



**STATE OF CONNECTICUT  
DEPARTMENT OF ENVIRONMENTAL PROTECTION**



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

July 15, 1998

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

Re: *State Comments Regarding Draft Lower Subbase Remedial Investigation for Naval Submarine Base- New London, Groton, Connecticut*

Dear Mr. Evans:

The Department has received and reviewed the *Draft Lower Subbase Remedial Investigation for Naval Submarine Base- New London, Groton, Connecticut*. The plan was dated April 1998, and was received by the Department on April 20, 1998.

**General Comments**

**Requirements of the Remediation Standard Regulations**

The State is concerned that this remedial investigation does not adequately consider the Remediation Standard Regulation requirements regarding direct exposure and pollutant mobility. No further action is recommended for several sites despite the fact the lead and other contaminants are present at concentrations which exceed the direct exposure and pollutant mobility criteria. The Navy must comply with these requirements. The Remediation Standard Regulations provide a number of alternative methods for complying with these requirements, in addition to conducting active remediation. The feasibility study must consider remediation or other methods for complying with these requirements.

The Navy's recommendations are not consistent between the different zones. For example, the Navy speculates that lead contamination in Zone 4 soils may be originating in Zone 3. However, no further action is recommended for soils in Zone 3, while a feasibility study is recommended in Zone 4.

Most of the Lower Base is either paved or covered with buildings. For this reason the Navy may be able to take advantage of Section 22a-133k(2)(b)(3). This section specifies that the direct exposure criteria for substances other than PCB do not apply to inaccessible soil less than 15 feet below the ground surface provided that an environmental land use restriction is in place to ensure that the soils will not be exposed as a result of excavation, demolition, or other activities and that any pavement

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which is necessary to render the soil inaccessible unless and until the land use restriction is released. Inaccessible soil is defined as "polluted soil which is (A) more than four feet below the ground surface; (B) more than two feet below a paved surface comprised of a minimum of three inches of bituminous concrete or concrete; or (C)(I) beneath an existing building or (ii) beneath another existing permanent structure provided written notice that such structure will be used to prevent human contact with soil has been provided to the Commissioner". In order to take advantage of this exemption, the Navy will be required to demonstrate that a sufficient thickness of pavement exists.

The direct exposure criteria apply to all soils above the seasonal high water table in a GB area. For this reason, it is important that the navy define the elevation of the seasonal high water table.

#### **Light Non Aqueous Phase Liquids**

The feasibility study report appears to suggest that separate phase petroleum may be present at various locations throughout the Subase. The Navy should be aware that the Remediation Standard Regulations require that LNAPLs be removed to the maximum extent practical.

#### **Catch Basin Sediments**

Lead is present in sediments in several catch basins at concentrations as high as 85,600 mg/kg. These sediments constitute a significant potential source of pollution to the waters of the State which must be addressed. This also suggests that there is a potential for violations of the base storm water permit.

#### **Specific Comments**

##### **Page ES-4 Section ES.2.2 Contaminant Fate and Transport (Zone 1)**

The text discusses the use of natural attenuation. While natural attenuation may be appropriate in some situations for remediating petroleum and other organic substances, it will not be effective in dealing with the significant concentrations of lead that are present in soil at many locations in the Lower Base. This comment applies also to Section ES.3.2 on page ES-8, ES.4.2 on page ES-11, Section ES.5.2 on page ES-15, Section ES.6.2 on page ES-18, Section ES.7.2 on page ES-21, and Section ES.8.2 on page ES-25.

##### **Page ES-5 Section ES.2.3 Baseline Human Health Risk Assessment (Zone 1)**

The text states in the first paragraph that the State's acceptable range for carcinogenic risks is 1E-5. This applies to the cumulative risk posed by multiple contaminants. The State's acceptable risk for individual contaminants is 1E-6. This statement applies also to the second paragraph on page ES-8, to the third paragraph on page ES-11, to the second paragraph on page ES-15, to the first paragraph

on page ES-19, to the last paragraph on page ES-21, and to the second paragraph on page ES-25.

