



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION I

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

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October 25, 1990

Ms. Adrienne Townsell
c/o Commanding Officer
Northern Division
Naval Facilities Engineering Command
Building 77-L, U.S. Naval Base
Philadelphia, PA 19112-5094

Dear Ms. Townsell:

This office is in receipt of the "Final Plan of Action - Installation Restoration Study, Naval Submarine Base-New London - Groton, Connecticut" dated April 1989 and prepared by Atlantic Environmental Services, Inc. Upon review, this office offers the following comments:

General Comment

- (1) On June 21, 1990, at the Technical Review Committee (TRC) meeting, copies of "Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA" and two guidance documents relative to the preparation of Risk Assessments were presented. In order to ensure that the RI/FS is completed in accordance with EPA guidance, an RI/FS workplan must be submitted to this office. Attached for your information is a guidance document relative to the development of the Risk Assessment Workplan.

Field Sampling Plan

Section 4.1 - General

- (1) Page 53 - In planning a soil gas survey of the areas chosen, details regarding the grid to be used or how the sampling points will be chosen should be provided. Also, details on how deep the sampling probe will be driven to obtain a sample of each location should be included. The soil gas plan also needs details on what compounds the field gas chromatograph will be calibrated for and what compounds will be measured. In addition,
 - (a) What is to be done with information recorded from soil gas survey?
 - (b) What parameters constitute a "hot spot?"



- (c) What type of sampling will be conducted at each "hot spot," e.g., surface soil samples, borings or monitoring wells?
- (2) Page 56 - Areas to be sampled should have a HNu onsite. HNu registers in ppm, while Photovac registers in ppb. High readings on HNu will give Photovac problems, i.e., will be time consuming to purge column.

What constitutes high concentrations in order to rinse syringe and sampling devices with methanol?

- (3) Page 56 - At many of the sites, it is stated that it will be necessary to perform gamma logging for radiation detection, yet nowhere is a nuclear waste problem discussed.
- (4) Page 57 - One of several discussed geophysical methods was discussed to determine, for example, the possible distribution of buried objects that may be sources of contamination at each site chosen for the survey. Based on previous site inspections, there should be adequate information to select a survey method for each of the sites. Also, the type of survey grid or line spacing that will be used at each area and the lateral extent of the survey over the area should be indicated.
- (5) Page 58 - Hydraulic tests are proposed on an undetermined number of wells. It is felt that there should be a definite plan for determining which wells will be tested and what information will be obtained. Slug tests should be performed on all wells as they are simple and quick ways to get conductivities.
- (6) Page 58 - In the last paragraph, it states, "All drill cuttings with visual contamination or with significant volatile organic readings . . . will be contained in 55 gallon drums." What is meant by "visual contamination?" What will be done with drill cuttings that are not "visually contaminated" or that do not exhibit "significant volatile organic readings?" What type of QC or screening procedure will be instituted to insure that the drill cuttings do not contain high concentrations of other contaminants, such as metals or pesticides/PCBs?

Section 4.2.1 - CBC Drum Area (Site No. 1)

- (1) Page 59 - In this area, as well as the Rubble Fill at Bunker A-86 and OBDANE, background soil samples should also be taken from an area not affected by disposal practices.

- (2) Page 61, Table 4-2 - In this Table through Table 4-14, reference is made to analyzing "TCLP metals" using CLP. What is meant by this reference? After the TCLP metals have been extracted, will the TCLP metals list be expanded to include all the CLP metals? It should be noted that the TCLP methods are specified in the Federal Register, March 29, 1990.
- (3) Page 61 - Table 4-2 - In this table and Procedure 1020-3, volatile organics cannot be composited.

Section 4.2.2 - Rubble Fill at Bunker A-86

- (1) Page 62 - Two samples may not be enough to adequately assess the potential for near surface contamination in this area which is approximately 60 feet across. Also, a sample downgradient should be considered.
- (2) Page 64, Table 4-3 - In this table and Procedure 1022, sediment samples for volatile organics cannot be composited and should be collected in 2 x 120 ml wide mouth glass vials.

