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

UNITED STATES OF AMERICA, Plaintiff, v. DUNBAR ASPHALT PRODUCTS, INC., Defendant	)	CIVIL ACTION NO. _____

CONSENT DECREE FOR REMEDIAL DESIGN AND REMEDIAL ACTION

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I. BACKGROUND

A. The United States of America ("United States"), on behalf of the Administrator of the United States Environmental Protection Agency ("EPA"), filed a complaint in this matter pursuant to Sections 106 and 107 of the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA"), 42 U.S.C. §§ 9606 and 9607.

B. The United States in its complaint seeks, *inter alia*: (1) reimbursement of costs incurred by EPA and the Department of Justice ("DOJ") for response actions related to real property owned by Defendant Dunbar Asphalt Products, Inc. within the Northern Slag Area (Operable Unit Two or "OU2") of the Sharon Steel Farrell Works Superfund Site, which is located in the City of Hermitage and the City of Farrell, Mercer County, Pennsylvania ("the Site"), together with accrued interest; and (2) performance of response actions by the Settling Defendant at the Site consistent with the National Contingency Plan ("NCP"), 40 C.F.R. Part 300.

C. In accordance with the NCP and Section 121(f)(1)(F) of CERCLA, 42 U.S.C. § 9621(f)(1)(F), EPA notified the Commonwealth of Pennsylvania (the "Commonwealth") on July 7, 2014, of negotiations with potentially responsible parties ("PRPs") regarding the implementation of the remedial design and remedial action for the Site, and EPA has provided the State with an opportunity to participate in such negotiations and be a party to this Consent Decree.

D. [Reserved].

E. In accordance with Section 122(j)(1) of CERCLA, 42 U.S.C. § 9622(j)(1), EPA notified the U.S. Department of Interior and the National Oceanographic and Atmospheric Administration ("NOAA") on July 1, 2014, of negotiations with PRPs regarding the release of hazardous substances that may have resulted in injury to the natural resources under federal trusteeship and encouraged the trustees to participate in the negotiation of this Consent Decree.

F. The Defendant, Dunbar Asphalt Products, Inc., who has entered into this Consent Decree ("Settling Defendant"), does not admit any liability to Plaintiff or to any other person arising out of the transactions or occurrences alleged in the complaint, nor does Settling Defendant acknowledge that the release or threatened release of hazardous substance(s) at or from the Site constitutes an imminent and substantial endangerment to the public health or welfare or the environment.

G. Pursuant to Section 105 of CERCLA, 42 U.S.C. § 9605, EPA placed the Site on the National Priorities List ("NPL"), set forth at 40 C.F.R. Part 300, Appendix B, by publication in the Federal Register on July 8, 1998. EPA commenced a Remedial Investigation and Feasibility Study ("RI/FS") for the Site pursuant to 40 C.F.R. § 300.430 in October 1999.

H. EPA completed a Remedial Investigation ("RI") Report in June 2005 and a Feasibility Study ("FS") Report for OU2 in September 2007.

I. Pursuant to Section 117 of CERCLA, 42 U.S.C. § 9617, EPA published notice of the completion of the FS and of the proposed plan for remedial action at OU2 on September 13, 2012, in a major local newspaper of general circulation. EPA provided an opportunity for written and oral comments from the public on the proposed plan for remedial action. A copy of the transcript of the public meeting is available to the public as part of the administrative record upon which the Division Director of the Hazardous Site Cleanup Division, EPA Region III, based the selection of the response action.

J. The decision by EPA on the interim remedial action to be implemented at OU2 is embodied in a final Record of Decision ("ROD") for OU2, which was executed on December 19, 2013. The Commonwealth has given its concurrence on the ROD, which includes a responsiveness summary addressing public comments received by EPA. Notice of the final plan was published in accordance with Section 117(b) of CERCLA, 42 U.S.C. § 9617(b).

K. Based on the information presently available to EPA, EPA believes that the Work will be properly and promptly conducted by Settling Defendant if conducted in accordance with the requirements of this Consent Decree and its appendixes.

L. Solely for the purposes of Section 113(j) of CERCLA, 42 U.S.C. § 9613(j), the interim remedy set forth in the ROD and the Work to be performed by Settling Defendant shall constitute a response action taken or ordered by the President for which judicial review shall be limited to the administrative record.

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

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

II. 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. §§ 9606, 9607, and 9613(b). This Court also has personal jurisdiction over Settling Defendant. Solely for the purposes of this Consent Decree and the underlying complaint, Settling Defendant waives all objections and defenses that it may have to jurisdiction of the Court or to venue in this District. Settling Defendant shall not challenge the terms of this Consent Decree or this Court's jurisdiction to enter and enforce this Consent Decree.

III. PARTIES BOUND

2. This Consent Decree applies to and is binding upon the United States and upon Settling Defendant and its successors and assigns. Any change in ownership or corporate status of Settling Defendant including, but not limited to, any transfer of assets or real or personal property, shall in no way alter Settling Defendant's responsibilities under this Consent Decree.

3. Settling Defendant shall provide a copy of this Consent Decree to each contractor hired to perform the Work required by this Consent Decree and to each person representing Settling Defendant with respect to the Site or the Work, and shall condition all contracts entered into hereunder upon performance of the Work in conformity with the terms of this Consent Decree. Settling Defendant or its contractors shall provide written notice of the Consent Decree to all subcontractors hired to perform any portion of the Work required by this Consent Decree. Settling Defendant shall nonetheless be responsible for ensuring that its contractors and subcontractors perform the Work in accordance with the terms of this Consent Decree. With regard to the activities undertaken pursuant to this Consent Decree, each contractor and subcontractor shall be deemed to be in a contractual relationship with Settling Defendant within the meaning of Section 107(b)(3) of CERCLA, 42 U.S.C. § 9607(b)(3).

IV. DEFINITIONS

4. Unless otherwise expressly provided in this Consent Decree, terms used in this Consent Decree 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 Consent Decree or its appendixes, the following definitions shall apply solely for purposes of this Consent Decree:

"CERCLA" shall mean the Comprehensive Environmental Response, Compensation, and Liability Act, as amended, 42 U.S.C. §§ 9601-9675.

"Commonwealth" shall mean the Commonwealth of Pennsylvania.

"Consent Decree" shall mean this Consent Decree and all appendixes attached hereto (listed in Section XXVIII). In the event of conflict between this Consent Decree and any appendix, this Consent Decree shall control.

"Day" or "day" shall mean a calendar day unless expressly stated to be a working day. The term "working day" shall mean a day other than a Saturday, Sunday, or federal or state holiday. In computing any period of time under this Consent Decree, where the last day would fall on a Saturday, Sunday, or federal or state holiday, the period shall run until the close of business of the next working day.

"Division Director" shall mean the Director of the EPA Region III Hazardous Site Cleanup Division.

"DOJ" shall mean the United States Department of Justice and its successor departments, agencies, or instrumentalities.

"Effective Date" shall mean either the date upon which this Consent Decree is entered by the Court as recorded on the Court docket, or the date upon which a motion to enter this Decree is granted, whichever occurs first.

"EPA" shall mean the United States Environmental Protection Agency and its successor departments, agencies, or instrumentalities.

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

"Future Response Costs" shall mean all costs, including, but not limited to, direct and indirect costs, that the United States pays after the Effective Date, in performing any response action concerning the Site, including, but not limited to, costs incurred for reviewing or developing plans, reports, and other deliverables submitted under this Consent Decree, costs for overseeing implementation of the Work required by this Consent Decree, including, but not limited to, payroll costs, contractor costs, travel costs, laboratory costs, and enforcement costs. Future Response Costs shall include any costs incurred by the United States under any provisions of this Consent Decree, including, but not limited to, Paragraph 9 (Notice to Successors-in-Title and Transfers of Real Property), Sections VII (Remedy Review), IX (Access and Institutional Controls) (including, but not limited to, the cost of attorney time and any monies paid to secure access or to secure, implement, monitor, maintain, or enforce Institutional Controls including, but not limited to, the amount of just compensation), XV (Emergency Response), Paragraph 48 (Funding for Work Takeover), and Section XXIX (Community Involvement). Future Response Costs shall not include any costs incurred by the United States for installation of the biosolid-enhanced cap or implementation of stormwater controls as provided for in Section V.3 of the June 23, 2015 ESD.

"Institutional Controls" or "ICs" shall mean Proprietary Controls and state or local laws, regulations, ordinances, zoning restrictions, or other governmental controls or notices that: (a) limit land, water, or resource use to minimize the potential for human exposure to hazardous substances at

the Site; (b) limit land, water, or resource use to implement, ensure non-interference with, or ensure the protectiveness of the Remedial Action; or (c) provide information intended to modify or guide human behavior at the Site.

"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.

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

"Operation and Maintenance" or "O&M" shall mean all activities required to maintain the effectiveness of the Remedial Action as required under the Operation and Maintenance Plan approved or developed by EPA pursuant to Section VI (Performance of the Work by Settling Defendant).

"PADEP" shall mean the Pennsylvania Department of Environmental Protection and any successor departments or agencies of the Commonwealth.

"Paragraph" shall mean a portion of this Consent Decree identified by an Arabic numeral or an upper or lower case letter.

"Parties" shall mean the United States and Settling Defendant.

"Past Response Costs" shall mean all costs, including, but not limited to, direct and indirect costs, that the United States has paid in connection with the Site before the Effective Date, plus any Interest on all such costs that has accrued pursuant to 42 U.S.C. § 9607(a) through the Effective Date.

"Performance Standards" shall mean the cleanup standards and other measures of achievement of the goals of the Remedial Action set forth in Section M.2 of the ROD and any modified standards established pursuant to this Consent Decree or by any explanation of significant differences issued under 40 C.F.R. § 300.435(c)(2).

"Plaintiff" shall mean the United States.

"Proprietary Controls" shall mean easements or covenants running with the land that (a) limit land, water, or resource use or provide access rights and (b) are created pursuant to common law or statutory law by an instrument that is recorded by the owner in the appropriate land records office.

"RCRA" shall mean the Solid Waste Disposal Act, 42 U.S.C. §§ 6901-6992 (also known as the Resource Conservation and Recovery Act).

"Record of Decision" or "ROD" shall mean the EPA interim Record of Decision, as modified by the Explanation of Significant Differences ("ESD") issued on June 23, 2015, any modifications thereof, and any Explanation of Significant Differences issued under 40 C.F.R. § 300.435(c)(2), along with all attachments, relating to Operable Unit 2 of the Sharon Steel Corporation (Farrell Works Disposal Area) Superfund Site. The ROD, which selected an interim remedial action for the Site and was signed on December 19, 2013, by the Acting Director of the Hazardous Site Cleanup Division of EPA Region III, is attached as Appendix A. The ESD, which modifies the interim remedial action and was issued by EPA on June 23, 2015, is attached as Appendix C.

"Remedial Action" shall mean the interim remedial action selected for the Site in the ROD and all activities Settling Defendant is required to perform to implement the ROD in accordance with the final approved remedial design submission, the approved RD/RA Work Plan, and other plans approved by EPA under this Consent Decree, including implementation of Institutional Controls, until the Performance Standards are met, and excluding performance of the Remedial Design, O&M, and the activities required under Section XXVI (Retention of Records).

"Remedial Design/Remedial Action Work Plan" or "RD/RA Work Plan" shall mean the document developed pursuant to Paragraph 11 (Remedial Design) and approved by EPA, and any modifications thereto.

"Remedial Design" shall mean those activities to be undertaken by Settling Defendant to develop the final plans and specifications for the Remedial Action pursuant to the RD/RA Work Plan.

"Section" shall mean a portion of this Consent Decree identified by a Roman numeral.

"Settling Defendant" shall mean Dunbar Asphalt Products, Inc.

"Sharon Steel Corp. Superfund Site OU2 Special Account" shall mean the special account, within the EPA Hazardous Substance Superfund, established for Operable Unit 2 of the Sharon Steel (Farrell Works Disposal Area) Superfund Site by EPA pursuant to Section 122(b)(3) of CERCLA, 42 U.S.C. § 9622(b)(3).

"Site" shall mean Operable Unit 2 of the Sharon Steel (Farrell Works Disposal Area) Superfund Site, encompassing approximately thirty-three (33) acres, located in the City of Hermitage and the City of Farrell, Mercer County, Pennsylvania, and depicted generally on the map attached as Appendix B.

"State" shall mean the Commonwealth of Pennsylvania.

"Supervising Contractor" shall mean the principal contractor retained by Settling Defendant to supervise and direct the implementation of the Work under this Consent Decree.

"Transfer" shall mean to sell, assign, convey, lease, mortgage, or grant a security interest in, or where used as a noun, a sale, assignment, conveyance, or other disposition of any interest by operation of law or otherwise.

"United States" shall mean the United States of America and each department, agency, and instrumentality of the United States, including, among others, EPA and any federal natural resource trustee.

"Waste Material" shall mean (1) any "hazardous substance" under Section 101(14) of CERCLA, 42 U.S.C. § 9601(14); (2) any pollutant or contaminant under Section 101(33) of CERCLA, 42 U.S.C. § 9601(33); and (3) any "solid waste" under Section 1004(27) of RCRA, 42 U.S.C.§ 6903(27).

"Work" shall mean all activities and obligations Settling Defendant is required to perform under this Consent Decree, except the activities required under Section XXV (Retention of Records). The Work shall not include installation of the biosolid-enhanced cap and implementation of stormwater controls as provided for in Section V.3 of the June 23, 2015 ESD.

V. GENERAL PROVISIONS

5. Objectives of the Parties. The objectives of the Parties in entering into this Consent Decree are to protect public health or welfare or the environment by the design and implementation of response actions at the Site, to pay certain response costs of the Plaintiff, and to resolve the claims of Plaintiff against Settling Defendant as provided in this Consent Decree.

6. Commitments by Settling Defendant. Settling Defendant shall finance and perform the Work in accordance with this Consent Decree, the ROD, and all work plans and other plans, standards, specifications, and schedules set forth in this Consent Decree or developed by Settling Defendant and approved by EPA pursuant to this Consent Decree. Settling Defendant shall pay the United States for Future Response Costs as provided in this Consent Decree.

7. Compliance With Applicable Law. All activities undertaken by Settling Defendant pursuant to this Consent Decree shall be performed in accordance with the requirements of all applicable federal and state laws and regulations. Settling Defendant must also comply with all applicable or relevant and appropriate requirements ("ARARs") of all federal and state environmental laws as set forth in the ROD. The activities conducted pursuant to this Consent Decree, if approved by EPA, shall be deemed to be consistent with the NCP.

8. Permits.

a. As provided in Section 121(e) of CERCLA, 42 U.S.C. § 9621(e), and Section 300.400(e) of the NCP, no permit shall be required for any portion of the Work conducted entirely on-site (i.e., within the areal extent of contamination or in very close proximity to the contamination and necessary for implementation of the Work). Where any portion of the Work that is not on-site requires a federal or state permit or approval, Settling Defendant shall submit timely and complete applications and take all other actions necessary to obtain all such permits or approvals.

b. Settling Defendant may seek relief under the provisions of Section XVIII (Force Majeure) for any delay in the performance of the Work resulting from a failure to obtain, or a delay in obtaining, any permit or approval referenced in Paragraph 8.a and required for the Work, provided that they have submitted timely and complete applications and taken all other actions necessary to obtain all such permits or approvals.

c. This Consent Decree is not, and shall not be construed to be, a permit issued pursuant to any federal or state statute or regulation.

9. Notice to Successors-in-Title and Transfers of Real Property.

a. Settling Defendant shall, at least 60 days prior to any Transfer of any real property located at the Site, give written notice: (1) to the transferee regarding the Consent Decree and any Institutional Controls regarding the real property; and (2) to EPA regarding the proposed Transfer, including the name and address of the transferee and the date on which the transferee was notified of the Consent Decree and any Institutional Controls.

b. Settling Defendant may Transfer any real property located at the Site only if: (1) any Proprietary Controls required by Paragraph 26.c have been recorded with respect to the real property; or (2) Settling Defendant has obtained an agreement from the transferee, enforceable by Settling Defendant and the United States, to (i) allow access and restrict land/water use, (ii) record any Proprietary Controls on the real property, and (iii) subordinate its rights to any such Proprietary Controls, and EPA has approved the agreement in writing. If, after a Transfer of the real property,

the transferee fails to comply with the agreement provided for in this Paragraph 9.b, Settling Defendant shall take all reasonable steps to obtain the transferee's compliance with such agreement. The United States may seek the transferee's compliance with the agreement or assist Settling Defendant in obtaining compliance with the agreement. Settling Defendant shall reimburse the United States under Section XVI (Payments for Response Costs), for all costs incurred, direct or indirect, by the United States regarding obtaining compliance with such agreement, including, but not limited to, the cost of attorney time.

c. In the event of any Transfer of real property located at the Site, unless the United States otherwise consents in writing, Settling Defendant shall continue to comply with its obligations under the Consent Decree, including, but not limited to, its obligation to provide or secure access, to implement, maintain, monitor, and report on Institutional Controls, and to abide by such Institutional Controls.

VI. PERFORMANCE OF THE WORK BY SETTLING DEFENDANT

10. Selection of Supervising Contractor and Other Contractors or Subcontractors.

a. All aspects of the Work to be performed by Settling Defendant pursuant to Sections VI (Performance of the Work by Settling Defendant), VII (Remedy Review), VIII (Quality Assurance, Sampling, and Data Analysis), IX (Access and Institutional Controls), and XV (Emergency Response) shall be under the direction and supervision of Settling Defendant as its own Supervising Contractor. If at any time after the Effective Date, Settling Defendant proposes to select a different Supervising Contractor, Settling Defendant shall give such notice to EPA and must obtain an authorization to proceed from EPA before the new Supervising Contractor performs, directs, or supervises any Work under this Consent Decree.

b. If EPA disapproves a proposed Supervising Contractor, EPA will notify Settling Defendant in writing. Settling Defendant shall submit to EPA a list of contractors, including the qualifications of each contractor, who would be acceptable to it within 30 days after receipt of EPA's disapproval of the contractor previously proposed. EPA will provide written notice of the names of any contractor(s) whose selection it would accept. Settling Defendant may select any contractor from this list and shall notify EPA of the name of the contractor selected within 21 days of EPA's written notice.

c. If EPA fails to provide written notice of its authorization to proceed or disapproval as provided in this Paragraph and this failure prevents Settling Defendant from meeting one or more deadlines in a plan approved by EPA pursuant to this Consent Decree, Settling Defendant may seek relief under Section XVIII (Force Majeure).

d. Settling Defendant shall submit to EPA for acceptance by EPA the names and qualifications of any additional contractors and subcontractors it proposes to use to satisfy any requirement of this Consent Decree before such contractor or subcontractor performs any Work. If EPA does not respond with a notice accepting or disapproving the proposal for additional contractors and subcontractors within 14 days of receipt by EPA of Settling Defendant's selections, the proposal for additional contractors and subcontractors shall be deemed accepted. In the event EPA disapproves any proposed contractor or subcontractor, Settling Defendant shall submit to EPA a list of at least three contractors or subcontractors, including the qualifications of each, who would be acceptable to it within ten (10) days of receipt of EPA's notice. EPA will provide written notice of the names of any contractor(s) or subcontractor(s) whose selection it would accept. Settling

Defendant may select any contractor or subcontractor from this list and shall notify EPA of the name of the contractor or subcontractor selected within five (5) days of EPA's written notice.

11. Remedial Design.

a. Within 90 days of the Effective Date, Settling Defendant shall submit to EPA and PADEP a work plan for the design and implementation of the interim Remedial Action at the Site ("Remedial Design/Remedial Action Work Plan" or "RD/RA Work Plan"). The RD/RA Work Plan shall provide for the design and construction of the interim action set forth in the ROD and for achievement of the Performance Standards and other requirements set forth in the ROD and this Consent Decree. Upon its approval by EPA, the RD/RA Work Plan shall be incorporated into and enforceable under this Consent Decree.

b. The RD/RA Work Plan shall include descriptions, plans and schedules for implementation of all remedial design and remedial action tasks, including, but not limited to: (1) description of the tentative remedial design and remedial action teams; (2) sampling-and-analysis plan for any design and remedial action-related sampling necessary to ensure Performance Standards are achieved (including, but not limited to, a Remedial Design Quality Assurance Project Plan in accordance with Section VIII (Quality Assurance, Sampling, and Data Analysis)); (3) a Health and Safety Plan for field design and remedial action activities that conforms to the applicable Occupational Safety and Health Administration and EPA requirements including, but not limited to, 29 C.F.R. § 1910.120; (4) a Construction Quality Assurance Plan ("CQAP"); (5) an Institutional Control Implementation and Assurance Plan ("ICIAP"); (6) method for selection of the remedial contractor; and (7) schedule for completion of the remedial design and remedial action. The RD/RA Work Plan shall provide for preparation of preliminary, pre-final, and final design submissions. The preliminary design may be included in the RD/RA Work Plan.

c. Upon approval of the RD/RA Work Plan by EPA, after a reasonable opportunity for review and comment by the Commonwealth, and submission of the Health and Safety Plan for all field activities to EPA and PADEP, Settling Defendant shall implement the RD/RA Work Plan. Settling Defendant shall submit to EPA and the Commonwealth all designs, plans, reports, and other deliverables required under the approved RD/RA Work Plan in accordance with the approved schedule for review and approval pursuant to Section XI (EPA Approval of Plans, Reports, and Other Deliverables). Unless otherwise directed by EPA, Settling Defendant shall not commence further RD/RA activities at the Site prior to approval of the RD/RA Work Plan.

d. The preliminary-design submission shall include, at a minimum, the following: (1) design criteria; (2) results of treatability studies; (3) results of additional field sampling and pre-design work; (4) project delivery strategy; (5) preliminary plans, drawings, and sketches; (6) required specifications in outline form; and (7) preliminary construction schedule.

e. The pre-final/final-design submission shall include, at a minimum, the following: (1) final plans and specifications; (2) Operation and Maintenance Plan; (3) CQAP; (4) Field Sampling Plan (directed at measuring progress towards meeting Performance Standards); and (5) Contingency Plan. The CQAP, which shall detail the approach to quality assurance during construction activities at the Site, shall specify a quality assurance official, independent of the Supervising Contractor, to conduct a quality assurance program during the construction phase of the project.

12. Remedial Action. Within 10 days after EPA approval of the final design submission, Settling Defendant shall implement the remedial action in accordance with the EPA-approved RD/RA Work Plan schedule.

13. Settling Defendant shall continue to implement the Remedial Action until the Performance Standards are achieved. Settling Defendant shall implement O&M for so long thereafter as it is required by this Consent Decree.

14. Modification of the Work.

a. If EPA determines that it is necessary to modify the Work to achieve and maintain the Performance Standards or to carry out and maintain the effectiveness of the remedy set forth in the ROD, and such modification is consistent with the scope of the remedy set forth in the ROD, as modified by the June 2015 ESD, then EPA may (1) require that such modification be incorporated into the RD/RA Work Plan, Operation and Maintenance Plan, or any other plan relating to the Work, and (2) require that Settling Defendant submit a plan for EPA approval incorporating such modification to the Work and implement such approved plan.

b. If Settling Defendant objects to the modification it may seek dispute resolution pursuant to Section XIX (Dispute Resolution), Paragraph 69 (Record Review). The RD/RA Work Plan, Operation and Maintenance Plan, and related work plans shall be modified in accordance with final resolution of the dispute, and the modification shall be incorporated into and enforceable under this Consent Decree. If Settling Defendant does not invoke the dispute resolution procedures within the time frames set forth in Section XIX (Dispute Resolution), the modification shall be incorporated into and enforceable under this Consent Decree, and Settling Defendant shall perform any Work modifications proposed by EPA under this Paragraph. Settling Defendant shall incorporate the modification into the RD/RA Work Plan.

c. Submission of Plans. Prior to performing any Work modifications proposed by EPA under this Paragraph, Settling Defendant shall submit modifications to the RD/RA Work Plan, Operation and Maintenance Plan, and/or work plans developed in accordance with this Paragraph to EPA for approval in accordance with the procedures set forth in Section VI (Performance of Work by Settling Defendant) and Section XI (EPA Approval of Plans, Reports and Other Deliverables.

d. Nothing in this Paragraph shall be construed to limit EPA's authority to require performance of further response actions as otherwise provided in this Consent Decree.

15. Nothing in this Consent Decree or the RD/RA Work Plan constitutes a warranty or representation of any kind by Plaintiff that compliance with the work requirements set forth in the Work Plan will achieve the Performance Standards.

16. Off-Site Shipment of Waste Material.

a. Settling Defendant may ship Waste Material from the Site to an off-Site facility only if it verifies, prior to any shipment, that the off-Site facility is operating in compliance with the requirements of Section 121(d)(3) of CERCLA, 42 U.S.C. § 9621(d)(3), and 40 C.F.R. § 300.440, by obtaining a determination from EPA that the proposed receiving facility is operating in compliance with 42 U.S.C. § 9621(d)(3) and 40 C.F.R. § 300.440.

b. Settling Defendant may ship Waste Material from the Site to an out-of-state waste management facility only if, prior to any shipment, it provides written notice to the appropriate state environmental official in the receiving facility's state and to the EPA Project Coordinator. This

notice requirement shall not apply to any off-Site shipments when the total quantity of all such shipments will not exceed ten cubic yards. The written notice shall include the following information, if available: (1) the name and location of the receiving facility; (2) the type and quantity of Waste Material to be shipped; (3) the schedule for the shipment; and (4) the method of transportation. Settling Defendant also shall notify the state environmental official referenced above and the EPA Project Coordinator of any major changes in the shipment plan, such as a decision to ship the Waste Material to a different out-of-state facility.

c. The identity of the receiving facility and state will be determined by the Settling Defendant following the award of the contract for Remedial Action construction. The Settling Defendant shall provide the information required by Paragraph 16.b as soon as practicable after the award of the contract, but in no case less than seven (7) days before the Waste Material is actually shipped.

VII. REMEDY REVIEW

17. Periodic Review. Settling Defendant shall conduct any studies and investigations that EPA requests in order to permit EPA to conduct reviews of whether the Remedial Action is protective of human health and the environment at least every five years as required by Section 121(c) of CERCLA, 42 U.S.C. § 9621(c), and any applicable regulations.

18. EPA Selection of Further Response Actions. If EPA determines, at any time, that the Remedial Action is not protective of human health and the environment, EPA may select further response actions for the Site in accordance with the requirements of CERCLA and the NCP.

19. Opportunity to Comment. Settling Defendant and the public, as required by Sections 113(k)(2) or 117 of CERCLA, 42 U.S.C. §§ 9613(k)(2) or 9617, will be provided with an opportunity to comment on any further response actions proposed by EPA as a result of the review conducted pursuant to Section 121(c) of CERCLA and to submit written comments for the record during the comment period.

20. Performance of Further Response Actions. If EPA selects further response actions relating to the Site in accordance with Paragraph 18, EPA reserves its rights to perform such further response actions, to request Settling Defendant to perform such further response actions under this Consent Decree, or to require Settling Defendant to perform such further response actions under an administrative order issued in accordance with Section 106(a) of CERCLA, 42 U.S.C. § 9606(a). Disputes pertaining to whether the Remedial Action is protective or to EPA's selection of further response actions shall be governed by Section 113(j) of CERCLA, 42 U.S.C. § 9613(j).

21. Submission of Plans. If Settling Defendant agrees to perform further response actions pursuant to Paragraph 20, Settling Defendant shall submit a plan for such response action to EPA for approval in accordance with the procedures of Section VI (Performance of the Work by Settling Defendant). Settling Defendant shall implement the approved plan in accordance with this Consent Decree.

VIII. QUALITY ASSURANCE, SAMPLING, AND DATA ANALYSIS

22. Quality Assurance.

a. Settling Defendant shall use quality assurance, quality control, and chain of custody procedures for all treatability, design, compliance, and monitoring samples in accordance with "EPA Requirements for Quality Assurance Project Plans (QA/R5)" (EPA/240/B-01/003, March 2001, reissued May 2006), "Guidance for Quality Assurance Project Plans (QA/G-5)" (EPA/240/R-

02/009, December 2002), and subsequent amendments to such guidelines upon notification by EPA to Settling Defendant of such amendment. Amended guidelines shall apply only to procedures conducted after such notification.

b. Prior to the commencement of any monitoring project under this Consent Decree, Settling Defendant shall submit to EPA for approval, after a reasonable opportunity for review and comment by PADEP, a Quality Assurance Project Plan ("QAPP") that is consistent with the RD/RA Work Plan, the NCP, and any applicable guidance documents. If relevant to the proceeding, the Parties agree that validated sampling data generated in accordance with the QAPP(s) and reviewed and approved by EPA shall be admissible as evidence, without objection, in any proceeding under this Consent Decree. Settling Defendant shall ensure that EPA and PADEP personnel and their authorized representatives are allowed access at reasonable times to all laboratories utilized by Settling Defendant in implementing this Consent Decree. In addition, Settling Defendant shall ensure that such laboratories shall analyze all samples submitted by EPA pursuant to the QAPP for quality assurance monitoring. Settling Defendant shall ensure that the laboratories it utilizes for the analysis of samples taken pursuant to this Consent Decree perform all analyses according to accepted EPA methods. Accepted EPA methods consist of those methods that are documented in the "USEPA Contract Laboratory Program Statement of Work for Inorganic Analysis, ILM05.4," and the "USEPA Contract Laboratory Program Statement of Work for Organic Analysis, SOM01.2," and any amendments made thereto during the course of the implementation of this Consent Decree; however, upon approval by EPA, after opportunity for review and comment by PADEP, Settling Defendant may use other analytical methods that are as stringent as or more stringent than the CLP-approved methods. Settling Defendant shall ensure that all laboratories it uses for analysis of samples taken pursuant to this Consent Decree participate in an EPA or EPA-equivalent quality assurance/quality control ("QA/QC") program. Settling Defendant shall use only laboratories that have a documented Quality System that complies with ANSI/ASQC E4-1994, "Specifications and Guidelines for Quality Systems for Environmental Data Collection and Environmental Technology Programs" (American National Standard, January 5, 1995), and "EPA Requirements for Quality Management Plans (QA/R-2)" (EPA/240/B-01/002, March 2001, reissued May 2006) or equivalent documentation as determined by EPA. EPA may consider laboratories accredited under the National Environmental Laboratory Accreditation Program ("NELAP") as meeting the Quality System requirements. Settling Defendant shall ensure that all field methodologies utilized in collecting samples for subsequent analysis pursuant to this Consent Decree are conducted in accordance with the procedures set forth in the QAPP approved by EPA.

23. Upon request, Settling Defendant shall allow split or duplicate samples to be taken by EPA and PADEP or their authorized representatives. Settling Defendant shall notify EPA and PADEP not less than 21 days in advance of any sample collection activity unless shorter notice is agreed to by EPA. In addition, EPA and PADEP shall have the right to take any additional samples that EPA or PADEP deems necessary, and EPA will endeavor to provide notice to settling Defendant no later than seven (7) days prior to any such sample collection activity. Upon request, EPA and PADEP shall allow Settling Defendant to take split or duplicate samples of any samples they take as part of Plaintiff's oversight of Settling Defendant's implementation of the Work.

24. Settling Defendant shall submit to EPA and PADEP electronic copies of the results of all sampling, tests, or other data obtained or generated by or on behalf of Settling Defendant with respect to the Site and the implementation of this Consent Decree unless EPA agrees otherwise. All sampling and associated data generated by or on behalf of Settling Defendant under the requirements

of this Consent Decree shall be provided electronically in a manner that enables EPA to incorporate such data into an Environmental Quality Information System ("EQuIS data management system").

25. Notwithstanding any provision of this Consent Decree, the United States retains all of its information-gathering and inspection authorities and rights, including enforcement actions related thereto, under CERCLA, RCRA, and any other applicable statutes or regulations.

IX. ACCESS AND INSTITUTIONAL CONTROLS

26. If the Site, or any other real property where access or land- or water-use restrictions are needed, is owned or controlled by Settling Defendant:

a. Commencing on the date of lodging of the Consent Decree, Settling Defendant shall provide the United States, the Commonwealth, and their representatives, contractors, and subcontractors, with access at all reasonable times to the Site, or such other real property, to conduct any activity required by this Consent Decree including, but not limited to, the following activities:

(1) Monitoring the Work;

(2) Verifying any data or information submitted to the United States;

(3) Conducting investigations regarding contamination at or near the Site;

(4) Obtaining samples;

(5) Assessing the need for, planning, or implementing additional response actions at or near the Site;

(6) Assessing implementation of quality assurance and quality control practices as defined in the approved CQAP;

(7) Implementing the Work pursuant to the conditions set forth in Paragraph 89 (Work Takeover);

(8) Inspecting and copying records, operating logs, contracts, or other documents maintained or generated by Settling Defendant or its agents, consistent with Section XXIV (Access to Information);

(9) Assessing Settling Defendant's compliance with the Consent Decree;

(10) Determining whether the Site or other real property is being used in a manner that is prohibited or restricted, or that may need to be prohibited or restricted under the Consent Decree; and

(11) Implementing, monitoring, maintaining, reporting on, and enforcing any Institutional Controls.

b. Commencing on the date of lodging of the Consent Decree, Settling Defendant shall not use the Site, or such other real property, in any manner that EPA determines will pose an unacceptable risk to human health or to the environment due to exposure to Waste Material or will interfere with or adversely affect the implementation, integrity, or protectiveness of the Remedial Action or Post-Achievement O&M. The restrictions shall include, but may not be limited to, any activities that damage the integrity of the asphalt and asphalt-equivalent caps required to be installed at the Site; and

c. Settling Defendant shall:

(1) Within 30 days of the Effective Date, (i) submit for EPA's approval a draft Land Use Control Assurance Plan ("LUCAP") as required by the ROD; and (ii) a current title insurance commitment or other evidence of title acceptable to EPA, that shows title to the land affected by the Institutional Controls to be free and clear of all prior liens and encumbrances (except when EPA otherwise waives the requirement that Settling Defendant release or subordinate such prior liens or encumbrances or when, despite best efforts, Settling Defendant is unable to obtain release or subordination of such prior liens or encumbrances);

(2) Within 15 days of EPA's approval of the LUCAP, submit for EPA's approval a draft environmental covenant under the Pennsylvania Uniform Environmental Covenants Act, 27 Pa.C.S. §§ 6501-6517, requiring Institutional Controls: (i) granting a right of access to EPA and PADEP to the real property owned by Settling Defendant at the Site to conduct any activity required by the Consent Decree, including, but not limited to, those activities listed in Paragraph 26.a; and (ii) granting the right to enforce the land- or water-use restrictions described in Paragraph 26.b, including, but not limited to, the specific restrictions listed therein and any land- or water-use restrictions listed in the approved LUCAP, as further specified in this Paragraph 26.c. The environmental covenant shall include a designation of EPA as "Agency," allowing EPA to maintain the right to enforce the environmental covenant without acquiring an interest in real property. The environmental covenant shall be granted to any appropriate grantee(s) under the Pennsylvania Uniform Environmental Covenants Act, including, among others, Settling Defendant. If the environmental covenant is granted to Settling Defendant pursuant to this Paragraph 26.c(2), then Settling Defendant shall monitor, maintain, report on, and enforce the environmental covenant.

(3) Within 30 days of EPA's approval of the environmental covenant described in Paragraph 26.c(2), update the title search and, if it is determined that nothing has occurred since the effective date of the commitment, or other title evidence, to affect the title adversely, execute and record the environmental covenant with the appropriate land records office. Within 30 days after recording the environmental covenant, Settling Defendant shall provide EPA with a final title insurance policy, or other final evidence of title acceptable to EPA, and a certified copy of the original recorded environmental covenant showing the clerk's recording stamps.

27. If the Site, or any other real property where access and land- or water-use restrictions are needed, is owned or controlled by persons other than Settling Defendant:

a. Settling Defendant shall use best efforts to secure from such persons:

(1) an agreement to provide access thereto for the United States, PADEP, Settling Defendant, and their representatives, contractors, and subcontractors, to conduct any activity regarding the Consent Decree including, but not limited to, the activities listed in Paragraph 26.a;

(2) an agreement, enforceable by Settling Defendant and the United States, to refrain from using the Site, or such other real property, in any manner that EPA determines will pose an unacceptable risk to human health or to the environment due to exposure to Waste Material or interfere with or adversely affect the implementation, integrity, or protectiveness of the Remedial Action. The agreement shall include, but not be limited to, the land- or water-use restrictions described in Paragraph 26.b; and

(3) the execution and recordation in the appropriate land records office of an environmental covenant in accordance with the Pennsylvania Uniform Environmental Covenants Act that (i) grants to EPA, DEP, and Settling Defendant a right of access to conduct any activity required by the Consent Decree including, but not limited to, those activities listed in Paragraph 26.a; and (ii) grants the right to enforce the land- or water-use restrictions described in Paragraph 26.b, including, but not limited to, the specific restrictions listed therein and any land- or water-use restrictions listed in the LUCAP. The environmental covenant shall be granted to any appropriate grantees under the Pennsylvania Uniform Environmental Covenants Act, including, among others, Settling Defendant. If the environmental covenant is granted to Settling Defendant pursuant to this Paragraph then Settling Defendant shall monitor, maintain, report on, and enforce the environmental covenant.

(4) The environmental covenant shall designate EPA as "Agency," allowing EPA to maintain the right to enforce the environmental covenant without acquiring an interest in real property.

b. Within 45 days after the Effective Date, Settling Defendant shall submit to EPA for review and approval regarding such property: (i) a draft environmental covenant under the Pennsylvania Uniform Environmental Covenants Act; and (ii) a current title insurance commitment, or other evidence of title acceptable to EPA, that shows title to the land affected by the environmental covenant to be free and clear of all prior liens and encumbrances (except when EPA waives the release or subordination of such prior liens or encumbrances or when, despite best efforts, Settling Defendant is unable to obtain release or subordination of such prior liens or encumbrances).

c. Within 15 days of EPA's approval and acceptance of the environmental covenant and the title evidence, Settling Defendant shall update the title search and, if it is determined that nothing has occurred since the effective date of the commitment, or other title evidence, to affect the title adversely, record the environmental covenant with the appropriate land records office. Within 30 days after the recording of the environmental covenant, Settling Defendant shall provide EPA with a final title insurance policy, or other final evidence of title acceptable to EPA, and a certified copy of the original recorded environmental covenant showing the clerk's recording stamps.

28. If, within 45 days after the Effective Date, Settling Defendant has not: (a) obtained agreements to provide access, restrict land or water use, or record an environmental covenant, as required by Paragraph 27.a(1), 27.a(2), or 27.a(3); or (b) obtained, pursuant to Paragraph 26.c(2) or 27.b, agreements from the holders of prior liens or encumbrances to release or subordinate such liens or encumbrances to the environmental covenant, Settling Defendant shall promptly notify the United States in writing, and shall include in that notification a summary of the steps that Settling Defendant has taken to attempt to comply with Paragraph 26 or 27. The United States may, as it deems appropriate, assist Settling Defendant in obtaining access, agreements to restrict land or water use, an environmental covenant, or the release or subordination of a prior lien or encumbrance. Settling Defendant shall reimburse the United States under Section XVI (Payments for Response Costs) for all direct and indirect costs incurred by the United States in obtaining such access, agreements to restrict land or water use, an environmental covenant, or the release or subordination of prior liens or encumbrances including, but not limited to, the cost of attorney time and the amount of monetary consideration paid or just compensation.

29. If EPA determines that Institutional Controls in the form of state or local laws, regulations, ordinances, zoning restrictions, or other governmental controls are needed at or in connection with the Site, Settling Defendant shall cooperate with EPA's efforts to secure and ensure compliance with such governmental controls.

30. Notwithstanding any provision of the Consent Decree, the United States retains all of its access authorities and rights, as well as all of its rights to require Institutional Controls, including enforcement authorities related thereto, under CERCLA, RCRA, and any other applicable statute or regulations.

X. REPORTING REQUIREMENTS

31. In addition to any other requirement of this Consent Decree, and while the Remedial Action is being implemented, Settling Defendant shall submit to EPA and PADEP two copies of written monthly progress reports that: (a) describe the actions that have been taken toward achieving compliance with this Consent Decree during the previous month; (b) include a summary of all results of sampling and tests and all other data received or generated by Settling Defendant or its contractors or agents in the previous month; (c) identify all plans, reports, and other deliverables required by this Consent Decree completed and submitted during the previous month; (d) describe all actions, including, but not limited to, data collection and implementation of work plans, that are scheduled for the next six weeks and provide other information relating to the progress of construction, including, but not limited to, critical path diagrams, Gantt charts and Pert charts; (e) include information regarding percentage of completion, unresolved delays encountered or anticipated that may affect the future schedule for implementation of the Work, and a description of efforts made to mitigate those delays or anticipated delays; (f) include any modifications to the work plans or other schedules that Settling Defendant has proposed to EPA or that has been approved by EPA; and (g) describe all activities undertaken in support of the Community Involvement Plan during the previous month and those to be undertaken in the next six weeks. Settling Defendant's reporting obligations under this Section X will change from monthly to quarterly reports upon EPA's Certification of Completion of the Remedial Action pursuant to Paragraph 50.b of Section XIV (Certification of Completion). For the purposes, of this Consent Decree, "quarterly" shall mean once every three months. Settling Defendant shall submit these progress reports to EPA and PADEP by the tenth day of every month or quarter, as appropriate, under this Paragraph 31, following the entry of this Consent Decree until EPA provides Settling Defendant Certification of Completion of the Work pursuant to Paragraph 51.b of Section XIV (Certification of Completion). If requested by EPA or PADEP, Settling Defendant shall also provide briefings for EPA and PADEP to discuss the progress of the Work.

