

IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF PENNSYLVANIA

UNITED STATES OF AMERICA,)
)
 Plaintiff,)
)
 v.)
)
 COMMONWEALTH OF PENNSYLVANIA,)
)
 Defendant.)

CIVIL ACTION NO.

SETTLEMENT AGREEMENT

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IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF PENNSYLVANIA

UNITED STATES OF AMERICA,)	
)	
Plaintiff,)	
)	CIVIL ACTION NO.
v.)	
)	
COMMONWEALTH OF PENNSYLVANIA)	
)	
Defendant.)	

SETTLEMENT AGREEMENT

INTRODUCTION:

A. The United States, on behalf of the Secretary of the United States Department of the Interior (“DOI”), including the National Park Service (“NPS”) (collectively, “DOI/NPS”), and the United States Environmental Protection Agency (“EPA”), has filed a complaint in this matter against the Commonwealth of Pennsylvania (“the Commonwealth”) pursuant to Section 107 of the Comprehensive Environmental Response, Compensation, and Liability Act (“CERCLA”), 42 U.S.C. § 9607, in connection with the Asbestos Release Superfund Site (“the Site”), located within the Valley Forge National Historical Park, Valley Forge, Pennsylvania, as further defined in Section III below.

B. The Commonwealth has not at this time filed a Complaint against the United States related to this matter. However, the Commonwealth asserts that it maintains claims under both federal and state law against the United States on behalf of DOI/NPS regarding costs allegedly incurred for response actions at the Site, as well as affirmative defenses to the United States' complaint.

C. In January 2007, the DOI/NPS issued a Record of Decision ("ROD") which documented the remedy selected to protect human health and the environment by addressing the release or threat of release of hazardous substances at the Site. The Commonwealth concurred in the selection of the remedy.

D. The Commonwealth does not admit any liability to the United States arising out of the transactions or occurrences alleged in the complaint. The United States does not admit any liability arising out of the transactions or occurrences that may be alleged in any claim or counterclaim that may be brought by the Commonwealth.

E. Pursuant to Executive Order 12580 and 40 C.F.R. § 300.5, DOI/NPS is the lead agency at the Site for implementation of response actions under CERCLA.

F. The purpose of this Settlement Agreement, inter alia, is to provide for resolution of the United States' and Commonwealth's claims with respect to response costs incurred and to be incurred at the Site and the remedy as provided herein and to provide for funding of the remedy. In consideration of the covenants set forth herein, the Commonwealth agrees to pay its negotiated share of the cost of the remedy to the United States as set forth in this Settlement Agreement. In consideration of the covenants set forth herein, the United States on behalf of

DOI/NPS agrees to pay its negotiated share of the costs of the remedy and to oversee and to ensure implementation of the remedy by a contractor.

G. The Parties recognize, and the Court by entering this Settlement Agreement finds, that this Settlement Agreement has been negotiated by the Parties in good faith, that implementation of this Settlement Agreement will expedite the cleanup of the Site and will avoid prolonged and complicated litigation between the Parties, and that this Settlement Agreement is fair, reasonable, and in the public interest.

NOW, THEREFORE, it is hereby Ordered, Adjudged, and Decreed:

I. JURISDICTION

1. This Court has jurisdiction over the subject matter of this action pursuant to 28 U.S.C. §§ 1331 and 1345, and 42 U.S.C. §§ 9607 and 9613(b). This Court also has personal jurisdiction over the Parties. Solely for the purposes of this Settlement Agreement and the underlying complaint, the Parties waive all objections and defenses that they may have to jurisdiction of this Court or to venue in this District. Neither the United States nor the Commonwealth shall challenge the terms of this Settlement Agreement or this Court's jurisdiction to enter and enforce this Settlement Agreement.

II. PARTIES BOUND

2. This Settlement Agreement is binding upon the United States and the Commonwealth, as defined below, and their successors and assigns.

III. DEFINITIONS

3. Unless otherwise expressly provided herein, terms used in this Settlement

Agreement that are defined in CERCLA or in regulations promulgated under CERCLA shall have the meaning assigned to them in CERCLA or in such regulations. Whenever terms listed below are used in this Settlement Agreement, the following definitions shall apply:

“CERCLA” shall mean the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, 42 U.S.C. § 9601, et seq.

“Commonwealth” shall mean the Commonwealth of Pennsylvania, including PADEP and all other state agencies, and all successor departments, agencies or instrumentalities of those agencies.

“Day” shall mean a calendar day. In computing any period of time under this Settlement Agreement, where the last day would fall on a Saturday, Sunday, or federal holiday, the period shall run until the close of business of the next working day.

“DOF” or “Department of the Interior” shall mean the Department of the Interior and any successor departments, agencies or instrumentalities of that Department.

“DOJ” shall mean the United States Department of Justice and any successor departments, agencies, or instrumentalities of that Department.

“Effective Date” shall mean the date on which this Settlement Agreement is executed by the Court.

“EPA” shall mean the United States Environmental Protection Agency and any successor departments, agencies, or instrumentalities of that Agency.

“EPA Hazardous Substance Superfund” shall mean the Hazardous Substance Superfund established by the Internal Revenue Code, 26 U.S.C. § 9507.

“EPA Past Response Costs” shall mean all costs, including but not limited to direct and indirect costs, that EPA or DOJ on behalf of EPA has paid at or in connection with the Site through the date of lodging of this Settlement Agreement, plus accrued Interest on all such costs through such date.

“Future Costs” shall mean all response costs, including direct and indirect costs, in excess of \$12 million incurred in connection with the performance of the Work.

“Interest” shall mean interest at the rate specified for interest on investments of the EPA Hazardous Substance Superfund established by 26 U.S.C. § 9507, compounded annually on October 1 of each year, in accordance with 42 U.S.C. § 9607(a). The applicable rate of interest shall be the rate in effect at the time the interest accrues. The rate of interest is subject to change on October 1 of each year.

“NCP” shall mean the National Oil and Hazardous Substances Pollution Contingency Plan, promulgated pursuant to Section 105 of CERCLA, 42 U.S.C. § 9605, and codified at 40 C.F.R. Part 300, and any amendments thereto.

“National Park Service” or “NPS” shall mean the National Park Service and any successor departments, agencies or instrumentalities of that Service.

“Natural Resources” shall have the meaning provided in Section 101(16) of CERCLA, 42 U.S.C. §9601(16).

“PADEP” shall mean the Pennsylvania Department of Environmental Protection, and any successor departments, agencies or instrumentalities of that Department.

“Paragraph” shall mean a portion of this Settlement Agreement identified by an

Arabic numeral or an upper or lower case letter.

“Parties” shall mean the United States, on behalf of EPA, DOI and NPS, and the Commonwealth.

“ROD” shall mean the Record of Decision issued by DOI/NPS in January, 2007, for the Site, and any subsequent amendments or modifications thereto, attached hereto as Appendix 1.

“Section” shall mean a portion of this Settlement Agreement identified by a Roman numeral.

“Settlement Agreement” shall mean this Settlement Agreement and the appendices attached hereto.

“Site” shall mean the Asbestos Release Superfund Site within the Valley Forge National Historical Park, located in Valley Forge, Montgomery County, Pennsylvania, and shall consist of the area indicated on Figure 1 to the ROD, attached as Appendix 2 to this Settlement Agreement.

“United States” shall mean the United States of America, including all of its departments, agencies, and instrumentalities.

“Work” shall mean all response actions, conducted by or on behalf of DOI/NPS, which are required to implement the ROD, including, without limitation, the remedial design and remedial action.

IV. OBJECTIVES OF THE PARTIES

4. The objectives of the Parties in entering into this Settlement Agreement are,

as set forth in this Settlement Agreement:

- a. to finance the Work;
- b. to reimburse EPA's Past Response Costs in connection with the Site;
- c. to resolve the claims, counterclaims, and defenses of the Parties as to each

other as set forth in Section VIII (Covenants Not to Sue).

V. PERFORMANCE OF AND PAYMENT FOR THE WORK

A. Overview.

5. The Commonwealth shall pay for 60% of the costs of the Work and the United States on behalf of DOI/NPS shall pay for 40% of the costs of the Work, up to a total cost of \$12 million, as set forth herein. Future Costs shall all be paid as set forth in Subsection E. of this Section. The payments received by the DOI Central Hazardous Materials Fund ("DOI CHF") shall be used exclusively for the Work. DOI/NPS shall oversee performance of the Work by contractors and shall ensure completion of the Work.

6. The Parties to this Settlement Agreement recognize and acknowledge that the payment obligations of DOI/NPS under this Settlement Agreement can only be paid from appropriated funds legally available for such purpose. Nothing in this Settlement Agreement shall be interpreted or construed as a commitment or requirement that the United States obligate or pay funds in contravention of the Anti-Deficiency Act, 31 U.S.C. § 1341, or any other applicable provision of law.

B. Initial Payments by the Commonwealth.

7. Within 30 days of the Effective Date, the Commonwealth shall pay to the

United States \$5,200,000 as provided below.

- a. The Commonwealth shall pay \$ 4,980,000 to DOI for financing the Work.
- b. The Commonwealth shall pay \$ 220,000 to EPA to reimburse EPA Past Response Costs.

8. Payment to EPA. The Commonwealth shall make the payment to EPA in accordance with instructions that the United States Attorney's Office for the Eastern District of Pennsylvania will provide to the Commonwealth in accordance with Section XIII (Notices and Submissions) and shall reference DOJ Case Number 90-11-3-06991/2, and the U.S. Attorney's Office File Number 2008VOO953. Payments shall be made by FedWire Electronic Funds Transfer ("EFT") to the appropriate U.S. Department of Justice account in accordance with current EFT procedures. Any payments received by the United States after 4:00 P.M. (Eastern Time) will be credited on the next business day. Copies of the transfer information and transmittal letters shall be provided to EPA and DOJ as specified in Section XIII (Notices and Submissions). In addition to the foregoing requirements, the payment to EPA shall reference the EPA Region and Site Spill No. A3-70. In addition to providing notice to EPA and DOJ in accordance with Section XIII (Notices and Submissions) that payment has been made, the Commonwealth also shall provide notice to the following: EPA Regional Docket Clerk (3RC00), United States Environmental Protection Agency, Region III, 1650 Arch Street, Philadelphia, PA 19103; and Barbara Borden (3PM30), United States Environmental Protection Agency, 1650 Arch Street, Philadelphia, PA 19103.

9. Payment to DOI/NPS. The Commonwealth shall make the payment to DOI/NPS under this Subsection in accordance with instructions that the United States Attorney's Office for the Eastern District of Pennsylvania will provide to the Commonwealth in accordance with Section XIII (Notices and Submissions) and shall reference DOJ Case Number 90-11-3-06991/2, and the U.S. Attorney's Office File Number 2008VOO953. Payments shall be made by FedWire Electronic Funds Transfer ("EFT") to the appropriate U.S. Department of Justice account in accordance with current EFT procedures. Any payments received by the United States after 4:00 P.M. (Eastern Time) will be credited on the next business day. Copies of the transfer information and transmittal letters shall be provided to DOI/NPS and DOJ as specified in Section XIII (Notices and Submissions).

C. Commonwealth Payments into Restricted Account.

10. As set forth below, the Commonwealth shall establish a Restricted Account in the amount of \$2 million limited exclusively to financing Work under the terms and conditions of this Settlement Agreement. The Restricted Account shall be used to pay 60% (sixty percent) of the cost of the Work at the Site that exceeds \$8.66 million and is less than or equal to \$12 million. In calculating those amounts, the DOI/NPS shall include only the costs of the Work paid after December 31, 2007. These requirements shall be implemented as follows:

a. Establishment and Funding of the Restricted Account. Within 12 months after the Effective Date, the Commonwealth shall establish a Restricted Account and shall deposit \$2 million in the Restricted Account for purposes of this Settlement Agreement. The Commonwealth shall provide notice to DOI/NPS of the establishment of the Restricted Account

along with copies of the documents establishing and governing the Restricted Account.

b. Drawdown on the Restricted Account. Once DOI/NPS has determined that the cost of the Work will exceed \$8.66 million and that additional funding is necessary for future Work, the DOI/NPS shall be entitled to receive drawdowns from the Restricted Account in an amount equal to 60% of the costs of performing additional Work until such time as (1) the total costs of the Work have reached or exceeded \$12 million; or (2) the DOI/NPS has issued a Certification of Completion pursuant to Paragraph 25 below. To make a drawdown from the Restricted Account, the DOI/NPS shall submit to the Commonwealth a demand for a drawdown. Such demand shall set forth: (1) the nature and expected duration of the future Work and the amount of the drawdown; (2) that the amount of the drawdown constitutes 60% of the costs that the DOI/NPS must pay for identified future Work; and (3) that the drawdown is otherwise consistent with the terms and conditions of this Settlement Agreement. Upon receipt of a demand for drawdown, the Commonwealth shall, within thirty (30) days of receipt, transfer the amount set forth in the demand for drawdown from the Restricted Account to the DOI/NPS in the same manner as set forth in Paragraph 9 above.

c. Closing of the Restricted Account. The Restricted Account shall be closed only when (1) the funds in the account have been fully depleted in accordance with the terms and conditions contained herein; or (2) the DOI/NPS has issued a Certification of Completion pursuant to Paragraph 25 below.

D. PADEP Costs.

11. DOI/NPS shall credit PADEP costs of \$20,000 incurred in connection with

the Site from its initial drawdown from the Commonwealth's Restricted Account.

E. Payment of Future Costs.

12. In the event that the costs of the Work exceed \$12 million, the Parties shall pay for their respective shares of the costs of the Work by alternating payments as follows: (1) the United States on behalf of DOI/NPS shall pay for the initial 40% of each additional \$1 million in response costs paid to perform the Work at the Site, or \$400,000; and (2) the Commonwealth then shall pay for the remaining 60% of each additional \$1 million in such costs, or \$600,000. The Parties shall continue to alternate the payment of costs in that fashion for each additional increment of \$1 million until the Work is completed and all costs are paid.

13. DOI/NPS shall send the Commonwealth a notice when the payment of Future Costs required under this Subsection is due. Each notice shall contain an accounting of the Future Costs paid at the Site and shall identify the amount of Future Costs the Commonwealth must expend for further implementation of the Work. The Commonwealth shall make its payment within 30 days of its receipt of the notice from DOI/NPS. The Commonwealth shall make its payment pursuant to the procedures set forth for payments to the DOI/NPS in this Section V, Subsection B, Paragraph 9.

14. The United States' share of Future Costs under this Section shall be made pursuant to Section VI, Paragraph 20 below.

15. The Commonwealth shall not challenge or contest in any way the ROD or the remedy selection or any other provisions in the ROD. The Commonwealth may contest payment of its increment of Future Costs pursuant to Section VIII (Dispute Resolution) only if it

contends that:

- a. The DOI/NPS has made an accounting error; or
- b. A cost item that is included in the DOI/NPS's accounting of its costs, or that will be incurred in the Commonwealth payment of Future Costs, represents costs that are or will be inconsistent with the NCP.

Such objection shall be made in writing within 15 days of receipt of the notice from the DOI/NPS. Any such objection shall specifically identify the disputed costs and the basis for the objection.

VI. UNITED STATES PAYMENTS ON BEHALF OF DOI/NPS

A. Payment to EPA.

16. Within 90 days following the Effective Date of this Settlement Agreement, the United States on behalf of DOI/NPS shall pay to EPA \$500,000, in reimbursement of EPA's Past Response Costs at the Site. The United States on behalf of DOI/NPS shall cause that amount to be transferred from the Department of Treasury's Judgment Fund to the Hazardous Substances Superfund, via the federal government's inter-agency electronic funds transfer system. In making such transfer, the following reference numbers shall be included: the United States Attorneys Office file number _____, the EPA Region and Site/Spill Identification Number A3-70, the DOJ/ENRD/EES case number 90-11-2-06991/2, and the civil action number for this action. Notice of such payment shall be provided to EPA as provided in Section XIII (Notices).

17. In the event that this payment is not made within 90 days following the Effective Date, the appropriate EPA Manager may raise any issues relating to payment to the

appropriate Department of Justice Assistant Section Chief for the Environmental Defense Section.

In any event, if this payment is not made within 120 days after the Effective Date of this Settlement Agreement, EPA and DOJ have agreed to resolve the issue within 30 days in accordance with a letter agreement dated December 28, 1998.

18. In the event that the payment required by this Section VI is not made within ninety (90) days of entry of this Settlement Agreement, Interest on the unpaid balance commencing on the Effective Date and accruing through the date of payment shall be paid to EPA.

B. Payment to the DOI CHF.

19. As soon as reasonably practicable after the Effective Date, the United States, on behalf of NPS, shall pay to the DOI CHF \$ 3,680,000 to be used exclusively for performance of the Work. The United States shall cause that amount to be transferred from the Department of the Treasury Judgment Fund to the DOI CHF in accordance with the following instructions:

- a. Payment shall be made to the DOI CHF by automated clearing-house known as Treasury's Automated Clearing House (ACH)/Remittance Express Program;
- b. Method of electronic transfer: Automated Clearing House (ACH);
- c. Receiver name: Central Hazardous Materials Fund ALC 14010001;
- d. Receiver Tax ID Number: 53-0196949;
- e. Receiver Address: 7401 West Mansfield Ave., Mailstop D-2777,

Lakewood, CO 80235;

- g. Receiver Bank: Federal Reserve Bank, New York, N.Y. ABA #05
1036706;
- h. Receiver ACH Account No.: 312024;
- i. If needed, additional information for Remitter's Banking Institution may be obtained from the DOI CHF Manager, following lodging of the Settlement Agreement.

20. In the event the costs of the Work exceed \$8.66 million, the United States on behalf of DOI/NPS shall send the Department of the Treasury periodic notices when additional payments of the DOI/NPS share of the costs of the Work are due. Each notice shall identify the amount of additional costs the United States on behalf of DOI/NPS must expend for further implementation of the Work and the costs to be transferred to the DOI CHF. The United States shall cause such payments to be transferred from the Department of Treasury Judgment Fund to the DOI CHF as soon as reasonably practicable using the procedures set forth in the foregoing paragraph.

VII. MODIFICATION OF THE WORK AND CERTIFICATION OF COMPLETION

A. Modification of the Work.

21. If DOI/NPS determines that modification of the Work is necessary to address areas of elevated asbestos or other hazardous substances not identified in the RI/FS, or to achieve and maintain the Performance Standards, or to carry out and/or maintain the effectiveness of the remedy selected in the ROD, the DOI/NPS, after notice to the Commonwealth, may incorporate such modification into the Remedial Design Work Plan, Remedial Action Work Plan,

and/or any other plan relating to such Work; provided, however, that a modification may be required pursuant to this Paragraph only to the extent that it is consistent with the scope of the remedy selected in the ROD.

22. For the purposes of the foregoing Paragraph, the “scope of the remedy selected in the ROD” includes: (1) excavation of all shallow soil contaminants exceeding Remediation Goals; (2) characterization of all excavated material for off-site disposal; (3) disposal of the material at an appropriately permitted facility (either an off-site landfill or a Resource Conservation and Recovery Act (RCRA) hazardous waste disposal facility, as appropriate); (4) disturbed area regrading, restoration, and revegetation; and (5) institutional controls.