Section 4.2.3 - Torpedo Shops

- (1) Page 68 - For the decontamination of Split Spoons, a 10 percent nitric acid rinse should not be used on carbon steel split spoons as metal from the spoons will leach out. A 1 percent nitric acid rinse is recommended. Methanol will remove only water soluble organics. Hexane will remove non-water soluble organics such as pesticides and PCBs. Therefore the methanol rinse should be followed by a hexane rinse. All solvents should be pesticide grade or better.
- (2) Page 65 - It is suggested that the location of SD-1 and SW-1 be moved further downstream past the influence of the backfields, just upstream of the storm drain.
- (3) Page 70 - There is no mention of steam cleaning of the casing. In addition, decontamination of the bailers should include a hexane rinse after the methanol rinse, which will remove pesticides and PCB's which are insoluble in water.

Section 4.2.4 - Goss Cove Landfill

- (1) Page 71 - For soil samples, CLP recommends 2 x 120 ml glass vials for volatile organics. In addition, as previously noted, volatile organics cannot be composited.

- (2) Page 71 - Paragraphs 2 and 5 discuss the drilling depths and sampling plan for the borings to be drilled at the Goss Cove Landfill. It is recommended that all borings be drilled to refusal, even if the fill layer is greater than 20 feet thick. This would be performed in order to obtain and screen samples from the stratigraphic horizon(s) below the fill layer. Soil samples from the background monitoring well, MW-4 and at least 3 of the remaining borings or monitoring wells from the stratigraphic horizon(s) below the fill layer should be analyzed for the target compound list in order to assess the vertical migration of contaminants. This could be included in the Step II phase of work.
- (3) Page 71 - The final paragraph discusses the monitoring wells to be installed. It should be noted that if contamination is found in the shallow groundwater in this area, wells with screened intervals set at a deeper elevation, possibly in the bedrock would need to be installed in order to assess the vertical migration of contaminants. This could be included in the Step II phase of work.
- (4) Page 73 - During well development, there is no mention of pH, conductivity or temperature measurements being performed. Well development may be considered complete when three consecutive measurements differ by less than 5 percent for all parameters, and a minimum of three well volumes have been purged.
- (5) Page 73 - This office recommends that the ground water samples at the four monitoring wells be collected regardless of the results of the site investigation at the DPDO area. Since it is uncertain about the types of material that were disposed, these wells should be sampled.
- (6) Page 73 - Bailers should be rinsed with hexane after the methanol rinse.

4.2.5 - OBDANE

- (1) Page 74 - As previously noted, composite samples for volatile organics cannot be performed. Also, two samples may not be adequate to assess the potential for contamination in this area. It is suggested that four samples be placed along the base of the fill.
- (2) Page 74 - Containers for volatile analysis for soil samples should be 2 x 120 ml glass vials.

4.2.6 - Spent Acid Storage and Disposal Area

- (1) Page 78 - Hexane rinse is needed in decontamination steps for split spoons. A 10 percent nitric acid rinse is not recommended. for carbon steel split spoons. One percent nitric rinse is recommended. Soil samples collected at 4 foot intervals (0-4' and 4-8', respectively) require compositing two split spoons to get the desired interval. Since volatile organics should not be composited, from what spoon will the 2 x 120 ml glass vials be filled?

4.2.7 - Former Gasoline Station

- (1) Page 82 - A 10 percent nitric acid rinse is not recommended for carbon steel. A hexane rinse should follow the methanol rinse. Volatile organics should not be composited; they should be collected in 2 x 120 ml glass vials.

4.3.1 - Area A Landfill

- (1) Page 86 - In the final paragraph, it is noted that the soil samples from the background monitoring wells will only have one stratigraphic interval analyzed, while the other downgradient monitoring wells will have two. It is recommended that the same stratigraphic intervals be analyzed for both the background wells and the wells located in and downgradient from the landfill. Two soil samples should be analyzed from the background wells.
- (2) Page 88 - In the final bullet on this page and the first bullet on page 89, the Navy should clarify at what depths they plan to install the screened intervals in the overburden wells and the bedrock wells. In the event there is groundwater present in the unconsolidated materials above the bedrock, we do not believe that, at this level of study, it is necessary to have so many of the monitoring wells screened both in the unconsolidated materials and in the bedrock. Selected locations could be chosen as nested pairs in the landfill area and the wetland area in order to determine vertical hydraulic parameters, a groundwater flow direction within the bedrock, and the potential for contamination in the bedrock. These locations would include an upgradient location, one or two within or immediately downgradient from the landfill, and one or two farther downgradient in the wetland area.
- (3) Page 89 - In the first paragraph it is stated that five bedrock wells will be constructed. The Navy should specify which wells they are referring to. On page 86 in paragraph 3 it is stated that six nested monitoring wells will be