32. Settling Defendant shall notify EPA of any change in the schedule described in the monthly progress report for the performance of any activity, including, but not limited to, data collection and implementation of work plans, no later than seven days prior to the performance of the activity.

33. Upon the occurrence of any event during performance of the Work that Settling Defendant is required to report pursuant to Section 103 of CERCLA, 42 U.S.C. § 9603, or Section 304 of the Emergency Planning and Community Right-to-Know Act ("EPCRA"), 42 U.S.C. § 11004, Settling Defendant shall within 24 hours of the onset of such event orally notify the EPA Project Coordinator or the Alternate EPA Project Coordinator (in the event of the unavailability of the EPA Project Coordinator), or, in the event that neither the EPA Project Coordinator nor Alternate EPA Project Coordinator is available, the Emergency Response Section, Region III, United States

Environmental Protection Agency. These reporting requirements are in addition to the reporting required by Section 103 of CERCLA or Section 304 of EPCRA.

34. Within 30 days after the onset of such an event, Settling Defendant shall furnish to EPA and PADEP a written report, signed by Settling Defendant's Project Coordinator, describing the events that occurred and the measures taken, and to be taken, in response thereto. Within 30 days after the conclusion of such an event, Settling Defendant shall submit a report setting forth all actions taken in response thereto.

35. Settling Defendant shall submit to EPA a copy of all plans, reports, data, and other deliverables required by the RD/RA Work Plan or any other approved plans in accordance with the schedules set forth in such plans. Settling Defendant shall simultaneously submit a copy of all such plans, reports, data, and other deliverables to PADEP. Upon request by EPA, Settling Defendant shall submit in both hard-copy and electronic form all or any portion of any deliverables Settling Defendant is required to submit pursuant to the provisions of this Consent Decree.

36. All deliverables submitted by Settling Defendant to EPA that purport to document Settling Defendant's compliance with the terms of this Consent Decree shall be signed by an authorized representative of Settling Defendant.

XI. EPA APPROVAL OF PLANS, REPORTS, AND OTHER DELIVERABLES

37. Initial Submissions.

a. After review of any plan, report, or other deliverable that is required to be submitted for approval pursuant to this Consent Decree, EPA, after reasonable opportunity for review and comment by PADEP, shall: (1) approve, in whole or in part, the submission; (2) approve the submission upon specified conditions; (3) disapprove, in whole or in part, the submission; or (4) any combination of the foregoing.

b. EPA also may modify the initial submission to cure deficiencies in the submission if: (1) EPA determines that disapproving the submission and awaiting a resubmission would cause substantial disruption to the Work; or (2) previous submission(s) have been disapproved due to material defects and the deficiencies in the initial submission under consideration indicate a bad faith lack of effort to submit an acceptable plan, report, or deliverable.

38. Resubmissions. Upon receipt of a notice of disapproval under Paragraph 37.a(3) or (4), or if required by a notice of approval upon specified conditions under Paragraph 37.a(2), Settling Defendant shall, within seven (7) days or such longer time as specified by EPA in such notice, correct the deficiencies and resubmit the plan, report, or other deliverable for approval. After review of the resubmitted plan, report, or other deliverable, EPA may: (a) approve, in whole or in part, the resubmission; (b) approve the resubmission upon specified conditions; (c) modify the resubmission; (d) disapprove, in whole or in part, the resubmission, requiring Settling Defendant to correct the deficiencies; or (e) any combination of the foregoing.

39. Material Defects. If an initially submitted or resubmitted plan, report, or other deliverable contains a material defect, and the plan, report, or other deliverable is disapproved or modified by EPA pursuant to Paragraphs 37 or 38 due to such material defect, then the material defect shall constitute a lack of compliance for purposes of Paragraph 72. The provisions of Section XIX (Dispute Resolution) and Section XX (Stipulated Penalties) shall govern the accrual and payment of any stipulated penalties regarding Settling Defendant's submissions under this Section.

40. Implementation. Upon approval, approval upon conditions, or modification by EPA under Paragraph 37 (Initial Submissions) or Paragraph 38 (Resubmissions), of any plan, report, or other deliverable, or any portion thereof: (a) such plan, report, or other deliverable, or portion thereof, shall be incorporated into and enforceable under this Consent Decree; and (b) Settling Defendant shall take any action required by such plan, report, or other deliverable, or portion thereof, subject only to their right to invoke the Dispute Resolution procedures set forth in Section XIX (Dispute Resolution) with respect to the modifications or conditions made by EPA. The implementation of any non-deficient portion of a plan, report, or other deliverable submitted or resubmitted under Paragraph 37 or 38 shall not relieve Settling Defendant of any liability for stipulated penalties under Section XX (Stipulated Penalties).

XII. PROJECT COORDINATORS

41. Within 20 days after the Effective Date, Settling Defendant and EPA will notify each other, in writing, of the name, address, telephone number, and email address of their respective designated Project Coordinators and Alternate Project Coordinators. If a Project Coordinator or Alternate Project Coordinator initially designated is changed, the identity of the successor will be given to the other Parties at least five (5) working days before the change occurs, unless impracticable, but in no event later than the actual day the change is made. Settling Defendant's Project Coordinator shall be subject to disapproval by EPA and shall have the technical expertise sufficient to adequately oversee all aspects of the Work. Settling Defendant's Project Coordinator shall not be an attorney for Settling Defendant in this matter. He or she may assign other representatives, including other contractors, to serve as a Site representative for oversight of performance of daily operations during remedial activities.

42. Plaintiff may designate other representatives, including, but not limited to, EPA employees, and federal contractors and consultants, to observe and monitor the progress of any activity undertaken pursuant to this Consent Decree. EPA's Project Coordinator and Alternate Project Coordinator shall have the authority lawfully vested in a Remedial Project Manager ("RPM") and an On-Scene Coordinator ("OSC") by the NCP, 40 C.F.R. Part 300. EPA's Project Coordinator or Alternate Project Coordinator shall have authority, consistent with the NCP, to halt any Work required by this Consent Decree and to take any necessary response action when he or she determines that conditions at the Site constitute an emergency situation or may present an immediate threat to public health or welfare or the environment due to release or threatened release of Waste Material.

43. EPA's Project Coordinator and Settling Defendant's Project Coordinator will meet, at a minimum, on a monthly basis while the Remedial Action is being implemented, and on a quarterly basis after EPA's Certification of Completion of the Remedial Action pursuant to Paragraph 50.b of Section XIV (Certification of Completion).

XIII. PERFORMANCE GUARANTEE

44. In order to ensure the full and final completion of the Work, Settling Defendant shall establish and maintain a performance guarantee, initially in the amount of $750,000 for the benefit of EPA (hereinafter "Performance Guarantee Amount"). The performance guarantee, which must be satisfactory in form and substance to EPA, shall be in the form of one or more of the following mechanisms (provided that, if Settling Defendant intends to use multiple mechanisms, such multiple mechanisms shall be limited to surety bonds guaranteeing payment, letters of credit, trust funds, and insurance policies):

a. A surety bond unconditionally guaranteeing payment and/or performance of the Work that is issued by a surety company among those listed as acceptable sureties on federal bonds as set forth in Circular 570 of the U.S. Department of the Treasury;

b. One or more irrevocable letters of credit, payable to or at the direction of EPA, that is issued by one or more financial institution(s), (1) who has the authority to issue letters of credit, and (2) whose letter-of-credit operations are regulated and examined by a federal or state agency;

c. A trust fund established for the benefit of EPA that is administered by a trustee, (1) who has the authority to act as a trustee, and (2) whose trust operations are regulated and examined by a federal or state agency;

d. A demonstration by Settling Defendant that it meets the financial test criteria of 40 C.F.R. § 264.143(f) with respect to the estimated cost of the Work or the Performance Guarantee Amount, as determined by EPA (plus the amount(s) of any other federal or any state environmental obligations financially assured through the use of a financial test or guarantee), provided that all other requirements of 40 C.F.R. § 264.143(f) are met to EPA's satisfaction; or

e. A written guarantee to fund or perform the Work executed in favor of EPA by one or more of the following: (1) a direct or indirect parent company of Settling Defendant, or (2) a company that has a "substantial business relationship" (as defined in 40 C.F.R. § 264.141(h)) with Settling Defendant; provided, however, that any company providing such a guarantee must demonstrate to the satisfaction of EPA that it satisfies the financial test and reporting requirements for owners and operators set forth in subparagraphs (1) through (8) of 40 C.F.R. § 264.143(f) with respect to the estimated cost of the Work or the Performance Guarantee Amount, as determined by the EPA (plus the amount(s) of any other federal or any state environmental obligations financially assured through the use of a financial test or guarantee) that it proposes to guarantee hereunder.

45. Settling Defendant has selected, and EPA has found satisfactory, as an initial performance guarantee a trust fund pursuant to Paragraph 44.c. Within thirty (30) days after the Effective Date, or 30 days after EPA's approval of the form and substance of Settling Defendant's financial assurance, whichever is later, Settling Defendant shall secure all executed and/or otherwise finalized mechanisms or other documents consistent with the EPA-approved form of financial assurance and shall submit such mechanisms and documents to the Regional Financial Assurance Specialist—Tanesha Paige, EPA Region III, 1650 Arch Street, Philadelphia, PA 19103, and to the United States and EPA as specified in Section XXVI (Notices and Submissions).

46. If, at any time after the Effective Date and before issuance of the Certification of Completion of the Work pursuant to Paragraph 51, Settling Defendant provides a performance guarantee for completion of the Work by means of a demonstration or guarantee pursuant to Paragraph 44.d or 44.e, Settling Defendant shall also comply with the other relevant requirements of 40 C.F.R. § 264.143(f) relating to these mechanisms, unless otherwise provided in this Consent Decree, including but not limited to: (a) the initial submission of required financial reports and statements from Settling Defendant's chief financial officer ("CFO") and independent certified public accountant ("CPA"), in the form prescribed by EPA in its financial test sample CFO letters and CPA reports currently available at: http://www.epa.gov/compliance/resources/policies/cleanup/superfund/fa-test-samples.pdf; (b) the annual resubmission of such reports and statements within 90 days after the close of Settling Defendant's fiscal year; and (c) the prompt notification of EPA after Settling Defendant determines that it no longer satisfies the financial test requirements set forth at 40 C.F.R. § 264.143(f)(1), and in

any event, within 90 days after the close of any fiscal year in which Settling Defendant no longer satisfies such financial test requirements. For purposes of the performance guarantee mechanisms specified in this Section XIII, references in 40 C.F.R. Part 264, Subpart H, to "closure," "post-closure," and "plugging and abandonment" shall be deemed to include the Work; the terms "current closure cost estimate," "current post-closure cost estimate," and "current plugging and abandonment cost estimate" shall be deemed to include the estimated cost of the Work or the Performance Guarantee Amount, as determined by EPA; the terms "owner" and "operator" shall be deemed to refer to Settling Defendant; and the terms "facility" and "hazardous waste facility" shall be deemed to include the Site.

47. In the event that EPA determines at any time that a performance guarantee provided by Settling Defendant pursuant to this Section is inadequate or otherwise no longer satisfies the requirements set forth in this Section, whether due to an increase in the estimated cost of completing the Work or for any other reason, or in the event that Settling Defendant becomes aware of information indicating that a performance guarantee provided pursuant to this Section is inadequate or otherwise no longer satisfies the requirements set forth in this Section, whether due to an increase in the estimated cost of completing the Work or for any other reason, Settling Defendant, within 30 days after receipt of notice of EPA's determination or, as the case may be, within 30 days after Settling Defendant becomes aware of such information, shall obtain and present to EPA for approval a proposal for a revised or alternative form of performance guarantee listed in Paragraph 44 that satisfies all requirements set forth in this Section XIII; provided, however, that if Settling Defendant cannot obtain such revised or alternative form of performance guarantee within such 30-day period, and provided further that Settling Defendant shall have commenced to obtain such revised or alternative form of performance guarantee within such 30-day period, and thereafter diligently proceeds to obtain the same, EPA shall extend such period for such time as is reasonably necessary for Settling Defendant in the exercise of due diligence to obtain such revised or alternative form of performance guarantee, such additional period not to exceed 60 days. On day 30, Settling Defendant shall provide to EPA a status report on its efforts to obtain the revised or alternative form of guarantee. In seeking approval for a revised or alternative form of performance guarantee, Settling Defendant shall follow the procedures set forth in Paragraph 49.b(2). Settling Defendant's inability to post a performance guarantee for completion of the Work shall in no way excuse performance of any other requirements of this Consent Decree, including, without limitation, the obligation of Settling Defendant to complete the Work in strict accordance with the terms of this Consent Decree.

48. Funding for Work Takeover. The commencement of any Work Takeover pursuant to Paragraph 89 shall trigger EPA's right to receive the benefit of any performance guarantee(s) provided pursuant to Paragraphs 44.a, 44.b, 44.c, 44.d, or 44.e, and at such time, EPA shall have immediate access to resources guaranteed under any such performance guarantee(s), whether in cash or in kind, as needed to continue and complete the Work assumed by EPA under the Work Takeover. Upon the commencement of any Work Takeover, if (a) for any reason EPA is unable to promptly secure the resources guaranteed under any such performance guarantee(s), whether in cash or in kind, necessary to continue and complete the Work assumed by EPA under the Work Takeover, or (b) in the event that the performance guarantee involves a demonstration of satisfaction of the financial test criteria pursuant to Paragraph 44.d or Paragraph 44.e(2), Settling Defendant (or in the case of Paragraph 44.e(2), the guarantor) shall immediately upon written demand from EPA deposit into a special account within the EPA Hazardous Substance Superfund or such other account as EPA may specify, in immediately available funds and without setoff, counterclaim, or condition of any kind, a cash amount up to but not exceeding the estimated cost of completing the Work as of such date, as determined by EPA. In addition, if at any time EPA is notified by the issuer of a

performance guarantee that such issuer intends to cancel the performance guarantee mechanism it has issued, then, unless Settling Defendant provide a substitute performance guarantee mechanism in accordance with this Section XIII no later than 30 days prior to the impending cancellation date, EPA shall be entitled (as of and after the date that is 30 days prior to the impending cancellation) to draw fully on the funds guaranteed under the then-existing performance guarantee. All EPA Work Takeover costs not reimbursed under this Paragraph shall be reimbursed under Section XVI (Payments for Response Costs).

49. Modification of Amount or Form of Performance Guarantee.

a. Reduction of Amount of Performance Guarantee. If Settling Defendant believes that the estimated cost of completing the Work has diminished below the amount set forth in Paragraph 44, Settling Defendant may, on any anniversary of the Effective Date, or at any other time agreed to by the Parties, petition EPA in writing to request a reduction in the amount of the performance guarantee provided pursuant to this Section, so that the amount of the performance guarantee is equal to the estimated cost of completing the Work. Settling Defendant shall submit a written proposal for such reduction to EPA specifying, at a minimum, the estimated cost of completing the Work and the basis upon which such cost was calculated. In seeking approval for a reduction in the amount of the performance guarantee, Settling Defendant shall follow the procedures set forth in Paragraph 49.b(2) for requesting a revised or alternative form of performance guarantee, except as specifically provided in this Paragraph 49.a. If EPA decides to accept Settling Defendant's proposal for a reduction in the amount of the performance guarantee, either to the amount set forth in Settling Defendant's written proposal or to some other amount as selected by EPA, EPA will notify Settling Defendant of such decision in writing. Upon EPA's acceptance of a reduction in the amount of the performance guarantee, the Performance Guarantee Amount shall be deemed to be the estimated cost of completing the Work set forth in EPA's written decision. After receiving EPA's written decision, Settling Defendant may reduce the amount of the performance guarantee in accordance with and to the extent permitted by such written acceptance and shall submit copies of all executed or otherwise finalized instruments or other documents required in order to make the selected performance guarantee(s) legally binding in accordance with Paragraph 49.b(2). In the event of a dispute, Settling Defendant may reduce the amount of the performance guarantee required hereunder only in accordance with a final administrative or judicial decision resolving such dispute pursuant to Section XIX (Dispute Resolution). No change to the form or terms of any performance guarantee provided under this Section, other than a reduction in amount, is authorized except as provided in Paragraphs 47 or 49.b.

b. Change of Form of Performance Guarantee.

(1) If, after the Effective Date, Settling Defendant desires to change the form or terms of any performance guarantee(s) provided pursuant to this Section, Settling Defendant may, on any anniversary of the Effective Date, or at any other time agreed to by the Parties, petition EPA in writing to request a change in the form or terms of the performance guarantee provided hereunder. The submission of such proposed revised or alternative performance guarantee shall be as provided in Paragraph 49.b(2). Any decision made by EPA on a petition submitted under this Paragraph shall be made in EPA's sole and unreviewable discretion, and such decision shall not be subject to challenge by Settling Defendant pursuant to the dispute resolution provisions of this Consent Decree or in any other forum.

(2) Settling Defendant shall submit a written proposal for a revised or alternative performance guarantee to EPA that shall specify, at a minimum, the estimated cost of completing the Work, the basis upon which such cost was calculated, and the proposed revised performance guarantee, including all proposed instruments or other documents required in order to make the proposed performance guarantee legally binding. The proposed revised or alternative performance guarantee must satisfy all requirements set forth or incorporated by reference in this Section. Settling Defendant shall submit such proposed revised or alternative performance guarantee to the EPA Regional Financial Management Officer in accordance with Section XXVI (Notices and Submissions), with a copy to Tanesha Paige, EPA Region III, 1650 Arch Street, Philadelphia, PA 19103. EPA will notify Settling Defendant in writing of EPA's decision to accept or reject a revised or alternative performance guarantee submitted pursuant to this Paragraph. Within ten (10) days after receiving a written decision approving the proposed revised or alternative performance guarantee, Settling Defendant shall execute and/or otherwise finalize all instruments or other documents required in order to make the selected performance guarantee(s) legally binding in a form substantially identical to the documents submitted to EPA as part of the proposal, and such performance guarantee(s) shall thereupon be fully effective. Settling Defendant shall submit copies of all executed and/or otherwise finalized instruments or other documents required in order to make the selected performance guarantee(s) legally binding to the EPA Regional Financial Management Officer within 30 days after receiving a written decision approving the proposed revised or alternative performance guarantee in accordance with Section XXVI (Notices and Submissions), with a copy to Tanesha Paige, EPA Region III, 1650 Arch Street, Philadelphia, PA 19103, and to the United States and EPA as specified in Section XXVI.

c. Release of Performance Guarantee. Settling Defendant shall not release, cancel, or discontinue any performance guarantee provided pursuant to this Section except as provided in this Paragraph. If Settling Defendant receives written notice from EPA in accordance with Paragraph 51 that the Work has been fully and finally completed in accordance with the terms of this Consent Decree, or if EPA otherwise so notifies Settling Defendant in writing, Settling Defendant may thereafter release, cancel, or discontinue the performance guarantee(s) provided pursuant to this Section. In the event of a dispute, Settling Defendant may release, cancel, or discontinue the performance guarantee(s) required hereunder only in accordance with a final administrative or judicial decision resolving such dispute pursuant to Section XIX (Dispute Resolution).

XIV. CERTIFICATION OF COMPLETION

50. Completion of the Remedial Action.

a. Within 90 days after Settling Defendant concludes that the Remedial Action has been fully performed and the Performance Standards have been achieved, Settling Defendant shall schedule and conduct a pre-certification inspection to be attended by Settling Defendant, EPA, and PADEP. If, after the pre-certification inspection, Settling Defendant still believes that the Remedial Action has been fully performed and the Performance Standards have been achieved, Settling Defendant shall submit a written report requesting certification to EPA for approval, with a copy to PADEP, pursuant to Section XI (EPA Approval of Plans, Reports, and Other Deliverables) within 30 days after the inspection. In the report, a registered professional engineer and Settling Defendant's Project Coordinator shall state that the Remedial Action has been completed in full satisfaction of the requirements of this Consent Decree. The written report shall include as-built

drawings signed and stamped by a professional engineer. The report shall contain the following statement, signed by a responsible corporate official of a Settling Defendant:

> I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

If, after completion of the pre-certification inspection and receipt and review of the written report, EPA, after reasonable opportunity for review and comment by PADEP, determines that the Remedial Action or any portion thereof has not been completed in accordance with this Consent Decree or that the Performance Standards have not been achieved, EPA will notify Settling Defendant in writing of the activities that must be undertaken by Settling Defendant pursuant to this Consent Decree to complete the Remedial Action and achieve the Performance Standards, provided, however, that EPA may only require Settling Defendant to perform such activities pursuant to this Paragraph to the extent that such activities are consistent with the scope of the remedy set forth in the ROD. EPA will set forth in the notice a schedule for performance of such activities consistent with the Consent Decree and the Remedial Action Work Plan or require Settling Defendant to submit a schedule to EPA for approval pursuant to Section XI (EPA Approval of Plans, Reports, and Other Deliverables). Settling Defendant shall perform all activities described in the notice in accordance with the specifications and schedules established pursuant to this Paragraph, subject to their right to invoke the dispute resolution procedures set forth in Section XIX (Dispute Resolution).

b. If EPA concludes, based on the initial or any subsequent report requesting Certification of Completion of the Remedial Action and after a reasonable opportunity for review and comment by PADEP, that the Remedial Action has been performed in accordance with this Consent Decree and that the Performance Standards have been achieved, EPA will so certify in writing to Settling Defendant. This certification shall constitute the Certification of Completion of the Remedial Action for purposes of this Consent Decree, including, but not limited to, Section XXI (Covenants by Plaintiff). Certification of Completion of the Remedial Action shall not affect Settling Defendant's remaining obligations under this Consent Decree.

51. Completion of the Work.

a. Within 90 days after Settling Defendant concludes that all phases of the Work, other than any remaining activities required under Section VII (Remedy Review), have been fully performed, Settling Defendant shall schedule and conduct a pre-certification inspection to be attended by Settling Defendant, EPA, and PADEP. If, after the pre-certification inspection, Settling Defendant still believe that the Work has been fully performed, Settling Defendant shall submit a written report by a registered professional engineer stating that the Work has been completed in full satisfaction of the requirements of this Consent Decree. The report shall contain the statement set forth in Paragraph 50.a, signed by a responsible corporate official of a Settling Defendant or Settling Defendant's Project Coordinator. If, after review of the written report, EPA, after reasonable opportunity for review and comment by PADEP, determines that any portion of the Work has not been completed in accordance with this Consent Decree, EPA will notify Settling Defendant in writing of the activities that must be undertaken by Settling Defendant pursuant to this Consent

Decree to complete the Work, provided, however, that EPA may only require Settling Defendant to perform such activities pursuant to this Paragraph to the extent that such activities are consistent with the scope of the remedy set forth in the ROD. EPA will set forth in the notice a schedule for performance of such activities consistent with the Consent Decree and the Remedial Action Work Plan or require Settling Defendant to submit a schedule to EPA for approval pursuant to Section XI (EPA Approval of Plans, Reports, and Other Deliverables). Settling Defendant shall perform all activities described in the notice in accordance with the specifications and schedules established therein, subject to Settling Defendant's right to invoke the dispute resolution procedures set forth in Section XIX (Dispute Resolution).

b. If EPA concludes, based on the initial or any subsequent request for Certification of Completion of the Work by Settling Defendant and after a reasonable opportunity for review and comment by PADEP, that the Work has been performed in accordance with this Consent Decree, EPA will so notify Settling Defendant in writing.

XV. EMERGENCY RESPONSE

52. If, during the performance of the Work, any action or occurrence causes or threatens a release of Waste Material from the Site that constitutes an emergency situation or may present an immediate threat to public health or welfare or the environment, Settling Defendant shall, subject to Paragraph 53, immediately take all appropriate action to prevent, abate, or minimize such release or threat of release, and shall immediately notify EPA's Project Coordinator, or, if the Project Coordinator is unavailable, EPA's Alternate Project Coordinator. If neither of these persons is available, Settling Defendant shall notify the EPA Emergency Response Unit for Region III. Settling Defendant shall take such actions in consultation with EPA's Project Coordinator or other available authorized EPA officer and in accordance with all applicable provisions of the Health and Safety Plans, the Contingency Plans, and any other applicable plans or documents developed pursuant to the Remedial Action Work Plan. In the event that Settling Defendant fails to take appropriate response action as required by this Section, and EPA takes such action instead, Settling Defendant shall reimburse EPA all costs of the response action under Section XVI (Payments for Response Costs).

53. Subject to Section XXI (Covenants by Plaintiff), nothing in the preceding Paragraph or in this Consent Decree shall be deemed to limit any authority of the United States: (a) to take all appropriate action to protect human health and the environment or to prevent, abate, respond to, or minimize an actual or threatened release of Waste Material on, at, or from the Site; or (b) to direct or order such action, or seek an order from the Court, to protect human health and the environment or to prevent, abate, respond to, or minimize an actual or threatened release of Waste Material on, at, or from the Site.

XVI. PAYMENTS FOR RESPONSE COSTS

54. Payment by Settling Defendant for Past Response Costs.

a. [Reserved].

55. Payments by Settling Defendant for Future Response Costs. Settling Defendant shall pay to EPA ninety percent (90%) of all Future Response Costs not inconsistent with the NCP.

a. On a periodic basis, EPA will send Settling Defendant a bill requiring payment that includes an itemized cost summary, which includes direct and indirect costs incurred by EPA, its contractors, and DOJ. Settling Defendant may request in writing copies of vouchers and

other documents evidencing EPA's expenditures for the Site ("supporting documentation"). EPA will produce such supporting documentation, provided Settling Defendant enters into a confidentiality agreement in accordance with 40 C.F.R Part 2 concerning the confidential business information of EPA contractors and subcontractors contained in the supporting documentation. Settling Defendant shall make all payments of Future Response Costs incurred not inconsistent with the NCP within 30 days after receipt of each bill requiring payment in accordance with Paragraphs 57.b (Instructions for Future Response Cost Payments), except as otherwise provided in Paragraph 58.

b. The total amount to be paid by Setting Defendant pursuant to Paragraph 54.a shall be deposited by EPA in the Sharon Steel Corp. Superfund Site OU2 Special Account to be retained and used to conduct or finance response actions at or in connection with the Site, or to be transferred by EPA to the EPA Hazardous Substance Superfund.

56. Interest. In the event that any payment for Past Response Costs or for Future Response Costs required under this Section is not made by the date required, Settling Defendant shall pay Interest on the unpaid balance. The Interest to be paid on Past Response Costs under this Paragraph shall begin to accrue on the 31st day after the Effective Date. The Interest on Future Response Costs shall begin to accrue on the 31st day after Settling Defendant's receipt of the bill or supporting documentation. The Interest shall accrue through the date of Settling Defendant's payment. Payments of Interest made under this Paragraph shall be in addition to such other remedies or sanctions available to Plaintiffs by virtue of Settling Defendant's failure to make timely payments under this Section including, but not limited to, payment of stipulated penalties pursuant to Paragraphs 73 and 74.

57. Payment Instructions for Settling Defendant.

a. [Reserved].

b. Instructions for Future Response Costs Payments and Stipulated Penalties. All payments required by this Consent Decree to be made in accordance with this Paragraph 57.b shall be made by Fedwire EFT to:

Federal Reserve Bank of New York
ABA = 021030004
Account = 68010727
SWIFT address = FRNYUS33
33 Liberty Street
New York NY 10045
Field Tag 4200 of the Fedwire message should read "D 68010727 Environmental Protection Agency"

When making payments under this Paragraph 57.b, Settling Defendant shall also comply with Paragraph 57.c.

c. Instructions for All Payments. All payments made under Paragraphs 57.a (Instructions for Past Response Cost Payments) or 57.b (Instructions for Future Response Cost Payments) shall reference the CDCS Number (provided by the FLU), Site/Spill ID Number 03DX, and DOJ Case Number _90-11-3-11103. At the time of any payment required to be made in accordance with Paragraphs 57.a or 57.b, Settling Defendant shall send notice that payment has been

made to the United States, and to EPA, in accordance with Section XXVI (Notices and Submissions), and to the EPA Cincinnati Finance Office by email at CINWD_AcctsReceivable@EPA.GOV, or by mail at:

U. S. Environmental Protection Agency
Cincinnati Finance Center, MS: NWD
26 W. Martin Luther King Drive
Cincinnati, Ohio 45268

Such notice shall also reference the CDCS Number, Site/Spill ID Number, and DOJ Case Number.

58. Settling Defendant may contest any Future Response Costs billed under Paragraph 55 (Payments by Settling Defendant for Future Response Costs) if Settling Defendant determines that EPA has made a mathematical error or included a cost item that is not within the definition of Future Response Costs, or if it believes EPA incurred excess costs as a direct result of an EPA action that was inconsistent with a specific provision or provisions of the NCP. Such objection shall be made in writing within 30 days after receipt of the bill and must be sent to the United States pursuant to Section XXVI (Notices and Submissions). Any such objection shall specifically identify the contested Future Response Costs and the basis for objection. In the event of an objection, Settling Defendant shall pay all uncontested Future Response Costs to the United States within 30 days after Settling Defendant's receipt of the bill requiring payment. Simultaneously, Settling Defendant shall establish, in a duly chartered bank or trust company, an interest-bearing escrow account that is insured by the Federal Deposit Insurance Corporation ("FDIC"), and remit to that escrow account funds equivalent to the amount of the contested Future Response Costs. Settling Defendant shall send to the United States, as provided in Section XXVI (Notices and Submissions), a copy of the transmittal letter and check paying the uncontested Future Response Costs, and a copy of the correspondence that establishes and funds the escrow account, including, but not limited to, information containing the identity of the bank and bank account under which the escrow account is established as well as a bank statement showing the initial balance of the escrow account. Simultaneously with establishment of the escrow account, Settling Defendant shall initiate the Dispute Resolution procedures in Section XIX (Dispute Resolution). If the United States prevails in the dispute, Settling Defendant shall pay the sums due (with accrued interest) to the United States within five (5) days after the resolution of the dispute. If Settling Defendant prevails concerning any aspect of the contested costs, Settling Defendant shall pay that portion of the costs (plus associated accrued interest) for which it did not prevail to the United States within five (5) days after the resolution of the dispute. Settling Defendant shall be disbursed any balance of the escrow account. All payments to the United States under this Paragraph shall be made in accordance with Paragraph 57.b (Instructions for Future Response Cost Payments and Stipulated Penalties). The dispute resolution procedures set forth in this Paragraph in conjunction with the procedures set forth in Section XIX (Dispute Resolution) shall be the exclusive mechanisms for resolving disputes regarding Settling Defendant's obligation to reimburse the United States for its Future Response Costs.

XVII. INDEMNIFICATION AND INSURANCE

59. Settling Defendant's Indemnification of the United States.

a. The United States does not assume any liability by entering into this Consent Decree or by virtue of any designation of Settling Defendant as EPA's authorized representative

under Section 104(e) of CERCLA, 42 U.S.C. § 9604(e). Settling Defendant shall indemnify, save and hold harmless the United States and its officials, agents, employees, contractors, subcontractors, and representatives for or from any and all claims or causes of action arising from, or on account of, negligent or other wrongful acts or omissions of Settling Defendant, its officers, directors, employees, agents, contractors, subcontractors, and any persons acting on its behalf or under its control, in carrying out activities pursuant to this Consent Decree, including, but not limited to, any claims arising from any designation of Settling Defendant as EPA's authorized representatives under Section 104(e) of CERCLA. Further, Settling Defendant agrees to pay the United States all costs it incurs including, but not limited to, attorneys' fees and other expenses of litigation and settlement arising from, or on account of, claims made against the United States based on negligent or other wrongful acts or omissions of Settling Defendant, its officers, directors, employees, agents, contractors, subcontractors, and any persons acting on its behalf or under its control, in carrying out activities pursuant to this Consent Decree. The United States shall not be held out as a party to any contract entered into by or on behalf of Settling Defendant in carrying out activities pursuant to this Consent Decree. Neither Settling Defendant nor any such contractor shall be considered an agent of the United States.

b. The United States shall give Settling Defendant notice of any claim for which the United States plans to seek indemnification pursuant to this Paragraph 59 and shall consult with Settling Defendant prior to settling such claim.

60. Settling Defendant covenants not to sue and agrees not to assert any claims or causes of action against the United States for damages or reimbursement or for set-off of any payments made or to be made to the United States, arising from or on account of any contract, agreement, or arrangement between any one or more of Settling Defendant and any person for performance of Work on or relating to the Site, including, but not limited to, claims on account of construction delays. In addition, Settling Defendant shall indemnify and hold harmless the United States with respect to any and all claims for damages or reimbursement arising from or on account of any contract, agreement, or arrangement between any one or more of Settling Defendant and any person for performance of Work on or relating to the Site, including, but not limited to, claims on account of construction delays.

61. No later than 15 days before commencing any on-site Work, Settling Defendant shall secure, and shall maintain until the first anniversary after issuance of EPA's Certification of Completion of the Remedial Action pursuant to Paragraph 50.b of Section XIV (Certification of Completion), commercial general liability insurance with limits of one (1) million dollars, for any one occurrence, and automobile liability insurance with limits of $500,000, combined single limit, naming the United States as an additional insured with respect to all liability arising out of the activities performed by or on behalf of Settling Defendant pursuant to this Consent Decree. In addition, for the duration of this Consent Decree, Settling Defendant shall satisfy, or shall ensure that its contractors or subcontractors satisfy, all applicable laws and regulations regarding the provision of worker's compensation insurance for all persons performing the Work on behalf of Settling Defendant in furtherance of this Consent Decree. Prior to commencement of the Work under this Consent Decree, Settling Defendant shall provide to EPA certificates of such insurance and a copy of each insurance policy. Settling Defendant shall resubmit such certificates and copies of policies each year on the anniversary of the Effective Date. If Settling Defendant demonstrates by evidence satisfactory to EPA that any contractor or subcontractor maintains insurance equivalent to that described above, or insurance covering the same risks but in a lesser amount, then, with respect to

that contractor or subcontractor, Settling Defendant need provide only that portion of the insurance described above that is not maintained by the contractor or subcontractor.

XVIII. FORCE MAJEURE

62. "Force majeure," for purposes of this Consent Decree, is defined as any event arising from causes beyond the control of Settling Defendant, of any entity controlled by Settling Defendant, or of Settling Defendant's contractors that delays or prevents the performance of any obligation under this Consent Decree despite Settling Defendant's best efforts to fulfill the obligation. The requirement that Settling Defendant exercise "best efforts to fulfill the obligation" includes using best efforts to anticipate any potential force majeure and best efforts to address the effects of any potential force majeure (a) as it is occurring, and (b) following the potential force majeure such that the delay and any adverse effects of the delay are minimized to the greatest extent possible. "Force majeure" does not include financial inability to complete the Work or a failure to achieve the Performance Standards.

63. If any event occurs or has occurred that may delay the performance of any obligation under this Consent Decree for which Settling Defendant intends or may intend to assert a claim of force majeure, Settling Defendant shall notify EPA's Project Coordinator orally or, in his or her absence, EPA's Alternate Project Coordinator or, in the event both of EPA's designated representatives are unavailable, the Director of the EPA Region III Hazardous Site Cleanup Division, within 72 hours of when Settling Defendant first knew that the event might cause a delay. Within five (5) days thereafter, or later if, upon request by Settling Defendant, such later submission is approved by EPA, Settling Defendant shall provide in writing to EPA an explanation and description of the reasons for the delay; the anticipated duration of the delay; all actions taken or to be taken to prevent or minimize the delay; a schedule for implementation of any measures to be taken to prevent or mitigate the delay or the effect of the delay; Settling Defendant's rationale for attributing such delay to a force majeure; and a statement as to whether, in the opinion of Settling Defendant, such event may cause or contribute to an endangerment to public health or welfare or the environment. Settling Defendant shall include with any notice all available documentation supporting its claim that the delay was attributable to a force majeure. Settling Defendant shall be deemed to know of any circumstance of which Settling Defendant, any person employed by or entity controlled by Settling Defendant, or Settling Defendant's contractors knew or should have known. Failure to comply with the above requirements regarding an event shall preclude Settling Defendant from asserting any claim of force majeure regarding that event, provided, however, that if EPA, despite the late notice, is able to assess to its satisfaction whether the event is a force majeure under Paragraph 62 and whether Settling Defendant has exercised its best efforts under Paragraph 62, EPA may, in its unreviewable discretion, excuse in writing Settling Defendant's failure to submit timely notices under this Paragraph.

64. If EPA agrees that the delay or anticipated delay is attributable to a force majeure, the time for performance of the obligations under this Consent Decree that are affected by the force majeure will be extended by EPA for such time as is necessary to complete those obligations. An extension of the time for performance of the obligations affected by the force majeure shall not, of itself, extend the time for performance of any other obligation. If EPA does not agree that the delay or anticipated delay has been or will be caused by a force majeure, EPA will notify Settling Defendant in writing of its decision. If EPA agrees that the delay is attributable to a force majeure, EPA will notify Settling Defendant in writing of the length of the extension, if any, for performance of the obligations affected by the force majeure.

65. If Settling Defendant elects to invoke the dispute resolution procedures set forth in Section XIX (Dispute Resolution), Settling Defendant shall do so no later than 20 days after receipt of EPA's notice. In any such proceeding, Settling Defendant shall have the burden of demonstrating by a preponderance of the evidence that the delay or anticipated delay has been or will be caused by a force majeure, that the duration of the delay or the extension sought was or will be warranted under the circumstances, that best efforts were exercised to avoid and mitigate the effects of the delay, and that Settling Defendant complied with the requirements of Paragraphs 62 and 63. If Settling Defendant carries this burden, the delay at issue shall be deemed not to be a violation by Settling Defendant of the affected obligation of this Consent Decree identified to EPA and the Court.

XIX. DISPUTE RESOLUTION

66. Unless otherwise expressly provided for in this Consent Decree, the dispute resolution procedures of this Section shall be the exclusive mechanism to resolve disputes regarding this Consent Decree. However, the procedures set forth in this Section shall not apply to actions by the United States to enforce obligations of Settling Defendant that have not been disputed in accordance with this Section.

67. Any dispute regarding this Consent Decree 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 30 days from the time the dispute arises, unless it is modified by written agreement of the parties to the dispute. The dispute shall be considered to have arisen when one party sends the other parties a written Notice of Dispute.

68. Statements of Position.

a. In the event that the parties cannot resolve a dispute by informal negotiations under the preceding Paragraph, then the position advanced by EPA shall be considered binding unless, within 20 days after the conclusion of the informal negotiation period, Settling Defendant invokes the formal dispute resolution procedures of this Section by serving on EPA 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 Settling Defendant. The Statement of Position shall specify Settling Defendant's position as to whether formal dispute resolution should proceed under Paragraph 69 (Record Review) or 70.

b. Within 30 days after receipt of Settling Defendant's Statement of Position, EPA will serve on Settling Defendant EPA's Statement of Position, including, but not limited to, any factual data, analysis, or opinion supporting that position and all supporting documentation relied upon by EPA. EPA's Statement of Position shall include a statement as to whether formal dispute resolution should proceed under Paragraph 69 (Record Review) or Paragraph 70. Within seven (7) days after receipt of EPA's Statement of Position, Settling Defendant may submit a Reply.

c. If there is disagreement between EPA and Settling Defendant as to whether dispute resolution should proceed under Paragraph 69 (Record Review) or 70, the parties to the dispute shall follow the procedures set forth in the paragraph determined by EPA to be applicable. However, if Settling Defendant 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 Paragraphs 69 and 70.

69. Record Review. 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, the adequacy or appropriateness of plans, procedures to implement plans, or any other items requiring approval by EPA under this Consent Decree, and the adequacy of the performance of response actions taken pursuant to this Consent Decree. Nothing in this Consent Decree shall be construed to allow any dispute by Settling Defendant regarding the validity of the ROD's provisions.

