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TREASURE ISLAND
SSIC NO. 5090.3.A

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

August 3, 1998

MEMORANDUM

SUBJECT: Review of the Draft RI Report for Offshore Sediments Operable Unit, Naval Station Treasure Island June, 1998

FROM: Clarence A. Callahan, PhD
BTAG Coordinator
Technical Support Team (SFD-8B)

TO: James Ricks, Remedial Project Manager
Navy Section (SFD-8-2)

There are several major problems with this document and the process described. These problem must be discussed and a satisfactory resolution reached before the document can be acceptable.

1. p5-1, Screening Methods. Ambient Chemical Concentrations. The "new" ambient Water Board numbers should be used, not the Shearwater numbers.

a- The Paradise Cove reference site may have been selected by the Navy on the advise of the Water Board and other agencies involved in this risk assessment, however, there are problems with the survival of the test organism that may be related to the lack of year round sampling at this site by the Navy which emphasizes the samples being collected in March and April.

b- p5-3-4, The ER-L and the ER-M are incorrectly defined. The ER-L is the 10th percentile of the concentration data from the published data sets and reported by Long and Morgan (1990), not the effects data that are associated with these concentrations. Long et al (1995) reports the incidence of adverse biological effects for these concentrations which is a different endpoint. Long et al (1995) provides the exact percentage of effects that were observed in the distribution of concentration data as incidence of

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effects at or below the ER-L, above the ER-M and in between these percentile concentrations.

c- Comparison of observed COC values to "project specific reference site" should be a distribution rather than the maximum or the mean if the "Reference Envelope" approach is used.

d- p5-2, What is the basis for using the Puget Sound number for tributyltin as a screening value at Treasure Island?

e- Table 5-1, Sediment Screening Values. The Ambient Concentrations of Toxic Chemicals in San Francisco Bay Sediments report by the Water Board should be used instead of the Shearwater Site numbers. When comparing these data with the new Water Board ambient numbers, the differences really stand out.

2. p6-1, Identification of Inorganic COPECS.

The discussion is fine, however, a more efficient way to examine these data is in the table of all the data with the appropriate standards i.e., the 1998 Water Board ambient numbers.

3. p6-17, Skeet Range Sediments. There were many observed concentrations even above the ambient number used of 35.00 mg/kg, yet the concluding statement by the Navy is, "*Detected lead concentration in skeet range sediments are within the range of concentration detected in Area C and D subsurface sediment samples*." I'm not sure this is the most meaningful statement that can be made about the skeet range and lead contamination. EPA feels that lead should be further evaluated for the skeet range.

4. p7-1, Identification of Organic COPECs.

5. How is SOD used, how will it be interpreted? Is there a standard method for this analysis? Please provide a citation.

6. p7-2, What is the Navy proposal for those detections limits above the available screening values?

7. Organic chemicals, like inorganic chemical concentrations should be compared to the 1998 Water Board ambient levels rather than the reference site.

a- p7-22, PCB detection limits were above the chronic AWQC.

8. p8-1, Bioassay Data.

a- I believe it is reasonable to use the RWQCB's reference envelope approach as comparison (Susan Gladstone, personal comm.) because the data from which the survival of 68% for *Eohaustorius estuarius* is based on several sites around the bay which makes the data more comprehensive. In addition, the 68% survival is very close to the generally acceptable survival rate as reported by Dewitt et al (1988) after adjusting for the potential effects (10%) of fine sediments (Jim Polisini, personal comm.).

b- It is unreasonable to compare any test results to the 45% survival observed at the Paradise Cove reference site.

9. p8-3, Echinoderm Bioassay.

a- Because of the large number of rejected data sets for the echinoderm tests, echinoderm fertilization should be used instead of embryo development during the next round of sampling and testing.

b- p8-4, What ammonia data were used to make the comparison for rejecting the tests? There are three columns of ammonia data in Table 8-2, are these correlated?

10. p9-1, Spatial Distribution of Chemical Concentrations. It is not acceptable to use the ER-Ms as a screening value to calculate the HQ or the HI because there are significant levels of effects occurring at even the ER-L level (Long et al, 1995).

A more logical approach would be an average effect as reported in Long et al (1995) based on the observed concentration. Any average over 25%, for example, should be considered a significant risk at the particular location. This is, of course, in-lieu of describing the risk as in risk characterization. All of section 9 should be recalculated as suggested here.

11. p10.1, Selection of Chemicals of Ecological Concern.

a- Condition number 1 is not based on any discussion or agreement between the Navy and the agencies and is unacceptable.

b- Condition number 2 is not based on any discussion or agreement between the Navy and the agencies and is unacceptable.

c- Condition number 3 is reasonable and is based discussions and agreements between the Navy and the agencies and is acceptable.

12. p10-9, 4,4'DDD. The reasoning presented for eliminating DDD from the list of COCs does not make sense, DDD should be retained in areas A, B, C, D and G.

13. p10-10, DDE. The same illogical reasoning is presented for DDE as was the case for DDD, DDE must be considered at sites A, B, C and D.

14. p10-10 and 10-11, DDT. The same illogical reasoning is presented for DDT as was the case for DDD and DDE, DDT must be considered at sites A, B, C, D, E C4, G2, G15, and G17.

