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November 30, 1999

Project Number 7397

Mr. James Shafer  
Remedial Project Manager  
Northern Division, Naval Facilities Engineering Command  
10 Industrial Highway, Mail Stop 82  
Lester, Pennsylvania 19113

Reference: CLEAN Contract No. N62472-90-D-1298  
Contract Task Order No. 0269

Subject: Transmittal of Response to Comments  
Marine Ecological Risk Assessment, Old Firefighting Training Area  
Naval Station - Newport, Newport Rhode Island

Dear Mr. Shafer:

Enclosed please find four copies of the response to RIDEM comments dated October 28, 1999. These are comments that RIDEM had on our response summary dated September 30, 1999, regarding the Draft Final Marine Ecological Risk Assessment for the Old Firefighting Training Area, located at Coasters Harbor at the Naval Station Newport, in Newport Rhode Island.

As you know, a teleconference was held on November 8, 1999 to discuss Comment No. 1 presented in the attachment. A very brief summary of that teleconference is provided as the response to that comment.

If you have any questions regarding this material, please do not hesitate to contact me.

Very truly yours,

A handwritten signature in black ink, appearing to read 'Stephen S. Parker', with a long, sweeping flourish extending to the right.

Stephen S. Parker  
Project Manager

enclosure

- c: M. Griffin, NETC (w/encl. - 7)  
K. Keckler, USEPA (w/encl. - 3)  
P. Kulpa, RIDEM (w/encl. - 4)  
J. Stump, Gannett Fleming (w/encl. - 2)  
K. Finkelstein, NOAA (w/encl. - 1)  
D. Egan, TAG (w/encl. - 1)  
J. Trepanowski/G. Glenn, B&RE (w/encl. - 1)  
File 7397-3.2 (w/o encl.)

**Response to RIDEM Comments  
on the Draft Final Ecological Risk Assessment,  
Naval Station Newport, Newport, Rhode Island  
Comments Dated October 28, 1999**

**1. General Comment**

Throughout the report comparisons to the background station are made. Therefore the report should include a discussion of background station. This discussion should note, amongst other things, whether there are any potential sources of contamination at this background station, whether the observed concentration of contaminants at the background station are within the values expected for an unimpacted area, etc. The report should also include a comparison of the reference station used for OFFTA with the ones employed for Derecktor Shipyard and McAllister Point Landfill.

*Evaluation*

*In correspondence dated, 7 April 1999 the Office questioned the validity of the background sampling stations and requested that the Navy provide additional information concerning these stations as well as a comparison to other background sample stations. The latter was provided in correspondence dated 2 June 1999. During subsequent meetings the Office clearly stated that the reference stations were not acceptable and the Navy could either utilize data from existing reference stations/sources or collect additional information. This position was again reiterate in correspondence dated 8 September 1999. Use of information from existing reference stations from other sites or from existing unimpacted non reference stations from this or other sites would allow for the finalization of the Ecological Risk Assessment without increasing the cost of the project or delaying schedule. The Navy has proposed collecting information from alternate reference stations while at the same time proceeding forward with Feasibility Study and the Preliminary Remediation Goals document. Although it is the Office position that utilizing existing data would be more cost and time effect, this alternative is acceptable to the State. However, until this information is obtained the Ecological Risk Assessment cannot be finalized. Should the Navy elect this alternative, the Office recommends that information from the additional stations be collected in a timely manner so as avoid possible extensive revisions not only in the Ecological Risk Assessment report, but also in the Feasibility Study and the Preliminary Remediation Goals document.*

**Response:** This comment prompted the Navy to initiate a teleconference to discuss the options for submittal of the Final ERA. This teleconference was held November 8, 1999 and the Navy again proposed to submit the ERA on schedule in order to meet the regulatory delivery schedule. The Navy also proposed to collect additional reference station data as previously proposed, and incorporate that data into the PRG development.

