sediment Investigation Report, EPA reiterated its request to select human health risk-based PRG for benzo(a)pyrene based on hazard quotient of 1, not 10, to meet the requirements of the NCP. The tables on pages 1-26 and 2-6 of*

the 2013 Draft FS erroneously reflect PRG based on hazard quotient of 10.

Navy Response: The PRG utilizing a HQ = 1 for benzo(a)pyrene (via shellfish ingestion) is 53.9 µg/kg (sediment concentration). Section 3.3.3 of the PRG Development document states the following "…there is a high probability that the exposure scenario is overly conservative (a subsistent fisherman is not likely to derive all seafood exclusively from Coddington Cove for 30+ years, nor could the cover support such intensive pressure from a subsistence population). Perhaps a more plausible (yet conservative) assumption is that the shellfishing population might rely on the cove for up to 10% of the amounts noted in Table 10, such that 10 times the PRG-HQ threshold is a realistic point of departure for assumption of possible adverse health effects due to shellfish consumption." For this reason the PRG Document evaluated at PRG HQ=1 and 10 times the PRG-HQ thresholds and determined that the 10 X PRG threshold was appropriate for benzo(a)pyrene given the conservative nature of the subsistence fisherman scenario.

The conservative assumptions made as part of the subsistence fisherman scenario (described in Section 5 of the HHRA) include 36.5 servings of shellfish per year, all originating from the Site, over a 30 year period.

Furthermore, Chapter 2 of the Risk Assessment Guidance for Superfund, Part B states that "The NCP Preamble and rule state that factors related to **exposure**, technical limitations, and uncertainty, should be considered when modifying PRGs … and setting final remediation levels".

EPA General Comment 9: *Since the marine human health risk assessment was finalized in 1998, there have been new guidances and studies that support risk assessment methodologies. The ingestion rates of shellfish for recreational fishermen and subsistence fishermen used in the HHRA are obsolete and likely underestimate site risks. The 1998 HHRA used the same ingestion rate for both child and adult recreational fishermen. The 2011 EPA Exposure Factors Handbook recommends higher ingestion rates based on new studies that could result in higher risks. The FS should be corrected.*

Navy Response: See response to General Comment 8. The 2011 handbook was evaluated, and it was determined that the site-specific ingestion rates established in appendix E of the HHRA are still adequate and supportable.

EPA General Comment 10: *The FS states that stormwater discharges are a main source of sediment contamination. The Navy needs to prevent recontamination of sediment from stormwater discharges. This will likely require investigation and cleaning of the stormwater drainage system and periodic future maintenance of the system to ensure a successful remedy. Please incorporate this into the scope and discussion of the proposed remedies or otherwise describe how this will occur.*

Navy Response: The FS states "The primary routes of contaminant transport from the shipyard operations into the marine sediment were likely overland runoff of spilled materials discharging to Codding Cove through the storm drainage system, and direct release of contaminated materials into the cove from the shoreline, floating dry docks, and Greenport Ferry." This statement clearly refers to the storm drainage system acting as a route of contamination from onshore spills. Currently, the most recent version of the On-Shore FS identifies the PCB Removal Area, and the Former Building 234 area (of which a significant portion is paved) as the only onshore areas where elevated levels of PAHs are present in surface soil that could potentially contribute contamination to the offshore marine sediment. These areas are being addressed as part of the Derecktor Onshore FS, therefore they should become a non-issue in the near future. It can be assumed that other areas where contaminated surface soils may once have contributed to the marine sediment contamination have been addressed through previous removal actions.

EPA General Comment 11: *EPA will require the Navy to address sediments beneath both piers when the service life of the piers expires. It is expected that the service life of these piers will not extend beyond the thirty-year cost evaluation period included for this FS. Further, the Navy needs to identify how the*

asbestos covered steam lines near the piers will be addressed, so that they do not pose a threat of release of asbestos. There should not be any release of asbestos in the event of a 100-year storm event. This FS does not adequately address the asbestos that has been released into Site sediments or that exists on the steam lines.

Navy Response: The alternatives presented in this FS (with the exception of Alternative 1) consider sediment beneath the piers. There are no alternatives that rely on the piers to be intact for the remedy to remain effective, so sediment beneath the piers has been addressed by all alternatives presented; with the caveat that should demolition or reconstruction of the piers risk damage to the remedy, measures must be taken to either protect the remedy or address the sediment so it will not pose unacceptable risk.

On May 22, the Navy has agreed to manage waste sediment that is dredged to assure that disposal is conducted with consideration to the possible presence of asbestos, and to discuss potential exposure with internal risk assessors. Such discussions have reached the conclusion that there is no potential for exposure to asbestos that is in the sediment.

The asbestos covered steam lines beneath the Piers are being addressed by the Naval Station's asbestos programs. The FS addresses the marine sediment and the contaminants that have come to reside there.

EPA General Comment 12: *In evaluating the alternatives, please identify which alternative it believes is the Least Environmentally Damaging Practicable Alternative under the federal Clean Water Act. Include the justification for the determination in the text.*

Navy Response: The suggested revision will be made.

EPA General Comment 13: *As stated in EPA's letters dated July 16, 2010 and May 23, 2012 on the Supplemental Sediment Investigation Report, EPA does not believe that natural recovery is occurring at Derecktor Shipyard. EPA pointed out numerous areas of uncertainty within the Navy's report and concluded that insufficient data exist to demonstrate that burial processes are occurring. EPA is therefore concerned that the FS includes an alternative, namely Alternative 2 (ENR), that relies on burial processes to be effective over the long-term. EPA does not support Alternative 2 because we do not believe that it would be protective of either human health or the environment.*

Navy Response: As discussed during the 1/3/13 meeting and 5/22/13 conference call, Alternative 2 will remain in the FS. The EPA's concerns are noted.

ATTACHMENT A

EPA Specific Comment 1: p. ES-2

Discuss the release of asbestos from the pier in the Conclusions section.

Navy Response: Discussions that the Navy has held with internal risk assessors have concluded that there is no current exposure to respirable asbestos in sediment, therefore it will not be discussed in this section of the FS.

EPA Specific Comment 2: p. ES-4

The phrase "that cause its PRG to be exceeded" is not clear. Please see 40 C.F.R. §300.430(e)(2)(i) for guidance on developing proper remedial action objectives (RAO). Add another Human Health RAO for soil to "Prevent inhalation exposure to any asbestos-contaminated sediments." Also add another Ecological RAO to restore the sediment as suitable habitat for the indigenous species.

Navy Response: The phrase "*that cause its PRG to be exceeded* " will be deleted. RAOs are otherwise adequate for the FS and the risks measured. Please also refer to the response to general comment 11 above.

EPA Specific Comment 3: p. ES-5, ¶1

Please note that the State criterion is met after reviewing state comments on the FS and Proposed Plan, but the Public criterion is only based on reviewing public comments on the Proposed Plan.

Navy Response: The text will be updated to state the following: "…evaluated following receipt of state comments on the Final FS and the PRAP, and public comments on the PRAP. The PRAP is to be developed at a …"

EPA Specific Comment 4: p. ES-5, Alt. 2

If placement of the thin layer cap will not immediately achieve sediment PRGs, state how long it will take to achieve the required standards and describe the associated uncertainty. The remedy needs to achieve RAOs and prevent release of deeper contaminated sediments in a 100-year storm event.

Navy Response: The thin layer placement (of a minimum 6 inch thickness) would immediately achieve the sediment PRG, based on the understanding that the bioturbation zone (exposure zone) is 0-6 inches, and additional deposition over time will further assure permanence. If the objective of the remedy is to withstand a 100 year storm event, this can be set as a design parameter, although bathymetric evidence suggests that the past events since pier construction have not altered sediment bathymetry considerably. If necessary, armoring (with addition of various size stone) can be used to improve resistance of the thin-layer placement to extreme storm events, and this type of change can be included in the design process.

Describe how traffic by large ships would be "partially restricted." Would shellfishing restrictions also be required to address the human consumption RAO? Would restrictions on dredging and pier maintenance/removal be required?

Navy Response: This section will be updated to explain that the partial restriction to large ships would include restriction of access to ships with draft greater than a certain depth, likely to be approximately 35 feet because such deep-draft vessels (e.g. aircraft carriers) could impact the thin layer cover. The cover would prevent shellfish from being impacted by sediment with COCs above PRGs, and therefore there would be no need for shellfish restrictions. This will be clarified.

EPA Specific Comment 5: p. ES-6, Alt. 3

Describe the components of the engineered cap. The cap must prevent release of subsurface contaminants in the event of a 100-year storm event.

Navy Response: The components of the engineered cap will be chosen during the design process. The text in the above referenced section can be updated to indicate that the cap will be designed to withstand a predicted 100 year storm event if that is determined to be a necessary design parameter. Armoring (e.g., with various sized stone) can be used, if required, to improve erosion resistance during extreme storm events. Please note however, storm events are not necessarily net erosional events. Storm related tides flow and ebb, causing re-deposition of sediment during the ebb.

EPA Specific Comment 6: p. ES-6, Alt. 4

If the backfill in the open water areas is a permanent cover over deeper contaminated sediments, it will require adding the cover as a component of the alternative with long-term maintenance, monitoring, and LUCs. The cover needs to prevent release of contaminants in a 100-year storm event.

Navy Response: Backfill is not utilized as cover and will only replace existing sediment. Refer to the response to comment 36 below.

EPA Specific Comment 7: p. ES-6, Alt. 5

Explain whether the backfill is required to meet PRGs or if is it a habitat mitigation measure.

Navy Response: Backfill is primarily included so that the volume of sediment present at the site remains the same after the remedial action. Backfill helps achieve PRGs without the uncertainty of multiple passes with a dredge and has been used for this purpose by USACE and EPA at other sites, such as Pegan Cove and Fox River.

EPA Specific Comment 8: p. 1-1, ¶2

Identify the boundary between the two Derecktor OUs.

Navy Response: The following text will be added before the last sentence: "The boundary between the onshore and offshore portions of Derecktor Shipyard is the shoreline, or bulkhead wall, as specific to the location."

EPA Specific Comment 9: p. 1-1, ¶3

Discuss the investigation of asbestos from the piers into the sediments.

Navy Response: The intent of the above referenced paragraph is to provide a brief history of the site investigation and decision process that has occurred at Derecktor Shipyard Off-Shore during the past 15 years. Details pertaining to specific investigation activities are described in Sections 1.4 and 1.5 of the FS.

EPA Specific Comment 10: p. 1-2, §1.0, ¶2

Please revise the last sentence to read: "… are separate operable units, the On-shore portions of the site will be addressed separately from this FS."

Navy Response: The requested revision will be made.

EPA Specific Comment 11: p. 1-6, ¶2

Differentiate which changes were in the Off-Shore OU versus to On-shore OU and explain their relevance to this FS.

Navy Response: The referenced paragraph will be updated to indicate which construction/restoration activities conducted at the site affect the onshore and offshore portions. Information will also be provided as to how these activities affect this FS.

EPA Specific Comment 12: p. 1-7

Describe the deterioration of the steam lines in the pier, the release of asbestos into the harbor, and any subsequent measures taken to address the threat of additional releases.

Navy Response: Asbestos covered steam pipes beneath the pier are managed under NAVSTA Newport's Asbestos Management program. Any such maintenance activities conducted under this program are not conducted under CERCLA and are considered maintenance. An update on the abatement program will be provided in the FS as appropriate.

EPA Specific Comment 13: p. 1-9, ¶1

Replace the last sentence with: "Groundwater on the base is federally regulated as a drinking water source, although it is currently not used for that purpose. On-shore groundwater will be addressed as part of the On-shore OU."

Navy Response: The suggested revision will be made.

EPA Specific Comment 14: p. 1-11, §1.3.5

Discuss the asbestos covered steam line system near the piers.

Navy Response: See response to Comment 12.

EPA Specific Comment 15: p. 1-32, §1.4.7

The FS states that asbestos is discussed further in Section 2, but there is no further discussion on asbestos. Please describe the asbestos sampling and results in the FS. Also address whether the steam line system poses a threat of release of asbestos into the harbor and, if so, how it will be addressed as part of this remedial action.

Navy Response: The statement that asbestos is discussed in Section 2 will be struck. Asbestos sampling and results are described in section 1.4.7 of the FS. Due to concentrations detected, further discussion is not warranted. Remaining asbestos on the steam lines beneath the piers is managed under NAVSTA Newport's Asbestos Management Program, not CERCLA.

EPA Specific Comment 16: p. 1-33, § 1.6

As part of the Conceptual Site Model, discuss that there may be future risks from exposure to asbestos in sediments removed from under the piers.

Navy Response: The Navy has discussed the potential for risk from asbestos in sediment at the Site with internal risk assessors and has concluded that there is no current exposure to respirable asbestos in sediment. Asbestos will not be included in the CSM.

EPA Specific Comment 17: p. 2-5, §2.2.1

Please clarify the third paragraph where it states that site sediment conditions are indirectly associated with unacceptable risks to humans from ingestion of shellfish that have accumulated chemicals from the site sediment.

Navy Response: Sediment conditions at the Site are indirectly associated with human health risk

because there is little or no chance of human exposure to the sediments at the Site. The exposure to site contaminants for humans would have to come through ingestion of shellfish (an indirect route). This will be clarified in the text.

Discuss that asbestos identified in Site sediments and located in the pier steam lines poses a potential future human health risk if the asbestos becomes airborne (i.e., releases from dried sediments removed by dredging activities or pier removal).

Navy Response: See response to Specific Comments 12 and 16.

EPA Specific Comment 18: p. 2-6, §2.2.2

Please make the ratio approach used to compare COC sediment concentrations with threshold effects values to develop the PRGs more transparent in the FS. Show the equations, exposure assumptions, and toxicity values used to develop the PRGs.

Navy Response: The information requested in this comment is available in the PRG document which is referenced multiple times in this section. No revisions are proposed based on this comment.

Develop a PRG for asbestos.

Navy Response: See response to Specific Comments 12 and 16.

EPA Specific Comment 19: p. 2-7, §2.2.2

Please explain the statement in the third paragraph that implementation of the Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens would increase young child cancer risks by up to a factor of 10. This should be more transparent to be used for qualitatively evaluating child cancer risks from mutagenic carcinogens.

Navy Response: The statement will be reevaluated with regards to mutagenic carcinogens.

EPA Specific Comment 20: p. 2-8, §2.2.4

Please clarify the SWACs and VWACs of the COCs further.

Navy Response: As is stated in the final paragraph of section 2.2.4, a detailed description of both the SWAC and VWAC calculation is presented in Appendix D-7 of the FS. This detail can be moved into the text, as requested.

EPA Specific Comment 21: p. 2-9, §2.3

The phrase "that cause its PRG to be exceeded" is not clear. Please see 40 C.F.R. §300.430(e)(2)(i) for guidance on developing proper RAOs. Add another Human Health RAO to prevent inhalation exposure to any asbestos-contaminated sediments and an Ecological RAO to restore the sediment as suitable habitat for the indigenous species.

Navy Response: The phrase "*that cause its PRG to be exceeded* " will be deleted. RAOs are otherwise adequate for the FS and the risks measured. Please also refer to the response to general comment 11 above.

EPA Specific Comment 22: p. 2-9, §2.4, ¶1

The text states that only 2011 sample results were used to establish areas requiring cleanup. This is not sufficient and consideration of areas identified in earlier sampling events that had PRG exceedances, toxic effects, and other evidence of contamination needs to be included, discussed, and compared to the

2011 locations.

Navy Response: Section 1.5 of the FS provides an accurate comparison of 2011 sample results to previous sample results and concluded that similar contaminants were found in similar locations. Because of this fact and because previously collected samples only analyzed the top 2 cm or 6 inches of sediment, only the 2011 data was used. The 2011 dataset is comprehensive and encompasses areas sampled during previous investigations, and is more representative of recent conditions.

EPA Specific Comment 23: p. 3-3, ¶1

Note that the cap would need to prevent a release of contaminants in the event of a 100-year storm event.

Navy Response: The requested revision will be made.

EPA Specific Comment 24: p. 3-3, §3.1.4, ¶2

State that the sediment under the piers would have to be dredged/managed under relevant asbestos standards, to prevent any airborne release of asbestos.

Navy Response: The requested revision will be added.

EPA Specific Comment 25: p. 3-6, §3.3.2.1

While LUCs to prevent access are discussed, there is no discussion about how the Navy will restrict activities that might disturb a sediment remedy (i.e., how would the Navy restrict dredging, pier maintenance/removal, berthing and any other activities that could interfere with the CERCLA remedy). How would these restrictions be transferred if the property is transferred (e.g., coordination with the Coast Guard to amend 33 C.F.R. §334.81 or promulgation of a navigational restriction regulation to prevent disturbance of any sediment remedy that leaves contamination in place).

Navy Response: The information requested above is provided on page 3-7 of the FS, no changes will be made based on this comment.

EPA Specific Comment 26: p. 3-10, §3.3.3.1

Thin Layer Cover: The relative consistency of the bathymetric survey results over the past 50 to 60 years, as discussed in this FS, indicates that there is no reliable evidence of a significant natural depositional process occurring that would appreciably supplement a thin layer cover over time. A thin layer cover is not a Containment remedy as it is a means to dilute surface contaminant levels to below PRGs.

Navy Response: Comment noted. The text will be clarified to state that this GRA would need to be implemented in conjunction with other elements if it is to be included as a technology used for an alternative.

