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DEPARTMENT OF THE NAVY
NORTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
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IN REPLY REFER TO

5090
Code 1823\ME

16 NOV 1999

Mr. Mark Lewis
Connecticut Department of Environmental Protection
Bureau of Water Management
Permitting, Enforcement & Remediation Division
79 Elm Street
Hartford, CT 06106-5127

Dear Mr. Lewis:

SUBJECT: RESPONSES TO CTDEP COMMENTS OF SEPTEMBER 7, 1999 REGARDING THE DRAFT WORK PLAN AND SAMPLING AND ANALYSIS PLAN FOR THE BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION FOR THE NAVAL SUBMARINE BASE, NEW LONDON, GROTON, CT

Thank you for reviewing the Draft Work Plan for the Basewide Groundwater Operable Unit Remedial Investigation for the Naval Submarine Base - New London. The Navy's responses to your comments are attached.

If you have any other questions or comments please do not hesitate to contact me at (610) 595-0567 ext. 162.

Sincerely,

M. R. Fahrer
for
Mark Evans
Remedial Project Manager
By direction of the
Commanding Officer

Copy to:
Ms. Kymberlee Keckler, USEPA Region I
Ms. Darlene Ward, NSB-NLON
Mr. Dave Cercone, Tetra Tech NUS - Pittsburgh

RESPONSES TO
CT DEP's SEPTEMBER 7, 1999 COMMENT LETTER
REGARDING THE JUNE 1999
DRAFT WORK PLAN AND SAMPLING ANALYSIS PLAN
FOR THE BASEWIDE GROUNDWATER OPERABLE UNIT
REMEDIAL INVESTIGATION,
NAVAL SUBMARINE BASE NEW LONDON
GROTON, CONNECTICUT

November 8, 1999

GENERAL COMMENTS (Cover Letter)

1. Pages 1-2 and 1-3; Objectives

Comment: The *Work Plan and Sampling and Analysis Plan* appears to meet the objectives stated on pages 1-2 and 1-3. The sampling and analysis program, if carried out according to the plan, should provide sufficient information to evaluate remedial alternatives during the feasibility study.

Response: Agree. No further action is required to address this comment.

2. Overall text; Ground water criteria

Comment: The Work Plan should consider all of the ground water criteria in the Remediation Standard Regulations. The ground water criteria applicable at the Naval Submarine Base, which has a ground water classification of GB, include the volatilization criteria and the surface water protection criteria. In several cases the text discusses the applicability of only one of these criteria, and not the other. The Navy proposes to use the ground water protection criteria, along with other criteria, in selecting Contaminants of Concern. The ground water protection criteria do not have regulatory significance in a GB area. However, it is appropriate to use them in selecting contaminants of concern since this is a conservative approach. Please note that the Navy is only obligated to evaluate and remediate substances, which are part of a release.

Response: The Navy makes a distinction between criteria that are used to identify chemicals of concern and criteria that will trigger a regulatory obligation. All chemicals that exceed a regulatory obligation are obviously chemicals of concern. However if a chemical exceeds a stringent but unrequired criteria (e.g. GA classification) it may not necessarily impose a regulatory obligation on the owner. The Navy has chosen to take a conservative approach in identifying chemicals of concern so that the selected remedy encompasses all regulatory and engineering requirements. The comment does not require any changes to the text.

3. Overall text; acceptable carcinogenic risk level

Comment: The text states in several places that Connecticut's acceptable carcinogenic risk level is 1E-5. Please note that the 1E-5 risk level applies to the cumulative risk posed by multiple polluting substances. The acceptable excess carcinogenic risk for individual polluting substances is 1E-6.

Response: Agree. Cancer risks presented in the human health risk assessment for the groundwater operable unit will be compared to CT DEP target levels of 1E-6 for individual constituents and 1E-5 for multiple constituents. Section 1.5.2.4, Risk Characterization, of the Work Plan will be revised accordingly.

SPECIFIC COMMENTS

1. Page 1-3; Section 1.2; Description of Site Conditions

Comment: The Basewide Groundwater Operable Unit specifically excludes the Lower Base as well as the DRMO. The Navy has previously stated in its March 10, 1999 letter that groundwater in the Lower Base will be considered during the Lower Base Feasibility Study. As stated in my March 26 letter, this approach is acceptable. However, the State wishes to reiterate its concern that ground water throughout the **entire** base must be considered as a whole. Considering the ground water in the Lower Base separately from that in upland portions of the base can result in a fragmented and incomplete investigation. Contaminant plumes originating in upland portions of the base may extend downgradient to the Lower Base. The results of the Basewide Groundwater investigation must be considered in scoping the Lower Base Feasibility Study to ensure that no data gaps occur.

