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LETTER AND U S EPA REGION I COMMENTS ON DRAFT SUPPLEMENTAL SEDIMENT INVESTIGATION REPORT SITE 19 FORMER DERECKTOR SHIPYARD NS NEWPORT RI
5/23/2012
U S EPA REGION I

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, REGION I
5 Post Office Square, Suite 100
Boston, MA 02109-3912

May 23, 2012

Winoma Johnson, P.E.
NAVFAC MIDLANT (Code OPNEEV)
Environmental Restoration
Building Z-144, Room 109
9742 Maryland Avenue
Norfolk, VA 23511-3095

Re: Technical Review Comments on Draft Supplemental Sediment Investigation Report Installation Restoration Site 19 - Former Derecktor Shipyard

Dear Ms. Johnson:

Thank you for the opportunity to review the *Draft Supplemental Sediment Investigation Report for Installation Restoration Site 19 - Former Derecktor Shipyard* dated April 2012. The document presents sediment data and investigation of the physical characteristics to support the development of remedial alternatives for a revised feasibility study for the site. The sediment stability analysis described in this report is technically flawed for the following three significant reasons:

- The stability analysis only used velocities measured during the low energy conditions that occurred at Derecktor Shipyard during a 17-day period in early September 2011,
- Ship-induced resuspension of contaminated sediment that likely occurs fairly regularly was not analyzed, and
- Sediment resuspension and subsequent transport during a high energy event such as a Nor'easter or tropical storm was not analyzed.

These three reasons lead EPA to conclude that the findings from the sediment stability analysis are not technically defensible. Other problems with the reported sediment stability analysis are identified in Attachment A. For the reasons stated herein, the findings from the reported sediment stability analysis are not technically defensible, and therefore cannot be approved by EPA for use during the FS in the selection and design of potential remedial measures at this site.

Although Derecktor ceased operations at the site several years ago, significant contamination remains in surface sediment. EPA therefore believes that the contention that deposition is an effective remedial action at Derecktor Shipyard remains questionable. While shore-related contamination discharged through the storm sewers may be a recent or continuing source for the near-shore contaminated areas, it is not likely a significant source for the pier-related areas more distant from the shore where significant surface sediment contamination is present.

The deposition rates estimated from the data collected suggest that in many locations it would require 50 to 200 years to accumulate a six-inch cover over existing contamination to make the existing surface sediment generally inaccessible to benthic organisms. However, an even greater clean sediment cover may be needed to be protective of other fauna, including burrowing organisms. Ship traffic was not

considered in these estimates, so given the use of the site as an active shipyard, the deposition rates presented in the report are highly uncertain and should not be relied upon to evaluate compliance with EPA's long-term protectiveness and permanence criterion [40 C.F.R. §300.430(e)(9)(iii)(C)].

Given the exceedances detected, the extent of contamination should be better characterized with a pre-design investigation. In particular, the areas requiring further characterization include the western end of Pier 2 extending to the western end of Pier 1; north of the eastern end of Pier 2 beyond the most recent sample locations; and south of the most recent sampling locations south of the middle of Pier 1. In addition, because only a limited number of samples were analyzed for copper and zinc (and based on the significant concentrations detected for zinc surrounding the two piers), the pre-design investigation will need to complete the characterization for these metals as well. Specifically, sampling for copper and zinc should be conducted between the two piers, north of the eastern end of Pier 2, and south of the most recent sampling locations south of Pier 1.