constructed. If this is a discrepancy, it should be addressed.

- (4) Page 89 - Decontamination Procedures - A 10 percent nitric acid rinse is not recommended for carbon steel.

A hexane rinse should follow the methanol rinse. Methanol will not remove PCBs and pesticides, which are insoluble in water, while hexane will remove them.

Well Installation - Based on past experience, mud rotary is not recommended for well installation, since the mud may affect the chemistry of the overburden well as part of this cluster.

Bedrock wells - The Navy should define what saturated bedrock is (rock with all pore space filled with water?) Bedrock lithology needs to be determined, e.g., whether it be highly fractured basalt or a porous sandstone in order to determine aquifer characteristics.

How is the compressed air to be filtered in the air hammer drill?

Well Development - No mention is made of pH, conductivity of temperature. It may be difficult to pump a bedrock well for 4 hours.

Groundwater Sampling - Bailers should be rinsed with pesticide grade hexane after the methanol rinse. Methanol will not remove PCBs or pesticides as hexane will.

4.3.1.2 - Area A Wetland

- (1) Page 94 - Sediment samples for volatile organics should not be composited. Two 120 ml vials should be used. What is a "grab composite sample?" (p.94) A sample is either a grab (no compositing) or a composite sample.

The locations of the two surface water samples are not shown on Figure 4-9A.

In paragraph 4, it is stated that composites from each of the designated wetland subareas will be analyzed for volatiles. As stated previously composites should not be analyzed for volatile organic compounds. One or two samples should be chosen from each subarea and analyzed separately for volatiles.

- (2) Page 95 - Paragraph 2 discusses the drilling of borings within the wetland area. Sampling should be continuous to

the bottom of the boring in order to not miss any changes in stratigraphy or contaminated zones.

- (3) Page 95 - Paragraph 3 discusses the samples to be analyzed from the soil borings. It may not be necessary to analyze as many of the intervals discussed in this paragraph. The borings should be advanced to bedrock or refusal, whichever comes first. Two or three samples from each of the borings should be analyzed for the target compound list from the first stratigraphic intervals, the dredged materials, a final sample should be analyzed from within the native soil, if any, encountered beneath the disposed material and above the bedrock. When constructing monitoring wells in this area, careful attention should be made to the possible presence of clay or till layers that may cause perched groundwater conditions.
- (4) Page 97 - Relative to the bedrock monitoring wells drilled 50 feet into bedrock:
 - (a) they should be packer tested and/or examined using other borehole geophysical techniques.
 - (b) will they be screened or open holes?

Biological Survey of Area A

- (1) Page 101 - Amphibians and reptiles should be included in the qualitative survey.

Residue Analysis of Birds

- (1) Page 102 - The red-winged blackbird (*Agelaius phoeniceus*) would be a good choice for an insectivorous wetland bird species. Since the wetland is approximately 25 acres, blackbirds should be abundant and easy to collect. Depending on the amount of water, plant species composition, and other properties of the wetland at the site and reference area, it may be difficult to find ten juvenile ducks of the same species. You may want to scale down the number of waterfowl proposed for collection.

"Whole animal" preparation of samples is mentioned. If the sampling is to indicate risks to human health and to show bioaccumulation potential, then muscle tissue may suffice. However, in order to conduct an environmental evaluation that allows comparison to "effect" levels at the site with levels reported in the literature, bird liver and brain tissue analysis should be considered.

Please make sure the appropriate federal and state wildlife and fish collection permits are obtained by the contractor.

