

STATE OF CONNECTICUT
DEPARTMENT OF ENVIRONMENTAL PROTECTION



BUREAU OF WATER MANAGEMENT
PERMITTING, ENFORCEMENT & REMEDIATION DIVISION
FEDERAL REMEDIATION PROGRAM

March 7, 1997

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

Re: State Comments Regarding The *Revised Draft Focused Feasibility Study for Area A Downstream/ OBDA (Site 3), Naval Submarine Base New London, Groton, Connecticut*

Dear Mr. Evans:

Staff of the Federal Remediation Program of the Permitting, Enforcement, and Remediation Division of the Bureau of Water Management have reviewed the "*Revised Draft Focused Feasibility Study for Area A Downstream/ OBDA (Site 3), Naval Submarine Base New London, Groton, Connecticut*". This document was dated December 1996 and was received by the Department on December 6, 1996. It was prepared by Brown and Root Environmental on behalf of the Northern Division Naval Facilities Engineering Command.

General Comments

1. The State's Preferred Alternative

Under Alternative 2, contaminated sediments and soil would be capped in place. Under Alternative 3 contaminated soil and sediment would be excavated and shipped off site for disposal, while under Alternative 4 sediments would be shipped off site for disposal and soil would be treated and replaced on site. The State would prefer that contaminated soils not be left in place, as proposed under Alternative 2. The State would support either Alternative 3 or Alternative 4, providing that the selected alternative is implemented in accordance with all requirements of our Remediation Standard Regulations. We are pleased that the Navy has informally agreed to select Alternative 4.

2. Applicability of Direct Exposure and Pollutant Mobility Criteria

Significant concentrations of DDT, DDD, and DDE are present in both soil and sediment, and significant risks are associated with these compounds. Direct Exposure and Pollutant Mobility Criteria for these compounds are not given in the regulations. Since these three compounds are the main Contaminants of Concern (COCs), Direct Exposure and Pollutant Mobility Criteria must be calculated

Area A Downstream/ OBDA FFS

State of Connecticut Comments

March 7, 1997

Page 2 of 9

for each. In addition, Direct Exposure and Pollutant Mobility Criteria should be calculated for manganese, since it is a contributor to risk under several risk assessment scenarios, and it is leaching from fill placed by the Navy. Several options are available to the Navy for doing so.

3. Calculating Direct Exposure Criteria

Section 22a-133k-2(b)(4) of the Regulations provides a mechanism for the Commissioner to approve a Direct Exposure Criterion for a substance when one is not specified in the regulations. This section of the regulations includes equations for calculating both residential and industrial/ commercial Direct Exposure Criteria. These are the equations that were used by the Department for calculating the default Direct Exposure Criteria listed in Appendix A of the regulations, and the equations make use of the same generic risk assessment scenarios that were used in the Department's calculations. A memo correcting errors in the risk based equations contained in the regulations is appended for use in calculating these criteria.

The report notes that as previously discussed between EPA, the State and the Navy on October 25, 1996, the industrial land use scenario is the most likely exposure scenario for this site. Based on this, the Navy cites the industrial/ commercial Direct Exposure Criteria. If the site is not cleaned up to meet the residential Direct Exposure Criteria, an environmental land use restriction would be required to ensure that the site is not used for residential purposes. In addition, the Navy would be required to continue to maintain the fence that separates the site from the adjacent playground and swimming area. In addition, the Area A Downstream site is largely wetlands. For this reason, it is unlikely that the site could be developed if the site was transferred from the Navy to another entity. It is likely that in this circumstance, one of the few acceptable uses for the site would be as a passive recreational area. Please note that under Section 22a-133k-1(a)(53) of the Remediation Standard Regulations, an outdoor recreational area is considered a residential activity which would be prohibited unless the site were remediated to comply with the Residential Direct Exposure Criteria.