The conclusions from the wave and current monitoring study characterize steady state site conditions over a limited time period and therefore the results of this study have specific, but limited applicability. Non-steady state conditions that are a result of storm surge, high winds, and large waves will likely have significant impacts on sediment mobility that cannot be predicted by the results of this study. The Navy should use available data to supplement this investigation with an analysis of sediment mobility under non-steady state conditions if it intends to evaluate any remedial alternatives that will leave contamination in place. EPA notes that the aircraft carrier, Saratoga, remains at Pier 1 and is slated to be removed within the next six to eighteen months. EPA is also aware of the Navy's plans to 1) demolish Pier 1 and possibly Pier 2, 2) homeport additional Coast Guard Cutters between Piers 1 and 2, and 3) possibly homeport the JFK aircraft carrier. As stated in EPA's letter to you dated July 16, 2010, it is unreasonable to expect an absence of ship traffic and prop scour in areas under and adjacent to the piers. Virtually no information is provided regarding ship traffic and prop scour induced sediment resuspension and subsequent exposure of buried contaminated sediments. EPA notes that the *Report on ^{210}Pb Accumulation Rates of Sediment Cores from Derecktor Shipyard Offshore* (Allison, 2012) concludes that sites under large ship anchorages display a variable accumulation/resuspension rate likely owing to the combination of human influences on sedimentation rates.

Please provide a qualitative assessment of the weight of evidence of asbestos at the site. The flow diagram from EPA 2008 Asbestos Framework (OSWER Directive #9200.0-68)
http://epa.gov/superfund/health/contaminants/asbestos/pdfs/framework_asbestos_guidance.pdf
should be followed to assess exposure to asbestos from the steam pipe under Pier 1. Since a main concern with asbestos is inhalation of the fibers, an evaluation of asbestos-containing materials transported to shore, dried, and becoming friable should be performed.

The *Preliminary Remediation Goals (PRGs) for Derecktor Shipyard/Coddington Cove* (November 1998) states (p. 3, §2.0): *"Implementing aquatic PRGs for a few CoCs exhibiting the maximum observed exceedances of PRG concentrations would be assumed to be protective of all co-located CoCs contributing to risk in the aquatic exposure pathway. The ability to draw such conclusions is critical to the derivation of 'Limiting' PRGs as described throughout Section 2.0."* Consequently, in the absence of the co-location of CoCs, the Navy must address the risk from individual CoC concentrations that result in excess risk when such CoCs were not selected as limiting CoCs. The results of the latest sampling at the site indicate that there are locations where the concentrations of copper and zinc are not co-located with limiting CoCs but where such concentrations exceed the baseline PRGs (BPRGs) and in many cases, that exceedance is significant. These locations must be addressed when establishing the scope of the remedial actions required.

As indicated in EPA's comments on earlier Derecktor Shipyard documents, the Navy needs to evaluate the storm water discharges to Coddington Cove as potential on-going sources of COCs that could recontaminate any remedy selected for the site. Since the report identifies new areas with elevated COCs in the surface sediment (page 5-3), it is clear that there are either new sources of contaminants to the area or that existing contamination is mobile.

While EPA recognizes that the Navy's plans are subject to frequent changes, it is important to identify the development plans for Derecktor Shipyard including the fate of the existing piers as this will significantly impact the evaluation of remedies in the feasibility study.

As EPA, RIDEM, and the Navy discussed on October 27, 2010, the data collected as part of the *Supplemental Sediment Investigation Report* were intended to further delineate and refine the boundaries of areas within Coddington Cove slated for removal. EPA continues to believe that removal should be the primary component to the remedial action for Derecktor Shipyard. EPA is concerned that the Navy continues to pursue monitored natural recovery (MNR) as a remedy for the site despite EPA's objections. Further, the Navy has disregarded the numerous data gaps identified by EPA to determine whether MNR is occurring. Attachment B to this letter provides EPA's evaluation of monitored natural recovery processes at Derecktor Shipyard

As discussed on May 16, 2012, it was EPA's understanding that this report was solely intended to be a data report. The draft report presents conclusions drawn from the data that are contrary to EPA's interpretations of the same data. The Navy has the option to either 1) resolve the concerns raised herein through responses, meetings, and revisions to the report or 2) include these comments as an appendix to the report documenting EPA's disagreement with the conclusions presented.

I look forward to working with you and the Rhode Island Department of Environmental Management to select a final remedy for Derecktor Shipyard. Please do not hesitate to contact me at (617) 918-1385 should you have any questions.