23. If the Commonwealth objects to any modification determined by DOI/NPS to be necessary pursuant to this Subsection, it may seek dispute resolution pursuant to Section VIII (Dispute Resolution), Paragraph 29 (record review). The Remedial Design Work Plan, the Remedial Action Work Plan, and/or related work plans shall be modified in accordance with the final resolution of the dispute. Nothing in this Subsection shall be construed to limit the DOI/NPS’s authority to require performance of further response actions as otherwise provided in this Settlement Agreement.

24. Nothing in this Settlement Agreement shall be construed to allow the Commonwealth to challenge or contest the ROD or the remedy selection or any provisions contained in the ROD.

25. Certification of Completion. On or within seventy-five (75) days of

completion of the Remedial Action, the DOI/NPS shall certify in writing that the Work has been completed in accordance with the Performance Standards, the ROD, and the NCP.

VIII. DISPUTE RESOLUTION

26. Unless otherwise expressly provided for in this Settlement Agreement, the dispute resolution procedures described in this Section shall be the exclusive mechanism to resolve disputes arising between the DOI/NPS and the Commonwealth under or with respect to this Settlement Agreement. However, the procedures set forth in this Section shall not apply to actions by the DOI/NPS to enforce obligations of the Commonwealth that have not been disputed in accordance with this Section.

27. Any dispute which arises under or with respect to this Settlement Agreement shall in the first instance be the subject of informal negotiations between the parties to the dispute. The period for informal negotiations shall not exceed thirty (30) days from the time the dispute arises, unless the period is modified by written agreement of the parties to the dispute. The dispute shall be considered to have arisen upon receipt by the DOI/NPS from the Commonwealth of a written Notice of Dispute.

28. In the event that the Parties cannot resolve a dispute by informal negotiations under the preceding Paragraph, then the position advanced by the DOI/NPS shall be considered binding unless, within thirty (30) days after the conclusion of the informal negotiation period, the Commonwealth invokes the formal dispute resolution procedures of this Section by serving on the DOI/NPS a written Statement of Position on the matter in dispute, including, but not limited to, any factual data, analysis or opinion supporting that position and any supporting

documentation relied upon by the Commonwealth. The Statement of Position shall specify the Commonwealth's position as to whether formal dispute resolution should proceed under Paragraph 29 or Paragraph 30.

a. Within fourteen (14) days after receipt of the Commonwealth's Statement of Position, The DOI/NPS will serve on the Commonwealth its Statement of Position, including, but not limited to, any factual data, analysis, or opinion supporting that position and all supporting documentation relied upon by the DOI/NPS. The DOI/NPS' Statement of Position shall include a statement as to whether formal dispute resolution should proceed under Paragraph 27 or 28. Within ten (10) days after receipt of the DOI/NPS' Statement of Position, the Commonwealth may submit a Reply.

b. If there is disagreement between the DOI/NPS and the Commonwealth as to whether dispute resolution should proceed under Paragraph 29 or 30, the parties to the dispute shall follow the procedures set forth in the Paragraph determined by the DOI/NPS to be applicable. However, if the Commonwealth ultimately appeals to the Court to resolve the dispute, the Court shall determine which Paragraph is applicable in accordance with the standards of applicability set forth in Paragraph 29 or 30.

29. Formal dispute resolution for disputes pertaining to the selection or adequacy of any response action and all other disputes that are accorded review on the administrative record under applicable principles of administrative law shall be conducted pursuant to the procedures set forth in this Paragraph. For purposes of this Paragraph, the adequacy of any response action includes, without limitation: (1) the adequacy or appropriateness

of plans, procedures to implement plans, or any other items requiring approval by the DOI/NPS under this Settlement Agreement; and (2) the adequacy of the performance of response actions taken pursuant to this Settlement Agreement. Nothing in this Settlement Agreement shall be construed to allow any dispute by the Commonwealth regarding the validity of the ROD's provisions.

a. An administrative record of the dispute shall be maintained by the DOI/NPS and shall contain all Statements of Position, including supporting documentation, submitted pursuant to this Section. Where appropriate, the DOI/NPS may allow submission of supplemental statements of position by the parties to the dispute.

b. The DOI/NPS will issue a final administrative decision resolving the dispute based on the administrative record described in Paragraph 29.a. This decision shall be binding upon the Commonwealth, subject only to the right to seek judicial review pursuant to Paragraph 29.c. and d.

c. Any administrative decision made by the DOI/NPS pursuant to Paragraph 29.b. shall be reviewable by this Court, provided that a motion for judicial review of the decision is filed by the Commonwealth with the Court and served on all Parties within ten (10) days of receipt of the DOI/NPS's decision. The motion shall include a description of the matter in dispute, the efforts made by the Parties to resolve it, the relief requested, and the schedule, if any, within which the dispute must be resolved to ensure orderly implementation of this Settlement Agreement. The DOI/NPS may file a response to the Commonwealth's motion.

d. In proceedings on any dispute governed by this Paragraph, the

Commonwealth shall have the burden of demonstrating that the decision of the DOI/NPS is arbitrary and capricious or otherwise not in accordance with law. Judicial review of the DOI/NPS's decision shall be on the administrative record compiled pursuant to Paragraph 29.a.

30. Formal dispute resolution for disputes that neither pertain to the selection or adequacy for any response action nor are otherwise accorded review on the administrative record under applicable principles of administrative law, shall be governed by this Paragraph.

a. Following receipt of the Commonwealth's Statement of Position submitted pursuant to Paragraph 28, the DOI/NPS will issue a final decision resolving the dispute. The DOI/NPS's decision shall be binding on the Commonwealth unless, within ten (10) days of receipt of the decision, the Commonwealth files with the Court and serves on the Parties a motion for judicial review of the decision setting forth the matter in dispute, the efforts made by the Parties to resolve it, the relief requested, and the schedule, if any, within which the dispute must be resolved to ensure orderly implementation of the Settlement Agreement. The DOI/NPS may file a response to the Commonwealth's motion.

b. Judicial review of any dispute governed by this Paragraph shall be governed by applicable principles of law.

31. The invocation of formal dispute resolution procedures under this Section shall not extend, postpone, or affect in any way any obligation of the Commonwealth under this Settlement Agreement not directly in dispute, unless the DOI/NPS or the Court agrees otherwise.

32. The Parties agree that nothing in this Section shall affect whatever rights the Commonwealth may have under Section 121(e)(2) of CERCLA regarding its state applicable

or relevant and appropriate requirement (“ARARs”); provided, however, that the Parties agree that they shall initially seek to resolve any issues concerning state ARARs through informal dispute resolution procedures. The United States reserves any and all rights and defenses it may have in any dispute or action initiated pursuant to Section 121(e)(2), including but not limited to the right to assert that the Commonwealth has no authority to maintain such an action.

IX. COVENANTS NOT TO SUE AND RESERVATIONS

A. United States’ Covenants and Reservations.

33. United States’ Covenant Not to Sue the Commonwealth. In consideration of the payments to be made by the Commonwealth, and except as specifically provided in Paragraphs 34 through 37 below (Reservation of Rights and Reopeners) and Paragraph 44 (Natural Resources Reopener), the United States (1) covenants not to sue or to take administrative action against the Commonwealth pursuant to Sections 106 and 107(a) of CERCLA, 42 U.S.C. §§ 9606 and 9607(a), relating to the Site; and (2) further covenants not to sue the Commonwealth for recovery of damages, including costs of damage assessment, recoverable under Section 107 of CERCLA 42 U.S.C. §§ 9607, for injury to, destruction of, or loss of Natural Resources at the Site under the trusteeship of the United States. Except with respect to future liability, these covenants not to sue shall take effect upon receipt by EPA and by the United States of all payments required by Section V, Subsection B (Initial Payment). With respect to future liability, these covenants not to sue shall take effect upon issuance of a Certification of Completion pursuant to Paragraph 25. These covenants not to sue are conditioned upon the satisfactory performance by the Commonwealth of its obligations under this Settlement Agreement. These covenants not to sue

extend only to the Commonwealth.

34. United States' Pre-Certification Reservations. Notwithstanding any other provision of this Settlement Agreement, the United States reserves, and this Settlement Agreement is without prejudice to, the right to institute proceedings in this action or in a new action, or to issue an administrative order seeking to compel the Commonwealth (1) to perform further response actions relating to the Site or (2) to reimburse the United States for additional costs of response if, prior to Certification of Completion of the Remedial Action:

- a. Conditions at the Site, previously unknown to NPS, are discovered,
- or
- b. Information, previously unknown to NPS, is received, in whole or in part, and these previously unknown conditions or information together with any other relevant information indicates that the Remedial Action is not protective of human health or the environment.

35. United States' Post-Certification Reservations. Notwithstanding any other provision of this Settlement Agreement, the United States reserves, and this Settlement Agreement is without prejudice to, the right to institute proceedings in this action or in a new action, or to issue an administrative order seeking to compel the Commonwealth (1) to perform further response actions relating to the Site (2) to reimburse the United States for additional costs of response if, subsequent to Certification of Completion of the Remedial Action:

- a. Conditions at the Site, previously unknown to NPS, are discovered,
- or

b. Information, previously unknown to NPS, is received, in whole or in part, and these previously unknown conditions or information together with any other relevant information indicates that the Remedial Action is not protective of human health or the environment.

36. For purposes of the Pre-Certification reservations set forth in Paragraph 34 above, information and conditions known to NPS shall consist only of that information and those conditions known to NPS as of the date the ROD was signed and that are set forth in the ROD and the NPS administrative record supporting the ROD. For purposes of the Post-Certification reservations set forth in Paragraph 35, the information and the conditions known to NPS shall consist only of that information and those conditions known to NPS as of the date of Certification of Completion of the Remedial Action and that are set forth in the ROD, the administrative record supporting the ROD, the post-ROD administrative record, or in any information received by NPS in connection with its implementation of the Work prior to the Certification of Completion.

37. General Reservation of Rights by the United States. The United States reserves, and this Settlement Agreement is without prejudice to, all rights against the Commonwealth with respect to all matters not expressly included within the Covenant of the United States to the Commonwealth, including but not limited to:

a. Claims for failure of the Commonwealth to meet a requirement of this Settlement Agreement;

b. Liability arising from the past, present, or future disposal, release, or threat of release of hazardous substances outside of the Site; and

c. criminal liability.

B. The Commonwealth's Covenants and Reservations.

38. Except as specifically provided in Paragraphs 39 and 44 below

(Commonwealth's Reservation of Rights and Natural Resources Reopener), the Commonwealth (1) covenants not to sue or take administrative action against the United States under Sections 106, 107, 111, 112 or 113 of CERCLA, 42 U.S.C. §§9606, 9607, 9611, 9612 and 9613, or Sections 507, 701, 1101, 1102 or 1103 of HSCA, 35 P.S. §§ 6020.507, 6020.701, 6020.1101, 6020.1102 and 6020.1103, or any other state or federal law, for response actions or the recovery of response costs at the Site; (2) covenants not to sue or take administrative action under the above-cited provisions of CERCLA and HSCA for the recovery of damages, including the costs of any damage assessment, for injury to, destruction of, or loss of Natural Resources at the Site under the trusteeship of the Commonwealth; and (3) covenants not to submit any claim under CERCLA, either direct or indirect, for reimbursement from the Hazardous Substance Superfund.

39. Commonwealth's Reservation of Rights

The covenants not to sue by the Commonwealth set forth in Paragraph 38 above shall not apply to the following claims:

- a. failure to meet the requirements of this Settlement Agreement;
- b. past, present or future releases or threatened releases of hazardous substances or contaminants outside the boundaries of the Site; and
- c. past, present or future violations of state or federal criminal law.

40. Nothing in this Settlement Agreement shall be deemed to constitute

approval or preauthorization of a claim within the meaning of Section 111 of CERCLA, 42 U.S.C. § 9611, or 40 C.F.R. 300.700(d).

C. Federal Agency Mutual Covenants.

41. Covenant of EPA to DOI/NPS. In consideration of the payment that will be made by the United States on behalf of DOI/NPS under this Settlement Agreement, and of the Work to be performed by DOI/NPS, and except as specifically provided in Paragraph 43 (Reservations of Rights by EPA, DOI and NPS), EPA covenants not to take administrative action against DOI/NPS pursuant to Sections 106 and 107(a) of CERCLA, as amended, relating to the Site. EPA's covenant shall take effect upon the receipt by EPA of the payment required by Section VI (Reimbursement of EPA's Past Response Costs) and any Interest due thereon under Paragraph 18. EPA's covenant is conditioned upon the satisfactory performance by DOI/NPS of their respective obligations under this Settlement Agreement. EPA's covenant extends only to DOI/NPS.

42. Covenant of DOI/NPS to EPA. DOI/NPS agree not to assert any direct or indirect claim for reimbursement from the Hazardous Substance Superfund (established pursuant to the Internal Revenue Code, 26 U.S.C. § 9507) through CERCLA Sections 106(b)(2), 107, 111, 112, 113 or any other provision of law with respect to the Site.

43. Reservations of Rights by EPA, DOI and NPS. EPA, DOI and NPS reserve, and this Settlement Agreement is without prejudice to, all rights against each other with respect to all matters not expressly included within the foregoing federal agency covenants.

D. Reservation of Claims for Natural Resource Damages

44. Notwithstanding any other provision of this Settlement Agreement, the United States and the Commonwealth reserve the right to institute proceedings in this action or in a new action seeking recovery of damages for injuries to Natural Resources based on: (1) injury to, destruction of, or loss of Natural Resources resulting from conditions that were unknown to the United States or the Commonwealth as of the Effective Date of this Settlement Agreement, or (2) information received by the United States or the Commonwealth after the Effective Date of this Settlement Agreement that indicates that there is injury to, destruction of, or loss of Natural Resources of a type unknown to the United States or the Commonwealth as of the Effective Date of this Settlement Agreement.

X. EFFECT OF SETTLEMENT/CONTRIBUTION PROTECTION

45. Nothing in this Settlement Agreement shall be construed to create any rights in, or grant any cause of action to, any person not a Party to this Settlement Agreement. Each of the Parties expressly reserves any and all rights (including, but not limited to, pursuant to Section 113 of CERCLA, 42 U.S.C. § 113), defenses, claims, demands, and causes of action that each Party may have with respect to any matter, transaction, or occurrence relating in any way to the Site against any person not a party hereto.

46. The Parties agree, and by entering this Settlement Agreement the Court finds, that this Settlement Agreement constitutes a judicially-approved settlement for purposes of Section 113(f)(2) of CERCLA, 42 U.S.C. § 9613(f)(2), and that each of the Parties is entitled, as

of the date of entry of this Settlement Agreement, to protection from contribution actions or claims brought by persons not Party to this Settlement Agreement, as provided by Section 113(f)(2) of CERCLA, 42 U.S.C. § 9613(f)(2), or as may otherwise be provided by law, with respect to the Site.

47. Both the United States and the Commonwealth agree that, with respect to any suit or claim for contribution brought against a third party by either Party for matters related to this Settlement Agreement, such Party will notify the other in writing no later than sixty (60) days prior to the initiation of such suit or claim. Both the United States and the Commonwealth also agree that, with respect to any suit or claim for contribution brought against either Party for matters related to this Settlement Agreement, such Party will notify the other within ten (10) days of service of the complaint or claim upon it. In addition, both the United States and the Commonwealth shall notify the other within ten (10) days of service or receipt of any motion for summary judgment, and within ten (10) days of receipt of any order from a court setting a case for trial, for matters related to this Settlement Agreement.

48. In any subsequent administrative or judicial proceeding initiated by either the Commonwealth or the United States against the other for injunctive relief, recovery of response costs, or other relief relating to the Site, the responding party shall not assert, and may not maintain, any defense or claim based upon the principles of waiver, res judicata, collateral estoppel, issue preclusion, claim-splitting, or other defenses based upon any contention that the claims raised by either the Commonwealth or the United States in the subsequent proceeding were

or should have been brought in the instant case; provided, however, that nothing in this paragraph affects the enforceability of the Covenants set forth in Section IX.

XI. ACCESS

49. The Commonwealth shall comply with all requirements and regulations of the NPS concerning access and entry to the Valley Forge National Historical Park.

XII. RETENTION OF RECORDS

50. The Commonwealth shall notify DOI/NPS and DOJ at least ninety (90) days before any destruction or disposal of any records pertaining to the Valley Forge National Historical Park or its predecessor state park, the site, and the Keene/Ehret inholding. The Commonwealth may assert that certain records are privileged under the attorney-client privilege or any other privilege recognized by federal law. If the Commonwealth asserts such a privilege, it shall redact documents or provide DOI/NPS and DOJ with a privilege log as required by the Federal Rules of Civil Procedure.

XIII. NOTICES AND SUBMISSIONS

51. Whenever, under the terms of this Settlement Agreement, notice is required to be given or a document is required to be sent by one Party to another, it shall be directed to the individuals at the addresses specified below, unless those individuals or their successors give notice of a change to the other parties in writing. Written notice as specified herein shall constitute complete satisfaction of any written notice requirement of this Settlement Agreement

with respect to the United States, including the DOJ, EPA, and DOI/NPS, and to the Commonwealth, respectively.

As to the United States:

As to DOJ:

Chief
Environmental Enforcement Section
Environment and Natural Resources Division
U.S. Department of Justice
P.O. Box 7611
Washington, D.C. 20044-7611
(DJ# 90-11-3-06691/2)

As to DOI:

Casey S. Padgett
Assistant Solicitor
Office of the Solicitor
U.S. Department of the Interior
1849 C Street NW, MS # 5530
Washington, D.C. 20240
casey.padgett@sol.doi.gov

William B. Lodder, Jr.
CHF Manager, MS # 2462
Office of Environmental Policy and Compliance
U.S. Department of the Interior
1849 C Street NW
Washington, D.C. 20240
william.lodder@ios.doi.gov

As to NPS:

Shawn P. Mulligan
National Park Service
1050 Walnut Street, Suite 220
Boulder, Colorado 80302
Shawn_Mulligan@nps.gov

As to EPA:

Suzanne M. Parent (3RC44)
Senior Assistant Regional Counsel
EPA Region III
1650 Arch Street
Philadelphia, PA 19103-2029
parent.suzanne@epa.gov

As to the Commonwealth:

Mr. Ragesh Patel
HSCA Manager
Pennsylvania Department of Environmental Protection
2 East Main Street
Norristown, PA 19401

And

Anderson Lee Hartzell
Pennsylvania Department of Environmental Protection
Regional Supervising Counsel
2 East Main Street
Norristown, PA 19401

XIV. RETENTION OF JURISDICTION

52. This Court shall retain jurisdiction over this matter for the purpose of interpreting and enforcing the terms of this Settlement Agreement.

XV. INTEGRATION/APPENDICES

53. This Settlement Agreement and its appendix constitute the final, complete and exclusive agreement and understanding between the Parties with respect to the settlement embodied in this Settlement Agreement. The Parties acknowledge that there are no representations, agreements, or understandings relating to the settlement other than those expressly contained in this Settlement Agreement. The following appendices are attached to and incorporated into this Settlement Agreement:

Appendix 1 Record of Decision

Appendix 2 Map of the Site

XVI. LODGING AND OPPORTUNITY FOR PUBLIC COMMENT

54. This Settlement Agreement shall not become final until at least sixty (60) days after it is lodged with the Court to allow for public notice and comment. The United States shall publish notice of this Settlement Agreement in the Federal Register, and the Commonwealth shall publish notice of this Settlement Agreement in the Pennsylvania Bulletin and a newspaper of general circulation in the area of the Site. The United States and the Commonwealth shall allow for a 60- day period for public comment and agree to share any comments received during the public comment period. Both the United States and the Commonwealth reserve the right to

withdraw their consent to this Settlement Agreement if comments received during the public comment period disclose facts or considerations which indicate that this Settlement Agreement is inappropriate, improper, inadequate or not in the public interest.