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

b. The Director of EPA Region III's Hazardous Site Cleanup Division ("Division Director") will issue a final administrative decision resolving the dispute based on the administrative record described in Paragraph 69.a. This decision shall be binding upon Settling Defendant, subject only to the right to seek judicial review pursuant to Paragraphs 69.c and 69.d.

c. Any administrative decision made by EPA pursuant to Paragraph 69.b shall be reviewable by this Court, provided that a motion for judicial review of the decision is filed by Settling Defendant with the Court and served on all Parties within ten (10) days after receipt of EPA'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 Consent Decree. The United States may file a response to Settling Defendant's motion.

d. In proceedings on any dispute governed by this Paragraph, Settling Defendant shall have the burden of demonstrating that the decision of the Division Director is arbitrary and capricious or otherwise not in accordance with law. Judicial review of EPA's decision shall be on the administrative record compiled pursuant to Paragraph 69.a.

70. Formal dispute resolution for disputes that neither pertain to the selection or adequacy of 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 Settling Defendant's Statement of Position submitted pursuant to Paragraph 68, the Division Director will issue a final decision resolving the dispute. The Division Director's decision shall be binding on Settling Defendant unless, within ten (10) days after receipt of the decision, Settling Defendant 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 Consent Decree. The United States may file a response to Settling Defendant's motion.

b. Notwithstanding Paragraph L (CERCLA Section 113(j) Record Review of ROD and Work) of Section I (Background), judicial review of any dispute governed by this Paragraph shall be governed by applicable principles of law.

71. The invocation of formal dispute resolution procedures under this Section shall not extend, postpone, or affect in any way any obligation of Settling Defendant under this Consent Decree not directly in dispute, unless EPA or the Court agrees otherwise. Stipulated penalties with respect to the disputed matter shall continue to accrue but payment shall be stayed pending resolution of the dispute as provided in Paragraph 79. Notwithstanding the stay of payment,

stipulated penalties shall accrue from the first day of noncompliance with any applicable provision of this Consent Decree. In the event that Settling Defendant does not prevail on the disputed issue, stipulated penalties shall be assessed and paid as provided in Section XX (Stipulated Penalties).

XX. STIPULATED PENALTIES

72. Settling Defendant shall be liable for stipulated penalties in the amounts set forth in Paragraphs 73 and 74 to the United States for failure to comply with the requirements of this Consent Decree specified below, unless excused under Section XVIII (Force Majeure). "Compliance" by Settling Defendant shall include completion of all payments and activities required under this Consent Decree, or any plan, report, or other deliverable approved under this Consent Decree, in accordance with all applicable requirements of law, this Consent Decree, the RD/RA Work Plan, and any plans, reports, or other deliverables approved under this Consent Decree and within the specified time schedules established by and approved under this Consent Decree.

73. Stipulated Penalty Amounts - Work (Including Payments and Excluding Plans, Reports, and Other Deliverables).

a. The following stipulated penalties shall accrue per violation per day for any noncompliance identified in Paragraph 73.b:

Penalty Per Violation Per Day	Period of Noncompliance
$500	1st through 14th day
$1,000	15th through 30th day
$1,500	31st day and beyond

b. Failure by Settling Defendant to comply with the following provisions of this Consent Decree shall subject Settling Defendant to stipulated penalties in the amounts listed in Paragraph 73.a:

(1) Paragraph 44 (Performance Guarantee);

(2) Paragraph 55 (Payments by Settling Defendant of Future Response Costs); and

(3) Paragraph 59 (Indemnification and Insurance).

74. Stipulated Penalty Amounts - Plans, Reports, and Other Deliverables. The following stipulated penalties shall accrue per violation per day for noncompliance with any requirements of this Consent Decree that are not identified in Paragraph 73.b:

Penalty Per Violation Per Day	Period of Noncompliance
$2,000	1st through 14th day
$4,000	15th through 30th day
$6,000	31st day and beyond

75. In the event that EPA assumes performance of a portion or all of the Work pursuant to Paragraph 89 (Work Takeover), Settling Defendant shall be liable for a stipulated penalty in the amount of $150,000. Stipulated penalties under this Paragraph are in addition to the remedies available under Paragraphs 48 (Funding for Work Takeover) and 89 (Work Takeover).

76. All penalties shall begin to accrue on the day after the complete performance is due or the day a violation occurs and shall continue to accrue through the final day of the correction of the noncompliance or completion of the activity. However, stipulated penalties shall not accrue: (a) with respect to a deficient submission under Section XI (EPA Approval of Plans, Reports, and Other

Deliverables), during the period, if any, beginning on the 31st day after EPA's receipt of such submission until the date that EPA notifies Settling Defendant of any deficiency; (b) with respect to a decision by the Division Director under Paragraph 69.b or 70.a of Section XIX (Dispute Resolution), during the period, if any, beginning on the 21st day after the date that Settling Defendant's reply to EPA's Statement of Position is received until the date that the Division Director issues a final decision regarding such dispute; or (c) with respect to judicial review by this Court of any dispute under Section XIX (Dispute Resolution), during the period, if any, beginning on the 31st day after the Court's receipt of the final submission regarding the dispute until the date that the Court issues a final decision regarding such dispute. Nothing in this Consent Decree shall prevent the simultaneous accrual of separate penalties for separate violations of this Consent Decree.

77. Following EPA's determination that Settling Defendant has failed to comply with a requirement of this Consent Decree, EPA may give Settling Defendant written notification of the same and describe the noncompliance. EPA may send Settling Defendant a written demand for the payment of the penalties. However, penalties shall accrue as provided in the preceding Paragraph regardless of whether EPA has notified Settling Defendant of a violation.

78. All penalties accruing under this Section shall be due and payable to the United States within 30 days after Settling Defendant's receipt from EPA of a demand for payment of the penalties, unless Settling Defendant invokes the Dispute Resolution procedures under Section XIX (Dispute Resolution) within the 30-day period. All payments to the United States under this Section shall indicate that the payment is for stipulated penalties and shall be made in accordance with Paragraph 57.b (Instructions for Future Response Cost Payments).

79. Penalties shall continue to accrue as provided in Paragraph 76 during any dispute resolution period, but need not be paid until the following:

a. If the dispute is resolved by agreement of the Parties or by a decision of EPA that is not appealed to this Court, accrued penalties determined to be owed shall be paid to EPA within 15 days after the agreement or the receipt of EPA's decision or order;

b. If the dispute is appealed to this Court and the United States prevails in whole or in part, Settling Defendant shall pay all accrued penalties determined by the Court to be owed to EPA within 60 days after receipt of the Court's decision or order, except as provided in Paragraph 79.c;

c. If the District Court's decision is appealed by any Party, Settling Defendant shall pay all accrued penalties determined by the District Court to be owed to the United States into an interest-bearing escrow account, established at a duly chartered bank or trust company that is insured by the FDIC, within 60 days after receipt of the Court's decision or order. Penalties shall be paid into this account as they continue to accrue, at least every 60 days. Within 15 days after receipt of the final appellate court decision, the escrow agent shall pay the balance of the account to EPA or to Settling Defendant to the extent that they prevail.

80. If Settling Defendant fails to pay stipulated penalties when due, Settling Defendant shall pay Interest on the unpaid stipulated penalties as follows: (a) if Settling Defendant has timely invoked dispute resolution such that the obligation to pay stipulated penalties has been stayed pending the outcome of dispute resolution, Interest shall accrue from the date stipulated penalties are due pursuant to Paragraph 79 until the date of payment; and (b) if Settling Defendant fail to timely invoke dispute resolution, Interest shall accrue from the date of demand under Paragraph 78 until the

date of payment. If Settling Defendant fails to pay stipulated penalties and Interest when due, the United States may institute proceedings to collect the penalties and Interest.

81. The payment of penalties and Interest, if any, shall not alter in any way Settling Defendant's obligation to complete the performance of the Work required under this Consent Decree.

82. Nothing in this Consent Decree shall be construed as prohibiting, altering, or in any way limiting the ability of the United States to seek any other remedies or sanctions available by virtue of Settling Defendant's violation of this Consent Decree or of the statutes and regulations upon which it is based, including, but not limited to, penalties pursuant to Section 122(l) of CERCLA, 42 U.S.C. § 9622(l), provided, however, that the United States shall not seek civil penalties pursuant to Section 122(l) of CERCLA for any violation for which a stipulated penalty is provided in this Consent Decree, except in the case of a willful violation of this Consent Decree.

83. Notwithstanding any other provision of this Section, the United States may, in its unreviewable discretion, waive any portion of stipulated penalties that have accrued pursuant to this Consent Decree.

XXI. COVENANTS BY PLAINTIFF

84. Covenants for Settling Defendant by United States. In consideration of the actions that will be performed and the payments that will be made by Settling Defendant under this Consent Decree, and except as specifically provided in Paragraph 88 (General Reservations of Rights), the United States covenants not to sue or to take administrative action against Settling Defendant pursuant to Sections 106 and 107(a) of CERCLA for the Work, Past Response Costs, and Future Response Costs. With respect to future liability, these covenants shall take effect upon Certification of Completion of Remedial Action by EPA pursuant to Paragraph 50.b of Section XIV (Certification of Completion). These covenants are conditioned upon the satisfactory performance by Settling Defendant of its obligations under this Consent Decree. These covenants extend only to Settling Defendant and do not extend to any other person.

85. [Reserved]

86. [Reserved]

87. [Reserved]

88. General Reservations of Rights. The United States reserves, and this Consent Decree is without prejudice to, all rights against Settling Defendant with respect to all matters not expressly included within Plaintiff's covenants. Notwithstanding any other provision of this Consent Decree, the United States reserves all rights against Settling Defendant with respect to:

a. liability for failure by Settling Defendant to meet a requirement of this Consent Decree;

b. liability arising from the past, present, or future disposal, release, or threat of release of Waste Material outside of the Site;

c. liability based on the ownership of the Site by Settling Defendant when such ownership commences after signature of this Consent Decree by Settling Defendant;

d. liability based on the operation of the Site by Settling Defendant when such operation commences after signature of this Consent Decree by Setting Defendant and does not arise solely from Settling Defendant's performance of the Work;

e. liability based on Settling Defendant's transportation, treatment, storage, or disposal, or arrangement for transportation, treatment, storage, or disposal of Waste Material at or in connection with the Site, other than as provided in the ROD, the Work, or otherwise ordered by EPA, after signature of this Consent Decree by Settling Defendant;

f. liability for damages for injury to, destruction of, or loss of natural resources, and for the costs of any natural resource damage assessments;

g. criminal liability;

h. liability for violations of federal or state law that occur during or after implementation of the Work;

i. liability, prior to Certification of Completion of the Remedial Action, for additional response actions that EPA determines are necessary to achieve and maintain Performance Standards or to carry out and maintain the effectiveness of the remedy set forth in the ROD, but that cannot be required pursuant to Paragraph 14 (Modification of the Work);

j. liability for additional operable units at the Site or the final response action;

k. liability for costs that the United States will incur related to the Site but are not within the definition of Future Response Costs; and

l. liability for costs incurred or to be incurred by the Agency for Toxic Substances Disease Registry ("ATSDR") regarding the Site.

89. Work Takeover.

a. In the event EPA determines that Settling Defendant has (1) ceased implementation of any portion of the Work, or (2) is seriously or repeatedly deficient or late in its performance of the Work, or (3) is implementing the Work in a manner that may cause an endangerment to human health or the environment, EPA may issue a written notice ("Work Takeover Notice") to Settling Defendant. Any Work Takeover Notice issued by EPA will specify the grounds upon which such notice was issued and will provide Settling Defendant a period of 30 days within which to remedy the circumstances giving rise to EPA's issuance of such notice.

b. If, after expiration of the 30-day notice period specified in Paragraph 89.a, Settling Defendant has not remedied to EPA's satisfaction the circumstances giving rise to EPA's issuance of the relevant Work Takeover Notice, EPA may at any time thereafter assume the performance of all or any portion(s) of the Work as EPA deems necessary ("Work Takeover"). EPA will notify Settling Defendant in writing (which writing may be electronic) if EPA determines that implementation of a Work Takeover is warranted under this Paragraph 89.b. Funding of Work Takeover costs is addressed under Paragraph 48.

c. Settling Defendant may invoke the procedures set forth in Paragraph 69 (Record Review), to dispute EPA's implementation of a Work Takeover under Paragraph 89.b. However, notwithstanding Settling Defendant's invocation of such dispute resolution procedures, and during the pendency of any such dispute, EPA may in its sole discretion commence and continue a Work Takeover under Paragraph 89.b until the earlier of (1) the date that Settling Defendant remedies, to EPA's satisfaction, the circumstances giving rise to EPA's issuance of the relevant Work Takeover Notice, or (2) the date that a final decision is rendered in accordance with Paragraph 69 (Record Review) requiring EPA to terminate such Work Takeover.

90. Notwithstanding any other provision of this Consent Decree, the United States retains all authority and reserves all rights to take any and all response actions authorized by law.

XXII. COVENANTS BY SETTLING DEFENDANT

91. Covenants by Settling Defendant. Subject to the reservations in Paragraph 93, Settling Defendant covenants not to sue and agrees not to assert any claims or causes of action against the United States with respect to the Site, the Work, past response actions regarding the Site, Past Response Costs, Future Response Costs, and this Consent Decree, including, but not limited to:

a. any direct or indirect claim for reimbursement from the EPA Hazardous Substance Superfund through CERCLA Sections 106(b)(2), 107, 111, 112 or 113, or any other provision of law;

b. any claims under CERCLA Sections 107 or 113, RCRA Section 7002(a), 42 U.S.C. § 6972(a), or state law regarding the Site, the Work, past response actions regarding the Site, Past Response Costs, Future Response Costs, Settling Defendant's Past Response Costs, Settling Defendant's Future Response Costs, and this Consent Decree; or

c. any claims arising out of response actions at or in connection with the Site, including any claim under the United States Constitution, the Pennsylvania Constitution, the Tucker Act, 28 U.S.C. §1491, the Equal Access to Justice Act, 28 U.S.C. § 2412, or at common law.

92. Except as provided in Paragraph 95 (Claims Against Ability-to-Pay Parties) and Paragraph 100 (Res Judicata and Other Defenses), the covenants in this Section shall not apply if the United States brings a cause of action or issues an order pursuant to any of the reservations in Section XXI (Covenants by Plaintiff), other than those in Paragraphs 88.a (liability for failure by Settling Defendant claims for failure to meet a requirement of the this Consent Decree), 88.g (criminal liability), and 88.h (liability of violations of federal/state law that occur during or after implementation of the Work), but only to the extent that Settling Defendant's claims arise from the same response action, response costs, or damages that the United States is seeking pursuant to the applicable reservation.

93. Settling Defendant reserves, and this Consent Decree is without prejudice to, claims against the United States, subject to the provisions of Chapter 171 of Title 28 of the United States Code, and brought pursuant to any statute other than CERCLA or RCRA and for which the waiver of sovereign immunity is found in a statute other than CERCLA or RCRA, for money damages for injury or loss of property or personal injury or death caused by the negligent or wrongful act or omission of any employee of the United States, as that term is defined in 28 U.S.C. § 2671, while acting within the scope of his or her office or employment under circumstances where the United States, if a private person, would be liable to the claimant in accordance with the law of the place where the act or omission occurred. However, the foregoing shall not include any claim based on EPA's selection of response actions, or the oversight or approval of Settling Defendant's plans, reports, other deliverables or activities.

94. Nothing in this Consent Decree shall be deemed to constitute 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).

95. Claims Against Ability-to-Pay Parties. Settling Defendant agrees not to assert any claims or causes of action and to waive all claims or causes of action (including but not limited to claims or causes of action under Sections 107(a) and 113 of CERCLA) that it may have for response costs relating to the Site against any person who has entered or in the future enters into a final

settlement based on limited ability to pay with EPA with respect to the Site. This waiver shall not apply with respect to any defense, claim, or cause of action that a Settling Defendant may have against any person if such person asserts a claim or cause of action relating to the Site against such Settling Defendant.

XXIII. EFFECT OF SETTLEMENT; CONTRIBUTION

96. Except as provided in Paragraph 95 (Claims Against Ability-to-Pay Parties), nothing in this Consent Decree shall be construed to create any rights in, or grant any cause of action to, any person not a Party to this Consent Decree. Except as provided in Paragraph 95 (Claims Against Ability-to-Pay Parties), each of the Parties expressly reserves any and all rights (including, but not limited to, rights pursuant to Section 113 of CERCLA, 42 U.S.C. § 9613), 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. Nothing in this Consent Decree diminishes the right of the United States, pursuant to Section 113(f)(2) and (3) of CERCLA, 42 U.S.C. § 9613(f)(2) and (f)(3), to pursue any such persons to obtain additional response costs or response action and to enter into settlements that give rise to contribution protection pursuant to Section 113(f)(2).

97. The Parties agree, and by entering this Consent Decree this Court finds, that this Consent Decree constitutes a judicially approved settlement for purposes of Section 113(f)(2) of CERCLA, 42 U.S.C. § 9613(f)(2), and that Settling Defendant is entitled, as of the Effective Date, to protection from contribution actions or claims as provided by Section 113(f)(2) of CERCLA, or as may be otherwise provided by law, for "matters addressed" in this Consent Decree. The "matters addressed" in this Consent Decree are all response actions taken or to be taken and all response costs incurred or to be incurred related to the Work, by the United States or any other person, except for the Commonwealth; provided, however, that if the United States exercises rights under the reservations in Section XXI (Covenants by Plaintiff), other than in Paragraphs 88.a (liability claims for failure by Settling Defendant to meet a requirement of the this Consent Decree), 88.g (criminal liability), or 88.h (violations of federal/state law during or after implementation of the Work), the "matters addressed" in this Consent Decree will no longer include those response costs or response actions that are within the scope of the exercised reservation.

98. Settling Defendant shall, with respect to any suit or claim brought by it for matters related to this Consent Decree, notify the United States in writing no later than 60 days prior to the initiation of such suit or claim.

99. Settling Defendant shall, with respect to any suit or claim brought against it for matters related to this Consent Decree, notify in writing the United States within 14 days after service of the complaint on Settling Defendant. In addition, Settling Defendant shall notify the United States within 14 days after service or receipt of any Motion for Summary Judgment and within 14 days after receipt of any order from a court setting a case for trial.

100. Res Judicata and Other Defenses. In any subsequent administrative or judicial proceeding initiated by the United States for injunctive relief, recovery of response costs, or other appropriate relief relating to the Site, Settling Defendant 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 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 not to sue set forth in Section XXI (Covenants by Plaintiffs).

XXIV. ACCESS TO INFORMATION

101. Settling Defendant shall provide to EPA, upon request, copies of all records, reports, documents, and other information (including records, reports, documents, and other information in electronic form) (hereinafter referred to as "Records") within its possession or control or that of its contractors or agents relating to activities at the Site or to the implementation of this Consent Decree, including, but not limited to, sampling, analysis, chain of custody records, manifests, trucking logs, receipts, reports, sample traffic routing, correspondence, or other documents or information regarding the Work. Settling Defendant shall also make available to EPA, for purposes of investigation, information gathering, or testimony, its employees, agents, or representatives with knowledge of relevant facts concerning the performance of the Work.

102. Business Confidential and Privileged Documents.

a. Settling Defendant may assert business confidentiality claims covering part or all of the Records submitted to Plaintiff under this Consent Decree to the extent permitted by and in accordance with Section 104(e)(7) of CERCLA, 42 U.S.C. § 9604(e)(7), and 40 C.F.R. § 2.203(b). Records determined to be confidential by EPA will be afforded the protection specified in 40 C.F.R. Part 2, Subpart B. If no claim of confidentiality accompanies Records when they are submitted to EPA, or if EPA has notified Settling Defendant that the Records are not confidential under the standards of Section 104(e)(7) of CERCLA or 40 C.F.R. Part 2, Subpart B, the public may be given access to such Records without further notice to Settling Defendant.

b. Settling Defendant may assert that certain Records are privileged under the attorney-client privilege or any other privilege recognized by federal law. If Settling Defendant asserts such a privilege in lieu of providing Records, Settling Defendant shall provide Plaintiff with the following: (1) the title of the Record; (2) the date of the Record; (3) the name, title, affiliation (e.g., company or firm), and address of the author of the Record; (4) the name and title of each addressee and recipient; (5) a description of the contents of the Record; and (6) the privilege asserted by Settling Defendant. If a claim of privilege applies only to a portion of a Record, the Record shall be provided to the United States in redacted form to mask the privileged portion only. Settling Defendant shall retain all Records that it claims to be privileged until the United States has had a reasonable opportunity to dispute the privilege claim and any such dispute has been resolved in the Settling Defendant's favor.

c. No Records created or generated pursuant to the requirements of this Consent Decree shall be withheld from the United States on the grounds that they are privileged or confidential.

103. No claim of confidentiality or privilege shall be made with respect to any data, including, but not limited to, all sampling, analytical, monitoring, hydrogeologic, scientific, chemical, or engineering data, or any other documents or information evidencing conditions at or around the Site.

XXV. RETENTION OF RECORDS

104. Until ten (10) years after Settling Defendant's receipt of EPA's notification pursuant to Paragraph 51.b (Completion of the Work), Settling Defendant shall preserve and retain all non-identical copies of Records (including Records in electronic form) now in its possession or control or that come into its possession or control that relate in any manner to its potential liability under CERCLA with respect to the Site. Settling Defendant must also retain all Records that relate to the potential liability of any other person under CERCLA with respect to the Site. Settling Defendant

must also retain, and instruct its contractors and agents to preserve, for the same period of time specified above all non-identical copies of the last draft or final version of any Records (including Records in electronic form) now in its possession or control or that come into its possession or control that relate in any manner to the performance of the Work; provided, however, that Settling Defendant (and its contractors and agents) must retain, in addition, copies of all data generated during the performance of the Work and not contained in the aforementioned Records required to be retained. Each of the above record-retention requirements shall apply regardless of any corporate retention policy to the contrary.

105. At the conclusion of this record-retention period, Settling Defendant shall notify the United States at least 90 days prior to the destruction of any such Records, and, upon request by the United States, Settling Defendant shall deliver any such Records to EPA. Settling Defendant may assert that certain Records are privileged under the attorney-client privilege or any other privilege recognized by federal law. If Settling Defendant asserts such a privilege, it shall provide Plaintiff with the following: (a) the title of the Record; (b) the date of the Record; (c) the name, title, affiliation (e.g., company or firm), and address of the author of the Record; (d) the name and title of each addressee and recipient; (e) a description of the subject of the Record; and (f) the privilege asserted by Settling Defendant. If a claim of privilege applies only to a portion of a Record, the Record shall be provided to the United States in redacted form to mask the privileged portion only. Settling Defendant shall retain all Records that it claims to be privileged until the United States has had a reasonable opportunity to dispute the privilege claim and any such dispute has been resolved in the Settling Defendant's favor. However, no Records created or generated pursuant to the requirements of this Consent Decree shall be withheld on the grounds that they are privileged or confidential.

106. Settling Defendant certifies that, to the best of its knowledge and belief, after thorough inquiry, it has not altered, mutilated, discarded, destroyed, or otherwise disposed of any Records (other than identical copies) relating to its potential liability regarding the Site since the earlier of notification of potential liability by the United States or the Commonwealth or the filing of suit against it regarding the Site and that it has fully complied with any and all EPA requests for information regarding the Site pursuant to Sections 104(e) and 122(e) of CERCLA, 42 U.S.C. §§ 9604(e) and 9622(e), and Section 3007 of RCRA, 42 U.S.C. § 6927.

XXVI. NOTICES AND SUBMISSIONS

107. Whenever, under the terms of this Consent Decree, written notice is required to be given or a report or other 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. All notices and submissions shall be considered effective upon receipt, unless otherwise provided. Written notice as specified in this Section shall constitute complete satisfaction of any written-notice requirement of the Consent Decree with respect to the United States, EPA, and Settling Defendant, respectively. Notices required to be sent to EPA, and not to the United States, under the terms of this Consent Decree should not be sent to the U.S. Department of Justice.

As to the United States:

Chief, Environmental Enforcement Section
Environment and Natural Resources Division
U.S. Department of Justice
P.O. Box 7611
Washington, D.C. 20044-7611
Re: DJ # 90-11-3-11103

As to EPA:	Cecil Rodrigues (3HS00) Director, Hazardous Site Cleanup Division United States Environmental Protection Agency Region III 1650 Arch Street Philadelphia, PA 19103
and:	Stephen Tyahla (3HS22) Remedial Project Manager United States Environmental Protection Agency Region III 1650 Arch Street Philadelphia, PA 19103
As to the Regional Financial Management Officer:	Daria Arnold (3PM30) U.S. EPA – Region III 1650 Arch Street Philadelphia, PA 19103
As to the Commonwealth:	John Morettini PADEP Project Officer PADEP Northwest Regional Office 230 Chestnut Street Meadville, PA 16335
As to Settling Defendant:	W. Patrick Burke Settling Defendant's Project Manager PO Box 477 Wheatland, PA 16161 or 3766 New Castle Road West Middlesex, PA 16159 Douglas Greene Settling Defendant's Alternate Project Manager PO Box 477 Wheatland, PA 16161 or 3766 New Castle Road West Middlesex, PA 16159

XXVII. RETENTION OF JURISDICTION

108. This Court retains jurisdiction over both the subject matter of this Consent Decree and Settling Defendant for the duration of the performance of the terms and provisions of this Consent Decree for the purpose of enabling either of the Parties to apply to the Court at any time for such further order, direction, and relief as may be necessary or appropriate for the construction or

modification of this Consent Decree, or to effectuate or enforce compliance with its terms, or to resolve disputes in accordance with Section XIX (Dispute Resolution).

XXVIII. APPENDIXES

109. The following appendixes are attached to and incorporated into this Consent Decree:

"Appendix A" is the ROD.

"Appendix B" is the description and map of the Site.

"Appendix C" is the June 2015 ESD.

XXIX. COMMUNITY INVOLVEMENT

110. If requested by EPA, Settling Defendant shall participate in community involvement activities pursuant to the community-involvement plan to be developed by EPA. EPA will determine the appropriate role for Settling Defendant under the Plan. Settling Defendant shall also cooperate with EPA in providing information regarding the Work to the public. As requested by EPA, Settling Defendant shall participate in the preparation of such information for dissemination to the public and in public meetings that may be held or sponsored by EPA [or the Commonwealth] to explain activities at or relating to the Site. Costs incurred by the United States under this Section, including the costs of any technical assistance grant under Section 117(e) of CERCLA, 42 U.S.C. § 9617(e), shall be considered Future Response Costs that Settling Defendant shall pay pursuant to Section XVI (Payments for Response Costs).

XXX. MODIFICATION

111. Except as provided in Paragraph 14 (Modification of the Work), material modifications to this Consent Decree, including the RD/RA Work Plan, shall be in writing, signed by the United States and Settling Defendant, and shall be effective upon approval by the Court. Except as provided in Paragraph 14, non-material modifications to this Consent Decree, including any to the Remedial Action Work Plan, shall be in writing and shall be effective when signed by duly authorized representatives of the United States and Settling Defendant. A modification to the Work shall be considered material if it fundamentally alters the basic features of the selected remedy within the meaning of 40 C.F.R. § 300.435(c)(2)(ii). Before providing its approval to any modification to the Work, the United States will provide the Commonwealth with a reasonable opportunity to review and comment on the proposed modification.

112. Schedules specified in this Consent Decree for completion of the Work may be modified by agreement of EPA and Settling Defendant. All such modifications shall be made in writing.

113. Nothing in this Consent Decree shall be deemed to alter the Court's power to enforce, supervise, or approve modifications to this Consent Decree.

XXXI. LODGING AND OPPORTUNITY FOR PUBLIC COMMENT

114. This Consent Decree shall be lodged with the Court for a period of not less than 30 days for public notice and comment in accordance with Section 122(d)(2) of CERCLA, 42 U.S.C. § 9622(d)(2), and 28 C.F.R. § 50.7. The United States reserves the right to withdraw or withhold its consent if the comments regarding the Consent Decree disclose facts or considerations indicating that the Consent Decree is inappropriate, improper, or inadequate. Settling Defendant consents to the entry of this Consent Decree without further notice.

115. If for any reason the Court should decline to approve this Consent Decree in the form presented, this agreement is voidable at the sole discretion of either Party and the terms of the agreement may not be used as evidence in any litigation between the Parties.

XXXII. SIGNATORIES/SERVICE

116. The undersigned representatives of Settling Defendant to this Consent Decree and the Assistant Attorney General for the Environment and Natural Resources Division of the Department of Justice certify that they are fully authorized to enter into the terms and conditions of this Consent Decree and to execute and legally bind the Party they represent to this document.

117. Settling Defendant agrees not to oppose entry of this Consent Decree by this Court or to challenge any provision of this Consent Decree unless the United States has notified Settling Defendant in writing that it no longer supports entry of the Consent Decree.

118. Settling Defendant shall identify, on the attached signature page, the name, address, and telephone number of an agent who is authorized to accept service of process by mail on behalf of that Party with respect to all matters arising under or relating to this Consent Decree. Settling Defendant 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 this Court, including, but not limited to, service of a summons. Settling Defendant need not file an answer to the complaint in this action unless or until the Court expressly declines to enter this Consent Decree.

XXXIII. FINAL JUDGMENT

119. This Consent Decree and its appendixes constitute the final, complete, and exclusive agreement and understanding among the Parties regarding the settlement embodied in the Consent Decree. The Parties acknowledge that there are no representations, agreements, or understandings relating to the settlement other than those expressly contained in this Consent Decree.

120. Upon entry of this Consent Decree by the Court, this Consent Decree shall constitute a final judgment between and among the United States and Settling Defendant. The Court enters this judgment as a final judgment under Fed. R. Civ. P. 54 and 58.

SO ORDERED THIS __ DAY OF _____, 20__.

_____

United States District Judge

THE UNDERSIGNED PARTIES enter into this Consent Decree entered in the matter of the *United States of America v. Dunbar Asphalt Products, Inc.* (W.D. Pa.).

FOR THE UNITED STATES OF AMERICA:

9/3/15
Date

NATHANIEL DOUGLAS
Deputy Section Chief
Environmental Enforcement Section
Environment and Natural Resources Division
U.S. Department of Justice
Washington, D.C. 20530

8/31/15
Date

MARCELLO MOLLO
Senior Attorney
Environmental Enforcement Section
Environment and Natural Resources Division
U.S. Department of Justice
P.O. Box 7611
Washington, D.C. 20044-7611

THE UNDERSIGNED PARTIES enter into this Consent Decree entered in the matter of the *United States of America v. Dunbar Asphalt Products, Inc.* (W.D. Pa.).

FOR THE UNITED STATES OF AMERICA:

DAVID J. HICKTON
United States Attorney
Western District of Pennsylvania

By: /s/ Rachael L. Mamula
RACHAEL L. MAMULA (IL Atty. No. 6294446)
PAUL E. SKIRTICH (PA Bar No. 30440)
Assistant United States Attorneys
Western District of Pennsylvania
U.S. Post Office and Courthouse
700 Grant Street, Suite 4000
Pittsburgh, Pennsylvania 15219
Tel.: (412) 644-3500 (main)
Fax: (412) 644-6995
Rachael.Mamula@usdoj.gov
Paul.Skirtich@usdoj.gov

Signature Page for Consent Decree regarding Operable Unit 2 of the Sharon Steel Corp. (Farrell Works Disposal Area) Superfund Site

SHAWN M. GARVIN
Regional Administrator, Region III
U.S. Environmental Protection Agency
1650 Arch Street
Philadelphia, PA 19103

Diane Ayp for
MARY B. COE
Acting Regional Counsel, Region III
U.S. Environmental Protection Agency
1650 Arch Street
Philadelphia, PA 19103

Robert Hasson
ROBERT S. HASSON
Senior Assistant Regional Counsel
U.S. Environmental Protection Agency
1650 Arch Street
Philadelphia, PA 19103

THE UNDERSIGNED PARTIES enter into this Consent Decree entered in the matter of the *United States of America v. Dunbar Asphalt Products, Inc.* (W.D. Pa.).

FOR DUNBAR ASPHALT PRODUCTS, INC.:

8/26/15
Date

William Patrick Burke
Name (print): William Patrick Burke
Title: CFO
Address: P.O. Box 477
Wheatland, PA 16161

Agent Authorized to Accept Service on Behalf of Above-signed Party:

Name (print): Robert W. Thomson, Esq.
Title: Babst, Calland, Clements and
Address: Zomnir, P.C.
Phone: Two Gateway Ctr., 603 Stanwix St.
email: Pittsburgh, PA 15222
(412) 394-5656
rthomson@babstcalland.com

APPENDIX A

NORTHERN SLAG AREA OPERABLE UNIT TWO

SHARON STEEL FARRELL WORKS SUPERFUND SITE
CITY OF FARRELL, MERCER COUNTY, PENNSYLVANIA

RECORD OF DECISION

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 3
PHILADELPHIA, PENNSYLVANIA
December 2013

TABLE OF CONTENTS

GLOSSARY: Highlighted Terms in Record of Decision are in the Glossary

FIGURES, TABLES, AND APPENDICES

FIGURES

TABLES

APPENDICES

LIST OF ACRONYMS

AR	Administrative Record
ARARs	Applicable or Relevant and Appropriate Requirements
ATSDR	Agency for Toxic Substances and Disease Registry
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
COC	Contaminant of Concern
CSM	Conceptual Site Model
DNAPL	Dense Non-Aqueous Phase Liquid
EPA	United States Environmental Protection Agency
ERAGS	Ecological Risk Assessment Guidance for Superfund
ESL	Ecological Screening Level
FS	Feasibility Study
FFS	Focused Feasibility Study
GAC	Granular Activated Carbon
gpm	Gallons per Minute
HHRA	Human Health Risk Assessment
HI	Hazard Index
ICs	Institutional Controls
LNAPL	Light Non-Aqueous Phase Liquid
MCL	Maximum Contaminant Level
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
ND	Non-Detect
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
OU	Operable Unit
O&M	Operation and Maintenance
PCE	Tetrachloroethylene
ppb	Parts per Billion
ppm	Parts per Million
PDI	Pre-Design Investigation
RA	Remedial Action
RAO	Remedial Action Objective
RBC	Risk Based Concentration
RI	Remedial Investigation
ROD	Interim Record of Decision
SARA	Superfund Amendments and Reauthorization Act of 1986
SI/GWTS	Stream Isolation and Groundwater Treatment System
SLERA	Screening Level Ecological Risk Assessment
SVOC	Semi-Volatile Organic Compound
TCE	Trichloroethylene
TS	Treatability Study
µg/L	Micrograms per Liter

VI	Vapor Intrusion
VOC	Volatile Organic Compound

APPENDIX A

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APPENDIX A

PART I – THE DECLARATION

APPENDIX A

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I. THE DECLARATION

A. Site Name and Location

The Site is called the Sharon Steel Farrell Works Superfund Site. The entire Site is approximately 300 acres in size and is located approximately one (1) mile southwest of the City of Farrell, Mercer County, Pennsylvania (Figure 1) and 300 hundred feet east of the Pennsylvania/Ohio border. Land use in the area is industrial to the north and east and rural to the west and south. The National Superfund Database Identification Number is PAD001933175. This Record of Decision for interim action addresses the Operable Unit 2 (OU2), area where two businesses are located. A Site Location Map is attached as Figure 1 and the Site Layout is attached as Figure 2.

OU2 is located between OU1 North of Ohio Street and OU1 South of Ohio Street. OU2 consists of two parcels totaling 33 acres owned by Dunbar Asphalt Products, Inc. ("Dunbar") and William Brothers. The companies operate an asphalt plant and a trucking operation respectively.

B. Statement of Basis and Purpose

This decision document presents the interim action for the Selected Remedy for the Sharon Steel Farrell Works Superfund Site in Farrell, Pennsylvania, which was chosen in accordance with the Comprehensive Environmental Response, Compensation and Liability Act of 1980 ("CERCLA"), 42 U.S.C. § 9601 et seq, as amended, and the National Oil and Hazardous Substances Pollution Contingency Plan ("NCP"), 40 C.F.R. Part 300, as amended.

This ROD describes EPA's selected interim action for OU2 which is the construction of an asphalt cap or asphalt-equivalent cap. See Figure 2 for a map showing the OU2 area.

This decision document is based on the Administrative Record for the Site, which was developed in accordance with Section 113 (k) of CERCLA (42 U.S.C. § 9613(k)). This Administrative Record file is available for review online at http://www.epa.gov/arweb, at the U.S. Environmental Protection Agency Region III Records Center in Philadelphia, Pennsylvania, and at the Stey-Nevant Public Library in Farrell, Pennsylvania. The Administrative Record Index (Appendix A) identifies each document contained in the Administrative Record upon which the selection of the remedy is based.

The Commonwealth of Pennsylvania concurs with the Selected Remedy (Appendix B).

C. Assessment of the Site

Pursuant to Section 106 of CERCLA, 42 U.S.C. § 9606, the response action selected in this Record of Decision (ROD) is necessary to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment. Pollutants or contaminants from this Site may present an imminent and substantial endangerment to public health, welfare, or the environment.

D. Description of the Selected Interim Remedy

The selected interim action in this ROD is the construction of a protective asphalt cap, or asphalt equivalent cap, to cover and prevent exposure to the contaminated soils and slag on OU2. A final ROD will be issued for OU2 in the future which will select a final remedy for cleanup of the contaminated soil and slag.

Under the selected cleanup, the area consisting of OU2 will be re-graded and the asphalt cap, or asphalt equivalent will be installed over the surface of OU2 in order to reduce dermal, ingestion, and inhalation risk and prevent percolation of rainwater into the groundwater so as to not negatively affect the groundwater remedy in the OU1 ROD. The asphalt cap or asphalt equivalent cap will reduce contaminants from entering the groundwater and the Shenango River. The selected interim action for OU2 consists of the following:

1. Capping OU2 to prevent erosion of slag from the Site negatively impacting the Shenango River and adjacent habitats.

2. Asphalt will be used in pavement of the estimated six acres on the Dunbar Property (6 acres of the 27 acres) and estimated one acre on the William Brothers property (1 acre of the 6 acres).

3. Confirmation sampling of the capped areas for the other estimated 21 acres on the Dunbar property and estimated 5 acres on the William Brothers property will be conducted through boring sampling outlined in section M.2 of this ROD to determine if there is additional slag present. All slag will be covered by an asphalt or asphalt equivalent cap (See Figure 3 and 4). The elevation and grade of the capped areas and non-capped areas in OU2 shall promote site drainage and minimize erosion.

4. An Operation and Maintenance Plan will be included as part of the design determining storm water control, the frequency of inspection of the capped areas and what time period is necessary to correct a breach with any component of the cap. This alternative shall (1) prevent contact with the slag and contaminated soil, (2) prevent the migration of slag dust from the Site, and (3) reduce groundwater infiltration and leaching of contamination from the slag which would reduce surface water contaminated runoff and shallow contaminated groundwater to the Shenango River so as to not negatively affect the groundwater remedy in OU1 for the Site.

5. Land use restrictions and institutional controls will be documented in a Land Use Control Assurance Plan ("LUCAP") to protect the integrity of the asphalt cap or asphalt equivalent cap. The LUCAP will include controls for OU2.

6. The OU2 institutional controls are for land use restrictions to protect the asphalt cap or asphalt equivalent cap.

The estimated cost to implement the selected interim action is $2,848,449.

D.1.1 Land Use Restrictions

The remedy will implement certain institutional controls as part of the interim action within the OU2 area in conjunction with institutional controls for OU1. A Land Use Control Assurance Plan ("LUCAP") shall be prepared to develop and document the mechanisms for implementing the institutional controls in the OU2 area. The institutional controls shall achieve the following restrictions:

1. Activities within the OU2 Area (Figure 2), that would damage the asphalt or asphalt equivalent type of cap shall be prohibited without EPA approval.

D.1.2 Results for Slag, Placement Under the OU-2 Asphalt (or Asphalt Equivalent) Cap

Placement of the asphalt cap or asphalt equivalent cap as described in Section D in the Description of the Selected Remedy is to address the risks of all the slag in OU2 because all slag exceeds one or more of the following:

1. The human health risk standards presented in Human Health Risk Summary Table 1 in the Northern Slag Area.
2. The ecological risk standards presented in Table 3 Contaminants of Concern and their Ecological Risk Based Critical Concentrations in Surface Soil OU2 Forested Riverine Floodplain Habitat.
3. The ecological risk standards presented in Table 4 Contaminants of Concern and their Ecological Risk Based Critical Concentrations in Surface Soil OU2 Scrub Shrub Upland Habitat.

E. Statutory Determinations

This selected interim action is protective of human health and the environment and is intended to provide adequate protection until a final ROD for the Site is signed, complies with Federal and State requirements that are applicable or relevant and appropriate (ARARs for the selected remedy are presented in Table 5) to this limited-scope action, and is cost-effective. The OU2 area at the Sharon Steel Site will be implemented as an interim remedy in order to address the current exposure of the on Site workers to slag and contaminated soil material. EPA will issue a final remedy for OU2 in the future.