Sincerely,

Kymberlee Keckler, Remedial Project Manager
Federal Facilities Superfund Section

Attachments

cc: Pam Crump, RIDEM, Providence, RI
Darlene Ward, NETC, Newport, RI
Bart Hoskins, USEPA, Boston, MA
Ken Finkelstein, NOAA, Boston, MA
Steven Parker, Tetra Tech-NUS, Wilmington, MA

ATTACHMENT A

Page	Comment
p. E-3, §E.3	As discussed on October 27, 2010, EPA believes that copper and zinc should be analyzed in addition to PAHs, benzo(a)pyrene, PCBs, and lead when evaluating remedial alternatives for the site. While much of the aerial impact is associated with these COCs, the latest sampling has identified areas with copper and significant zinc contamination that is not co-located with the four PRGs and the sampling has not identified the full extent of the copper and zinc contamination.
p. E-4, §E.5	a) The first conclusion is hedged by stating "*under steady state conditions.*" Steady state conditions do not exist at Derecktor Shipyard. In fact, some of the Navy's actions (*e.g.*, moving aircraft carriers, removing piers) will cause unsteady conditions at the site. High bed shear stresses caused by the movement of large ships will likely result in resuspension of the bedded sediment. The investigation has not adequately accounted for non-steady state conditions that will have a significant impact on the site sediment. In particular, storms will provide disruptive forces that are expected to mobilize surface sediment and ship and tug traffic can also potentially mobilize sediment especially closer to shore. These forces need to be evaluated in detail for any alternatives that propose to leave contaminated sediment in place. b) The second conclusion references contaminated sediment in the 24-48-inch depth interval south of the center of Pier 1 that has been buried, suggesting that this supports the Navy's conceptual model that the site is depositional. There are areas with contamination at depth without overlying contaminated sediment that are located beneath the two aircraft carriers and Pier 1. These artificial depositional areas will no longer exist when the ships are moved and when Pier 1 is razed. EPA further notes that at Pier 2, large areas of surface sediment are present at the center and western end of the pier without any deep contamination. This suggests that burial may not be a significant process farther from the shore.
p. 2-1, §2.0	If correct, please add a statement to the last paragraph indicating that "other than these field modifications, all requirements of the SAP were satisfied."
p. 2-7, §2.3.2	Describe both types of samplers that were used. Include a table that gives the elevation of each surface water sample above the sediment bed and the total water depth at the times when samples were collected.
p. 3-1, §3-1	Please correct the discussions that refer to dredging depths. The references to depths in feet of elevation should refer to depth below mean lower low water.
p. 3-2, §3.2.1	Please edit depth references to refer to depths as "below MLLW."
p. 3-4, §3.2.3	In general, EPA agrees that "accumulation tends to be higher where there are flow impedances," yet even in this small data base of ten sediment accumulation rates there are some exceptions to the specific statement that stations that are closest to shore have the highest sedimentation rates. For example, Station 10 (also located close to shore) had a rate that was approximately eight times lower than that at

Station 6. Station 2, which is the station farthest from shore, had a rate almost three times higher than at Station 10. Station 1, which is also close to shore, had the lowest sedimentation rate of all 10 stations. These three examples demonstrate that sedimentation rate is affected by more natural and anthropogenic factors than just those listed in this section.

p. 3-5, §3.3.1 — Please include a figure that shows the exact location or portion of Coddington Cove where the higher velocities were measured (*i.e.,* at the mouth of the cove near the end of the breakwater).

p. 3-5, §3.3.1 — The highest sand content given in Table 3-1 is 63.5 percent, and only at two stations was the sand content higher than 40 percent. The third paragraph should be changed to indicate the correct percentages.

p. 3-5, §3.3.1 — It is not apparent why the third paragraph is included because it is not a hydrographic discussion. Please move it to a more appropriate section of the report.

p. 3-6, §3.3.2 — a) Regarding the third full paragraph, the text states that "..few storms occurred during the deployment period…" Please clarify if any significant storms occurred during the ADCP deployment.

