UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF MISSOURI
EASTERN DIVISION

UNITED STATES OF AMERICA and STATE OF MISSOURI,	)	
Plaintiffs,	)	
v.	)	No. 4:18CV502 RLW
THE DOE RUN RESOURCES CORPORATION, In its own capacity and on behalf of ST. JOE MINERAL CORPORATION and ST. JOSEPH LEAD COMPANY,	)	
Defendants.	)	

REMEDIAL DESIGN/REMEDIAL ACTION

CONSENT DECREE

30355207

TABLE OF CONTENTS

I. BACKGROUND 1
II. JURISDICTION 2
III. PARTIES BOUND 2
IV. DEFINITIONS 3
V. GENERAL PROVISIONS 8
VI. PERFORMANCE OF THE WORK 9
VII. REMEDY REVIEW 13
VIII. PROPERTY REQUIREMENTS 13
IX. FINANCIAL ASSURANCE 14
X. PAYMENTS FOR RESPONSE COSTS 17
XI. INDEMNIFICATION AND INSURANCE 20
XII. CLAIMS AGAINST THE SUPERFUND 21
XIII. FORCE MAJEURE 23
XIV. DISPUTE RESOLUTION 24
XV. STIPULATED PENALTIES 26
XVI. COVENANTS BY PLAINTIFFS 29
XVII. COVENANTS BY SD AND SFAs 32
XVIII. EFFECT OF SETTLEMENT; CONTRIBUTION 34
XIX. ACCESS TO INFORMATION 35
XX. RETENTION OF RECORDS 36
XXI. OTHER OUTSTANDING ORDERS 37
XXII. NOTICES AND SUBMISSIONS 38
XXIII. RETENTION OF JURISDICTION 40
XXIV. APPENDICES 40
XXV. MODIFICATION 41
XXVI. LODGING AND OPPORTUNITY FOR PUBLIC COMMENT 41
XXVII. SIGNATORIES/SERVICE 41
XXVIII. FINAL JUDGMENT 42

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 at the Big River Mine Tailings Superfund Site, St. Francois County, Missouri (the "Site"), together with accrued interest; and (2) performance of response actions by the defendant at the Site consistent with the National Contingency Plan, 40 C.F.R. Part 300 ("NCP").

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 State of Missouri (the "State") on October 31, 2011, of negotiations with potentially responsible parties ("PRPs") regarding the implementation of the remedial design and remedial action ("RD/RA") 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 ("CD").

D. The State has joined as co-Plaintiff in the United States' complaint.

E. In accordance with Section 122(j)(1) of CERCLA, 42 U.S.C. § 9622(j)(1), EPA notified the Department of the Interior on October 31, 2011, 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 trustee to participate in the negotiation of this CD.

F. The defendant that has entered into this CD ("Settling Defendant" or "SD") does not admit any liability to Plaintiffs arising out of the transactions or occurrences alleged in the complaint, nor does it acknowledge that the release or threatened release of hazardous substances at or from the Site constitutes an imminent and substantial endangerment to the public health or welfare or the environment. Settling Federal Agencies ("SFAs") do not admit any liability arising out of the transactions or occurrences alleged in any counterclaim asserted by SD.

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 October 14, 1992, 57 Fed. Reg. 47180.

H. In response to a release or a substantial threat of a release of a hazardous substance at or from the Site, SD, on January 29, 1997, entered into Administrative Order on Consent for RI/FS, Docket No. VII-97-F-0002, to conduct a Remedial Investigation and Feasibility Study ("RI/FS") for the Site pursuant to 40 C.F.R. § 300.430.

I. Consistent with that Order on Consent, SD completed a Remedial Investigation ("RI") Report on March 3, 2006, and completed a Feasibility Study ("FS") Report on July 6, 2011.

J. 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 on July 22, 2011, 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 Director of the Superfund Division, EPA Region 7, based the selection of the response action for Operable Unit 01.

K. The decision by EPA on the remedial action for Operable Unit 01 to be implemented at the Site is embodied in a Record of Decision ("ROD"), executed on September 30, 2011, on which the State has given its concurrence. The ROD includes a responsiveness summary to the public comments. Notice of the final plan was published in accordance with Section 117(b) of CERCLA, 42 U.S.C. § 9617(b).

L. Based on the information presently available to EPA and the State, EPA and the State believe that the Work will be properly and promptly conducted by the SD if conducted in accordance with this CD and its appendices.

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

N. On October 19, 2016, EPA issued a Unilateral Administrative Order (the 2016 UAO) to SD, requiring SD to implement a portion of the Remedial Action. The 2016 UAO was issued with the Parties' knowledge of the continuing settlement negotiations in recognition of their mutual desire for the Remedial Action to commence before final agreement regarding this CD.

O. The Parties recognize, and the Court by entering this CD finds, that this CD has been negotiated by the Parties in good faith and implementation of this CD will expedite the cleanup of the Site and will avoid prolonged and complicated litigation between the Parties, and that this CD 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, 1367, and 1345, and 42 U.S.C. §§ 9606, 9607, and 9613(b). This Court also has personal jurisdiction over SD. Solely for the purposes of this CD and the underlying complaints, SD waives all objections and defenses that it may have to jurisdiction of the Court or to venue in this District. SD shall not challenge the terms of this CD or this Court's jurisdiction to enter and enforce this CD.

III. PARTIES BOUND

2. This CD is binding upon the United States and the State and upon SD and the SFAs and their successors, and assigns. Any change in ownership or corporate or other legal

status of SD including, but not limited to, any transfer of assets or real or personal property, shall in no way alter SD's responsibility under this CD.

3. SD shall provide a copy of this CD to each contractor hired to perform the Work and to each person representing the SD 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 CD. SD or its contractors shall provide written notice of the CD to all subcontractors hired to perform any portion of the Work. SD shall nonetheless be responsible for ensuring that its contractors and subcontractors perform the Work in accordance with the terms of this CD. With regard to the activities undertaken pursuant to this CD, each contractor and subcontractor shall be deemed to be in a contractual relationship with SD 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 CD, terms used in this CD 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 CD or its appendices, the following definitions shall apply solely for purposes of this CD:

"Affected Property" shall mean all real property at the Site and any other real property where EPA determines, at any time, that access, land, water, or other resource use restrictions, and/or Institutional Controls are needed to implement the Remedial Action, including, but not limited to, Residential Properties within the Response Area.

"CD Properties Remaining to Be Sampled" shall mean the 3,648 Residential Properties within the Response Area that had not yet been sampled by EPA, SD, or another entity as of September 1, 2016, less the number of Residential Properties within the Response Area sampled after September 1, 2016.

"CD Properties to Be Remediated" shall mean the Residential Properties to be remediated by SD pursuant to this CD, determined according to the formula X + Y – Z, where: X is the Known Properties Requiring Remediation; Y is the number of CD Properties Remaining to Be Sampled that, following sampling, are shown to exceed the Cleanup Level set forth in the ROD; and Z is the number of Properties to Be Remediated By Others. Upon issuance by EPA of the Notice of Completion of the Work pursuant to Section XIX of the 2016 UAO, the number of CD Properties to Be Remediated shall be reduced by a further 155 Residential Properties.

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

"Consent Decree" or "CD" shall mean this consent decree and all appendices attached hereto (listed in Section XXIV). In the event of conflict between this CD and any appendix, this CD shall control.

"Day" or "day" shall mean a calendar day. In computing any period of time under this CD, 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.

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

"Effective Date" shall mean the date upon which the approval of this CD is recorded on the Court's docket.

"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.

"MDNR" shall mean the Missouri Department of Natural Resources and any successor departments or agencies of MDNR.

"Future Response Costs" shall mean all costs, including, but not limited to, direct and indirect costs, that the United States incurs in reviewing or developing deliverables submitted pursuant to this CD, in overseeing implementation of the Work and 2016 UAO Work, or otherwise implementing, overseeing, or enforcing this CD, or otherwise in connection with Operable Unit 01, after the Effective Date.

"Hayden Creek Mining Area" shall mean the former mining site located one mile southwest of the town of Frankclay at 216 State Route M, Irondale, St. Francois County, Missouri. The Hayden Creek Mining Area is estimated to be approximately 50 acres in size and contains several old concrete structures that remain from former mining activities. The area of the former mining operations is approximately eight acres. MDNR completed a Preliminary Assessment/Removal Site Evaluation of the Hayden Creek Mining Area in September of 2011.

"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 other resource use to minimize the potential for human exposure to Waste Material at or in connection with the Site; (b) limit land, water, or other resource use to implement, ensure non-interference with, or ensure the protectiveness of the RA; and/or (c) provide information intended to modify or guide human behavior at or in connection with the Site.

"Interest" shall mean interest at the rate specified for interest on investments of the EPA Hazardous Substance Superfund, 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. Rates are available online at http://www2.epa.gov/superfund/superfund-interest-rates.

"Known Properties Requiring Remediation" shall mean the Residential Properties within the Response Area that EPA has identified as exceeding the Cleanup Level set forth in the ROD, that have not been remediated as of the Effective Date. As of September 1, 2016, there were 1,765 Known Properties Requiring Remediation. This number shall be adjusted by adding the number of Residential Properties sampled by parties other than SD after September 1, 2016 that exceed the Cleanup Level set forth in the ROD, and by subtracting the number of Residential Properties remediated by parties other than SD between September 1, 2016 and the Effective

Date, but shall not be adjusted by the number of Residential Properties remediated by the SD between September 1, 2016 and the Effective Date.

"Leadwood Soil Repository" shall mean the former mining site located west and south of the City of Leadwood, St. Francois County, Missouri. The Leadwood Soil Repository can be located on the Flat River 7.5-Minute U.S. Geological Survey ("USGS") quadrangle map in Sections 4, 5, 8, 9, and 16 Township 36 North, Range 4 East in St. Francois County, Missouri.

"The Big River Mine Tailings Special Account" shall mean the special account, within the EPA Hazardous Substance Superfund, established for the Site by EPA pursuant to Section 122(b)(3) of CERCLA, 42 U.S.C. § 9622(b)(3).

"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.

"Non-Settling Owner" shall mean any person, other than SD, that owns or controls any Affected Property. The clause "Non-Settling Owner's Affected Property" means Affected Property owned or controlled by Non-Settling Owner.

"Operable Unit 01" shall mean Residential Properties located within the Site.

"Operation and Maintenance" or "O&M" shall mean all activities required to operate, maintain, and monitor the effectiveness of the RA as specified in the SOW or any EPA-approved O&M Plan.

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

"Parties" shall mean the United States, the State of Missouri, and SD.

"Past Response Costs" shall mean all costs, including, but not limited to, direct and indirect costs, that the United States paid in connection with Operable Unit 01 at the Site through the Effective Date.

"Performance Standards" or "PS" shall mean the cleanup levels and other measures of achievement of the remedial action objectives, as set forth in the ROD.

"Plaintiffs" shall mean the United States and the State of Missouri.

"Properties to Be Remediated By Others" shall mean Residential Properties within the Response Area that exceed the Cleanup Level that, after the Effective Date, will be remediated by entities other than SD. As of September 1, 2016, there were 732 Properties to Be Remediated By Others. This number shall be reduced by the number of Residential Properties within the Response Area remediated by entities other than SD between September 1, 2016 and the Effective Date.

"Proprietary Controls" shall mean easements or covenants running with the land that (a) limit land, water, or other resource use and/or provide access rights and (b) are created pursuant

to common law or statutory law by an instrument that is recorded 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 Record of Decision relating to the Operable Unit 01, Residential Properties at the Site signed on September 30, 2011, by the Director of the Superfund Division, EPA Region 7, and all attachments thereto. The ROD is attached as Appendix A.

"Reimbursable Future Response Costs" shall mean those Future Response Costs that SD is required to reimburse to the United States pursuant to Paragraphs 11, 17, and 21.d.

"Reimbursable State Future Response Costs" shall mean those Future Response Costs that SD is required to reimburse to the State pursuant to Paragraphs 11 and 21.d

"Related Orders" shall mean the following orders:

Administrative Order on Consent, Docket No. CERCLA-7-2000-0015

Administrative Order on Consent, Docket No. CERCLA 07-97-F-007

Administrative Order on Consent, Docket No. CERCLA 07-97-F-009

Administrative Order on Consent, Docket No. CERCLA 07-2000-0022

Administrative Order on Consent, Docket No. CERCLA 07-98-F-0007

Administrative Order on Consent, Docket No. CERCLA 07-2000-0023

Administrative Order on Consent, Docket No. CERCLA 07-2000-0024

Administrative Order on Consent, Docket No. CERCLA 07-2000-0025

Administrative Order on Consent, Docket No. CERCLA 07-2004-0167

Administrative Order on Consent, Docket No. VII-94-F-0015

Unilateral Administrative Order, Docket No. CERCLA 07-2005-0169

Unilateral Administrative Order, Docket No. CERCLA 07-2005-0272

Unilateral Administrative Order, Docket No. CERCLA 07-2006-0231

"Remedial Action" or "RA" shall mean the remedial action selected in the ROD.

"Remedial Design" or "RD" shall mean those activities to be undertaken by SD to develop final plans and specifications for the RA as stated in the SOW.

"Residential Properties" shall mean properties that contain single and multi-family dwellings, apartment complexes, vacant lots in residential areas, schools, daycare centers, playgrounds, parks and green ways.

"Response Area" shall mean the area within one mile of chat and tailings waste at each of the mine waste areas in St. Francois County, including: Desloge; Doe Run; Elvins (Rivermines); Federal; Leadwood; and, National, and as depicted on Figure 1 of the ROD (attached to this CD as Appendix F).

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

"Settling Defendant" or "SD" shall mean The Doe Run Resources Corporation, in its own capacity and on behalf of its predecessors, including the St. Joe Mineral Corporation and the St. Joseph Lead Company.

"SD's Future Response Costs" shall mean the necessary costs of response consistent with the NCP that SD incurs and pays at Operable Unit 01, after the Effective Date, including, but not limited to costs that the SD incurs implementing the Work, the 2016 UAO Work, any Reimburseable Future Response Costs that Settling Defendant pays to EPA under Paragraph 24 of this Consent Decree, and any Reimburseable State Future Response Costs that Settling Defendant pays to the State under Paragraph 26 of this Consent Decree.

"SD's Past Response Costs" shall mean the necessary costs of response consistent with the NCP that the SD incurred at or in connection with the Site, prior to and including the Effective Date, including, but not limited to, costs that SD incurred implementing the 2016 UAO Work, but excluding costs that SD incurred related to Operable Unit 02 at the Site.

"Settling Federal Agencies" or "SFAs" shall mean the Department of Defense, Department of the Treasury, Department of the Interior, and Department of the Army and their successor departments, agencies, or instrumentalities.

"Site" shall mean the Big River Mine Tailings Superfund Site, located in St. Francois County, Missouri, and depicted generally on the map attached as Appendix C. The boundaries of the "Site" are coextensive with the boundaries of St. Francois County.

"State" shall mean the State of Missouri.

"State Future Response Costs" shall mean all costs, including, but not limited to, direct and indirect costs, that the State incurs in reviewing or developing deliverables submitted pursuant to this CD, in overseeing implementation of the Work and 2016 UAO Work, or otherwise implementing, overseeing, or enforcing this CD, or otherwise in connection with Operable Unit 01, after the Effective Date.

"State Past Response Costs" shall mean all costs, including, but not limited to, direct and indirect costs, that the State paid in connection with Operable Unit 01 at the Site through the Effective Date.

"Statement of Work" or "SOW" shall mean the document describing the activities SD must perform to implement the RD, the RA, and O&M regarding the Site, which is attached as Appendix B.

"Supervising Contractor" shall mean the principal contractor retained by SD to supervise and direct the implementation of the Work under this CD.

"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 EPA, and the SFAs.

"2016 UAO" shall mean the Unilateral Administrative Order issued by EPA on October 19, 2016 with number CERCLA-07-2017-0001.

"2016 UAO Work" shall mean all activities and obligations that SD is required to perform under the 2016 UAO.

"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); (3) any "solid waste" under Section 1004(27) of RCRA, 42 U.S.C.§ 6903(27); and (4) any "hazardous substance" under Sections 260.360 and 260.500 Revised Statutes of Missouri ("RSMo").

"Work" shall mean all activities and obligations SD is required to perform under this CD, except the activities required under Section XX (Retention of Records). Work does not include 2016 UAO Work or activities undertaken in compliance with SOW Section 8 (Related Orders).

V. GENERAL PROVISIONS

5. **Objectives of the Parties**. The objectives of the Parties in entering into this CD are to protect public health or welfare or the environment by the implementation of response actions for Operable Unit 01 at the Site and at the Hayden Creek Mining Area by SD, and to resolve the claims of Plaintiffs for Operable Unit 01 of the Site and for the Hayden Creek Mining Area against SD, potential administrative actions of EPA and the claims of the State of Missouri for Operable Unit 01 of the Site and for the Hayden Creek Mining Area against the SFAs, and the claims of SD that have been or could have been asserted against the United States and the State with regard to Operable Unit 01 of the Site, the Hayden Creek Mining Area, and SD's Past Response Costs as provided in this CD.

6. **Commitments by SD and SFAs**. SD shall finance and perform the Work in accordance with this CD and all deliverables developed by SD and approved or modified by EPA pursuant to this CD. SD shall pay the United States for its Reimbursable Future Response Costs and the State for its Reimbursable State Future Response Costs as provided in this CD. The United States, on behalf of the SFAs, shall pay SD for its response costs, as provided in this CD.

7. **Compliance with Applicable Law**. Nothing in this CD limits SD's obligations to comply with the requirements of all applicable federal and state laws and regulations. SD must also comply with all applicable or relevant and appropriate requirements of all federal and state environmental laws as set forth in the ROD and the SOW. The activities conducted pursuant to

this CD, if approved by EPA, shall be deemed to be consistent with the NCP as provided in Section 300.700(c)(3)(ii) of 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, SD shall submit timely and complete applications and take all other actions necessary to obtain all such permits or approvals.

b. SD may seek relief under the provisions of Section XIII (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 ¶ 8.a and required for the Work, provided that it has submitted timely and complete applications and taken all other actions necessary to obtain all such permits or approvals.

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

VI. PERFORMANCE OF THE WORK

9. **Coordination and Supervision.**

a. **Project Coordinators.**

(1) SD's Project Coordinator must have sufficient technical expertise to coordinate the Work. SD's Project Coordinator may not be an attorney representing SD in this matter and may not act as the Supervising Contractor. SD's Project Coordinator may assign other representatives, including other contractors, to assist in coordinating the Work.

(2) EPA shall designate and notify the SD of EPA's Project Coordinator and Alternate Project Coordinator. EPA may designate other representatives, which may include its employees, contractors and/or consultants, to oversee the Work. EPA's Project Coordinator/Alternate Project Coordinator will have the same authority as a remedial project manager and/or an on-scene coordinator, as described in the NCP. This includes the authority to halt the Work and/or to conduct or direct any necessary response action when he or she determines that conditions at the Site constitute an emergency or may present an immediate threat to public health or welfare or the environment due to a release or threatened release of Waste Material.

(3) The State shall designate and notify EPA and the SD of its Project Coordinator[s] and Alternate Project Coordinator[s]. The State may designate other representatives, including its employees, contractors and/or consultants to oversee the Work. For any meetings and inspections in which EPA's Project Coordinator

participates, the State's Project Coordinator also may participate. SDs shall notify the State reasonably in advance of any such meetings or inspections.

(4) SD's Project Coordinators shall meet or confer by telephone with EPA's and the State's Project Coordinators monthly, or as otherwise mutually agreed among the Project Coordinators.

b. **Supervising Contractor**. SD's proposed Supervising Contractor must have sufficient technical expertise to supervise the Work and a quality assurance system that complies with ANSI/ASQC E4-2004, Quality Systems for Environmental Data and Technology Programs: Requirements with Guidance for Use (American National Standard).

c. **Procedures for Disapproval/Notice to Proceed.**

(1) SD shall designate, and notify EPA, within 10 days after the Effective Date, of the names, contact information, and qualifications of the SD's proposed Project Coordinator and Supervising Contractor.

(2) EPA, after a reasonable opportunity for review and comment by the State, shall issue notices of disapproval and/or authorizations to proceed regarding the proposed Project Coordinator and Supervising Contractor, as applicable. If EPA issues a notice of disapproval, SD shall, within 30 days, submit to EPA a list of supplemental proposed Project Coordinators and/or Supervising Contractors, as applicable, including a description of the qualifications of each. EPA shall issue a notice of disapproval or authorization to proceed regarding each supplemental proposed coordinator and/or contractor. SD may select any coordinator/contractor covered by an authorization to proceed and shall, within 21 days, notify EPA of SD's selection.

(3) SD may change its Project Coordinator and/or Supervising Contractor, as applicable, by following the procedures of ¶¶ 9.c(1) and 9.c(2).

