

**NAVY RESPONSE TO COMMENTS FROM THE  
U.S. ENVIRONMENTAL PROTECTION AGENCY  
ON THE REVISED DRAFT FEASIBILITY STUDY  
FOR SOIL AND GROUND WATER AT THE LOWER SUBBASE  
NAVAL SUBMARINE BASE NEW LONDON  
GROTON, CONNECTICUT**

**COMMENTOR:** Kymberlee Keckler, Remedial Project Manager **DATED:** 5 November 2001  
Federal Facilities Superfund Section

**GENERAL COMMENTS**

Thank you for the opportunity to review the *Revised Draft Feasibility Study for Soil and Groundwater at the Lower Subbase, Naval Submarine Base - New London* dated September 2001. The Revised Feasibility Study (FS) embodies extensive revisions from the earlier draft, dated July 1999. EPA reviewed the document with particular attention to compliance with the NCP and to its accommodation of the comments on the previous draft. Detailed comments are provided in Attachment A.

1. As you know, EPA provided extensive comments on the previous draft on 26 October 1999. It is disappointing that virtually no progress has been made after two years have passed and we are still grappling with similar issues. Moreover, EPA also wrote the ARARs tables for the Navy and provided them in October 1999 so it is unclear why they were not included in the revised draft.

The Revised Draft FS generally embodies the revisions requested and/or discussed in Navy's Response to Comments from the U.S. Environmental Protection Agency on the Draft Feasibility Study for Soil and Ground Water, dated February 2000. Of particular note is major revision of the remedial alternatives considered. As per the Comments on the Draft version, the Revised Draft considers a broader range of technologies for the cleanup of contaminated soils, including considerably more aggressive alternatives. This enriches the options that might be considered for soils remediation.

**Response**—The Lower Subbase Feasibility Study (FS) is a complex document, encompassing many sites and numerous remedial alternatives. Many internal meetings have been held throughout the process of writing this Revised Draft and many more will probably be held to complete this document and potential remedial actions. While we acknowledge that this is a work-in-progress, we also think that significant strides have been made toward its completion. Due to the complexity of this document, we will most likely need to schedule a technical review meeting for the purpose of discussing this document and any outstanding comments that may exist. The Navy looks forward to jointly resolving these issues and moving forward toward remedial action at the Lower Subbase.

The exclusion of the ARAR tables from the document was an oversight. Because the remedial alternatives have been revised since the original draft, we have revised the ARAR tables. The revised ARAR tables are included as Attachment B to these response to comments.

2. A major change in the Revised Draft is evident in the treatment of groundwater remediation. In the previous draft, exceedances of groundwater quality criteria were discussed for Zones 1, 3, 4, and 7; a number of cleanup technologies for groundwater were screened; and several technologies were retained for further evaluation. Those retained were evaluated for application in Zone 4, which had exhibited elevated levels of TPH (up to 5400 micrograms per liter) and lead (up to 2760 J micrograms per liter) in groundwater. In the Revised Draft, the summary of results from previous investigations (sec. 1.4) makes passing mention of groundwater contamination, and no ground-water cleanup technologies are considered (e.g., Table 2-22). The text should be modified and/or expanded to develop the rationale behind this conclusion. This would help to set the stage for section 3, in which no mention is made of groundwater contamination, which represents a major departure from the earlier Draft. The discussion of the rationale behind dropping groundwater remediation at this point should include any arguments that might tend to mitigate concerns for various elevated detections reported in earlier investigations. For example, it is noted that lead was found in groundwater in Zone 4 in well NES011 at 2760 J micrograms per liter in March 1994, and was a cause for some concern. However, this was an unfiltered sample, and a filtered sample taken at the same time yielded only 10.9 J micrograms per liter lead. Subsequent sampling and analyses found a maximum of 14.4 J micrograms per liter lead in this well. Thus, there is a rather strong argument that the very high lead detection was associated with turbidity in the unfiltered sample. Wherever possible, this type of argument should be offered to support the decision to drop consideration of groundwater remediation in the FS.

**Response**—The text in Section 1.4 includes a summary for each zone on ground water. Chapter 1 is intended to be a background review of applicable information. Chapter 2, specifically Sections 2.3.4 and 2.3.5, clearly outline the approach to ground-water assessment and remediation. The Navy would be happy to discuss this with EPA at the next technical review meeting (date to be determined).

3. We recommend the development of an additional decision tree for inclusion in Section 2. Figure 2-1 does not clearly illustrate the methodology for PRG derivation. The decision tree should clearly present the final PRG selection from the different ARAR driven and risk-based preliminary remediation goals (Connecticut Industrial Direct Exposure Criteria, risk-based PRGs, state-mobility criteria, and dilution adjusted mobility criteria). This decision tree should illustrate the process by which the PRG was selected for each COC in each hot spot area. The decision tree should be streamlined by exclusion of the residential criteria that have been eliminated from consideration previously.

**Response**—The figure identified in Chapter 2 (Figure 2-1) is essentially the same figure which was used in the Site 20 – Area A Weapons Center. The figure identifies the process by which constituents of concern (COCs) were selected, and preliminary remediation goals

(PRGs) developed. A second figure, Figure 2-2, is proposed to be added to this FS to further clarify the decision process. This new figure has been included with these response to comments for your review and consideration (Attachment C).

4. In addition, the text of Section 2 should verbally describe the process for selection of the specific PRGs for specific COCs in each hot spot area. Examples should be provided using actual COCs. A recommended example to be provided is lead in Zone 4 (*i.e.*, please describe the process by which the final PRG was derived (in mg/kg for lead in Zone 4.)

**Response**—Chapter 2 will be revised to include a discussion of the process used to identify the cleanup target for each COC for each zone.

5. Finally, to clarify the selection of PRGs between ICDEC values and the calculated risk-based PRGs, please include a summary column in Table 2-12 that identifies which of the potential PRGs was selected for each COC from the values presented in this table.

**Response**—Table 2-12 will be revised to include a column which indicates which PRG was selected as the cleanup target for each COC from the values presented in this table.

6. Development of a clean-up goal for lead should be based on a risk-based value. The 1,000 mg/kg value cited in Table 2-8 and 2-11 is not a currently recommended OSWER directive value. The most current screening level in effect for lead in soil at commercial/industrial (*i.e.*, non-residential) sites is 710 mg/kg (EPA, 2001). Screening levels are conservative levels below which there is little concern; however, they are not necessarily equivalent to cleanup levels or PRGs. It is stated in EPA (2001) that PRGs in the range of 710-1712 mg/kg would be obtained if default exposure assumptions for commercial/industrial workers were used in the adult blood lead model. The adult lead model should be used to develop a site specific risk-based PRG for lead.

**Response**—The Adult Lead Model has been used to derive site-specific risk-based PRGs for commercial workers and construction workers for lead in Zones 4 and 7. These values are 1,550 mg/kg for commercial workers and 1,150 mg/kg for construction workers. The Model results are attached for your review as Attachment D. Tables 2-7, 2-8, and 2-11 will be revised to reflect this change.

7. The Introductory Section for the Development of Remedial Alternatives for each Zone (Sections 4 through 10) should be clarified. It is uncertain how the contaminants listed in the introductory sections which were detected at levels exceeding the Dilution-Adjusted Pollutant Mobility Criteria and Connecticut Pollutant Mobility Criteria compare to Table 2-16. It appears that not all chemicals exceeding either criteria and listed in Table 2-16 are listed in the specific Development of Remedial Alternatives Section.

**Response**—It was the intent of the Introductory sections for the Development of Remedial Alternatives for each Zone (Chapters 4 through 10) to identify the contaminants of concern in soil that require evaluation of remedial alternatives for protection of ground water due to

pollutant mobility from soil under Connecticut RSRs. Additional discussion will be provided to clearly demonstrate the relationship between the contaminants listed in the Remedial Alternatives Sections and Table 2-16 in Chapter 2. Under Connecticut RSRs, soil at a site must be remediated to a level that complies with the Pollutant Mobility Criteria (PMC). Alternatively, with approval of the Commissioner, site-specific dilution factors can be calculated and used to modify the standard PMC and develop site-specific dilution-adjusted PMC. Given approval by the Commissioner, the dilution-adjusted PMC replace the standard PMC, except in the case of total petroleum hydrocarbons (TPHs) which cannot be adjusted for dilution. Chapters 4 through 10 have been prepared with the assumption that the proposed dilution factors will receive approval from the Commissioner. A request for this approval has been submitted and is undergoing review by the CTDEP. Therefore, the individual remediation alternatives sections for each zone lists TPH where it exceeds standard PMC and lead where it exceeds dilution-adjusted PMC. All other soil contaminants (PAHs) that exceeded standard PMC are excluded from further consideration as they do not exceed the dilution-adjusted PMC.

8. All mention of TPH in the document should be removed since CERCLA does not regulate petroleum. To the extent TPH was incorporated into any risk assessment it should be removed and the risk assessment revised. Regulation of TPH on the site is through state action (which may or may not be coordinated with remedial actions the Navy makes on the site under CERCLA).

**Response**—Although TPH is not regulated by CERCLA, the PMC are defined in Chapter 2 as an ARAR under the Connecticut RSRs and, therefore, TPHs should be included as part of this document. It is the Navy's intent to pursue remediation of non-CERCLA regulated COCs along with CERCLA-regulated COCs as this would be more cost effective and efficient. Removal of TPH from this document would require the Navy to pursue development of other documents to satisfy the CT RSRs, when currently, this FS can address both CERCLA and non-CERCLA-regulated COCs. The risk assessment performed in the RI has already been approved and would not subsequently be changed. TPH was not included in the RI risk assessment, and not subsequently included in the risk-based PRG development performed in the FS. The Navy would be happy to discuss this with EPA at the next technical review meeting.

9. There is no discussion of monitoring as part of the potential remedial actions. Anytime waste is left in place monitoring is required until it is shown to no longer be a risk. ARARs relating to monitoring should be included. Monitoring of the adjacent surface water/sediment in the Thames River should also be included. There also has to be a monitoring plan for the institutional controls, whereby there is, at a minimum, yearly inspection and certification that the controls are in place and that no violations have occurred.

**Response**—It was determined that through the application of risk-based PRGs for soil and ground water, execution of dilution-adjusted PMC and Alternate Surface Water Protection Criteria, and hazardous waste regulations, ground-water monitoring is not required. This determination was made due to the fact that no COC will be left in place above the dilution-adjusted PMC, Alternate Surface Water Protection Criteria, or hazardous waste regulations.

Only limited concentrations exceeding the Direct Exposure Criteria are proposed to be left in place. These concentrations are in soils that will meet the CTDEP definition of inaccessible soils. As indicated throughout the preparation of the Draft and Revised Draft FS for the Lower Subbase, the Thames River is not part of the FS, and monitoring of the Thames River would not be performed. Institutional controls are included in each alternative for each zone, except for the No Action Alternative. It is implied that once the Record of Decision is signed, inspection or confirmation of institutional controls will be implemented as per the Record of Decision.

10. Concerning use of the Connecticut Remediation Standard regulations as an ARAR. EPA has adopted the use of the numerical standards in the regulations as an ARAR. To the extent that the Navy proposes using any alternative standards that may be allowed under the regulations, it is EPA's position that under CERCLA EPA makes all interpretations of how a state standard will be implemented for a remedy. Therefore, EPA needs to review and approve any alternative standard proposed by the Navy before it is incorporated into the FS. Any proposed dilution-method PMCs or SWPC proposed by the Navy are not yet valid until EPA approval is obtained. Lacking such an approval, the Navy needs to meet the published PMCs and SWPCs in the state regulations.

**Response**—As discussed in the response to General Comment No. 7, the Navy still believes that the dilution-based PMC approach is appropriate in this document and would be happy to discuss this with EPA at the next technical review meeting.

11. In the Zones where hazardous waste (lead) has been identified, all such contamination must be addressed under the standards of RCRA/CT Hazardous Waste Management Regulations. This means that when removal is proposed, all the hazardous waste must be removed above and below the groundwater level (this may entail dewatering the excavation area and treating the removed groundwater before discharge into either the POTW or surface waters). No hazardous waste can be left in place (even small amounts) unless it is capped or otherwise addressed under the applicable hazardous waste standards. Land use controls are insufficient. Any remaining lead in the soil after the hazardous waste is removed that still exceeds the state remediation standards should be addressed under those regulatory requirements (which could include institutional controls to allow lead to remain above residential, but below industrial levels).

**Response**—Where technically practical, it is the Navy's intent to effectively remove waste that exceeds the hazardous waste characterization. Currently, the FS focuses on the known contamination as defined in the Final RI. The data do not suggest that excavation beneath the ground-water table will be required in any of the proposed alternatives. In addition, general excavation practices would not be feasible at the Lower Subbase (due to the extensive network of subsurface utilities). De-watering in a tidally-influenced area would not be feasible due to the recharge of ground water from the Thames River, coupled with the inability to install sheeting and shoring due to extensive utilities.

Simple language

12. The Navy needs to include ARARs tables for each option which discussed exactly how the proposed alternative will satisfy the ARAR. Section 2 of the FS does not serve this purpose, in part because it does not list all of the ARARs and because it lumps all of the proposed remedial actions together. In its comments to the first draft of the FS EPA supplied the Navy with ARARs Tables for each alternative.

*Response*—The Navy has prepared the enclosed ARAR tables for your review (Attachment B). The Navy would be happy to discuss any concerns or comments that you may have on these revised tables at the next technical review meeting.

13. Throughout the document (except for the No Action alternatives) under the “**Evaluation - Overall Protection of Human Health and the Environment**” subsection, when the Navy makes the statement that “No ecological risks were identified onsite at Zone \_” add a second sentence: “Monitoring of the site and the adjacent Thames River will allow the Navy to determine that no future ecological risk is posed by wastes left in place.”

*Response*—The Thames River is not included in this FS, and evaluation of current or future ecological impact is not addressed in this document, therefore, no additional monitoring of the Thames River will be added. Based on the dilution-adjusted PMC and alternate Surface Water Protection Criteria included in the FS, no ground-water monitoring is required as the ground water does not exceed the alternate criteria. The Navy would be happy to discuss EPA’s concern at the next technical review meeting.

14. Throughout the document (except for the No Action alternatives) under the “**Evaluation - Compliance with ARARs**” subsection, in the last sentence insert “chemical-specific,” before “location-specific.”

*Response*—The requested text will be added to the Draft Final revision of the FS.

15. Throughout the document (except for the No Action alternatives) under the “**Description - Institutional Controls**” subsection, add a new sentence: “There shall be at least a yearly inspection and certification of the compliance status of all land use controls.”

*Response*—Appropriate text will be added to the section discussing institutional controls outlining annual maintenance and inspection activities of the institutional controls.

**Attachment A**  
**Specific Comments**

**ATTACHMENT A**  
**SPECIFIC COMMENTS**

Comment No.	Page/Section	Comment
1	p. 1-1, §1.1.1	In the third sentence change: “, state, and local” to “and state.” <i>Response</i> —The requested change will be made to the text.
2	p. 1-1, §1.1.1	In the fifth sentence insert “and the U.S. Environmental Protection Agency (EPA) Region 1” after “the Navy” and after “concurrence of the” remove “U.S. Environmental Protection Agency (EPA) Region 1 and.” <i>Response</i> —The requested change will be made to the text.
3	p. 1-4, ¶1	In the last sentence remove “, the Hazardous and Solid Waste Amendment of 1984,” and remove “other” before “applicable state laws.” <i>Response</i> —The requested change will be made to the text.
4	p. 1-27, §1.4	Remove all discussion of TPH as a constituent of concern throughout this section and the entire document, since petroleum is not covered under CERCLA (and therefore is not covered by this FS). <i>Response</i> —Please see response to General Comment No. 8.
5	p. 1-33, ¶1	In the last sentence, the Navy needs to include a citation to the “reported background concentration ranges” and explain why a chromium level that exceeds the PMC should not be remediated. Is it the Navy’s position that the chromium found at Zone 1 is not from Navy activities? <i>Response</i> —Citation for background concentrations at the Subbase will be provided in the document. It is the Navy’s intent not to remediate those COCs that are below approved background levels for the Subbase.
6	p. 1-33, §1.5.2	In the last line of the second paragraph: the Navy needs to include a citation to the “reported background concentration ranges” and explain why chromium and arsenic levels that exceed the PMC should not be remediated. Is it the Navy’s position that the chromium and arsenic found at Zone 2 is not from Navy activities? <i>Response</i> —Please see response to Specific Comment No. 5.
7	p. 1-34, ¶2	In the last sentence: the Navy needs to include a citation to the “reported background concentration ranges” and explain why chromium and antimony levels that exceed the PMC should not be remediated. Is it the Navy’s position that the chromium and antimony found at Zone 3 is not from Navy activities? <i>Response</i> —Please see response to Specific Comment No. 5.
8	p. 1-35, ¶2	In the last sentence: the Navy needs to include a citation to the “reported background concentration ranges” and explain why chromium and arsenic levels that exceed the PMC should not be remediated. Is it the Navy’s position that the chromium and arsenic found at Zone 6 is not from Navy activities? <i>Response</i> —Please see response to Specific Comment No. 5.
9	p. 1-36, §1.6	The Baseline Human Health Risk Assessment should be based only on federal risk standards, not state risk standards. Remove references to the CT cumulative risk target of 10 <sup>-5</sup> . <i>Response</i> —References to state risk standards will be removed from the Baseline Human Health Risk Assessment discussion.
10	p. 1-43, ¶5	In this paragraph, there needs to be more discussion why a low-moderate ecological risk was screened out.

## ATTACHMENT A (Continued)

Comment No.	Page/Section	Comment
		<p><b>Response</b>—The existing paragraph will be changed from:</p> <p><i>In summary, the weight-of-evidence indicated that there are low-to-moderate potential risks to sediment-dwelling organisms from COCs in Zone 4 sediment. That is, although some generic, conservative ecotoxicological benchmarks were exceeded, site-specific eco-risk measurement endpoints indicated that no significant effects on the benthic aquatic community have occurred.</i></p> <p>to:</p> <p><i>In summary, the weight-of-evidence indicated that there are low-to-moderate potential risks to sediment-dwelling organisms from COCs in Zone 4 sediment. However, consistent with interpretative guidance by the developers of ER-Ls and ER-Ms (Long and MacDonald 1998), acceptable risk is found for benthic organisms for the following reasons:</i></p> <ol style="list-style-type: none"> <li>1. <i>While five metals exceeded the ER-L, no metals exceeded its ER-M in Zone 4 sediments. As noted in Long and MacDonald (1998) "The ERL and TEL values were not intended to be used as tools for predicting adverse biological effects. Therefore, samples in which chemical concentrations exceeded low-range guidelines but none in the mid-range values should be viewed as medium-low or medium-high in priority."</i></li> <li>2. <i>Only one organic chemical (benzo[a]pyrene) exceeded the ER-L. This same chemical also slightly exceeded the ER-M screening value. Many cases of a single chemical found exceeding the ER-M are shown in Long and MacDonald (1998) in which this same condition occurred, but no toxicity was found.</i></li> <li>3. <i>Site-specific Zone 4 sediment toxicity tests and bioaccumulation tests did not reveal any significant toxicity or bioaccumulation.</i></li> </ol> <p><i>The ER-L and ER-M are designed to be conservative screening values, and exceedance of any specific one of these values is not meant to imply that the sediments are toxic to sediment-dwelling organisms. Rather, they are used as indicators with which to weigh and rank sediments. In this situation, Zone 4 exhibited no toxicity in site-specific tests. Consequently, risks to sediment-dwelling organisms are acceptable in Zone 4.</i></p> <p><b>Additional Reference:</b>            Long, E.R. and D.D. MacDonald. 1998. Recommended uses of empirically derived, sediment quality guidelines for marine and estuarine ecosystems. Human and Ecological Risk Assessment. 4:1019-1039.</p>
11	p. 1-46, ¶3	<p>Additional testing should be done on the existing sediments at Piers 15 and 17 to determine whether they are newly contaminated.</p> <p><b>Response</b>—The Thames River is not included as part of the FS for the Lower Subase. Therefore, no additional testing will be performed as part of this FS.</p>
12	Table 1-4	<p>Please correct the numbers for Hazard Index for Total Risk from Soil and Cumulative Risk for all three receptors. These numbers do not match the numbers presented in Table 4-19 of the Remedial Investigation report (October 1998). The correct hazard index numbers are lower than those presented in Table 1-4.</p> <p><b>Response</b>—The total soil and cumulative HIs for all three receptors will be revised in Table 1-4 to reflect the values presented in Table 4-19 of the RI.</p>
13	Table 1-5	<p>Please correct the Incremental Cancer Risk for Total Risk from Soil and Cumulative Risk for full-time employee. The risk number as presented in the Remedial Investigation report is 6.8E-06.</p> <p><b>Response</b>—The values in Table 1-5 for the full-time employee will be corrected to reflect the value in the RI.</p>

**ATTACHMENT A (Continued)**

Comment No.	Page/Section	Comment
14	Table 1-11	Please correct the Hazard Indices for Total Risk from Soil for three receptors in Zone 1 and the Incremental Cancer Risk for Total Risk from Soil for full-time employee in Zone 2 as mentioned in Tables 1-4 and 1-5. <i>Response</i> —These corrections will be made to Table 1-11.
15	p. 2-1, §2.1	In the first bullet change “, state, and local” to “and state.” <i>Response</i> —The requested change will be made to the text.
16	p. 2-1, §2.2	In the third paragraph, change the second sentence from “and state environmental laws, facility siting laws” to “environmental and more stringent state environmental and facility siting laws.” <i>Response</i> —The requested change will be made to the text.
17	p. 2-3, ¶2	Remove the third bullet since it is not an ARAR and is covered by §2.2.3. <i>Response</i> —The requested change will be made to the text.
18	p. 2-4, §2.2.5	This section description should be clear that not all ARARs are being discussed in this section and that specific ARARs for each alternative proposed will be listed (in tables) in chapters 4-10. <i>Response</i> —All ARARs are discussed within this section. It is agreed that additional floodplain ARARs or TBCs will be included in the text. In addition, specific ARAR tables for each alternative will be included in Chapters 4 through 10 and are provided as Attachment B to this response to comment document.
19	pp. 2-4 and 2-5	The section discussing the CTDEP Remediation Standards for Soil and Ground Water should clarify that only the published values in the tables are ARARs. In the 2 <sup>nd</sup> paragraph of page 2-5 revise the last two sentences since EPA’s jurisdiction under CERCLA gives the Agency the authority to determine whether the site-specific dilution factors under 22a-133k-2(c)(2)(D) and 22a-133k-2(c)(2)(E)(ii) are applicable. <i>Response</i> —Please see response to General Comment No. 10.
20	p. 2-5, ¶2	The Navy needs to meet the GWPA for surface-water protection of the Thames River (22a-133k-3(b)). The Navy cannot use the alternative surface-water protection criteria under subsection (b)(3)(b) without the prior approval of EPA (which under CERCLA has the authority to approve state alternative criterion). Under any alternative that leaves waste in place, these standards need to be ARARs for monitoring (as an action-specific ARAR). <i>Response</i> —Please see response to General Comment No. 10.
21	p. 2-5, ¶3	If groundwater is left above residential levels the GWPC are ARARs and are the legal basis for any ELURs (action-specific). In addition, see the previous note for the second paragraph regarding the standards being an ARAR for monitoring. <i>Response</i> —Please see response to General Comment No. 9.
22	p. 2-5, §2.2.5.2	In the first paragraph, the third paragraph is only accurate if there is no intertidal zone along the shore that may be altered by any remedial action. Any work on the shore (such as to bulkheads) needs to meet state and federal wetlands ARARs. <i>Response</i> —No remedial actions are proposed along the shore or to bulkheads. As a result, state and federal wetland regulations would, therefore, not be ARARs for the Lower Subase.
23	p. 2-5, §2.2.5.2	Additional bullets can be added regarding federal executive orders pertaining to work in wetlands and floodplains (see previous ARARs tables provided by EPA). There also may be RCRA floodplain requirements for any hazardous waste facilities in the floodplain (dewatering piles). <i>Response</i> —No remedial actions are proposed along the shore or to bulkheads. As a result, state and federal wetland regulations would, therefore, not be ARARs for the Lower Subase. In addition, no hazardous waste facilities (dewatering piles) will be located within the floodplain as no dewatering is expected to occur.
24a	p. 2-7, ¶4	Under the description of the CT Endangered Species Act change the second sentence to: “Other than the Atlantic Sturgeon, the 1997 Integrated Natural Resources....” <i>Response</i> —The requested change will be made to the text.
24b		In the third sentence, insert “or any other action that could affect the Thames River,” after “involving excavation.” <i>Response</i> —The requested change will be made to the text.

**ATTACHMENT A (Continued)**

Comment No.	Page/Section	Comment					
25a	p. 2-7, ¶5	In the title of the fifth paragraph, remove "Water Quality Criteria."					
		<i>Response</i> —The requested change will be made to the text.					
25b		At the end of the second sentence add: ", including restoration, if required."					
		<i>Response</i> —The requested change will be made to the text.					
26	p. 2-7, ¶6	In the second sentence change "may be regulated by permit through the U.S. Army Corps of Engineers under this Act" to "the substantive environmental protection standards under the Act will be met."					
		<i>Response</i> —The requested change will be made to the text.					
27a	p. 2-8, ¶1	In the third sentence insert "U.S." before "Fish and Wildlife," change "or" to "and the," change "alteration of the water" to "alteration of regulated areas," and remove "offsite."					
		<i>Response</i> —The requested change will be made to the text.					
27b		Remove the fourth sentence (consultation is required for onsite actions).					
		<i>Response</i> —The requested change will be made to the text.					
28a	p. 2-8, §2.2.5.3	There needs to be a discussion of monitoring ARARs (including the CT Remediation Standards and Section 304 of the Clean Water Act -from ARARs tables previously provided to the Navy in earlier EPA comments):					
		<table border="1"> <tr> <td>Clean Water Act, Section 304</td> <td>33 U.S.C. 1314; 40 CFR 122.44</td> <td>Relevant and Appropriate</td> <td>Guidelines establish Ambient Water Quality Criteria (AWQC) for the protection of human health and/or the aquatic organisms.</td> <td>Standards will be used to evaluate monitoring results to determine if further remedial action is required to protect resources.</td> </tr> </table>	Clean Water Act, Section 304	33 U.S.C. 1314; 40 CFR 122.44	Relevant and Appropriate	Guidelines establish Ambient Water Quality Criteria (AWQC) for the protection of human health and/or the aquatic organisms.	Standards will be used to evaluate monitoring results to determine if further remedial action is required to protect resources.
		Clean Water Act, Section 304	33 U.S.C. 1314; 40 CFR 122.44	Relevant and Appropriate	Guidelines establish Ambient Water Quality Criteria (AWQC) for the protection of human health and/or the aquatic organisms.	Standards will be used to evaluate monitoring results to determine if further remedial action is required to protect resources.	
<i>Response</i> —Please see response to General Comment No. 9.							
28b		The Navy should include a bullet on federal water quality regulations if any water from dewatering soil below the groundwater or if groundwater removed during the excavation of soil below the groundwater needs to be treated before discharge into either a POTW or surface waters.					
		<i>Response</i> —According to sample results and ground-water elevations, it is not necessary to have any excavation below the water table. None of the remedial alternatives involves the discharge of ground water. As a result, federal water quality regulations will, therefore, not be included as an ARAR.					
29	p. 2-9, ¶2	Remove the third and sixth bullets (because offsite requirements aren't ARARs and LDR is not proposed). Bullets should be added if capping is proposed and for the prohibition on leaving wastes in place).					
		<i>Response</i> —The third bullet will be deleted. However, the Navy believes the sixth bullet should remain. Please see response to General Comment No. 11.					
30		Note again that the section of the regulations for facilities in a floodplain should be included as a location-specific ARAR.					
		<i>Response</i> —Please see response to Specific Comment No. 23.					
31	p. 2-11, ¶5	The last sentence should be changed if federal/state regulators identify ecological risks that need to be addressed (such as potential ecological risks to the Thames River that would require monitoring).					
		<i>Response</i> —Ecological risks, if present, would have been identified by federal/state regulators during the development of the remedial investigation. In addition, the Thames River is not included in this document and, therefore, no monitoring is included.					
32	p. 2-12, ¶5	Remove this paragraph since under a CERCLA action only federal risk assessment standards are to be used. However, there should be a new section "2.3.2 Connecticut Remediation Standards Regulatory Levels" which discusses the PRGs that are derived from state soil and groundwater remediation standards. The subsequent sections should be renumbered accordingly.					
		<i>Response</i> —This paragraph will be moved from this section into a new section which will discuss state remediation standards.					

## ATTACHMENT A (Continued)

Comment No.	Page/Section	Comment
33	pp. 2-13 and 2-14	<p>Was lead calculated as part of the cumulative risk?</p> <p><b>Response</b>—Lead risks are not calculated as part of the cumulative risks because there are no published RfDs or cancer slope factors for lead. Therefore, it is not possible to calculate HIs or cancer risks for lead. Lead risks are assessed using EPA's Lead Models and, based on these results, lead was identified as a COC in zones where predicted blood lead levels exceeded EPA targets for either residential or industrial exposures.</p>
34	p. 2-13, ¶3	<p>For the risk results of Zone 3, please check for consistency between text and Table 2-4. The text mentioned that calculated cancer risks for Zone 3 exceeded the 10<sup>-6</sup> cumulative risk goal for construction workers. This contradicts the information in Table 2-4.</p> <p><b>Response</b>—The text and Table 2-4 are correct. Although cumulative risks exceeded 10<sup>-6</sup> for construction workers in Zone 3, there were no individual COPCs with cumulative risks exceeding 10<sup>-6</sup>.</p>
35	p. 2-13, ¶3	<p>Remove the second sentence since CT risk assessment standards are not used for evaluating a CERCLA remedy.</p> <p><b>Response</b>—Discussion of state standards will be removed from this section and discussed in a separate section.</p>
36a	p. 2-14, §2.3.2.2, ¶1	<p>The first sentence in this paragraph appears to be incorrect. The first sentence indicates that human health risk-based PRGs were derived for each COC identified in soil for each receptor in each zone. The third paragraph correctly indicates that risk-based PRGs were derived for all COCs that had cancer risk estimates exceeding 10<sup>-6</sup> or HIs exceeding 1.0 for soil. Risk-based PRGs were developed only for COCs that had cancer risk estimates exceeding 10<sup>-6</sup> or HIs exceeding 1.0 for soil.</p> <p><b>Response</b>—COC is defined in Section 2.3.2.1, Paragraph 2, as any chemical with cumulative risks exceeding 10<sup>-6</sup> or HI of 1.0. We will clarify this in the next version of the document.</p>
36b		<p>This paragraph is not consistent with Table 2-4, which identifies the COCs in soil exceeding 10<sup>-6</sup> cancer risk or hazard index of 1.0. Please correct the text to match the table. The text and the table should identify any single COC in soil that has incremental cancer risk exceeding 1 x 10<sup>-6</sup> and hazard index exceeding 1. These COCs are presented in Table 2-4 with their respective calculated cancer risks and hazard indices and the Preliminary Remedial Goals (PRGs) are calculated and presented in Tables 2-5 through 2-11 for Zones 1 through 7. The text in this paragraph does not fully present all of these COCs as in Table 2-4 and must be corrected.</p> <p><b>Response</b>—The list of COCs presented in Table 2-4 is discussed in Section 2.3.2.1, Paragraph 3 (not Section 2.3.2.2). This section will be expanded to include all COCs presented in Table 2-4.</p>
37	p. 2-14, ¶2	<p>Put a space between the first and second paragraphs. In the third sentence, insert "risk" before "guidelines."</p> <p><b>Response</b>—The requested changes will be made to the text.</p>
38	p. 2-14, ¶2	<p>Please change the fifth sentence to "If the Adult Lead Model predicted blood lead levels exceeding 10 µg/dL for more than 5% of developing fetuses born to construction or full-time female workers exposed to lead, lead was....."</p> <p><b>Response</b>—The requested change will be made to the text.</p>
39	p. 2-14, ¶3	<p>Even though there were exceedances of hazardous waste standards for lead in Zone 2, there was determined to be no risk?</p> <p><b>Response</b>—Lead risks in Zone 2 were determined to be acceptable for all receptors. Average soil lead concentration in surface soil was 159 mg/kg; maximum was 178 mg/kg. Average soil lead concentration in subsurface soil was 128mg/kg; maximum was 404 mg/kg. These resulted in blood lead levels below EPA's targets for all receptors.</p>

**ATTACHMENT A (Continued)**

Comment No.	Page/Section	Comment
40	§2.3.2.3	<p>Human Health Risk-Based Soil Cleanup Goals: Potential cleanup values were selected based upon the Connecticut Industrial/Commercial Direct Exposure Criteria (ICDEC), Connecticut Residential Direct Exposure Criteria (RDEC), and risk-based PRGs corresponding to a cancer risk of <math>10^{-5}</math> or hazard index of 1. Although the <math>10^{-5}</math> risk value is used in the FS because it falls within EPA's "acceptable" risk range of <math>10^{-4}</math> to <math>10^{-6}</math>, EPA recommends presenting all State's ARARs (i.e., ICDEC and RDEC) and all risk-based PRGs for <math>10^{-4}</math>, <math>10^{-5}</math>, <math>10^{-6}</math> risks as potential soil cleanup values. The decision of which value to be used as the final cleanup number can be made during risk management, taking into consideration other factors such as reliability of institutional controls, technical feasibility, and community acceptance. Each zone could have different cleanup numbers instead of using a fixed <math>10^{-5}</math> risk value as a soil cleanup goal for all 7 zones.</p> <p><i>Response</i>—Table 2-12 will be revised to include risk-based PRGs for cancer risk levels of <math>10^{-6}</math>, <math>10^{-5}</math>, and <math>10^{-4}</math>, as well as ICDEC and RDEC.</p>
41a	p. 2-15, ¶2	<p>Please check the PRGs for lead in Tables 2-8 and 2-11 and insert lead PRGs into Table 2-7 for Zone 3. Provide the basis for the 1,000 mg/kg PRG for lead in commercial/industrial area (for construction worker and full-time employee exposure). Tables 2-8 and 2-11 indicate that the proposed PRGs for lead are 400 mg/kg for residential and 1,000 mg/kg for the construction worker and full-time employee. According to OSWER Directive #9200.4-27P (August 1998) and the Frequently Asked Questions on the Adult Lead Model Guidance Document (August 2001), EPA recommends 400 mg/kg and 710 mg/kg of lead in soil as screening levels for residential and commercial/industrial areas, respectively.</p> <p><i>Response</i>—Tables 2-7, 2-8, and 2-11 will be revised to include site-specific risk-based PRGs for lead-based PRGs on the Adult Lead Model. Please see response to General Comment No. 6.</p>
41b		<p>The Directive recommends using the Integrated Exposure Uptake Biokinetic (IEUBK) Model for lead in children to set site-specific residential PRGs since the model is the best tool currently available for predicting the potential blood lead levels of children exposed to lead in the environment. The screening level of 400 mg/kg for residential area was calculated with the IEUBK model and can be used as lead PRG for this site as in the tables. However, the FS provided no basis for calculating and using 1,000 mg/kg as lead PRG for commercial/industrial area. The Frequently Asked Questions suggest a range of 710-1,712 mg/kg as PRGs for commercial/industrial workers using the Adult Blood Lead model with all the default exposure assumptions. Thus, a range of 710-1,712 mg/kg should be used as lead PRGs for commercial/industrial workers instead of 1,000 mg/kg.</p> <p><i>Response</i>—For children (residents), a PRG of 400 mg/kg will be retained as the PRG for lead. For commercial and construction workers, site-specific risk-based PRGs for lead will be developed using the Adult Lead Model. Please see response to General Comment No. 6.</p>
42	p. 2-15, §2.3.2.3	<p>All references to state risk assessment standards should be removed from this section. Use of the State Remediation Standard for developing PRG is not based on risk, but on the fact that the numeric standards in the tables under the regulations have been adopted as ARARs for the remedial action. Therefore, discussions of State Remediation Standard PRGs should be moved to the new Section 2.3.2 (see comment for Page 2-12, ¶5).</p> <p><i>Response</i>—References to CT standards will be removed from this section and discussed in a new section.</p>
43	p. 2-16, § 2.3.4	<p>This section should be included in the new section "2.3.2 Connecticut Remediation Standards Regulatory Levels." See General Comment No. 3 regarding the Navy's inability to use any site-specific dilution factor without EPA's prior approval. If EPA does not approve of the Navy's proposed dilution fraction, then the pollutant mobility standards listed in the section's tables should be used to establish the PMC.</p> <p><i>Response</i>—This section will be moved to a new section on state standards.</p>
44	p. 2-20, §2.3.5	<p>This section should be included in the new section "2.3.2 Connecticut Remediation Standards Regulatory Levels." See General Comment No. 3 regarding the Navy's inability to use any alternative SWPC without EPA's prior approval.</p> <p><i>Response</i>—This section will be moved to a new section on state standards.</p>

**ATTACHMENT A (Continued)**

Comment No.	Page/Section	Comment
45	p. 2-25, ¶4	Add at the end of the second sentence: “, depending on which is more stringent.” <b>Response</b> —The requested change will be made to the text.
46	p. 2-26, §2.4.1	The section will need to be revised if EPA does not adopt the Navy’s proposed alternative dilution factors or alternative SWPCs. Also note General Note No. 1 that TPH is not a constituent of concern under CERCLA. <b>Response</b> —Please see response to General Comment No. 8.
47	p. 2-27, ¶1	In the last sentence, insert at the end: “, depending on which is more stringent, and contingent on monitoring and institutional controls being enacted.” <b>Response</b> —The text will be revised to mimic the text changed as outlined in Specific Comment No. 45.
48	p. 2-28, ¶1	In the last sentence, insert at the end: “, depending on which is more stringent, and contingent on monitoring and institutional controls being enacted.” <b>Response</b> —Please see response to Specific Comment No. 47.
49	p. 2-28, ¶6	In the last sentence insert at the end: “, depending on which is more stringent, and contingent on monitoring and institutional controls being enacted.” <b>Response</b> —Please see response to Specific Comment No. 47.
50	p. 2-29, ¶7	In the last sentence, insert at the end: “, depending on which is more stringent, and contingent on monitoring and institutional controls being enacted.” <b>Response</b> —Please see response to Specific Comment No. 47.
51	p. 2-35, ¶2	Add a new bullet for “Monitoring.” <b>Response</b> —Please see response to General Comment No. 9.
52	Figures 2-3 to 2-9	Remove references to TPH and to alternate PMC if not approved by EPA. <b>Response</b> —Please see response to General Comment Nos. 8 and 10.
53	Tables 2-1 to 2-3	Revise based on previous ARARs tables provided by EPA. In particular, ARARs pertaining to work in wetlands and floodplains, and monitoring need to be added. <b>Response</b> —ARARs pertaining to floodplains will be added to these tables. No wetlands are located within the Lower Subbase, and no remedial actions are proposed for the shore or the bulkheads. In addition, no monitoring is proposed for the site. As a result, ARARs pertaining to wetlands and monitoring will not be included in these tables.
54	Tables 2-13 - 2-17	These tables to be removed if EPA doesn’t accept the Navy’s proposed dilution factors. <b>Response</b> —As discussed in previous response, the tables will remain in the FS. The Navy will be happy to discuss this issue at the next technical review meeting.
55	Table 2-19	Note that the Navy’s proposed dilution-based criteria does not apply to determining whether a lead sample exceeds hazardous waste thresholds under RCRA/CT Hazardous Waste standards. <b>Response</b> —Agreed. The dilution-based criteria were not applied in the determination of whether lead samples exceed hazardous waste thresholds. Only TCLP sample results were compared to RCRA/CT Hazardous Waste Standards.
56	Tables 2-19 to 2-21	These tables to be removed if EPA doesn’t accept the Navy’s proposed alternative SWPC. <b>Response</b> —Please see response to General Comment Nos. 8 and 10. The Navy will be happy to discuss this issue at the next technical review meeting..
57a	Table 2-22	Monitoring should be moved to the “General Response Action” column. The Remedial Tech. Types and Process Option column should state: “Monitoring onsite and in the adjacent Thames River.” The third column should state: “To assess the success of proposed remedial measures and to determine ongoing risk to human health and the environment from wastes left in place.” <b>Response</b> —Please see response to General Comment No. 9.
57b		Remove “monitored natural attenuation” from the “Biological Treatment heading in the In Situ Treatment row and make it a separate General Response Action (natural attenuation in not treatment).