b) Regarding the partial paragraph at the bottom of the page, it appears that the ADCP monitoring occurred during a relatively tranquil time that is not representative of non-steady state conditions that occur at the site. Consequently, the conclusions drawn based on the data collected must be recognized as limited in scope. Please draw on other available information regarding conditions at the site to supplement the conclusions regarding wave heights, currents, and wind speeds in order to present a more accurate depiction of the impacts of these parameters on site sediment during non-steady state conditions.

p. 3-6, §3.3.2 — While it is correct that "faster ebb currents are more capable of initiating particle suspension and transport" in an ebb-dominant water body, the text needs to be changed to define what is meant by flushing, and to explain why "ebb-dominant systems typically flush sediment more readily" as opposed to what occurs in flood-dominant systems that have higher flood currents than ebb currents.

p. 3-6, §3.3.2 — The description in the third paragraph regarding current direction and tides needs to be greatly expanded to be of any quantitative use. Figures should be used to describe the tidal circulation in the cove over a tidal cycle. Specifically, figures with velocity vectors that show the different current patterns in the cove at four or more different stages of a tidal cycle would be helpful. Also, a two panel figure that has a time series of measured water surface elevations in the top panel, and a time series of measured surface currents in the bottom panel would be extremely helpful in explaining the tidal circulation.

p. 3-6, §3.3.2 — Quantify what is meant by "low amplitude" in the last paragraph on this page.

p. 3-7, §3.3.2, ¶1 — Were any of the waves measured during the hydrographic investigation either intermediate or shallow water waves? If so, then the bed shear stresses at those

locations at the times when these waves were measured would need to be calculated using the near bottom currents from both tides and waves.

p. 3-7, §3.3.2, ¶2 — Explain what is meant by "steady state" in the first sentence. What time interval was used to calculate the mean flow velocities? Where did the maximum flow velocities occur within the cove and at what position in the water column, and at which stage of the tidal cycle did they occur?

p. 3-7, §3.3.2, ¶3 — Specify the unit of the depth listed in the second column of Table 3-2. The report should state that the r^2 values given for the last three sample locations reveals that no quantitative relationship was found between TSS and ADCP backscatter at these stations.

p. 3-7, §3.4, ¶2 — Change "Ziegler, Lick and Jones" to "Jones and Lick." Also, delete "and deposition velocity" since a Sedflume study does not measure the settling/deposition velocity of suspended sediment.

p. 3-8, §3.4, ¶2 — Change 'flow rate' to 'flow velocity' in the second sentence. Provide the calculation that equates a flow velocity of 28.7 cm/s to a bed shear stress of 0.2 Pa.

Bed shear stresses are a function of the near-bed velocity, the distance above the bed the velocity is measured, and the roughness of the bed surface. They are also a function of the flow depth since near-bed velocities are a function of the flow depth. As seen in the cores collected during the studies reported herein, the roughness of the sediment bed surface at this site is spatially variable as the bed roughness is a function of the median sediment size, presence of clam shells, *etc.* As such, it is not valid to assign a single velocity (especially one to three significant digits) as the one and only velocity that would generate a bed shear stress equal to 0.2 Pa. Typically, the range of flow velocities that are measured at a given distance above the bottom that produce a specific bed shear stress are reported, where the range of velocities accounts for the varying bed roughnesses at the site. To base an entire sediment stability analysis on a single velocity is not correct for many reasons, one of which is that it does not account for the uncertainty associated with the determination of the critical shear stress for erosion or the uncertainty in the measurements of the currents using an ADCP. In addition, the comparison of a single velocity, *i.e.,* 28.7 cm/s, to the maximum current speeds in the table that gives the near bottom flow statistics at the locations where the ten cores were collected should not be done unless the elevations above the bottom where the velocity measurements were made are known and the bottom friction coefficients at these sites have been determined. These factors would be required to calculate the bed shear stresses generated by the reported maximum velocities.

p. 3-8, §3.4, last ¶ — Change 'sheer' to 'shear' in the second and third sentences, and change 'the flow rate required erode' to 'the flow rate required to erode' in the third sentence.

p. 4-9, §4.2.2.6 — Please indicate that the sample where asbestos was found in excess of the criterion was located beneath the eastern end of Pier 1.