The discussions held at the June 1999 EAB meeting were reviewed. Participants were reminded that the comment focuses on the offshore reference station OFF-23, and elevated concentrations of PAHs found there. Certain biological parameters measured at offshore OFFTA stations were compared to those parameters measured at this reference station. These comparisons were used in conjunction with chemistry and other parameters to measure risk in the offshore portions of the site.

It was made clear that no additional information could be incorporated into the report and have it meet the delivery schedule. It was agreed that the delivery of the final ERA would be delayed.

RIDEM requested that data from other reference stations in Narragansett Bay be used in place of the data from OFF-23 (offshore reference station for OFFTA). The Navy directed reviewers to the Draft Final Report where this was done already, and the findings were discussed. These other reference stations were selected to match the substrate of other project sites, and none of them matched that at the outer portions of Coasters Harbor. RIDEM then suggested using other stations within other project sites, however, use of these stations would have the same difficulty.

Tentative agreements were reached to collect additional sediment samples for bulk chemistry if suitable substrate could be found North of Jamestown Island, and also around the existing station 23. It was also suggested that at three of these stations, biological parameters be measured to compare to findings at station 23. If this new sampling shows that station 23 is a "hot spot", then a revision would be appropriate. However, if the data supports regional conditions near but outside the harbor are similar to station 23, it would seem inappropriate to revise the report.

RIDEM was not able to agree to these proposals, they requested an additional call be held when Bob Richardson and Chris Deacutis could participate as well. The Navy stated that they would forward a letter requesting an extension of the final ERA based on these discussions, and wait for RIDEM to schedule a call.

## **2. General Comment**

Please indicate whether all of the contaminants detected in the soil and the groundwater samples were analyzed for in the sediment and tissues samples collected for the Ecological Risk Assessment.

### *Evaluation*

*The Office requested that the Navy indicate in the report whether all of the contaminants detected in the soil and groundwater were analyzed for in the sediment. The Navy has indicated that should RIDEM be interested in those detected analytes that are not common to the two (offshore vs. onshore), the State should obtain the list of analytes from the onshore studies and compare them to the offshore studies. The Ecological Risk Assessment is a public document and information of this nature should be included in the report.*

**Response:** The ERA report will be included in the RI for the site. The requested comparison will be included in the RI Report.

## **3. General Comment**

It is known that free product was detected at the site. In addition, it is known that petroleum products contain a wide range of compounds, many of which are not detected in standard VOC/SVOC runs. Therefore, as this is a public document the report should state why a simple TPH analysis was not performed on the sediment samples.

### *Evaluation*

*The Navy has revised the report as follows:*

*Total Petroleum Hydrocarbon (TPH) was detected in the onshore soils and groundwater at the site. TPH is typically measured in soil and groundwater to meet regulatory requests, since there are cleanup criteria enforced by RIDEM that apply to TPH in groundwater and soil. In addition, there is no toxicity information that can be used to characterize risk to ecological receptors from TPH.*

*The Navy has indicated the TPH will be evaluated during the PRG process, therefore statements concerning the lack of toxicity information should be deleted and the report should be modified as follows:*

*Total Petroleum Hydrocarbon (TPH) was detected in the onshore soils and groundwater at the site. TPH is typically measured in soil and groundwater to meet regulatory requests, since there are cleanup criteria enforced by RIDEM that apply to TPH in groundwater and soil.*

**Response:** The Navy agrees with the intent of the language stated above, however, we have not been able to find data that states TPH was detected in groundwater at the site. It is known that petroleum sheens are visible on water in open test pits, however, this does not confirm TPH present. Therefore the passage will be added as follows to page 3-4 (Section 3.1.2.):

"Total Petroleum Hydrocarbon (TPH) was detected in the onshore soils at the site. TPH is typically measured in soil and groundwater to meet regulatory requests, since there are cleanup criteria enforced by RIDEM that apply to TPH in groundwater and soil."

**7. Section 3.3, Contaminants of Concern,  
Page 3-16, Paragraph 2.**

The bench marks employed for determining contaminants of concern are equivalent to those employed in the draft Ecological Risk Assessment for Derecktor Shipyard dated July 1996. Please indicate whether any other benchmark from other states or other Regions, have been developed since that time. It is the Office's understanding that Region IV and New Jersey are developing or have developed sediment-screening values. These values should be incorporated into the report. The Office recommends investigating whether the other coastal states or Regions have developed standards.