XVII. SIGNATORIES/SERVICE

55. The undersigned representatives of the Commonwealth and the Assistant Attorney General of the Environmental and Natural Resources Division of the United States Department of Justice certify that they are authorized to enter into the terms and conditions of this Settlement Agreement and to execute and bind legally each respective Party to this Settlement Agreement.

56. The Commonwealth shall identify, on the attached signature page, the name and address of an agent who is authorized to accept service of process by mail on behalf of the Commonwealth with respect to all matters arising under or relating to this Settlement Agreement. The Commonwealth hereby agrees to accept service in that manner and to waive the formal service requirements set forth in Rule 4 of the Federal Rules of Civil Procedure and any applicable local rules of the Court, including but not limited to, service of a summons. The Parties agree and stipulate that the Commonwealth need not file an answer to the complaint in this action unless or until the Court expressly withdraws the entry of this Settlement Agreement.

XVIII. FINAL ORDER

57. Upon entry and approval of this Settlement Agreement by the Court, this

Settlement Agreement shall constitute the final agreement between the United States and the Commonwealth. The Court finds that there is no just reason for delay and therefore enters this Settlement Agreement as a final order under Fed. R. Civ. P. 54, 58 and 65.

SO ORDERED THIS DAY OF _____, 20__.

United States District Judge

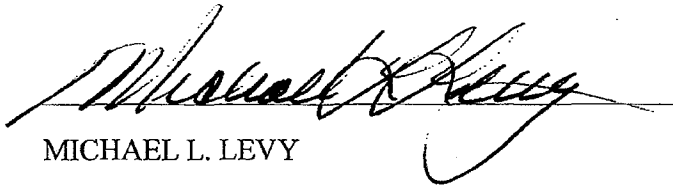
Settlement Agreement between the United States and the Commonwealth of Pennsylvania
regarding the Valley Forge Asbestos Release Superfund Site:

FOR THE UNITED STATES OF AMERICA

DEPARTMENT OF JUSTICE:

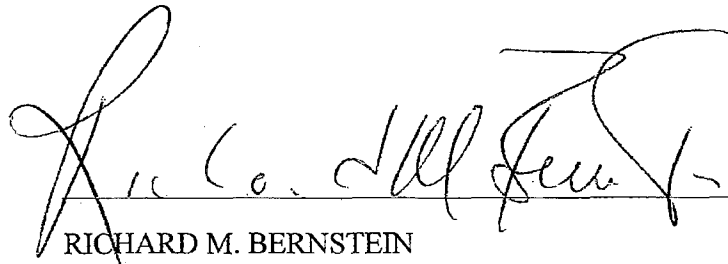
IGNACIA S. MORENO
Assistant Attorney General
Environment and Natural Resources Division
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MICHAEL L. LEVY

United States Attorney



RICHARD M. BERNSTEIN

Assistant United States Attorney

615 Chestnut Street Suite 1250

Philadelphia PA 19106

(215) 861-8334

Settlement Agreement between the United States and the Commonwealth of Pennsylvania
regarding the Valley Forge Asbestos Release Superfund Site:

FOR THE UNITED STATES DEPARTMENT OF THE INTERIOR:

RACHEL JACOBSON

Principal/Deputy Solicitor

Department of the Interior

1849 C. Street NW

Washington, DC 20240

Settlement Agreement between the United States and the Commonwealth of Pennsylvania
regarding the Valley Forge Asbestos Release Superfund Site:

FOR THE NATIONAL PARK SERVICE:

Dated: 3.12.10

~~STEVEN E. WHITESELL~~
Associate Director
Park Planning, Facilities, and Lands
National Park Service
1849 C Street, N.W. -Room 3120
Washington, DC 20240-0001

Dated: 3.12.10

SHAWN P. MULLIGAN
Senior Environmental Program Advisor
National Park Service
United States Department of the Interior
1050 Walnut Street-Suite 220
Boulder, CO 80302

Settlement Agreement between the United States and the Commonwealth of Pennsylvania
regarding the Valley Forge Asbestos Release Superfund Site:

FOR THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY REGION 3:

SHAWN M. GARVIN
Regional Administrator
United States Environmental Protection Agency
Region 3

MARCIA E. MULKEY
Regional Counsel
United States Environmental Protection Agency
Region 3

SUZANNE M. PARENT
Senior Assistant Regional Counsel
United States Environmental Protection Agency
Region 3
1650 Arch Street, mailcode 3RC44
Philadelphia, PA 19103-2029
(215) 814-2630

Settlement Agreement between the United States and the Commonwealth of Pennsylvania regarding the Valley Forge Asbestos Release Superfund Site:

FOR THE COMMONWEALTH OF PENNSYLVANIA:

~~KENNETH R. REISINGER~~ 2/17/10
Acting Deputy Secretary Date
Waste, Air and Radiation Management
Pennsylvania Department of Environmental Protection
Rachel Carson State Office Building
400 Market Street, Harrisburg, PA 17101

~~ANDERSON LEE HARTWELL~~ 3/4/10
Regional Supervising Counsel Date
Office of Chief Counsel
Pennsylvania Department of Environmental Protection
2 East Main Street
Norristown, PA 19401

I hereby approve this Settlement Agreement and certify that funds in the amount of \$7.2 million are available under Appropriation No. 7007009000/3522509000/3525041227/6343117

~~Office of the Comptroller~~ 2/19/10
Pennsylvania Department of Environmental Protection Date

ME# 4000014590

APPENDIX 1

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LIST OF ACRONYMS

AMQ	Amphitheater Quarry
AOCs	Areas of Concern
AR	Administrative Record
ARAR	Applicable or Relevant and Appropriate Requirement
ARS	Asbestos Release Site
BERA	Baseline Ecological Risk Assessment
bgs	Below Ground Surface
CECs	Contaminants of Ecological Concern
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
COCs	Contaminants of Concern
CPECs	Contaminants of Potential Ecological Concern
CVQ	Cave Quarry
ELCR	Excess Lifetime Cancer Risk
FEMA	Federal Emergency Management Agency
FKP	Former Keene Plant Area
FKP-CLRPDD	Former Keene Plant Area-County Line Road Potential Debris Dump
FKP-FOOT	Former Keene Plant Area-Plant Footprint
FKP-I	Former Keene Plant Area-Impoundments
FKP-LQ	Former Keene Plant Area-Lower Quarry
FKP-MISC	Former Keene Plant Area-Miscellaneous Areas
FKP-NB	Former Keene Plant Area-Northern Buildings
FKP-NWP	Former Keene Plant Area-Waste Piles
FKP-UQ	Former Keene Plant Area-Upper Quarry
FS	Feasibility Study
HHRA	Baseline Human Health Risk Assessment
HI	Hazard Index
HIB	Historic Bridge
HQ	Hazard Quotient
LOAEL	Lowest Observable Adverse Effects Level
LVQ	Lower Visitor Center Quarry
MAR	Maintenance Area Ruins
MDL	Method Detection Limit
MLE	Most Likely Exposure
MQ 1	Maintenance Quarry 1
MQ 2	Maintenance Quarry 2
MQ 3	Maintenance Quarry 3
MQ 4	Maintenance Quarry 4
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NESHAPs	National Emission Standards for Hazardous Air Pollutants
NOAEL	No Observed Adverse Effects Level
NPS	National Park Service
OSHA	United States Occupational Safety and Health Administration

OU	Operable Units
PADEP	Pennsylvania Department of Environmental Protection
PADOT	Pennsylvania Department of Transportation
PAHs	Polycyclic Aromatic Hydrocarbons
PCBs	Polychlorinated Biphenyls
PDQ	Pennsylvania Department of Transportation Quarry AOC
PEM	Palustrine Emergent Wetlands
PFO1	Palustrine Forested Broad-Leaved Deciduous Wetlands
PLM	Polarized Light Microscopy
PPE	Personal Protective Equipment
PRG	Preliminary Remediation Goal
RAGS	Risk Assessment Guidance for Superfund
RAOs	Remedial Action Objectives
RBCs	Risk-Based Concentrations
RCRA	Resource Conservation and Recovery Act
RGs	Remediation Goals
RI	Remedial Investigation
RME	Reasonable Maximum Exposure
ROD	Record of Decision
SAQ	Small Additional Quarry AOC
SIB	Silicate Bank AOC
SVOC	Semi-Volatile Organic Compound
TBC	To Be Considered
TEM	Transmission Electron Microscopy
TtEC	Tetra Tech EC, Inc.
TtFWI	Tetra Tech Foster Wheeler, Inc.
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
VFNHP	Valley Forge National Historical Park
VOC	Volatile Organic Compound
WAP	Waste Pile AOC
WCR	Waste Channel and Railbed
WCRN	Waste Channel and Railbed – North AOC
WCRS	Waste Channel and Railbed – South AOC
yd ³	Cubic Yards

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DECLARATION

Site Name and Location

Asbestos Release Site (ARS)
Valley Forge National Historical Park (VFNHP)
Montgomery County, Pennsylvania

Statement of Basis and Purpose

This decision document presents the Remedial Action ("Selected Remedy") for the Asbestos Release Site ("the Site"), located in the Valley Forge National Historical Park (VFNHP) in Montgomery County, Pennsylvania. The Selected Remedy was chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended, and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The Selected Remedy was chosen by the Department of the Interior, National Park Service (NPS) pursuant to its CERCLA lead agency status. This decision is based on the Administrative Record (AR) file for this Site.

The Commonwealth of Pennsylvania has concurred with the Selected Remedy outlined in this Record of Decision (ROD).

Assessment of the Site

The Selected Remedy presented in this ROD is necessary to protect the public health or welfare and the environment from actual or threatened releases of hazardous substances into the environment.

Description of the Selected Remedy

Under the Selected Remedy, shallow soil containing levels of contaminants that pose unacceptable risk to residents of, and visitors to, the VFNHP; or unacceptable risk to the environment, will be excavated and disposed off-site at appropriately licensed or permitted facilities. An estimated 52,000 cubic yards (yd³) of soil will be excavated and removed from the Site. Contaminants will remain deeper in the subsurface that do not present risks to residents, visitors, or the environment. These subsurface contaminants could pose a risk to maintenance and/or construction workers who may encounter the contamination during future excavation activities if these workers are uninformed and unprotected. Therefore, institutional controls are part of the Selected Remedy to prevent exposure and protect the health of these workers. A more detailed discussion of the principal components of the Selected Remedy is presented in Section XII of the Decision Summary of this ROD.

Statutory Determination

The Selected Remedy is protective of human health and the environment, complies with Federal and State requirements that are applicable or relevant and appropriate, is cost-effective, and utilizes permanent solutions and alternative treatment (or resource recovery) technologies to the maximum extent practicable. Although the Selected Remedy may not satisfy the statutory preference for treatment that permanently and significantly reduces the volume, toxicity, or mobility of hazardous substances as a principal element, this is appropriate because no potentially viable alternative exists for on-site treatment of the predominant contaminant type (asbestos) that will effectively reduce its volume, mobility, and toxicity. The Selected Remedy, by excavating contaminated soil and disposing it at an appropriate off-site facility, effectively reduces the volume of hazardous substances present at the VFNHP, and reduces its toxicity and mobility by eliminating the exposure potential and isolating it from potential migration pathways (e.g., water and wind erosion).

Because the Selected Remedy will result in hazardous substances, pollutants, or contaminants remaining in subsurface soil above levels that allow for unrestricted use, a statutory review will be conducted within 5 years after initiation of remedial action, and every 5 years thereafter, to ensure that the remedy is, or will be, protective of human health and the environment.

Data Certification Checklist

The following information is included in the Decision Summary of this ROD. Additional information can be found in the Administrative Record file for this Site.

- Chemicals of concern and their respective concentrations (see pages 8-9, page 13, pages 15-18, and Appendix A, Tables A-1 through A- 4)
- Baseline risk represented by the chemicals of concern (see pages 13-18)
- Cleanup levels established for chemicals of concern and the basis for these levels (see pages 19-22)
- Current and reasonably anticipated future land use assumptions (see pages 11-13)
- Estimated capital, annual operation and maintenance (O&M), and total present worth costs, discount rate, and the number of years over which the remedy cost estimates are projected (see page 34)
- Key factor(s) that led to selecting the remedy (see page 31)

Authorizing Signature

_____ Date

Assistant Secretary, Policy, Management and Budget
Department of the Interior
National Park Service

DECISION SUMMARY

I. SITE NAME, LOCATION AND DESCRIPTION

The Asbestos Release Site ("ARS" or "the Site") is located within the Valley Forge National Historical Park (VFNHP) in Montgomery County, Pennsylvania (see Figure 1). The Site is managed by the National Park Service (NPS). VFNHP has an area of approximately 3,600 acres and is maintained as an active historical park and recreation area. VFNHP is comprised of rolling hills, open fields, wooded areas, and former limestone quarry areas.

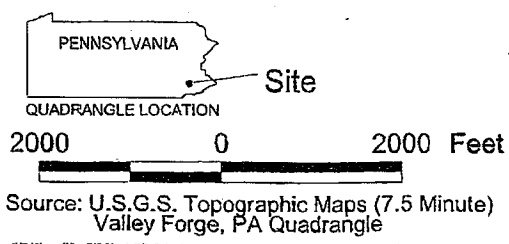
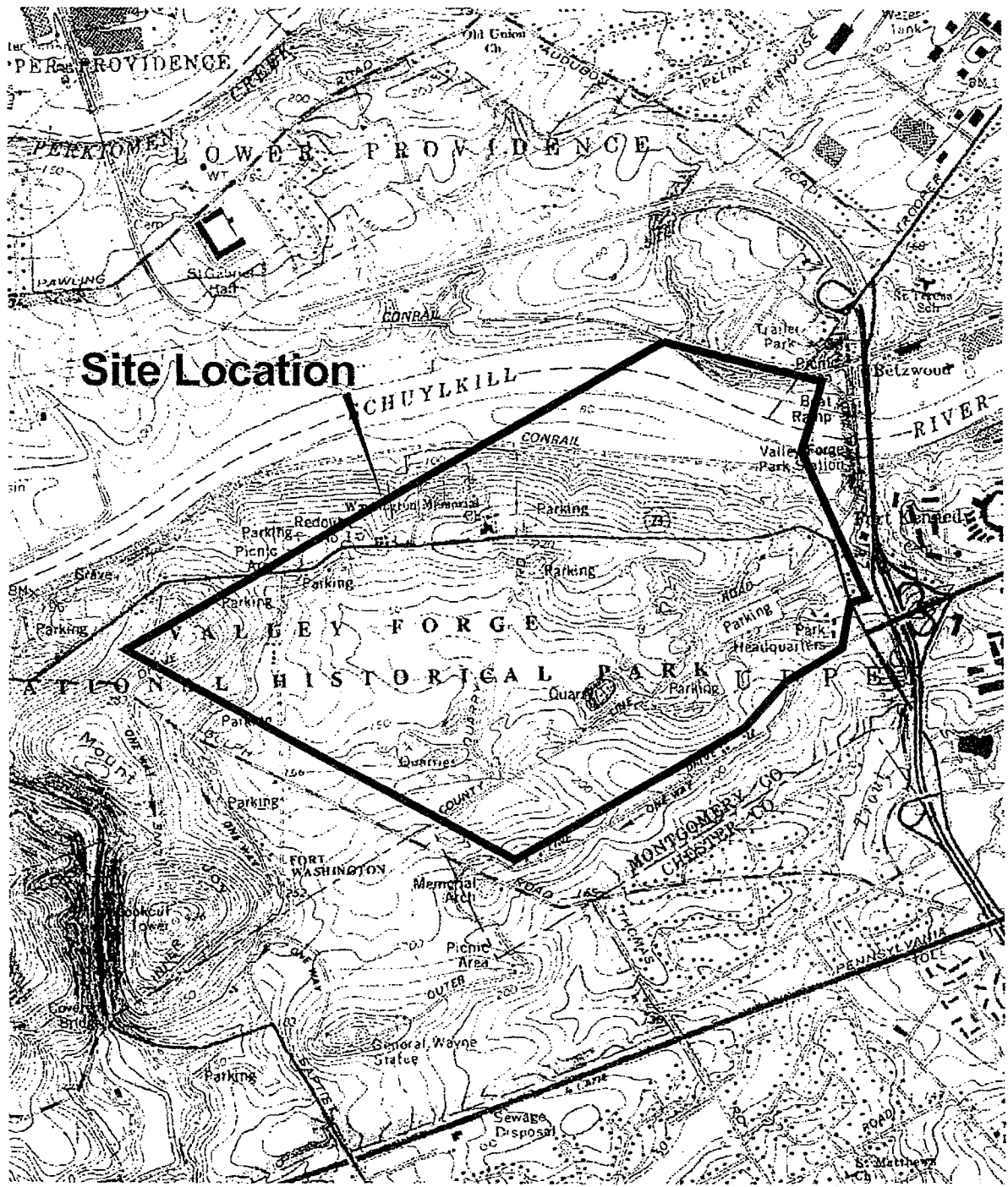
The Site is located in the central section of the eastern side of VFNHP and has an area of approximately 112 acres (see Figure 2). Surface drainage is generally towards the Schuylkill River, the northern boundary of the Site. The Site is divided into two operable units (OUs): the Keene OU and the Former State Lands OU. The Keene OU is approximately 42 acres and is bounded on two sides by the Former State Lands OU (approximately 70 acres). These OUs include 15 Areas of Concern (AOCs) which are shown on Figure 2. Only 9 of these AOCs require active remediation as determined in the Feasibility Study (FS), and these AOCs are indicated on Figure 2. Much of the Site is found along and surrounding County Line Road.

II. SITE HISTORY AND ENFORCEMENT ACTIVITIES

In the early 1800s, the limestone industry developed with the quarrying of limestone and construction of kilns in portions of the VFNHP to produce limestone for use in agriculture. From the early 1890s to the 1970s, Ehret Magnesia Company ("Ehret") and its successor, Keene Corporation ("Keene"), manufactured asbestos insulation at a plant located within the Site. The pipe insulation was manufactured by pouring a slurry mix of asbestos fibers and magnesium carbonate (from the readily available dolostone present within the local limestone deposits) into molds. Ehret disposed of waste asbestos slurry by either pumping it through pipelines into the former limestone quarries, in what was then a state park, or by directing the slurry waste to a waste channel constructed in a natural drainage swale that parallels a former railbed and ultimately discharges to the Schuylkill River. The waste slurry deposits in the abandoned quarries were subsequently covered with soil.

