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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION I
J.F. KENNEDY FEDERAL BUILDING, BOSTON, MASSACHUSETTS 02203-2211

June 17, 1991

Mr. James Shafer (Code 1421)
Northern Division
Naval Facilities Engineering Command
U.S. Naval Base, Bldg. 77 Low
Philadelphia, PA 19112-5094

Subj: U.S. EPA Comments
Draft Focused Feasibility Study
Site 8
Naval Air Station Brunswick
Brunswick, Maine

Dear Mr. Shafer:

The United States Environmental Protection Agency (EPA) has received and reviewed the document entitled "Draft Focused Feasibility Study (FFS), Site 8" dated May 1991, for the Naval Air Station Brunswick in Brunswick, Maine. The comments provided are divided into two attachments.

Attachment I contains general comments on the FFS. Attachment II outlines specific comments regarding the report. Also attached are two sets of tables, which serve as examples, and are discussed further in the comments. A letter containing comments from the National Oceanic and Atmospheric Administration (NOAA) is also included with the comment package. NOAA's comments should be addressed and the Navy's responses included with EPA 's responses.

EPA requests that the Navy submit a comment by comment response, as well as incorporate the necessary changes into the Draft Final Focused Feasibility Study. Pursuant to Section 6.7(e)of the Federal Facility Agreement (FFA), the response to comments and Draft Final Focused Feasibility Study for this site will be due no later than August 12, 1991.

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If you have any questions regarding the enclosed comments or would like to discuss the comments further, please contact me at (617)573-5785.

Sincerely,

Meghan F. Cassidy

Meghan F. Cassidy
Remedial Project Manager

Enclosure

cc: Eileen Curry/NASB
Mel Dickenson/E.C. Jordan
Ted Wolfe/ME DEP
Ann Johnson/SAIC
Mary Jane O'Donnell/US EPA
Bob DiBiccaro/US EPA
Richard Willey/US EPA
Jui-yu Hsieh/US EPA
Ken Finkelstein/NOAA

ATTACHMENT I

The general comments provided below pertain to the report entitled "Draft Focused Feasibility Study, Site 8" (May 1991). This report was submitted by the U.S. Department of the Navy for the Naval Air Station Brunswick in Brunswick, Maine. The report was prepared for the Navy by E.C. Jordan.

1. The narrative for each alternative in Section 3 and the presentation in Table 4-1 (page 4-5) do not adequately address the specific elements of each of the nine criteria. Figure 6-2 of the RI/FS Guidance lists all of the elements. Each of these elements should be addressed for each alternative. This should be done in a table, with discussion of significant issues in the narrative. Attachment A to these comments is an example of a table which contains sufficient information.

2. The narrative discussion for the ARARs is not adequate. All of the ARARs for each alternative should be identified in a table and there should be a statement of how each ARAR is or is not attained. Significant issues should be discussed in the narrative. Attachment B to these comments is an example of a table which contains sufficient information.

3. Action specific ARARs are not adequately addressed. The action specific ARAR table (Table 2-5) from the Supplemental RI Report (April 1991) should be reviewed to determine which ARARs should be included for each of the alternatives. For example, the OSHA requirements on page 2-19 of Table 5 in the Supplemental RI should be included as ARARs for Alternatives 8C and 8D.

4. Table 2-3 (page 2-9) of the Supplemental RI Report references rare and endangered plants and animals in connection with Site 8. This information should be discussed in the Focused Feasibility Study including an explanation of how these ARARs are to be met or not met in connection with each of the alternatives.

5. In the ARAR discussion for each alternative, the report states that there are no chemical specific and no location specific ARARs for Site 8 (in connection with PAH). However, chemical specific and location specific ARARs in connection with iron, lead, cyanide and aluminum have not been addressed.

ATTACHMENT II

The comments provided below pertain to the report entitled "Draft Focused Feasibility Study, Site 8" (May 1991). This report was submitted by the U.S. Department of the Navy for the Naval Air Station Brunswick in Brunswick, Maine. The report was prepared for the Navy by E.C. Jordan.

Section 2.0 - Summary of Response Objectives and Remedial Alternatives

1. Page 2-1, Paragraph 2: This paragraph should include a statement regarding the reported disposal of solvent at the site as part of the historical information. Subsequent discussion can indicate that there is no data to substantiate the disposal of solvents.

2. Page 2-1, Paragraph 3: This paragraph mentions the Jordan Avenue Wellfield (JAW). Show the JAW on either Figure 2-1 or 2-2.

3. Page 2-5, Paragraph 2: This paragraph should summarize the findings of lead and 4,4-DDT in the soils at Site 8 since these compounds were detected. Discuss the risks associated with these compounds which indicate that remedial objectives need not address lead and 4,4-DDT.

4. Page 2-6, Paragraph 1: Indicate whether all contaminants found in groundwater had MCLs or MCLGs to use for comparison.

5. Page 2-6, 2-9 and 2-15: The remedial action objectives are not sufficiently specific. The contaminants of concern and the exposure routes, and the receptors should be clearly specified. See discussion at page 4-7 of the Guidance for Conducting Remedial Investigations and Feasibility Studies (October 1988) (RI/FS Guidance) and Table 4-1 of the guidance. Also, all media are not covered in the remedial action objectives.

6. Page 2-7, Paragraph 1: This paragraph states "no contaminant was detected in the groundwater, downgradient of the site, above its respective drinking water standard or criteria." Were any contaminants detected at Site 8 above their respective drinking water standards or criteria?

7. Page 2-7, Paragraph 3: Discuss whether the detection of DDT in leachate sediments during Rounds II and III only could have been a result of seasonal fluctuations.

8. Page 2-7, Paragraph 3: Include, in the text, the risk associated with 0.003 mg/kg of DDT.

9. Page 2-7, Paragraph 3: Indicate in the text how the average DDT concentration was calculated (i.e., were only positive results used, etc.).

10. Page 2-8, Paragraph 2: Provide the expected range of background levels for DDT in leachate and indicate how these background levels were established.

11. Page 2-10, Paragraph 2: What is the background concentration range for carcinogenic PAHs only.

12. Page 2-10, Paragraph 2: Clarify where background samples were collected, both location and matrix, which had concentrations ranging from 1.8 to 21.9 mg/kg.

13. Page 2-10, Paragraph 2: Discuss the use of background concentrations derived from surface water/sediment samples for comparison to surface soils. Since several test pits in and around Site 8 had no detectable concentrations of PAHs, EPA considers that this better represents "background".

14. Page 2-13, Paragraph 2: This paragraph states that remedial action objectives were not developed to reduce concentrations of iron, lead, cyanide and aluminum in surface water because these contaminants were detected at elevated concentrations at sampling locations both upstream and downstream of the site. Since AWQC for these contaminants will not be met, a discussion regarding the need for an ARAR waiver should be included in the ARARs analysis.

15. Page 2-13, Paragraph 2: This paragraph states that "Iron, lead, cyanide and aluminum were detected (compared to background) in both upstream and downstream sampling locations, suggesting that other nonpoint source areas... are contributing to the current levels of contamination...". Indicate what is considered background. Also, describe what is being done to characterize and alleviate the nonpoint source areas.