15. p10-11, Total DDT. Total DDT should be considered a COC because of the problem with the detection limit and the observed concentrations at areas A, B, C, D, G, C4, G2, G15 and G17.

16. p10-12, Alpha, beta and delta BHC should be considered a COC in areas A, B, C, D, E, and G.

17. p10-13, Lindane. Lindane should be considered a COC for areas C, D, G, C4, D8.

18. p10-13, Gamma-Chlordane. Gamma-chlordane should be a COC for areas A, B, C, D, E, and G.

19. p10-14, Heptachlor. Heptachlor should be a COC for areas A, C and D.

20. p10-14, Methoxychlor. Methoxyachlor should be a COC for areas A, C and D.

21. p10-15, Total PAHs. Total PAHs should be considered a COC for areas A, B, C and E.

22. p11-4, Ground water-Surface Water Interactions. I don't remember that the referenced report (PRC 1995) was reviewed and accepted. This should be revisited because of this effort.

23. p11-7, Rationale for Selection of Endpoints. I don't believe that EPA has accepted particular taxa as assessment endpoints. Reviews of past documents have made this point and this should be clarified. Particular species can be receptors, but they should not be identified as assessment endpoints or even measurement endpoints. This section should be rewritten to reflect this difference.

24. p12-3, Spatial and Temporal Variation in Exposure. ER-Ms should not be used as screening values.

25. p12-5 and 6. The Calculated Dose. The model shown for calculating the dose should be used to calculate a range of doses for a juvenile and an adult breeding receptor. This can be accomplished by holding all of the input data constant for the two specific age groups and varying the concentration of chemical in food items for each age group. These exposure doses should then be compared to the appropriate TRV (from the Navy-BTAG listing) to determine the dose that is considered to be a significant impact.

26. p12-9, Sediment Characterization. SOD should be defined and described how it is calculated, what is the standard and the Navy should provide a citation. Sediment data should include the median particle size.

27. (deleted)

28. p12-19, Bioavailability of Organic Chemicals. Some of the chemical concentrations appear to be correlated between the bulk samples and the pore water samples, however, the plots suggest that problems exist with detection limits e.g., benzo(a)pyrene and benzo(e)pyrene.

29. p13-9, Toxicity Tests. The data for the echinoderm embryo development test should be reconsidered because of the suspected effects from ammonia, however, these data should be evaluated carefully as some inconsistencies appear to be

present. There are some tests with high survival (72 and 79 percent) that were rejected because of high ammonia (Samples A1 and B7 respectively from Table 8-2).

30. p13-9, Amphipod Bioassay. What is the total N for the test results stated to be the average survival for *E. estuarius* (77 plus or minus 24 percent?

31. p13-11, There are other factors that affect the bioavailability of metals in addition to AVS/SEM relationships including pH, TOC and particle size distribution of sediment.

32. Mercury is not considered to be influenced greatly by AVS/SEM relationships (Ankley et al, 1996). These statements should be rewritten.

33. The amphipod survival benchmark should be 68% not 45%.

34. p14-1, Risk Characterization. The ER-M is not a good indicator of risk, only potential effects. Long et al (1995) show the distribution of incidence of effects at the ER-M, the ER-L and in between. This paper should be used to interpret the data collected for the Treasure effort. I don't remember Ed Long stating that an ER-M average of 30 to 50 indicates a high potential for adverse effects.

a- Risk characterization based on the ER-M is not acceptable.

b- Risk characterization to higher trophic receptors is yet to be presented.

Literature Citations:

Ankley, G.T., D.M. Di Toro, D.J. Hansen and W.J. Berry. 1996. Technical basis and proposal for deriving sediment quality criteria for metals. Environmental Toxicology and Chemistry, Vol. 15, No. 12, pp2056-2066.

Dewitt, T.H., G.R. Ditsworth and R.C. Swartz. 1988. Effects of natural sediment features on survival of the Phoxocephalid amphipod, *Rhepoxynius abronius*. Marine Environmental Research 25, pp99-124.

Susan Gladstone (personal comm.) Question, "Is it appropriate for the Shearwater

survival level (survival of 68% for *Eohaustorius estuarius*) as determined by the Reference Envelope approach to be used for a benchmark at Treasure Island?" Answer, "Yes, because the Reference Envelope approach uses a number of sites throughout the San Francisco Bay (in the Shearwater case) to develop the critical survival level. By using multiple sites and samples, the approach is more representative of the ambient levels found in the Bay and therefore more logical as a benchmark. "

Long, E.R., D.D. MacDonald, S.L.Smith and F.D. Calder. 1995. Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuarine sediments. Environmental Management. Vol 19, No. 1, pp81-97.

Long, E.R. and L.G. Morgan. 1990. The potential for biological effects of sediment-sorbed contaminants tested in the national status and trends program. NOAA Technical Memorandum NOS OMA 52. Seattle: National Oceanic and Atmospheric Administration, Office of Oceanography and Marine Assessment.

Jim Polisini (personal comm.). Question, "Is 68% survival from the Shearwater site a reasonable and logical benchmark for comparison to Treasure Island test results?" Answer, "Yes, because 68% is very close to the generally acceptable survival rate (76%) as reported by Dewitt et al (1988) after adjusting for the potential effects of fine sediments (10%) yields a survival of approximately 69%.

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