Response: The Navy has historically viewed these two areas separately. The Navy believes that previous works have adequately defined the nature and extent of contamination and potential impacts to the Thames River; consequently, additional groundwater investigations in this area are not warranted. However, groundwater physical and chemical data along with groundwater flow information will be used to associate the potential impacts in this area with the rest of the base. Contaminant fate and transport analyses undertaken on a basewide problem will not be done piecemeal. Instead, groundwater models and remedial actions will treat problems entirely and not stop at OU boundaries.

2. Page 1-12; Section 1.3; Site Descriptions

Comment: It would be helpful to the reader if site numbers were included in the headers for each subsection.

Response: Agree. Site numbers will be referenced as appropriate in each of the subsections within sections 1.3.1, 1.3.2, and 1.3.3.

3. Page 1-21; Area A Weapons Center

Comment: The text states that this site consists of building 524 and the weapons storage bunkers. However, Plate 1 and Figure 1-9 show building 524 as being outside the boundaries of Site 20. It should be noted that the Feasibility Study recently submitted for Site 20 by the Navy also shows building 524 as being outside the site boundaries. Please clarify whether building 524 is included or excluded as part of site 20.

Response: Since the original basewide remedial investigation (B&RE, 1997), Building 524 has been considered to be part of Site 20 (Area A Weapons Center). Building 524, which is located near the top of a local topographic and bedrock high, was constructed in 1990-1991. Although

no weapons production takes place in Building 524, it is used for administration, minor torpedo assembly, and storage of simulator torpedoes and small quantities of chemicals and chemical wastes are generated and stored in this building. The remainder of Site 20 includes the north and south weapons storage bunkers.

Plate 1 mistakenly labels the drainage area of the storage bunkers as Site 20. This drawing will be corrected by extending the Site 20 boundary to include Building 524. Figure 1-9 is also mislabeled. On that figure the "Area A Weapons Center" label will be replaced by "Storage Bunker Drainage Area". It should be noted that no test borings were collected adjacent to Building 524 because of its location described above and because portions of the site were blasted to remove bedrock to accommodate construction of the building.

4. Page 1-25; Section 1.3.3.2; Spent Acid Storage and Disposal Area

Comment: This section should briefly discuss the State's soil sampling effort at the Spent Acid Storage and Disposal Area.

Response: Agree. The following paragraph will be inserted between the third and fourth paragraphs on page 1-25 (Section 1.3.3.2).

> "In June 1997, CT DEP completed additional soil sampling at Site 15 and analyzed the samples for lead by SPLP. This program was conducted to determine if the remaining site soils could act as a potential source of contamination to the groundwater. The results indicated that the remaining soils did not pose a potential contaminant migration problem. Although CT DEP did not provide the Navy with the analytical results or a map showing sampling locations, they issued a letter on September 15, 1997 providing concurrence with the No Further Action remedy for this site."

5. Page 1-30; Section 1.4.1.2; Natural Attenuation

Comment: Please include carbon dioxide in the list of analytical parameters. It is a daughter product of the oxidative breakdown pathway. Elevations greater than twice background may be considered evidence that attenuation is occurring through oxidation. Please include hydrogen on the list of analytical parameters. Concentrations greater than 1 nM indicate that a reductive pathway may be possible and vinyl chloride may accumulate, while vinyl chloride may be oxidized at concentrations less than 1 nM.

Response: Table 2.1 of the September *1998 EPA Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Groundwater* indicates that dissolved hydrogen is an optional specialized analysis. In addition, the goal of the RI sampling and analysis is to determine if natural attenuation (NA) is or not occurring and this parameter is not necessary for this determination. Therefore, the Navy does not agree to add dissolved hydrogen to the analytical parameter list for the RI.

Carbon dioxide is not listed in Table 2.1 as an analysis that is useful to evaluate the Potential for Natural Attenuation of Chlorinated Solvents or Fuel Hydrocarbons. The Navy does not agree to add carbon dioxide to the parameter list for the RI.

6. Page 1-32; Section 1.4.1.3.1; Developing Background Groundwater Concentration

Comment: The Navy proposes to develop site specific background concentrations for inorganics, and will conduct statistical analysis to determine if basewide background concentrations can be developed. The methodology proposed by the Navy appears to be sound. Please refer to the definition of "background concentration for groundwater" given in section 22a-133k-1(a)(5). With respect to a particular release, this term means the concentration of a substance in ground water (A) at the nearest location upgradient of and unaffected by the release; or (B) if such release occurred at or created a ground-water divide, at the nearest location representative of ground water quality unaffected by any release.