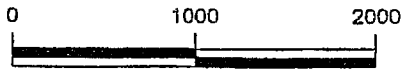
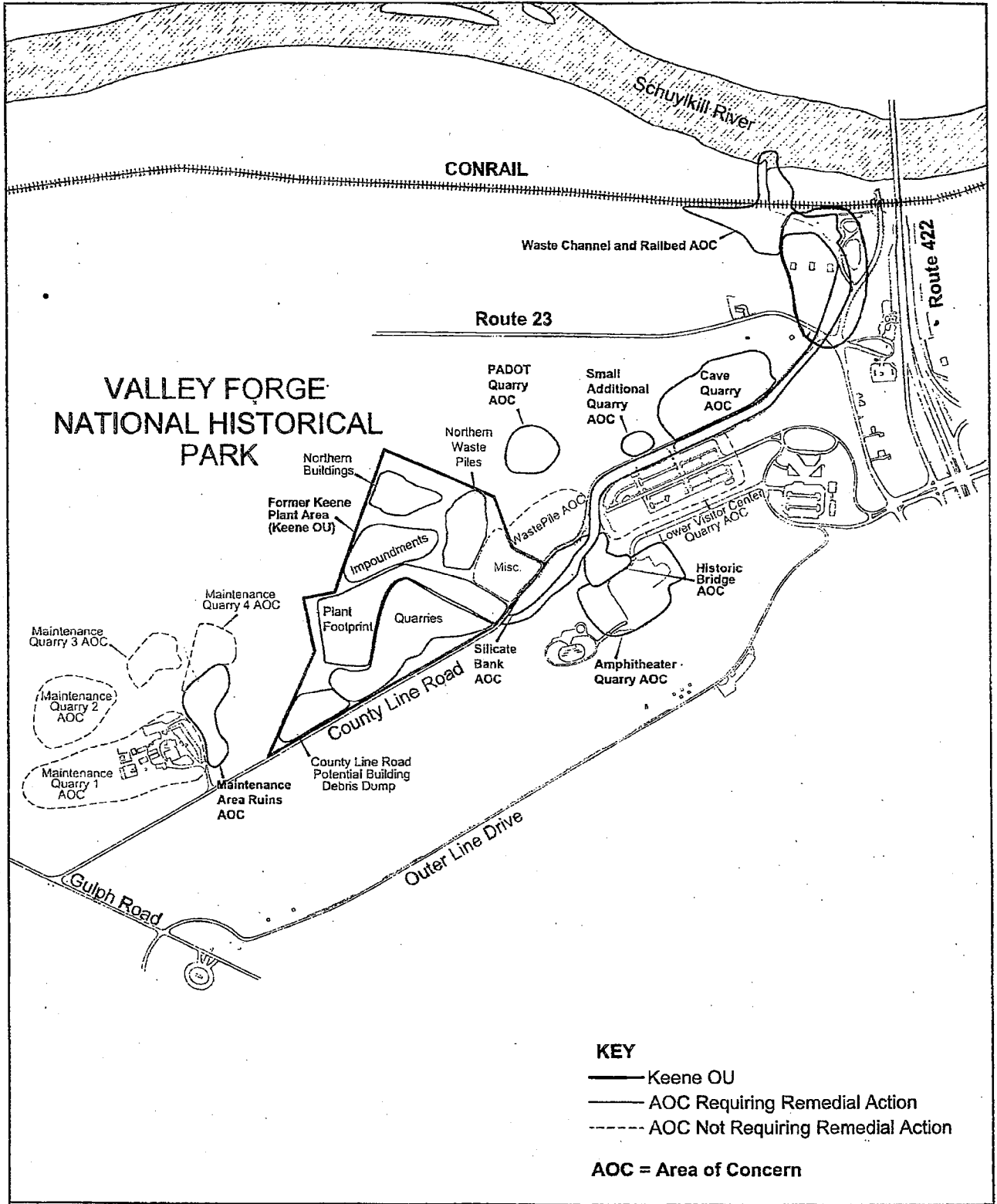
In the 1960s, Ehret sold the plant and property to Keene. Keene continued to manufacture asbestos products until the plant was closed in the early 1970s. On October 13, 1976, NPS purchased the Keene property. On November 24, 1982, following official transfer of title for the state park land to NPS, the Secretary of the Interior issued official notice establishing the Valley Forge National Historical Park as a unit of the National Park System.

The asbestos contamination at VFNHP was identified in January 1997 during the excavation of a trench for a fiber optic cable through the Amphitheater Quarry AOC. In certain soil samples, asbestos was detected at concentrations as high as 70 percent.



Valley Forge Asbestos Release Site

**Figure 1
Site Location Map**



The horizontal datum is PA State Coordinate System (NAD 83) and the vertical datum is NAVD 88.

Valley Forge Asbestos Release Site

**Figure 2
Site Map**

The presence of high concentrations of asbestos caused the U.S. Environmental Protection Agency (USEPA) and NPS to conduct response activities that included: removal of asbestos contamination in some areas; covering other areas with clean soil or a cement-like soil binding agent and revegetating; and installing warning fencing and signs to control public access to contaminated areas. .

Following implementation of these response activities, a Remedial Investigation (TtFWI, 2005a) and Feasibility Study (NPS, 2006) were conducted to determine the nature and extent of contamination at the Site and to evaluate alternatives for responding to contamination at the Site. NPS issued the Remedial Investigation (RI) and Feasibility Study (FS) Reports in February 2005 and August 2006, respectively. The RI/FS reports are contained in the Administrative Record file for this Site.

In 2002, Reinhold Industries, the corporate successor to Keene, agreed to pay NPS \$500,000 to settle all NPS CERCLA claims against Keene at the Site.

III. COMMUNITY PARTICIPATION

The RI/FS and Proposed Plan for the Site were made available to the public September 22, 2006. These documents were placed in the Administrative Record file at the Valley Forge National Historical Park Welcome Center Desk and the NPS Environmental Management Program office in Boulder, Colorado. The Proposed Plan was also made available on the NPS website from: <http://parkplanning.nps.gov> by selecting "Valley Forge NHP", then "Clean-up of the Asbestos Release Site....", then "Document List", then "Proposed Plan...". The public was invited to use this website to submit comments. Additional information about the Site is available on the VFNHP website: www.nps.gov/vafo/. The Notice of Availability of these documents was published in the Philadelphia Inquirer and the Pottstown Mercury on September 17, 2006. A public comment period was held from September 22, 2006 to November 6, 2006. In addition, a public meeting was held on September 28, 2006, at the Education Center at VFNHP to present the Proposed Plan. NPS representatives explained the Preferred Alternative and other alternatives that were considered and answered questions from the public. Oral comments and questions were received at the meeting. The National Park Service's responses to comments received during the comment period are presented in the Responsiveness Summary, which is included at the end of this ROD (see page RS-1).

IV. SCOPE AND ROLE OF THE REMEDIAL ACTION

The overall Site Remedial Action strategy is to clean up the Site to achieve formulated remediation goals (RGs) so that the Site will not present unacceptable risk to recreational visitors, workers, residents, or relevant ecological receptors. The Selected Remedy includes excavation of all shallow soil that contains contaminants exceeding RGs; characterization of all excavated material for off-site disposal; and disposal of the material at an appropriately permitted facility (either an off-site landfill or a Resource Conservation and Recovery Act (RCRA) hazardous waste disposal facility, as appropriate). The entire disturbed area will be

backfilled with clean soil, graded, and re-vegetated to minimize erosion and return the area to a natural state. In addition, institutional controls will be put in place to manage and control potential future exposure by Park maintenance and/or construction workers to deep contamination that will remain in place. A more detailed discussion of the principal components of the Selected Remedy is provided in Section XII.

V. SITE CHARACTERISTICS

Site Overview

As noted above, the Site covers approximately 112 acres (see Figure 2). Topographic relief in the Site is generally low to moderate with elevations ranging from 80 to 200 feet above mean sea level. More moderate relief is associated with karst terrain and quarry areas. Natural surface features in the Site include rolling hills, caves and sinkholes, open fields and wooded areas. Anthropogenic features include former quarry areas, roads, parking lots, and Park buildings.

The general flow pattern within the Site watershed is from southwest to northeast. The Waste Channel, which receives stormwater runoff from the Site, starts approximately mid-site near the location of the Former Keene Plant and discharges to the Unnamed Tributary that discharges to the Schuylkill River west of the Route 422 Bridge. The Waste Channel is intermittent and the Unnamed Tributary to the Schuylkill is perennial. Together they form the main conduit for surface runoff for the area associated with the Site. Locally, quarries, caves, and sinkholes control some drainage.

Floodplain

Mapped floodplains in the Site vicinity are associated solely with the Schuylkill River. Most of the Site is located within an area determined by FEMA to be outside the 500-year floodplain. Fourteen of the 15 AOCs are entirely outside of the 500-year floodplain and only a small portion of the Waste Channel and Railbed AOC is within designated flood zones. The extreme northern portion of the Waste Channel and Railbed AOC near the Schuylkill River is subject to 100-year and 500-year flooding. The 100-year flood elevation for this region of the Schuylkill River is approximately 82 feet above mean sea level, which incorporates most of the outlet area of the Unnamed Tributary north of the active east/west Norfolk-Southern rail line crossing.

Wetlands

Two wetland habitat types were identified in the RI within the Site's AOCs: palustrine forested broad-leaved deciduous wetlands (PFO1) and palustrine emergent wetlands (PEM).

The forested wetland extends approximately 300 feet along the Unnamed Tributary in the Waste Channel and Railbed AOC from the Schuylkill River southward. Palustrine emergent wetlands were identified in the Quarry and Impoundment portions of the Former Keene Plant AOC.

Archeologically Sensitive Areas

The RI identified five archeologically sensitive areas within the Site:

- The Northern Building Area within the Former Keene Plant AOC;
- The Miscellaneous Area within the Former Keene Plant AOC;
- The Historic Bridge AOC;
- The Maintenance Area Ruins AOC; and
- Portions of the Waste Channel and Railbed AOC.

Additional archeological surveys will be needed for those archeologically sensitive areas that will be disturbed as a result of the Selected Remedy to properly identify historic and cultural resources. These resources will need to be avoided or impacts on them mitigated during excavation.

Results of Remedial Investigation

Field investigations to support the RI were conducted from June 2002 through December 2002 and June 2004 through July 2004. These investigations included:

- Geophysical surveys;
- Surface and subsurface soil sampling and analysis;
- Background soil sampling and analysis;
- Monitoring well installation;
- Groundwater sampling and analysis;
- Surface water sampling and analysis;
- Sediment sampling and analysis;
- Surveying and mapping of sample locations and other important features;
- Ecological survey; and
- Human population survey.

The results of these investigations are summarized below.

Soil

During the RI, over 1,600 surface and subsurface soil samples were collected from the Site and analyzed for asbestos, and over 200 samples were analyzed for other contaminants (volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), metals, pesticides, and polychlorinated biphenyls (PCBs)).

Within AOCs, asbestos was detected in surface soil samples collected between 0.5 feet and 1.5 feet below ground surface with concentrations ranging from 1% to greater than 10%. The most concentrated areas of asbestos detections were in the Waste Channel and Railbed AOC.

Although VOCs, pesticides, and PCBs were detected in soil samples from a few locations, concentrations of these substances were too low to be a concern (i.e., they do not exceed RGs and do not pose unacceptable health or ecological risks).

A subset of the SVOCs, called polycyclic aromatic hydrocarbons (PAHs), and three metals (lead, mercury, and arsenic) were measured in some soil samples at levels that may cause unacceptable risks to humans and/or ecological receptors (see the risk discussion below).

Groundwater

A total of eight groundwater monitoring wells were installed and sampled several times during the RI. No contaminants at levels of concern were detected.

Sediment and Surface Water

Analytical results from sediment samples taken at the Site indicate the presence of asbestos, VOCs, SVOCs, pesticides, and PCBs in the sediments of the Schuylkill River and the Unnamed Tributary, the primary surface water drainage outlet from the Site. The data indicate that upstream sources are larger contributors to sediment contamination in the Schuylkill River than discharges from the Unnamed Tributary. Results of sediment macroinvertebrate community analyses performed during the RI indicated no significant adverse effects to the macroinvertebrate community from contaminants in the sediments. Contaminated sediments in the Unnamed Tributary, however, were found to be a potential source of human health risk.

No contaminants at levels of concern were detected in surface water samples from the Schuylkill River or the Unnamed Tributary.

Conceptual Site Model

Conceptual site and pathway analysis models were developed to evaluate exposure of potential Park users and ecological receptors to Site contaminants in the human health and ecological risk assessments (see Section VII). The human health risk assessment identified four types of current or future Park users:

- Adult on-site Park worker;
- Adult construction worker;
- Adult and child recreational users; and
- Adult and child residents.

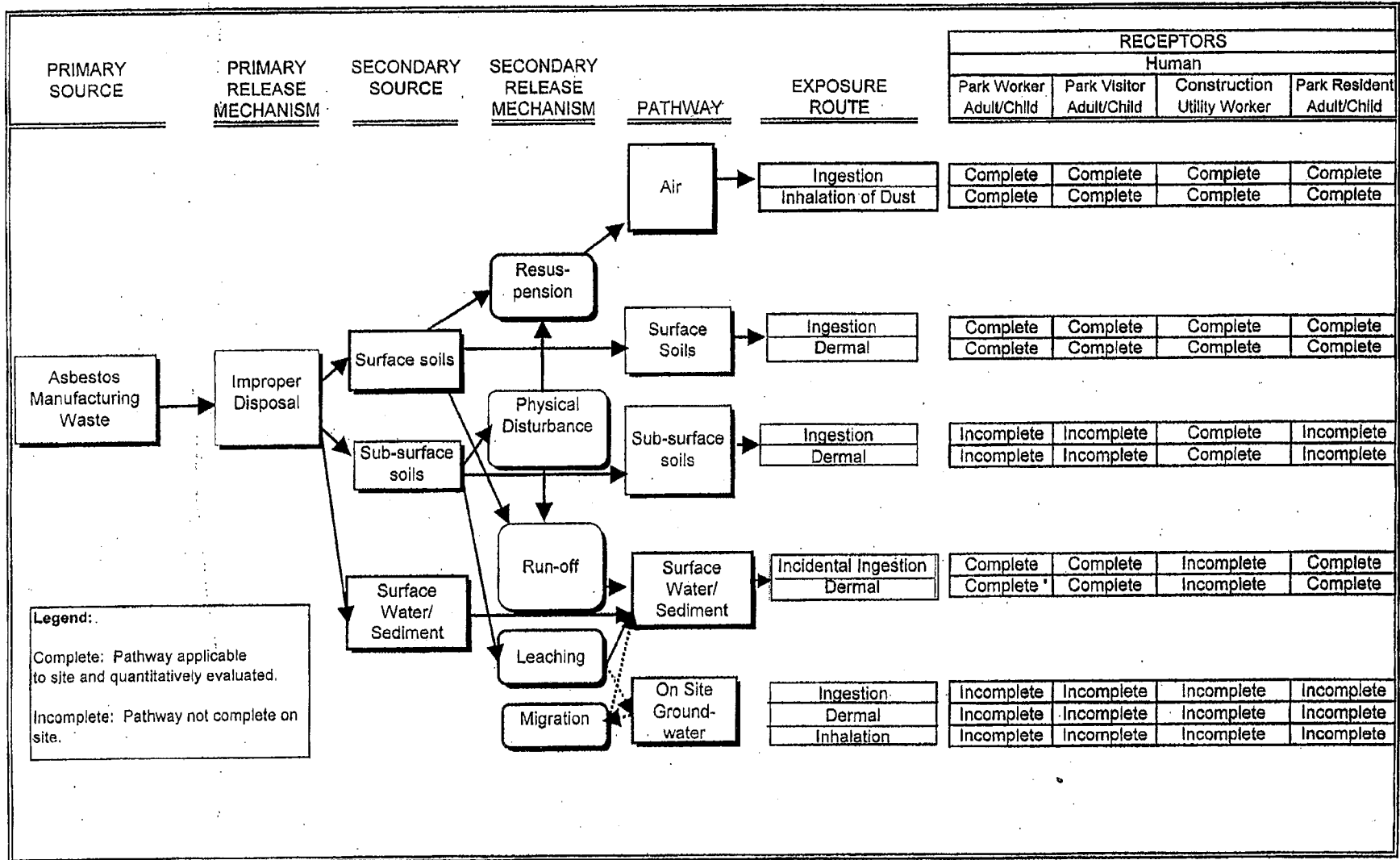
The exposure points and media evaluated were: surface soil, subsurface soil, sediment, and surface water; and exposure routes were: inhalation, dermal absorption, and incidental ingestion. Complete exposure pathways were evaluated for human health risk. The conceptual site model for human exposure to site contaminants is presented in Figure 3.

The ecological risk assessment identified terrestrial and aquatic receptor groups and constructed a simplified food chain model. The terrestrial receptors evaluated as representative were:

- Plants;
- Soil invertebrates;
- Insectivorous small mammal (short-tailed shrew);
- Insectivorous bird (American robin);
- Omnivorous bird (mallard duck);
- Piscivorous mammal (mink);

Figure 3

Valley Forge National Historical Park Asbestos Release Site (VFNHP-ARS)
 Baseline Human Health Risk Evaluation Conceptual Site Exposure Model



- Carnivorous mammal (red fox);
- Carnivorous bird (red-tailed hawk);
- Herbivorous small mammal (eastern cottontail); and
- Herbivorous large mammal (white-tailed deer);

The following aquatic receptor groups were evaluated:

- Plankton;
- Freshwater fish; and
- Benthic macroinvertebrates.

The exposure pathways evaluated were: direct contact with soil or sediment, inhalation, dietary ingestion of contaminated prey, and incidental ingestion of soil or sediment. The conceptual site exposure model for ecological receptors is presented in Figure 4.