16. Page 2-13, Paragraph 2: The paragraph indicates that elevated levels of some compounds were detected in surface water at both upstream and downstream sampling locations. The paragraph then states "Specific remedial actions taken to reduce contaminant concentrations would therefore not be effective in reducing potential exposure concentrations". This statement is somewhat misleading and must be clarified. The statement should indicate that remedial actions taken at Site 8 only may not be effective in reducing potential exposure concentrations, however actions could be taken by

the Navy to decrease the elevated concentrations of iron, lead, cyanide and aluminum in the surface water.

17. Page 2-13, Paragraph 2: If the salt pile is the source of cyanide, as has been stated in previous reports, state this in the text. Also, indicate what steps are being taken to alleviate cyanide from the salt pile from impacting the environment.

18. Page 2-14, Figure 2-3: Provide further discussion regarding how the contaminated area was interpreted. It seems like contamination over 18 ppm should include the area of TP-803 and TP-806.

19. Page 2-17, Paragraph 1: The fourth alternative (removal/ solidification) also includes removal and treatment of contaminated soil and sediment. Indicate this in the text.

20. Page 2-17, Paragraph 2: A short discussion providing the rationale for excluding alternatives 3, 5, and 6 is necessary in the discussion of remedial alternatives.

Section 3.0 - Detailed Evaluation of Remedial Alternatives

21. Page 3-1, Paragraph 1: The purpose of the detailed evaluation is not adequately stated. The purpose as stated under the "Proposed Rule" in the NCP at page 8719 should either be quoted or paraphrased.

22. Page 3-1, Paragraph 2: Add a reference to the newly developed table setting forth the elements of each criterion. See comment number 1 in Attachment I.

23. Page 3-1, Paragraph 2: After the "RI/FS" in line 3, insert "and proposed plan" and replace "by" with "from". In line 5 insert "RI/FS and" before "proposed plan". See RI/FS Guidance, page 6-13.

    Also, since the state is a party to the Federal Facility Agreement (FFA) and is reviewing and commenting on this Focused Feasibility Study, there should be a statement to that effect in regard to this criterion on page 3-1 and in a footnote to Table 3-1 on page 3-2.

24. Page 3-2, Table 3-1: This table should conform to the descriptions contained in the RI/FS Guidance on page 6-6. For example, the fourth criterion should include "through treatment" and the descriptions for criteria 2, 3, 8 and 9 should match the guidance descriptions.

25. Page 3-4, Paragraph 1: Provide examples, in the text, of the kind of geographic information which was used to determine the lateral extent of PAH contamination.

26. Page 3-4, Paragraph 1: Indicate how the lateral distribution of contamination will be plotted in the field. Will a survey be performed? Discuss this issue in the text.

27. Page 3-4, Paragraph 1: Initially, it is stated that the "vertical distribution of contamination was...assumed to extend 2 feet below the surface." However, in the conclusion of the paragraph, the volume of soil subject to remediation will be based on a depth of 1 foot below the surface. Provide a more detailed explanation why a depth of 1 foot was selected.

28. Page 3-5, Figure 3-1. This figure and accompanying text do not provide sufficient supporting data to justify the boundary of the proposed area for contaminated soil greater than 18 ppm of carcinogenic PAHs (carc. PAHs), which is subject to remediation. From Figure 2-3 (Page 2-14), soils in the vicinity of TP-805 (carc. PAHs = 3 ppm at 0 ft.) will be remediated while soils in the vicinity of TP-806 (carc. PAHS = 19 ppm at 0 ft.) and TP-803 (carc. PAHs = 13 ppm at 0 ft.), both outside of the proposed treatment area, will remain untreated. Provide a more detailed explanation of how the proposed area subject to remediation was determined. Also, extend the area which will be remediated to include, at a minimum, TP-806.

29. Page 3-7, Paragraph 2: Is this paragraph attempting to say that the solidification/stabilization technique does not reduce leachability for these site conditions? Provide additional discussion in the text regarding this issue.

30. Page 3-9, Section 3.3: Alternative 8B must include an environmental monitoring program to ensure that risk levels do not increase over time. Include an environmental monitoring program in both the narrative and cost analysis for this alternative.

31. Page 3-12, Paragraph 1: Indicate how long it was estimated (for costing purposes) that 5 year reviews would continue.

32. Page 3-13, Paragraph 3: Indicate that a health and safety plan will need to be followed for installation of the fence and environmental monitoring as well as for conducting the five-year sampling.

33. Page 3-13, Paragraph 4: How easily implementable will it be to impose deed and land-use restrictions for future site use? Provide additional details regarding the procedures.

34. Page 3-14, Section 3.4: An environmental monitoring program must be a component of Alternative 8C. Include such a program in both the narrative and costs for this alternative.

35. Page 3-14, Section 3.4: The following comments pertain to Alternative 8C, Soil Cover. Inclusion of these comments will help to ensure overall long-term reliability of the soil cover.

- The ground surface should be cleared, grubbed and graded (proofrolled to minimize the potential for differential settlements). This site prep work should be included in the discussion and costs.

- A non-woven filter fabric layer should be placed, below the maximum depth of frost penetration in the area of interest, on a graded surface (nominal 3% slope). Use of the filter fabric as discussed provides the functions of separation, reinforcement, drainage, and capillary breaks to reduce frost-heaving damages.

- The thickness of the cover should be greater than the greatest frost penetration depth to minimize the disruption and upward migration of contaminants due to freezing. Indicate in the text the frost penetration depth in this area.

- When the surface drainage plan is developed it must accommodate runoff from both covered and non-covered areas.

36. Page 3-15, Table 3-3: The following comments pertain to this table.

- Operating costs should include costs for inspecting and maintaining the fence as well as sign replacement.

- The discount rate used, 5%, is incorrect. The Office of Management and Budget (OMB) in Circular A-94 has established a 10% discount rate which must be used to determine the net present value of a remedy (see page 8722 of the Preamble to the NCP). Revise the costs in the table to reflect the 10% discount rate.

37. Page 3-18, Paragraph 1: The sentence starting with, "To achieve the 18 mg/kg [ppm] target clean-up level" should read, "to provide a sufficient cover for the proposed target clean-up area..." No Treatment of contaminated soil will be performed in alternative 8C, therefore the target clean-up level will not be attained.

38. Page 3-18, Paragraph 1: This paragraph indicates that a cover system was suggested by the ME DEP. Indicate when this suggestion was made and be which division of the DEP.

39. Page 3-18, Paragraph 3: The word "can" which appears in the first sentence of this paragraph must be changed to "will". Deed and land-use restrictions would definitely need to be used in conjunction with this alternative.

40. Page 3-20, Paragraph 2: Indicate to which area of Site 8 the statement, "the residual PAH would be below levels..." refers.

41. Page 3-22, Paragraph 2: This paragraph states that the treatability study demonstrated that PAHs are immobile contaminants. Clarify that this statement refers to PAHs in soil.

42. Page 3-22, Paragraph 3: This paragraph must include a statement indicating that all work performed at Site 8 in conjunction with the soil cover will be carried out according to a Health and Safety Plan.