Response: Agree. This is consistent with the text presented on page 1-32. No further action is necessary to address this comment.

7. Page 1-38; Section 1.4.2.1.2; First Paragraph; Site 3- Area A Downstream Watercourses and OBDA

Comment: The first paragraph states that because ground water protection criteria are not available for an area with a ground water classification of GB, the GA/GAA ground water protection criteria are "used to protect existing groundwater" within the context of the Area A Landfill ground water monitoring program. As the Navy notes, this ground water monitoring program was previously approved by the State. Please note, however, that the Navy must comply with the volatilization and surface water protection criteria. The Navy is not required to comply with the ground water protection criteria. However, the ground water protection criteria provide an appropriately conservative benchmark for the ground water monitoring program.

Response: Agreed. The groundwater chemistry data will be screened against several sets of criteria formulated by both Federal and State agencies. The criteria from US EPA that will be considered will include Region III RBCs, Region IX PRGs and MCLs while the criteria from the CT DEP will include volatilization criteria, surface water protection criteria and groundwater protection criteria. The comparisons will be used to develop the chemicals of potential concern. Chemicals of potential concern identified by this screening will be subjected to more rigorous risk assessment.

Compliance is viewed as a different issue than the determination of constituents of concern. The Navy will evaluate the volatilization and surface water protection criteria as an ARAR during the RI preparation. Text that describes the criteria in the previous paragraph will be added to clarify the COC criteria.

8. Page 1-38; Section 1.4.2.1.2; Second Paragraph; Site 3- Area A Downstream Watercourses and OBDA

Comment: The second paragraph states that carcinogenic risks were within the Department's target range of 1E-5. Please note that the Department's target carcinogenic risk range for an individual pollutant is 1E-6. The 1E-5 target risk applies to the collective risk posed by multiple pollutants.

Response: Agree. Cancer risks presented in the human health risk assessment for the groundwater operable unit will be compared to CT DEP target levels of 1E-6 for individual

constituents and 1E-5 for multiple constituents. Text in Section 1.4.2.1.2 will be revised accordingly. See response to General Comment 3.

9. Page 1-38; Section 1.4.2.1.2; Third Paragraph; Site 3- Area A Downstream Watercourses and OBDA

Comment: The third paragraph states that samples will be analyzed for "quick-turn VOCs". Will this be performed by a fixed base laboratory or using field methods?

Response: A fixed-base laboratory will perform the quick-turn VOC analyses. It is anticipated that the turnaround time will be 24 hours on this work.

10. Page 1-39; Section 1.4.2.1.3; Site 7- Torpedo Shops

Comment: Analytical results for ground water should also be compared to the volatilization criteria.

Response: Agreed. See response to specific comment 7.

11. Page 1-40; Section 1.4.2.1.4; First Paragraph; Site 14- OBDANE

Comment: In the first paragraph, analytical results for ground water should also be compared to the volatilization and surface water protection criteria.

Response: Agreed. See response to specific comment 7.

12. Page 1-40; Section 1.4.2.1.4; Second Paragraph; Site 14- OBDANE

Comment: The second paragraph states that carcinogenic risks were within the Department's target range of 1E-5. Please note that the Department's target carcinogenic risk range for an individual pollutant is 1E-6. The 1E-5 target risk applies to the collective risk posed by multiple pollutants.

Response: Agree. Cancer risks presented in the human health risk assessment for the groundwater operable unit will be compared to CT DEP target levels of 1E-6 for individual constituents and 1E-5 for multiple constituents. Text in Section 1.4.2.1.4 will be revised accordingly. See response to General Comment 3.

13. Page 1-41; Section 1.4.2.1.5; First Paragraph; Site 20- Area A Weapons Center

Comment: In the first paragraph, analytical results for ground water should also be compared to the volatilization criteria.

Response: Agreed. See response to specific comment 7.

14. Page 1-41; Section 1.4.2.1.5; Second Paragraph; Site 20- Area A Weapons Center

Comment: The second paragraph states that carcinogenic risks exceeded the Department's target range of 1E-5. Please note that the Department's target carcinogenic risk range for an individual pollutant is 1E-6. The 1E-5 target risk applies to the collective risk posed by multiple pollutants.

Response: Agree. Cancer risks presented in the human health risk assessment for the groundwater operable unit will be compared to CT DEP target levels of 1E-6 for individual constituents and 1E-5 for multiple constituents. Text in Section 1.4.2.1.5 will be revised accordingly. See response to General Comment 3.