VI. CURRENT AND FUTURE SITE AND RESOURCE USES

Current On-Site Land Uses

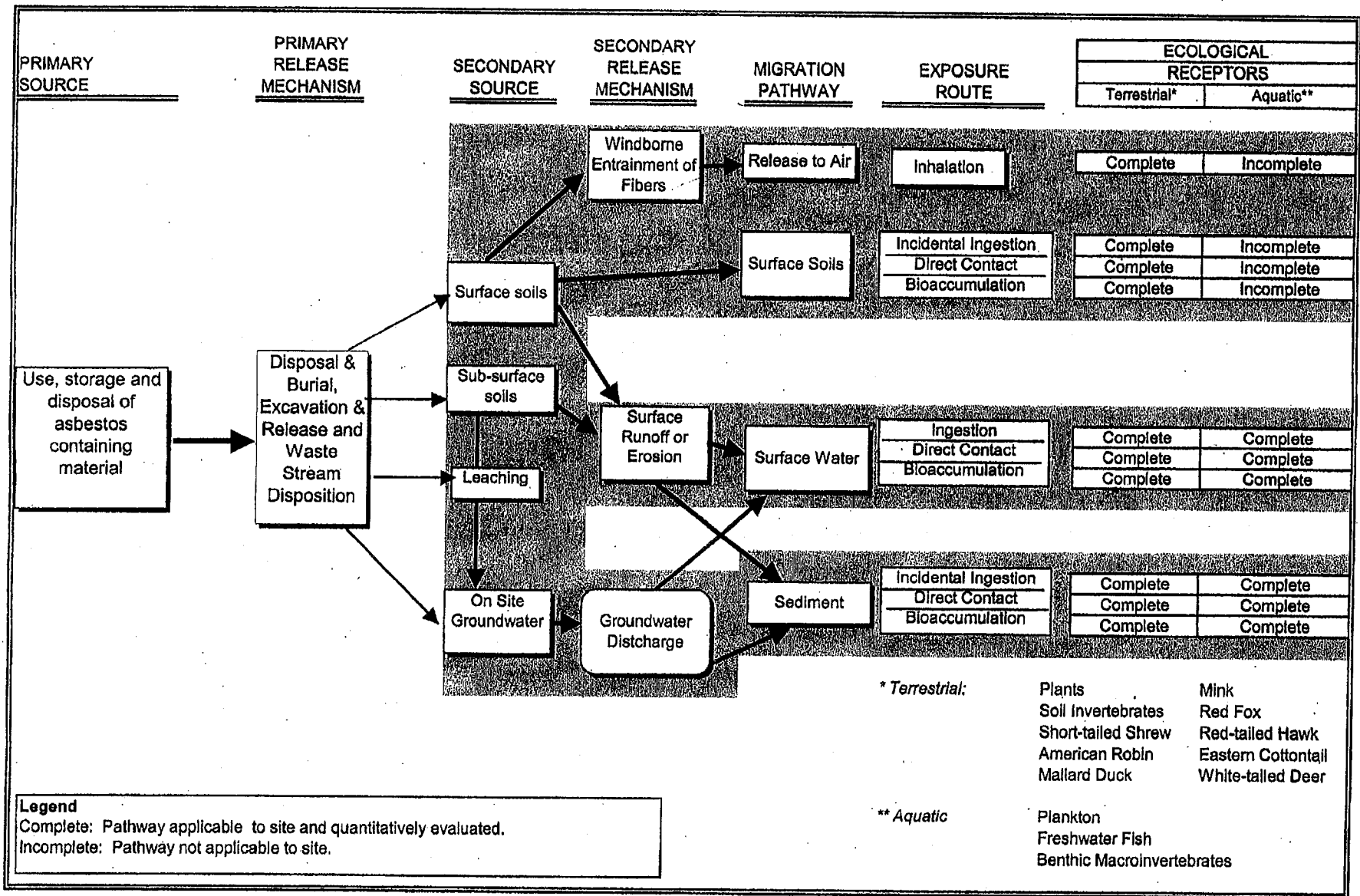
AOCs within the Site currently are fenced and posted to discourage use of the contaminated areas, thereby preventing exposure. If this were not the case, the Site would be used fully for all appropriate park uses, including public use and enjoyment. The AOCs within the Site have not been improved, for example, for historic interpretation or recreational facilities such as trails or picnic areas due to the current presence of contamination. The Waste Channel and Railbed AOC provides drainage for precipitation. The AOCs provide habitat for terrestrial plants and animals.

Current Land Use of Surrounding Properties

The Site is within and surrounded by VFNHP-managed property. County Line Road passes through the Site (see Figure 2). The surrounding uses within VFNHP include the Park Headquarters, Park Maintenance facilities, and residences that are occupied by NPS employees. Thus, recreation, park maintenance, residences, and transportation are land uses on surrounding VFNHP property.

VFNHP is immediately surrounded by residences to the southeast, southwest, and west; Route 422 and King of Prussia (population 18,511) to the east; fields, woodlands, a railroad line and the Schuylkill River to the north; and fields and woodlands to the west and southwest. Other cities and towns within a five mile radius of VFNHP include Norristown (31,282) to the northeast; Audubon (6,549) to the North; Phoenixville (14,788) to the northwest; Devon-Berwyn (5,067) to the south; and Paoli (5,425) to the southwest. To the east is Upper Merion Township, population approximately 26,863, which includes King of Prussia and is a major center for economic activity. Upper Merion Township includes office and retail developments that employ more people than any other municipality in Montgomery County. Tredyffrin Township is located to the south of VFNHP and has a population of approximately 29,062. This township is mainly agricultural with some residential and industrial areas. Schuylkill Township, located to the west of VFNHP in Chester County, has a population of approximately 6,960 and is more rural than the other surrounding townships. To the north of VFNHP is Lower Providence Township,

Figure 4
Valley Forge National Historical Park Asbestos Release Site (VFNHP-ARS)
Ecological Conceptual Site Model



population approximately 22,390, which includes residential, commercial, industrial, and open space land uses. Sections of Lower Providence Township include the communities of Trooper, Eagleville, Evansburg, and Audubon. To the northeast of VFNHP is West Norristown Township with a population of approximately 14,901. Areas within West Norristown Township, which is mainly residential with light industrial and recreational areas, include the communities of Jeffersonville, Trooper, and Port Indian.

Future On-Site Land Uses

The future on-site land uses will include recreation and historic preservation because the Site is within the VFNHP. The development of additional recreational facilities and historic interpretive areas are likely future land uses. Also, some areas may remain undeveloped and thus provide wildlife habitat in an otherwise urban area. The NPS Organic Act, which governs uses of Park Service lands, requires the conservation of the Park and its resources for the unimpaired enjoyment of future generations, so future use as parkland is assured.

Future Use of Surrounding Properties

The VFNHP property surrounding the Site will continue in park use as described above. In addition to the public areas, the maintenance area and residences for Park employees are likely future uses. The Organic Act controls use of this property as described above.

The surrounding areas outside the park will likely remain in commercial and residential use as they are currently; with the likelihood that population will increase in the region over time.

Current and Future Natural Resource Uses

Natural resources at the Site include groundwater and woodland. The groundwater is not used for water supply. The woodland is maintained for ecological health and Park use and enjoyment. Future use of the resources is expected to remain the same as current use.

VII. SUMMARY OF SITE RISKS

Summary of Human Health Risk

The baseline human health risk assessment (HHRA) (TTFWI, 2005b) estimates what risks the Site poses if no action were taken. It provides the basis for taking action and identifies the contaminants and exposure pathways that need to be addressed by the Remedial Action. This section of the ROD summarizes the results of the HHRA for the Site.

The Contaminants of Concern (COCs) at the Site are asbestos, PAHs, lead, and arsenic in soil and sediment. The risk characterization process quantitatively examined potential exposures to the COCs along specific pathways and routes of exposure as described in the conceptual site model discussed above. Exposure scenarios based on current and future use were developed for complete exposure pathways, and quantitative risk assessment was performed for those scenarios. Receptor groups evaluated were child and adult Park visitors, child and adult Park residents, Park maintenance workers, and construction workers.

AOCs were identified during the Remedial Investigation (RI) based on former on-site activities, known waste disposal practices, and topographic boundaries (see Figure 2). Human health risk was evaluated for all AOCs. Residential exposure was only evaluated for the Waste Channel and Railbed-North AOC, the AOC nearest park residences.

Residential exposure was based on concentrations of contaminants in surface soil and sediment (0-2 ft below ground surface) and surface water in the Waste Channel and Railbed-North AOC. For all other receptor groups, exposure to COCs in surface soil and sediments was evaluated in all AOCs. Exposure to sub-surface soil was also evaluated for the construction worker scenario. The exposure point concentration was based on the Reasonable Maximum Exposure (RME) concentration in surface soil and sediments (and in subsurface soil for the construction worker exposure scenario). The routes of exposure evaluated for all receptor groups were incidental ingestion, dermal absorption, and inhalation of particulates.

Risk from carcinogenic COCs was described in terms of excess lifetime cancer risk. The HHRA was based on exposure in each AOC proportional to the surface area of the AOC to the total area of the Site, an assumption representing equal visitation to all areas of the Site. However, the exposure assumption for a construction worker also included an assumed 6-month duration exposure within single AOCs to represent a construction project scenario. For non-carcinogenic COCs, except lead, risk was described in terms of a Hazard Index (HI) expressed as the sum of quotients of the exposure dose divided by the reference dose for adverse effects. Lead risk evaluation was based on predicted lead levels in blood using the adult and child models approved by USEPA.

Tables 1 and 2 summarize the findings of the HHRA for all receptor groups and for construction workers, respectively.

TABLE 1 SUMMARY OF HUMAN HEALTH BASELINE RISK ASSESSMENT		
Receptor Group	Excess Lifetime Cancer Risk (ELCR) ¹	Hazard Index (HI)
	RME	RME
Recreational User – Adult	1.4×10^{-5}	1.5×10^{-2}
Recreational User – Child	2.2×10^{-5}	1.3×10^{-1}
Resident – Adult	7.4×10^{-5}	8.1×10^{-2}
Resident – Child	8.3×10^{-5}	7.2×10^{-1}
Park Maintenance Worker	4.3×10^{-5}	4.9×10^{-2}
Construction Worker	5.9×10^{-5}	3.8×10^{-1}

¹ Based on exposure in each AOC proportional to surface area of AOC to total surface Area of Site. Excess risk determined from exposure to asbestos, arsenic and PAHs

TABLE 2 EXCESS LIFETIME CANCER RISK TO CONSTRUCTION WORKERS	
Location	Excess Lifetime Cancer Risk (RME)
Sitewide exposure proportional to area of AOCs	5.9×10^{-5}
Exposure During 6 Months Within a Single AOC	
Amphitheater Quarry AOC	2.9×10^{-4}
Waste Channel and Railbed South AOC	1.4×10^{-4}
Former Keene Plant – Upper Quarry AOC	1.7×10^{-4}

The assumptions used in the HHRA process were conservative so that the final results tended to overestimate rather than underestimate risk from exposure to COCs. The assumed levels of activity in the AOCs that were used to develop the exposure scenarios were higher than what occurs at the present time or would likely occur in the future. According to the NCP, the lifetime excess cancer risk should fall within or below the range of one excess cancer case in 10,000 individuals (1×10^{-4}) to one excess cancer case in 1,000,000 individuals (1×10^{-6}). Only the construction worker scenarios within individual AOCs (see Table 2) resulted in excess risk greater than one in 10,000. The other exposures were between one in 10,000 and one in 1,000,000 excess risk. All of the HIs were less than one, indicating that non-carcinogenic risk was unlikely. Modeled blood lead levels for the child and adult resident and the construction worker, however, were found to exceed USEPA recommended levels. Based on these results, the NPS has determined that further response action is necessary and that the Selected Remedy will reduce risk from carcinogens and lead to acceptable levels.

Summary of Ecological Risk

The Screening Level Ecological Risk Assessment identified the following Contaminants of Potential Ecological Concern (CPECs): asbestos, metals, pesticides, PCBs, PAHs, other SVOCs, and a limited number of VOCs. These contaminants were evaluated in the Baseline Ecological Risk Assessment (BERA) (TtFWI, 2005c) to determine if they were Contaminants of Ecological Concern (CECs). Aquatic and terrestrial communities were evaluated as shown in the conceptual site model discussed above. The results of the BERA are summarized in Table 3.

**Table 3
Summary of the Ecological Risk Assessment**

Receptor Group	Area of Concern (AOC)	Contaminants of Ecological Concern (CECs)	Principle Exposure Route Identified	Toxicological Endpoint
Benthic Community	--	--	--	--
Pelagic Aquatic Community	--	--	--	--
Terrestrial Plants	--	--	--	--
Soil Invertebrates and Microbial Process	Amphitheater Quarry & Historic Bridge	Asbestos	NA	Moisture Reduction
Insectivorous Mammals	Maintenance Area Ruins, Pennsylvania Department of Transportation Quarry & Waste Channel and Railbed	Mercury	Ingestion of Terrestrial Invertebrates	Mortality + weight loss
Insectivorous Birds	Waste Channel and Railbed & Small Additional Quarry Maintenance Quarry 3 Maintenance Area Ruins	Lead 4,4'-DDT 4,4'-DDE	Ingestion of Terrestrial Invertebrates Ingestion of Terrestrial Invertebrates Ingestion of Terrestrial Invertebrates	Reproductive Impairment Reproductive Impairment Reproductive Impairment
Omnivorous Birds	--	--	--	--
Piscivorous Mammals	--	--	--	--
Carnivorous Mammals	--	Asbestos	Incidental Ingestion of Surface Soil	Gastrointestinal Inflammation ¹
Carnivorous Birds	--	--	--	--
Small Herbivorous Mammals	Amphitheater Quarry & Historic Bridge	Asbestos	Incidental Ingestion of Surface Soil	Gastrointestinal Inflammation ¹
Large Herbivorous Mammals	--	--	--	--

Notes:

NA: Not Applicable

-- No COCs identified in any of the AOCs

¹ End point not a population level effect

The aquatic communities were evaluated by direct methods: a direct community assessment in the case of benthic macroinvertebrates; and aquatic toxicity tests for the pelagic community. The BERA determined that there were no significant risks for the aquatic communities.

The terrestrial plant community was evaluated based on a comparison of surface soil contaminant data to screening level benchmarks for phytotoxicity and direct observations of vegetation. While soil concentrations of some metals greater than benchmark values were found in some AOCs, the lime-rich soil reduces the bioavailability of metals, and no observations of stressed vegetation or areas devoid of vegetative cover were noted. The BERA determined that there were no significant risks for the terrestrial plant communities.

The terrestrial soil invertebrate and microbial process assessment endpoint relied upon two lines of evidence: 1) comparison of analytical data to screening level benchmarks deemed protective of soil invertebrates and microbial processes; and, 2) comparison of analytical data to background concentrations. Results of the evaluation indicated that soil invertebrates (i.e., earthworms) may be at risk of moisture reduction from exposure to asbestos in the Amphitheater Quarry and Historic Bridge AOCs, and therefore asbestos was retained as a CEC.

For insectivorous small mammals (short-tailed shrew), exposure to CECs in surface soil in the Maintenance Area Ruins, Pennsylvania Department of Transportation Quarry, and Waste Channel and Railbed AOCs was identified as posing potential risk from mercury and vanadium in soil. Evaluation of these risks indicated that exposure was comparable to background exposure dosages for both metals; however, mercury was retained as a CEC due to its high potential for bioaccumulation.

For insectivorous small birds (American robin), exposure to one CPEC, lead, in surface soil indicated potential risk of reproductive impairment. Lead was therefore retained as a CEC (and is also a COC for human receptors). Potential risks of reproductive impairment were determined for 4,4'-DDT concentrations in Maintenance Quarry 3 AOC surface soil and 4,4'-DDE concentrations in the Maintenance Area Ruins AOC due to exceedence of the no observed adverse effects level (NOAEL), although the calculated effects levels from Site data did not exceed the lowest observed adverse effects level (LOAEL). These pesticides were retained as CECs due to their high potential for bioaccumulation.

For omnivorous birds (mallard duck), a low risk from magnesium exposure was identified from the near-shore Schuylkill River and Unnamed Tributary. However, comparison to the background concentration of magnesium revealed similar concentrations, and magnesium was not retained as a CEC. No other CECs were identified for omnivorous birds.

For piscivorous mammals (mink), the risk assessment and background evaluations did not identify significant risk from exposure to heavy metals, PCBs, pesticides, SVOCs, and VOCs for the near-shore Schuylkill River and Unnamed Tributary. Therefore, no CECs were identified for piscivorous mammals.

Carnivorous mammals (red fox) were found to be exposed to asbestos fibers via incidental ingestion of soil on a site-wide basis, based on evaluation of exposure pathways and modeling results. The toxicological endpoint for this exposure was potential risk of minor gastrointestinal inflammation. This endpoint did not produce a population level effect. A finding of low/no risk associated with exposure to heavy metals, PCBs, pesticides, SVOCs, or VOCs was determined for carnivorous mammals. Therefore, no CECs were identified for carnivorous mammals.

No risks from exposure to heavy metals, PCBs, pesticides, SVOCs, and VOCs were identified for carnivorous birds (red-tailed hawk) utilizing the habitats of the Site. Therefore, no CECs were identified for carnivorous birds.

Potential risk of reduced growth from exposure to magnesium was identified for small herbivorous mammals (eastern cottontail) in some AOCs. However, because magnesium is an essential nutrient, it was not considered a CEC. No other CECs were identified for herbivorous mammals.

No risks from exposure to heavy metals, PCBs, pesticides, SVOCs, and VOCs were identified for large herbivorous mammals (white-tailed deer) utilizing the habitats of the VFNHP ARS, therefore no CECs were identified for herbivorous mammals.

In summary, the Baseline Ecological Risk Assessment identified the following CECs for the Site: asbestos, lead, mercury, 4,4'-DDE, and 4,4'-DDT as summarized in Table 3. During risk management, it was determined that further action to reduce risk from 4,4'-DDE and 4,4'-DDT was not warranted because exposure point concentrations based on the RME concentrations were between the NOAEL and LOAEL for the American robin, uncertainties in the food chain model assumptions overestimated the effect, and the BERA did not result in an HI >1 for other potential receptors. Therefore, the need for Remedial Action to address risks to ecological receptors was based on the other CECs: asbestos, lead, and mercury.

Basis for Taking Action

Based on the findings of the human health and ecological risk assessments, which identified asbestos, arsenic, lead and PAHs as presenting unacceptable human health risks, and asbestos, mercury and lead as presenting unacceptable ecological risks, the Remedial Action selected in this Record of Decision is necessary to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

VIII. REMEDIAL ACTION OBJECTIVES

The following Remedial Action Objectives (RAOs) were formulated to guide the development of remedial alternatives for the Site:

- Prevent direct contact (i.e., incidental ingestion, inhalation, and dermal absorption) by human and ecological receptors with contaminated soil above acceptable risk levels;
- Eliminate or minimize contaminant-related constraints to the full utilization of Park resources for all appropriate purposes consistent with NPS mandates; and
- Attain federal and state ARARs.

The following is a description of the development of Site-specific human health and ecological risk-based RGs for the Site. If the calculated human health or ecological-based RGs were less than Site-specific background concentrations, the Site-specific background concentrations were used as the RGs. All three metals identified as COCs or CECs are naturally-occurring and present in Site background soil samples. Site-specific background concentrations are presented in Table 4.

TABLE 4 BACKGROUND CONCENTRATIONS AS REMEDIATION GOALS		
COC or CEC	Surface Soil (mg/kg)	Subsurface Soil (mg/kg)
Arsenic	12.8	12.4
Lead	64.7	38.6
Mercury	0.15	0.17

Human Health Risk-Based Remediation Goals

Selection of Human Health Target Risk Levels

USEPA's *Role of the Baseline Risk Assessment in Superfund Remedy Selection Decisions* (USEPA, 1991) indicates that response action is generally warranted at a site when the cumulative excess cancer risk is greater than 10^{-4} or the HI exceeds 1.0 based on RME assumptions. It is generally appropriate to develop risk-based RGs for media where RGs are not clearly defined by ARARs. Generally, risk-based RGs are not needed for any chemicals in a medium with a cumulative excess cancer risk of less than 1 in 10^{-6} and/or a HI less than or equal to 1.0, or where the RGs are clearly defined by ARARs.

Two primary factors have been considered for the Site in setting carcinogenic risk management-based RGs within the NCP-prescribed range of 1×10^{-4} to 1×10^{-6} :

- Key uncertainties identified in the HHRA process tended to over-estimate site risks; and
- The Site is located within a unit of the National Park System.

Assumptions introduced into the HHRA process were conservative in nature such that the final risk and hazard results tended to overestimate, rather than underestimate, the potential impacts of exposure to Site COCs. Therefore, a target risk level of 1×10^{-5} is considered protective and has been selected for the Site as the basis for the RGs. Consequently, risk-based RGs were calculated for combinations of AOC, media, receptors, and COCs where risks greater than 10^{-5} or HIs greater than 1.0 were determined to be present. Attainment of these risk-based RGs assumes that there will be no permanent or long-term impairment of the use and enjoyment of the resources at the Site, as required by the NPS Organic Act.

Development of Human Health Remediation Goals

As discussed above, COCs presenting human health risks greater than the target risk level of 10^{-5} are asbestos, arsenic, and potentially carcinogenic PAHs.

