



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**

**REGION I**

**J.F. KENNEDY FEDERAL BUILDING, BOSTON, MASSACHUSETTS 02203-2211**

January 8, 1993

Deborah Stockdale, RPM  
U.S. Department of the Navy  
Northern Division  
10 Industrial Highway  
Code 1823, Mail Stop 82  
Lester, PA 19113-2090

RE: EPA's Comments on the Phase II Remedial Investigation

Dear Ms Stockdale:

The purpose of this letter is to transmit EPA's comments on the proposed Phase II Remedial Investigation for the Naval Submarine Base - New London, Groton, Connecticut.

Attached you will find EPA's comments on the draft workplan, the proposed field sampling plan and quality assurance/quality control plan. EPA's comments consist of both general and specific comments; these comments are numbered for future reference.

Upon review of the rationale for the proposed extension to the Phase II Workplan Schedule, EPA agrees to extend the deadline for the submission of the Phase II draft report until the date currently listed in Figure 10-1 for the submission of the draft report for Navy review. This revised date for the submission and review of the draft report is consistent with the deadlines set for other Navy facilities in Region I. Based on a review of Figure 10-1 - Project Schedule, EPA and the Navy would receive the draft report twelve and half months after the initiation of the mobilization activities.

Based on our previous discussions, you will note on page 4 that EPA has requested the collection of surface water samples and the installation of groundwater monitoring wells immediately down-gradient of the Pistol Range located along Triton Road. This sampling effort will help determine if these soils of the Pistol Range are releasing contaminants to the environment.

The Navy should review these comments and provide EPA with a Response to Comments within forty-five days of receipt. Upon successful resolution of any outstanding issues with regard to work to be performed, a draft final workplan should be submitted which incorporates the previously generated data and the investigations.



EPA recommends that either a meeting or a conference call be scheduled in the near future to discuss some of the possible methods to expedite the selection of interim remedial options.

If you have any questions regarding these comments, you should feel free to call me at (617) 573-9614.

Sincerely,



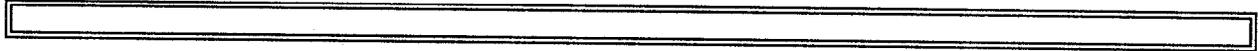
Andrew F. Miniuks, Geologist  
Federal Facilities Superfund Section

Attachments

cc. Carol Keating, EPA  
William Mansfield, NSBNL  
Dale Weiss, TRC  
Paul Jameson, CTDEP

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Attachment A - Ambient Air Sampling Plan  
with QA/QC Procedures

Attachment B - Standard Operating Procedures (SOPs)

**DRAFT WORKPLAN PHASE II REMEDIAL INVESTIGATION**

**General Comments**

1. The text frequently refers to "to be considered (TBC) values". Revise the workplan to include an explanation of this acronym and a description how these proposed values will be used to evaluate the data generated from the investigation.
2. The draft workplan does not adequately define the analytical methods. Examples of the lack of specificity include:
  - "the samples will be analyzed by NET methods";
  - two methods are listed for determining the total organic carbon (TOC) content of the soils;
  - incomplete description of the methods to be used for the Toxicity Characteristic Leaching Procedure (TCLP) (the workplan lists Method 1311, yet this is only a preparatory method).

Revise the workplan to define the site-specific analytical methods.

3. The Quality Assurance/Quality Control (QA/QC) Plan does not contain all the site-specific proposed methods or their respective quantitation limits (e.g., dioxins and radiologicals).

Revise the workplan to include all of the site-specific analytical methods and the quantitation limits for all of the proposed methods.

4. The QA/QC Plan does not clearly indicate that sediment samples must contain greater than thirty (30) percent solids in order for the samples to be considered valid. Revise the workplan accordingly.
5. The proposed workplan does not present a discussion of the data reporting/data submission procedures. Revise the workplan to include the data reporting procedures. This description should include the format in which the results will be presented and the presentation of the field screening data.

6. Based on the information presented in the Draft Work Plan, air pathway analyses for pollutants, in addition to VOCs, are required. EPA suggests that the US Navy revise the workplan to include, at a minimum, the monitoring of the air pathways for lead, polychlorinated biphenols (PCBs), DDT, and other semi-volatiles.

The US Navy should develop an air monitoring plan for the site investigation. For reference, the US Navy should review the four volume Air/Superfund National Technical Guidance Study (NTGS) Series, as well as the attached Air Sampling Plan guidance (see Attachment A).

7. The draft workplan includes only brief references to the previously detected contamination, resulting in inadequate justification to support the proposed sampling locations. Additional figures which depict the extent of contamination are necessary to support the proposed sampling plan.

Provide maps which show the aerial and vertical extent of contamination which has been previously detected at the Step II Sites.

8. Modify the workplan to include descriptions of the Supplemental Step I Investigations. Provide the rationale for not including the investigative plans for the CBU Drum Storage Area or the OBDANE in this workplan.
9. Several references to inorganic background concentration levels are made throughout the workplan. These references include discussions of nature and extent (e.g. page 18 ¶4, page 35 ¶1, page 38 ¶ 2, etc.) and risk (e.g. page 70 ¶ 5) without recognizing the fact that these levels have not been approved by EPA.

Qualify the references to inorganic background concentration levels with a statement which indicates that these levels have not yet been finalized.

10. There are numerous references throughout the workplan to contamination present at a particular unit which may "possibly be associated" with some other adjacent unit, or that "ground water flow is projected to be generally to the southwest (page 29 ¶1)" but there are no maps which portray the surface or subsurface flow relationships.

EPA suggests that the US Navy consolidate the investigation of the Rubble Fill at Bunker A-86, the Area A Landfill, CBU Drum Storage Area, Area A Wetland, Area A Downstream, Weapons Center, Over Bank Disposal Area, and the Torpedo Shops to help optimize the sampling activities outside of the immediate source areas.

11. Revise the workplan to include the installation of additional groundwater monitoring wells immediately upgradient of the Downstream Watercourse located along Triton Road. These shallow groundwater monitoring wells shall be installed between the Pistol Range and the downstream watercourse. In addition, modify the workplan to include the collection of both upgradient and downgradient surface water samples from both of these drainpipes. These samples should be analyzed for metals; in particular lead. These groundwater and surface water samples will identify potential releases of hazardous constituents from upgradient sources.
12. Present groundwater elevation maps (i.e., contouring of the potentiometric surface) with the interpreted direction of groundwater flow for all Step II sites.
13. Modify the Site Dynamics section of the workplan to include discussions of the source areas and release mechanisms. The conceptual model approach should follow RI/FS guidance.
14. Without a base-wide understanding of the bedrock elevation contours, it is not possible to fully understand potential migration pathways.

Modify the workplan to include the development of a base-wide bedrock elevation map. This modification should also include the use of seismic refraction surveys to obtain the bedrock elevation data where there are no borings.

15. Modify the workplan to clearly explain the procedures used to determine the potential target remediation levels, as presented in Section 6.0 and Appendix C. The workplan should also cite the appropriate guidance (e.g., Human Health Evaluation Manual, Part B: "Development of Risk-based Preliminary Remediation Goals". OSWER Directive 9285.7-01B. December 13, 1991).

Present, if applicable, sample calculations showing exposure assumptions used to develop each target remediation level need to be presented. For target levels based on ARARs rather than on risk assessment, provide the appropriate references for the use of the target level.