This action is an interim solution only, and is not intended to utilize permanent solutions and alternative treatment (or resource recovery) technologies to the maximum extent practicable for this operable unit. Because this action does not constitute the final remedy for the Site, the statutory preference for remedies that employ treatment that reduces toxicity, mobility, or volume as a principal element may be addressed by the final response action.

Because this remedy will result in hazardous substances, pollutants, or contaminants remaining on-Site above levels that allow for unlimited use and unrestricted exposure, a review will be conducted within five years after initiation of remedial action to ensure that the selected interim remedy continues to be protective of human health.

F. ROD Data Certification Checklist

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

- Baseline human health and ecological risk represented by the chemicals of concern (COCs); (Table 1, 3, and 4);
- Chemicals of concern and their respective concentrations;
- How source materials constituting principal threats are addressed;
- Current and reasonably anticipated future land use assumptions and current and potential future beneficial uses of groundwater used in the baseline risk assessment and ROD;
- Potential land and groundwater use that will be available at the Site as a result of the Selected Remedy;
- Estimated capital, annual O&M, and total present worth costs, discount rate, and the number of years over which the interim remedy cost estimates are projected; and
- Key factors that led to selecting the interim remedy.

G. Authorizing Signature

This Interim ROD selects the remedy for OU2 at the Sharon Steel Farrell Works Superfund Site, and is based on the Administrative Record for the Site. EPA selected this interim action remedy with the concurrence of the Pennsylvania Department of the Environment ("PADEP").

Approved by: K. Hodgkiss

Date: 12/19/2013

Kathryn A. Hodgkiss, Acting Director
Hazardous Site Cleanup Division

APPENDIX A

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PART II- THE DECISION SUMMARY

APPENDIX A

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II. THE DECISION SUMMARY

A. Site Name, Location and Description

The Sharon Steel Farrell Works Superfund Site (the "Site"), (CERCLIS Identification No. PAD001933175), has been separated into two operable units (See Figures 1, 2, 3 and 4) for the purpose of remedy implementation. The entire Site is approximately 300 acres in size and is located approximately one (1) mile southwest of the City of Farrell, Mercer County, Pennsylvania (Figure 1) and 300 hundred feet east of the Pennsylvania/Ohio border.

Operable Unit 1: OU1 consists of a total of 292 acres, and has been divided into two sections: OU1 North, consisting of 61 acres North of Ohio Street and OU1 South consisting of 231 acres South of Ohio Street. The final cleanup plan for OU1 was selected in a 2006 ROD and includes construction of a biosolid vegetative cap. The biosolid cap was the most cost effective cleanup for the 292 acre and the reasoning for being selected for OU1. The groundwater and floodplain on the whole Site will be addressed as part of the OU1 remedy including the groundwater under OU2 and floodplain adjacent to OU2. The Remedial Design for OU1 was completed in February 2012. The remedy will be constructed in phases: Phase 1 will be constructed at OU1 North and then Phase II at OU1 South. The EPA Region 3 is waiting for funding to proceed with the remedial action for OU1 North.

Operable Unit 2: OU2 is located between OU1 North and OU1 South and consists of two parcels totaling 33 acres owned by Dunbar (27 acres) and William Brothers (6 acres), where the companies operate an asphalt plant, and trucking operation, respectively. This ROD describes EPA's selected cleanup for OU2.

The former Sharon Steel Plant, located across the Shenango River to the northeast of the Site, was founded in 1900 and manufactured a variety of steel products but is not part of the Superfund Site.

EPA is the lead Agency for the Site and PADEP is the support agency.

B. Site History and Enforcement Activities

B.1. History of Activities Leading to Contamination

The former Sharon Steel Plant, located across the Shenango River to the northeast of the Site, was founded in 1900 and manufactured a variety of steel products. Throughout the operating history of the plant, waste and byproducts of the manufacturing process were transported by rail cars across the Shenango River and discarded on embankments or piled into large mounds in several areas on the Site adjacent to the Shenango River. From 1949 to 1981, waste liquids (acids and oils) were poured onto the hot slag wastes, which were subsequently disposed of at the Site. This practice continued until 1981, when Sharon Steel was ordered by PADEP to stop disposing the waste liquids in this manner. Although the disposal of waste liquids stopped in 1981, Sharon Steel continued to stockpile slag at the Site until operations at the plant ended in 1992. There are two businesses at OU2, the Dunbar Asphalt Products, Inc. is a current owner of an asphalt plant and the William Brothers Trucking Company is a current owner of a trucking company. These businesses originally leased the property from Sharon Steel Inc. prior to their purchasing properties in the OU2 area.

Three types of slag were disposed of on Site. These included basic oxygen furnace slag, blast furnace slag, and electric arc furnace slag. Basic oxygen furnace slag and blast furnace slag from carbon steel production are Bevill exempt under RCRA 40 CFR Part 261.4(b)(ii)(R).[1] Electric arc furnace slag is not a listed hazardous waste under 40 CFR Part 261, Subpart D. Additionally, electric arc furnace slag did not exhibit a hazardous waste characteristic under 40 CFR 261 Subpart C from the total concentrations for the eight RCRA metals.

PADEP conducted several inspections of the waste disposal areas in the 1970's and concluded that the contamination from the byproducts at the Sharon Steel Plant was responsible for the lack of a biological community along at least 11.5 miles of the Shenango River.

In 1992, Sharon Steel Corporation filed for bankruptcy.

The Sharon Steel Plant is not part of the Site. The environmental contamination resulting from plant operations at the Sharon Steel Plant on the east side of the Shenango River is being addressed by PADEP in accordance with the requirements of Pennsylvania's Land Recycling and Environmental Remediation Standards Act (Act 2 Cleanup Program).

B.2. History of Previous Environmental Investigations and Response Actions

The large mounds of slag wastes placed on the west side of the Shenango River and the contamination resulting from the slag wastes were evaluated under CERCLA. In August 1993, samples of groundwater, soil, ***sediment***, and surface water were collected by EPA. The samples were analyzed during an Expanded Site Investigation ("ESI") to assess Site conditions. EPA subsequently recommended the preparation of a ***Hazard Ranking System (HRS)*** score. The investigation identified

[1] In October, 1980, RCRA was amended by adding section 3001(b)(3)(A)(ii), known as the Bevill exclusion, to exclude "solid waste from the extraction, beneficiation, and processing of ores and minerals," slag from regulation as hazardous waste under Subtitle C of RCRA.

metals and ***organic compounds*** at the Site. Based on the findings of the ESI, the Site was recommended for HRS scoring in 1995. The HRS scoring package was completed in February 1998, and the Site scored high enough to warrant listing on the ***National Priorities List ("NPL")***. The Site was proposed to the NPL on March 6, 1998. It was formally added to the NPL on July 28, 1998, making it eligible for Federal cleanup funds.

In October 1999, EPA initiated an RI/FS for the Site to evaluate existing data; collect additional data, as necessary; and assess and consider appropriate actions. Due to the size and complexity of the Site, the RI was conducted in two phases. Phase 1, included monitoring well installation, groundwater evaluation; groundwater sampling; surface water and sediment sampling; slag and sludge sampling; preliminary ***air/dust dispersion modeling***; and preliminary ***risk assessments.*** Phase 1 was completed in early June 2001.

Phase 2 was completed in early 2004. Phase 2 included additional groundwater sampling; surface and subsurface soil sampling; residential well sampling; surface water and sediment sampling; biota sampling (fish, crayfish, amphibians, mammals, and reptiles); slag/sludge sampling in disposal areas; and the final human health and ecological risk assessments. The results of the Phase 1 and 2 investigations are summarized in the Final RI report, dated June 2005. The Final RI report indicated that the Site presents unacceptable risks to human health and the environment; therefore, remedial actions are required to control, reduce, or eliminate these risks.

An FS report for OU1 was prepared in April 2006 to develop an appropriate range of remedial actions for managing wastes and contaminated areas on the Site in a manner that will protect human health and the environment and meet applicable or relevant and appropriate requirements ("ARARs").

The remedial action for OU1 addresses all the remedial activities that are necessary to remediate OU1. The OU1 includes:

1) The Northern Area, which consists of approximately sixty one acres and includes those portions of the Site which are north of Ohio Street-the Northern Slag Source Pile, the Basic Oxygen Furnace (BOF) Sludge Source Area; and

2) The Southern Area, which consists of approximately two hundred and thirty one acres and includes those areas south of Ohio Street-the Southern Slag Source Pile which is currently being mined by a Prospective Purchaser Party, and the wetlands/floodplain located between the slag piles and the Shenango River (to the east) and the unnamed tributary (to the south).

The EPA selected remedy for OU1 is a Biosolid-Enhanced Cap and Passive Vegetated Groundwater Barrier with Institutional Controls and Long-Term Groundwater Monitoring. This will include re-grading and contouring the Site to prevent erosion of slag materials from the Site into the Shenango River and adjacent habitats.

Class A biosolids were blended with the top layer to create a protective cover over small plots of the contaminated slag and sludge in a treatability study for the OU1 parcel. The initial results from the treatability study were positive. The biosolid cover in the OU1 area will prevent contact with the slag and sludge material and prevent the migration of slag dust from the Site. The biosolids cap in the OU1

area will also minimize infiltration of metals to the groundwater through the treatment of the slag and sludge with biosolids binding with the metals. This treatment will reduce the mobility of the metals to the groundwater. Long-term monitoring of contaminants shall be conducted throughout the extent of the groundwater plume to determine if the biosolid source control measures are effective in reducing contaminant concentrations in groundwater to drinking water standards. A primary reason that the biosolid cap was selected for the OU1 area was that it was the most cost effective cleanup for the 292 acre portion of the Site.

In addition, there will be an installation of a passive vegetated groundwater barrier to reduce the volume of contaminated shallow groundwater currently being discharged into the Shenango River which will reduce the contaminant concentrations in surface sediment. There will be a re-establishment of a more natural floodplain along the Shenango River and implementation of erosion protection to prevent erosion of waste slag and sludge into the Shenango River and wetland/pond area to protect surface water and sediment adjacent to the Site.

In the OU1 ROD, institutional controls were selected to minimize health exposure risks so that the biosolid cap is not damaged and to prohibit shallow contaminated groundwater (0 ft-120 ft) under the Site from being used for drinking water on Site.

For the purposes of implementation, OU2 includes the asphalt plant and trucking storage company properties totaling approximately 33 acres. This portion of the Site will be addressed by this separate, additional remedial action (OU2). In the 2006 Record of Decision for the Site, EPA deferred the selection of a remedy for the OU2 portion of the Site because EPA could not implement a biosolid cap on this portion of the Site without negatively impacting Dunbar and the William Brothers' business operations. An FS report for OU2 was prepared in September 2007 to develop an appropriate range of remedial actions for addressing wastes and contaminated areas on OU2 in a manner that will protect human health and the environment and meet ***applicable or relevant and appropriate requirements*** (***ARARs***).

This selected remedy will address the 33 acre OU2 area by placing an asphalt cap or asphalt equivalent cap to address metal contamination in the slag and soil. In addition, certain institutional controls shall be implemented to restrict land use which shall prevent damage to the asphalt or asphalt-equivalent caps for OU2.

EPA accepted public comments on the proposed remedial action plan for OU2. The initial comment period began on September 17, 2012 and concluded on October 16, 2012. The comment period was then extended to November 19, 2012. A public meeting on the Proposed Plan for OU2 was held on October 4, 2012 at 6:30 pm at the Farrell City Building at 500 Roemer Blvd in Farrell, Pennsylvania.

The institutional controls for the groundwater for the whole Site are in the 2006 OU1 ROD and apply to the groundwater that also underlies the OU2 area. The groundwater institutional controls prohibit shallow contaminated groundwater (0 ft-120 ft) under the entire Site from being used for drinking water.

C. Community Participation

The Proposed Plan was released for public comment on October 4, 2012 and the RI/FS for OU2 was

made available to the public in November 2012. These documents can be found in the Administrative Record file and the information repository maintained at the EPA Docket Room in Region III or at the following EPA website http://loggerhead.epa.gov/arweb/public/advanced_search.jsp and at the Stey-Nevant Public Library in Farrell, Pennsylvania. The notice of the availability of these documents was published in the Sharon Steel Herald and Sharon Steel Vindicator on September 17, 2012 and November 5, 2012 respectively. The public comment period was held from September 17, 2012 to November 19, 2012. EPA hosted a Public Meeting on October 4, 2012 from 6:30 p.m. - 8:30 p.m. in the Council Chambers of the City Building located at 500 Roemer Boulevard, Farrell, PA 16121 to present the Proposed Plan and take public comments. At this meeting, representatives from EPA and PADEP answered questions about the Site and the remedial alternatives. EPA's responses to comments received during this period are included in the Responsiveness Summary, which is included as Part III of this Interim ROD.

These community participation activities meet the public participation requirements in CERCLA (42 U.S.C. § 9617) and the NCP (40 C.F.R. § 300.430 (f)(3)).

D. Scope and Role of Operable Unit

EPA has organized the work at the Site into two Operable Units (OUs).

- Operable Unit 1: Northern and Southern Slag, Sludge and Soil Areas Excluding Dunbar Asphalt and William Brothers Property, Floodplain on Site, Surface Water and Sediment Adjacent to the Site
- Operable Unit 2: Dunbar Asphalt and William Brothers Soil and Slag

EPA selected a remedy for OU1 in a ROD signed on September 16, 2006.

The Sharon Steel Farrell Works Site (See Figure 2) is comprised of three main areas:

1) The Northern Area, which consists of approximately sixty-one (61) acres and includes those portions of the Site which are north of Ohio Street - the Northern Slag Source Pile, the Basic Oxygen Furnace (BOF) Sludge Source Area (OU1);

2) An Asphalt Plant Property, approximately twenty-seven (27) acre area which includes an approximately eight (8) acre work area under the asphalt plant and an approximately six (6) acre property owned by a Trucking Company (OU2); and,

3) The Southern Area, which consists of approximately two hundred and thirty-one (231) acres and includes those areas south of Ohio Street (also OU1) - the Southern Slag Source Pile, which is currently being mined by a Prospective Purchaser Party, and the wetlands/floodplain located between the slag piles and the Shenango River (to the east) and the unnamed tributary (to the south) (see Figure 2).

The Prospective Purchaser Party operates an active slag mining operation on the Southern portion of the Site permitted by Pennsylvania Department of Environmental Protection (PADEP) and authorized by EPA pursuant to a Prospective Purchasers Agreement. The Prospective Purchaser Party will reduce the volume of contaminated waste slag at the Site by continuing to mine and remove slag from the Southern

Area. Mining is expected to remove over 3 million cubic yards of slag from the Site which is beneficially reused to make road aggregate. However, due to technical limitations (groundwater dewatering) and cost/benefit considerations, the Prospective Purchaser Party will not remove the last four feet of slag vertically. Four feet of slag will be left over the original native soil in the Southern Area. EPA will implement Phase 2 of the OU1 remedy and place a biosolid cap on the Southern property of the Site after the Prospective Purchaser Party completes mining the slag.

EPA Region 3 is waiting for funding to proceed with the remedial action for OU1 North. Groundwater treatment for the entire Site including groundwater under OU1 and OU2 and monitoring for site wide groundwater is under the 2006 OU1 ROD. In addition, shallow groundwater use for the entire Site including groundwater under the OU1 and OU2 areas will be restricted by institutional controls as required in the 2006 ROD for OU1. The groundwater institutional controls will prohibit shallow contaminated groundwater under the entire Site from being used for drinking water.

The alternatives for the floodplain were evaluated and selected as part of the OU1 Record of Decision; the floodplain will be covered with compost and vegetated. Upon completion of remedial actions, the restored floodplain will prevent erosion of slag and sludge into the Shenango River to protect surface water and sediment adjacent to the Site.

The OU2 area includes the asphalt plant and trucking storage company properties totaling approximately 33 acres. The Dunbar Asphalt Plant stores 12 different types of aggregate piles on an estimated 21 acres of their 27-acre parcel before the aggregate is made into asphalt at the plant and trucked off Site. The William Brothers Trucking Company parks trucks on their six acre parcel. This Interim Record of Decision describes the contamination at OU2, the risks associated with the exposure to the contamination, explains clean up alternatives assessed by EPA, and EPA's selected clean up alternative. The goal of the remediation of OU2 is (1) to prevent any kind of contact with metals in the slag including direct contact via ingestion and dermal contact; and indirect contact via inhalation of windborne dust and (2) to reduce the concentration of contaminants entering the groundwater and discharging into the Shenango River and the wetland/unnamed tributary so as to not negatively affect the OU1 groundwater remedy. Ultimately, this interim ***remedial action*** should reduce the overall amount of contamination entering the Shenango River from the Site.

E. Site Characteristics

This section of the interim ROD provides an overview of the Site's geology and hydrogeology, the sampling strategy used during Site investigations, and the nature and extent of contamination. Additional information regarding the nature and extent of contamination can be found in the Administrative Record.

E.1. Overview of the Site

The Sharon Steel Site is approximately 300 acres in size and is located approximately one mile southwest of the City of Farrell, Mercer County, Pennsylvania. The Site is located approximately 300 hundred feet east of the Pennsylvania/Ohio border. Land use in the area is industrial to the north and east and rural to the west and south. Please refer to Figure 1 for a Site Location Map and Figure 2 presents the Site Layout showing the extent of the OU2 study area.

E.2. Geology and Hydrogeology

E.2.1 *Geology*

The Site is located within the ***glaciated*** section of the Appalachian Plateaus Physiographic Province in Mercer County, Pennsylvania. Regional topography consists of hilly uplands and broad deep valleys cut by the Shenango River. The Shenango River valley contains Quaternary glacial and alluvial deposits, and the upland areas consist of glacial till. Regionally, glacial deposits are underlain by Mississippian and Pennsylvanian aged bedrock consisting of shale and sandstone with some thin beds of limestone, coal, and fireclay. At the Site, the Shenango River has completely eroded the Pennsylvanian bedrock, and as a result, the glacial and alluvial deposits beneath the Site are directly underlain by Upper Mississippian bedrock of the Pocono Group. The Site is located on the western ***floodplain*** of the Shenango River between the river and the Ohio and Pennsylvania state border.

The slag and sludge are extremely ***porous***. Most rainfall infiltrates the wastes and becomes groundwater. The limited surface runoff from OU-1 North and the Dunbar Asphalt Plant portion of OU-2 flows overland and eastward into the Shenango River within OU-1 North. Drainage from the northern portion of OU-1 South flows overland in a northward direction into a wetland area bisected by Ohio Street. There is no direct surface connection between this wetland area and nearby surface water ponds. Any hydraulic connection to nearby surface waters is through groundwater. Drainage from the southern portion of the Site area (south of Ohio Street) flows overland in a southward direction into the emergent wetland/pond area or into the unnamed tributary. Both the emergent wetland/pond complex and the unnamed tributary ultimately flow into the Shenango River.

E.2.2 *Source Areas*

Data from on Site soil and groundwater samples, as well as observations made during drilling operations, were compiled in the Remedial Investigation ("RI") report to develop an understanding of the nature of the soils, geology, and groundwater at the Site. The RI information provides an insight into the nature and extent of contamination at the Site and the direction that contamination may travel. Analysis of soil borings at the Site indicates that the waste piles of slag and sludge range in thickness from 5 to over 40 feet. The Northern Area contains two sources of contamination: the basic oxygen furnace (BOF) Sludge Disposal Area, and the Northern Slag Pile. The contamination from these areas is transported by rain water run-off onto OU2. The BOF Sludge Pile at OU1 North contains the most contamination. Risks in this area were driven by metals (arsenic, barium, cadmium, chromium, iron, lead, manganese, nickel, thallium, vanadium, and zinc). The Northern Slag Pile in OU1 North was the least contaminated source/slag area and contained metals, polyaromatic hydrocarbons (PAHs), and polychlorinated biphenyls (PCBs). These contaminants were the most frequently detected constituents and were detected in all depth intervals.

E.2.3 *Groundwater*

Site-related contamination was detected in the groundwater, which flows beneath both operable units beneath the Site. There are four geologic units underlying the Site. Groundwater occurs in three aquifers underlying the Site. The four geologic units that underlie the Site: (1) an uppermost or "shallow" silty sand aquifer, which ranges in thickness from 0 to 30 feet; (2) an underlying silt and clay ***low permeability*** unit called the "glacial till," approximately 30 to 70 feet thick (not an aquifer); (3) a sand and gravel aquifer ("gravel zone" aquifer), approximately 70 to 120 feet thick; and (4) an underlying bedrock aquifer.

The two uppermost aquifers contain elevated levels of metals and organic chemicals above the levels of concern for risks. Groundwater in these areas moves towards the east and southeast. Depth to groundwater is approximately three to five feet below ground surface. At the BOF Sludge and the Northern Slag disposal areas, groundwater flow discharges to the Shenango River. Groundwater in the two lower geological units flows towards the north with some discharge to the Shenango River. Concentrations of Site-related constituents in the gravel and bedrock aquifers are generally consistent with regional ***background levels*** except for barium and thallium in the gravel zone. These observations suggest that there is little or no downward flow of contamination into the deeper confined aquifers. Flow in the confined aquifers (the shallow silty-sand aquifer and the glacial till aquifer) is generally to the north and east and does not discharge into the Shenango River. Wells in the confined aquifers indicated ***artesian conditions***.

E.2.4 *Residential Wells*

The majority of residences in the area surrounding the Site receive drinking water from the Aqua America Company, which has two surface water intakes along the Shenango River at 3.5 miles upstream and 18 miles downstream of the Site.

Drinking water wells for some of the residents along Stateline and Wansack Roads (west and southwest of the Site, respectively) contained levels of arsenic exceeding drinking water ***maximum contaminant levels*** ("MCLs"). Thallium was also detected at levels of potential concern. Based on the well surveys, these wells were ***screened*** in the gravel zone or bedrock aquifers. Data evaluated in the RI indicate that the aquifers which supply these local residents have a groundwater flow in the north or northeast, towards the Shenango River and away from residential wells. Based on this information, contaminated groundwater from the Site is not impacting these residential well users. Additionally, groundwater on Site is contaminated with metals and volatile organic compounds in the upper two aquifers on Site while the current residents have their drinking water wells in the lower bedrock aquifer, which has not been impacted by the Site.

E.2.5 *Shenango River*

Site-related contamination has resulted in some contamination of adjacent floodplain soils located between the disposal areas and the Shenango River. While contamination is not widespread, there are isolated depressions that contain elevated levels of metals and organic compounds. Shallow groundwater from the waste areas of the Site discharges into the Shenango River. The Site groundwater is the most significant source of Site contamination in the river and adjacent floodplains. The contamination was detected in sediment and surface water one kilometer downstream of the Site. According to the RI, benzo[a]pyrene, chromium, iron, manganese, nickel, and vanadium were detected in the floodplain soil. Benzo[a]pyrene and dibenz[a,h]anthracene were detected in the river sediment.

F. Sampling Activities and Extent of Contamination

1. Slag and Sludge Areas

The three source areas at the Sharon Steel Farrell Site [BOF Sludge Disposal Area (OU-1), Northern Slag Pile Area (OU2), and Southern Slag Pile Area (OU-1)] contain similar types of contaminants in soils, including metals, poly-aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), and pesticides. Some semi-volatile organic compounds (SVOCs): such as dibenzofuran, and others which are typically associated with PAH contamination were also detected at elevated concentrations in the source areas.

The BOF Sludge Disposal Area (OU1) is generally the most contaminated source area. In particular, 2-methylnaphthalene and several metals (cadmium, chromium, lead, and zinc) were detected at higher concentrations than in the Southern Slag Pile Area. PAHs were detected at significant concentrations in the northern and southern ends of the BOF Sludge Disposal Area. Most of the contaminants detected in the BOF Sludge Disposal Area were also detected in down gradient Shenango River floodplain soils and in sediment in the Shenango River. This finding indicates that contamination migrates from the BOF Sludge Disposal Area to low-lying areas via surface runoff and flooding.

The Northern Slag Pile Area is generally the least contaminated source area in terms of number of detected constituents and the concentrations of those constituents. Metals, PAHs, and PCBs were the most frequently detected constituents and were detected in all depth intervals in the soil (thus defining the vertical extent of contamination). The southern end of the Northern Slag Pile Area contained notably high concentrations of metals. Most of the contaminants detected in the Northern Slag Pile Area were also detected in downgradient Shenango River floodplain soils, southeast floodplain soils, and in sediment in the Shenango River. This finding indicates that contamination migrates from the Northern Slag Pile Area to these low-lying areas via surface runoff and flooding.

Metals, PAHs, pesticides, and PCBs were the most frequently detected constituents in all depth intervals in the Southern Slag Pile Area (OU1). This area also contained contaminants (VOCs and pesticides) not detected in other source areas; however, these were detected relatively infrequently and at relatively low concentrations. The Southern Slag Pile Area, particularly the central portion of the area, contains concentrations of most PAHs, Aroclor-1248, Dichloro-diphenyl-trichloroethane (DDT) metabolites, and heptachlor epoxide that are notably higher than concentrations in the other two source areas. Most of the contaminants detected in the Southern Slag Pile Area were also detected in downgradient southeast floodplain soils, unnamed tributary floodplain soils and sediment, wetland ponds, and the Ohio Street wetlands. These findings suggest that contamination likely migrates from the Southern Slag Pile Area to these low-lying areas via surface runoff and flooding.

2. Soil-to-Surface Water/Sediment Migration

Contaminants from source areas may be transported by wind or storm runoff, to be deposited on downgradient floodplains, surface water, and riverbed/streambed sediment. Soils from the BOF Sludge Area and the Northern Slag Pile Area can travel downslope into the Shenango River floodplain and ultimately into the Shenango River. Soils from the Southern Slag Pile Area can travel downslope into the Ohio Street wetland area or into the wetland complex south of the pile, into the wetland ponds, the unnamed tributary and ultimately into the Shenango River. Soils from the Southern Slag Pile Area also can travel downslope and into the western floodplain of the Shenango River and then into the Shenango River.

The analytical data generated in the RI revealed a spatial relationship between the nature of contaminants observed in the source areas and the distribution of these same contaminants in downgradient areas. In general, downgradient areas of floodplain soil associated with topographic depressions contained Site-related contaminants at relatively high concentrations. Downgradient riverbed or streambed sediment depositional areas also contained source-related contaminants at relatively high concentrations. These observations suggest a high likelihood that contaminants from the Site areas are moving downgradient into adjacent floodplains, wetlands, and surface waters.

3. Soil-to-Groundwater Migration

Based on the evaluation of Site characteristics and monitoring data, groundwater is one of the more important modes of transport for contaminants at the Site. During the field investigation, the sampling crew observed that water levels in the ponds located in the Southern Slag Pile Area would rise approximately 2 to 3 days after a steady rain. During periods of rainfall, water infiltrates the source areas containing contaminants and carries with it dissolved organic and inorganic constituents into the groundwater.

The analytical data for groundwater in the unconfined aquifers below the source areas (the surface and glacial till aquifers) indicated significantly high levels of the same metals detected in the source areas. In some areas, PAHs were detected in both source area soils and in underlying groundwater. The grain size and total organic carbon data provide an additional line of evidence that migration from soil-to-groundwater occurs rapidly at the Site. These observations indicate a high likelihood that contaminants from the source areas are leaching into groundwater in the unconfined aquifers.

The potential for contaminants to move into groundwater from source material is dependent on several physical and chemical properties of the particular contaminants. The ability for a contaminant to move from soil into water is affected by the organic carbon-normalized partition coefficient (K_{oc}) for contaminants in the soil/slag. Contaminants with high K_{oc} are likely to strongly adsorb to soil particles and will resist leaching into groundwater. These chemicals generally include SVOCs, PCBs, PAHs and pesticides.

Metals present as soluble salts can dissolve in percolating precipitation and can contaminate the groundwater. Metals present as insoluble minerals will be more resistant to migration in dissolved form. Contaminant migration is also expected to be slower than groundwater flow due to retardation as a result of adsorption to soil particles. Retardation may be negligible for the highly mobile constituents (such as the metals) and significant for the relatively immobile compounds (such as large, hydrophobic organic contaminants). Constituents also disperse laterally as they are transported downgradient and are diluted by adjacent, uncontaminated groundwater.

4. Groundwater-to-Surface Water Migration

Based on the hydrogeologic assessment conducted in the RI, groundwater in the unconfined aquifers at the Site (the surficial and the glacial till) generally flows to the east and southeast and discharges into adjacent surface water bodies. At the BOF Sludge and the Northern Slag Disposal Areas, groundwater flow in these surface aquifers discharges into the Shenango River. At the Southern Slag Disposal Area, groundwater flow in the surficial aquifers discharges into the wetland/pond complex, the unnamed tributary, and the Shenango River. Ultimately, all groundwater that interacts with source area material will discharge into the Shenango River.

The concentrations of Site-related constituents in the groundwater are significant at the source areas. However, as groundwater migrates toward distant surface discharge points, concentrations generally decrease due to retardation, adsorption, and dilution. Groundwater is expected to flow downward from the surficial aquifer into the glacial till as evidenced by the generally consistent concentrations of Site related metals in both aquifers. Glacial sediments on-Site are extensive enough to produce a confining bed above the gravel zone and underlying bedrock that results in artesian conditions in the vicinity.

Concentrations of most detected constituents in the gravel and bedrock aquifers, below and downgradient of the source areas, are generally consistent with regional background levels. In addition, the concentrations of these constituents decrease with depth. The contaminant concentrations and the confined aquifer (indicating upward flow from the deeper aquifers into the shallow aquifers and the Shenango River), suggest that there is no substantial downward flow into the deeper confined aquifers.

5. Food Chain Effect

Contaminant migration through biological organisms may occur through direct exposure to contaminated media, **bioaccumulation** through ingestion of contaminated media, and food-chain transfer from prey to predator. EPA recognizes the contaminants listed in Table 4-2 of *Bioaccumulative Testing and Interpretation for the Purposes of Sediment Quality Assessment, Status and Needs* (EPA, 2000a) as highly susceptible to transport by these biological or ecological mechanisms. Bioaccumulative contaminants from this list detected in media at the SSFW Site include: arsenic, cadmium, chromium (as hexavalent chromium), copper, lead, mercury (as methyl mercury), nickel, silver, zinc, PAHs, pesticides, PCBs (Aroclors), and dioxin/furans.

6. Soil-to-Air Migration

Fine-grained material from source areas may be transported by the wind and released to the atmosphere. Constituents bound to surface soils may be transported as low-density or small diameter particulates and dust, which are suspended by wind energy, then blown to downwind locations. Although some portions of the source areas are covered with vegetation, most of the material at the source areas have little or no cover. Dust formation, and therefore soil-to-air migration of contaminants, may be significant during extended periods of dry weather.

An air dispersion model is a computer model used to study and predict the transport of air and pollutants in the air. Air dispersion modeling was conducted as part of the RI and the associated human health risk assessment (MACTEC, 2004) to calculate the concentration of non-volatile and semi-volatile contaminants in the air due to the surface soil contamination of the Site. The results of the air modeling analysis are presented in the *Air Dispersion Modeling Analysis and Identification of Chemicals of Potential Concern for Inhalation Exposure* report (Phase 1 and Phase 2; MACTEC, 2004). Contaminant concentrations in the air were predicted using EPA's air dispersion model, Industrial Source Complex Short Term version 3 (ISCST3) with Site-specific assumptions regarding emissions of the erodible surface material of the Site.

To evaluate air migration, seven on-Site exposure areas were identified. The areas are (1) Northern Slag Pile, (2) the BOF Sludge Area, (3) the Southern Slag Area, (4) the Shenango River Floodplain, (5) the Unnamed Tributary Floodplain, (6) the Southeast Floodplain, and (7) the Ohio Street Wetlands. Four potential exposure areas located beyond the property boundaries were also identified. The four other areas are: (1) the State Line Residential Area, (2) the Wansack Residential Area, (3) the Ohio Street Industrial Area, and (4) the Farrell Residential Area. A fifth potential exposure area was identified for areas not encompassed by any of the other exposure zones.

Details of the constituents and predicted air concentrations for all areas are presented in the Phase 2 report (see Appendix H of the RI report; Black and Veatch 2005). Dust-borne contaminants of concern include PAHs, pesticides, PCBs, total 2,3,7,8-tetrachlorodibenzodioxin ("TCDD") toxic equivalent quotient ("TEQ") and inorganic contaminants. The surface soils at the Site have experienced long-term

natural weathering and very likely have lost the bulk of volatile constituents as a result of volatilization, leaching to groundwater, and/or runoff to surface water. Therefore, air transport of volatile organics likely is not an important migration process at the Site. The locations of the highest concentrations varied among the constituents. However, the model estimated that the highest dust-borne contaminant concentrations would be located within the boundaries of the three source areas (Northern Slag Pile, BOF Sludge Area, Southern Slag Area) and would decrease rapidly with distance from the sources. The air modeling indicated that there is a potential for dust-borne contamination from the source areas to move from the Site to adjacent areas, primarily toward the east-northeast. However, the distribution of dust-borne contaminants at levels of concern is general limited to areas within 500 feet of the Site (See Black and Veatch Final Feasibility Study Report June 2006). These documents can be found in the Administrative Record file and the information repository maintained at the EPA Docket Room in Region III or at the following EPA website http://loggerhead.epa.gov/arweb/public/advanced_search.jsp.

G. Conceptual Site Models

A Conceptual Site Model was developed to identify which human exposure pathways were complete or could be potentially complete in the future. The following discussion identifies complete pathways for potential on-Site and off-Site receptors as identified in the Conceptual Site Model.

The primary sources of Site-related contamination are the slag and soil located at the Northern and Southern Areas for OU1 and OU2 which were placed during the operation of the former Sharon Steel Plant. Site-related contaminants are released by leaching from slag and sludge to groundwater and by erosion combined with overland runoff into the Shenango River. Groundwater contamination impacts the shallow aquifer on Site, and as a secondary source, impacts surface water and sediments, which in turn affect bio-uptake in certain plants and animals off Site. Erosion of slag and sludge and overland runoff also contribute contamination to surface water and sediments. Wind erosion of slag and sludge will also release contamination into the air. (See conceptual Site model in Section 1.3 and 1.4 in the Final Feasibility Study Report for the Sharon Steel Farrell Works OU2, September 2007). These documents can be found in the Administrative Record file and the information repository maintained at the EPA Docket Room in Region III or at the following EPA website http://loggerhead.epa.gov/arweb/public/advanced_search.jsp.

The ecological Conceptual Site Model predicts relationships between stressors and ecological entities. It evaluates contaminants, potential ecological receptors and exposure pathways. The primary exposure medium to ecological receptors is slag and sludge waste and contaminated soils. Plants, vertebrates and invertebrates in floodplain habitats and wetlands habitats have been exposed to contaminated soils. (See conceptual Site model in Section 5 in the Final Ecological Risk Assessment Report for the Sharon Steel Farrell Works Site, June 2005). These documents can be found in the Administrative Record file and the information repository maintained at the EPA Docket Room in Region III or at the following EPA website http://loggerhead.epa.gov/arweb/public/advanced_search.jsp.

H. Current and Potential Future Land Use and Water Use

The Northern and Southern portions of the Site are currently located within an industrial area. The Northern Area is approximately sixty-one acres and includes those portions of the Site which are north of Ohio Street (See Figure 2). The Northern portion of the Site includes an asphalt plant property (OU2) (see Figure 3): a twenty-seven acre area which includes an asphalt plant and a six acre property

owned by a trucking company currently used as a garage and truck storage area (see Figure 4). The Southern Slag (OU1) pile consists of approximately two hundred and thirty one acres and includes those areas south of Ohio Street; the Southern Slag Pile which is currently being mined by a prospective purchaser party (231 acres), and the wetlands/***floodplain*** located between the slag piles and the Shenango River (to the east) and the unnamed tributary (to the south) (See Figure 2). The Prospective Purchaser Party operates an active slag mining operation on the Southern portion of the Site permitted by Pennsylvania Department of Environmental Protection (PADEP) and authorized by EPA pursuant to the Prospective Purchasers Agreement ("PPA").

As discussed earlier in Section D, Scope and Role of Operable Unit, the Prospective Purchaser Party will reduce the volume of contaminated waste slag at the Site by continuing to mine and remove slag from the OU1 Southern Area. Mining is expected to remove over 3 million cubic yards of slag from the Site, which is beneficially reused to make road aggregate mixed in asphalt. The PPA Party will leave four feet of slag over the original native soil in the OU1 Southern Area and then the biosolid cap remedy from the OU1 ROD will be completed in this area.

Protection of groundwater and surface water is provided by the OU1 ROD, please see the OU1 ROD for the evaluation of surface water and groundwater impacts from the Site and for current use, and future use of water for the Site. The Site groundwater is not currently being used for drinking water for OU1 and OU2.

In the public official briefing and the public meeting for the proposed plan, EPA solicited the public's and local officials' preference for future use of the Site. There was interest from the officials and the public to put in a road through the Site for access from Pennsylvania to Ohio. Other possibilities for use of the Site included open space and developing industrial facilities on the Site.

I. Summary of Site Risks

The ***Risk Assessment*** for the Site was conducted before the Site was separated into two operable units. Potential risks to human health were determined by a Baseline Human Health Risk Assessment (HHRA). Risks to the environment were determined by a Baseline Ecological Risk Assessment (ERA). The risk assessments estimated the likelihood of adverse effects if no cleanup action were taken at a Site. The HHRA and ERA reports are part of the RI report. The HHRA and the ERA indicated that contamination in soils, groundwater, sediment, surface water and fish tissue at, or impacted by, the Site pose an unacceptable level of risk to human health. It is EPA's current judgment that the selected cleanup identified in this Interim Record of Decision, or one of the other active measures considered in the FS and described in this Interim Record of Decision, is necessary to protect public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment. The OU2 area at the Sharon Steel Site will be implemented as an interim remedy in order to address the current exposure of the on Site workers to slag and contaminated soil material. For more detailed human health and ecological risk information, please refer to the November 2012 OU2 Human Health Risk Assessment (HHRA) and August 2007 OU2 Screening-Level Ecological Risk Assessment (SLERA) available in the Administrative Record for the Site.

HOW IS HUMAN HEALTH RISK CALCULATED?

A Superfund human health risk assessment estimates the baseline risk. The baseline risk is an estimate of the likelihood of developing cancer or non-cancer health effects if no cleanup action were taken at a Site. To estimate baseline risk at a Superfund Site, EPA undertakes a four-step process:

Step 1: Analyze Contamination (Data Evaluation; Identify Chemicals of Potential Concern)
Step 2: Estimate Exposure (Exposure Assessment)
Step 3: Assess Potential Health Dangers (Toxicity Assessment)
Step 4: Characterize Site Risk (Risk Characterization)

In Step 1, EPA looks at the concentrations of contaminants found at a Site as well as past scientific studies on the effects these contaminants have had on people (or animals, when human studies are unavailable). Comparison between Site-specific concentrations and concentrations reported in past studies helps EPA to determine which concentrations are most likely to pose the greatest threat to human health.

In Step 2, EPA considers the different ways that people might be exposed to contaminants identified in Step 1, the concentrations that people might be exposed to, and the potential frequency and duration of exposure. Using this information, EPA calculates a "reasonable maximum exposure" scenario, which portrays the highest level of exposure that could reasonably be expected to occur.

In Step 3, EPA uses the information from Step 2 combined with information on the toxicity of each chemical to assess potential risks. EPA considers two types of risk: cancer and non-cancer risk. The likelihood of any kind of cancer resulting from a Superfund Site is generally expressed as an upper bound probability; for example, a "1 in 10,000 chance." In other words, for every 10,000 people that could be exposed, one extra cancer may occur as a result of exposure to Site contaminants. An extra cancer case means that one more person could get cancer than would normally be expected from all other causes. For non-cancer health effects, EPA calculates a "hazard index." The key concept here is that a "threshold level" (measured as a Hazard Index (HI) of less than 1) exists below which non-cancer health effects are no longer predicted.

In Step 4, EPA determines whether Site risks are great enough to cause health problems for people at or near the Superfund Site. The results of the three previous steps are combined, evaluated, and summarized. EPA adds up the potential risks from the individual contaminants and exposure pathways and calculates a total Site risk. Generally, cancer risks between 10^{-4} and 10^{-6}, and a non-cancer hazard index of 1 or less are considered acceptable for EPA Superfund Sites.