15. Page 1-42 Section 1.4.2.3.1; First Paragraph; Site 8- Goss Cove Landfill

Comment: In the first paragraph, analytical results for ground water should also be compared to the volatilization and surface water protection criteria.

Response: Agreed. See response to specific comment 7.

16. Page 1-42 Section 1.4.2.3.1; Second Paragraph; Site 8- Goss Cove Landfill

Comment: The second paragraph states that carcinogenic risks exceeded the Department's target range of 1E-5. Please note that the Department's target carcinogenic risk range for an individual pollutant is 1E-6. The 1E-5 target risk applies to the collective risk posed by multiple pollutants.

Response: Agree. Cancer risks presented in the human health risk assessment for the groundwater operable unit will be compared to CT DEP target levels of 1E-6 for individual constituents and 1E-5 for multiple constituents. Text in Section 1.4.2.3.1 will be revised accordingly. See response to General Comment 3.

17. Page 1-42 Section 1.4.2.3.2; First Paragraph; Site 15 - Spent Acid Storage and Disposal Area

Comment: In the first paragraph, analytical results for ground water should also be compared to the volatilization criteria.

Response: Agreed. See response to specific comment 7.

18. Page 1-42 Section 1.4.2.3.2; Second Paragraph; Site 15- Spent Acid Storage and Disposal Area

Comment: The second paragraph states that carcinogenic risks exceeded the Department's target range of 1E-5. Please note that the Department's target carcinogenic risk range for an individual pollutant is 1E-6. The 1E-5 target risk applies to the collective risk posed by multiple pollutants.

Response: Agree. Cancer risks presented in the human health risk assessment for the groundwater operable unit will be compared to CT DEP target levels of 1E-6 for individual constituents and 1E-5 for multiple constituents. Text in Section 1.4.2.3.2 will be revised accordingly. See response to General Comment 3.

19. Page 1-43 Section 1.4.2.3.4; First Paragraph; Site 23- Fuel Farm

Comment: In the first paragraph, analytical results for ground water should also be compared to the volatilization criteria.

Response: Agreed. See response to specific comment 7.

20. Page 1-44; Section 1.4.2.4; Background

Comment: Please refer to the definition of "background concentration for ground water" given in the Remediation Standard Regulations: "The concentration of a substance in ground water (A) at the nearest location upgradient of and unaffected by the release; or (B) if such release occurred at or created a ground-water divide, at the nearest location representative of ground water quality unaffected by any release."

Response: Agree. This is consistent with the text presented on pages 1-31 and 1-32 (Section 1.4.1.3.1). No further action is necessary to address this comment.

21. Page 1-48; Section 1.5.2.1.1; Third Paragraph; Selection of Chemicals of Concern

Comment: The third paragraph states that for the purpose of COC selection, soil samples collected from depths greater than 10 feet will not be used. This appears to be a reasonable approach. However, please note that the direct exposure criteria apply to all soil above a depth of 15 feet. Soils at a depth greater than 4 feet or soils more than two feet below a paved surface comprised of a minimum of three inches of bituminous concrete or concrete are considered "inaccessible soil". The direct exposure criteria do not apply to inaccessible soil provided that an environmental land use restriction is in effect. The environmental land use restriction must ensure that the soil will not be exposed as a result of excavation, demolition, or other activities and that any pavement which is necessary to render the soil inaccessible is maintained in good condition.

Response: All soil samples collected from the unsaturated zone above a depth of 15 will be used in the COC selection process. Soil samples collected from areas that meet the CT DEP definition of "inaccessible soil" will also be evaluated in the COC selection process to determine if an environmental land use restriction would be required.

The second sentence of the paragraph will be modified as follows:

> For soil, the COC selection process will not use data obtained from historical sampling locations that have since been excavated, unsaturated soil collected from depths greater than 15 feet below ground surface (bgs), saturated soils, and composite soils. Soil samples collected from areas that meet the CT DEP definition of "inaccessible soil" will also be evaluated in the COC selection process to determine if an environmental land

use restriction would be required. "Inaccessible soils" are defined by the CT DEP as soils at a depth greater than 4 feet or soils more than two feet below a paved surface comprised of a minimum of three inches of bituminous concrete or concrete. The direct exposure criteria do not apply to inaccessible soil provided that an environmental land use restriction is in effect. The environmental land use restriction must ensure that the soil will not be exposed as a result of excavation, demolition, or other activities and that any pavement which is necessary to render the soil inaccessible is maintained in good condition. Upon analysis of the analytical data, the Navy will petition the CT DEP for environmental land use restrictions on a site by site basis.