**ATTACHMENT A (Continued)**

Comment No.	Page/Section	Comment
		<b>Response</b> —According to the “Federal Remediation Technologies Roundtable, Remediation Technologies Screening Matrix and Reference Guide, Version 3.0.” Monitored Natural Attenuation is listed under Table 3.1, <i>In Situ</i> Biological Treatment. Therefore, the Navy thought monitored natural attenuation was properly placed under this GRA.
58	p. 3-1, §3.1	Add a section on Monitoring. <b>Response</b> —Please see response to General Comment No. 9.
59	p. 3-5, §3.1.4.1	Make natural attenuation its own section since it is not an <i>In Situ</i> Treatment Action. <b>Response</b> —Please see response to Specific Comment No. 57b.
60	Table 3-1	Add a row for Monitoring. Move Monitored Natural Attenuation from the <i>In Situ</i> Treatment row to its own General Response Action row. <b>Response</b> —Please see response to General Comment No. 9 with regards to monitoring and response to Specific Comment No. 57b for monitored natural attenuation.
61	Table 2-7	Please include lead as a COC for Zone 3 as indicated in the text in Section 2.3.2.1. <b>Response</b> —The requested change will be made.
62	Table 2-8	Please change the lead PRG to 710-1,712 mg/kg for the full-time worker and construction worker. <b>Response</b> —Table 2-8 will be modified to include a site-specific risk-based PRG for lead for commercial and construction workers using the Adult Lead Model.
63	Table 2-11	Please change lead PRG to 710-1,712 mg/kg for the full-time worker and construction worker. <b>Response</b> —Table 2-11 will be modified to include a site-specific risk-based PRG for lead for commercial and construction workers using the Adult Lead Model.
64a	Table 2-12	Please present industrial and residential PRGs associated with 10 <sup>-4</sup> and 10 <sup>-6</sup> risks in addition to PRGs associated with 10 <sup>-5</sup> risk. <b>Response</b> —The tables will be revised to include industrial and residential PRGs associated with 10 <sup>-6</sup> and 10 <sup>-4</sup> risks.
64b		Please verify that the industrial risk-based PRG calculated for the non-carcinogen mercury is correctly calculated. Upon close inspection, it appears that the reference dose was incorrectly treated as a cancer slope factor in the PRG calculation. The appropriate risk-based PRG should approach the concentration of the ICDEC value, 610 mg/kg. The following equation should have been applied to the PRG calculation: $PRG_{nc} = \frac{THI \times BW \times AT \times 365 \text{ days / year}}{EF \times ED \times \left[ \frac{1}{RFD_o \times CF \times IR_{soil}} \right]}$ <b>Response</b> —A review of the mercury PRG indicates that the cumulative HI for mercury was incorrect in Tables 1-4 and 1-11. The cumulative HI for soil as presented in the RI is less than 1.0 for each receptor in Zone 1. Therefore, mercury is not a COC in soil at Zone 1 and a PRG will not be presented. Tables 2-4, 2-5, and 2-12 will be revised to reflect this.
65	Figure 2-3	The “tag” for boring TB2-1RI denotes arsenic by “AS,” rather than As. The use of all capital letters results in possible confusion with the abbreviations adopted for organic compounds. Please check this and other figures for consistency with standard usage. <b>Response</b> —The requested change will be made to the text.
66	p 4-1, §4.1 ¶1	The list of soil COCs that had exceedances of the 10 <sup>5</sup> Risk-Based PRGs should not include mercury. Mercury is a non-carcinogen and, therefore, did not have a 10 <sup>5</sup> Risk-Based PRG developed. <b>Response</b> —Please see response to Specific Comment No. 64b.
67	p. 4-1, ¶2	Remove the third bullet. Remove the fourth bullet if EPA does not approve the proposed alternative dilution factor. <b>Response</b> —Please see response to General Comment No. 8.
68	pp. 4-1 & 4-2	For the bullets for Alternatives 2-5, insert “Monitoring,” before “and Institutional.” <b>Response</b> —Please see response to General Comment No. 9.
69	p. 4-5, §4.3.2	Insert “Monitoring,” before “and Institutional.” <b>Response</b> —Please see response to General Comment No. 9.

**ATTACHMENT A (Continued)**

Comment No.	Page/Section	Comment
70	p. 4-5, §4.3.2.1	Insert a bullet for "Monitoring onsite and in the adjacent Thames River." <b>Response</b> —Please see response to General Comment No. 9.
71	p. 4-7, ¶3	At the end of the 1 <sup>st</sup> sentence, add: ", after testing for hazardous constituents is negative. If hazardous constituents are identified, disposal will be at an offsite, licensed hazardous waste TSDF." <b>Response</b> —The requested change will be made to the text.
72	p. 4-7, ¶4	Add a section discussing monitoring onsite and in the adjacent Thames River to assess ongoing risks posed by waste left in place after the selective excavation. <b>Response</b> —Please see response to General Comment No. 9.
73	p. 4-8, §4.3.2.2	Need to discuss monitoring under each criterion. <b>Response</b> —Please see response to General Comment No. 9.
74a	p. 4-8, ¶4	Add at the end of the first sentence: "as long as no hazardous waste is left in place." <b>Response</b> —Please see response to General Comment No. 11. The Navy will be happy to discuss this issue at the next technical review meeting.
74b		In the last sentence, add "chemical-specific," before "location-specific." <b>Response</b> —The requested change will be made to the text.
75	p.4-8, ¶6	Replace the paragraph with: "This alternative does not reduce the toxicity, mobility, and volume of contamination onsite through treatment." <b>Response</b> —After the first sentence, the following text will be added:  <i>Although selective excavation and disposal achieves the onsite remedial goal of reducing the toxicity, mobility, and volume of contamination, it does not meet the preference for treatment.</i>
76	p. 4-9, ¶6	The proposed cost estimate must include the cost of long-term monitoring. <b>Response</b> —Please see response to General Comment No. 9.
77	p. 4-10, §4.3.3	Insert "Monitoring," before "and Institutional." <b>Response</b> —Please see response to General Comment No. 9.
78	p. 4-10, §4.3.3.1	Insert a bullet for "Monitoring onsite and in the adjacent Thames River." <b>Response</b> —Please see response to General Comment No. 9.
79	p. 4-10, ¶3	In the first sentence, remove ", dilution-adjusted PMC" if it has not been approved by EPA. <b>Response</b> —Please see response to General Comment No. 10.
80	p. 4-11, ¶4	Add at the end of the 1 <sup>st</sup> sentence add: ", after testing for hazardous constituents is negative. If hazardous constituents are identified, disposal will be at an offsite, licensed hazardous waste TSDF." <b>Response</b> —The requested change will be made to the text.
81	pp. 4-11 & 4-12	In the second sentence of the "Capping" paragraph, change "state and federal regulators" to "applicable state and federal standards." <b>Response</b> —The requested change will be made to the text.
82	p. 4-12, ¶2	Add a section discussing monitoring onsite and in the adjacent Thames River to assess ongoing risks posed by waste left in place after the selective excavation. <b>Response</b> —Please see response to General Comment No. 9.
83	p. 4-12, §4.3.3.2	Need to discuss monitoring under each criterion. <b>Response</b> —Please see response to General Comment No. 9.
84a	p. 4-13, ¶3	Add at the end of the first sentence: "as long as no hazardous waste is left in place." <b>Response</b> —Please see response to General Comment No. 11.
84b		In the second sentence remove "risk-based 10 <sup>-5</sup> " and "and dilution-adjusted PMC" if not approved by EPA. <b>Response</b> —The Navy intends to use the 10 <sup>-5</sup> risk-based PRGs as cleanup goals to comply with federal risk standards at the site. The EPA's acceptable risk range is 10 <sup>-6</sup> -10 <sup>-4</sup> ; therefore, 10 <sup>-5</sup> is within this range and should satisfy this requirement. Please see response to General Comment No. 10 with regards to discussion of dilution-adjusted PMCs. The Navy will be happy to discuss these issues with EPA at the next technical review meeting.

**ATTACHMENT A (Continued)**

Comment No.	Page/Section	Comment
84c		<p>In the third sentence, at the end add: "to meet applicable state remediation standards for any contamination that is left in place that does not exceed hazardous waste standards."</p> <p><b>Response</b>—The following text will be added to the end of the third sentence:</p> <p align="center"><i>...to meet applicable state remediation standards for any contamination that is left in place.</i></p> <p>The Navy will be happy to discuss this comment with EPA at the next technical review meeting.</p>
84d		<p>In the fourth sentence change, "Institutional" to "Monitoring and institutional." In the last sentence, add "chemical-specific," before "location-specific."</p> <p><b>Response</b>—Please see response to General Comment No. 9. The requested change for the last sentence will be made to the text.</p>
85	p. 4-13, ¶5	<p>Replace the paragraph with: "This alternative does not reduce the toxicity, mobility, and volume of contamination onsite through treatment."</p> <p><b>Response</b>—After the first sentence, the following text will be added:</p> <p align="center"><i>Although selective excavation and disposal achieves the onsite remedial goal of reducing the toxicity, mobility, and volume of contamination, it does not meet the preference for treatment.</i></p>
86	p. 4-14, ¶3	<p>Add at the end of the first sentence "or hazardous waste TSDF, if required."</p> <p><b>Response</b>—This text will be added appropriately to chapters that contain zones having been identified with lead concentrations in excess of hazardous waste characterization.</p>
87	p. 4-14, ¶5	<p>The proposed cost estimate must include the cost of long-term monitoring.</p> <p><b>Response</b>—Please see response to General Comment No. 9.</p>
88	p. 4-14, §4.3.4	<p>Insert "Monitoring," before "and Institutional."</p> <p><b>Response</b>—Please see response to General Comment No. 9.</p>
89a	p. 4-14, §4.3.4.1	<p>In the first bullet, remove "/dilution-adjusted PMC" if it has not been approved by EPA.</p> <p><b>Response</b>—Please see response to General Comment No. 10.</p>
89b		<p>Insert a bullet for "Monitoring onsite and in the adjacent Thames River."</p> <p><b>Response</b>—Please see response to General Comment No. 9.</p>
90	p. 4-15, ¶4	<p>In the first sentence, remove ", dilution-adjusted PMC" if it has not been approved by EPA.</p> <p><b>Response</b>—Please see response to General Comment No. 10.</p>
91a	p. 4-15, ¶5	<p>In the second sentence, remove "or dilution-based PMCs" if not approved by EPA.</p> <p><b>Response</b>—Please see response to General Comment No. 10.</p>
91b		<p>In the third and fourth sentences, remove "risk-based 10<sup>-5</sup>."</p> <p><b>Response</b>—The Navy intends to use the 10<sup>-5</sup> risk-based PRGs as cleanup goals to comply with federal risk standards at the site. The EPA's acceptable risk range is 10<sup>-6</sup>-10<sup>-4</sup>; therefore, 10<sup>-5</sup> is within this range and should satisfy this requirement. The Navy will be happy to discuss this issue with EPA at the next technical review meeting.</p>
92	p. 4-16, ¶2	<p>Add at the end of the first sentence: ", after testing for hazardous constituents is negative. If hazardous constituents are identified disposal will be at an offsite, licensed hazardous waste TSDF."</p> <p><b>Response</b>—The requested change will be made to the text.</p>
93	p. 4-17, ¶4	<p>In the second sentence, change "Lower Subase" to "the entire base."</p> <p><b>Response</b>—The requested change will be made to the text.</p>
94	p. 4-17, ¶5	<p>In the second sentence of the "Capping" paragraph, change "state and federal regulators" to "applicable state and federal standards."</p> <p><b>Response</b>—The requested change will be made to the text.</p>
95	p. 4-18, ¶1	<p>Add a section discussing monitoring onsite and in the adjacent Thames River to assess ongoing risks posed by waste left in place after the selective excavation.</p> <p><b>Response</b>—Please see response to General Comment No. 9.</p>

**ATTACHMENT A (Continued)**

Comment No.	Page/Section	Comment
96	p. 4-18, ¶1	In the last sentence after "Zone 1," add "would be monitored at least yearly,"
		<b>Response</b> —Please see response to General Comment No. 9.
97	p. 4-18, §4.3.4.2	Need to discuss monitoring under each criterion.
		<b>Response</b> —Please see response to General Comment No. 9.
98a	p. 4-18, ¶3	Add at the end of the first sentence: "as long as no hazardous waste is left in place."
		<b>Response</b> —Please see response to General Comment No. 11.
98b		In the second sentence, remove "/dilution-adjusted PMC" if not approved by EPA.
		<b>Response</b> —Please see response to General Comment No. 10.
98c		In the third sentence, remove "risk-based 10 <sup>-5</sup> ."
		<b>Response</b> —The Navy intends to use the 10 <sup>-5</sup> risk-based PRGs as cleanup goals to comply with federal risk standards at the site. The EPA's acceptable risk range is 10 <sup>-6</sup> -10 <sup>-4</sup> ; therefore, 10 <sup>-5</sup> is within this range and should satisfy this requirement. The Navy will be happy to discuss this issue with EPA at the next technical meeting.
99	p. 4-18, ¶4	In the fifth sentence, change "institutional" to "monitoring and institutional."
		<b>Response</b> —Please see response to General Comment No. 9.
100	p. 4-19, ¶3	Add at the end of the first sentence: "as long as no hazardous waste is left in place."
		<b>Response</b> —Please see response to General Comment No. 11.
101		In the last sentence, add "chemical-specific," before "location-specific."
		<b>Response</b> —The requested change will be made to the text.
102	p. 4-19, ¶5	Remove the second sentence regarding TPH. Remove the last two sentences since capping and institutional controls are not treatment.
		<b>Response</b> —Please see response to General Comment No. 8.
103	p. 4-20, ¶6	The proposed cost estimate must include the cost of long-term monitoring.
		<b>Response</b> —Please see response to General Comment No. 9.
104	p. 4-21, §4.3.5	Insert "Monitoring," before "and Institutional." Make all of the applicable changes requested for Alternatives 2-4.
		<b>Response</b> —Please see response to General Comment No. 9.
105	p. 4-28, ¶3	Remove the second sentence. In the third sentence, change: "However, each of the alternatives includes" to "Alternatives 2-5 include monitoring and" and insert "current and" before "potential future."
		<b>Response</b> —The second sentence will remain as it relates to the current exposure pathways and the location of the impacted soil. Please see response to General Comment No. 9 regarding monitoring.
106a	p. 4-28, §4.4.2	In the first sentence, insert "chemical-specific ARARs regarding" after "does not address."
		<b>Response</b> —The requested change will be made to the text.
106b		In the second sentence, insert "monitoring and" after "conjunction with." In the third sentence, insert "chemical-specific," before "location-specific."
		<b>Response</b> —Please see response to General Comment No. 9 regarding monitoring. The requested change to the third sentence will be made to the text.
107	p. 4-28, ¶5	In the fourth sentence, change "Institutional" to "Monitoring and institutional."
		<b>Response</b> —Please see response to General Comment No. 9.
108	p. 4-29, ¶3	Insert a new paragraph discussing monitoring.
		<b>Response</b> —Please see response to General Comment No. 9.
109	p. 4-29, ¶5	Replace this paragraph with "Alternatives 2 and 3 do not meet this criteria since they do not include any treatment in their remedial action."
		<b>Response</b> —After the first sentence, the following text will be added:  <i>Although Alternatives 2 and 3, through selective excavation and disposal, achieve the onsite remedial goal of reducing the toxicity, mobility, and volume of contamination, they do not meet the preference for treatment.</i>
110	p. 4-30, ¶2	Insert a new paragraph discussing monitoring.
		<b>Response</b> —Please see response to General Comment No. 9.

**ATTACHMENT A (Continued)**

Comment No.	Page/Section	Comment
111	p. 4-30, ¶7	Insert a new paragraph discussing monitoring.
		<i>Response</i> —Please see response to General Comment No. 9.
112	p. 4-30, §4.4.7	Include costs of long-term monitoring.
		<i>Response</i> —Please see response to General Comment No. 9.
113	Table 4-1	Include monitoring in the Descriptions sections for Alternatives 2 through 5.
		<i>Response</i> —Please see response to General Comment No. 9.
114a	Table 4-2	Include a line for monitoring that would be checked for Alternatives 2 through 5.
		<i>Response</i> —Please see response to General Comment No. 9.
114b		Add alternative-specific ARARs tables of Alternative 1-5. These were previously supplied by EPA in its comments to the first draft FS.
		<i>Response</i> —Please see response to General Comment No. 1. The new ARAR tables are included as Attachment B to this response to comment document.
115	Table 4-2	The footnote to this table (and similar tables for each Zone) indicates that a check mark shows the “Zones in which specific remedial actions are retained.” However, the check marks actually show the elements comprising each alternative considered for the particular zone under discussion. Please check footnote.
		<i>Response</i> —Agreed. The footnote of Table 4-2, and other similar tables for the other zones, will be changed to indicate the following:  <i>Specific remedial actions included in the selected alternative.</i>
116	p. 5-1, §5	It is unclear from the Navy’s discussion whether the presence of lead in Zone 2 which exceeds federal/state hazardous waste standards also poses a risk (based on federal risk standards) to human health or the environment. If there is no exceedance of federal risk standards, then there is no action required under CERCLA (although the Navy would still need to comply with state remediation requirements, potentially under a separate state action). If there is no federal risk, this section of the FS should be eliminated (the following comments regarding this chapter assume a federal risk is present).
		<i>Response</i> —The chapter does not state explicitly that federal risk to human health or the environment is present. However, in review of Section 5.1 and Figure 5-1, it is clear that no federal risk to human health or the environment exists. Although no federal risk exists, the chapter will remain to discuss the remediation of soils that exceed the dilution-adjusted PMC, and the hazardous waste standards. Please see response to General Comment Nos. 8 and 10 for further discussion on PMC and non-CERCLA regulated wastes issues.
117	p. 5-1, §5	Throughout this entire chapter, the Navy needs to include citations to and descriptions of monitoring (see comments throughout Chapter 4). This includes monitoring of any waste left in place, monitoring of alternative involving capping to assess the successful functioning of the cap, monitoring of the adjacent Thames River (to show that there is no future ecological risk to the river), and establishing a monitoring and certification program to document (at least yearly) compliance with institutional controls. The specific comments regarding monitoring issues are not repeated again but should be incorporated throughout this chapter. This includes the titling of the alternatives throughout the text and the tables, discussing monitoring throughout the alternatives analysis (such as implementability and ARARs), and including the cost of monitoring in all cost analysis.
		<i>Response</i> —Any waste left in place in any of the zones would be at levels that may exceed the Direct Exposure Criteria or risk-based PRGs, and would meet the CTDEP description for isolated soils. Therefore, monitoring of ground water would not be required since the contaminants left in place do not pose a threat to ground water. The effectiveness of the cap is determined by the reduced exposure pathway by isolating the soils, and this would potentially require engineering inspections to assess the cap condition. Since contaminants left in place will not pose a threat to ground-water quality, they will subsequently not pose a threat to the Thames River and would not require monitoring. Therefore, no changes will be incorporated at this time. Please also see response to General Comment Nos. 7 through 11.

## ATTACHMENT A (Continued)

Comment No.	Page/Section	Comment
118	p. 5-1, §5.1	Throughout this section, the discussion of use of the "dilution-adjusted state PMC" should only be included if EPA accepts use of it. Otherwise, the Navy needs to meet the standard PMC published in the CT remediation regulations. <i>Response</i> —Please see response to General Comment No. 10.
119	p. 5-3, §5.3	Throughout the individual evaluation of the remedial alternatives, it should be clarified that for all alternatives except Alternative 1 (No Action), all hazardous waste will be removed from the site (to whatever depth it is found, including below the water table). Hazardous waste can only be left in place (even in areas of limited accessibility) if it is treated or capped in compliance with the standards of the CT Hazardous Waste Management Regulations. Since no such action is proposed under any of the alternatives, none of the alternatives would be compliant with ARARs unless all of the hazardous waste is removed. <i>Response</i> —Please see response to General Comment No. 11.
120	p. 5-6, ¶1	The last three sentences need to be revised so that the handling of any hazardous waste is compliant with applicable Hazardous Waste Management standards including: that any water from dewatering contaminated soil below the water table (hazardous waste) and ground water dewatered from the hole is treated in compliance with Clean Water Act and hazardous waste management standards; that a containment system be designed (including placement outside of the 100-year floodplain) that would meet hazardous waste standards; and that the cost of such a system for hazardous material management and dewatering be incorporated in the specific costs for all the alternatives (except Alternative 1 - No Action) for Zone 2. <i>Response</i> —Please see response to General Comment No. 11.
121	p. 5-8, ¶2	Replace the paragraph with "This Alternative does not reduce the toxicity, mobility, and volume of contaminants through treatment." <i>Response</i> —After the first sentence the following text will be added:  <i>Although Alternative 2, through selective excavation and disposal, achieves the onsite remedial goal of reducing the toxicity, mobility, and volume of contamination, it does not meet the preference for treatment.</i>
122	p. 5-8, ¶4	Add a new second sentence: "Workers will need to be qualified and equipped to work with hazardous waste." <i>Response</i> —The requested change will be made to the text.
123	p. 5-9, ¶3	In the second sentence, insert "outside of the 100-year flood plain" after "Zone 2." <i>Response</i> —The requested change will be made to the text.
124	p. 5-13,12	Remove the first two sentences and the last sentence (removal and institutional controls are not treatment). <i>Response</i> —After the first sentence, the following text will be added:  <i>Although Alternative 2, through selective excavation and disposal, achieves the onsite remedial goal of reducing the toxicity, mobility, and volume of contamination, it does not meet the preference for treatment.</i>  The last sentence will be removed as requested.
125	p. 5-16, ¶3	In the second sentence, change "Lower Subase" to "the base." <i>Response</i> —The text will be changed to match the response to Specific Comment No. 93, "the entire base."
126	p. 5-19, ¶4	Remove the second sentence. <i>Response</i> —It is the Navy's opinion that the statement is applicable since it indicates that there are institutional controls that will be used for overall protection of human health and the environment. The Navy would be happy to discuss this comment at the next technical review meeting.

## ATTACHMENT A (Continued)

Comment No.	Page/Section	Comment
127	p. 5-19, ¶5	Change the first sentence to: "Alternatives 2, 3, and 4 would comply with ARARs as long as all hazardous waste is removed from the site, whereas Alternative 1 would not comply with chemical-specific ARARs because it would not address the lead above PRGs." <i>Response</i> —The requested change will be made to the text.
128	p. 5-20, ¶6	Change the paragraph to: "Alternative 2 does not reduce the toxicity, mobility, and volume of contaminants through treatment." <i>Response</i> —After the first sentence the following text will be added:  <i>Although Alternative 2, through selective excavation and disposal, achieves the onsite remedial goal of reducing the toxicity, mobility, and volume of contamination, it does not meet the preference for treatment.</i>
129	p. 5-21, ¶2	Change "the institutional" to "Monitoring and institutional" and change "in each alternative for" to "for Alternatives 2, 3, and 4 in." <i>Response</i> —Please see response to General Comment No. 9.
130	p. 5-21, ¶5	In the second sentence, insert "outside of the 100-year flood plain" after "suitable area." <i>Response</i> —The requested change will be made to the text.
131	p. 5-21, §5.4.7	This section must include the costs for removal all of the hazardous waste and for monitoring. <i>Response</i> —Please see response to General Comment No. 9.
132a	Tables 5-1 & 5-2	Include lines for monitoring for each table. <i>Response</i> —Please see response to General Comment No. 9.
132b		Add alternative-specific ARARs tables of Alternative 1-4. These were previously supplied by EPA in its comments to the first draft FS. <i>Response</i> —Please see response to General Comment No. 1.
133	p. 6-1, §6	Incorporate all the applicable text changes cited for Chapter 4 in Chapter 6 since characteristic hazardous waste was not identified in Zone 3. If hazardous waste is present, incorporate the applicable text changes from Chapter 5. <i>Response</i> —Applicable changes will be made to the text.
134	p. 7-1, §7	Incorporate all the applicable text changes cited for Chapter 5 in Chapter 7 since characteristic hazardous waste was identified in Zone 4. <i>Response</i> —Applicable changes will be made to the text.
135	p. 8-1, §8	Remove this chapter since there is no federal risk identified for Zone 5. The area may still require remediation under state standards, but not under CERCLA. <i>Response</i> —The chapter was effectively removed. The text indicates that No Further Action is required. The Navy is pleased that EPA concurs. However, as a placeholder to show that the Navy performed the detailed analysis, minimal text will remain.
136	p. 9-I, §9	Remove this chapter since there is no federal risk identified for Zone 6. The area may still require remediation under state standards, but not under CERCLA. <i>Response</i> —Please see response to Specific Comment No. 135.
137	p. 10-1, § 10	Incorporate all the applicable text changes cited for Chapter 4 in Chapter 10 assuming characteristic hazardous waste is not identified in Zone 7. If hazardous waste is present, incorporate the applicable text changes from Chapter 5 (the text, including Section 10.3.2.1, discusses taking the excavated material to a RCRA-hazardous waste facility which would imply hazardous waste is present). <i>Response</i> —Applicable changes will be made to the text.
138	p. 11-1, §11	Incorporate all of the changes from Chapters 3-10 into this chapter. In particular, incorporate monitoring requirements, removing all reference to remediating TPH, the presence of hazardous waste in Zones 2 and 4, and the elimination of Zones 5 and 6 from this document due to the lack of a federal risk. <i>Response</i> —Please see response to General Comment Nos. 8 and 9 with regards to monitoring and issues surrounding inclusion of non-CERCLA regulated wastes. Other requested changes will be appropriately changed in the text.

**Attachment B**

**Revised ARAR Tables**

**TABLE 4-3 ASSESSMENT OF CHEMICAL-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS  
AND TO BE CONSIDERED GUIDANCE FOR  
ALTERNATIVE 1 – NO ACTION  
ZONE 1, LOWER SUBBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT**

Requirement	Citation	Status	Synopsis of Requirement	Action to Be Taken to Attain Relevant and Appropriate Requirement
<b>FEDERAL</b>				
Cancer Slope Factors		To Be Considered	These are guidance values used in risk assessment to evaluate the potential carcinogenic hazards caused by exposure to contaminants.	The No Action Alternative would provide no protection from risk posed by contaminants in the soil.
Reference Dose		To Be Considered	These are guidance values used in risk assessment to evaluate the potential non-carcinogenic hazards caused by exposure to contaminants.	The No Action Alternative would provide no protection from risk posed by contaminants in the soil.
<b>STATE OF CONNECTICUT</b>				
Remediation Standard Regulations	CGS 22a-133k; RCSA 22a-133k-1 through 3	Applicable	These regulations establish direct exposure and pollutant mobility criteria for contaminated soils.	The No Action Alternative does not satisfy state standards for either site remediation nor for sufficient engineering controls to prevent risk to human health and the environment.
NOTE: CGS = Connecticut General Statutes. RCSA = Regulations of Connecticut State Agencies.				

**TABLE 4-4 ASSESSMENT OF LOCATION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND TO BE CONSIDERED GUIDANCE FOR ALTERNATIVE 1 – NO ACTION ZONE 1, LOWER SUBBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT**

Requirement	Citation	Status	Synopsis of Requirement	Action to Be Taken to Attain Applicable or Relevant and Appropriate Requirement
<b>FEDERAL</b>				
There are no federal location-specific applicable or relevant and appropriate requirements.				
<b>STATE OF CONNECTICUT</b>				
There are no state location-specific applicable or relevant and appropriate requirements.				

**TABLE 4-5 ASSESSMENT OF ACTION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND TO BE CONSIDERED GUIDANCE FOR ALTERNATIVE 1 – NO ACTION ZONE 1, LOWER SUBBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT**

Requirement	Citation	Status	Synopsis of Requirement	Action to Be Taken to Attain Applicable or Relevant and Appropriate Requirement
<b>FEDERAL</b>				
There are no federal action-specific applicable or relevant and appropriate requirements.				
<b>STATE OF CONNECTICUT</b>				
There are no state action-specific applicable or relevant and appropriate requirements.				

**TABLE 4-6 ASSESSMENT OF CHEMICAL-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND TO BE CONSIDERED GUIDANCE FOR ALTERNATIVE 2 – SELECTIVE EXCAVATION, OFFSITE DISPOSAL, AND INSTITUTIONAL CONTROLS ZONE 1, LOWER SUBBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT**

Requirement	Citation	Status	Synopsis of Requirement	Action to Be Taken to Attain Applicable or Relevant and Appropriate Requirement
<b>FEDERAL</b>				
Cancer Slope Factors		To Be Considered	These are guidance values used in risk assessment to evaluate the potential carcinogenic hazards caused by exposure to contaminants.	The alternative would eliminate exposure to contaminants in soil to industrial standards through excavation and offsite disposal. Institutional controls would prevent future residential use and limit construction activities at the site.
Reference Dose		To Be Considered	These are guidance values used in risk assessment to evaluate the potential non-carcinogenic hazards caused by exposure to contaminants.	The alternative would eliminate exposure to contaminants in soil to industrial standards through excavation and offsite disposal. Institutional controls would prevent future residential use and limit construction activities at the site.
<b>STATE OF CONNECTICUT</b>				
Remediation Standard Regulations	CGS 22a-133k; RCSA 22a-133k-1 through 3	Applicable	These regulations establish direct exposure and pollutant mobility criteria for contaminated soils.	The alternative would eliminate exposure to contaminants in the soil to industrial standards through excavation and offsite disposal. Institutional controls would prevent residential use and limit construction activities at the site.
NOTE: CGS = Connecticut General Statutes. RCSA = Regulations of Connecticut State Agencies.				

**TABLE 4-7 ASSESSMENT OF LOCATION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND TO BE CONSIDERED GUIDANCE FOR ALTERNATIVE 2 – SELECTIVE EXCAVATION, OFFSITE DISPOSAL, AND INSTITUTIONAL CONTROLS ZONE 1, LOWER SUBBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT**

Requirement	Citation	Status	Synopsis of Requirement	Action to Be Taken to Attain Applicable or Relevant and Appropriate Requirement
<b>FEDERAL</b>				
Clean Water Act, Section 404	33 USC 1344; 40 CFR Part 230 and 33 CFR Parts 320-323	Applicable	These rules regulate the discharge of dredge and fill materials in wetlands and navigable waters. Such discharges are not allowed if practicable alternatives are available. Furthermore, the regulations require that the remedial action is the best practicable alternative to avoiding, minimizing, or mitigating impacts to protected habitats.	Remedial action includes excavation of soil and replacement/restoration with uncontaminated material. All activities associated with excavation will be designed to ensure or minimize impacts to protected habitats. Discharge to the Thames River is not expected during the remedial action. If an accidental discharge does occur, the requirements set forth will be followed to mitigate and monitor any release.
Fish and Wildlife Coordination Act	16 USC Part 661 <i>et. seq.</i> , 40 CFR 122.49	Applicable	This Order protects fish and wildlife when federal actions result in control or structural modification of a natural stream, body of water, floodplains, or flood-prone areas.	Appropriate agencies would be consulted prior to excavation to minimize adverse effects to fish and wildlife from excavating floodplains or flood-prone areas.
<b>STATE OF CONNECTICUT</b>				
Connecticut Coastal Management Act	CGS 22a-444	Applicable	The site is within a coastal zone management area. As a result, activities at the site require a Coastal Site Plan that addresses adverse and beneficial effects of the propose activities.	Remedial actions at the site are required to comply with the substantive requirements of the Act, but are not required to comply with the formal submissions and local reviews. Local officials will be consulted before activities begin to ensure coastal zone issues are addressed.
Connecticut Endangered Species Act	CGS 26-303 through 315	Applicable	Remedial actions may not jeopardize the continued existence of state-listed endangered or threatened species, or adversely modify or destroy their habitat.	Before remedial actions occur, the NSB-NLON Natural Resources Manager will be notified. The Natural Resources Manager will determine whether additional surveys must be completed prior to remedial actions. In addition, state officials will be consulted prior to any activities.
NOTE: USC = United States Code. CFR = Code of Federal Regulations. CGS = Connecticut General Statutes. RCSA = Regulations of Connecticut State Agencies.				