I.1 Summary of Human Health Risk Assessment

The Baseline Human Health Risk Assessment ("BHHRA") for the Site was updated for OU-2 and is found in the February 7, 2012 Sharon Steel Farrell OU-2 Risk Update Human Health Risk Assessment

("HHRA") available in the Administrative Record for the Site. The Baseline Human Health Risk Assessment was prepared in order to determine the current and potential future effects of slag in the absence of further cleanup actions at the Site. The BHHRA consisted of a four step process: (1) the identification of chemicals of potential concern ("COPCs"), i.e., those that have the potential to cause adverse health effects; (2) an exposure assessment, which identified actual and potential exposure pathways, potentially exposed populations, and the magnitude of possible exposure; (3) a toxicity assessment, which identified the adverse health effects associated with exposure to each COPC and the relationship between the extent of exposure and the likelihood or severity of adverse effects; and (4) a risk characterization, which integrated the three earlier steps to summarize the potential and actual risks posed by hazardous substances at the Site, including carcinogenic and non-carcinogenic risks. A summary of the four parts of the human health risk assessment, which support the need for this interim remedial action, is discussed below.

I.1.1 Chemicals of Potential Concern

During the Remedial Investigation, a number of inorganic chemicals were detected in on-Site soils, slag, and dust. The soil/slag/dust data for the Northern Slag Pile area were used as the most representative of OU2 soils, due to their respective locations (see Figures 2 & 3 of the 2006 OU1 ROD). The 2012 update focused on the Reasonable Maximum Exposure ("RME") assessment, since that typically serves as the basis for action. First, RI data for the Northern Slag area were rescreened to verify the chemicals of potential concern ("COPCs"). For chronic exposures, the new screening criteria were the November 2011 Regional Screening Level Tables. For acute exposures, the original cited sources were checked and updated values as of February 2011 were used. The updated COPCs, along with their maximum concentrations and the exposure point concentrations ("EPCs") that were used in the risk assessment, are shown below:

Chemical	Maximum conc.	EPC
Surface soil (mg/kg)		
Benz[a]anthracene	1.4	0.818
Benzo[a]pyrene	0.69	0.357
Benzo[b]fluoranthene	1	0.332
Dibenz[a,h]anthracene	0.2	0.2
Indeno[1,2,3-c,d]pyrene	0.44	0.3
Dieldrin	0.035	0.0076
Aroclor 1248	0.48	0.135
Aroclor 1254	0.24	0.0974
Aroclor 1260	0.36	0.127
Aluminum	44300	25300
Arsenic	23	10.4
Chromium	1230	292
Cobalt	10	6.2
Iron (See Section I.1.4.2	275000	51400

Chemical	Maximum conc.	EPC
for information on iron)		
Manganese	18000	5040
Vanadium	404	93.7
Deep subsurface soil (mg/kg)		
Benz[a]anthracene	0.17	0.129
Benzo[a]pyrene	0.27	0.232
Aluminum	54300	29900
Arsenic	13.6	8.74
Total Chromium	37.9	17.7
Cobalt	14.6	8.7
Iron	33300	18800
Manganese	4390	1640
Dust emissions (chronic scenario) (ug/m^3)		
Aluminum	4.01	4.01
Arsenic	0.0018	0.0018
Cadmium	2.68E-3	2.68E-3
Chromium	0.168	0.168
Cobalt	1.07E-3	1.07E-3
Manganese	1.8	1.8
Dust emissions (acute scenario) (ug/m^3)		
Aluminum	1070	1070
Arsenic	0.572	0.572
Barium	10.7	10.7
Iron	6220	6220
Nickel	3.91	3.91
Vanadium	10.2	10.2
Zinc	883	883

I.1.2 Exposure Assessment

The Baseline Risk Assessment was conducted in order to determine the current and potential future effects (if no cleanup actions were taken at the Site) of contaminants in slag and on-Site soils on human health and the environment. The current and potential future land use plays a key role when EPA determines the exposure scenarios to be evaluated in the Baseline Risk Assessment. The Site was historically used for industrial purposes and is currently zoned as industrial.

Potential human health effects associated with exposure to the COPCs were estimated quantitatively or qualitatively through the evaluation of several actual or potential exposure pathways. These pathways were developed to reflect the potential for exposure to hazardous substances at the Site. Demographics and land use were evaluated to assess present and potential future populations working or otherwise spending time at the Site. The exposure scenarios evaluated in the Baseline Risk Assessment included: 1) construction worker, 2) visitor /trespasser, 3) industrial worker, 4) adult resident, 5) child resident and 6) total adult and child. The Baseline Risk Assessment considered the following effects: 1) incidental ingestion of slag and on-Site soils; 2) dermal contact with slag and on-Site soils; and 3) inhalation of air

and fugitive dust from slag and on-Site soils. Infiltration of slag and soil into shallow groundwater was identified as a Site-wide issue in OU1, as was runoff into surface water and sediment. A number of assumptions were used in the risk assessment process to calculate the dose for each exposure pathway since it is seldom possible to measure a specific dose.

I.1.3 Toxicity Assessment

Excess lifetime cancer risks were determined for each exposure pathway by incorporating the chemical-specific cancer slope factor ("CSF") or inhalation unit risk ("IUR"). CSFs and IURs have been developed by EPA from epidemiological or animal studies to reflect a conservative "upper bound" of the risk posed by potentially carcinogenic substances. The resulting risk estimates are expressed in scientific notation as a probability (e.g., $1x10^{-6}$ or 1/1,000,000) and indicate, using this example, that an average individual is not likely to have greater than a one in a million chance of developing cancer over 70 years as a result of Site-related exposure to the compound at the stated concentrations. All risks estimated represent an "excess lifetime cancer risk," or the additional cancer risk on top of that which we all face from other causes such as genetic and lifestyle factors.

In assessing the potential for exposure to a chemical to cause adverse health effects other than cancer (referred to as non-cancer effects), a hazard quotient ("HQ") is calculated by dividing the daily intake level by the Reference Dose ("RfD"), Reference Concentration ("RfC"), or other suitable benchmark. EPA has developed RfDs and RfCs for many chemicals which represent a level of exposure that is expected to result in no adverse health effects. RfDs and RfCs are derived from epidemiological or animal studies and incorporate uncertainty factors to help ensure that the potential for adverse health effects will not be underestimated.

At this Site, acute toxicity factors were also used to evaluate acute exposures to dust (airborne slag/contaminated soil emissions). The acute toxicity values were referenced by the EPA Air Toxics program from a variety of sources (which are listed in the risk assessment document), and they tend to be used for high-concentration, short-duration events.

Site Groundwater

All risks for the groundwater on Site are outlined in the Final Baseline Human Health Risk Assessment Report dated June 2005 and addressed by the OU1 ROD dated November 2006. Groundwater at the Site is contaminated above drinking water standards. However, there are no current users of contaminated groundwater at the Site. The groundwater data demonstrates a groundwater risk to prohibit groundwater being utilized as a future drinking water supply and (See Record of Decision for OU-1, 11/06 -Table 1 Summary of Potential Risks and Hazards of Concern Sharon Steel Works for Shallow Aquifer, Glacial Till Aquifer, and Gravel Zone in Groundwater) indicate a potential unacceptable cancer risk associated with the use of shallow zone (0 Ft- 30 Ft) or glacial till zone (30 Ft- 70 Ft), and an unacceptable non-cancer hazard in the gravel zone (70 Ft- 120 Ft). As part of the OU1 remedy institutional controls prohibit shallow contaminated groundwater under the entire Site (groundwater underlying OU1 and OU2 areas) from being used for drinking water purposes on Site.

I.1.4 Risk Characterization

In the risk characterization step of the risk assessment, the Site concentrations, exposure assumptions and toxicity factors are combined to produce quantitative estimates of risk.

For acute exposures to dust, those quantitative estimates of risk took the form of margins of exposure ("MOEs"), in which the modeled dust concentrations were divided by the acute toxicity criteria. If an MOE exceeds 1, then the dust exceeds the acute toxicity factor. The MOEs for arsenic, barium, iron, vanadium and nickel ranged from 2 to 20. None of these constituents could be attributed to background. Although the MOE estimates associated with these metals exceed 1, it is important to acknowledge some of the uncertainties associated with the analysis, such as the estimates of exposure (e.g., dispersion modeling rather than direct measurement) and toxicity (e.g., the varying bases of the acute toxicity criteria). The MOE assessment basically indicates that if there were a worst-case, short-term, high-dust event (such as from an extreme weather event), the dust could reach levels of acute concern. While unlikely, this possibility cannot be completely ruled out.

For long-term cancer risks, the quantitative risk estimate is a cancer risk expressed as a probability, as described above. EPA's generally acceptable risk range for Site-related exposure is $1x10^{-4}$ to $1x10^{-6}$. A $1x10^{-4}$ carcinogenic risk means that 1 person in 10,000 would have an increased risk for cancer, while a $1x10^{-6}$ carcinogenic risk means that 1 person in 1,000,000 would have an increased risk for cancer. Current EPA practice considers carcinogenic risks to be additive when assessing exposure to multiple hazardous substances or exposure via multiple pathways.

For long-term non-cancer risks, the quantitative estimates are Hazard Quotients ("HQs") and Hazard Indices ("HIs"). The HQ was defined above. An HQ of 1 or less indicates that a receptor's dose of a single contaminant is less than the RfD or RfC, and that harmful non-cancer effects from a chemical are unlikely. The Hazard Index ("HI") is generated by adding the HQs for all COPCs that affect the same target organ (e.g., liver) within or across those pathways by which the same individual may reasonably be exposed. An HI of 1 or less indicates that harmful non-cancer health effects are not expected as a result of exposure to all of the COPCs within a single or multiple exposure pathway(s). Exceeding an HI of 1 does not necessarily mean that adverse effects are expected, only that they can no longer be ruled out.

The current and potential risk to human health posed by Site conditions at OU2 exceed EPA's acceptable range for non-cancer risks (HI). The updated RME risk estimates for the Northern Slag area are shown in the tables below.

The risks were originally calculated with two different assumptions for chromium: that it was in the hexavalent form, or that it was in the trivalent form. Chromium is sampled as total chromium (thus not distinguishing between trivalent and hexavalent), but the trivalent form is far more common in soil than the more toxic hexavalent form. In the absence of known uses of hexavalent chromium on Site, the much less toxic trivalent form is expected on Site. The risks shown below do not include the risks from hexavalent chromium, which would only further increase the cancer and non-cancer risks. In both the trivalent or hexavalent chromium case, risks posed from metals exceed EPA's acceptable risk goals: the Hazard Index is well above 1, although chromium would only be a chemical of concern if it were in the hexavalent form. Because the interim action for OU2 is a cap, it is expected to address the risk from all metals including chromium, even if the chromium were present in the hexavalent form. As stated above, the BHHRA for the OU2 portion of the Site was updated in 2012 and is part of the

administrative record. These documents can be found in the Administrative Record file for the Site at the information repository maintained at the EPA Docket Room in Region III or at the following EPA website http://loggerhead.epa.gov/arweb/public/advanced_search.jsp.

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The following updated risk estimates were therefore obtained. In the tables below, HI = Hazard Index, CR = Cancer Risk, Ing = Ingestion, Derm = Dermal, and Inhal = Inhalation.

Chronic Risks
Industrial Worker
Surface + Deep Soil

Compound	Ing + Derm HI	Ing + Derm CR	Inhal HI	Inhal CR	Total HI	Total CR
benz[a]anthracene	-	3.00E-07	-	-	-	3.00E-07
benzo[a]pyrene	-	2.00E-06	-	-	-	2.00E-06
benzo[b]fluoranthene	-	9.00E-08	-	-	-	9.00E-08
dibenz[a,h]anthracene	-	6.00E-07	-	-	-	6.00E-07
indeno[1,2,3-c,d]pyrene	-	8.00E-08	-	-	-	8.00E-08
Aroclor 1248	-	1.00E-07	-	-	-	1.00E-07
Aroclor 1254	0.006	8.00E-08	-	-	0.006	8.00E-08
Aroclor 1260	-	1.00E-07	-	-	-	1.00E-07
dieldrin	1.00E-04	4.00E-08	-	-	1.00E-04	4.00E-08
aluminum	0.02	-	0.2	-	0.2	-
arsenic	0.03	4.00E-06	0.03	6.00E-07	0.06	5.00E-06
cadmium	-	-	0.03	4.00E-07	0.03	4.00E-07
cobalt	0.015	-	0.04	8.00E-07	0.06	8.00E-07
iron	0.03	-	-	-	0.03	-
manganese	0.6	-	8	-	9	-
vanadium	0.007	-	-	-	0.007	-
TOTAL	**0.7**	**7E-6**	**8**	**2E-6**	**9**	**1E-05**

APPENDIX A

Construction Worker

Surface + Deep Soil

Compound	Ing + Derm HI	Ing + Derm CR	Inhal HI	Inhal CR	Total HI	Total CR
benz[a]anthracene	-	3.00E-08	-	-	-	3.00E-08
benzo[a]pyrene	-	2.00E-07	-	-	-	2.00E-07
benzo[b]fluoranthene	-	1.00E-08	-	-	-	1.00E-08
dibenz[a,h]anthracene	-	6.00E-08	-	-	-	6.00E-08
indeno[1,2,3-c,d]pyrene	-	9.00E-09	-	-	-	9.00E-09
Aroclor 1248	-	1.00E-08	-	-	-	1.00E-08
Aroclor 1254	0.01	8.00E-09	-	-	0.01	8.00E-09
Aroclor 1260	-	1.00E-08	-	-	-	1.00E-08
dieldrin	4.00E-04	4.00E-09	-	-	4.00E-04	4.00E-09
aluminum	0.04	-	0.2	-	0.2	-
arsenic	0.07	8.00E-07	0.03	2.50E-08	0.1	1.00E-06
cadmium	-	-	0.03	2.00E-08	0.03	2.00E-08
cobalt	0.04	-	0.04	3.00E-08	0.08	3.00E-08
iron	0.1	-	-	-	0.1	-
manganese	1	-	8	-	9	-
vanadium	0.03	-	-	-	0.03	-
TOTAL	**1**	**1E-6**	**8**	**8E-8**	**10**	**1E-6**

APPENDIX A

Trespasser/Visitor
Surface + Deep Soil

Compound	Ing + Derm HI	Ing + Derm CR	Inhal HI	Inhal CR	Total HI	Total CR
benz[a]anthracene	-	2.00E-07	-	-	-	2.00E-07
benzo[a]pyrene	-	1.00E-06	-	-	-	1.00E-06
benzo[b]fluoranthene	-	5.00E-08	-	-	-	5.00E-08
dibenz[a,h]anthracene	-	3.00E-07	-	-	-	3.00E-07
indeno[1,2,3-c,d]pyrene	-	5.00E-08	-	-	-	5.00E-08
Aroclor 1248	-	2.00E-08	-	-	-	2.00E-08
Aroclor 1254	0.002	2.00E-08	-	-	0.002	2.00E-08
Aroclor 1260	-	2.00E-08	-	-	-	2.00E-08
dieldrin	6.00E-05	8.00E-09	-	-	6.00E-05	8.00E-09
aluminum	0.004	-	0.01	-	0.01	-
arsenic	0.007	1.00E-06	0.001	2.00E-08	0.008	1.00E-06
cadmium	-	-	0.002	1.00E-08	0.002	1.00E-08
cobalt	0.004	-	0.002	2.00E-08	0.006	2.00E-08
iron	0.01	-	-	-	0.01	-
manganese	0.2	-	0.4	-	0.6	-
vanadium	0.003	-	-	-	0.003	-
TOTAL	**0.2**	**3E-6**	**0.4**	**5E-8**	**0.7**	**3E-6**

APPENDIX A

Resident HI
Surface + Deep Soil

Compound	Ing + Derm HI	Ing + Derm CR	Inhal HI	Inhal CR	Total HI	Total CR
benz[a]anthracene	-	-	-	-	-	-
benzo[a]pyrene	-	-	-	-	-	-
benzo[b]fluoranthene	-	-	-	-	-	-
dibenz[a,h]anthracene	-	-	-	-	-	-
indeno[1,2,3-c,d]pyrene	-	-	-	-	-	-
Aroclor 1248	-	-	-	-	-	-
Aroclor 1254	0.05	-	0.05	0.007	-	.007
Aroclor 1260	-	-	-	-	-	-
dieldrin	0.001	-	0.001	2e-4	-	.00E-04
aluminum	0.15	0.8	0.95	0.02	0.8	0.8
arsenic	0.2	0.1	0.3	0.03	0.1	0.1
cadmium	-	0.1	0.1	-	0.1	0.1
cobalt	0.1	0.2	0.3	0.02	0.2	0.2
iron	0.4	-	0.4	0.05	-	0.05
manganese	3.5	34.5	38	0.5	34.5	5
vanadium	0.1	-	0.1	0.01	-	.01
TOTAL	**4**	**36**	**39**	**0.6**	**36**	**36**

APPENDIX A

Resident CR

Surface + Deep Soil

Compound	Child Ing + Derm CR		Child Inhal CR		Adult Ing + Derm CR		Adult Inhal CR		Total CR
Age Range/Date	0-2	6Feb	0-2	6-Feb	16-Jun	16-30	16-Jun	16-30	
benz[a]anthracene	2e-6	1e-6	-	-	4e-7	2e-7	-	-	e-6
benzo[a]pyrene	e-6	4e-6	-	-	2e-6	7e-7	-	-	1e-5
benzo[b]fluoranthene	e-7	4e-7	-	-	e-7	7e-8	-	-	1e-6
dibenz[a,h]anthracene	e-6	2.5e-6	-	-	9e-7	4e-7	-	-	8e-6
indeno[1,2,3-c,d]pyrene	6e-7	4e-7	-	-	1e-7	6e-8	-	-	1e-6
Aroclor 1248	e-8	2e-7	-	-	6e-8	8e-8	-	-	4e-7
Aroclor 1254	e-8	1e-7	-	-	4e-8	6e-8	--	-	3e-7
Aroclor 1260	e-8	2e-7	-	-	5e-8	7e-8	-	-	4e-7
dieldrin	e-8	6e-8	-	-	2e-8	3e-8	-	-	1e-7
aluminum	-	-	-	-	-	-	-	-	-
arsenic	3e-6	6e-6	2e-7	4e-7	2e-6	.3e-6	1e-6	1.5e-6	1e-5
cadmium	-	-	1e-7	3e-7	-	-	7e-7	9e-7	2e-6
cobalt	-	-	3e-7	5e-7	-	-	1e-6	2e-6	4e-6
iron							-	-	-
manganese	-	-	-	-	-	-	-	-	-
vanadium	-	-	-	-	-	-	-	-	-
TOTAL	**2e-5**	**1.5e-5**	**6e-7**	**1e-6**	**6e-6**	**5e-6**	**3e-6**	**4e-6**	**4e-5**

Acute risks

Acute risks were evaluated using a margin-of-exposure (MOE) comparison to the acute criteria identified during screening. The MOE for zinc was 0.9 and for aluminum was 1, indicating these chemicals do not exceed their acute concentrations of concern. The other MOEs (for arsenic, barium, iron, vanadium and nickel) ranged from 2 to 20. None of these constituents could be attributed to background. Previously, the total RME acute margin of exposure estimate for all receptors was 80, driven by arsenic, barium, nickel, and vanadium. Although the MOE estimates associated with several metals exceed unity, it is important to consider some of the uncertainties associated with the analysis such as the estimates of exposure (e.g., dispersion modeling) and toxicity (e.g., basis of the acute toxicity criteria). The MOE assessment basically indicates that if there were a worst-case, short-term, high-dust event (such as from an extreme weather event), the dust could reach levels of acute concern. While unlikely, this possibility cannot be completely ruled out.

Conclusion on Risk Characterization

These risks are summarized along with the COC's in the Human Health Risk Summary Table 1 in the Northern Slag Area with Slag and Soil below.

Table 1: Human Health Risk Summary in the Northern Slag Area Slag and Soil for OU2

Receptor	Cancer Risk	HI	Chemicals of concern
Industrial worker	1E-05	9	Non-cancer hazard due to Aluminum and Manganese. Potential acute effects due to Arsenic, Barium, Iron, Nickel, Vanadium.
Construction worker	1E-06	10	
Adult resident	*	36	
Child resident	*	39	
Total adult and child	4E-05	n/a	
Trespasser/visitor	3E-06	0.7	

*The total cancer risk of 4E-05 reflects a long-term exposure that includes years of exposure in both childhood and adulthood.

I.1.4.1 Cancer Risk

For slag and contaminated soil, the Human Health Risk Assessment found that the carcinogenic risks from potential exposure to slag were within EPA's acceptable range of 1E-6 to 1E-4, as presented in Table 1, assuming the chromium is not in hexavalent form.

I.1.4.2 Non-Cancer Risk from Slag

The non-carcinogenic risks from slag and contaminated soil resulted in a total Hazard Index (HI) above 1 for workers and residents. For long-term exposure, aluminum and manganese in the slag and soil were the chemicals that contributed most significantly. For potential acute exposures to dust, the chemicals of concern were arsenic, barium, iron, nickel, and vanadium.

As a result of these non-cancer hazards, EPA has identified these seven metals as chemicals of concern: aluminum, arsenic, barium, iron, nickel, vanadium and manganese. Although iron is not a hazardous substance, EPA finds that, at this Site the levels detected, iron is a pollutant or contaminant that may present an imminent and substantial danger to the public health or welfare of the United States pursuant to 40 C.F.R. §300.400(a)(2).

I.1.4.3 Uncertainty in Risk Characterization

Risk assessment provides a systematic means of organizing, analyzing, and presenting information on the nature and magnitude of risks posed by contaminant exposures. Uncertainties are present in all risk assessments because of the quality of available data and the need to make assumptions and develop inferences based on incomplete information about existing conditions and future circumstances. To support decision-making processes, significant uncertainties in the risk assessment are discussed in this section and in greater detail in the HHRA documents. The greatest sources of uncertainty were discussed above and include:

Uncertainty about acute exposures: the likelihood of acute high-dust events, and the appropriate MOE; in this case the bias is probably high, to ensure protectiveness;

Uncertainty about chromium: EPA believes chromium is not predominantly hexavalent in OU2 slag and soil. This assumption carries a low bias, but the remedy would incidentally address chromium in either case. Therefore, the remedy is still protective;

Uncertainty associated with data analysis: This is expected to be minimal, since the data were fully validated prior to use in the risk assessment;

Uncertainty in the COPC screening process: While chemicals without toxicity factors were omitted from the risk assessment, producing a low bias in that instance, the other general assumptions used in the COPCs selection process were conservative (biased high) to ensure true COPCs were not eliminated from the quantitative risk assessment and that the most reasonable risk was estimated.

Exposure assessment is a mix of high-end and average values which are designed to produce an overall reasonable maximum exposure ("RME"). RME exposures are intended to protect most receptors in most situations; they may represent higher than average exposures, but not the worst possible case.

Toxicological information such as RfDs and slope factors inherently carry uncertainty. The uncertainty results from extrapolating animal data to humans, extrapolating carcinogenic effects from the laboratory high-dose to the environmental low-dose scenarios, and variations in toxicological endpoints for interspecies and intra-species.

I.2 Ecological Risk Assessment

Like a Human Health Risk Assessment, an Ecological Risk Assessment (ERA) serves to evaluate the potential for risks due to exposure to Site contaminants specific to ecological receptors (such as wildlife, fish, and plants). Since the ERA evaluates many species that have drastically different exposure pathways, the ERA can appear complicated. Numerous environmental processes and ecological receptor groups (part of which are referred to as "assessment endpoints") are evaluated, and there are differences in contaminant exposures and sensitivity to contaminants between groups. For example, wildlife are mainly exposed through their diet while soil organisms are exposed through direct contact with the soil in which they live. The complexity of the ERA arises from the need to evaluate the important exposure pathways to the relevant receptors. The toxicology varies between the different ecological groups. In addition, some contaminants are effectively transferred through the food chain, bioconcentrating and ultimately posing risks, while other contaminants are not transferred because they are metabolized, biologically regulated or simply not absorbed.

The ecological risk assessment for the Sharon Steel Site evaluated all of the habitats across the entire Site. Subsequent to the completion of the risk assessment, the Site was split into Operable Units 1 and 2. The ERA process followed for the Site is described in the following paragraphs.

Superfund Site-specific ERAs are conducted using an eight-step process which minimally consists of two tiers of evaluation: a Screening Level ERA ("SLERA" - steps 1 and 2) and the Baseline ERA ("BERA" - steps 3 through 7). Step 8 is a risk management step. The function of the SLERA is to determine if the potential for unacceptable risk exists and if a BERA is necessary, along with which contaminants should be evaluated further. A SLERA uses published conservative toxicity benchmarks found in literature for water, sediment and soil, and compares Site concentrations to these benchmarks.

The BERA begins with the results of the SLERA and with problem formulation, which establishes the goals, breadth and focus of the investigation. It also establishes the assessment endpoints, which are the "explicit expressions of the ecological values to be protected." The assessment endpoints can also be viewed as the adverse effect(s) that the contaminant(s) from a Site may have on ecological receptors or communities that should be addressed by remedial actions at a Site. The questions and issues to be addressed in the BERA are defined based on potentially complete exposure pathways and ecological effects. Ultimately through the risk assessment process information is generated through literature reviews and field studies, results are compiled and conclusions are reached regarding whether or not the Site poses risk to ecological receptors.

As part of the ecological risk assessment, a conceptual Site model (CSM) is developed that identifies the relationships between exposure and effects. The CSM for the Sharon Steel Farrell Works Site illustrates that the primary sources of chemical contaminants are the slag piles and the BOF sludge pile. Contaminants originate from the northern and southern slag piles and the BOF sludge pile which migrate to the various habitat types (upland, wetland, and open water) through wind erosion, runoff, infiltration and deposition, where soil and benthic invertebrates, fish and other organisms may be

exposed. The potential risk exists where organisms are exposed to contamination directly (e.g., benthic invertebrates living in contact with contaminated sediments, fish contacting contaminated sediments/surface water and/or earthworms and other burrowing organisms living in contact with soil), as well as when organisms higher in the food chain consume organisms lower in the food chain that have been in contact with contamination and stored contamination in their bodies (e.g., benthic invertebrates may store contaminants, then a spotted sandpiper eats the invertebrates). In general, the SLERA for the Site identified PAHs, PCBs and inorganic compounds exceeding benchmarks in sediment, soil and water.

A total of 15 assessment endpoints were evaluated for the Sharon Steel Site. Five were related to direct exposure, three related to bioaccumulation of contaminants in tissue and seven related to exposure to contamination through the food chain for both terrestrial and aquatic receptors. Of the 15 assessment endpoints evaluated, only six (endpoints: 1, 2, 10, 9, 4, and 12) were determined to be at potential risk from Site related contaminants (see Table 3 and 4). Four of these assessment endpoints are based on the comparison of Site-specific media data (soil, sediment, and surface water) to ecologically-relevant benchmarks (protective of plants, soil invertebrates, aquatic communities, and benthic invertebrates), representing direct exposure pathways. The remaining two assessment endpoints (terrestrial vermivore and benthivore) are based upon food chain consumption of soil invertebrates and benthic invertebrates respectively.

In general, soil exposure pathways of concern for assessment endpoint 1 (protection of plant communities) and assessment endpoint 2 (protection of soil invertebrate communities) were identified for the following habitats: shrub-scrub, forested riverine floodplain – Shenango River; shrub-sapling floodplain; forested riverine floodplain – Unnamed Tributary (assessment endpoint 1 only). Chemicals of concern for these habitats included several inorganic compounds, total PAHs, and endrin metabolites.

Sediments exposure pathways of concern for assessment endpoint 10 (protection of benthic invertebrate communities) were identified for the following habitats: palustrine emergent wetland; wetland pond habitats; and both open water habitats – Unnamed Tributary and Shenango River. Chemicals of concern for these habitats included inorganic compounds, several individual PAHs, some SVOCs, PCBs, and pesticides.

Surface water exposure pathways of concern for assessment endpoint 9 (protection of aquatic communities) were identified for the following habitats: small wetland and slag pond habitats; and both open water habitats – Unnamed Tributary and Shenango River. Chemicals of concern for these habitats include several inorganic compounds.

Assessment endpoint 4 (protection of vermivores) is based upon Site-specific bioaccumulation earthworm studies to estimate the chemical concentration in earthworm tissue. The estimated tissue concentration is then used in the exposure model for the short-tailed shrew and American robin. Exposure pathways of concern were identified in the following habitats: shrub-scrub; forested riverine floodplain – Shenango River; shrub-sapling floodplain; forested riverine floodplain – Unnamed Tributary; and shrub-scrub palustrine wetland. Chemicals of concern for these habitats included inorganic compounds, several individual PAHs, and dioxins/furans.

Assessment endpoint 12 (protection of benthivores) is based upon estimated benthic invertebrate tissue concentrations. A sediment to invertebrate biotransfer factor (BTF) was used to estimate chemical concentration levels in benthic invertebrates. This value was then used in the exposure model for the spotted sandpiper. Exposure pathways of concern were identified in the following habitats: palustrine emergent wetland; wetland pond habitats; and both open water habitats – Unnamed Tributary and Shenango River. Chemicals of concern for these habitats include inorganic compounds, SVOCs, individual PAHs, and some pesticides.

I.2.1 Summary of Site-Related Ecological Risk

In summary, the evaluation of the assessment endpoints for each habitat of concern at the Site indicated that all habitats contained contaminated media that present a risk to ecological communities. The primary sources of the contaminants are the Northern and Southern Slag Piles and the BOF Sludge Area. The habitat-specific results from the BERA as they specifically pertain to Operable Unit 2 are as follows.

Northern and Southern Slag Piles and BOF Sludge Area

Although not evaluated in the BERA because it is not considered a viable habitat, it has been determined that the slag piles are, or have been, the primary source of contamination in adjacent habitats. The piles and sludge are relatively barren because of the physical and chemical nature of the slag. Because of the nature of these wastes, little to no soil is available for plant communities to become established. Where soil does exist on the piles, the chemical contamination associated with the slag or sludge, often prohibits the establishment of any plant community. Therefore, remediation of the slag piles and sludge area had become the primary focus of the FS, subsequent investigations, and Records of Decision.

Shrub-Scrub Upland Habitat

In the shrub-scrub upland habitat the plant community is likely adversely impacted by direct exposure to metals, PAHs, and dioxins. The BOF Sludge Area is located within this habitat. Beyond the sludge area, no overt visible signs of plant toxicity were observed. However, plants species which had recolonized this area are likely to be resistant to the contaminants in the surface soil. The soil invertebrate population is likely adversely impacted by metals in surface soils. Finally, the **vermivores** are likely impacted by food-chain exposure to metals from surface soils. Metals appear to be the key risk drivers in the shrub-scrub upland habitat.

Forested Riverine Floodplain Habitat – Shenango River

In the forested riverine floodplain habitat, the plant community does not appear to be adversely impacted by physical or chemical stressors. Metals, PAHs, and pesticides are present in surface soils from all areas of this habitat at levels that present a direct exposure risk to soil invertebrates and food chain exposure risk to vermivore communities. Repeated, unsuccessful efforts to collect earthworm samples indicate that the soil invertebrate community is meager. Metals appear to be the key risk drivers in the forested riverine floodplain habitat.

I.2.2 OU2 Ecological Risk Evaluation

OU2 is part of what was identified as the "Slag Piles/Industrialized Area Habitats" in the June 2005 Final Remedial Investigation Report and Final Baseline Ecological Risk Assessment for the Sharon Steel Farrell Works Site. The slag piles/industrialized area is an area where slag had been historically disposed of at the Site. In addition, processed slag materials are stored on OU2.

As noted above, the slag piles are known sources of contamination at the Site. The majority of OU2 is an active industrial/storage area. The area of OU2 adjacent to the Shenango River is comprised of forested riverine floodplain habitat. The area between the floodplain and the active areas of the OU is being invaded by pioneer species such as quaking aspen (*Populus tremuloides*), sumac (*Rhus sp.*), and other successional species, as are other smaller areas within the unit. In the event that operations at OU2, including the operation of an asphalt plant and trucking business were to be discontinued, these pioneer species would likely be the first to dominate as part of the shrub-scrub upland habitat present at the Sharon Steel Site.

Currently, the few disposal areas not significantly impacted by the industrial activities at OU2 are still open piles of gravel, rock, and boulder size pieces of slag with limited vegetation. Since these areas and the operational areas of the unit were essentially void of usable ecological habitat, they were not considered to be exposure areas in the BERA.

In order to evaluate the potential risk associated with just the area now known as OU2, the sample results from locations within the unit were evaluated. These locations were either situated within the Shenango River Floodplain or the Slag Pile/Industrialized Area. The sample results were evaluated by comparing the maximum concentrations detected in each area with the critical concentrations (i.e., ecological toxicity reference values) developed for ecological receptors within the Forested Riverine Floodplain Habitat – Shenango River or the Shrub-Scrub Upland Habitat for the Slag Pile/Industrialized Area. Table 3 shows the ecological risk calculation for the surface soil in the floodplain associated with OU2. Table 4 shows the ecological risk calculation for the surface soil in the scrub shrub habitat associated with OU2.

The ecological risk evaluation indicated potential risk is posed by OU2 floodplain soils to plants, soil invertebrates, and vermivorous birds. The alternatives for the floodplain were evaluated and selected as part of the OU1 ROD. The primary risk drivers were chromium, iron, and manganese for plants; iron for invertebrates; and, chromium and PAHs for vermivorous birds. The upland soils pose a potential risk to the same receptors as the floodplain soils. The primary risk drivers were also chromium, iron, and manganese for plants; iron for invertebrates; and, PAHs for vermivorous birds.

I.2.3 Conclusion of Risk Assessments

EPA has concluded that the human health risk to industrial and construction workers, future residents (if Site use were unrestricted), and nearby current residents exceeds the acceptable non-carcinogenic risk due to inhalation of dust from metals in the slag and contaminated soil. The metals that are chemicals of concern are: arsenic, barium, iron, nickel and vanadium, aluminum and manganese. In addition, EPA has concluded that runoff from contaminated slag areas poses an unacceptable risk to surface water and sediments. Lastly, metal contamination from the slag infiltrates the shallow groundwater at OU2 and may negatively affect the groundwater remedy addressed in the OU1 ROD.

The ecological risk evaluation indicated potential risk is posed by OU2 floodplain soils to plants, soil invertebrates, and vermivorous birds. The alternatives for the floodplain were evaluated and selected as part of the OU1 ROD. The primary risk drivers were chromium, iron, and manganese for plants; iron for invertebrates; and, chromium and PAHs for vermivorous birds. The upland soils pose a potential risk to the same receptors as the floodplain soils. The primary risk drivers were also chromium, iron, and manganese for plants; iron for invertebrates; and, PAHs for vermivorous birds.

EPA has determined that the interim action selected in this Interim 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. This interim action is intended to achieve a significant reduction of risk posed by the slag and contaminated soil.

APPENDIX A

Table 3: Contaminants of Concern and their Ecological Risk-Based Critical Concentrations in Surface Soil
OU2 Forested Riverine Floodplain Habitat

COPC	Maximum Concentration	Plants		Soil Invertebrates		Vermivorous Mammals		Vermivorous Birds	
		Critical Concentration	Hazard Quotient	Critical Concentration	Hazard Quotient	Critical Concentration	Hazard Quotient	Critical Concentration	Hazard Quotient
INORGANICS (mg/kg)									
Aluminum	30700	pH <5.5	N/A	6180	5	NR	N/A	NR	N/A
Arsenic	13.3	NR	N/A	NR	N/A	10.6	1.25	NR	N/A
Cadmium	2	NR	N/A	NR	N/A	5.8	0.34	7.7	0.26
Chromium	283	1.8 - 31	9.13	NR	N/A	NR	N/A	29.4	9.63
Copper	93.1	10 - 100	0.931	50 - 100	0.93	NR	N/A	NR	N/A
Iron	54700	500 - 1000	54.7	280	195	NR	N/A	NR	N/A
Lead	66	110	0.60	1682	0	NR	N/A	61	1.09
Manganese	2780	500	5.56	1067 - 2836	1	NR	N/A	NR	N/A
Mercury	0.2	NR	N/A	NR	N/A	0.3	0.67	0.073	2.74
Vanadium	56.3	2.5 - 50		NR	N/A	NR	N/A	NR	N/A
Zinc	490	58.8 - 1087	0.45	120	4	3199.6	0.15	416.8	1.18
ORGANICS (ug/kg)									
ACENAPHTHENE	100	Evaluated as Total PAHs		Evaluated as Total PAHs		NR	N/A	46	2.17
ACENAPHTHYLENE	300					NR	N/A	46	6.52
ANTHRACENE	510					NR	N/A	43	11.86
BENZO(a)ANTHRACENE	1200					NR	N/A	37	32.43
BENZO(a)PYRENE	1100					NR	N/A	35	31.43
BENZO(b)FLUORANTHENE	1100					NR	N/A	34	32.35
BENZO(g,h,i)PERYLENE	770					NR	N/A	32	24.06
BENZO(k)FLUORANTHENE	1000					NR	N/A	34	29.41
CHRYSENE	1100					NR	N/A	37	29.73
DIBENZO(a,h)ANTHRACENE	350					NR	N/A	32	10.94
FLUORANTHENE	1900					NR	N/A	40	47.50
FLUORENE	330					NR	N/A	45	7.33
INDENO(1,2,3-c,d)PYRENE	730					NR	N/A	32	22.81
PHENANTHRENE	1200					NR	N/A	43	27.91
PYRENE	1900					NR	N/A	40	47.50
Total PAHs	13590	NR	N/A	5280	3	NR	N/A	N/A	N/A
Endrin aldehyde	19.0	10.5	1.81	10.5	2	NR	N/A	NR	N/A
4,4'-DDT	100	NR	N/A	NR	N/A	NR	N/A	25	4.00

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Calculated using maximum concentrations from locations SS50-1, SS51-1, and SS-52-1.
Where a range of critical concentrations is provided, the high end of the range was utilized to calculate the hazard quotient.
The following ecological risk Table 4 shows the risk calculation in surface soil scrub shrub upland habitat.

Table 4: Contaminants of Concern and their Ecological Risk-Based Critical Concentrations in Surface Soil
OU2 Scrub Shrub Upland Habitat

COPC	Maximum Concentration	Plants		Soil Invertebrates		Vermivorous Mammals		Vermivoro
		Critical Concentration	Hazard Quotient	Critical Concentration	Hazard Quotient	Critical Concentration	Hazard Quotient	Critical Concentration
INORGANICS (mg/kg)								
Arsenic	23	NR	N/A	NR	N/A	10.6	2.17	30.6
Chromium	276	1.8 - 31	8.90	32 - 625	0.44	NR	N/A	NR
Copper	32.2	10 - 100	0.32	50 - 100	0.32	171.6	0.19	304
Iron	51200	500 - 1000	51.20	280	182.86	NR	N/A	NR
Lead	30	110	0.27	1682	0.02	1908	0.02	61
Manganese	4920	500	9.84	1067 - 2836	1.73	NR	N/A	NR
Nickel	19.6	NR	N/A	200	0.10	NR	N/A	NR
Selenium	1.2	0.5 - 4	0.30	NR	N/A	2.4	0.50	2.7
Vanadium	72.6	2.5 - 50	1.45	23 - 127.3	0.57	NR	N/A	NR
Zinc	280	58.8 - 1087	0.26	120	2.33	3199	0.09	416.8
ORGANICS (ug/kg)								
ACENAPHTHYLENE	100	Evaluated as total PAHs		Evaluated as total PAHs		NR	N/A	46
ANTHRACENE	390					NR	N/A	43
BENZO(a)ANTHRACENE	1400					NR	N/A	37
BENZO(a)PYRENE	690					NR	N/A	35
BENZO(b)FLUORANTHENE	1000					NR	N/A	34
BENZO(g,h,i)PERYLENE	380					NR	N/A	32
BENZO(k)FLUORANTHENE	910					NR	N/A	34
CHRYSENE	1800					NR	N/A	37
DIBENZ(a,h)ANTHRACENE	200					NR	N/A	32
FLUORANTHENE	2500					NR	N/A	40
FLUORENE	150					NR	N/A	45
INDENO(1,2,3-c,d)PYRENE	410					NR	N/A	32
PHENANTHRENE	520					NR	N/A	43
PYRENE	2600					NR	N/A	40
Total PAHs	13050	NR	N/A	5280	2.47	NR	N/A	N/A

APPENDIX A

Calculated using maximum concentrations from locations SB04-2, SB05-2, SB06-2, SB07-1, and SB07-2.
Where a range of critical concentrations is provided, the high end of the range was utilized to calculate the hazard quotient.

I.3 Basis for Remedial Action

In summary, the HHRA and SLERA for OU-2 demonstrated the presence of unacceptable risks to human health and the environment. EPA determined that this interim remedial actions is necessary to reduce the risks to. Therefore, it is EPA's determination that implementation of the interim action Selected Remedy identified in this ROD is necessary to protect human health and the environment from actual or threatened releases of hazardous substances. This interim action is intended to achieve a significant reduction of risk posed by the slag and contaminated soil.