p. 5-3, §5.1.5 — a) Please clarify the third sentence of the second paragraph that ends with "but not others."

b) The last sentence in the fourth paragraph should be changed to "...burial was occurring at the site." With the removal of the Forrestal it is not apparent that burial is continuing to occur south of the west-central portion of Pier 1 or that the burial that was measured still exists. Burial may continue near shore because of discharges from storm sewers.

c) Please include a map of the areas described in this section.

p. 5-4, §5.3

The third sentence in the second paragraph states that copper and zinc concentrations in sediment were found at levels similar to previously-collected samples. Please support this statement by comparing the concentrations found in this investigation with concentrations found in previous sampling events.

p. 5-5, §5.3

The first full paragraph states: "Although the zinc PRG was exceeded in the ERA, the avian predator would have to spend its entire life feeding in the affected area for true risks to occur." This statement neglects the migratory nature of the avian receptor. The analysis in the ERA assumed the avian would only be present at the site for 60% its life owing to seasonal migration, but it assumed that all its food would be obtained from the site while in the site vicinity. Because the range of the birds is variable with some ranging only within one kilometer of the nest while others range tens of kilometers, the rationale for disregarding risk from zinc is not clearly justified. If the Navy believes the zinc PRG is too conservative based on the assumptions it used in its calculations, it should revise them to produce a viable PRG rather than dismissing zinc without appropriate rationale.

EPA questioned the rationale for limiting the PRGs to the recommended PRGs (RPRGs) in the 1998 SAIC document in its original review of this document, and the matter has never been entirely resolved. In the event that a contaminant poses a risk to a receptor in the BERA, the only rationale for not developing and using a PRG is if contaminants are co-located, such that removal of RPRG contaminants would effectively eliminate the risk posed by chemicals for which a RPRG was developed. In the case of copper and zinc, the distribution is distinctly different from that of the RPRG contaminants. It is unclear why copper and zinc baseline PRGs should not be carried forward, unless the underlying assumptions for ecological risk are in need of revision, as discussed above for zinc. Copper posed a risk from resuspension, so the BPRG should be carried forward for this chemical.

p. 5-6, §5.5.1

Except for the first sentence, the discussion in the third paragraph needs to be rewritten or deleted. Because the Navy does not know how much sediment was originally deposited beneath the two ships, it cannot know that the outlines are similar to the original depths. It may be that a large deposit was originally present and most of it has now been eroded. Alternatively, it may be that the current sediment outlines are almost identical to the original outlines indicating that almost no sediment has been deposited in these areas since the ships departed.

Table 1-1

The RPRG selected for benzo(a)pyrene is set at hazard quotient of 10 based on human health risk endpoint. A PRG based on hazard quotient of 1 should be selected to meet the NCP requirement.

Figure ES-2

At the eastern end of Pier 2, there is a small green circular area located within a larger green circular area. Is the small green area redundant? If so, should it be

	deleted?
Figure 2-1	This figure shows the planned sample locations. Since the Navy was not able to collect all samples at the planned locations, please provide a figure depicting the actual sample locations. An appendix identifying the coordinates of the sample locations would be beneficial.
Figure 3-1	Based on the better quality image e-mailed to EPA on May 17, 2012, EPA was able to more clearly see some of the bathymetric features shown in Coddington Cove. Of particular note are: 1) prop scour furrows that follow the curving arcs of maneuvering, 2) linear ridges that are likely a result of dredging/construction of the piers, 3) ridges from dredging, 4) pock marks from anchoring, and 5) a ridge that looks to be the extent of a second 'deepening' dredging south of Pier 2.
Appendix C2	Please correct the text for Figure 2 because the Saratoga was present during the ADCP monitoring.
Appendix C2	(p. 14, ¶3) Were the waves with the peak significant wave heights given in Table 6 either intermediate or shallow water waves? Please determine this and include it in the report.
Appendix C4	EPA notes the conclusion from the *Report on ^{210}Pb Accumulation Rates of Sediment Cores* that states: "While definitive conclusions cannot be made about the sedimentation trends in the study area because of the impact of dredging and ship-induced resuspension, it is clear that inshore (protected) areas tend to have high accumulation rates. Inshore areas exposed to wave fetch, and hence to bottom resuspension tend to be lower."