EPA Specific Comment 27: p. 3-11, §3.3.3.2

Subaqueous Cover System: It is not clear that this option would preserve the marine habitat if it would create a barrier preventing the marine organisms that normally inhabit this area from using it. Preservation or reconstruction of suitable habitat needs to be a requirement for remediation. The subaqueous cover needs prevent release of contaminants in the case of a 100-year storm event.

Navy Response: This section will be updated to state that the cap under Alternative 3 will be constructed to withstand a 100-year storm event. In regards to the preservation of marine habitat, the area proposed for capping under alternatives 2 and 3 (and for backfill under 4 and 5) equates to less than 7% of the total site area. Habitat preservation or mitigation is not part of the RAOs. According to the US Fish & Wildlife service, there are no critical habitats within Coddington Cove, or Narragansett

Bay.

EPA Specific Comment 28: p. 3-12, §3.3.3.2

Discuss whether backfilling of dredged areas is considered a subaqueous cover. If the backfill is required to contain underlying contaminants it needs to prevent release of any contamination in a 100-year storm event.

Navy Response: As described here, the purpose behind the placement of a subaqueous cover system is to isolate contaminated sediment beneath a clean cover material; backfill, as described in Section 4 under Alternatives 4 and 5 is not considered a subaqueous cover. This will be clarified in all appropriate sections of the FS.

EPA Specific Comment 29: p. 3-19, §3.3.5.2

Sediment removed from under the pier for off-site disposal needs to be tested for asbestos before disposal.

Navy Response: A sentence will be added at the end of the second paragraph of the section stating that if material is dredged from beneath the piers (during pier demolition) it will be managed with consideration of the possible presence of asbestos fibers within the waste dredge material.

EPA Specific Comment 30: p. 3-20, §3.3.5.3

Sediment under the piers needs to be tested for asbestos as part of materials processing. Any asbestos contaminated sediments should be segregated and handled according the applicable standards.

Navy Response: A sentence will be added to the first paragraph of the section stating that material dredged from beneath the piers will be managed with consideration of the possible presence of asbestos.

Supplement this section with a discussion of gravity filtration (i.e., Geotubes, and in-line chemical treatment of hydraulically-dredged sediment to enhance dewatering).

Navy Response: The requested revision will be made.

EPA Specific Comment 31: p. 3-23, §3.3.7

In the table, state that Access Restrictions could prevent human exposure from consumption of site-contaminated seafood).

Navy Response: The requested revision will be made to the Use Restrictions row of the table in the Representative Process Options column.

EPA Specific Comment 32: p. 3-24, Table

EPA does not consider a thin layer cap to be a containment remedy.

Navy Response: The comment is noted. During the conference call held May 22, it was agreed that Alternative 2 should remain in the FS.

Treatment also includes treatment of dewatering liquid before discharge or disposal.

Navy Response: The table will be updated to include treatment of dewatering liquid.

EPA Specific Comment 33: p. 3-25, §3.5

How will the potential future release of asbestos from the abandoned steam line system under the piers be

incorporated into these alternatives?

Navy Response: The asbestos insulation on the piping below the piers is being managed by the Naval Station asbestos program. Refer also to comment 12 above. Should either pier be scheduled for demolition or rehabilitation/maintenance, any asbestos present will be addressed during that action.

EPA Specific Comment 34: p. 3-26, §3.5

Alternative 3 also includes long-term maintenance of the engineered cover.

Navy Response: Maintenance of the cover will be included in the description.

Alternative 4, as described in the Executive Summary, also includes backfilling the dredged areas. If backfilling is required to isolate any contamination, then EPA considers the back fill to be an engineered cover that needs to be added as a component of the alternative (along with long-term cover maintenance).

Navy Response: Please refer to the response to comment 7.

Assuming the goal of the excavation in Alternative 5 is to remove all sediment contamination so there no longer is a CERCLA risk, the purpose for backfilling (other than potentially habitat restoration) is not clear. Also, please correct Alternative 5 to read: "… through SWAC and VWAC Calculations to remove all sediment contamination exceeding PRGs…."

Navy Response: The goal of Alternative 5 is not to remove all sediment contamination. The goal is to achieve a site wide volume weighted average for each COC below its respective PRG; this is accomplished by backfilling cells after dredging, and this will be clarified.

EPA Specific Comment 35: p. 4-1, §4.0

See comments made concerning each alternative noted for §3.5.

Navy Response: See responses to those comments.

EPA Specific Comment 36: p. 4-2, §4.0, ¶1

The scope of the long-term monitoring program for Alternative 4 is not adequate. This alternative creates a cover by backfilling over contaminated sediment left in place and just as a comprehensive long-term monitoring program is required for Alternatives 2 and 3. It is also required for Alternative 4. Revise the scope of this alternative to include the same long-term monitoring program elements required by Alternative 2 and 3.

Navy Response: The goal of Alternative 4 is to reduce risk to the receptors by reducing exposure to COCs exceeding the PRGs; and to accomplish this, the approach is to reduce the surface area weighted average concentrations of COCs to below the PRGs. By removing the most highly contaminated sediment and replacing it with backfill, the area weighted average concentration for each COC is reached. This was the approach discussed in January 2013. The use of backfill is not a cover material; it is replacement material in the dredged area to reduce average concentrations. Further discussion may be warranted.

Alternative 4 will be revised for the revised FS to demonstrate that both SWACs and VWACs at the site are below PRGs. Therefore, even if mixing occurs, the site-wide concentration would still be less than, or at, PRGs. This should address concerns with mixing of sediment during storm events.

Use of backfill to help achieve cleanup goals has been followed at many sites including Pegan Cove, Fox River, and Green Bay. By contrast, the Navy's approach at this site is more robust and involves more backfill and lower residuals.

Similarly, the scope of the LUCs proposed for Alternative 4 is not adequate. Because this alternative covers sediment in place throughout much of the site, LUCs identical to Alternatives 2 and 3 are required to limit activity of deep draft vessels and access by recreational and commercial fishing vessels.

Navy Response: The need for LUCs under Alternative 4 is uncertain. This alternative is being reevaluated by the Navy to better address regulatory concerns and further discussion is needed.

EPA Specific Comment 37: p. 4-2, §4.1, ¶1

In the first sentence add at the end: "and potential future human risk from asbestos."

Navy Response: See response to Specific Comment 16.

EPA Specific Comment 38: p. 4-3, §4.1, ¶1

Please include the complete calculations performed to compute the baseline surface weighted and volume weighted average concentrations presented.

Navy Response: Complete SWAC and VWAC calculations will be presented in Appendix D for each alternative. They will be included after the SWAC and VWAC explanation and examples.

EPA Specific Comment 39: p. 4-3, §4.1.2

The Navy has not demonstrated that this alternative will meet RAOs, since it is uncertain whether the alternative relies natural deposition to keep the sediment surface from becoming recontaminated over time. If RAOs are not achieved immediately, estimate how long it will take to achieve cleanup standards. If the goal is to have the thin layer applied be sufficient to achieve RAOs immediately, then the cover would need to be able to prevent release of deeper contaminated sediments under the conditions of a 100-year storm event.

Navy Response: The thin layer cover will reduce risk, and may meet RAOs immediately by providing a layer of clean material to reduce exposure in the zone of bioturbation (exposure zone) for the receptors. This is considered a minimum thickness, and the depositional action (if it is confirmed to be occurring) will ensure long term protection. This will be clarified. It was agreed during the May 22, 2013 call that Alternative 2 will be retained in the FS.

EPA Specific Comment 40: p. 4-4, §4.1.2

a) Please include the complete calculations performed to compute the surface weighted average concentrations presented.

Navy Response: Tables will be included that present the process utilized for the selection of cells to cover. These tables are provided as attachment A to this response document.

b) EPA notes that the SWAC values presented are based on a one-foot cover although the construction goal of this alternative is to establish a minimum six-inch cover over targeted areas. Therefore, the values presented here may not be achieved by this alternative as proposed. Unless the design requires a minimum 12-inch cover throughout the site and this is confirmed with a bathymetric survey, the SWAC values presented will not reflect the site conditions after this alternative is implemented. Reliance on additional deposition to augment the thin cover at some future date is uncertain. Furthermore, it appears that any disruption of the cover that impacts a substantial portion of the site, such as a storm event, could easily cause failure of this alternative.

Navy Response: The EPA's concerns are noted. The Navy believes that through the implementation of a thin layer cover and LUCs Alternative 2 would be protective enough to achieve RAOs after

completion of cover construction and implementation of LUCs (see response to comment 39 above).

EPA Specific Comment 41: p. 4-4, §4.1.2

Institutional Controls need to be developed to restrict use, maintenance, and eventual demolition of the piers and to prevent exposure to asbestos in the pier and underlying sediment. Also, provisions need to be made to maintain ICs in the event of property transfer. The ability to revise the existing arrangement that allows fishing in Coddington Cove needs to be evaluated further if this alternative were proposed.

Navy Response: The institutional controls as described in this section are appropriate. Section 3.3.2.1 describes the methods used to maintain IC in the event of property transfer. This section will be revised to specify that contaminated sediment would have to be addressed if maintenance or demolition of the Piers would disturb the cover.

EPA Specific Comment 42: p. 4-4, §4.1.2, ¶3

EPA expects the thin cover would be sand or an organic substrate rather than gravel so that the existing habitat would not be significantly altered by this alternative.

Navy Response: The actual material used as cover will be determined during design; this is stated on page 4-5 of the same section. The Navy does not intend to consider habitat alteration during the design or construction process. The area affected is approximately 6.3 percent of the entire study area and even less when considering the entire cove. The sediment within the study area is not considered sensitive or endangered habitat.

EPA Specific Comment 43: p. 4-5, §4.1.2, ¶2

EPA does not concur that the institutional controls (ICs) could be limited only to the Pier 2 areas because fishing could occur throughout the site and vessels could access either pier. The ICs that limit vessel movement and restrict fishing must be implemented broadly over any areas with contaminated sediment.

Navy Response: The ICs described in this section would apply to the cover areas. The intent of the paragraph was to indicate that while ICs would be implemented for the entire site, currently, the only area where the actions limited by the ICs are of concern are surrounding Pier 2. The paragraph will be revised to state the following: "…will be disturbed due to fishing activities or vessel traffic. While the ICs would be implemented for the entire study area, the only area where these activities are currently a concern are the areas at Pier 2 because…"

EPA Specific Comment 44: p. 4-5, §4.1.2, ¶3

Reliance on future deposition of sediment to significantly enhance the planned thin cover is uncertain. The depositional rate at the site has not been defined and appears to be rather slow from available data.

Navy Response: The comment is noted. This alternative has been included in the FS to provide a full range of remedial alternatives. Please refer to the response to Comment 39, above.

Page 4-3 states that a 6 to 12 inch cover will be installed, but the thickness is said to be 12 inches here. Obtaining a 12 inch cover will require specifying a thicker cover to allow for inconsistency in the application in deep water. Please clarify.

Navy Response: The sentence will be revised to state the following: "The final thickness of the cover would be between 6 and 12 inches (the goal being a minimum of 6 inches, but design for placement of 12 inches to allow for inconsistency in the application in deep water). The cover area would extend slightly beyond the target areas due to sloping at the edges."

EPA Specific Comment 45: p. 4-5, §4.1.2, ¶5

While one sampling event per year may be reasonable to monitor the status of the cap, it is not sufficient in the event of a significant storm that may require a supplemental check depending on the severity of the storm. A 25-year storm may warrant a supplemental sampling event to determine if such a storm is deemed to be problematic. Although the details of the monitoring program can be developed later, the Navy needs to account for the impacts of storms in its costing, for both monitoring and maintenance/repair of the cap.

Navy Response: The Navy agrees that monitoring should occur in a reasonable time frame following an identified threshold storm event, but does not agree that this monitoring should constitute an additional monitoring event, it can simply count as that year's monitoring event. LTM requirements would be provided in the ROD and detailed in a LTM SAP.

EPA Specific Comment 46: p. 4-5, §4.1.2, ¶6

The adequacy of bathymetric inspections every five years would need to be evaluated based on the results of the sampling events and the occurrence of major storms, either of which could trigger the need for a supplemental bathymetric inspection. Please revise the FS discussion accordingly.

Navy Response: The referenced section will be updated to include the following: "If annual sampling, or natural occurrences, such as a significant storm event, indicate or suggest that change has occurred, additional bathymetric monitoring may be required."

EPA Specific Comment 47: p. 4-6, §4.1.3

The same comments made relative to Section 4.1.2 are also applicable to Section 4.1.3. Also, the Navy's VWACs calculations take credit for a two-foot cover but the text states that a one to two foot cover will be installed. Please correct the text.

Navy Response: Section 4.1.3 will be revised similar to the revisions made to Section 1.4.2, as appropriate.

The Navy did not provide VWAC calculations for Alternative 3, and the SWAC calculations are designed to only consider the surface sediment. This was done intentionally as stated in the third paragraph of Section 4.1.3. COC exceedances in subsurface sediment are addressed by LUCs under this alternative so evaluation of VWACs are not necessary.

EPA Specific Comment 48: p. 4-8, §4.1.4, ¶1

Please explain if the backfill is intended to serve as an engineered cover over deeper contaminated sediment. Any engineered cover needs to be described as a component of the alternative, along with long-term maintenance, monitoring and LUCs to protect the cover.

Navy Response: Please refer to the response to comment No. 36 above. Further discussion may be warranted.

EPA Specific Comment 49: p. 4-9, §4.1.4, ¶1

The text indicates an engineered barrier will be constructed beneath Pier 2. Sample cores indicate a significant amount of shell debris beneath Pier 2 in the areas to be capped under this alternative, indicating that this is may be prime habitat for shellfish. All remedial alternatives should restore the habitat for beneficial use.

Navy Response: The local habitat for the predominant shellfish (blue mussels) is the pier pilings below the high tide and above the low tide lines. The significant amount of shell debris is certainly from years of the blue mussels using the pier pilings as habitat. This indicates nothing regarding the

use of substrate beneath Pier 2 as "prime habitat for shellfish". Capping materials will be chosen during the design process; the Navy has not identified any need to require materials for habitat restoration during the FS due to the small area impacted by capping.

EPA Specific Comment 50: p. 4-9, §4.1.4, ¶3

EPA's assessment of the VWACs does not match the Navy's. Results in both benzo(a)pyrene and total HMW PAHs failing to achieve the PRGs and lead barely achieves the PRG. Further clarification of the calculations will be warranted to resolve the differences. If the VWACs are not satisfied, Alternative 4 will need to include long-term monitoring and LUCs akin to those for Alternatives 2 and 3.

Navy Response: Please refer to the response to Comment 36. The Navy is revising alternative 4 to assure that VWAC and SWACs are met under this alternative for all COCs.

Although the VWAC for lead is 164 mg/kg and the PRG is 168 mg/kg, the PRGs were developed as a benchmark, and any number below that benchmark would be acceptable. Furthermore, the VWAC and SWAC calculations are already a conservative estimate of site wide concentrations due to the fact that they only consider cells or prisms that have an exceedance of PRGs.

EPA Specific Comment 51: p. 4-10, §4.1.4, ¶2

If the backfill serve as an engineered cover, LUCs will be needed to protect the covered areas.

Navy Response: Please refer to the response to comment 36 above. By removing the most highly contaminated sediment and replacing it with backfill the area-weighted average concentration for each COC is reached. If mixing does occur within the one foot interval, it will not degrade the protectiveness: the site wide concentration will still be below PRGs.

EPA Specific Comment 52: p. 4-10, §4.1.4, ¶3

The text states that a 1-2 foot engineered barrier/cap would be installed under this alternative. Please determine whether a 2-foot cap is sufficient to prevent release of underlying contaminants in the case of a 100-year storm event. Because of the difficulty of installing cap material under water at depth and under a pier, allowance needs to be provided to the contractor to over fill to ensure the minimum required cap thickness is achieved. The Navy's VWACs assume a two foot thick cap. Therefore to obtain a minimum of two feet thickness, a greater cap thickness should be specified. Please revise the description to reconcile the VWACs calculations with the proposed cap design.

Navy Response: The proposed design is correct; the VWAC calculation will be adjusted to compensate for the 1 foot minimum cap.

In additional to bathymetric surveys, will and post-dredge contaminant surveys be conducted to document the levels of contamination left in place?

Navy Response: The FS does not include any post dredging confirmation sampling. Using the revised Alternative 4, VWACs are met after backfill, so even if mixing occurs, the site wide volume weighted average would in theory still be less than, or at, PRGs.

EPA Specific Comment 53: p. 4-11, §4.1.4, ¶4

Will the area of the in situ cap under the pier include the area where asbestos was identified?

Navy Response: There is no record of release of asbestos from under Pier 2, there and was no asbestos sampling conduced beneath Pier 2 where the cap is proposed, so no asbestos was identified. Traces of asbestos were found under Pier 1, but are not considered actionable since there is no exposure pathway.

EPA Specific Comment 54: p. 4-13, §4.1.5, ¶4

If backfill is necessary to meet PRGs, then contamination will be left in place below the excavation layer. It is therefore unclear why this is presented as a alternative that does not require long-term monitoring, LUCs and five-year reviews.