43. Page 3-23, Section 3.5: The EPA guidance document entitled "Technology Screening Guide for Treatment of CERCLA Soils and Sludges" (EPA/540/2-88/004) states that the long-term reliability of the solidification technology is unknown. Leachate that may be produced as a result of the curing process should be collected before disposal. Alternative 8D does not mention the collection or analysis of leachate to determine the necessity for treatment before disposal. Discuss how leachate collection might be achieved.

44. Page 3-24, Table 3-4: The following comments pertain to Table 3-4:

- Health and Safety costs must reflect costs during construction of the soil cover in addition to the five-year review.

- The discount rate used to calculate present worth should be 10 percent. See comment number 36 above.

45. Page 3-26, Paragraph 1: The volume increase of 6 percent seems low for a cementation addition. Provide a more detailed discussion or calculations to substantiate this information.

46. Page 3-26, Paragraph 1: Indicate how the 6 percent increase in solidified material will be handled during backfilling.

47. Page 3-26, Bullet Section: A compliance testing step should be included after the curing of solidified soil.

48. Page 3-27, Figure 3-6: If possible, the curing area should be located north of the perimeter road near the target clean-up area as opposed to that shown on Figure 3-6. PAHs were not detected in the proposed curing area, but this area may become contaminated during the implementation of this alternative.

49. Page 3-28, Paragraph 1. Provide a more descriptive location of the area referred to as "the hill leading down to the stream."

50. Page 3-28, Paragraph 3: Provide additional information in the text regarding the stabilization additives. What is the composition of these additives? Also, explain in more detail the type of equipment used to homogenize the mixture.

51. Page 3-28, Paragraph 3: Provide an estimate of the amount of time needed to complete the stabilization mixing process.

52. Page 3-28, Paragraph 4: Clarify whether it has been determined that the PAH contamination at Site 8 is not subject to RCRA via classification as a listed waste.

53. Page 3-28, Paragraph 4: Provide more detail regarding how it will be determined that the curing process in complete.

54. Page 3-29, Paragraph 1: EPA <u>would</u> require that testing be performed prior to backfilling. Indicate this in the text.

55. Page 3-29, Paragraph 4: Provide further discussion regarding any monitoring necessary to ensure that the integrity of the stabilized material is maintained over time.

56. Page 3-31, Figure 3-7: A post-treatment soil TCLP testing step must be included in the process diagram as well as a contingency pathway for failure of the TCLP test.

57. Page 3-32, Paragraph 2: Include a discussion in the text addressing possible environmental impacts during the implementation of alternative 8D.

58. Page 3-34, Table 3-5: The discount rate used to calculate present worth should be 10 percent. See comment number 36 above.

Section 4.0 - Comparative Analysis of Alternatives

59. General: Alternative 8A must be discussed under each criteria.

60. Page 4-1, Paragraph 2: Explain how each of the alternatives reduces exposure.

61. Page 4-1, Paragraph 3: Include a reference to the proposed target clean-up level for PAHs.

62. Page 4-2, Paragraph 1: Do not use the word capping when discussing Alternative 8C, soil cover, since this may lead to confusion regarding the kind of cover system.

63. Page 4-2, Paragraph 1: The statement "It is sometimes considered less reliable than treatment to remove or fix contaminants in soil because if treatment is not used,..." is inaccurate since soil covers do not treat or fix contaminants. This sentence should be removed or rewritten.

64. Page 4-3, Paragraph 2: Provide a more detailed discussion of the difference between alternatives 8B and 8C with respect to their short-term effectiveness. Additionally, include a discussion on the environmental impacts of the implementation of alternatives 8C and 8D.

65. Page 4-3, Paragraph 2: Include a statement that Alternatives 8B, 8C and 8D all pose some short-term risk to workers during implementation.

66. Page 4-4, Paragraph 2: Clarify whether the cost presented for alternative 8D is the present-worth cost.

67. Page 4-5, Table 4-1: The following comments pertain to this table.

    - The table should conform to Attachment B to these comments.

- The descriptions presented for alternatives 8B, 8C and 8D under the heading "Overall Protection of Human Health and the Environment" need more detail. Specifically, indicate how each alternative decreases human health risks.

- The text under the heading "Long-Term Effectiveness and Performance" for alternative 8C is misleading. Contaminant levels in the surface soils would remain the same under this alternative. Exposure to this soil would be minimized by placing it under a cover. Rewrite the text to clarify this matter.

- The column heading "Reduction of Mobility, Toxicity and Volume Through Treatment" should be rewritten to say "Reduction of Mobility, Toxicity <u>or</u> Volume Through Treatment" (see page 8720 of the preamble to the NCP).

- Alternative 8C does not decrease mobility as described under the criteria of "Reduction of Mobility, Toxicity or Volume Through Treatment" since there is no treatment involved. Rewrite the this statement to reflect this.

68. Reference page: The last reference listed on this page lists a specific page of the NCP. However, the NCP was referenced numerous times throughout this document and the references were not limited to page 8851. Correct this discrepancy.

<u>Appendix A - Treatability Study Results</u>

69. Page A-9, Bullet Section: A freeze/thaw characteristic for durability testing should be conducted (ASTM D560-89) especially considering the extreme cold in Maine.

TABLE 8

CHEMICAL - SPECIFIC ARARS AND TBCS FOR
WELLS G&H SITE, WOBURN, MASSACHUSETTS

REQUIREMENT	REQUIREMENT SYNOPSIS	ACTION TO BE TAKEN TO ATTAIN REQUIREMENT
1) ARARS		
o SDWA - Maximum Contaminant Levels (MCLs) (40 CFR 141.11 -141.16)[2]	o MCLS have been promulgated for a number of common organic and inorganic contaminants. These levels regulate the concentration of contaminants in public drinking water supplies, but may also be considered relevant and appropriate for groundwater aquifers potentially used for drinking water.	o Treatment will be conducted to achieve SDWA MCLs in groundwater.
o RCRA - Maximum Concentraton Limits (MCLS) (40 CFR 264.94)[2]	o RCRA MCLS provide groundwater protection standards for 14 common contaminants. All are equal to the SDWA MCLs for those contaminants.	o Treatment will be conducted to achieve RCRA MCLs in groundwater.
o DEQE Regulations - Massachusetts Drinking Water Maximum Contaminant Levels (MCL) (310 CMR 22.00)[2]	o Massachusetts MCLs establish levels of contaminants allowable in public water supplies. They are essentially equivalent to SDWA MCLs.	o Since DEQE MCLS are the same as SDWA MCLs, they were used to set clean-up levels for contaminants of concern.
o DEQE - Massachusetts Groundwater Quality Standards (314 CMR 6.00)[2]	o These standards consist of groundwater classifications which designate and assign the uses of Commonwealth groundwaters, and water quality criteria necessary to substain these uses. There is a presumption that all groundwaters are Class I.	o DEQE groundwater standards were considered when determining clean-up levels.
o CWA - Ambient Water Quality Criteria (AWQC) - Protection of Freshwater Aquatic Life, Human Health - Fish Consumption	o AWQC are developed under the Clean Water Act (CWA) as guidelines from which states develop water quality standards. A more strigent AWQC for aquatic life may be found relevant and appropriate rather than an MCL, when protection of aquatic organisms is being considered at a site.	o AWQC were used to characterize risks to fresh water aquatic life resulting from discharge of treated groundwater to the Aberjona River.
2) TBCS		
o EPA Risk Reference Doses (RfDs)	o RfDs are dose levels developed by the EPA for noncarcinogenic effects.	o EPA RfDs were used to characterize risks due to exposure to contaminants in groundwater, as well as other media.
o EPA Carcinogen Assessment Group Potency Factors	o Potency factors are developed by the EPA from Health Assessments or evaluation by the Carcinogen Efforts Assessment Group.	o EPA Carcinogenic Potency Factors were used to compute the individual incremental cancer risk resulting from exposure to site contamination.
o Massachusetts Drinking Water Halth Adviseries	o DEQE Health Adviseries are guidance criteria for drinking water.	o DEQE Health Advisories were considered when developing clean-up levels for groundwater.