22. Page 1-48; Section 1.5.2.1.1; Fourth Paragraph; Selection of Chemicals of Concern

Comment: The fourth paragraph, which continues onto page 1-49, states that "when necessary, other health based criteria (e.g. Connecticut pollutant mobility criteria) will be used to identify additional COCs based on likely contaminant migration pathways". The various criteria of the Remediation Standard regulations, including the direct exposure, pollutant mobility, ground water protection, surface water protection, and volatilization criteria should be used in all cases for selecting COCs.

Response: Agreed. See response to specific comment 7. Additionally the Navy will consider direct exposure and pollutant mobility for soil data.

23. Page 1-50; Section 1.5.2.1.1; Selection of Chemicals of Concern

Comment: Connecticut Direct Exposure Criteria - The text notes that standards for carcinogens are based on a 1E-6 excess incremental lifetime cancer risk. This is true for individual chemicals. However, it should be noted that a 1E-5 excess incremental lifetime cancer risk also applies to the collective risk posed by groups of contaminants. This comment applies also to the discussion on the next page regarding the volatilization criteria.

Response: Agree. Cancer risks presented in the human health risk assessment for the groundwater operable unit will be compared to CT DEP target levels of 1E-6 for individual constituents and 1E-5 for multiple constituents. Text in Section 1.5.2.1.1 will be revised accordingly. See response to General Comment 3.

24. Page 1-51; Section 1.5.2.1.1; Selection of Chemicals of Concern

Comment: Connecticut Soil Vapor Volatilization Criteria - The text should distinguish clearly between the volatilization criteria, which apply to groundwater (Appendix E of the RSRs) and the volatilization criteria which apply to soil vapor (Appendix F of the RSRs). The soil vapor criteria listed in Appendix F apply only if the groundwater volatilization criteria listed in Appendix E are exceeded.

Response: During this field investigation the Navy is not anticipating the collection of soil gas samples in areas with elevated groundwater VOC concentrations. The following text will be added to the section to clarify the use of the soil vapor volatilization criteria.

If the results of the groundwater investigation indicate an exceedence of the Connecticut Groundwater Volatilization Criteria (Appendix E of the RSRs), the CT-DEP and the US EPA will be advised about the elevated VOC concentrations. A scope of work to address the soil vapor issue in potentially impacted buildings will be drafted after the agencies are notified. If a soil vapor investigation is undertaken, the data will be compared to the criteria listed in Appendix F of the RSRs.

25. Page 1-51; Section 1.5.2.1.1; Background

Comment: Please consult the Remediation Standard Regulation definition of "background concentration for soil".

Response: Agree. This is consistent with the text presented on pages 1-31 and 1-32 (Section 1.4.1.3.1). No further action is necessary to address this comment.

26. Page 1-52; Section 1.5.2.1.1; Selection of Chemicals of Concern

Comment: USEPA Region III COC Screening Levels for Tap Water Ingestion - Please ensure that the most recent version of the Region III RBC table is used. This table is updated every 6 months.

Response: In a response to a comment by the USEPA on this draft Work Plan, the Navy indicated that USEPA Region I is using USEPA Region IX Preliminary Remedial Goals (PRGs) Table to identify COCs rather than the Region III Risk-Based Concentrations (RBCs). Both Region III RBCs and EPA Region IX PRGs in the WP/SAP will be used to determine COCs. The Navy will ensure that the most recent versions of the both the Region III RBC tables and the Region IX PRG tables are used for this comparison. A section describing the Region IX PRGs will be attached as follows:

> **Region 9 Preliminary Remediation Goals (PRGs).** Region 9 Preliminary Remediation Goals (PRGs) are risk-based tools for evaluating and cleaning up contaminated sites. They are being used to streamline and standardize all stages of the risk decision-making process. The Region 9 PRG table combines current EPA toxicity values with "standard" exposure factors to estimate contaminant concentrations in environmental media (soil, air, and water) that are considered protective of humans, including sensitive groups, over a lifetime. Chemical concentrations above these levels would not automatically designate a site as "dirty" or trigger a response action. However, exceeding a PRG suggests that further evaluation of the potential risks that may be posed by site contaminants is appropriate. Further evaluation may include additional sampling, consideration of ambient levels in the environment, or a reassessment of the assumptions contained in these screening-level estimates (e.g. appropriateness of route-to-route extrapolations, appropriateness of using chronic toxicity values to evaluate childhood exposures, appropriateness of generic exposure factors for a specific site etc.) (US EPA Region 9 Home Page, 1999).