Residues in Fish Tissues

- (1) Page 102 - PCBs should be included in the residue analysis. If sampling is for food chain analysis, a whole fish analysis is preferred. In this event, PAH analyses should also be conducted. If the sampling is for a human health evaluation, fillet analysis is satisfactory from our perspective only if the offal is also analyzed, so that a composite of whole fish can be "reconstructed" from fillet and offal data.

4.3.1.3 - Area A Downstream Watercourses

- (1) Page 104 - It is recommended that two surface water and sediment samples be collected at the discharge points of the drainage ditches into the Thames River. In order to evaluate the impact of contaminants from the Subase to aquatic resources in the Thames River, the scope of the sampling effort in the river needs to be expanded to evaluate the Subase as a contaminant source. Additional sediment contaminant data is critical to evaluate the threat to NOAA resources.

Mussel Cages in Thames River

- (1) Page 108 - Under the current sampling design, mussel bioaccumulation studies may provide little information regarding actual bioaccumulation potential of contaminants originating from the Subase. Information regarding the specific elements of the mussel bioaccumulation study was not presented in the field sampling plan. Where will the mussels used in the study come from? When will the study occur? Will cages be suspended in the water column or placed on the bottom? Will condition or gonad index be measured? Answers to these questions are necessary to evaluate the effectiveness of the study design for determining bioaccumulation potential. In addition, it was unclear from the sampling plan as to how these data will be used to evaluate the Subase as a contaminant source.

If bioaccumulation studies are to be included in this phase of the investigation, additional species need to be considered for inclusion. Recreational or commercially important fishes and shellfish in the Thames River should be considered for evaluation of bioaccumulation. Samples of shellfish populations in the river adjacent to the Subase

may be more indicative of local contamination because they are sessile and in contact with bottom sediments.

- (2) Page 108 - How far upstream from the site will the "control" site be located? If the "control" site is too close, tidal action may actually be flushing contaminants upstream, thereby influencing the control site. Reference is made to a tidal excursion, but we have been unable to find a definition for the term. What is a tidal excursion?

4.3.3 - DPDO Area

- (1) Page 115 - The sixth paragraph discusses the choice of twenty feet as the limit of the depth of the soil borings. The rationale for this choice should be explained.
- (2) Page 117 - As a background monitoring well, MW-5 should be screened in the same interval with respect to the water table as the downgradient wells. This would mean turning MW-5 into an overburden monitoring well.
- (3) Page 118 - Paragraph 3 discusses the influence that the Thames River may have on the groundwater on the site. It may be useful to monitor the tidal fluctuations over at least three tidal cycles in the river and selected monitoring wells progressively farther away from the shore. This information can provide quantitative data on the influence of the river on the aquifer and the transmissivity and storage factor of the aquifer.

5.0 - Sample Preservation and Shipping

- (1) Page 129 - Please provide a reference for the source of the preservation procedure in this section. It should be stated that sample shipment will be in accordance with all state and federal (U.S. DOT) guidelines.

7.0 - Schedule

- (1) Page 132 - The schedule for the various tasks should be inserted into the document.

Appendix A - Atlantic Technical Procedures

Procedure No. 1020 - Surface Soil Samples

- (1) No mention of soil gas survey. Typically soil gas surveys are used to define sampling locations, whether it be surface soil, subsurface, or groundwater.
- (2) Sample containers - 1 liter container are very large. Field members might be hard pressed to fill these containers with surface soil.
- (3) Composite samples - should not composite volatile organics.
- (4) Containers for volatile analysis of surface soils should be 2 x 120 ml wide mouth glass vials (User's Guide to the Contract Laboratory Program).
- (5) There is no mention of decontamination of sampling equipment.

Procedure No. 1021 - Subsurface soils

- (1) In Section 6.2, this office questions the statement "until further decisions are made."
- (2) Samples should be in clean laboratory jars and on ice if held for analysis.
- (3) Containers for volatile analysis of subsurface soils should be 2 x 120 ml wide mouth glass vials.
- (4) What parameters dictate analysis by a laboratory?
- (5) Are split-spoon samples to be screened with HNu or OVA? Also, split spoons and remote samples should be decontaminated after each use.