(4) Notwithstanding the procedures of ¶¶ 9.c(1) through 9.c(3), SD has proposed, and EPA has authorized SD to proceed, regarding the following Project Coordinator and Supervising Contractor:

<u>Project Coordinator</u>

Chris Neaville
Asset Development Director
The Doe Run Company
Suite 300
1801 Park 270 Drive
St. Louis, MO 63146

<u>Supervising Contractor</u>

AMEC Foster Wheeler plc
15933 Clayton Rd
Ballwin, MO 63011

10. **Performance of Work.**

a. **Performance of Work in Accordance with SOW.** SD shall: perform the RA and operate, maintain, and monitor the effectiveness of the RA; all in accordance with the SOW and all EPA-approved, conditionally-approved, or modified deliverables as required by the SOW. The SOW shall require SD to complete the provisions of this Paragraph on all Affected Properties, including, not later than the end of the thirteenth calendar year after the Effective Date, sampling of all CD Properties Remaining to Be Sampled, and remediation of all CD Properties to Be Remediated; provided that SD shall not be required to attempt to gain access to a number of Residential Properties greater than the number of CD Properties to be Sampled or to perform remediation on Residential Properties other than the CD Properties to be Remediated. SD shall perform remediation on CD Properties to Be Remediated according to the schedule set forth in the SOW. All deliverables required to be submitted for approval under the CD or SOW shall be subject to approval by EPA in accordance with ¶ 6.6 (Approval of Deliverables) of the SOW.

b. **Performance of Work Related to Hayden Creek Mining Area.** Subject to obtaining necessary access, SD agrees to address all Site contamination at the Hayden Creek Mining Area to health-based cleanup levels appropriate for the future use of the property. SD shall submit a Work Plan in accordance with Appendix H for approval by EPA and the State not later than two years after the Effective Date. The Work Plan shall address the identification of all sources of Site contamination at the Hayden Creek Mining Area; provide recommendations for an appropriate response action to address sources of Site contamination at the Hayden Creek Mining Area; and provide a schedule for completion of the investigation and completion of the response action. The Work Plan shall require SD to complete the response action for the Hayden Creek Mining Area not later than five years after the Effective Date or three years after EPA's approval of the Work Plan, whichever is later. All deliverables submitted for EPA approval or EPA comment pursuant to this Paragraph or the Work Plan for the Hayden Creek Mining Area shall be subject to Section 6 (Deliverables) of the SOW.

c. **Notification to Doe Run Regarding Properties Requiring Remediation and Sampling.** Not later than thirty days after the Effective Date, EPA shall identify and provide to SD the list of Known Properties Requiring Remediation and the number of CD Properties Remaining to Be Sampled and Properties to Be Remediated By Others.

d. **Leadwood Soil Repository**.

(1) SD agrees to allow, free of charge, EPA and its contractors access to and use of the Leadwood Soil Repository for disposal of lead contaminated residential yard soils from the Site, until the end of the thirteenth year after the Effective Date, provided that such use leaves sufficient capacity for SD to use the Leadwood Soil Repository for disposal of soils generated by SD under the 2016 UAO and this CD. SD shall provide an annual update of the estimated capacity of each of its soil repositories, including the Leadwood Soil Repository. This information shall be included in the revised RA Construction Schedule. EPA and its contractors will be responsible for the day-to-day control and management of the portion of the Leadwood Soil Repository that they use, during the period of such use. SD shall be responsible for such control and

management of the Leadwood Soil Repository, consistent with the Repository Operation Plan, upon the conclusion of its use by EPA and its contractors and for the long-term operation and maintenance of the Leadwood Soil Repository, consistent with an approved O&M Plan, after the completion of the Work.

(2) SD shall notify EPA as soon as practicable if it determines that the Leadwood Soil Repository lacks, or will lack, sufficient capacity to accommodate both SD's disposal of soils generated by SD under the 2016 UAO and this CD and disposal of Site soils by EPA or its contractors. SD's notice shall include available information demonstrating that the repository will lack sufficient capacity to accommodate both EPA's and SD's projected needs with regard to Site soils. SD and EPA shall confer regarding SD's notice to identify potential solutions.

(3) Within thirty (30) days after such notice, EPA shall decide whether it will continue unchanged, reduce, or eliminate entirely the use of the Leadwood Soil Repository for disposal of Site soils by EPA and its contractors, and provide notice of such decision to SD.

(4) EPA's decision under Paragraph 10.d(3) shall be subject to Dispute Resolution. If SD initiates Dispute Resolution, EPA and its contractors shall cease using the Leadwood Soil Repository during the pendency of the dispute.

11. **Emergencies and Releases**. SD shall comply with the emergency and release response and reporting requirements under ¶ 4.4 (Emergency Response and Reporting) of the SOW. Subject to Section XVI (Covenants by Plaintiffs), nothing in this CD, including ¶ 4.4 of the SOW, limits any authority of Plaintiffs: (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. If, due to SD's failure to take appropriate response action under ¶ 4.4 of the SOW, EPA or, as appropriate, the State takes such action instead, SD shall reimburse EPA and the State under Section X (Payments for Response Costs) for all costs of the response action.

12. **Community Involvement**. If requested by EPA, SD shall conduct community involvement activities under EPA's oversight as provided for in, and in accordance with, Section 2 (Community Involvement) of the SOW. Such activities may include, but are not limited to, designation of a Community Involvement Coordinator and development of a Health Education Program.

13. **Modification of SOW or Related Deliverables**.

a. If EPA determines that it is necessary to modify the work specified in the SOW and/or in deliverables developed under the SOW in order to achieve and/or maintain the Performance Standards or to carry out and maintain the effectiveness of the RA, and such modification is consistent with the Scope of the Remedy set forth in ¶ 1.3 of the SOW, then EPA

may notify SD of such modification. If SD objects to the modification it may, within 30 days after EPA's notification, seek dispute resolution under Section XIV.

b. The SOW and/or related work plans shall be modified: (1) in accordance with the modification issued by EPA; or (2) if SD invokes dispute resolution, in accordance with the final resolution of the dispute. The modification shall be incorporated into and enforceable under this CD, and SD shall implement all work required by such modification. SD shall incorporate the modification into the deliverable required under the SOW, as appropriate.

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

14. Nothing in this CD, the SOW, or any deliverable required under the SOW constitutes a warranty or representation of any kind by Plaintiffs that compliance with the work requirements set forth in the SOW or related deliverable will achieve the Performance Standards.

VII. REMEDY REVIEW

15. **Periodic Review**. SD shall conduct, in accordance with ¶ 4.7 (Periodic Review Support Plan) of the SOW, studies and investigations to support EPA's reviews under Section 121(c) of CERCLA, 42 U.S.C. § 9621(c), and applicable regulations, of whether the RA is protective of human health and the environment.

VIII. PROPERTY REQUIREMENTS

16. **Agreements Regarding Access and Non-Interference.** SD shall, with respect to any Non-Settling Owner's Affected Property, use best efforts to secure from such Non-Settling Owner an agreement, enforceable by SD and by Plaintiffs, providing that such Non-Settling Owner (i) provide Plaintiffs, their representatives, contractors, and subcontractors with access at all reasonable times to such Affected Property to conduct any activity regarding the CD, including those listed in ¶ 16.a (Access Requirements); and (ii) refrain from using such Affected 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.

a. **Access Requirements**. The following is a list of activities for which access is required regarding the Affected Property:

(1) Conducting and Monitoring the Work;

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

(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 construction quality assurance quality control plan as provided in the SOW;

(7) Implementing the Work pursuant to the conditions set forth in ¶ 63 (Work Takeover);

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

(9) Assessing SD's compliance with the CD;

(10) Determining whether the Affected Property is being used in a manner that is prohibited or restricted, or that may need to be prohibited or restricted under the CD; and

(11) Implementing, monitoring, maintaining, reporting on, and enforcing any land, water, or other resource use restrictions and Institutional Controls.

17. **Best Efforts**. As used in this Section, "best efforts" means the efforts that a reasonable person in the position of SD would use so as to achieve the goal in a timely manner, including the cost of employing professional assistance and the payment of reasonable sums of money to secure access and/or use restriction. If SD is unable to accomplish what is required through "best efforts" in a timely manner, it shall notify the EPA and include a description of the steps taken to comply with the requirements. If the EPA deems it appropriate, it may assist SD, or take independent action, in obtaining such access and/or use restrictions. SD shall reimburse all costs incurred by the United States or State in providing such assistance or taking such action, including the cost of attorney time and the amount of monetary consideration or just compensation paid, and such costs shall constitute Reimbursable Future Response Costs to be reimbursed under Section X (Payments for Response Costs).

IX. FINANCIAL ASSURANCE

18. In order to ensure completion of the Work, SD shall secure financial assurance for the benefit of EPA, initially in the amount of $1,000,000 and ultimately in the amount of $35,800,000, in the amounts and by the dates set forth in Appendix D. The financial assurance must be one or more of the mechanisms listed below, in a form substantially identical to the relevant sample documents available from the "Financial Assurance" category on the Cleanup Enforcement Model Language and Sample Documents Database at http://cfpub.epa.gov/compliance/models/, and satisfactory to EPA. SDs may use multiple mechanisms as long as they are limited to surety bonds guaranteeing payment, letters of credit, trust funds, and/or insurance policies.

a. A surety bond 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. An irrevocable letter of credit, payable to or at the direction of EPA, that is issued by an entity that has the authority to issue letters of credit and 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 that has the authority to act as a trustee and whose trust operations are regulated and examined by a federal or state agency. SD shall make deposits to the trust fund in accordance with the schedule set forth in Appendix D, provided, however, that the Amount of Deposit for each required deposit shall equal the lesser of 1) the Amount of Deposit identified in Appendix D or 2) the difference between the Principal Balance in Trust After Deposit identified in Appendix D corresponding to that deposit and the principal amount of funds in the trust (i.e., balance exclusive of any interest earned to date) at the time the deposit is due. SD may make its annual deposits in two equal parts as set forth in Appendix D.

d. A policy of insurance that provides EPA with acceptable rights as a beneficiary thereof and that is issued by an insurance carrier that has the authority to issue insurance policies in the applicable jurisdiction(s) and whose insurance operations are regulated and examined by a federal or state agency;

19. As set forth above and in Appendix D, SD has selected, and EPA has found satisfactory, as an initial financial assurance a trust fund in the form attached as Appendix G. Within 30 days after the Effective Date, SD shall secure all executed and/or otherwise finalized mechanisms or other documents consistent with the form of financial assurance attached as Appendix G and shall submit such mechanisms and documents to the Regional Financial Management Officer, to the United States, and to EPA and the State as specified in Section XXI (Notices and Submissions).

20. SD shall diligently monitor the adequacy of the financial assurance. If SD becomes aware of any information indicating that the financial assurance provided under this Section is inadequate or otherwise no longer satisfies the requirements of this Section, SD shall notify EPA of such information within 7 days of such discovery. If EPA determines that the financial assurance provided under this Section is inadequate or otherwise no longer satisfies the requirements of this Section, EPA will notify the affected SD of such determination. SD shall, within 30 days after notifying EPA or receiving notice from EPA under this Paragraph, secure and submit to EPA for approval a proposal for a revised or alternative financial assurance mechanism that satisfies the requirements of this Section. EPA may extend this deadline for such time as is reasonably necessary for SD, in the exercise of due diligence, to secure and submit to EPA a proposal for a revised or alternative financial assurance mechanism, not to exceed 60 days. SD shall follow the procedures of ¶ 22 (Modification of Financial Assurance) in seeking approval of, and submitting documentation for, the revised or alternative financial assurance mechanism. SD's inability to secure and submit to EPA financial assurance in accordance with this Section shall in no way excuse performance of any other requirements of this CD, including,

without limitation, the obligation of SD to complete the Work in accordance with the terms of this CD.

21. **Access to Financial Assurance.**

a. If EPA issues a notice of implementation of a Work Takeover under ¶ 63.b, then, in accordance with any applicable financial assurance mechanism EPA is entitled to: (1) the performance of the Work; and/or (2) require that any funds guaranteed be paid in accordance with ¶ 21.c.

b. If EPA is notified by the issuer of a financial assurance mechanism that it intends to cancel such mechanism, and SD fails to provide an alternative financial assurance mechanism in accordance with this Section at least 30 days prior to the cancellation date, the funds guaranteed under such mechanism must be paid prior to cancellation in accordance with ¶ 21.c. If, upon issuance of a notice of implementation of a Work Takeover under ¶ 63.b, EPA is unable for any reason to promptly secure the resources guaranteed under any applicable financial assurance mechanism then EPA may demand an amount, as determined by EPA, sufficient to cover 60 percent of the cost to EPA of the remaining Work to be performed. SD shall, within 30 days of such demand, pay the amount demanded as directed by EPA.

c. Any amounts required to be paid under this ¶ 21 shall be, as directed by EPA: (i) paid to EPA in order to facilitate the completion of the Work by EPA or by another person; or (ii) deposited into an interest-bearing account, established at a duly chartered bank or trust company that is insured by the FDIC, in order to facilitate the completion of the Work by another person. If payment is made to EPA, EPA may deposit the payment into the EPA Hazardous Substance Superfund or into the Big River Mine Tailings Superfund Site Special Account within the EPA Hazardous Substance Superfund 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.

d. All EPA Work Takeover costs and State Work Takeover costs not paid under this ¶ 21 must be reimbursed as Reimbursable Future Response Costs and/or State Reimbursable Future Response Costs under Section X (Payments for Response Costs).

22. **Modification of Amount, Form, or Terms of Financial Assurance.**

a. SD may submit, on any anniversary of the Effective Date or at any other time agreed to by the Parties, but not more often than once per calendar year, a request to reduce the amount, or change the form or terms, of the financial assurance mechanism. Any such request must be submitted to EPA in accordance with ¶ 18, and must include an estimate of the cost of the remaining Work, an explanation of the bases for the cost calculation, and a description of the proposed changes, if any, to the form or terms of the financial assurance.

b. EPA will notify SD of its decision to approve or disapprove a requested reduction or change pursuant to this Paragraph. If EPA determines that the SD has demonstrated that 60% of the estimated costs of the remaining Work (based on the number of CD Properties Remaining To be Remediated) is less than the balance of the financial assurance trust fund created pursuant to Section IX, EPA shall approve a requested reduction in an amount equal to

the difference shown. SD may reduce the amount of the financial assurance mechanism only in accordance with: (a) EPA's approval, which will not be unreasonably withheld, conditioned or delayed; or (b) if there is a dispute, the agreement, final administrative decision, or final judicial decision resolving such dispute under Section XIV (Dispute Resolution). Any decision made by EPA on a request submitted under this Paragraph to change the form or terms of a financial assurance mechanism, not including a request to reduce the amount of financial assurance, shall be made in EPA's sole and unreviewable discretion, and such decision shall not be subject to challenge by SD pursuant to the dispute resolution provisions of this CD or in any other forum. Within 30 days after receipt of EPA's approval of, or the agreement or decision resolving a dispute relating to, the requested modifications pursuant to this Paragraph, SD shall submit to EPA documentation of the reduced, revised, or alternative financial assurance mechanism in accordance with ¶ 19.

23. **Release, Cancellation, or Discontinuation of Financial Assurance**. SD may release, cancel, or discontinue any financial assurance provided under this Section only: (a) if EPA issues a Certification of Work Completion under ¶ 4.8 (Certification of Work Completion) of the SOW; (b) in accordance with EPA's approval of such release, cancellation, or discontinuation; or (c) if there is a dispute regarding the release, cancellation or discontinuance of any financial assurance, in accordance with the agreement, final administrative decision, or final judicial decision resolving such dispute under Section XIV (Dispute Resolution).

X. PAYMENTS FOR RESPONSE COSTS

24. **Payments by SD for Future Response Costs**. SD shall pay to EPA those Reimbursable Future Response Costs not inconsistent with the NCP, only as required to be paid and expressly set forth in this CD. Any EPA demand for reimbursement of Reimbursable Future Response Costs shall be accompanied by an Itemized Cost Summary, which includes direct and indirect costs incurred by EPA, its contractors, subcontractors, and DOJ.

25. **Deposit of Future Response Costs Payments**. The total amount to be paid by SD as reimbursement of Reimbursable Future Response Costs shall be deposited by EPA in the Big River Mine Tailings Superfund 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, provided, however, that EPA may deposit a Future Response Costs payment directly into the EPA Hazardous Substance Superfund if, at the time the payment is received, EPA estimates that the Big River Mine Tailings Superfund Site Special Account balance is sufficient to address currently anticipated future response actions to be conducted or financed by EPA at or in connection with the Site. Any decision by EPA to deposit a Future Response Costs payment directly into the EPA Hazardous Substance Superfund for this reason shall not be subject to challenge by SD pursuant to the dispute resolution provisions of this CD or in any other forum.

26. **Payments by SD to State**. SD shall pay to the State those Reimbursable State Future Response Costs not inconsistent with the NCP, only as required to be paid and expressly set forth in this Decree. The State will send SD a bill requiring payment that includes a State-prepared cost summary, accompanied by documentation not inconsistent with the NCP, which includes direct and indirect costs incurred by the State and its contractors on a periodic basis. SD

shall make payments of all undisputed costs within 30 days after SD's receipt of each bill requiring payment, except as otherwise provided in ¶ 28 (Contesting Future Response Costs).

27. **Payment Instructions for SD.**

a. Future Response Costs Payment and Stipulated Penalties. For payments to the United States:

(1) For all payments subject to this ¶ 27.a, SD shall make such payment by Automated Clearinghouse (ACH) payment as follows:

PNC Bank
808 17th Street, NW
Washington, DC 20074
Contact B Jesse White 301-887-6548
ABA = 051036706
Transaction Code 22 - checking
Environmental Protection Agency
Account 310006
CTX Format

(2) For all payments made under this ¶ 27.a, SD must include references to the Site/Spill ID and DJ numbers. At the time of any payment required to be made in accordance with ¶ 27.a, SD shall send notices that payment has been made to the United States, EPA, and the EPA Cincinnati Finance Center, all in accordance with ¶ 90. All notices must include references to the Site/Spill ID and DJ numbers.

b. For all payments to the State pursuant to Paragraph 26, SD shall pay by certified or cashier's check payable to the "Treasurer, State of Missouri (Hazardous Waste Fund)" referencing the name and address of the party making the payment, EPA Site/Spill ID Number, and sent to:

Chief, Superfund Section
Hazardous Waste Program
Missouri Department of Natural Resources
P.O. Box 176
Jefferson City, MO 65102

c. For all payments to the State under Section XV (Stipulated Penalties), SD shall make payment by certified check or cashier's check made payable to the "Treasurer, State of Missouri (St. Francois County School Fund)" referencing the name and address of the party making the payment, EPA Site/Spill ID Number, and sent to

JoAnn Horvath, or designee
Financial Services
Missouri Attorney General's Office
P.O. Box 899
Jefferson City, MO 65102

F

28. **Contesting Future Response Costs**. SD may submit a Notice of Dispute, initiating the procedures of Section XIV (Dispute Resolution), regarding any Reimbursable Future Response Costs or any Reimbursable State Future Response Costs billed under ¶ 24 (Payments by SD for Future Response Costs) or under ¶ 26 (Payments by SD to State) if SD determines that EPA or the State has made a mathematical error or included a cost item that is not within the definition of Reimbursable Future Response Costs or Reimbursable State Future Response Costs, or if SD believes EPA or the State incurred excess costs as a direct result of an EPA or State action that was inconsistent with a specific provision or provisions of the NCP. Such Notice of Dispute shall be submitted in writing within 30 days after receipt of the bill and must be sent to the United States (if the United States' accounting is being disputed) or the State (if the State's accounting is being disputed) pursuant to Section XXI (Notices and Submissions). Such Notice of Dispute shall specifically identify the contested Reimbursable Future Response Costs or Reimbursable State Future Response Costs and the basis for objection. If SD submits a Notice of Dispute, SD shall within the 30-day period, also as a requirement for initiating the dispute, (a) pay all uncontested Reimbursable Future Response Costs to the United States and all uncontested Reimbursable State Future Response Costs to the State, and, if the amount in dispute exceeds $25,000 (b) 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 or State Future Response Costs. SD shall send to the United States or the State, as appropriate, as provided in Section XXI (Notices and Submissions), a copy of the transmittal letter and check paying the uncontested Future Response Costs or State 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. If the United States or the State prevails in the dispute, SD shall pay the sums due (with accrued interest) to the United States or the State, if State costs are disputed, within 7 days after the resolution of the dispute. If SD prevails concerning any aspect of the contested costs, SD shall pay that portion of the costs (plus associated accrued interest) for which it did not prevail to the United States or the State, if State costs are disputed, within 7 days after the resolution of the dispute. SD shall be disbursed any balance of the escrow account. All payments to the United States under this Paragraph shall be made in accordance with ¶ 27.a (instructions for future response cost payments). The dispute resolution procedures set forth in this Paragraph in conjunction with the procedures set forth in Section XIV (Dispute Resolution) shall be the exclusive mechanisms for resolving disputes regarding SD's obligation to reimburse the United States and the State for their Reimbursable Future Response Costs and Reimbursable State Future Response Costs.

29. **Interest**. In the event that any payment for Reimbursable Future Response Costs required under this Section is not made by the date required, SD shall pay Interest on the unpaid balance. The Interest on Future Response Costs shall begin to accrue on the date of receipt of the bill. The Interest shall accrue through the date of SD'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 SD's failure to make timely payments under this Section including, but not

limited to, payment of stipulated penalties pursuant to ¶ 47 (Stipulated Penalty Amounts – Work).

30. **Payments by SFAs.**

a. **Payment to SD**. As soon as reasonably practicable after the Effective Date, the United States, on behalf of SFAs, shall pay to SD $2,000,000 by Automated Clearing House (ACH) Electronic Funds Transfer in accordance with instructions provided by SD.

b. **Interest**. In the event that any payment required by ¶ 30.a is not made within 120 days after the Effective Date, the United States, on behalf of SFAs, shall pay Interest on the unpaid balance, with such Interest commencing on the 121st day after the Effective Date and accruing through the date of the payment.

c. The Parties to this CD recognize and acknowledge that the payment obligations of the SFAs under this CD can only be paid from appropriated funds legally available for such purpose. Nothing in this CD shall be interpreted or construed as a commitment or requirement that any Settling Federal Agency obligate or pay funds in contravention of the Anti-Deficiency Act, 31 U.S.C. § 1341, or any other applicable provision of law.

XI. INDEMNIFICATION AND INSURANCE

31. **SD's Indemnification of the United States and the State.**

a. The United States and the State do not assume any liability by entering into this CD or by virtue of any designation of SD as EPA's authorized representatives under Section 104(e) of CERCLA, 42 U.S.C. § 9604(e). SD shall indemnify, save, and hold harmless the United States and the State and their 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 SD, its officers, directors, employees, agents, contractors, subcontractors, and any persons acting on SD's behalf or under its control, in carrying out activities pursuant to this CD, including, but not limited to, any claims arising from any designation of SD as EPA's authorized representatives under Section 104(e) of CERCLA. Further, SD agrees to pay the United States and the State all costs they incur 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 and the State based on negligent or other wrongful acts or omissions of SD, 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 CD. Neither the United States nor the State shall be held out as a party to any contract entered into by or on behalf of SD in carrying out activities pursuant to this CD. Neither SD nor any such contractor shall be considered an agent of the United States or the State.

b. The United States and the State, respectively, shall give SD notice of any claim for which the United States or the State plans to seek indemnification pursuant to this ¶ 31, and shall consult with SD prior to settling such claim.