16. The proposed workplan makes general references to numerous locations regarding analytical parameters. Modify the workplan to reference the US EPA Contract Laboratory Program (CLP) Target Analyte List (TAL) and Target Compound List (TCL) whenever appropriate.
17. Modify the workplan to ensure that the ecological risk assessment include the analysis of full TAL and TCL Volatile Organic Compounds (VOCs), Semi-Volatile Organic Compounds (SVOCs), pesticides and PCBs for all surface water and sediment samples, as well as Total Organic Carbon (TOC) and grain size analyses in sediments. Fresh water samples also require the analysis of hardness.
18. EPA suggests that the US Navy consider the Connecticut Arboretum across the Thames River in New London as one of the possible sources of surface water, soil and sediment background data. Although this area is separated from the base by the river, it is possible that it may resemble background conditions of the area.
19. The Remedial Action Objectives (RAOs) in the workplan do not adequately describe the contaminants of concern for groundwater, the remediation levels and the remedial technology data requirements. Each remedial technology must have a corresponding list of data requirements specific to the technology.

In addition, the draft workplan does not clearly describe whether the remedial investigation objectives tables fulfill the information requirements of the preliminary action objectives tables.

Modify the workplan to ensure that each remedial technology has a corresponding list of data requirements specific to the technology and present the RAOs in the format specified in the Guidance for Remedial Investigations and Feasibility Studies under CERCLA (EPA, 1988). The modified RAOs should include the following components:

- Contaminant(s) of Concern;
- Exposure Route(s) and Receptors;
- Acceptable contaminant level or range of levels for each exposure route.

The identification of the specific compounds and the preliminary remediation levels are needed to identify which technologies actually apply and to determine which contaminants require further delineation.

20. The investigative objectives of the workplan indicate that the selection of screen settings in the shallow and deep wells will be determined by the stratigraphic data gathered from the test borings. The screen placement should also consider the different physical characteristics and mobilities of the contaminants at each unit.

For sites which are lacking information regarding the nature of the contaminants, such as the Rubble Fill at Bunker A-86, the workplan should consider the installation of well clusters, screened at various depths.

Modify the workplan to consider the physical characteristics and mobilities of the contaminants at each unit during the placement of the well screens and the installation of well clusters screened at various depths to help characterize inadequately defined areas.

21. Modify the workplan to include the specific values (e.g., maximum values, average values, etc.) for the exceedance of the ARAR/TBC values in Tables 6-2, 6-4, 6-7, 6-9, and 6-11.
22. The sampling for engineering properties must be reviewed on a site-specific basis. The present Work Plan proposes the same set of analyses at each site, yet certain analyses may not be necessary at all sites.

Modify the workplan to ensure that the sampling for the engineering properties will correspond to each specific area and the specific technologies which will be evaluated during the Feasibility Study at each specific site.

23. The location specific ARAR restrictions must be identified in order to evaluate whether certain actions may not be implementable. The various remedial alternatives must consider such items as vehicular and equipment access, staging areas, need for temporary roads or sewers, etc.

Modify the workplan to include a discussion of the restrictions imposed by each location specific ARAR. Include in the workplan modification a map which illustrates where each restriction applies. This information should be integrated into the preliminary remedial alternatives identification process.

24. The following are general comments regarding the attached memo on target soil clean up levels, prepared by Menzie-Cura and Associates, Inc. addressed to Barry Giroux (March 9 1992).
- A. Provide the rationale for the proposed clean up levels based on a worker scenario rather than a residential scenario? The proposed cleanup levels based on a worker scenario are often several orders of magnitude greater than a residential scenario. These levels can not adequately protect the general public.
  - B. Most of the proposed clean up levels are based on target clean up levels of  $10^{-4}$ . EPA requires each chemical use  $10^{-6}$  as the target risk level such that total risk from all the chemical mixtures will fall within the acceptable risk range of  $10^{-4}$  to  $10^{-6}$ . Modify the workplan accordingly.
  - C. Since no equations and calculations are presented along with the memo, it is unknown if the clean up levels are accurately derived. Revise the workplan to include the equations and assumptions used in the development of the proposed clean up levels.
25. Revise the workplan to ensure that Standard Operating Procedures (SOPs) are prepared for all aspects of sampling, analysis and instrument calibration. An SOP is defined as a complete description of a sample collection, analysis or other operation whose mechanisms are thoroughly prescribed and which details a commonly accepted method of performing routine or repetitive tasks. See Attachment B for additional information regarding the development of these SOPs.

### Specific Comments

1. Section 1.0 - Introduction (Page 1)

The purpose and scope of the Phase II Remedial Investigation are not stated in the text. The narrative of the Draft Work Plan should begin with a clearly defined "Purpose and Scope" of the proposed RI.

Modify the workplan to include a purpose and scope which reflects the objectives of this investigation.

2. Section 1.0 - Introduction (Page 4)

Modify this figure to include the location of the former incinerator, Pier 33, Berth 16/Former Incinerator, the fuel farm, and the Area "A" Downstream zone of investigation. Include in the workplan modification a brief discussion of the known and suspected contamination at these sites.

3. Section 2.0 - Evaluation of Existing Data (Page 8)

Modify the workplan to include a summary tabulation and data interpretation narrative of the site-specific analytical results of the previous investigations. The workplan should summarize the site-specific geological and chemical contaminant conditions.

5. Section 2.3.1.2 - Site Specific Geology and Hydrology (Rubble fill at Bunker 86) (Page 18 ¶3)

This section describes local groundwater flow to the northwest. Modify the workplan to include a local groundwater map, with the potentiometric surface contours and flow directions, which reflects the groundwater flow directions discussed in the text.

6. Section 2.3.1.3 - Nature and Extent of Contamination (Rubble fill at Bunker 86) (Page 18 ¶4)

EPA has previously questioned the source of the "To Be Considered" (TBC) values listed in the previous report (i.e., Table 4-2: Summary of Chemical Specific ARARs and TBCs by Media in Draft RI, August 1992). In particular, EPA's was concerned with the soil TBC values which were listed exactly the same values as drinking water ARARs and the source is listed as CTDEP. The values of TBCs in soil are risk based concentrations (i.e., based on risk level or hazard index).

For the purposes of this investigation, the concentration of the chemicals in the soil is obtained through the Contract Laboratory Program (CLP) chemical analysis for solid waste; not the product of the TCLP. Therefore, the results of this method can not be compared to RCRA regulatory levels and can not be compared to the CTRL (which is based on and equal to drinking water standard) as is currently proposed for this site.

Modify the workplan to clearly define the "TBC" values in soil.

7. Section 2.3.2.1. Site Background (Torpedo Shops) (Page 19 ¶2)

EPA has not reviewed the 1989 GZA report, and therefore can not evaluate or support the conclusions which have been presented in this section. Based on the portion of the report included in Appendix A, it appears that samples were not collected in accordance with EPA protocol (e.g., samples consisted of auger cuttings and the analytical data was not validated).

Revise the workplan to include confirmatory sampling in accordance with EPA-approved methods and add dioxin to the list of analytes.

8. Section 2.4.1.1. Site Background (Page 33 ¶8)

This section references the collection and analysis of samples from the weapons center. EPA has not previously reviewed this data, and it is not clear what sampling protocols were used to obtain the samples.

Modify the workplan to provide a full discussion of the Appendix B sample results, include a map of the sample locations and describe the sample locations denoted as "above table" and "below table" and "below grade."