27. Page 1-52; Section 1.5.2.1.1; Selection of Chemicals of Concern

Comment: Connecticut Surface Water Protection Criteria - This paragraph states that because the Thames River is a marine ecosystem, surface water protection criteria are not directly applicable for COC screening. However, the surface water protection criteria listed in Appendix D are applicable to both fresh water and marine water. The Navy has applied to the Department for approval of site specific surface water protection criteria. On June 17 the State notified the Navy that it does not accept as submitted the Navy's application for approval of alternative surface water protection criteria for the Basewide Groundwater Operable Unit. The Navy must submit additional information in order for the State to continue its review. Discussions between the Department and the Navy's consultant are ongoing.

Response: Upon resolution of this issue appropriate criteria will be applied to the Basewide Groundwater Operable Unit. Two approaches to resolve this issue are as follows:

Approach 1 - Develop site-specific dilution factors and revise criteria in RI WP/SAP. Use revised criteria for COC screening in RI.

Approach 2 - Use conservative Ambient Water Quality Criteria for COC screening in RI. Develop site-specific dilution factors and revise criteria in FS.

28. Page 1-53; Section 1.5.2.1.1; Selection of Chemicals of Concern

Comment: Federal and State Maximum Contaminant Levels - The second sentence states that "state MCLs have been promulgated under guidance for Connecticut Agencies. Please note that the Public Health Code is part of the Regulations of Connecticut State Agencies. It is not guidance, but is a regulation.

Response: Agree. The second sentence will be revised as follows:

> State MCLs have been promulgated under the Public Health Code as part of the Regulations of Connecticut State Agencies.

29. Page 1-54; Section 1.5.2.1.1; Selection of Chemicals of Concern

Comment: Connecticut Groundwater Volatilization Criteria - The text should distinguish clearly between the volatilization criteria, which apply to ground water (Appendix E of the RSRs) and the volatilization criteria which apply to soil vapor (Appendix F of the RSRs). The soil vapor criteria listed in Appendix F apply only if the groundwater volatilization criteria listed in Appendix E are exceeded.

Response: See response to comment 24.

30. Page 1-54; Section 1.5.2.1.1; Selection of Chemicals of Concern

Comment: Background - The Navy should consider the RSR definition of "background concentration for groundwater".

Response: The text, in its current form, does not eliminate chemicals from the list of COCs by comparing concentrations to background. Therefore, the Navy is being conservative and no modifications to the text are necessary.

31. Page 1-54; Section 1.5.2.1.1; Selection of Chemicals of Concern

Comment: Surface Water - Please specify the criteria to which analytical data for surface water will be compared. The Numerical Water Quality Criteria listed in Appendix D of the State's Water Quality Regulations should be included in the comparison.

Response: The criteria to which surface water will be compared include: 1) CT-DEP Numerical Water Quality Criteria and, 2) Ambient Water Quality Criteria (AWQCs). A reference will be added to the text.

32. Page 1-61; Section 1.5.2.2.2; Third Paragraph; Non Carcinogenic Effects

Comment: The third paragraph states that if no CSF is available, then carcinogenic risks will not be quantified. If no CSF or RfD values are available for a given pollutant, risk should still be quantified by selecting an appropriate surrogate chemical to represent the toxicological properties of the pollutant.

Response: The text will be revised to state that if a CSF or RfD is not available then a surrogate will be selected if appropriate, otherwise the risks will not be quantified and potential exposures will be addressed in the uncertainty section of the risk assessment.

33. Page 1-63; Section 1.5.2.3.2; Conceptual Site Model

Comment: The Area A Weapons Center (Site 20) should be included in the list of sites with potential subsurface sources of contamination.

Response: Agree. Several metals concentrations in samples collected at greater than 2 feet depth exceeded State Pollutant Mobility Criteria. This site will be added to the list on page 1-63.

34. Figure 1-16 Conceptual Site Model- Surface Sources

Comment: The figure should consider inhalation by building residents of volatile organic compounds, which volatilize from ground water and enter the building. This comment applies also to Figure 1-17.

Response: Agree. Figures 1-16 and 1-17 will be modified as requested.

35. Page 2-3; Section 2.3.1.2; Site 3- Area A Downstream Watercourses and OBDA

Comment: The Navy proposes to use a peristaltic pump to sample the ground water for VOCs via direct push holes. This is appropriate for the intended purpose of determining the source and extent of the VOC plume, and for optimizing the location of permanent monitoring wells. It is the Department's experience that some loss of volatile organics will occur when peristaltic

pumps are used for sample collection. Any data generated should be appropriately qualified. Such data should not be used for the purpose of determining compliance with the Remediation Standard Regulations (RSRs). Standard EPA low flow sampling techniques should be used to collect any samples which will be used to determine compliance with the Remediation Standard Regulations. This comment applies also to the discussion on page 2-5 regarding the Torpedo Shops, on page 2-8 regarding the Hospital Incinerator, on page 2-8 regarding the Goss Cove Landfill, and on page 2-11 regarding the background wells.