32. SD covenants not to sue and agrees not to assert any claims or causes of action against the United States and the State, respectively, for damages or reimbursement or for set-off of any payments made or to be made to the United States or the State, arising from or on account

of any contract, agreement, or arrangement between SD 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, SD shall indemnify, save and hold harmless the United States and the State with respect to any and all claims for damages or reimbursement arising from or on account of any contract, agreement, or arrangement between SD and any person for performance of Work on or relating to the Site, including, but not limited to, claims on account of construction delays.

33. **Insurance**. No later than 15 days before commencing any on-site Work, SD shall secure, and shall maintain until the first anniversary after the RA has been performed in accordance with this CD and the Performance Standards have been achieved, commercial general liability insurance with limits of $3 million, for any one occurrence, and automobile liability insurance with limits of $1 million, combined single limit, naming the United States and the State as additional insureds with respect to all liability arising out of the activities performed by or on behalf of SD pursuant to this CD. In addition, for the duration of this CD, SD 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 SD in furtherance of this CD. Prior to commencement of the Work, SD shall provide to EPA and the State certificates of such insurance and a copy of each insurance policy. SD shall resubmit such certificates and copies of policies each year on the anniversary of the Effective Date. If SD demonstrates by evidence satisfactory to EPA and the State 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, SD need provide only that portion of the insurance described above that is not maintained by the contractor or subcontractor.

XII. CLAIMS AGAINST THE SUPERFUND

34. **Reimbursement of Claims**

a. Pursuant to Sections 111(a)(2), 112, and 122(b)(1) of CERCLA, 42 U.S.C. §§ 9611(a)(2), 9612, and 9622(b)(1), SD may submit a claim for reimbursement to the Hazardous Substance Superfund (the Fund) for up to 40% of the necessary costs incurred in completing the Work in accordance with this Consent Decree, the ROD, the SOW and Appendix E (Preauthorization Decision Document). In no event shall SD's total claim(s) against the Fund under this Section exceed the sum of $31,560,000. Reimbursement from the Fund shall be subject to the provisions of Section 112 of CERCLA, the regulations set forth in 40 C.F.R. Part 307, and the applicable claims and audits procedures specified in the Preauthorization Decision Document, attached hereto as Appendix E, and shall be made in accordance with the procedures outlined in therein.

b. As provided in the Preauthorization Decision Document (Attached as Appendix E), EPA shall make eligible for reimbursement $5.26 million to the SD after the Effective Date.

c. Beginning on the second anniversary of the Effective Date, and every two years thereafter until the cumulative amount requested to be eligible for reimbursement is $31,560,000, SD may submit for approval an amendment to the Preauthorization Decision Document increasing the amount eligible for reimbursement by an additional $5.26 million each

time SD submits such an amendment. Notwithstanding anything else in this paragraph, SD shall submit such amendments whenever the projected reimbursement claims against the Fund for the succeeding six months exceed the amount eligible for reimbursement set forth in the Preauthorization Decision Document (as amended by any previously approved amendments). SD's failure timely to submit an amendment application shall not alter any of its obligations under this CD in any way. At no time may the cumulative amount requested for reimbursement exceed $31,560,000. EPA shall not be obligated to make available for reimbursement to SD more than the amount specified in Appendix E unless and until an amended Preauthorization Decision Document is issued by EPA.

d. If SD timely submits a complete Preauthorization Decision Document amendment application, and EPA does not approve it before SD's reimbursement claims exhaust the amount eligible for reimbursement set forth in the Preauthorization Decision Document (as amended by any previous approved amendments), SD shall not be required to complete more than 60% of the Work otherwise scheduled until such time as EPA approves the amendment with a reimbursement rate adjusted to provide for overall reimbursement at the previously approved rate.

e. SD's claim(s) against the Fund may cover only those costs incurred in implementing the Work, including costs for SD personnel and equipment only to the extent that such costs are directly necessary for the implementation of the Work, and may include attorney's fees only to the extent that such fees are directly necessary for the implementation of the Work (e.g. attorneys' fees for drawing necessary contract documents), and otherwise meet the requirements of 40 C.F.R. Part 307. SD shall be solely responsible for any other type of attorneys' fees (e.g., fees related to evaluating or establishing the liability of SD or any person, pursuing a claim against any other person, defending a claim by the United States or any other person, evaluating SD's submissions under, or compliance with, the terms of this Consent Decree, or advising or representing SD in any action or dispute resolution under this Consent Decree or in any action or proceeding to enforce this Consent Decree) and all Operation and Maintenance costs incurred after the issuance by EPA of the Certification of RA Completion, and may not submit a claim against the Fund for these costs.

f. If EPA denies a claim for reimbursement in whole or in part, it shall notify SD in writing of the reason for such denial. Within thirty (30) days after receiving such written notice of EPA's decision, SD may request an administrative hearing as provided in Section 112(b)(2) of CERCLA, 42 U.S.C. § 9612(b)(2), and 40 C.F.R. Part 307.

g. EPA shall deposit any funds paid on account of a claim for reimbursement into the financial assurance trust set forth in Paragraph 19 until EPA approves a reduction in the amount of financial assurance in accordance with Paragraph 22.b. After the first such reduction, EPA shall make all payments on account of a claim for reimbursement directly to SD.

h. Pursuant to Section 112(c)(1) of CERCLA, 42 U.S.C. § 9612(c)(1), SD hereby subrogates its rights to the United States to recover from other parties, who are not signatories of this Consent Decree, any costs reimbursed to SD under this Section, and SD and its contractors shall assist in any action to recover these costs that may be initiated by the United States. All of SD's contracts for implementing the Preauthorization Decision Document shall

include a specific requirement that the contractors agree to provide this cost recovery assistance to the United States. The cost recovery assistance shall include, but not be limited to, furnishing the personnel, services, documents, and materials requested by the United States to assist the United States in documenting the work performed and costs expended by SD or SD's contractors at the Site in order to aid in cost recovery efforts. Assistance shall also include providing all requested assistance in the interpretation of evidence and costs, and providing requested testimony.

XIII. FORCE MAJEURE

35. "Force majeure," for purposes of this CD, is defined as any event arising from causes beyond the control of SD, of any entity controlled by SD, or of SD's contractors that delays or prevents the performance of any obligation under this CD despite SD's best efforts to fulfill the obligation. The requirement that SD 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.

36. If any event occurs or has occurred that may delay the performance of any obligation under this CD for which SD intends or may intend to assert a claim of force majeure, SD 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 Superfund Division, EPA Region 7, within 10 days of when SD first knew that the event might cause a delay. Within 10 days thereafter, SD shall provide in writing to EPA and the State 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; SD's rationale for attributing such delay to a force majeure; and a statement as to whether, in the opinion of SD, such event may cause or contribute to an endangerment to public health or welfare, or the environment. SD shall include with any notice all available documentation supporting its claim that the delay was attributable to a force majeure. SD shall be deemed to know of any circumstance of which SD, any entity controlled by SD, or SD's contractors or subcontractors knew or should have known. Failure to comply with the above requirements regarding an event shall preclude SD from asserting any claim of force majeure regarding that event, provided, however, that if EPA, despite the late or incomplete notice, is able to assess to its satisfaction whether the event is a force majeure under ¶ 35 and whether SD has exercised its best efforts under ¶ 35, EPA may, in its unreviewable discretion, excuse in writing SD's failure to submit timely or complete notices under this Paragraph.

37. If EPA, after a reasonable opportunity for review and comment by the State, agrees that the delay or anticipated delay is attributable to a force majeure, the time for performance of the obligations under this CD that are affected by the force majeure will be extended by EPA, after a reasonable opportunity for review and comment by the State, 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, after a reasonable opportunity for review and comment by the State, does not agree that the delay or anticipated delay has been or will be caused by a force majeure, EPA will notify SD in writing of its decision. If EPA, after a reasonable opportunity for review and comment by the State, agrees that the delay is attributable to a force majeure, EPA will notify SD in writing of the length of the extension, if any, for performance of the obligations affected by the force majeure.

38. If SD elects to invoke the dispute resolution procedures set forth in Section XIV (Dispute Resolution) regarding EPA's decision, it shall do so no later than 30 days after receipt of EPA's notice. In any such proceeding, SD 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 SD complied with the requirements of ¶¶ 35 and 36. If SD carries this burden, the delay at issue shall be deemed not to be a violation by SD of the affected obligation of this CD identified to EPA and the Court.

39. The failure by EPA to timely complete any obligation under the CD or under the SOW is not a violation of the CD, provided, however, that if such failure prevents SD from meeting one or more deadlines in the SOW, SD may seek relief under this Section.

XIV. DISPUTE RESOLUTION

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

41. A dispute shall be considered to have arisen when one party sends the other parties a written Notice of Dispute. Any dispute regarding this CD 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.

42. **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 30 days after the conclusion of the informal negotiation period, SD invokes the formal dispute resolution procedures of this Section by serving on the United States and the State 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 SD. The Statement of Position shall specify SD's position as to whether formal dispute resolution should proceed under ¶ 43 (Record Review) or 44.

b. Within 30 days after receipt of SD's Statement of Position, EPA will serve on SD its Statement of Position, including, but not limited to, any factual data, analysis, or opinion supporting that position and all supporting documentation relied upon by EPA. EPA's

Statement of Position shall include a statement as to whether formal dispute resolution should proceed under ¶ 43 (Record Review) or 44. Within 30 days after receipt of EPA's Statement of Position, SD may submit a Reply.

c. If there is disagreement between EPA and SD as to whether dispute resolution should proceed under ¶ 43 (Record Review) or 44, the parties to the dispute shall follow the procedures set forth in the Paragraph determined by EPA to be applicable. However, if SD 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 ¶¶ 43 and 44.

43. **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 CD, and the adequacy of the performance of response actions taken pursuant to this CD. Nothing in this CD shall be construed to allow any dispute by SD 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 the Superfund Division, EPA Region 7, will issue a final administrative decision resolving the dispute based on the administrative record described in ¶ 43.a. This decision shall be binding upon SD, subject only to the right to seek judicial review pursuant to ¶¶ 43.c and 43.d.

c. Any administrative decision made by EPA pursuant to ¶ 43.b shall be reviewable by this Court, provided that a motion for judicial review of the decision is filed by SD with the Court and served on all Parties within 20 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 CD. The United States may file a response to SD's motion.

d. In proceedings on any dispute governed by this Paragraph, SD shall have the burden of demonstrating that the decision of the Superfund 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 ¶ 43.a.

44. 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. The Director of the Superfund Division, EPA Region 7, will issue a final decision resolving the dispute based on the statements of position and reply, if any, served under ¶ 42. The Superfund Division Director's decision shall be binding on SD unless, within 20 days after receipt of the decision, SD 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 CD. The United States may file a response to SD's motion.

b. Notwithstanding ¶ M (CERCLA § 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.

45. The invocation of formal dispute resolution procedures under this Section does not extend, postpone, or affect in any way any obligation of SD under this CD, except as provided in ¶ 28 (Contesting Future Response Costs), as agreed by EPA, or as determined by the Court. 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 ¶ 53. Notwithstanding the stay of payment, stipulated penalties shall accrue from the first day of noncompliance with any applicable provision of this CD. In the event that SD does not prevail on the disputed issue, stipulated penalties shall be assessed and paid as provided in Section XV (Stipulated Penalties).

XV. STIPULATED PENALTIES

46. SD shall be liable for stipulated penalties in the amounts set forth in ¶¶ 47, 48 and 49, to the United States and the State, with each Plaintiff receiving fifty percent of the payment, for failure to comply with the requirements of this CD specified below, unless excused under Section XII (Force Majeure). "Compliance" by SD shall include completion of all activities and obligations, including payments, required under this CD, or any deliverable approved under this CD, in accordance with all applicable requirements of law, this CD, the SOW, and any deliverables approved under this CD and within the specified time schedules established by and approved under this CD.

47. <u>Stipulated Penalty Amounts - Work (Including Payments and Excluding Deliverables)</u>.

a. The following stipulated penalties shall accrue per violation per day for any noncompliance identified in ¶ 47.b:

Period of Noncompliance	Penalty Per Violation Per Day
1st through 14th day	$1,000
15th through 30th day	$2,000
31st day and beyond	$3,000

b. Compliance Milestones.

(1) Completion of Work as set forth in the SOW and in work plans required by the SOW, including timely completion of milestones set forth in Section 7 of the SOW.

(2) Completion of Hayden Creek Mining Area response action as set forth in Hayden Creek Mining Area Work Plan and in any work plans required thereby.

(3) Notification to EPA of SD's inability to obtain access pursuant to Paragraph 17 within thirty days of the property owner's final refusal to provide access.

48. **Stipulated Penalty Amounts – Financial Assurance**

a. The following stipulated penalties shall accrue per violation per day for any noncompliance identified in ¶ 48.b:

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

b. Establishment and maintenance of financial assurance in compliance with the timelines and other substantive and procedural requirements of Section IX (Financial Assurance) and Appendix D.

49. **Stipulated Penalty Amounts - Deliverables.**

a. **Material Defects.** If an initially submitted or resubmitted deliverable contains a material defect, and the deliverable is disapproved or modified by EPA under ¶ 6.6(a) (Initial Submissions) or 6.6(b) (Resubmissions) of the SOW due to such material defect, then the material defect shall constitute a lack of compliance for purposes of ¶ 46. The provisions of Section XIV (Dispute Resolution) and Section XV (Stipulated Penalties) shall govern the accrual and payment of any stipulated penalties regarding SD's submissions under this CD.

b. The following stipulated penalties shall accrue per violation per day for failure to submit timely or adequate deliverables pursuant to the CD:

Period of Noncompliance	Penalty Per Violation Per Day
1st through 14th day	$500
15th through 30th day	$1,500
31st day and beyond	$2,500

50. In the event that EPA assumes performance of a portion or all of the Work pursuant to ¶ 63 (Work Takeover), SD shall be liable for a stipulated penalty in the amount of $3,000,000. Stipulated penalties under this Paragraph are in addition to the remedies available under ¶¶ 21 (Access to Financial Assurance) and 63 (Work Takeover).

51. 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 ¶ 6.6 (Approval of Deliverables) of the SOW, during the period, if any, beginning on the 31st day after EPA's receipt of such submission until the date that EPA notifies SD of any deficiency; (b) with respect to a decision by the Director of the Superfund Division, EPA Region 7, under ¶ 43.b or 44.a of Section XIV (Dispute Resolution), during the period, if any, beginning on the 21st day after the date that SD's reply to EPA's Statement of Position is received until the date that the Director issues a final decision regarding such dispute; or (c) with respect to judicial review by this Court of any dispute under Section XIV (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 CD shall prevent the simultaneous accrual of separate penalties for separate violations of this CD.

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

a. All penalties accruing under this Section shall be due and payable, fifty percent to the United States and fifty percent to the State, within 30 days after SD's receipt from EPA of a demand for payment of the penalties, unless SD invokes the Dispute Resolution procedures under Section XIV (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 ¶ 27.a (instructions for future response cost payments) and 27.c.

53. Penalties shall continue to accrue as provided in ¶ 51 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 and the State 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, SD shall pay all accrued penalties determined by the Court to be owed to EPA and the State within 60 days after receipt of the Court's decision or order, except as provided in ¶ 53.c;

c. If the District Court's decision is appealed by any Party, SD shall pay all accrued penalties determined by the District Court to be owed to the United States and the State

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 and the State or to SD to the extent that they prevail.

54. If SD fails to pay stipulated penalties when due, SD shall pay Interest on the unpaid stipulated penalties as follows: (a) if SD 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 ¶ 53 until the date of payment; and (b) if SD fails to timely invoke dispute resolution, Interest shall accrue from the date of demand under ¶ 52.a until the date of payment. If SD fails to pay stipulated penalties and Interest when due, the United States or the State may institute proceedings to collect the penalties and Interest.

55. The payment of penalties and Interest, if any, shall not alter in any way SD's obligation to complete the performance of the Work required under this CD.

56. Nothing in this CD shall be construed as prohibiting, altering, or in any way limiting the ability of the United States or the State to seek any other remedies or sanctions available by virtue of SD's violation of this CD 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 CD, except in the case of a willful violation of this CD.

57. 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 CD.

XVI. COVENANTS BY PLAINTIFFS

58. **Covenants for SD by United States**. Except as provided in ¶ 62 (General Reservations of Rights), the United States covenants not to sue or to take administrative action against SD pursuant to Sections 106 and 107(a) of CERCLA for Operable Unit 01, the Work, the 2016 UAO Work, Past Response Costs, and Future Response Costs, SD's Past Response Costs, and SD's Future Response Costs. These covenants shall take effect upon the Effective Date. These covenants are conditioned upon the satisfactory performance by SD of its obligations under this CD. These covenants extend only to SD and do not extend to any other person.

59. **Covenant for SFAs by United States**. Except as provided in ¶ 62 (General Reservations of Rights), EPA covenants not to take administrative action against SFAs pursuant to Sections 106 and 107(a) of CERCLA for Operable Unit 01, the Work, the 2016 UAO Work, Past Response Costs, Future Response Costs. EPA's covenant shall take effect upon the Effective Date. EPA's covenant is conditioned upon the satisfactory performance by SFAs of

their obligations under this CD. EPA's covenant extends only to SFAs and does not extend to any other person.

60. **Covenant for SD by the State.** Except as provided in ¶ 62 (General Reservation of Rights), the State covenants not to sue or take administrative action against SD pursuant to Section 107(a) of CERCLA for Operable Unit 1, the Work, the 2016 UAO Work, State Past Response Costs, and State Future Response Costs, SDs' Past Response Costs, and SDs' Future Response Costs. The State additionally covenants not to sue or take administrative action against SD for damages for injury to, destruction of, or loss of natural resources at OU-1. The State additionally covenants not to sue or take administrative action against SD for primary restoration of terrestrial natural resources at the Site; provided that at the time the Leadwood pile is no longer used as a repository, SD shall establish and maintain an appropriate mix of native plant species (selected by SD from the list in Appendix I) on the areas of the Leadwood Soil Repository used for placement of soils that will be vegetated as part of the Repository closure pursuant to the approved Repository Operation Plan. This covenant does not extend to claims for interim loss of natural resources or to any natural-resource damage claims for the Big River, its tributaries, floodplains, other streams within the Site, and assessment costs related thereto. The covenants set forth in this ¶ 60 shall take effect upon the Effective Date.

61. **Covenant for SFAs by State.** Except as provided in ¶ 62 (General Reservations of Rights), the State covenants not to sue, not to take administrative action against, and not to assert any claims or causes of action against SFAs with respect to Operable Unit 01, the Work, the 2016 UAO Work, State Past Response Costs, State Future Response Costs, and this CD, including, but not limited to, any claims under CERCLA §§ 107 or 113, RCRA Section 7002(a), 42 U.S.C. § 6972(a), or state law. The State additionally covenants not to sue or take administrative action against SFAs for damages for injury to, destruction of, or loss of natural resources at Operable Unit 1. The State additionally covenants not to sue or take administrative action against SFAs for primary restoration of terrestrial natural resources at the Site. This covenant does not extend to claims for interim loss of natural resources or to any natural-resource damage claims for the Big River, its tributaries, floodplains, other streams within the Site, and assessment costs related thereto. These covenants shall take effect upon the Effective Date. These covenants are conditioned upon the satisfactory performance by SFAs of their obligations under this CD. These covenants extend only to SFAs and do not extend to any other person.

62. **General Reservations of Rights**. The United States and the State reserve, and this CD is without prejudice to, all rights against SD, and EPA and the State reserve, and this CD is without prejudice to, all rights against SFAs, with respect to all matters not expressly included within Plaintiffs' covenants. Notwithstanding any other provision of this CD, the United States and the State reserve all rights against SD, and EPA and the State reserve, and this CD is without prejudice to, all rights against SFAs, with respect to:

a. liability for failure by SD or SFAs to meet a requirement of this CD;

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 SD or SFAs when such ownership commences after signature of this CD by SD or SFAs;

d. liability based on the operation of the Site by SD when such operation commences after signature of this CD by SD and does not arise solely from SD's performance of the Work and liability based on the operation of the Site by SFAs when such operation commences after signature of this CD by SFAs;

e. liability based on SD's or SFAs' 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 CD by SD or SFAs;

f. liability for damages for injury to, destruction of, or loss of natural resources, and for the costs of any natural resource damage assessments (except, as to the State, as provided in ¶ 60 (Covenant for SD by the State) and ¶ 61 (Covenant for SFAs by State));

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 achievement of Performance Standards, 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 ¶ 13 (Modification of SOW or Related Deliverables);

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

k. liability for costs that the United States or the State will incur regarding the Site but that are not within the definition of Future Response Costs or State Future Response Costs; and,

l. previously incurred costs of response that are not within the definition of Past Response Costs or State Past Response Costs.

63. **Work Takeover**.

a. In the event EPA determines that SD: (1) has ceased implementation of any portion of the Work; (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 SD. Any Work Takeover Notice issued by EPA will specify the grounds upon which such notice was issued and will provide SD a period of 10 days within which to remedy the circumstances giving rise to EPA's issuance of such notice.

b. If, after expiration of the 10-day notice period specified in ¶ 63.a, SD 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 SD in writing (which writing may be electronic) if EPA determines that implementation of a Work Takeover is warranted under this ¶ 63.b. Funding of Work Takeover costs is addressed under ¶ 21 (Access to Financial Assurance).

c. SD may invoke the procedures set forth in ¶ 43 (Record Review), to dispute EPA's implementation of a Work Takeover under ¶ 63.b. However, notwithstanding SD'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 ¶ 63.b until the earlier of (1) the date that SD 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 ¶ 43 (Record Review) requiring EPA to terminate such Work Takeover.