9. Section 2.4.1.1. Site Background (Page 35 ¶1)

Modify the workplan to remove the reference to "published background levels," since these "background" levels are not relevant to this investigation.

10. Section 2.4.1.3. Residential Well Analytical Results (Page 42 ¶5,6)

Revise the workplan to incorporate the newly promulgated MCL for cadmium at 5 ppb. (Federal Register, January 1991) and reevaluate the concentration of this metal in relation to this standard.

Revise the workplan to reflect the regulatory status of sodium. Sodium does not have a secondary MCL, but the Office of Water of the EPA has set a drinking water equivalent level (DWEL) of 20 mg/L as guidance for persons who have hypertension problems.

11. Section 2.4.1.3. Residential Well Analytical Results (Page 43, ¶1)

Revise the workplan to include a discussion of the analytical uncertainty associated with the existing boron data.

12. Section 2.4.3.3. Nature and Extent of Contamination (Page 51, ¶6)

This section references the discovery of thin layers of free product in MH83.

Present the location of MH83 on Figure 2-15.

13. Section 3.2.1. Rubble Fill at Bunker A-86 (Page 54)

Modify this figure in the workplan to depict the possibility of direct contact between the fill and bedrock, since bedrock is exposed at the surface near this site.

14. Section 3.2.2. Torpedo Shops (Page 56)

Modify this figure in the workplan to include all source areas, including the Otto fuel tanks. The modification to this figure should also include a transport pathway to bedrock and a pathway of discharge to surface water and sediment.

Modify this figure to provide an illustration of the location and depth of the tanks, drainage lines, leach fields, existing and proposed monitoring wells and borings, the bedrock geologic unit contact, previous sample locations which have been determined to be contaminated, and any other pertinent site features. These data are fundamental to the conceptual model.

15. Section 3.2.3 Goss Cove Landfill (Page 57)

Modify this figure to include a groundwater flow path into the bedrock where the fill is, or is suspected of, being in direct contact with bedrock.

16. Section 3.3 Supplemental Step II Investigations (Page 60 ¶5)

Revise this workplan to reflect the fact the proposed inorganic background levels have not yet been approved by EPA.

17. Section 3.3 Supplemental Step II Investigations (Page 61)

Modify this figure to include the CBU Drum Storage Area, the Torpedo Shops, and, if applicable, any off-site contamination.

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### RISK ASSESSMENT

18. Section 4.1 Introduction (Page 68 ¶6)

While carcinogenic risk can be explained in probability terms, non-carcinogenic risk should be described as a hazard index. Modify the workplan accordingly.

19. Section 4.2 Data Evaluation and Hazard Identification (Page 70, ¶5)

Revise the workplan to explain the source of the background concentrations referenced in this paragraph and used to select compounds of potential concern.

20. Table 4-1 Compounds of Concern for Step II Sites (Page 71)

Compounds of concern should be presented as medium specific. It is illogical to evaluate risk or develop clean up level if the threat posed by these various contaminants are unknown in each of the affected media.

Revise this table to clearly indicate the compounds of concern for each of the various media at this site.

21. Section 4.2.3 Selection of Compounds of Concern (Page 73 ¶3)

This section of the workplan is not clearly written. Revise the workplan to clearly define the frequency of detection and the spatial extent of contamination which is proposed to select compounds of potential concern. Include in this revision how the "natural range of elemental abundance" for each inorganic compound will be determined.

22. Section 4.3.2. Identification of Potentially Exposed Populations (Page 74 ¶ 1 & 3)

Revise the workplan to include a statement that the identification of exposed populations and exposure routes under current and future land use conditions will be explained and justified in the Phase II Remedial Investigation risk assessment report.

23. Table 4-2 Exposure Summary for Potential Human Receptors (Page 75)

Since all the contact rates in the exposure equations in the risk assessment guidance are based on per day consumption, (except for swimming scenario), revise this table to eliminate the column for exposure duration (i.e., time/event) with the unit hour/day except for the swimming scenario.

Provide the rationale for the lack of future receptors associated with the Torpedo Shops, although the text of paragraph 2 of page 74 states that potential future receptors at the Torpedo Shops include workers involved in excavation and construction activities.

24. Section 4.3.4. Estimation of Average Daily Doses (Page 80)

Revise the exposure equations of this section of the workplan to exhibits 6-11, 6-12 through 6-18 of the Risk Assessment Guidance from Superfund (RAGs), Volume 1 Human Health Evaluation Manual (Part A) 1989.

Except for site specific data, exposure parameters should be referenced in the following hierarchy: 1) Supplemental Guidance to RAGs: Standard Default Exposure Factors, 2) RAGs, 1989, 3) Dermal guidance, 4) Region 1's guidance, 5) Exposure Handbook.

25. Section 4.4.1. Toxicity Assessment for Non-carcinogenic Effects (Page 82 ¶1)

Based on the document provided to EPA Region I by ECAO, entitled "Evaluate the appropriateness of using proposed surrogate RfDs (U.S. Naval Submarine Base, New London/Groton, CT), PART 1, 2 and 3", the statements in this paragraph are incorrect.

In Part II, attachment 2 - " Feasibility of developing an RfD for Acenaphthylene by analogy to potential surrogates (Phenanthrene, Acenaphthene)", ECAO concluded that it is inappropriate to use the RfD from Phenanthrene or Acenaphthene for Acenaphthylene. In Part III, attachment 1 - "Risk Assessment Issue Paper for Status of Polyaromatic hydrocarbons", ECAO further updated the toxicity for all the PAHs. Neither attachment includes the statement of the first paragraph of page 82 of this work plan.

In addition, EPA Region I has previously advised Menzie Cura & Associates, regarding the Region I interim policy to use the RfD of Naphthalene as the surrogate RfD for the non-carcinogen PAHs which do not yet have verified RfDs.

Revise this section of the workplan to incorporate the use of the RfD of Naphthalene as the surrogate RfD for the non-carcinogen PAHs which do not yet have verified RfDs.

26. Section 4.4.1. Toxicity Assessment for Non-carcinogenic Effects (Page 82 ¶4)

The lead uptake/biokinetics model is developed for evaluation of lead exposure in children, and therefore should not be used for evaluation of adult population.

Revise the workplan to delete the reference to the use of the lead uptake/biokinetics model for the adult population.

27. Section 4.4.1. Toxicity Assessment for Non-carcinogenic Effects (Page 83 ¶1)

Revise the workplan to cite the Dermal Exposure Assessment Guidance for the dermal exposure pathway. Include in this revision the use of the absorption factors for a few chemicals in soil and the recommended permeability constants for surface water.

28. Section 4.4.1. Toxicity Assessment for Non-carcinogenic Effects (Page 83 ¶2)

Revise the workplan to incorporate the oral cancer potency factor for benzo(a)pyrene. The standard is 7.3 per mg/kg/day (as opposed to 5.8 per mg/kg/day recommended earlier; the change is due to the detection of a mathematical error) which is currently on IRIS.

Since the relative toxicity equivalent factor approach has not been finalized by EPA, it should not be presented in this workplan. Revise the workplan to reflect the status of the toxicity factor and delete references to other regions' approaches to risk assessment.

