RHODE ISLAND
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

235 Promenade Street, Providence, RI 02908-5767 TDD 401-831-5508

September 18, 1998

James Shaffer, Remedial Project Manager
Department of the Navy, Northern Division
Naval Facilities Engineering Command
10 Industrial Highway
Code 1823-Mail Stop 82
Lester, PA 19113-2090

RE: Draft Final, Preliminary Remediation Goals for Offshore Derecktor Shipyard Ecological Risk Assessment, Naval Education and Training Center, Newport, Rhode Island

Dear Mr. Shaffer,

The Office of Waste Management has reviewed the Draft Final Preliminary Remediation Goals (PRG) for the Derecktor Shipyard Site, dated 19 August 1998. Attached are comments generated by this Office on the Preliminary Remediation Goals document.

If the Navy has any questions concerning the above, please contact this Office at (401) 277-2797.

Sincerely,

Paul Kulpa

Paul Kulpa, Project Manager
Office of Waste Management

cc: Warren S. Angell, DEM OWM
Richard Gottlieb, DEM OWM
Christopher Deacutis, DEM OWR
Robert Richardson, DEM OWR
Kymberlee Keckler, USEPA
Melissa Griffin, NETC

derdera com

Comments of Draft Final
Preliminary Remediation Goals
Derecktor Shipyard

1. **General Comment**

As previously stated, a number of parameters were utilized during the evaluation conducted under the Ecological Risk Assessment. These parameters included sediment chemistry, water chemistry, biotoxicity test, tissue analysis, biota condition analysis and modeling. This comprehensive evaluation was deemed necessary, as no single parameter was considered adequate in an ecological risk assessment. As an illustration, chemical analysis of the sediment may not reveal a problem that would be evident through a biota condition analysis. However, the process developed for the PRG derivations has relied heavily upon chemistry, toxicity and modeling. This is of concern as it was realized that all of the aforementioned parameters were needed to conduct the risk assessment. However, only a limited number of parameters were used in the PRG process. This may be the reason why there is disagreement between the output of the ecological risk assessment and the PRG document. It is this Office understanding that the evaluation of all of the parameters, at least qualitatively, would be incorporated into the PRG document. Please indicate which section\sections contain this evaluation.

2. **Section 2.1, PRG Development Approach; Page 4, Paragraph 2.**

The report notes that the actual toxicity of sediments may be less than that predicted by direct comparisons to bulk sediment concentrations due site specific factors which limit the bioavailability of the contaminants. Accordingly, exposure to water as opposed to bulk sediments is used in the PRG development process. It is known that a number of organisms, clams, worms, etc. ingest sediments directly. Even in human health risk assessments, incidental ingestion of contaminants found on soil or sediments is include in the overall risk assessment. Since organisms are exposed via both pathways sediments, and dissolved constituents, incorrect PRG values will be obtained if only one route is evaluated. Therefore, the PRG process should evaluate exposure to bulk and dissolved contaminants at the site. Please modify the report accordingly.

3. **Section 2.1, PRG Development Approach; Page 4, Paragraph 2.**

This section of the report notes that elutriate concentrations were compared to WQSVs. Elutriates are not obtained by allowing the water to drain from the sediment samples. Elutriates are obtained by mixing one part sediment with four parts water. This represents a dilution and should be treated as such in any comparison of WQCV to elutriate concentrations (i.e. direct comparison is not possible, dilution should be factored into the comparisons). Please modify the report accordingly.

4. **Section 2.1, PRG Development Approach;**
Page 4, Paragraph 2.

Porewater/elutriate concentration are then divided by the water quality screening values derived from available water and sediment benchmark representing thresholds for adverse effects to obtain porewater hazard Quotients (PW-HQ) and elutriate Hazard Quotients (ELU-HQs).

Note the above would imply that porewater concentrations are compared to bulk sediment values. This is not the case. The sediment values used in this assessment are Long and Morgan values translated into porewater values using the EqP model. Therefore, the above should note this and be modified as follows:

Porewater/elutriate concentration are then divided by the water quality screening values derived from available water and modified sediment benchmarks representing thresholds for adverse effects to obtain porewater hazard Quotients (PW-HQ) and elutriate Hazard Quotients (ELU-HQs).

5. **Section 2.1, PRG Development Approach;**
Page 4, Paragraph 2.

These predicted values for organic contaminants are combined with direct measurements of SEM/AVS measures of metal bioavailability to constitute the porewater data set.

The report indicates the SEM/AVS information will be used to determine whether inorganic contaminants are a concern at the site. This approach may be valid under static conditions, that is no resuspension of sediments. Resuspension events will change the SEM/AVS values (i.e. metal bioavailablity is increased). Therefore, the AVS/SEM modifications should not be applied for areas subject to resuspension. Please modify the report accordingly.

6. **Section 2,1, PRG Development Approach:**
Page 4.