ATTACHMENT

B

TABLE 4-36

COMPARISON OF SOURCE CONTROL ALTERNATIVES

Criteria	SC-1 No Action	SC-3 Excavation/On-Site Incineration/Backfill On-Site	SC-4 Excavation/Off-Site Incineration/Backfill with Clean Off-site Soil	SC-5 Excavation/On-Site High Temperature Enhanced Volatilization/Backfill On-Site	SC-7 Excavation/On-Site Supercritical Fluid Extraction/Backfill On-site
1. Short-Term Effectiveness					
• Protection of community during remedial actions.	No risks, since no remedial action	Dust control and air emissions controls required for soil handling and incineration	Dust control and air emissions control required for soil handling; traffic control required	Dust control and air emissions controls required for soil handling and treatment.	Dust control and air emissions controls required for soil handling and soil slurry system.
• Protection of workers during remedial actions	No risk, since no remedial action	Health and safety protection and air emission control required	Health and safety protection required	Same as SC-3	Same as SC-3
• Environmental impacts	Wildlife continues to be impacted	Potential adverse air quality impacts from soil handling and incineration emissions; clearing of plants and trees required; impact to wetlands	Potential air quality impacts from soil handling; clearing of plants and trees required; impact to wetlands	Same as SC-3	Potential adverse air quality impacts from soil handling; clearing of plants and trees required; impact to wetlands
• Time until remedial response objectives are achieved.	Long period of time; may never be achieved	Overall remediation period approx 4 yrs; Actual cleanup period 15 months	Overall remediation period approx 3.5 yrs; Actual cleanup period 15 months.	Overall remediation period approx 3 yrs; Actual cleanup period 9 months.	Overall remediation period approx 3.5 yrs Actual cleanup period 1 year.
2. Long-term effectiveness and permanence					
• Magnitude of residual risks.	Long-term risk remains	Risk would be reduced to selected target levels	Same as SC-3	Expected to achieve target levels but some uncertainty exists for cPAHs and chlordane	Need pilot test to determine residual risk; may reduce risk to selected target levels but uncertainty exist for VOCs and chlordane

ATTACHMENT A

TABLE 4-36 (Cont'd)

COMPARISON OF SOURCE CONTROL ALTERNATIVES

Criteria	SC-1 No Action	SC-3 Excavation/On-Site Incineration/Backfill On-Site	SC-4 Excavation/Off-Site Incineration/Backfill with Clean Off-site Soil	SC-5 Excavation/On-Site High Temperature Enhanced Volatilization/Backfill On-Site	SC-7 Excavation/On-Site Supercritical Fluid Extraction/Backfill On-site
Adequacy of Controls.	Fence and institutional controls prevent ingestion, inhalation and/or direct contact	No long-term controls required	Same as SC-3	Same as SC-3	Same as SC-3
Reliability of Control	Fence subject to vandalism	No long-term controls involved	Same as SC-3	Same as SC-3	Same as SC-3
3. Reduction of Toxicity, Mobility or Volume					
o Treatment process and remedy	No treatment employed except fence around contaminated soil area and institutional controls	Incineration of all contaminated soil and backfill treated soil on-site	Incineration of all contaminated soil off-site, backfill with clean soil from off-site	Volatilization of soil and backfill with treated soil on-site	Extraction f soil contaminants and backfill treated soil on-site
o Amount of hazardous material destroyed or treated	None by treatment Natural attenuation continues to take place	9500 cubic yards of contaminated soils exceeding target levels to be treated.	Same as SC-3	Same as SC-3	Same as SC-3
o Reduction in toxicity, mobility r volume	None by treatment Natural migration might increase volume of contaminated groundwater	Would achieve significant and permanent reduction in toxicity, mobility & volume of VOCs, PAHs, PCBs and chlordane.	Contaminated soil is completely removed from the site	Expected to achieve significant and permanent reduction in toxicity, mobility and volume of, VOCs, PAHs, PCBs and chlordane; but some uncertainty exists in achieving target levels for cPAHs, and chlordane	May achieve significant and permanent reduction in toxicity, mobility and volume of VOCs, PAHs, PCBs and chlordane
o Irreversibility of the treatment	No treatment involved	Irreversible treatment	Same as SC-3	Same as SC-3	Same as SC-3
o Type and quantity of treatment residual	No treatment involved	Scrubber water, treated soil	No residuals	Scrubber water, treated soil	Extracted rganics, treated soil, spent carbon

TABLE 4-36 (Cont'd)

COMPARISON OF SOURCE CONTROL ALTERNATIVES

Criteria	SC-1 No Action	SC-3 Excavation/On-Site Incineration/Back-fill On-Site	SC-4 Excavation/Off-Site Incineration/Backfill with Clean Off-site Soil	SC-5 Excavation/On-Site High Temperature Enhanced Vola-tilization/Back-fill On-Site	SC-7 Excavation/On-Site Supercritical Fluid Extraction/Backfill On-site
4. Implementibility					
Technical Feasibility					
o Ability to construct technology	Fence and monitoring wells are easily con-structed	Easily implemented at site with mobile unit	Easily implementable at site, no construction involved, only exca-vation and packing of soil in drums	Same as SC-3	Difficult t implement, depends on ven-dors ability t construct full scale mobil unit
R liability of technology	No technology	Highly reliable technology, target levels would be achieved	Off-site technology is reliable, target levels would be achieved by removing soil from site	Reliable technology some uncertainty. Although target levels are expected to be achieved	May need some modifi-cation in scaling up sizes. Some uncer-tainty that target levels can be achieved due t innovative technology.
Ease of undertaking additional remedial action, if necessary	Easy to undertake	Easy to undertake	Same as SC-3	Same as SC-3	Same as SC-3
Monitoring Considerations	Migration or exposure pathways can be monitored	Migration or exposure pathways can be monitored	Same as SC-3	Same as SC-3	Same as SC-3
Administrative Feasibility					
o C ordination with other agencies	Coordination required with all agencies for long period of time	Coordination required with all agencies and no coordination needed after remediation	Same as SC-3	Same as SC-3	Same as SC-3
Availability of Services and Materials					
Availability of treatment, storage, capacity,and disposal services.	No treatment, storage or disposal services required	Availability is good.	Available capacity is uncertain	Availability is good for off-site regeneration of spent carbon	Availability is good for off-site incin-eration of xtractant
Availability of technologies, nec ssary equipment and specialists	Equipment and specialists are locally available	Availability is good many vendors	Available capacity is uncertain. Limited facilities in U.S.	Limited number of vendors	Only one vendor. Full scale unit is not readily available.