In the third paragraph the text states that appropriate surface water protection criteria are generally the State's salt water quality standards with a factor of 10 applied. This statement is inaccurate and should be revised to reflect the requirements of Section 22a-133k-3(b)(3) of the Remediation Standard Regulations. That section provides two methods for calculating alternative surface water protection criteria. This comment applies also to the first paragraph on page ES-9, to the second paragraph on page ES-12, to the second paragraph on page ES-16, to the third paragraph on page ES-19, to the second paragraph on page ES-22, and to the second paragraph on page ES-26.

Page ES-12 and 13 Section ES.4.4 Recommendations (Zone 3)

The Navy proposes no further action for soil in this zone, which includes Building 31. Building 31 was the site of a removal action in 1995 to address lead contaminated soil. No further action is not acceptable for soil at this site as high concentrations of lead (up to 5.88 mg/l measured by TCLP) were detected in several soil samples. These concentrations exceed the GB pollutant mobility criterion for lead as well as the RCRA criteria for characteristically hazardous waste. Compliance with the GB pollutant mobility criteria for all soils above the seasonal high water table is required at this and all other sites in the Lower Base.

The Navy states in the sixth bullet point on page ES-13 that "a majority of the lead- contaminated soil that historically acted as a source of contamination to other media has been remediated". This statement ignores the fact that significant concentrations of lead remain in the soil at this site. This lead apparently continues to act as a source of contamination to ground water since lead was detected at concentrations up to 392 µg/l in ground water beneath the building.

In addition, this recommendation is not consistent with the Navy's recommendation to conduct a feasibility study for soils in Zone 4. The Navy speculates that lead contamination detected in Zone 4 may be originating from the area of Building 31 in Zone 3. While the Navy does not recommend further action for soil in Zone 3, it does recommend that a feasibility study be conducted for Zone 4 soils. The Navy may be able to demonstrate that the soils beneath Building 31 are environmentally isolated under the Regulations.

Page ES-16 Section ES.5.3 Baseline Human Health Risk Assessment (Zone 4)

The text states that beryllium was detected in soil in this zone at a concentration that "exceeds the pollutant mobility criteria but was within background levels". The Navy previously collected soil samples from widely scattered areas on and near the base for the purposes of determining background concentrations of metals. While the data generated by this report may be useful for comparison purposes, it does not constitute a determination of the background concentration for soil. Section 22a-133k-1(a)(6) of the Regulations defines a background concentration for soil as "the

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representative concentration of a substance in soil of similar texture and composition outside the subject release area and in the general geographic vicinity of such release area, but not within any other release area.”

Page ES-19 Section ES.6.4 Recommendations (Zone 5)

No further action is recommended for soil in this zone. This recommendation is not appropriate since lead and other contaminants were detected at concentrations exceeding the GB pollutant mobility criteria. The Navy notes that lead was detected at concentrations exceeding the pollutant mobility criterion in samples analyzed by TCLP, but not in samples analyzed by SPLP. However, a very limited number of samples was analyzed by SPLP. In addition, lead was detected in catch basin sediments at concentrations as high as 85,600 mg/kg. These lead contaminated sediments constitute a significant potential source of pollution to the waters of the State which must be addressed.

Page ES-22 Section ES.7.4 Recommendations (Zone 6)

No further action is proposed for soil. This recommendation is not acceptable since metals, PAHs, and TPH are present in soil at levels exceeding the GB pollutant mobility criteria.

Page 1-12 Section 1.3.5 Geology

The Navy should discuss in this section the presence of older piers and layers of fill beneath the present ground surface. Reportedly fill was placed directly on top of the older piers to raise the ground to its present level. These piers and the associated fill layers are likely to play a significant role in contaminant transport within the Lower Base area.

Page 1-17 Section 1.3.6.3 Comprehensive Water-Level Investigation

One task which the Navy has yet to accomplish is to determine the elevation of the seasonal high water table. This is important because the pollutant mobility criteria will apply to all soils located above this elevation, while the pollutant mobility criteria will not apply to soils below this elevation.