Because of the very limited number of locations where lead was identified as a COC, Site-specific cleanup goals were not developed. Instead, the USEPA-recommended screening values were used as risk-based RGs. USEPA recommends 400 mg/kg as a lead screening level for surface soil and 1,000 mg/kg as a lead screening level for subsurface soil under residential land use (USEPA, 1994). For commercial/industrial sites the lead screening level is 710 mg/kg (USEPA, 2001).

Risk-based RGs for asbestos, arsenic, and PAHs were conservatively calculated by assuming that the entire duration of exposure is spent within a single AOC (rather than proportionate to the surface area of the AOC to the total surface area of all AOCs as was assumed in the HHRA). This assumption is particularly conservative for recreational visitors to the Park as it is unlikely that a Park visitor would spend significant amounts of time within a single AOC (an hour a day, 3 days a week, 50 weeks a year for 30 years was the assumed exposure duration). Furthermore, it is the NPS' intent that all AOCs will be readily accessible to park visitors consistent with the requirements of the Organic Act. It is conceivable, however, that a significant portion of a construction worker's time could be spent within a single AOC for the duration of a particular construction project. Under these circumstances, and based on the results of the HHRA, risks may exceed 10^{-4} for a construction worker in the Upper Quarry portion of the Former Keene Plant AOC, the southern portion of the Waste Channel and Railbed AOC, and the Amphitheater Quarry AOC (see Table 2). These construction worker risk estimates and corresponding RGs are conservative in that they do not take into account the use of dust suppressants or personal protective equipment that would likely be used by construction workers to reduce exposure to asbestos during road or other construction.

The Human Health-based RGs are summarized in Table 5.

TABLE 5 SITE-SPECIFIC HUMAN HEALTH REMEDIATION GOALS FOR CONTAMINANTS OF CONCERN (COCs)					
COC	Units	Resident Remediation Goal	Construction Worker Remediation Goal ¹	Park Maintenance Worker Remediation Goal ¹	Site Visitor Remediation Goal
		Target Risk level 10^{-5}	Target Risk level 10^{-5}	Target Risk level 10^{-5}	Target Risk level 10^{-5}
Asbestos	%	0.7 TEM 2.7 PLM	0.4 TEM 1.5 PLM	1.9 TEM 7.6 PLM	49 TEM 190 PLM
Arsenic	mg/kg	12.8 ²	232	17.7	16.7
Benzo(a)anthracene	mg/kg	6.5	435	24.4	23.4
Benzo(a)pyrene	mg/kg	0.6	41.0	2.3	2.2
Benzo(b)fluoranthene	mg/kg	6.5	429	24.4	23.4
Dibenzo(a,h)anthracene	mg/kg	0.6	41.2	2.3	2.2
Indeno(1,2,3-cd)pyrene	mg/kg	6.5	NA	24.4	23.4
Lead	mg/kg	400 ³	710 ³	710 ³	NA

¹ Worker exposure to surface soil only, calculated carcinogenic risk for subsurface soil exposure was less than 1×10^{-6}
² Site-specific background
³ Based on USEPA recommended risk based screening criteria
TEM = analyzed by Transmission Election Microscopy
PLM = analyzed by Polarized Light Microscopy
NA = Not Available

Ecological Risk-Based Remediation Goals

Selection of Target Risk Levels for Ecological Receptors

USEPA's *Role of the Baseline Risk Assessment in Superfund Remedy Selection Decisions* (USEPA, 1991) indicates that, in assessing the potential for unacceptable risk to ecological receptors, a critical question to be answered is "At what level of ecological organization should risk be evaluated?" or "What is ecologically significant?" The National Park System, including the ecological systems within the Park System, is considered to be among the most highly valued of all public land resources. As a result, a conservative approach is appropriate in evaluating if identified risks in units of the National Park System are ecologically significant and should therefore be remediated. Given the degree of assessment uncertainty at the Site and the sensitivity of estimating risk to ecological resources within a unit of the National Park System, the ecological RGs are based on contaminant concentrations that would yield HQ values of 1. These RGs are shown in Table 6 below. In some cases contaminant concentrations would have to be reduced to below background to achieve an HQ of 1. For these situations, background (for naturally-occurring analytes) is identified as the remediation goal.

The following AOCs were identified as presenting a risk based on the ecological assessment endpoints in the BERA:

- Waste Channel and Railbed AOC: Lead bioaccumulation within the food chain resulting in the excess risk of reproductive impairment in insectivorous birds (American robin).
- Maintenance Area Ruins, Pennsylvania Department of Transportation Quarry, and Waste Channel and Railbed AOCs: Mercury bioaccumulation within the food chain resulting in the excess risk of premature mortality and weight loss in insectivorous small mammals.
- Amphitheater Quarry and Historic Bridge AOCs: Excess risk from moisture loss due to direct contact with asbestos in soil to soil invertebrates (earthworm).

Ecological risk is managed to protect populations, not individuals, unless threatened or endangered species are involved. The BERA did not identify any threatened or endangered species potentially impacted by Site contaminants.

The ecological risk-based RGs for CECs are presented in Table 6.

CEC	Units	Soil Invertebrates (Earthworm)	Insectivorous Mammal (Short-tailed Shrew)	Insectivorous Bird (American Robin)
Asbestos	%	0.45 ¹	HQ<1 ²	NA ³
Mercury	mg/kg	0.15 ⁴	0.15 ⁴	0.15 ⁴
Lead	mg/kg	500 ¹	HQ<1 ²	64.7 ⁴

¹ Benchmark value (Efroymson, *et al.*, 1997)
² HQ<1 Calculated hazard quotient was less than 1 indicating insignificant risk
³ NA = Not a CEC for the receptor group
⁴ Site Specific Background

Remediation Goal Verification

Consistent with the requirements in Appendix F to this ROD, a remediation goal verification program will be adopted that provides assurance that when determinations are made under the verification program that the Site remediation goals are met, such determinations are correct. The number of verification samples taken will be sufficient to provide assurance that the relevant human and ecological receptors can safely use the Site, consistent with the analyses provided in the Site human health and ecological risk assessments.

Summary

The overall risk management-based remediation goals (human health and ecological risk) for the Site are presented in Table 7.

COC/CEC	Units	Waste Channel/Railbed - North AOC		All other AOCs	
		Remediation Goal	Basis	Remediation Goal	Basis
Asbestos	%	0.4 TEM 1.5 PLM	Construction Worker Risk 10 ⁻⁵	0.4 TEM 1.5 PLM	Construction Worker Risk 10 ⁻⁵
Arsenic	mg/kg	12.8	Site-Specific Background ¹	12.8	Site-Specific Background ¹
Benzo(a)anthracene	mg/kg	6.5	Resident Child/Adult Risk 10 ⁻⁵	23.4	Site Visitor Risk 10 ⁻⁵
Benzo(a)pyrene	mg/kg	0.6	Resident Child/Adult Risk 10 ⁻⁵	2.2	Site Visitor Risk 10 ⁻⁵
Benzo(b)fluoranthene	mg/kg	6.5	Resident Child/Adult Risk 10 ⁻⁵	23.4	Site Visitor Risk 10 ⁻⁵
Dibenzo(a,h)anthracene	mg/kg	0.6	Resident Child/Adult Risk 10 ⁻⁵	2.2	Site Visitor Risk 10 ⁻⁵
Indeno(1,2,3-cd)pyrene	mg/kg	6.5	Resident Child/Adult Risk 10 ⁻⁵	23.4	Site Visitor Risk 10 ⁻⁵
Lead - Surface 0-0.5'	mg/kg	64.7	Site-Specific Background ²	64.7	Site-Specific Background ²
Lead - Sub-surface >0.5'	mg/kg	400	USEPA Screening Criteria Residential	710	USEPA Screening Criteria Worker
Mercury	mg/kg	0.15	Site-Specific Background ³	0.15	Site-Specific Background ³

¹ Calculated human health risk-based exposure point concentration at 1 x 10⁻⁵ risk level was less than site-specific background concentration, so site specific background concentration was set as the RG.

² Calculated ecological exposure point concentration for lead that resulted in an HQ>1 for insectivorous bird was less than the site specific background concentration. Therefore, the RG was set at the site-specific background concentration.

³ Calculated ecological exposure point concentration for mercury that resulted in an HQ>1 for insectivorous small mammal was less than the site-specific background concentration. Therefore, the RG was set at the site-specific background concentration.

TEM = analyzed by Transmission Electron Microscopy
PLM = analyzed by Polarized Light Microscopy

IX. DESCRIPTION OF ALTERNATIVES

The following comprehensive remedial alternatives were developed and evaluated in the FS:

- FS Alternative 1: No Action
 - FS Alternative 2: Capping with Limited Excavation and Off-site Disposal
 - FS Alternative 3a: Soil Stabilization with Limited Capping and Excavation
 - FS Alternative 3b: Soil Stabilization with Limited Excavation
 - FS Alternative 4: Shallow Excavation with Off-Site Disposal
 - FS Alternative 5: Complete Excavation with Off-site Disposal
- FS Alternative 4 is the Selected Remedy. Each of the alternatives is further described below.

Overview of Alternatives Considered

FS Alternative 1: No Action

The No Action alternative provides a baseline for evaluation of the alternatives and is required for inclusion in the FS by the NCP. Under this alternative, no cleanup or containment measures regarding Site contamination would be taken.

FS Alternative 2: Capping with Limited Excavation and Off-site Disposal

The Capping alternative involves containment/isolation of contaminated soil through placement of a 1.5 foot thick soil cap covered with 0.5 feet of topsoil. Following cap construction, the area would be planted similar to surrounding areas.

Capping would not be feasible in portions of the Waste Channel and Railbed AOC due to the presence of wetlands, the need to maintain flow capacity of the existing drainage channel, and being in a floodplain; therefore, in those areas excavation of the contaminated soil (and replacement with clean soil) and disposal at a permitted off-site facility was assumed.

FS Alternative 3a: Soil Stabilization with Limited Capping and Excavation

Soil stabilization involves injection and mixing of reagents in the contaminated soil to create a stable, cement-like matrix in which the contaminants are bound and become immobilized. The stabilized soil is then covered with 0.5 feet of topsoil and revegetated.

Stabilization is not feasible where steep slopes are present in portions of the Former Keene Plant and Amphitheatre Quarry AOCs due to implementation difficulties. It is also not appropriate where there are numerous mature trees, such as in portions of the Waste Channel and Railbed and Historic Bridge AOCs, since much of the contaminated soil to be stabilized would come out with the stumps of the trees that must be removed prior to stabilization. Capping, however, would be feasible in these areas and is assumed there under this alternative instead of stabilization.

As with capping, stabilization is not feasible in portions of the Waste Channel and Railbed AOC due to wetlands and floodplain issues, and the need to maintain the flow capacity of the channel (the soil volume increases when the soil is stabilized). Therefore, excavation of the

contaminated soil in the drainage channel, wetlands, and floodplain portions of this AOC (and off-site disposal at a permitted facility) is assumed instead of stabilization.

FS Alternative 3b: Soil Stabilization with Limited Excavation

As with FS Alternative 3a, this alternative relies on soil stabilization in most AOCs to bind and immobilize the contaminants. However, in all AOCs where stabilization is not feasible (as described under Alternative 3a above), excavation with off-site disposal is assumed rather than utilizing capping in selected areas as in Alternative 3a.

FS Alternative 4: Shallow Excavation with Off-Site Disposal (the Selected Remedy)

Shallow excavation with off-site disposal involves excavation of between 1.5 and 3 feet of soil where clean-up standards are exceeded (only the shallow soil, i.e., between 0 and 24 inches, poses unacceptable risks to visitors and residents). Excavated soil will be transported and disposed in an appropriately permitted landfill. Clean soil covered with topsoil will be used as backfill, and disturbed surfaces will be restored through seeding and replacement of shrubs and trees, replacement of pavement, etc.

The variability of the proposed depths of excavation under this alternative (i.e., 1.5 to 3 feet as described in the FS) is due to the differences in the depths of contamination among the AOCs as measured during the RI. In some areas, the proposed excavation depths will remove all of the contaminated soil in those locations since the RI data indicate that contaminants are only present in the shallow soil there. For example, where contaminants were only detected in the top 6 inches, excavation up to a depth of 1.5 feet will be implemented (an additional 12 inches of excavation depth (over-excavation) was added in the FS to be conservative), which will result in the removal of all of the contaminated soil at that location. Similarly, in areas where contaminants were detected up to a depth of 24 inches, a 30 to 36 inch depth of excavation will be implemented to confidently remove all the contaminants. The allowance for over-excavation may be reduced during final design (e.g., to 6 inches) from the 12 inches assumed in the FS if a higher degree of confidence in contaminant distribution is achieved through pre-design sampling.

In other locations, contaminants were detected at depths greater than 24 inches. For example, in the Amphitheater AOC asbestos was detected at depths up to 35 feet as a result of historical dumping of waste materials that were subsequently covered with clean soil. The RI demonstrated that the contamination at these depths is not leaching or migrating and does not pose a risk unless excavated. In such locations, the excavation depth will be 24 inches. Because this alternative will leave in place deep contamination, institutional controls will be implemented to ensure the protection of Park maintenance and construction workers if temporary construction or utility-related excavations in this soil are required in the future. To alert construction or maintenance workers to the presence of contaminated soil at depth, a warning layer will be installed at the lowest point of remedial excavation to serve as an indicator of potential contamination beneath that layer for future construction or utility activities. Such activities will conform to Site Institutional Controls.

FS Alternative 5: Complete Excavation with Off-site Disposal

FS Alternative 5 includes removal of all contaminated material and disposal at a permitted off-site facility and represents the opposite end of the spectrum from No Action. It includes excavation of all detected contaminants (i.e., metals, VOCs, SVOCs, pesticides, PCBs, and/or asbestos) regardless of concentration. This alternative involves excavation in more areas of the Park and in many places to much greater depths than in FS Alternative 4 (Shallow Excavation).

Common Elements and Distinguishing Features of Each Alternative

With the exception of FS Alternative 1 (No Action), all of the alternatives would involve excavation of contaminated soil/sediment in wetlands and flood plains and replacement with clean soil/sediments to achieve compliance with ARARs specific to those areas. In addition, FS Alternatives 2 (Capping) and 3a/3b (Stabilization) would include excavation of a portion of the Waste Channel to maintain its function as a storm water conveyance channel. FS Alternatives 3a/3b (stabilization) are not feasible in areas of mature trees and steep slopes. In those areas, the contaminated soil would be excavated or capped (FS Alternative 3a) or excavated with off-site disposal (FS Alternative 3b).

In FS Alternative 2, all soil that presents unacceptable risk would be capped except in flood plains, wetlands, and a portion of the Waste Channel (to maintain a flow channel). Approximately 37,500 yd³ of contaminated soil would be capped over discrete remediation areas totaling approximately 10.2 acres, and approximately 14,200 yd³ of soil would be excavated over a total area of 3.7 acres in the Waste Channel and Railbed AOC.

In FS Alternative 3a, soil in most areas to be remediated would be stabilized. However, remediation areas with mature trees and/or steep slopes would be capped and the soil in flood plains, wetlands and a portion of the Waste Channel would be excavated and disposed off-site. Approximately 14,600 yd³ of soil would be stabilized over discrete remediation areas totaling approximately 5.4 acres, approximately 22,900 yd³ of soil would be capped over approximately 4.7 acres, and approximately 14,200 yd³ of soil would be excavated over a total area of 3.7 acres in the Waste Channel and Railbed AOC.

As with FS Alternative 3a, soil in most areas to be remediated would be stabilized in FS Alternative 3b. However, remediation areas with mature trees and/or steep slopes and the soil in flood plains, wetlands and a portion of the Waste Channel and Railbed AOC would be excavated and disposed off-site. Approximately 14,600 yd³ of soil would be stabilized over discrete remediation areas totaling approximately 5.4 acres, and approximately 37,100 yd³ of soil would be excavated over a total area of 8.5 acres.

In FS Alternative 4 (the Selected Remedy), all shallow soil that presents unacceptable risk would be excavated to a depth of up to 3 feet (which includes up to 12 inches over-excavation to account for uncertainty) and disposed off-site. Approximately 51,700 yd³ would be excavated from 29 discrete remediation areas totaling approximately 13.9 acres.

In FS Alternative 5, all soil containing any detected contaminants would be excavated, resulting in approximately 2,150,000 yd³ being excavated from 48 discrete remediation areas totaling approximately 56 acres. Implementation of Alternative 5 would meet all ARARs and obviate the need for Institutional Controls and 5-year reviews. Nevertheless, this alternative is considered cost prohibitive, with an estimated cost nearly 30 times that of the Selected Remedy. Complete Excavation also would require more than 10 years to implement, as compared to an estimated 3 to 4 years for the Selected Remedy. Such a lengthy construction period increases the short and medium-term disruption of Park operations, visitor access, and local traffic patterns, as well as increasing the risk of accident or injury associated with prolonged construction activity.

In FS Alternatives 2 and 3a/3b, contaminated soil would be left in place and contained via capping or stabilization. In FS Alternative 4, some contaminated soil below the depth of excavation will be left in place in certain AOCs. Because all four of these alternatives (2, 3a, 3b, and 4) would leave some contaminated soil on-site, Section 121(c) of CERCLA requires that five-year reviews be performed to evaluate the effectiveness of the remedial action over time. In addition, because of the deep contamination being left in place, institutional controls would be required to control and manage potential risks associated with future excavation activities performed by Park maintenance or construction workers.

In FS Alternative 5, no contaminated soil would be left in-place and no institutional controls would be needed. Therefore, five-year reviews of the effectiveness of the remedial action would not be required.

FS Alternative 2 is estimated to require two to three years to implement. FS Alternatives 3a/3b and 4 are estimated to require a slightly longer time frame to implement (three to four years). FS Alternative 5 is estimated to require over 10 years for implementation.

Expected Outcomes of Each Alternative

FS Alternative 1 (No Action): the long-term risk to human health and environment would not be reduced and much of the Site would continue to be unavailable for desired Park uses.

FS Alternatives 2 and 3a/3b (capping and soil stabilization): the risks associated with the contaminants remaining at the Site under these alternatives would not be eliminated, but the containment barrier (cap) or stabilized soil (soil stabilization) would effectively break the exposure pathway between the contamination and potential receptors thereby managing the risk appropriately. While access to the Site would not be restricted under FS Alternatives 2 and 3a/3b, maintenance of the cap or stabilized soil would need to be performed over time to maintain the integrity of these remedies. FS Alternatives 2 and 3a/3b would limit potential Park development and certain uses in the remediation areas to ensure that the integrity of the cap or stabilized soil matrix is not compromised. Placement of the cap and soil stabilization would also result in increases in the ground surface elevation altering the topography of the remediation areas from the surrounding areas. Revegetation of stabilized areas (FS Alternatives 3a/3b) with shrubs and trees may not be possible due to the solid soil matrix immediately beneath the topsoil cover.

FS Alternative 4 (shallow excavation and off-site disposal): all soil in the zone of potential exposure (top 24 inches) containing levels of contaminants that pose unacceptable risk to humans and the environment would be excavated, essentially eliminating the risk posed. With the exception of institutional controls to limit exposure to contaminated soil greater than two feet in depth, Park use of the remediation areas would not be restricted. Following excavation of the contaminated soil, the remediation areas would be backfilled to the original ground surface and revegetated with grasses, shrubs and trees.