J. Remedial Action Objectives ("RAOs")

The following Remedial Action Objectives ("RAOs") were developed to protect human health and the environment from current and potential future risk of contamination in OU2

- Prevent dermal and ingestion exposure to slag, for the industrial workers, trespassers, and nearby or potential future residents.
- Prevent inhalation of dust in air above health-based action levels so that Site conditions do not pose an unacceptable risk for the industrial workers, trespassers, and nearby or potential future residents.
- Reduce future migration of chemicals into shallow groundwater in order to avoid negatively impacting the OU-1 groundwater remedy.
- Reduce surface runoff including storm water and discharge of source materials from the Site into the Shenango River.
- The purpose of the selected interim action is to address contaminated metals in the slag and contaminated soil that pose an unacceptable risk to human health.

K. SUMMARY OF REMEDIAL ACTION ALTERNATIVES

Summary of Alternatives

During the OU2 FS, various alternatives[2] were evaluated to address exposure to slag, contaminated soils and dust; prevent/reduce the migration of contaminants into the groundwater at the Site, and reduce surface runoff and subsequent discharge of contaminants into the Shenango River. This evaluation was based on the information gathered during the RI. EPA's interim action is ***Alternative 3- Install Asphalt Cap or Asphalt Equivalent Cap at the two businesses on Site, and implement Institutional Controls***

EPA has determined that alternative 3 will effectively address slag and contaminated soil that poses an unacceptable risk to human health.

Several alternatives evaluated in the FS did not meet the criteria of protecting human health and the environment. Therefore, they are not discussed in detail in this Interim Record of Decision for OU2. Further information about the rejected alternatives can be obtained from the FS Report in the Administrative Record.

Each remaining alternative, except the "no action" alternative, contains common elements that were considered in the evaluation process. The following section is a summary of the cleanup alternatives[2] evaluated that, if implemented would achieve RAOs compared to taking no action.

[2] These alternatives were evaluated under the 2007 OU2 Feasibility Study (FS). In the OU2 Feasibility Study, option 10a in the FS is option 2a in this Record of Decision, option 10b in the FS is option 2b in this Interim Record of Decision and option 11 in the FS is option 3 in this Interim Record of Decision. In addition, a Cost Estimate supplement for OU2 was completed in November, 2011. All

Alternative 1 - No Action

Capital Cost:	$0
Annual Operation and Maintenance (O&M) Costs:	$0
Total O&M Costs:	$0
*Total **Present Worth Cost**:*	$0
Time to Implement:	0 years

Under this alternative, no remedial measures would be implemented at OU2 to prevent exposure to the waste slag and sludge and contaminated dust and soil. The "no action" alternative was evaluated because the NCP requires that a "no action" alternative be developed as a baseline for evaluating other remedial alternatives.

This alternative would not reduce human health and ecological risks to acceptable levels and is therefore not protective of human health and the environment; this alternative would also not meet ARARs.

Alternative 2a – Purchase of Two Properties, Relocate Impacted Businesses and Move Equipment of Two Businesses to new location, Construction of a Biosolids and Compost Cap, Institutional Controls and Demolition of Buildings

Under this alternative, the two properties would be purchased and the two businesses would be relocated. The expense of moving the businesses and their equipment to their new location would also be included. In this alternative, the buildings on Site would be demolished and a soil cover system would be created by mixing ***Class A biosolids and compost*** with native slag material to create a new soil cover.

Class A biosolid is formed by wastewater treatment processes at local wastewater treatment plants. The treatment provided by the biosolids and compost cap would reduce the mobility of metals by creating physical complexes that bind metals in the slag. The biosolids and compost cover would also allow re-vegetation of the Site and thus would create a protective cover over the contaminated slag and sludge. This vegetative cover would (1) prevent contact with the slag and sludge, (2) prevent the migration of slag dust from the Site, (3) minimize groundwater ***infiltration*** and leaching of contamination from the slag and sludge which would result in a reduction of contaminated surface water runoff and contaminated shallow groundwater to the Shenango River.

Any future land use would have to be coordinated with EPA to ensure protection of the remedy. This alternative also includes erosion protection measures to prevent the erosion of slag and soil into the Shenango River.

Additionally, institutional controls would be implemented on Site to ensure that the biosolid cap is not damaged. The operation and maintenance would include maintaining the vegetative cap.

Capital Cost:	$3,931,010.75
Annual O&M Costs:	$30,295
Total O&M Costs:	$908,843
Total Present Worth Cost:	$4,839,853
Time to Implement:	*Up to 2 years*

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these documents are part of the administrative record and available at following EPA website http://loggerhead.epa.gov/arweb/public/advanced_search.jsp.

Alternative 2b – Purchase of Two Properties and Relocate Impacted Businesses, Appraise and Pay for the Businesses' Equipment, Demolish Buildings, Construct a Biosolids and Compost Cap, and Implement Institutional Controls

Under this alternative, the two properties would be purchased and the two businesses would be paid for their equipment and to relocate their businesses. This alternative varies from Alternative 2a only in that the businesses would be paid for their equipment, enabling the business to buy new equipment after they relocate. In this alternative, the buildings on the Site would be demolished, and a cover system would be created by mixing ***Class A biosolids and compost*** with native slag material to create a new soil cover. This alternative would also implement erosion protection measures to prevent the erosion of slag and sludge into the Shenango River and the wetland/pond area. Additionally, institutional controls would be implemented on Site to ensure that the biosolid cap is not damaged.

Capital Cost:	$6,014,860.75
Annual O&M Costs:	$30,295
Total O&M Costs:	$908,843
Total Present Worth Cost:	$6,923,703.75
Time to Implement:	*Up to 2 years*

Alternative 3- Construction of an Asphalt Cap or Asphalt Equivalent Cap at the Two Businesses Located on this Property, and Institutional Controls

Under this alternative, an asphalt cap or asphalt equivalent cap instead of a biosolid cap shall be constructed over all slag on the two properties on OU2 where the two businesses on the Site are located in order for the businesses to continue to operate.

An EPA visual inspection and the remedial investigation data indicated approximately seven acres are exposed slag on OU2 and would have to be paved with asphalt. An asphalt cap or asphalt equivalent cap shall be used in pavement of the approximately six acres on the Dunbar Property (6 acres of the 27 acres) and approximately one acre on the William Brothers property (1 acre of the 6 acres).

The confirmation sampling of the capped areas for the other approximate 21 acres on the Dunbar property and approximate 5 acres on the William Brothers property shall be conducted through boring sampling outlined in the Performance Standard Section in M.2 of this ROD to determine if there is slag present. All slag and contaminated soils shall be covered by an asphalt or asphalt equivalent cap (See Figures 3 & 4).

An Operation and Maintenance Plan will be included as part of design determining the frequency of inspection of the capped areas and the time period necessary to correct a breach with any component of the cap. This alternative shall prevent contact with the slag and contaminated soil, prevent the migration of slag dust from the Site, reduce groundwater infiltration, and reduce leaching of contamination from the slag which shall reduce surface water contaminated runoff and shallow contaminated groundwater to the Shenango River.

Additionally, institutional controls shall be implemented on Site to restrict land use which shall prevent damage to the asphalt and asphalt-equivalent caps for OU-2.

Capital Cost:	$1,948,449.75
Annual O&M Costs:	$30,000
Total O&M Costs:	$900,000
Total Present Worth Cost:	$2,848,449
Time to Implement:	*1.5 Years*

K.1 SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

In the FS, EPA evaluated the alternatives to determine which alternative would be the most effective in achieving the goals of CERCLA, and in particular, achieving the RAOs established for the Site. EPA uses nine criteria to evaluate cleanup alternatives in order to select a remedy. Below is a description of each of the nine criteria set forth in the NCP at 40 CFR §300.430(e)(9)(3). These nine criteria can be categorized into three groups: threshold criteria, primary balancing criteria, and modifying criteria. An alternative must satisfy the threshold criteria to be further considered.

Threshold Criteria

1. *Overall Protection of Human Health and the Environment*

   Overall protection of human health and the environment addresses whether a remedy provides adequate protection to human health and the environment and describes how risks are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

2. *Compliance with Applicable or Relevant and Appropriate Requirements ("ARARs")*

Section 121(d) of CERCLA and the NCP §300.430(f)(1)(ii)(B) require that remedial actions at CERCLA Sites at least attain legally applicable or relevant and appropriate Federal and State requirements, standards, criteria, and limitations which are collectively referred to as "ARARs," unless such ARARs are waived under CERCLA section 121(d)(4).

Applicable requirements are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under Federal environmental or State environmental or facility siting laws that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance found at a CERCLA Site. Only those State standards that are identified by a state in a timely manner and that are more stringent than Federal requirements may be applicable. Relevant and appropriate requirements are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under Federal environmental or State environmental or facility siting laws that, while not "applicable" to a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA Site address problems or situations sufficiently similar to those encountered at the CERCLA Site that their use is well-suited to the particular Site. Only those State standards that are identified in a timely manner and are more stringent than Federal requirements may be relevant and appropriate.

Compliance with ARARs addresses whether a remedy will meet all of the applicable or relevant and appropriate requirements of environmental statutes, regulations, and/or whether there are grounds for invoking a waiver.

Primary Balancing Criteria

3. *Long-term Effectiveness and Permanence*

Long-term effectiveness and permanence refers to expected residual risk and the ability of a remedy to maintain reliable protection of human health and the environment over time, once clean-up levels have been met. This criterion includes the consideration of residual risk that will remain onsite following remediation and the adequacy and reliability of controls.

4. *Reduction of Toxicity, Mobility, or Volume through Treatment*

Reduction of Toxicity, Mobility, or Volume through Treatment refers to the anticipated performance of the treatment technologies that may be included as part of a remedy.

5. *Short-term Effectiveness*

Short-term Effectiveness addresses the period of time needed to implement the remedy and any adverse impacts that may be posed to workers, the community and the environment during construction and operation of the remedy until cleanup levels are achieved.

6. *Implementability*

Implementability addresses the technical and administrative feasibility of remedy from design through construction and operation. Factors such as availability of services and materials, administrative feasibility, and coordination with other governmental entities are also considered.

7. *Cost*

The cost includes estimated capital (startup) costs, as well as operation and maintenance costs. They are usually combined and presented as the Total Net Present Worth Cost.

Modifying Criteria

8. *State Acceptance* indicates whether, based on its review of supporting documents and the Interim Record of Decision, the State supports, opposes, or has no comment on the preferred alternative.

9. *Community Acceptance* will be assessed in the ROD following a review of public comments received on the Proposed Plan and supporting documents included in the Administrative Record.

Overall Protection of Human Health and the Environment

Overall protection of human health and the environment addresses whether each alternative provides adequate protection of human health and the environment and describes how risks posed through each exposure pathway are eliminated, reduced, or controlled, through treatment, engineering controls, and/or institutional controls.

The "no action" alternative (Alternative 1) does not meet this threshold criterion. Without any remedial action, human health risks through inhalation and direct contact with contaminants in the waste slag and sludge will remain. Exposure and risk could increase over time due to continued migration of slag/soils and percolation of precipitation through the source material to groundwater.

Alternatives 2a, 2b, and 3 all provide a sufficient level of protection to human health or the environment through the use of source control and institutional controls. Alternative 2a and 2b, would provide protection to the industrial workers on Site by relocating the two businesses and restricting future land use to industrial activity only. Alternative 2a and 2b would also implement institutional controls to not damage the biosolid cap. Alternative 3 protects the workers by covering the contaminants with a cap.

Alternative 3 will be protective of human health by removing the direct contact, ingestion and inhalation pathways because a physical barrier will be placed between the public (including Site workers) and the contaminated slag. Institutional controls and a maintenance program will ensure the continued integrity of the barrier. Alternative 3 will prevent further infiltration of contaminants into the groundwater so as to not

negatively affect the OU1 remedy for the groundwater. The asphalt cap or asphalt equivalent cap will prevent additional source materials from contaminating groundwater. It will also control additional storm water runoff related to an impervious surface (asphalt cap). The asphalt cap or asphalt equivalent cap will also help by reducing the infiltration of storm water through the contaminated slag. A maintenance program will ensure the continued integrity of the barrier.

Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)(Refer to Table 5 ARARs)

Alternative 1, the no action alternative, is not required to meet ARARs because it is not a remedial action. Alternatives 2a, 2b, and 3 must comply with all the ARARs set forth in Table 5.

All of the remedial alternatives have potential impacts of the Shenango River; therefore, the ARARs will apply to each alternative.

Since RCRA hazardous waste is not located on the Site, RCRA Subtitle B and C do not apply to any of the remedial alternatives.

The applicable portions of Pennsylvania's waste management regulations are applicable or relevant and appropriate requirements for alternatives 2a, 2b, and 3. Alternatives 2a, 2b, and 3 are each able to comply with all of these ARARs. No waivers are proposed.

Long-Term Effectiveness and Permanence

The evaluation of alternatives under this criterion considers whether the alternative will maintain protection of human health and the environment over time, usually measured in one or more decades. The evaluation takes into account the residual risk remaining from untreated waste at the conclusion of remedial activities, as well as the adequacy and reliability of containment systems and institutional controls.

The cover systems proposed in these alternatives would all require some routine monitoring and maintenance to maintain its integrity.

Alternatives 2a and 2b because the property owners would be relocated would provide the best degree of long-term effectiveness and permanence because they would provide a permanent solution (relocation, capping and erosion protection).

Alternative 3 would provide a solution (asphalt cap or asphalt-equivalent cap) and not interfere with the current operations of the businesses located on the Site. The OU2 area at the Sharon Steel Site will be implemented as an interim remedy in order to address the current exposure of the on Site workers to slag and contaminated soil material. The selected interim action, Alternative 3 will be effective in the short term by capping areas of slag and contaminated soil and it will be effective in the long term through maintenance and institutional controls.

Reduction in Toxicity, Mobility, or Volume through Treatment

This evaluation criterion addresses the ***statutory*** preference for selecting remedial actions that employ treatment technologies that permanently or significantly reduce the toxicity, mobility, or volume of hazardous substances as their principal element.

Alternatives 2a, 2b, and 3 would all provide for reductions in mobility of contaminants to the groundwater by limiting infiltration and decreasing the discharge of groundwater into the Shenango River and the wetlands.

The biosolids and compost cover used in Alternatives 2a and 2b would reduce infiltration of metals into the groundwater and provide treatment of metals by the biosolids and compost binding with the slag material to reduce mobility and toxicity of metals. The ***Benchscale Treatability Study*** conducted as part of the FS demonstrated reduced leachability and toxicity for slag material that was supplemented with biosolid materials from local sources. In addition, Alternatives 2a and 2b would promote the rapid establishment of a native habitat which would reduce erosion and surface migration of the cover material itself. Evapotranspiration of vegetation reduces the amount of water available to infiltrate the cap; organic material added to the cap via the vegetation increases the adsorptive capacity of the cap material.

Alternative 3 will reduce the mobility of the contaminants by providing a physical barrier between contaminated materials and potential receptors. The remedy will not reduce the toxicity or volume of the contaminants.

Short-Term Effectiveness

This evaluation criterion addresses the effects of the alternatives during the construction and implementation phase until remedial action objectives are met. The criterion considers risks to the community and to on-Site workers. It also considers available mitigation measures, as well as the time frame for the attainment of the response objectives.

The cap/cover alternatives (Alternatives 2a, and 2b and 3) would require regrading the slag located on Site, Alternatives 2a and 2b require transport of biosolids and compost from local facilities, which could increase traffic and noise.

Alternatives 2a and 2b require relocation of the businesses, which could take up to two years to implement.

Alternative 3 would require the least amount of material to be imported to the Site because asphalt is a material produced on Site. As a result, Alternative 3 would be completed faster than any of the other alternatives. The capping activities will require the use of heavy equipment including on and off-road equipment. The risks associated with the use of this equipment (traffic, Site disruption) will be minimal. The limited areas being capped will further minimize these risks.

Implementability

The evaluation of alternatives under this criterion considers the technical and administrative feasibility of implementing an alternative and the availability of services and materials required during implementation. Each of the alternatives is implementable, and the services and materials required for each alternative are available. However, some alternatives would be more difficult to implement than others.

Alternatives 2a and 2b are technically feasible. There is an abundance of Class A biosolid material and compost available from local sources to implement this remedial action. However, relocating the businesses would be dependent upon finding other suitable locations, which may not be available.

Alternative 3 is the most technically feasible given the possibility of using local asphalt materials. It would also take the least amount of time to complete. Implementing this cleanup remedy will be relatively simple from a technical standpoint. Technically, the placement of asphalt capping material and asphalt equivalent capping materials on Site are both very straightforward activities. The capping approach can be phased with Dunbar Asphalt's operation so that exposed slag is capped first and other areas on the property that need to fulfill the performance criteria can be completed in phases. In addition, institutional controls will be implemented to protect the asphalt cap. This cleanup approach will be cost effective and cover any remaining slag present on

the surface and serve as a barrier against storm water infiltration. This cleanup approach will meet EPA's stated goals of reducing inhalation and dermal risk and reducing the migration of contaminants into the shallow groundwater. An Operation and Maintenance Plan identifying the frequency of periodic Site inspections, and repairs as needed, will ensure the integrity of the cap and the permanence of the approach.

Cost

The Alternative Cost Summary Table (See Table 2 below) summarizes the capital, annual O&M, and total present worth costs for each alternative. The total present worth is based on an O&M time period of 30 years for an engineered cover system and environmental monitoring. For additional details on the cost estimate breakdown, see the Administrative Record. The cost of cleanup alternative 3 will depend heavily on the market price of asphalt components, specifically oil, and the availability and location of the asphalt or asphalt equivalent materials for the cap on the northern portion of the Dunbar and William Brother's property. In addition, the cost estimate for cleanup alternative 3 is based on capping seven out of the thirty three acres of OU2 with an asphalt or asphalt equivalent cap. There is a potential for an increase of costs for alternative 3 if more slag is identified with the confirmation sampling of the twenty six areas in OU2 outlined in section M.2. The limited area impacted by this cleanup approach and the comparatively lower oil prices and availability of asphalt and asphalt equivalent capping materials on Site will decrease the total cost when compared to the other alternatives proposed in the FS.

Table 2
Alternative Cost Comparison Table

Alternative No.	Description	Capital Cost	Annual O&M Cost	Total O&M Present Worth (30 years)	Total Present Worth (30 years)
1	No Action	$ 0	$ 0	$ 0	$ 0
2a	Purchase of Two Properties and Relocation of Businesses and Equipment, Construction of a Biosolid Cap, Erosion Protection, Demolition of Buildings, Institutional Controls	$3,961,010.75	$30,295	$908,843	$4,869,853
2b	Purchase of Two Properties and Relocation of Businesses, Appraising and Paying the Two Businesses the Cost of their Equipment, Construction of a Biosolid Cap, Erosion Protection, Institutional Controls, Demolition of Buildings	$6,044,860.75	$30,295	$908,843	$6,953,703.75
3	Construction of an Asphalt Cap at the property of the two businesses on Site, Institutional Controls	$1,978,449.75	$30,000	$900,000	$2,878,449

Alternatives 2a and 2b are by far the most expensive alternatives to implement. These costs are primarily attributable to the relocation costs and the purchase of equipment under Alternative 2a and 2b. Alternative 3 is the least expensive of the protective alternatives.

State Acceptance

The Pennsylvania Department of Environmental Protection ("PADEP") concurs with EPA's Selected Remedy for the Site; a concurrence letter was received by EPA on August 12, 2013 with the following conditions: and the Department will have the opportunity to review and concur before any modification to this Interim ROD and the issuance of an Explanation of Significance Difference and concurrence with the remedy should not be interpreted as acceptance of on-Site Operation and Maintenance by the Department. State O & M obligation will be determined during design of the remedy and the completion of a Superfund State Contract. (Appendix B).

Community Acceptance

EPA conducted a public meeting for the Proposed Plan on October 4, 2012 at 6:30 pm at the Farrell City Building. EPA's Preferred Alternative was well received by those in attendance. Questions and concerns that were raised during the public meeting along with EPA's responses are provided in Section III of this Interim ROD, the Responsiveness Summary. Additional comments that were submitted to EPA during the comment period are also addressed in the Responsiveness Summary.

L. Principal Threat Waste

The NCP establishes an expectation that EPA will use treatment to address the principal threats posed by a Site wherever practicable (40 C.F.R. § 300.430(a)(1)(iii)(A)). The principal threat concept is applied to the characterization of source materials at a Superfund Site. A source material is material that includes or contains hazardous substances, pollutants or contaminants that act as a reservoir for migration of contamination.

Slag is the principal threat waste at the Site. Principal threat wastes are those source materials considered to be highly toxic or highly mobile, which would present a significant risk to human health or the environment should exposure occur. In this case, the metals in the slag are highly mobile through the air with an inhalation risk and through mobility in the shallow groundwater.

The use of treatment technology for OU2 (application of biosolid vegetative cap for OU1), could not be utilized for the principal threat waste (contaminated slag and soil at OU2) because the businesses operations would destroy the biosolid vegetative cap and if this remedy was selected EPA, would have to shut down the current operation of the two businesses on the OU2 parcel. Contact with principal threat wastes is prevented with all alternatives through capping.

M. SELECTED REMEDY

Following consideration of the requirements of CERCLA, a detailed analysis of the alternatives using the nine criteria set forth in the NCP, and careful review of public comments, EPA has selected, Alternative 3:

Construction of an Asphalt Cap or Asphalt Equivalent Cap and Institutional Controls for implementation at the Sharon Steel Farrell Works Superfund Site OU2.

Alternative 3, Total Present Worth = $2,848,449

The interim selected remedy includes the following:

1. Capping OU2 to prevent erosion of slag from the Site negatively impacting the Shenango River and

adjacent habitats.

2. Asphalt will be used in pavement of the estimated six acres on the Dunbar Property (6 acres of the 27 acres) and estimated one acre on the William Brothers property (1 acre of the 6 acres).

3. Confirmation sampling of the capped areas for the other estimated 21 acres on the Dunbar property and estimated 5 acres on the William Brothers property will be conducted through boring sampling outlined in section M.2 of this ROD to determine if there is additional slag present. All slag will be covered by an asphalt or asphalt equivalent cap (See Figure 3 and 4). The elevation and grade of the capped areas and non-capped areas in OU2 shall promote site drainage and minimize erosion.

4. An Operation and Maintenance Plan will be included as part of the design determining storm water control, the frequency of inspection of the capped areas and what time period is necessary to correct a breach with any component of the cap. This alternative shall (1) prevent contact with the slag and contaminated soil, (2) prevent the migration of slag dust from the Site, and (3) reduce groundwater infiltration and leaching of contamination from the slag which would reduce surface water contaminated runoff and shallow contaminated groundwater to the Shenango River so as to not negatively affect the groundwater remedy in OU1 for the Site.

5. Land use restrictions and institutional controls will be documented in a Land Use Control Assurance Plan ("LUCAP") to protect the integrity or the asphalt cap of asphalt equivalent cap. The LUCAP will include controls for OU2.

6. The OU2 institutional controls are for land use restrictions to protect the asphalt cap or asphalt equivalent cap.

M.1 Summary of the Rationale for the Selected Remedy

Overall, based on the currently available information, EPA selects that Alternative 3 for the following reasons:

- It provides the most cost-effective means to achieve the RAOs established for the Site, reduces risk to human health to acceptable levels, and meet the ARARs for the Site.

- It is the most easily implemented alternative available and offers the greatest combination of short-term benefits with minimal short- and long-term adverse impacts. This alternative could be implemented faster than the other alternatives, because it does not require relocation of the businesses and there is sufficient asphalt material readily available for the cover.

- It would allow the two businesses to continue their operation on their property and would require the least maintenance in the long-term. In addition, residential exposure to contamination will be prevented.

M.2 Performance Standards

<u>Performance Standards for the Cover System</u>

1. Conduct sampling to identify the lateral and vertical extent of slag throughout the OU2 area (specified in Figures 3 & 4) where an asphalt cap, or asphalt equivalent cap, will be constructed.
    a. Move aggregate piles temporarily as necessary to accomplish such sampling.

b. Conduct continuous split spoon sampling until native soils are reached in each borehole location.
c. Measure the permeability of the subsurface in all boreholes where slag is present.

2. Construct an asphalt cap, or asphalt equivalent cap, above all slag present in the OU2 area, including that identified pursuant to the sampling in 1 above.
   a. The asphalt cap, or asphalt equivalent cap, shall have a permeability less than 1×10^{-7} cm/sec in order to minimize the migration of rainwater through the asphalt cap or asphalt equivalent cap.
   b. The cap shall promote drainage, minimize erosion, and require minimum maintenance.

3. The elevation and grade of the capped areas and non-capped areas in OU-2 shall promote site drainage and minimize erosion.

4. Control storm water flow in OU2 to minimize impacts to the Shenango River.

5. Prohibit activities, unless approved by EPA in consultation with PADEP, that could damage the asphalt cap or asphalt equivalent cap areas placed in the OU2 areas (specified in Figures 3 and 4) described in 2 above through the implementation of institutional controls.

M.3 Expected Outcome of the Selected Remedy

The Selected Remedy for an interim action presented herein will prevent current and potential future exposure to contaminated slag and soil through a combination of containment and institutional controls. This interim remedy will utilize containment to address contaminants in Site media to the maximum extent practicable and so that the two businesses on Site can continue their operations.

N. STATUTORY DETERMINATIONS

This selected interim action is protective of human health and the environment and is intended to provide adequate protection until a final ROD for the Site is signed, complies with Federal and State requirements that are applicable or relevant and appropriate (ARARs for the selected remedy are presented in Table 5) to this limited-scope action, and is cost-effective. The OU2 area at the Sharon Steel Site will be implemented as an interim remedy in order to address the current exposure of the on Site workers to slag and contaminated soil material. EPA will issue a final remedy for OU2 in the future.

This action is an interim solution only, and is not intended to utilize permanent solutions and alternative treatment (or resource recovery) technologies to the maximum extent practicable for this operable unit. Because this action does not constitute the final remedy for the Site, the statutory preference for remedies that employ treatment that reduces toxicity, mobility, or volume as a principal element may be addressed by the final response action.

Because this remedy will result in hazardous substances, pollutants, or contaminants remaining on-Site above levels that allow for unlimited use and unrestricted exposure, a review will be conducted within five years after initiation of remedial action to ensure that the selected interim remedy continues to be protective of human health.

N.1 Protection of Human Health and the Environment

The asphalt cap called for in Alternative 3 will (1) prevent direct contact with the slag and contaminated soil through both dermal contact and through ingestion, (2) prevent the airborne migration of slag dust from the Site, (3) minimize groundwater infiltration and leaching of contamination from the slag so that the OU2 area does not negatively impact the OU1 groundwater remedy, and (4) the OU2 cleanup alternative would reduce source

materials contaminating surface water runoff into the Shenango River. Based on the information currently available, EPA has determined that the Selected interim Remedy for the contaminated slag and soil is protective of human health and the environment and is cost effective. Exposure levels will be reduced within EPA's acceptable risk range.

N.2 Compliance with Applicable or Relevant and Appropriate Requirements

Section 121(d) of CERCLA and the NCP §300.430(f)(1)(ii)(B) require that remedial actions at CERCLA Sites at least attain legally applicable or relevant and appropriate Federal and State requirements, standards, criteria, and limitations which are collectively referred to as "ARARs," unless such ARARs are waived under CERCLA section 121(d)(4).

Applicable requirements are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under Federal environmental or State environmental or facility siting laws that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance found at a CERCLA Site. Only those State standards that are identified by a state in a timely manner and that are more stringent than Federal requirements may be applicable. Relevant and appropriate requirements are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under Federal environmental or State environmental or facility siting laws that, while not "applicable" to a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA Site address problems or situations sufficiently similar to those encountered at the CERCLA Site that their use is well-suited to the particular Site. Only those State standards that are identified in a timely manner and are more stringent than Federal requirements may be relevant and appropriate.

Compliance with ARARs addresses whether a remedy will meet all of the applicable or relevant and appropriate requirements of environmental statutes, regulations, and/or whether there are grounds for invoking a waiver.

The interim action in the Selected Remedy for OU2 will comply with ARARs (See Table 5).

N.3 Cost Effectiveness

Cost effectiveness is determined by evaluating the remedy's long-term effectiveness and permanence; reduction in toxicity, mobility, or volume through treatment; and short-term effectiveness. If the overall cost of the remedy is proportional to its overall effectiveness, then it is considered to be cost effective. The cost estimate for the interim action for cleanup alternative 3 is based on capping seven out of the thirty three acres of OU2 with an asphalt or asphalt equivalent cap. There is a potential for an increase of alternative 3 if any more slag is identified with the confirmation sampling of the twenty six areas in OU2 outlined in section M.2. The Selected Remedy satisfies the criteria listed above because it offers a containment solution through capping of contaminants in slag and soil onsite with an asphalt cap available on Site or asphalt equivalent cap, reducing toxicity of metals in slag dust, and reducing mobility of metals to the shallow groundwater so as to not negatively impact the OU1 groundwater remedy and is effective in both the short term and long term. Therefore, the interim action in the Selected Remedy is cost effective.

N.4 Utilization of Permanent Solutions to the Maximum Extent Practicable

The interim action will prevent exposure to Site contaminants by human and ecological receptors and will cover any remaining slag present on the surface and serve as a barrier against groundwater infiltration while the businesses continue to operate. The interim action remedy will reduce the mobility of the contaminants by providing a physical barrier between contaminated materials and potential receptors. Institutional controls will be implemented to protect the asphalt cap.

The selected interim action will be effective in the short term by capping areas of slag and contaminated soil and it will be effective in the long term through maintenance and institutional controls. The asphalt cap or asphalt equivalent cap will require maintenance to ensure integrity. The interim action remedy will be protective in the short term because this remedy would require the least amount of material to be imported to the Site because asphalt is a material produced on Site by one of the businesses. As a result, this interim action remedy would be completed faster than any of the other alternatives and will be cost effective.

This cleanup approach will meet EPA's stated goals of reducing inhalation risk and reducing the migration of contaminants into the shallow groundwater. EPA has determined that the interim action in the Selected Remedy represents the maximum extent to which permanent solutions and treatment are practicable at the Site. When compared to the other protective alternatives that were evaluated, EPA has determined that the interim action in the Selected Remedy provides the best balance of tradeoffs in terms of the five balancing criteria, as well as the preference for containment as a principal element so that two businesses onsite can operate. The interim action remedy has State and community acceptance.

N.5 Preference for Treatment as a Principal Element

Slag is the principal threat waste at the Site. Principal threat wastes are those source materials considered to be highly toxic or highly mobile, which would present a significant risk to human health or the environment should exposure occur. In this case, the metals in the slag are highly mobile through the air with an inhalation and dermal risk and through mobility of metals in the slag in the shallow groundwater.

The use of treatment technology for OU2 (application of biosolid vegetative cap for OU1), could not be utilized for the principal threat waste (contaminated slag and soil at OU2) because the businesses operations would destroy the biosolid vegetative cap and if this remedy was selected, EPA would have to shut down the current operation of the two businesses on the OU2 parcel. This asphalt capping remedy will avoid negatively impacting the OU1 groundwater remedy and utilize containment to reduce the toxicity, mobility, and volume of contaminants in Site media to the maximum extent practicable so that the two businesses on Site can continue their operations safely.

N.6 Five-Year Review Requirements

CERCLA (42 U.S.C. § 9621 (c)) and the NCP (40 C.F.R. § 300.430(f)(4)(ii) provide the statutory and legal bases for conducting Five Year Reviews. The interim action in the Selected Remedy will result in hazardous substances remaining onsite above levels that allow for unlimited use and unrestricted exposure. Therefore, a statutory review will be conducted within five years after initiation of the Remedial Action to ensure the remedy is, or will be, protective of human health and the environment.

N.7 Documentation of Significant Changes

The Proposed Plan for OU2 was released for public comment on September 17, 2012. The public comment period for the Proposed Plan was held from September 17, 2012 to November 19, 2012. EPA held a public meeting on October 4, 2012 to present the Preferred Alternative for OU2 in the Proposed Plan. EPA has reviewed and responded to verbal and written comments submitted during the public comment period in Part III of this ROD, the Responsiveness Summary. The selected remedy for OU2 in this Interim Record of Decision is contingent upon the businesses operating. The remedy that was selected for OU1 on this Site does not work with the current operations of the two businesses on Site and would have put them out of business.

The remedy in the Proposed Plan (September 13, 2012) is the same cleanup option outlined in this Interim ROD but this Interim ROD specifies the performance criteria in section M.2, including confirmation sampling required for the asphalt cap or asphalt equivalent cap for the OU2 area in more detail than the proposed plan. The cost estimate for cleanup option 3 is based on capping seven out of the thirty three acres of OU2 with an asphalt or asphalt equivalent cap. There is a potential for an increase of option 3 if any more slag is identified with the confirmation sampling of the other twenty six areas in OU2 outlined in section M.2. In addition, the Residual Waste Landfill ARAR was found to be applicable and added as an ARAR for this Interim ROD but did not have an impact on the selected remedy. PADEP also agreed that the Residual Waste Landfill ARAR was applicable to the Sharon Steel Site. Lastly, the groundwater institutional controls were removed from this Interim Record of Decision for OU2 because the institutional controls to prohibit use of shallow contaminated groundwater for drinking water use for the entire groundwater on the Site were already included in the Sharon Steel Farrell Works 2006 OU1 ROD.

Glossary

Administrative Record: EPA's official compilation of documents, data, reports, and other information about a Superfund Site and which forms the basis of EPA's decisions about the Site. The record is placed in the information repository to allow public access to the material.

Air/dust dispersion model: A computer model used to study and predict the transport of air or transport of dust in the air.

Applicable or Relevant and Appropriate Requirements (ARARs): Standards, requirements, or criteria established under federal and state environmental law that are determined to be legally applicable or are relevant for the Site cleanup work.

Aquifer: A layer of rock or soil that can supply usable quantities of ground water to wells and springs. Aquifers can be a source of drinking water and provide water for other uses as well.

Artesian conditions: When a confined aquifer contains groundwater that will flow upwards out of a well without the need for pumping.

Background levels: The concentration of a substance in an environmental media (air, water, or soil) that is not related to the contaminated Site. Background levels may occur naturally or may be the result of non-Site human activities.

Benchscale treatability study: A small study conducted in a laboratory to test the effectiveness of a remedial treatment or innovative technology on contaminated Site materials.

Bioaccumulation: accumulation of substances, such as pesticides, or other organic chemicals in an organism.

Bio-engineered bank stabilization techniques: Techniques that are designed (or engineered) to stabilize or re-build the banks of rivers and streams to prevent erosion. These techniques include erosion blankets, planting vegetation, and bank reconstruction.

Biosolid: Solid, semi-solid, or liquid materials generated from primary, secondary, or advanced treatment wastewater or sewage, often used as fertilizer.

Capital costs: The total purchase price.

Carcinogen: An agent which causes or contributes to the production of cancer.

Class A biosolids: Biosolids that contain very low levels of pathogens, or agents that cause disease. To achieve Class A certification, biosolids must undergo heating, composting, digestion or increased pH that reduces pathogens to low levels.

Code of Federal Regulations (CFR): The codification of federal rules and regulations. For example, the citation 40 C.F.R. 260 means Title 40 of the Code of Federal Regulations, Part 260.

Compost: A mixture of decaying organic matter, such as from leaves and manure, used to improve soil structure and provide nutrients.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA): A federal law passed in 1980 and modified in 1986 by the Superfund Amendments and Reauthorization Act (SARA) and in 2002 by the Brownfields Amendments. The Act created a Trust Fund, known as the Superfund, to investigate and clean up abandoned or uncontrolled hazardous waste Sites.

Confining bed: A hydrogeologic unit comprised of impermeable or distinctly less permeable material that bounds or restricts one or more groundwater aquifers.

Contaminant: Any physical, chemical, biological, or radiological substance or matter above background in air, water, or soil.

Ecological communities: Groups of plant and animal life.

Erosion: A process or group of processes (including weathering, dissolution, abrasion, corrosion, and transportation) by which loose or consolidated earth materials are dissolved, loosened or worn away and moved from one place and deposited in another.

Feasibility Study (FS): A report that identifies and evaluates alternatives for addressing the contamination that presents unacceptable risks at a Superfund Site.

Floodplain: An area that borders a body of water (e.g., river) and is subject to flooding.

Glaciated: Formed by the process of glaciation or a geological phenomenon in which massive ice sheets form in the Arctic and Antarctic and advance toward or away from the equator.

Groundwater: The water beneath the earth's surface that flows through the soil and rock openings and often serves as a source of drinking water.

Hazard Index (HI): A numeric representation of non-cancer risk. An HI exceeding one (1) is generally considered an unacceptable non-cancer risk. A Hazard Index for a pathway or Site is often obtained by adding the ***Hazard Quotients*** of individual chemicals.

Hazard Quotient (HQ): The estimated dose or concentration of a chemical from Site-related exposure divided by the acceptable, or Reference, dose or concentration. HQs for chemicals that affect the same receptor and the same target organ are added to calculate a total Hazard Index.

Infiltration: The process by which water on the ground surface enters the soil.

Institutional controls: Non-engineered instruments such as administrative and/or legal controls that minimize the potential for human exposure to contamination by limiting land or resource use.

Low-permeability: Having a low ability to allow the passage of a liquid, such as water, through rocks.

Maximum Contaminant Levels (MCLs): Enforceable standards for public drinking water supplies under the Safe Drinking Water Act. These standards apply to specific contaminants which EPA has determined have an adverse effect on human health above certain levels.

National Oil and Hazardous Substances Pollution Contingency Plan (NCP): The federal regulations found at 40 C.F.R. Part 300 that provides the organizational structure and procedures for preparing for and responding to discharges of oil and releases of hazardous substances, pollutants and contaminants under the Superfund

program.

National Priorities List (NPL): EPA's list of the nation's top priority hazardous waste Sites that is eligible to receive federal money for response under CERCLA.

Organic Compound: A carbon-based material.

Pathways: Routes which contaminants may follow as they move by gravity or ground water flow. In addition, an exposure pathway is the route a contaminant takes in reaching a potential receptor, such as a person, animal or plant.

Porous: Degree to which soil, gravel, sediment, or rock is permeated with pores or cavities through which water or air can move.

Present worth costs: The sum of the present values of the annual cash flows minus the initial investment.

Promulgated: When a law receives final formal approval.

Interim Record of Decision (ROD): A public document that describes the interim remedial actions selected for a Superfund Site, why certain remedial actions were chosen as opposed to others, and how much they will cost. It summarizes the results of the Remedial Investigation and Feasibility Study reports and the comments received during the comment period for the Proposed Plan. A final remedy for the Site will be addressed by a final response action by a final ROD in the future.

Remedial Action (RA): The actual construction or implementation phase of a Superfund Clean-up following plans for a Remedial Design (RD).

Remedial Action Objectives (RAO): The goals of a remedial action.

Remedial Investigation (RI): A study which identifies the nature and extent of contamination at a Superfund Site and forms the basis for the evaluation of environmental and human health risks posed by the Site.

Remedial Investigation/Feasibility Study (RI/FS): A report composed of two scientific studies, the RI and the FS. The RI is the study to determine the nature and extent of contaminants present at a Site and the problems caused by their release. The FS is conducted to develop and evaluate options for the cleanup of a Site.

Resource Conservation and Recovery Act (RCRA): A federal law that established a regulatory system to track hazardous waste from the time of generation to disposal including requirements for treating, transporting, storing and disposing of hazardous waste.

Risk Assessment: A human health or ecological evaluation process which provides a framework for determining the potential health hazards from contamination at a Site.

Screened: Slotted to keep out soil particles while allowing water to flow freely. Groundwater well casings are screened.

Sediment: Soils, sand and minerals washed from land into water.

Slag: Soil-like material left as a residue from the smelting of metallic ore. A by-product of the steel industry.

Sludge: Semi-solid material. A solid by-product of the steel making process. At the Site, the sludge is a powdery-fine, rust-colored solid.

Statutory: Enacted, regulated, or authorized by a statute.

Superfund: The common name used for CERCLA.