64. Notwithstanding any other provision of this CD, the United States and the State retain all authority and reserve all rights to take any and all response actions authorized by law.

XVII. COVENANTS BY SD AND SFAs

65. **Covenants by SD**. Subject to the reservations in ¶ 68, SD covenants not to sue and agrees not to assert any claims or causes of action against the United States or the State with respect to Operable Unit 01, the Work, the 2016 UAO Work, Past Response Costs, Future Response Costs, State Past Response Costs, State Future Response Costs, SD's Past Response Costs, SD's Future Response Costs, and this CD, including, but not limited to:

a. Except as set forth in Section XII (Claims Against the Fund), any direct or indirect claim for reimbursement from the EPA Hazardous Substance Superfund through CERCLA §§ 106(b)(2), 107, 111, 112 or 113, or any other provision of law;

b. any claims under CERCLA §§ 107 or 113, RCRA Section 7002(a), 42 U.S.C. § 6972(a), or state law regarding Operable Unit 01, the Work, the 2016 UAO Work, Past Response Costs, Future Response Costs, State Past Response Costs, State Future Response Costs, SD's Past Response Costs, SD's Future Response Costs, and this CD; or

c. any claims arising out of response actions at or in connection with Operable Unit 01 of the Site, including any claim under the United States Constitution, the Constitution of the State of Missouri, the Tucker Act, 28 U.S.C. § 1491, the Equal Access to Justice Act, 28 U.S.C. § 2412, or at common law.

SD additionally covenants not to sue and agrees not to assert any claims or causes of action against the SFAs with respect to the revegetation of the Leadwood Soil Repository set forth in ¶ 60.

66. **Covenant by SFAs**. SFAs agree not to assert any direct or indirect claim for reimbursement from the EPA Hazardous Substance Superfund through CERCLA §§ 106(b)(2), 107, 111, 112, or 113, or any other provision of law, or to assert any claim against the State under CERCLA §§ 107 or 113, with respect to Operable Unit 01, the Work, the 2016 UAO Work, Past Response Costs, Future Response Costs, SD's Past Response Costs, SD's Future Response Costs, and this CD. This covenant does not preclude demand for reimbursement from

the Superfund of costs incurred by a SFA in the performance of its duties (other than pursuant to this CD) as lead or support agency under the NCP.

67. Except as provided in ¶¶ 70 (Waiver of Claims by SD) and 77 (Res Judicata and Other Defenses), the covenants in this Section shall not apply if the United States or the State brings a cause of action or issues an order pursuant to any of the reservations in Section XVI (Covenants by Plaintiffs), other than in ¶¶ 62.a (claims for failure to meet a requirement of the CD), 62.g (criminal liability), and 62.h (violations of federal/state law during or after implementation of the Work), but only to the extent that SD's or the SFAs' claims arise from the same response action, response costs, or damages that the United States or the State is seeking pursuant to the applicable reservation.

68. SD reserves, and this CD 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 SD's deliverables or activities. SD also reserves, and this CD is without prejudice to, contribution claims against SFAs in the event any claim is asserted by the United States or the State against SD pursuant to any of the reservations in Section XVI (Covenants by Plaintiffs) other than in ¶¶ 62.a (claims for failure to meet a requirement of the CD), 62.g (criminal liability), and 62.h (violations of federal/state law during or after implementation of the Work), but only to the extent that SD's claims arise from the same response action, response costs, or damages that the United States or the State is seeking pursuant to the applicable reservation.

69. Except as set forth in Section XII (Claims Against the Fund), nothing in this CD shall be deemed to constitute approval or preauthorization of a claim within the meaning of Section 111 of CERCLA, 42 U.S.C. § 9611, or 40 C.F.R. § 300.700(d).

70. **Waiver of Claims by SD.**

a. SD agrees not to assert any claims 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 they may have with respect to the following:

(1) **De Micromis Waiver**. For all matters relating to the Site against any person where the person's liability to SD with respect to the Site is based solely on having arranged for disposal or treatment, or for transport for disposal or treatment, of hazardous substances at the Site, or having accepted for transport for disposal or treatment of hazardous substances at the Site, if all or part of the disposal, treatment, or transport occurred before April 1, 2001, and the total amount of material containing hazardous substances contributed by such person to the Site was less than 110 gallons of liquid materials or 200 pounds of solid materials;

(2) **Specific Persons Doe Run Contends Are Potentially Responsible Parties.** For all matters relating to OU-1 against any other person, except any person to whom SD presents a claim pursuant to 40 C.F.R. § 307.30. SD shall present any such claim at least 60 days prior to SD submitting its first claim for reimbursement pursuant to Paragraph 34 (Reimbursement of Claims) and Appendix E (Preauthorization Decision Document), with a simultaneous copy to the United States and State.

71. SD agrees not to seek judicial review of the final rule listing the Site on the NPL based on a claim that changed site conditions that resulted from the performance of the Work in any way affected the basis for listing the Site.

XVIII. EFFECT OF SETTLEMENT; CONTRIBUTION

72. Except as provided in ¶ 70 (Waiver of Claims by SD), nothing in this CD shall be construed to create any rights in, or grant any cause of action to, any person not a Party to this CD. Except as provided in Section XVII (Covenants by SD and SFAs), each of the Parties expressly reserves any and all rights (including, but not limited to, pursuant to Section 113 of CERCLA, 42 U.S.C. § 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 CD diminishes the right of the United States, pursuant to Section 113(f)(2) and (3) of CERCLA, 42 U.S.C. § 9613(f)(2)-(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).

73. The Parties agree, and by entering this CD this Court finds, that this CD constitutes a judicially-approved settlement pursuant to which SD and each SFA has, as of the Effective Date, resolved liability to the United States and the State within the meaning of Section 113(f)(2) of CERCLA, 42 U.S.C. § 9613(f)(2), and 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 the "matters addressed" in this CD. The "matters addressed" in this CD are Operable Unit 01, the Work, the 2016 UAO Work, Past Response Costs, Future Response Costs, State Past Response Costs, State Future Response Costs, SD's Past Response Costs, SD's Future Response Costs.

74. The Parties further agree, and by entering this CD this Court finds, that the complaint filed by the Plaintiffs in this action is a civil action within the meaning of Section 113(f)(1) of CERCLA, 42 U.S.C. § 9613(f)(1), and that this CD constitutes a judicially-approved settlement pursuant to which Settling Defendant and each SFA has, as of the Effective Date, resolved liability to the United States and the State within the meaning of Section 113(f)(3)(B) of CERCLA, 42 U.S.C. § 9613(f)(3)(B).

75. SD shall, with respect to any suit or claim brought by it for matters related to this CD, except for a demand required by 40 C.F.R. § 307.30, notify the United States and the State in writing no later than 60 days prior to the initiation of such suit or claim.

76. SD shall, with respect to any suit or claim brought against it for matters related to this CD, notify in writing the United States and the State within 10 days after service of the

complaint on SD. In addition, SD shall notify the United States and the State within 10 days after service or receipt of any Motion for Summary Judgment and within 10 days after receipt of any order from a court setting a case for trial.

77. **Res Judicata and Other Defenses**. In any subsequent administrative or judicial proceeding initiated by the United States or the State for injunctive relief, recovery of response costs, or other appropriate relief relating to the Site, SD and, with respect to a State action, SFAs 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 or the State 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 XVI (Covenants by Plaintiffs).

XIX. ACCESS TO INFORMATION

78. SD shall provide to EPA and the State, 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 SD's possession or control or that of its contractors or agents relating to activities at the Site or to the implementation of this CD, 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. SD shall also make available to EPA and the State, for purposes of investigation, information gathering, or testimony, their employees, agents, or representatives with knowledge of relevant facts concerning the performance of the Work.

79. **Privileged and Protected Claims**.

a. SD may assert that all or part of a Record requested by Plaintiffs is privileged or protected as provided under federal law, in lieu of providing the Record, provided SD complies with ¶ 79.b, and except as provided in ¶ 79.c.

b. If SD asserts a claim of privilege or protection, it shall provide Plaintiffs with the following information regarding such Record: its title; its date; the name, title, affiliation (e.g., company or firm), and address of the author, of each addressee, and of each recipient; a description of the Record's contents; and the privilege or protection asserted. If a claim of privilege or protection applies only to a portion of a Record, SD shall provide the Record to Plaintiffs in redacted form to mask the privileged or protected portion only. SD shall retain all Records that it claims to be privileged or protected until Plaintiffs have had a reasonable opportunity to dispute the privilege or protection claim and any such dispute has been resolved in the SD's favor.

c. SD may make no claim of privilege or protection regarding: (1) any data regarding the Site, including, but not limited to, all sampling, analytical, monitoring, hydrogeologic, scientific, chemical, radiological or engineering data, or the portion of any other Record that evidences conditions at or around the Site; or (2) the portion of any Record that SD is required to create or generate pursuant to this CD.

80. **Business Confidential Claims**. SD may assert that all or part of a Record provided to Plaintiffs under this Section or Section XX (Retention of Records) is business confidential 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). SD shall segregate and clearly identify all Records or parts thereof submitted under this CD for which SD asserts business confidentiality claims. Records submitted to EPA 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 and the State, or if EPA has notified SD 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 SD.

81. If relevant to the proceeding, the Parties agree that validated sampling or monitoring data generated in accordance with the SOW and reviewed and approved by EPA shall be admissible as evidence, without objection, in any proceeding under this CD.

82. Notwithstanding any provision of this CD, Plaintiffs retain all of their information gathering and inspection authorities and rights, including enforcement actions related thereto, under CERCLA, RCRA, and any other applicable statutes or regulations.

XX. RETENTION OF RECORDS

83. Until 10 years after EPA's Certification of Work Completion under ¶ 4.8 (Certification of Work Completion) of the SOW, SD 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 liability under CERCLA with respect to the Site, and all Records that relate to the liability of any other person under CERCLA with respect to the Site. SD 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 SD (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. Retention of an electronic copy of a Record satisfies the requirement to retain such Record, provided that 1) SD shall retain a hard copy of any Record which any applicable law requires be maintained in hard copy to have legal effect; 2) SD shall retain a hard copy of any oversized document; and 3) SD shall ensure that any electronic copy of any Record is legible and, if originally electronic, is maintained in both its native format and in a format that is reasonably accessible to the public. Each of the above record retention requirements shall apply regardless of any corporate retention policy to the contrary.

84. The United States acknowledges that each SFA is subject to all applicable federal record retention laws, regulations, and policies.

85. At the conclusion of this record retention period, SD shall notify the United States and the State at least 90 days prior to the destruction of any such Records, and, upon request by

the United States or the State, and except as provided in ¶ 79 (Privileged and Protected Claims), SDs shall deliver any such Records to EPA or the State.

86. SD 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 notification of potential liability by the United States or the State and that it has fully complied with any and all EPA and State requests for information regarding the Site pursuant to Sections 104(e) and 122(e)(3)(B) of CERCLA, 42 U.S.C. §§ 9604(e) and 9622(e)(3)(B), and Section 3007 of RCRA, 42 U.S.C. § 6927, and state law.

XXI. OTHER OUTSTANDING ORDERS

87. Upon the Effective Date of this Consent Decree and, with respect to the Related Orders listed in SOW Section 8 (Related Orders) upon completion of the respective provisions of SOW Section 8, and except as provided in ¶ 88, below, SD's obligations under the Related Orders are deemed satisfied and all actions have been fully performed in accordance with the terms of the Related Orders. This Paragraph shall serve as EPA's written Notice of Completion to Settling Defendant, in accordance with the terms of the Related Orders, for each of the Related Orders.

88. The following requirements of the Related Orders remain in effect and are incorporated into this CD as enforceable requirements:

a. Record Retention. Until 10 years after Effective Date, SD shall preserve and retain all non-identical copies of records and documents (including records or documents in electronic form) now in its possession or control or which come into its possession or control that relate to the performance of the Work (as defined in each Related Order) or the liability of any person under CERCLA with respect to the St. Francois County Mining Area, regardless of any corporate retention policy to the contrary. SD shall also instruct its contractors and agents to preserve and retain all non-identical copies of documents, records, and information of whatever kind, nature or description relating to performance of the Work (as defined in each Related Order). At the conclusion of this document retention period, SD shall notify EPA at least 90 days prior to the destruction of any such records or documents, and, upon request by EPA, SD shall deliver any such records or documents to EPA. SD may assert that certain documents, records and other information are privileged under the attorney-client privilege or any other privilege recognized by federal law. If SD asserts such a privilege, it shall provide EPA with the following: 1) the title of the document, record, or information; 2) the date of the document, record, or information; 3) the name and title of the author of the document, record, or information; 4) the name and title of each addressee and recipient; 5) a description of the subject of the document, record, or information; and 6) the privilege asserted by SD. However, no documents, reports or other information created or generated pursuant to the requirements of the Related Orders shall be withheld on the grounds that they are privileged.

b. Access. If any property within the St. Francois County Mining Area where access is needed to implement one of the Related Orders is owned or controlled by SD, SD shall, commencing on the Effective Date, provide EPA and its representatives, including

contractors, with access at all reasonable times to the property for the purpose of conducting any activity related to the relevant Related Order.

c. Post-Removal Site Control. With respect to AOC CERCLA Docket No. 07-2000-024 (Bonne Terre Western Portion), AOC CERCLA Docket No. 07-2000-025 (Bonne Terre Eastern Portion), AOC Docket No. VII-94-F-0015 (Desloge / Big River), UAO Docket No. CERCLA 07-2005-0169 (Elvins UAO), UAO Docket No. CERCLA 07-2006-0272 (Leadwood UAO), and UAO Docket No. CERCLA 07-2006-0231 (National UAO), SD shall provide long-term operation and maintenance of such sites to ensure the long-term effectiveness and integrity of the removal action as constructed by SD and as described in the applicable EPA-approved Removal Action Report. SD shall implement the Post-Removal Site Control Plan including appropriate land-use restrictions as approved by EPA.

89. EPA will use its best efforts to determine whether to approve or deny a request for a Notice of Completion of the Work pursuant to Paragraph 76 of the 2016 UAO within one year after SD submits a Final Report requesting a Notice of Completion of the Work pursuant to Paragraph 76.a of the 2016 UAO. Such decision will not be unreasonably delayed.

XXII. NOTICES AND SUBMISSIONS

90. All approvals, consents, deliverables, modifications, notices, notifications, objections, proposals, reports, and requests specified in this CD must be in writing unless otherwise specified. Whenever, under this CD, notice is required to be given, or a report or other document is required to be sent, by one Party to another, it must be directed to the person(s) specified below at the addresses specified below. Any Party may change the person and/or address applicable to it by providing notice of such change to all Parties. All notices under this Section are effective upon receipt, unless otherwise specified. Notices required to be sent to EPA, and not to the United States, should not be sent to the DOJ. Except as otherwise provided,

notice to a Party by email (if that option is provided below) or by regular mail in accordance with this Section satisfies any notice requirement of the CD regarding such Party.

As to the United States:

EES Case Management Unit
U.S. Department of Justice
Environment and Natural Resources Division
P.O. Box 7611
Washington, D.C. 20044-7611
eescdcopy.enrd@usdoj.gov
Re: DJ # 90-11-3-09306/4

and:

Chief
U.S. Department of Justice
Environment and Natural Resources Division
Environmental Defense Section
P.O. Box 7611
Washington, D.C. 20044-7611
Re: DJ # 90-11-6-19877

As to EPA:

Chief
Superfund Branch
Office of Regional Counsel
United States Environmental Protection Agency
Region 7
11201 Renner Boulevard
Lenexa, Kansas 66219

and:

Chief
Lead Mining and Special Emphasis Branch
Superfund Division
United States Environmental Protection Agency
Region 7
11201 Renner Boulevard
Lenexa, Kansas 66219

As to the Regional Financial Management Officer:	Financial Management Services Team United States Environmental Protection Agency Region 7 11201 Renner Boulevard Lenexa, Kansas 66219
At to EPA Cincinnati Finance Center:	EPA Cincinnati Finance Center 26 W. Martin Luther King Drive Cincinnati, Ohio 45268 cinwd_acctsreceivable@epa.gov
As to the State:	Brandon Wiles State Project Manager Missouri Department of Natural Resources Hazardous Waste Program P.O. Box 176 Jefferson City, MO 65102-0176 Brandon.Wiles@dnr.mo.gov
As to SD:	Chris Neaville SDs' Project Coordinator Asset Development Director The Doe Run Company Suite 300 1801 Park 270 Drive St. Louis, MO 63146 314-453-7132

XXIII. RETENTION OF JURISDICTION

91. This Court retains jurisdiction over both the subject matter of this CD and SD for the duration of the performance of the terms and provisions of this CD for the purpose of enabling any 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 CD, or to effectuate or enforce compliance with its terms, or to resolve disputes in accordance with Section XIV (Dispute Resolution).

XXIV. APPENDICES

92. The following appendices are attached to and incorporated into this CD:

"Appendix A" is the ROD.

"Appendix B" is the SOW.

"Appendix C" is the description and/or map of the Site.

"Appendix D" is the schedule for financial assurance.

"Appendix E" is the Preauthorization Decision Document.

"Appendix F" is a map of the Response Area.

"Appendix G" is the Form of Financial Assurance Trust Agreement

"Appendix H" is the Requirements for Removal Action, Hayden Creek Mining Area

"Appendix I" is the List of Native Plant Species for Leadwood Revegetation

XXV. MODIFICATION

93. Except as provided in ¶ 13 (Modification of SOW or Related Deliverables), material modifications to this CD, including the SOW, shall be in writing, signed by the United States and SD, and shall be effective upon approval by the Court. Except as provided in ¶ 13, non-material modifications to this CD, including the SOW, shall be in writing and shall be effective when signed by duly authorized representatives of the United States and SD. All modifications to the CD, other than the SOW, also shall be signed by the State, or a duly authorized representative of the State, as appropriate. A modification to the SOW shall be considered material if it implements a ROD amendment that 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 SOW, the United States will provide the State with a reasonable opportunity to review and comment on the proposed modification.

XXVI. LODGING AND OPPORTUNITY FOR PUBLIC COMMENT

94. This CD shall be lodged with the Court for at least 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 CD disclose facts or considerations that indicate that the CD is inappropriate, improper, or inadequate. SD consents to the entry of this CD without further notice.

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

XXVII. SIGNATORIES/SERVICE

96. The undersigned representative of SD to this CD and the Assistant Attorney General for the Environment and Natural Resources Division of the Department of Justice and the Director of the Missouri Department of Natural Resources for the State certifies that he or

she is fully authorized to enter into the terms and conditions of this CD and to execute and legally bind such Party to this document.

97. SD agrees not to oppose entry of this CD by this Court or to challenge any provision of this CD unless the United States has notified SD in writing that it no longer supports entry of the CD.

98. SD 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 CD. SD 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. SD need not file an answer to the complaint in this action unless or until the Court expressly declines to enter this CD.

XXVIII. FINAL JUDGMENT

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

100. Upon entry of this CD by the Court, this CD shall constitute a final judgment between and among the United States, the State, and SD. The Court enters this judgment as a final judgment under Fed. R. Civ. P. 54 and 58.

SO ORDERED THIS 22 DAY OF May, 2018.

Ronnie L. White

United States District Judge

Signature Page for CD regarding OU-1 of the Big River Mine Tailings Superfund Site

FOR THE UNITED STATES OF AMERICA:

3/21/18
Dated

JEFFREY H. WOOD
Acting Assistant Attorney General
U.S. Department of Justice
Environment and Natural Resources Division
Washington, D.C. 20530

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

Phillip Dupré
U.S. Department of Justice
Environment and Natural Resources Division
Environmental Defense Section
P.O. Box 7611
Washington, D.C. 20044-7611

Signature Page for CD regarding OU-1 of the Big River Mine Tailings Superfund Site

James B. Gulliford
Regional Administrator
U.S. Environmental Protection Agency
Region 7
11201 Renner Boulevard
Lenexa, Kansas 66219

Steven L. Sanders
Senior Counsel
U.S. Environmental Protection Agency
Region 7
11201 Renner Boulevard
Lenexa, Kansas 66219

Signature Page for CD regarding OU-1 of the Big River Mine Tailings Superfund Site

FOR THE STATE OF MISSOURI:

Dated

Shawna Bligh
Assistant Attorney General
Agriculture and Environment Division
P.O. Box 899
Jefferson City, MO 65102

1-30-2018
Dated

Carol S. Comer, Director
Missouri Department of Natural Resources
P.O. Box 176
Jefferson City, MO 65102-0176

APPENDIX A

RECORD OF DECISION
BIG RIVER MINE TAILINGS SUPERFUND SITE
ST. FRANCOIS COUNTY, MISSOURI
CERCLIS ID#: MOD981126899
OPERABLE UNIT - 1

RECORD OF DECISION

BIG RIVER MINE TAILINGS SUPERFUND SITE
ST. FRANCOIS COUNTY, MISSOURI
CERCLIS ID#: MOD981126899
OPERABLE UNIT – 1

Prepared by:

U.S. Environmental Protection Agency
Region VII
901 N. 5th Street
Kansas City, KS. 66101

September 2011

30244274
Superfund

Table of Contents

I. **Declaration** 2
- A. Site Name and Location 2
- B. Statement of Basis and Purpose 2
- C. Assessment of Site 2
- D. Description of Selected Remedy 2
- E. Statutory Determinations 3
- F. ROD Data Certification Checklist 3
- G. Authorizing Signature 3

II. **Decision Summary** 4
- A. Site Name, Location, and Brief Description 4
- B. Site History and Enforcement Activities 4
- C. Community Participation 10
- D. Scope and Role of Operable Unit 1 10
- E. Site Characteristics 11
- F. Current and Potential Future Site and Resource Uses 11
- G. Summary of Site Risks 12
- H. Remedial Action Objectives 14
- I. Description of Alternatives 15
- J. Comparative Analysis of Alternatives 19
- K. Principal Threat Waste 24
- L. Selected Remedy 25
- M. Statutory Determinations 25

List of Appendices

Appendix A: Figures

Figure 1: Big River Response Area
Figure 2: National Pile before Remediation
Figure 3: Bonne Terre Pile before Remediation
Figure 4: Visible Mine Waste blowing off the Desloge Pile
Figure 5. Visual erosion of Mine Waste into Big Rive
Figure 6. Conceptual Site Model
Figure 7: Big River (Desloge) Repository
Figure 8: Leadwood Repository

Appendix B: Tables

Table 1: St. Francois County 2000 Census Information
Table 2: Federal and State Chemical Specific ARARs
Table 3: Location - Specific ARARs
Table 4: Federal and State Action - Specific ARARs
Table 5: Alternative 2 Cost Estimate
Table 6: Alternative 3 Cost Estimate

Appendix C: Responsiveness Summary

RECORD OF DECISION

I. DECLARATION

A. SITE NAME AND LOCATION

Big River Mine Tailings Site, Operable Unit 1 (OU 1)
Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) ID #: MOD981126899
St. Francois County, Missouri

B. STATEMENT OF BASIS AND PURPOSE

This decision document presents the Selected Remedy for addressing lead-contaminated residential and high child exposure area soil at the Big River Mine Tailings site (Site), OU 1. This decision was chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act, and to the extent practicable, the National Contingency Plan (NCP). This decision is based on the Administrative Record (AR) for the Site. The AR is located at the following information repositories:

St. Francois County Health Center
1025 West Main Street
Park Hills, Missouri

U.S. Environmental Protection Agency,
Region 7 Records Center
901 North 5th Street
Kansas City, Kansas 66101

The United States Environmental Protection Agency (EPA) has coordinated the selection of this remedial action with the Missouri Department of Natural Resources (MDNR). The state of Missouri concurs with the Selected Remedy.