For your information, we have calculated the residential and industrial/ commercial Direct Exposure Criteria for DDT and associated compounds and provided these below:

Direct Exposure Criteria (mg/kg)		
	Residential	Industrial/Commercial
DDD	2.6	23.8
DDE	1.8	16.8
DDT	1.8	16.8

Please note that the Department has established acceptable risk levels at 1E-6 for individual chemicals and 1E-5 for cumulative risks for exposure to mixtures of carcinogens. The report indicates that these

*Area A Downstream/ OBDA FFS
State of Connecticut Comments
March 7, 1997
Page 3 of 9*

risk levels are exceeded within zones 1, 2 and 3 for the older child trespasser and construction worker scenarios.

4. Alternative Exposure Scenarios

A second option available to the Navy is to use alternative risk based Direct Exposure Criteria based on site specific exposure scenarios. In order to determine the appropriate risk based clean up level for the site, future site uses must be explicitly identified. Within the report, the industrial Direct Exposure Criteria have been used. However, it is likely that neither the industrial nor the residential criteria contained in the regulations are entirely applicable. Exposure scenarios for child trespassers and construction workers have been identified in the human health risk assessment. The trespassing scenario, along with potential recreational exposure, are of concern at this site. The exposure assumptions implicit in the industrial Direct Exposure Criteria are not appropriate for setting risk based remedial goals considering recreational and trespasser scenarios.

If the Navy does not chose to apply the Direct Exposure Criteria calculated using the default exposure scenarios, I recommend that the Navy submit for the review and approval of the Department a proposal to develop alternate risk based criteria for this site based on site specific exposures, as provided for in Section 22a-133k-2(d)(2) of the Regulations. The potential exposure of children to this site must be evaluated for the establishment of appropriate remediation criteria.

Site specific Pollutant Mobility Criteria should also be calculated. Section 22a-133k-2(c)(5) allows the Commissioner to approve a Pollutant Mobility Criterion for a substance when one is not specified in the regulations. With the Commissioner's approval, the Navy may also use alternative Pollutant Mobility Criteria as specified in Section 22a-133k-2(d)(5), or an alternative Dilution or Dilution and Attenuation Factor as specified in Section 22a-133k-2(d)(6).

5. Other Contaminants

It is appropriate to focus remedial efforts on DDTR but also important to note that there are other chemicals on site which may also pose risk to ecological receptors. The Navy must make sure that remedial actions address these issues and do not increase the concentrations of these compounds, such as metals, thereby increasing risk to human or ecological receptors.

6. Application of Soil Criteria to Sediments

Although the RSRs present the Direct Exposure Criteria as applicable to soils, it is also appropriate to apply these standards to sediments which can come in contact with human receptors. Sediment data should be evaluated for consistency with the Direct Exposure Criteria.

*Area A Downstream/ OBDA FFS
State of Connecticut Comments
March 7, 1997
Page 4 of 9*

7. Reuse of Treated Soil

Treated soils would be replaced onsite under Alternative 4. Section 22a-133k-2(h)(1-4) of the Remediation Standard Regulations specifies the circumstances under which treated soils may be reused on the site. Treated soils may be reused at any location on the site or another site if any naturally-occurring substance is present in the soils in concentrations not exceeding the background concentration for soil of such substance at the release area from which such soil is removed; and no other substance is detectable in such soil at a concentration greater than its analytical detection limit.

Soils which are treated to comply with both the Direct Exposure and Pollutant Mobility Criteria, but still have detectable contamination may be reused only above the water table, in an area which is not subject to erosion. This would preclude replacement of any treated soil or sediment within wetland or watercourse areas. Prior to placement of soils in upland areas, a map showing the location and depth of proposed placement must be submitted to the Commissioner. In addition, any soil which does not meet the GA Pollutant Mobility Criteria may not be placed over soil and groundwater which has not been affected by a release on the parcel where placement has been proposed.

For alternatives 3 and 4, the Navy draws a distinction between sediments which would be dredged from ponds and streams, and soils which would be excavated from upland areas. Sediments would be shipped off site for disposal under either of these alternatives. This approach would eliminate concerns regarding replacement of treated sediments below the water table. Treated soils would be replaced onsite under Alternative 4. Replacement of treated soils in areas above the water table would be acceptable to the State providing it is done in accordance with the requirements of the Remediation Standard Regulations.