Navy Response: This remedy does not include long term monitoring, LUCs, or 5 year reviews because it reaches VWACs below PRGs for all COCs. This means that even if disruption of the backfill or sediment with COCs present at concentrations greater than PRGs occurs, the site wide volume weighted average (conservatively based on only cells where COCs exceed PRGs) would remain below PRGs. The principal behind this approach is that enough contaminated sediment has been removed and replaced with backfill so unacceptable risk no longer remains in marine sediment at the site regardless of sediment disturbance.

EPA Specific Comment 55: p. 4-14, §4.1.5

Sediments under the pier need to be sampled for asbestos and managed based on relevant asbestos standards if they contain asbestos.

Navy Response: The Navy has agreed to manage sediment dredged from beneath the pier with consideration of the possibility that it contains asbestos. Please refer to the response to comment 16.

EPA Specific Comment 56: p. 4-18, §4.3.1

Non-CERCLA LUCs do not satisfy the criterion.

Navy Response: LUCs are not discussed on the referenced page. No changes are proposed based on this comment.

EPA Specific Comment 57: p. 4-20, §4.3.2, ¶1

As stated in previous letters, EPA does not believe that the investigations conducted at the site support the assumption that an appropriate natural cap will develop over time. Therefore, this alternative is not reliable. Furthermore, the silty surface sediment throughout the site will make placement of cap material almost impossible without significant disturbance of the silt and substantial mixing of contaminated sediment with the cover material. The resulting cap will have much less ecological benefit because of this mixing. The calculated SWACs for this alternative are questionable. This alternative is not protective of human health or the environment.

Navy Response: The Navy notes the EPA's concerns with Alternative 2. As discussed during the 5/22 conference call, Alternative 2 will remain in the FS to represent a full range of remedial actions.

EPA Specific Comment 58: p. 4-21, §4.3.2, ¶3

Since there is estimate of how long it will take for Alternative 2 to achieve PRGs and because a thin layer cap would likely not prevent a release of contamination in a 100-year storm event, EPA does not believe that this alternative meets ARARs.

Navy Response: See response to comment 57.

EPA Specific Comment 59: p. 4-21, §4.3.2, ¶6

While the PCB contaminated sediment is regulated under TSCA, it is not at levels that would require disposal in a TSCA-compliant landfill.

Navy Response: The Navy concurs, and this section notes that a finding will be provided in the ROD.

EPA Specific Comment 60: p. 4-21, §4.3.2, ¶7

EPA does not believe that Alternative 2 meets the Long-term Effectiveness and Permanence criterion.

Navy Response: Comment noted. Alternative 2 has been included in this FS to present a range of options and it was discussed during the 5/22 conference call that Alternative 2 would remain in the FS.

EPA Specific Comment 61: p. 4-24, §4.3.2, ¶1

The cost estimate does not include any costs for maintenance and repair of the cap, which are expected to be significant, and the cost of monitoring is understated and not consistent with EPA guidance. Please adjust the costs to include the appropriate maintenance, repair, and monitoring costs.

Navy Response: With regards to monitoring, monitoring is described on Page 4-5. Section 5.5.4 of the EPA Sediment Guidance states: "Performance monitoring of a cap should be related to the design standards and remedial action objectives related to the site." The thin layer cover may meet RAOs by providing a clean zone for exposure to the receptors, and monitoring is used to assure this cover remains in place. Expectations of monitoring can be resolved in the ROD and details are best left for development of the LTMP SAP.

With regards to the additional costs associated with maintenance and repair of the cap, the Navy will add an additional line item equal to 10% of the capping and post construction costs to be included every 5 years. This should be appropriate for anticipating costs maintenance and repair costs.

EPA Specific Comment 62: p. 4-24, §4.3.3, ¶1

The silty surface sediment will make placement of cap material almost impossible without significant disturbance of the silt and substantial mixing of contaminated sediment with the cover material. The resulting cap will have less ecological benefit than predicted because of the mixing of contaminated sediment and cap material. The calculated SWACs overestimate the protectiveness of this alternative, although the magnitude cannot be readily quantified.

Navy Response: The cap will be designed recognizing that the surface sediment in most areas is extremely silty. The monitoring to be conducted annually will ensure that the SWACs are brought to levels below PRGs and remain there.

EPA Specific Comment 63: p. 4-25, §4.3.3, ¶1

This alternative will meet ARARs if the cap and be designed, installed, and maintained to survive a 100-year storm event without a release of contaminants.

Navy Response: The first paragraph of this section will be updated to state that the cap will be designed to withstand a 100 year storm event. Part of the design will therefore need to include a model to predict the energy from such an event at sediment/water interface.

EPA Specific Comment 64: p. 4-26, §4.3.3, ¶2

EPA expects the habitat at the site to be restored to simulate existing conditions. Use of armoring or capping material designed to prevent erosion will not be acceptable and should not be used. Reestablishment of habitat by natural deposition over such material is not expected to occur and should not be part of any proposed remedy.

Navy Response: Due to the fact that critical habitat is not present at the site the Navy does not intend to put fourth excessive effort either during design or construction to restore habitat unless critical habitats or habitats of special significance are identified. The selection of cover / cap material would be selected in the design step and could be required to be protective of a 100-year storm event,

The entire site (as defined by the SSI sample grid) is comprised of approximately 110 acres; the Navy is proposing to cap (or dredge and backfill) approximately 6.9 acres; this equates to 6.3 percent of the entire site, and an even smaller percentage of the entire cove. If the cap is selected an effective design may include armoring to protect the cap.

EPA Specific Comment 65: p. 4-27, §4.3.3, ¶5

The cost estimate should include costs for maintenance and repair of the cap, which are expected to be significant. The cost of monitoring is understated and not consistent with EPA guidance. Please adjust the costs to include the appropriate maintenance, repair, and monitoring costs.

Navy Response:

With regards to monitoring, Section 5.5.4 of the EPA Sediment Guidance states: "Performance monitoring of a cap should be related to the design standards and remedial action objectives related to the site." The cap meets RAOs by providing a barrier to prevent exposure the receptors, and monitoring is used to assure this barrier remains in place. Expectations of monitoring can be resolved in the ROD and details are best left for development of the LTMP SAP.

With regards to the additional costs associated with maintenance and repair of the cap, the Navy will add an additional line item equal to 10% of the capping and post construction costs to be included every 5 years. This should be appropriate for anticipating costs maintenance and repair costs.

EPA Specific Comment 66: p. 4-27, §4.3.4

The analysis of Alternative 4 needs to be revised based on EPA's previous comments. In particular, the proposed backfill appears to be serving as an engineered cover, so additional components need to be evaluated, including the engineered cover (backfill) and associated long-term maintenance, monitoring, and LUC requirements.

Navy Response: Please refer to the response to comment 36 above. The backfill is not acting as a cap.

EPA Specific Comment 67: p. 4-28, §4.3.4, ¶3

LUCs will also be required for backfilled areas throughout the site because these are also capped areas and this alternative does not satisfy the PRGs based on VWACs. Please revise the description of this alternative accordingly and also adjust the cost estimate to account for this requirement.

Navy Response: Please refer to the response to Comment 36, above. Alternative 4 is being revised, and LUCs would be restricted to under-pier areas.

EPA Specific Comment 68: p. 4-28, §4.3.4

Regarding the last paragraph, all areas that are dredged and backfilled, but where contaminated sediment is left in place beneath the one foot backfill will also be subject to long-term monitoring because they also are capped areas and this alternative does not satisfy the PRGs based on VWACs. Please revise the description of this alternative accordingly and also adjust the cost estimate to account for this requirement.

Navy Response: Please refer to the response to Comment 36, above. Alternative 4 is being redeveloped by the Navy to better address regulatory concerns .

EPA Specific Comment 69: p. 4-30, §4.3.4, ¶1

The stability of a cap placed beneath Pier 2 needs to be evaluated to determine if it is practical. A

significant slope already exists from the sediment under the pier to the sediment surrounding the pier.

Navy Response: The practicality of placing a cap beneath the pier has been evaluated by Apex Inc. Experts employed by Apex who specialize in this type of work have determined that while capping beneath the pier will be difficult, it is possible. Their report and pricing are provided in Appendix E. Assessment beyond what has been provided is not appropriate for the FS and will be considered during design.

EPA Specific Comment 70: p. 4-31, §4.3.4, ¶4

While EPA supports the Navy's decision to work with the State, under CERCLA, the Navy should not state that dredging windows increase costs or make implementability more challenging.

Navy Response: The last sentence of the fourth paragraph will be struck.

EPA Specific Comment 71: p. 4-32, §4.3.5

See EPA's previous comments regarding whether the alternative, as proposed will leave contamination in place. If so, the analysis needs to include long-term monitoring, maintenance, LUCs and five-year reviews. Dredging under the piers also needs to address asbestos.

Navy Response: As discussed during the team meeting on 1/3/13 Alternative 5 will leave some sediment with COCs above PRGs remaining in place but the VWAC for each COC will be below its respective PRG. Following the VWAC approach which was discussed and agreed to in January 2013 under Alternative 5, sediment where elevated levels of COCs were reported will be dredged and replaced with backfill.

Please also refer to the response to comment 36, above. The principal is the same for alternative 5 as it is for alternative 4, with the exception of the inclusion of the areas under Pier 2 in the dredging program.

EPA Specific Comment 72: p. 4-33, §4.3.5, ¶5

While the PCB contaminated sediment is regulated under TSCA, it is not at levels that would require disposal at a TSCA-compliant landfill. The sediment under the pier needs be handled under relevant asbestos standards.

Navy Response: The above reference section will be clarified to indicate that PCB contaminated sediment is regulated under TSCA, but the PCB levels are not elevated enough to require disposal at a TSCA compliant landfill. The Navy has agreed to manage sediment dredged from beneath the piers with consideration that there is a possibility of the presence of asbestos.

EPA Specific Comment 72: p. 4-34, §4.3.5, ¶6

The discussion mentions anticipated debris beneath the pier and risk of compromising the structural integrity of the pier. Because of the limited amount of accumulated sediment under the eastern end of Pier 2, it is not likely that significant debris exists or that removal of a limited volume of silty sediment would compromise the structural integrity of the pier. Consequently, the difficulties of dredging beneath the pier are grossly overstated. EPA acknowledges that dredging beneath the pier will be more expensive than open water dredging, but the volume of sediment to be managed may be much less than anticipated in this FS.

Navy Response: The Navy is not aware of a connection between the amount of sediment present beneath the pier and the amount of debris present. The debris being referred to in this section is pieces of former shoreline structures cable, and other material dropped from the pier. It is unlikely that there is a correlation between the amount of sediment and the amount of debris present. The Navy is

basing its assumption that there is debris located beneath on records provided by divers who investigated other areas of the shipyard during the SSI and stated that there is a large amount of debris present.

Secondly, the Navy has not based the difficulties of dredging beneath the pier solely on the potential that debris may be present or that dredging may compromise the structural integrity of the pier. The difficulties and challenges are primarily concerning available overhead clearance, piling spacing, and side-access, as well as and safety issues if diver assisted dredging is utilized. The Navy has spent a great deal of time researching other similar projects, and discussing options with experts. There is a high uncertainty with many aspects of this part of Alternative 5, but the Navy has completed an appropriate amount of research into the issues and is confident that the price presented in the FS is reflective of a price that is within the +50 percent -30 percent range required.

No changes will be made based on this comment.

EPA Specific Comment 73: p. 4-35, §4.3.5, ¶1

Although the Navy may consider State dredging windows as part of remedial design, the FS should not imply that dredging windows increase costs or make implementability more challenging.

Navy Response: See response to comment 70.

EPA Specific Comment 74: p. 4-35, §4.4

Incorporate all of the previous comments about these alternatives and the analysis of each alternative under the NCP criteria. In particular, 1) Alternative 2 may not achieve either the Protectiveness or ARARs criteria, 2) Any alternative that leaves contamination in place needs to be protective in a 100-year storm event, and 3) Backfilling under Alternatives 4 and 5 may constitute the use of engineered covers that require long-term maintenance, monitoring, LUC and five-year reviews.

Navy Response: Changes based on responses to previous comments will be carried forward to this section as appropriate.

EPA Specific Comment 75: p. 4-35, §4.4, ¶2

A more balanced discussion of the comparison of alternatives is required. EPA believes the greatest negative for Alternative 5 is the cost, not the implementability, and as noted earlier, the cost needs to be reassessed. The FS should note the challenges and practicality of installing an effective and protective cap beneath Pier 2 for Alternative 4.

Navy Response: This section will be reviewed to determine if a more balanced discussion of comparison of alternative is required, and appropriate changes will be made based on this review.

EPA Specific Comment 76: p. 4-36, §4.4, ¶¶2&3

Contrary to the discussion, EPA believes that it is likely that placing a cap over the silty sediment under Pier 2 would generate greater sediment resuspension than hydraulic dredging of that sediment. The problems in constructing an effective cap over silty sediment need to be more fully developed in the FS.

Navy Response: There is uncertainty with all work evaluated for beneath the pier. Further discussion regarding the placement of a cap on silty sediment should be left for the design stage. The FS has considered the difficulties with capping on silty sediment at depths ranging from 20 to 40 feet by requiring additional material in the design to ensure that the minimum requirement is met (design 1 foot to ensure 6 inches in Alt 3, and design 2 feet to ensure 1 foot for Alt 3 and Alt 4).

EPA Specific Comment 77: p. 4-37, §4.4, ¶1

Please correct the text to reflect the fact that Alternative 3 does not achieve PRGs based on VWAC calculations.

Navy Response: The partial sentence at the beginning of the referenced page will be updated to state that Alternative 4 is the one that reaches VWACs below PRGs (see Comment 36).

Alternative 4 does not achieve the PRG for benzo(a)pyrene, it exceeds the PRG by almost 50% and it does not achieve the PRG for total HWM PAHs, or does not achieve it with reasonable certainty, depending on how the cap is simulated in the calculations. Furthermore, this alternative relies on only one foot of backfill in areas where contaminated sediment is left in place so disruption of that backfill cap could expose receptors to contaminated sediment concentrations in excess of those calculated. This is problematic given that the VWACs area not satisfied for Alternative 4. Finally, achieving a clean two-foot cap over silty sediment under a pier will be difficult to achieve so the modeled SWACs and VWACs for Alternative 4 do not reflect reality. A modification of Alternative 4 could be viable if it were to achieve the PRGs for VWACs with reasonable certainty.

Navy Response: Please refer to the response to comment 36 above. Alternative 4 has been redeveloped to achieve VWAC and SWAC goals. The area under the Pier is excluded from the calculation since it is capped under this alternative.

EPA Specific Comment 78: Table ES-1

Incorporate previous comments regarding the sediment alternatives, including a statement that Alternative 2 does not meet either the Protectiveness or ARARs criteria.

Navy Response: See responses to previous comments. As discussed during the 5/22 conference call, Alternative 2 will remain in the FS. The Navy believes that the thin layer cover in conjunction with monitoring and LUCs will address protectiveness goals.

EPA Specific Comment 79: Table 1-5, p. 8

*Please correct the color shading for benzo(a)pyrene in three places: change orange to yellow. Also, change the lead shading for N24 from orange to red because 5*168=840<842J.*

Navy Response: The suggested revisions will be made.

Please check the data entry for sample DSY-SD-J24. There are duplicate entries for the 0-1 foot sample. Please indicate if another sample interval should have been presented and whether this duplication created an error in the SWAC and VWAC calculations. EPA also notes that only the 0-1 foot interval was presented in the data table for the Supplemental Sediment Investigation Report.

Navy Response: The duplicate entry for the sample at J24, 0-1 foot will be replaced with the results from sample J24 1-2 foot. See also response to comment 105.

EPA Specific Comment 80: Table 2-1

Please cite EPA's non-cancer guidance.

Navy Response: Concur, RFDs will be cited.

The text notes on page 4-19 (and repeats the statement for the other alternatives): "Alternative 1 fails to meet sediment PRGs that have been derived, in part, from federal and state water quality chemical specific ARARs." The water quality standards should be cited in this table.

Navy Response: Water quality standards will be cited in the Table and other chemical specific ARARs tables.

List any other sediment guidances used to develop the ecological PRGs.

Navy Response: A series of guidance documents cited in the PRG development document including sediment quality criteria, FDA guidance, etc. will be reviewed for inclusion in this table.

EPA Specific Comment 81: Table 2-2, p. 3

Remove the State Endangered Species Act since the Atlantic Sturgeon is not listed and the Short-nosed Sturgeon is only listed as a historically occurring species.

Navy Response: The suggested revision will be made.

EPA Specific Comment 82: Table 2-3, p. 2

Cite 33 C.F.R. §334.81 separately.

Corps of Engineers, Danger Zone and Restricted Areas: Narragansett Bay, East Passage, Coddington Cove, Naval Station Newport, Naval Restricted Area, Newport, Rhode Island	33 C.F.R. §334.81	Applicable	All persons, swimmers, vessels and other craft, except those vessels authorized by the Navy or Coast Guard and local or state law enforcement vessels, are prohibited from entering the restricted area without specific permission from the Commanding Officer.	Enforceable basis for preventing unauthorized vessels and fisherman from entering the area where sediment caps/covers are installed or where there is a risk from consumption of contaminated seafood.

Navy Response: The revision will be made per the EPA request.