C. ASSESSMENT OF THE SITE

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.

D. DESCRIPTION OF THE SELECTED REMEDY

The Selected Remedy focuses on the remediation of lead contaminated mine ore processing waste in residential areas of OU 1. For the purposes of this ROD, the term residential properties includes properties that contain single- and multi-family dwellings, apartment complexes, vacant lots in residential areas, schools, daycare centers, playgrounds, parks, and green ways. This cleanup action is one part of the EPA's overall efforts to cleanup environmental contamination resulting from historic lead mining operations at the Site. Cleanup activities of the original tailings piles (source areas) have already occurred and are nearly complete. The EPA believes that the Selected Remedy is protective of human health and the environment.

The Selected Remedy includes the excavation of residential soil until lead concentrations are below 400 parts per million (ppm) in the top 12 inches, or below 1,200 ppm below 12 inches down to 24 inches below ground surface (bgs), transportation of contaminated soil to on-site soil repositories, replacement of contaminated soil with clean backfill and vegetative cover and institutional controls (ICs). Any properties with lead-levels remaining above 1,200 ppm at depth would be subject to ICs. Further detail on the Selected Remedy can be found in Section I in the Decision Summary.

E. STATUTORY DETERMINATIONS

The Selected Remedy is protective of human health and the environment, is expected to comply with the chemical-, location-, and action-specific federal and state requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost effective. This remedy utilizes permanent solutions to the maximum extent practicable.

Because this remedy will result in hazardous substances remaining on OU 1, a review will be conducted within five years to ensure that the remedy continues to provide adequate protection of human health and the environment.

F. ROD DATA CERTIFICATION CHECKLIST

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

- Chemicals of concern and their respective concentrations
- Baseline risk represented by the chemicals of concern
- Cleanup levels established for chemicals of concern and the basis for these levels
- How source materials constituting principal threats are addressed
- Current and reasonably anticipated future land use assumptions
- Potential land use that will be available at the Site as a result of the selected remedy
- Estimated capital, annual operation and maintenance (O&M), and total present worth costs, discount rate, and the number of years over which the remedy cost estimates are projected
- Key factors that led to selecting the remedy

G. AUTHORIZING SIGNATURE

Cecilia Tapia, Director
Superfund Division

9/30/11
Date

RECORD OF DECISION

II. DECISION SUMMARY

A. SITE NAME, LOCATION, AND BRIEF DESCRIPTION

The Site (CERCLIS ID #: MOD981126899) is located in southeastern Missouri entirely within St. Francois County, approximately 70 miles southwest of St. Louis (Appendix A, Figure 1). The first recorded mining in St. Francois County occurred at Mine-a-Gabore between 1742 and 1762. Discoveries of disseminated lead in the Bonne Terre, Leadwood, and Flat River areas occurred in 1864. The introduction of the diamond drill in 1869 facilitated the discovery of additional reserves and output from the mines increased dramatically in the late 1800s. Mine output from St. Francois County peaked in 1942 when the concentrate equivalent of 197,430 tons of lead was produced. Mining ceased in the county in 1972 with the closing of St. Joe Lead Company's Federal mine.

The Site resides within the Old Lead Belt, which is on the northeastern edge of the Precambrian igneous core of the St. Francois Mountains. This area is one of the world's largest lead mining districts, having produced more than nine million tons of pig lead. It has been estimated that some 250 million tons of mill waste tailings and chat were produced in the Old Lead Belt from ore milling and beneficiation processes. The chat has been used extensively as aggregate for ballast in railroads, aggregate in concrete and asphalt, and fill. Some chat is used today as aggregate and fill. Tailings have been used as agricultural amendments due to the lime content.

Chat deposits include sand- to gravel-sized material resulting from the crushing, grinding, and dry separation of the ore material. Tailings deposits include sand- and silt-sized material resulting from the wet washing or flotation separation of the ore material. The mine waste contains elevated levels of lead and other heavy metals which pose a threat to human health and the environment. These deposits may have contaminated soils, sediments, surface water, and groundwater. These materials also may have been transported by wind and water erosion or manually relocated to other areas throughout the county. It has been reported that mine waste may have been used on residential properties for fill material and private driveways, used as aggregate for road construction, and placed on public roads around St. Francois County to control snow and ice in the winter.

The EPA is the lead agency and MDNR is the support agency. The source of cleanup monies is mixed funding from potentially responsible party (PRP) settlements and the Superfund trust fund.

B. SITE HISTORY AND ENFORCEMENT ACTIVITIES

To date, eight source areas of mine waste have been identified within the Site. These areas are shown on Figure 1 in Appendix A and are listed below:

- Desloge Pile (Big River Pile)
- National Pile
- Leadwood Pile
- Elvins Pile
- Bonne Terre Pile
- Federal Pile (St. Joe State Park)
- Doe Run Pile
- Hayden Creek

Part of EPA's overall strategy for the Site and St. Francois County was to address source control to reduce the continued transportation of mine waste. The sources of most of the lead contamination in the Site are the large mine waste piles listed above. For this reason EPA, with cooperation from some of the PRPs, began addressing the mine waste piles as removal actions before beginning remediation of residential properties.

Desloge Pile (Big River Pile)

In 1887, the Desloge Lead Company acquired the Bogy Tract (formerly Mine-a-Joe) near Desloge, Missouri, and commenced its operations under the name Desloge Consolidated Lead Company. In 1890 operations began in Shaft No. 1, originally sunk in 1873, by Bogy to a depth of 224 feet, and in 1893 the mill was started. By 1924, three shafts were operating with a fourth mill shaft being sunk so that ore could be hoisted directly into the crushing plant. The St. Joseph Lead Company took over the property in 1929 and operated it until 1958, when the Desloge mill shut down.

EPA and The Doe Run Resources Corporation entered into an Administrative Order on Consent in 1994 for a removal action to stabilize the Desloge Pile. Stabilization work on the Desloge Pile (Big River Pile) was mostly completed by 2000. Part of the site was left open for a Corrective Action Management Unit to store lead-contaminated soils on-site.

National Pile

In May 1898, the St. Louis Smelting and Refining Company (SLS&RC), a subsidiary of National Lead Company, purchased a block of land located near the Flat River station on the Mississippi River and Bonne Terre (MR&BT) railroad. The block included a working mine of the Flat River Lead Company (1,295 acres) and the old Taylor mines (900 acres). Shaft No. 1, sunk in 1893 by the Flat River Lead Company, was abandoned by SLS&RC. Shaft No. 2 was sunk in 1898, followed by Shaft No. 3 in 1899; and, the first SLS&RC ore produced from the property came in 1900. A state-of-the-art electric powered mill with a capacity of 1,200 tons per day was completed in 1901. Ore obtained from the mine (shafts) and several other small producers was milled, and concentrates were shipped to National Lead Company's Collinsville, Illinois, smelter. By 1910, four shafts had been sunk on the property. The property was sold to the St. Joseph Lead Company in 1933. St. Joseph Lead Company operated the National mine for several more years after the purchase but hauled the ore underground to the Federal mill.

EPA issued a Unilateral Administrative Order (UAO) in 2006 to the city of Park Hills, Missouri; The Doe Run Resources Corporation; NL Industries, Inc; and, the Park Hills Chamber of Commerce. The purpose of the UAO was for a time-critical-removal action to stabilize the National Pile. This work is ongoing and is projected to be completed by June 2012.

Leadwood Pile

The St. Joseph Lead Company's mining operations at Leadwood commenced in the Leadwood area as early as 1894. During 1903-1904, St. Joseph Lead Company constructed the Hoffman mill in Leadwood near Shafts Nos. 12 and 14, with a capacity of 1,000 to 1,200 tons per day. A concise description of the Hoffman concentrating plant operation is given in the Initial RI (Fluor Daniel 1995, page 2-74). Other

St. Joseph Lead Company mines in the area included Shaft No. 10 at Gumbo and Shaft No. 11, known as the Hunt, at the northeast edge of Leadwood near the Big River. The Leadwood mill was modernized periodically but ultimately closed by a strike in 1962.

EPA issued a Unilateral Administrative Order in 2006 to The Doe Run Resources Corporation for a removal action to stabilize the Leadwood Pile. The major earthwork at Leadwood was complete in June 2011. Remaining work includes the construction of passive bioreactors to treat dissolved zinc in groundwater seeps located at the east seep and erosion area and at the Leadwood Dam.

Elvins/Rivermines Pile

Flat River, Missouri, was the site of several mines and small concentrating works. A partial list of some of the companies with mining interests in the Flat River area (including the historic towns of Elvins, Central, St. Francois) included the Flat River Lead Company, Central Lead Company, The Doe Run Lead Company, Columbia Lead Company, Federal Lead Company, and Commercial Lead Company. In the early years, the milling operations were small and conducted at various locations. In 1891, The Doe Run Lead Company commenced mining in the Flat River area and subsequently acquired the properties of the Columbia Lead Company and Commercial Lead Company. By 1909, The Doe Run Lead Company controlled 6,548 acres in the Flat River area and carried on mining in seven shafts. In 1911, The Doe Run Lead Company consolidated its mill operations at Elvins to a 1,500 to 2,000 tons per day plant. The mill ceased operation in 1934. The property was acquired by St. Joe Minerals Corporation in 1936 when The Doe Run Lead Company was dissolved.

EPA issued a Unilateral Administrative Order in 2005 to The Doe Run Company for a time-critical-removal action to stabilize the Elvins/Rivermines Pile. All major earthwork was complete in June 2009. Remaining work includes the construction of passive bioreactors to treat dissolved zinc in a groundwater seep on the south end of the pile.

Bonne Terre Pile

The St. Joseph Lead Company was organized in 1864 and began mining operations at Bonne Terre in 1865 after purchasing the La Grave property. A mill was constructed and several shafts were sunk thereafter. In 1883, the Bonne Terre mill and associated works were destroyed by fire, after which a new and larger plant was constructed. The adjoining Desloge Lead Company mill, in operation since 1877, burned in 1884 and was subsequently purchased by the St. Joseph Lead Company. The smelter at Herculaneum was completed in 1892, and the furnaces from Bonne Terre were moved there. All Bonne Terre ore was smelted at Herculaneum thereafter.

EPA and The Doe Run Company entered into two Administrative Orders on Consent for the removal actions at the Bonne Terre Pile. The first was issued in 2001 and addressed the Western Portion of Bonne Terre. The second was issued in 2003 and addressed the Eastern Portion of Bonne Terre. All construction was complete in 2007.

Federal Tailings Pile

The Federal Lead Company, the corporate predecessor of the American Smelting and Refining Company (ASARCO), began operations in 1902 after acquiring various properties from the Irondale Lead Company, the Derby Lead Company, the Central Lead Company, the

Missouri Lead Fields Company, the Union Lead Company and others. In 1907, the Federal Lead Company constructed a large mill with a capacity of 3,000 tons per day (what is now the No. 3 mill at St. Joe State Park). A detailed inventory of shafts or mines operated by the Federal Lead Company (Buckley 1908) is presented in the Initial Remedial Investigation (Fluor Daniel 1995, page 2-58). By 1908, there were seven producing mines at the Federal Tailings Pile site and at least nine shafts, and by 1910, Federal Lead Company controlled 16,000 acres in St. Francois and Washington counties and was one of three major producers in the district with St. Joseph Lead Company and Doe Run. Milling operations were consolidated at the Federal mill in 1911. The Federal mill burned in 1912 and was reconstructed. In October 1923, the St. Joseph Lead Company purchased all of the Federal Lead Company holdings, including at least 12 shafts and the mill, which at that time was treating 4,800 tons per day. The Federal mill was permanently closed in 1970 when the mining operations in the area shifted to the Viburnum trend or New Lead Belt. St. Joe Minerals Corporation donated 8,561 acres to the state of Missouri for use as a park in 1975. The successor to the St. Joe Minerals Corporation was renamed The Doe Run Resources Corporation in 1994 and currently does business as The Doe Run Company.

EPA entered into an Administrative Settlement Agreement and Order on Consent for Removal Action with The Doe Run Resources Corporation and the state of Missouri Department of Natural Resources, Division of Parks in 2011 for stabilization of the Federal Pile. Work will be completed at Federal in 2013.

Doe Run Pile

The Doe Run Lead Company was organized in 1886 or 1887 and began operations in the town of Doe Run on the old Wm. R. Taylor tract. The Doe Run Lead Company sank two shafts, one 110 feet and the other 47 feet deep at the Doe Run property. About 1890, The Doe Run Lead Company acquired a tract of land in the Flat River area, and in 1907 acquired additional properties formerly owned by the Union Lead Company and the Columbia Lead Company. As of about 1908, The Doe Run Lead Company operated four shafts, two in the town of Doe Run and two in the Flat River area. By 1910, The Doe Run Lead Company had eleven shafts in the Flat River area. The property was acquired by St. Joe Minerals Corporation in 1936 when The Doe Run Lead Company was dissolved. St. Joe Minerals Corporation sold the site of the Doe Run Pile to an individual in 1977. The Doe Run Pile is approximately 24 acres in a rural area immediately south of the town of Doe Run.

The Doe Run pile has not been addressed. EPA plans to address this pile as part of Operable Unit 02 (OU 2).

Hayden Creek Mine

The Hayden Creek mine is located one mile southwest of the town of Frankclay. St. Joe Minerals Corporation discovered the ore body by random drilling in 1943. Underground development of the Hayden Creek or No. 22 Mine started in 1949 with the sinking of the shaft. Further development was undertaken in 1951 with limited mining in 1952. Mine production averaged about 1,000 tons of ore per day. A 1,200 ton-per-day magnetic separation mill was constructed but failed to operate satisfactorily; eventually all ore produced was trucked to St. Joseph Lead Company's Leadwood mill for processing. The Hayden Creek mine was closed in 1958, and the facilities were demolished.

Most material at Hayden Creek was addressed under the 2006 Unilateral Administrative Order for the Removal Action at Leadwood described above; however, Hayden Creek will be further assessed under OU 2 to determine if additional work is required to mitigate ecological risk.

Operable Units (OUs)

Currently there are four OUs designated at the Site that organize the work into logical elements based on removal criteria. This ROD addresses OU 1, lead contaminated mine ore processing waste in residential areas. Final RODs for the other OUs will be issued in the future.

OU 00 consists of the removal activities at the pile locations (Bonne Terre, Desloge, Leadwood, Federal, Elvins, and National).

OU 1 consists of the stabilization of the Desloge Pile (stabilized in 2000) and remediation of residential properties and high child exposure areas exceeding lead levels in residential soil of 400 ppm in St. Francois County and focuses on properties in the towns of Park Hills, Desloge, Bonne Terre, Leadwood, Leadington, and Doe Run; this also includes the rural residential properties surrounding these communities.[1]

OU 2 includes the remedial action to address terrestrial ecological risks and impacted watersheds associated with the mine wastes. OU 2 will also include future work on the Doe Run Pile.

OU 3 consists of the Interim Program and Halo Removal Action to address elevated blood lead at the Site. This included time-critical residential properties and high child exposure areas (i.e., playgrounds and daycare facilities).

History of Investigations

Over 100 years of lead mining left behind large piles of mine waste that dwarfed the towns of St. Francois County. Historical photos depicting mine waste piles are included in Appendix A as Figures 2 and 3. Mining operations in St. Francois County are estimated to have produced over 250 million tons of mine waste. Much of this waste was located in the eight major mine waste areas, identified above. Over twenty years ago, when EPA and the state of Missouri began investigations in St. Francois County, the mine waste piles were predominately barren of vegetation. Access to the waste piles was unrestricted. The waste piles were unstable and subject to wind erosion. A 1988 EPA inspection documented that dust from the Desloge Pile "created a suspended particulate plume" of lead-contaminated dust (Figure 4). Before the removal actions and stabilization of the mine waste piles, the Desloge Pile was 600 acres in size and up to 100 feet deep; Elvins was 149 acres and 170 feet higher than surrounding area; Bonne Terre (eastern portion) was 306 acres and up to 50 feet deep, Bonne Terre (western portion) was approximately 39 acres and about 160 feet higher than the surrounding area; the Federal tailings pile covers over 1,000 acres; and the Leadwood Pile was approximately 563 acres in size.

[1] The city of Park Hills was created recently when the former towns of Flat River, Esther, Rivermines, Frankclay, Wortham, and Elvins Combined.

EPA and the Missouri Department of Health and Senior Services (MDHSS) began investigating the Site in 1988. These investigations focused on the effects of the mine waste from the Desloge (Big River) Pile which was located adjacent to the Big River and as a result of rain fall and erosion had released lead mine waste into the Big River (Figure 5). In order to investigate a broader area, EPA performed a Listing Site Inspection in 1991 and a Site Assessment in 1992, which resulted in the Site listing on the National Priorities List (NPL) in 1992. The NPL is a national list of Superfund sites that prioritizes cleanups in order of the most serious contamination problems and greatest threats to human health and the environment.

The Site inspection and Site assessment identified potential sources of mine ore processing waste in the Big River watershed, determined the composition of these sources, and determined that there had been a release of mining-related contaminants (heavy metals) to media within the Big River watershed. The Site inspection and Site assessment also identified uses of mine waste in the area and provided analytical data on soil, tailings, sediment, air, surface water, and groundwater near the mine waste piles. Geographically, the Site investigation included the entire Site. A limited number of samples were collected from mine waste, groundwater, sediment, and soil, and were analyzed for heavy metals. Overall, the results indicated elevated concentrations of a number of heavy metals in samples of mine waste, groundwater, sediment, and soil.

Studies conducted by MDHSS including a Preliminary Public Health Assessment in 1994 and a lead exposure study in 1997 concluded that 17 percent of children tested in the mining area of St. Francois County had elevated levels of lead in their blood. A comparable city (Salem, Missouri) with similar aged housing stock was also studied and found to have an EBL rate of only 3 percent. As a result of the elevated blood lead levels in children, in 1997 and 1998, MDHSS followed the Exposure Study with the St. Francois and Jasper Counties Lead Intervention Study in 2000 as an effort to reduce the percentage of elevated blood leads in children at the Site.

In 1997, EPA entered into an Administrative Order on Consent for the development of the Remedial Investigation/Feasibility Study (RI/FS) with The Doe Run Resources Corporation and ASARCO Incorporated. The RI//FS was completed and released in 2011. The FS developed the alternatives for the remedial action for the residential properties. As part of the FS, an investigation of lead contamination in the subsurface soils was conducted. This investigation focused on the subsurface soils at 58 residential properties in the mining areas. Soil core samples were collected in 6-inch intervals, moving down in the soil profile to 30 inches bgs. The Subsurface Soil Report concluded that 7 percent of the yard quadrants after a 12 inch bgs excavation would have confirmation subgrade soil lead concentrations greater than 1,200 ppm.

The results of this Subsurface Investigation are part of the FS. The remedial alternatives developed and evaluated in the FS form the basis of this ROD. The FS is located in the AR for this Site.

In 2000, EPA entered into an Administrative Order on Consent with The Doe Run Resources Corporation, for implementation of a soil testing and removal program and blood lead testing and control program within the Site. This Order, called the Interim Program, provided that these programs would end when either EPA issued a ROD for residential yards or after four years. At the end of the Interim Program (March 30, 2004), 1,955 residential yards had been sampled and 563 homeowners had refused sampling, for a 78 percent sampling rate.

In 2004, EPA entered into another Administrative Order on Consent with The Doe Run Resources Corporation for a Removal Action to replace the expiring 2000 Interim Program. The 2004 Administrative Order was called the Halo Removal Order. The Halo Removal Order designated six of the mine waste areas in St. Francois County: National; Elvins; Bonne Terre; Federal; Desloge; and, Leadwood. The Halo Removal Order required removal actions within the halo around each of these waste areas. The halo was defined as the area within 500 feet of chat and tailings waste, 1,000 feet from four identified smelters/calciners, and 100 feet from mine shafts.

Under the Halo Removal Order 69 additional yards were sampled; of these 3 were parks, 5 were childcare facilities or school playground facilities, 29 were sampling refusals during the Interim Action, 17 were not within the Halo but were sampled due to the presence of a child with elevated blood lead levels, and the remaining 15 yards were primarily new construction within the Halo. Of the total yards sampled, 387 were completely remediated (all areas < 400 ppm) and 188 were partially remediated (part of the yard remains > 400 ppm).