*Evaluation*

*The Navy has stated that they are unaware of any values from EPA Region IV or the State of New Jersey and request full references from the State of Rhode Island concerning these values. Please be advised that Region IV values have been available since 1995, the State of New Jersey has had values since 1991, (these values were updated in 1998).*

*The Navy also notes that their contractor had requested a copy of the values from the DEM and this Office had failed to provide the requested material. Consequently, the Navy does not intend to modify the report at this time. The State of Rhode Island is not a clearinghouse for documents produce by EPA Region IV and the State of New Jersey. The State had obtained the information by simply contacting the Region IV and the State of New Jersey and requesting a copy of the sediment values. The information is also readily available on the Internet and is easily downloaded. Therefore, the Office does not understand the Navy's position that since the State did not provide the requested information it will not be included in the report.*

**Response:** The Navy has consistently stated that they are unaware of any **new** values. The New Jersey marine sediment screening values are the same as NOAA ER-L/ER-M values used for the OFFTA ERA. Also, the EPA Region IV values are a mix of Florida (PEL) and NOAA values which were also evaluated for the OFFTA ERA. Other states have also adopted values, but the values are not different from those evaluated in the OFFTA ERA.

**8. Section 4.1, Sources and Exposures Pathways of CoCs,  
Page 4-3, Paragraph 2.**

This section of the report states that the concentration of organic contaminants in aquatic organisms is based upon lipid content of the organisms and not due to other factors such as biomagnification. That is the external surface of the respiratory systems of water borne organisms facilitate the transfer of lipid soluble contaminants and thus biomagnification is not present. This would seem to imply that respiratory systems of aquatic organisms have a

detoxification function, and as such contaminants absorbed by the organism, through ingestion, respiration or dermal contact is removed via the respiratory system. Since biomagnification is known to exist in the aquatic environment, please indicate whether any other studies other than the 1977 reference support his position.

#### *Evaluation*

*The State requested additional literature sources in support of the Navy's position that lipid content not biomagnification is important in determining the concentrations of contaminants in organisms. The Navy has noted that the results for cunner samples taken at OFFTA support this position and have included an additional study performed by the authors of the report. The Office requested that the Navy confirm whether these two studies are the only one available in support of this position.*

*The Navy has stated that they are unaware of any studies in support of Rhode Island implied meaning to the mode of biomagnification. The Office reiterates its comments, that is whether there are any other literature sources in support of the Navy's position that lipid content and not biomagnification is important in determining the concentrations of contaminants in organisms.*

**Response:** The following text was added (page 4-3 (Section 4.1.)) to address RIDEM's request for additional literature sources (references to be supplied in the Final ERA):

"Magnification through the food web (i.e., biomagnification), although known to exist in the aquatic environment, does not occur for all contaminants. Factors such as low octanol-water partition coefficients, susceptibility to metabolism, inefficient food assimilation, and rapid elimination/excretion tend to minimize food-chain biomagnifying capacities for PAHs (Braune and Norstrom, 1989; Browman et al., 1990; Opperhuizen and Sijm, 1990; Russell et al., 1995). In contrast, chlorine substitution patterns in organochlorine compounds, increased hydrophobicity, membrane permeation, and reduced assimilation/elimination promote biomagnification (Anliker and Moser, 1987; Braune and Norstrom, 1989). For contaminants such as chlorinated pesticides, mirex, and PCBs with octanol/water partition coefficients > 6.1 (Braune and Norstrom, 1989; Clark and Mackay, 1991; Pereira et al., 1996; Russell et al., 1995).

In summary, the rate of uptake of highly lipid-soluble organic contaminants in aquatic organisms is controlled by transfer mechanisms but the resulting contaminant concentrations in these species are more dependent on the lipid content as related, for example, to reproductive condition, than on magnification of the chemical within a food web."