Add the following asbestos standards:

Clean Air Act (CAA), National Emission Standards for Hazardous Air Pollutants (NESHAPS); National Emission Standards for Asbestos	*42 U.S.C. §§7411, 7412; 40 C.F.R. Part 61, Subpart M*	*Applicable*	*Establish standards for demolition of facilities containing asbestos, managing existing asbestos, and for disposal of asbestos contaminated waste.*	*Any maintenance or demolition of the piers where asbestos is present must be conducted in accordance with these standards. Existing asbestos on the steam pipes must be managed to prevent release to the environment.*

Clean Air Act (CAA), National Emission Standards for Hazardous Air Pollutants (NESHAPS), Standards for Inactive waste disposal sites for asbestos mills and manufacturing and fabricating operations	*42 U.S.C. §§7411, 7412; 40 C.F.R. §61.151*	*Relevant and Appropriate*	*NESHAPS standards for preventing air releases from inactive asbestos disposal sites, including cover standards, dust suppression, and land use controls.*	*For areas of sediments under the piers where asbestos is present, that will be capped/covered substantive requirements of these standards and land use controls will be established to address health and safety requirements to maintain the cover and to address any potential asbestos exposure if the cover is disturbed.*
Framework for Investigating Asbestos-Contaminated Superfund Sites	*OSWER Directive #9200.0-68 (Sept. 2008)*	*To Be Considered*	*Guidance on investigating and characterizing the potential human exposure from asbestos contamination at Superfund sites.*	*Guidance will be used to establish procedures for sampling for asbestos either for delineating the area of contamination or if areas of covered sediment are disturbed in the future.*

Navy Response: The cited ARARs will be included at the EPA request. It is noted that the Asbestos frameworks do not pertain to sediment.

In describing the dewatering process for the dredging alternatives, the text mentions potentially discharging treated water to a POTW. Therefore, federal and State pre-treatment standards should be included in the Action-specific Tables both here and in the alternative-specific tables.

Navy Response: The text states that water removed from sediment during dredging may require treatment prior to disposal into the bay or to a POTW. It is acknowledged that ARARs specific to the actual disposal will need to be met, however, it is uncertain at this point which disposal route will be proposed. The Navy will continue to look into this and will provide ARARs as appropriate in the next version of the FS if a decision is reached.

EPA Specific Comment 83: Table 3-1

Modify the table text based on text comments, above.

Navy Response: Table 3-1 will be modified as needed based on other revisions to the FS document.

EPA Specific Comment 84: Table 4-1

Incorporate comments from Table 2-1.

Navy Response: Revisions to Table 2-1 will be carried through Tables 4-1, 4-4, 4-7, 4-10 and 4-13 as appropriate.

EPA Specific Comment 85: Table 4-4

Incorporate comments from Table 2-1. It is unclear whether this alternative will achieve chemical-specific standards.

Navy Response: Revisions to Table 2-1 will be carried through Tables 4-1, 4-4, 4-7, 4-10 and 4-13 as appropriate.

EPA Specific Comment 86: Table 4-5

Incorporate comments from Table 2-2. The Navy needs to identify the Least Environmentally Damaging Practicable Alternative under the Clean Water Act.

Navy Response: Revisions to Table 2-2 will be carried through Tables 4-2, 4-5, 4-8, 4-11 and 4-14 as appropriate. The least environmentally damaging practicable alternative will be identified in Table 4-16.

As noted in the text comments, it is unclear whether this alternative will meet the location-specific standards for protecting aquatic resources (i.e., wetlands, aquatic habitat, endangered species habitat).

Navy Response: It is not clear what this comment is in reference to. Alternative 2 was discussed on May and it was agreed to retain it in the FS.

EPA Specific Comment 87: Table 4-6

Incorporate comments from Table 2-3 (add asbestos standards). It is unclear whether this alternative will meet the action-specific standards listed.

Navy Response: Please see the response to Comment 82. Revisions to Table 2-3 will be incorporated into Tables 4-3, 4-6, 4-9, 4-12 and 4-15 as appropriate.

In the Sediment Remediation Guidance, Action to be Taken text state how long it will take for the alternative to meet all RAOs.

Navy Response: Alternative 2 will meet RAOs when the thin layer cover is installed and the LUC is in place. Please refer to the response to comments 4 and 39, above.

EPA Specific Comment 88: Table 4-7

Incorporate comments from Table 2-1.

Navy Response: Revisions to Table 2-1 will be carried through Tables 4-1, 4-4, 4-7, 4-10 and 4-13 as appropriate.

EPA Specific Comment 89: Table 4-8

Incorporate comments from Table 2-2. Identify the Least Environmentally Damaging Practicable Alternative under the Clean Water Act.

Navy Response: Revisions to Table 2-2 will be carried through Tables 4-2, 4-5, 4-8, 4-11 and 4-14 as appropriate. The least environmentally damaging practicable alternative will be identified in Table 4-16.

EPA Specific Comment 90: Table 4-9

Incorporate comments from Table 2-3 (add the asbestos standards).

Navy Response: Please see the response to Comment 82. Revisions to Table 2-3 will be incorporated into Tables 4-3, 4-6, 4-9, 4-12 and 4-15 as appropriate.

In the TSCA Action to be Taken column, replace "ENR cover layer" with "in situ cap, LUCs, and monitoring."

Navy Response: The proposed text revision will be made.

EPA Specific Comment 91: Alt. 4 ARARs Tables

Revise the analysis in the tables to discuss standards for the backfill, which is serving as an engineered cover. See ARARs descriptions for Alternative 3's in situ cap.

Navy Response: Backfill does not require LUCs, because it is not relying on cover to meet the RAOs. LUCs will be needed for the cover area under Pier 2.

EPA Specific Comment 92: Table 4-10

Incorporate comments from Table 2-1.

Navy Response: Revisions to Table 2-1 will be carried through Tables 4-1, 4-4, 4-7, 4-10 and 4-13 as appropriate.

EPA Specific Comment 93: Table 4-11

Incorporate comments from Table 2-2. Identify the Least Environmentally Damaging Practicable Alternative under the Clean Water Act.

Navy Response: Revisions to Table 2-2 will be carried through Tables 4-2, 4-5, 4-8, 4-11 and 4-14 as appropriate. The least environmentally damaging practicable alternative will be identified in Table 4-16.

EPA Specific Comment 94: Table 4-12

Incorporate comments from Table 2-3 (add the asbestos standards).

Navy Response: Please see the response to Comment 82. Revisions to Table 2-3 will be incorporated into Tables 4-3, 4-6, 4-9, 4-12 and 4-15 as appropriate.

In the TSCA Action to be Taken column, replace "ENR cover layer" with "dredging, engineered cover, LUCs, and monitoring."

Navy Response: The proposed text revision will be made.

For the Coast Guard Anchorage, Action to be Taken text, LUCs will be required through the area, both around the pier cover area and where there is backfill/cover.

Navy Response: Backfill does not require LUCs, because it is not relying on cover to meet the RAOs. LUCs will be needed for the cover area under Pier 2.

State Water Quality regulations apply to cover operations, as well as to dredging.

Navy Response: Concur, this will be included.

EPA Specific Comment 95: Alt. 5 ARARs

The tables need to address whether contaminated sediment will remain under the backfill that will require additional measures (long-term maintenance/monitoring of the backfill cover, LUCs, five-year reviews.

Navy Response: Backfill does not require LUCs, because it is not relying on cover to meet the RAOs.

EPA Specific Comment 96: Table 4-13

Incorporate comments from Table 2-1.

Navy Response: Revisions to Table 2-1 will be carried through Tables 4-1, 4-4, 4-7, 4-10 and 4-13 as appropriate.

EPA Specific Comment 97: Table 4-14

Incorporate comments from Table 2-2. Identify the Least Environmentally Damaging Practicable Alternative under the Clean Water Act.

Navy Response: Revisions to Table 2-2 will be carried through Tables 4-2, 4-5, 4-8, 4-11 and 4-14 as appropriate. The least environmentally damaging practicable alternative will be identified in Table 4-16.

EPA Specific Comment 98: Table 4-15

Incorporate comments from Table 2-3 (add asbestos standards) and identify the Least Environmentally Damaging Practicable Alternative under the Clean Water Act.

Navy Response: Please see the response to Comment 82. Revisions to Table 2-3 will be incorporated into Tables 4-3, 4-6, 4-9, 4-12 and 4-15 as appropriate. The least environmentally damaging practicable alternative will be identified in Table 4-16.

EPA Specific Comment 99: Table 4-16

Incorporate previous text comments regarding the sediment alternatives. EPA does not believe that Alternative 2 would be protective of human health or the environment.

Navy Response: Alternative 2 was discussed on May and it was agreed to retain it in the FS.

EPA Specific Comment 100: Figure 4-4

This figure indicates that grid cell Y30 would be dredged from 0 to 2 feet in depth. It appears that dredging two feet at Y30 contributes less to lowering the VWAC concentrations than other choices. Other cells with greater concentrations would provide a greater benefit. Please either correct the figure or explain why this cell was selected. Cells Y25, Y26, or Y28 all appear to be better choices for a two foot dredging area.

Navy Response: The figure will be corrected, Y30 should only be dredged to 1 foot depth.

EPA Specific Comment 101: Figure 1-11B

After correcting the color shading errors in Table 1-5, also correct the associated colored symbols on this figure for N28, N30, and Q29, changing them from orange to yellow and for N24 changing orange to red.

Navy Response: The suggested revision will be made.

EPA Specific Comment 102: Appendix D-7

Please provide a complete presentation of the calculations made to arrive at the targeted remediation areas proposed.

Navy Response: Tables will be included that present the process followed to select action areas.

EPA Specific Comment 103: Appendix E

Table E1-2.2: Please change "Annual Site Inspection Cap Inspection" to "Annual LUC Inspection." Make the same change for all other annual cost tables where appropriate.

Navy Response: The suggested revision will be made.

Table E1-4.1: In Line Item 4.5 Backfill, change Unit to CY.

Navy Response: The suggested revision will be made.

Table E1-4.2: The monitoring costs assumed for Alternative 4 grossly underestimate the monitoring that will be required because of leaving contaminated sediment at multiple locations throughout the site. In addition, bathymetric surveys will be required for all locations where contaminated sediment has been left in place, including dredged areas that are backfilled without removing all contaminated sediment. This comment applies to annual cost tables for Alternatives 2 and 3.

Site-wide long-term monitoring, including bathymetry surveys, cap maintenance and repair, and LUCs will be required for alternatives that do not satisfy the PRGs based on VWACs. The costs as presented are not representative of the true costs. Please revise the costs to include these items.

Navy Response: Alternative 4 is being redeveloped by the Navy to better address regulatory concerns. The level of monitoring required after successful completion of Alternative 4 needs further discussion.

Comments on the April 22, 2013 Spreadsheets

EPA Specific Comment 104:

Incorrect data were entered for J30 for the 2-4 foot depth interval (J28 data has been used.)

Navy Response: The reviewer is correct, the concentrations have been updated to represent the correct sample location and interval. It should be noted that this update does not change final calculations because concentrations of all COCs still remain below PRGs.

EPA Specific Comment 105:

J24 lists two sample intervals, but only one sample interval is presented in Table 1-5 and in the Supplemental Sediment Investigation Report. Please clarify where the second sample interval data originates.

Navy Response: During the SSI samples were collected at location J24 from the 0-1 foot and 1-2 foot intervals. Tables presented in the SSI (4-3 and Appendix B2-B) erroneously provided data for the 0-1 foot interval in place of the 1-2 foot interval data. Table 1-5 of the FS also erroneously presents the data in this manner. Table 1-5 will be updated accordingly with a footnote as to the source of the error, as will Figure 1-11B of the FS. The correct concentrations were used for the VWAC calculations so those will remain the same.

EPA Specific Comment 106:

The Navy inconsistently adjusted the area of grid cells that abut the shore line. Why?

Navy Response: One purpose of the FS was to identify areas and volumes of sediment that require remedial action (cover, dredge, LUCs, etc.). The project team decided that the 100x100 and 200x200 foot grid cells would be represented by the samples collected from within the cell (the actual cells are presented on many figures in the FS including Figure 1-11A). In some instances, the dimensions of these cells were adjusted to compensate for distance to other samples collected in the area, or solid site boundaries such as the shoreline or T-wharf. In an effort to calculate areas and volumes as accurately as possible the Navy used mapping software to individually calculate areas of those cells where dimensions were adjusted (including cells along the uneven shoreline).

EPA Specific Comment 107:

The row AA grid cells beneath Pier 1 should only represent sediment beneath Pier 1. These cell boundaries should not extend beyond the pier (see Figures 4-1 through 4-4). Is sediment under the piers considered differently from sediment not under the piers?

Navy Response: The intent of structuring the grid the way it has been presented in the FS was to identify the area that each sample point would represent; the grid design did not account for sub-pier sediment and open water sediment separately. The EPA raises a valid point in stating that sample points below the piers should only represent sub-pier sediment, as it is likely that there are different physical characteristics beneath the piers. However, cells under and adjacent to Pier 1 are not identified for remedial action so the changes, while they can be made, are not expected to have an effect on the areas that do require remediation.

EPA Specific Comment 108:

The size of the row AD cells should not be reduced in area by offsetting them from the pier. These cells should be the full 40,000 ft2 except possibly where intrusion of row AB cells occurs unless row AB

samples were collected under the pier (see Figures 4-1 through 4-4).

Navy Response: The row AD cells are reduced in size because the distance between row AA and AD is only 150 feet rather than the 200 feet between sample points in the area between the piers. This occurred in an effort the keep the row AA samples in the center of Pier 1. The distance from the sample point to the southern edge of the cell in row AD is still 100 feet. The AD cells were not extended further south because the Navy was trying to avoid representing sediment that isn't near any sample points.

AB samples were collected from alongside the pier, in the open water per a request from the group during development of the SAP.

EPA Specific Comment 109: Sheet VWAC Alt 4:

The sample interval for G29 was 1.5 ft. The SS assumes a contribution from only one foot. Contaminant mass and volume should be corrected.

Navy Response: The requested revision will be made.

EPA Specific Comment 110: Sheet VWAC Alt 5:

For Y30 only the top one foot is dredged whereas the Alternative 5 figure in the Draft FS shows a two foot dredge depth at Y-30.

Navy Response: The figure will be updated to indicate that only 1 foot of dredging will be conducted at Y30.

RIDEM Comments Dated June 24, 2013

RIDEM Specific Comment 1: p. ES-2, Executive Summary, Background; 1st sentence.

"On-shore investigations were conducted from 1995 to 1998 and found little residual contamination on the land portions of the site and only trace chemicals in the groundwater at the site."

Based on the recent FS submitted for Onshore Derecktor, the existing contamination is significant enough to conduct remedial actions for both soil and groundwater. Please revise this statement to indicate that contamination still exists on the land portion of the site which will need to be addressed through future remedial actions.

Navy Response: Instead of the proposed language in the cited sentence, an additional sentence will be added immediately following it to state: "Further investigation was conducted in 2011 to fill data gaps; the results of that investigation indicated that human health risks were present at various locations throughout the site due to metals in soil and groundwater, TCE in groundwater, PAHs in soil, and PCBs in soil. These results are being addressed separately in the Site 19, Derecktor Shipyard, On-Shore Feasibility Study (Tetra Tech, 2012)."

RIDEM Specific Comment 2: p. ES-2, Executive Summary, Background; 2nd paragraph, last sentence.

"The PRGs were finalized with agency review and input in November 1998."

Please revise this report to note that RIDEM never concurred with the PRGs developed in 1998 due to many issues as explained in RIDEM's letter to the Navy on January 2, 2009.

Navy Response: The comment is noted. The report will be revised to note that the RIDEM had concerns about the PRGs, and these concerns will be summarized from the letter 1/2/09.

RIDEM Specific Comment 3: p. ES-3, Executive Summary, Conclusions of Investigations Supporting FS Development; 4th paragraph, last sentence.

"This study also found that the sediments were stable within a depositional environment."

Please note that based on comments issued for the 2011 SSI, EPA and RIDEM did not agree with this conclusion.

Navy Response: The referenced sentence will be deleted.

RIDEM Specific Comment 4: p. ES-4, Executive Summary, Feasibility Study Process, RAOs; bullets.

Please reword the RAOs to remove the phrase "that cause its PRG to be exceeded".

Navy Response: This phrase will be deleted.

RIDEM Specific Comment 5: p. ES-5, Executive Summary, Feasibility Study Process, Alternatives; bullets.

Please note that RIDEM requested that the Navy include two additional alternatives (6 & 7) that included dredging without backfill. RIDEM had hoped that these alternatives would be evaluated as part of this FS; however, the Navy only briefly discussed these alternatives in a memo sent following the issuance of the Draft FS. RIDEM requests that the Navy revise the FS to include Alternative 6, at a minimum, because Alternatives 4 & 5, as currently presented in this FS, will require long-term monitoring (LTM) and land use controls (LUCs) which will limit this natural resource for the State of RI. See comment #10 below.

Navy Response: Alternatives 6 and 7 were requested by RIDEM on January 18th, 2013. At the meeting held on January 3, 2013 the Navy agreed to submit a draft FS to the regulatory agencies by March 30th, 2013. The time commitment required to include two additional Alternatives into the FS would have significantly delayed the submission of the Draft FS. As such the Navy provided a technical memorandum describing what are referred to as Alternatives 6 and 7. The Navy does not intend to pursue these as viable alternatives in the FS.

The Navy understands RIDEM's position on backfill. As presented in the Draft FS, Alternative 5 does not require LUCs because it achieves VWACs below PRGs for each COC. It is the Navy's position that achievement of VWACs below PRGs would require no LUCs.