EPA has also remediated seven schools, sixteen daycares, and two parks under removal authority.

C. COMMUNITY PARTICIPATION

The EPA issued the Proposed Plan for OU 1 on July 22, 2011, and provided a 30-day review and comment period opening on July 22, 2011. The public comment period was extended an additional 30 days and closed on September 21, 2011. A public meeting to present the plan and receive comments was held August 4, 2011, at the Mineral Area College from 6:00 pm to 8:00 pm. Included in this ROD in Appendix C is a Responsiveness Summary that addresses in writing the significant comments the EPA received from the public during the comment period.

D. SCOPE AND ROLE OF OPERABLE UNIT-1

This ROD sets forth the Selected Remedy for the response action and represents EPA's approach to address OU 1, residential properties and high child exposure areas at the Site. OU 1 includes lead-contaminated surface soils present at residential properties across the Site that have been contaminated as a result of migration of metal-bearing materials from past mining and ore processing practices via natural erosional processes, wind-blown mine waste, and human activities. EPA proposes to address the residential properties as the first remedial action to expedite cleanup of the areas that pose the greatest and most immediate threat to human health. This first remedial action for the Site is a continuation of the residential soil removal actions that have been ongoing in St. Francois County since the 2000 Interim Action. Additional remedial actions at the Site to address residual risk, such as actions for protection of the Big River watershed and stabilization of the Doe Run pile, will be addressed under future Proposed Plans and RODs.

The estimated total number of residential properties with lead-contaminated soil that will be addressed under this remedial action is approximately 4,000. This estimate is based upon the 1,000 contaminated properties sampled during the Interim Action that require remediation and an additional estimated 3,000 properties that have not been sampled but that potentially could exceed 400 ppm lead in soil.

As set forth below, the action level for lead in residential soil, 400 ppm, is based on the site-specific Human Health Risk Assessment (HHRA) and the site-specific blood lead study. This action level also assumes lead is measured in the bulk soil sample taken from the mid yard area with a X-Ray Spectrometer (XRF).

E. SITE CHARACTERISTICS

The Site is located within the Salem Plateau section of the Ozark physiographic province. The topography is hilly with several hundred feet of relief with altitudes ranging from about 700 to 1,000 feet above mean sea level. The climate in St. Francois County is continental with cold winters and hot summers. Annual precipitation is approximately 40 inches with a rainy season in fall and winter. Average annual snowfall is 13.7 inches. Prevailing winds are from the south.

The Site is located on the flanks of the St. Francois Mountains, a positive topographic structure in the southeast portion of the county composed of Precambrian granite and volcanic rocks. Cambrian sedimentary rocks are present above the Precambrian rocks and are, from oldest to youngest, the Lamotte Sandstone, Bonneterre Formation, Davis Shale, Derby-Doe Run Dolomite, Potosi Dolomite, and Eminence Dolomite.

The Bonneterre Formation is host to most of the ore bodies and is composed mostly of dolomite in the Old Lead Belt. The Bonneterre is 200 to 400 feet thick. The dolomite occurs as halos around igneous knobs that extend into or through the Bonneterre. Away from these igneous paleo-topographic highs, the Bonneterre is composed of unmineralized limestone. The lower 100 feet contain a variety of depositional structures where the richest ore was concentrated. The most abundant sulfide minerals in the Bonneterre Formation are galena, sphalerite, chalcopyrite, pyrite, and marcasite. Sphalerite (zinc ore) is restricted to certain areas of the district and is much less common than in the Tri-State Mining District of northeast Oklahoma, southwest Missouri, and southeast Kansas.

As indicated previously, past mining operations have left at least 8 identified major mine waste areas in the form of tailings and chat deposits from smelting and mineral processing operations in St. Francois County. Five of the mine waste deposits have been stabilized in place and there are plans in place to address the remaining areas. The mine waste contains elevated levels of lead and other heavy metals which pose a threat to human health and the environment. These deposits have contaminated soils, sediments, surface water, and groundwater. These materials may also have been transported by wind and water erosion or manually relocated to other areas throughout the county. It has been reported that mine waste may have been used on residential properties for fill material and private driveways, and as aggregate for road construction.

F. CURRENT AND POTENTIAL FUTURE SITE AND RESOURCE USES

The primary land use within St. Francois County is agricultural crop and pasture land since mining operations have ended. Industrial activities consist of light manufacturing, aggregate production, and construction. The 2000 census indicated that the population of St. Francois County is 55,641 with most (55 percent) of the population living in Farmington, Park Hills, Desloge, and Bonne Terre. The city of Park Hills and the smaller towns of Leadwood, Leadington, and Doe Run are in the affected area. Future land use is expected to be primarily residential.

G. SUMMARY OF SITE RISKS

A Baseline HHRA was conducted for the Site by EPA in 2009 The HHRA assesses the potential risks to humans, both present and past, from Site-related contaminants present in environmental media including surface soil, indoor dust, sediment, surface water, groundwater, and fish tissue. The HHRA assumes that no steps are taken to remediate the environment or to reduce human contact with contaminated environmental media. The results of the HHRA are intended to inform risk managers and the public about potential human health risks attributable to site-related contaminants and to help determine if there is a need for action at the Site.

The HHRA identified lead as the primary contaminant of concern (COC) for OU 1. Other metals (zinc and cadmium) were identified in nonresidential soil and stream sediment and are considered COCs along with lead in OU 2. The focus of this ROD is the risk associated with lead because it is the primary COC for residential properties at OU1. For further information, please refer to the HHRA in the AR. Young children (typically defined as seven years of age or below) are the most sensitive population group potentially exposed to lead contamination at the Site. Young children are most susceptible to lead exposure because they have higher contact rates with soil and dust, absorb lead more readily than adults, and are more sensitive to the adverse effects of lead than older children and adults. The effect of exposure to lead contamination of greatest concern in children is impairment of the nervous system, including learning deficits, lowered intelligence, and adverse effects on behavior.

The risk for adverse health effects from exposure to lead contamination is evaluated using a different approach than for most other metals. Because lead is widespread in the environment, exposure can occur by many different pathways. Thus, the risk of exposure to lead is based on consideration of total exposure (all pathways) rather than just site-related exposure. In addition, because most studies of lead exposures and the resultant health effects in humans have traditionally been described in terms of the resulting level of lead in the blood (expressed in micrograms/deciliter [µg/dl]), lead exposures and risks are typically assessed using mathematical models.

In determining the acceptable level to clean up soil in residential yards at the Site, the HHRA used EPA's Integrated Exposure Uptake Biokinetic (IEUBK) Model for Lead in Children to estimate the distribution of blood lead levels in a population of residential children exposed to lead at the Site. As set forth above, the focus of a risk assessment for lead in a residential setting is on children because they are a more sensitive population than older children or adults. Thus, the IEUBK model was used to evaluate the risks posed to young children (6 to 84 months) as a result of exposure to lead contamination at the Site.

EPA's health protection goal is that there should be no more than a 5 percent chance of exceeding a blood lead level of 10 µg/dl in a given child or group of similarly-exposed children. The basis for this goal is the Center for Disease Control and Prevention and EPA analyses demonstrating health effects at or above a blood lead level of 10 µg/dl.

The IEUBK model uses site-specific and default inputs (e.g., soil concentration, indoor dust concentration, bioavailability) to estimate the probability that a child's blood lead level might exceed 10 µg/dl.

For a residential child, the IEUBK model used available Site-specific data, including lead concentrations in residential property soil, indoor dust, and groundwater. In addition, testing was performed to estimate the relative bioavailability of the lead present at the Site. Bioavailability testing measures the amount of lead absorbed into the body following incidental ingestion of soil. The results indicate that bioavailability of lead at the Site is greater than the IEUBK model default value of 30 percent. Based on results of Site-specific measurements of *in vivo* bioavailability and *in vitro* bioaccessibility, the bioavailability of lead in soil and dust was estimated as 37 percent.

Exposure Pathways and Exposed Populations

Figure 6 presents the Conceptual Site Model (CSM) which shows a variety of exposure pathways by which Site-related COCs may migrate from on-site mine waste piles or contaminated surface soils acting as sources of contamination for other environmental media such as soil and indoor dust.

Risk Estimates for Residents from Soil

The IEUBK model was used to assess lead exposures to young children at the Site and within each community. Based on Site-specific information, EPA's IEUBK model predicts that a young child residing at the Site will have greater than a 5 percent chance of having a blood lead level exceeding 10 µg/dl if the lead soil concentrations to which he or she is exposed are above 337 ppm under the assumed exposure conditions. This is based on a Site-specific absolute bioavailability of 37 percent.

In addition to the modeling performed by EPA, one of the potentially responsible parties for the Site performed a Site-Specific Blood Lead Study. This study paired actual blood lead level measurements of 162 children with the corresponding residential yard soil lead concentrations. The study plotted actual blood lead levels with projected blood lead levels based on the Site-specific absolute bioavailability of 37 percent. The study also plotted the blood lead levels based on the default absolute bioavailability of 30 percent. The Blood Lead Study showed that a cleanup level of 400 ppm lead in residential soils would reduce risk to children to less than a 5 percent chance of having a blood lead level exceeding 10 µg/dl . Therefore, EPA has concluded that 400 ppm lead in residential yard soil will be the cleanup level of the remedial action as measured in the bulk soil fraction (sieving the soil sample with a #10 mesh sieve to obtain particles less than 2 millimeters) based on analysis with an XRF. Based upon this cleanup level, an estimated 4,000 homes at the Site are of potential health concern with regard to lead contamination to yard soil. This number is based on existing data which shows that 79 percent of properties sampled have lead levels greater than 400 ppm.

Risk Estimates for Residents from Groundwater

During the RI, 189 wells were sampled. Many of these wells were located close together in clusters. The results of this testing show no consistent lead contamination at these clusters and suggest no wide-spread impacts from lead mining at the Site to groundwater. Instead, elevated lead concentrations (lead > 15 µg/l) occur sporadically and were limited to 4 wells and could not be linked to the mining activities at the Site.

Further, groundwater concentrations fall within the range of those typical for drinking water in the area. Fifty-four percent of the wells tested were found to be at or below a lead concentration of 1 µg/l, and 85 percent were at or below the IEUBK model default of 4 µg/l. Further, 97 percent of the wells tested were at or below 15 µg/l, the level at which municipal supplies must attempt to reduce lead exposure.

Significantly elevated risks due to exposure to lead in groundwater appear to be limited to a small number of domestic well locations.

Summation

In past experience at Superfund sites where lead is the contaminant of concern, EPA generally selects a residential soil cleanup level within the range of 400 ppm to 1,200 ppm for lead, based on the IEUBK model results and the nine criteria analysis included in this ROD and in accordance with the NCP. As described above, the IEUBK modeling results for the Site along with the Site-Specific Blood Lead Study recommend a lead soil concentration of 400 ppm to ensure that a child has less than a 5 percent probability of having a blood lead level exceeding 10 µg/dl.

This ROD only addresses human health risk at residential properties within the Site. Since this ROD only addresses human health, a summary of the Ecological Risk Assessment has not been included in the Selected Remedy. The Ecological Risk Assessment identified significant risk to ecologically sensitive areas and the natural environment. For example, elevated lead and zinc in the sediments and surface waters of Big River and Flat River Creek pose a significant risk to aquatic biota. Because of the lack of sensitive ecological receptors in the residential areas, the risk to the Big River, Flat River Creek and other identified risks to human health and the environment will be addressed in future cleanup decisions. For example, future EPA actions for OU 2 will address risk to ecological receptors and human health from lead-impacted non-residential soil, surface water, and sediment.

H. REMEDIAL ACTION OBJECTIVES

Remedial Action Objectives (RAOs) consist of quantitative goals for: reducing human health and environmental risks; and/or, meeting established regulatory requirements at Superfund sites. RAOs are identified by reviewing: site characterization data; risk assessments; applicable or relevant and appropriate requirements (ARARs); and, other relevant site information. This ROD addresses the risk to human health resulting from exposure to residential soils contaminated with lead mine waste.

Based on current Site data and evaluations of potential risk, lead was identified as being a COC. The primary cause of human health risk from residential property soils at the Site is through direct ingestion (by mouth). Thus, the RAO for the residential property soils at the Site is to:

> **Reduce the risk of exposure of young children (children under seven years old) to lead such that an individual child or group of similarly exposed children have no greater than a 5 percent chance of exceeding a blood lead level of 10 µg/dl.**

Site-specific information, EPA's IEUBK model and the Site-Specific Blood Lead Study predict that a young child residing at the Site will have greater than a 5 percent chance of having a blood lead level exceeding 10 µg/dl if the lead soil concentrations to which he or she is exposed are above 400 ppm lead under the assumed exposure conditions. Thus, 400 ppm lead in soil will be the cleanup level of the remedial action as measured in the bulk soil fraction using an XRF instrument. As the lead agency, it is the current judgment of EPA that the Selected Remedy identified in this ROD is necessary to protect public health from actual or threatened releases of lead.

I. DESCRIPTION OF ALTERNATIVES

The FS evaluated three remedial action alternatives. The No Action alternative was evaluated; however, EPA believes that the No Action Alternative is not protective of human health and does not consider it a viable option. Each of the other two alternatives would require institutional controls to protect the remedy. The two action alternatives require sampling, excavation and disposal of lead contaminated residential yard soils with replacement of soil and reseeding of residential properties. The primary difference between the two action alternatives is the depth of the excavation. As set forth below, Alternative 3 is EPA's Selected Remedy. Each alternative is presented in much greater detail in the FS, which is part of the AR for the Site. The remedial alternatives developed to address the RAO previously identified in this ROD for the Site are presented below.

Alternative 1: No Action

Estimated Total Capital Cost: $0
Estimated Annual O&M Cost Range: $0
Estimated Present Worth Cost: $0
Estimated Construction Time Frame: zero months
Estimated Time to Achieve RAO: Infinite, RAO unachievable

The NCP requires that EPA consider a no-action alternative against which other remedial alternatives can be compared. Under this alternative, no further action would be taken to monitor, control, or remediate the threat of lead contamination in residential property soil at the Site. Alternative 1 would not meet the RAO because it does not minimize or eliminate the existing or future human health risk at the Site.

Alternative 2: Soil Removal with 12 inch Subgrade Barrier and Institutional Controls

Estimated Total Capital Cost: $ 118.3 million
Estimated Annual O&M Cost Range: $0
Estimated Annual Health Education Cost: $20 thousand
Estimated Present Worth Cost: $ 97.72 million
Estimated Construction Time Frame: 7 years
Estimated Time to Achieve RAO: 7 years

Under this alternative, residential properties with at least one quadrant sample testing greater than or equal to (≥) 400 ppm for lead will have that quadrant, and if applicable the drip zones, remediated. The drip zones would be remediated if the lead concentrations in the drip zone are ≥ 400 ppm. Residential properties where no quadrant samples exceed 400 ppm lead would not be addressed under this alternative. Under this alternative, EPA estimates that as many as 4,000 residential properties may contain lead soil concentrations greater than 400 ppm and will require remediation. This estimate is based on data from properties that have already been sampled. It is estimated that the soil at 4,540 residential properties at the Site has not been sampled for lead contamination. Under this alternative, all residential properties within the Site will be sampled for lead contamination. For more information please refer to the FS in the AR.

This alternative includes excavation and removal of lead-contaminated soil, backfilling the excavation with clean soil, and seeding. Excavation of a residential property would be triggered when the highest recorded soil sample for any defined area of the property contains ≥ 400 ppm lead. Soil would be

excavated using excavation equipment and hand tools in the portions of the property where the surface soil is ≥ 400 ppm lead. Excavation will continue until either the underlying soil at the bottom of the excavation is less than 400 ppm lead; or to a maximum depth of 12 inches bgs, except for garden areas, where the maximum depth of excavation will be 24 inches bgs.

EPA will not intentionally address naturally occurring lead ores in their undisturbed state as part of this action. Although the Site has been heavily mined in the past, it may be possible to encounter naturally occurring lead ores during residential property excavation. Section 104(a)(3)(A) of CERCLA states that removal or remedial actions shall not be provided in response to a release or threat of release "of a naturally occurring substance in its unaltered form, or altered solely through natural processes or phenomena, from a location where it is naturally found." Naturally occurring lead ores could be found at the bedrock interface. Another indicator of the presence of naturally occurring lead ores could be a high density of galena crystals in soils or unusually high concentrations of lead in excavated soils. When these conditions are encountered, they will be documented, excavation will stop, and backfilling will be initiated.

If at 12 inches bgs the lead soil concentration is ≥ 400 ppm, placement of a visual barrier will be required. The barrier placed will be a highly visible plastic barrier that is permeable, wide meshed, and will not affect soil hydrology or vegetation, such as an orange-mesh plastic sheet. The physical barrier will function as a warning that digging deeper will result in exposure to soils contaminated with lead at a level that EPA has determined to be a human health concern. A minimum of 12 inches of clean soil would be used as an adequate soil barrier for the protection of human health. The rationale for establishing a minimum clean soil thickness of 12 inches is that the top 12 inches of soil is considered available for direct human contact. Clean fill and topsoil would be used to replace soil removed after excavation, returning the residential property to its original elevation and grade.

Based on EPA's previous soil removal activities at the Site, EPA estimates that a total of approximately 1,247,000 cubic yards (yd^3) of soil would be required for excavation, disposal, and replacement. This alternative uses this quantity to develop the cost estimate.

Excavated soils will be transported in covered trucks to the soil repositories located at the Desloge (Big River) Pile and the Leadwood Pile (Figures 7 and 8, Appendix A). The contaminated soil will be placed in the soil repositories, capped with a clean 12 inch layer of soil, and revegetated with an appropriate seed mix. The placement of the contaminated soil will improve conditions at each of these mine waste piles by reducing the amount of wind-blown lead contaminated dust transported off the piles. It will also reduce water infiltration of the piles. The capacity of the soil repositories has not been determined but will be determined during the Remedial Design (RD). The O&M at the Big River Mine Tailings Pile will be implemented per the conditions of the 1994 Administrative Order on Consent (Docket # VII-94-F-0015). The O&M at the Leadwood Mine Tailings Pile will be implemented per the conditions of the 2006 Unilateral Administrative Order (Docket # CERCLA-07-2006-0272).

After replacement of topsoil at each residential property, the property will be hydroseeded to restore the vegetation. Hydroseeding is preferred over sodding for its ease of initial maintenance and significant cost reduction. However, sod may be used in areas of properties with steep slopes that would be subject to erosion before the vegetation can be established.

Health education is required under this alternative to reduce potential adverse health effects. An active educational program would be conducted in cooperation with EPA, the Agency for Toxic Substances

and Disease Registry (ATSDR), MDNR, MDHSS, and the St. Francois County Health Department. The educational activities would primarily be conducted by the St. Francois County Health Department. The following activities are examples of the types of education activities that may be conducted as part of this alternative:

- Extensive community-wide blood-lead monitoring.
- In-home assessments for children identified with elevated blood lead levels.
- Distribution of prevention information and literature.
- HEPA Vacuum cleaner loan program to houses subject to remediation.
- Outreach activities directed to area physicians.
- Community education meetings; and distribution of literature at such presentations at civic clubs, schools, nurseries, pre-schools, churches, fairs.
- Family assistance.
- Special projects to increase awareness of heavy metal health risks.

Institutional Controls (ICs): Alternative 2 requires institutional controls because lead contamination will remain at unlimited concentrations below 12 inches bgs. Based on the FS, approximately 12 percent, or 544, of the residential properties at the Site would remain contaminated with lead at levels above 400 ppm at 12 inches bgs. Additionally, 543 properties that were remediated during the Interim Program and Halo Removal Action remain contaminated above 400 ppm at 12 inches bgs and have barriers in place. Therefore, a total estimate of 1087 properties would be $\geq$ 400 ppm at 12 inches bgs and would be subject to ICs under Alternative 2.

EPA has historically required ICs to ensure a remedy's long-term protectiveness. At present, there are no applicable zoning ordinances in St. Francois County for residential properties. However, there are potential IC's that could be utilized. These include but are not limited to the following:

- Establishment of a registry of residential properties that have greater than 400 ppm lead in soil at 12 inches bgs with the St. Francois County Health Department.
- Yards subject to the ICs will also be extensively evaluated during each 5-year review to ensure protectiveness. This will ensure the remedy has remained protective.
- Building permit requirements that would involve pre-screening properties for lead.
- Builder and developer education programs for dealing with heavy metal soil contamination and best management practices for construction workers.
- Deed restrictions such as covenants or easements.

Future land use of the remediated residential properties is assumed to be residential. Under this alternative, land use will be enhanced because lead-contaminated soil will be removed from the remediated properties.

Alternative 3: Soil Removal with 24 inch Excavation with limited Institutional Controls

Estimated Total Capital Cost: $130.3 million
Estimated Annual O&M Cost Range: $0
Estimated Annual Health Education Cost: $20 thousand
Estimated Present Worth Cost: $107.62 million
Estimated Construction Time Frame: 7 years
Estimated Time to Achieve RAO: 7 years

Alternative 3 requires remediation of residential properties where a quadrant sample result shows ≥ 400 ppm lead. Excavation of a residential property would be triggered when the highest recorded soil sample for any defined area of the property contains ≥ 400 ppm lead. The entire drip zone will be remediated if the lead concentration in the drip zone is greater than 400 ppm. Residential properties where quadrant samples are < 400 ppm lead would not be addressed under this alternative.

Under this alternative, EPA estimates that approximately 4,000 residential properties may contain a quadrant with lead soil concentrations greater than 400 ppm and will require remediation. In contrast to the requirements for excavation in Alternative 2, Alternative 3 will require further excavation if the lead concentration is above 1,200 ppm at 12 inches. Excavation will continue until either a maximum depth of 24 inches; or underlying soils at the bottom of the excavation are below 1,200 ppm lead.