29. Section 5.3.2.3. Additional Terrestrial Field Assessments (Page 99, ¶3)

In order to assess pesticide bioaccumulation, the Draft Work Plan proposes to analyze the tissue concentrations of healthy earthworms after the 28-day bioassay is completed. It would appear that earthworms exhibiting sub-lethal effects (e.g., coiling, swelling) should also be analyzed for pesticide tissue concentrations as these individuals may represent worms most exposed to soil pesticide concentrations.

Revise the workplan to provide the rationale for not including these individuals in the tissue analyses.

Sterile silica sand does not appear to be optimal substrate for the earthworm. A combination of silica sand, peat and reagent grade lime may be a better choice of substrate.

Provide the rationale for the use of sterile silica sand, or modify the workplan to include a different substrate.

30. Section 5.3.2.4. In-field Earthworm Bioassays Using Sediment (Page 100, ¶2)

The text proposes to use terrestrial (as opposed to aquatic) worms in bioassay chambers placed at the pond bank. There are several concerns with this approach:

- The method proposes to use terrestrial earthworms to assess the toxicity of an aquatic substrate.
- The sediments for the test will be relocated from within the pond to the pond bank, where the sediments are not truly "in-situ."

Provide further justification for this approach including references which describe previous studies where terrestrial earthworms have been used to assess aquatic sediment toxicity.

Clarify the methodology proposed for performing in-field bioassays, in particular, explain why standard ASTM laboratory sediment toxicity tests are not being performed.

31. Section 5.3.2.4 Additional Assessment of Freshwater Systems in Area A (Page 100, ¶4)

Revise the workplan to indicate that the species of frog collected will be recorded, and it is recommended that a potential year-round resident frog species (i.e., green frog, pickerel frog) be collected.

32. Section 5.3.2.4 Additional Assessment of Freshwater Systems in Area A (Page 101, ¶5)

A biotic index will provide additional insight into the relative health of the aquatic benthic communities. Revise the workplan to indicate that a biotic index (i.e., Hilsenhoff Biotic Index) will be determined for each of the benthic sampling stations.

33. Section 5.3.3 Wetlands Delineation (Page 102)

In order to be in agreement with the Army Corps of Engineers, EPA requires the use of the 1987 version of the "Corps of Engineers Wetlands Delineation Manual", rather than the referenced 1989 version.

Revise the workplan to reference the 1987 version of the "Corps of Engineers Wetlands Delineation Manual".

34. Table 5-2 Thames River Field Sampling Plan (Page 105)

The use of upgradient and downgradient sampling locations as comparison for the evaluation of NLON Submarine base impact dictates that surface water at these locations be analyzed for pesticides also

Revise the workplan to include the sampling of surface waters and include the analysis of pesticides to the analyte list for the upgradient station. This information is necessary to provide data on background concentrations that are not attributable to the sub base.

35. Section 5.3.4.4 Caged Oyster Study (Page 108)

Revise the workplan to include a detailed description of the preparation techniques for the VOC analysis, in particular, discuss the efforts to be taken to ensure that the volatile constituents will not be lost in the process leading to low recoveries and useless results.

In regards to the freezing of tissue for later analyses, according to the CLP protocols, the sample holding times will be a limiting factor. Revise the workplan to include an expanded discussion of the time required from the collection of the sample to the time of the analysis.

Revise the workplan to provide the rationale for the selection of oysters as the test species and not mussels.

36. Section 5.4.1. Identification of Contaminants of Concern (Page 109)

The statement is made in the first paragraph that the contaminants of concern have been identified for Area A. This is incorrect; EPA's comments from the last review clearly indicated that there are some areas of disagreement in the contaminants of concern list.

Revise the workplan to either eliminate or qualify this statement accordingly.

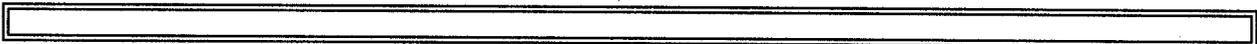
37. Section 5.5.2.1. Estimating Exposure in Soils and Sediments from Organic Contaminants - Equilibrium Partitioning (Page 112)

This is only discussion on the use of the Equilibrium Partitioning (EP) approach.

Revise the workplan to expand the discussion to include the evaluation of the inorganic contaminant exposure assessments.

38. Section 5.7.3. Presentation of Risk (Page 118, ¶3)

Sediment concentrations of contaminants are proposed to be compared with both NOAA sediment benchmarks and EPA sediment criteria. Revise the workplan to clearly state that the Equilibrium Partitioning method will be used to calculate sediment criteria for those non-polar organic contaminants that do not have EPA sediment criteria.



## PRELIMINARY IDENTIFICATION OF REMEDIAL ACTION ALTERNATIVES

### 39. Section 6.1.1.1. Potential ARARs (Page 119)

Revise the workplan to present the comparison of the detected contaminant concentrations to the current Federal drinking water standards; this may result in additional contaminant concentrations exceeding ARARs. If this comparison results in additional contaminant concentrations exceeding ARARs, then incorporate this information into the narrative. This revision should also ensure that only the most recent Federal drinking water standards are used in this investigation.

### 40. Section 6.1.4.1. Potential ARARs (Page 123, ¶6)

This paragraph contains an example of the inappropriate comparison of the lead concentration in soil (in solid form, mg/kg) from routine CLP chemical analysis to the concentration of RCRA TCLP regulatory level (i.e., 5 mg/L, in solution) and CRDL (0.05 ug/L, in solution). This approach is incorrect.

Under the Resource Conservation and Recovery Act (RCRA) program, the leached concentration of a chemical in the soil, after conducting the Toxicity Characteristics Leaching Procedure (TCLP) analysis, is compared to a regulatory level to determine if the excavated soil is to be handled as a hazardous waste. This comparison is not to be used to determine if the soils pose a risk to human health or the environment based on a risk level or a hazard index.

Revise the workplan to reflect the correct approach to evaluating ARARs.

### 41. Table 6-5 Preliminary Remedial Action Objectives and Alternative Process Options (Page 124)

Revise this table to include a Remedial Action Objective (RAO) which addresses groundwater contamination, since groundwater has been determined to be contaminated with, at a minimum, vinyl chloride, benzene, toluene, ethylbenzene, xylene, and PAHs.

### 42. Section 7.2.1 Rubble Fill at Bunker A-86 (Page 136, ¶2)

Revise this list of contaminants for which the source, nature and extent will need to be defined to include chlorinated solvents.

43. Section 7.2.1 Rubble Fill at Bunker A-86 (Page 136, ¶4)

Given that bedrock is exposed in the area it is possible that contaminants may be released directly to bedrock, and therefore may not be detected in the overburden, if present.

Revise the workplan to include one shallow bedrock well clustered with an overburden well in order to determine the vertical flow gradient and contaminant levels in this area.

44. Table 7-8 Rationale for Selection of Constituents for Analysis (Page 138)

Revise the engineering characteristics of the workplan to include the measurement of the subsurface soils and/or fill material pH in the contaminated area.

Definition of parameters such as compaction, percent moisture, permeability, strength, pH, etc. need to be proposed for the fill material and surrounding soils. The feasibility of capping may be greatly affected should the fill need compaction, or the fill not be strong enough to support the heavy machinery needed or the weight of the cap over time.

Revise the workplan to include efforts to characterize and delineate the fill material.

45. Table 7-9 Rubble Fill at Bunker A-86 Field Sampling Plan (Page 139)

Revise the workplan to include the addition of a surface water sample at location 4SD2 to measure the level of sediment contamination leaving the site.