Procedure No. 1022 - Surface Water and Sediments Samples

- (1) In Section 6.4.2, it is stated that sediments would be scooped into a jar using a spoon. This approach will not result in a valid sample if used in standing water, lakes, streams or rivers. Most of the material "scooped" will be lost or heavily washed before it is put in the sample container. Use of a coring device or grab (hand held or otherwise) is appropriate for this type of sampling.

Procedure No. 1023 - Ground Water Samples

- (1) EPA Region I prohibits the use of peristaltic pumps to collect water samples for VOCs. Samples can be collected using stainless steel or teflon bailers. The sample

collection device must be compatible with the type of sample being collected. A table, which includes sampling procedures, sampling equipment, and media to be sampled, along with the compatibilities of each, should be provided.

Procedure No. 1040 - Sample Preservation

- (1) As previously mentioned in the Field Sampling Plan, sample preservation in Section 6.1 must follow the procedures outlined in the specific analytical method used.
- (2) Table 6-1 - Are the sample volumes, containers, preservation procedures, and holding times appropriate for the analytical method listed? Please provide a reference for the sample volumes, containers, and holding times for those parameters that do not have a method reference ("Flameless AAS, Total Organic halogens, Total Organic Carbon," etc.)?

According to 40 CFR Part 136, for EPA Method 625, the holding time should be 7 days from the date of collection to the date of extraction and 40 days from the date of extraction to the date of sample analysis.

For EPA Method 624, aromatics must be preserved with HCL to attain a 14 day holding time. The holding time for unpreserved aromatics is 7 days.

For EPA Method 608, the holding time should be 7 days from the date of collection to the date of extraction and 40 days from the date of extraction to the date of sample analysis. In addition, the sample pH must be adjusted to between 5.0 and 9.0 with sodium hydroxide or sulfuric acid if the extraction is not completed within 72 hours.

- (3) Table 6-2 - For the Semivolatiles methods, there should not be any preservative unless residual chlorine is present.

This Table references "SW-846, USEPA, April 1984;" however, the QAPjP references the third edition of SW-846, 1986. Which edition will be used? It should be the most current (third) edition, and the sample volumes, containers, preservation procedures, and holding times should be as specified in this edition.

- (4) In Section 6.4, what does "conventional parameters" refer to?

Procedure No. 1042 - Shipping Procedures

- (1) As previously stated in Section 6.0, sample packaging and shipment must be in accordance with all state and federal (U.S. DOT) regulations.

Procedure No. 1060 - Cleaning Procedure

- (1) We do not see the need for two separate decontamination procedures. If two procedures are used, a sample interval at 10 feet to 12 feet could only be analyzed for one component, wither organics or inorganics. The next split spoon would sample from 12 feet to 14 feet and, an interval of analyses would be missed.
- (2) A (0.1N) HCL and/or HNO₃ rinse is not recommended as a decontamination step. A rinse with 10 percent HNO₃, ultrapure, is recommended on all equipment except carbon steel split spoons. Split spoons should be rinsed with 1 percent HNO₃ to minimize leaching of metal.

Final Quality Assurance/Quality Control and Data Management Plan

- (1) EPA requires that Quality Assurance Project Plans address sixteen items which must be considered for inclusion. Review of the Plan indicated that several of these items were not addressed:
 - (a) At the bottom of the title page, provisions must be made for the signatures of approving personal.
 - (b) For each major measurement system, including all pollutant measurement systems, a written description of calibration procedures should be provided, including the frequency of the calibration and the standards to be used.
 - (c) For each major measurement system, including all pollutant measurement systems, the procedures for data reduction, validation, and reporting should be briefly described. If data validation is to be performed, it should be done according to USEPA Region I Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analyses (7/88, modified 2/89).
 - (d) Each plan must describe the internal and external performance and systems audits which will be required to monitor the capability and performance of the total measurement system(s).