8. Groundwater and Surface Water Issues

It is expected that groundwater and surface water issues will be evaluated at a later date, as part of the planned Basewide Groundwater Operable Unit, or other appropriate studies.

Specific Comments

9. Page 1-54 Section 1.3.4 Comparison of Site Data with Federal & State Standards

The last sentence in the first paragraph cites the January 1992 version of the Department's Water Quality Standards. Please note that the revised Ground Water Quality Standards became effective April 12, 1996. The Surface Water Quality Standards, which became effective on May 15, 1992, continue to apply. Please revise the citation accordingly.

The last sentence in the second paragraph discusses "Direct Contact" and "Groundwater Protection" criteria for soil. The Ground Water Protection Criteria are not directly applicable to soil. The Direct

*Area A Downstream/ OBDA FFS
State of Connecticut Comments
March 7, 1997
Page 5 of 9*

Exposure Criteria and the GB Pollutant Mobility Criteria are the appropriate standards which should be cited here.

This sentence also states that neither criteria was exceeded, and the accompanying Table 1-10 notes that Remediation Standards for these compounds are not available. This statement ignores the fact that significant concentrations of DDT, DDD and DDE, as well as manganese, are present at the site. Direct Exposure and Pollutant Mobility Criteria should be calculated for each of these substances, as discussed above in General Comments 2-5. Please revise this paragraph to discuss the derivation of Direct Exposure and Pollutant Mobility Criteria for these substances.

The second paragraph of Section 1.3.4 states also that the current ground water classification of the site is GAA/GA. The same requirements under the remediation standard regulations apply to GA areas as apply to GAA areas. However, GAA areas are not the same as GA areas. The GAA classification applies to groundwater within the area of influence of public water supply wells or within a public water supply watershed. This is not the case at the Sub base. The actual classification of the site is GA. As noted in the text, the Navy expects that the ground water classification for the base will be changed to GB.

10. Page 1-56 Table 1-11

Please revise this table to include aquatic life criteria for aluminum (EPA 440/5-86-008; 750 ppb CMC & 87 ppb CCC) as well as the Connecticut water quality criteria designated human health: consumption of organisms. These criteria are applicable to surface waters within the state in addition to the aquatic life criteria. Health criteria are available for several of the compounds in the table including DDT, DDE and DDD.

11. Page 1-59 Table 1-13

Does this table contain all chemicals which may contribute risk at the site? At a minimum, should lead be included in this table?

12. Page 2-5, Table 2-1; Page 2-6, Table 2-2; and Page 2-23 Table 2-6

These tables list respectively the Chemical Specific, Location Specific, and Action Specific ARARs and TBCs which would apply at this site. The Department agrees that all of the listed state ARARs and TBCs would apply at this site. However, several additional state ARARs should be listed. We will forward under separate cover a complete list of state ARARs which we believe would apply.

13. Page 3-19 Section 3.2.6.1 Offsite Landfill

This section discusses various types of landfills being considered for disposal of contaminated soils

*Area A Downstream/ OBDA FFS
State of Connecticut Comments
March 7, 1997
Page 6 of 9*

and sediments. It should be noted that under Section 22a-209-7(o) of the Department's Solid Waste Regulations, disposal of hazardous waste (as defined in RCSA §22a-209-1) at a landfill is prohibited. However, Section 22a-133k-2(h)(2) of the Remediation Standard Regulations specifies that in accordance with RCSA §22a-209-8, the Commissioner may authorize polluted soil, which is not hazardous waste as defined pursuant to CGS §22a-449(c), to be disposed of as special waste as defined in RCSA §22a-209-1. Please contact me if you wish assistance in making arrangements for disposal at an in- state landfill.

14. Page 3-21 Section 3.2.6.2 Onsite Reuse- Implementability

As discussed above in General Comment 7, replacement of treated soils and sediments in wetland areas or areas below the water table is prohibited under the remediation standard regulations unless the soil is treated so that no substances are present at concentrations exceeding detection limits, except for naturally occurring substances which do not exceed background concentrations. Under Alternative 4, the Navy would ship all sediments off site for disposal, while treating and replacing soils on site. Would this restriction have any effect on the implementability of Alternative 4? Please add a sentence noting that treated soils would be replaced only in areas above the water table, which are not subject to erosion, as specified in the regulations.