46. Figure 7-3 Rubble Fill at Bunker A-86 Field Sampling Plan (Page 141)

Geophysical work or additional borings need to be proposed to confirm the interpreted extent of fill material. This information will be needed to determine the volume of material which will require treatment.

Provide the rationale for the collection of only one surface soil sample (of 8 proposed) from the suspected source area. Revise the workplan to include two additional surface soil samples from the suspected source area.

47. Section 7.2.2. Torpedo Shops (Page 142, ¶1)

Revise the workplan to include Otto fuel and PCBs in the list of contaminants for which the source, nature and extent need to be defined.

48. Section 7.2.2. Torpedo Shops (Page 142, ¶4)

Revise the workplan to indicate how the results of the soil gas surveys will be used (e.g., indicate whether any of the proposed sample locations will be re-positioned, or new locations will be added based on survey results, etc.). Include in this revision the criteria that will be used to decide these issues.

49. Section 7.2.3. Goss Cove (Page 142)

This section of the workplan proposes the measurement of air quality for the risk assessment, yet there is no mention of air pathway in the risk assessment section of this work plan.

Revise the workplan to clarify the status of the air pathway investigation.

50. Table 7-11 (Page 144)

Revise the workplan to include the measurement of the heat content of soils (BTU analysis), porosity, and hydraulic conductivity in the engineering characteristics parameter.

51. Table 7-12 (Page 145)

The US Navy has indicated in the response to EPA comments regarding the August 1992 RI Report (Navy Summary of Resolutions Reached Regarding EPA Comments [May 20, 1992] on Draft IR Report [August, 1991], Comment No. 1, for Page 29, response 6, located on Page 8 of Navy Response), that samples would be obtained for dioxins at this site.

Revise the workplan to include the addition of the collection and analysis of samples for dioxins.

Revise the workplan to include engineering analysis at sample location 7MW2D.

52. Figure 7-4 (Page 147)

Revise the workplan to include the addition of a monitoring well hydraulically downgradient of monitoring well 7MW3 to determine the downgradient extent of contamination which has been observed in monitoring well 7MW3.

Include in the revision to this figure the location and discharge point of the floor drains which have been determined to contain volatile organic compounds.

Revise this figure to indicate the areas referred to as "where chemicals were stored (page 142, ¶ 4)."

The revision to this figure should also include the sample locations from the GZA study in order to evaluate the sample locations around the Otto Fuel Tank Area.

Since the GZA study identified contamination around Building 450, revise the workplan to include additional soil and groundwater sampling location around Building 450 to determine the nature and extent of the contamination identified in the GZA study.

53. Section 7.2.3. Goss Cove (Page 148)

One of the stated objectives for Goss Cove is to confirm that radiological constituents in groundwater are from natural sources. However, analysis for radiological parameters in groundwater is only planned for the existing 8MW1 and 8MW4. Confirmation sampling at these locations will not determine whether the previously observed levels of radiological analytes are occurring at "natural levels".

Revise the workplan to include sampling of upgradient wells to help determine the background level of the previously detected radioisotopes.

54. Section 7.2.3. Goss Cove (Page 148, ¶4)

Revise the workplan to clearly state the specific criteria which will be employed in determining how the results from the field screening will be used to determine if additional borings are required.

Composited samples may be used to generally characterize the nature of the fill material as a potential source of any contaminants detected in the area of the landfill. However, composited samples will not "properly characterize the nature, extent and degree of contamination." Composited samples would potentially result in the dilution of contaminants and therefore, would be an inappropriate representation of the degree of contamination.

Revise the workplan to ensure that all subsurface soil samples (especially samples for VOC analysis) will be collected as discrete grab samples.

55. Table 7-15 Goss Cove Landfill Field Sampling Plan (Page 151)

Revise the workplan to include the rationale that was used to select the locations and depths from which samples will be collected for the analysis of engineering properties.

Include in this revision, the analysis of pesticides in groundwater since pesticides were detected in soils at this site.

56. Figure 7-5 Field Sampling Plan Goss Cove Landfill (Page 154)

The US Navy should consider gathering an additional sample along the bank of the Thames River north and upstream of the pier, yet south and downstream of the storm drain outfall. It is recommended that the sample analysis include CLP TAL and TCL, TPH, TOC and a grain size determination.

Revise the workplan to include, as a water quality parameter, the measurement of water hardness for surface water samples.

57. Table 7-16 Spent Acid Storage and Disposal Area Remedial Investigation Objectives (Page 156)

Revise the workplan to include performing hydraulic conductivity testing in additional wells. This is necessary since many Phase I hydraulic conductivity pump test results were not usable.

Also include in this revision the specific criteria regarding the results of X-ray fluorescence screening. Describe how the samples will be selected for chemical analysis (e.g., highest detection, deepest detection, at the water table, etc.).

58. Table 7-18 Spent Acid Storage and Disposal Area Field Sampling Plan (Page 158)

Revise the workplan to include a bedrock monitoring well to evaluate the transport pathway indicated in the conceptual model (Figure 3-4). In addition, provide the rationale used to select the locations and depths from which samples will be collected for analysis of engineering properties.

59. Section 7.3.1. Area A (Page 161)

The eighth bullet of this section proposes verification sampling to determine whether previously detected radiological contamination is naturally occurring; however, this repetitive effort will help further determine the background level of the radiological compounds.

Revise the workplan to include a series of background sampling locations to assist in this determination. These additional sampling points should be located upgradient of these areas known or suspected contamination.

60. Table 7-19, Chemical Investigation, Surface Water North Lake (Page 164)

This statement states that surface water will be taken "during non-summer months and/or when the lake is drained." Revise the workplan to ensure that the surface water samples will be collected prior to the actual draining of the lake.

The same logic would apply to the collection of sediment samples from the North Lake. Revise the workplan to ensure that the sediment samples will be collected prior to the actual draining of the lake.

61. Table 7-20 Area A Rationale for Selection of Constituents for Analysis (Page 166)

Subsection 2.4.1.3 of the workplan states that pesticides were detected in three subsurface soil samples and yet does not discuss whether or not they were detected (or analyzed for) in groundwater.

Revise the workplan to include pesticides in the proposed groundwater analyses.

62. Table 7-21 Area A Field Sampling Plan (Page 168)

Revise the workplan to include the analysis for PCBs in the groundwater samples collected from monitoring wells 2WCMW1S, 2S, 3S.

63. Figure 7-7 Field Sampling Plan Area A Landfill, Wetland and Weapons Center (Page 173)

The groundwater flow arrows on this map are not accurate, and it is not clear whether they depict flow in the overburden or bedrock. In addition, it is not possible to determine whether the proposed monitoring wells are optimally located.

Revise the "Groundwater Flow Direction" arrows to correspond to flow path lines which have been constructed based on potentiometric maps and add information to this map which will indicate the variation of the vertical gradient across the site. Include in the revised workplan, a groundwater elevation map, a bedrock elevation map, and a map of the extent of contamination observed in previous studies.

64. Table 7-22 DRMO Remedial Investigation Objectives (Page 175)

Revise the workplan to include the rationale for the selection of only wells 6MW4S and 6MW3D for hydraulic conductivity testing.

Confirmation sampling for radiological parameters at the proposed locations will not determine whether the previously observed levels of radiological analytes are occurring at "natural levels".

Revise the workplan to include a series of background sampling locations to assist in this determination. These additional sampling points should be located upgradient of these areas known or suspected contamination.