**TABLE 4-8 ASSESSMENT OF ACTION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND TO BE CONSIDERED GUIDANCE FOR ALTERNATIVE 2 – SELECTIVE EXCAVATION, OFFSITE DISPOSAL, AND INSTITUTIONAL CONTROLS ZONE 1, LOWER SUBBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT**

Requirement	Citation	Status	Synopsis of Requirement	Evaluation/Action to be Taken to Attain Applicable or Relevant and Appropriate Requirement
<b>STATE OF CONNECTICUT</b>				
Connecticut Air Pollution Control Act	RCSA 22a-174	Relevant and Appropriate	These regulations establish ambient air quality standards and emission limitations/standards.	Air monitoring will occur during excavation activities. Excavation activities may produce fugitive dusts and vapors that will be monitored at all times. All site emissions will be kept in compliance with this Act.
Connecticut Guidelines for Soil Erosion and Sediment Control	Connecticut Council on Soil and Water Conservation	To Be Considered	Technical and administrative guidance for development, adoption, and implementation of erosion and sediment control program.	All excavation activities, including soil stockpiling, will meet the substantive requirements set forth in this guidance document to minimize runoff and migration of COCs.
NOTE: RCSA = Regulations of Connecticut State Agencies. CGS = Connecticut General Statutes.				

**TABLE 4-9 ASSESSMENT OF CHEMICAL-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND TO BE CONSIDERED GUIDANCE FOR ALTERNATIVE 3 – SELECTIVE EXCAVATION, OFFSITE DISPOSAL, CAPPING, AND INSTITUTIONAL CONTROLS ZONE 1, LOWER SUBBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT**

Requirement	Citation	Status	Synopsis of Requirement	Action to Be Taken to Attain Applicable or Relevant and Appropriate Requirement
<b>FEDERAL</b>				
Cancer Slope Factors		To Be Considered	These are guidance values used in risk assessment to evaluate the potential carcinogenic hazards caused by exposure to contaminants.	The alternative would eliminate exposure to contaminants in soil to industrial standards through excavation, offsite disposal, and capping. Institutional controls would prevent residential use and limit construction activities.
Reference Dose		To Be Considered	These are guidance values used in risk assessment to evaluate the potential non-carcinogenic hazards caused by exposure to contaminants.	The alternative would eliminate exposure to contaminants in soil to industrial standards through excavation, offsite disposal, and capping. Institutional controls would prevent residential use and limit construction activities.
<b>STATE OF CONNECTICUT</b>				
Remediation Standard Regulations	CGS 22a-133k; RCSA 22a-133k-1 through 3	Applicable	These regulations establish direct exposure and pollutant mobility criteria for contaminated soils.	The alternative would eliminate exposure to contaminants in the soil to industrial standards through excavation, offsite disposal, and capping. Excavation and offsite disposal would remove contamination from the site. Capping would render any residual or deep soil inaccessible. Institutional controls would prevent residential use, limit exposure to, and minimize mobility of inaccessible COCs.
NOTE: CGS = Connecticut General Statutes. RCSA = Regulations of Connecticut State Agencies.				

**TABLE 4-10 ASSESSMENT OF LOCATION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND TO BE CONSIDERED GUIDANCE FOR ALTERNATIVE 3 – SELECTIVE EXCAVATION, OFFSITE DISPOSAL, CAPPING, AND INSTITUTIONAL CONTROLS ZONE 1, LOWER SUBBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT**

Requirement	Citation	Status	Synopsis of Requirement	Action to Be Taken to Attain Applicable or Relevant and Appropriate Requirement
<b>FEDERAL</b>				
Clean Water Act, Section 404	33 USC 1344; 40 CFR Part 230 and 33 CFR Parts 320-323	Applicable	These rules regulate the discharge of dredge and fill materials in wetlands and navigable waters. Such discharges are not allowed if practicable alternatives are available. Furthermore, the regulations require that the remedial action is the best practicable alternative to avoiding, minimizing, or mitigating impacts to protected habitats.	Remedial action includes excavation of soil and replacement/restoration with uncontaminated material. All activities associated with excavation will be designed to ensure or minimize impacts to protected habitats. Discharge to the Thames River is not expected during the remedial action. If an accidental discharge does occur, the requirements set forth will be followed to mitigate and monitor any release.
Fish and Wildlife Coordination Act	16 USC Part 661 <i>et. seq.</i> , 40 CFR 122.49	Applicable	This Order protects fish and wildlife when federal actions result in control or structural modification of a natural stream, body of water, floodplains, or flood-prone areas.	Appropriate agencies would be consulted prior to excavation to minimize adverse effects to fish and wildlife from excavating floodplains or flood-prone areas.
<b>STATE OF CONNECTICUT</b>				
Connecticut Coastal Management Act	CGS 22a-444	Applicable	The site is within a coastal zone management area. As a result, activities at the site require a Coastal Site Plan that addresses adverse and beneficial effects of the propose activities.	Remedial actions at the site are required to comply with the substantive requirements of the Act, but are not required to comply with the formal submissions and local reviews. Local officials will be consulted before activities begin to ensure coastal zone issues are addressed.
Connecticut Endangered Species Act	CGS 26-303 through 315	Applicable	Remedial actions may not jeopardize the continued existence of state-listed endangered or threatened species, or adversely modify or destroy their habitat.	Before remedial actions occur, the NSB-NLON Natural Resources Manager will be notified. The Natural Resources Manager will determine whether additional surveys must be completed prior to remedial actions. In addition, state officials will be consulted prior to any activities.
<p>NOTE: USC = United States Code.  CFR = Code of Federal Regulations.  CGS = Connecticut General Statutes.  RCSA = Regulations of Connecticut State Agencies.</p>				

**TABLE 4-11 ASSESSMENT OF ACTION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND TO BE CONSIDERED GUIDANCE FOR ALTERNATIVE 3 – SELECTIVE EXCAVATION, OFFSITE DISPOSAL, CAPPING, AND INSTITUTIONAL CONTROLS ZONE 1, LOWER SUBBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT**

Requirement	Citation	Status	Synopsis of Requirement	Evaluation/Action to be Taken to Attain Applicable or Relevant and Appropriate Requirement
<b>STATE OF CONNECTICUT</b>				
Connecticut Air Pollution Control Act	RCSA 22a-174	Relevant and Appropriate	These regulations establish ambient air quality standards and emission limitations/standards.	Air monitoring will occur during excavation activities. Excavation activities may produce fugitive dusts and vapors that will be monitored at all times. All site emissions will be kept in compliance with this Act.
Connecticut Guidelines for Soil Erosion and Sediment Control	Connecticut Council on Soil and Water Conservation	To Be Considered	Technical and administrative guidance for development, adoption, and implementation of erosion and sediment control program.	All excavation activities, including soil stockpiling, will meet the substantive requirements set forth in this guidance document to minimize runoff and migration of COCs.
<b>NOTE:</b> RCSA = Regulations of Connecticut State Agencies. CGS = Connecticut General Statutes.				

**TABLE 4-12 ASSESSMENT OF CHEMICAL-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND TO BE CONSIDERED GUIDANCE FOR ALTERNATIVE 4 – SELECTIVE EXCAVATION, EX SITU SOIL WASHING, EX SITU STABILIZATION/SOLIDIFICATION, OFFSITE DISPOSAL, CAPPING, AND INSTITUTIONAL CONTROLS ZONE 1, LOWER SUBBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT**

Requirement	Citation	Status	Synopsis of Requirement	Action to Be Taken to Attain Applicable or Relevant and Appropriate Requirement
<b>FEDERAL</b>				
Cancer Slope Factors		To Be Considered	These are guidance values used in risk assessment to evaluate the potential carcinogenic hazards caused by exposure to contaminants.	The alternative would eliminate exposure to contaminants in soil to industrial standards through excavation, chemical and physical soil treatment, offsite disposal, and capping. Institutional controls would prevent residential use and limit exposure to inaccessible COCs.
Reference Dose		To Be Considered	These are guidance values used in risk assessment to evaluate the potential non-carcinogenic hazards caused by exposure to contaminants.	The alternative would eliminate exposure to contaminants in soil to industrial standards through excavation, chemical and physical soil treatment, offsite disposal, and capping. Institutional controls would prevent residential use and limit exposure to inaccessible COCs.
<b>STATE OF CONNECTICUT</b>				
Remediation Standard Regulations	CGS 22a-133k; RCSA 22a-133k-1 through 3	Applicable	These regulations establish direct exposure and pollutant mobility criteria for contaminated soils.	The alternative would eliminate exposure to contaminants in the soil to industrial standards through excavation, offsite disposal, and capping. Excavation, chemical and physical soil treatment, and offsite disposal would treat and remove contaminated soil from the site. Capping would render any residual or deep soil inaccessible. Institutional controls would prevent residential use, limit exposure to, and minimize mobility of residual COCs.
NOTE: CGS = Connecticut General Statutes. RCSA = Regulations of Connecticut State Agencies.				

**TABLE 4-13 ASSESSMENT OF LOCATION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND TO BE CONSIDERED GUIDANCE FOR ALTERNATIVE 4 – SELECTIVE EXCAVATION, EX SITU SOIL WASHING, EX SITU STABILIZATION/SOLIDIFICATION, OFFSITE DISPOSAL, CAPPING, AND INSTITUTIONAL CONTROLS ZONE 1, LOWER SUBBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT**

Requirement	Citation	Status	Synopsis of Requirement	Action to Be Taken to Attain Applicable or Relevant and Appropriate Requirement
<b>FEDERAL</b>				
Clean Water Act, Section 404	33 USC 1344; 40 CFR Part 230 and 33 CFR Parts 320-323	Applicable	These rules regulate the discharge of dredge and fill materials in wetlands and navigable waters. Such discharges are not allowed if practicable alternatives are available. Furthermore, the regulations require that the remedial action is the best practicable alternative to avoiding, minimizing, or mitigating impacts to protected habitats.	Remedial action includes excavation of soil and replacement/restoration with uncontaminated material. All activities associated with excavation will be designed to ensure or minimize impacts to protected habitats. Discharge to the Thames River is not expected during the remedial action. If an accidental discharge does occur, the requirements set forth will be followed to mitigate and monitor any release.
Fish and Wildlife Coordination Act	16 USC Part 661 <i>et. seq.</i> , 40 CFR 122.49	Applicable	This Order protects fish and wildlife when federal actions result in control or structural modification of a natural stream, body of water, floodplains, or flood-prone areas.	Appropriate agencies would be consulted prior to excavation to minimize adverse effects to fish and wildlife from excavating floodplains or flood-prone areas.
<b>STATE OF CONNECTICUT</b>				
Connecticut Coastal Management Act	CGS 22a-444	Applicable	The site is within a coastal zone management area. As a result, activities at the site require a Coastal Site Plan that addresses adverse and beneficial effects of the propose activities.	Remedial actions at the site are required to comply with the substantive requirements of the Act, but are not required to comply with the formal submissions and local reviews. Local officials will be consulted before activities begin to ensure coastal zone issues are addressed.
Connecticut Endangered Species Act	CGS 26-303 through 315	Applicable	Remedial actions may not jeopardize the continued existence of state-listed endangered or threatened species, or adversely modify or destroy their habitat.	Before remedial actions occur, the NSB-NLON Natural Resources Manager will be notified. The Natural Resources Manager will determine whether additional surveys must be completed prior to remedial actions. In addition, state officials will be consulted prior to any activities.
<b>NOTE:</b> USC = United States Code. CFR = Code of Federal Regulations. CGS = Connecticut General Statutes. RCSA = Regulations of Connecticut State Agencies.				

**TABLE 4-14 ASSESSMENT OF ACTION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND TO BE CONSIDERED GUIDANCE FOR ALTERNATIVE 4 – SELECTIVE EXCAVATION, EX SITU SOIL WASHING, EX SITU STABILIZATION/SOLIDIFICATION, OFFSITE DISPOSAL, CAPPING, AND INSTITUTIONAL CONTROLS ZONE 1, LOWER SUBBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT**

Requirement	Citation	Status	Synopsis of Requirement	Evaluation/Action to be Taken to Attain Applicable or Relevant and Appropriate Requirement
<b>STATE OF CONNECTICUT</b>				
Connecticut Air Pollution Control Act	RCSA 22a-174	Relevant and Appropriate	These regulations establish ambient air quality standards and emission limitations/standards.	Air monitoring will occur during excavation and soil washing activities. Excavation activities may produce fugitive dusts and vapors that will be monitored at all times. In addition, vapor collection may be necessary during soil washing activities depending upon final solutions employed. All site emissions will be kept in compliance with this Act.
Connecticut Guidelines for Soil Erosion and Sediment Control	Connecticut Council on Soil and Water Conservation	To Be Considered	Technical and administrative guidance for development, adoption, and implementation of erosion and sediment control program.	All excavation activities, including soil stockpiling, will meet the substantive requirements set forth in this guidance document to minimize runoff and migration of COCs.
NOTE: RCSA = Regulations of Connecticut State Agencies. CGS = Connecticut General Statutes.				

**TABLE 4-15 ASSESSMENT OF CHEMICAL-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND TO BE CONSIDERED GUIDANCE FOR ALTERNATIVE 5 – SELECTIVE EXCAVATION, EX SITU SOIL WASHING, EX SITU STABILIZATION/SOLIDIFICATION, OFFSITE DISPOSAL, IN SITU SOIL VAPOR EXTRACTION, AND INSTITUTIONAL CONTROLS ZONE 1, LOWER SUBBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT**

Requirement	Citation	Status	Synopsis of Requirement	Action to Be Taken to Attain Applicable or Relevant and Appropriate Requirement
<b>FEDERAL</b>				
Cancer Slope Factors		To Be Considered	These are guidance values used in risk assessment to evaluate the potential carcinogenic hazards caused by exposure to contaminants.	The alternative would eliminate exposure to contaminants in soil to industrial standards through excavation, ex situ and in situ soil treatment, and offsite disposal. Institutional controls would prevent future residential use and limit construction activities.
Reference Dose		To Be Considered	These are guidance values used in risk assessment to evaluate the potential non-carcinogenic hazards caused by exposure to contaminants.	The alternative would eliminate exposure to contaminants in soil to industrial standards through excavation, ex situ and in situ soil treatment, and offsite disposal. Institutional controls would prevent future residential use and limit construction activities.
<b>STATE OF CONNECTICUT</b>				
Remediation Standard Regulations	CGS 22a-133k; RCSA 22a-133k-1 through 3	Applicable	These regulations establish direct exposure and pollutant mobility criteria for contaminated soils.	The alternative would eliminate exposure to contaminants in the soil to industrial standards through excavation, chemical and physical soil treatment, and offsite disposal. Excavation, ex situ soil treatment and offsite disposal would remove contaminated soil from the site. In situ soil vapor extraction would remediate PAHs from deep soil. Institutional controls would prevent future residential use, prevent exposure to, and minimize migration of inaccessible COCs.
<p>NOTE: CGS = Connecticut General Statutes.  RCSA = Regulations of Connecticut State Agencies.</p>				

**TABLE 4-16 ASSESSMENT OF LOCATION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND TO BE CONSIDERED GUIDANCE FOR ALTERNATIVE 5 – SELECTIVE EXCAVATION, EX SITU SOIL WASHING, EX SITU STABILIZATION/SOLIDIFICATION, OFFSITE DISPOSAL, IN SITU SOIL VAPOR EXTRACTION, AND INSTITUTIONAL CONTROLS ZONE 1, LOWER SUBBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT**

Requirement	Citation	Status	Synopsis of Requirement	Action to Be Taken to Attain Applicable or Relevant and Appropriate Requirement
<b>FEDERAL</b>				
Clean Water Act, Section 404	33 USC 1344; 40 CFR Part 230 and 33 CFR Parts 320-323	Applicable	These rules regulate the discharge of dredge and fill materials in wetlands and navigable waters. Such discharges are not allowed if practicable alternatives are available. Furthermore, the regulations require that the remedial action is the best practicable alternative to avoiding, minimizing, or mitigating impacts to protected habitats.	Remedial action includes excavation of soil and replacement/restoration with uncontaminated material. All activities associated with excavation will be designed to ensure or minimize impacts to protected habitats. Discharge to the Thames River is not expected during the remedial action. If an accidental discharge does occur, the requirements set forth will be followed to mitigate and monitor any release.
Fish and Wildlife Coordination Act	16 USC Part 661 <i>et. seq.</i> , 40 CFR 122.49	Applicable	This Order protects fish and wildlife when federal actions result in control or structural modification of a natural stream, body of water, floodplains, or flood-prone areas.	Appropriate agencies would be consulted prior to excavation to minimize adverse effects to fish and wildlife from excavating floodplains or flood-prone areas.
<b>STATE OF CONNECTICUT</b>				
Connecticut Coastal Management Act	CGS 22a-444	Applicable	The site is within a coastal zone management area. As a result, activities at the site require a Coastal Site Plan that addresses adverse and beneficial effects of the propose activities.	Remedial actions at the site are required to comply with the substantive requirements of the Act, but are not required to comply with the formal submissions and local reviews. Local officials will be consulted before activities begin to ensure coastal zone issues are addressed.
Connecticut Endangered Species Act	CGS 26-303 through 315	Applicable	Remedial actions may not jeopardize the continued existence of state-listed endangered or threatened species, or adversely modify or destroy their habitat.	Before remedial actions occur, the NSB-NLON Natural Resources Manager will be notified. The Natural Resources Manager will determine whether additional surveys must be completed prior to remedial actions. In addition, state officials will be consulted prior to any activities.
<b>NOTE:</b> USC = United States Code. CFR = Code of Federal Regulations. CGS = Connecticut General Statutes. RCSA = Regulations of Connecticut State Agencies.				

**TABLE 4-17 ASSESSMENT OF ACTION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND TO BE CONSIDERED GUIDANCE FOR ALTERNATIVE 5 – SELECTIVE EXCAVATION, EX SITU SOIL WASHING, EX SITU STABILIZATION/SOLIDIFICATION, OFFSITE DISPOSAL, IN SITU SOIL VAPOR EXTRACTION, AND INSTITUTIONAL CONTROLS ZONE 1, LOWER SUBBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT**

Requirement	Citation	Status	Synopsis of Requirement	Evaluation/Action to be Taken to Attain Applicable or Relevant and Appropriate Requirement
<b>STATE OF CONNECTICUT</b>				
Connecticut Air Pollution Control Act	RCSA 22a-174	Relevant and Appropriate	These regulations establish ambient air quality standards and emission limitations/standards.	Air monitoring will occur during excavation, soil washing, and soil vapor extraction activities. Excavation activities may produce fugitive dusts and vapors that will be monitored at all times. Vapor collection may be necessary during soil washing activities depending upon final solutions employed. The soil vapor extraction unit will have emission of extracted gases. The unit will be designed with off-gas treatment, if necessary. All site emissions will be kept in compliance with this Act.
Connecticut Guidelines for Soil Erosion and Sediment Control	Connecticut Council on Soil and Water Conservation	To Be Considered	Technical and administrative guidance for development, adoption, and implementation of erosion and sediment control program.	All excavation activities, including soil stockpiling, will meet the substantive requirements set forth in this guidance document to minimize runoff and migration of COCs.
<p>NOTE: RCSA = Regulations of Connecticut State Agencies.  CGS = Connecticut General Statutes.</p>				

TABLE 4-18 SUMMARY OF COMPARATIVE ANALYSIS OF REMEDIAL ALTERNATIVES FOR ZONE 1  
LOWER SUBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT

Criteria	Alternative 1 No Action	Alternative 2 Selective Excavation, Offsite Disposal, and Institutional Controls	Alternative 3 Selective Excavation, Offsite Disposal, Capping, and Institutional Controls	Alternative 4 Selective Excavation, <i>Ex Situ</i> Soil Washing, <i>Ex Situ</i> Stabilization/Solidification, Offsite Disposal, Capping, and Institutional Controls	Alternative 5 Selective Excavation, <i>Ex Situ</i> Soil Washing, <i>Ex Situ</i> Stabilization/Solidification, Offsite Disposal, <i>In Situ</i> Soil Vapor Extraction, and Institutional Controls
<b>OVERALL PROTECTIVENESS – HUMAN HEALTH</b>					
Exposure to COCs in soil	Would not address.	Soil with COCs above ICDECs, 10 <sup>-5</sup> Risk-Based PRGs, state PMCs, and Dilution-Adjusted PMCs would be excavated and disposed offsite, which would remove associated risks to human health. Risks to remedial phase workers would be minimized through proper construction and engineering safety practices. Signage would be protective limiting zone access. Institutional controls (ELUR) would control employee/site worker exposure beneath pavement, prevent future residential site use, and provide protection through amendments if property was transferred.	Soil with COCs above the 10 <sup>-5</sup> Risk-Based PRGs, state PMCs, and Dilution-Adjusted PMCs would be excavated and disposed offsite, which would remove associated risks to human health. Soil with COCs above the state ICDECs will be capped to prevent exposure risk to human health. Risks to remedial phase workers would be minimized through proper construction and engineering safety practices. Signage would be protective limiting zone access. Institutional controls (ELUR) would control employee/site worker exposure beneath pavement, prevent future residential site use, and provide protection through amendments if property was transferred.	Soil with COCs above the 10 <sup>-5</sup> Risk-Based PRGs, state PMCs, and Dilution-Adjusted PMCs would be excavated, treated, and disposed offsite, which would remove associated risks to human health. Soil with COCs above the state ICDECs will be capped to prevent exposure risk to human health. Risks to remedial phase workers would be minimized through proper construction and engineering safety practices. Signage would be protective limiting zone access. Institutional controls (ELUR) would control employee/site worker exposure beneath pavement, prevent future residential site use, and provide protection through amendments if property was transferred.	Soil with COCs above the 10 <sup>-5</sup> Risk-Based PRGs, state PMCs, and Dilution-Adjusted PMCs would be excavated, treated, and disposed offsite, which would remove associated risks to human health. Soil with COCs above the state ICDECs will be treated <i>in situ</i> to minimize/eliminate potential associated risks to human health and migration of COCs at Lower Subase. Risks to remedial phase workers would be minimized through proper construction and engineering safety practices. Signage would be protective limiting zone access. Institutional controls (ELUR) would control employee/site worker exposure beneath pavement, prevent future residential site use, and provide protection through amendments if property was transferred.
<b>OVERALL PROTECTIVENESS – ENVIRONMENT</b>					
Potential offsite receptors	Would not address; however, no significant risks to offsite ecological receptors at Lower Subase are present.	No significant risks to offsite ecological receptors are present or anticipated at Lower Subase during implementation of alternative. Removal of soil with COC concentrations above the zone's cleanup goals would reduce/eliminate potential for COC migration. Proper safety controls would reduce/eliminate potential impact to offsite receptors.	No significant risks to offsite ecological receptors are present or anticipated at Lower Subase during implementation of alternative. Removal and capping of soil with COC concentrations above the zone's cleanup goals would reduce/eliminate potential for COC migration. Proper safety controls would reduce/eliminate potential impact to offsite receptors.	No significant risks to offsite ecological receptors are present or anticipated at Lower Subase during implementation of alternative. Removal, treatment, and capping of soil with COC concentrations above the zone's cleanup goals would reduce/eliminate potential for COC migration. Proper safety controls would reduce/eliminate potential impact to offsite receptors.	No significant risks to offsite ecological receptors are present or anticipated at Lower Subase during implementation of alternative. Removal and treatment of soil with COC concentrations above the zone's cleanup goals would reduce/eliminate potential for COC migration. Proper safety controls would reduce/eliminate potential impact to offsite receptors.
Potential onsite receptors	Would not address; however, no significant risks to onsite ecological receptors at Lower Subase are present.	No significant risks to onsite ecological receptors are present or anticipated at Lower Subase during implementation of alternative. Removal of impacted soil would reduce/eliminate potential for COC migration. Risks to onsite receptors during remedial work would be minimized through proper construction and engineering safety practices. Signage would be protective by limiting zone access.	No significant risks to onsite ecological receptors are present or anticipated at Lower Subase during implementation of alternative. Removal and capping of impacted soil quantities would reduce/eliminate potential for COC migration. Proper safety controls would reduce/eliminate potential for COC migration and potential impact to onsite receptors. ELUR would address COCs in soil above residential cleanup goals.	No significant risks to onsite ecological receptors are present or anticipated at Lower Subase during implementation of alternative. Removal, treatment and capping of impacted soil quantities would reduce/eliminate potential for COC migration. Proper safety controls would reduce/eliminate potential for COC migration and potential impact to onsite receptors. ELUR would address COCs in soil above residential cleanup goals.	No significant risks to onsite ecological receptors are present or anticipated at Lower Subase during implementation of alternative. Removal and treatment of impacted soil quantities would reduce/eliminate potential for COC migration. Proper safety controls would reduce/eliminate potential for COC migration and potential impact to onsite receptors. ELUR would address COCs in soil above residential cleanup goals.
<b>COMPLIANCE WITH APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS</b>					
Chemical-specific	Would not achieve because no action specified.	Would achieve compliance with ICDECs, 10 <sup>-5</sup> Risk-Based PRGs, state PMCs, and Dilution-Adjusted PMCs, for soil. Institutional controls would address residual COCs in soil.	Would achieve compliance with ICDECs, 10 <sup>-5</sup> Risk-Based PRGs, state PMCs, and Dilution-Adjusted PMCs, for soil. Institutional controls would address residual COCs in soil.	Would achieve compliance with ICDECs, 10 <sup>-5</sup> Risk-Based PRGs, state PMCs, and Dilution-Adjusted PMCs, for soil. Institutional controls would address residual COCs in soil.	Would achieve compliance with ICDECs, 10 <sup>-5</sup> Risk-Based PRGs, state PMCs, and Dilution-Adjusted PMCs, for soil. Institutional controls would address residual COCs in soil.
Location-specific	Not applicable because no action specified.	Would be conducted in accordance with requirements.	Would be conducted in accordance with requirements.	Would be conducted in accordance with requirements.	Would be conducted in accordance with requirements.
Action-specific	Not applicable because no action specified.	Would be conducted in accordance with requirements.	Would be conducted in accordance with requirements.	Would be conducted in accordance with requirements.	Would be conducted in accordance with requirements.
NOTE: COC = Constituents of concern. ELUR = Environmental land use restriction. PRG = Preliminary Remediation Goals. PMC = Pollutant Mobility Criteria.					

10260B1Z

Criteria	Alternative 1 No Action	Alternative 2 Selective Excavation, Offsite Disposal, and Institutional Controls	Alternative 3 Selective Excavation, Offsite Disposal, Capping, and Institutional Controls	Alternative 4 Selective Excavation, <i>Ex Situ</i> Soil Washing, <i>Ex Situ</i> Stabilization/Solidification, Offsite Disposal, Capping, and Institutional Controls	Alternative 5 Selective Excavation, <i>Ex Situ</i> Soil Washing, <i>Ex Situ</i> Stabilization/Solidification, Offsite Disposal, <i>In Situ</i> Soil Vapor Extraction, and Institutional Controls
<b>LONG-TERM EFFECTIVENESS AND PERMANENCE</b>					
Magnitude of residual risk	Current risks would remain.	Excavation of COC-containing soil to industrial cleanup goals would minimize/eliminate residual risk at Lower Subbase for the long term. Proper disposal of the affected soil at a licensed TSDF would provide long-term protection to the environment and human health at large. Long-term risks at the site from residual COCs would be adequately addressed through institutional controls.	Excavation and capping of COC-containing soil to industrial cleanup goals would minimize/eliminate residual risk at Lower Subbase for the long term. Proper disposal of the affected soil at a licensed TSDF and proper capping of remaining soil would provide long-term protection to the environment and human health at large. Long-term risks at the site from residual COCs would be adequately addressed through institutional controls.	Excavation and capping of COC-containing soil to industrial cleanup goals would minimize/eliminate residual risk at Lower Subbase for the long term. Proper treatment and disposal of the affected soil at a licensed TSDF and proper capping of remaining soil would provide long-term protection to the environment and human health at large. Long-term risks at the site from residual COCs would be adequately addressed through institutional controls.	Excavation and treatment of COC-containing soil to industrial cleanup goals would minimize/eliminate residual risk at Lower Subbase for the long term. Proper treatment and disposal of the affected soil at a licensed TSDF would provide long-term protection to the environment and human health at large. Long-term risks at the site from residual COCs would be adequately addressed through institutional controls.
Adequacy and reliability of controls	Not applicable because no controls are specified.	Active strategy. Selective excavation and disposal of impacted soil would be a reliable method to mitigate COCs above the industrial cleanup goals. Institutional controls would be reliable and suitable to control access and activity at the site. Site planned to remain for industrial use for Naval Submarine Base, New London, Connecticut.	Active strategy. Selective excavation, capping and disposal would be a reliable method to mitigate COCs above this alternative's industrial cleanup goals. ELUR would be reliable and suitable to control access and activity at the site. Site planned to remain for industrial use for Naval Submarine Base, New London, Connecticut.	Active strategy. Selective excavation, treatment, capping and disposal would be a reliable method to mitigate COCs above this alternative's industrial cleanup goals. ELUR would be reliable and suitable to control access and activity at the site. Site planned to remain for industrial use for Naval Submarine Base, New London, Connecticut.	Active strategy. Selective excavation, treatment, disposal, and <i>in situ</i> treatment would be a reliable method to mitigate COCs above this alternative's industrial cleanup goals. ELUR would be reliable and suitable to control access and activity at the site. Site planned to remain for industrial use for Naval Submarine Base, New London, Connecticut.
<b>REDUCTION OF TOXICITY, MOBILITY, AND VOLUME THROUGH TREATMENT</b>					
Treatment processes used and materials treated	No treatment included.	Selected soil would be excavated and disposed of at an offsite, licensed facility. Any necessary treatment of the disposed soil will be determined by the TSDF.	Select quantities of soil would be excavated and disposed of at an offsite, licensed facility. Any necessary treatment of the disposed soil will be determined by the TSDF. The remaining quantity of affected soil onsite would be capped.	Select quantities of soil would be excavated, treated through a method of <i>ex situ</i> soil washing and/or <i>ex situ</i> stabilization/solidification, and disposed of at an offsite, licensed facility. The remaining quantity of affected soil onsite would be capped.	Select quantities of soil would be excavated, treated through a method of <i>ex situ</i> soil washing and/or <i>ex situ</i> stabilization/solidification, and disposed of at an offsite, licensed facility. The remaining quantity of affected soil onsite would be treated <i>in situ</i> via soil vapor extraction.
Hazardous material destroyed or treated	No treatment included. Natural attenuation of COCs in soil and sediment would occur, but would not be verified.	Soil with COCs above industrial cleanup goals would be disposed at offsite, licensed TSDF, with any necessary treatment to be determined and conducted by disposal facility.	Select quantities of soil with COCs above industrial cleanup goals would be disposed at offsite, licensed TSDF, with any necessary treatment to be determined and conducted by disposal facility. The remaining quantity of affected soil onsite would be capped.	Select quantities of soil with COCs above industrial cleanup goals would be treated through a method of <i>ex situ</i> soil washing or <i>ex situ</i> stabilization/solidification, and disposed of at an offsite, licensed facility. The remaining quantity of affected soil onsite would be capped.	Select quantities of soil with COCs above industrial cleanup goals would be treated through a method of <i>ex situ</i> soil washing and/or <i>ex situ</i> stabilization/solidification, and disposed of at an offsite, licensed facility. The remaining quantity of affected soil onsite would be treated <i>in situ</i> via soil vapor extraction.
Type and quantity of residuals remaining after treatment	No treatment included. Natural attenuation of COCs in soil and sediment would occur, but would not be verified.	All efforts will be made to ensure selective excavation would be complete and no residual affected soil would remain at Lower Subbase. Excavated material would be disposed/treated offsite.	All efforts will be made to ensure selective excavation would be complete and no residual affected soil would remain at Lower Subbase. Excavated material would be disposed/treated offsite. Impacted inaccessible soil intentionally left in place would be treated via capping.	All efforts will be made to ensure selective excavation would be complete and no residual affected soil would remain at Lower Subbase. Excavated material would be treated and disposed. Impacted inaccessible soil intentionally left in place would be treated via capping.	All efforts will be made to ensure selective excavation would be complete and no residual affected soil would remain at Lower Subbase.
Degree to which treatment is irreversible	No treatment included.	Excavation and offsite treatment/ disposal of impacted soil would be irreversible.	Excavation and offsite treatment/ disposal of impacted soil would be irreversible. Capping of select portion of soil would be reversible.	Excavation, treatment and offsite disposal of impacted soil would be irreversible. Capping of select portion of soil would be reversible.	Excavation, treatment and offsite disposal of impacted soil would be irreversible. <i>In situ</i> treatment of the remaining impacted soils would be irreversible.
Statutory preference for treatment	Does not satisfy.	Satisfies, if impacted soil is treated at offsite TSDF. Does not satisfy, if excavated soil is disposed without treatment.	Satisfies (for a portion of the soil), if excavated soil is treated at offsite TSDF. Does not satisfy if excavated soil is disposed without treatment. Does not satisfy for soil left in place and capped.	Satisfies (for a portion of the soil), if excavation, soil washing and stabilization/solidification is selected. Does not satisfy for soil left in place and capped.	Satisfies, if excavation, soil washing, stabilization/solidification, and <i>in situ</i> SVE is selected.
NOTE: COC = Constituents of concern. ELUR = Environmental land use restriction. PRG = Preliminary Remediation Goals. PMC = Pollutant Mobility Criteria.					