This section of the report has compared the results of the biotoxicity test in the evaluation of whether contaminated sediment represents a threat. In numerous meetings this Office has indicated that due to variability in biotoxicity test and sampling, the biotoxicity test may be used as an indicator of contamination. It <u>cannot</u> be used as a stand alone test in the determination as to whether contaminated sediments represent a problem. The PRG document has used the biotoxicity test to discount contaminated sediments. The biotoxicity test performed at the site would not have sufficient rigor to meet this task and should not be used as such. Please modify the report accordingly.

7. **Section 2,1, PRG Development Approach:**
Page 4.

This section of the report appears to state that the No Observable Effect Quotient represents the highest concentrations of contaminants for which adverse affects are unlikely. As stated, this method does not appear to be conservative, in that instead of using the lowest concentration of a contaminant that does not produce an adverse affect, the highest concentration of the contaminant is used. Please clarify. As this is a public document the Office recommends that an example be used to illustrate this concept, (ex. Effect was observed at 2, 3 and 4 ppm, but not at 0.5 and 1 ppm. Therefore, 1 ppm was selected as the NOEC.

8. **Section 2,2, Aquatic TEV Derivation:**
Page 7

This section of the report indicates that EPA WQC values were used in the PRG development. Please be advised that RIDEM WQC values are used throughout this State. Therefore, in order to be consistent, RIDEM's WQC values must be used in the PRG derivation process.

9. **Section 2.4.1, Benchmark Selection HQ Derivation;**
Page 13, Whole Section.

This section of the report notes that the "receptor population for the consumption of locally-caught shellfish include local adult subsistence fisherman." The report also note that the consumption rate is 15.6 g/day. As noted in the Human Health Risk Assessment the exposure rate for subsistence fisherman would be greater than the 15.6 g/day value. Therefore, the report should note that the exposure for the subsistence fisherman would be greater than the 15.6 g/day.

10. **Section 3.2, Approach for Spatial Implementation of PRGs;**
Page 22, Paragraph 1.

This section of report discusses the comparability of sediments samples collected from the EPA investigation (0-15 cm) and the URI study (0-2 cm). In support of incorporating the URI data the report has noted that the Relative Percent Difference for paired samples is within an acceptable range. Samples used in this comparison include DSY 3/29, 11/31, 18/26, 19/32 and 20/31. Using the distance criteria employed for the above sets the following groups should also be included in this analysis; 1/41, 1/40, 2/28, 21/33, 10/41. Please modify the report accordingly.

11. **Section 3.2, Approach for Spatial Implementation of PRGs;**
Page 21, Whole Section.

The report has incorporated the results from previous studies in the PRG development process (i.e. URI study). However, the report has not incorporated results from other studies specifically the ACOE investigation that was conducted in the Pier 1 area. Historically two large floating dry docks and a barge was moored at Pier 1. Operations carried out on these docks resulted in the uncontrolled continuous release of contaminated sand blast grit into the environment during sand blasting operations. In addition, it was common practice to either remove the contaminated sand blast debris from the dry docks by either dumping the material over the side or submerging the dry docks. Other waste from operations conducted on the dry docks were also dumped over the side. These waste included, bilge waste, waste oils and sludges from either the dry docks or the ships being serviced by the dry docks. These actions resulted in a Cease and Desist Order being issued against Derecktor Shipyard. The amount of material dumped in this area was considerable as it could be measured by a bathometric survey of the area, (the survey was conducted in order to determine the extent of contamination in the area). Twenty sediment samples collected in this area were analyzed for lead, copper and zinc. The concentrations of these contaminates in the majority of these samples exceeded the proposed PRGs for Derecktor Shipyard. As previously noted in meetings and correspondence, this area was not sampled during the recent ERA. Therefore, the proposed PRGs should apply to these results.

12. **Section 3.3, Assessment of PRGs for Risk Assessment Reduction; Page 22, Whole Section.**

The correlation between PRG and ecological risk assessment appears to be limited to high risk areas and not intermediate risk stations. Please confirm. Note, it is this Offices position that intermediate risk stations should be addressed, and the PRGs development should incorporate these stations.

13. **Section 3.3, Assessment of PRGs for Risk Assessment Reduction; Page 23, HWW PAHs.**

This section of the report discusses the relationship between observed risk and the PRG value. The report notes that eight stations exceeded the PRG value (6923 ng/g). However the report recommends a PRG of 13846 ng/g apparently based upon the fact that two stations close to Station 20 did not show similar exceedance of the PRG-HQ and the fact that the recommend value is within the Long and Morgan range. The concentrations of contaminants at two closely located stations probably represents sediment heterogeneity. It is unclear how sample concentrations at different stations can be used in support of a higher PRG. Therefore, the PRG value of 6923 ng/g should be employed.

14. **Section 3.3, Assessment of PRGs for Risk Assessment Reduction; Page 24, Copper.**

This section of the report discusses the relationship between observed risk and the PRG value. The report notes that two stations sediment concentrations above the PRG value had non detect elutriate concentrations and therefore copper should not be used in the PRG assessment. The two referenced stations (27 and 29) were high risk stations with high concentrations of copper in the sediment. As stated above, exposure to site contaminants is not limited to elutriates. Therefore, copper should be retained in the PRG assessment.