TABLE 4-36 (Cont'd)

COMPARISON OF SOURCE CONTROL ALTERNATIVES

Criteria	SC-1 No Action	SC-3 Excavation/On-Site Incineration/Back-fill On-Site	SC-4 Excavation/Off-Site Incineration/Backfill with Clean Off-site Soil	SC-5 Excavation/On-Site High Temperature Enhanced Vola-tilization/Back-fill On-Site	SC-7 Excavation/On-Site Supercritical Fluid Extraction/Backfill On-site
5. Cost					
• Capital Cost	0	$7.5 Million	22.1 Million	$6.6 Million	$7.5 Million
Operation and maintenance cost	$ 50,200	0	0	0	0
• Present worth	$0.80 Million	$7.5 Million	22.1 Million	$6.6 Million	$7.5 Million
6. Compliance with ARARs					
• Contaminant-specific ARARs	Does not comply	Complies in combination with MOM alternative	Same as SC-3	Same as SC-3	Same as SC-3
• Action-specific ARARs	None identified	Complies	Complies	Complies	Complies
• Location-specific ARARs	Does not comply with wetlands ARARs	Complies; but difficulty in meeting wetlands ARARs due to need to replicate habitat	Same as SC-3	Same as SC-3	Same as SC-3C
• Compli nce with criteria, advisories and guidances	Does not comply	Complies	Complies	Complies	Complies
7. Overall Protection of Human Health and Environment					
• How risks are eliminated, reduced or controlled	Risk continues to exist at site, does not achieve overall protection of public health and environment; does not reduce toxicity, mobility and volume of contaminants	Would achieve overall protection of public health and environment. Excavation may disturb wildlife and vegetation temporarily. Would reduce toxicity, mobility and volume of contaminants to target levels	Would achieve overall protection of public health and environment. Excavation may disturb wildlife and vegetation temporarily. Would reduce toxicity, mobility and volume of contaminants to target levels	Expected to achieve overall protection of public health and environment Excavation may disturb wildlife and vegetation temporarily. Expected to reduce toxicity, mobility and volume of contaminants to target levels.	May achieve overall protection of public health and environment. Excavation may disturb wildlife and vegetation temporarily. May reduce toxicity, mobility, and volume of contaminants to target levels.

TABLE 4-36 (Cont'd)

COMPARISON OF SOURCE CONTROL ALTERNATIVES

Criteria	SC-8 Excavation/On-Site Enhanced Volatilization/ On-Site Incineration/ Backfill On-Site	SC-9 Excavation/On-Site Enhanced Volatilization/ Off-Site Incineration/ Backfill with Treated and Clean Off-site Soil	SC-10 In Situ Volatilization/ Excavation/On-Site Incineration/Back-fill On-Site	SC-11 In Situ Volatilization/ Excavation/Off-Site Incineration/Backfill with Clean Off-Site Soil
1. Short-Term Effectiveness				
Protection of community during remedial actions.	Dust control and air emission controls required for soil handling, enhanced volatilization and incineration	Dust control and air emission controls required for soil handling, and enhanced volatilization; traffic control required for off-site disposal	Less dust control and air emissions controls required for soil handling, due to in situ technique	Less dust control and air emission control required for soil handling due to in situ technique; traffic control required for off-site disposal
Protection of workers during remedial actions	Health and safety protection and air emission control required	Same as SC-8	Same as SC-8	Same as SC-8
o Environmental impacts	Potential adverse air quality impacts from soil handling; clearing of plants and trees required	Potential air quality impacts from soil handling, and enhanced volatilization emission; clearing of plants and trees required.	Less excavation required. Potential air quality impacts from soil handling, in situ volatilization and incineration emissions; less damage to environment	Less excavation required. Potential air quality impacts from soil handling, in situ volatilization emissions; less damage to environment
o Time until remedial response objectives are achieved.	Overall remediation period approx 4 yrs. Actual cleanup period 16 months.	Overall remediation period approx 3.5 yrs. Actual cleanup period 10 months.	Overall remediation period approx 4 yrs. Actual cleanup period 16 months.	Overall remediation period 3.5 years. Actual cleanup period 10 months.
2. Long-term effectiveness and permanence				
o Magnitude of residual risks.	Need treatability test to determine if all target levels would be acheived.	Same as SC-8	Risk would be reduced to selected target levels	Same as SC-10

TABLE 4-36 (Cont'd)

COMPARISON OF SOURCE CONTROL ALTERNATIVES

Criteria	SC-8 Excavation/On-Site Enhanced Volatilization/ On-Site Incineration/ Backfill On-Site	SC-9 Excavation/On-Site Enhanced Volatilization/ Off-Site Incineration/ Backfill with Treated and Clean Off-site Soil	SC-10 In Situ Volatilization/ Excavation/On-Site Incineration/Back-fill On-Site	SC-11 In Situ Volatilization/ Excavation/Off-Sit Incineration/Backfill with Clean Off-Site Soil
o Adequacy of Controls.	No long-term controls required	Same as SC-8	Same as SC-8	Same as SC-8
o Reliability of Control	No long-term controls involved	Same as SC-8	Same as SC-8	Same as SC-8
3. Reduction of Toxicity, Mobility or Volume				
Treatment process and remedy	Enhanced volatilization of soil contaminated with VOCs only and incineration of mixed contaminant soil; backfill with treated soil on-site	Enhanced volatilization of soil contaminated with VOCs only and off-site incineration of mixed contaminant soil; backfill clean and treated soil on-site	In situ volatilization of soil contaminated with VOCs only and incineration of mixed contaminant soil; backfill treated soil on-site	In situ volatilization of soil contaminated with VOCs only and off-site incineration of mixed contaminant soil; back-fill clean off-site s il
o Amount of hazardous material d str yed or treated	9500 cubic yards of contaminated soils exceeding target levels	Same as SC-8	Same as SC-8	Same as SC-8
o Reduction in toxicity, mobility r volume	Significant and permanant reduction in toxicity, mobility, & volume of contaminants	Same as SC-8	Same as SC-8	Same as SC-8
o Irrev rsibility of the treatment	Irreversible treatment	Same as SC-8	Same as SC-8	Same as SC-8
Type and quantity of treatment residual	Scrubber water from incineration and/or spent carbon from enhanced volatilization	Scrubber water and/or spent carbon from enhanced volatilization	Spent carbon from in situ volatilization and scrubber water from incineration	Spent carbon from in situ volatilization

TABLE 4-36 (Cont'd)