Criteria	Alternative 1 No Action	Alternative 2 Selective Excavation, Offsite Disposal, and Institutional Controls	Alternative 3 Selective Excavation, Offsite Disposal, Capping, and Institutional Controls	Alternative 4 Selective Excavation, <i>Ex Situ</i> Soil Washing, <i>Ex Situ</i> Stabilization/Solidification, Offsite Disposal, Capping, and Institutional Controls	Alternative 5 Selective Excavation, <i>Ex Situ</i> Soil Washing, <i>Ex Situ</i> Stabilization/Solidification, Offsite Disposal, <i>In Situ</i> Soil Vapor Extraction, and Institutional Controls
<b>SHORT-TERM EFFECTIVENESS</b>					
Protection of site workers	No new risks to site workers.	Engineered safety controls would address potential risks to site workers during remedial activities.	Engineered safety controls would address potential risks to site workers during remedial activities.	Engineered safety controls would address potential risks to site workers during remedial activities.	Engineered safety controls would address potential risks to site workers during remedial activities.
Protection of community	No new risks to the community.	Engineered safety controls would address potential risks to the community during remedial activities.	Engineered safety controls would address potential risks to the community during remedial activities.	Engineered safety controls would address potential risks to the community during remedial activities.	Engineered safety controls would address potential risks to the community during remedial activities.
Time to achieve remedial goals	Remedial goals would not be achieved.	Remedial time required will be highly dependent on complexity of excavation due to proximity to underground utilities and structures. Excavation at this zone (with 5 impacted sites) would likely be completed within a relatively short time (less than one month). Transport of excavated soil to an offsite TSDF, which would likely take place after stockpiling soil in order to accumulate an adequate volume of impacted soil, would require additional time. Institutional controls (including ELUR) would immediately address the risks.	Remedial time required will be highly dependent on complexity of excavation due to proximity to underground utilities and structures. Excavation at this zone (with 5 impacted sites) would likely be completed within a relatively short time. Transport of excavated soil to an offsite TSDF, which would likely take place after stockpiling soil in order to accumulate an adequate volume of impacted soil, would require additional time. Capping of 2 sites, as proposed, would likely be completed within a relatively short time. Institutional controls (including ELUR) would immediately address the risks.	Remedial time required will be highly dependent on complexity of excavation due to proximity to underground utilities and structures. Excavation at this zone (with 5 impacted sites) would likely be completed within a relatively short time. Onsite treatment and subsequent transport of excavated soil to an offsite TSDF, which would likely take place after stockpiling soil in order to accumulate an adequate volume of impacted soil, would require additional time. Capping of 2 sites, as proposed, would likely be completed within a relatively short time. Institutional controls (including ELUR) would immediately address the risks.	Remedial time required will be highly dependent on complexity of excavation due to proximity to underground utilities and structures. Excavation at this zone (with 5 impacted sites) would likely be completed within a relatively short time. Onsite treatment and subsequent transport of excavated soil to an offsite TSDF, which would likely take place after stockpiling soil in order to accumulate an adequate volume of impacted soil, would require additional time. <i>In situ</i> soil vapor extraction is a long-term treatment technology and is expected to take some time to adequately treat impacted soils. Institutional controls (including ELUR) would immediately address the risks.
<b>IMPLEMENTABILITY</b>					
Ability to construct and operate	No action specified.	Readily implemented	Moderately impacted by Naval Base activities and schedules.	Moderately impacted by Naval Base activities and schedules.	Moderately impacted by Naval Base activities and schedules.
Ease of conducting other actions, if needed	Other actions readily implementable.	Other actions readily implementable.	Other actions readily implementable.	Other actions readily implementable.	Other actions readily implementable.
Ability to monitor effectiveness	Status of COC verified through monitoring and 5-year reviews.	Effectiveness readily verified through monitoring and 5-year reviews.	Effectiveness readily verified through monitoring and 5-year reviews.	Effectiveness readily verified through monitoring and 5-year reviews.	Effectiveness readily verified through monitoring and 5-year reviews.
Ability to obtain approvals and coordinate with other agencies	Unlikely to receive approval because COCs will remain which exceed Connecticut ICDECs, 10 <sup>-5</sup> Risk-Based PRGs, state PMCs, and Dilution-Adjusted PMCs.	Likely to receive regulatory approval because impacted soil would be removed and risks associated with COC concentrations would be mitigated. Institutional controls would address site risks.	Likely to receive regulatory approval. A select quantity of impacted soil would be removed and risks associated with COC concentrations would be mitigated. The remaining impacted, inaccessible soil left in place would be treated via capping. Institutional controls would address site risks.	Likely to receive regulatory approval. A select quantity of impacted soil would be removed and treated, mitigating risks associated with COC concentrations. The remaining impacted, inaccessible soil left in place would be treated via capping. Institutional controls would address site risks.	Likely to receive regulatory approval because impacted soil would be treated so that risks associated with COC concentrations would be mitigated. Institutional controls would address site risks.
Availability of materials and services	Not applicable because no actions included.	Readily available.	Readily available.	Readily available.	Readily available.
<b>COST</b>					
Capital Cost	\$0	\$262,400	\$225,600	\$409,900	\$427,700
Annual Operation and Maintenance Costs (Years 1-30)	\$3,300	\$11,600	\$14,800	\$14,800	\$71,600
Total 30-Year Present Worth Cost <sup>(a)</sup>	\$68,200	\$503,400	\$532,000	\$716,300	\$1,914,000
(a) Calculated at a 5 percent discount rate.					

**TABLE 5-3 ASSESSMENT OF CHEMICAL-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS  
AND TO BE CONSIDERED GUIDANCE FOR  
ALTERNATIVE 1 – NO ACTION  
ZONE 2, LOWER SUBBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT**

Requirement	Citation	Status	Synopsis of Requirement	Action to Be Taken to Attain Relevant and Appropriate Requirement
<b>FEDERAL</b>				
Cancer Slope Factors		To Be Considered	These are guidance values used in risk assessment to evaluate the potential carcinogenic hazards caused by exposure to contaminants.	The No Action Alternative would provide no protection from risk posed by contaminants in the soil.
Reference Dose		To Be Considered	These are guidance values used in risk assessment to evaluate the potential non-carcinogenic hazards caused by exposure to contaminants.	The No Action Alternative would provide no protection from risk posed by contaminants in the soil.
<b>STATE OF CONNECTICUT</b>				
Remediation Standard Regulations	CGS 22a-133k; RCSA 22a-133k-1 through 3	Applicable	These regulations establish direct exposure and pollutant mobility criteria for contaminated soils.	The No Action Alternative does not satisfy state standards for either site remediation nor for sufficient engineering controls to prevent risk to human health and the environment.
NOTE: CGS = Connecticut General Statutes. RCSA = Regulations of Connecticut State Agencies.				

**TABLE 5-4 ASSESSMENT OF LOCATION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND TO BE CONSIDERED GUIDANCE FOR ALTERNATIVE 1 – NO ACTION ZONE 2, LOWER SUBBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT**

Requirement	Citation	Status	Synopsis of Requirement	Action to Be Taken to Attain Applicable or Relevant and Appropriate Requirement
<b>FEDERAL</b>				
There are no federal location-specific applicable or relevant and appropriate requirements.				
<b>STATE OF CONNECTICUT</b>				
There are no state location-specific applicable or relevant and appropriate requirements.				

**TABLE 5-5 ASSESSMENT OF ACTION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND TO BE CONSIDERED GUIDANCE FOR ALTERNATIVE 1 – NO ACTION ZONE 2, LOWER SUBBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT**

Requirement	Citation	Status	Synopsis of Requirement	Evaluation/Action to be Taken to Attain Applicable or Relevant and Appropriate Requirement
<b>STATE OF CONNECTICUT</b>				
Connecticut Hazardous Waste Management Regulations	RCSA 22a-449(c)100 through 110	Applicable	The Connecticut Hazardous Waste Management Regulations incorporate by reference the essential sections of the Code of Federal Regulations covering the Resource Conservation and Recovery Act. Any regulated waste identified must be remediated in accordance with these regulations.	The regulations stipulate that any identified hazardous waste and associated media must either be capped or treated, or removed and disposed in a permitted hazardous waste landfill. This alternative would not comply with the requirements set forth in these regulations.
<p>NOTE: RCSA = Regulations of Connecticut State Agencies.  RCRA = Resource Conservation and Recovery Act.</p>				

**TABLE 5-6 ASSESSMENT OF CHEMICAL-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND TO BE CONSIDERED GUIDANCE FOR ALTERNATIVE 2 – SELECTIVE EXCAVATION, OFFSITE DISPOSAL, AND INSTITUTIONAL CONTROLS ZONE 2, LOWER SUBBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT**

Requirement	Citation	Status	Synopsis of Requirement	Action to Be Taken to Attain Applicable or Relevant and Appropriate Requirement
<b>FEDERAL</b>				
Cancer Slope Factors		To Be Considered	These are guidance values used in risk assessment to evaluate the potential carcinogenic hazards caused by exposure to contaminants.	The alternative would eliminate exposure to contaminants in soil to industrial standards through excavation and offsite disposal. Institutional controls would prevent residential use and limit construction activities.
Reference Dose		To Be Considered	These are guidance values used in risk assessment to evaluate the potential non-carcinogenic hazards caused by exposure to contaminants.	The alternative would eliminate exposure to contaminants in soil to industrial standards through excavation and offsite disposal. Institutional controls would prevent residential use and limit construction activities.
<b>STATE OF CONNECTICUT</b>				
Remediation Standard Regulations	CGS 22a-133k; RCSA 22a-133k-1 through 3	Applicable	These regulations establish direct exposure and pollutant mobility criteria for contaminated soils.	The alternative would eliminate exposure to contaminants in the soil to industrial standards through excavation and offsite disposal. Institutional controls would prevent residential use and limit construction activities.
NOTE: CGS = Connecticut General Statutes. RCSA = Regulations of Connecticut State Agencies.				

**TABLE 5-7 ASSESSMENT OF LOCATION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND TO BE CONSIDERED GUIDANCE FOR ALTERNATIVE 2 – SELECTIVE EXCAVATION, OFFSITE DISPOSAL, AND INSTITUTIONAL CONTROLS ZONE 2, LOWER SUBBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT**

Requirement	Citation	Status	Synopsis of Requirement	Action to Be Taken to Attain Applicable or Relevant and Appropriate Requirement
<b>FEDERAL</b>				
Clean Water Act, Section 404	33 USC 1344; 40 CFR Part 230 and 33 CFR Parts 320-323	Applicable	These rules regulate the discharge of dredge and fill materials in wetlands and navigable waters. Such discharges are not allowed if practicable alternatives are available. Furthermore, the regulations require that the remedial action is the best practicable alternative to avoiding, minimizing, or mitigating impacts to protected habitats.	Remedial action includes excavation of soil and replacement/restoration with uncontaminated material. All activities associated with excavation will be designed to ensure or minimize impacts to protected habitats. Discharge to the Thames River is not expected during the remedial action. If an accidental discharge does occur, the requirements set forth will be followed to mitigate and monitor any release.
Fish and Wildlife Coordination Act	16 USC Part 661 <i>et. seq.</i> , 40 CFR 122.49	Applicable	This Order protects fish and wildlife when federal actions result in control or structural modification of a natural stream, body of water, floodplains, or flood-prone areas.	Appropriate agencies would be consulted prior to excavation to minimize adverse effects to fish and wildlife from excavating floodplains or flood-prone areas.
<b>STATE OF CONNECTICUT</b>				
Connecticut Coastal Management Act	CGS 22a-444	Applicable	The site is within a coastal zone management area. As a result, activities at the site require a Coastal Site Plan that addresses adverse and beneficial effects of the propose activities.	Remedial actions at the site are required to comply with the substantive requirements of the Act, but are not required to comply with the formal submissions and local reviews. Local officials will be consulted before activities begin to ensure coastal zone issues are addressed.
Connecticut Endangered Species Act	CGS 26-303 through 315	Applicable	Remedial actions may not jeopardize the continued existence of state-listed endangered or threatened species, or adversely modify or destroy their habitat.	Before remedial actions occur, the NSB-NLON Natural Resources Manager will be notified. The Natural Resources Manager will determine whether additional surveys must be completed prior to remedial actions. In addition, state officials will be consulted prior to any activities.
<b>NOTE:</b> USC = United States Code. CFR = Code of Federal Regulations. CGS = Connecticut General Statutes. RCSA = Regulations of Connecticut State Agencies.				

**TABLE 5-8 ASSESSMENT OF ACTION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND TO BE CONSIDERED GUIDANCE FOR ALTERNATIVE 2 – SELECTIVE EXCAVATION, OFFSITE DISPOSAL, AND INSTITUTIONAL CONTROLS ZONE 2, LOWER SUBBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT**

Requirement	Citation	Status	Synopsis of Requirement	Evaluation/Action to be Taken to Attain Applicable or Relevant and Appropriate Requirement
<b>STATE OF CONNECTICUT</b>				
Connecticut Hazardous Waste Management Regulations	RCSA 22a-449(c)100 through 110	Applicable	The Connecticut Hazardous Waste Management Regulations incorporate by reference the essential sections of the Code of Federal Regulations covering RCRA. Any regulated waste identified must be remediated in accordance with these regulations.	Lead contaminated soil identified as characteristic hazardous waste will be excavated and disposed at a licensed, hazardous waste TSDF. All substantive requirements set forth in these regulations concerning the excavation and storage of hazardous waste onsite will be followed. In addition, all waste transported and disposed offsite will be in accordance with these regulations.
Connecticut Air Pollution Control Act	RCSA 22a-174	Relevant and Appropriate	These regulations establish ambient air quality standards and emission limitations/standards.	Air monitoring will occur during excavation activities. Excavation activities may produce fugitive dusts and vapors that will be monitored at all times. All site emissions will be kept in compliance with this Act.
Connecticut Guidelines for Soil Erosion and Sediment Control	Connecticut Council on Soil and Water Conservation	To Be Considered	Technical and administrative guidance for development, adoption, and implementation of erosion and sediment control program.	All excavation activities, including soil stockpiling, will meet the substantive requirements set forth in this guidance document to minimize runoff and migration of COCs.
NOTE: RCSA = Regulations of Connecticut State Agencies. RCRA = Resource Conservation and Recovery Act.				

**TABLE 5-9 ASSESSMENT OF CHEMICAL-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND TO BE CONSIDERED GUIDANCE FOR ALTERNATIVE 3 – SELECTIVE EXCAVATION, EX SITU STABILIZATION/SOLIDIFICATION, OFFSITE DISPOSAL, AND INSTITUTIONAL CONTROLS ZONE 2, LOWER SUBBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT**

Requirement	Citation	Status	Synopsis of Requirement	Action to Be Taken to Attain Applicable or Relevant and Appropriate Requirement
<b>FEDERAL</b>				
Cancer Slope Factors		To Be Considered	These are guidance values used in risk assessment to evaluate the potential carcinogenic hazards caused by exposure to contaminants.	The alternative would eliminate exposure to contaminants in soil to industrial standards through excavation, chemical and physical soil treatment, and offsite disposal. Institutional controls would prevent residential use and limit construction activities.
Reference Dose		To Be Considered	These are guidance values used in risk assessment to evaluate the potential non-carcinogenic hazards caused by exposure to contaminants.	The alternative would eliminate exposure to contaminants in soil to industrial standards through excavation, chemical and physical soil treatment, and offsite disposal. Institutional controls would prevent residential use and limit construction activities.
<b>STATE OF CONNECTICUT</b>				
Remediation Standard Regulations	CGS 22a-133k; RCSA 22a-133k-1 through 3	Applicable	These regulations establish direct exposure and pollutant mobility criteria for contaminated soils.	The alternative would eliminate exposure to contaminants in the soil to industrial standards through excavation, and offsite disposal. Excavation, chemical and physical soil treatment, and offsite disposal would treat and remove contaminated soil from the site. Institutional controls would prevent residential use, limit exposure to, and minimize mobility of residual COCs.
NOTE: CGS = Connecticut General Statutes. RCSA = Regulations of Connecticut State Agencies.				

TABLE 5-10 ASSESSMENT OF LOCATION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND TO BE CONSIDERED GUIDANCE FOR ALTERNATIVE 3 – SELECTIVE EXCAVATION, EX SITU STABILIZATION/SOLIDIFICATION, OFFSITE DISPOSAL, AND INSTITUTIONAL CONTROLS ZONE 2, LOWER SUBBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT

Requirement	Citation	Status	Synopsis of Requirement	Action to Be Taken to Attain Applicable or Relevant and Appropriate Requirement
<b>FEDERAL</b>				
Clean Water Act, Section 404	33 USC 1344; 40 CFR Part 230 and 33 CFR Parts 320-323	Applicable	These rules regulate the discharge of dredge and fill materials in wetlands and navigable waters. Such discharges are not allowed if practicable alternatives are available. Furthermore, the regulations require that the remedial action is the best practicable alternative to avoiding, minimizing, or mitigating impacts to protected habitats.	Remedial action includes excavation of soil and replacement/restoration with uncontaminated material. All activities associated with excavation will be designed to ensure or minimize impacts to protected habitats. Discharge to the Thames River is not expected during the remedial action. If an accidental discharge does occur, the requirements set forth will be followed to mitigate and monitor any release.
Fish and Wildlife Coordination Act	16 USC Part 661 <i>et. seq.</i> , 40 CFR 122.49	Applicable	This Order protects fish and wildlife when federal actions result in control or structural modification of a natural stream, body of water, floodplains, or flood-prone areas.	Appropriate agencies would be consulted prior to excavation to minimize adverse effects to fish and wildlife from excavating floodplains or flood-prone areas.
<b>STATE OF CONNECTICUT</b>				
Connecticut Coastal Management Act	CGS 22a-444	Applicable	The site is within a coastal zone management area. As a result, activities at the site require a Coastal Site Plan that addresses adverse and beneficial effects of the proposed activities.	Remedial actions at the site are required to comply with the substantive requirements of the Act, but are not required to comply with the formal submissions and local reviews. Local officials will be consulted before activities begin to ensure coastal zone issues are addressed.
Connecticut Endangered Species Act	CGS 26-303 through 315	Applicable	Remedial actions may not jeopardize the continued existence of state-listed endangered or threatened species, or adversely modify or destroy their habitat.	Before remedial actions occur, the NSB-NLON Natural Resources Manager will be notified. The Natural Resources Manager will determine whether additional surveys must be completed prior to remedial actions. In addition, state officials will be consulted prior to any activities.
<b>NOTE:</b> USC = United States Code. CFR = Code of Federal Regulations. CGS = Connecticut General Statutes. RCSA = Regulations of Connecticut State Agencies.				

**TABLE 5-11 ASSESSMENT OF ACTION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND TO BE CONSIDERED GUIDANCE FOR ALTERNATIVE 3 – SELECTIVE EXCAVATION, EX SITU STABILIZATION/SOLIDIFICATION, OFFSITE DISPOSAL, AND INSTITUTIONAL CONTROLS ZONE 2, LOWER SUBBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT**

Requirement	Citation	Status	Synopsis of Requirement	Evaluation/Action to be Taken to Attain Applicable or Relevant and Appropriate Requirement
<b>STATE OF CONNECTICUT</b>				
Connecticut Hazardous Waste Management Regulations	RCSA 22a-449(c)100 through 110	Applicable	The Connecticut Hazardous Waste Management Regulations incorporate by reference the essential sections of the Code of Federal Regulations covering the RCRA. Any regulated waste identified must be remediated in accordance with these regulations.	Lead contaminated soil identified as characteristic hazardous waste will be excavated and stockpiled in accordance with these regulations. The hazardous waste will be stabilized/solidified so it is no longer considered hazardous waste. As a result, these regulation are not applicable to the transportation and disposal of site waste.
Connecticut Air Pollution Control Act	RCSA 22a-174	Relevant and Appropriate	These regulations establish ambient air quality standards and emission limitations/standards.	Air monitoring will occur during excavation. Excavation activities may produce fugitive dusts and vapors that will be monitored at all times. All site emissions will be kept in compliance with this Act.
Connecticut Guidelines for Soil Erosion and Sediment Control	Connecticut Council on Soil and Water Conservation	To Be Considered	Technical and administrative guidance for development, adoption, and implementation of erosion and sediment control program.	All excavation activities, including soil stockpiling, will meet the substantive requirements set forth in this guidance document to minimize runoff and migration of COCs.
NOTE: RCSA = Regulations of Connecticut State Agencies. RCRA = Resource Conservation and Recovery Act.				

**TABLE 5-12 ASSESSMENT OF CHEMICAL-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND TO BE CONSIDERED GUIDANCE FOR ALTERNATIVE 4 – SELECTIVE EXCAVATION, EX SITU CHEMICAL REDUCTION-OXIDATION, OFFSITE DISPOSAL, AND INSTITUTIONAL CONTROLS ZONE 2, LOWER SUBBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT**

Requirement	Citation	Status	Synopsis of Requirement	Action to Be Taken to Attain Applicable or Relevant and Appropriate Requirement
<b>FEDERAL</b>				
Cancer Slope Factors		To Be Considered	These are guidance values used in risk assessment to evaluate the potential carcinogenic hazards caused by exposure to contaminants.	The alternative would eliminate exposure to contaminants in soil to industrial standards through excavation, chemical soil treatment, and offsite disposal. Institutional controls would prevent future residential use and limit construction activities.
Reference Dose		To Be Considered	These are guidance values used in risk assessment to evaluate the potential non-carcinogenic hazards caused by exposure to contaminants.	The alternative would eliminate exposure to contaminants in soil to industrial standards through excavation, chemical soil treatment, and offsite disposal. Institutional controls would prevent future residential use and limit construction activities.
<b>STATE OF CONNECTICUT</b>				
Remediation Standard Regulations	CGS 22a-133k; RCSA 22a-133k-1 through 3	Applicable	These regulations establish direct exposure and pollutant mobility criteria for contaminated soils.	The alternative would eliminate exposure to contaminants in the soil to industrial standards through excavation, chemical soil treatment, and offsite disposal. Institutional controls would prevent future residential use, limit exposure to, and minimize mobility of residual COCs.
NOTE: CGS = Connecticut General Statutes. RCSA = Regulations of Connecticut State Agencies.				

**TABLE 5-13 ASSESSMENT OF LOCATION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND TO BE CONSIDERED GUIDANCE FOR ALTERNATIVE 4 – SELECTIVE EXCAVATION, EX SITU CHEMICAL REDUCTION-OXIDATION, OFFSITE DISPOSAL, AND INSTITUTIONAL CONTROLS ZONE 2, LOWER SUBBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT**

Requirement	Citation	Status	Synopsis of Requirement	Action to Be Taken to Attain Applicable or Relevant and Appropriate Requirement
<b>FEDERAL</b>				
Clean Water Act, Section 404	33 USC 1344; 40 CFR Part 230 and 33 CFR Parts 320-323	Applicable	These rules regulate the discharge of dredge and fill materials in wetlands and navigable waters. Such discharges are not allowed if practicable alternatives are available. Furthermore, the regulations require that the remedial action is the best practicable alternative to avoiding, minimizing, or mitigating impacts to protected habitats.	Remedial action includes excavation of soil and replacement/restoration with uncontaminated material. All activities associated with excavation will be designed to ensure or minimize impacts to protected habitats. Discharge to the Thames River is not expected during the remedial action. If an accidental discharge does occur, the requirements set forth will be followed to mitigate and monitor any release.
Fish and Wildlife Coordination Act	16 USC Part 661 <i>et. seq.</i> , 40 CFR 122.49	Applicable	This Order protects fish and wildlife when federal actions result in control or structural modification of a natural stream, body of water, floodplains, or flood-prone areas.	Appropriate agencies would be consulted prior to excavation to minimize adverse effects to fish and wildlife from excavating floodplains or flood-prone areas.
<b>STATE OF CONNECTICUT</b>				
Connecticut Coastal Management Act	CGS 22a-444	Applicable	The site is within a coastal zone management area. As a result, activities at the site require a Coastal Site Plan that addresses adverse and beneficial effects of the proposed activities.	Remedial actions at the site are required to comply with the substantive requirements of the Act, but are not required to comply with the formal submissions and local reviews. Local officials will be consulted before activities begin to ensure coastal zone issues are addressed.
Connecticut Endangered Species Act	CGS 26-303 through 315	Applicable	Remedial actions may not jeopardize the continued existence of state-listed endangered or threatened species, or adversely modify or destroy their habitat.	Before remedial actions occur, the NSB-NLON Natural Resources Manager will be notified. The Natural Resources Manager will determine whether additional surveys must be completed prior to remedial actions. In addition, state officials will be consulted prior to any activities.
<p>NOTE: USC = United States Code.  CFR = Code of Federal Regulations.  CGS = Connecticut General Statutes.  RCSA = Regulations of Connecticut State Agencies.</p>				

**TABLE 5-14 ASSESSMENT OF ACTION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND TO BE CONSIDERED GUIDANCE FOR ALTERNATIVE 4 – SELECTIVE EXCAVATION, EX SITU CHEMICAL REDUCTION-OXIDATION, OFFSITE DISPOSAL, AND INSTITUTIONAL CONTROLS ZONE 2, LOWER SUBBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT**

Requirement	Citation	Status	Synopsis of Requirement	Evaluation/Action to be Taken to Attain Applicable or Relevant and Appropriate Requirement
<b>STATE OF CONNECTICUT</b>				
Connecticut Hazardous Waste Management Regulations	RCSA 22a-449(c)100 through 110	Applicable	The Connecticut Hazardous Waste Management Regulations incorporate by reference the essential sections of the Code of Federal Regulations covering the RCRA. Any regulated waste identified must be remediated in accordance with these regulations.	Lead contaminated soil, identified as characteristic hazardous waste, will be excavated and stockpiled in accordance with these regulations. The hazardous waste will be treated, so it is no longer considered hazardous waste. As a result, these regulation are not applicable to the transportation and disposal of site waste.
Connecticut Air Pollution Control Act	RCSA 22a-174	Relevant and Appropriate	These regulations establish ambient air quality standards and emission limitations/standards.	Air monitoring will occur during excavation activities. Excavation activities may produce fugitive dusts and vapors that will be monitored at all times. All site emissions will be kept in compliance with this Act.
Connecticut Guidelines for Soil Erosion and Sediment Control	Connecticut Council on Soil and Water Conservation	To Be Considered	Technical and administrative guidance for development, adoption, and implementation of erosion and sediment control program.	All excavation activities, including soil stockpiling, will meet the substantive requirements set forth in this guidance document to minimize runoff and migration of COCs.
<b>NOTE:</b> RCSA = Regulations of Connecticut State Agencies. RCRA = Resource Conservation and Recovery Act.				

TABLE 5-15 SUMMARY OF COMPARATIVE ANALYSIS OF REMEDIAL ALTERNATIVES FOR ZONE 2  
LOWER SUBBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT

Criteria	Alternative 1 No Action	Alternative 2 Selective Excavation, Offsite Disposal, and Institutional Controls	Alternative 3 Selective Excavation, <i>Ex Situ</i> Stabilization/Solidification, Offsite Disposal, and Institutional Controls	Alternative 4 Selective Excavation, <i>Ex Situ</i> Chemical Reduction- Oxidation, Offsite Disposal, and Institutional Controls
<b>OVERALL PROTECTIVENESS – HUMAN HEALTH</b>				
Exposure to COCs in soil	Would not address.	Soil with COCs above the state dilution-adjusted PMC would be excavated and disposed offsite, which would remove associated risks to human health. Risks to remedial phase workers would be minimized through proper construction and engineering safety practices. Signage would be protective limiting zone access. Institutional controls (ELUR) would control employee/site worker exposure beneath pavement, prevent future residential site use, and provide protection through amendments if property was transferred.	Soil with COCs above the state dilution-adjusted PMC would be excavated, treated and disposed offsite, which would remove associated risks to human health. Risks to remedial phase workers would be minimized through proper construction and engineering safety practices. Signage would be protective limiting zone access. Institutional controls (ELUR) would control employee/site worker exposure beneath pavement, prevent future residential site use, and provide protection through amendments if property was transferred.	Soil with COCs above the state dilution-adjusted PMC would be excavated, treated and disposed offsite, which would remove associated risks to human health. Risks to remedial phase workers would be minimized through proper construction and engineering safety practices. Signage would be protective limiting zone access. Institutional controls (ELUR) would control employee/site worker exposure beneath pavement, prevent future residential site use, and provide protection through amendments if property was transferred.
<b>OVERALL PROTECTIVENESS – ENVIRONMENT</b>				
Potential offsite receptors	Would not address; however, no significant risks to offsite ecological receptors at Lower Subbase are present.	No significant risks to offsite ecological receptors are present or anticipated at Lower Subbase during implementation of alternative. Removal of soil with COC concentrations above the zone's cleanup goals would reduce/eliminate potential for COC migration. Proper safety controls would reduce/eliminate potential impact to offsite receptors.	No significant risks to offsite ecological receptors are present or anticipated at Lower Subbase during implementation of alternative. Removal of soil with COC concentrations above the zone's cleanup goals would reduce/eliminate potential for COC migration. Proper treatment and safety controls during treatment and disposal would reduce/eliminate potential impact to offsite receptors.	No significant risks to offsite ecological receptors are present or anticipated at Lower Subbase during implementation of alternative. Removal of soil with COC concentrations above the zone's cleanup goals would reduce/eliminate potential for COC migration. Proper treatment and safety controls during treatment and disposal would reduce/eliminate potential impact to offsite receptors.
Potential onsite receptors	Would not address; however, no significant risks to onsite ecological receptors at Lower Subbase are present.	No significant risks to onsite ecological receptors are present or anticipated at Lower Subbase during implementation of alternative. Removal of impacted soil would reduce/eliminate potential for COC migration. Risks to onsite receptors during remedial work would be minimized through proper construction and engineering safety practices. Signage would be protective by limiting zone access.	No significant risks to onsite ecological receptors are present or anticipated at Lower Subbase during implementation of alternative. Removal of impacted soil would reduce/eliminate potential for COC migration. Risks to onsite receptors during remedial work would be minimized through proper construction and engineering safety practices. Signage would be protective by limiting zone access.	No significant risks to onsite ecological receptors are present or anticipated at Lower Subbase during implementation of alternative. Removal of impacted soil would reduce/eliminate potential for COC migration. Risks to onsite receptors during remedial work would be minimized through proper construction and engineering safety practices. Signage would be protective by limiting zone access.
<b>COMPLIANCE WITH APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS</b>				
Chemical-specific	Would not achieve because no action specified.	Would achieve compliance with the state dilution-adjusted PMC, for soil. Institutional controls would address residual COCs in soil.	Would achieve compliance with the state dilution-adjusted PMC, for soil. Institutional controls would address residual COCs in soil.	Would achieve compliance with the state dilution-adjusted PMC, for soil. Institutional controls would address residual COCs in soil.
Location-specific	Not applicable because no action specified.	Would be conducted in accordance with requirements.	Would be conducted in accordance with requirements.	Would be conducted in accordance with requirements.
Action-specific	Not applicable because no action specified.	Would be conducted in accordance with requirements.	Would be conducted in accordance with requirements.	Would be conducted in accordance with requirements.
NOTE: COC = Constituents of concern. ELUR = Environmental land use restriction. PRG = Preliminary Remediation Goals. PMC = Pollutant Mobility Criteria.				

1021027

Criteria	Alternative 1 No Action	Alternative 2 Selective Excavation, Offsite Disposal, and Institutional Controls	Alternative 3 Selective Excavation, <i>Ex Situ</i> Stabilization/Solidification, Offsite Disposal, and Institutional Controls	Alternative 4 Selective Excavation, <i>Ex Situ</i> Chemical Reduction- Oxidation, Offsite Disposal, and Institutional Controls
<b>LONG-TERM EFFECTIVENESS AND PERMANENCE</b>				
Magnitude of residual risk	Current risks would remain.	Excavation of COC-containing soil to industrial cleanup goals would minimize/eliminate residual risk at Lower Subbase for the long term. Proper disposal of the affected soil at a licensed TSDF would provide long-term protection to the environment and human health at large. Long-term risks at the site from residual COCs would be adequately addressed through institutional controls.	Excavation of COC-containing soil to industrial cleanup goals would minimize/eliminate residual risk at Lower Subbase for the long term. Proper disposal of the treated soil at a licensed TSDF would provide long-term protection to the environment and human health at large. Long-term risks at the site from residual COCs would be adequately addressed through institutional controls.	Excavation of COC-containing soil to industrial cleanup goals would minimize/eliminate residual risk at Lower Subbase for the long term. Proper disposal of the treated soil at a licensed TSDF would provide long-term protection to the environment and human health at large. Long-term risks at the site from residual COCs would be adequately addressed through institutional controls.
Adequacy and reliability of controls	Not applicable because no controls are specified.	Active strategy. Selective excavation and disposal of impacted soil would be a reliable method to mitigate COCs above the industrial cleanup goals. Institutional controls would be reliable and suitable to control access and activity at the site. Site planned to remain for industrial use for Naval Submarine Base, New London, Connecticut.	Active strategy. Selective excavation and treatment/disposal would be a reliable method to mitigate COCs above the industrial cleanup goals. Institutional controls would be reliable and suitable to control access and activity at the site. Site planned to remain for industrial use for Naval Submarine Base, New London, Connecticut.	Active strategy. Selective excavation and treatment/disposal would be a reliable method to mitigate COCs above the industrial cleanup goals. Institutional controls would be reliable and suitable to control access and activity at the site. Site planned to remain for industrial use for Naval Submarine Base, New London, Connecticut.
<b>REDUCTION OF TOXICITY, MOBILITY, AND VOLUME THROUGH TREATMENT</b>				
Treatment processes used and materials treated	No treatment included.	Selected soil would be excavated and disposed of at an offsite, licensed facility. Any necessary treatment of the disposed soil will be determined by the TSDF.	Selected soil would be excavated, treated through a method of stabilization/solidification, and disposed of at an offsite, licensed facility.	Selected soil would be excavated, treated through a method of chemical reduction-oxidation, and disposed of at an offsite, licensed TSDF.
Hazardous material destroyed or treated	No treatment included.	Soil with COCs above industrial cleanup goals would be disposed at offsite, licensed TSDF, with any necessary treatment to be determined and conducted by disposal facility.	Soil with COCs above industrial cleanup goals would be treated by stabilization/solidification and the treated soil would be disposed of at an offsite, licensed TSDF.	Soil with COCs above industrial cleanup goals would be treated by chemical reduction-oxidation and the treated soil would be disposed of at an offsite, licensed TSDF.
Type and quantity of residuals remaining after treatment	No treatment included.	All efforts will be made to ensure selective excavation would be complete and no residual affected soil would remain at Lower Subbase. Excavated material would be disposed/treated offsite.	All efforts will be made to ensure selective excavation would be complete and no residual affected soil would remain at Lower Subbase. Excavated material would be disposed/treated offsite.	All efforts will be made to ensure selective excavation would be complete and no residual affected soil would remain at Lower Subbase. Excavated material would be disposed/treated offsite.
Degree to which treatment is irreversible	No treatment included.	Excavation and offsite treatment/ disposal of impacted soil would be irreversible.	Excavation, treatment through stabilization/solidification, and offsite disposal of impacted soil would be irreversible.	Excavation, treatment through chemical reduction-oxidation and offsite disposal of impacted soil would be irreversible.
Statutory preference for treatment	Does not satisfy.	Satisfies, if impacted soil is treated at offsite TSDF. Does not satisfy, if excavated soil is disposed without treatment.	Satisfies, if excavation and stabilization/solidification is selected.	Satisfies, if excavation and chemical reduction-oxidation is selected.
NOTE: COC = Constituents of concern. ELUR = Environmental land use restriction. PRG = Preliminary Remediation Goals. PMC = Pollutant Mobility Criteria.				

Criteria	Alternative 1 No Action	Alternative 2 Selective Excavation, Offsite Disposal, and Institutional Controls	Alternative 3 Selective Excavation, <i>Ex Situ</i> Stabilization/Solidification, Offsite Disposal, and Institutional Controls	Alternative 4 Selective Excavation, <i>Ex Situ</i> Chemical Reduction- Oxidation, Offsite Disposal, and Institutional Controls
<b>SHORT-TERM EFFECTIVENESS</b>				
Protection of site workers	No new risks to site workers.	Engineered safety controls would address potential risks to site workers during remedial activities.	Engineered safety controls would address potential risks to site workers during remedial activities.	Engineered safety controls would address potential risks to site workers during remedial activities.
Protection of community	No new risks to the community.	Engineered safety controls would address potential risks to the community during remedial activities.	Engineered safety controls would address potential risks to the community during remedial activities.	Engineered safety controls would address potential risks to the community during remedial activities.
Time to achieve remedial goals	Remedial goals would not be achieved.	Remedial time required will be highly dependent on complexity of excavation due to proximity to underground utilities and structures. Excavation at this zone (with 2 impacted sites) would likely be completed within a relatively short time. Transport of excavated soil to an offsite TSDF, which would likely take place after stockpiling soil in order to accumulate an adequate volume of impacted soil, would require additional time. Institutional controls (including ELUR) would immediately address the risks.	Remedial time required will be highly dependent on complexity of excavation due to proximity to underground utilities and structures. Excavation at this zone (with 2 impacted sites) would likely be completed within a relatively short time. Onsite treatment and subsequent transport of excavated soil to an offsite TSDF, which would likely take place after stockpiling soil in order to accumulate an adequate volume of impacted soil, would require additional time. Institutional controls (including ELUR) would immediately address the risks.	Remedial time required will be highly dependent on complexity of excavation due to proximity to underground utilities and structures. Excavation at this zone (with 2 impacted sites) would likely be completed within a relatively short time. Onsite treatment and subsequent transport of excavated soil to an offsite TSDF, which would likely take place after stockpiling soil in order to accumulate an adequate volume of impacted soil, would require additional time. Institutional controls (including ELUR) would immediately address the risks.
<b>IMPLEMENTABILITY</b>				
Ability to construct and operate	No action specified.	Readily implemented	Moderately impacted by Naval Base activities and schedules.	Moderately impacted by Naval Base activities and schedules.
Ease of conducting other actions, if needed	Other actions readily implementable.	Other actions readily implementable.	Other actions readily implementable.	Other actions readily implementable.
Ability to monitor effectiveness	Status of COC verified through monitoring and 5-year reviews.	Effectiveness readily verified through monitoring and 5-year reviews.	Effectiveness readily verified through monitoring and 5-year reviews.	Effectiveness readily verified through monitoring and 5-year reviews.
Ability to obtain approvals and coordinate with other agencies	Unlikely to receive approval because COCs will remain which exceed Connecticut dilution-adjusted PMC and would not be addressed.	Likely to receive regulatory approval because impacted soil would be removed and risks associated with COC concentrations would be mitigated. Institutional controls would address site risks.	Likely to receive regulatory approval because impacted soil would be treated and removed so that risks associated with COC concentrations would be mitigated. Institutional controls would address site risks.	Likely to receive regulatory approval because impacted soil would be treated and removed so that risks associated with COC concentrations would be mitigated. Institutional controls would address site risks.
Availability of materials and services	Not applicable because no actions included.	Readily available.	Readily available.	Readily available.
<b>COST</b>				
Capital Cost	\$0	\$165,300	\$301,000	\$295,400
Annual Operation and Maintenance Costs (Years 1-30)	\$3,300	\$11,600	\$11,600	\$11,700
Total 30-Year Present Worth Cost <sup>(a)</sup>	\$68,200	\$406,300	\$542,100	\$536,500
(a) Calculated at a 5 percent discount rate.				
NOTE: COC = Constituents of concern. ELUR = Environmental land use restriction. PRG = Preliminary Remediation Goals. PMC = Pollutant Mobility Criteria.				