- (d) The plan should provide a schedule of important preventive maintenance tasks that must be carried out to prevent downtime of measurement systems, as well as list any critical spare parts that should be on hand.
- (2) The Data Quality Objective which is outlined in Section 1.2 states that Level C will be used. Region I uses Levels I-V as defined in the Superfund manual "Data Quality Objectives for Remedial Response Activities" (EPA 540/G-87/003, March 1987). The objective needs to be defined using these levels.
- (3) Section 3.3 - This paragraph indicates that, whenever possible, sample preservatives will be added to the sample containers at the laboratory. Sample preservation must follow the procedures specified in the analytical methods utilized. This may require that sample preservatives be added in the field at the time of the sampling.
- (4) Table 3-1 - The source for the container, preservation and holding time requirements listed in this table should be provided. Are the holding times from the time of sample collection or from the time the samples are received at the laboratory? The holding times for CLP, which are provided in the 2/88 Organic SOW and in the 7/88 Inorganic SOW, are from the time the samples are received at the laboratory. However, for the purposes of a QA/QC plan, holding times must be defined from the time of sample collection.

Chromium VI is not a routine CLP parameter. In addition, Chromium VI should not be preserved.

In this table and several other tables, it is indicated that samples will be analyzed for metals. Is this total or dissolved metals? If it is dissolved metals, the samples must be field filtered at the time of collection.

EPA Region I requires that all VOC samples be preserved with HCl.

- (5) Table 3-3 - The frequency of collection for the equipment blanks should be greater than one per day unless dedicated sampling equipment is to be used. For non-dedicated sampling, a frequency of one per twenty samples is appropriate.

Footnote 2 indicates that only samples collected every other day will be analyzed. The samples that are held are analyzed only if evidence of contaminants exists. For those samples that are held, will the holding time limits, particularly for the VOCs, be maintained?

- (6) In the first paragraph on page 11, it should indicate that sample packaging and shipment will conform to all state and federal (U.S. DOT) regulations.
- (7) Section 3-4 - This section addresses field QC samples. Laboratory QC samples should also be addressed in this section (spiked samples, replicates, surrogate samples, reagent checks, etc.).
- (8) Section 5.0 - In the first paragraph, it states that "Target Compound List (TCL) parameters will be analyzed by CLP protocols for both organic and inorganic analyses." According to CLP, the TCL refers to the list of CLP organic compounds in the 2/88 organic SOW; the Target Analyte List (TAL) is the list of inorganic parameters from the 7/88 Inorganic SOW.

In the second paragraph, it states "The Target Compound List (TCL) is the suite of parameters to be determined on samples of soil, sediment, surface water, and groundwater." Are these the only media that will be sampled? Which type of samples (media) will be analyzed for all of the other analytical methods listed in Tables 5-5 and 5-6?

- (9) Section 5.1 - In the first paragraph, it references the September 3, 1985 version of the Organic SOW; however, the remainder of the plan refers to the July 1987 version. The most updated versions of the SOW should be used (2/88 for Organics, 7/88 for Inorganics) and these references should be consistent throughout the plan. Will the detection limits provided in the CLP SOWs be met? If not, please provide the detection limits for the compounds being analyzed by CLP.

If TCLP analyses will be performed for metals, why does Table 5-4 provide the CLP metals list? After the TCLP metals have been extracted, will the TCLP metals list be expanded to include CLP metals? It should also be stated that TCLP will follow the procedures for the method, as provided in the March 29, 1990 Federal Register.

- (10) Table 5-1 - The compound 2-chloroethyl vinyl ether is not listed on the CLP TCL from the 2/88 Organic SOW.
- (11) Table 5-3 - "Endrin aldehyde" should be endrin aldehyde and is not on the TCL list from the 2/88 Organic SOW. In addition, chlordane should include alpha and gamma isomers.
- (12) Table 5-4 - Boron is not listed in the CLP 7/88 Inorganic SOW.

(13) Section 5.2 - Sections 5.0 and 5.1 indicate that all analyses will be done using CLP methods. Why are Tables 5-5 and 5-6 provided? Will other analytical methods be used? If so, when and on which samples? As previously mentioned, this Plan should specifically state which methods will be used on all samples collected. The method references and method detection limits should also be provided.

If you have any questions, please do not hesitate to contact me at (617) 573-5793.

Sincerely,



Paul N. Marchessault, Remedial Project Manager
Federal Facilities Office

cc: Paul Jameson
Paul Burgess
Al Klinger
William Mansfield
Dale Weiss