ATTACHMENT B

EVALUATION OF MONITORED NATURAL RECOVERY PROCESSES AT DERECKTOR SHIPYARD

Based upon review of the *Draft Supplemental Sediment Investigation Report for Installation Restoration Site 19 - Former Derecktor Shipyard* (Supplemental Report) dated April 2012, EPA became aware that the objective of the sampling effort differed from what EPA and the Navy agreed to on October 27, 2010. EPA had previously believed that the intent of the sampling was solely to better delineate the areas offshore exceeding PRGs that were planned to be removed. Rather, it appears that the Navy instead planned to present the technical basis for concluding that contaminated sediments are undergoing natural recovery in the marine sediment proximal to Derecktor Shipyard.

As stated in EPA's July 16, 2010 letter to you, MNR is a viable remedial option when natural processes exist that decrease contaminant exposures over time. As described in Magar *et al.* (2009), the primary processes driving MNR are:

1. Transformation/degradation of contaminants,
2. Dispersion of contaminants or contaminated sediments,
3. Burial of contaminated sediments, and
4. Sequestration of contaminants such that they are no longer bioavailable.

The suitability of MNR as a remedial option will depend on whether those processes are occurring at the site and will continue in the future. As discussed on October 27, 2010, multiple, independent lines of evidence (LoEs) are required to verify these processes. Further, those LoEs should be sufficiently robust to indicate that processes have occurred and will continue to occur. They should encompass the area of concern and a timeframe of sufficient duration to provide confidence in future predictions of declines in contaminant exposures.

The supplemental report concludes that the site is a depositional environment that has led to the burial of contaminants, which indicates that burial is the primary natural recovery process. Burial is a viable process for MNR *if supported by lines of evidence that demonstrate* 1) The area of concern is depositional (sediments are accumulating at a rate sufficient to reduce contaminant exposures over time); 2) Newly-deposited sediments are at an acceptable level of contamination; and 3) Sediment beds are anticipated to be stable such that buried contamination will not subsequently be exposed. The technical bases of those lines of evidence as supported by the Supplemental Report are evaluated below.

EVALUATION OF LINES OF EVIDENCE SUPPORTING BURIAL AS AN MNR PROCESS

Stated Condition: The area is depositional

LoE: Bathymetry

The supplemental report compared the 2011 survey to previous surveys and concludes "The survey results indicated that sediment depths are generally similar to depths that have been reported in previous surveys." The bathymetric map also shows evidence of a variety of features from past activities (*e.g.*, dredging and ship berthing). The presence of these features does not suggest a depositional environment as they would likely be preferentially filled and smoothed considering the more prominent hull outline was "less than a foot in height" and the outline of a ship removed in 2003 is still present. The bathymetric data provides empirical evidence of prop scour tracks and depressions from anchoring. If Coddington Cove still looks like that since it was last dredged in 1968, it is clearly not a place of active burial.

LoE: ^{210}Pb analysis to estimate deposition rates

Depth increments of various depths were sampled in ten cores and tested for Po-210 to approximate Pb-210. Appendix C presents charts of the Pb-210 profiles with depth and notes on the analysis. Most cores did not present a classic profile indicative of a consistently depositional environment where activities decline with depth. In fact, some showed Po-210 spikes at great depth. Deposition rates were estimated by eliminating data points from the analyses (*e.g.*, core 1 eliminated 5 of 8 points) that showed greater activity deeper in profile. Core profiles with bidirectional variation in activity by depth can also indicate a dynamic environment, which is consistent with site history. While this LoE appears to be the primary support for the conclusion that Coddington Cove is an area of sediment accumulation, it is based on data that provide ambiguous support for that conclusion.