65. Section 7.3.3. Lower Sub Base (Page 177 ¶3)

The US Navy has previously reported that VOCs such as vinyl chloride, benzene and floating product layers have been detected in groundwater.

Revise the workplan to include the determination of the extent of VOC contamination in groundwater as one of the goals of the Phase II RI.

66. Figure 7-9 Field Sampling Plan DRMO (Page 180)

Revise the workplan to include a figure defining the suspected extent of fill material.

67. Table 7-25 Lower Sub Base (Page 181)

Revise the workplan to include the installation of additional groundwater monitoring wells in the area of 13MW5 and the tanks in order to determine the extent of the floating layer observed at this location.

Revise the Remedial Investigation Objectives of the workplan to include determining the extent of VOC contamination in groundwater.

68. Figure 10-1 Project Schedule (Page 196)

Revise the project schedule to the schedule listed in the Federal Facility Agreement (FFA) or submit a petition for a schedule extension. This petition for schedule extension should include a detailed description of the level of effort that the US Navy will be requiring to justify the additional time.

References:

The reference entitled "USEPA, (1992c). Risk Assessment for Polyaromatic Hydrocarbons. ORD memorandum, January 23, 1992" is outdated and should be replaced by the Part III, Attachment 1 entitled "Risk Assessment Issue Paper for Status of Polyaromatic Hydrocarbons" of the document entitled "Evaluate the appropriateness of using proposed surrogate RfDs" provided by ECAO to Region I for this site.

## PROPOSED FIELD SAMPLING PLAN

### **General Comments**

1. It appears that for many sediment samples, the "engineering" characteristics are not going to be examined. In order for the sediment sample to be useful for an ecological risk assessment, the total organic carbon (TOC) content and grain size distribution must be determined.
2. There seems to be lack of distinction between the use of terms "soils" and "wetland sediments" when analyses and sampling are discussed. "Wetland sediments" should be termed "wetland soils" and the term "sediments" should be used when referring to the samples below the surface of the water.

Revise the workplan to ensure that these terms are not used interchangeably, especially in the tables.

3. The Air Monitoring activities discussion in Section 4.1.12 of the Field Sampling Plan (FSP) makes reference to USEPA Method TO1, a copy of which is included in Appendix A.

Revise the workplan to include Standard Operating Procedures (SOPs) covering all aspects of sampling and analysis for Volatile Organic Compounds (VOCs) and any other contaminants monitored at the site (see Attachment B).

### **Specific Comments**

1. Section 2.1 - Supplemental Step II Investigation (Page 7)

According to page 1 of the Field Sampling Plan (FSP), these sites are to be part of Supplemental Step I, yet this page indicates that these areas part of a Supplemental Step II Investigation.

Revise the workplan to clarify the status of these areas.

2. Section 4.1.1.1. Sample Headspace Screening for VOCs (Page 16 ¶3)

Clarify the statement, "Resulting data will not be used qualitatively."

3. Section 4.1.1.2. PCB and DDT Screening and Section 4.1.1.4. Lead Screening (Page 18)

Revise the workplan to include the detection limits for the field screening methods.

4. Section 4.1.3. Test Borings and Subsurface Soil Sampling (Page 19 ¶3)

It is strongly recommended that the workplan be revised to include the use of an alternative method of collecting soil samples. The use 5-foot Central Mining Equipment (CME) is not encouraged due to problems associated with sample recovery.

Revise the workplan to ensure that all test borings are advanced to bedrock to a minimum of five feet to verify the presence of bedrock.

5. Section 4.1.4.1. Monitoring Well Construction (Page 19 ¶4)

Revise the workplan to include a description of the type of well construction materials planned for the Spent Acid Disposal Area considering that the soil pH is low.

6. Section 4.1.4.1. Monitoring Well Construction (Page 20 ¶3)

Revise the workplan to ensure that the maximum well screen length will be no greater than 10 feet.

Revise the workplan to indicate that the mud rotary drilling method will only be used as a last resort if no other well installation methods are successful.

7. Section 4.1.4.2. Monitoring Well Development (Page 20 ¶4)

Revise the workplan to indicate that well development will proceed until three successive measurements of specific conductance, temperature and pH have stabilized (i.e., vary less than 10 percent) and turbidity is less than 5 NTUs, or until three well volumes have been removed.

8. Section 4.1.4.3. Monitoring Well Sampling (Page 20 ¶5)

Revise the workplan to ensure that groundwater samples will remain unfiltered prior to analysis.

9. Section 4.1.5. Evaluation of Aquifer Hydraulic Properties (Page 22 ¶1)

Revise the workplan to provide additional details regarding the Area A pump test. Include in this revision a description of which wells will be used as observation wells, how long the test will run, how the purge water will be managed (i.e., disposed), degree of recovery which will be measured (90 percent), frequency of measurement of water levels, etc. Ensure that the pumping test plan includes the monitoring of bedrock well water levels.

10. Section 4.1.14. Sampling and Testing of Soils for Engineering Parameters (Page 24 ¶4)

Revise the workplan to clearly state whether all of the proposed engineering analyses will be performed for all sites. Some of the engineering analyses may not be needed at all sites.

It is recommended that additional testing for compaction and strength be performed at Goss Cove, DRMO, and the Area A Landfill. As mentioned previously, this information may be critical in determining whether these areas will be capable of accepting some of the remedial alternatives.

The text suggests that the Walkley-Black method will be used to determine the Total Organic Carbon (TOC) content. However, the NET Quality Assurance Project Plan (QAPP) lists two other methods, 415.2 and 9060. Revise the workplan to clearly state the method that will be used for TOC determinations.

Revise the workplan to identify the laboratories that will perform the engineering analyses, the radiological analyses, and the air sample analyses. The NET QAPP does not list these methods on the qualifications statement.

11. Section 4.2.2.4. Spent Acid Storage and Disposal Area (Page 47 ¶5)

Revise the workplan to include the collection of a complete round of monthly water level measurements for all monitoring wells on the base to produce a series of groundwater elevation maps. These groundwater maps would depict the groundwater flow directions and flow divides.

12. Table 4-15 Area A Field Sampling Plan (Page 54)

Table 4-15 proposes that in situ earthworm bioassays be used in "soils/wetland sediment". If the purpose of a bioassay is to assess the suitability of sediment for benthic organisms, then the use of earthworms in a soil bioassay is of questionable value.

If the US Navy is proposing to use in situ earthworm bioassays to assess the suitability of sediment for benthic organisms, then provide the supporting rationale for this proposed method.

13. Section 4.2.3.1. Area A (Page 57 ¶1)

Revise the workplan to ensure that all test borings are advanced to the water table.

14. Section 4.2.3.1. Area A (Page 58 ¶1)

The objective of simulating residential well water withdrawal does not appear to be appropriate. The focus of the bedrock wells should be to determine whether groundwater is contaminated. It is possible that the reason the residential wells have not previously contained organic contamination, is that they are open over long intervals potentially resulting in an off-gassing of the contaminants.

Revise the workplan to indicate that bedrock wells will be advanced until they are capable of providing a reasonable sustainable yield (e.g., over 1 gallon per minute).

15. Section 4.2.3.1. Area A (Page 58 ¶3)

Revise the workplan to indicate the proposed location of the observation wells and revise the narrative to include the gathering and analysis of groundwater samples from the pumping well. These groundwater samples would be analyzed for Volatile Organic Compounds (VOCs) at the following intervals during the pump test: start, 1 hour, 2 hours, 4 hours, 8, hours, 16 hours and at the conclusion.