#### **10. Section 4.1, Sources and Exposures Pathways of CoCs, Page 4-4, Paragraph 1.**

This section of the report states combusted forms of PAHs are more highly particle bound than what is suggested by their chemical structure. Please provide the basis for this statement.

#### *Evaluation*

*The Navy has noted that based upon observations at McAllister Point and Deredtor Shipyard bioaccumulation is less for PAHs than that which would be expected for other organic chemical classes. However, the Navy is unaware of any studies that examine combusted PAH bioavailability. The report should therefore note that the Navy's speculation concerning the behavior of PAHs is based upon one study and observations made at the other NETC sites.*

**Response:** The following text was added (p. 4-5; Section 4.1) to address RIDEM's request for additional literature sources (references to be supplied in the Final ERA):

"Because PAH exposures tend to derive primarily from weathered sources (e.g., combusted fossil fuels), these compounds may be more highly particle-bound and hence less bioavailable than would be predicted from their chemical structure (Kane Driscoll and McElroy, 1996; Landrum et al., 1991; Maruya et al., 1997; Paine et al., 1996; Sandoli et al., 1996; Tracey and Hansen, 1996; Wilcock et al., 1996)".

**16. Section 4.3.1.2, Porewater,  
Page 4-16, Paragraph 2.**

This section of the report states that mercury values were not used due to insufficient sample volume. As discussed in previous correspondence the mercury values are valid and should be treated as such in this report.

*Evaluation*

*The Navy has noted that the mercury found in the samples is not site related. Please be advised that mercury was detected in groundwater at the site in concentrations exceeding MCLs. In addition, depending upon the source of the oil it may also be found in petroleum products. Therefore, the Office reiterates its concern with respect to the mercury data. In order to ascertain whether the mercury results will affect the overall risk assessment, the Office recommends including the mercury data in the risk assessment. In this manner the affect of the mercury data on the overall risk assessment can be gauged.*

**Response:** Mercury data in fish tissue samples was rejected because the laboratory was unable to meet quality control measures that are stipulated in the Work Plan. Therefore, the quantities reported by the laboratory are not reliable for those samples. The reader should be aware that much larger sets of shellfish tissue samples were successfully analyzed for mercury and results are presented in Appendix A4. In addition, mercury will be screened for evaluation in the human health risk assessment, which will include residential use of the property (even though the study area lies within a GB aquifer), and ingestion of shellfish. The human health risk assessment report will be presented in the revised Remedial Investigation Report.

**20. Section 4.3.2.4, Tissue Residues,  
Page 4-28, Whole Section.**

It is not clear from this section of the report whether tissue samples analyzed for mercury, from all the species collected, including cunner were included in this section of the report. As stated in previous correspondence, the Office considers all of the tissue samples analyzed for mercury as valid and should be considered such in the report.

*Evaluation*

*The States comment was not addressed. The Office simply requested if mercury samples from all species, including cunner were included in the report (the State is aware that samples from the other species was included in the report). Therefore, the State reiterates its comment. Was tissues samples for mercury from all species collected, including cunner, included in the report, i.e. was the mercury results from cunner excluded and were there any results from clams, mussel, lobsters etc, which were excluded from the report.*

*The Navy has indicated that all tissue samples that were collected were analyzed for mercury and were included in the report. A review of the information in Appendix 4 of the Old FireFighter Trainer Area Technical Support Document indicated that the mercury values for cunner were rejected. Please explain.*

**Response:** Cunner data are 'r' flagged and values not reported. values not reported were not evaluated in the report. The QA/QC report (Appendix C3) states that values were rejected due to "initial calibration verification was greater than the 125% quality control criteria.

**21. Section 5.0, Toxicity Evaluations,  
Page 5-50, Whole Section**

This section of the report discusses the different toxicity test performed on the sediments and water samples. As these are standardized test the report should include a table that lists the typical cut off values inherent in these test. In addition, the report should include a discussion of the standard interpretation of these values.