15. **Section 3.3, Assessment of PRGs for Risk Assessment Reduction; Page 24, Lead.**

This section of the report discusses the relationship between observed risk and the PRG value. The report notes that five stations exceeded the proposed PRG value (84 ng/g). Two stations had high risk (two stations employed URI data, risk assessment were not conducted at these locations), however, one station had low risk (Station 32). The report recommends adopting the higher PRG-HQ equal to 2 (this translates into a concentration of 166 ug/g). In essence, even though high risk was observed at a station with a HQ less than two, the lack of similar risk at the other station supports adopting a HQ value of 2. A review of the risk assessment for these stations reveal that the weights of evidence sediment hazard quotients for metals, elutriate HQ, laboratory toxicity, and field effects indicators are similar amongst the three stations. However, the tissue concentration ratios for Station 32 is lower than Stations 27 and 29, thus the overall lower risk for this station. It should be noted that this lower risk is not based upon the fact that the tissue samples had lower concentrations of contaminants; it is due to the lack of data, tissue samples were not collected at Station 32. That is, the lower risk is not based upon data but the lack there of. Therefore, it would be inappropriate to recommend a PRG value based upon a HQ equal to two and the PRG value of eighty four should be employed.

16. **Section 3.3, Assessment of PRGs for Risk Assessment Reduction; Page 24, Total PCBs.**

This section of the report discusses the relationship between observed risk and the PRG value. The report notes that four stations exceeded the proposed PRG value (530 ng/g). Two stations had high risk (the other stations employed URI data, risk assessment were not conducted at these locations), however, one station had a hazard quotient that only slightly exceed the PRG-HQ equal to one. The report therefore recommends adopting the higher PRG-HQ equal to 2 (1060 ng/g). High risk observed at a slight exceedance of the HQ would seem to validate the lower value (560 ng/g) not higher value. Therefore, the lower PRG value (560) should be employed at the site.

17. **Section 3.3, Assessment of PRGs for Risk Assessment Reduction; Page 24, Total PCBs.**

The proposed PRG for PCBs is 1638 ng/g, which is well beyond the Long and Morgan value of 22-180 ng/g. Previously, in support of the proposed PRG value for PAHs the document referenced the Long and Morgan value. This comparison was not done for PCBs. Please explain why the proposed PRG for PCBs greatly exceeds the Long and Morgan values.

18. **Section 3.3, Resuspension Evaluation; Page 25, Whole Section.**

This section of the report employs a model to predict the areas subject to resuspension by prop wash. The model predicts that any area greater than 10 meters in depth will not be subject to resuspension from prop wash. It is known that the ability of a model to assess or predict conditions at a site is limited by a number of factors, including the assumptions used in the model and the prevailing site conditions. These limitations can result in the model not being representative of field conditions. That is, the model's predictions are incorrect. Accordingly, when possible, it is common practice to test the predictions of a model. Such a test occurred at the Derecktor Shipyard during the docking of the USS Saratoga. The Rhode Island Department of Environmental Management inspected the area after the Saratoga had been docked. Resuspension of sediments was observed from the propellers of the tugboats used to dock the ship. The resuspension of sediments was extensive as the entire area in between Pier 1 and Pier 2 was muddied by the tender vessels. It should be noted that these observations were made well after the ship had been docked. In addition, the tug boats were not operating at moderate high propeller RPMs (as assumed by the model), but instead were idling as the ship had already been secured to the dock, (vessel was tied to the dock). Therefore, the predictions of this model are incorrect, (the model predicted no resuspension in area where the Saratoga was docked;

resuspension was observed), and this model should not be used to evaluate resuspension from vessels operating at the site. Finally, it is unnecessary to expend monies and manpower employing another model as the conditions at this site has been proven to be subject to resuspension. Therefore resuspension via propeller action should be considered for the entire study area.

19. Section 3.3, Resuspension Evaluation; Page 25, Whole Section.

This part of the document notes that resuspension is possible due to vessels operating in the area and storm action. The report has indicated that resuspension is most likely for areas known to contain silt and clay. Resuspension of courser grain material is possible during storm events. Resuspension of the sands and the corresponding scouring action in the Stillwater Basin has been proposed as the responsible agent for the lack of life in this area (report indicates entire basin is subject to resuspension even though the sediment in the basin is heterogenous, areas of sands, or silts).

20. Section 3.3, Resuspension Evaluation; Page 25, Whole Section.

The PRGs developed for resuspension appear to applied to the surface sediment, (0-7 cm, 0-2.5 inches). Resuspension due to storm action or ship traffic is not expected to be limited to the top 2.5 inches. Therefore, the report should be modified to include contaminants from the deeper sediments in this evaluation.

21. Section 4.0, Conclusion and Recommendations; Page 28 Whole Section.

This section of the document summarizes the results of the PRG process. The Office recommends that a figure be included which depicts the areas which exceeds all of the recommend PRGs (aquatic, avian, and human health). This figure would also indicate the exceedance for the particular polygon, (ie a letter A for aquatic, AV for avian and H for human health would be in the polygon). In this manner the reader can quickly determine the bases for the exceedance in each polygon.