



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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February 6, 2006

Mark Evans, Remedial Project Manager
U.S. Department of the Navy
Naval Facilities Engineering Command
Northern Division
10 Industrial Highway
Code 1823, Mail Stop 82
Lester, PA 19113-2090

Re: Response to EPA's July 19, 2005 letter on the New London Subbase Work Plan

Dear Mr. Evans:

Thank you for the opportunity to review the response to EPA's July 19, 2005 letter on the New London Subbase Work Plan that EPA received on January 11, 2006. Evaluation of a response is provided only when additional clarification or discussion is warranted. The numbering used in the response is retained.

EPA recommended another round of toxicity testing. The Navy has disagreed with this recommendation. The concerns expressed in EPA's letter must be thoroughly discussed in the uncertainty section of the ecological risk assessment report. These uncertainties must be considered along with other weights of evidence during the decision-making process. In addition, EPA has the following comments on the Navy's responses to our comments.

Response 1. The Navy indicates the toxicity testing manual for *Leptocheirus* bioassays recognizes that variability occurs for the growth and reproductive test endpoints. However, what was observed in the bioassays under discussion is a high variability in the *survival* endpoint. This endpoint is not only critical for interpreting the toxicity of the data, but also critical in its influence on growth and reproductive endpoints. As you know, accepting a test where significant unacceptable survival in the controls occurred severely limits our ability to discern toxic samples from non-toxic samples.

In support of its claim that variability is to be expected, the Navy cites the Bioassay Manual Method for Assessing the Chronic Toxicity of Marine and Estuarine Sediment-associated Contaminants with the Arthropod *Leptocheirus plumulosus*, First Edition, EPA 600/R-01/020 March 2001. Particular reference is made to Table 13.3 of the manual. Please note Section A of this table, in which survival results for laboratories *that met Control Performance Criteria* are presented. Control survival ranged from 89% to 98%, with a mean of 93.6%. Results from the

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New London test are more similar to the results for that laboratories that did not meet Control Performance Criteria.

The Navy also indicates that the nature of the contamination would preclude complete homogenization unless extreme measures such as grinding or emulsifying were used. Based on at least twenty years of bulk sediment toxicity testing experience, EPA has rarely observed that type of variability and generally there is a ready explanation such as the presence of a predatory invertebrate that went un-noticed in the test set-up. The Navy's explanation also does not address the variability in control survival that is intended to be free of contaminants.

The comment noted concern regarding the failure to meet laboratory control performance standards and the extreme degree of variability within replicates of control, reference, and site samples. These concerns lead to questions about the initial health and condition of the test organisms and about potential problems with test protocols, procedures related to randomization/homogenization of samples, or test conditions between replicates. The comment also noted that a concurrent reference toxicant test, if performed, could illuminate the condition of the test organisms.

In reference to the final part of the comment, the response confirms that a reference toxicant test was performed and indicated that the organisms used in the test were responsive to the test toxicant and further indicate that the test was functional. Results of the reference toxicant test should be included in the ecological risk assessment report with the other toxicity test results.

The response indicates that the study design specified that nine replicates were necessary to address this variability. Please note that the Work Plan [Section A.5.0] recommended ten samples, not nine, to achieve DQOs. EPA concurred with the Navy that the use of more than the minimum number of replicates (5) presented in the EPA manual was a prudent measure in any case, and would support a statistical analysis of the data to distinguish real effects from test artifacts *provided there is a valid control for comparative purposes*.

Response 2. EPA recommended a repeat toxicity test because no explanation for the problems with test acceptability have been identified. Additional tests be run using all but the following samples: Zone 4, Station Z4-S2 (to be considered non-toxic); Pier 1, Station P5 (to be considered non-toxic); and Zone 4, Station Z4-S6 (to be considered toxic).

The response disagrees with the proposed repeated test, contends that variability is inherent in various aspects of ecological risk assessment and does not preclude the usability of the toxicity test data. The Navy believes that the entire data set can be used for toxicity evaluation, with the exception that no comparisons to laboratory control will be conducted.

EPA attempted to salvage data from this test by proposing that certain sediments be accepted as demonstrably non-toxic, and one sediment be accepted as demonstrably toxic, based on a thorough review of the data. As indicated by the Navy, this approach has been employed before by EPA. It should be noted that the use of this approach is generally limited to situations where the control performance had no practical impact on the Agency's ability to discern toxic from non-toxic sediments (*e.g.*, control survival is 79% rather than 80%, and statistical analysis demonstrates that interpretation of toxicity is unaffected). In the particular instance cited by the Navy, the data from a compromised test was presented by the responsible party late in the risk assessment process, and was included for informational purposes in the risk assessment, but given very little weight because there were multiple tests and multiple lines of evidence that were of better quality. (EPA can clarify these data further if needed). EPA's expectations for data quality have increased since that time, and more commonly, EPA chooses to re-run the test.

The response notes that the *Leptocheirus* Bioassay Protocol recognizes the expected high variability in the test results and points specifically to Table 13.3. Table 13.3 demonstrates some variability between laboratories in a Round Robin assay. The variability demonstrated in the table, however, is not as great as the variability seen in the results of the NSBNL toxicity tests. Further, while it is true that the *Leptocheirus* protocol denotes potential variability, it does not highlight high variability and does not focus on variability between beakers with the same homogenized sediment sample. This type of variability was seen in the NSBNL tests and indicates a potential problem that could be related to the failure of the test to meet acceptability criteria. As discussed above, results from the New London test are more similar to the results for that *laboratories that did not meet Control Performance Criteria*.

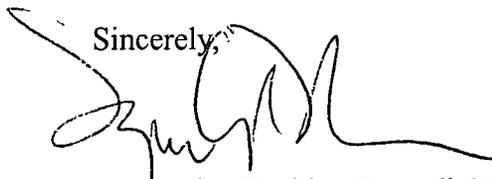
If the Navy believes that a limited re-test is unscientific, all samples could be run again. In the next round of testing, assuming that the next test has valid results, any sample that shows significant impact on survival, growth, or reproduction will be considered toxic. Results from previous testing will not be used or referenced in any way to refute the valid test. EPA is concerned with the Navy's extensive delays in resolving this issue.

Response 3. See previous response. The toxicity test did not meet performance criteria. The entire data set is therefore not valid and can not be used for toxicity evaluation.

Response 5. The response is correct in its explanation that the 70% criterion does not distinguish between acceptable and unacceptable risk, but between low and high unacceptable risk. If the Reference area survival were 70% and a site station had survival greater than 70% of the Reference area survival, the location would be given a "low magnitude unacceptable risk" designation. The risk management decision is then based on an interpretation of low versus high magnitude risk.

I look forward to working with you and the Connecticut Department of Environmental Protection to protect the environs of the Naval Submarine Base. EPA is particularly interested in seeing some progress at the lower submarine base site and to the ultimate delisting of the site from the NPL. Please do not hesitate to contact me at (617) 918-1385 should you have any questions or wish to arrange a meeting.

Sincerely,

A handwritten signature in black ink, appearing to read 'Kymberlee Keckler', written over the word 'Sincerely,'.

Kymberlee Keckler, Remedial Project Manager
Federal Facilities Superfund Section

cc: Mark Lewis, CTDEP, Hartford, CT
Dick Conant, NSBNL, Groton, CT
Bart Hoskins, USEPA, Boston, MA
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