In the second line of the last paragraph, please replace the word “are” with “is” so that the sentence reads as follows: “...east of NSB is at higher elevations than along the eastern boundary...”.

Page 3-49 Section 3.4.3.3 Potential Routes of Exposure

The Navy states that due to the limited guidance available to estimate exposure to soil via dermal contact, EPA Region 1 recommends performing a quantitative risk assessment for dioxins, PCBs and cadmium only. This statement is inaccurate as Regions 1 Supplemental Risk Assessment Guidance for the Superfund Program (EPA 901/5-89-001, 1989) provides default dermal exposure factors for

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contaminants in addition to cadmium, dioxins, and PCBs. Please see Wester *et al* (1990, 1992, 1993). EPA currently recommends quantitative assessment of the risks posed by dermal exposure to PAHs. In addition, the Department requires, to the extent possible, a full quantitative analysis of the dermal risks posed by contaminants. Please see my letter dated April 21, 1998 to the Navy regarding the Navy's application for alternative direct exposure criteria at the Area A Downstream Site (attached).

This statement applies also to Section 4.6.1.3 on page 4-27.

Page 3-83 Section 3.5.4.2 Risk Calculation- Other Risk Considerations

In the second paragraph of this page the Navy states that when HQs exceed the most conservative guidelines, less conservative guidelines are presented. This may be appropriate as long as the more conservative guidelines are also presented. However, it would not be appropriate to present only the less conservative guidelines.

Page 3-100 Table 3-7 Footnote 7

The Navy should present the most recently adopted version of the Water Quality Standards. The most recent Surface Water Quality Standards became effective April 8, 1997.

Page 4-16 Section 4.4.2.1 Historical Data (Zone 1)

The Navy states that 18 metals were detected in Zone 1 filtered ground water samples, while 22 metals were detected in unfiltered ground water samples. However, the occurrence of lead in ground water is not discussed. Please add a discussion regarding lead.

Page 4-21 Section 4.5.3 Evaluation of Natural Attenuation Data (Zone 1)

The Navy states in the second paragraph that high concentrations of TPH, indicative of petroleum hydrocarbons, were detected in this zone. The State assumes that the Navy intends to say that the TPH concentrations are indicative of *free phase* petroleum hydrocarbons. Please clarify this statement. The Navy should note that Section 22a-133k-2(g) requires that LNAPLs be removed to the maximum extent practical. The State would therefore require active removal of free floating petroleum.

Page 4-24 Section 4.6.1.1 Soil Chemicals of Concern (Zone 1)

The last paragraph on this page refers to the "RSR guidance". This term is incorrect as the Remediation Standard Regulations are not a guidance document. The Remediation Standard Regulations are part of the Regulations of Connecticut State Agencies and were adopted in January

1996. The Department is in the process of drafting a guidance document to accompany the Remediation Standard Regulations. This comment applies also to the last paragraph on page 5-18, to the third paragraph on page 6-21, to the fourth paragraph on page 7-25, to the last paragraph on page 8-20, to the second paragraph on page 9-14, and the second paragraph on page 10-23.

The Navy notes that while lead was detected in soil samples extracted using TCLP, it was not detected in soil samples using SPLP. The Navy states on page 4-25 that the SPLP results "do not support the conclusion that lead is migrating from the site at concentrations of potential concern as previously indicated by the TCLP results". The Navy acknowledges that some uncertainty exists regarding mobility of lead because not all soil samples were analyzed for lead using the SPLP. In fact, only two soil samples were analyzed for SPLP. Two soil samples are not sufficient to be representative of the distribution of lead in soil at the site.

Soil concentrations should also be compared to the direct exposure criteria to select contaminants of concern.

Page 4-26 Section 4.6.1.2 Groundwater Chemicals of Concern (Zone 1)

The Navy states in the third paragraph that the "appropriate alternative Connecticut Surface Water Protection Criteria (SWPC) for this site would be the salt water WQSs with a dilution factor of 10 applied. This statement does not accurately portray the requirements of the Remediation Standard Regulations. Section 22a-133k-3(b)(3) of the Regulations provides two alternative methods for calculating alternative surface water protection criteria. However, alternative surface water protection criteria may not be derived by simply multiplying the Numerical Water Quality Standards by a ten fold dilution factor.