COMPARISON OF SOURCE CONTROL ALTERNATIVES

Criteria	SC-8 Excavation/On-Site Enhanced Volatilization/ On-Site Incineration/ Backfill On-Site	SC-9 Excavation/On-Site Enhanced Volatilization/ Off-Site Incineration/ Backfill with Treated and Clean Off-site Soil	SC-10 In Situ Volatilization/ Excavation/On-Site Incineration/Back-fill On-Site	SC-11 In Situ Volatilization/ Excavation/Off-Site Incineration/Backfill with Clean Off-Site Soil
4. Implementibility				
T chnical Feasibility				
o Ability to construct technology	Easily constructed or mobilized units. Site clearing can be easily accomplished.	Mobile enhanced volatilization units are easily mobilized; No construction involved, only excavation and packing for off-site incineration. Site clearing can be easily accomplished	In situ volatilization pipe and vent system can be easily constructed at the site. Mobile incineration units are easily mobilized. Site clearing can be easily accomplished.	Insitu volatilization pipe and vent system can be easily constructed at the site. No construction involved, only excavation and packing for off-site incineration. Site clearing can be easily accomplished.
Reliability of technology	Highly reliable; some uncertainty that action levels can be achieved with enhanced volatilization	Highly reliable; some uncertainty that action levels can be achieved with enhanced volatilization	Highly reliable; Pilot tests required to optimize operating conditions	Highly reliable; pilot tests required to optimize operating conditions
o Eas f undertaking additional remedial action, if necessary	Easy to undertake	Same as SC-8	Same as SC-8	Same as SC-8
o Monitoring Considerations	Migration or exposure pathways can be monitored	Same as SC-8	Same as SC-8	Same as SC-8
Administrative Feasibility				
Coordination with other agencies	Coordination required with all agencies and no coordination needed after remediation	Same as SC-8	Same as SC-8	Same as SC-8
Availability of Services and Materials				
Availability of treatment, storage, capacity,and disposal services.	Availability is good for off-site regeneration of spent carbon	Off-site incineration capacity availability is uncertain	Availability is good for off-site regeneration of spent carbon	Off-site incineration capacity availability is uncertain. Availability is good for off-site regeneration of spent carbon.

TABLE 4-36 (Cont'd)

COMPARISON OF SOURCE CONTROL ALTERNATIVES

Criteria	SC-8 Excavation/On-Site Enhanced Volatilization/ On-Site Incineration/ Backfill On-Site	SC-9 Excavation/On-Site Enhanced Volatilization/ Off-Site Incineration/ Backfill with Treated and Clean Off-site Soil	SC-10 In Situ Volatilization/ Excavation/On-Site Incineration/Back-fill On-Site	SC-11 In Situ Volatilization/ Excavation/Off-Site Incineration/Backfill with Clean Off-Site Soil
o Availability of technologies, necessary equipment and specialists	Availability is good for both mobile ehanched volatilization and incineration units.	Off-site incineration facilities availability is uncertain. Availability of mobile enhanced volatilization unit is good.	Limited equipment available for in situ volatilization. Availability of mobile incineration is good.	Off-site incineration facilities availability is unc rtain. Availability of in situ volatilization unit is limited.
5. Cost				
o Capital Cost	$6.2 Million	$9.0 Million	$3.2 Million	$6.2 Million
o Operation and maintenance cost	0	0	0	0
o Present worth	$6.2 Million	$9.0 Million	$3.2 Million	$6.2 Million
6. Compliance with ARARs				
Contaminant-specific ARARs	Complies in combination with MOM alternative	Complies in combination with MOM Alternative	Complies in combination with MOM alternative	Complies in combination with MOM alternative
o Action-specific ARARs	Complies	Complies	Complies	Complies
o L cation-specific ARARs	Complies; but difficulty in meeting, wetlands ARAR due to replicate habitat	Same as SC-8	Same as SC-8	Same as SC-8
o Compliance with criteria advisories and guidances	Complies	Complies	Complies	Complies
7. Overall Protection of Human Health and Environment				
o How risks are eliminated, reduced or controlled	Expected to achieve overall protection of public health and environment. Excavation will disturb wildlife and vegetation for a short period of time; Incineration	Expected to achive overall protection of public health and environment; Excavation will disturb wildlife and vegetation for a short period of time;	Would achieve overall protection of public health and environment. Excavation will disturb wildlife and vegetation for a short	Would achieve overall protection of public health and environment; Excavation will disturb wildlife and vegetation for a short period of

TABLE 4-36 (Cont'd)

COMPARISON OF SOURCE CONTROL ALTERNATIVES

Criteria	SC-8 Excavation/On-Site Enhanced Volatilization/ On-Site Incineration/ Backfill On-Site	SC-9 Excavation/On-Site Enhanced Volatilization/ Off-Site Incineration/ Backfill with treated and Clean Off-site Soil	SC-10 In Situ Volatilization/ Excavation/On-Site Incineration/Back-fill On-Site	SC-11 In Situ Volatilization/ Excavation/Off-Site Incineration/Backfill with Clean Off-Site Soil
	would reduce toxicity, mobility and volume of contaminants to target levels. Some uncertainity with enhanced volatilization achieving target levels for VOCs based on leaching model.	Both technologies can reduce toxicity, mobility and volume of contaminants. Some uncertainty with enhanced volatilization achieving target levels for VOCs based on leaching model.	period of time but to a lesser degree; both technologies would reduce toxicity, mobil-ity and volume of contaminants to target levels for VOCs based on leaching model and mixed contaminants based on direct contact pathway.	time but to a lesser degree; Both technologies would reduce toxicity, mobility and volume of contaminants to target levels for VOCs based on leaching model and mixed contaminants based on direct contact pathway.

TABLE 8

CHEMICAL - SPECIFIC ARARS AND TBCS FOR
WELLS G&H SITE, WOBURN, MASSACHUSETTS

REQUIREMENT	REQUIREMENT SYNOPSIS	ACTION TO BE TAKEN TO ATTAIN REQUIREMENT
1) ARARS		
o SDWA - Maximum Contaminant Levels (MCLs) (40 CFR 141.11 -141.16)[2]	o MCLS have been promulgated for a number of common organic and inorganic contaminants. These levels regulate the concentration of contaminants in public drinking water supplies, but may also be considered relevant and appropriate for groundwater aquifers potentially used for drinking water.	o Treatment will be conducted to achieve SDWA MCLs in groundwater.
o RCRA - Maximum Concentraton Limits (MCLS) (40 CFR 264.94)[2]	o RCRA MCLS provide groundwater protection standards for 14 common contaminants. All are equal to the SDWA MCLs for those contaminants.	o Treatment will be conducted to achieve RCRA MCLs in groundwater.
DEQE Regulations - Massachusetts Drinking Water Maximum Contaminant Levels (MCL) (310 CMR 22.00)[2]	o Massachusetts MCLs establish levels of contaminants allowable in public water supplies. They are essentially equivalent to SDWA MCLs.	o Since DEQE MCLS are the same as SDWA MCLs, they were used to set clean-up levels for contaminants of concern.
o DEQE - Massachusetts Groundwater Quality Standards (314 CMR 6.00)[2]	o These standards consist of groundwater classifications which designate and assign the uses of Commonwealth groundwaters, and water quality criteria necessary to substain these uses. There is a presumption that all groundwaters are Class 1.	o DEQE groundwater standards were consid red when determining clean-up levels.
o CWA - Ambient Water Quality Crit ria (AWQC) - Protection of Freshwater Aquatic Life, Human H alth - Fish Consumption	o AWQC are developed under the Clean Water Act (CWA) as guidelines from which states develop water quality standards. A more strigent AWQC for aquatic life may be found relevant and appropriate rather than an MCL, when protection of aquatic organisms is being considered at a site.	o AWQC were used to characterize risks t fresh water aquatic life resulting from discharge of treated groundwater to the Aberjona River.
2) TBCS		
o EPA Risk Reference Doses (RfDs)	o RfDs are dose levels developed by the EPA for noncarcinogenic effects.	o EPA RfDs were used to characterize risks due t exposure to contaminants in groundwater, as well as other media.
o EPA Carcinogen Assessment Gr up Potency Factors	o Potency Factors are developed by the EPA from Health Assessments or evaluation by the Carcinogen Efforts Assessment Group.	o EPA Carcinogenic Potency Factors wer used t compute the individual incremental cancer risk resulting from exposure to site contamination.
o Massachusetts Drinking Water Halth Adviseries	o DEQE Health Advisories are guidance criteria for drinking water.	o DEQE Health Advisories were considered when developing clean-up levels for groundwater.