This comment applies also to the discussion on pages 4-24 and page 4-29 regarding Alternative 4.

15. Page 3-22 Containment

Please replace "sheet piping" with "sheet piling".

16. Page 3-23 Section 3.4 Screening of Technologies and Selection of Representative Process Options for Wastewater

An individual NPDES permit would be required for discharge of dewatering wastewater to surface water. Although a general permit is available for storm water and construction dewatering wastewater, the potential presence of DDT and its breakdown products in the water would make this discharge ineligible for the general permit. It is likely that this discharge would be eligible for an abbreviated NPDES permit known as a "Temporary Authorization" (TA). A TA allows certain types of discharges to surface water for up to one year. As with regular NPDES discharges, effluent limitations for TAs are set on a case- by- case basis, based on the chemical characteristics and flow rate of both the discharge and the receiving water body. The Department would require that the proposed discharge comply with individual effluent limitations for a suite of contaminants, as well as acute and chronic toxicity requirements. The second paragraph on page 3-23 cites specific limits for gross particulate matter and DDT, DDD, and DDE. The limits cited are useful for the purpose of comparing various alternatives proposed in the FS. However, the Navy should be aware that the actual limits may be different. To allow as much processing time as possible, we encourage the Navy to contact the

*Area A Downstream/ OBDA FFS
State of Connecticut Comments
March 7, 1997
Page 7 of 9*

Department regarding permitting requirements as soon as a final remedy is selected.

17. Page 4-1 Section 4.1 Assembly of Alternatives

Section 22a-133k-3(g) of the RSRs requires that a ground water monitoring plan be prepared and implemented as part of any remedial action. This requirement would apply to each of the 3 alternatives (with the exception of no action). The goal of groundwater monitoring, in a GB area is to determine the following: (A) the effectiveness of soil remediation in preventing further pollution of ground water (B) the effectiveness of any remediation taken to eliminate or minimize identified health or safety risks associated with such release; (C) whether applicable Ground-water Protection Criteria, Surface-water Protection Criteria, and Volatilization Criteria have been met; and (D) whether the ground-water plume interferes with any existing use of the ground water for a drinking water supply or with any other existing use of the ground water, including but not limited to industrial, agricultural or commercial purposes. Goals (C) and (D) would not apply to the presently proposed remedy, since it is not designed to address ground water issues. However, these issues must be addressed as part of the planned separate base- wide ground water study.

Monitoring of "contaminated media" is discussed on page 4-2 in Section 4.12 as part of Alternative 2. This monitoring would be ongoing, since wastes would be left in place under this alternative. However, ground water monitoring should also be included as an element of Alternatives 3 and 4. RCSA Section 22a-133k-3(g)(3)(B) specifies that in a GB area ground water monitoring may be discontinued two years after completion of remediation if the surface water and ground water protection criteria are met and ground water is suitable for all existing uses. Please revise sections 4.1.3 and 4.1.4 to include ground water monitoring.

18. Page 4-23 Section 4.2.3 Alternative 3 - Cost and Page 4-29 Section 4.2.4 Alternative 4-Cost

Cost estimates for these two alternatives are not provided due to the expected short duration of the work. However, as noted above in our comments regarding page 4-1, ground water monitoring would be required during and for a minimum of a two year period following completion of remediation. The cost of a ground water monitoring program should be included in the cost estimates provided in the report.

Comments on Appendix A: Estimation of PRGs for Ecological Receptors - DDTR Contamination

19. What value is used for the variable TF (fraction of ingested contaminant converted to contaminant in shrew tissues)? Please provide justification.