This statement applies also to the third paragraph on page 4-32, to the second paragraph on page 5-20, to the first paragraph on page 5-26, to the fourth paragraph on page 6-22, to the first paragraph on page 6-28, to the third paragraph on page 7-27, to the first paragraph on page 7-34, to the first paragraph on page 8-22, to the fourth paragraph on page 8-26, to the fourth paragraph on page 9-15, to the last paragraph on page 9-19, to the fourth paragraph on page 10-24, and to the last paragraph on page 10-31.

Page 4-31 Section 4.7.2 Contaminant Fate and Transport (Zone 1)

The Navy states that natural attenuation is feasible for soil and ground water in this zone. While natural attenuation may be appropriate for addressing the petroleum and SVOCs in soil, it will not address the lead and other inorganic contaminants present in the soil. More active remedial measures may be needed to deal with the inorganic contaminants. This comment applies also to the first paragraph on page 5-25, the first paragraph on page 6-27, the first paragraph on page 7-33, the last paragraph on page 8-25, the first paragraph on page 9-19, and the fourth paragraph on page 10-30.

Page 4-32 Section 4.7.4 Recommendations (Zone 1)

The proposed feasibility study should also examine whether the use of institutional controls would be appropriate at this site in the event that contaminated soil must be left in place. The feasibility study should define the specific types of institutional controls which might be appropriate, such as notations to the base master plan, the use of the base excavation permit system, etc.

Page 5-10 Section 5.4.1.2 Deep Soil (Zone 2)

The Navy notes that lead was not detected in soil samples analyzed for lead using the SPLP procedure. However, lead was detected at a concentration of 3.43 mg/l in one soil sample analyzed by TCLP. Only three soil samples were analyzed by TCLP, while three others were analyzed by SPLP. Three samples analyzed by either method is not sufficient to be representative of the distribution of lead in soil. However, the detection of lead at a concentration of 3.43 mg/l in one soil sample suggests that significant concentrations of lead remain in soil at the site.

Page 5-13 Section 5.4.2.2 Lower Subbase RI (Zone 2)

The Navy notes that the reporting limit for TPH in groundwater was greater than the groundwater protection criteria of 500 µg/l. On Drawing 12, the Navy shows all samples where TPH was not detected as one half of the detection limit. The Navy notes that the values shown (500 to 600 µg/l) are just above the Connecticut remediation criteria. The Navy concludes on this basis that TPH contamination in Zone 2 shallow soils most likely has not impacted groundwater. This statement is not accurate and must be revised. The only conclusion that can be drawn from this data is that TPH is not present in the five ground water samples at concentrations above the detection limit. Since the detection limits were considerably higher than the groundwater protection criterion, it is not possible to conclude that groundwater has not been impacted by TPH in soil.

Page 5-15 Section 5.5.3 Evaluation of Natural Attenuation Data ¶2 (Zone 2)

The Navy states that moderate to high concentrations of TPH, indicative of petroleum hydrocarbons, were detected in this zone. The State assumes that the Navy intends to say that the TPH concentrations are indicative of *free phase* petroleum hydrocarbons. Please clarify this statement. The Navy should note that Section 22a-133k-2(g) requires that LNAPLs be removed to the maximum extent practical. The State would therefore require active removal of free floating petroleum.

Page 5-17 Section 5.6.1 Data Evaluation ¶1 (Zone 2)

Please correct the reference in the third sentence to Zone 1 soils. Table 5-14 actually summarizes COCs for Zone 2.

Page 5-18 Section 5.6.1.1 Soil Chemicals of Concern (Zone 1)

The last paragraph on this page refers to the "RSR guidance". This term is incorrect as the Remediation Standard Regulations are not a guidance document. The Remediation Standard Regulations are part of the Regulations of Connecticut State Agencies and were adopted in January 1996. The Department is in the process of drafting a guidance document to accompany the Remediation Standard Regulations.