ATTACHMENT

B

TABLE 10 (Cont'd)

ACTION-SPECIFIC AND LOCATION-SPECIFIC ARARS AND TBCS FOR ALTERNATIVE SC-10:
IN-SITU VOLATILIZATION/EXCAVATION/ON-SITE INCINERATION/BACKFILL ON-SITE
WELLS G&H SITE, WOBURN, MASSACHUSETTS

REQUIREMENT	REQUIREMENT SYNOPSIS	ACTION TO BE TAKEN TO ATTAIN REQUIREMENT
o RCRA - Tank Requirements (40 CFR 264 Subpart J)	o Provides design and operating requirements for RCRA waste treatment facilities utilizing tanks.	o Design and operation of the in-situ v latilization facility will follow these requirements.
o RCRA - Preparedness and Prevention (40 CFR 264.30 - 264.31)[2]	o This regulation outlines requirements for safety equipment and spill control.	o On-site facilities and activities will be designed and operated in accordance with RCRA requirements.
RCRA - Contingency Plan and Emerg ncy Procedures (40 CFR 264.50 - 264.56)[2]	o This regulation outlines the requirements for emergency procedures to be used following explosions, fires, etc.	o Emergency procedures will be devel ped and implemented in accordance with RCRA requirements.
RCRA - Manifesting, Recordkeeping, and Reporting (40 CFR 264.70 - 264.77)[2]	o This regulation specifies the recordkeeping and reporting requirements for RCRA facilities.	o Records will be maintained during site remediation in compliance with this requirement.
o RCRA - Closure and Post-Closure (40 CFR 264 Subpart G)[2]	o This regulation details the specific requirements for closure and post-closure care of hazardous waste facilities.	o Hazardous waste facilities will be clos d in a manner that meets the requirements f the closure regulations.
o OSHA - General Industry Standards (29 CFR 1910)[1]	o This regulation specifies the 8-hour, time-weighted average concentration for various organic compounds and 2 PCB compounds; site control procedures; training; and protective clothing requirements for worker protection at site remediations.	o Proper respiratory equipment will be worn if it is not possible to maintain the work atmosphere bel w these concentrations.
OSHA - Safety and Health Standards (29 CFR 1926)[1]	o This regulation specifies the type of safety equipment and procedures to be followed during construction and excavation activities.	o All appropriate safety equipment will b n-sit and procedures will be followed during groundwat r monitoring and excavation.
o OSHA - Recordkeeping, Reporting and R lated Regulations (29 CFR 1904)[1]	o The regulation outlines the recordkeeping and reporting requirements for an employer under OSHA.	o These regulations are applicable t the company contracted to execute site remediation.

TABLE 10 (Cont'd)

ACTION-SPECIFIC AND LOCATION-SPECIFIC ARARS AND TBCS FOR ALTERNATIVE SC-10:
IN-SITU VOLATILIZATION/EXCAVATION/ON-SITE INCINERATION/BACKFILL ON-SITE
WELLS G&H SITE, WOBURN, MASSACHUSETTS

REQUIREMENT	REQUIREMENT SYNOPSIS	ACTION TO BE TAKEN TO ATTAIN REQUIREMENT
DEQE - Hazardous Waste Management Requirements (310 CMR 30.00)[2]	o These regulations provide comprehensive monitoring, storing, recordkeeping, etc. programs at hazardous waste sites.	o During remedial design, these regulations will be compared to the corresponding federal RCRA regulations, and the more stringent requirements will be utilized. Note that Massachusetts considers s il contaminated in excess of 50 ppm PCBs to be a hazardous waste (310 CMR 30.131, wast #M002).
o DEQE - Hazardous Waste Incinerator Air Emisson Requirements 310 CMR 7.08(4)[2]	o Provides air emission requirements for hazardous waste incinerators. Principal Organic Hazardous Constituents (POHCS) destroyed to 99.99 percent, PCBs to 99.9999 percent. Particulate, HCL and CO emissions also controlled.	o On-site incineration activities to be design d and operated in compliance with requirements.
o TSCA - Marking of PCBs and PCB Items (40 CFR 761.40 - 761.79)[1]	o 50 ppm PCB storage areas, storage items, and transport equipment must be marked with the M_L mark.	o All storage areas, drums, and transp rt equipment will carry the appropriate markings displayed in an easily readable position.
o TSCA - Storage and Disposal (40 CFR 761.60 - 761.79)[1]	o This requirement specifies the requirements for storage and disposal/destruction of PCBs in excess of 50 ppm. These PCB-contaminated soils would have to be disposed of or treated in a facility permitted for PCBs, in compliance with TSCA regulations. Treatment must be performed using incineration or some other method with equivalent destruction efficiencies.	o Storage areas for drums containing PCB soils in excess of 50 ppm will be constructed to comply with this requirement. Verification of incinerator compliance will be made prior to drum shipment.
o TSCA - Records and Reports (40 CFR 761.18-761.185)[1]	o This regulation outlines the requirements for recordkeeping for storage and disposal of >50 ppm PCBs.	o Records will be maintained during remedial action in compliance with this regulation for all PCB drums which contain soils in excess of 50 ppm.
o CAA - National Air Quality Standards for Total Suspended Particulates (40 CFR 129.105, 750)[1]	o This regulation specifies maximum primary and secondary 24-hour concentrations for particulate matter.	o Fugitive dust emissions from site activiti s will be maintained below 150 ug/m^3 (secondary standard) by water sprays and other dust suppressants.
o DEQE - Ambient Air Quality Standards for the Commonwealth of Massachusetts[1] (310 CMR 6.00)	o This regulation specifies dust, odor, and noise emissions from construction activities.	o Fugitive dust will be controlled by water sprays or suppressants. All equipment will be maintained so as not to produce excessive noise.
o DEQE - Air Pollution Controls (310 CMR 7.00)[1]	o Regulates new sources of air pollution to prevent air quality degradation. Requires the use of "Best Available Control Technology" (BACT) on all new sources.	o BACT will be used on all new sources.