EPA will not intentionally address naturally occurring lead ores in their undisturbed state as part of this action. Although the Site has been heavily mined in the past, it may be possible to encounter naturally occurring lead ores during residential property excavation. Section 104(a)(3)(A) of CERCLA states that removal or remedial actions shall not be provided in response to a release or threat of release "of a naturally occurring substance in its unaltered form, or altered solely through natural processes or phenomena, from a location where it is naturally found." Naturally occurring lead ores could be found at the bedrock interface. Another indicator of the presence of naturally occurring lead ores could be a high density of galena crystals in soils or unusually high concentrations of lead in excavated soils. When these conditions are encountered, they will be documented, excavation will stop, and backfilling will be initiated.

Based on the Subsurface Investigation, which is included in the AR, approximately 7 percent of the properties that are estimated to be above the action level, or 280, may be contaminated with lead at concentrations greater than 1,200 ppm at 12 inches bgs. For the Selected Remedy, the FS estimates that a total of approximately 1,280,000 yd^3 of soil would require excavation, disposal, and replacement. This estimate is used as the basis for the cost estimate for this alternative. As compared with Alternative 2, the excavation of an additional 33,000 yd^3 of soil at depth would result in a reduction of approximately 200 properties requiring some form of future IC. Alternative 3 requires placement of a visual barrier if at 24 inches bgs the lead soil concentration is greater than 1,200 ppm. The barrier placed will be an obvious plastic barrier that is permeable, wide meshed, and will not affect soil hydrology or vegetation, such as an orange-mesh plastic sheet. The physical barrier will function as a warning that digging deeper will result in exposure to soils contaminated at a level that EPA has determined to be a human health concern.

The application of the action level requires consideration of the depths of excavation and other risk management elements. Due to the distribution of lead contamination in the soil profile at the Site, EPA has determined that backfilling of excavated areas to original grade with clean material after reaching a

residual soil lead level less than 400 ppm in the upper 12 inches bgs, or a residual concentration of less than 1,200 ppm at a depth greater than 24 inches bgs, combined with other elements of the selected remedy, is protective of human health. These cleanup criteria are based upon a risk-management determination made by EPA in consideration of site-specific conditions at the Site and the experience gained in remediating thousands of properties using this strategy.

The 1,200 ppm cleanup level at depth is protective for occupational exposure of utility workers or other construction workers that could potentially contact subsurface soils following soil remediation. Disturbances could include installing or repairing water, sewer or natural gas lines, underground electrical, television or phone cables, fence and mail box posts, basketball poles and similar activities. It also could include planting trees or shrubs. For these types of disturbances, EPA's underlying premise is reasonable and would be protective of public health. The Selected Remedy is more protective than regulations promulgated under 40 CFR Part 745, which require:

> ...under the new standards, lead is considered a hazard when equal to or exceeding 40 micrograms of lead in dust per square foot on floors, 250 micrograms of lead in dust per square foot on interior window sills, and 400 ppm of lead in bare soil in children's play areas or 1,200 ppm average for bare soil in the rest of the yard.

In addition, Alternative 3 is consistent with the recommendations of the Superfund Lead-Contaminated Residential Sites Handbook (OSWER 9285.7-50, 2003). Five-year review procedures will apply to any eligible properties where soil remediation does not achieve the action or cleanup levels specified in this ROD.

As set forth above, EPA estimates that approximately 4,540 residential properties have not been sampled for lead contamination. Under this alternative, all residential properties within the Site will be sampled for lead contamination to determine if they have been impacted by mining-related activities. If a soil sample for a property quadrant has a lead concentration greater than 400 ppm, the property will be included in the remedial action.

ICs: ICs would be required on properties greater than 1,200 ppm lead at 24 inches bgs. The FS estimated that ICs would be applicable to approximately 2 percent, or 80 properties. Approximately 320 additional properties that were previously remediated to 12 inches bgs are ≥ 1,200 ppm and would be subject to ICs. Therefore, approximately 400 properties would be subject to ICs under Alternative 3. ICs are the same as Alternative 2 described above.

The repositories, vegetation restoration, and health education are the same as Alternative 2. Future land use for the Site under Alternative 3 is expected to be similar to Alternative 2.

J. COMPARATIVE ANALYSIS OF ALTERNATIVES

Summary of the Comparative Analysis of Alternatives

The NCP, 40 CFR. part 300, requires EPA to evaluate remedial alternatives against nine criteria to determine which alternative is preferred. This analysis is performed during the FS. The detailed analysis in the FS provides an in-depth analysis of the three alternatives compared against the nine criteria. The

FS is available in the AR for the Site. An alternative must satisfy all nine criteria before it can be selected. The first step is to meet the threshold criteria, which are overall protection of public health and the environment and compliance with ARARs. In general, alternatives that do not satisfy these two criteria are rejected.

The second step is to compare the alternatives against a set of balancing criteria. The NCP establishes five balancing criteria which include long-term effectiveness and permanence; reduction in toxicity, mobility, or volume achieved through treatment; implementability; short-term effectiveness; and cost. The third and final step is to evaluate the alternatives on the basis of modifying criteria, which are state and community acceptance.

Threshold Criteria

The following presents a brief description of whether and how the alternatives satisfy the threshold criteria of overall protection of public health and the environment and compliance with ARARs.

Overall Protection of Human Health and the Environment

This criterion provides an overall assessment of whether an alternative meets the requirement that it is protective of human health and the environment. This criterion considers whether an alternative eliminates, reduces, or controls threats to public health and the environment through institutional controls, engineering controls, or treatment. This ROD focuses on risk to human health. Ecological risk will be addressed under OU 2.

Alternative 1 does not provide protection for human health and the environment at the Site because of the continued risk to residents of the Site. Alternative 1 does not meet the RAO identified for this Site. Lead contaminated residential soil will continue to pose exposure risk for an indefinite period.

Alternative 2 provides protection to human health by removing the significant exposure pathway associated with contaminated residential property soils. Alternative 2 would meet the RAO for the Site once excavation, soil replacement, and revegetation is complete, and the removed soils are properly disposed, enforceable ICs are implemented, and an effective health education program is implemented. Risks associated with lead-contaminated residential property soil will be mitigated.

Alternative 3 is protective of human health by addressing the risks associated with lead contaminated residential soil. Alternative 3 is more protective of human health than Alternative 2 because Alternative 3 requires removal of soil below 12 inches bgs if the soil is contaminated above 1,200 ppm lead. Alternative 3 requires removal of contaminated soil to a maximum depth of 24 inches bgs. Alternative 3 would also meet the RAO for the Site. Alternative 3 would reduce the number of properties that would require ICs by an estimated 587 properties. ICs are potentially difficult to implement on residential properties. The FS showed that by excavating beyond 12 inches bgs and to a maximum depth of 24 inches bgs, approximately 98 percent of the properties that have not yet been addressed will have safe lead concentrations and will not be subject to ICs. Because there are fewer residential properties contaminated at depth below 12 inches, fewer visual barriers would be required to be installed under Alternative 3.

Compliance with ARARs

This criterion is used to determine whether an alternative meets federal and state ARARs as defined by section 121 of CERCLA, 42 U.S.C. § 9611. Compliance is judged with respect to chemical-specific, action-specific, and location-specific ARARs as well as to be considered (TBC) requirements that include nonpromulgated criteria, advisories, guidance and proposed standards issued by federal or state governments. The ARARs for this ROD are included in attached Tables 2 through 4.

Alternative 1 does not comply with ARARs because this alternative does not take any action to mitigate the risk associated with lead. Compliance with ARARs would be met if EPA assumes that no disturbance of contaminated soil occurs in the future; however, this would be an unreasonable assumption due to the maintenance and construction activities that are routine practice at residential areas.

In contrast, Alternative 2 and Alternative 3 would comply with chemical and location-specific ARARs because they both address the risk by eliminating the direct exposure to lead-contaminated soil.

Alternatives 2 and 3 will also meet the action-specific ARARs. Action-specific federal and state ARARs would be achieved by making sure all soil above the cleanup level is excavated, transported, and disposed of properly. Storm water runoff will be kept to a minimum during excavation, soil replacement, and hydroseeding using best management practices, thus keeping local streams free of additional sediment. Dust suppression will be used during all phases of construction and time spent at each residence will be kept to a minimum to minimize exposure to the residents. All precautions will be considered at each location to ensure that excavation will not hinder or interfere with wildlife and local streams.

Balancing Criteria

The following presents a brief description of how the alternatives developed in the FS satisfy the balancing criteria.

Long-term Effectiveness and Permanence

This criterion addresses the results of a cleanup action in terms of the risk remaining at the Site after the goals of the cleanup have been met. The primary focus of this evaluation is to determine the extent and effectiveness of the controls that may be required to manage the risk posed by treatment residuals and/or untreated wastes.

Alternative 1 provides no long-term effectiveness or permanence for the protection of human health and the environment. Alternative 1 provides no controls to manage residual risk associated with lead contamination to soil at residential properties. Under Alternative 1, residual risks to human health would remain at or near current levels.

Under Alternative 2 and Alternative 3, the residual risks (the risk remaining after implementation) would be significantly reduced. Under both Alternative 2 and Alternative 3, the residual risk is the lead contamination left in place at depth after the completion of the remedy. This risk is managed by clean soil cover and use of a visual barrier to warn of the remaining contamination. While both Alternative 2

and Alternative 3 manage the residual risk in this manner, Alternative 3 would provide the most long-term effectiveness and permanence because any remaining lead contamination (>1,200 ppm) would be covered with a 24 inch barrier of clean soil compared to the 12 inch barrier of clean soil in Alternative 2.

A significant aspect of Alternative 2 and Alternative 3 is the placement of the contaminated soils at the Desloge Pile (Big River Pile) and Leadwood Pile Soil Repositories. The repositories would require storm water controls and other design and engineering controls for long-term stability.

Reduction of Toxicity, Mobility, or Volume of Contaminants Through Treatment

This criterion addresses the statutory preference for selecting remedial actions that employ treatment technologies that permanently and significantly reduce toxicity, mobility, or volume of the contaminants. This criterion evaluates an alternative's use of treatment to reduce the harmful effects of principal contaminants, their ability to move in the environment, and the amount of contamination present.

Under Alternative 1 there is no reduction in the toxicity, mobility, or volume of contamination because lead contaminated soils are left in place.

Alternatives 2 and 3 would significantly reduce the mobility of the COC by transporting and consolidating the lead contaminated soils from the residential yards and high child exposure areas at the Desloge Pile (Big River Pile) and Leadwood Pile Soil Repositories. Contaminated soil would be placed at the repositories in designated areas that are not prone to erosion. After placement, the contaminated soil would be capped with clean soil, less than 400 ppm, and revegetated. The cap thickness and seed mix for revegetation will be determined during the final design. Although the exposure pathway would be eliminated or minimized, the toxicity and volume of the material would not be reduced by these alternatives. Proper long-term maintenance of the designated repositories is an important component of Alternatives 2 and 3 to ensure the significant reduction of heavy metal mobility.

Alternatives 2 and 3 do not utilize treatment to address the threats posed by the residential property soils. The residual waste found in the residential soils is considered a low-level threat waste, which is defined as surface soil containing contaminants of concern that generally is relatively immobile in air or ground water in the specific environmental setting (Office of Solid Waste and Emergency Response (OSWER), Publication 9380.3-06FS, 1991).

Additionally, no treatment technologies were identified that have definitively demonstrated the ability to reliably provide short- and long-term effectiveness, permanence, and meet the other NCP criteria. Various phosphate compounds have been used at the Viburnum Tailings Pile site and the Oronogo-Duenweg Mining Belt site to treat mine waste and lead-contaminated soil. In both cases the phosphate compounds were shown to be an ineffective and unfeasible alternative when compared to soil removal and replacement.

Short-term Effectiveness

This criterion addresses the effects of the alternative during the construction until the remedial action is completed and the selected level of protection has been achieved.

Alternative 1 does not create any short term risk to the local community or workers because no work will be performed under Alternative 1. Alternative 1 also does not create any short term risk of environmental impact during construction since there is no construction under this alternative. Exposure pathways for the public and environment would remain.

Alternatives 2 and 3 have increased risks to the local communities and workers, as well as the environment from excavation and transportation of lead contaminated soil. Short-term community protection concerns are similar under both Alternative 2 and 3, and include possible fugitive dust emissions and heavy metal ingestion. Disturbed contaminated soil could enter the ambient air during excavation and transportation. Dust suppression would be implemented for the protection of the community and workers during the remedial action. Alternatives 2 and 3 would require a minimum of 7 years to implement for all affected residences. However, the length of time at any one residence during excavation would be minimal. Therefore, the residential exposure to dust would be minimal.

Implementability

This criterion addresses the technical and administrative feasibility of implementing a cleanup and the availability of various services and materials required during its implementation.

Alternative 1 does not require any implementation.

Alternative 2 and Alternative 3 are readily implementable because they are technically feasible from an engineering perspective. Excavation methods, backfilling, and revegetation are typical engineering controls. The experience gained from previous Site removal actions conducted by EPA at this and other lead mining Superfund sites has shown that Alternative 2 and Alternative 3 are readily implementable.

Cost

This criterion addresses the direct and indirect capital cost of the remedy. O&M costs incurred over the life of the project, as well as present worth costs, are also evaluated.

No capital or O&M costs would be associated with Alternative 1 because no remedial actions would be conducted.

The present worth cost for Alternative 2 is estimated to be $97.72 million.

The present worth cost for Alternative 3 is estimated to be $107.62 million.

For the cost estimates for both Alternative 2 and 3, capital costs are spread over a period of 30 years. A 7 percent discount rate was used to calculate the present worth. These estimates are approximate and made without detailed engineering data. The actual cost of the remedial action would depend on the final scope of the remedial action, actual length of time required to implement the alternative, and other unknown factors.

The historical average amount of soil removed from each property is 305.19 yd^3, on a 12 inch excavation. These estimates are averages of past construction activities on this Site but future costs could well vary. Annual costs of $20,000 are estimated for public health education. Additional information on cost can be found in Tables 5 and 6 of Appendix B.

Modifying Criteria

The two modifying criteria of community and state acceptance are intended to assess the views of both groups regarding the Alternatives. EPA conducts meetings with representatives from MDNR, MDHSS, ATSDR, St. Francois County Health Department, news media, visiting academics and students, and local citizens to address activities and policies at the Site on a regular basis.

State/Support Agency Acceptance

MDNR supports the Selected Remedy (Alternative 3) proposed by EPA. MDNR has commented on and concurs with the Selected Remedy.

Community Acceptance

During the public comment period, the community expressed its support for Alternatives 2 and 3. A Responsiveness Summary (which captures public comments) is included in Appendix C.

K. PRINCIPAL THREAT WASTE

Principal threat wastes are source materials that require remediation based on toxicity, mobility, and the potential to create unacceptable human health or ecological risks. The NCP establishes a preference that treatment will be used to address principal threat wastes when practical.

The eight mine waste piles are the source deposits and constitute the principal threat to human health and the environment. This threat is being addressed by stabilizing the mine waste deposits in place, which includes regrading and covering the mine waste deposits with clean rock and/or soil. The eight mine waste piles either are, or are in the process of being, covered with clean soil and revegetated as part of removal actions at the Site. In place stabilization of the mine waste deposits provides adequate protection when combined with ICs, such as site access restrictions (fences, rock barriers, etc.). In addition, removal or treatment of the very large mine waste deposits (>5,000,000 cubic yards) is impracticable.

The residual waste found in the residential soils is considered a low-level threat waste, which is defined as surface soil containing contaminants of concern that generally are relatively immobile in air or ground water in the specific environmental setting (OSWER, Publication 9380.3-06FS, 1991). However, the residual waste in soil has the potential to be a principal threat waste when it is mobilized by mechanical means, therefore, remediation is necessary to mitigate the potential risk.

L. SELECTED REMEDY

The Selected Remedy is Alternative 3 — Excavation of soil until lead concentrations are below 400 ppm in the top 12 inches; or below 1,200 ppm below 12 inches down to 24 inches bgs; transportation of contaminated soil to on-Site soil repositories; replacement of contaminated soil with clean backfill, vegetative cover and limited institutional controls.

The Selected Remedy was chosen over the other alternatives by EPA based on the nine NCP criteria set forth above. The Selected Remedy provides the best balance of trade-offs and achieves the RAO. A primary consideration is the significant reduction in the number of properties that would require difficult to implement ICs as a result of the more extensive excavation (to a depth of 24 inches bgs) which would be required at a relatively small number of properties.

M. STATUTORY DETERMINATIONS

EPA expects the Selected Remedy to satisfy the following statutory requirement of section 121(b) of CERCLA: (1) be protective of human health and the environment, (2) comply with ARARs, (3) be cost-effective, (4) utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable, and (5) satisfy the preference for treatment as a principal element or explain why the preference for treatment will not be met. The following sections discuss how the Selected Remedy meets these statutory requirements.

Protection of Human Health and the Environment

The Selected Remedy will protect human health and the environment at remediated residential properties by achieving the RAO through conventional engineering measures. Risks associated with lead-contaminated residential soils at the Site are caused by the potential for direct contact with contaminated soils. The Selected Remedy eliminates this direct exposure pathway through excavation and replacement of lead-contaminated soils at the residential properties. Contaminated soils will be removed from residential properties, permanently eliminating this identified source of exposure. The implementation of the Selected Remedy will not pose unacceptable short-term risks or cross-media impacts.

Compliance with ARARs

In general, Selected Remedies should comply with ARARs unless waivers are granted. The Selected Remedy is expected to meet all chemical-specific, action-specific, and location-specific ARARs and does not involve any waivers. The ARARs for this ROD are included in Tables 2 through 4 in Appendix B.

Cost Effectiveness

The Selected Remedy is a cost-effective solution to lead-contaminated residential soils at the Site. The Selected Remedy relies on conventional engineering methods that are easily implemented. Contaminated soils are removed and replaced, thereby providing a permanent remedy for remediated residential soils which will not be subject to future costs.

Utilization of Permanent Solutions and Alternate Treatment Technologies

The Selected Remedy utilizes a well-demonstrated remediation approach to lead-contaminated soils that will provide a permanent remedy for residential properties. Removal and replacement of contaminated residential soils permanently removes heavy metal contaminants as a potential source of exposure. Since all contaminated soil will remain on-site, lead stabilization treatment is not required to prevent the soils from failing the Toxicity Characteristic Leaching Procedure (TCLP) test. The Selected Remedy best satisfies the statutory mandates for permanence.

Preference for Treatment

The Selected Remedy does not utilize treatment to address the threats posed by the residential property soils. The residual waste found in the residential soils is considered a low-level threat waste, which is defined as surface soil containing contaminants of concern that generally is relatively immobile in air or ground water in the specific environmental setting (OSWER, Publication 9380.3-06FS, 1991).

Additionally, no treatment technologies were identified that have definitively demonstrated the ability to reliably provide short- and long-term effectiveness, permanence, and meet the other NCP criteria. Various phosphate compounds have been used at the Viburnum Tailings Pile site and the Oronogo-Duenweg Mining Belt site to treat mine waste and lead-contaminated soil. In both cases the phosphate compounds were shown to be an ineffective and unfeasible alternative when compared to soil removal and replacement.

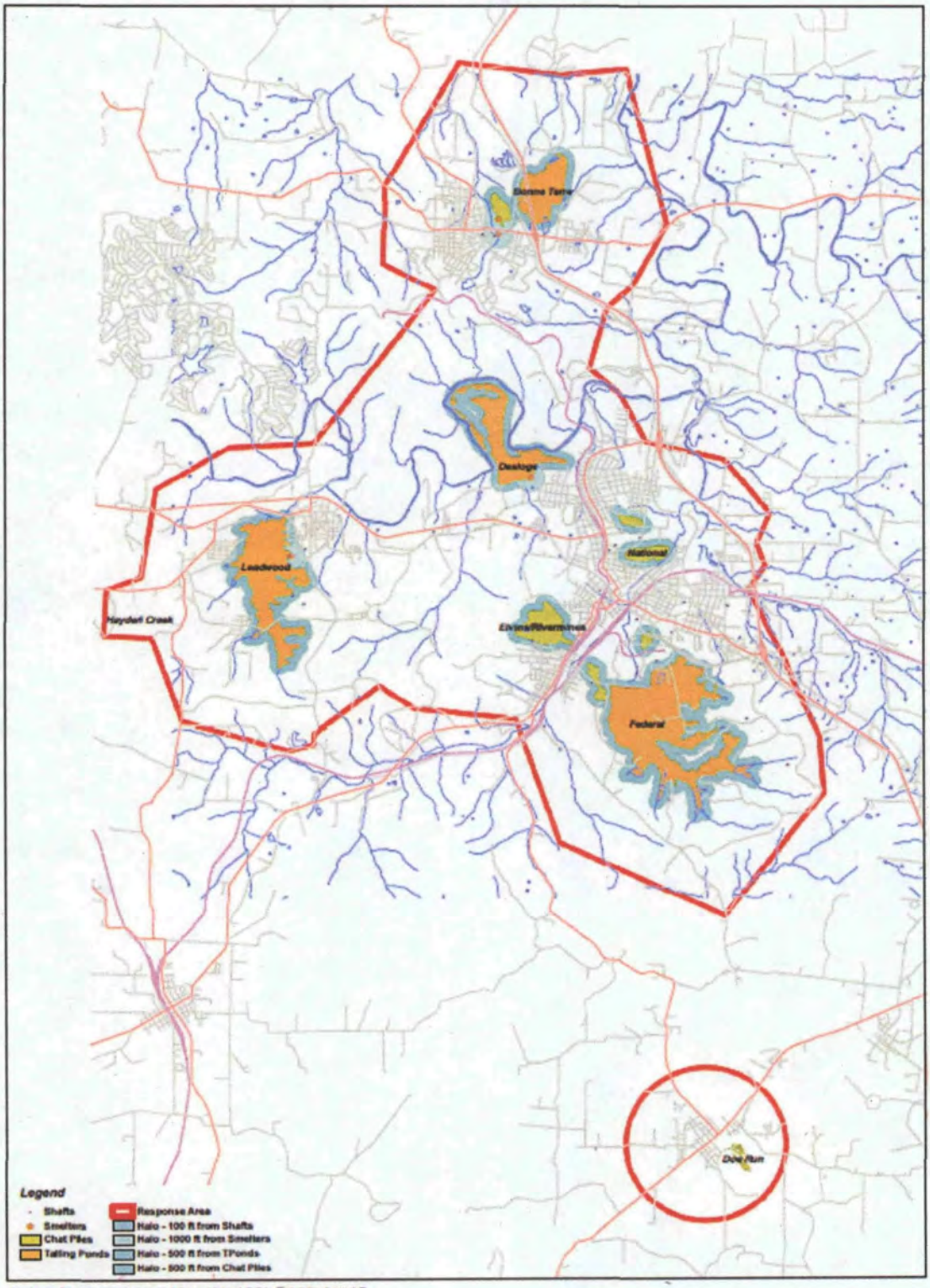
Under the Selected Remedy for this Site, contaminated soil will be placed on the existing repositories located at the Desloge Pile (Big River Pile) and Leadwood Pile. The contaminated soil will be placed on the repositories, capped with a clean 12 inch layer of soil, and revegetated with a site-specific seed mix. The placement of the contaminated soil will improve conditions on the mine waste piles by reducing the amount of wind-blown lead contaminated dust transported off the piles and will also reduce water infiltration of the piles. Since contaminated soil will remain on-Site, treatment is not required to prevent the soils from failing the TCLP test.

