UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 1
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BOSTON, MASSACHUSETTS 02114-2023

December 8, 1999

Mr. John Burleson
BRAC Environmental Coordinator
Stratford Army Engine Plant
550 Main Street
Stratford, CT 06497

Re: Draft Remedial Investigation Ecological Problem Formulation Technical Memorandum
Stratford Army Engine Plant
Stratford, CT

Dear John:

The United States Environmental Protection Agency (EPA) has reviewed the draft document entitled "Remedial Investigation Ecological Problem Formulation Technical Memorandum" for the Stratford Army Engine Plant (SAEP) in Stratford, Connecticut. This report was received in this office November 3, 1999.

EPA's comments on the above-mentioned document are provided in Attachment I to this document.

If you have any questions regarding these comments, please contact me at (617)918-1387.

Sincerely,

Meghan F. Cassidy

Meghan F. Cassidy
Remedial Project Manager

Enclosure

cc: Jeff Frye/Army Corps of Engineers
Ken Feathers/CT DEP

ATTACHMENT I

The following are the United States Environmental Protection Agency's (EPA"s) comments on the draft document entitled "Remedial Investigation Ecological Problem Formulation Technical Memorandum" for the Stratford Army Engine Plant (SAEP) in Stratford, Connecticut. This report is dated September 30, 1999 and was received at EPA's office on November 3, 1999.

1.0 GENERAL COMMENTS

Concentration units reported in Appendix A tables (Summary of Detected Compounds ...) should be checked. For example, concentrations of arsenic are in some cases very high in sediment or biota, yet arsenic was not identified as a COC. Inorganic or trivalent arsenic was reported in hundreds of mg/g in sediment or tens of mg/kg in biota. This also appears to be the case for lead. Perform a QA check as needed, and revise the tables or edit the text and list of COCs as appropriate.

It's not clear whether Nell's Island Reference Area chemical data qualifies as background While it may be true that the area was previously sampled for that purpose for an NPL site, the data was later supplemented or replaced by data from Great Meadows Marsh, presumably because of unexpectedly high concentrations of certain sediment contaminants at Nell's Island This matter needs further discussion in the report to support the use of this data.

The RIECOMEM (1999) uses best professional judgement to identify COCs to be evaluated in the risk assessment, however, there appears to be premature dismissal of potential COCs. This would inappropriately bias (underestimate) a potential finding of risk Therefore, the following comments are suggested:

1. As stated in the RIECOMEM (1999), there are a number of criteria used to screen the data for COCs, including comparisons to reference area data. The reference location data was said to represent background without explanation or justification However, the procedure was not followed in the case of antimony, beryllium, aluminum, barium, cobalt, manganese, and vanadium. In general, EPA Region 1's policy is that all compounds with maximum concentrations that exceed screening values be carried through the risk assessment. If a certain compound is, or class of compounds are, thought to be in site media at background levels, such a hypothesis can be stated in problem formulation, but can only be tested (by comparison to appropriate background) in the risk characterization. Therefore, EPA does not support a screening based on background While a <5% frequency of detection rule can be used to screen data, a minimum of 20 samples is necessary to use this technique. Since fewer than this number were collected, the technique cannot be used. Revise the problem formulation to provide explanation and justification of the potential use of reference area data for background comparisons in the risk characterization, and revise the list of potential COCs based on the above comments

2. VOCs were detected in both the surface water and sediment at several locations yet these compounds are dropped from the RIECOMEM (1999). Since there are no screening benchmarks for these compounds, and the rationale for excluding them is based on the fact that the, "....concentrations were relatively low", these chemicals must be retained as COCs, or screened out in a manner that is less arbitrary.

3. PAHs were detected in sediment at each of the four ecosystems of concern at the site. Some of the highest concentrations occurred at the Outfall 008 Drainageway and particularly at sampling location 008-03. The RIECOMEM (1999) provides some text regarding the trends in the data and the nature and extent of contamination in the drainageway and the nearby Marine Basin. The text argues that based on a number of factors it is prudent to exclude several of the PAHs as COCs. While there may be some valid points presented in the text, based on the data presented, risks associated with these chemicals (and total PAH) should be carried into the risk characterization, and not discounted at the problem formulation step.

The basis for the preceding comments is the USEPA (1997) guidance which breaks the risk assessment process into two tiers: screening level and baseline. During the latter tier, the preliminary contaminants of concern are refined and eliminated as appropriate. Therefore, it is premature to exclude chemicals at the screening level (problem formulation) stage.

In Tables 7-10 of the RIECOMEM (1999), the TOC and AVS/SEM values are listed as minimum and maximum ranges for each the ecosystems of concern. This TOC data, however, is best used on a location-specific basis where hydrophobic organic compounds are a concern. Likewise, the AVS/SEM data is best used where the metals are a concern at specific locations. Please provide additional text to describe how this information is going to be incorporated into the ERA.

2.0 SPECIFIC COMMENT

Comment 1:

Page 2-4, Section 2.3.4, *Nell's Island Reference Area*

Revise to provide rationale/ justification for the use of the reference data as "background". It is presently unclear why it is assumed to represent background (see general comment above). Please edit the text.