TABLE 10 (Cont'd)

ACTION-SPECIFIC AND LOCATION-SPECIFIC ARARS AND TBCS FOR ALTERNATIVE SC-10:
IN-SITU VOLATILIZATION/EXCAVATION/ON-SITE INCINERATION/BACKFILL ON-SITE
WELLS G&H SITE, WOBURN, MASSACHUSETTS

REQUIREMENT	REQUIREMENT SYNOPSIS	ACTION TO BE TAKEN TO ATTAIN REQUIREMENT
o Employee and Community Right-to-Know R quirements (310 CMR 33)[1]	o Establishes rules for the dissemination of information related to toxic and hazardous substances to the public.	o Information dissemination procedures in these regulations will be used.
2) Action-Specific TBCs		
RCRA - Proposed Air Emission Standards for Treatment Facilities (52 FR 3748, February 5, 1987)	o This proposal would set performance standards for RCRA treatment facility air emissions.	o Volatilization facilities and other non-incinerat rs that have air emissions (e.g., air strippers) will be designed to meet the proposed federal regulations.
3) Location-Specific ARARs		
o RCRA - Location Standards (40 CFR 264.18)[1]	o This regulation outlines the requirements for constructing a RCRA facility on a 100-year floodplain. A facility located on a 100-year floodplain must be designed, constructed, operated, and maintained to prevent washout of any hazardous waste by a 100-year flood, unless waste may be removed safely before floodwater can reach the facility, or no adverse effects on human health and the environment would result if washout occurred.	o It is assumed that remediation faciliti s will b located outside floodplains. Temporary staging areas or remediation facilities that are located in a floodplain will be a designed to allow quick mobilization out of the area and to prevent damage caused by initial floodwaters.
o CWA - Section 404 Dredge and Fill Requirements (Guidelines at 40 CFR 230)[1]	o The placement for fill following excavation of contaminated soil pursuant to remediation activities in the Aberjona River wetlands triggers Section 404 jurisdiction. The governing regulations favor practicable alternatives that have less impact on wetlands. If no mitigated practicable alternative exists, impacts must be mitigated.	o Under this alternative no excavation will ccur in Section 404 wetlands. Soil contamination in such areas will be remediated using in-situ v latilization which does not require excavation and subsequent filling.
o Massachusetts Wetlands Protection Requirements (310 CMR 10.00)[1]	o These requirements control regulated activities in freshwater wetlands, 100-year floodplains, and 100-foot buffer zones beyond these areas. Regulated activities include virtually any construction or excavation activity. Performance standards are provided for evaluation of the acceptability of various activities.	o Under this alternative, no excavation will ccur in the regulated wetlands. Excavation of contaminated soil may occur in the wetlands buff r zon . In this case, the alternative will meet performance standards for activities in the buffer zone.

TABLE 10 (Cont'd)

ACTION-SPECIFIC AND LOCATION-SPECIFIC ARARS AND TBCS FOR ALTERNATIVE SC-10:
IN-SITU VOLATILIZATION/EXCAVATION/ON-SITE INCINERATION/BACKFILL ON-SITE
WELLS G&H SITE, WOBURN, MASSACHUSETTS

REQUIREMENT	REQUIREMENT SYNOPSIS	ACTION TO BE TAKEN TO ATTAIN REQUIREMENT
o Wetlands Executive Order (EO 11990)[1]	o Under this Executive Order, federal agencies are required to select alternatives that minimize the destruction, loss or degradation of wetlands, and preserve and enhance natural and beneficial values of wetlands.	o No excavation will occur in Section 404 wetlands. This is the best practicable alternative for treating contaminated wetlands.
Fl odplains Executive Order (EO 11888)[1]	o Federal agencies are required to reduce the risk of flood loss, to minimize impact of floods, and to restore and preserve the natural and beneficial value of floodplains. In addition, practicable alternatives must be selected that have less impact on wetlands.	o Excavation and filling are temporary disruptions, anc filling will match preconstruction t pography. Thus, there is no permanent disruption of floodplain values and the ARAR will be met.
o Pr t ction of Archaeological Resources (32 CFR 229)	o These regulations develop procedures for the protection of archaeological resources.	o If archaeological resources are encountered during excavation, work will stop until th area has be n reviewed by federal and state archae logists.

[1]Applicabl

[2]Relevant and Appr priate

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
OCEAN ASSESSMENTS DIVISION
HAZARDOUS MATERIALS RESPONSE BRANCH
c/o U.S. Environmental Protection Agency
Waste Management Division - HEE-6
J.F. Kennedy Federal Building
Boston, MA 02203
5 June 1991

Ms. Meghan Cassidy
U.S. EPA Waste Management Division
J.F. Kennedy Federal Office Building
Boston, MA 02203

Dear Meghan:

Thank you for the Draft Feasibility Study, Detailed Analysis of Alternatives, Site 8, Brunswick Naval Air Station. A total of four remedial actions addressing soil contamination have been proposed for Site 8. The alternatives under consideration are:

1. No action.

2. Minimal action, including institutional controls and five-year site reviews.

3. Soil cover composed of geotextile fabric, soil, and vegetative layers.

4. Soil excavation, layering, conditioning, and solidification; and on-site backfilling, regrading, and revegetating of treated soils.

Comments

As noted in earlier reviews, concentrations of some contaminants are migrating downstream in the unnamed tributary to the Androscoggin River at levels which may pose potential threats to NOAA trustee habitats and species. Trace elements were detected in soils, groundwater, and seeps from Site 8 at concentrations exceeding applicable screening criteria. Concentrations of lead and PAHs detected in sediments collected from the unnamed tributary to the Androscoggin River downstream of the site exceeded ER-L values. Lead, zinc, and cyanide were detected in surface waters from the unnamed tributary at and downstream of the site at concentrations exceeding freshwater chronic and/or acute AWQC. Although clear gradients of contamination could not be fully established, the results of the data collected during the remedial investigation indicated that contamination is limited primarily to areas near the site, marginally decreases away from the site, and is unlikely to be present at high concentrations in habitats used extensively by NOAA trust resources. However, high levels of lead and cyanide warrant further additional sampling of surface waters and sediments in the vicinity of Site 8.

A target clean-up level of 18 mg/kg for PAHs in soils was proposed in the feasibility study. This target level would be protective of aquatic resources. Approximately 280 cubic meters of contaminated soils would be remediated at the site. Target clean-up levels for trace elements in soils were not proposed in the study.

Although Alternatives 3 and 4 would limit the migration of contaminants to nearby surface waters via erosion control, the proposed remedial actions do not include reducing the concentrations of contaminants detected in groundwater. Since groundwater discharge to the unnamed tributary is one of the primary mechanisms for the off-site transport of contaminants, NOAA is concerned that this discharge to the tributary would continue. Further review should be made regarding the likelihood that removal of contaminated soils will quickly eliminate the groundwater contamination.

Please contact me if you have any questions concerning this review.

Sincerely,

Kenneth Finkelstein