The Navy notes that while lead was detected in soil samples extracted using TCLP, it was not detected in soil samples using SPLP. The Navy acknowledges that some uncertainty exists regarding mobility of lead because not all soil samples were analyzed for lead using the SPLP. In fact, only three soil samples were analyzed using each of the two methods. Three soil samples analyzed by either method are not sufficient to be representative of the distribution of lead in soil at the site.

Page 5-19 Section 5.6.1.2 Groundwater Chemicals of Concern (Zone 2)

The Navy states in the second paragraph that lead concentrations in filtered ground water samples were less than the direct exposure criteria. This statement should be omitted since the direct exposure criteria do not apply to ground water.

Page 5-26 Section 5.7.4 Recommendations (Zone 2)

No further action is recommended for soil in this zone. However, several contaminants remain in soil at concentrations exceeding the pollutant mobility criteria. The Navy will be required to comply with the Remediation Standard Regulation requirements regarding pollutant mobility.

Page 6-13 Section 6.4.2.2 Lower Subbase RI (Zone 3)

The Navy notes that the reporting limit for TPH in groundwater was greater than the groundwater protection criteria of 500 µg/l. On Drawing 12, the Navy shows all samples where TPH was not detected as one half of the detection limit. The Navy notes that the values shown (500 to 600 µg/l) are just above the Connecticut remediation criteria. The Navy concludes on this basis that TPH contamination in Zone 3 shallow soils most likely has not impacted groundwater. This statement is not accurate and must be revised. The only conclusion that can be drawn from this data is that TPH is not present in the ground water samples at concentrations above the detection limit. Since the detection limits were considerably higher than the groundwater protection criterion, it is not possible to conclude that groundwater has not been impacted by TPH in soil.

Page 6-18 Section 6.5.3 Evaluation of Natural Attenuation Data (Zone 3)

The Navy states in the second paragraph that high concentrations of TPH, indicative of petroleum

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hydrocarbons, were detected in this zone. The State assumes that the Navy intends to say that the TPH concentrations are indicative of *free phase* petroleum hydrocarbons. Please clarify this statement. The Navy should note that Section 22a-133k-2(g) requires that LNAPLs be removed to the maximum extent practical. The State would therefore require active removal of free floating petroleum.

Page 6-28 Section 6.7.4 Recommendations (Zone 3)

Soil contaminants are present at concentrations exceeding both the direct exposure and pollutant mobility criteria. However, the Navy recommends no further action for soil in this zone. This recommendation is not acceptable as the Navy will be required to comply with the Remediation Standard Regulation requirements regarding direct exposure and pollutant mobility. The State is particularly concerned about the lead concentrations remaining in soil in the vicinity of Building 31.

This recommendation is not consistent with the Navy's recommendation to perform a feasibility study in Zone 4. The Navy speculates that one possible source for lead contamination in Zone 4 is lead which has migrated from the vicinity of Building 31 in Zone 3.

Page 7-13 Section 7.4.1.1 Shallow Soil (Zone 4)

Lead was detected at concentrations exceeding the GB pollutant mobility criteria in soil samples analyzed using both TCLP and SPLP. The Navy notes that the SPLP samples were not collected from the same areas as the TCLP samples, so the results cannot be correlated. Regardless of whether the results can be correlated, the results indicate that further evaluation of lead concentrations is needed.

Page 7-19 Section 7.4.2.2 Lower Subbase RI (Zone 4)

The Navy notes that the reporting limit for TPH in groundwater was greater than the groundwater protection criteria of 500 µg/l. On Drawing 12, the Navy shows all samples where TPH was not detected as one half of the detection limit. The Navy notes that the values shown (500 to 600 µg/l) are just above the Connecticut remediation criteria. The Navy concludes on this basis that TPH contamination in Zone 4 shallow soils most likely has not impacted groundwater. This statement is not accurate and must be revised. The only conclusion that can be drawn from this data is that TPH is not present in the ground water samples at concentrations above the detection limit. Since the detection limits were considerably higher than the groundwater protection criterion, it is not possible to conclude that groundwater has not been impacted by TPH in soil.