FS Alternative 5 (complete excavation and off-site disposal): since all soil, regardless of contaminant concentration or depth, would be removed under this alternative, there would be no restrictions on future access or use of the Site. Following excavation of the contaminated soil the remediation areas would be backfilled to the original ground surface and revegetated.

X. COMPARATIVE ANALYSIS OF ALTERNATIVES

The NCP prescribes the use of nine criteria to evaluate remedial alternatives in order to identify a preferred alternative. The nine criteria are summarized in Table 8. The first two criteria, Overall Protection of Human Health and the Environment, and Compliance with ARARs, are considered "threshold criteria." An alternative must satisfy these threshold criteria in order to be eligible for selection.

A summary of the comparative analysis of alternatives using the nine NCP criteria that was presented in the FS is provided below. A summary table presenting the results of this comparative analysis is provided in Appendix B. FS Alternatives 1 and 5 are not included in the Appendix B summary table, or in the summary of the comparative analysis below, for the following reasons. FS Alternative 1, No Action, did not satisfy the threshold criteria and therefore cannot be considered for the Selected Remedy. FS Alternative 5, although meeting the threshold criteria, was not considered cost effective and greatly prolongs the construction period, thereby increasing disturbance to Park activities, local traffic patterns, and risks related to construction traffic.

TABLE 8 NINE EVALUATION CRITERIA FOR SUPERFUND REMEDIAL ALTERNATIVES	
1.	Overall Protection of Human Health and the Environment evaluates whether the alternative adequately protects human health and the environment from unacceptable risks posed by hazardous substances.
2.	Compliance with Applicable or Relevant and Appropriate Requirements (ARARs) evaluates whether the alternative meets Federal, and more stringent State, environmental statutes, regulations, and other requirements identified for the Site, or whether a waiver of such requirements is justified.
3.	Long-Term Effectiveness and Permanence assesses the alternative in terms of the magnitude of residual risk remaining at the conclusion of remedial action and the reliability of long-term controls to permanently protect human health and the environment.
4.	Reduction of Contaminant Toxicity, Mobility, or Volume through Treatment evaluates the alternative's effectiveness in the reduction of the harmful effects of principal contaminants, their ability to move in the environment, and the amount of contamination present.

TABLE 8 (continued)
NINE EVALUATION CRITERIA FOR SUPERFUND REMEDIAL ALTERNATIVES

5. Short-Term Effectiveness considers the length of time needed to implement the alternative and the risks the alternative poses to workers, residents, and the environment during implementation.
6. Implementability considers the technical and administrative feasibility of implementing the alternative, including factors such as the relative availability of goods and services.
7. Cost includes estimated capital and annual operations and maintenance costs, as well as present worth cost. Present worth cost is the total cost of an alternative over time in terms of today's dollar value. Cost estimates are expected to be accurate within a range of +50 to -30 percent.
8. State Acceptance assesses the State's position and key concerns related to the preferred alternative and other alternatives including comments on ARARs and the proposed use of ARAR waivers.
9. Community Acceptance assesses which components of the alternatives received support, reservations, or opposition from members of the community. Comments received on the Proposed Plan are an important indicator of community acceptance.

Overall Protection of Human Health and the Environment

FS Alternatives 2, 3a & 3b, and 4 would all provide a high degree of overall protectiveness of human health and the environment.

Compliance with Applicable or Relevant and Appropriate Requirements

FS Alternatives 2, 3a & 3b, and 4 are all expected to meet all identified ARARs.

Long-term Effectiveness and Permanence

Capping and Soil Stabilization (FS Alternatives 2 and 3a/3b) rely on maintenance and institutional controls to ensure long-term integrity and effectiveness of the remedy, while shallow excavation (FS Alternative 4) does not. Additionally, shallow excavation with off-site disposal permanently removes contaminated shallow soil that poses unacceptable risk to human or ecological receptors. Consequently, FS Alternative 4 is ranked higher than the other alternatives under this criterion.

Reduction of Toxicity, Mobility, or Volume through Treatment

Shallow Excavation with Off-Site Disposal (FS Alternative 4) would remove the contaminants in the top several feet of the remediation areas, thereby achieving reduction of volume of the waste present at the VFNHP. Capping (FS Alternative 2) would indirectly reduce toxicity by eliminating the exposure pathway. Soil Stabilization (FS Alternatives 3a & 3b) immobilizes the contaminants (making them less bioavailable), thereby reducing the toxicity of the contaminants. Since each alternative satisfies this criterion in different ways, they are ranked equally.

Short-term Effectiveness

Short-term impacts associated with Capping, Soil Stabilization, or Shallow Excavation could be readily controlled and/or restored in a reasonable period of time. Therefore, FS Alternatives 2, 3a, 3b, & 4 are ranked equally under this criterion.

Implementability

There are no implementability issues associated with Shallow Excavation or Capping. Soil Stabilization requires some specialized mixing equipment and will require bench/pilot testing to determine the effectiveness of stabilization, the best additives, and the optimum doses. Therefore, FS Alternatives 3a/3b (stabilization) are ranked lower than the other alternatives under this criterion.

Cost

The estimated present worth for each of the FS Alternatives evaluated is presented in Table 9. Capping (FS Alternative 2) has the lowest cost (of which about 35% is associated with long-term Operation and Maintenance (O&M), shallow excavation (FS Alternative 4) is in the middle of the cost range (with most of its cost (96%) being capital costs for construction), and stabilization (FS Alternatives 3a/3b) has the highest cost (with the O&M portion ranging from 33% for FS Alternative 3a to 17% for FS Alternative 3b). However, within the limits of the accuracy of FS-level cost estimating (+50%/-30% per the USEPA FS Guidance) these alternatives are all relatively similar in cost.

A 30-year O&M performance period was used in the present worth analysis in the FS as recommended by EPA guidance. As the effectiveness of the remedies in FS Alternatives 2 and 3a/3b is dependent on the long-term integrity of the cap or stabilized soil, O&M costs beyond the 30-year period would almost certainly be incurred. Therefore, if one were to extend the O&M beyond 30 years, the estimated present worth for these two alternatives would be higher than these presented in Table 9.

State Agency Acceptance

The Commonwealth of Pennsylvania has concurred with the Selected Remedy for reasons including protectiveness of human health and the environment, implementability, cost effectiveness, and consistency with NPS long-term management goals for the Site.

Community Acceptance

In general, the Selected Remedy received significant support from the community. There was no opposition to the Selected Remedy expressed during the Proposed Plan public meeting. Among the written comments, two supported the Selected Remedy, one preferred total removal (Alternative 5), and one preferred no action (Alternative 1). Specific responses by NPS to public comments are found in the Responsiveness Summary provided at the end of this ROD (page RS-1).

**TABLE 9
REMEDIAL ALTERNATIVES COST ESTIMATE SUMMARY**

AOC	FS Alternative 2 Capping with Limited Excavation			FS Alternative 3a Stabilization with Limited Capping			FS Alternative 3b Stabilization with Limited Excavation			FS Alternative 4 Shallow Excavation and Off-site Disposal		
	Total PW	O&M PW	CAPITAL	Total PW	O&M PW	CAPITAL	Total PW	O&M PW	CAPITAL	Total PW	O&M PW	CAPITAL
MAR	\$399,918	\$221,455	\$178,463	\$742,095	\$284,140	\$457,955	\$742,095	\$284,140	\$457,955	\$362,785	\$0	\$362,785
FKP	\$1,380,974	\$764,716	\$616,258	\$2,863,905	\$1,111,485	\$1,752,420	\$2,815,697	\$1,063,101	\$1,752,596	\$1,825,408	\$44,796	\$1,780,612
WCRN	\$3,706,932	\$505,992	\$3,200,940	\$3,706,932	\$505,992	\$3,200,940	\$3,573,866	\$0	\$3,573,866	\$3,573,866	\$0	\$3,573,866
WCRS	\$2,405,006	\$952,825	\$1,452,181	\$2,405,006	\$952,825	\$1,452,181	\$3,658,929	\$0	\$3,658,929	\$3,658,929	\$0	\$3,658,929
HIB	\$280,461	\$155,306	\$125,155	\$280,461	\$155,306	\$125,155	\$212,769	\$0	\$212,769	\$212,769	\$0	\$212,769
AMQ	\$174,709	\$96,745	\$77,964	\$174,709	\$96,745	\$77,964	\$97,897	\$0	\$97,897	\$97,897	\$0	\$97,897
SIB	\$138,838	\$76,882	\$61,956	\$238,027	\$91,138	\$146,889	\$238,027	\$91,138	\$146,889	\$77,585	\$0	\$77,585
CVQ	\$307,606	\$170,337	\$137,269	\$529,159	\$202,609	\$326,550	\$529,159	\$202,609	\$326,550	\$265,285	\$0	\$265,285
SAQ	\$145,764	\$80,717	\$65,047	\$211,702	\$81,058	\$130,644	\$211,702	\$81,058	\$130,644	\$71,115	\$0	\$71,115
PDO	\$291,859	\$161,618	\$130,241	\$647,728	\$248,007	\$399,721	\$647,728	\$248,007	\$399,721	\$1,103,518	\$190,259	\$913,259
Site Wide	\$9,562,065	\$3,459,593¹	\$6,102,472	\$12,129,724	\$4,002,307²	\$8,127,417	\$13,057,868	\$2,243,052³	\$10,814,816	\$11,579,154	\$508,053⁴	\$11,071,101

PW = Present worth based on 30 years and a 7% discount rate.

Note: Site Wide Costs includes capital costs associated with institutional controls plus 20% contingency (\$57,000), and the present worth of costs associated with five-year reviews and legal/technical support (\$273,000).

FS Alternative 1, No Action, has no capital cost and \$10,000 annual O&M cost for 5-year reviews resulting in a present worth of \$124,090 (30 years, 7%).

FS Alternative 5, Complete excavation with off-site disposal, has a capital cost of \$350M and no O&M cost.

- ¹ FS Alternative 2 Site-wide annual O&M = \$278,796
- ² FS Alternative 3a Site-wide annual O&M = \$318,632
- ³ FS Alternative 3b Site-wide annual O&M = \$180,759
- ⁴ FS Alternative 4 Site-wide annual O&M = \$40,942

XI. PRINCIPAL THREAT WASTE

The NCP establishes an expectation that treatment to address principal threats posed by a site will be considered and used where practicable (NCP § 300.430(a)(1)(iii)(A)). In general, principal threat wastes are those source materials considered to be highly toxic or highly mobile and which generally cannot be reliably contained or would present significant risk to human health or the environment should exposure occur. NPS has determined that the Site does not contain principal threat wastes.

XII. SELECTED REMEDY

Summary of the Rationale for the Selected Remedy

The following are the principal factors upon which the selection of FS Alternative 4 as the Selected Remedy is based:

- FS Alternative 4 provides a high degree of overall protectiveness to human health and the environment and maximizes long-term protectiveness
- FS Alternative 4 complies with all ARARs
- On-Site risk to Park visitors and residents is permanently eliminated by FS Alternative 4 by removing all contaminated soil containing levels of contaminants that pose unacceptable risk to humans and the environment
- FS Alternative 4 can be readily implemented with existing technologies that can be provided by a large number of vendors
- FS Alternative 4 is cost effective when compared to the other alternatives
- FS Alternative 4 is the most consistent with the management and goals of a unit of the National Park System.
- The Commonwealth of Pennsylvania agrees with the selection of FS Alternative 4 as the Selected Remedy
- The public did not express any reservations regarding the choice of FS Alternative 4 as the Selected Remedy

Detailed Description of the Selected Remedy

Active Remediation

The Selected Remedy includes excavation of shallow contaminated soil posing an unacceptable risk to human health and/or the environment and disposal at a permitted off-site facility. Only contaminants in the top two feet of soil pose a risk to park visitors or residents or ecological receptors. Therefore, the Selected Remedy only requires excavation of shallow soil, with an over-excavation of up to one foot as a measure of added protectiveness. Excavated contaminated soil will be characterized for off-site disposal to determine if the soil/waste being excavated is considered Subtitle C Hazardous Waste under RCRA which will require disposal at a landfill permitted for such waste. Soil determined not to be Subtitle C waste will be sent off-site for disposal at a permitted solid waste landfill. Once excavation activities have been completed, clean soil will be used as backfill to achieve pre-remediation grades, and the remediated areas will be restored to their original conditions through seeding and replacement of shrubs, trees,

pavement, and any other disturbed surfaces, and installation of erosion protection. All active remediation components shall be completed in accordance with Performance Standards developed during final design, which shall be developed in accordance with the basis for Performance Standards presented in Appendix C.

The imported backfill, common fill and topsoil, must comply with the NPS Clean Fill Criteria and the Commonwealth's Management of Fill policy (as further described in Appendix C), and must also meet the RGs for COCs/CECs. Compliance with these requirements will assure that no contaminated soil will be used as backfill.

The areas delineated in the FS for remediation under ES Alternative 4, and the associated estimated volumes of soil to be excavated from each remedial area, are provided in Appendix D. The areas and depths of soil to be excavated will be refined based on pre-design testing done prior to finalization of the Remedial Design.

Excavation in wetlands and flood-plain areas will be restored to pre-remediation topography and hydrology and be designed to provide the original wetlands functions, therefore will be compliant with wetlands and floodplains ARARs. Wetland restoration plans will be developed for the implementation of the Selected Remedy in wetland areas. Additionally, remedial design plans will include appropriate measures to protect nesting habitat of the red-bellied turtle (*Pseudemys rubriventris*), a Pennsylvania-listed threatened species known to exist along the shoreline of the Schuylkill River.

During excavation and truck loading activities, control methods and monitoring will be used to address potential risks of exposure to construction workers and the public due to contact and inhalation of contaminants. Other potential safety concerns include physical hazards related to construction. There will also be an increase in truck traffic and associated noise, and a potential increase in dust levels during construction. During construction, dust suppression techniques will be used and appropriate containers/covers utilized during transportation to minimize fugitive dust emissions. Appropriate personal protective equipment (PPE) will be utilized to protect site workers from direct contact and inhalation risks, and adherence to OSHA construction safety requirements will protect site workers from construction hazards.

Public access to construction areas will be restricted with appropriate site controls (e.g. construction fencing, road barricades, etc.), and on-going air monitoring performed to ensure that workers and the public are not exposed to unacceptable contaminant levels during remediation. Upon confirmation that the Selected Remedy has been completely and effectively implemented such that no Site COCs or CECs remain in surface soil or sediment above RGs, all Site-specific warning signs and fencing will be removed.

Potential adverse environmental impacts during construction will be addressed by erosion control measures to minimize soil transport during precipitation events. Additional measures to protect surface water quality, such as bypassing the perennial stream in the Unnamed Tributary during construction in that area, will be developed during Remedial Design. Construction

activities may result in the temporary displacement of resident species. Following restoration of the area, however, displaced species are expected to return in a relatively short period of time (i.e., a year or two).

Coordination with Park officials will be necessary during the planning and implementation of the Selected Remedy regarding construction staging, phasing, hours and routes of truck traffic, management of existing Park traffic, and access control. Coordination with the PADOT may be necessary to integrate the Selected Remedy with the Betzwood Bridge project in their common areas. Coordination with the Norfolk-Southern Railroad will also need to occur for activities adjacent to the Norfolk-Southern tracks.

Remedial Action is proposed in the following four of the five archeologically sensitive areas within the Site identified in the RI:

- The Northern Building Area within the Former Keene Plant AOC;
- The Historic Bridge AOC;
- The Maintenance Area Ruins AOC; and
- Portions of the Waste Channel Railbed AOC.

To properly identify historic and cultural resources, additional archeological surveys will be required prior to remedial construction in those archeologically sensitive areas that may be disturbed during construction. Final Remedial Design will identify methods to be utilized to avoid (or otherwise mitigate) impacts to these sensitive resources during construction.

Institutional Controls

The Selected Remedy leaves contaminated soil at depths greater than 3 feet (2 feet of excavation to remove contaminated shallow soils, plus up to one foot of over-excavation as a measure of added protectiveness) in several of the AOCs. In some of these areas an extensive amount of historic waste has been placed and subsequently covered with clean fill and, therefore, this waste is present at substantial depths below the existing ground surface. This subsurface contamination poses no human health risks for Park visitors or residents or ecological exposure risks if left undisturbed. However, this waste potentially poses a risk to construction workers who may encounter this material during future construction projects or to Park maintenance workers during future maintenance of subsurface utilities. Therefore, institutional controls are included in the Selected Remedy to manage these potential future risks. The form of the institutional controls will be determined during the design and implementation of the Selected Remedy.

Institutional controls may include development and implementation of Park policies that set forth procedures for characterization and management of potential risks associated with excavation and other intrusive activities in the Site or limit future use of these areas.

Summary of the Estimated Remedy Costs

The estimated costs of the Selected Remedy as developed in the FS are summarized in Table 10 and are presented in more detail in Appendix E to this ROD. The cost analysis is based on U.S. USEPA guidance documents that define the accuracy for an FS-level cost estimate as +50 percent to -30 percent. Present worth cost analysis was used in the FS to provide a common basis from which to compare the different alternatives that have expenditures that occur over different time periods. For the present worth analysis, a period of performance of 30 years and a discount rate of 7 percent were assumed.

The information in Table 10 (and in the more detailed cost summary provided in Appendix E to this ROD) is based on the best available information regarding the anticipated scope of the Selected Remedy. Changes in the estimated costs are likely to occur as a result of new information and data collected during the pre-design and design phases for the Selected Remedy.

TABLE 10	
Estimated Costs for the Selected Remedy	
Item	Estimated Cost
Pre-design, Design and Oversight	
Pre-Design Sampling and Design	\$756,000
Oversight, Air monitoring, and Confirmatory sampling	\$413,000
Legal and Technical Support Related to IC Development	\$48,000
Total Indirect Capital Costs	\$1,217,000
Construction	
Excavation – mob/demob, clearing and grubbing, excavation	\$453,000
Clean fill, Topsoil, Compaction and Vegetation	\$1,244,000
Waste characterization and Off-site Disposal	\$6,312,000
Total Direct Capital Cost	\$8,009,000
Total Capital Costs	\$9,226,000
Contingency	
20 % of Total Construction Costs	\$1,845,000
Total Capital Costs plus Contingency	\$11,071,000
Operation and Maintenance	
Annual Operation and Maintenance Cost	\$41,000
Present Worth (30 years, 7%) of O&M Cost	\$508,000
TOTAL PRESENT WORTH	\$11,579,000

Expected Outcome of the Selected Remedy

Upon completion of the Selected Remedy, the NPS will immediately be able to allow unrestricted access by Park visitors and residents to areas of the Site that are currently restricted due to the potential for exposure to unacceptable levels of contaminants. In addition, ecological receptors currently at risk at the Site may populate and occupy the Site without harm. The Selected Remedy will allow the entire Site, excepting those areas developed to accommodate Park visitor, resident, maintenance and operation activities, to succeed to its ultimate habitat potential which is upland forest. This full succession is expected to take 50 to 80 years.