*Evaluation*

*The Navy has stated that the exact relationship between the toxicity of a sample and the extent of risk is not known therefore arbitrary cutoff values were selected. Accordingly, the Navy has assigned a low risk to samples in which forty percent of the organisms die with respect to the control and fifty percent had development problems with respect to the control. As the former is close to a LC 50 the Office does not agree with the assignment of a low risk to this value.*

*The Navy has noted that with limited toxicity was observed at the site with respect to amphipod survival and only one sample exhibited larval development problems at less than 60 % pore water concentration. A review of the information for the elutriate test reveal that a number of sample exhibited larval development problems. Therefore, the Office reiterates it concern with respect to the cutoff values used in the assessment.*

**Response:** To address RIDEM's concerns, the following text changes will be made:

The text (page 5-55,Section 5.2.2.) will be modified as follows:

"The IC10 was selected versus the more common IC50 (concentration which causes a 50% reduction in normal development) as IC50s could not be calculated for the majority of samples since toxicity was low or absent (i.e., no reduction in normal development)."

The text (page 6-30, Section 6.4.1.) will be modified as follows:

"The IC10 was selected over the more commonly used IC50 because toxicity was low (i.e., even high concentrations of porewater did not induce reduced normal larval development) and IC50s could not be calculated with statistical confidence units for all stations (see Section 5.2)."

The text page 6-32, Section 6.4.2.) will be modified as follows:

"The IC10 was selected over the more commonly used IC50 because toxicity was generally low (i.e., even high concentrations of elutriate did not induce a 50% reduction in normal development) and IC50s could not be calculated with statistical confidence units for all stations (see Section 5.2)."

The text page 6-32 (Section 6.4.2.) will be modified as follows:

"However, the elutriate sample was not toxic to larvae (the precise IC10 could not be calculated as a hypothetical elutriate concentration > 100% would be required to reduce normal larval development by 10%)."

**28. Section 5.3.1.2, Benthic Community Assessment Protocols  
Page 5-62, Whole Section**

This section of the report includes a discussion of the different indexes that were used to analyze the data. The significance of the values obtained from these indices has not been included for all the assessment, which were conducted. As an illustration, the Shannon

Weiner Diversity Index was performed at the site. However, the significance of the values obtained the critical values and the limitations of the analysis was not discussed in the report. Please modify the report accordingly.

#### *Evaluation*

*Different biological indexes may have inherent limitations, which would produce false positives or negatives and therefore restrict their application. The Office has requested that the Navy note these limitations in order to avoid inappropriate use of the indexes, which would generate erroneous results. The Navy has stated that reviewing the weakness of the indexes is beyond the scope of this program. The Office cannot approve of a potential misapplication of indexes and therefore reiterates its comment.*

**Response:** To address RIDEMs concerns, the text (page 5-64 (Section 5.3.1.1.)) will be modified as follows:

"It is acknowledged that these different biological indices may have inherent data limitations as to the number of species/individuals required, which could produce false positives or negatives in regard to the determination of potential pollution impacts. Despite this fact, there exists little guidance as to recommended data requirements. Most recently, EPA's revised Rapid Bioassessment Protocol (RBP) recommends only that species counts contain at least 80-120 animals within replicate samples (EPA, 1999), a criterion which was met in the present sampling program. No other data limitations for individual metrics was found during literature review."

**30. Section 5.3.1.2, Infaunal Community Assessment Results, Benthic Community Assessment. Page 5-66, Paragraph 2.**

*Ranges were calculated using an arbitrary division system dividing the benchmark values into ranges.*

The above states that an "arbitrary division system" was used to segregate the various matrixes and determine the final ranking, low, intermediate or high. This would by definition translate into an arbitrary ranking system. One of the results of this approach is that a sample with only fifty percent of the matrix of the reference station is ranked as a low risk. In essence a sampling locations with half of the number of individuals or diversity may be given a low risk. Therefore, the ranking system should revised and the arbitrary division should be replaced by one reflective of risk.