*Area A Downstream/ OBDA FFS
State of Connecticut Comments
March 7, 1997
Page 8 of 9*

20. Further detail should be provided regarding the use of LOAEL values in place of NOAEL values in determining risk based RAOs. Please specify whether any uncertainty factors were applied to the LOAEL values prior to use. Provide example calculations.
21. The use of alternative water quality criteria for DDTR in deriving sediment quality criteria based on equilibrium partitioning is acceptable to DEP for this site.
22. ER-M values from NOAA have been proposed as sediment RAOs for inorganic contaminants. These values represent a concentration at or above which "effects would frequently occur" (Long *et al.*, *Environmental Management* v. 19, No. 1, pp. 81-97). Additionally, the ER-M values for metals were compared with the Lowest Effect Levels and Severe Effect Levels established for freshwater sediments by the Ontario Ministry of the Environment. Sediment effect levels established by NOAA for arsenic, chromium and copper are two to more than three times greater than the Severe Effects Levels established by the Ontario Ministry of the Environment.

The application of sediment effects ranges from estuarine and marine environments to freshwater ecosystems is generally accepted. However, two factors suggest a higher level of uncertainty regarding the anticipated level of environmental protection afforded by the use of the ER-M for a cleanup (RAO) value, as proposed by the Navy. First, the ER-M is less protective than the ER-L value, which is the level at which no effects are anticipated. The second factor is the discrepancy observed between these values and the freshwater levels established by Ontario. To address the uncertainties surrounding the use of ER-M values as opposed to ER-L values, the Navy has indicated that the maximum sediment concentrations should be compared with the RAO values to determine if adequate protection is provided. However, in the tables provided within the report which compare site data with proposed RAOs and in the calculation of hazard quotients for sediment exposures, average sediment concentrations were used, rather than maximum concentrations.

RAOs for sediment should be based either on background data from applicable reference sites or acceptable sediment effects levels, whichever is greater. It is preferable to use effects levels that are indicative of limited impacts to the ecosystem, such as ER-L and Lowest Effects Levels. However, if less conservative effects concentrations are used, the most restrictive of the ER-M and the Ontario Severe Effect Level values should be used and compared with maximum sediment concentrations. Tables within the report should be revised to reflect the use of maximum values. A more detailed discussion of the ability to achieve these RAOs should also be included.

23. It is not appropriate to dismiss the observed variability of TOC within the various water bodies. EPA has considered organic carbon content in the establishing sediment quality criteria based on equilibrium partitioning. This indicates that differences in TOC could affect the

*Area A Downstream/ OBDA FFS
State of Connecticut Comments
March 7, 1997
Page 9 of 9*

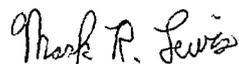
bioavailability of sediment contaminants to exposed organisms. In general there is an inverse correlation between TOC of a sediment and the degree to which DDT and its residues are bioavailable in that sediment.

The RAO proposed was derived for DDT in sediments collected from Area 1. Total organic carbon reported for Area 1 is significantly greater than that reported for Areas 2 and 3. Therefore, the proposed RAO for DDTR may not be sufficiently protective for Areas 2 and 3. This hypothesis is further supported by the RAO values provided in Table 9. The proposed RAO of 3 mg/kg for DDTR is the highest of all the calculated RAO values for benthic macroinvertebrates for all DDTR components across the 3 areas. Additionally, within the discussion of the empirical approach to evaluating risk for benthic macroinvertebrates, the report (Appendix A, p. 21, ¶ 1) indicates that the lower threshold for DDTR effects observed within the streams is around 1 mg/kg. Based on these concerns, the applicability of the proposed RAO across the entire site needs to be technically justified or modified prior to concurrence by the Department.

24. As part of the ecological data collected in support of the risk assessment, frog tissues were analyzed for DDTR content. Please evaluate this data with respect to establishing a site specific bioaccumulation factor using this data. The frog BAF should then be compared with the site specific earthworm BAF developed and an evaluation made as to which BAF value is most appropriate for use in the risk assessment.

If you have any questions regarding this letter, please contact me at (860) 424-3768.

Sincerely,



Mark R. Lewis
Senior Environmental Analyst
Federal Remediation Program
Permitting, Enforcement & Remediation Division
Bureau of Water Management

Attachment

cc: Kymberlee Keckler, US EPA New England, Federal Facilities Section
Andy Stackpole, NSBNL Environmental Department
Jean-Luc Glorieux, P.E., Brown & Root Environmental
Traci Iott, CTDEP