Furthermore, in an effort to better meet the requests of the regulatory agencies, the Navy has redeveloped Alternative 4. This alternative still includes backfill, but achieves SWACs and VWACs below PRGs for each COC by excluding cells G25 and G29 (addressed through capping, not dredging and backfilling).

The Navy does not connect alternatives 4 and 5 with limiting a natural resource in the State of Rhode Island: LUCs would be needed under Pier 2 under Alternative 4, but this would not be a limit on the natural resource.

RIDEM Specific Comment 6: p. ES-5, Executive Summary, Summary of Alternatives, Alternative 2.

This alternative will address deeper sediments through implementation of ICs to partially restrict traffic by large ships. Please note that the Navy indicated that the existing aircraft carrier located at Pier 1 will be transferred to another location as some point in the near future (as discussed on p. 1-7), and the Navy also mentioned that another large ship may potentially be brought into Newport to be docked at Pier 1. Therefore, restriction of large ships at this site does not seem practical.

Navy Response: LUCs under Alternatives 2 and 3 would restrict large ship traffic. If a large ship were to be moved via tug, as long as its draft is shallower than the depth of the cove, there would be no issues and this would not be considered potential impact to the cover/cap. The potential for sediment resuspension arises when a large ship with a deep draft moves under its own power.

RIDEM Specific Comment 7: p. ES-5, Executive Summary, Summary of Alternatives, Alternative 2; 3rd sentence.

RIDEM does not agree that "ongoing deposition" was proven to be occurring at this Site. Please remove "ongoing deposition" or revise to "possible ongoing deposition".

Navy Response: In accordance with the request, the sentence will be revised to use the term "possible ongoing deposition".

RIDEM Specific Comment 8: p. ES-6, Executive Summary, Summary of Alternatives, Alternative 3.

Please describe the "engineered barrier" in more detail in this paragraph.

Navy Response: Details will not be included in the executive summary. No changes will be made based on this comment. Details about the engineered barrier are provided in Section 3.3.3.2.

RIDEM Specific Comment 9: p. ES-6, Executive Summary, Summary of Alternatives, Alternative 4.

In addition to the cap under the pier, please include long-term monitoring of the open water areas where a cover will be placed over deeper sediment exceeding PRGs.

Navy Response:

The goal of Alternative 4 is to reduce risk to the receptors by reducing exposure to COCs exceeding the PRGs; and to accomplish this, the approach is to reduce the surface area weighted average concentrations of COCs to below the PRGs. By removing the most highly contaminated sediment and replacing it with backfill, the area weighted average concentration for each COC is reached. This was the approach discussed in January 2013. The use of backfill is not a cover material; it is replacement material in the dredged area to reduce average concentrations. Further discussion may be warranted.

Alternative 4 will be revised for the revised FS to demonstrate that VWACs at the site are also below PRGs. Therefore, even if mixing occurs, the site-wide concentration would still be less than, or at, PRGs. This should address concerns with mixing of sediment during storm events.

RIDEM Specific Comment 10: p. ES-6, Executive Summary, Summary of Alternatives, Alternative 5.

"...LUCs and LTM would not be necessary."

As currently presented in this FS, the volume-weighted average concentration (VWAC) is below the PRG for each constituent for Alternative 5; however, the VWACs for benzo(a)pyrene and lead are just slightly under their PRG; therefore, compliance with the PRGs on a volume-weighted average basis cannot be achieved with reasonable certainty. The surface-weighted average concentration (SWAC) for benzo(a)pyrene (707 ug/kg) exceeds the PRG (539 ug/kg) significantly. Also, it is unknown whether the areas proposed to be dredged and backfilled contain contamination at a greater depth. The backfill may be serving as a cap over contaminated sediments which would require LTM and LUCs. Further, this alternative leaves in place contamination at several locations which is 2-5 times the PRG. Based on these reasons, LUCs, LTM and 5-years reviews should be required for Alternative 5, unless further revisions to this alternative are made to include additional dredging in several hotspot areas and confirmatory sampling to indicate if contamination exists below the proposed backfilled areas.

Navy Response: The Comment is noted. Please note that Alternative 4 is being revised for the revised FS to assure that both VWAC and SWAC concentrations are below PRGs for all COCs. The Navy understands RIDEM's concerns about backfill, however, the Navy stands behind the SWAC and VWAC approach as it has been successfully used in the past at other sites to reduce contaminant load and to reduce risk. After risk and contaminant concentrations are addressed in this manner, LUCs and LTM would not be required. Use and extent of confirmatory sampling is a potential subject for further discussion for this FS.

Further discussion of the selection of the remedy is appropriate prior to moving to the PRAP and ROD however, use of alternatives 4 and 5 in the FS are appropriate for establishing a range of alternatives for the remedy evaluation.

RIDEM Specific Comment 11: p. 1-1, Section 1.0, Introduction; 3rd paragraph; 3rd sentence.

Please see specific comment #2.

Navy Response: Please see response to Comment #2.

RIDEM Specific Comment 12: p. 1-5, Section 1.2, Site History; last paragraph, 2nd sentence.

Please see specific comment #2.

Navy Response: Please see response to Comment #2

RIDEM Specific Comment 13: p. 1-25, Section 1.4.4, Identification of COCs and Development of PRGs – 1998; 2nd paragraph.

"The PRG development document was finalized in November of 1998; USEPA accepted this document in a letter dated December 21, 1998. RIDEM provided follow-up comments to the final document, which were resolved without revision to the document on May 11, 1999."

Please see specific comment #2. The issues discussed in RIDEM's comments were not resolved.

Navy Response: Please see response to Comment #2.

RIDEM Specific Comment 14: p. 2-6, Section 2.2.2, Development of PRGs; 1st paragraph.

Please explain in greater detail in this section how the recommended PRGs (RPRGs) were calculated. Please state that the baseline PRGs (BPRGs) were multiplied by a factor of 10 to obtain the RPRGs and explain the reason that this was done.

Navy Response: Only the BPRG for Benzo(a)pyrene was developed into an RPRG using an HQ of 10, and this was based on many uncertainties documented in the HHRA and the FS. The BPRG of 53.9 ug/kg was adjusted based on the uncertainty of the transfer of the contaminant from sediment to shellfish, then transfer from shellfish to the person ingesting the shellfish and also based on that transferred contaminant causing the risk to the receptor. This COC is actionable due only to RME risk from benzo(a)pyrene measured at 5.12E-5 through exposure to mussels collected from the site and ingested by a person ingesting 36 meals per year of this catch. These are all highly uncertain variables. Finally, a cleanup value of 53.9 ug/kg is not believed to be achievable in a marine sediment setting. This information will be included as requested.

RIDEM Specific Comment 15: p. 2-6, Section 2.2.2, Development of PRGs; 2nd paragraph.

Please see specific comments #2 and #13.

Navy Response: Please see responses to Comments #2 and #13.

RIDEM Specific Comment 16: p. 2-9, Section 2.3, Formulation of Sediment Remedial Action Objectives; 2 bullets

Please reword the RAOs to remove the phrase "that cause its PRG to be exceeded".

Navy Response: This phrase will be deleted.

RIDEM Specific Comment 17: p. 3-10, Section 3.3.3.1, Thin Layer Cover.

This section discusses that the thin layer cover would "enhance the process of natural depositional recovery". Please note that the results of the SSI do not show that natural deposition is occurring at this site. Based on the bathymetric surveys (as discussed on p. 1-13), the depths remain fairly consistent and are in agreement with conditions dating back to the 1950's.

Navy Response: This alternative will be updated to include monitoring of deposition through sediment sampling, as well as additional provisions to ensure that repair of the cover will be included if monitoring indicates it is necessary.

RIDEM Specific Comment 18: p. 3-11, Section 3.3.3.2, Subaqueous Cover System; 1st paragraph, 2nd sentence.

Please specify the thickness of the cap to differentiate between this alternative and the thin layer cover alternative.

Navy Response: The major difference between the thin layer cover and the engineered barrier is that the thin layer cover relies on natural deposition and natural attenuation to permanently eliminate risk,

while the engineered barrier achieves this immediately upon placement. This will be clarified in sections 3.3.3.1 and 3.3.3.2 of the FS. Since this section is describing the technology, and not it's specific application to the Site, it would be inappropriate to include a description of cap/cover thickness.

RIDEM Specific Comment 19: p. 3-26, Section 3.5, Rationale for Development of Alternatives, Alternative 5.

"This alternative would not require ICs, LTM and 5-year reviews."

Please see comment #10 above.

Navy Response: Please see response to Comment #10.

RIDEM Specific Comment 20: p. 4-1, Section 4.0, Alternative 4; 3rd bullet.

In addition to LUCs to limit access under Pier 2, LUCs will also be required for the open water areas covered by one foot of clean fill. Contamination in the 1-2 ft zone in some areas is significant; therefore, LUCs similar to Alternatives 2 and 3 will be necessary to prevent deep draft vessels or fishing vessels from disturbing the 1-foot cover over contamination in the 1-2 foot zone that would remain in place with this alternative.

Navy Response: Please refer to the response to Comment 10.

RIDEM Specific Comment 21: p. 4-2, Section 4.0, Alternative 4; 1st bullet.

Similar to the comment above, LTM will also be required for the open water areas covered by one foot of clean fill in addition to the areas under Pier 2. Contamination in the 1-2 ft zone in some areas is significant; therefore, LTM will be necessary to ensure that concentrations exceeding PRGs do not become exposed at the sediment surface.

Navy Response: Please refer to the response to Comment 10.

RIDEM Specific Comment 22: p. 4-2, Section 4.0, Alternative 5; 2nd bullet.

Please see comment #10 above.

Navy Response: Please see response to comment #10 above.

RIDEM Specific Comment 23: p. 4-3, Section 4.1.1, Alternative 1; table.

Please change the units for the lead PRG to mg/kg instead of µg/kg. Also, the PRG of 1,284 µg/kg for benzo(a)pyrene is slightly different from the PRG of 1,283 µg/kg provided in Appendix D-7. Please review all Section 4 PRG tables for consistency with Appendix D-7. (Please note that other PRG tables in other sections also have incorrect units for lead.)

Navy Response: The units for lead will be updated accordingly. The Draft Final FS will include tables that identify the remedial areas of each Alternative and the associated SWACs and VWACs if appropriate. The FS will be reviewed to ensure consistency between these tables and the rest of the FS.

RIDEM Specific Comment 23: p. 4-3, Section 4.1.2, Alternative 2, Thin Layer Cover; whole section.

Please see comment #17. A "natural depositional recovery process" does not appear to be occurring at this site.

Navy Response: Please see response to Comments #17 and #18.

RIDEM Specific Comment 24: p. 4-4, Section 4.1.2, Alternative 2, Thin Layer Cover; table.

Please include in this table the SWAC concentrations based on a 6-inch cap. Although the design would specify a 12-inch cover, the goal of this remedy is to achieve a minimum cover of 6 inches. If the SWAC concentrations for a 6-inch cover exceed the PRGs, then please revise this alternative to a 12-inch minimum thin layer cover.

Navy Response: As described in the note below the table, the SWACs presented represent predicted conditions after cover placement and additional deposition. This alternative relies on natural depositional processes and would take time after cover placement to achieve the predicted SWACs presented in the table. The purpose of the cover is to address high ecological risk areas in the short term while LUCs prevent human exposure while deposition is occurring. The Navy understands that the EPA and RIDEM do not feel that the Navy has established enough evidence to prove that deposition is occurring, but the Navy believes that with appropriate monitoring (to show that deposition is occurring) this Alternative could be protective.

RIDEM Specific Comment 25: p. 4-4, Section 4.1.2, Alternative 2, Thin Layer Cover; 2nd paragraph, 1st sentence.

Please explain why the placement of a thin layer cover will not likely impact subtidal areas (e.g., water column depth, etc., such as discussed on p. 4-7 for the in-situ cap).

Navy Response: The above reference sentence states that placement of the cap will not convert subtidal areas into intertidal areas. The depths of the areas where the cap would be placed are far below the intertidal zone, so a 6 inch change in bottom elevation is not expected to change the ecosystem from subtidal to intertidal. No changes will be made based on this comment.

RIDEM Specific Comment 26: p. 4-5, Section 4.1.2, Alternative 2, Thin Layer Cover; 2nd paragraph.

Please note that the Navy indicated that the existing aircraft carrier located at Pier 1 will be transferred to another location at some point in the near future (as discussed on p. 1-7), and the Navy also mentioned that another large ship may be brought into Newport to be docked at Pier 1. Therefore, Pier 1 is also an area of concern regarding disturbance by vessel traffic. In addition, ICs will be required across the entire site to restrict recreational and commercial fishing activities.

Navy Response: As described in the institutional controls section on page 4-4, institutional controls would include limiting operations by large deep draft vessels; this does not mean that they cannot be berthed at Pier 1, it simply means that they would likely require tug assistance for placement. Using smaller tug boats with shallow drafts would eliminate the risk of sediment resuspension due to deep draft prop wash. No changes will be made based on this comment.

RIDEM Specific Comment 27: p. 4-5, Section 4.1.2, Alternative 2, Thin Layer Cover; 3rd paragraph, last sentence.

Please see comment #17. A "natural depositional recovery process" does not appear to be occurring at this site.

Navy Response: Please see response to Comment #17.

RIDEM Specific Comment 28: p. 4-5, Section 4.1.2, Alternative 2, Thin Layer Cover, Long-Term Monitoring and 5-Year Reviews.

This section states that a single sediment sampling event per year and a bathymetric survey every five years may be sufficient for long-term monitoring. For costing purposes, please include estimates for additional sampling/bathymetric surveys that may be necessary due to a significant storm event. Also, the frequency of monitoring and surveys should be evaluated further in the remedial design phase.

Navy Response: Costing will be updated to include funding for additional sampling or bathymetric surveys that may be required in the event of a significant storm event. The regulatory agencies will have an opportunity to voice opinions and concerns regarding monitoring during development of the LTMP.

RIDEM Specific Comment 29: p. 4-8, Section 4.1.3, Alternative 3, In-Situ Cap (Engineered Barrier), Long-Term Monitoring and 5-Year Reviews.

Please see previous comment for Alternative 2.

Navy Response: Please see response to Comment #28.

RIDEM Specific Comment 30: p. 4-9, Section 4.1.4, Alternative 4, Combination Dredge/Backfill; 4th bullet.

Please indicate in this bullet which "capped areas" will be monitored long-term (i.e., target areas beneath Pier 2 only).

Navy Response: The bullet will be updated to specify that the only capped areas under this alternative are beneath Pier 2. Additionally, Alternative 4 is being redeveloped to better address the concerns of the regulatory agencies.

RIDEM Specific Comment 31: p. 4-9, Section 4.1.4, Alternative 4, Combination Dredge/Backfill; table.

Please do not include the area under Pier 2 in the VWAC calculations. This area will already be addressed with an engineered barrier for this alternative. Therefore, the VWAC concentrations should be based on the remaining areas of the site where PRGs are exceeded. As currently presented, the PRG for benzo(a)pyrene, based on a volume-weighted average, does not meet the PRG identified in this FS. Given that the baseline PRGs (BPRGs) were multiplied by a factor of 10 to obtain the RPRGs, a remedy in which an exceedance of an RPRG would remain is not a protective remedy.

If the VWACs calculated without including the area under Pier 2 still indicate exceedances of any PRG, please modify this alternative to include additional dredging to ensure that the remaining VWACs do not exceed PRGs.

Navy Response: Alternative 4 is being redeveloped to better address the concerns of the regulatory agencies. Part of this revision includes removal of Pier 2 areas from the VWAC calculations as suggested above. Regarding the PRGs, please refer to the response to comment 14 above.

RIDEM Specific Comment 32: p. 4-9, Section 4.1.4, Alternative 4, Combination Dredge/Backfill, Institutional Controls.

In addition to ICs to limit access under Pier 2, LUCs will also be required for the open water areas covered by one foot of clean fill. Contamination in the 1-2 ft zone in some areas is significant; therefore, LUCs similar to Alternatives 2 and 3 will be necessary to prevent deep draft vessels, fishing vessels, etc. from disturbing the 1-foot cover over contamination in the 1-2 foot zone that would remain in place with this alternative.

Navy Response: Please refer to the responses to comments 10 and 11 above.

RIDEM Specific Comment 33: p. 4-10, Section 4.1.4, Alternative 4, Combination Dredge/Backfill, Dredging and Disposal; 1st paragraph.

In addition to bathymetric surveys, please indicate if the Navy plans to conduct confirmatory sampling after dredging and backfilling are conducted.

Navy Response: Use and extent of confirmatory sampling is a potential subject for further discussion for this FS.

RIDEM Specific Comment 34: p. 4-12, Section 4.1.4, Alternative 4, Combination Dredge/Backfill, Long-Term Monitoring and 5-Year Reviews; 1st paragraph.

Long-term monitoring (LTM) will also be required for the open water areas covered by one foot of clean fill in addition to the areas under Pier 2. Contamination in the 1-2 ft zone in some areas is significant; therefore, LTM will be necessary to ensure that concentrations exceeding PRGs do not become exposed at the sediment surface. Please include LTM of the open water areas as part of this alternative.

Navy Response: Please refer to the response to comments 10 and 11, above.

RIDEM Specific Comment 35: p. 4-12, Section 4.1.4, Alternative 4, Combination Dredge/Backfill, Long-Term Monitoring and 5-Year Reviews; 2nd and 3rd paragraphs.