**TABLE 6-3 ASSESSMENT OF CHEMICAL-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS  
AND TO BE CONSIDERED GUIDANCE FOR  
ALTERNATIVE 1 – NO ACTION  
ZONE 3, LOWER SUBBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT**

Requirement	Citation	Status	Synopsis of Requirement	Action to Be Taken to Attain Relevant and Appropriate Requirement
<b>FEDERAL</b>				
Cancer Slope Factors		To Be Considered	These are guidance values used in risk assessment to evaluate the potential carcinogenic hazards caused by exposure to contaminants.	The No Action Alternative would provide no protection from risk posed by contaminants in the soil.
Reference Dose		To Be Considered	These are guidance values used in risk assessment to evaluate the potential non-carcinogenic hazards caused by exposure to contaminants.	The No Action Alternative would provide no protection from risk posed by contaminants in the soil.
<b>STATE OF CONNECTICUT</b>				
Remediation Standard Regulations	CGS 22a-133k; RCSA 22a-133k-1 through 3	Applicable	These regulations establish direct exposure and pollutant mobility criteria for contaminated soils.	The No Action Alternative does not satisfy state standards for either site remediation nor for sufficient engineering controls to prevent risk to human health and the environment.
NOTE: CGS = Connecticut General Statutes. RCSA = Regulations of Connecticut State Agencies.				

**TABLE 6-4 ASSESSMENT OF LOCATION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND TO BE CONSIDERED GUIDANCE FOR ALTERNATIVE 1 - NO ACTION ZONE 3, LOWER SUBBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT**

Requirement	Citation	Status	Synopsis of Requirement	Action to Be Taken to Attain Applicable or Relevant and Appropriate Requirement
<b>FEDERAL</b>				
There are no federal location-specific applicable or relevant and appropriate requirements.				
<b>STATE OF CONNECTICUT</b>				
There are no state location-specific applicable or relevant and appropriate requirements.				

**TABLE 6-5 ASSESSMENT OF ACTION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND TO BE CONSIDERED GUIDANCE FOR ALTERNATIVE 1 – NO ACTION ZONE 3, LOWER SUBBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT**

Requirement	Citation	Status	Synopsis of Requirement	Action to Be Taken to Attain Applicable or Relevant and Appropriate Requirement
<b>FEDERAL</b>				
There are no federal action-specific applicable or relevant and appropriate requirements.				
<b>STATE OF CONNECTICUT</b>				
There are no state action-specific applicable or relevant and appropriate requirements.				

**TABLE 6-6 ASSESSMENT OF CHEMICAL-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND TO BE CONSIDERED GUIDANCE FOR ALTERNATIVE 2 – SELECTIVE EXCAVATION, OFFSITE DISPOSAL, AND INSTITUTIONAL CONTROLS ZONE 3, LOWER SUBBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT**

Requirement	Citation	Status	Synopsis of Requirement	Action to Be Taken to Attain Applicable or Relevant and Appropriate Requirement
<b>FEDERAL</b>				
Cancer Slope Factors		To Be Considered	These are guidance values used in risk assessment to evaluate the potential carcinogenic hazards caused by exposure to contaminants.	The alternative would eliminate exposure to contaminants in soil to industrial standards through excavation and offsite disposal. Institutional controls would prevent residential use and limit construction activities.
Reference Dose		To Be Considered	These are guidance values used in risk assessment to evaluate the potential non-carcinogenic hazards caused by exposure to contaminants.	The alternative would eliminate exposure to contaminants in soil to industrial standards through excavation and offsite disposal. Institutional controls would prevent residential use and limit construction activities.
<b>STATE OF CONNECTICUT</b>				
Remediation Standard Regulations	CGS 22a-133k; RCSA 22a-133k-1 through 3	Applicable	These regulations establish direct exposure and pollutant mobility criteria for contaminated soils.	The alternative would eliminate exposure to contaminants in the soil to industrial standards through excavation and offsite disposal. Institutional controls would prevent residential use and limit construction activities.
<p>NOTE: CGS = Connecticut General Statutes.  RCSA = Regulations of Connecticut State Agencies.</p>				

**TABLE 6-7 ASSESSMENT OF LOCATION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND TO BE CONSIDERED GUIDANCE FOR ALTERNATIVE 2 – SELECTIVE EXCAVATION, OFFSITE DISPOSAL, AND INSTITUTIONAL CONTROLS ZONE 3, LOWER SUBBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT**

Requirement	Citation	Status	Synopsis of Requirement	Action to Be Taken to Attain Applicable or Relevant and Appropriate Requirement
<b>FEDERAL</b>				
Clean Water Act, Section 404	33 USC 1344; 40 CFR Part 230 and 33 CFR Parts 320-323	Applicable	These rules regulate the discharge of dredge and fill materials in wetlands and navigable waters. Such discharges are not allowed if practicable alternatives are available. Furthermore, the regulations require that the remedial action is the best practicable alternative to avoiding, minimizing, or mitigating impacts to protected habitats.	Remedial action includes excavation of soil and replacement/restoration with uncontaminated material. All activities associated with excavation will be designed to ensure or minimize impacts to protected habitats. Discharge to the Thames River is not expected during the remedial action. If an accidental discharge does occur, the requirements set forth will be followed to mitigate and monitor any release.
Fish and Wildlife Coordination Act	16 USC Part 661 <i>et. seq.</i> , 40 CFR 122.49	Applicable	This Order protects fish and wildlife when federal actions result in control or structural modification of a natural stream, body of water, floodplains, or flood-prone areas.	Appropriate agencies would be consulted prior to excavation to minimize adverse effects to fish and wildlife from excavating floodplains or flood-prone areas.
<b>STATE OF CONNECTICUT</b>				
Connecticut Coastal Management Act	CGS 22a-444	Applicable	The site is within a coastal zone management area. As a result, activities at the site require a Coastal Site Plan that addresses adverse and beneficial effects of the proposed activities.	Remedial actions at the site are required to comply with the substantive requirements of the Act, but are not required to comply with the formal submissions and local reviews. Local officials will be consulted before activities begin to ensure coastal zone issues are addressed.
Connecticut Endangered Species Act	CGS 26-303 through 315	Applicable	Remedial actions may not jeopardize the continued existence of state-listed endangered or threatened species, or adversely modify or destroy their habitat.	Before remedial actions occur, the NSB-NLON Natural Resources Manager will be notified. The Natural Resources Manager will determine whether additional surveys must be completed prior to remedial actions. In addition, state officials will be consulted prior to any activities.
<b>NOTE:</b> USC = United States Code. CFR = Code of Federal Regulations. CGS = Connecticut General Statutes. RCSA = Regulations of Connecticut State Agencies.				

**TABLE 6-8 ASSESSMENT OF ACTION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND TO BE CONSIDERED GUIDANCE FOR ALTERNATIVE 2 – SELECTIVE EXCAVATION, OFFSITE DISPOSAL, AND INSTITUTIONAL CONTROLS ZONE 3, LOWER SUBBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT**

Requirement	Citation	Status	Synopsis of Requirement	Evaluation/Action to be Taken to Attain Applicable or Relevant and Appropriate Requirement
<b>STATE OF CONNECTICUT</b>				
Connecticut Air Pollution Control Act	RCSA 22a-174	Relevant and Appropriate	These regulations establish ambient air quality standards and emission limitations/standards.	Air monitoring will occur during excavation activities. Excavation activities may produce fugitive dusts and vapors that will be monitored at all times. All site emissions will be kept in compliance with this Act.
Connecticut Guidelines for Soil Erosion and Sediment Control	Connecticut Council on Soil and Water Conservation	To Be Considered	Technical and administrative guidance for development, adoption, and implementation of erosion and sediment control program.	All excavation activities, including soil stockpiling, will meet the substantive requirements set forth in this guidance document to minimize runoff and migration of COCs.
NOTE: RCSA = Regulations of Connecticut State Agencies. CGS = Connecticut General Statutes.				

**TABLE 6-9 ASSESSMENT OF CHEMICAL-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND TO BE CONSIDERED GUIDANCE FOR ALTERNATIVE 3 – SELECTIVE EXCAVATION, EX SITU STABILIZATION/SOLIDIFICATION, OFFSITE DISPOSAL, AND INSTITUTIONAL CONTROLS ZONE 3, LOWER SUBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT**

Requirement	Citation	Status	Synopsis of Requirement	Action to Be Taken to Attain Applicable or Relevant and Appropriate Requirement
<b>FEDERAL</b>				
Cancer Slope Factors		To Be Considered	These are guidance values used in risk assessment to evaluate the potential carcinogenic hazards caused by exposure to contaminants.	The alternative would eliminate exposure to contaminants in soil to industrial standards through excavation, chemical and physical soil treatment, and offsite disposal. Institutional controls would prevent residential use and limit construction activities.
Reference Dose		To Be Considered	These are guidance values used in risk assessment to evaluate the potential non-carcinogenic hazards caused by exposure to contaminants.	The alternative would eliminate exposure to contaminants in soil to industrial standards through excavation, chemical and physical soil treatment, and offsite disposal. Institutional controls would prevent residential use and limit construction activities.
<b>STATE OF CONNECTICUT</b>				
Remediation Standard Regulations	CGS 22a-133k; RCSA 22a-133k-1 through 3	Applicable	These regulations establish direct exposure and pollutant mobility criteria for contaminated soils.	The alternative would eliminate exposure to contaminants in the soil to industrial standards through excavation, and offsite disposal. Excavation, chemical and physical soil treatment, and offsite disposal would treat and remove contaminated soil from the site. Institutional controls would prevent residential use, limit exposure to, and minimize mobility of residual COCs.
NOTE: CGS = Connecticut General Statutes. RCSA = Regulations of Connecticut State Agencies.				

**TABLE 6-10 ASSESSMENT OF LOCATION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND TO BE CONSIDERED GUIDANCE FOR ALTERNATIVE 3 – SELECTIVE EXCAVATION, EX SITU STABILIZATION/SOLIDIFICATION, OFFSITE DISPOSAL, AND INSTITUTIONAL CONTROLS ZONE 3, LOWER SUBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT**

Requirement	Citation	Status	Synopsis of Requirement	Action to Be Taken to Attain Applicable or Relevant and Appropriate Requirement
<b>FEDERAL</b>				
Clean Water Act, Section 404	33 USC 1344; 40 CFR Part 230 and 33 CFR Parts 320-323	Applicable	These rules regulate the discharge of dredge and fill materials in wetlands and navigable waters. Such discharges are not allowed if practicable alternatives are available. Furthermore, the regulations require that the remedial action is the best practicable alternative to avoiding, minimizing, or mitigating impacts to protected habitats.	Remedial action includes excavation of soil and replacement/restoration with uncontaminated material. All activities associated with excavation will be designed to ensure or minimize impacts to protected habitats. Discharge to the Thames River is not expected during the remedial action. If an accidental discharge does occur, the requirements set forth will be followed to mitigate and monitor any release.
Fish and Wildlife Coordination Act	16 USC Part 661 <i>et. seq.</i> , 40 CFR 122.49	Applicable	This Order protects fish and wildlife when federal actions result in control or structural modification of a natural stream, body of water, floodplains, or flood-prone areas.	Appropriate agencies would be consulted prior to excavation to minimize adverse effects to fish and wildlife from excavating floodplains or flood-prone areas.
<b>STATE OF CONNECTICUT</b>				
Connecticut Coastal Management Act	CGS 22a-444	Applicable	The site is within a coastal zone management area. As a result, activities at the site require a Coastal Site Plan that addresses adverse and beneficial effects of the proposed activities.	Remedial actions at the site are required to comply with the substantive requirements of the Act, but are not required to comply with the formal submissions and local reviews. Local officials will be consulted before activities begin to ensure coastal zone issues are addressed.
Connecticut Endangered Species Act	CGS 26-303 through 315	Applicable	Remedial actions may not jeopardize the continued existence of state-listed endangered or threatened species, or adversely modify or destroy their habitat.	Before remedial actions occur, the NSB-NLON Natural Resources Manager will be notified. The Natural Resources Manager will determine whether additional surveys must be completed prior to remedial actions. In addition, state officials will be consulted prior to any activities.
<p>NOTE: USC = United States Code.  CFR = Code of Federal Regulations.  CGS = Connecticut General Statutes.  RCSA = Regulations of Connecticut State Agencies.</p>				

**TABLE 6-11 ASSESSMENT OF ACTION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND TO BE CONSIDERED GUIDANCE FOR ALTERNATIVE 3 – SELECTIVE EXCAVATION, EX SITU STABILIZATION/SOLIDIFICATION, OFFSITE DISPOSAL, AND INSTITUTIONAL CONTROLS ZONE 3, LOWER SUBBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT**

Requirement	Citation	Status	Synopsis of Requirement	Evaluation/Action to be Taken to Attain Applicable or Relevant and Appropriate Requirement
<b>STATE OF CONNECTICUT</b>				
Connecticut Air Pollution Control Act	RCSA 22a-174	Relevant and Appropriate	These regulations establish ambient air quality standards and emission limitations/standards.	Air monitoring will occur during excavation activities. Excavation activities may produce fugitive dusts and vapors that will be monitored at all times. All site emissions will be kept in compliance with this Act.
Connecticut Guidelines for Soil Erosion and Sediment Control	Connecticut Council on Soil and Water Conservation	To Be Considered	Technical and administrative guidance for development, adoption, and implementation of erosion and sediment control program.	All excavation activities, including soil stockpiling, will meet the substantive requirements set forth in this guidance document to minimize runoff and migration of COCs.
NOTE: RCSA = Regulations of Connecticut State Agencies. CGS = Connecticut General Statutes.				

TABLE 6-12 SUMMARY OF COMPARATIVE ANALYSIS OF REMEDIAL ALTERNATIVES FOR ZONE 3  
 LOWER SUBBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT

Criteria	Alternative 1 No Action	Alternative 2 Selective Excavation, Offsite Disposal, and Institutional Controls	Alternative 3 Selective Excavation, <i>Ex Situ</i> Stabilization/Solidification, Offsite Disposal, and Institutional Controls
<b>OVERALL PROTECTIVENESS – HUMAN HEALTH</b>			
Exposure to COCs in soil	Would not address.	Soil with COCs above the state dilution-adjusted PMCs would be excavated and disposed offsite, which would remove associated risks to human health. Risks to remedial phase workers would be minimized through proper construction and engineering safety practices. Signage would be protective limiting zone access. Institutional controls (ELUR) would control employee/site worker exposure beneath pavement, prevent future residential site use, and provide protection through amendments if property was transferred.	Soil with COCs above the state dilution-adjusted PMCs would be excavated, treated and disposed offsite, which would remove associated risks to human health. Risks to remedial phase workers would be minimized through proper construction and engineering safety practices. Signage would be protective limiting zone access. Institutional controls (ELUR) would control employee/site worker exposure beneath pavement, prevent future residential site use, and provide protection through amendments if property was transferred.
<b>OVERALL PROTECTIVENESS – ENVIRONMENT</b>			
Potential offsite receptors	Would not address; however, no significant risks to offsite ecological receptors at Lower Subbase are present.	No significant risks to offsite ecological receptors are present or anticipated at Lower Subbase during implementation of alternative. Removal of soil with COC concentrations above the zone's cleanup goals would reduce/eliminate potential for COC migration. Proper safety controls would reduce/eliminate potential impact to offsite receptors.	No significant risks to offsite ecological receptors are present or anticipated at Lower Subbase during implementation of alternative. Removal of soil with COC concentrations above the zone's cleanup goals would reduce/eliminate potential for COC migration. Proper treatment and safety controls during treatment and disposal would reduce/eliminate potential impact to offsite receptors.
Potential onsite receptors	Would not address; however, no significant risks to onsite ecological receptors at Lower Subbase are present.	No significant risks to onsite ecological receptors are present or anticipated at Lower Subbase during implementation of alternative. Removal of impacted soil would reduce/eliminate potential for COC migration. Risks to onsite receptors during remedial work would be minimized through proper construction and engineering safety practices. Signage would be protective by limiting zone access.	No significant risks to onsite ecological receptors are present or anticipated at Lower Subbase during implementation of alternative. Removal of impacted soil would reduce/eliminate potential for COC migration. Risks to onsite receptors during remedial work would be minimized through proper construction and engineering safety practices. Signage would be protective by limiting zone access.
<b>COMPLIANCE WITH APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS</b>			
Chemical-specific	Would not achieve because no action specified.	Would achieve compliance with the state dilution-adjusted PMCs, for soil. Institutional controls would address residual COCs in soil.	Would achieve compliance with the state dilution-adjusted PMCs, for soil. Institutional controls would address residual COCs in soil.
Location-specific	Not applicable because no action specified.	Would be conducted in accordance with requirements.	Would be conducted in accordance with requirements.
Action-specific	Not applicable because no action specified.	Would be conducted in accordance with requirements.	Would be conducted in accordance with requirements.
<b>LONG-TERM EFFECTIVENESS AND PERMANENCE</b>			
Magnitude of residual risk	Current risks would remain.	Excavation of COC-containing soil to industrial cleanup goals would minimize/eliminate residual risk at Lower Subbase for the long term. Proper disposal of the affected soil at a licensed TSDF would provide long-term protection to the environment and human health at large. Long-term risks at the site from residual COCs would be adequately addressed through institutional controls.	Excavation of COC-containing soil to industrial cleanup goals would minimize/eliminate residual risk at Lower Subbase for the long term. Proper disposal of the treated soil at a licensed TSDF would provide long-term protection to the environment and human health at large. Long-term risks at the site from residual COCs would be adequately addressed through institutional controls.
Adequacy and reliability of controls	Not applicable because no controls are specified.	Active strategy. Selective excavation and disposal of impacted soil would be a reliable method to mitigate COCs above the industrial cleanup goals. Institutional controls would be reliable and suitable to control access and activity at the site. Site planned to remain for industrial use for Naval Submarine Base, New London, Connecticut.	Active strategy. Selective excavation and treatment/disposal would be a reliable method to mitigate COCs above the industrial cleanup goals. Institutional controls would be reliable and suitable to control access and activity at the site. Site planned to remain for industrial use for Naval Submarine Base, New London, Connecticut.
NOTE: COC = Constituents of concern. ELUR = Environmental land use restriction. PRG = Preliminary Remediation Goals. PMC = Pollutant Mobility Criteria.			

10010837

Criteria	Alternative 1 No Action	Alternative 2 Selective Excavation, Offsite Disposal, and Institutional Controls	Alternative 3 Selective Excavation, <i>Ex Situ</i> Stabilization/Solidification, Offsite Disposal, and Institutional Controls
<b>REDUCTION OF TOXICITY, MOBILITY, AND VOLUME THROUGH TREATMENT</b>			
Treatment processes used and materials treated	No treatment included.	Selected soil would be excavated and disposed of at an offsite, licensed facility. Any necessary treatment of the disposed soil will be the determined by the TSDF.	Selected soil would be excavated, treated through a method of stabilization/solidification, and disposed of at an offsite, licensed facility.
Hazardous material destroyed or treated	No treatment included.	Soil with COCs above industrial cleanup goals would be disposed at offsite, licensed TSDF, with any necessary treatment to be determined and conducted by disposal facility.	Soil with COCs above industrial cleanup goals would be treated by stabilization/solidification and the treated soil would be disposed of at an offsite, licensed TSDF.
Type and quantity of residuals remaining after treatment	No treatment included.	All efforts will be made to ensure selective excavation would be complete and no residual affected soil would remain at Lower Subase. Excavated material would be disposed/treated offsite.	All efforts will be made to ensure selective excavation would be complete and no residual affected soil would remain at Lower Subase. Excavated material would be disposed/treated offsite.
Degree to which treatment is irreversible	No treatment included.	Excavation and offsite treatment/ disposal of impacted soil would be irreversible.	Excavation treatment through stabilization/solidification, and offsite disposal of impacted soil would be irreversible.
Statutory preference for treatment	Does not satisfy.	Satisfies, if impacted soil is treated at offsite TSDF. Does not satisfy, if excavated soil is disposed without treatment.	Satisfies, if excavation and stabilization/solidification is selected.
NOTE: COC = Constituents of concern. ELUR = Environmental land use restriction. PRG = Preliminary Remediation Goals. PMC = Pollutant Mobility Criteria.			
<b>SHORT-TERM EFFECTIVENESS</b>			
Protection of site workers	No new risks to site workers.	Engineered safety controls would address potential risks to site workers during remedial activities.	Engineered safety controls would address potential risks to site workers during remedial activities.
Protection of community	No new risks to the community.	Engineered safety controls would address potential risks to the community during remedial activities.	Engineered safety controls would address potential risks to the community during remedial activities.
Time to achieve remedial goals	Remedial goals would not be achieved.	Remedial time required will be highly dependent on complexity of excavation due to proximity to underground utilities and structures. Excavation at this zone (with 2 impacted sites) would likely be completed within a relatively short time. Transport of excavated soil to an offsite TSDF, which would likely take place after stockpiling soil in order to accumulate an adequate volume of impacted soil, would require additional time. Institutional controls (including ELUR) would immediately address the risks.	Remedial time required will be highly dependent on complexity of excavation due to proximity to underground utilities and structures. Excavation at this zone (with 2 impacted sites) would likely be completed within a relatively short time. Onsite treatment and subsequent transport of excavated soil to an offsite TSDF, which would likely take place after stockpiling soil in order to accumulate an adequate volume of impacted soil, would require additional time. Institutional controls (including ELUR) would immediately address the risks.
<b>IMPLEMENTABILITY</b>			
Ability to construct and operate	No action specified.	Readily implemented	Moderately impacted by Naval Base activities and schedules.
Ease of conducting other actions, if needed	Other actions readily implementable.	Other actions readily implementable.	Other actions readily implementable.
Ability to monitor effectiveness	Status of COC verified through monitoring and 5-year reviews.	Effectiveness readily verified through monitoring and 5-year reviews.	Effectiveness readily verified through monitoring and 5-year reviews.
Ability to obtain approvals and coordinate with other agencies	Unlikely to receive approval because COCs will remain which exceed Connecticut dilution-adjusted PMCs and would not be addressed.	Likely to receive regulatory approval because impacted soil would be removed and risks associated with COC concentrations would be mitigated. Institutional controls would address site risks.	Likely to receive regulatory approval because impacted soil would be treated and removed so that risks associated with COC concentrations would be mitigated. Institutional controls would address site risks.
Availability of materials and services	Not applicable because no actions included.	Readily available.	Readily available.
<b>COST</b>			
Capital Cost	\$0	\$131,900	\$220,500
Annual Operation and Maintenance Costs (Years 1-30)	\$3,300	\$11,600	\$11,600
Total 30-Year Present Worth Cost <sup>(a)</sup>	\$68,200	\$372,900	\$461,500
(a) Calculated at a 5 percent discount rate.			

**TABLE 7-3 ASSESSMENT OF CHEMICAL-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS  
 AND TO BE CONSIDERED GUIDANCE FOR  
 ALTERNATIVE 1 - NO ACTION  
 ZONE 4, LOWER SUBBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT**

Requirement	Citation	Status	Synopsis of Requirement	Action to Be Taken to Attain Relevant and Appropriate Requirement
<b>FEDERAL</b>				
Cancer Slope Factors		To Be Considered	These are guidance values used in risk assessment to evaluate the potential carcinogenic hazards caused by exposure to contaminants.	The No Action Alternative would provide no protection from risk posed by contaminants in the soil.
Reference Dose		To Be Considered	These are guidance values used in risk assessment to evaluate the potential non-carcinogenic hazards caused by exposure to contaminants.	The No Action Alternative would provide no protection from risk posed by contaminants in the soil.
<b>STATE OF CONNECTICUT</b>				
Remediation Standard Regulations	CGS 22a-133k; RCSA 22a-133k-1 through 3	Applicable	These regulations establish direct exposure and pollutant mobility criteria for contaminated soils.	The No Action Alternative does not satisfy state standards for either site remediation nor for sufficient engineering controls to prevent risk to human health and the environment.
NOTE: CGS = Connecticut General Statutes. RCSA = Regulations of Connecticut State Agencies.				

**TABLE 7-4 ASSESSMENT OF LOCATION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND TO BE CONSIDERED GUIDANCE FOR ALTERNATIVE 1 – NO ACTION ZONE 4, LOWER SUBBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT**

Requirement	Citation	Status	Synopsis of Requirement	Action to Be Taken to Attain Applicable or Relevant and Appropriate Requirement
<b>FEDERAL</b>				
There are no federal location-specific applicable or relevant and appropriate requirements.				
<b>STATE OF CONNECTICUT</b>				
There are no state location-specific applicable or relevant and appropriate requirements.				

**TABLE 7-5 ASSESSMENT OF ACTION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND TO BE CONSIDERED GUIDANCE FOR ALTERNATIVE 1 – NO ACTION ZONE 4, LOWER SUBBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT**

Requirement	Citation	Status	Synopsis of Requirement	Evaluation/Action to be Taken to Attain Applicable or Relevant and Appropriate Requirement
<b>STATE OF CONNECTICUT</b>				
Connecticut Hazardous Waste Management Regulations	RCSA 22a-449(c)100 through 110	Applicable	The Connecticut Hazardous Waste Management Regulations incorporate by reference the essential sections of the Code of Federal Regulations covering the RCRA. Any regulated waste identified must be remediated in accordance with these regulations.	The regulations stipulate that any identified hazardous waste and associated media must either be capped or treated, or removed and disposed in a permitted hazardous waste landfill. This alternative would not comply with the requirements set forth in these regulations.
<p>NOTE: RCSA = Regulations of Connecticut State Agencies.  RCRA = Resource Conservation and Recovery Act.</p>				

**TABLE 7-6 ASSESSMENT OF CHEMICAL-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND TO BE CONSIDERED GUIDANCE FOR ALTERNATIVE 2 – SELECTIVE EXCAVATION, OFFSITE DISPOSAL, AND INSTITUTIONAL CONTROLS ZONE 4, LOWER SUBBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT**

Requirement	Citation	Status	Synopsis of Requirement	Action to Be Taken to Attain Applicable or Relevant and Appropriate Requirement
<b>FEDERAL</b>				
Cancer Slope Factors		To Be Considered	These are guidance values used in risk assessment to evaluate the potential carcinogenic hazards caused by exposure to contaminants.	The alternative would eliminate exposure to contaminants in soil to industrial standards through excavation and offsite disposal. Institutional controls would prevent residential use and limit construction activities.
Reference Dose		To Be Considered	These are guidance values used in risk assessment to evaluate the potential non-carcinogenic hazards caused by exposure to contaminants.	The alternative would eliminate exposure to contaminants in soil to industrial standards through excavation and offsite disposal. Institutional controls would prevent residential use and limit construction activities.
<b>STATE OF CONNECTICUT</b>				
Remediation Standard Regulations	CGS 22a-133k; RCSA 22a-133k-1 through 3	Applicable	These regulations establish direct exposure and pollutant mobility criteria for contaminated soils.	The alternative would eliminate exposure to contaminants in the soil to industrial standards through excavation and offsite disposal. Institutional controls would prevent residential use, limit exposure to, and minimize mobility of residual COCs.
NOTE: CGS = Connecticut General Statutes. RCSA = Regulations of Connecticut State Agencies.				

**TABLE 7-7 ASSESSMENT OF LOCATION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND TO BE CONSIDERED GUIDANCE FOR ALTERNATIVE 2 – SELECTIVE EXCAVATION, OFFSITE DISPOSAL, AND INSTITUTIONAL CONTROLS ZONE 4, LOWER SUBBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT**

Requirement	Citation	Status	Synopsis of Requirement	Action to Be Taken to Attain Applicable or Relevant and Appropriate Requirement
<b>FEDERAL</b>				
Clean Water Act, Section 404	33 USC 1344; 40 CFR Part 230 and 33 CFR Parts 320-323	Applicable	These rules regulate the discharge of dredge and fill materials in wetlands and navigable waters. Such discharges are not allowed if practicable alternatives are available. Furthermore, the regulations require that the remedial action is the best practicable alternative to avoiding, minimizing, or mitigating impacts to protected habitats.	Remedial action includes excavation of soil and replacement/restoration with uncontaminated material. All activities associated with excavation will be designed to ensure or minimize impacts to protected habitats. Discharge to the Thames River is not expected during the remedial action. If an accidental discharge does occur, the requirements set forth will be followed to mitigate and monitor any release.
Fish and Wildlife Coordination Act	16 USC Part 661 <i>et. seq.</i> , 40 CFR 122.49	Applicable	This Order protects fish and wildlife when federal actions result in control or structural modification of a natural stream, body of water, floodplains, or flood-prone areas.	Appropriate agencies would be consulted prior to excavation to minimize adverse effects to fish and wildlife from excavating floodplains or flood-prone areas.
<b>STATE OF CONNECTICUT</b>				
Connecticut Coastal Management Act	CGS 22a-444	Applicable	The site is within a coastal zone management area. As a result, activities at the site require a Coastal Site Plan that addresses adverse and beneficial effects of the proposed activities.	Remedial actions at the site are required to comply with the substantive requirements of the Act, but are not required to comply with the formal submissions and local reviews. Local officials will be consulted before activities begin to ensure coastal zone issues are addressed.
Connecticut Endangered Species Act	CGS 26-303 through 315	Applicable	Remedial actions may not jeopardize the continued existence of state-listed endangered or threatened species, or adversely modify or destroy their habitat.	Before remedial actions occur, the NSB-NLON Natural Resources Manager will be notified. The Natural Resources Manager will determine whether additional surveys must be completed prior to remedial actions. In addition, state officials will be consulted prior to any activities.
<b>NOTE:</b> USC = United States Code. CFR = Code of Federal Regulations. CGS = Connecticut General Statutes. RCSA = Regulations of Connecticut State Agencies.				

**TABLE 7-8 ASSESSMENT OF ACTION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND TO BE CONSIDERED GUIDANCE FOR ALTERNATIVE 2 – SELECTIVE EXCAVATION, OFFSITE DISPOSAL, AND INSTITUTIONAL CONTROLS ZONE 4, LOWER SUBBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT**

Requirement	Citation	Status	Synopsis of Requirement	Evaluation/Action to be Taken to Attain Applicable or Relevant and Appropriate Requirement
<b>STATE OF CONNECTICUT</b>				
Connecticut Hazardous Waste Management Regulations	RCSA 22a-449(c)100 through 110	Applicable	The Connecticut Hazardous Waste Management Regulations incorporate by reference the essential sections of the Code of Federal Regulations covering the RCRA. Any regulated waste identified must be remediated in accordance with these regulations.	Lead contaminated soil identified as characteristic hazardous waste will be excavated and disposed at a licensed, hazardous waste TSDF. All substantive requirements set forth in these regulations concerning the excavation and storage of hazardous waste onsite will be followed. In addition, all waste transported and disposed offsite will be in accordance with these regulations.
Connecticut Air Pollution Control Act	RCSA 22a-174	Relevant and Appropriate	These regulations establish ambient air quality standards and emission limitations/standards.	Air monitoring will occur during excavation activities. Excavation activities may produce fugitive dusts and vapors that will be monitored at all times. All site emissions will be kept in compliance with this Act.
Connecticut Guidelines for Soil Erosion and Sediment Control	Connecticut Council on Soil and Water Conservation	To Be Considered	Technical and administrative guidance for development, adoption, and implementation of erosion and sediment control program.	All excavation activities, including soil stockpiling, will meet the substantive requirements set forth in this guidance document to minimize runoff and migration of COCs.
NOTE: RCSA = Regulations of Connecticut State Agencies. CGS = Connecticut General Statutes.				

**TABLE 7-9 ASSESSMENT OF CHEMICAL-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND TO BE CONSIDERED GUIDANCE FOR ALTERNATIVE 3 – SELECTIVE EXCAVATION, EX SITU SOIL WASHING, EX SITU CHEMICAL REDUCTION-OXIDATION, OFFSITE DISPOSAL, AND INSTITUTIONAL CONTROLS ZONE 4, LOWER SUBBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT**

Requirement	Citation	Status	Synopsis of Requirement	Action to Be Taken to Attain Applicable or Relevant and Appropriate Requirement
<b>FEDERAL</b>				
Cancer Slope Factors		To Be Considered	These are guidance values used in risk assessment to evaluate the potential carcinogenic hazards caused by exposure to contaminants.	The alternative would eliminate exposure to contaminants in soil to industrial standards through excavation, chemical and physical soil treatment, and offsite disposal. Institutional controls would prevent future residential use and limit construction activities.
Reference Dose		To Be Considered	These are guidance values used in risk assessment to evaluate the potential non-carcinogenic hazards caused by exposure to contaminants.	The alternative would eliminate exposure to contaminants in soil to industrial standards through excavation, chemical and physical soil treatment, and offsite disposal. Institutional controls would prevent future residential use and limit construction activities.
<b>STATE OF CONNECTICUT</b>				
Remediation Standard Regulations	CGS 22a-133k; RCSA 22a-133k-1 through 3	Applicable	These regulations establish direct exposure and pollutant mobility criteria for contaminated soils.	The alternative would eliminate exposure to contaminants in the soil to industrial standards through excavation, chemical and physical soil treatment, and offsite disposal. Institutional controls would prevent future residential use, limit exposure to, and minimize mobility of residual COCs.
NOTE: CGS = Connecticut General Statutes. RCSA = Regulations of Connecticut State Agencies.				