The purpose of the Selected Remedy is to control risks posed by direct contact, inhalation and ingestion of contaminated soil by receptors. The results of the HHRA indicate that existing conditions at the Site pose an unacceptable human health excess lifetime cancer risk of up to 2.9×10^{-4} from exposure to contaminated soil and sediment. In addition, the results of the BERA indicate that existing conditions at the Site pose an unacceptable risk to ecological receptors based on HQs greater than 1. The Selected Remedy will address all soil contaminated with COCs and CECs that exceed the remediation goals identified in Table 7. These soil cleanup levels are protective of human health at the aggregate 1×10^{-5} excess cancer risk level defined as the Site remediation goal, and at the Site human health-based remediation goals for lead. These soil cleanup levels are also protective of ecological receptors at the Site based on ecological risk-based remediation goals for all CECs except in instances where an ecological risk-based remediation goal is below background concentrations. For these situations, background is identified as the remediation goal because CERCLA does not provide for cleanup to concentrations below background for naturally-occurring analytes. Following remediation, verification sampling as specified in Appendix F to this ROD will be performed to ensure that the identified remediation goals are achieved.

XIII. STATUTORY DETERMINATIONS

Under CERCLA §121, a remedial action must: be protective of human health and the environment (one of the two threshold criteria); comply with ARARs unless a statutory waiver is justified (the second of the two threshold criteria); be cost-effective; and utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. In addition, CERCLA §121 includes a preference for remedial actions that employ treatment that permanently and significantly reduces the volume, toxicity, or mobility of hazardous substances as a principal element. This section discusses how the Selected Remedy meets these statutory requirements and preference.

Protection of Human Health and the Environment

The Selected Remedy will maximize long-term protection of human health and the environment on-site by removing all soil that contains contaminants exceeding remediation goals and which are accessible by Park visitors and residents and ecological receptors (the top 24 inches), and disposing those materials off-site. The Selected Remedy will also control the risks of exposure to contaminated soil greater than two feet through the use of institutional controls. The Selected Remedy will allow the entire Site to be fully utilized for all appropriate Park purposes, consistent with the management and goals of a National Park.

Compliance with Applicable or Relevant and Appropriate Requirements

The Selected Remedy will comply with all ARARs (see Appendix G to this ROD).

Cost Effectiveness

The Selected Remedy is cost-effective and represents a reasonable value for the money to be spent. Under the NCP, a remedy is considered cost-effective "if its costs are proportional to its overall effectiveness." 40 CFR § 300.430(f)(1)(ii)(D). This NCP provision also states that

overall effectiveness is evaluated by assessing three of the five balancing criteria (long-term effectiveness and permanence; reduction in toxicity, mobility, and volume through treatment; and short-term effectiveness). Overall effectiveness is then compared to costs to determine cost-effectiveness.

The relationship of the overall effectiveness of the Selected Remedy was determined to be proportional to its costs. The Selected Remedy will provide a degree of protectiveness of human health and the environment equal to FS Alternative 5 but at a much lower cost, and will provide a higher degree of protectiveness of human health and the environment than FS Alternatives 2, 3a and 3b at a comparable cost. The Selected Remedy provides a significantly higher degree of protectiveness of human health and the environment than FS Alternative 1 (No Action) although the Selected Remedy is much more costly. However, FS Alternative 1 does not satisfy the threshold criteria; therefore it cannot be selected as the remedy for the Site.

Utilization of Permanent Solutions and Alternative Treatment Technologies (or Resource Recovery Technologies) to the Maximum Extent Practicable

The Selected Remedy represents the maximum extent to which permanent solutions and alternative treatment technologies can be utilized in a practicable manner at the Site as discussed below.

The Selected Remedy partially satisfies the requirement for utilization of permanent solutions by permanently removing from Park lands the soil that contains contaminants exceeding remediation goals and which are accessible by Park visitors and residents and ecological receptors (the top 24 inches).

Deeper contaminated soil that may be accessed by Park maintenance or construction workers cannot be practically removed permanently without potentially creating unacceptable short-term risks to Park visitors, residents, maintenance and construction workers, and ecological receptors; and without creating construction hazards and safety concerns, and significant disruptions to Park operations during the many years of construction that would be required. Therefore, permanent removal of the deeper contaminated soil is not considered practicable.

There are no known alternative treatment or resource recovery technologies for the primary contaminant at the site (asbestos). The screening of technology types and process options during the FS process determined that asbestos fibers cannot be effectively treated or recovered using any known treatment process including thermal, physical/chemical, volatilization, or biological treatment. Asbestos fibers do not migrate in the subsurface, so disposal at a controlled, licensed off-site solid or hazardous waste facility (included in the Selected Remedy) is the most practical method of managing this type of waste. The only potentially effective alternative *in-situ* technologies available for the contaminants at this site, capping and stabilization, were evaluated in FS Alternatives 2 and 3a/3b, respectively. These alternatives were found to be less protective of human health and the environment and less permanent than the Selected Remedy.

Preference for Treatment as a Principal Element to Permanently and Significantly Reduce the Volume, Toxicity, or Mobility of Hazardous Substances

As described above, the screening of technology types and process options performed during the FS did not identify treatment technologies or process options that could effectively remediate the site hazardous substances, either *ex-situ* or *in-situ*.

Under the Selected Remedy, no treatment would be performed. However, all soil containing contaminants exceeding remediation goals and which are accessible by Park visitors and residents and ecological receptors (the top 24 inches) would be excavated for disposal at an appropriately permitted off-site landfill. By removal of this soil from the Park lands the Selected Remedy significantly reduces the volume of hazardous substances in the Park. Further, once capped in the landfill the contaminants would be permanently rendered immobile (i.e., there would no longer be any erosion or air borne transport potential), and made inaccessible to receptors (indirectly eliminating toxicity), thus reducing the toxicity and mobility of hazardous substances. Although FS Alternative 2 (capping) also reduces mobility and toxicity (indirectly by isolation), it does not reduce the volume of hazardous substances in the Park. Similarly, FS Alternative 3 (soil stabilization) reduces mobility and toxicity (but not the volume) of hazardous substances, but its permanence is questionable since it depends on the long-term integrity of the stabilized soil matrix.

The Selected Remedy therefore significantly reduces the volume, toxicity, and mobility of hazardous substances, and does so more effectively than the other alternatives.

Five-Year Review Requirements

Because some contamination will remain at the Site in the subsurface, CERCLA requires five-year reviews. These reviews will assess the on-going effectiveness of the Selected Remedy, the physical condition of the remediated areas, the adequacy of the revegetation, and the effectiveness of the institutional controls at preventing unacceptable exposure to the deep contamination.

XIV. DOCUMENTATION OF SIGNIFICANT CHANGES

The Proposed Plan for the ARS was released for public comment in September 2006. The Proposed Plan identified FS Alternative 4, Shallow Excavation and Off-site Disposal, as the Preferred Alternative for remediation of the Site. Four written comments were received during the public comment period. After careful analysis of these comments, NPS has determined that no significant changes to the remedy as originally identified in the Proposed Plan are necessary or appropriate.

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RESPONSIVENESS SUMMARY

Overview of Public Comment Process

In accordance with Section 117 of CERCLA and section 300.430(f) of the NCP, NPS published a notice of availability and opportunity to comment on the Proposed Plan on September 17, 2006. The formal comment period began on September 22, 2006 and, at the request of the Commonwealth of Pennsylvania, was extended to November 6, 2006.

On September 28, 2006, NPS held a public meeting at VFNHP to solicit oral comments on the Proposed Plan from interested parties. Twenty six people attended the public meeting, including eight representatives of contracting or consulting firms, five citizens, four representatives of the Pennsylvania Department of Environmental Protection, one local government representative, one representative of a non-profit organization, and seven representatives of NPS. During the public meeting, NPS received comments from eight individuals. In addition, by the close of the formal comment period, NPS received four written comments.

The oral and written comments submitted by the public on the Proposed Plan, and NPS' response to each, are summarized below.

Comments Received/NPS Responses

Written Comments

NPS received written comments from two citizens who reside near the Park. One resident supported FS Alternative 5 (Complete Excavation with Off-Site Disposal). The other resident supported FS Alternative 1 (No Action).

The National Parks Conservation Association (NPCA) submitted a letter, on behalf of its 325,000 members nationwide, offering its full support for NPS' efforts to clean up contaminated soils at the Site. In the letter, NPCA expressed its position that the Preferred Alternative "appears to be the best method for cleaning up this site ... Excavating and removing contaminated soil is preferred to capping as it allows the park to adhere to the Organic Act of 1916..."

The Commonwealth of Pennsylvania, through its Department of Environmental Protection, submitted a letter stating, in part, "(s)ubject to the comments set forth in this letter, the Department concurs with the NPS Preferred Alternative as set forth in the Proposed Plan." The Commonwealth also advised NPS that it had collected information to analyze potential cost savings that might be realized from consolidating waste materials for disposal within the boundaries of the Park in lieu of off-site disposal:

Based upon this information, the Department no longer submits that the consolidation remedy will provide for a more cost effective response within the meaning of Section 121 of CERCLA, and therefore the Department endorses the Preferred Alternative. However, the Department submits that extraordinary attention must be paid to addressing any potential adverse affects (sic) on the public health and the environment from excavation with off-site disposal and its consequential increase in truck traffic.

Response:

NPS respects and appreciates the concurrence and support of the Commonwealth and NPCA on the Selected Remedy. NPS agrees that potential adverse effects arising from truck traffic associated with off-site disposal of contaminated material must be addressed to protect public health and safety.

With respect to FS Alternative 5, NPS has determined that complete excavation would not be cost effective and would entail undue disruption of Park activities over the long time period (estimated at more than ten years) required for implementation. The estimated \$355 million cost of implementing FS Alternative 5 did not provide commensurate risk reduction in comparison to the Selected Remedy's estimated \$11.6 million cost and substantially similar risk reduction.

With respect to FS Alternative 1, NPS rejected the no action alternative because it did not satisfy the two threshold remedy selection criteria. Specifically, NPS found that the no action alternative would not protect human health and the environment from unacceptable risks and would not attain ARARs.

Comments from the Public Meeting

1. Implementation Issues

Depth of excavation:

One commenter requested clarification regarding how NPS would determine the depth of excavation that would be necessary in different areas. The commenter questioned whether testing would be performed or if all areas of contamination would be excavated to a depth of three feet in a "one-size fits all" approach.

Response:

The Selected Remedy requires excavation of contaminated soil posing an unacceptable risk to human health and/or the environment and disposal at a permitted off-site facility. The RI determined that contaminants in the top two feet of soil may pose a risk to Park visitors or residents or ecological receptors based on the potential for exposure to contaminants.

In areas where contaminants were detected no deeper than 24 inches, a maximum 30-36 inch depth of excavation will be implemented to ensure complete removal of the contaminants that pose a risk to Park visitors, residents, or ecological receptors (the extra 6-12 inches of excavation will be included to be conservative – the final determination of the over-excavation amount will depend upon the level of confidence achieved regarding contaminant distribution once pre-design testing is completed). In other areas where contaminants are limited to shallower soils, excavation depths will be shallower. For example, where contaminants were only detected in the top 6 inches, excavation to a depth of 12-18 inches will be implemented which will result in the removal of all of the contaminated soil at that location. In other areas where contaminants are known to be present deeper than 24 inches, the excavation will stop at 24 inches and the remaining deeper contamination will be left in place. In those areas, a synthetic warning layer will be placed at the bottom of the excavation prior to backfilling and institutional controls implemented (see a more detailed description in response to the next comment below). The variability of the depths of excavation will be based on the differences in the depths of contamination among the AOCs as measured during the RI and additionally measured during pre-design testing.

The areas delineated in the FS for excavation, and the associated estimated volumes of soil to be excavated from each remedial area, are provided in Appendix D. The areas and depths of soil to be excavated will be refined based on pre-design testing done prior to finalization of the Remedial Design.

Verification that Remediation Goals (RGs) will be achieved:

One commenter asked for information concerning how NPS will verify that RGs and other cleanup objectives are achieved and that the remedy has succeeded.

Response:

Appendix F of the ROD establishes detailed RG verification procedures. Initially, contaminated soils will be excavated at the locations and to the depths as specified in the ROD or at revised locations and depths determined during Remedial Design. A pre-design sampling plan will be developed and implemented to confirm that excavating at the locations and to the depths established in the FS will achieve the RGs, or provide the basis for a revised excavation plan to achieve the RGs.

In areas where pre-design sampling data indicate that contaminated soils exceeding RGs are present at depths greater than two feet (determined during the pre-design testing), excavation will be completed to two feet and a suitable synthetic warning layer will be installed at the bottom of the excavation prior to backfilling to alert future construction and utility workers to the presence of contamination beneath the warning layer, and institutional controls will be established to control and manage exposure to Site contamination by Park maintenance and/or construction workers.

For all areas where pre-design data indicate that RG exceedances are limited to the top two feet, post-excavation verification sampling will be performed to verify that soils remaining within two feet of the ground surface meet the RGs set forth in Table 7 of this ROD.

Vertical verification samples will be collected from the top six inches of the base of the excavation in each 2500 square foot area (but in no case less than three locations within a discrete remediation area), except in areas where RG exceedances are known to exist deeper than 24 inches in which case a warning layer will be installed without additional vertical verification sampling, and the area backfilled with clean soil and institutional controls implemented (see response to prior comment above). In addition, regardless of the excavation depth, horizontal verification samples will be collected around the perimeter of the excavation sidewalls from 0-6 inches and 12-18 inches below the original ground surface. Horizontal verification samples will be collected approximately every 200 lineal feet around the excavation perimeter at no fewer than three approximately equally spaced locations (six samples) per remediation area.

In addition to these prescribed vertical and horizontal sampling locations, additional representative samples will be taken for asbestos analysis from any area of the excavation bottom or sidewall that visually has the appearance indicating the potential presence of asbestos fibers. All post-excavation sampling will be fully documented and the locations determined in the field with a GPS and mapped for future reference.

If the results of post-excavation verification sampling reveal that a base or perimeter sidewall sample exceeds the RGs, those areas will be subject to additional characterization and/or further excavation.

In the case where a vertical verification sample from the base of the excavation exceeds the RGs, the excavation will be extended to a minimum depth of 24 inches (if not already at that depth), and a warning layer installed and institutional controls implemented if the previous or an additional round of verification data indicate RG exceedances at or beneath the 24 inch deep excavation.

In the case where a horizontal verification sample from the sidewall of the excavation exceeds the RGs, additional sampling will be performed to delineate the horizontal extent of the RG exceedance in that area. Additional samples will be collected at the same density as the vertical verification sampling of a minimum of one location per 2500 square feet from 0-6 and 12-18 inches below the original ground surface until sample results are reported below the RGs, which will be used to define the new horizontal limits of excavation. The depths of excavation within the expanded area of excavation will be dependent upon the results of the individual depth samples. In some instances anthropogenic features, such as County Line Road and quarry walls, may be utilized to define the horizontal limit of additional excavation.

Finally, in accordance with Section 121(c) of CERCLA, because some contamination will remain at the Site in the subsurface, NPS will review the effectiveness of the Selected Remedy no less often than every five years. These reviews will assess the on-going effectiveness of the

Selected Remedy, the physical condition of the remediated areas, the adequacy of the revegetation, and the effectiveness of the institutional controls at preventing unacceptable exposure to the deep contamination.

Timeline for implementation of the Selected Remedy:

One commenter asked what the projected timeline was for designing and implementing the Selected Remedy.

Response:

NPS expects that remedial design activities will take between one and two years and that implementation of the Remedial Action will take an additional year or two.

2. Potential Off-site Sources or Migration

Two commenters asked whether the results of the RI, other investigations, or any other information available to NPS suggested either (1) that disposal of waste material from the Keene facility occurred in quarries or other locations beyond the boundaries of VFNHP or (2) that sources other than the Keene facility may have contributed to releases of hazardous substances at the Site.

Response:

The Commonwealth of Pennsylvania, Department of Environmental Protection, conducted the RI subject to NPS oversight. The RI included an investigation into the historic waste disposal practices of Ehret and Keene as well as a comprehensive field investigation that revealed remnants of the mechanisms by which Ehret and Keene disposed of wastes.

Based on these investigations, the Commonwealth concluded, and NPS concurs, that Ehret and Keene utilized disposal locations (e.g., quarries) and methods (e.g., slurring waste down the Waste Channel and Railbed) that were the most readily available. Readily available quarries were those located within Valley Forge State Park, which Ehret and Keene were authorized by the Commonwealth to use for disposal, and the Keene Quarry located on the Ehret/Keene property. NPS has also concluded that the results of the RI demonstrate that the full geographical distribution of contamination emanating from the Ehret/Keene facility has been established.

In addition, based upon the commingling of asbestos waste with other hazardous substances detected at the Site, along with the fact that only Ehret and Keene were authorized to dispose of wastes within the Site, NPS has concluded that it is likely that all of these substances originated from the operations of Ehret and Keene.

3. Other Technical Issues

One commenter questioned the rationale for shallow soil excavation called for by the Selected Remedy instead of just stabilizing or capping contaminated soils in place as contemplated by FS Alternatives 2, 3a, and 3b.

Response:

Under the Selected Remedy, contaminants in the top two feet that pose unacceptable risks will be excavated, essentially eliminating risks associated with those materials. Under the capping and soil stabilization alternatives, risks posed by contaminants in the top two feet would not be eliminated even though the containment barrier (cap) or stabilized soil would effectively break the exposure pathway between the contamination and potential receptors thereby managing the risk appropriately. However, maintenance of the cap or stabilized soil would need to be performed over time to maintain the integrity of these remedies. The possibility that the integrity of the cap or stabilized soil could be compromised in the future would remain. Consequently, the Selected Remedy will achieve a higher level of long term effectiveness and permanence than the capping and soil stabilization alternatives.

FS Alternatives 2, 3a, and 3b would limit potential Park development and certain uses in the remediated areas as necessary to ensure that the integrity of the cap or stabilized soil matrix was not compromised. Under the Selected Remedy, with the exception of institutional controls to limit exposure to contaminated soil greater than two feet in depth, Park use of the remediated areas will not be restricted. In addition, capping and soil stabilization alternatives would result in increases in the ground surface elevation altering the topography of the remediated areas from the surrounding areas. Successful revegetation of stabilized areas (Alternatives 3a/3b) with shrubs and trees might not be possible due to the solid soil matrix immediately beneath the topsoil. For these reasons, the Selected Remedy is more consistent with the management and goals of a unit of the National Park System.

Finally, within the limits of the accuracy of FS-level cost estimating (+50%/-30%), FS Alternatives 2, 3a, 3b, and the Selected Remedy are all relatively similar in cost. Moreover, as the effectiveness of the remedies in FS Alternatives 2 and 3a/3b is dependent on the long-term integrity of the cap or stabilized soil, O&M costs beyond the 30-year period included in the FS cost estimate would almost certainly be incurred. Extending the O&M costs beyond 30 years would increase the estimated present worth for FS Alternatives 2, 3a, and 3b above that presented in the FS.

4. Liability Issues

Three commenters raised issues regarding whether, and how many, potentially responsible parties (PRPs) have been identified by NPS. In written comments submitted to NPS, the Commonwealth of Pennsylvania reiterated the comment made by one of its representatives on

this topic at the public meeting. In addition, one commenter inquired why the Commonwealth of Pennsylvania is a PRP at the Site.

Response:

NPS has conducted a comprehensive investigation to identify PRPs and to pursue the recovery of response costs from responsible parties. Because the number and identify of PRPs at the Site is not relevant to the evaluation of remedial alternatives and the selection of the Selected Remedy, NPS has determined that it is inappropriate to address these comments in this Responsiveness Summary.

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