This section states that a single sediment sampling event per year and a bathymetric survey every five years may be sufficient for long-term monitoring. For costing purposes, please include estimates for additional sampling/bathymetric surveys that may be necessary due to a significant storm event. Also, the frequency of monitoring and surveys should be evaluated further in the remedial design phase.

Navy Response: Costing will be updated to include funding for additional sampling or bathymetric surveys that may be required in the event of a significant storm event. It is agreed that details of the monitoring will be established during development of the LTMP.

RIDEM Specific Comment 36: p. 4-13, Section 4.1.5, Alternative 5, Target Dredging and Backfill; table.

As currently presented, the concentration of benzo(a)pyrene, based on a surface-weighted average, does not meet the PRG identified in this FS. Given that the baseline PRGs (BPRGs) were multiplied by a factor of 10 to obtain the RPRGs, a remedy in which an exceedance of an RPRG would remain is not a protective remedy. Please modify this alternative to include additional dredging to ensure that the remaining SWACs do not exceed PRGs.

Navy Response: The success of alternative 5 is based on the VWAC to be below PRGs for all COCs. Since this objective is met, the RAOs would be achieved. Regarding PRGs, see response to comment 14.

RIDEM Specific Comment 37: p. 4-13, Section 4.1.5, Alternative 5, Target Dredging and Backfill; 3rd paragraph.

Rather than backfill, confirmatory sampling could be conducted following dredging which may indicate that the sediment at deeper intervals does not exceed PRGs. This data could then be used to calculate site-wide SWACs and VWACs. The use of backfill to cover existing contamination would be considered a cap which would require LUCs, LTM and 5-year reviews.

Navy Response: The use of backfill is not a cap, its purpose is to replace the volume of sediment dredged with clean material, therefore decreasing the site wide volume concentration of COCs to levels below PRGs. It serves no purpose with regard to reducing exposure to sediment at depth.

Furthermore, with the exception of cells G25 and Y30, all other dredge locations have data from the interval beneath the dredge depth.

RIDEM Specific Comment 38: p. 4-20, Section 4.3.2, Alternative 2, Enhanced Natural Recovery through Thin Layer Cover; whole section.

Please see comment #17. A "natural depositional processes" does not appear to be occurring at this site.

Navy Response: Please see response to Comment #17.

RIDEM Specific Comment 39: p. 4-27, Section 4.3.4, Alternative 4, Combination Dredge/Backfill; 1st paragraph.

Please revise this paragraph based on comment #32 above.

Navy Response: Please refer to the responses to comments 10 and 11 above.

RIDEM Specific Comment 40: p. 4-28, Section 4.3.4, Alternative 4, Combination Dredge/Backfill; 3rd paragraph.

Please revise this section to include LUCs for the backfilled (capped) open port areas. See comment #33 above.

Navy Response: Please refer to the response to comments 10 and 11 above.

RIDEM Specific Comment 41: p. 4-28, Section 4.3.4, Alternative 4, Combination Dredge/Backfill; 6th paragraph.

Please revise this section to include long-term monitoring and 5-year reviews of the backfilled (capped) open port areas. See comment #35 above.

Navy Response: Please refer to the response to comments 10 and 11 above.

RIDEM Specific Comment 42: p. 4-31, Section 4.3.4, Alternative 4, Combination Dredge/Backfill, Cost.

Please update the cost estimates for Alternative 4 to include LUCs, long-term monitoring, and 5-year reviews for the backfilled (capped) open port areas, in addition to the area under Pier 2.

Navy Response: Please refer to the response to comments 10 and 11 above.

RIDEM Specific Comment 43: p. 4-32, Section 4.3.5, Alternative 5, Target Dredging and Backfill; 1st paragraph.

Please see comment #37 above. The SWAC for benzo(a)pyrene does not meet the PRG identified in this FS. Please modify this alternative to include additional dredging to lower the SWAC to below the PRG for benzo(a)pyrene.

Navy Response: Please refer to the response to comments 10 and 11 above.

RIDEM Specific Comment 44: p. 4-32, Section 4.3.5, Alternative 5, Target Dredging and Backfill; 4th & 5th paragraphs.

Please see comment #10 above.

Navy Response: Please refer to the response to comments 10 and 11 above.

RIDEM Specific Comment 45: p. 4-34, Section 4.3.5, Alternative 5, Target Dredging and Backfill, Implementability.

RIDEM understands that dredging down to 4 feet beneath Pier 2 is projected to be difficult and may not be implementable, although the silty sediment under the pier may not be as difficult to dredge as presented in this FS. However, given the potential concerns with dredging under the pier, if this alternative is chosen as the preferred alternative in the Proposed Plan/ROD, a stipulation should be included to cap the sediment under Pier 2 as outlined in Alternative 4 if it is determined during the remedial design phase that dredging under the pier is not possible. Also, please state that when Pier 2 is ultimately reconstructed or demolished, the contaminated sediment will then be dredged from this area as it becomes accessible.

Navy Response: The Navy's conclusions regarding the difficulty of dredging beneath Pier 2 are backed up by multiple similar projects that encountered technical and financial difficulties during dredging beneath piers or wharfs; the difficulty of dredging beneath Pier 2 is not overstated in this FS. A stipulation can be added to this alternative to require capping (as described in Alternative 4) if it is determined during the remedial design phase that dredging beneath the pier is not possible.

RIDEM Specific Comment 46: p. 4-35, Section 4.3.5, Alternative 5, Target Dredging and Backfill, Cost.

Please update the cost estimates based on comments #37 and #44 above.

Navy Response: Please see responses to Comments #10 and #37.

RIDEM Specific Comment 47: p. 4-35, Section 4.4, Comparative Analysis of Remedial Alternatives, Overall Protection of Human Health and the Environment; 1st paragraph.

Please revise this paragraph to state that LUCs restricting ship traffic, fishing vessels, etc. will be required for the open port areas under Alternative 4. As currently proposed in this FS, risk to human and ecological receptors will remain at depth, requiring long-term monitoring and maintenance for the entire site.

Navy Response: Please refer to the response to comments 10 and 11 above. Alternative 4 is being redeveloped to better address concerns of the regulatory agencies.

RIDEM Specific Comment 48: p. 4-36, Section 4.4, Comparative Analysis of Remedial Alternatives, Overall Protection of Human Health and the Environment; 3rd paragraph.

Please see comment #17. A "natural depositional processes" does not appear to be occurring at this site.

Navy Response: Please see response to Comment #17.

RIDEM Specific Comment 49: p. 4-36, Section 4.4, Comparative Analysis of Remedial Alternatives, Compliance with ARARs.

Please see comment #17. A "natural depositional processes" does not appear to be occurring at this site.

Navy Response: Please see response to Comment #17.

RIDEM Specific Comment 49: p. 4-37, Section 4.4, Comparative Analysis of Remedial Alternatives, Long-Term Effectiveness and Permanence; 1st paragraph.

Please see comment #32. The area underneath Pier 2 should not be included in the VWAC calculation for Alternative 4 since it will be addressed separately with a cap.

Navy Response: Alternative 4 is being redeveloped to better address concerns of the regulatory agencies. Please refer to the response to comment 31.

RIDEM Specific Comment 50: p. 4-37, Section 4.4, Comparative Analysis of Remedial Alternatives, Long-Term Effectiveness and Permanence; 1st paragraph, last sentence.

Please see comment #10 above.

Navy Response: Please see response to Comment #10.

RIDEM Specific Comment 51: p. 4-38, Section 4.4, Comparative Analysis of Remedial Alternatives, Short-term Effectiveness; last sentence.

Please revise this sentence to state that Alternative 2 (thin-layer cover) would also provide short-term effectiveness comparable to that of Alternative 3.

Navy Response: Alternative 2 relies on deposition of sediment over time to fully build a protective barrier, it is not comparable to the short term effectiveness of Alternative 3. No changes will be made based on this comment.

RIDEM Specific Comment 52: p. 4-38, Section 4.4, Comparative Analysis of Remedial Alternatives, Implementability; bullets.

The problems that the Navy may encounter in dredging under the pier are clearly outlined in this section, while the difficulties in capping under the pier are not discussed. Due to slope created from the shallower sediment under the pier compared to the deeper adjacent sediment, and silty nature of the sediment, capping under the pier will also be challenging and should be discussed in this section and reflected in the cost estimates for Alternative 4.

Navy Response: This section will be updated to identify the difficulties associated with capping beneath Pier 2. The costs presented in the Draft FS do account for the difficulties of dredging beneath Pier 2, and no cost changes will be made based on this comment.

RIDEM Specific Comment 53: p. 4-39, Section 4.4, Comparative Analysis of Remedial Alternatives; Cost.

Please revise these cost estimates based on previous comments.

Navy Response: The Navy will update cost estimates as needed to account for revisions made to the FS.

RIDEM Specific Comment 54: Table ES-1, Summary of Remedial Alternatives.

The implementability of Alternative 5 (under Pier 2) is listed as "NO". This alternative is presented as in this FS as difficult but potentially achievable. Please change "NO" to "TBD". Also, please revise the cost estimates based on previous comments.

Navy Response: Making the table entry as TBD indicates that an attempt will be made to do the dredging under the pier, which is not the type of optional action that can be included in the FS.

RIDEM Specific Comment 55: Table 3-1, Preliminary Screening of Sediment Technologies and Process Options

1. *Under the description of the Thin Layer Cover (p. 2): This table specifies that a 6-inch layer of natural material will be installed. However, Section 4 of this FS specifies a cap thickness of 6-12". Please revise the cap thickness depth in this table to be consistent with the text.*

   Navy Response: The text is correct. Section 3 of the FS (including Table 3-1) presents descriptions of remedial technologies and screens them based on their applicability. Descriptions in this section are meant to be general. Section 4 describes Alternative development as the technologies would be applied to site specific conditions.

2. *Under the description of Hydraulic Dredging (p. 3, 3rd sentence): Please revise the end of the sentence to state that "the use of hydraulic pumps will dramatically reduce re-suspension compared to other forms of dredging."*

   Navy Response: The suggested revision will be made except to say that use of such pumps "can" dramatically reduce resuspension....

3. *Under the screening comments for landfilling off-site/off-site disposal (p. 3): Please remove the reference to "island".*

   Navy Response: The suggested revision will be made.

4. *Under the screening comments for the use of CAD cells (p. 3): This table indicates that this technology is retained for further evaluation; however, p. 3-19 of this FS states that CAD was eliminated from the evaluation.*

   Navy Response: Table 3-1 presents the preliminary screening process, and Section 3.3 presents the evaluation of technologies on a more site specific level. CAD cells are retained during the preliminary screening but eliminated during the second evaluation step because of regulatory concerns, Table 3-1 is correct. Section 3.2.1 will be updated to explain that options retained during preliminary screening as described on Table 3-1 are further evaluated for site specific applicability in Section 3.3.

5. *Under the process option for ex-situ, off-site treatment (p. 4): Please remove the extra word "physical" from the description.*

   Navy Response: The suggested revision will be made.

RIDEM Specific Comment 56: Table 4-16, Summary of Detailed Analyses of Sediment Remedial Alternatives.

Please revise this entire table based on the previous comments.

Navy Response: This table will be updated accordingly based on revisions made to the FS.

For the Short-Term Effectiveness section:

- *Risk to Community: Alternative SD4 would likely have significant truck traffic similar to that of Alternative SD5. Please change the risk from minor to moderate.*

  Navy Response: The suggested revision will be made.

- *Risk to Workers: For Alternative SD5, there is a moderate to high risk to divers working under Pier 2. Please revise the table to reflect this.*

  Navy Response: The suggested revision will be made.

- *Environmental Impacts: Please note typographical error ("temporary") in this row. Also, Alternatives SD4 and SD5 would likely have impacts to aquatic organisms due to sediment disturbance and resuspension.*

  Navy Response: The typographical error will be corrected. Specific environmental impacts are not listed in this table, impacts to the benthic community could be caused by a multitude of actions, as noted in this comment, but since this table lacks that amount of specificity no changes will be made base on the second part of this comment.

RIDEM Specific Comment 57: Tables.

Please include an additional table in this FS with the length and width of each cell, and the total cubic yards for 1 ft, 2 ft, and 4 ft depths as appropriate.

Navy Response: The Navy intends to include a table(s) in the Revised Draft FS that presents the SWAC and VWAC calculation process for each alternative where appropriate. This table will include areas and cubic yards for each cell.

Attachment A – Revised Tables for Alternative 4

TABLE XX
ALTERNATIVE 2 SWAC CALCULATIONS
SITE 19, DIRECKTOR SHIPYARD MARINE SEDIMENT
FEASIBILITY STUDY
NAVSTA NEWPORT, NEWPORT RI

SAMPLE[1]	ACTION[2]	AREA (sf)	BENZO(A) PYRENE (µg/kg)		HMW PAHs (µg/kg)		PCBs (µg/kg)		LEAD (mg/kg)	
DSY-SD-AA30-0012	N	11658	290		5220	J	1880	J	59.8	
DSY-SD-AD13-0012	N	32408	1300		17300		120		109	J
DSY-SD-AD21-0012	N	34800	250		2310	J	110	J	200	J
DSY-SD-AE24-0012	Y	10000	0		0		0		0	
DSY-SD-AT30-0012	N	38193	890		12300		10.3	UJ	35	
DSY-SD-BB26-0012	N	10028	930	J	16400	J	16.4	UJ	143	
DSY-SD-BC28-0012	Y	9987	0		0		0		0	
DSY-SD-BC30-0012	Y	9467	0		0		0		0	
DSY-SD-BD26-0012-AVG	Y	12449	0		0		0		0	
DSY-SD-BE28-0012	Y	9950	0		0		0		0	
DSY-SD-BE30-0012	Y	8944	0		0		0		0	
DSY-SD-BG28-0012	Y	12334	0		0		0		0	
DSY-SD-BI26-0012	N	14714	580		6450	J	13.4	UJ	39.7	J
DSY-SD-C21-0012	N	40000	160		1670	J	190	J	320	J
DSY-SD-C25-0012	N	40000	840		9250	J	140	J	198	J
DSY-SD-C29-0012	N	43818	620	J	6430	J	470	J	209	J
DSY-SD-G01-0012	N	40000	210		4280	J	22.6	U	368	J
DSY-SD-G25-0012	Y	40000	0		0		0		0	
DSY-SD-G29-0018	Y	43574	0		0		0		0	
DSY-SD-J24-0012	Y	10000	0		0		0		0	
DSY-SD-J30-0012	Y	11630	0		0		0		0	
DSY-SD-K05-0012	Y	40000	0		0		0		0	
DSY-SD-K13-0012	Y	40000	0		0		0		0	
DSY-SD-L24-0012	Y	10000	0		0		0		0	
DSY-SD-L26-0012	N	10000	670	J	8580	J	1800	J	324	J
DSY-SD-L28-0012	Y	10000	0		0		0		0	
DSY-SD-L30-0012	N	11586	930	J	11500	J	270		65.2	J
DSY-SD-T25-0012	N	34788	250		2070	J	1500		64.2	
DSY-SD-W24-0012-AVG	Y	10000	0		0		0		0	
DSY-SD-Y26-0012	N	7246	900	J	10800	J	200	J	69.5	
DSY-SD-Y30-0012	Y	11677	0		0		0		0	
		SWACs[3]	460.7		4,024.5		675.0		152.5	

1 - Sample collected during the SSI. The resulting concentration was used to represent the entire cell from which the sample was collected. All surface sediment samples that had a reported exceedance of PRGs are represented in this table.

2 - A "Y" in this column indicates that the 0 to 1 foot interval of that specific cell will be covered, capped, or dredged (depending on the alternative). A "Y" designation results in COC concentrations being replaced with zeros, representing placement of clean backfill.

3 - See Appendix D-7 for a detailed explanation as to how the SWAC calculation was performed. For Alternative 2 the SWAC will not be achieved until an additional 6 inches of material have been deposited ontop of placed cover material.