**TABLE 7-10 ASSESSMENT OF LOCATION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND TO BE CONSIDERED GUIDANCE FOR ALTERNATIVE 3 – SELECTIVE EXCAVATION, EX SITU SOIL WASHING, EX SITU CHEMICAL REDUCTION-OXIDATION, OFFSITE DISPOSAL, AND INSTITUTIONAL CONTROLS ZONE 4, LOWER SUBBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT**

Requirement	Citation	Status	Synopsis of Requirement	Action to Be Taken to Attain Applicable or Relevant and Appropriate Requirement
<b>FEDERAL</b>				
Clean Water Act, Section 404	33 USC 1344; 40 CFR Part 230 and 33 CFR Parts 320-323	Applicable	These rules regulate the discharge of dredge and fill materials in wetlands and navigable waters. Such discharges are not allowed if practicable alternatives are available. Furthermore, the regulations require that the remedial action is the best practicable alternative to avoiding, minimizing, or mitigating impacts to protected habitats.	Remedial action includes excavation of soil and replacement/restoration with uncontaminated material. All activities associated with excavation will be designed to ensure or minimize impacts to protected habitats. Discharge to the Thames River is not expected during the remedial action. If an accidental discharge does occur, the requirements set forth will be followed to mitigate and monitor any release.
Fish and Wildlife Coordination Act	16 USC Part 661 <i>et. seq.</i> , 40 CFR 122.49	Applicable	This Order protects fish and wildlife when federal actions result in control or structural modification of a natural stream, body of water, floodplains, or flood-prone areas.	Appropriate agencies would be consulted prior to excavation to minimize adverse effects to fish and wildlife from excavating floodplains or flood-prone areas.
<b>STATE OF CONNECTICUT</b>				
Connecticut Coastal Management Act	CGS 22a-444	Applicable	The site is within a coastal zone management area. As a result, activities at the site require a Coastal Site Plan that addresses adverse and beneficial effects of the proposed activities.	Remedial actions at the site are required to comply with the substantive requirements of the Act, but are not required to comply with the formal submissions and local reviews. Local officials will be consulted before activities begin to ensure coastal zone issues are addressed.
Connecticut Endangered Species Act	CGS 26-303 through 315	Applicable	Remedial actions may not jeopardize the continued existence of state-listed endangered or threatened species, or adversely modify or destroy their habitat.	Before remedial actions occur, the NSB-NLON Natural Resources Manager will be notified. The Natural Resources Manager will determine whether additional surveys must be completed prior to remedial actions. In addition, state officials will be consulted prior to any activities.
<b>NOTE:</b> USC = United States Code. CFR = Code of Federal Regulations. CGS = Connecticut General Statutes. RCSA = Regulations of Connecticut State Agencies.				

**TABLE 7-11 ASSESSMENT OF ACTION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND TO BE CONSIDERED GUIDANCE FOR ALTERNATIVE 3 – SELECTIVE EXCAVATION, EX SITU SOIL WASHING, EX SITU CHEMICAL REDUCTION- OXIDATION, OFFSITE DISPOSAL, AND INSTITUTIONAL CONTROLS ZONE 4, LOWER SUBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT**

Requirement	Citation	Status	Synopsis of Requirement	Evaluation/Action to be Taken to Attain Applicable or Relevant and Appropriate Requirement
<b>STATE OF CONNECTICUT</b>				
Connecticut Hazardous Waste Management Regulations	RCSA 22a-449(c)100 through 110	Applicable	The Connecticut Hazardous Waste Management Regulations incorporate by reference the essential sections of the Code of Federal Regulations covering the RCRA. Any regulated waste identified must be remediated in accordance with these regulations.	Lead contaminated soil, identified as characteristic hazardous waste, will be excavated and stockpiled in accordance with these regulations. The hazardous waste will be treated, so it is no longer considered hazardous waste. As a result, these regulations are not applicable to the transportation and disposal of site waste.
Connecticut Air Pollution Control Act	RCSA 22a-174	Relevant and Appropriate	These regulations establish ambient air quality standards and emission limitations/standards.	Air monitoring will occur during excavation and soil washing activities. Excavation activities may produce fugitive dusts and vapors that will be monitored at all times. In addition, vapor collection may be necessary during soil washing activities depending upon final solutions employed. All site emissions will be kept in compliance with this Act.
Connecticut Guidelines for Soil Erosion and Sediment Control	Connecticut Council on Soil and Water Conservation	To Be Considered	Technical and administrative guidance for development, adoption, and implementation of erosion and sediment control program.	All excavation activities, including soil stockpiling, will meet the substantive requirements set forth in this guidance document to minimize runoff and migration of COCs.
NOTE: RCSA = Regulations of Connecticut State Agencies. RCRA = Resource Conservation and Recovery Act.				

**TABLE 7-12 ASSESSMENT OF CHEMICAL-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND TO BE CONSIDERED GUIDANCE FOR ALTERNATIVE 4 – SELECTIVE EXCAVATION, EX SITU STABILIZATION/SOLIDIFICATION, OFFSITE DISPOSAL, AND INSTITUTIONAL CONTROLS ZONE 4, LOWER SUBBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT**

Requirement	Citation	Status	Synopsis of Requirement	Action to Be Taken to Attain Applicable or Relevant and Appropriate Requirement
<b>FEDERAL</b>				
Cancer Slope Factors		To Be Considered	These are guidance values used in risk assessment to evaluate the potential carcinogenic hazards caused by exposure to contaminants.	The alternative would eliminate exposure to contaminants in soil to industrial standards through excavation, chemical and physical soil treatment, and offsite disposal. Institutional controls would prevent residential use and limit construction activities.
Reference Dose		To Be Considered	These are guidance values used in risk assessment to evaluate the potential non-carcinogenic hazards caused by exposure to contaminants.	The alternative would eliminate exposure to contaminants in soil to industrial standards through excavation, chemical and physical soil treatment, and offsite disposal. Institutional controls would prevent residential use and limit construction activities.
<b>STATE OF CONNECTICUT</b>				
Remediation Standard Regulations	CGS 22a-133k; RCSA 22a-133k-1 through 3	Applicable	These regulations establish direct exposure and pollutant mobility criteria for contaminated soils.	The alternative would eliminate exposure to contaminants in the soil to industrial standards through excavation, chemical and physical soil treatment, and offsite disposal. Institutional controls would prevent residential use, limit exposure to, and minimize mobility of residual COCs.
NOTE: CGS = Connecticut General Statutes. RCSA = Regulations of Connecticut State Agencies.				

**TABLE 7-13 ASSESSMENT OF LOCATION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND TO BE CONSIDERED GUIDANCE FOR ALTERNATIVE 4 – SELECTIVE EXCAVATION, EX SITU STABILIZATION/SOLIDIFICATION, OFFSITE DISPOSAL, AND INSTITUTIONAL CONTROLS ZONE 4, LOWER SUBBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT**

Requirement	Citation	Status	Synopsis of Requirement	Action to Be Taken to Attain Applicable or Relevant and Appropriate Requirement
<b>FEDERAL</b>				
Clean Water Act, Section 404	33 USC 1344; 40 CFR Part 230 and 33 CFR Parts 320-323	Applicable	These rules regulate the discharge of dredge and fill materials in wetlands and navigable waters. Such discharges are not allowed if practicable alternatives are available. Furthermore, the regulations require that the remedial action is the best practicable alternative to avoiding, minimizing, or mitigating impacts to protected habitats.	Remedial action includes excavation of soil and replacement/restoration with uncontaminated material. All activities associated with excavation will be designed to ensure or minimize impacts to protected habitats. Discharge to the Thames River is not expected during the remedial action. If an accidental discharge does occur, the requirements set forth will be followed to mitigate and monitor any release.
Fish and Wildlife Coordination Act	16 USC Part 661 et. seq., 40 CFR 122.49	Applicable	This Order protects fish and wildlife when federal actions result in control or structural modification of a natural stream, body of water, floodplains, or flood-prone areas.	Appropriate agencies would be consulted prior to excavation to minimize adverse effects to fish and wildlife from excavating floodplains or flood-prone areas.
<b>STATE OF CONNECTICUT</b>				
Connecticut Coastal Management Act	CGS 22a-444	Applicable	The site is within a coastal zone management area. As a result, activities at the site require a Coastal Site Plan that addresses adverse and beneficial effects of the proposed activities.	Remedial actions at the site are required to comply with the substantive requirements of the Act, but are not required to comply with the formal submissions and local reviews. Local officials will be consulted before activities begin to ensure coastal zone issues are addressed.
Connecticut Endangered Species Act	CGS 26-303 through 315	Applicable	Remedial actions may not jeopardize the continued existence of state-listed endangered or threatened species, or adversely modify or destroy their habitat.	Before remedial actions occur, the NSB-NLON Natural Resources Manager will be notified. The Natural Resources Manager will determine whether additional surveys must be completed prior to remedial actions. In addition, state officials will be consulted prior to any activities.
<p>NOTE: USC = United States Code.  CFR = Code of Federal Regulations.  CGS = Connecticut General Statutes.</p>				

**TABLE 7-14 ASSESSMENT OF ACTION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND TO BE CONSIDERED GUIDANCE FOR ALTERNATIVE 4 – SELECTIVE EXCAVATION, *EX SITU* STABILIZATION/SOLIDIFICATION, OFFSITE DISPOSAL, AND INSTITUTIONAL CONTROLS ZONE 4, LOWER SUBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT**

Requirement	Citation	Status	Synopsis of Requirement	Evaluation/Action to be Taken to Attain Applicable or Relevant and Appropriate Requirement
<b>STATE OF CONNECTICUT</b>				
Connecticut Hazardous Waste Management Regulations	RCSA 22a-449(c)100 through 110	Applicable	The Connecticut Hazardous Waste Management Regulations incorporate by reference the essential sections of the Code of Federal Regulations covering the RCRA. Any regulated waste identified must be remediated in accordance with these regulations.	Lead contaminated soil identified as characteristic hazardous waste will be excavated and stockpiled in accordance with these regulations. The hazardous waste will be stabilized/solidified, so it is no longer considered hazardous waste. As a result, these regulations are not applicable to the transportation and disposal of site waste.
Connecticut Air Pollution Control Act	RCSA 22a-174	Relevant and Appropriate	These regulations establish ambient air quality standards and emission limitations/standards.	Air monitoring will occur during excavation. Excavation activities may produce fugitive dusts and vapors that will be monitored at all times. All site emissions will be kept in compliance with this Act.
Connecticut Guidelines for Soil Erosion and Sediment Control	Connecticut Council on Soil and Water Conservation	To Be Considered	Technical and administrative guidance for development, adoption, and implementation of erosion and sediment control program.	All excavation activities, including soil stockpiling, will meet the substantive requirements set forth in this guidance document to minimize runoff and migration of constituents of concern.
<p>NOTE: RCSA = Regulations of Connecticut State Agencies.  RCRA = Resource Conservation and Recovery Act.</p>				

TABLE 7-15 SUMMARY OF COMPARATIVE ANALYSIS OF REMEDIAL ALTERNATIVES FOR ZONE 4  
LOWER SUBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT

Criteria	Alternative 1 No Action	Alternative 2 Selective Excavation, Offsite Disposal, and Institutional Controls	Alternative 3 Selective Excavation, <i>Ex Situ</i> Soil Washing, <i>Ex Situ</i> Chemical Reduction-Oxidation, Offsite Disposal, and Institutional Controls	Alternative 4 Selective Excavation, <i>Ex Situ</i> Stabilization/Solidification, Offsite Disposal, and Institutional Controls
<b>OVERALL PROTECTIVENESS – HUMAN HEALTH</b>				
Exposure to COCs in soil	Would not address.	Soil with COCs above ICDECs, 10 <sup>-5</sup> Risk-Based PRGs, state PMCs, and Dilution-Adjusted PMCs would be excavated and disposed offsite, which would remove associated risks to human health. Risks to remedial phase workers would be minimized through proper construction and engineering safety practices. Signage would be protective limiting zone access. Institutional controls (ELUR) would control employee/site worker exposure beneath pavement, prevent future residential site use, and provide protection through amendments if property was transferred.	Soil with COCs above the ICDECs, 10 <sup>-5</sup> Risk-Based PRGs, state PMCs, and Dilution-Adjusted PMCs would be excavated, treated and disposed offsite, which would remove associated risks to human health. Risks to remedial phase workers would be minimized through proper construction and engineering safety practices. Signage would be protective limiting zone access. Institutional controls (ELUR) would control employee/site worker exposure beneath pavement, prevent future residential site use, and provide protection through amendments if property was transferred.	Soil with COCs above the ICDECs, 10 <sup>-5</sup> Risk-Based PRGs, state PMCs, and Dilution-Adjusted PMCs would be excavated, treated and disposed offsite, which would remove associated risks to human health. Risks to remedial phase workers would be minimized through proper construction and engineering safety practices. Signage would be protective limiting zone access. Institutional controls (ELUR) would control employee/site worker exposure beneath pavement, prevent future residential site use, and provide protection through amendments if property was transferred.
<b>OVERALL PROTECTIVENESS – ENVIRONMENT</b>				
Potential offsite receptors	Would not address; however, no significant risks to offsite ecological receptors at Lower Subase are present.	No significant risks to offsite ecological receptors are present or anticipated at Lower Subase during implementation of alternative. Removal of soil with COC concentrations above the zone's cleanup goals would reduce/eliminate potential for COC exposure or migration. Proper safety controls would reduce/eliminate potential impact to offsite receptors.	No significant risks to offsite ecological receptors are present or anticipated at Lower Subase during implementation of alternative. Removal of soil with COC concentrations above the zone's cleanup goals would reduce/eliminate potential for COC migration. Proper safety controls during treatment and disposal would reduce/eliminate potential impact to offsite receptors.	No significant risks to offsite ecological receptors are present or anticipated at Lower Subase during implementation of alternative. Removal of soil with COC concentrations above the zone's cleanup goals would reduce/eliminate potential for COC migration. Proper safety controls during treatment and disposal would reduce/eliminate potential impact to offsite receptors.
Potential onsite receptors	Would not address; however, no significant risks to onsite ecological receptors at Lower Subase are present.	No significant risks to onsite ecological receptors are present or anticipated at Lower Subase during implementation of alternative. Removal of impacted soil would reduce/eliminate potential for COC exposure or migration. Risks to onsite receptors during remedial work would be minimized through proper construction and engineering safety practices. Signage would be protective by limiting zone access.	No significant risks to onsite ecological receptors are present or anticipated at Lower Subase during implementation of alternative. Removal of impacted soil would reduce/eliminate potential for COC migration. Risks to onsite receptors during remedial work would be minimized through proper construction and engineering safety practices. Signage would be protective by limiting zone access.	No significant risks to onsite ecological receptors are present or anticipated at Lower Subase during implementation of alternative. Removal of impacted soil would reduce/eliminate potential for COC migration. Risks to onsite receptors during remedial work would be minimized through proper construction and engineering safety practices. Signage would be protective by limiting zone access.
<b>COMPLIANCE WITH APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS</b>				
Chemical-specific	Would not achieve because no action specified.	Would achieve compliance with ICDECs, 10 <sup>-5</sup> Risk-Based PRGs, state PMCs, and Dilution-Adjusted PMCs, for soil. Institutional controls would address residual COCs in soil.	Would achieve compliance with ICDECs, 10 <sup>-5</sup> Risk-Based PRGs, state PMCs, and Dilution-Adjusted PMCs, for soil. Institutional controls would address residual COCs in soil.	Would achieve compliance with ICDECs, 10 <sup>-5</sup> Risk-Based PRGs, state PMCs, and Dilution-Adjusted PMCs, for soil. Institutional controls would address residual COCs in soil.
Location-specific	Not applicable because no action specified.	Would be conducted in accordance with requirements.	Would be conducted in accordance with requirements.	Would be conducted in accordance with requirements.
Action-specific	Not applicable because no action specified.	Would be conducted in accordance with requirements.	Would be conducted in accordance with requirements.	Would be conducted in accordance with requirements.
<b>LONG-TERM EFFECTIVENESS AND PERMANENCE</b>				
Magnitude of residual risk	Current risks would remain.	Excavation of COC-containing soil to industrial cleanup goals would minimize/eliminate residual risk at Lower Subase for the long term. Proper disposal of the affected soil at a licensed, hazardous waste TSDF would provide long-term protection to the environment and human health at large. Long-term risks at the site from residual COCs would be adequately addressed through institutional controls.	Excavation of COC-containing soil to industrial cleanup goals would minimize/eliminate residual risk at Lower Subase for the long term. Proper disposal of the treated soil at a licensed TSDF would provide long-term protection to the environment and human health at large. Long-term risks at the site from residual COCs would be adequately addressed through institutional controls.	Excavation of COC-containing soil to industrial cleanup goals would minimize/eliminate residual risk at Lower Subase for the long term. Proper disposal of the treated soil at a licensed TSDF would provide long-term protection to the environment and human health at large. Long-term risks at the site from residual COCs would be adequately addressed through institutional controls.
Adequacy and reliability of controls	Not applicable because no controls are specified.	Active strategy. Selective excavation and disposal of impacted soil would be a reliable method to mitigate COCs above the industrial cleanup goals. Institutional controls would be reliable and suitable to control access and activity at the site. Site planned to remain for industrial use for Naval Submarine Base, New London, Connecticut.	Active strategy. Selective excavation and treatment/disposal would be a reliable method to mitigate COCs above the industrial cleanup goals. Institutional controls would be reliable and suitable to control access and activity at the site. Site planned to remain for industrial use for Naval Submarine Base, New London, Connecticut.	Active strategy. Selective excavation and treatment/disposal would be a reliable method to mitigate COCs above the industrial cleanup goals. Institutional controls would be reliable and suitable to control access and activity at the site. Site planned to remain for industrial use for Naval Submarine Base, New London, Connecticut.
NOTE: COC = Constituents of concern. ICDEC = Industrial/Commercial Direct Exposure Criteria. PRG = Preliminary Remediation Goals. PMC = Pollutant Mobility Criteria. ELUR = Environmental land use restriction.				

10260B47

Criteria	Alternative 1 No Action	Alternative 2 Selective Excavation, Offsite Disposal, and Institutional Controls	Alternative 3 Selective Excavation, <i>Ex Situ</i> Soil Washing, <i>Ex Situ</i> Chemical Reduction-Oxidation, Offsite Disposal, and Institutional Controls	Alternative 4 Selective Excavation, <i>Ex Situ</i> Stabilization/Solidification, Offsite Disposal, and Institutional Controls
<b>REDUCTION OF TOXICITY, MOBILITY, AND VOLUME THROUGH TREATMENT</b>				
Treatment processes used and materials treated	No treatment included.	Selected soil would be excavated and disposed of at an offsite, licensed facility. Any necessary treatment of the disposed soil will be determined by the TSDF.	Selected soil would be excavated, selected quantities of soil would be treated through a method of soil washing, and selected quantities would be treated through a method of chemical reduction-oxidation and then all treated soil would be subsequently disposed of at an offsite, licensed TSDF.	Selected soil would be excavated and would be treated through a method of stabilization/solidification and then subsequently disposed of at an offsite, licensed TSDF.
Hazardous material destroyed or treated	No treatment included. Natural attenuation of COCs in soil and sediment would occur, but would not be verified.	Soil with COCs above industrial cleanup goals would be disposed at offsite, licensed hazardous waste TSDF, with any necessary treatment to be determined and conducted by disposal facility.	Soil with COCs above industrial cleanup goals would be treated by soil washing and chemical reduction-oxidation and the treated soil would be disposed of at an offsite, licensed TSDF.	Soil with COCs above industrial cleanup goals would be treated by stabilization/solidification and the treated soil would be disposed of at an offsite, licensed TSDF.
Type and quantity of residuals remaining after treatment	No treatment included. Natural attenuation of COCs in soil and sediment would occur, but would not be verified.	All efforts will be made to ensure selective excavation would be complete and no residual affected soil would remain at Lower Subase. Excavated material would be disposed/treated offsite.	All efforts will be made to ensure selective excavation would be complete and no residual affected soil would remain at Lower Subase. Excavated material would be disposed/treated offsite.	All efforts will be made to ensure selective excavation would be complete and no residual affected soil would remain at Lower Subase. Excavated material would be disposed/treated offsite.
Degree to which treatment is irreversible	No treatment included.	Excavation and offsite treatment/disposal of impacted soil would be irreversible.	Excavation, treatment through soil washing, chemical reduction-oxidation, and offsite disposal of impacted soil would be irreversible.	Excavation, treatment through stabilization/solidification and offsite disposal of impacted soil would be irreversible.
Statutory preference for treatment	Does not satisfy.	Satisfies, if impacted soil is treated at offsite hazardous waste TSDF. Does not satisfy, if excavated soil is disposed without treatment.	Satisfies, if excavation, soil washing, and chemical reduction-oxidation is selected.	Satisfies, if excavation and stabilization/solidification is selected.
<b>SHORT-TERM EFFECTIVENESS</b>				
Protection of site workers	No new risks to site workers.	Engineered safety controls would address potential risks to site workers during remedial activities.	Engineered safety controls would address potential risks to site workers during remedial activities.	Engineered safety controls would address potential risks to site workers during remedial activities.
Protection of community	No new risks to the community.	Engineered safety controls would address potential risks to the community during remedial activities.	Engineered safety controls would address potential risks to the community during remedial activities.	Engineered safety controls would address potential risks to the community during remedial activities.
Time to achieve remedial goals	Remedial goals would not be achieved.	Remedial time required will be highly dependent on complexity of excavation due to proximity to underground utilities and structures. Excavation at this zone (with 7 impacted sites) would likely be completed within a relatively short time. Transport of excavated soil to an offsite hazardous waste TSDF, which would likely take place after stockpiling soil in order to accumulate an adequate volume of impacted soil, would require additional time. Institutional controls (including ELUR) would immediately address the risks.	Remedial time required will be highly dependent on complexity of excavation due to proximity to underground utilities and structures. Excavation at this zone (with 7 impacted sites) would likely be completed within a relatively short time. Onsite treatment and subsequent transport of excavated soil to an offsite TSDF, which would take place after stockpiling/staging soil in respective treatment areas (for each treatment method), would require additional time. Institutional controls (including ELUR) would immediately address the risks.	Remedial time required will be highly dependent on complexity of excavation due to proximity to underground utilities and structures. Excavation at this zone (with 7 impacted sites) would likely be completed within a relatively short time. Onsite treatment and subsequent transport of excavated soil to an offsite TSDF, which would likely take place after stockpiling soil in order to accumulate an adequate volume of impacted soil, would require additional time. Institutional controls (including ELUR) would immediately address the risks.
<b>IMPLEMENTABILITY</b>				
Ability to construct and operate	No action specified.	Readily implemented	Moderately impacted by Naval Base activities and schedules.	Moderately impacted by Naval Base activities and schedules.
Ease of conducting other actions, if needed	Other actions readily implementable.	Other actions readily implementable.	Other actions readily implementable.	Other actions readily implementable.
Ability to monitor effectiveness	Status of COC verified through monitoring and 5-year reviews.	Effectiveness readily verified through monitoring and 5-year reviews.	Effectiveness readily verified through monitoring and 5-year reviews.	Effectiveness readily verified through monitoring and 5-year reviews.
Ability to obtain approvals and coordinate with other agencies	Unlikely to receive approval because COCs will remain which exceed Connecticut ICDECs, 10 <sup>-5</sup> Risk-Based PRGs, state PMCs, and Dilution-Adjusted PMCs.	Likely to receive regulatory approval because impacted soil would be removed and risks associated with COC concentrations would be mitigated. Institutional controls would address site risks.	Likely to receive regulatory approval because impacted soil would be treated and removed so that risks associated with COC concentrations would be mitigated. Institutional controls would address site risks.	Likely to receive regulatory approval because impacted soil would be treated so that risks associated with COC concentrations would be mitigated. Institutional controls would address site risks.
Availability of materials and services	Not applicable because no actions included.	Readily available.	Readily available.	Readily available.
<b>COST</b>				
Capital Cost	\$0	\$368,200	\$514,900	\$430,600
Annual Operation and Maintenance Costs (Years 1-30)	\$3,300	\$11,600	\$11,600	\$11,600
Total 30-Year Present Worth Cost <sup>(a)</sup>	\$68,200	\$609,300	\$756,000	\$671,600
(a) Calculated at a 5 percent discount rate.				

**TABLE 9-3 ASSESSMENT OF CHEMICAL-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND TO BE CONSIDERED GUIDANCE FOR ALTERNATIVE 1 – NO ACTION ZONE 6, LOWER SUBBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT**

Requirement	Citation	Status	Synopsis of Requirement	Action to Be Taken to Attain Relevant and Appropriate Requirement
<b>FEDERAL</b>				
Cancer Slope Factors		To Be Considered	These are guidance values used in risk assessment to evaluate the potential carcinogenic hazards caused by exposure to contaminants.	The No Action Alternative would provide no protection from risk posed by contaminants in the soil.
Reference Dose		To Be Considered	These are guidance values used in risk assessment to evaluate the potential non-carcinogenic hazards caused by exposure to contaminants.	The No Action Alternative would provide no protection from risk posed by contaminants in the soil.
<b>STATE OF CONNECTICUT</b>				
Remediation Standard Regulations	CGS 22a-133k; RCSA 22a-133k-1 through 3	Applicable	These regulations establish direct exposure and pollutant mobility criteria for contaminated soils.	The No Action Alternative does not satisfy state standards for either site remediation nor for sufficient engineering controls to prevent risk to human health and the environment.
NOTE: CGS = Connecticut General Statutes. RCSA = Regulations of Connecticut State Agencies.				

**TABLE 9-4 ASSESSMENT OF LOCATION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND TO BE CONSIDERED GUIDANCE FOR ALTERNATIVE 1 – NO ACTION ZONE 6, LOWER SUBBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT**

Requirement	Citation	Status	Synopsis of Requirement	Action to Be Taken to Attain Applicable or Relevant and Appropriate Requirement
<b>FEDERAL</b>				
There are no federal location-specific applicable or relevant and appropriate requirements.				
<b>STATE OF CONNECTICUT</b>				
There are no state location-specific applicable or relevant and appropriate requirements.				

**TABLE 9-5 ASSESSMENT OF ACTION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND TO BE CONSIDERED GUIDANCE FOR ALTERNATIVE 1 – NO ACTION ZONE 6, LOWER SUBBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT**

Requirement	Citation	Status	Synopsis of Requirement	Action to Be Taken to Attain Applicable or Relevant and Appropriate Requirement
<b>FEDERAL</b>				
There are no federal action-specific applicable or relevant and appropriate requirements.				
<b>STATE OF CONNECTICUT</b>				
There are no state action-specific applicable or relevant and appropriate requirements.				

**TABLE 9-6 ASSESSMENT OF CHEMICAL-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND TO BE CONSIDERED GUIDANCE FOR ALTERNATIVE 2 – SELECTIVE EXCAVATION, OFFSITE DISPOSAL, AND INSTITUTIONAL CONTROLS ZONE 6, LOWER SUBBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT**

Requirement	Citation	Status	Synopsis of Requirement	Action to Be Taken to Attain Applicable or Relevant and Appropriate Requirement
<b>FEDERAL</b>				
Cancer Slope Factors		To Be Considered	These are guidance values used in risk assessment to evaluate the potential carcinogenic hazards caused by exposure to contaminants.	The alternative would eliminate exposure to contaminants in soil to industrial standards through excavation and offsite disposal. Institutional controls would prevent residential use and construction activities.
Reference Dose		To Be Considered	These are guidance values used in risk assessment to evaluate the potential non-carcinogenic hazards caused by exposure to contaminants.	The alternative would eliminate exposure to contaminants in soil to industrial standards through excavation and offsite disposal. Institutional controls would prevent residential use and limit construction activities.
<b>STATE OF CONNECTICUT</b>				
Remediation Standard Regulations	CGS 22a-133k; RCSA 22a-133k-1 through 3	Applicable	These regulations establish direct exposure and pollutant mobility criteria for contaminated soils.	The alternative would eliminate exposure to contaminants in the soil to industrial standards through excavation and offsite disposal. Institutional controls would prevent residential use, limit exposure to, and minimize mobility of residual constituents of concern.
NOTE: CGS = Connecticut General Statutes. RCSA = Regulations of Connecticut State Agencies.				

**TABLE 9-7 ASSESSMENT OF LOCATION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND TO BE CONSIDERED GUIDANCE FOR ALTERNATIVE 2 – SELECTIVE EXCAVATION, OFFSITE DISPOSAL, AND INSTITUTIONAL CONTROLS ZONE 6, LOWER SUBBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT**

Requirement	Citation	Status	Synopsis of Requirement	Action to Be Taken to Attain Applicable or Relevant and Appropriate Requirement
<b>FEDERAL</b>				
Clean Water Act, Section 404	33 USC 1344; 40 CFR Part 230 and 33 CFR Parts 320-323	Applicable	These rules regulate the discharge of dredge and fill materials in wetlands and navigable waters. Such discharges are not allowed if practicable alternatives are available. Furthermore, the regulations require that the remedial action is the best practicable alternative to avoiding, minimizing, or mitigating impacts to protected habitats.	Remedial action includes excavation of soil and replacement/restoration with uncontaminated material. All activities associated with excavation will be designed to ensure or minimize impacts to protected habitats. Discharge to the Thames River is not expected during the remedial action. If an accidental discharge does occur, the requirements set forth will be followed to mitigate and monitor any release.
Fish and Wildlife Coordination Act	16 USC Part 661 <i>et. seq.</i> , 40 CFR 122.49	Applicable	This Order protects fish and wildlife when federal actions result in control or structural modification of a natural stream, body of water, floodplains, or flood-prone areas.	Appropriate agencies would be consulted prior to excavation to minimize adverse effects to fish and wildlife from excavating floodplains or flood-prone areas.
<b>STATE OF CONNECTICUT</b>				
Connecticut Coastal Management Act	CGS 22a-444	Applicable	The site is within a coastal zone management area. As a result, activities at the site require a Coastal Site Plan that addresses adverse and beneficial effects of the proposed activities.	Remedial actions at the site are required to comply with the substantive requirements of the Act, but are not required to comply with the formal submissions and local reviews. Local officials will be consulted before activities begin to ensure coastal zone issues are addressed.
Connecticut Endangered Species Act	CGS 26-303 through 315	Applicable	Remedial actions may not jeopardize the continued existence of state-listed endangered or threatened species, or adversely modify or destroy their habitat.	Before remedial actions occur, the NSB-NLON Natural Resources Manager will be notified. The Natural Resources Manager will determine whether additional surveys must be completed prior to remedial actions. In addition, state officials will be consulted prior to any activities.
NOTE: USC = United States Code. CFR = Code of Federal Regulations. CGS = Connecticut General Statutes.				

**TABLE 9-8 ASSESSMENT OF ACTION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND TO BE CONSIDERED GUIDANCE FOR ALTERNATIVE 2 – SELECTIVE EXCAVATION, OFFSITE DISPOSAL, AND INSTITUTIONAL CONTROLS ZONE 6, LOWER SUBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT**

Requirement	Citation	Status	Synopsis of Requirement	Evaluation/Action to be Taken to Attain Applicable or Relevant and Appropriate Requirement
<b>STATE OF CONNECTICUT</b>				
Connecticut Air Pollution Control Act	RCSA 22a-174	Relevant and Appropriate	These regulations establish ambient air quality standards and emission limitations/standards.	Air monitoring will occur during excavation activities. Excavation activities may produce fugitive dusts and vapors that will be monitored at all times. All site emissions will be kept in compliance with this Act.
Connecticut Guidelines for Soil Erosion and Sediment Control	Connecticut Council on Soil and Water Conservation	To Be Considered	Technical and administrative guidance for development, adoption, and implementation of erosion and sediment control program.	All excavation activities, including soil stockpiling, will meet the substantive requirements set forth in this guidance document to minimize runoff and migration of constituents of concern.
<b>NOTE: RCSA = Regulations of Connecticut State Agencies.</b>				

**TABLE 9-9 ASSESSMENT OF CHEMICAL-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND TO BE CONSIDERED GUIDANCE FOR ALTERNATIVE 3 – SELECTIVE EXCAVATION, *EX SITU* SOIL WASHING, OFFSITE DISPOSAL, AND INSTITUTIONAL CONTROLS ZONE 6, LOWER SUBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT**

Requirement	Citation	Status	Synopsis of Requirement	Action to Be Taken to Attain Applicable or Relevant and Appropriate Requirement
<b>FEDERAL</b>				
Cancer Slope Factors		To Be Considered	These are guidance values used in risk assessment to evaluate the potential carcinogenic hazards caused by exposure to contaminants.	The alternative would eliminate exposure to contaminants in soil to industrial standards through excavation, chemical and physical soil treatment, and offsite disposal. Institutional controls would prevent residential use and limit construction activities.
Reference Dose		To Be Considered	These are guidance values used in risk assessment to evaluate the potential non-carcinogenic hazards caused by exposure to contaminants.	The alternative would eliminate exposure to contaminants in soil to industrial standards through excavation, chemical and physical soil treatment, and offsite disposal. Institutional controls would prevent residential use and limit construction activities.
<b>STATE OF CONNECTICUT</b>				
Remediation Standard Regulations	CGS 22a-133k; RCSA 22a-133k-1 through 3	Applicable	These regulations establish direct exposure and pollutant mobility criteria for contaminated soils.	The alternative would eliminate exposure to contaminants in the soil to industrial standards through excavation, chemical soil treatment, and offsite disposal. These technologies would treat and remove contaminants from soil. Institutional controls would prevent residential use, limit exposure to, and minimize mobility of residual constituents of concern.
NOTE: CGS = Connecticut General Statutes. RCSA = Regulations of Connecticut State Agencies.				