Page 7-22 Section 7.5.3 Evaluation of Natural Attenuation Data ¶2 (Zone 5)

The Navy states that high concentrations of TPH, indicative of petroleum hydrocarbons, were

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detected in this zone. The State assumes that the Navy intends to say that the TPH concentrations are indicative of *free phase* petroleum hydrocarbons. Please clarify this statement. The Navy should note that Section 22a-133k-2(g) requires that LNAPLs be removed to the maximum extent practical. The State would therefore require active removal of free floating petroleum.

**Page 7-33 Section 7.3.3 Baseline Human Health Risk Assessment (Zone 4)**

The text states that beryllium was detected in soil in this zone at a concentration that "exceeds the pollutant mobility criteria but was within background levels". The Navy previously collected soil samples from widely scattered areas on and near the base for the purposes of determining background concentrations of metals. While the data generated by this report may be useful for comparison purposes, it does not constitute a determination of the background concentration for soil. Section 22a-133k-1(a)(6) of the Regulations defines a background concentration for soil as "the representative concentration of a substance in soil of similar texture and composition outside the subject release area and in the general geographic vicinity of such release area, but not within any other release area."

**Page 8-1 Section 8.1.1 Site 22 - Pier 33 (Zone 5)**

The text states that this zone includes Pier 33, Building 175, and approximately 800 feet of additional property. Please clarify the meaning of "800 feet". Does this mean 800 square feet, or 800 lineal feet along the river?

**Page 8-13 Section 8.4.2.2 Lower Subase RI (Zone 5)**

The Navy notes that the reporting limit for TPH in groundwater was greater than the groundwater protection criteria of 500 µg/l. On Drawing 12, the Navy shows all samples where TPH was not detected as one half of the detection limit. The Navy notes that the values shown (500 to 600 µg/l) are just above the Connecticut remediation criteria. The Navy concludes on this basis that TPH contamination in Zone 5 shallow soils most likely has not impacted groundwater. This statement is not accurate and must be revised. The only conclusion that can be drawn from this data is that TPH is not present in the ground water samples at concentrations above the detection limit. Since the detection limits were considerably higher than the groundwater protection criterion, it is not possible to conclude that groundwater has not been impacted by TPH in soil.

**Page 8-17 Section 8.5.3 Evaluation of Natural Attenuation Data ¶2 (Zone 5)**

The Navy states that high concentrations of TPH, indicative of petroleum hydrocarbons, were detected in this zone. The State assumes that the Navy intends to say that the TPH concentrations are indicative of *free phase* petroleum hydrocarbons. Please clarify this statement. The Navy should note that Section 22a-133k-2(g) requires that LNAPLs be removed to the maximum extent practical.

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The State would therefore require active removal of free floating petroleum.

Page 8-26 Section 8.7.4 Recommendations (Zone 5)

No further action is recommended for soil in this zone, despite the presence of contaminants at concentrations exceeding both the direct exposure and pollutant mobility criteria. The Navy will be required to comply with the Remediation Standard Regulation requirements regarding direct exposure and pollutant mobility. The State is particularly concerned about the TPH in the soil around the tank south of Building 175, as well as lead contaminated sediments in the catch basins.

Page 9-8 Section 9.4.2 Groundwater (Zone 6)

The Navy notes that the reporting limit for TPH in groundwater was greater than the groundwater protection criteria of 500 µg/l. On Drawing 12, the Navy shows all samples where TPH was not detected as one half of the detection limit. The Navy notes that the values shown (500 to 600 µg/l) are just above the Connecticut remediation criteria. The Navy concludes on this basis that TPH contamination in Zone 6 shallow soils most likely has not impacted groundwater. This statement is not accurate and must be revised. The only conclusion that can be drawn from this data is that TPH is not present in the five ground water samples at concentrations above the detection limit. Since the detection limits were considerably higher than the groundwater protection criterion, it is not possible to conclude that groundwater has not been impacted by TPH in soil.