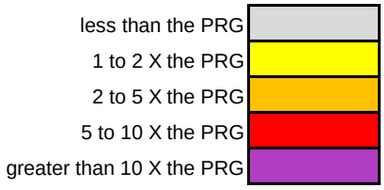

TABLE XX
ALTERNATIVE 3 SWAC CALCULATOINS
SITE 19, DERECKTOR SHIPYARD MARINE SEDIMENT
FEASIBILITY STUDY
NAVSTA NEWPORT, NEWPORT RI

SAMPLE[1]	ACTION[2]	AREA (sf)	BENZO(A) PYRENE (µg/kg)		HMW PAHs (µg/kg)		PCBs (µg/kg)		LEAD (mg/kg)	
DSY-SD-AA30-0012	N	11658	290		5220	J	1880	J	59.8	
DSY-SD-AD13-0012	N	32408	1300		17300		120		109	J
DSY-SD-AD21-0012	N	34800	250		2310	J	110	J	200	J
DSY-SD-AE24-0012	Y	10000	0		0		0		0	
DSY-SD-AT30-0012	N	38193	890		12300		10.3	UJ	35	
DSY-SD-BB26-0012	N	10028	930	J	16400	J	16.4	UJ	143	
DSY-SD-BC28-0012	Y	9987	0		0		0		0	
DSY-SD-BC30-0012	Y	9467	0		0		0		0	
DSY-SD-BD26-0012-AVG	Y	12449	0		0		0		0	
DSY-SD-BE28-0012	Y	9950	0		0		0		0	
DSY-SD-BE30-0012	Y	8944	0		0		0		0	
DSY-SD-BG28-0012	Y	12334	0		0		0		0	
DSY-SD-BI26-0012	N	14714	580		6450	J	13.4	UJ	39.7	J
DSY-SD-C21-0012	N	40000	160		1670	J	190	J	320	J
DSY-SD-C25-0012	N	40000	840		9250	J	140	J	198	J
DSY-SD-C29-0012	N	43818	620	J	6430	J	470	J	209	J
DSY-SD-G01-0012	N	40000	210		4280	J	22.6	U	368	J
DSY-SD-G25-0012	Y	40000	0		0		0		0	
DSY-SD-G29-0018	Y	43574	0		0		0		0	
DSY-SD-J24-0012	Y	10000	0		0		0		0	
DSY-SD-J30-0012	Y	11630	0		0		0		0	
DSY-SD-K05-0012	Y	40000	0		0		0		0	
DSY-SD-K13-0012	Y	40000	0		0		0		0	
DSY-SD-L24-0012	Y	10000	0		0		0		0	
DSY-SD-L26-0012	N	10000	670	J	8580	J	1800	J	324	J
DSY-SD-L28-0012	Y	10000	0		0		0		0	
DSY-SD-L30-0012	N	11586	930	J	11500	J	270		65.2	J
DSY-SD-T25-0012	N	34788	250		2070	J	1500		64.2	
DSY-SD-W24-0012-AVG	Y	10000	0		0		0		0	
DSY-SD-Y26-0012	N	7246	900	J	10800	J	200	J	69.5	
DSY-SD-Y30-0012	Y	11677	0		0		0		0	
		SWACs[3]	460.7		4,024.5		675.0		152.5	

1 - Sample collected during the SSI. The resulting concentration was used to represent the entire cell from which the sample was collected. All surface sediment samples that had a reported exceedance of PRGs are represented in this table.

2 - A "Y" in this column indicates that the 0 to 1 foot interval of that specific cell will be covered, capped, or dredged (depending on the alternative). A "Y" designation results in COC concentrations being replaced with zeros, representing placement of clean backfill.

3 - See Appendix D-7 for a detailed explanation as to how the SWAC calculation was performed.

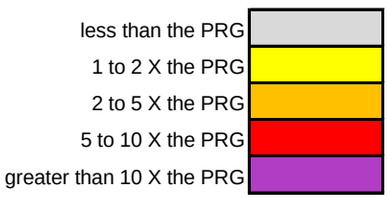

TABLE XX
ALTERNATIVE 4 SWAC CALCULATIONS
SITE 19, DERECKTOR SHIPYARD MARINE SEDIMENT
FEASIBILITY STUDY
NAVSTA NEWPORT, NEWPORT RI

SAMPLE[1]	ACTION[2]	AREA (sf)	BENZO(A) PYRENE (µg/kg)		HMW PAHs (µg/kg)		PCBs (µg/kg)		LEAD (mg/kg)	
DSY-SD-AA30-0012	N	11658	290		5220	J	1880	J	59.8	
DSY-SD-AD13-0012	N	32408	1300		17300		120		109	J
DSY-SD-AD21-0012	N	34800	250		2310	J	110	J	200	J
DSY-SD-AE24-0012	Y	10000	0		0		0		0	
DSY-SD-AT30-0012	N	38193	890		12300		10.3	UJ	35	
DSY-SD-BB26-0012	Y	10028	0		0		0		0	
DSY-SD-BC28-0012	Y	9987	0		0		0		0	
DSY-SD-BC30-0012	Y	9467	0		0		0		0	
DSY-SD-BD26-0012-AVG	Y	12449	0		0		0		0	
DSY-SD-BE28-0012	Y	9950	0		0		0		0	
DSY-SD-BE30-0012	Y	8944	0		0		0		0	
DSY-SD-BG28-0012	N	12334	810	J	9760	J	12.3	U	28.8	J
DSY-SD-BI26-0012	N	14714	580		6450	J	13.4	UJ	39.7	J
DSY-SD-C21-0012	N	40000	160		1670	J	190	J	320	J
DSY-SD-C25-0012	N	40000	840		9250	J	140	J	198	J
DSY-SD-C29-0012	N	43818	620	J	6430	J	470	J	209	J
DSY-SD-G01-0012	N	40000	210		4280	J	22.6	U	368	J
DSY-SD-G25-0012	Y	40000	0		0		0		0	
DSY-SD-G29-0018	Y	43574	0		0		0		0	
DSY-SD-J24-0012	Y	10000	0		0		0		0	
DSY-SD-J30-0012	Y	11630	0		0		0		0	
DSY-SD-K05-0012	Y	40000	0		0		0		0	
DSY-SD-K13-0012	Y	40000	0		0		0		0	
DSY-SD-L24-0012	Y	10000	0		0		0		0	
DSY-SD-L26-0012	N	10000	670	J	8580	J	1800	J	324	J
DSY-SD-L28-0012	Y	10000	0		0		0		0	
DSY-SD-L30-0012	Y	11586	0		0		0		0	
DSY-SD-T25-0012	N	34788	250		2070	J	1500		64.2	
DSY-SD-W24-0012-AVG	Y	10000	0		0		0		0	
DSY-SD-Y26-0012	Y	7246	0		0		0		0	
DSY-SD-Y30-0012	Y	11677	0		0		0		0	
		SWACs[3]	417.8		3,111.7		675.0		152.5	

1 - Sample collected during the SSI. The resulting concentration was used to represent the entire cell from which the sample was collected. All surface sediment samples that had a reported exceedance of PRGs are represented in this table.

2 - A "Y" in this column indicates that the 0 to 1 foot interval of that specific cell will be covered, capped, or dredged (depending on the alternative). A "Y" designation results in COC concentrations being replaced with zeros, representing placement of clean backfill.

3 - See Appendix D-7 for a detailed explanation as to how the SWAC calculation was performed.

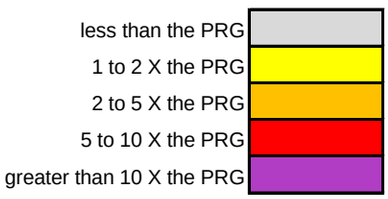

TABLE XX
ALTERNATIVE 5 SWAC CALCULATIONS
SITE 19, DERECKTOR SHIPYARD MARINE SEDIMENT
FEASIBILITY STUDY
NAVSTA NEWPORT, NEWPORT RI

SAMPLE[1]	ACTION[2]	AREA (sf)	BENZO(A) PYRENE (µg/kg)		HMW PAHs (µg/kg)		PCBs (µg/kg)		LEAD (mg/kg)	
DSY-SD-AA30-0012	N	11658	290		5220	J	1880	J	59.8	
DSY-SD-AD13-0012	N	32408	1300		17300		120		109	J
DSY-SD-AD21-0012	N	34800	250		2310	J	110	J	200	J
DSY-SD-AE24-0012	Y	10000	0		0		0		0	
DSY-SD-AT30-0012	N	38193	890		12300		10.3	UJ	35	
DSY-SD-BB26-0012	Y	10028	0		0		0		0	
DSY-SD-BC28-0012	N	9987	790	J	9660	J	13.3	UJ	67.5	
DSY-SD-BC30-0012	Y	9467	0		0		0		0	
DSY-SD-BD26-0012-AVG	Y	12449	0		0		0		0	
DSY-SD-BE28-0012	Y	9950	0		0		0		0	
DSY-SD-BE30-0012	Y	8944	0		0		0		0	
DSY-SD-BG28-0012	N	12334	810	J	9760	J	12.3	U	28.8	J
DSY-SD-BI26-0012	N	14714	580		6450	J	13.4	UJ	39.7	J
DSY-SD-C21-0012	N	40000	160		1670	J	190	J	320	J
DSY-SD-C25-0012	N	40000	840		9250	J	140	J	198	J
DSY-SD-C29-0012	N	43818	620	J	6430	J	470	J	209	J
DSY-SD-G01-0012	N	40000	210		4280	J	22.6	U	368	J
DSY-SD-G25-0012	Y	40000	0		0		0		0	
DSY-SD-G29-0018	N	43574	1600	J	17300	J	480	J	98.2	
DSY-SD-J24-0012	Y	10000	0		0		0		0	
DSY-SD-J30-0012	Y	11630	0		0		0		0	
DSY-SD-K05-0012	Y	40000	0		0		0		0	
DSY-SD-K13-0012	Y	40000	0		0		0		0	
DSY-SD-L24-0012	Y	10000	0		0		0		0	
DSY-SD-L26-0012	N	10000	670	J	8580	J	1800	J	324	J
DSY-SD-L28-0012	Y	10000	0		0		0		0	
DSY-SD-L30-0012	N	11586	930	J	11500	J	270		65.2	J
DSY-SD-T25-0012	N	34788	250		2070	J	1500		64.2	
DSY-SD-W24-0012-AVG	Y	10000	0		0		0		0	
DSY-SD-Y26-0012	N	7246	900	J	10800	J	200	J	69.5	
DSY-SD-Y30-0012	Y	11677	0		0		0		0	
		SWACs[3]	662.4		7,295.5		675.0		152.5	

1 - Sample collected during the SSI. The resulting concentration was used to represent the entire cell from which the sample was collected. All surface sediment samples that had a reported exceedance of PRGs are represented in this table.

2 - A "Y" in this column indicates that the 0 to 1 foot interval of that specific cell will be covered, capped, or dredged (depending on the alternative). A "Y" designation results in COC concentrations being replaced with zeros, representing placement of clean backfill.

3 - See Appendix D-7 for a detailed explanation as to how the SWAC calculation was performed.

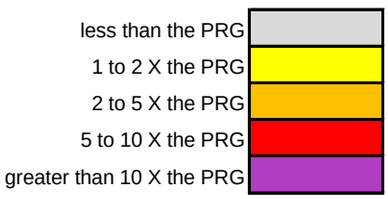

TABLE XX
ALTERNATIVE 4 VWAC CALCULATIONS
SITE 19, DERECKTOR SHIPYARD MARINE SEDIMENT
FEASIBILITY STUDY
NAVSTA NEWPORT, NEWPORT RHODE ISLAND

					SAMPLE RESULTS[2]									AVERAGE PRISM CONCENTRATIONS[3]			
LOCATION (Cell)[1]	DREDGE/ BACKFILL	CAP/ COVER[5]	AREA (sf)	VOLUME (cy)	BENZO(A) PYRENE (µg/kg)		HMW PAHs (µg/kg)		PCBs (µg/kg)		LEAD (mg/kg)		BLOCK VOLUME (CY)	BENZO(A) PYRENE (µg/kg)	HMW PAHs (µg/kg)	PCBs (µg/kg)	LEAD (mg/kg)
DSY-SD-AA05-0012	N	N	32342	1,197.9	170		1340	J	13	UJ	56		4,791.4	920	17188	91	83
DSY-SD-AA05-1224	N		32342	1,197.9	310		4210	J	11	UJ	55						
DSY-SD-AA05-2448	N		32342	2,395.7	1600		31600	J	170	J	111						
DSY-SD-AB11-0012	N	N	10000	370.4	160		2960	J	9	U	58	J	1,481.5	755	22520	8	106
DSY-SD-AB11-1224	N		10000	370.4	260		5120	J	11	U	88	J					
DSY-SD-AB11-2448	N		10000	740.7	1300	J	41000	J	7	U	139	J					
DSY-SD-AB15-0012	N	N	10000	370.4	220		3960	J	10	UJ	166	J	1,481.5	330	6178	54	204
DSY-SD-AB15-1224	N		10000	370.4	200	J	2810	J	10	UJ	90	J					
DSY-SD-AB15-2448	N		10000	740.7	450		8970	J	97		281	J					
DSY-SD-AC26-0012	N	N	10000	370.4	180		1740	J	170		114		1,481.5	164	1776	379	192
DSY-SD-AC26-1224	N		10000	370.4	370		4730	J	1100	J	473						
DSY-SD-AC26-2448	N		10000	740.7	52	J	317	J	122	J	91						
DSY-SD-AC28-0012	N	N	10000	370.4	230	J	2790	J	65	J	75		1,481.5	935	14448	536	183
DSY-SD-AC28-1224	N		10000	370.4	310		8600	J	460	J	103						
DSY-SD-AC28-2448	N		10000	740.7	1600	J	23200	J	810	J	276						
DSY-SD-AC30-0012	N	N	11642	431.2	80	J	80	J	12	U	63	J	1,724.7	385	5738	1346	436
DSY-SD-AC30-2448	N		11642	431.2	520		7910	J	170		104	J					
DSY-SD-AC30-2448	N		11642	862.4	470		7480	J	2600		788	J					
DSY-SD-AD09-0012	N	N	33663	1,246.8	56		296	J	10	U	36	J	4,987.1	112	1272	160	242
DSY-SD-AD09-1224	N		33663	1,246.8	110		690	J	10	U	60	J					
DSY-SD-AD09-2448	N		33663	2,493.6	140		2050	J	310		437	J					
DSY-SD-AE24-0012	Y	N	10000	370.4	0		0		0		0		1,481.5	56	423	43	52
DSY-SD-AE24-1224	N		10000	370.4	190		1660	J	160	J	198						
DSY-SD-AE24-2448	N		10000	740.7	16	J	16	J	6	UJ	5						
DSY-SD-AE26-0012	N	N	10000	370.4	100		430	J	13	U	48		1,481.5	450	4650	701	177
DSY-SD-AE26-1224	N		10000	370.4	240		2130	J	11	U	68						
DSY-SD-AE26-2448	N		10000	740.7	730	J	8020	J	1390	J	296						
DSY-SD-BB26-0012	Y	N	10028	371.4	0		0		0		0		1,485.6	150	2015	3	38
DSY-SD-BB26-1224	Y		10028	371.4	0		0		0		0						
DSY-SD-BB26-2448	N		10028	742.8	300		4030	J	7	UJ	75						
DSY-SD-BC30-0012	Y	N	9467	350.6	0		0		0		0		1,402.5	345	4380	3	13
DSY-SD-BC30-1224	Y		9467	350.6	0		0		0		0						
DSY-SD-BC30-2448	N		9467	701.3	690	J	8760	J	6	UJ	25						
DSY-SD-BD26-0012-AVG	Y	N	12449	461.1	0		0		0		0		1,844.3	60	765	3	6
DSY-SD-BD26-1224	Y		12449	461.1	0		0		0		0						

TABLE XX
ALTERNATIVE 4 VWAC CALCULATIONS
SITE 19, DERECKTOR SHIPYARD MARINE SEDIMENT
FEASIBILITY STUDY
NAVSTA NEWPORT, NEWPORT RHODE ISLAND

					SAMPLE RESULTS[2]									AVERAGE PRISM CONCENTRATIONS[3]			
LOCATION (Cell)[1]	DREDGE/ BACKFILL	CAP/ COVER[5]	AREA (sf)	VOLUME (cy)	BENZO(A) PYRENE (µg/kg)		HMW PAHs (µg/kg)		PCBs (µg/kg)		LEAD (mg/kg)		BLOCK VOLUME (CY)	BENZO(A) PYRENE (µg/kg)	HMW PAHs (µg/kg)	PCBs (µg/kg)	LEAD (mg/kg)
DSY-SD-BD26-2448	N		12449	922.1	120		1530	J	6	UJ	11						
DSY-SD-BE28-0012	Y	N	9950	368.5	0		0		0		0		737.0	0	0	0	0
DSY-SD-BE28-1224	Y		9950	368.5	0		0		0		0						
DSY-SD-BE30-0012	Y	N	8944	331.3	0		0		0		0		1,325.0	125	1810	3	5
DSY-SD-BE30-1224	Y		8944	331.3	0		0		0		0						
DSY-SD-BE30-2448	N		8944	662.5	250		3620	J	6	UJ	10	J					
DSY-SD-C29-0012	N	N	43818	1,622.9	620	J	6430	J	470	J	209	J	6,491.6	335	3147	285	248
DSY-SD-C29-1224	N		43818	1,622.9	550		5330	J	550	J	759	J					
DSY-SD-C29-2448	N		43818	3,245.8	84	J	414	J	59	J	12	J					
DSY-SD-G25-0012	N	Y	40000	1,481.5	1200		15000	J	11	UJ	50	J	5,925.9	1520	18920	112	135
DSY-SD-G25-1224	N		40000	1,481.5	2200		26800	J	170	J	199	J					
DSY-SD-G25-2448	N		40000	2,963.0	2100		26400	J	190	J	212	J					
DSY-SD-G29-0018	N	Y	43574	2,420.8	1600	J	17300	J	480	J	98		2,420.8	800	8650	240	49
DSY-SD-J24-0012	Y	N	10000	370.4	0		0		0		0		740.7	29	429	200	305
DSY-SD-J24-1224	N		10000	370.4	57		857	J	400	J	610	J					
DSY-SD-J30-0012	Y	N	11630	430.7	0		0		0		0		1,723.0	265	5225	113	67
DSY-SD-J30-1224	N		11630	430.7	580	J	12400	J	130	J	81	J					
DSY-SD-J30-2448	N		11630	861.5	240	J	4250	J	160	J	94	J					
DSY-SD-K05-0012	Y	N	40000	1,481.5	0		0		0		0		5,925.9	5	107	4	4
DSY-SD-K05-1224	N		40000	1,481.5	6	UJ	140	UJ	6	U	5						
DSY-SD-K05-2448	N		40000	2,963.0	7	UJ	145	UJ	5	UJ	4						
DSY-SD-K13-0012	Y	N	40000	1,481.5	0		0		0		0		5,925.9	13	157	19	45
DSY-SD-K13-1224	N		40000	1,481.5	37	J	337	J	66	J	168						
DSY-SD-K13-2448	N		40000	2,963.0	7	UJ	145	UJ	5	UJ	5						
DSY-SD-L24-0012	Y	N	10000	370.4	0		0		0		0		1,481.5	21	2290	3	10
DSY-SD-L24-1224	Y		10000	370.4	0		0		0		0						
DSY-SD-L24-2448	N		10000	740.7	41		4580	J	6	U	21	J					
DSY-SD-L28-0012	Y	N	10000	370.4	0		0		0		0		1,481.5	27	124	45	27
DSY-SD-L28-1224	N		10000	370.4	74		458	J	115		86	J					
DSY-SD-L28-2448	N		10000	740.7	18	J	18	J	32		10	J					
DSY-SD-N24-0012	N	N	10000	370.4	290	J	2310	J	192	J	53	J	1,481.5	212	2360	361	451
DSY-SD-N24-1224	N		10000	370.4	500		6880	J	990	J	67	J					
DSY-SD-N24-2448-AVG	N		10000	740.7	30	J	124	J	130	J	842	J					
DSY-SD-N28-0012	N	N	10000	370.4	68	J	748	J	100		71	J	1,481.5	227	2377	650	274
DSY-SD-N28-1224	N		10000	370.4	710	J	7790	J	960		246	J					