**TABLE 9-10 ASSESSMENT OF LOCATION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND TO BE CONSIDERED GUIDANCE FOR ALTERNATIVE 3 – SELECTIVE EXCAVATION, *EX SITU* SOIL WASHING, OFFSITE DISPOSAL, CAPPING, AND INSTITUTIONAL CONTROLS ZONE 6, LOWER SUBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT**

Requirement	Citation	Status	Synopsis of Requirement	Action to Be Taken to Attain Applicable or Relevant and Appropriate Requirement
<b>FEDERAL</b>				
Clean Water Act, Section 404	33 USC 1344; 40 CFR Part 230 and 33 CFR Parts 320-323	Applicable	These rules regulate the discharge of dredge and fill materials in wetlands and navigable waters. Such discharges are not allowed if practicable alternatives are available. Furthermore, the regulations require that the remedial action is the best practicable alternative to avoiding, minimizing, or mitigating impacts to protected habitats.	Remedial action includes excavation of soil and replacement/restoration with uncontaminated material. All activities associated with excavation will be designed to ensure or minimize impacts to protected habitats. Discharge to the Thames River is not expected during the remedial action. If an accidental discharge does occur, the requirements set forth will be followed to mitigate and monitor any release.
Fish and Wildlife Coordination Act	16 USC Part 661 <i>et. seq.</i> , 40 CFR 122.49	Applicable	This Order protects fish and wildlife when federal actions result in control or structural modification of a natural stream, body of water, floodplains, or flood-prone areas.	Appropriate agencies would be consulted prior to excavation to minimize adverse effects to fish and wildlife from excavating floodplains or flood-prone areas.
<b>STATE OF CONNECTICUT</b>				
Connecticut Coastal Management Act	CGS 22a-444	Applicable	The site is within a coastal zone management area. As a result, activities at the site require a Coastal Site Plan that addresses adverse and beneficial effects of the proposed activities.	Remedial actions at the site are required to comply with the substantive requirements of the Act, but are not required to comply with the formal submissions and local reviews. Local officials will be consulted before activities begin to ensure coastal zone issues are addressed.
Connecticut Endangered Species Act	CGS 26-303 through 315	Applicable	Remedial actions may not jeopardize the continued existence of state-listed endangered or threatened species, or adversely modify or destroy their habitat.	Before remedial actions occur, the NSB-NLON Natural Resources Manager will be notified. The Natural Resources Manager will determine whether additional surveys must be completed prior to remedial actions. In addition, state officials will be consulted prior to any activities.
<p>NOTE: USC = United States Code.  CFR = Code of Federal Regulations.  CGS = Connecticut General Statutes.  RCSA = Regulations of Connecticut State Agencies.</p>				

**TABLE 9-11 ASSESSMENT OF ACTION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND TO BE CONSIDERED GUIDANCE FOR ALTERNATIVE 3 – SELECTIVE EXCAVATION, *EX SITU* SOIL WASHING, OFFSITE DISPOSAL, CAPPING, AND INSTITUTIONAL CONTROLS ZONE 6, LOWER SUBBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT**

Requirement	Citation	Status	Synopsis of Requirement	Evaluation/Action to be Taken to Attain Applicable or Relevant and Appropriate Requirement
<b>STATE OF CONNECTICUT</b>				
Connecticut Air Pollution Control Act	RCSA 22a-174	Relevant and Appropriate	These regulations establish ambient air quality standards and emission limitations/standards.	Air monitoring will occur during excavation and soil washing activities. Excavation activities may produce fugitive dusts and vapors that will be monitored at all times. In addition, vapor collection may be necessary during soil washing activities depending upon final solutions employed. All site emissions will be kept in compliance with this Act.
Connecticut Guidelines for Soil Erosion and Sediment Control	Connecticut Council on Soil and Water Conservation	To Be Considered	Technical and administrative guidance for development, adoption, and implementation of erosion and sediment control program.	All excavation activities, including soil stockpiling, will meet the substantive requirements set forth in this guidance document to minimize runoff and migration of constituents of concern.
<b>NOTE: RCSA = Regulations of Connecticut State Agencies.</b>				

**TABLE 9-12 ASSESSMENT OF CHEMICAL-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND TO BE CONSIDERED GUIDANCE FOR ALTERNATIVE 4 – *IN SITU* SOIL VAPOR EXTRACTION AND INSTITUTIONAL CONTROLS ZONE 6, LOWER SUBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT**

Requirement	Citation	Status	Synopsis of Requirement	Action to Be Taken to Attain Applicable or Relevant and Appropriate Requirement
<b>FEDERAL</b>				
Cancer Slope Factors		To Be Considered	These are guidance values used in risk assessment to evaluate the potential carcinogenic hazards caused by exposure to contaminants.	The alternative would eliminate exposure to contaminants in soil to industrial standards through in situ soil vapor extraction. Institutional controls would prevent future residential use and limit construction activities.
Reference Dose		To Be Considered	These are guidance values used in risk assessment to evaluate the potential non-carcinogenic hazards caused by exposure to contaminants.	The alternative would eliminate exposure to contaminants in soil to industrial standards through in situ soil vapor extraction. Institutional controls would prevent future residential use and limit construction activities.
<b>STATE OF CONNECTICUT</b>				
Remediation Standard Regulations	CGS 22a-133k; RCSA 22a-133k-1 through 3	Applicable	These regulations establish direct exposure and pollutant mobility criteria for contaminated soils.	The alternative would eliminate exposure to contaminants in the soil to industrial standards through in situ soil vapor extraction. Institutional controls would prevent future residential use, limit exposure to, and minimize migration of inaccessible constituents of concern.
<p>NOTE: CGS = Connecticut General Statutes.  RCSA = Regulations of Connecticut State Agencies.</p>				

**TABLE 9-13 ASSESSMENT OF LOCATION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND TO BE CONSIDERED GUIDANCE FOR ALTERNATIVE 4 – *IN SITU* SOIL VAPOR EXTRACTION AND INSTITUTIONAL CONTROLS ZONE 6, LOWER SUBBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT**

Requirement	Citation	Status	Synopsis of Requirement	Action to Be Taken to Attain Applicable or Relevant and Appropriate Requirement
<b>FEDERAL</b>				
There are no federal location-specific applicable or relevant and appropriate requirements.				
<b>STATE OF CONNECTICUT</b>				
Connecticut Coastal Management Act	CGS 22a-444	Applicable	The site is within a coastal zone management area. As a result, activities at the site require a Coastal Site Plan that addresses adverse and beneficial effects of the proposed activities.	Remedial actions at the site are required to comply with the substantive requirements of the Act, but are not required to comply with the formal submissions and local reviews. Local officials will be consulted before activities begin to ensure coastal zone issues are addressed.
Connecticut Endangered Species Act	CGS 26-303 through 315	Applicable	Remedial actions may not jeopardize the continued existence of state-listed endangered or threatened species, or adversely modify or destroy their habitat.	Before remedial actions occur, the NSB-NLON Natural Resources Manager will be notified. The Natural Resources Manager will determine whether additional surveys must be completed prior to remedial actions. In addition, state officials will be consulted prior to any activities.
<b>NOTE: CGS = Connecticut General Statutes.</b>				

**TABLE 9-14 ASSESSMENT OF ACTION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND TO BE CONSIDERED GUIDANCE FOR ALTERNATIVE 4 – *IN SITU* SOIL VAPOR EXTRACTION AND INSTITUTIONAL CONTROLS ZONE 6, LOWER SUBBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT**

Requirement	Citation	Status	Synopsis of Requirement	Evaluation/Action to be Taken to Attain Applicable or Relevant and Appropriate Requirement
<b>STATE OF CONNECTICUT</b>				
Connecticut Air Pollution Control Act	RCSA 22a-174	Relevant and Appropriate	These regulations establish ambient air quality standards and emission limitations/standards.	Air monitoring will occur during soil vapor extraction activities. The soil vapor extraction unit will have an emission control of extracted gases. The unit will be designed with off-gas treatment, if necessary. All site emissions will be kept in compliance with this Act.
Connecticut Guidelines for Soil Erosion and Sediment Control	Connecticut Council on Soil and Water Conservation	To Be Considered	Technical and administrative guidance for development, adoption, and implementation of erosion and sediment control program.	All activities associated with construction and installation of the soil vapor extraction unit will meet the substantive requirements set forth in this guidance document to minimize runoff and migration of constituents of concern.
<b>NOTE: RCSA = Regulations of Connecticut State Agencies.</b>				

TABLE 9-15 SUMMARY OF COMPARATIVE ANALYSIS OF REMEDIAL ALTERNATIVES FOR ZONE 6  
LOWER SUBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT

Criteria	Alternative 1 No Action	Alternative 2 Selective Excavation, Offsite Disposal, and Institutional Controls	Alternative 3 Selective Excavation, <i>Ex Situ</i> Soil Washing, Offsite Disposal, and Institutional Controls	Alternative 4 <i>In Situ</i> Soil Vapor Extraction, and Institutional Controls
<b>OVERALL PROTECTIVENESS – HUMAN HEALTH</b>				
Exposure to COCs in soil	Would not address.	Soil with COCs above the state PMCs would be excavated and disposed offsite, which would remove associated risks to human health. Risks to remedial phase workers would be minimized through proper construction and engineering safety practices. Signage would be protective limiting zone access. Institutional controls (ELUR) would control employee/site worker exposure beneath pavement, prevent future residential site use, and provide protection through amendments if property was transferred.	Soil with COCs above the state PMCs would be excavated, treated and disposed offsite, which would remove associated risks to human health. Risks to remedial phase workers would be minimized through proper construction and engineering safety practices. Signage would be protective limiting zone access. Institutional controls (ELUR) would control employee/site worker exposure beneath pavement, prevent future residential site use, and provide protection through amendments if property was transferred.	Treating the soil with COCs above the state PMCs <i>in situ</i> minimizes/eliminates potential associated risks to human health and migration of COCs at Lower Subase. Risks to remedial phase workers would be minimized through proper construction and engineering safety practices. Signage would be protective limiting zone access. Institutional controls (ELUR) would control employee/site worker exposure beneath pavement, prevent future residential site use, and provide protection through amendments if property was transferred.
<b>OVERALL PROTECTIVENESS – ENVIRONMENT</b>				
Potential offsite receptors	Would not address; however, no significant risks to offsite ecological receptors at Lower Subase are present.	No significant risks to offsite ecological receptors are present or anticipated at Lower Subase during implementation of alternative. Removal of soil with COC concentrations above the zone's cleanup goals would reduce/eliminate potential for COC migration. Proper safety controls would reduce/eliminate potential impact to offsite receptors.	No significant risks to offsite ecological receptors are present or anticipated at Lower Subase during implementation of alternative. Removal of soil with COC concentrations above the zone's cleanup goals would reduce/eliminate potential for COC migration. Proper treatment and safety controls during treatment and disposal would reduce/eliminate potential impact to offsite receptors.	No significant risks to offsite ecological receptors are present or anticipated at Lower Subase during implementation of alternative. Treatment of soil with COC concentrations above this zone's cleanup goals would reduce/eliminate potential for COC migration. Proper safety controls would reduce/eliminate potential impact to offsite receptors.
Potential onsite receptors	Would not address; however, no significant risks to onsite ecological receptors at Lower Subase are present.	No significant risks to onsite ecological receptors are present or anticipated at Lower Subase during implementation of alternative. Removal of impacted soil would reduce/eliminate potential for COC migration. Risks to onsite receptors during remedial work would be minimized through proper construction and engineering safety practices. Signage would be protective by limiting zone access.	No significant risks to onsite ecological receptors are present or anticipated at Lower Subase during implementation of alternative. Removal of impacted soil would reduce/eliminate potential for COC migration. Risks to onsite receptors during remedial work would be minimized through proper construction and engineering safety practices. Signage would be protective by limiting zone access.	No significant risks to onsite ecological receptors are present or anticipated at Lower Subase during implementation of alternative. Treatment of impacted soil would reduce/eliminate potential for COC migration. Proper safety controls would reduce/eliminate potential for COC migration and potential impact to onsite receptors.
<b>COMPLIANCE WITH APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS</b>				
Chemical-specific	Would not achieve because no action specified.	Would achieve compliance with PMCs, for soil. Institutional controls would address residual COCs in soil.	Would achieve compliance with PMCs, for soil. Institutional controls would address residual COCs in soil.	Would achieve compliance with PMCs, for soil. Institutional controls would address residual COCs in soil.
Location-specific	Not applicable because no action specified.	Would be conducted in accordance with requirements.	Would be conducted in accordance with requirements.	Would be conducted in accordance with requirements.
Action-specific	Not applicable because no action specified.	Would be conducted in accordance with requirements.	Would be conducted in accordance with requirements.	Would be conducted in accordance with requirements.
NOTE: COC = Constituents of concern. ELUR = Environmental land use restriction. PRG = Preliminary Remediation Goals. PMC = Pollutant Mobility Criteria.				

Criteria	Alternative 1 No Action	Alternative 2 Selective Excavation, Offsite Disposal, and Institutional Controls	Alternative 3 Selective Excavation, <i>Ex Situ</i> Soil Washing, Offsite Disposal, and Institutional Controls	Alternative 4 <i>In Situ</i> Soil Vapor Extraction, and Institutional Controls
<b>LONG-TERM EFFECTIVENESS AND PERMANENCE</b>				
Magnitude of residual risk	Current risks would remain.	Excavation of COC-containing soil to industrial cleanup goals would minimize/eliminate residual risk at Lower Subase for the long term. Proper disposal of the affected soil at a licensed TSDF would provide long-term protection to the environment and human health at large. Long-term risks at the site from residual COCs would be adequately addressed through institutional controls.	Excavation of COC-containing soil to industrial cleanup goals would minimize/eliminate residual risk at Lower Subase for the long term. Proper disposal of the treated soil at a licensed TSDF would provide long-term protection to the environment and human health at large. Long-term risks at the site from residual COCs would be adequately addressed through institutional controls.	Treatment of COC-containing soil to industrial cleanup goals would minimize/eliminate residual risk at Lower Subase for the long term. Proper treatment would provide long-term protection to the environment and human health at large. Long-term risks at the site from residual COCs would be adequately addressed through institutional controls.
Adequacy and reliability of controls	Not applicable because no controls are specified.	Active strategy. Selective excavation and disposal of impacted soil would be a reliable method to mitigate COCs above the industrial cleanup goals. Institutional controls would be reliable and suitable to control access and activity at the site. Site planned to remain for industrial use for Naval Submarine Base, New London, Connecticut.	Active strategy. Selective excavation and treatment/disposal would be a reliable method to mitigate COCs above the industrial cleanup goals. Institutional controls would be reliable and suitable to control access and activity at the site. Site planned to remain for industrial use for Naval Submarine Base, New London, Connecticut.	Active strategy. <i>In situ</i> treatment of impacted soils would be a reliable method to mitigate COCs above the industrial cleanup goals. Institutional controls would be reliable and suitable to control access and activity at the site. Site planned to remain for industrial use for Naval Submarine Base, New London, Connecticut.
<b>REDUCTION OF TOXICITY, MOBILITY, AND VOLUME THROUGH TREATMENT</b>				
Treatment processes used and materials treated	No treatment included.	Selected soil would be excavated and disposed of at an offsite, licensed facility. Any necessary treatment of the disposed soil will be determined by the TSDF.	Selected soil would be excavated, treated through a method of soil washing, and disposed of at an offsite, licensed facility.	Impacted soil would be treated in place through the use of <i>in situ</i> soil vapor extraction.
Hazardous material destroyed or treated	No treatment included. Natural attenuation of COCs in soil and sediment would occur, but would not be verified.	Soil with COCs above industrial cleanup goals would be disposed at offsite, licensed TSDF, with any necessary treatment to be determined and conducted by disposal facility.	Soil with COCs above industrial cleanup goals would be treated by soil washing and the treated soil would be disposed of at an offsite, licensed TSDF.	Soil with COCs above industrial cleanup goals would be treated in place through the use of <i>in situ</i> soil vapor extraction.
Type and quantity of residuals remaining after treatment	No treatment included. Natural attenuation of COCs in soil and sediment would occur, but would not be verified.	All efforts will be made to ensure selective excavation would be complete and no residual affected soil would remain at Lower Subase. Excavated material would be disposed/treated offsite.	All efforts will be made to ensure selective excavation would be complete and no residual affected soil would remain at Lower Subase. Excavated material would be disposed/treated offsite.	All efforts will be made to ensure the treatment of soils would be complete and no residual affected soil would remain at Lower Subase.
Degree to which treatment is irreversible	No treatment included.	Excavation and offsite treatment/ disposal of impacted soil would be irreversible.	Excavation, treatment through soil washing, and offsite disposal of impacted soil would be irreversible.	Treatment of impacted soil would be irreversible.
Statutory preference for treatment	Does not satisfy.	Satisfies, if impacted soil is treated at offsite TSDF. Does not satisfy, if excavated soil is disposed without treatment.	Satisfies, if excavation and soil washing is selected.	Satisfies, if treatment through <i>in situ</i> soil vapor extraction is selected.
NOTE: COC = Constituents of concern. ELUR = Environmental land use restriction. PRG = Preliminary Remediation Goals. PMC = Pollutant Mobility Criteria.				
<b>SHORT-TERM EFFECTIVENESS</b>				
Protection of site workers	No new risks to site workers.	Engineered safety controls would address potential risks to site workers during remedial activities.	Engineered safety controls would address potential risks to site workers during remedial activities.	Engineered safety controls would address potential risks to site workers during remedial activities.
Protection of community	No new risks to the community.	Engineered safety controls would address potential risks to the community during remedial activities.	Engineered safety controls would address potential risks to the community during remedial activities.	Engineered safety controls would address potential risks to the community during remedial activities.
Time to achieve remedial goals	Remedial goals would not be achieved.	Remedial time required will be highly dependent on complexity of excavation due to proximity to underground utilities and structures. Excavation at this zone (with 1 impacted site) would likely be completed within a relatively short time. Transport of excavated soil to an offsite TSDF, which would likely take place after stockpiling soil in order to accumulate an adequate volume of impacted soil, would require additional time. Institutional controls (including ELUR) would immediately address the risks.	Remedial time required will be highly dependent on complexity of excavation due to proximity to underground utilities and structures. Excavation at this zone (with 1 impacted site) would likely be completed within a relatively short time. Onsite treatment and subsequent transport of excavated soil to an offsite TSDF, which would likely take place after stockpiling soil in order to accumulate an adequate volume of impacted soil, would require additional time. Institutional controls (including ELUR) would immediately address the risks.	<i>In situ</i> soil vapor extraction is a long-term treatment technology and is expected to take some time to adequately treat impacted soils. Institutional controls (including ELUR) would immediately address the risks during the treatment process.

Criteria	Alternative 1 No Action	Alternative 2 Selective Excavation, Offsite Disposal, and Institutional Controls	Alternative 3 Selective Excavation, <i>Ex Situ</i> Soil Washing, Offsite Disposal, and Institutional Controls	Alternative 4 <i>In Situ</i> Soil Vapor Extraction, and Institutional Controls
<b>IMPLEMENTABILITY</b>				
Ability to construct and operate	No action specified.	Readily implemented	Moderately impacted by Naval Base activities and schedules.	Moderately impacted by Naval Base activities and schedules.
Ease of conducting other actions, if needed	Other actions readily implementable.	Other actions readily implementable.	Other actions readily implementable.	Other actions readily implementable.
Ability to monitor effectiveness	Status of COC verified through monitoring and 5-year reviews.	Effectiveness readily verified through monitoring and 5-year reviews.	Effectiveness readily verified through monitoring and 5-year reviews.	Effectiveness readily verified through monitoring and 5-year reviews.
Ability to obtain approvals and coordinate with other agencies	Unlikely to receive approval because COCs will remain which exceed Connecticut PMCs would not be addressed.	Likely to receive regulatory approval because impacted soil would be removed and risks associated with COC concentrations would be mitigated. Institutional controls would address site risks.	Likely to receive regulatory approval because impacted soil would be treated and removed so that risks associated with COC concentrations would be mitigated. Institutional controls would address site risks.	Likely to receive regulatory approval because impacted soil would be treated so that risks associated with COC concentrations would be mitigated. Institutional controls would address site risks.
Availability of materials and services	Not applicable because no actions included.	Readily available.	Readily available.	Readily available.
<b>COST</b>				
Capital Cost	\$0	\$92,500	\$177,100	\$66,700
Annual Operation and Maintenance Costs (Years 1-30)	\$3,300	\$11,600	\$11,600	\$41,600
Total 30-Year Present Worth Cost <sup>(a)</sup>	\$68,200	\$333,500	\$418,200	\$930,400
(a) Calculated at a 5 percent discount rate.				

**TABLE 10-3 ASSESSMENT OF CHEMICAL-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS  
AND TO BE CONSIDERED GUIDANCE FOR  
ALTERNATIVE 1 – NO ACTION  
ZONE 7, LOWER SUBBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT**

Requirement	Citation	Status	Synopsis of Requirement	Action to Be Taken to Attain Relevant and Appropriate Requirement
<b>FEDERAL</b>				
Cancer Slope Factors		To Be Considered	These are guidance values used in risk assessment to evaluate the potential carcinogenic hazards caused by exposure to contaminants.	The No Action Alternative would provide no protection from risk posed by contaminants in the soil.
Reference Dose		To Be Considered	These are guidance values used in risk assessment to evaluate the potential non-carcinogenic hazards caused by exposure to contaminants.	The No Action Alternative would provide no protection from risk posed by contaminants in the soil.
<b>STATE OF CONNECTICUT</b>				
Remediation Standard Regulations	CGS 22a-133k; RCSA 22a-133k-1 through 3	Applicable	These regulations establish direct exposure and pollutant mobility criteria for contaminated soils.	The No Action Alternative does not satisfy state standards for either site remediation nor for sufficient engineering controls to prevent risk to human health and the environment.
NOTE: CGS = Connecticut General Statutes. RCSA = Regulations of Connecticut State Agencies.				

**TABLE 10-4 ASSESSMENT OF LOCATION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND TO BE CONSIDERED GUIDANCE FOR ALTERNATIVE 1 – NO ACTION ZONE 7, LOWER SUBBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT**

Requirement	Citation	Status	Synopsis of Requirement	Action to Be Taken to Attain Applicable or Relevant and Appropriate Requirement
<b>FEDERAL</b>				
There are no federal location-specific applicable or relevant and appropriate requirements.				
<b>STATE OF CONNECTICUT</b>				
There are no state location-specific applicable or relevant and appropriate requirements.				

**TABLE 10-5 ASSESSMENT OF ACTION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND TO BE CONSIDERED GUIDANCE FOR ALTERNATIVE 1 – NO ACTION ZONE 7, LOWER SUBBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT**

Requirement	Citation	Status	Synopsis of Requirement	Evaluation/Action to be Taken to Attain Applicable or Relevant and Appropriate Requirement
<b>STATE OF CONNECTICUT</b>				
Connecticut Hazardous Waste Management Regulations	RCSA 22a-449(c)100 through 110	Applicable	The Connecticut Hazardous Waste Management Regulations incorporate by reference the essential sections of the Code of Federal Regulations covering the Resource Conservation and Recovery Act. Any regulated waste identified must be remediated in accordance with these regulations.	The regulations stipulate that any identified hazardous waste and associated media must either be capped or treated, or removed and disposed in a permitted hazardous waste landfill. This alternative would not comply with the requirements set forth in these regulations.
<p>NOTE: RCSA = Regulations of Connecticut State Agencies.  CGS = Connecticut General Statutes.</p>				

**TABLE 10-6 ASSESSMENT OF CHEMICAL-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND TO BE CONSIDERED GUIDANCE FOR ALTERNATIVE 2 – SELECTIVE EXCAVATION, OFFSITE DISPOSAL, AND INSTITUTIONAL CONTROLS ZONE 7, LOWER SUBBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT**

Requirement	Citation	Status	Synopsis of Requirement	Action to Be Taken to Attain Applicable or Relevant and Appropriate Requirement
<b>FEDERAL</b>				
Cancer Slope Factors		To Be Considered	These are guidance values used in risk assessment to evaluate the potential carcinogenic hazards caused by exposure to contaminants.	The alternative would eliminate exposure to contaminants in soil to industrial standards through excavation and offsite disposal. Institutional controls would prevent residential use, limit exposure to, and minimize mobility of residual COCs.
Reference Dose		To Be Considered	These are guidance values used in risk assessment to evaluate the potential non-carcinogenic hazards caused by exposure to contaminants.	The alternative would eliminate exposure to contaminants in soil to industrial standards through excavation and offsite disposal. Institutional controls would prevent residential use, limit exposure to, and minimize mobility of residual COCs.
<b>STATE OF CONNECTICUT</b>				
Remediation Standard Regulations	CGS 22a-133k; RCSA 22a-133k-1 through 3	Applicable	These regulations establish direct exposure and pollutant mobility criteria for contaminated soils.	The alternative would eliminate exposure to contaminants in the soil to industrial standards through excavation and offsite disposal. Institutional controls would prevent residential use, limit exposure to, and minimize mobility of residual COCs.
NOTE: CGS = Connecticut General Statutes. RCSA = Regulations of Connecticut State Agencies.				

**TABLE 10-7 ASSESSMENT OF LOCATION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND TO BE CONSIDERED GUIDANCE FOR ALTERNATIVE 2 – SELECTIVE EXCAVATION, OFFSITE DISPOSAL, AND INSTITUTIONAL CONTROLS ZONE 7, LOWER SUBBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT**

Requirement	Citation	Status	Synopsis of Requirement	Action to Be Taken to Attain Applicable or Relevant and Appropriate Requirement
<b>FEDERAL</b>				
Clean Water Act, Section 404	33 USC 1344; 40 CFR Part 230 and 33 CFR Parts 320-323	Applicable	These rules regulate the discharge of dredge and fill materials in wetlands and navigable waters. Such discharges are not allowed if practicable alternatives are available. Furthermore, the regulations require that the remedial action is the best practicable alternative to avoiding, minimizing, or mitigating impacts to protected habitats.	Remedial action includes excavation of soil and replacement/restoration with uncontaminated material. All activities associated with excavation will be designed to ensure or minimize impacts to protected habitats. Discharge to the Thames River is not expected during the remedial action. If an accidental discharge does occur, the requirements set forth will be followed to mitigate and monitor any release.
Fish and Wildlife Coordination Act	16 USC Part 661 <i>et. seq.</i> , 40 CFR 122.49	Applicable	This Order protects fish and wildlife when federal actions result in control or structural modification of a natural stream, body of water, floodplains, or flood-prone areas.	Appropriate agencies would be consulted prior to excavation to minimize adverse effects to fish and wildlife from excavating floodplains or flood-prone areas.
<b>STATE OF CONNECTICUT</b>				
Connecticut Coastal Management Act	CGS 22a-444	Applicable	The site is within a coastal zone management area. As a result, activities at the site require a Coastal Site Plan that addresses adverse and beneficial effects of the proposed activities.	Remedial actions at the site are required to comply with the substantive requirements of the Act, but are not required to comply with the formal submissions and local reviews. Local officials will be consulted before activities begin to ensure coastal zone issues are addressed.
Connecticut Endangered Species Act	CGS 26-303 through 315	Applicable	Remedial actions may not jeopardize the continued existence of state-listed endangered or threatened species, or adversely modify or destroy their habitat.	Before remedial actions occur, the NSB-NLON Natural Resources Manager will be notified. The Natural Resources Manager will determine whether additional surveys must be completed prior to remedial actions. In addition, state officials will be consulted prior to any activities.
<p>NOTE: USC = United States Code.  CFR = Code of Federal Regulations.  CGS = Connecticut General Statutes.  RCSA = Regulations of Connecticut State Agencies.</p>				

**TABLE 10-8 ASSESSMENT OF ACTION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND TO BE CONSIDERED GUIDANCE FOR ALTERNATIVE 2 – SELECTIVE EXCAVATION, OFFSITE DISPOSAL, AND INSTITUTIONAL CONTROLS ZONE 7, LOWER SUBBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT**

Requirement	Citation	Status	Synopsis of Requirement	Evaluation/Action to be Taken to Attain Applicable or Relevant and Appropriate Requirement
<b>STATE OF CONNECTICUT</b>				
Connecticut Hazardous Waste Management Regulations	RCSA 22a-449(c)100 through 110	Applicable	The Connecticut Hazardous Waste Management Regulations incorporate by reference the essential sections of the Code of Federal Regulations covering the Resource Conservation and Recovery Act. Any regulated waste identified must be remediated in accordance with these regulations.	Lead contaminated soil identified as characteristic hazardous waste will be excavated and disposed at a licensed, hazardous waste TSDF. All substantive requirements set forth in these regulations concerning the excavation and storage of hazardous waste onsite will be followed. All waste transported and disposed offsite will be done in accordance with these regulations and permitted.
Connecticut Air Pollution Control Act	RCSA 22a-174	Relevant and Appropriate	These regulations establish ambient air quality standards and emission limitations/standards.	Air monitoring will occur during excavation activities. All site emissions will be kept in compliance with this Act.
Connecticut Guidelines for Soil Erosion and Sediment Control	Connecticut Council on Soil and Water Conservation	To Be Considered	Technical and administrative guidance for development, adoption, and implementation of erosion and sediment control program.	All excavation activities, including soil stockpiling, will meet the substantive requirements set forth in this guidance document to minimize runoff and migration of COCs.
NOTE: RCSA = Regulations of Connecticut State Agencies. CGS = Connecticut General Statutes.				

**TABLE 10-9 ASSESSMENT OF CHEMICAL-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND TO BE CONSIDERED GUIDANCE FOR ALTERNATIVE 3 – SELECTIVE EXCAVATION, OFFSITE DISPOSAL, CAPPING, AND INSTITUTIONAL CONTROLS ZONE 7, LOWER SUBBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT**

Requirement	Citation	Status	Synopsis of Requirement	Action to Be Taken to Attain Applicable or Relevant and Appropriate Requirement
<b>FEDERAL</b>				
Cancer Slope Factors		To Be Considered	These are guidance values used in risk assessment to evaluate the potential carcinogenic hazards caused by exposure to contaminants.	The alternative would eliminate exposure to contaminants in soil to industrial standards through excavation, offsite disposal, and capping. Institutional controls would prevent residential use and limit construction activities.
Reference Dose		To Be Considered	These are guidance values used in risk assessment to evaluate the potential non-carcinogenic hazards caused by exposure to contaminants.	The alternative would eliminate exposure to contaminants in soil to industrial standards through excavation, offsite disposal, and capping. Institutional controls would prevent residential use and limit construction activities.
<b>STATE OF CONNECTICUT</b>				
Remediation Standard Regulations	CGS 22a-133k; RCSA 22a-133k-1 through 3	Applicable	These regulations establish direct exposure and pollutant mobility criteria for contaminated soils.	The alternative would eliminate exposure to contaminants in the soil to industrial standards through excavation, offsite disposal, and capping. Excavation and offsite disposal would remove contamination from the site. Capping would render any residual or deep soil inaccessible. Institutional controls would prevent residential use and limit construction activities.
NOTE: CGS = Connecticut General Statutes. RCSA = Regulations of Connecticut State Agencies.				

**TABLE 10-10 ASSESSMENT OF LOCATION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND TO BE CONSIDERED GUIDANCE FOR ALTERNATIVE 3 – SELECTIVE EXCAVATION, OFFSITE DISPOSAL, CAPPING, AND INSTITUTIONAL CONTROLS ZONE 7, LOWER SUBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT**

Requirement	Citation	Status	Synopsis of Requirement	Action to Be Taken to Attain Applicable or Relevant and Appropriate Requirement
<b>FEDERAL</b>				
Clean Water Act, Section 404	33 USC 1344; 40 CFR Part 230 and 33 CFR Parts 320-323	Applicable	These rules regulate the discharge of dredge and fill materials in wetlands and navigable waters. Such discharges are not allowed if practicable alternatives are available. Furthermore, the regulations require that the remedial action is the best practicable alternative to avoiding, minimizing, or mitigating impacts to protected habitats.	Remedial action includes excavation of soil and replacement/restoration with uncontaminated material. All activities associated with excavation will be designed to ensure or minimize impacts to protected habitats. Discharge to the Thames River is not expected during the remedial action. If an accidental discharge does occur, the requirements set forth will be followed to mitigate and monitor any release.
Fish and Wildlife Coordination Act	16 USC Part 661 <i>et. seq.</i> , 40 CFR 122.49	Applicable	This Order protects fish and wildlife when federal actions result in control or structural modification of a natural stream, body of water, floodplains, or flood-prone areas.	Appropriate agencies would be consulted prior to excavation to minimize adverse effects to fish and wildlife from excavating floodplains or flood-prone areas.
<b>STATE OF CONNECTICUT</b>				
Connecticut Coastal Management Act	CGS 22a-444	Applicable	The site is within a coastal zone management area. As a result, activities at the site require a Coastal Site Plan that addresses adverse and beneficial effects of the proposed activities.	Remedial actions at the site are required to comply with the substantive requirements of the Act, but are not required to comply with the formal submissions and local reviews. Local officials will be consulted before activities begin to ensure coastal zone issues are addressed.
Connecticut Endangered Species Act	CGS 26-303 through 315	Applicable	Remedial actions may not jeopardize the continued existence of state-listed endangered or threatened species, or adversely modify or destroy their habitat.	Before remedial actions occur, the NSB-NLON Natural Resources Manager will be notified. The Natural Resources Manager will determine whether additional surveys must be completed prior to remedial actions. In addition, state officials will be consulted prior to any activities.
NOTE: USC = United States Code. CFR = Code of Federal Regulations. CGS = Connecticut General Statutes. RCSA = Regulations of Connecticut State Agencies.				

**TABLE 10-11 ASSESSMENT OF ACTION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND TO BE CONSIDERED GUIDANCE FOR ALTERNATIVE 3 – SELECTIVE EXCAVATION, OFFSITE DISPOSAL, CAPPING, AND INSTITUTIONAL CONTROLS ZONE 7, LOWER SUBBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT**

Requirement	Citation	Status	Synopsis of Requirement	Evaluation/Action to be Taken to Attain Applicable or Relevant and Appropriate Requirement
<b>STATE OF CONNECTICUT</b>				
Connecticut Hazardous Waste Management Regulations	RCSA 22a-449(c)100 through 110	Applicable	The Connecticut Hazardous Waste Management Regulations incorporate by reference the essential sections of the Code of Federal Regulations covering the Resource Conservation and Recovery Act. Any regulated waste identified must be remediated in accordance with these regulations.	Lead contaminated soil identified as characteristic hazardous waste will be excavated and disposed at a licensed, hazardous waste TSDF. All substantive requirements set forth in these regulations concerning the excavation and storage of hazardous waste onsite will be followed. All waste transported and disposed offsite will be done in accordance with these regulations and permitted.
Connecticut Air Pollution Control Act	RCSA 22a-174	Relevant and Appropriate	These regulations establish ambient air quality standards and emission limitations/standards.	Air monitoring will occur during excavation activities. All site emissions will be kept in compliance with this Act.
Connecticut Guidelines for Soil Erosion and Sediment Control	Connecticut Council on Soil and Water Conservation	To Be Considered	Technical and administrative guidance for development, adoption, and implementation of erosion and sediment control program.	All excavation activities, including soil stockpiling, will meet the substantive requirements set forth in this guidance document to minimize runoff and migration of COCs.
NOTE: RCSA = Regulations of Connecticut State Agencies. CGS = Connecticut General Statutes.				

**TABLE 10-12 ASSESSMENT OF CHEMICAL-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND TO BE CONSIDERED GUIDANCE FOR ALTERNATIVE 4 – SELECTIVE EXCAVATION, EX SITU STABILIZATION/SOLIDIFICATION, OFFSITE DISPOSAL, CAPPING, AND INSTITUTIONAL CONTROLS ZONE 7, LOWER SUBBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT**

Requirement	Citation	Status	Synopsis of Requirement	Action to Be Taken to Attain Applicable or Relevant and Appropriate Requirement
<b>FEDERAL</b>				
Cancer Slope Factors		To Be Considered	These are guidance values used in risk assessment to evaluate the potential carcinogenic hazards caused by exposure to contaminants.	The alternative would eliminate exposure to contaminants in soil to industrial standards through excavation, chemical and physical soil treatment, offsite disposal, and capping. Institutional controls would prevent residential use, limit exposure to, and minimize mobility of residual COCs.
Reference Dose		To Be Considered	These are guidance values used in risk assessment to evaluate the potential non-carcinogenic hazards caused by exposure to contaminants.	The alternative would eliminate exposure to contaminants in soil to industrial standards through excavation, chemical and physical soil treatment, offsite disposal, and capping. Institutional controls would prevent residential use, limit exposure to, and minimize mobility of residual COCs.
<b>STATE OF CONNECTICUT</b>				
Remediation Standard Regulations	CGS 22a-133k; RCSA 22a-133k-1 through 3	Applicable	These regulations establish direct exposure and pollutant mobility criteria for contaminated soils.	The alternative would eliminate exposure to contaminants in the soil to industrial standards through excavation, offsite disposal, and capping. Excavation, chemical and physical soil treatment, and offsite disposal would treat and remove contaminated soil from the site. Capping would render any residual or deep soil inaccessible. Institutional controls would prevent residential use, limit exposure to, and minimize mobility of residual COCs.
NOTE: CGS = Connecticut General Statutes. RCSA = Regulations of Connecticut State Agencies.				

**TABLE 10-13 ASSESSMENT OF LOCATION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND TO BE CONSIDERED GUIDANCE FOR ALTERNATIVE 4 – SELECTIVE EXCAVATION, EX SITU STABILIZATION/SOLIDIFICATION, OFFSITE DISPOSAL, CAPPING, AND INSTITUTIONAL CONTROLS ZONE 7, LOWER SUBBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT**

Requirement	Citation	Status	Synopsis of Requirement	Action to Be Taken to Attain Applicable or Relevant and Appropriate Requirement
<b>FEDERAL</b>				
Clean Water Act, Section 404	33 USC 1344; 40 CFR Part 230 and 33 CFR Parts 320-323	Applicable	These rules regulate the discharge of dredge and fill materials in wetlands and navigable waters. Such discharges are not allowed if practicable alternatives are available. Furthermore, the regulations require that the remedial action is the best practicable alternative to avoiding, minimizing, or mitigating impacts to protected habitats.	Remedial action includes excavation of soil and replacement/restoration with uncontaminated material. All activities associated with excavation will be designed to ensure or minimize impacts to protected habitats. Discharge to the Thames River is not expected during the remedial action. If an accidental discharge does occur, the requirements set forth will be followed to mitigate and monitor any release.
Fish and Wildlife Coordination Act	16 USC Part 661 <i>et. seq.</i> , 40 CFR 122.49	Applicable	This Order protects fish and wildlife when federal actions result in control or structural modification of a natural stream, body of water, floodplains, or flood-prone areas.	Appropriate agencies would be consulted prior to excavation to minimize adverse effects to fish and wildlife from excavating floodplains or flood-prone areas.
<b>STATE OF CONNECTICUT</b>				
Connecticut Coastal Management Act	CGS 22a-444	Applicable	The site is within a coastal zone management area. As a result, activities at the site require a Coastal Site Plan that addresses adverse and beneficial effects of the proposed activities.	Remedial actions at the site are required to comply with the substantive requirements of the Act, but are not required to comply with the formal submissions and local reviews. Local officials will be consulted before activities begin to ensure coastal zone issues are addressed.
Connecticut Endangered Species Act	CGS 26-303 through 315	Applicable	Remedial actions may not jeopardize the continued existence of state-listed endangered or threatened species, or adversely modify or destroy their habitat.	Before remedial actions occur, the NSB-NLON Natural Resources Manager will be notified. The Natural Resources Manager will determine whether additional surveys must be completed prior to remedial actions. In addition, state officials will be consulted prior to any activities.
NOTE: USC = United States Code. CFR = Code of Federal Regulations. CGS = Connecticut General Statutes. RCSA = Regulations of Connecticut State Agencies.				