Response: Agree. Since the data generated from the direct push/peristaltic pump method was intended only to assist in the determination of the location of permanent monitoring wells, the data collected from these points will not be used in formulating risk calculations. Only groundwater data collected using EPA Region I low flow techniques (July, 1996) will be used in quantitative risk assessment. For permanent monitoring wells, the Navy proposes to use submersible pumps with dedicated, 0.25 to 0.375-inch, polyethylene tubing. In instances where low well yield is an issue, a check valve will be placed at the top of the submersible pump in order to prevent backflow of groundwater which can cause elevated turbidity readings during purging and sampling. The work plan text and operating procedures will be modified to reflect the change in sampling technique and equipment.

36. Page 2-6; Section 2.3.1.4; Site 14- OBDANE

Comment: The Navy proposes to use a peristaltic pump to collect a ground water sample from existing monitoring well 14MW1S. Due to the potential loss of volatiles during sample collection with a peristaltic pump, a submersible pump should be used instead to collect ground water samples. EPA low flow sampling techniques should be followed. Ground water samples with a turbidity exceeding 5 NTU will not be considered representative and will not be accepted as valid by the Department. This may require that some existing monitoring wells be redeveloped by alternately surging using a properly designed surge block and pumping or bailing. This comment applies also to the discussion on page 2-7 regarding the Area A Weapons Center

Response: The Navy does not believe that turbidity readings below 5 NTUs can always be achieved throughout an entire field program. The Navy will use best practices in well installation and development that will include:

- bailing solids from boreholes prior to well installation,
- installing filterpack and screen materials which will minimize entry of drill cuttings and formation materials from entering the screen,
- alternatively surging and pumping with an appropriately sized surge block and submersible pump until the turbidity stabilizes.

Utilizing these practices should produce wells that have turbidity readings below 5 NTUs, however requiring this drinking water standard to be instituted in every well of a groundwater monitoring program of this size and scope may not be possible. Text that describes these practices will be included in sections 2.4.1.1 (Temporary Groundwater Monitoring Wells) and 2.4.2 (Hollow Stem Augering and Permanent Monitoring Well Drilling and Installation).

37. Page 2-8; Section 2.3.3.2; Site 15- Spent Acid Storage and Disposal Area

Comment: The Navy proposes to sample four existing monitoring wells. However, none of the four wells are located downgradient of the former acid storage tank. If the Navy intends to

determine whether any ground water contamination has emanated from the former tank, it will be necessary to install and sample a well or wells located in the downgradient direction from the tank. Please specify what technique will be used for collection of ground water samples.

Response: The text in the first two paragraphs will be modified as follows:

> The investigation at Site 15 will include groundwater elevation measurements in nearby wells, monitoring well installation at a downgradient location, well development, groundwater sampling for chemical analysis and geochemical and hydrogeological data collection. The Navy proposes to collect groundwater elevation data in and around this area at the initial stage of the field program. The data will be used to locate the position of a new monitoring well that will be located downgradient of the former acid storage tank.
>
> Groundwater samples will be collected from the newly installed plus the four existing groundwater ..."

38. Page 2-9; Section 2.3.3.3; Site 18- Solvent Storage Area (Building 33)

Comment: The report states that temporary monitoring wells will be installed. Please specify whether these will be installed by direct push or conventional rotary techniques. Please specify also what technique will be used for collection of ground water samples.

Response: The temporary monitoring wells will be installed with direct push techniques into holes created by macrocore samplers. Also the technique for groundwater sample collection will follow the procedure outlined in *US EPA Region I Low Stress (low flow) Purging and Sampling Procedure for the Collection of Ground Water Samples from Monitoring Wells* (US EPA Region I, 1996). This citation will be added to the text where appropriate.

39. Page 2-10; Section 2.3.3.4; Site 23- Fuel Farm

Comment: The Navy plans to install and sample two additional monitoring wells as well as sample existing monitoring wells. Please specify what technique will be used for collection of ground water samples.

Response: The technique for groundwater sample collection will follow the procedure outlined in *US EPA Region I Low Stress (low flow) Purging and Sampling Procedure for the Collection of Ground Water Samples from Monitoring Wells* (US EPA Region I, 1996). This citation will be added to the text where appropriate.