16. Section 4.2.3.1. Area A Wetland (Page 59 ¶3)

It is unclear how the water levels in residential wells will be measured, since this will require removing pumping appurtenances, and discontinuing water removal for a period of time long enough to ensure stabilization of water levels.

Revise the workplan to include a discussion of how the water levels of the select residential wells will be measured.

17. Section 4.2.3.2. Defense Reutilization and Marketing Office (DRMO) (Page 63 ¶5)

Revise the workplan, if necessary, to ensure that soil samples gathered for VOC analysis are not composited.

Revise the workplan to ensure that deeper soil samples (below 1 foot) will be gathered for the risk assessment to evaluate exposure of construction workers.

18. Section 5.0 Sample Preservation and Shipping (Page 75)

More detailed information needs to be provided in this section. Specifically, describe the following:

- the method to confirm the pH of the samples;
- describe the pH at which the samples will be preserved and the preservative(s) that will be used in this effort.

Provide a table that includes this information. This information must be also be incorporated into Section 3.3 of the QA/QC Plan.

19. Appendix A SOPs - Technical Procedures

- A. Revise the workplan to include a description of who will be performing these analyses and describe if all the methods listed in this table are to be performed in the field. For additional reference, see Attachment B.

SOP 1020 (Page 5 ¶1)

- B. Revise the workplan to ensure that samples will not be composited.

SOP 1022 (Page 7)

- C. Revise the workplan to include the following statement to the text: "the samples will be immediately preserved after filtration".

SOP 1023 (Page 7 ¶3)

- D. Revise the workplan to indicate that no filtering of groundwater will be performed.

SOP 1060

- E. Revise the workplan to ensure that this procedure will be modified to correspond to EPA Region I protocol.

**QUALITY ASSURANCE/QUALITY CONTROL**  
**DATA MANAGEMENT PLAN**

1. Section 1.1 Data Quality Objectives (DQO) (Page 1)

The references to both the SOWs and Data Validation Functional Guidelines are not current. The NET QAPP indicates that it follows the 3/90 CLP SOWs.

Revise the text of the workplan to reflect the 3/90 SOW and the USEPA Region I Laboratory Data Validation Functional Guidelines for Organic Analyses February 1, 1988, modified July 1988 and USEPA Region I Laboratory Data Validation Functional Guidelines for Inorganic Analyses June 13, 1988, modified February 1989.

2. Section 1.1 Data Quality Objectives (DQO) (Page 1 ¶6)

The text cites the 7/88 and 2/88 Statements of Work for inorganic and organic CLP procedures, yet Section 8 Page 2 of the NET Quality Assurance Plan cites the 3/90 Statements of Work.

Revise the text of the workplan to ensure consistency.

3. Section 2.0 Project Organization and Responsibilities (Page 4)

Modify Section 2.0 of the workplan to identify the individuals responsible for the validation of analytical chemical data and include their qualifications for this activity.

4. Section 3.3 Sample Collection, Handling and Shipment (Page 8)

Potential interferences may be caused by some of the constituents that make-up the flint glass products.

Revise the workplan to ensure that soil samples will be collected in 40-ml vials unless information can be provided demonstrating that the 60-ml vials are made of borosilicate glass rather than flint glass.

The text references the NET QAPP for sample containers, preservatives, and holding times. The referenced table does not provide this information for all of the proposed analyses (e.g., dioxins and radiologicals).

Revise the workplan to provide this information in a table format with this information presented by method and matrix.

5. Table 3-1 Frequency of Field QC Samples (Page 9)

Revise the workplan to ensure that equipment blanks will be collected at a frequency of one per day per matrix per piece of equipment for non-dedicated equipment.

6. Section 3.4.4. Field Duplicates (Page 10)

Field duplicates are two separate samples collected from the same source.

Revise this section of the workplan to reflect this definition.

7. Section 5.1.1. Organic and Inorganic Analyses (Page 13)

Section 5 of the QA/QC Plan lists several options for analysis of water and soil rather than clearly specifying the exact procedure to be analyzed for each of the analytes of interest. For example, it is unclear whether some water samples will be analyzed by CLP protocols and some by EPA Method 524.2 or whether all water samples will be subjected to the low level VOC procedure (Method 524.2). Boron analysis procedures are of particular interest, since boron is not on the CLP metals analyte list. Yet the QAPP refers to a list of manuals of which five provide several optional metals analysis procedures.

Revise the QA/QC Project Plan to include a table listing the analysis method and reference for each matrix and parameter of interest.

The specific methods used for this site for the "non-CLP" analyses must be specified since NET QAPP lists more than one method for the same parameter. Revise the workplan to specifically describe these above-mentioned methods.

Include in this revision a description specifying the time when the low-level VOC samples be collected. Neither the FSP nor the QAPP has discussed these samples prior to this section.

8. Section 5.2 Field Procedures (Page 17)

Reference is made in the text to EPA's Field Screening Methods Catalogue (EPA/540/2-88/005) for analytical procedures for PCB and metals screening. The document referenced is a compilation of available technologies which have been employed in on-site situations. It does not provide the standard operating procedures (SOP) which are necessary for conducting these analyses.

Revise the workplan to include the detailed SOPs for EPA to review. These SOPs should provide detailed descriptions of sample preparation, stock standard preparation, calibration standard preparation, instrument operating conditions, instrument calibration sequence, initial and continuing calibration acceptance criteria, instrument corrective action and maintenance, quality control sample preparation and acceptance criteria, example calculations and detection limits. See Attachment B for additional information regarding the development of SOPs.

9. Section 6.0 Data Validation (Page 18 ¶1)

Revise the workplan to include the following dates of the Functional Guidelines:

- USEPA Region I Laboratory Data Validation Functional Guidelines for Organic Analyses February 1, 1988, modified July 1988;
- USEPA Region I Laboratory Data Validation Functional Guidelines for Inorganic Analyses June 13, 1988, modified February 1989.

Include a description of the personnel who will be performing the data validation and describe the data reporting methods.

10. Section 6.0 Data Validation (Page 18 ¶2 & 3)

It is unclear which samples will be analyzed using CLP methods and consequently, validated using EPA Level IV validation protocols.

Revise the QA/QC Project Plan to specify which samples will be validated in accordance with EPA Level IV requirements.

11. Section 6.0 Data Validation (Page 18 ¶5)

Revise the workplan to include a detailed description of the calibration procedures to be utilized for soil gas analysis. Include in this description the source of reference standards, the concentrations of specific analytes in calibrations standards and the acceptance criteria for calibration. Specify the number of duplicate samples to be evaluated in the laboratory.

12. Section 7.0 Data Quality Objectives (Page 19 ¶1)

Contrary to the statement made in the text, data quality objectives cannot be found in Table 5-2 of Appendix A. Appendix A provides lists of QA objectives for several analysis procedures, but does not specify which objectives apply to samples to be collected during Phase II of the RI.

Revise the workplan in order to provide a table of project-specific QA objectives for each analysis parameter.

13. Section 7.2 Accuracy (Page 19 ¶3)

The text makes generic statements about the assessment of accuracy which need to be supported by summaries of project-specific procedures. For example, the use of surrogate spikes to evaluate the accuracy of organics analysis is not cited although surrogate spiking is a typical requirement of analysis methods.