Stratigraphic markers

The supplemental report describes the presence of "bedding layers." Although the term is not defined, it suggests distinct sediment layers that indicate depositional events - an observation that supports the concept of burial. Figure 2-2 shows 6 out of 10 cores not having "observable bedding," which conflicts with the conclusion statement that "radioisotope analysis indicates sediment bedding and deposition over time." Although EPA is not recommending additional study, further information regarding the nature of observed layers (*e.g.*, seasonal deposition or large disturbances) would be useful to indicate whether the environment is depositional and which processes drive that deposition. For example, the presence of seasonal deposition patterns would indicate consistent deposition (suggesting bed stability); thick homogeneous deposits indicate large scale disturbance and deposition (suggesting the opposite). One observation that could be expanded upon as an MNR line of evidence is that "Surface sediments in Coddington Cove were typically found to be more fine-grained (*i.e.*, more silt and clay) than the underlying, more sandy sediments, probably because of the significantly decreased bottom energy and increased likelihood of fine-grained sediment deposition resulting from construction of the Coddington Cove breakwater in 1957." Can grain size analyses be interpreted in light of this statement?

Stated Condition: Decreasing Sediment Surface Contamination

LoE: Concentrations have declined over time.

The supplemental report describes a sampling effort to characterize the spatial and vertical extent and magnitude of a variety of COCs. The description and presentation of results does not analyze the core contaminant concentrations in a vertical plane. In its July 16, 2010 letter, EPA provided extensive commentary that this was an important, but neglected, line of evidence. The supplemental report continues to disregard this essential LoE. By reviewing Figures 4-1c, 4-2c, and 4-3c in sequence, it appears that surface sediment PCB concentrations are greater than subsurface sediments. This is a powerful indication that most areas are not undergoing natural recovery by burial of sediments.

Stated Condition: Sediment Bed Stability

LoE: Hydrodynamic measurements.

The collection of sediment cores for Sedflume analysis and comparison to bottom velocities is generally a useful approach if the range, particularly the upper range, of potential velocities is encompassed. In this case, measurements were taken in a relatively quiescent period. More specific concerns about ADCP measurements and derivation of shear stresses from those measurements are provided earlier in this letter.

A Comprehensive Analysis of the Suitability of MNR Has Not Been Conducted

As stated previously, an evaluation of whether current processes, as supported by the lines of evidence, will achieve specified objectives is a fundamental component that is missing. Are current trends sufficient to achieve desired risk reduction over a specified area in the necessary time frame? Such an analysis should be much more rigorous than looking at lines of evidence in isolation. To provide confidence in MNR as a potential remedy, there has to be reasonable assurance, based on past performance, that risk reduction will occur into the future and obtain risk reduction objectives. The lines of evidence need to be integrated to support the conclusion that contaminant concentration trends will achieve cleanup levels in the specified areas in an acceptable timeframe. Further, the analysis should use the lines of evidence to demonstrate that processes responsible for MNR trends are reasonably anticipated to continue and not be adversely affected by natural or anthropogenic disturbances at the site. The Supplemental Report fails to demonstrate that MNR is occurring at Derecktor Shipyard.

SUMMARY

Overall, the updated information in the report does not provide sufficient information to establish that burial is occurring, the rate at which burial is occurring, that burial is reducing surface sediment contaminant concentrations, that the environmental processes driving burial and sediment contaminant declines are anticipated to continue, or that MNR processes could achieve desired levels in a reasonable timeframe.

The memo does not provide sufficient information to establish the area of concern as depositional. While burial could be occurring in some areas, the Supplemental Report neither provides lines of evidence that are suitable to support that conclusion nor addresses the realities of the site (*e.g.,* ship traffic, pier demolition plans, and storm events).

REFERENCES

Magar V.S., Chadwick D.B., Bridges T.S., Fuchsman P.C., Conder J.M., Dekker T.J., Steevens J.A., Gustavson K.E., Mills M.A. 2009. Technical Guide. *Monitored Natural Recovery at Contaminated Sediment Sites.* ESTCP Project ER-0622. Department of Defense. Environmental Security Technology Certification Program.