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Table 5 Applicable or Relevant and Appropriate Requirements (ARARs)

Requirement	Legal Citation	Classification	Summary of Requirement	Comments
1. Pennsylvania Water Quality Standards	25 Pa. Code, Chapter 93.6, 93.7, 93.8	Applicable	Sets forth criteria for pollutants to protect designated uses of water bodies.	Storm water discharges from the Site to surface waters and wetlands must not cause a violation of these substantive standards.
2. Pennsylvania Water Quality Toxics Management Strategy	25 Pa. Code Chapter 16	Relevant and Appropriate	Sets forth guidelines and procedures for development of criteria for toxic substances and also lists those Site-specific criteria which have been developed.	Substantive provisions more stringent than Clean Water Act/National Recommended Water Quality Criteria are relevant and appropriate to all Site activities that could involve discharge into surface water.
3. Pennsylvania Uniform Environmental Covenants Act	25 Pa. Code Chapter 253.2, 253.3, 253.4	Applicable	Provides a standardized process for creating, documenting and assuring the enforceability of activity and use limitations on contaminated Sites.	Substantive, applicable requirements may apply whenever an engineering or institutional control is used to demonstrate the attainment of an Act 2 remediation standard for any cleanup conducted under an applicable Pennsylvania environmental law.
4. Fugitive Particulate Matter	25 Pa. Code Chapter 123.1 and 123.2	Applicable	Establishes particulate matter requirements.	Substantive standards may apply to remedial alternatives that emit fugitive air contaminants into the outdoor atmosphere.
5. Erosion and Sediment Control	25 Pa. Code Chapters 102.4, 102.11 and	Relevant and Appropriate	Requires preparation of an erosion and sediment control plan for	Substantive standards apply to construction

	102.22		activities involving land clearing, grading and other earth disturbances and establishes erosion and sediment control criteria. No plan will be submitted since this a procedural requirement, but any substantive standards shall be met.	activities at the Site which disturb any ground surface, including clearing, grading and excavation, to extent they are more stringent than federal requirements.
6. Pennsylvania Flood Plain Management Act Regulations	25 Pa. Code Chapter 106.31 - .32	Relevant and Appropriate	Standards relating to construction, earthmoving, filling and excavation within 100-year flood plain, wetlands and regulated water.	The substantive standards of subsections 106.31 and 106.32 apply because the Site is in the Shenango River floodplain and associated wetlands.
7. Discharge of Storm Water	40 CFR 122.26 40 CFR 122.44(h)(iv)(4)	Applicable	Storm water from the Site would fall within the definition of storm water discharge associated with industrial activity.	Storm water runoff from the Site remediation may result in runoff to the Shenango River. Any such runoff must be controlled to comply with the substantive requirements.
8. Federal Clean Air Act Emission Standards	NAAQs: 40 C.F.R. Part 50	Applicable	Establishes National ambient air quality standards for particulate matter.	Fugitive dust emissions generated during remedial activities will be controlled in order to comply with these regulations.
9. Pennsylvania Air Pollution Control Act	25 Pa. Code, Chapter 123 (including 123.1; 123.2; 123.31; 123.41) and 131 (including 131.1 – 131.4)	Applicable	Establishes requirements for fugitive dust emissions and other limitations for visible emissions (Chapter 123) and ambient air quality standards for discharges of air pollutants (Chapter 131).	Substantive standards more stringent than federal standards may apply in design of treatment processes.

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10. Residual Waste Landfills	25 Pa. Code Chapter 288.234	Applicable	Establishes requirements for a cap system	The substantive requirements of the specific subchapter listed apply to design, construction or maintenance of the asphalt or asphalt equivalent cap.
11. Residual Waste Landfill	25 Pa. Code Chapter 288.236	Applicable	Establishes requirements for revegetation on land affected by residual waste landfills	The substantive requirements of the specific subchapters listed apply to land affected by residual waste landfills.
12. Residual Waste Landfill	25 Pa. Code Chapter 288.291 and 288.292	Applicable	Establishes requirements for closure and post closure care of a cap system.	The substantive requirements of the specific subchapter listed apply to the closure and post closure plans for residual waste landfill

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PART III - THE RESPONSIVENESS SUMMARY

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III. RESPONSIVENESS SUMMARY

This section summarizes the questions and comments received during the public comment period for the Sharon Steel Farrell Works Superfund Site. The Proposed Plan was released for public comment on October 4, 2012. The notice of the availability of these documents was published in the Sharon Steel Herald and Sharon Steel Vindicator on September 17, 2012 and November 5, 2012 respectively. The public comment period was held from September 17, 2012 to November 19, 2012. EPA hosted a Public Meeting on October 4, 2012 from 6:30 p.m. - 8:30 p.m. in the Council Chambers of the City Building located at 500 Roemer Boulevard, Farrell, PA 16121 to present the Proposed Plan and take public comments.

A. Questions Raised During the October 4, 2012 Public Meeting

Question 1: A participant in the public meeting asked, how did EPA decide where you were going to divide OU-1 from OU-2 on the Sharon Steel Site? Another commenter also asked: How long have the two businesses been on Site? Did they buy the place and was it some time ago?
EPA Response: Operable Unit 1 (OU-1) addresses approximately two-hundred- ninety acres in the Northern and Southern areas of the Site. The remedy for OU-1 is a biosolids vegetative cap. OU-1 addresses the Site excluding the OU-2 parcel where the two businesses are located. Both businesses have been there since the 1960's and own their parcels. The operations of these businesses were not consistent with the application of the biosolids cap that was selected for OU-1. Relocating the businesses, which EPA considered, would be difficult and not cost-effective. Therefore, EPA has selected an asphalt cap or material equivalent to asphalt for the OU-2 area on Site that would accomplish the goal of covering the contaminated material while allowing the established businesses to continue their operations. The decision was based on current use.

Question 2: A citizen asked whether EPA has to submit the proposed plan to PADEP to get their approval on it?
EPA Response: PADEP contact, Gary Mechtly responded by stating that EPA gave the proposed plan to PADEP and that they were in agreement with the EPA cleanup for OU-2. PADEP also provided a list of regulations to EPA for review and EPA included these regulations in the ARAR's section of the Record of Decision. PADEP includes their most stringent requirements to include in the ARAR's, and EPA is required to use them as cleanup standards if they are more stringent than federal laws and regulations. In addition, PADEP stated that they provided a concurrence letter to EPA documenting their agreement with the cleanup for OU-2.

Question 3: A participant in the public meeting asked whether the OU-1 Phase 1 plan and cleanup is completed and the OU-1 Phase 2 plan and cleanup completed? Another participant asked whether there is a schedule for work at the Site.
EPA Response: The Record of Decision for OU1 was written and the design for the OU1 Phase 1 was completed as well. EPA is waiting for funding for OU1. Any NPL Site that requires federal funding to pay for the selected remedy must be evaluated by the National risk Based Priority Panel to determine its risk level versus other Sites which require funding. The OU-1 remedy was previously evaluated by the Panel and a risk ranking has been established. Due to the comparative level of risk and the availability of funding, the OU-1 selected remedy has not yet received funding. The design for OU1 Phase 2 has not been completed because the prospective purchaser party has not completed mining the slag for OU1 in the southern half of the Site. There is only one Record of Decision for OU1 Phase 1 and Phase 2.

Question 4: A citizen asked if the slag produced by Dunbar Asphalt was contaminated? Do they wash the slag and sell it?
EPA Response: The asphalt company makes asphalt from the raw materials, so, EPA's understanding is that they are not selling the contaminated slag from the Site.

Question 5: A participant asked what does Farrell Slag (Prospective Purchaser Party south of Ohio Street) use the slag for?
EPA response: OU1 Phase 2 addresses the parcel south of Ohio Street. Currently there is a Prospective Purchaser Party who is reusing the slag on the southern half of the Site. Farrell Slag is the party who mines the slag and uses it in a mixture for asphalt. Once it is solidified in that form, the metals are bound up in the material. Farrell Slag will leave four feet of slag behind at the Site when it finishes operations, and then EPA will place the OU1 remedy, a vegetative biosolid cap, in this area.

Question 6: A participant in the public meeting asked what is the nature of the two facilities at OU2 that are operating in relation to where the cap is going to be placed? Are the parties participating or cooperating or are they actually participating in providing the asphalt? How do you persuade the two businesses to fund the cleanup?
EPA Response: After the Interim Record of Decision is finalized, EPA will then negotiate the implementation of the cleanup with the two businesses.

Question 7: A citizen asked whether there are any more responsible parties besides the two businesses on Site.
EPA Response: Sharon Steel Corporation is a responsible party but is not financially viable.

B. Stakeholder Comments

The following written comments were received directly from attorney, Robert Thomson, on behalf of the Dunbar Asphalt Plant in a letter dated October 16, 2012 questioning the Air Dispersion Modeling Analysis, and citing issues in Appendix A and B.

EPA responses are provided by the EPA technical staff and the EPA Remedial Project Manager .

Comment 1: The air model assumed all contaminants are absorbed onto/into dust particles

EPA Response: The model assumes that when the wind mobilizes particles of slag, the concentration of the contaminants in the dust is the same as the concentration of the contaminants in the slag. This is not necessarily a conservative assumption, but is believed to be reasonably protective. Furthermore, since most of the contaminants were metals, PCBs and PAHs which are not considered to be volatile, it was reasonable to assume that they were adsorbed onto the dust particles.

Comments 2, 3, & 4: The air model assumed the following: That the facility remains dry and exposed at all times; that erosion potential is restored after each event and that effects of precipitation and vegetation are ignored.

EPA Response: There was little to no vegetation reported at the Site, and no guarantee that the Site would be vegetated in the future. The model assumed that the sampled material would be exposed; this does not constitute all the material on the Site. Dryness was assumed in generating emissions, and this part of the model was conservative. Meteorological data from the area were considered in the dispersion part of the model.

While material that is subject only to wind disturbance may have a somewhat lower erosion potential than that assumed by the model, any active disturbance of the material (e.g., from human or animal activities) would be underestimated by this assumption in the model. Therefore, EPA considered this a protective but reasonable assumption.

Actual contaminant data from the storage areas were used in the emissions estimation model. A grain-size analysis was performed on surface soils which showed that a significant percentage of the surface material was in the 0-75 um size range, which is the most susceptible to wind erosion. Since erodible material was proven to be present at the Site, the standard emission estimation procedures found in document AP-42, Section 13.2.5 – Industrial Wind Erosion, were applied with the assumption that the surface soils were uncovered, dry, devoid of vegetation, and continuously erodible to strong winds.

Comment 5: The air model assumed that a disturbance occurs every hour.

EPA Response: Because the meteorology is evaluated on an hourly basis, the erodibility of the material was also evaluated on an hourly basis. The actual assumption of the model is that the material is "continuously erodible," as described above.

Comment 6: The air model assumed that slag contaminant concentrations are uniform at the highest concentration.

EPA Response: For the Phase I air modeling analysis, it was conservatively assumed that the concentrations of contaminants present in the slag/sludge at the Site were uniformly distributed across all storage areas, and that for each contaminant they were equal to the highest concentration of that contaminant found anywhere on Site in either the Phase I or II soil sampling. However, for the Phase II

air modeling analysis, the measured soil concentrations were examined for spatial variations among the three storage areas, as well as among the various sampling locations within each storage area, so that the emissions estimates were more realistic. The slag areas were subdivided into smaller subareas (polygons), and the emissions estimates were based on the area-weighted polygon concentrations.

Comment 7: EPA assumed toxic effects are additive; Hazard Indexes (HIs) were summed and Margin of Exposures (MOEs) were summed.

EPA Response: EPA added together the risks from multiple chemicals present at the site. This is called "assuming additive." However, EPA did not assume that all chemical risks were additive, only those that affected the same target organs. For example, the risks from a chemical that affected the nervous system would be added to the risks from another chemical that also affected the nervous system. But the risks from that chemical would not be added to risks from a chemical that affected the kidney.

The risks from chemicals are often truly additive in this way. On the other hand, sometimes chemicals act antagonistically toward one another, so that the effects of one "cancel out" the effects from another. Assuming additivity overestimates risks for that kind of antagonistic interaction. But chemicals can also interact through potentiation or synergism, where they increase one another's toxicity, to a degree beyond the simple sum of the risks. Additivity underestimates those sorts of effects.

Because the interactions of multiple chemicals in the environment are complex and cannot always be predicted, EPA must choose an assumption when considering the total risks from multiple chemicals. EPA could assume potentiation and synergism (the most protective assumption, but which could exaggerate risks), or antagonism (at the risk of being underprotective), or addivity (the middle-of-the-road assumption). In the absence of more specific evidence, EPA defaults to additivity.

For further discussion of this topic, see Section 8.2.2 of Risk Assessment Guidance for Superfund ("RAGS"), Volume I, Part A.

Comment 8: Background was not considered; Contaminant of Potential Concerns (COPCs) were selected without considering background.

EPA Response: Background was not considered in the selection of initial COPCs, the chemicals that receive detailed evaluation in the risk assessment. However, background, where available, was considered at the end of the risk assessment (see, e.g., Section 6 of the risk assessment). Those chemicals that contributed to unacceptable risk were assessed for possible attribution to background. Chemicals attributed to background were then footnoted on RAGS D Table 10s (Risk Assessment, Appendix I) and were called out in, e.g., Table 7-1 of the risk assessment, and OU-1 ROD Table 1, and were not part of the basis for taking action. Pages 6-4 through 6-7 of the risk assessment describe the detailed statistical analysis, the conclusions of the background assessment, and statements of confidence and uncertainty about those conclusions in relation to the Northern Slag Pile.

Comment 9: Adsorbed dose toxicity values were calculated from an administered dose.

EPA Response: As noted in the uncertainty section of the risk assessment, "The resulting risks may be overestimated or underestimated" from this assumption. The conversion of administered dose to absorbed dose is necessary to avoid underestimating the risk from chemicals absorbed through the skin (see, e.g., Appendix A of RAGS Volume I, Part A). However, such methodology can underestimate point-of-entry effects on the skin, if any occur. On the other hand, this method does not account for first-pass metabolism, and thus can overestimate risk. The bottom line is that this assumption can produce bias in either direction, and does not necessarily overestimate risks.

Comment 10: The air model assumed acute exposures estimated as one-hour maximums.

EPA Response: One hour was the smallest unit of exposure time that this particular model could generate under these conditions. EPA looked at the highest one-hour concentration to gauge the potential for acute exposures of unacceptable risk to occur.

Comment 11: Toxicity for one-hour exposure estimates (from air modeling) was based on one-day, subchronic or intermediate study duration; this probably overestimates risk for one-hour exposures.

EPA Response: EPA believes there is a high bias resulting from the use of acute toxicity values that were based on a longer than one-hour duration. (Such values were used because one-hour acute toxicity values were limited in availability.) However, the magnitude of this bias is uncertain. This is one reason that EPA consulted ATSDR for further opinions with respect to short-term risks. ATSDR concurred that even though the modeling was biased high overall, there was the potential for concern during high-dust events.

Comment 12: "Moderate to high uncertainty" is associated with acute toxicity criteria.

EPA Response: As noted in the risk assessment report, there are fewer acute than chronic and subchronic toxicity criteria available. The available acute numbers did not always exactly match the exposure time assumed in the modeling, and the direction of bias was high, to ensure protectiveness. However, the presence of uncertainty in and of itself does not invalidate the risk-assessment findings; uncertainty is integral to scientific studies.

Comment 13: Exposure time, exposure frequency, and exposure duration are overestimated.

EPA Response: The risk management evaluation (RME) inputs for exposure time, exposure frequency, and exposure duration are high-end, but not maximum or worst-case, values. Other RME inputs, such as body weight, reflect average values. The combination of high-end and average values is intended to produce an overall "conservative exposure case (i.e., well above the average case) that is still within the range of possible exposures" (RAGS Volume I, Part A, Section 6.1.2). Section 6.4.1 of RAGS describes this process in detail, including the recommendation of high-end values for exposure frequency and duration. See also OSWER Directive 9285.6-03, which states, "Readers are reminded that the goal of RME is to combine upper-bound and mid-range exposure factors ... so that the result represents an exposure scenario that is both protective and reasonable; not the worst possible case" and specifies exposure frequency and exposure duration as factors that use upper-bound values.

Comment 14: The HHRA report contains language acknowledging that the overall risk bias is probably high, i.e., toward overestimation rather than underestimation. Also, uncertainty is inherent in the toxicity values used to characterize cancer and non-cancer risks.

EPA Response: Uncertainty is inherent in any scientific undertaking. The uncertainty in risk assessments is associated with a high bias for some factors and a low bias for others; overall, EPA prefers a high bias because of the need to protect human health and the environment. EPA acknowledges in RAGS Section 8.4 that "As in all environmental risk assessments, it already is known that uncertainty about the numerical results is generally large ... Consequently, it is more important to identify the key Site-related variables and assumptions that contribute most to the uncertainty than to precisely quantify the degree of uncertainty in the risk assessment." However, "Actions at Superfund Sites should be based on an estimate of the reasonable maximum exposure (RME) expected to occur under both current and future land-use conditions. The reasonable maximum exposure is defined here as the highest exposure that is reasonably expected to occur at a Site."

Comment 15: Real-time air sampling could substitute for the modeling estimates used in the risk assessment at this Site.

EPA Response: It should be noted that the usefulness of such data would be limited. While such samples would represent current conditions on the date of sampling, they would not assess future exposures or acute exposures

from significant dust-producing events, and the latter two considerations were factors in the decision to take action at the Site.

Comment 16: Percolation of precipitation through the high pH aggregate would not contribute to groundwater contamination; in fact, it would have a positive effect.
EPA Response: There is no evidence that the groundwater is being positively influenced by the aggregate; the aggregate will be subject to the same permeability performance criteria as the asphalt cap.

Comment 17: There are no drinking water wells, and institutional controls would prevent future wells.
EPA Response: EPA had the obligation to address the aquifer for current and future use. However, EPA does agree that institutional controls will be implemented for groundwater.

Comment 18: Emissions for each wind speed category were based on the upper bound of the category.
EPA Response: A range of wind speeds was considered, but emissions were only quantified for the two highest wind-speed ranges because those were the only categories that produced dust.

Comment 19: Reference Doses *(RfDs) of varying levels of confidence and uncertainty factor (UF) and modifying factor (MF) are combined, making interpretation more complex.*
EPA Response: This is an unavoidable source of uncertainty, but it does not mean that the toxicity values or risk estimates are invalid. It merely means that some toxicity factors have more available data (and hence more confidence) than others. Equal amounts of toxicity information are not available for all chemicals; this is a limitation of the scientific literature on which the toxicity values are based.

Comment 20: By eliminating the low risk values in the data sets, the resulting exposure point concentrations may have been biased high.
EPA Response: This statement in the risk assessment was made in the context of eliminating B-flagged data; i.e., eliminating data that were believed to be attributed to blank contamination rather than Site-related. Therefore, one source of potential high bias was eliminated by this practice. In data sets where a substantial amount of data was B-flagged, this could have the effect, as noted, of including more high-concentration samples. However, the low-concentration samples could not be reliably quantified because of the masking effect of blank contamination. In any case, as stated in the risk assessment, "This effect is expected to be greatest on some of the smaller data sets and least on the larger data sets." Furthermore, it only affects data sets with B-flagged data. Also, the greater the contamination (i.e., the higher the concentrations), the less the impact of this issue would be, since blank contamination affects lower-concentration samples.

Comment 21: Models are uncertain; therefore, concentrations in dust, vapor and duck tissue may have been overestimated.
EPA Response: Modeled data are generally less certain than measured data. However, they do have the advantage of zeroing in on specific chemicals, reducing confounding factors, and estimating the contribution from Site-related chemicals in the absence of other effects (such as background or off-Site sources).

Also, the statements of high bias from the risk assessment must be considered in context. Note that the risk assessment stated, "Because considerable information is available with respect to reasonable assumptions for intake parameters, the related uncertainty is considered to be low for potential exposures to soil, groundwater, surface water and sediment. Moderate to high uncertainty is associated with intake parameters associated with fish and duck ingestion." Significant human health risks were estimated for, and the bulk of the proposed actions have focused on, the media of soil/slag, groundwater, and sediment.

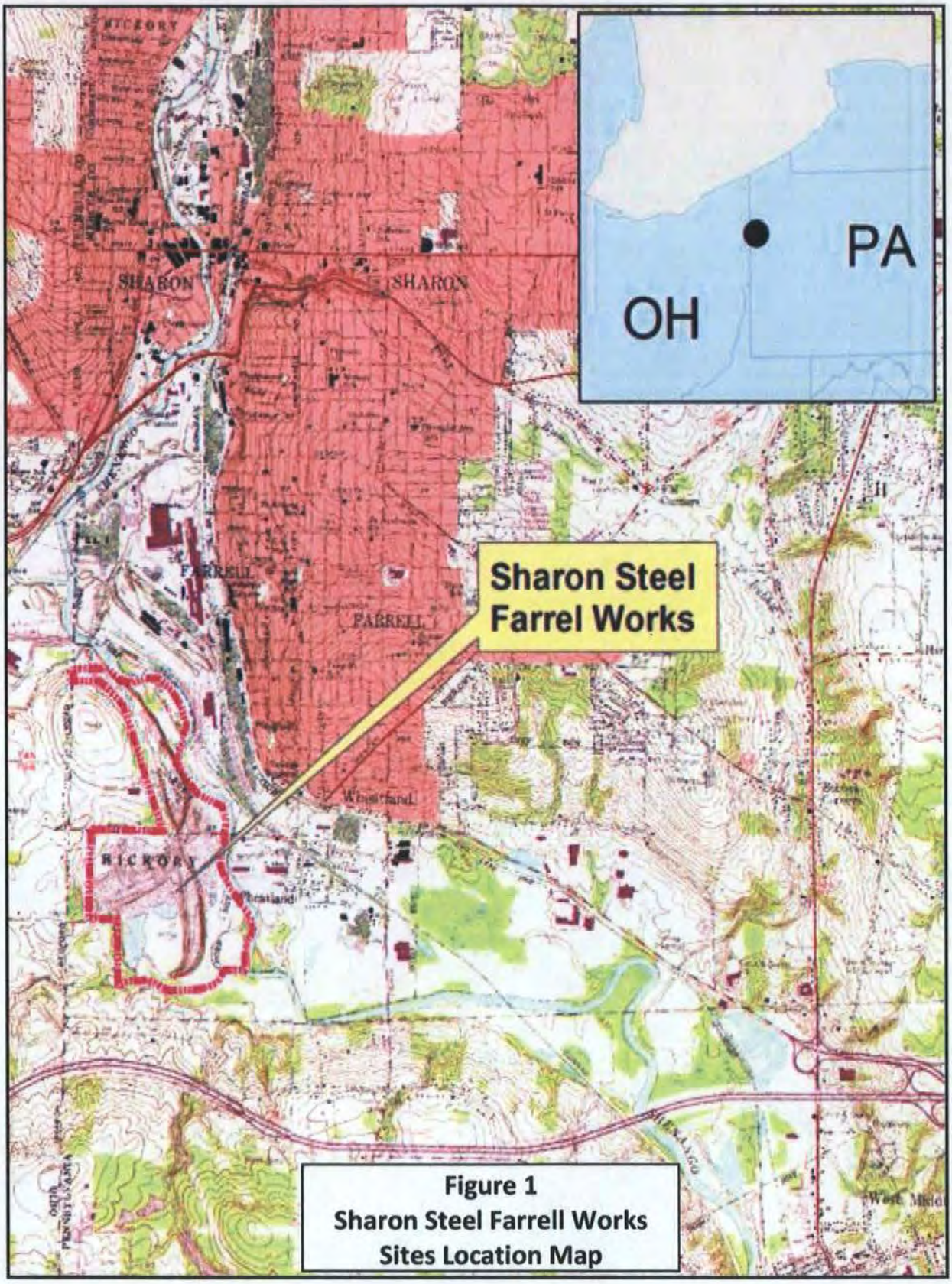
Comment 22: There is "moderate uncertainty" that arsenic, barium, nickel, and vanadium risks in N Slag surface soil/slag are Site-related.

EPA Response: With respect to these specific metals, it should be noted that even if all four were ultimately attributable to background (something for which EPA does not have evidence), the need for action and the types of action proposed would not be likely to change significantly. Other metals in the soil/slag material (aluminum, iron, manganese) were also identified as posing significant risks.

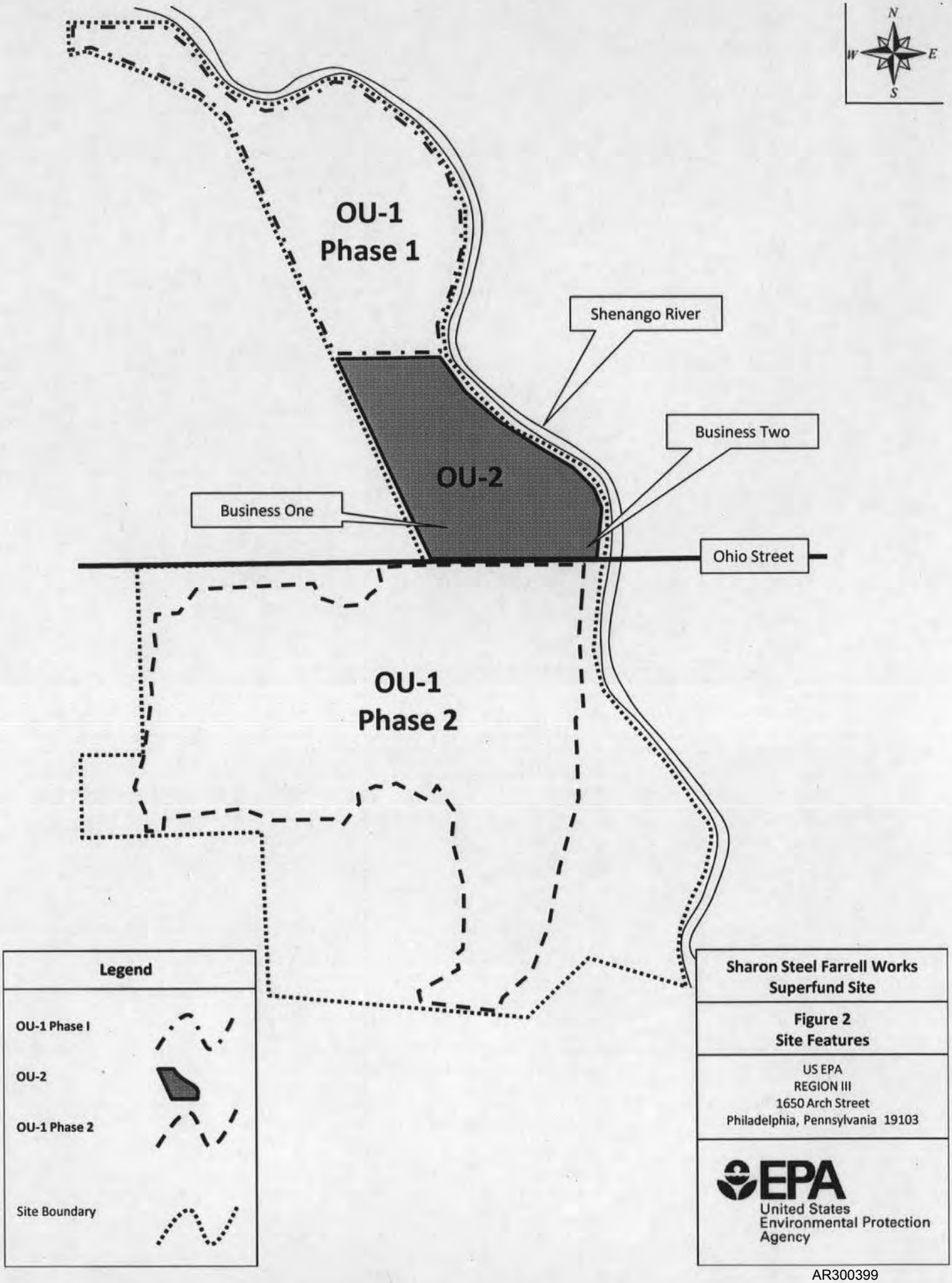
APPENDIX A

FIGURES

APPENDIX A


PA
OH
SHARON
SHARON
FARRELL
FARRELL
Sharon Steel
Farrel Works
Westland
HICKORY
Figure 1
Sharon Steel Farrell Works
Sites Location Map

APPENDIX A


N
W
E
S
OU-1
Phase 1
Shenango River
Business Two
OU-2
Business One
Ohio Street
OU-1
Phase 2
Legend
OU-1 Phase I
OU-2
OU-1 Phase 2
Site Boundary
Sharon Steel Farrell Works
Superfund Site
Figure 2
Site Features
US EPA
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103
EPA
United States
Environmental Protection
Agency

U.S. EPA Region III, GIS Team - Map 3710 - J. Cruz, 03/06/2013

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Legend

- DA - Soil Borings
- Soil Sample Locations
- DA - Areas that Need to Have an Asphalt Cap (6 acres)
- DA - Areas That Have To Fulfill Performance Criteria Specified in the Sharon Steel Rod for Operable Unit 2
- DA - Property Line

Notes -
DA - Dunbar Asphalt
DTS - Depth to Slag (at time of boring)
SB Series Soil Borings were advanced by EPA Contractors during RI Activities
B Series Soil Borings were advanced by Dunbar Asphalt during May 2009

EPA United States Environmental Protection Agency

Sharon Steel Superfund Site
Farrell, Pennsylvania

Figure 3
Dunbar Asphalt Property
Areas to Cap

AR300400

U.S. EPA Region III, GIS Team - Map 3720 - J. Cruz, 03/20/2013

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United States Environmental Protection Agency

Sharon Steel Superfund Site
Farrell, Pennsylvania

Figure 4
Williams Brothers Property
Areas to Cap

AR300401

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SHARON STEEL FARRELL WORKS
OU2 ADMINISTRATIVE RECORD FILE *
INDEX OF DOCUMENTS

II. REMEDIAL ENFORCEMENT PLANNING

1. Letter to Mr. Robert Thomson, Babst, Calland, Clements, & Zomni, P.C., from Ms. Ami Antoine, U.S. EPA, re: Administrative Order Settlement on Consent, 12/23/08. P. 200001-200022. Related documents are attached.

2. Appraisal of Real Property, Dunbar Asphalt Products, prepared by Integra Realty Resources - Pittsburgh, 8/8/11. P. 200023-200136.

3. Appraisal of Real Property, Williams Brothers Trucking, prepared by Integra Realty Resources - Pittsburgh, 8/8/11. P. 200137-200276.

4. Letter to Mr. Robert Thomson, Babst Calland Clements, & Zomni, P.C., from Mr. Mark Bolender, U.S. EPA, re: Draft Administrative Settlement Agreement and Order on Consent for Removal Response Action, 4/9/09. P. 200277-200279. Response Action Elements at Sharon Steel Superfund Site, Operable Unit 2, is attached.

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* Administrative Record File available 9/14/12, updated 9/24/13.

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III. REMEDIAL RESPONSE PLANNING

1. Report: Remedial Investigation (RI) Report, Volume 1 of 12, Sharon Steel Farrell Works Site, Farrell, Mercer County, Pennsylvania, prepared by Black & Veatch, 6/05. **

2. Report: Remedial Investigation (RI) Report, Volume 2 of 12, Sharon Steel Farrell Works Site, Farrell, Mercer County, Pennsylvania, prepared by Black & Veatch, 6/05. **

3. Report: Remedial Investigation (RI) Report, Volume 3 of 12, Sharon Steel Farrell Works Site, Farrell, Mercer County, Pennsylvania, prepared by Black & Veatch, 6/05. **

4. Report: Remedial Investigation (RI) Report, Volume 4 of 12, Sharon Steel Farrell Works Site, Farrell, Mercer County, Pennsylvania, prepared by Black & Veatch, 6/05. **

5. Report: Remedial Investigation (RI) Report, Volume 5 of 12, Sharon Steel Farrell Works Site, Farrell, Mercer County, Pennsylvania, prepared by Black & Veatch, 6/05. **

6. Report: Remedial Investigation (RI) Report, Volume 6 of 12, Sharon Steel Farrell Works Site, Farrell, Mercer County, Pennsylvania, prepared by Black & Veatch, 6/05. **

7. Report: Remedial Investigation (RI) Report, Volume 7 of 12, Sharon Steel Farrell Works Site, Farrell, Mercer County, Pennsylvania, prepared by Black & Veatch, 6/05. **

** Marked documents can be found in the Sharon Steel Farrell Works OU1 Administrative Record File and are incorporated herein by reference.

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8. Report: Remedial Investigation (RI) Report, Volume 8 of 12, Sharon Steel Farrell Works Site, Farrell, Mercer County, Pennsylvania, prepared by Black & Veatch, 6/05. **

9. Report: Remedial Investigation (RI) Report, Volume 9 of 12, Sharon Steel Farrell Works Site, Farrell, Mercer County, Pennsylvania, prepared by Black & Veatch, 6/05. **

10. Report: Remedial Investigation (RI) Report, Volume 10 of 12, Sharon Steel Farrell Works Site, Farrell, Mercer County, Pennsylvania, prepared by Black & Veatch, 6/05. **

11. Report: Remedial Investigation (RI) Report, Volume 11 of 12, Sharon Steel Farrell Works Site, Farrell, Mercer County, Pennsylvania, prepared by Black & Veatch, 6/05. **

12. Report: Remedial Investigation (RI) Report, Volume 12 of 12, Sharon Steel Farrell Works Site, Farrell, Mercer County, Pennsylvania, prepared by Black & Veatch, 6/05. **

13. Record of Decision, Operable Unit 1, Sharon Steel Farrell Works, 11/14/06. P. 300001-300077.

14. Report: Final Feasibility Study Report, Sharon Steel Farrell Works (SSFW) Site - OU2, prepared by CDM Federal Programs Corporation (CDM), 9/07. P. 300078-300221.

15. Meeting Minutes: Discussion of Technical Approach Memo, Sharon Steel Farrell Works Superfund Site, Operable Unit 2, 2/19/10. P. 300222-300224. A March 2, 2010, transmittal letter to Ms. Rashmi Mathur, U.S. EPA, from Mr. James Romig, CDM, is attached.

16. Letter Report to Ms. Rashmi Mathur, U.S. EPA, from Mr. James Romig, CDM, re: Revised Draft Technical Approach Memorandum - Sharon Steel Farrell Works OU2, (Dunbar Asphalt Company, Inc. Property), 2/25/10. P. 300225-300234.

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17. Table, Asphalt Paving of Former OU2 Area, Rough Order-of-Magnitude Cost Estimate, Sharon Steel Farrell Works, OU2, (undated). P. 300235-300236. A November 29, 2011, electronic transmittal memorandum, to Ms. Rashmi Mathur, U.S. EPA, from Mr. James Romig, CDM, is attached.

18. Superfund Program Proposed Plan, Sharon Steel Corporation (Farrell Works Disposal Area) Superfund Site - Operable Unit 2, Hickory Township and the City of Farrell, Pennsylvania, 9/13/12. P. 300237-300269.

19. Letter to Ms. Ami Antoine, U.S. EPA, from Mr. Robert Thomson, Babst, Calland, Clements, and Zomnir, P.C., re: Dunbar Asphalt, Inc., 2/23/09. P. 300270-300277. Comments on the Phase II, Air Dispersion Modeling Analysis for Identified Chemicals of Potential Concern for Inhalation Exposure, Sharon Steel, Farrell Works Facility, and the Final Baseline Human Health Risk Assessment Report, are attached.

20. Memorandum to Mr. Mitch Cron, U.S. EPA, from Ms. Jennifer Hubbard, U.S. EPA, re: Review of Sharon Steel Farrell Issues in Response to Counsel's Letter, 3/4/09. P. 300278-300285. A March 12, 2009, letter to Ms. Ami Antione, U.S. EPA, from Mr. Robert Thomson, Babst, Calland, Clements, and Zomnir, P.C., regarding Dunbar Asphalt Company, Inc., is attached.

21. Letter to Mr. Mark Bolender, U.S. EPA, from Mr. Robert Thomson, Babst, Calland, Clements, and Zomnir, P.C., re: Response to April 9, 2009, letter, 7/16/09. P. 300286-300289. A response to the April, 9, 2009, letter's attachment regarding Response Action Elements, is attached.

22. Memorandum to Ms. Rashmi Mathur, U.S. EPA, from Ms. Jennifer Hubbard, U.S. EPA, re: OU2 Risk Update for the 2005 Baseline Risk Assessment, 2/7/12. P. 300290-300297.

23. Letter to Ms. Rashmi Mathur, U.S. EPA, from Mr. Robert Thomson, Babst, Calland, Clements, and Zomnir, P.C., re: Proposed Plan for Sharon Steel, Farrell Works Superfund Site, Operable Unit 2, 10/16/12. P. 300298-300301. Comments entitled: Phase II, Air

Dispersion Modeling Analysis for Identified Chemicals of Potential Concern for Inhalation Exposure (Unrealistic Assumptions) and Final Baseline Human Health Risk Assessment Report Unreasonable Assumptions and Uncertainty, are attached.

24. Memorandum to Ms. Rashmi Mathur, U.S. EPA, from Ms. Jennifer Hubbard, U.S. EPA, re: Sharon Steel Farrell Operable Unit 2, Evaluation of PRP Attorney Letter, 1/4/13. P. 300302-300303.

25. Letter to Mr. Robert Thomson, Babst, Calland, Clements, and Zomnir, P.C., from Mr. Lee Zarzecki, U.S. EPA, re: Response to comments submitted to EPA on October 16, 2012, in response to EPA's Air Dispersion Modeling Analysis, 2/21/13. P. 300304-300309.

26. Memorandum to File, from Ms. Rashmi Mathur, U.S. EPA, re: Sharon Steel Farrell Works Superfund Site History for the OU2 Record of Decision, 4/30/13. P. 300310-300312. Δ

27. Letter to Ms. Kathy Hodgkiss, U.S. EPA, from Mr. Kelvin Burch, PADEP, re: State concurrence on the Record of Decision (ROD), 8/12/13. P. 300313-300314.

Δ Confidential Business Information has been redacted from this document. The redaction is evident from the face of the document.

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IV. REMOVAL RESPONSE PROJECTS

1. Memorandum to Mr. James Burke, U.S. EPA, from Ms. Rashmi Mathur, U.S. EPA, re: Recommendation for Determination of Imminent and Substantial Endangerment at the Sharon Steel Farrell Works Superfund Site, 3/19/08. **

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V. COMMUNITY INVOLVEMENT/CONGRESSIONAL CORRESPONDENCE/ IMAGERY

1. U.S. EPA Public Notice, Sharon Steel-Farrell Works Superfund Site, Farrell, Mercer County, PA, re: US EPA Issues Proposed Remedial Action Plan, 9/17/12. P. 500001-500002.

2. U.S. EPA Public Notice, Sharon Steel-Farrell Works Superfund Site, Farrell, Mercer County, PA, re: US EPA Issues Proposed Remedial Action Plan, 9/17/12. P. 500003-500003.

3. Transcript of Proposed Plan Public Meeting, Sharon Steel Farrell Works Site, Operable Unit 2, 10/4/12. P. 500004-500034.

4. U.S. EPA Public Notice, Sharon Steel-Farrell Works Superfund Site, Farrell, Mercer County, PA, re: US EPA Re-Opens Public Comment Period on the Proposed Remedial Action Plan, 11/5/12. P. 500035-500035.

5. U.S. EPA Public Notice, Sharon Steel-Farrell Works Superfund Site, Farrell, Mercer County, PA, re: US EPA Re-Opens Public Comment Period on the Proposed Remedial Action Plan, 11/5/12. P. 500036-500036.

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Confidential Documents ***

1. Quote for moving Dunbar Asphalt, prepared by A&A Machinery Moving, Inc., 9/20/11. P. 000001-000002.

2. Quote for moving Williams Trucking, prepared by A&A Machinery Moving, Inc., 9/20/11. P. 000003-000004.

*** Confidential documents are documents available for review at the U.S. EPA Region III office only with court ordered access in order to protect against the disclosure of privileged and confidential information. For internal reference, confidential documents ONLY are part of SDMS Collection #62687, while releasable documents ONLY are part of SDMS Collection #62662.

APPENDIX A

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION
NORTHWEST REGIONAL OFFICE

August 12, 2013

Ms. Kathy Hodgkiss
Acting Director
Hazardous Site Cleanup Division
US EPA, Region III
1650 Arch Street
Philadelphia, PA 19103-2029

Re: OU2 Record of Decision
Sharon Steel Farrell Works Superfund Site.
City of Farrell, Mercer County, PA

Dear Ms. Hodgkiss:

The Pennsylvania Department of Environmental Protection "Department" has received and reviewed the Record of Decision (ROD) for the Sharon Steel Farrell Works Superfund Site received July 23, 2013. This ROD presents the selected remedial action for Operable Unit 2 (OU2), which addresses the Northern Slag Area. OU2 is located between OU1 North and OU1 South and consists of two parcels totaling 33 acres owned by Dunbar Asphalt Products, Inc. and Williams Brothers, where the companies operate an asphalt plant and trucking operation, respectively.

In evaluating the potential threat to human health and the environment posed by hazardous substances in contaminated soil and slag, the Environmental Protection Agency (EPA) has determined response action is necessary. The selected remedy for the OU2 includes the construction of an asphalt cap, or a cap of equivalent material, to reduce the dermal and inhalation risks. The cap will also reduce the ability of rainwater to pass through the contaminated soils and slag, thus decreasing the migration of contaminants into the groundwater and the Shenango River. The remedy presently addresses 7 acres of the 33 acre OU2, however concurrent sampling of the remaining 26 acres during implementation of the response may require expanding the size of that cap to help meet performance criteria.