Revise this section of the workplan to cite or reference the accuracy objectives for the Phase II program.

14. Section 9.1 Laboratory Data Management (Page 24 ¶4)

Revise the workplan to include a description of the format in which laboratory data will be presented in the Phase II RI Report. This description should include the sample identification, the analysis method, the laboratory sample identification and date sampled.

The Phase I RI Report provided summaries of results only for those analytes detected at least once in the samples listed. No detection limits for undetected analytes were provided. This type of presentation is insufficient.

The Phase II RI Report should have, available upon EPA request, an appendix containing the complete validated analytical results for all parameters analyzed. The appendix should be formatted and cross-referenced such that specific analysis results can be located for review.

Revise the workplan to ensure that all of the analytical information is available to EPA for review.

15. Appendix A

Section 7

- A. Revise this section of the workplan to cite the quality control objectives anticipated for this project. The quality control objectives anticipated for this project should be consistent with Section 7 of the QA/QC Plan.
- B. Revise Table 7-1 to specify control limits for boron and ensure that boron is included in all calibration verifications (initial and continuing), laboratory control samples, matrix spikes, interference check samples (for ICP analysis) and duplicate samples. Revise Table 7-1 to be consistent with the TPH analytical method and quality control requirements cited in Appendix C.

Section 8

- C. This section provides a complete listing of all analytical methods utilized by NET, Inc.

Revise the workplan to include a project-specific listing of methods in this appendix or elsewhere in the QAPP. Boron should be added to Table 8.2.

Section 9

- D. Revise this section of the workplan in order to clarify the set of project-specific detection limits for all analytical protocols employed by NET, Inc.

## Laboratory QA/QC Plan

- E. Addendum 4 contains a table that lists preservation and holding time requirements. The holding times listed must be from the time of sample collection (including those for CLP analyses). This table also lists the CLP requirements for metals, but no CLP designation has been provided for the organics, unless the NEESA designation is considered equivalent to the CLP for the purposes of this project.

Revise the workplan to clarify this discrepancy.

## ATTACHMENT A

### Ambient Air Sampling Plan with QA/QC Procedures

A work plan documenting all aspects of sampling, analysis and associated QC/QA must be prepared, reviewed and approved prior to any sampling effort:

1. Data quality objectives must be established, in order to determine whether any data collected will be relevant and useful. For example, if a risk assessment is to be performed, how many sampling stations and at which key locations will be required? Which species will be sampled for? Is the method to be utilized capable of quantifying those contaminants at the expected levels? Specify the detection limits expected under the proposed conditions.
2. Specification of the method to be utilized must include, for example, documentation of applicability to the species sought during sampling (provide a list of species expected to be found), and a detailed description of both sampling procedures and analytical procedures to be followed. Any deviations from referenced procedures must be thoroughly documented. Include the Standard Operating Procedures specified by the method. In addition, data must be presented demonstrating the capability of the method to be used to attain the required quality of data under the actual sampling and analysis conditions anticipated (see Performance Criteria and Quality Assurance requirements delineated in each method).
3. Sampling and analytical procedures should be described in a sufficient level of detail to provide assurance that they will be performed in accordance with accepted quality control standards. The same general level of scientific rigor as adhered to in the Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air (EPA-600/4-84-041) must be demonstrated for any technique utilized, in order to lend credibility to the results.
4. Sampling locations should be specified and identified on a site map, including sufficient detail to show sources and directions of potential receptors. The map should be north-oriented and include a scale. Specify the expected prevailing wind speed and direction during the proposed sampling period, including a wind rose. Address sampling station issues such as provisions for security and electrical power, as applicable. The sampling Standard Operating Procedure must list all necessary equipment and supplies.

Specify how flow rates and sampling times will be established.

- What is the rejection criteria for pre/post flow-rate calibration?
  - How will the sampling equipment be cleaned, and how will the requisite degree of cleanliness be demonstrated?
  - Will flow rates be corrected to standard conditions of temperature, pressure and humidity?
  - Specify laboratory, trip and field blanks and quality control duplicates, as well as backup (secondary) cartridges where applicable.
5. Delineate the collection procedures for concurrent on-site meteorological data (specify equipment, siting criteria, calibration procedures, data recording and reduction, etc.). Attempt to conduct baseline ambient air monitoring under worst-case conditions (high temperatures, low humidity, low wind speeds).
6. Include procedures for sample collection, handling, storage and transportation, including preservation methods and holding times. Specify chain of custody procedures.
7. Additional Requirements:
- What are the calibration procedures for the analytical instruments to be used? How will standards be prepared?
  - How will data from blank analysis be utilized? What is the limit of blank contamination for which data will be acceptable?
  - Will backup (series) cartridges be utilized? What is the criteria of acceptance for breakthrough from primary to backup cartridge? Specify the acceptance criteria (precision and accuracy) for duplicate cartridges.
  - Will an internal standard be established by the spiking of blank, sample and calibration cartridges? Describe the spiking procedure.
  - Are recovery and precision data available for the selected contaminants to establish the validity of quantitative data? Present all such data and all numerical criteria for quality control purposes.

8. In general, the proposal for ambient monitoring of air toxics must establish the scientific legitimacy of the sampling. Inadequately documented sampling and analytical procedures may necessitate discarding the resulting data.
9. The data package submitted should include, along with the raw data, all the information necessary to perform data validation, including standards preparation, calibration curves, all calculations used for the determination of detection limits and acceptance criteria to be applied (including precision and accuracy limits).

## ATTACHMENT B

### Standard Operating Procedures (SOPs)

Standard Operating Procedures (SOPs) must be prepared for all aspects of sampling, analysis and instrument calibration. An SOP is defined as a complete description of a sample collection, analysis or other operation whose mechanisms are thoroughly prescribed and which details a commonly accepted method of performing routine or repetitive tasks. Its purpose is to ensure consistency of application of a method and repeatability and comparability of results, regardless of which qualified person is performing the operation.

A SOP for sampling and analysis would include the following information:

- Method testing, including ruggedness testing
- Configuration and maintenance of sampling equipment
- Calibration of sampling equipment
- Cleaning and demonstration of cleanliness of sampling equipment
- Chain-of-custody
- Sample collection, including quality control samples such as blanks, duplicates, backups, etc.
- Sample handling/preservation/storage
- Configuration and maintenance of analytical equipment
- Tuning and calibration of analytical equipment
- Cleaning and demonstration of cleanliness of analytical equipment
- Standards preparation and control
- Sample preparation
- Spiking
- Introduction of samples
- Data reduction, processing (including uncertainty analysis), handling, storage and retrieval
- Data validation
- Reporting of results, including quality parameters
- Retention of samples and data
- Record-keeping

A calibration SOP would include:

- a definition of terms used in the procedure
- a description of the specific equipment to which the procedure is applicable, including model number and specifications
- a brief description of the scope, principle and/or theory of the calibration method

- fundamental calibration specifications, such as environmental conditions, calibration points and tolerances
- a description of standards required to perform an effective calibration, including source, identifying serial number, specified tolerance and expiration date
- a list of equipment necessary to perform a calibration, including manufacturer, model number, specified accuracy and maintenance status
- a cautionary list of possible impediments to a successful calibration, such as common procedural errors or interferences
- a clear, concise step-by-step breakdown of the calibration operation from beginning to end
- specific instructions for recording and reporting the calibration data and its use in qualifying the resultant experimental data