Comment 2:

Page 2-7, Section 2.5, *Critical Habitats and Species*

This section discusses the threatened and endangered species likely to use the site as habitat such as the piping plover and least tern. Since these shorebirds are likely to frequent the site for both nesting and feeding purposes (critical habitat of these T&E species), some additional discussion

is warranted in the text regarding the presence of these species/ habitat and how their presence might impact the risk assessment. In other words, the presence of these species should cause one or another of these to be selected as avian receptors, impact the selection of the reference toxicity values (RTVs), and exposure factors used in the risk assessment. Revise the list of avian receptors and elaborate.

Comment 3:

Page 2-7, Section 2.5, *Critical Habitats and Species*

The section also describes the Preliminary Screening conducted in 1991 by Woodward Clyde where this critical species information was first presented. Since the last time this information was presented was eight years ago, and because this information is subject to change, it is recommended that an additional critical species search be conducted for the site as part of the upcoming ERA

Comment 4:

Page 3-6, Section 3.2 1, *Approach*

In the section on frequency of detection and estimated value, recognize that a minimum of 20 samples is needed to use the <5% frequency of detection rule to screen out chemicals from the list of COCs Revise the text and list of potential COCs.

In the section on bioaccumulation potential, insert text that describes how the risk assessment will determine which chemicals pose a risk of bioaccumulation/ biomagnification (based on physical chemical properties, using residue data, etc.). Consider adding a bioaccumulation screening step by comparing residue levels in area biota to residue levels of effect in USEPA (1999) or USACE databases.

Comment 5.

Page 3-6, Section 3.2.2.1, *Intertidal Mudflats*

In the second paragraph on the page, there is a discussion of exclusion of arsenic from the list of COCs based on screening values alone. In addition to the shortcomings of the COC selection process noted in the **General Comments** section, concentration units reported in Appendix A tables are in question, but especially for inorganic and trivalent arsenic and lead in sediment and biota. Edit the text and list of COCs as appropriate.

Comment 6

Page 3-13, Section 3 2.2.3, *Outfall 008 Drainage*

This section argues for the exclusion of sampling location 008-03 from the screening analysis

based on a number of factors As mentioned in the **General Comments** section, it is premature to exclude chemicals at this stage of the risk assessment except by comparison to screening levels of effect. Moreover, one of the sentences in this section states that it is unclear what role the Site has played in PAH contamination in the drainageway and Marine Basin. For this reason, it is important to retain the PAHs as COCs in the risk assessment.

Comment 7:

Page 3-13, Section 3.4, *Biota*

The section states that toxicity and bioaccumulation test data will be used qualitatively in determining risk to the ecological communities using the Site areas. Since the ERA plans on making full use of a weight-of-evidence approach, it is recommended that the Menzie et al. (1996) reference be consulted. Then describe how toxicity and bioaccumulation test data will be used as lines of evidence in the assessment.

Comment 8.

Page 3-13, Section 3 4.1, *Fish Tissue*

This section describes the fish sampling collected and analyzed for during the 1999 sampling round which included the prey species the Atlantic silverside and the mummichog However, if one consults Table 3 of the subject document, it seems to indicate that several other species were also collected such as the striped bass and American eel, but they were not analyzed. Previously, other reviewers had commented on collecting both eel and striped bass to represent those feeding niches in the estuarine ecosystem, however, this was not done. Please explain why and clarify.

Comment 9:

Page 3-14, Section 3.4.1 1, *Intertidal Mudflats*

The values detected in fish tissue are presented in the text. It also states that the values are not corrected for lipid concentrations. It is recommended that USEPA (1992) be consulted concerning methods for normalizing tissue residues based on tissue lipid content.

3.0 CONCLUSIONS

The RIECOMEM (1999) reports a reasonable approach for performing the ecological risk assessment at Stratford Army Engine Plant in Stratford, Connecticut with the following exceptions:

- selection of COCs is premature and inappropriate by certain techniques - faulty rules and logic are sometimes used,

- reference or background chemical data may be used to discuss relative risks in the risk characterization, but should not be used to screen out chemicals in the problem formulation step;

- inorganic and trivalent arsenic and lead should be retained as COCs based on reported sediment and tissue residue chemistry, unless data units are in error in Appendix A tables;

- clarification on the use of location-specific parameters such as TOC and AVS/SEM is needed;

- additional discussion is needed concerning T&E species and critical habitat that is known to occur on site and how this may impact selection of (avian) receptors and resulting risk assessment.

5.0 REFERENCES

Long, E R., D D. McDonald, 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* 19 81-97

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. National Oceanic and Atmospheric Administration

Menzie, C., M.H Henning, J Cura, K. Finkelstein, J Gentile, J. Maughn, D. Mitchell, S. Petron, B. Potocki, S Svirsky, and P. Tyler. 1996 *Special Report on the Massachusetts Weight of Evidence Workgroup: A Weight-of Evidence Approach for Evaluating Ecological Risks.* 2(2). 277-304.

USEPA 1999. *Linkage of Effects to Tissue Residues: Development of a Comprehensive Database for Aquatic Organisms Exposed to Inorganic and Organic Chemicals*, by A.F. Jarvinen and G.T. Ankley, SETAC Publication Series.

USEPA. 1992. *National Study of Chemical Residues in Fish.* Office of Science and Technology EPA 823-R-92-008.