Page 9-11 Section 9.5.3 Evaluation of Natural Attenuation Data ¶2 (Zone 6)

The Navy states that high concentrations of TPH, indicative of petroleum hydrocarbons, were detected in this zone. The State assumes that the Navy intends to say that the TPH concentrations are indicative of *free phase* petroleum hydrocarbons. Please clarify this statement. The Navy should note that Section 22a-133k-2(g) requires that LNAPLs be removed to the maximum extent practical. The State would therefore require active removal of free floating petroleum.

Page 9-17 Section 9.6.3.2 Carcinogenic Risks (Zone 6)

The text notes that the cancer risk estimates for benzo(a)pyrene and arsenic exceeded 1E-6. Please specify the estimated risks for these two chemicals.

Page 9-20 Section 9.7.4 Recommendations (Zone 6)

No further action is recommended for soil in this zone, although contaminants are present at concentrations exceeding both the direct exposure and pollutant mobility criteria. The Navy will be required to comply with the Remediation Standard Regulation requirements regarding direct exposure and pollutant mobility.

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**Page 10-12 Section 10.4.1.2 Deep Soil (Zone 7)**

The Navy notes that the results of recent analysis for lead using SPLP "do not support the results of the historical TCLP analyses". However, only three soil samples were analyzed for lead using SPLP. Three soil samples is not a sufficient quantity to accurately delineate the distribution of lead in soil in Zone 7. The Navy cannot conclude, based on the results of the three SPLP samples, that lead contamination is not present at levels in excess of the GB pollutant mobility criterion.

**Page 10-16 Section 10.4.2.2 Lower Subbase RI (Zone 7)**

The Navy notes that the reporting limit for TPH in groundwater was greater than the groundwater protection criteria of 500 µg/l. On Drawing 12, the Navy shows all samples where TPH was not detected as one half of the detection limit. The Navy notes that the values shown (500 to 600 µg/l) are just above the Connecticut remediation criteria. The Navy concludes on this basis that TPH contamination in Zone 7 shallow soils most likely has not impacted groundwater. This statement is not accurate and must be revised. The only conclusion that can be drawn from this data is that TPH is not present in the five ground water samples at concentrations above the detection limit. Since the detection limits were considerably higher than the groundwater protection criterion, it is not possible to conclude that groundwater has not been impacted by TPH in soil.

**Page 10-27 Section 10.6.3.1 Non-carcinogenic Risks (Zone 7)**

The table at the top of the page lists the hazard quotients for manganese and antimony. Should lead be included in this table? If lead is not a significant risk driver, this should be discussed in the text.

**Page 11-27 Section 11.5 Contaminant Fate and Transport (Thames River)**

The Navy states in the first paragraph that "metals may be soluble in surface water (as a function of pH) but are more likely to remain in dissolved form at near neutral pH. This sentence appears to be incorrect since metals will be mobile if they remain in dissolved form. In fact, mobility of metals tends to increase as pH becomes lower. One would expect that at near neutral pH metals would tend to remain in the soil matrix and would be relatively immobile.

**Page 11-28 Section 11.6.1 Data Evaluation (Thames River)**

The Navy states that exposure to sediment in the river is unlikely. The State agrees that exposure to sediments is unlikely in most of the lower base area. However, exposure to sediments is possible in Goss Cove. Although this report does not address Goss Cove, this fact should be acknowledged in the text.

**Page 11-99 Section 11.7.8.2 Preliminary Exposure Estimate and Risk Calculation- Benthic**

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Macroinvertebrates

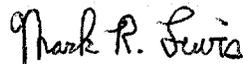
In the first paragraph, the Navy makes a distinction between the upper and lower river. Please clarify that this term refers to upstream versus downstream portions of the river, rather than to relative depths.

Page 11-103 Section 11.7.8.3 Conclusions

In the last sentence, please replace "and" with "after" so that the sentence reads "... after this program has been accepted by the regulatory agencies".

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

Sincerely,



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

cc: Kymberlee Keckler, US EPA New England, Federal Facilities Section  
Jeff Sullivan, NSBNL Environmental Department  
Jack Looney, CT Attorney General's Office