40. Page 2-13; Section 2.4.1.1; Temporary Groundwater Monitoring Wells

Comment: The Navy proposes to use well screen with a slot size of 0.010 inches, with a filter pack consisting of No. 20 to No. 40 US Standard Sieve sand, if it is possible to install a sand pack. It is the State's experience that this combination of filter pack and screen may not be appropriate for use in formations with a significant proportion of fine-grained material. Please ensure that the size of the filter pack, and the slot size of the well screen are specifically selected according to site conditions to ensure that the samples are not excessively turbid. If

silt is present, an appropriate choice would be a filter pack consisting of Morie Size 00 sand with a well screen with a slot size of 0.006 inches. Ground water samples with a turbidity exceeding 5 NTU will not be considered representative and will not be accepted as valid by the Department. The Navy proposes to develop the wells by alternately surging and bailing. This method is acceptable to the State.

Response: As stated previously, the Navy's experience has shown that having a turbidity requirement of 5 NTUs throughout the field program may not be achievable in every well. In situations where the screened interval encounters formations with grain sizes below that of fine sand, a filterpack consisting of material comparable to Morie Size 00 (Morie brand is no longer available) will be installed along with 0.006-inch slot screens. Otherwise the 0.010-inch slot screen with No. 20 to No. 40 US Standard Sieve sand will be installed. The option of having a 0.010-inch slot screen or a 0.006-inch slot screen will be placed into the work plan.

41. Page 2-14; Section 2.4.2; Hollow Stem Augering and Permanent Monitoring Well Drilling and Installation

Comment: The Navy proposes to use well screen with a slot size of 0.010 inches, with a filter pack consisting of No. 20 to No. 30 US Standard Sieve sand. It is the State's experience that this combination of filter pack and screen may not be appropriate for use in formations with a significant proportion of fine-grained material. Please ensure that the size of the filter pack, and the slot size of the well screen are specifically selected according to site conditions to ensure that the samples are not excessively turbid. If silt is present, an appropriate choice would be a filter pack consisting of Morie Size 00 sand with a well screen with a slot size of 0.005 or 0.006 inches. Ground water samples with a turbidity exceeding 5 NTU will not be considered representative and will not be accepted as valid by the Department. The Navy proposes to install a secondary filter pack consisting of finer grained sand between the screened interval and the bentonite- cement grout. The State is pleased that the Navy proposes to do so. This should prevent grout from penetrating into the primary filter pack. Please note that a licensed well driller must install monitoring wells.

Response: See response to comment 40.

42. Page 2-16; Section 2.4.4; Permanent Monitoring Well Development

Comment: The Navy proposes to develop monitoring wells by repeatedly pumping the wells, creating drawdown, and allowing the wells to recharge. The wells should also be surged using a properly designed surge block. Wells should be developed until they yield water with turbidity not greater than 5 NTU.

Response: Every effort will be taken to properly design and develop groundwater monitoring wells that produce groundwater with turbidity less than 5 NTUs. The Navy cannot ensure that these efforts will result in all wells producing turbidity less than 5 NTUs.

43. Page 2-18; Section 2.5.2; Monitoring Well Purging and Groundwater Sampling

Comment: The Navy proposes to purge and sample the wells using low flow sampling techniques and a peristaltic pump. The Navy should use a submersible pump rather than a peristaltic pump for sampling and purging.

Response: Agreed. See response to comment 39.

44. Page 2-19; Section 2.5.2; Fourth Paragraph; Monitoring Well Purging and Groundwater Sampling

Comment: The fourth paragraph states that "groundwater samples collected for dissolved metals will be **dissolved** in the field prior to preservation with nitric acid". I believe the Navy meant to use the word "filtered" in place of the bold faced "dissolved". The Navy should collect and analyze unfiltered samples. If proper well development and low flow sampling techniques are used, it should be possible to collect unfiltered samples with a turbidity of less than 5 NTU.

Response: The Navy does not agree that it will be possible to collect groundwater with turbidity less than 5 NTUs at all monitoring wells. All reference to dissolved metals will be removed. Only total metals samples will be collected.

45. Figure 2-1

Comment: Arrows depicting the direction of ground water flow would assist the reader in evaluating the appropriateness of monitoring well locations.

Response: Agree. Wherever appropriate arrows will be inserted onto Figure 2-1 to indicate the direction of groundwater flow.

46. Figure 2-1

Comment: What is the significance of the asterisks next to the monitoring wells in this figure?

Response: There is no significance to the asterisks. The asterisk will be removed in each case on Figure 2-1.