The Department hereby concurs with the proposed remedy with the following conditions:

* The Department will have the opportunity to review and concur before any modification to the ROD and the issuance of an Explanation of Significant Difference (ESD).

* Concurrence with the remedy should not be interpreted as acceptance of on-site Operation and Maintenance (O&M) by the Department. State O&M obligations will be determined during design of the remedy and the completion of a Superfund State Contract.

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Thank you for the opportunity to comment and concur on this Record of Decision. If you have any questions regarding this matter, please contact Mr. Gary Mechtly at 814.332.6646.

Sincerely,

Kelvin A. Burch
Regional Director

cc: Ms. Rashmi Mathur, EPA Region III
Mr. Weaver (file)

KAB:JW:lsl

APPENDIX B


North
OU-2 of Sharon Steel Corp (Farrell Works Disposal Area)
Quality Ln
200 feet
Approximate scale
3015
Ohio St
© 2015 Google
Google earth

APPENDIX C

EXPLANATION OF SIGNIFICANT DIFFERENCES
for
Operable Unit 2 of the Sharon Steel Corporation (Farrell Works Disposal Area)
Superfund Site

I. INTRODUCTION

Site Name:	Sharon Steel Corporation (Farrell Works Disposal Area) Site ("Site"), Operable Unit Two
Site Location:	Mercer County, Pennsylvania (approximately one (1) mile southwest of the City of Farrell)
Lead Agency:	U.S. Environmental Protection Agency, Region III ("EPA")
Support Agency:	The Commonwealth of Pennsylvania Department of Environmental Protection ("PADEP")

II. STATEMENT OF PURPOSE

In accordance with Sections 117(c) and 117(d) of the Comprehensive Environmental Response, Compensation, and Liability Act, as amended ("CERCLA"), 42 U.S.C. §§ 9617(c) and 9617(d), and Section 300.435(c)(2)(ii) of the National Oil and Hazardous Substances Pollution Contingency Plan ("NCP"), 40 C.F.R. § 300.435(c)(2)(ii), this Explanation of Significant Differences ("ESD") documents changes to the interim remedial action selected by EPA for Operable Unit Two ("OU-2") of the Sharon Steel Corporation (Farrell Works Disposal Area) Superfund Site ("Site") in Mercer County Pennsylvania. EPA's interim remedial action for OU-2 was selected in a Record of Decision ("ROD") issued in December 2013. CERCLA and the NCP require publication of an ESD when EPA determines modifications to a remedial action selected in a ROD are necessary, and when such modifications significantly change, but do not fundamentally alter, the selected remedial action with respect to scope, performance or cost.

The interim remedial action for OU-2 selected by EPA in its December 2013 ROD includes capping all areas where slag is found with a low permeability asphalt (or asphalt-equivalent) cap, operation and maintenance of the cap, and institutional controls. As described in further detail in Section V below, by this ESD EPA is modifying the interim remedial action for OU-2 in several ways. First, EPA is changing the type of cover to be placed at OU-2 from an asphalt (or "asphalt-equivalent") cover with a permeability less than 10^{-7} centimeters per second ("cm/s") to one that may also consist of clean material such as aggregate or clean soil. Second, EPA is eliminating the requirement for "split spoon" confirmatory sampling to determine where slag exists beneath the surface of OU-2. Instead, the modified cover is to be installed over all exposed slag and soil. Third, EPA is adding a new requirement that a material/soil management plan be prepared to safeguard any covers installed or existing at OU-2. Fourth, the ESD expands institutional

controls ("ICs") to include maintenance of the soil/material management plan mentioned above. [1] Institutional controls, including the Site-wide use restrictions selected in the ROD for OU-1, should preferably be implemented by an Environmental Covenant recorded in accordance with Pennsylvania's Uniform Environmental Covenants Act, 27 Pa. C.S. §§ 6501-6517. Fifth, the ESD provides for the potential extension of the biosolid-enhanced cap, which has been selected as the final remedy for Operable Unit One ("OU-1") of the Site, to any unused portions of the northern area of OU-2 lying adjacent to OU-1 (See **Figure 1**). Finally, EPA is making two changes to the applicable or relevant and appropriate requirements ("ARARs") selected in the interim ROD: (1) the provisions of Pa. Code Chapter 288 concerning requirements for residual waste landfill cap systems and closure are waived as ARARs in accordance with Section 300.430(f)(1)(ii)(C)(1) of the NCP because the cleanup alternative selected for OU-2 is an interim measure; and (2) EPA has determined that the provisions of Pa. Code Chapter 253 concerning Pennsylvania's Uniform Environmental Covenants Act are not ARARs.

Public Participation for this ESD

On May 7, 2015 EPA issued a draft of this ESD and provided the public an opportunity to comment on the proposed changes. EPA received one letter of comments during the thirty (30) day comment period. The commenter reiterated an opinion it had expressed during the public comment period for the interim ROD, namely that institutional controls alone on groundwater and surface use at the Site would sufficiently protect human health from releases of hazardous substances into groundwater and the air. After carefully considering this comment, EPA has determined that the modifications to the interim action remedy described in this ESD should remain unchanged from those proposed by EPA in the draft ESD.

The documents that form the basis for this ESD, as well as the ESD itself, any comments received on the draft ESD, and EPA's responses to these comments, have been incorporated into the Administrative Record in accordance with Section 300.825(a)(2) of the NCP, 40 C.F.R. § 300.825(a)(2). The Administrative Record is available for review during business hours at the information repository in the offices of EPA Region III at 1650 Arch Street, Philadelphia, PA, and at the information repository at the Stey Nevant Library, Farrell, PA; and online at http://www.epa.gov/arweb/.

The changes made by this ESD do not change the overall goal of the interim remedial action for OU-2: to protect human health and the environment by addressing contamination in soils and mitigating potential impacts to surface water from the migration of Site-impacted soils. Indeed, as summarized above, this ESD enhances that goal by taking additional steps to protect the integrity of the cover, bolstering the ICs, and enhancing coordination between the final remedy for the adjacent OU-1 and the interim action at OU-2. This ESD significantly changes, but does not fundamentally alter, the interim remedial action selected for OU-2 with respect to scope, performance, or cost.

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[1] EPA defines Institutional Controls ("ICs") as "Non-engineered instruments, such as administrative and legal controls, that help to minimize the potential for human exposure to contamination and/or protect the integrity of a response action." (U.S. EPA, 2012b. "Institutional Controls: A Guide to Planning, Implementing, Maintaining, and Enforcing Institutional Controls at Contaminated Sites," OSWER 9355.0-89, EPA-540-R-09-001, December.)

APPENDIX C

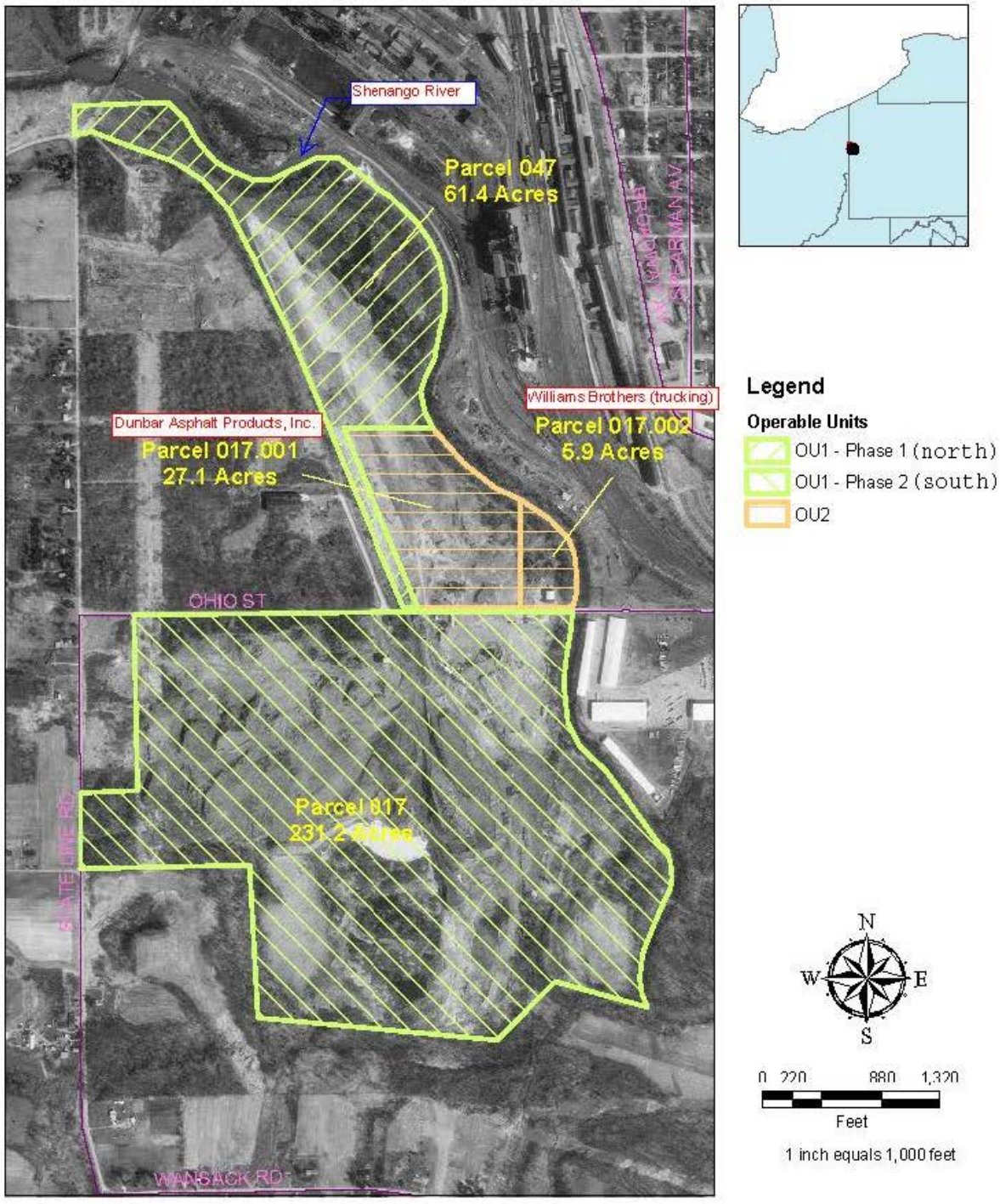

Figure 1
Operable Units and Tax Parcels
Sharon Steel - Farrell Works Superfund Site

(Source: Annotated Figure 1-2 of Final OU-2 Feasibility Study ["FS"] Report, Sep.2007)

AR316780

AR300217

III. SUMMARY OF SITE HISTORY AND SITE CONDITIONS

The Site has a lengthy history. Presented below are highlights of the Site's background, operational history, site condition, and chronology. For a more detailed summary of the Site's history and conditions, as well as enforcement activities related to Site, the reader should review Section II of EPA's December 2013 interim ROD for OU-2. The interim ROD can be found in the Administrative Record, which may be reviewed at the public repositories mentioned above and on the Internet at http://www.epa.gov/arweb/.

A. Background

The Sharon Steel Corporation (Farrell Works Disposal Area) Superfund Site is approximately 325 acres in size and located approximately one mile southwest of the City of Farrell, Mercer County, Pennsylvania and 300 hundred feet east of the Pennsylvania/Ohio border. The Site has been separated into two OUs for the purpose of remedy implementation due to site ownership and property usage considerations (See **Figure 1**).

OU-l consists of a total of 292 acres and has been divided into two sections to phase remedial action construction: OU-l north (61 acres) and OU-l south (231 acres). The final remedy for OU-l was selected in a 2006 ROD and includes construction of a biosolid-enhanced cap. The remedial design for OU-l north was completed in September 2012. Construction of the OU-1 northern portion of the remedy is presently awaiting funding. Design and construction of the remedy on OU-l south will follow after completion of ongoing slag mining being performed under Pennsylvania beneficial reuse and mining permits.

OU-2, the subject of this ESD, is located between OU-l north and OU-l south and consists of two parcels totaling 33 acres, owned by Dunbar Asphalt Products, Inc. (26 acres) and Williams Brothers (7 acres). Dunbar Asphalt Products, Inc. ("Dunbar") operates an asphalt plant, while Williams Brothers operates a trucking company.

B. Operational History

The former Sharon Steel Plant, located across the Shenango River to the northeast of the Site, was founded in 1900 and manufactured a variety of steel products. Throughout the operating history of the plant, waste and byproducts of the manufacturing process were transported on rail cars across the Shenango River (via bridge) and discarded down embankments or piled into large mounds in several areas on the Site, adjacent to the Shenango River. From 1949 to 1981, waste liquids (acids and oils) were poured onto the hot slag wastes that were disposed of at the Site. This practice continued until 1981, when Sharon Steel was ordered by the Pennsylvania Department of Environmental Protection ("PADEP") to stop disposing the waste liquids in this manner. Although the disposal of waste liquids stopped in 1981, Sharon Steel continued to stockpile slag at the Site until operations at the plant stopped in 1992. PADEP conducted several inspections of the waste disposal areas in the 1970s and concluded that the contamination from the byproducts from the Sharon Steel Plant was responsible for the depressed biological community along at least 11.5 miles of the Shenango River. In 1992, Sharon Steel Corporation filed for bankruptcy.

C. Site Condition

The Sharon Steel Plant is not part of the Superfund Site. The environmental contamination resulting from plant operations at the Sharon Steel Plant on the east side of the Shenango River is being addressed by PADEP in accordance with the requirements of Pennsylvania's Act 2 Cleanup Program. The Superfund Site is OU-1 and OU-2, the locations of slag and other waste disposal just west of the Shenango River.

The large mounds of slag wastes abandoned on the west side of the Shenango River and the contamination resulting from the slag wastes were evaluated under CERCLA. In August 1993, samples of groundwater, soil, sediment, and surface water were collected and analyzed during an Expanded Site Investigation ("ESI") to assess site conditions and, later, to support the preparation of a Hazard Ranking System ("HRS") score. The investigation identified metals and organic compounds at the Site. It was formally added to the National Priorities List ("NPL") on July 28, 1998, making it eligible for Federal cleanup funds.

In October 1999, EPA initiated a Remedial Investigation ("RI") for the Site to evaluate existing data; collect additional data, as necessary; and assess and consider appropriate actions. Performed in two phases between 1999 and 2004, the RI involved groundwater sampling, surface and subsurface soil sampling, residential well sampling, surface water and sediment sampling, biota sampling (fish, crayfish, amphibians, mammals, and reptiles), slag/sludge sampling in disposal areas, and assessments of human health and ecological risks posed by the Site. The results of the Phase 1 and 2 investigations are summarized in the Final RI report, dated June 2005. The Final RI report concluded that the Site presents unacceptable risks to human health and the environment; therefore, remedial actions are required to control, reduce, or eliminate these risks.

The majority of residents in the vicinity of the Site receive drinking water from the Aqua America Company whose raw water is drawn from the Shenango River 3.5 miles upstream and 18 miles downstream of the Site. Data collected during the RI, including private well sampling, indicate that private wells in the Site's vicinity are not impacted by the Site. The private wells are located topographically and hydrogeologically above groundwater at the Site. However, groundwater contamination found in the on-Site shallow aquifer does impact the Shenango River. The ROD for OU-1 provides a remedy for Site-wide groundwater.

The unacceptable health risks to human receptors on OU-2 are to industrial and construction workers, future residents (if Site use were unrestricted), and nearby current residents. Health risks exceed the acceptable non-carcinogenic risk due to incidental ingestion, dermal contact, and inhalation of dust from metals in the slag and soil. The metals that are chemicals of concern are: arsenic, barium, iron, nickel and vanadium, aluminum and manganese, with manganese exposure being the predominant risk-driver. EPA has also concluded that runoff from slag-contaminated areas poses an unacceptable risk to surface water and sediments.

The ecological risk evaluation indicated that potential risk is posed by OU-2 floodplain soils to plants, soil invertebrates, and vermivorous birds. The primary risk drivers were chromium, iron, and manganese for plants; iron for invertebrates; and, chromium and

polyaromatic hydrocarbons ("PAHs") for vermivorous birds. The upland soils pose a potential risk to the same receptors as the floodplain soils. The primary risk drivers were also chromium, iron, and manganese for plants; iron for invertebrates; and, PAHs for vermivorous birds. The remedial alternatives for the floodplain were evaluated in a Feasibility Study for OU-1 and selected as part of the OU-1 ROD. It was during the preparation of the OU-1 Feasibility Study that the Site was divided into two Operable Units, OU-1 and OU-2, so the businesses located on OU-2 (Dunbar Asphalt Products, Inc. and Williams Brothers trucking) could continue to operate.

A Feasibility Study ("FS") report for OU-2 was prepared in September 2007 to develop an appropriate range of remedial actions for addressing wastes and contaminated areas on OU-2 of the Site in a manner that would protect human health and the environment and meet ARARs. As described in the OU-2 interim ROD, the remedial alternatives analyzed during the FS included: Alternative 1-No Action; Alternative 2a-Purchase of Two Properties, Relocate Impacted Businesses and Move Equipment of Two Businesses to new location, Construction of a Biosolids and Compost Cap, Institutional Controls and Demolition of Buildings; Alternative 2b-Purchase of Two Properties and Relocate Impacted Businesses, Appraise and Pay for the Businesses' Equipment, Demolish Buildings, Construct a Biosolids and Compost Cap, and Implement Institutional Controls; and Alternative 3-Construction of an Asphalt Cap or Asphalt-Equivalent Cap at the Two Businesses Located on this Property, and Institutional Controls. In the OU-2 ROD, Alternative 3 was selected as the interim remedial action.

D. Chronology

Table 1, below, provides a chronology of key Site events.

Table 1. Chronology of Key Site Events

Event	Date(s)
Sharon Steel operations and slag/waste disposal at Site	1900 to 1992
Waste liquids (acids and oils) were poured onto the hot slag wastes, which were subsequently disposed of at the Site.	1949 to 1981
PADEP order to Sharon Steel to stop disposing waste liquids in this manner (slag/waste disposal continued)	1981
Sharon Steel plant operations (and slag/waste disposal) ended, and Sharon Steel filed for bankruptcy	1992
EPA conducted Expanded Site Investigation ("ESI") to allow HRS scoring	1993
Sharon Steel Corp (Farrell Works Disposal Area) Site proposed for listing on the National Priorities List ("NPL")	March 6, 1998
Sharon Steel Corp (Farrell Works Disposal Area) Site formally added to the NPL	July 28, 1998

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Event	Date(s)
Remedial Investigation ("RI") completed for entire Sharon Steel Corp (Farrell Works Disposal Area) Site (Final RI report issued)	June 2005
Feasibility Study ("FS") completed for OU-1 (Final FS report issued)	June 2006
Proposed Remedial Action Plan for OU-1 is released for comment	July 16, 2006
ROD for OU-1 signed by EPA	November 14, 2006
FS completed for OU-2 (Final FS report issued)	September 2007
EPA updated the OU-2 human health risk assessment	February 7, 2012
Proposed Remedial Action Plan for OU-2 is released for comment	September 13, 2012
Remedial Design for OU-1 north (or "Phase 1") is completed	September 28, 2012
ROD for interim remedial action at OU-2 signed by EPA	December 19, 2013
EPA sends Dunbar Asphalt Products, Inc. ("Dunbar") a Special Notice Letter in accordance with Section 122 of CERCLA inviting Dunbar to negotiate a settlement for implementing the OU-2 ROD.	July 8, 2014
Dunbar submits to EPA a "good faith" proposal in response to the Special Notice Letter.	August 5, 2014
Department of Justice ("DOJ"), on behalf of EPA, responds to Dunbar's "good faith" proposal and initiates "formal negotiations" with Dunbar for a Remedial Design/Remedial Action ("RD/RA") Consent Decree ("CD").	August 27, 2014
Parties (Dunbar, DOJ, and EPA) meet at Site to tour it and begin face-to-face negotiations of a RD/RA CD. During meeting, Dunbar requests EPA to reconsider selected interim action remedy for OU-2.	September 29, 2014

IV. DESCRIPTION OF THE SELECTED INTERIM REMEDIAL ACTION FOR OU-2

EPA issued its interim action ROD for OU-2 on December 19, 2013. The ROD for OU-2 identified five Remedial Action Objectives ("RAOs") to be addressed by the interim action. The RAOs are listed below in Table 2, with numbering added solely for convenience.

Table 2. Remedial Action Objectives as Stated in the OU-2 Interim Action ROD

Remedial Action Objectives of OU-2 ROD
"1. Prevent dermal and ingestion exposure to slag, for the industrial workers, trespassers, and nearby or potential future residents.
2. Prevent inhalation of dust in air above health-based action levels so that Site conditions do not pose an unacceptable risk for the industrial workers, trespassers, and nearby or potential future residents.
3. Reduce future migration of chemicals into shallow groundwater in order to avoid negatively impacting the OU-1 groundwater remedy.[2]
4. Reduce surface runoff including storm water and discharge of source materials from the Site into the Shenango River.
5. The purpose of the selected interim action is to address contaminated metals in the slag and contaminated soil that pose an unacceptable risk to human health."

The interim remedial action selected for OU-2 to achieve the above RAOs includes the components listed in Table 3. Table 4 lists the Performance Standards specified in the 2013 OU-2 ROD for the selected interim action.

Table 3. Components of the Selected OU-2 Interim Remedial Action as Stated in the 2013 OU-2 ROD (Section M.)

OU-2 Interim Remedial Action Components (2013 ROD)
"1. Capping OU2 to prevent erosion of slag from the Site negatively impacting the Shenango River and adjacent habitats.
2. Asphalt will be used in pavement of the estimated six acres on the Dunbar Property (6 acres of the 27 acres) and estimated one acre on the William Brothers property (1 acre of the 6 acres).
3. Confirmation sampling of …the other estimated 21 acres on the Dunbar property and estimated 5 acres on the William Brothers property will be conducted through boring sampling outlined in section M.2 [Performance Standards] of this ROD to determine if there is additional

[2] The groundwater remedy for the Site is provided for in the ROD of OU-1. The selected OU-1 remedy includes placing a biosolid-enhanced "cap" over slag and sludge material within OU-1, which generally will encompass the areas posing a greater adverse impact to Site groundwater. The biosolids cap will provide treatment of the slag and sludge by binding with the metals. This treatment will reduce the mobility of the metals to the groundwater.

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OU-2 Interim Remedial Action Components (2013 ROD)
slag present. All slag will be covered by an asphalt or asphalt equivalent cap (See Figure 3 and 4) [Refer to the OU-2 ROD]. The elevation and grade of the capped areas and non-capped areas in OU2 shall promote site drainage and minimize erosion.
4. An Operation and Maintenance Plan will be included as part of the design determining storm water control, the frequency of inspection of the capped areas and what time period is necessary to correct a breach with any component of the cap. This alternative shall (1) prevent contact with the slag and contaminated soil, (2) prevent the migration of slag dust from the Site, and (3) reduce groundwater infiltration and leaching of contamination from the slag which would reduce surface water contaminated runoff and shallow contaminated groundwater to the Shenango River so as to not negatively affect the groundwater remedy in OU1 for the Site.
5. Land use restrictions and institutional controls will be documented in a Land Use Control Assurance Plan ("LUCAP") to protect the integrity or the asphalt cap or asphalt equivalent cap. The LUCAP will include controls for OU2.
6. The OU2 institutional controls are for land use restrictions to protect the asphalt cap or asphalt equivalent cap."

Table 4. Performance Standards for the Cover System as Stated in the OU-2 ROD (Section M.2)

OU-2 Interim Remedial Action Performance Standards of OU-2 ROD (Section M.2)
"1. Conduct sampling to identify the lateral and vertical extent of slag throughout the OU2 area (specified in Figures 3 & 4) [Refer to the OU-2 ROD] where an asphalt cap, or asphalt equivalent cap, will be constructed. a. Move aggregate piles temporarily as necessary to accomplish such sampling. b. Conduct continuous split spoon sampling until native soils are reached in each borehole location. c. Measure the permeability of the subsurface in all boreholes where slag is present.
2. Construct an asphalt cap, or asphalt equivalent cap, above all slag present in the OU2 area, including that identified pursuant to the sampling in 1 above. a. The asphalt cap, or asphalt equivalent cap, shall have a permeability less than 1×10^{-7} cm/sec [centimeters per second] in order to minimize the migration of rainwater through the asphalt cap or asphalt equivalent cap. b. The cap shall promote drainage, minimize erosion, and require minimum maintenance.
3. The elevation and grade of the capped areas and non-capped areas in OU-2 shall promote site drainage and minimize erosion.
4. Control storm water flow in OU2 to minimize impacts to the Shenango River.

OU-2 Interim Remedial Action Performance Standards of OU-2 ROD (Section M.2)
5. Prohibit activities, unless approved by EPA in consultation with PADEP, that could damage the asphalt cap or asphalt equivalent cap areas placed in the OU2 areas (specified in Figures 3 and 4) [Refer to the OU-2 ROD] described in 2 above through the implementation of institutional controls."

V. SIGNIFICANT DIFFERENCES AND BASIS

EPA has determined that the following changes are necessary to the interim action to ensure it is implementable, protective, and properly safeguarded in light of ongoing commercial operations on OU-2. For clarity, the below changes address both the components of the selected interim remedial action (Table 3) and the associated Performance Standards specified in Section M.2 of the OU-2 ROD (Table 4). Where numbered remedy components or Performance Standards are used below, they refer to the numbering in Tables 3 and 4, which are identical to how they are numbered in the OU-2 ROD. In addition, modifications to the ARARs are being made.

1. Interim Action Remedy Components Withdrawn: Components 2 and 3 of the interim remedial action and Performance Standards 1, 2 and 2.a, as described in the OU-2 ROD, are withdrawn and replaced with the following requirements:

   Cover all exposed slag and soil, including berms, with clean material (e.g., compacted aggregate, clean soil) at a minimum thickness of one (1) foot if clean soil or aggregate, or minimum of 3 inches if asphalt concrete ("AC") or Portland cement concrete to prevent direct contact with and wind erosion of slag and soil, and alleviate migration of contaminants to surface water. Berms and drainage swales should be vegetated to reduce stormwater runoff volume and alleviate thermal impact of runoff. Where clean soil is used as cover material, an inert demarcation layer shall be installed across the area being covered. The demarcation layer must provide a visual indicator that distinguishes the soil beneath the demarcation layer from overlying clean soil. The elevation and grade of the covered areas and non-covered areas in OU-2 shall promote site drainage and minimize erosion.

   Discussion: This change to the interim action replaces installation of a low permeability cap with a containment cover that provides the dermal and air exposure protections that are the primary reasons for this action. As described in the footnote to Table 2 above, the Site-wide groundwater remedy is included in the remedy selected in the OU-1 ROD. The permeability Performance Standard (Table 4, 2.a.) is being removed as it is a requirement of an ARAR that is being waived for this interim action, as described in Section V.4 below. With respect to cost, this change in cover type and location is estimated to cost approximately $2.1 million, including design, construction and O&M. This compares favorably with the $2.8 million estimated cost for capping presented in the ROD, and is not fundamentally different.

   Basis for change: In 2006, the Site was divided into OUs 1 and 2 to accommodate continued business operations located on OU-2. It was EPA's intent that both

businesses located on the property (Dunbar and Williams Brothers trucking) be able to continue operations even while a remedy on OU-2 is selected and implemented. During a September 2014 site visit, EPA learned more about Dunbar's physical operations on OU-2. Based on that improved understanding, EPA has determined that the 2013 OU-2 ROD is arguably not implementable due to the interference it would cause to on-Site business operations. EPA believes that the changes in this ESD can be implemented in concert with ongoing business operations and will still meet the above stated remedial objectives for this interim action. EPA's Remedial Project Manager's Memo to File dated December 8, 2014 documents observations made and discussions held during the September 2014 Site visit; it is included as part of the Administrative Record.

2. Interim Action Remedy Components 4, 5, and 6 Modified: Prevent damage to all covered areas of OU-2 that may cause exposure to, or releases of, hazardous substances. Implement this requirement with institutional controls and a Material and Soil Management Plan, which will supplement the O&M plan required in the 2013 OU-2 ROD, specifying operational practices to be followed on OU-2 to protect all covered areas.

   Discussion: In addition to the Site-wide ICs selected in the OU-1 ROD (i.e., prohibition on use of Site groundwater for drinking purposes and prohibition on use of Site for residential purposes), the ROD for OU-2 also required a prohibition on activities that could damage the asphalt (or asphalt-equivalent) cap installed at OU-2 as part of the interim remedial action, unless EPA first approved these activities after consultation with PADEP. This prohibition shall be expanded to include any areas at OU-2 covered in accordance with this ESD. Additionally, current and future operations on OU-2 shall be conducted in accordance with an EPA-approved O&M Plan and EPA-approved Material and Soil Management Plan.

   Basis for change: While the OU-2 ROD requires preparation of an O&M plan for the cover, EPA recognizes that the on-Site business operations (some of which utilize excavation and earthmoving equipment) warrant an additional safeguard to ensure that day-to-day operations do not expose Site workers or the environment to releases of hazardous substances. The new requirement for an OU-2-specific Material and Soil Management Plan addresses this concern and is not a significant change to the cost or scope of the interim action selected for OU-2.

   EPA also wishes to clarify that any area of OU-2 covered in accordance with this ESD, and not just areas covered with an asphalt or asphalt-equivalent cover, must be protected from activities that would damage the covers and cause exposure to, or releases of, hazardous substances. In addition, the required Material and Soil Management Plan will provide protection to any newly covered areas of OU-2, as well as any areas of OU-2 currently meeting the requirements of this ESD because they are covered either by asphalt concrete, concrete, aggregate piles or by several feet of compacted aggregate.

   Implementation of Institutional Controls: EPA intends to ask the owners of the two parcels comprising OU-2 to record environmental covenants in accordance with Pennsylvania's Uniform Environmental Covenants Act, 27 Pa. C.S. §§ 6501-6517.

These environmental covenants would implement the ICs described in this ESD and the 2013 OU-2 ROD, as well as any Site-wide institutional controls required in the 2006 OU-1 ROD, namely prohibitions on the use of Site groundwater and reuse of the Site for residential purposes.

3. New Requirement: Install a biosolid-enhanced cap and implement stormwater controls on the northern portion of Dunbar's property at OU-2 not used for Dunbar's business operations.

   Discussion: As discussed in Section III.A of this ESD, EPA selected, among other things, installation of a biosolid-enhanced cap as the remedial action for OU-1 of the Site. During EPA's September 2014 visit to OU-2 and observation of Dunbar's operations, EPA learned that a relatively small portion of Dunbar's property is not used in their operations, particularly along the northern boundary, adjacent to OU-1. Depending on the relative progress of the cleanups at OU-1 and OU-2, either the remedial design of the interim action at OU-2 or the existing remedial design for OU-1 may be changed to accommodate the other, with the preference being to have the OU-1 remedy be as expansive as possible. Combining the stormwater controls for both OUs would be a more effective and spatially efficient single system.

   Basis for change: This change would allow for the OU-1 remedy to be expanded into a portion of OU-2 to the extent practicable based on discussions with Dunbar and engineering considerations during the remedial design of OU-2's interim remedial action.

4. Modifications to ARARs: The following requirements listed as ARARs in the OU-2 ROD are being waived for this interim action: the provisions of Pa. Code Chapter 288 concerning requirements for residual waste landfill cap systems and closure (i.e., 25 Pa. Code §§ 288.234, 288.236, 288.291, and 288.292). EPA has determined that the requirements of Pennsylvania's Uniform Environmental Covenants Act, 27 Pa. C.S. §§ 6501-6517 (cited as 25 Pa. Code §§ 253.2, 253.3 and 253.4 in the OU-2 ROD) are not ARARs.

   Basis for change: EPA has determined that the Pennsylvania residual waste landfill final cover and closure requirements are not "applicable" because they have an effective date of January 13, 2001, which is after the slag disposal at the Site took place. While these requirements may nevertheless be "relevant and appropriate," EPA will hereby waive these requirements in accordance with Section 300.430(f)(1)(ii)(C)(1) of the NCP, 40 C.F.R. § 300.430(f)(1)(ii)(C)(1), because the cover described in this ESD is an interim measure. The specific ARARs being waived include the cap Performance Standard of having a permeability less than 1×10^{-7} cm/sec. The NCP at 40 C.F.R. § 300.430(f)(1)(ii)(C)(1) allows for selection of a remedy that does not meet an ARAR if the alternative is an interim measure and will become part of a total remedial action that will attain the ARAR. A future final ROD will select a final remedy for OU-2, and as part of that decision, ARARs will be identified, and the final on-Site remedy will either meet each ARAR or an appropriate waiver will be invoked as required by the NCP.

EPA has also determined that Pennsylvania's Uniform Environmental Covenants Act is not an ARAR because it is not a "substantive" cleanup standard or standard of control. Rather, it is a procedural, legal tool for implementing ICs.[3] Nevertheless, EPA intends to ask the owners of the two parcels comprising OU-2 to agree to record environmental covenants in accordance with Pennsylvania's Uniform Environmental Covenants Act in order to implement the ICs.

Net Effect of Significant Differences to the Interim Remedial Action at OU-2

Since this ESD includes multiple significant changes to the OU-2 interim ROD, Table 5, on the following page, is included to clearly identify the net effect of these changes. Stated another way, Table 5 presents what the revised OU-2 interim action will be as a result of these changes.

VI. SUPPORT AGENCY COMMENTS

In accordance with Section 300.435(c)(2) of the NCP, 40 C.F.R. § 300.435(c)(2), EPA has consulted with PADEP about the modifications in this ESD, and PADEP supports the modifications.

VII. STATUTORY DETERMINATIONS

EPA has determined that the modifications to the interim remedial action described in this ESD comply with the statutory requirements of Section 121 of CERCLA, 42 U.S.C. § 9621. The modifications to the interim remedial action will protect human health and the environment and are cost-effective. The modifications also meet all Federal and State ARARs enumerated in the ROD, except those provisions of the PA Code identified in Section V.4 above that EPA is waiving because this is an interim measure or EPA has determined are not ARARs because they are not substantive cleanup standards.

VIII. COMMUNITY INVOLVEMENT

In accordance with Section 117(d) of CERCLA, 42 U.S.C. Section 9617(d), and Section 300.435(c)(2)(i)(B) of the NCP [40 C.F.R. § 300.435(c)(2)(i)(B)], EPA published a "Notice of Availability" for a draft of this ESD in *The Herald*, of Sharon, Pennsylvania on May 7, 2015. EPA provided the public with an opportunity to comment on the draft ESD. The opportunity to comment ended on June 5, 2015, thirty (30) days after the date the Notice of Availability was published in *The Herald*. EPA received one letter of comments. The commenter reiterated an opinion it had expressed during the public comment period for the interim ROD, namely that institutional controls alone on groundwater and surface use at the Site would sufficiently protect human health from releases of hazardous substances into groundwater and the air. After carefully considering this comment, and for the reasons discussed in this Section, EPA has determined that the modifications to the interim action remedy described in this ESD should remain unchanged from those proposed by EPA in the draft ESD.

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[3] As defined in Section 300.5 of the NCP [40 C.F.R. § 300.5], both "applicable requirements" and "relevant and appropriate requirements" must be "substantive" requirements.

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In accordance with Section 300.430(a)(1)(iii) of the NCP, EPA's selection of remedial alternatives gives priority to actions that treat wastes or use engineering controls where appropriate. Institutional controls are used to supplement active response measures, as well as to ensure the long-term protection of remedial actions. *See* 40 C.F.R. § 300.430(a)(1)(iii). In this case, institutional controls alone would not address the unacceptable risks to human health and the environment posed by hazardous substances present in areas of exposed slag or contaminated soil at the Site. Engineering controls, such as the covers required on all areas of exposed slag or soil, and the required Soil Management Plan will address these risks.

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Table 5. Revised Interim Action for OU-2

Components	Description of Revised Remedy Components and Performance Standards	Comments
1.	Capping OU-2 to prevent erosion of slag from the Site negatively impacting the Shenango River and adjacent habitats.	Unchanged Component 1 of the OU-2 interim ROD. A general description of the interim action that remains accurate.
2.	Cover all exposed slag and soil, including berms*, with clean material (e.g., compacted aggregate, clean soil) at a minimum thickness of one (1) foot if clean soil or aggregate, or minimum of 3 inches of asphalt concrete ("AC") or Portland cement concrete to prevent direct contact with and wind erosion of slag and soil, and reduce migration of contaminants to surface water. (*Berms and drainage swales should be vegetated to reduce stormwater runoff volume and alleviate thermal impact of runoff.) Where clean soil is used as cover material, an inert demarcation layer shall be installed across the area being covered. The demarcation layer must provide a visual indicator that distinguishes the soil beneath the demarcation layer from overlying clean soil. The elevation and grade of the covered areas and non-covered areas in OU-2 shall promote site drainage, minimize erosion, and require minimum maintenance. Control storm water flow in OU-2 to minimize impacts to the Shenango River.	ESD Change 1—replaces Components 2 and 3, and Performance Standards 1 and 2 of the OU-2 interim ROD. Retains Performance Standards 3 and 4 of the OU-2 ROD.
3.	An Operation and Maintenance Plan will be included as part of the design determining storm water control, the frequency of inspection of the capped areas and what time period is necessary to correct a breach with any component of the cap. This alternative shall (1) prevent contact with the slag and contaminated soil, (2) prevent the migration of slag dust from the Site, and (3) reduce groundwater infiltration and leaching of contamination from the slag which would reduce surface water contaminated runoff and shallow contaminated groundwater to the Shenango River so as to not negatively affect the groundwater remedy in OU-1 for the Site.	Unchanged Component 4 of the OU-2 interim ROD. While the type of cap/cover has changed, the requirement for appropriate O&M remains.
4.	Prevent damage to all covered areas of OU-2 that may cause exposure to, or releases of, hazardous substances. Implement this requirement with institutional controls and a Material and Soil Management Plan, which will supplement the O&M plan required in the ROD, specifying operational practices to be followed on OU-2 to protect all covered areas.	ESD Change 2—adds requirement for Material and Soil Management Plan and expands ICs to all covered areas.
5.	Land use restrictions and institutional controls will be documented in a Land Use Control Assurance Plan ("LUCAP") to protect the integrity or the asphalt cap or asphalt equivalent cap. The LUCAP will include controls for OU-2.	Same as Component 5 of the OU-2 interim ROD. Should now document ICs for all covered areas.
6.	The OU-2 institutional controls are for land use restrictions to protect any areas covered as part of this interim action. Prohibit activities, unless approved by EPA in consultation with PADEP, that could damage the covered areas placed in OU-2 through the implementation of institutional controls.	Essentially the same as Component 6 and Performance Standard 5 of the OU-2 interim ROD except that reference to Performance Standard 2 of the ROD is removed since this ESD (Change 1) replaced it. Component 4 of this ESD (Change 2) above expands IC requirements to areas not covered by an asphalt cap.
7.	Install a biosolid-enhanced cap and implement stormwater controls on the northern portion of Dunbar's property at OU-2 not used for Dunbar's business operations.	ESD Change 3
8.	The following requirements listed as ARARs in the OU-2 ROD are waived as ARARs: the provisions of Pa. Code Chapter 288 concerning requirements for residual waste landfill cap systems and closure (i.e., 25 Pa. Code §§ 288.234, 288.236, 288.291, and 288.292); and Pennsylvania's Uniform Environmental Covenants Act, 27 Pa. C.S. §§ 6501-6517 (cited as 25 Pa. Code §§ 253.2, 253.3 and 253.4 in the OU-2 ROD) has been determined to not be an ARAR.	ESD Change 4

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This ESD is supported by and will be incorporated into an Administrative Record. The Administrative Record includes the documents that form the basis for the interim remedial action modification described in this ESD, any public comments on the draft version of this ESD received by EPA, and EPA's responses to these comments. The Administrative Record is available for public review at the following locations:

Stey Nevant Library
1000 Roemer Blvd.
Farrell, PA 16121
(724) 983-2714

EPA Region III
1650 Arch Street
Philadelphia, PA 19103-2029
(215) 814-3157

or on the internet at: http://www.epa.gov/arweb/.

Questions on EPA's action and requests to review the Administrative Record can be directed to:

Stephen F. Tyahla (3HS22)
Remedial Project Manager
U.S. Environmental Protection Agency – Region III
1650 Arch Street
Philadelphia, PA 19103
(215) 814-3268
Email: tyahla.stephen@epa.gov

IX. SIGNATURE

This Explanation of Significant Differences modifies the OU-2 interim remedial action set forth in the OU-2 ROD of December 19, 2013 for the Sharon Steel Corporation (Farrell Works Disposal Area) Superfund Site to include changes to the type and location of cover, preparation of a Materials & Soil Management Plan, changes to the institutional controls, and potential extension of the adjacent OU-1 remedy onto OU-2.

Approved by

Cecil Rodrigues, Director
Hazardous Site Cleanup Division

JUN 23 2015
Date