TABLE XX
ALTERNATIVE 4 VWAC CALCULATIONS
SITE 19, DERECKTOR SHIPYARD MARINE SEDIMENT
FEASIBILITY STUDY
NAVSTA NEWPORT, NEWPORT RHODE ISLAND

					SAMPLE RESULTS[2]									AVERAGE PRISM CONCENTRATIONS[3]			
LOCATION (Cell)[1]	DREDGE/ BACKFILL	CAP/ COVER[5]	AREA (sf)	VOLUME (cy)	BENZO(A) PYRENE (µg/kg)		HMW PAHs (µg/kg)		PCBs (µg/kg)		LEAD (mg/kg)		BLOCK VOLUME (CY)	BENZO(A) PYRENE (µg/kg)	HMW PAHs (µg/kg)	PCBs (µg/kg)	LEAD (mg/kg)
DSY-SD-N28-2448	N		10000	740.7	64	J	484	J	770	J	390	J					
DSY-SD-W24-0012-AVG	Y	N	10000	370.4	0		0		0		0		1,481.5	44	474	285	147
DSY-SD-W24-1224	N		10000	370.4	150		1870	J	1130		577						
DSY-SD-W24-2448	N		10000	740.7	13	J	13	J	6	UJ	5						
DSY-SD-Y25-0012	N	N	6020	223.0	520		10200	J	190	J	165		891.9	593	11380	348	295
DSY-SD-Y25-1224	N		6020	223.0	1600	J	31100	J	1000	J	918						
DSY-SD-Y25-2448	N		6020	445.9	126		2110	J	100	J	49						
DSY-SD-Y26-0012	Y	N	7246	268.4	0		0		0		0		1,073.5	485	7050	650	103
DSY-SD-Y26-1224	N		7246	268.4	1200	J	17200	J	1000	J	160						
DSY-SD-Y26-2448	N		7246	536.7	370		5500	J	800		125						
DSY-SD-Y28-0012	N	N	10000	370.4	220		1840	J	190	J	69		1,481.5	745	12135	348	93
DSY-SD-Y28-1224	N		10000	370.4	2300	J	39000	J	680	J	199						
DSY-SD-Y28-2448	N		10000	740.7	230		3850	J	260	J	52						
DSY-SD-Y30-0012	Y	N	11677	432.5	0		0		0		0		865.0	325	7500	3	21
DSY-SD-Y30-1224	N		11677	432.5	650	J	15000	J	6	UJ	41						
													VWACs[4]	524.0	13,285.6	266.8	166.0

1 - Sample collected durng the SSI. The resulting concentration was used to represent the entire cell at the specified interval from which the sample was collected.

2 - Sample results presented here with a "U" or "UJ" (non-detect) qualifier are half the reported non-detect value.

3 - A detailed description of the average prism concentration calculation is provided in Appendix D-7.

4 - A detailed description of the VWAC calculation is provided in Appendix D-7.

5 - Capped/Covered cells are not included in the VWAC calculation because they are addressed separately.

less than the PRG	
1 to 2 X the PRG	
2 to 5 X the PRG	
5 to 10 X the PRG	
greater than 10 X the PRG	

TABLE XX
ALTERNATIVE 5 VWAC CALCULATIONS
SITE 19, DERECKTOR SHIPYARD MARINE SEDIMENT
FEASIBILITY STUDY
NAVSTA NEWPORT, NEWPORT RHODE ISLAND

						SAMPLE RESULTS[2]									AVERAGE PRISM CONCENTRATIONS[3]			
LOCATION (Cell)[1]	DREDGE/ BACKFILL	CAP/ COVER	INTERVAL	AREA (sf)	VOLUME (cy)	BENZO(A) PYRENE (µg/kg)		HMW PAHs (µg/kg)		PCBs (µg/kg)		LEAD (mg/kg)		BLOCK VOLUME (CY)	BENZO(A) PYRENE (µg/kg)	HMW PAHs (µg/kg)	PCBs (µg/kg)	LEAD (mg/kg)
DSY-SD-AA05-0012	N	N	top	32342	1,197.9	170		1340	J	13	UJ	56		4,791.4	920	17188	91	83
DSY-SD-AA05-1224	N		middle	32342	1,197.9	310		4210	J	11	UJ	55						
DSY-SD-AA05-2448	N		bottom	32342	2,395.7	1600		31600	J	170	J	111						
DSY-SD-AB11-0012	N	N	top	10000	370.4	160		2960	J	9	U	58	J	1,481.5	755	22520	8	106
DSY-SD-AB11-1224	N		middle	10000	370.4	260		5120	J	11	U	88	J					
DSY-SD-AB11-2448	N		bottom	10000	740.7	1300	J	41000	J	7	U	139	J					
DSY-SD-AB15-0012	N	N	top	10000	370.4	220		3960	J	10	UJ	166	J	1,481.5	330	6178	54	204
DSY-SD-AB15-1224	N		middle	10000	370.4	200	J	2810	J	10	UJ	90	J					
DSY-SD-AB15-2448	N		bottom	10000	740.7	450		8970	J	97		281	J					
DSY-SD-AC26-0012	N	N	top	10000	370.4	180		1740	J	170		114		1,481.5	164	1776	379	192
DSY-SD-AC26-1224	N		middle	10000	370.4	370		4730	J	1100	J	473						
DSY-SD-AC26-2448	N		bottom	10000	740.7	52	J	317	J	122	J	91						
DSY-SD-AC28-0012	N	N	top	10000	370.4	230	J	2790	J	65	J	75		1,481.5	935	14448	536	183
DSY-SD-AC28-1224	N		middle	10000	370.4	310		8600	J	460	J	103						
DSY-SD-AC28-2448	N		bottom	10000	740.7	1600	J	23200	J	810	J	276						
DSY-SD-AC30-0012	N	N	top	11642	431.2	80	J	80	J	12	U	63	J	1,724.7	385	5738	1346	436
DSY-SD-AC30-1224	N		middle	11642	431.2	520		7910	J	170		104	J					
DSY-SD-AC30-2448	N		bottom	11642	862.4	470		7480	J	2600		788	J					
DSY-SD-AD09-0012	N	N	top	33663	1,246.8	56		296	J	10	U	36	J	4,987.1	112	1272	160	242
DSY-SD-AD09-1224	N		middle	33663	1,246.8	110		690	J	10	U	60	J					
DSY-SD-AD09-2448	N		bottom	33663	2,493.6	140		2050	J	310		437	J					
DSY-SD-AE24-0012	Y	N	top	10000	370.4	0		0		0		0		1,481.5	56	423	43	52
DSY-SD-AE24-1224	N		middle	10000	370.4	190		1660	J	160	J	198						
DSY-SD-AE24-2448	N		bottom	10000	740.7	16	J	16	J	6	UJ	5						
DSY-SD-AE26-0012	N	N	top	10000	370.4	100		430	J	13	U	48		1,481.5	450	4650	701	177
DSY-SD-AE26-1224	N		middle	10000	370.4	240		2130	J	11	U	68						
DSY-SD-AE26-2448	N		bottom	10000	740.7	730	J	8020	J	1390	J	296						
DSY-SD-BB26-0012	Y	N	top	10028	371.4	0		0		0		0		1,485.6	150	2015	3	38
DSY-SD-BB26-1224	Y		middle	10028	371.4	0		0		0		0						
DSY-SD-BB26-2448	N		bottom	10028	742.8	300		4030	J	7	UJ	75						
DSY-SD-BC30-0012	Y	N	top	9467	350.6	0		0		0		0		1,402.5	345	4380	3	13
DSY-SD-BC30-1224	Y		middle	9467	350.6	0		0		0		0						
DSY-SD-BC30-2448	N		bottom	9467	701.3	690	J	8760	J	6	UJ	25						
DSY-SD-BD26-0012-AVG	Y	N	top	12449	461.1	0		0		0		0		1,844.3	335	4090	5	18
DSY-SD-BD26-1224	N		middle	12449	461.1	1100	J	13300	J	7	UJ	51						
DSY-SD-BD26-2448	N		bottom	12449	922.1	120		1530	J	6	UJ	11						
DSY-SD-BE28-0012	Y	N	top	9950	368.5	0		0		0		0		737.0	470	5800	3	25

TABLE XX
ALTERNATIVE 5 VWAC CALCULATIONS
SITE 19, DERECKTOR SHIPYARD MARINE SEDIMENT
FEASIBILITY STUDY
NAVSTA NEWPORT, NEWPORT RHODE ISLAND

						SAMPLE RESULTS[2]									AVERAGE PRISM CONCENTRATIONS[3]			
LOCATION (Cell)[1]	DREDGE/ BACKFILL	CAP/ COVER	INTERVAL	AREA (sf)	VOLUME (cy)	BENZO(A) PYRENE (µg/kg)		HMW PAHs (µg/kg)		PCBs (µg/kg)		LEAD (mg/kg)		BLOCK VOLUME (CY)	BENZO(A) PYRENE (µg/kg)	HMW PAHs (µg/kg)	PCBs (µg/kg)	LEAD (mg/kg)
DSY-SD-BE28-1224	N	N	middle	9950	368.5	940	J	11600	J	6	UJ	51	J	737.0	470	3800	3	23
DSY-SD-BE30-0012	Y	N	top	8944	331.3	0		0		0		0		1,325.0	125	1810	3	5
DSY-SD-BE30-1224	Y		middle	8944	331.3	0		0		0		0						
DSY-SD-BE30-2448	N		bottom	8944	662.5	250		3620	J	6	UJ	10	J					
DSY-SD-C29-0012	N	N	top	43818	1,622.9	620	J	6430	J	470	J	209	J	6,491.6	335	3147	285	248
DSY-SD-C29-1224	N		middle	43818	1,622.9	550		5330	J	550	J	759	J					
DSY-SD-C29-2448	N		bottom	43818	3,245.8	84	J	414	J	59	J	12	J					
DSY-SD-G25-0012	Y	N	top	40000	1,481.5	0		0		0		0		5,925.9	0	0	0	0
DSY-SD-G25-1224	Y		middle	40000	1,481.5	0		0		0		0						
DSY-SD-G25-2448	Y		bottom	40000	2,963.0	0		0		0		0						
DSY-SD-G29-0018	N	N	top	43574	2,420.8	1600	J	17300	J	480	J	98		2,420.8	1600	17300	480	98
DSY-SD-J24-0012	Y	N	top	10000	370.4	0		0		0		0		740.7	29	429	200	305
DSY-SD-J24-1224	N		middle	10000	370.4	57		857	J	400	J	610	J					
DSY-SD-J30-0012	Y	N	top	11630	430.7	0		0		0		0		1,723.0	265	5225	113	67
DSY-SD-J30-1224	N		middle	11630	430.7	580	J	12400	J	130	J	81	J					
DSY-SD-J30-2448	N		bottom	11630	861.5	240	J	4250	J	160	J	94	J					
DSY-SD-K05-0012	Y	N	top	40000	1,481.5	0		0		0		0		5,925.9	5	107	4	4
DSY-SD-K05-1224	N		middle	40000	1,481.5	6	UJ	140	UJ	6	U	5						
DSY-SD-K05-2448	N		bottom	40000	2,963.0	7	UJ	145	UJ	5	UJ	4						
DSY-SD-K13-0012	Y	N	top	40000	1,481.5	0		0		0		0		5,925.9	13	157	19	45
DSY-SD-K13-1224	N		middle	40000	1,481.5	37	J	337	J	66	J	168						
DSY-SD-K13-2448	N		bottom	40000	2,963.0	7	UJ	145	UJ	5	UJ	5						
DSY-SD-L24-0012	Y	N	top	10000	370.4	0		0		0		0		1,481.5	23	3615	693	146
DSY-SD-L24-1224	N		middle	10000	370.4	10	UJ	5300	J	2760		543	J					
DSY-SD-L24-2448	N		bottom	10000	740.7	41		4580	J	6	U	21	J					
DSY-SD-L28-0012	Y	N	top	10000	370.4	0		0		0		0		1,481.5	27	124	45	27
DSY-SD-L28-1224	N		middle	10000	370.4	74		458	J	115		86	J					
DSY-SD-L28-2448	N		bottom	10000	740.7	18	J	18	J	32		10	J					
DSY-SD-N24-0012	N	N	top	10000	370.4	290	J	2310	J	192	J	53	J	1,481.5	212	2360	361	451
DSY-SD-N24-1224	N		middle	10000	370.4	500		6880	J	990	J	67	J					
DSY-SD-N24-2448-AVG	N		bottom	10000	740.7	30	J	124	J	130	J	842	J					
DSY-SD-N28-0012	N	N	top	10000	370.4	68	J	748	J	100		71	J	1,481.5	227	2377	650	274
DSY-SD-N28-1224	N		middle	10000	370.4	710	J	7790	J	960		246	J					
DSY-SD-N28-2448	N		bottom	10000	740.7	64	J	484	J	770	J	390	J					
DSY-SD-W24-0012-AVG	Y	N	top	10000	370.4	0		0		0		0		1,481.5	44	474	285	147
DSY-SD-W24-1224	N		middle	10000	370.4	150		1870	J	1130		577						
DSY-SD-W24-2448	N		bottom	10000	740.7	13	J	13	J	6	UJ	5						

TABLE XX
ALTERNATIVE 5 VWAC CALCULATIONS
SITE 19, DERECKTOR SHIPYARD MARINE SEDIMENT
FEASIBILITY STUDY
NAVSTA NEWPORT, NEWPORT RHODE ISLAND

						SAMPLE RESULTS[2]									AVERAGE PRISM CONCENTRATIONS[3]			
LOCATION (Cell)[1]	DREDGE/ BACKFILL	CAP/ COVER	INTERVAL	AREA (sf)	VOLUME (cy)	BENZO(A) PYRENE (µg/kg)		HMW PAHs (µg/kg)		PCBs (µg/kg)		LEAD (mg/kg)		BLOCK VOLUME (CY)	BENZO(A) PYRENE (µg/kg)	HMW PAHs (µg/kg)	PCBs (µg/kg)	LEAD (mg/kg)
DSY-SD-Y25-0012	N	N	top	6020	223.0	520		10200	J	190	J	165		891.9	593	11380	348	295
DSY-SD-Y25-1224	N		middle	6020	223.0	1600	J	31100	J	1000	J	918						
DSY-SD-Y25-2448	N		bottom	6020	445.9	126		2110	J	100	J	49						
DSY-SD-Y26-0012	N	N	top	7246	268.4	900	J	10800	J	200	J	70		1,073.5	710	9750	700	120
DSY-SD-Y26-1224	N		middle	7246	268.4	1200	J	17200	J	1000	J	160						
DSY-SD-Y26-2448	N		bottom	7246	536.7	370		5500	J	800		125						
DSY-SD-Y28-0012	N	N	top	10000	370.4	220		1840	J	190	J	69		1,481.5	745	12135	348	93
DSY-SD-Y28-1224	N		middle	10000	370.4	2300	J	39000	J	680	J	199						
DSY-SD-Y28-2448	N		bottom	10000	740.7	230		3850	J	260	J	52						
DSY-SD-Y30-0012	Y	N	top	11677	432.5	0		0		0		0		865.0	0	0	0	0
DSY-SD-Y30-1224	Y		middle	11677	432.5	0		0		0		0						
													N		534.8	9,513.3	378.7	149.5

1 - Sample collected durng the SSI. The resulting concentration was used to represent the entire cell at the specified interval from which the sample was collected.

2 - Sample results presented here with a "U" or "UJ" (non-detect) qualifier are half the reported non-detect value.

3 - A detailed description of the average prism concentration calculation is provided in Appendix D-7.

4 - A detailed description of the VWAC calculation is provided in Appendix D-7.

less than the PRG	
1 to 2 X the PRG	
2 to 5 X the PRG	
5 to 10 X the PRG	
greater than 10 X the PRG	