#### *Evaluation*

*The Navy has indicated that the Office agreed to the quartile method for evaluating the data. The Office is questioning the cutoff values used in the quartiles, not the quartiles method itself. Therefore, the Office reiterates its comment.*

**Response:** To address RIDEMs concerns, the text (page 5-66 (Section 5.3.1.1.)) will be modified as follows:

"Intertidal and subtidal stations were evaluated with respect to reference condition using calculated ranges derived from the reference value for a specific metric, called the multimetric index. The multimetric index for a site is a summation of the scores of the individual metrics for a given station. Because metrics vary in their scales (e.g., integers, percentages), it is necessary to categorize the metric result via transformation to unitless scores (EPA, 1999). The standardization assumes that each metric has the same importance, such that one metric score was the same value as any other (EPA, 1999).

EPA RBP methods recommend that the scoring criterion for each metric be based on the distribution of values in the reference areas. EPA cites a conservative approach wherein it is assumed that a metric value less than the lower quartile (e.g, 25th percentile) of reference expectations represents greatest degradation. Accordingly, the upper quartile (75th percentile) represents non-degraded conditions. In this approach, it is presumed only that decreased comparability of benthic metrics between the site and reference stations is an indicator of possible CoC-related impacts. It is acknowledged that this system to derive the scoring criteria is somewhat arbitrary because the state of knowledge of benthic community structure is not presently sufficient to support more rigorous interpretive guidelines. For example, the relative reduction of 50% of species or comparable metric change in its relation to population stability is not known. When such relationships are determined, better scoring procedures can be applied. Further description of the calculation and function of these metric ranges is presented in the EPA RBP method (U.S.EPA, 1999)".

**38. Table 6.02, Indicator specific and Overall Weight of Evidence Ranking for Effects Concentrations.**

Bedded/Resuspended Sediment Toxicity. This section of the report provides cut off values for assign low and intermediate risk based upon survival or development rates. The report is a public document and therefore justification should be provided for the different cutoff values. As an illustration, as presented a low risk value is assigned for a sampling site in which forty percent of the organisms died.

*Evaluation*

*As of this writing the Office has not received a copy of the requested information. Upon receipt of said information the Office will complete its evaluation of the Navy's response.*

**Response:** Reference has been faxed to Mr. Kulpa. Also, the text (page 5-53 (Section 5.2.1.)) will be modified as shown below:

"Statistical power curves created from SAIC's extensive testing database with *A. abdita* show that the power to detect a 20% difference from the control is approximately 90% (Thursby et al., 1997)."

**42. Table 6.6-3, Overall summary of exposure and Effects-based Weights of Evidence.**

This table assigns a low overall risk to areas, which have intermediate risk for one weights of evidence summary and a low risk for the other weights of evidence summary. Using this scheme a sampling site with intermediate risk for bedded sediment, resuspended sediments and bioconcentration would be assign a low risk if sediment toxicity, field effects and tissue effects are low. The Office recommends that an overall intermediate risk be assigned if two or more individual exposure effects in either summary are intermediate, i.e. if two or more exposure effects in one weights of evidence summary are intermediate and the other weights of summary overall assessment is low the station would be assigned an intermediate value.

*Evaluation*

*The Navy has assigned an intermediate risk if both chemical exposure and biological effect have an intermediate rank. The Office position was that an intermediate risk would be applied if either not both had an intermediate value. The same approach should be employed for demarcating high-risk stations. Please modify the table accordingly.*

**Response:** Table 6.6-3 shows numerous stations ranked intermediate where exposure WoE summary is intermediate and the effects WoE summary is low (e.g., OFF-9, 13, 15, 17, 18, 21, 23). The same approach would be applied to high WoE evaluations, but no such situations occurred.

**43. Table 6.6-3, Overall summary of exposure and Effects-based Weights of Evidence.**

Please explain the following difference between the draft and draft final versions of this table:

*Evaluation*

*The Navy has noted that stations 14 and 15 changed due to the fact that the mercury rankings for both were changed. Please elaborate.*

**Response:** The change was due to a spreadsheet error. This error was corrected resulting in the change.