**TABLE 10-14 ASSESSMENT OF ACTION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND TO BE CONSIDERED GUIDANCE FOR ALTERNATIVE 4 – SELECTIVE EXCAVATION, EX SITU SOIL WASHING, EX SITU STABILIZATION/SOLIDIFICATION, OFFSITE DISPOSAL, CAPPING, AND INSTITUTIONAL CONTROLS ZONE 7, LOWER SUBBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT**

Requirement	Citation	Status	Synopsis of Requirement	Evaluation/Action to be Taken to Attain Applicable or Relevant and Appropriate Requirement
<b>STATE OF CONNECTICUT</b>				
Connecticut Hazardous Waste Management Regulations	RCSA 22a-449(c)100 through 110	Applicable	The Connecticut Hazardous Waste Management Regulations incorporate by reference the essential sections of the Code of Federal Regulations covering the Resource Conservation and Recovery Act. Any regulated waste identified must be remediated in accordance with these regulations.	Lead contaminated soil identified as characteristic hazardous waste will be excavated and disposed at a licensed, hazardous waste TSDF. All substantive requirements set forth in these regulations concerning the excavation and storage of hazardous waste onsite will be followed. The hazardous waste will be rendered non-hazardous through stabilization/solidification. As a result, these regulations are not applicable to waste transportation.
Connecticut Air Pollution Control Act	RCSA 22a-174	Relevant and Appropriate	These regulations establish ambient air quality standards and emission limitations/standards.	Air monitoring will occur during excavation. Excavation activities may produce fugitive dusts and vapors that will be monitored at all times. All site emissions will be kept in compliance with this Act.
Connecticut Guidelines for Soil Erosion and Sediment Control	Connecticut Council on Soil and Water Conservation	To Be Considered	Technical and administrative guidance for development, adoption, and implementation of erosion and sediment control program.	All excavation activities, including soil stockpiling, will meet the substantive requirements set forth in this guidance document to minimize runoff and migration of COCs.
NOTE: RCSA = Regulations of Connecticut State Agencies. CGS = Connecticut General Statutes.				

**TABLE 10-15 ASSESSMENT OF CHEMICAL-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND TO BE CONSIDERED GUIDANCE FOR ALTERNATIVE 5 – SELECTIVE EXCAVATION, EX SITU SOIL WASHING, EX SITU CHEMICAL REDUCTION-OXIDATION, OFFSITE DISPOSAL, IN SITU SOIL VAPOR EXTRACTION, AND INSTITUTIONAL CONTROLS ZONE 7, LOWER SUBBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT**

Requirement	Citation	Status	Synopsis of Requirement	Action to Be Taken to Attain Applicable or Relevant and Appropriate Requirement
<b>FEDERAL</b>				
Cancer Slope Factors		To Be Considered	These are guidance values used in risk assessment to evaluate the potential carcinogenic hazards caused by exposure to contaminants.	The alternative would eliminate exposure to contaminants in soil to industrial standards through excavation, chemical and physical soil treatment, and offsite disposal. Soil vapor extraction would remediate deep soils. Institutional controls would prevent future residential use and limit construction activities.
Reference Dose		To Be Considered	These are guidance values used in risk assessment to evaluate the potential non-carcinogenic hazards caused by exposure to contaminants.	The alternative would eliminate exposure to contaminants in soil to industrial standards through excavation, chemical and physical soil treatment, and offsite disposal. Soil vapor extraction would remediate deep soils. Institutional controls would prevent future residential use and limit construction activities.
<b>STATE OF CONNECTICUT</b>				
Remediation Standard Regulations	CGS 22a-133k; RCSA 22a-133k-1 through 3	Applicable	These regulations establish direct exposure and pollutant mobility criteria for contaminated soils.	The alternative would eliminate exposure to contaminants in the soil to industrial standards through excavation, chemical and physical soil treatment, and offsite disposal. Soil vapor extract would remediate deep soils. Institutional controls would prevent future residential use and limit construction activities.
NOTE: CGS = Connecticut General Statutes. RCSA = Regulations of Connecticut State Agencies.				

TABLE 10-16 ASSESSMENT OF LOCATION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND TO BE CONSIDERED GUIDANCE FOR ALTERNATIVE 5 – SELECTIVE EXCAVATION, EX SITU SOIL WASHING, EX SITU CHEMICAL REDUCTION-OXIDATION, OFFSITE DISPOSAL, IN SITU SOIL VAPOR EXTRACTION, AND INSTITUTIONAL CONTROLS ZONE 7, LOWER SUBBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT

Requirement	Citation	Status	Synopsis of Requirement	Action to Be Taken to Attain Applicable or Relevant and Appropriate Requirement
<b>FEDERAL</b>				
Clean Water Act, Section 404	33 USC 1344; 40 CFR Part 230 and 33 CFR Parts 320-323	Applicable	These rules regulate the discharge of dredge and fill materials in wetlands and navigable waters. Such discharges are not allowed if practicable alternatives are available. Furthermore, the regulations require that the remedial action is the best practicable alternative to avoiding, minimizing, or mitigating impacts to protected habitats.	Remedial action includes excavation of soil and replacement/restoration with uncontaminated material. All activities associated with excavation will be designed to ensure or minimize impacts to protected habitats. Discharge to the Thames River is not expected during the remedial action. If an accidental discharge does occur, the requirements set forth will be followed to mitigate and monitor any release.
Fish and Wildlife Coordination Act	16 USC Part 661 <i>et. seq.</i> , 40 CFR 122.49	Applicable	This Order protects fish and wildlife when federal actions result in control or structural modification of a natural stream, body of water, floodplains, or flood-prone areas.	Appropriate agencies would be consulted prior to excavation to minimize adverse effects to fish and wildlife from excavating floodplains or flood-prone areas.
<b>STATE OF CONNECTICUT</b>				
Connecticut Coastal Management Act	CGS 22a-444	Applicable	The site is within a coastal zone management area. As a result, activities at the site require a Coastal Site Plan that addresses adverse and beneficial effects of the proposed activities.	Remedial actions at the site are required to comply with the substantive requirements of the Act, but are not required to comply with the formal submissions and local reviews. Local officials will be consulted before activities begin to ensure coastal zone issues are addressed.
Connecticut Endangered Species Act	CGS 26-303 through 315	Applicable	Remedial actions may not jeopardize the continued existence of state-listed endangered or threatened species, or adversely modify or destroy their habitat.	Before remedial actions occur, the NSB-NLON Natural Resources Manager will be notified. The Natural Resources Manager will determine whether additional surveys must be completed prior to remedial actions. In addition, state officials will be consulted prior to any activities.
NOTE: USC = United States Code. CFR = Code of Federal Regulations. CGS = Connecticut General Statutes. RCSA = Regulations of Connecticut State Agencies.				

**TABLE 10-17 ASSESSMENT OF ACTION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND TO BE CONSIDERED GUIDANCE FOR ALTERNATIVE 5 – SELECTIVE EXCAVATION, EX SITU SOIL WASHING, EX SITU CHEMICAL REDUCTION-OXIDATION, OFFSITE DISPOSAL, IN SITU SOIL VAPOR EXTRACTION, AND INSTITUTIONAL CONTROLS ZONE 7, LOWER SUBBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT**

Requirement	Citation	Status	Synopsis of Requirement	Evaluation/Action to be Taken to Attain Applicable or Relevant and Appropriate Requirement
<b>STATE OF CONNECTICUT</b>				
Connecticut Hazardous Waste Management Regulations	RCSA 22a-449(c)100 through 110	Applicable	The Connecticut Hazardous Waste Management Regulations incorporate by reference the essential sections of the Code of Federal Regulations covering the Resource Conservation and Recovery Act. Any regulated waste identified must be remediated in accordance with these regulations.	Lead contaminated soil, identified as characteristic hazardous waste, will be excavated and stockpiled in accordance with these regulations. The hazardous waste will be treated, so that it is no longer considered hazardous waste. As a result, the transportation and disposal of site waste does not have to follow these regulations.
Connecticut Air Pollution Control Act	RCSA 22a-174	Relevant and Appropriate	These regulations establish ambient air quality standards and emission limitations/standards.	Air monitoring will occur during excavation, soil washing, and soil vapor extraction activities. Excavation activities may produce fugitive dusts and vapors that will be monitored at all times. Vapor collection may be necessary during soil washing activities depending upon final solutions employed. The soil vapor extraction unit will have emission of extracted gases. The unit will be designed with off-gas treatment, if necessary. All site emissions will be kept in compliance with this Act.
Connecticut Guidelines for Soil Erosion and Sediment Control	Connecticut Council on Soil and Water Conservation	To Be Considered	Technical and administrative guidance for development, adoption, and implementation of erosion and sediment control program.	All excavation activities, including soil stockpiling, will meet the substantive requirements set forth in this guidance document to minimize runoff and migration of COCs.
NOTE: RCSA = Regulations of Connecticut State Agencies. CGS = Connecticut General Statutes.				

TABLE 10-18 SUMMARY OF COMPARATIVE ANALYSIS OF REMEDIAL ALTERNATIVES FOR ZONE 7  
LOWER SUBBASE, NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT

Criteria	Alternative 1 No Action	Alternative 2 Selective Excavation, Offsite Disposal, and Institutional Controls	Alternative 3 Selective Excavation, Offsite Disposal, Capping, and Institutional Controls	Alternative 4 Selective Excavation, <i>Ex Situ</i> Stabilization/Solidification, Offsite Disposal, Capping, and Institutional Controls	Alternative 5 Selective Excavation, <i>Ex Situ</i> Soil Washing, <i>Ex Situ</i> Chemical Reduction-Oxidation, Offsite Disposal, <i>In Situ</i> Soil Vapor Extraction, and Institutional Controls
<b>OVERALL PROTECTIVENESS – HUMAN HEALTH</b>					
Exposure to COCs in soil	Would not address.	Soil with COCs above ICDECs, 10 <sup>-5</sup> Risk-Based PRGs, and State Dilution-Adjusted PMCs would be excavated and disposed offsite, which would remove associated risks to human health. Risks to remedial phase workers would be minimized through proper construction and engineering safety practices. Signage would be protective limiting zone access. Institutional controls (ELUR) would control employee/site worker exposure beneath pavement, prevent future residential site use, and provide protection through amendments if property was transferred.	Soil with COCs above the 10 <sup>-5</sup> Risk-Based PRGs and State Dilution-Adjusted PMCs would be excavated and disposed offsite, which would remove associated risks to human health. Soil with COCs above the state ICDECs will be capped to prevent exposure risk to human health. Risks to remedial phase workers would be minimized through proper construction and engineering safety practices. Signage would be protective limiting zone access. Institutional controls (ELUR) would control employee/site worker exposure beneath pavement, prevent future residential site use, and provide protection through amendments if property was transferred.	Soil with COCs above the 10 <sup>-5</sup> Risk-Based PRGs and State Dilution-Adjusted PMCs would be excavated, treated, and disposed offsite, which would remove associated risks to human health. Soil with COCs above the state ICDECs will be capped to prevent exposure risk to human health. Risks to remedial phase workers would be minimized through proper construction and engineering safety practices. Signage would be protective limiting zone access. Institutional controls (ELUR) would control employee/site worker exposure beneath pavement, prevent future residential site use, and provide protection through amendments if property was transferred.	Soil with COCs above the 10 <sup>-5</sup> Risk-Based PRGs and State Dilution-Adjusted PMCs would be excavated, treated, and disposed offsite, which would remove associated risks to human health. Soil with COCs above the state ICDECs will be treated <i>in situ</i> to minimize/eliminate potential associated risks to human health and migration of COCs at Lower Subbase. Risks to remedial phase workers would be minimized through proper construction and engineering safety practices. Signage would be protective limiting zone access. Institutional controls (ELUR) would control employee/site worker exposure beneath pavement, prevent future residential site use, and provide protection through amendments if property was transferred.
<b>OVERALL PROTECTIVENESS – ENVIRONMENT</b>					
Potential offsite receptors	Would not address; however, no significant risks to offsite ecological receptors at Lower Subbase are present.	No significant risks to offsite ecological receptors are present or anticipated at Lower Subbase during implementation of alternative. Removal of soil with COC concentrations above the zone's cleanup goals would reduce/eliminate potential for COC migration. Proper safety controls would reduce/eliminate potential impact to offsite receptors.	No significant risks to offsite ecological receptors are present or anticipated at Lower Subbase during implementation of alternative. Removal and capping of soil with COC concentrations above the zone's cleanup goals would reduce/eliminate potential for COC migration. Proper safety controls would reduce/eliminate potential impact to offsite receptors.	No significant risks to offsite ecological receptors are present or anticipated at Lower Subbase during implementation of alternative. Removal, treatment, and capping of soil with COC concentrations above the zone's cleanup goals would reduce/eliminate potential for COC migration. Proper safety controls would reduce/eliminate potential impact to offsite receptors.	No significant risks to offsite ecological receptors are present or anticipated at Lower Subbase during implementation of alternative. Removal and treatment of soil with COC concentrations above the zone's cleanup goals would reduce/eliminate potential for COC migration. Proper safety controls would reduce/eliminate potential impact to offsite receptors.
Potential onsite receptors	Would not address; however, no significant risks to onsite ecological receptors at Lower Subbase are present.	No significant risks to onsite ecological receptors are present or anticipated at Lower Subbase during implementation of alternative. Removal of impacted soil would reduce/eliminate potential for COC migration. Risks to onsite receptors during remedial work would be minimized through proper construction and engineering safety practices. Signage would be protective by limiting zone access.	No significant risks to onsite ecological receptors are present or anticipated at Lower Subbase during implementation of alternative. Removal and capping of impacted soil quantities would reduce/eliminate potential for COC migration. Proper safety controls would reduce/eliminate potential for COC migration and potential impact to onsite receptors. ELUR would address COCs in soil above residential cleanup goals.	No significant risks to onsite ecological receptors are present or anticipated at Lower Subbase during implementation of alternative. Removal, treatment and capping of impacted soil quantities would reduce/eliminate potential for COC migration. Proper safety controls would reduce/eliminate potential for COC migration and potential impact to onsite receptors. ELUR would address COCs in soil above residential cleanup goals.	No significant risks to onsite ecological receptors are present or anticipated at Lower Subbase during implementation of alternative. Removal and treatment of impacted soil quantities would reduce/eliminate potential for COC migration. Proper safety controls would reduce/eliminate potential for COC migration and potential impact to onsite receptors. ELUR would address COCs in soil above residential cleanup goals.
<b>COMPLIANCE WITH APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS</b>					
Chemical-specific	Would not achieve because no action specified.	Would achieve compliance with ICDECs, 10 <sup>-5</sup> Risk-Based PRGs, and Dilution-Adjusted PMCs, for soil. Institutional controls would address residual COCs in soil.	Would achieve compliance with ICDECs, 10 <sup>-5</sup> Risk-Based PRGs, and Dilution-Adjusted PMCs, for soil. Institutional controls would address residual COCs in soil.	Would achieve compliance with ICDECs, 10 <sup>-5</sup> Risk-Based PRGs, and Dilution-Adjusted PMCs, for soil. Institutional controls would address residual COCs in soil.	Would achieve compliance with ICDECs, 10 <sup>-5</sup> Risk-Based PRGs, and Dilution-Adjusted PMCs, for soil. Institutional controls would address residual COCs in soil.
Location-specific	Not applicable because no action specified.	Would be conducted in accordance with requirements.	Would be conducted in accordance with requirements.	Would be conducted in accordance with requirements.	Would be conducted in accordance with requirements.
Action-specific	Not applicable because no action specified.	Would be conducted in accordance with requirements.	Would be conducted in accordance with requirements.	Would be conducted in accordance with requirements.	Would be conducted in accordance with requirements.
NOTE: COC = Constituents of concern. ELUR = Environmental land use restriction. PRG = Preliminary Remediation Goals. PMC = Pollutant Mobility Criteria.					

10260617

Criteria	Alternative 1 No Action	Alternative 2 Selective Excavation, Offsite Disposal, and Institutional Controls	Alternative 3 Selective Excavation, Offsite Disposal, Capping, and Institutional Controls	Alternative 4 Selective Excavation, <i>Ex Situ</i> Stabilization/Solidification, Offsite Disposal, Capping, and Institutional Controls	Alternative 5 Selective Excavation, <i>Ex Situ</i> Soil Washing, <i>Ex Situ</i> Chemical Reduction-Oxidation, Offsite Disposal, <i>In Situ</i> Soil Vapor Extraction, and Institutional Controls
<b>LONG-TERM EFFECTIVENESS AND PERMANENCE</b>					
Magnitude of residual risk	Current risks would remain.	Excavation of COC-containing soil to industrial cleanup goals would minimize/eliminate residual risk at Lower Subbase for the long term. Proper disposal of the affected soil at a licensed TSDF would provide long-term protection to the environment and human health at large. Long-term risks at the site from residual COCs would be adequately addressed through institutional controls.	Excavation and capping of COC-containing soil to industrial cleanup goals would minimize/eliminate residual risk at Lower Subbase for the long term. Proper disposal of the affected soil at a licensed TSDF and proper capping of remaining soil would provide long-term protection to the environment and human health at large. Long-term risks at the site from residual COCs would be adequately addressed through institutional controls.	Excavation and capping of COC-containing soil to industrial cleanup goals would minimize/eliminate residual risk at Lower Subbase for the long term. Proper treatment and disposal of the affected soil at a licensed TSDF and proper capping of remaining soil would provide long-term protection to the environment and human health at large. Long-term risks at the site from residual COCs would be adequately addressed through institutional controls.	Excavation and treatment of COC-containing soil to industrial cleanup goals would minimize/eliminate residual risk at Lower Subbase for the long term. Proper treatment and disposal of the affected soil at a licensed TSDF would provide long-term protection to the environment and human health at large. Long-term risks at the site from residual COCs would be adequately addressed through institutional controls.
Adequacy and reliability of controls	Not applicable because no controls are specified.	Active strategy. Selective excavation and disposal of impacted soil would be a reliable method to mitigate COCs above the industrial cleanup goals. Institutional controls would be reliable and suitable to control access and activity at the site. Site planned to remain for industrial use for Naval Submarine Base, New London, Connecticut.	Active strategy. Selective excavation, capping and disposal would be a reliable method to mitigate COCs above this alternative's industrial cleanup goals. ELUR would be reliable and suitable to control access and activity at the site. Site planned to remain for industrial use for Naval Submarine Base, New London, Connecticut.	Active strategy. Selective excavation, treatment, capping and disposal would be a reliable method to mitigate COCs above this alternative's industrial cleanup goals. ELUR would be reliable and suitable to control access and activity at the site. Site planned to remain for industrial use for Naval Submarine Base, New London, Connecticut.	Active strategy. Selective excavation, treatment, disposal, and <i>in situ</i> treatment would be a reliable method to mitigate COCs above this alternative's industrial cleanup goals. ELUR would be reliable and suitable to control access and activity at the site. Site planned to remain for industrial use for Naval Submarine Base, New London, Connecticut.
<b>REDUCTION OF TOXICITY, MOBILITY, AND VOLUME THROUGH TREATMENT</b>					
Treatment processes used and materials treated	No treatment included.	Selected soil would be excavated and disposed of at an offsite, licensed facility. Any necessary treatment of the disposed soil will be the determined by the TSDF.	Select quantities of soil would be excavated and disposed of at an offsite, licensed facility. Any necessary treatment of the disposed soil will be the determined by the TSDF. The remaining quantity of affected soil onsite would be capped.	Select quantities of soil would be excavated, treated through a method of <i>ex situ</i> stabilization/solidification and disposed of at an offsite, licensed facility. The remaining quantity of affected soil onsite would be capped.	Select quantities of soil would be excavated, treated through a method of <i>ex situ</i> soil washing and/or <i>ex situ</i> chemical reduction-oxidation, and disposed of at an offsite, licensed facility. The remaining quantity of affected soil onsite would be treated <i>in situ</i> via soil vapor extraction.
Hazardous material destroyed or treated	No treatment included. Natural attenuation of COCs in soil and sediment would occur, but would not be verified.	Soil with COCs above industrial cleanup goals would be disposed at offsite, licensed TSDF, with any necessary treatment to be determined and conducted by disposal facility.	Select quantities of soil with COCs above industrial cleanup goals would be disposed at offsite, licensed TSDF, with any necessary treatment to be determined and conducted by disposal facility. The remaining quantity of affected soil onsite would be capped.	Select quantities of soil with COCs above industrial cleanup goals would be treated through a method of <i>ex situ</i> stabilization/solidification and disposed of at an offsite, licensed facility. The remaining quantity of affected soil onsite would be capped.	Select quantities of soil with COCs above industrial cleanup goals would be treated through a method of <i>ex situ</i> soil washing and/or <i>ex situ</i> chemical reduction-oxidation, and disposed of at an offsite, licensed facility. The remaining quantity of affected soil onsite would be treated <i>in situ</i> via soil vapor extraction.
Type and quantity of residuals remaining after treatment	No treatment included. Natural attenuation of COCs in soil and sediment would occur, but would not be verified.	All efforts will be made to ensure selective excavation would be complete and no residual affected soil would remain at Lower Subbase. Excavated material would be disposed/treated offsite.	All efforts will be made to ensure selective excavation would be complete and no residual affected soil would remain at Lower Subbase. Excavated material would be disposed/treated offsite. Impacted inaccessible soil intentionally left in place would be treated via capping.	All efforts will be made to ensure selective excavation would be complete and no residual affected soil would remain at Lower Subbase. Excavated material would be treated and disposed. Impacted inaccessible soil intentionally left in place would be treated via capping.	All efforts will be made to ensure selective excavation would be complete and no residual affected soil would remain at Lower Subbase.
Degree to which treatment is irreversible	No treatment included.	Excavation and offsite treatment/ disposal of impacted soil would be irreversible.	Excavation and offsite treatment/ disposal of impacted soil would be irreversible. Capping of select portion of soil would be reversible.	Excavation, treatment and offsite disposal of impacted soil would be irreversible. Capping of select portion of soil would be reversible.	Excavation, treatment and offsite disposal of impacted soil would be irreversible. <i>In situ</i> treatment of the remaining impacted soils would be irreversible.
Statutory preference for treatment	Does not satisfy.	Satisfies, if impacted soil is treated at offsite TSDF. Does not satisfy, if excavated soil is disposed without treatment.	Satisfies (for a portion of the soil), if excavated soil is treated at offsite TSDF. Does not satisfy, if excavated soil is disposed without treatment. Does not satisfy for soil left in place and capped.	Satisfies (for a portion of the soil), if excavation and stabilization/solidification is selected. Does not satisfy for soil left in place and capped.	Satisfies, if excavation, soil washing, chemical reduction-oxidation, and <i>in situ</i> SVE is selected.
NOTE: COC = Constituents of concern. ELUR = Environmental land use restriction. PRG = Preliminary Remediation Goals. PMC = Pollutant Mobility Criteria.					

Criteria	Alternative 1 No Action	Alternative 2 Selective Excavation, Offsite Disposal, and Institutional Controls	Alternative 3 Selective Excavation, Offsite Disposal, Capping, and Institutional Controls	Alternative 4 Selective Excavation, <i>Ex Situ</i> Stabilization/Solidification, Offsite Disposal, Capping, and Institutional Controls	Alternative 5 Selective Excavation, <i>Ex Situ</i> Soil Washing, <i>Ex Situ</i> Chemical Reduction-Oxidation, Offsite Disposal, <i>In Situ</i> Soil Vapor Extraction, and Institutional Controls
<b>SHORT-TERM EFFECTIVENESS</b>					
Protection of site workers	No new risks to site workers.	Engineered safety controls would address potential risks to site workers during remedial activities.	Engineered safety controls would address potential risks to site workers during remedial activities.	Engineered safety controls would address potential risks to site workers during remedial activities.	Engineered safety controls would address potential risks to site workers during remedial activities.
Protection of community	No new risks to the community.	Engineered safety controls would address potential risks to the community during remedial activities.	Engineered safety controls would address potential risks to the community during remedial activities.	Engineered safety controls would address potential risks to the community during remedial activities.	Engineered safety controls would address potential risks to the community during remedial activities.
Time to achieve remedial goals	Remedial goals would not be achieved.	Remedial time required will be highly dependent on complexity of excavation due to proximity to underground utilities and structures. Excavation at this zone (with 8 impacted sites) would likely be completed within a relatively short time (less than one month). Transport of excavated soil to an offsite TSDF, which would likely take place after stockpiling soil in order to accumulate an adequate volume of impacted soil, would require additional time. Institutional controls (including ELUR) would immediately address the risks.	Remedial time required will be highly dependent on complexity of excavation due to proximity to underground utilities and structures. Excavation at this zone (with 8 impacted sites) would likely be completed within a relatively short time. Transport of excavated soil to an offsite TSDF, which would likely take place after stockpiling soil in order to accumulate an adequate volume of impacted soil, would require additional time. Capping of 2 sites, as proposed, would likely be completed within a relatively short time. Institutional controls (including ELUR) would immediately address the risks.	Remedial time required will be highly dependent on complexity of excavation due to proximity to underground utilities and structures. Excavation at this zone (with 8 impacted sites) would likely be completed within a relatively short time. Onsite treatment and subsequent transport of excavated soil to an offsite TSDF, which would likely take place after stockpiling soil in order to accumulate an adequate volume of impacted soil, would require additional time. Capping of 2 sites, as proposed, would likely be completed within a relatively short time. Institutional controls (including ELUR) would immediately address the risks.	Remedial time required will be highly dependent on complexity of excavation due to proximity to underground utilities and structures. Excavation at this zone (with 4 impacted sites) would likely be completed within a relatively short time. Onsite treatment and subsequent transport of excavated soil to an offsite TSDF, which would likely take place after stockpiling soil in order to accumulate an adequate volume of impacted soil, would require additional time. <i>In situ</i> soil vapor extraction (proposed for 4 sites) is a long-term treatment technology and is expected to take some time to adequately treat impacted soils. Institutional controls (including ELUR) would immediately address the risks.
<b>IMPLEMENTABILITY</b>					
Ability to construct and operate	No action specified.	Readily implemented	Moderately impacted by Naval Base activities and schedules.	Moderately impacted by Naval Base activities and schedules.	Moderately impacted by Naval Base activities and schedules.
Ease of conducting other actions, if needed	Other actions readily implementable.	Other actions readily implementable.	Other actions readily implementable.	Other actions readily implementable.	Other actions readily implementable.
Ability to monitor effectiveness	Status of COC verified through monitoring and 5-year reviews.	Effectiveness readily verified through monitoring and 5-year reviews.	Effectiveness readily verified through monitoring and 5-year reviews.	Effectiveness readily verified through monitoring and 5-year reviews.	Effectiveness readily verified through monitoring and 5-year reviews.
Ability to obtain approvals and coordinate with other agencies	Unlikely to receive approval because COCs will remain which exceed Connecticut ICDECs, 10 <sup>-5</sup> Risk-Based PRGs, state PMCs, and Dilution-Adjusted PMCs.	Likely to receive regulatory approval because impacted soil would be removed and risks associated with COC concentrations would be mitigated. Institutional controls would address site risks.	Likely to receive regulatory approval. A select quantity of impacted soil would be removed and risks associated with COC concentrations would be mitigated. The remaining impacted, inaccessible soil left in place would be treated via capping. Institutional controls would address site risks.	Likely to receive regulatory approval. A select quantity of impacted soil would be removed and treated, mitigating risks associated with COC concentrations. The remaining impacted, inaccessible soil left in place would be treated via capping. Institutional controls would address site risks.	Likely to receive regulatory approval because impacted soil would be treated so that risks associated with COC concentrations would be mitigated. Institutional controls would address site risks.
Availability of materials and services	Not applicable because no actions included.	Readily available.	Readily available.	Readily available.	Readily available.
<b>COST</b>					
Capital Cost	\$0	\$442,500	\$356,700	\$420,300	\$476,200
Annual Operation and Maintenance Costs (Years 1-30)	\$3,300	\$11,600	\$19,200	\$19,200	\$131,600
Total 30-Year Present Worth Cost <sup>(a)</sup>	\$68,200	\$683,500	\$754,700	\$818,200	\$3,207,600
(a) Calculated at a 5 percent discount rate.					

**Attachment C**

**New Figure 2-2**

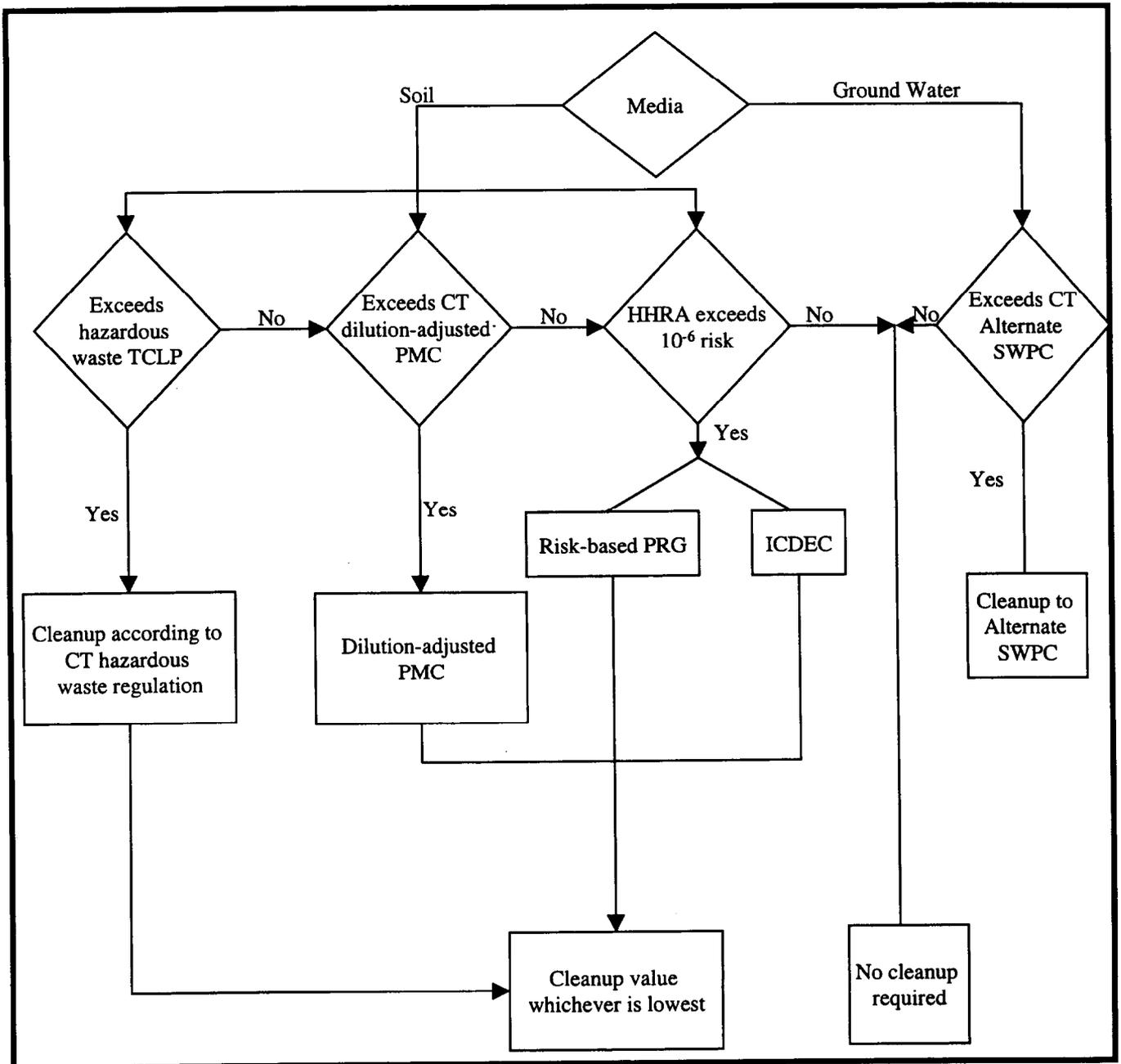


Figure 2-2. Process used to select cleanup goals, Lower Subbase, Naval Submarine Base, New London, Connecticut.

## **Attachment D**

### **Adult Lead Model Results**

TABLE A-1 CALCULATION OF CLEANUP VALUE FOR LEAD USING U.S. ENVIRONMENTAL PROTECTION AGENCY TRW MODEL COMMERCIAL WORKER SCENARIO

Parameter	Units	Reference
Central estimate of blood lead concentrations = $PbB_{adult,central}$	Calculated $\mu\text{g/dL}$	
Goal for blood lead concentration among fetuses = $PbB_{fetal,0.95}$	Calculated $\mu\text{g/dL}$	
Typical adult blood level concentration = $PbB_{adult,0}$	2.0 $\mu\text{g/dL}$	EPA 1996
Soil lead concentration = PbS	1,550 $\mu\text{g/g}$	Site-specific
Biokinetic slope factor = BKSF	0.4 $\text{g/dL per } \mu\text{g/day}$	EPA 1996
Intake rate of Soil = $IR_s$	0.05 $\text{g/day}$	EPA 1991, 1997: Table 4-23 adult mean
Absolute gastrointestinal absorption fraction = $AF_s$	0.12	EPA 1996
Exposure frequency = $EF_s$	150 day/year	EPA Region I
Averaging Time = AT	365 days/year	EPA 1996
Estimated Value of the individual geometric standard deviation = GSD	2.0 dimensionless	EPA 1996
Constant of proportionality between fetal blood lead concentration and maternal blood lead concentration = R	0.9 dimensionless	EPA 1996
<b>Blood Lead Level Calculations:</b> $PbB_{adult,central} = PbB_{adult,0} + PbS * BKSF * IR_s * AF_s * EF_s / AT$ $PbB_{adult,central} = 3.53 \mu\text{g/dL}$ $PbB_{fetal,0.95} = PbB_{adult,central} * GSD^{1.645} * R_{fetal/maternal}$ $PbB_{fetal,0.95} = 9.93 \mu\text{g/dL}$		

TABLE A-2 CALCULATION OF CLEANUP VALUE FOR LEAD USING EPA TRW  
MODEL CONSTRUCTION WORKER SCENARIO

Parameter	Units	Reference
Central estimate of blood lead concentrations = $PbB_{adult,central}$	Calculated $\mu\text{g/dL}$	
Goal for blood lead concentration among fetuses = $PbB_{fetal,0.95}$	Calculated $\mu\text{g/dL}$	
Typical adult blood level concentration = $PbB_{adult,0}$	2.0 $\mu\text{g/dL}$	EPA 1996
Soil lead concentration = $PbS$	1,150 $\mu\text{g/g}$	Site-specific
Biokinetic slope factor = $BKSF$	0.4 $\mu\text{g/dL per } \mu\text{g/day}$	EPA 1996
Intake rate of Soil = $IR_S$	0.1 $\text{g/day}$	EPA 1991; FAQ sheet
Absolute gastrointestinal absorption fraction = $AF_S$	0.12	EPA 1996
Exposure frequency = $EF_S$	219 100 day/year	EPA Region 1
Averaging Time = $AT$	365 days/year	EPA 1996
Estimated Value of the individual geometric standard deviation = $GSD$	2.0 dimensionless	EPA 1996
Constant of proportionality between fetal blood lead concentration and maternal blood lead concentration = $R$	0.9 dimensionless	EPA 1996
<b>Blood Lead Level Calculations:</b> $PbB_{adult,central} = PbB_{adult,0} + PbS * BKSF * IR_S * AF_S * EF_S / AT$ $PbB_{adult,central} = 3.51 \mu\text{g/Dl}$ $PbB_{fetal,0.95} = PbB_{adult,central} * GSD^{1.645} * R_{fetal/maternal}$ $PbB_{fetal,0.95} = 9.89 \mu\text{g/dL}$		
NOTE: FAQ sheet = Frequently Asked Questions document developed by EPA for the TRW model.		