Five-Year Review Requirements

The selected remedy is subject to periodic five-year reviews in accordance with Section 121(c) of CERCLA and the NCP. Although mining wastes will be removed from the residential yards and placed in the existing repositories, waste will remain onsite at elevated levels in a small amount of the yards below 24 inches bgs and in the repositories. The status and effectiveness of the ICs will be evaluated during the 5-year review process.

APPENDIX A

FIGURES



Source: Figure reconstructed from Halo AOC's Exhibits A and B

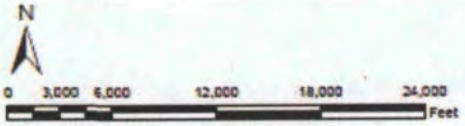


Figure 1
Response Area and Halo
St. Francois Co. Mined Areas

Figure 2. National Pile Before Remediation

Figure 3. Bonne Terre Pile Before Remediation

Figure 4. Visible Mine Waste blowing off the Desloge Pile

Figure 5. Visual erosion of Mine Waste into Big River

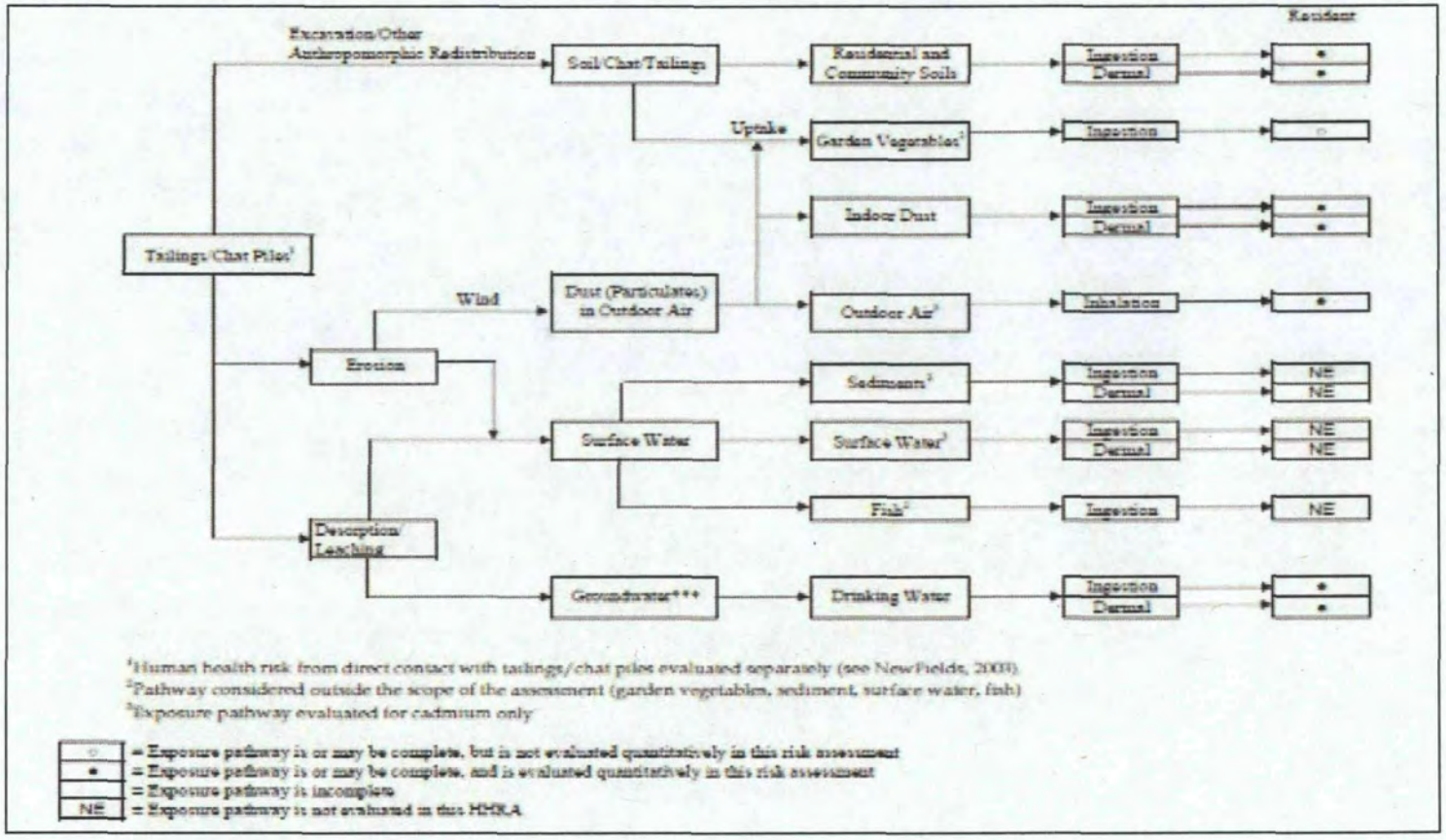


Figure 6. Conceptual Site Model

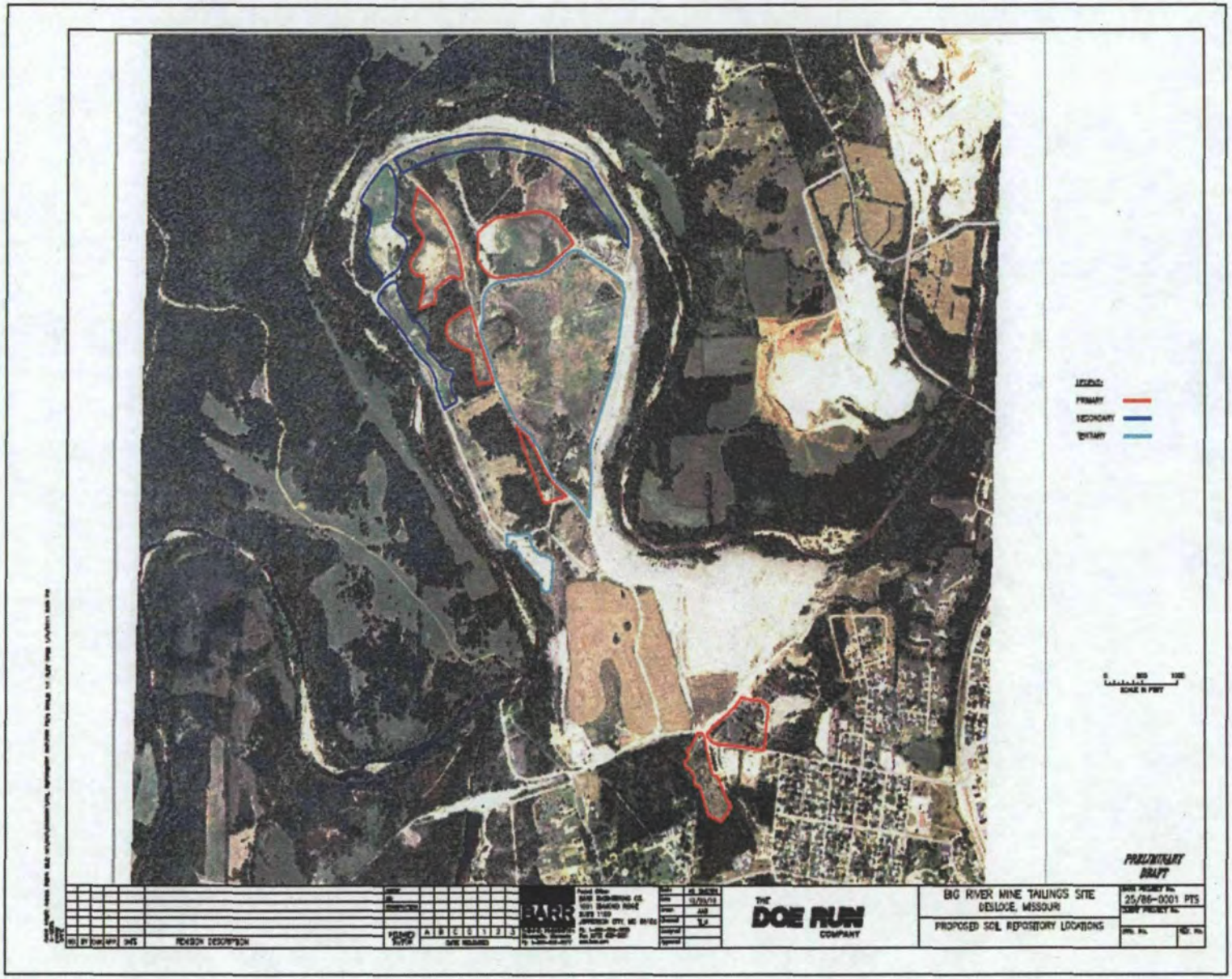


Figure 7. Big River (Desloge) Repository

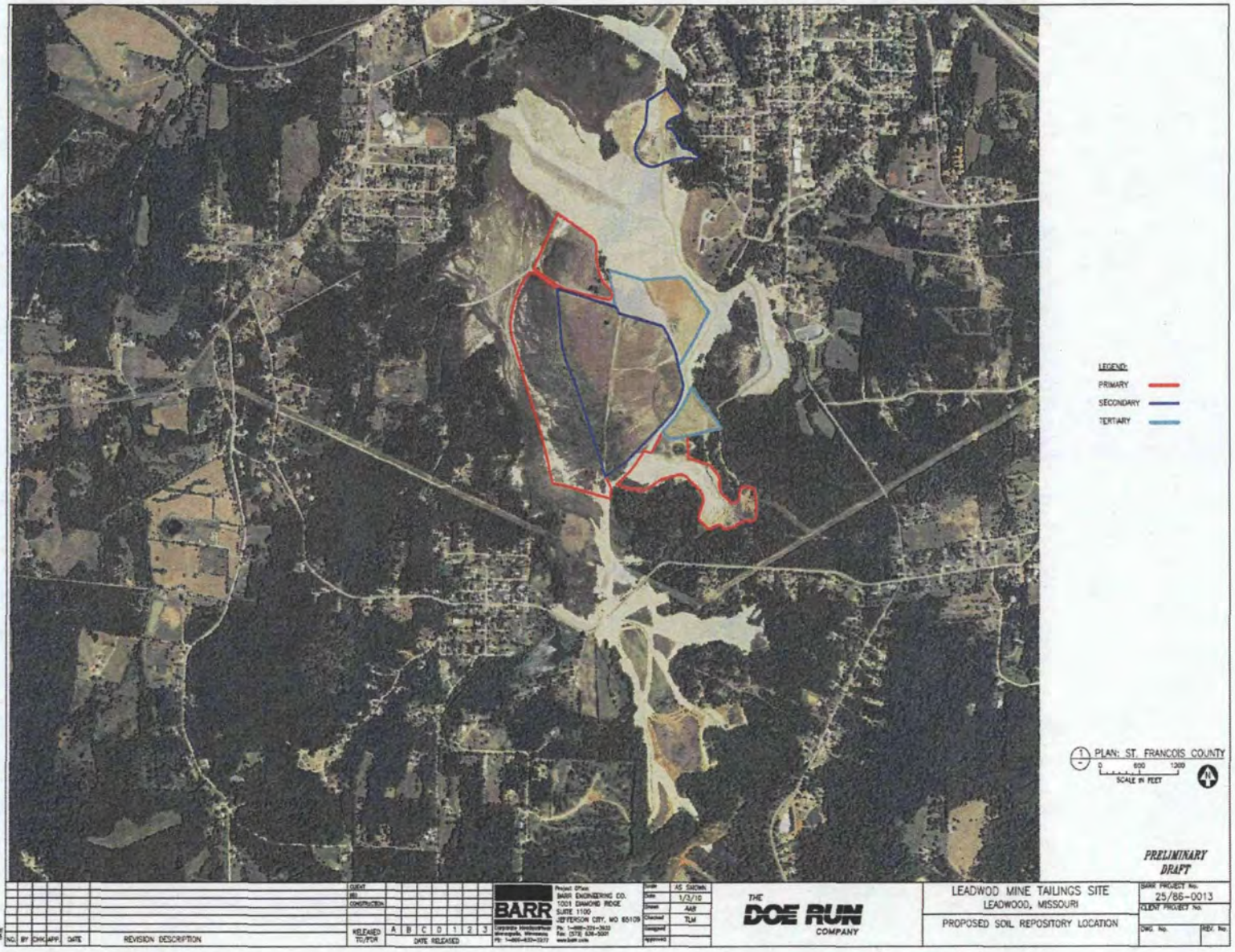


Figure 8. Leadwood Repository

APPENDIX B

TABLES

TABLE 1. ST. FRANCOIS COUNTY 2000 CENSUS INFORMATION

City/Community	Population
Farmington	13,924
Park Hills	7,861
Desloge	4,802
Bonne Terre	4,039
Bismarck	1,470
Leadwood	1,160
Iron Mountain Lake	693
Leadington	206
Balance of St. Francois County	21,486

Source: United States Census Bureau, 2001

TABLE 2. FEDERAL AND STATE CHEMICAL SPECIFIC ARARs

Standard, Requirement or Criteria	Applicable	Relevant and Appropriate	Citation	Description	Comment
FEDERAL					
Hazardous Waste Criteria	Potentially	–	40 CFR 264	Establishes criteria for use in determining hazardous wastes and disposal requirements. Excavated soil would be classified as D008 hazardous waste if the lead concentration from the TCLP test was greater than 5.0 mg/L.	Would be applicable if hazardous wastes are generated and disposed of off-site at a RCRA Facility. All excavated yard soils would be disposed of in an onsite CAMU. This regulation would potential apply if any of the wastes were disposed of off-site.
National Ambient Air Quality Standards (NAAQS)	No	Yes	40 CFR Part 50	Establishes ambient air quality standards for certain "criteria pollutants" to protect public health and welfare. Standard is: 0.15 microgram lead per cubic meter ($\mu g/m^3$) maximum – arithmetic mean averaged over a rolling 3 month average.	NAAQS are implemented through the New Source Review Program and State Implementation Plans (SIPs). The Federal New Source Review Program addresses only major sources. Emissions associated with the remedial action would be limited to fugitive dust emissions associated with earth moving activities during construction. These activities will not constitute a major source. Therefore, attainment and maintenance of NAAQS pursuant to the New Source Review Program are not applicable. However, the standards relating to lead are relevant and appropriate.
STATE					
Missouri Ambient Air Standards	Yes	–	Missouri Code of State Regulations (CSR) 10 CSR 010-06.010	Missouri uses the NAAQS as the state standards for airborne emissions. The NAAQS air quality standards for particulates, as PM10, are 50 $\mu g/m^3$ (annual geometric mean) and 150 $\mu g/m^3$ (24 hour), as PM2.5 they are 15 $\mu g/m^3$ (annual geometric mean) and 65 $\mu g/m^3$ (24 hour). The NAAQS emission limit for lead is 0.15 $\mu g/m^3$ averaged over a rolling 3 month average.	Relevant and appropriate to actions that generate fugitive dust at individual properties and the staging area.

TABLE 3. LOCATION - SPECIFIC ARARs

Standard, Requirement or Criteria	Applicable	Relevant and Appropriate	Citation	Description	Comment
FEDERAL					
Archaeological and Historic Preservation Act	No	No	16 USC Sec. 469	Establishes procedures to provide for preservation of historical and archaeological data that might be destroyed through alteration of terrain as a result of a Federally licensed activity or program.	Area to be part of soil remedial activities is not believed to contain any historical or archaeological resources due to residential nature of Site and shallow depth (<2 ft) of excavation activities to be performed (if necessary).
Archaeological Resources Protection Act	No	No	16 USC Secs. 470 aa - mm	Requires permits for any excavation or removal of archaeological resources from public or Indian lands. Provides guidance for federal land managers to protect such resources.	Activities will not take place on public land or Indian land.
National Historic Preservation Act	No	No	16 USC Sec. 470 36 CFR Part 800 Executive Order 11593, May 3, 1971	Requires Federal agencies to take into account the effect of any Federally assisted undertaking or licensing on any district, site, building, structure, or object that is included in or eligible for Register of Historic Places.	Area to be part of soil remedial activities is not believed to contain any feature that would be eligible for registration as a historic place due to residential nature and location of Site.
Historic Sites, Buildings, and Antiquities Act	No	No	16 USC Secs. 461 - 467, 470h-2(f)	Requires Federal agencies to consider the existence and location of landmarks on the National Registry of Natural Landmarks to avoid undesirable impacts on such landmarks.	Area to be part of soil remedial activities is not believed to contain any National Natural Landmarks due to residential nature and location of Site.
Fish and Wildlife Coordination Act	No	No	16 USC Secs. 661 - 666	Requires any Federal agency or permitted entity to consult with the U.S. Fish and Wildlife Service and appropriate state agency prior to modification of any stream or other water body. The intent of this requirement is to conserve, improve, or prevent loss of wildlife habitat and resources.	Area to be part of soil remedial activities is not believed to directly impact any stream or water feature. However, streams adjacent to properties could be potentially affected by runoff from remedial activities.
Fish and Wildlife Conservation Act	No	No	16 USC Secs. 2901 - 2912	Requires Federal agencies to utilize their statutory and administrative authority to conserve and promote conservation of non-game fish and wildlife species.	Area to be part of soil remedial activities is not believed to directly impact any stream or water feature. However, streams adjacent to properties could be potentially affected by runoff from remedial activities.

Standard, Requirement or Criteria	Applicable	Relevant and Appropriate	Citation	Description	Comment
Endangered Species Act	No	No	16 USC Secs. 1531-1544 50 CFR Parts 17, 402	Requires that Federal agencies ensure that any action authorized, funded, or carried out by the agency is not likely to jeopardize the continued existence of any threatened or endangered species or destroy or adversely modify critical habitat.	Area to be part of soil remedial activities is not believed to directly impact any critical habitat. Remedial activities will be restricted to residential properties and are not expected to adversely impact listed species.
Federal Migratory Bird Treaty Act	No	No	16 USC Secs. 703 - 712	Prohibits taking of any migratory bird.	Area to be part of soil remedial activities is not believed to directly impact any critical habitat. Remedial activities will be restricted to residential properties and not expected to adversely impact migratory birds.
Executive Order on Floodplain Management	No	No	Executive Order No. 11988	Requires Federal agencies to evaluate the potential effects of actions they may take in a floodplain to avoid, to the maximum extent possible, the adverse impacts associated with direct and indirect development of a floodplain.	Remedial activities to be performed are comprised of restoration of residential properties. As such, no additional development within the floodplain is anticipated beyond that previously performed during the original development of the property.
Executive Order on Protection of Wetlands	No	No	Executive Order No. 11990	Requires Federal agencies to avoid, to the maximum extent possible, the adverse impacts associated with the destruction or loss of wetlands and to avoid new construction in wetlands, if a practicable alternative exists.	Remedial activities to be performed are comprised of restoration of residential properties. As such, no adverse impacts on wetlands are anticipated.
Farmland Protection Policy Act	No	No	7 USC Sec. 4201 *et. seq.*	Protects significant or important agricultural lands from irreversible conversion to uses that result in its loss as an environmental or essential food production resource.	Remedial activities to be performed are comprised of restoration of residential properties and are not expected to impact agricultural lands. As such, no loss of environmental or essential food production resources is anticipated.

Standard, Requirement or Criteria	Applicable	Relevant and Appropriate	Citation	Description	Comment
RCRA – Location Standards for Hazardous Waste Facilities	Potentially	–	42 USC Sec. 6901 40 CFR 264.18	Requires that any hazardous waste facility located within the 100-year floodplain be designed, constructed, operated, and maintained to avoid washout. Also, contains requirements for locating facilities away from seismically active zones. Because most mining and mill wastes are explicitly excluded from RCRA regulations, these requirements are only TBCs for the Site.	All excavated yard soils will be disposed of in an onsite CAMU – BRMTS Repository. This unit, located on a designated mine area, is managed in accordance with the CAMU Approval Memorandum dated December 12, 2001 and the Operation Manual (NewFields 2003).
Rivers and Harbors Act	No	No	33 CFR Secs. 320 - 330	Requires preapproval of the US Army Corps of Engineers prior to placement of any structures in waterways and restricts the placement of structures in waterways.	Area to be part of soil remedial activities is not believed to directly impact any navigable stream or water feature or necessitate placement of any structures within these features.
STATE					
Missouri Hazardous Waste Regulations	--	Potentially	10 CSR 25-7.264 - 270	Hazardous waste disposal areas shall not be placed within a 100-year floodplain or wetland. Provisions related to placement and management of hazardous waste units.	Relevant and appropriate to actions that generate hazardous waste. All excavated yard soils will be disposed of in an onsite CAMU – BRMTS Repository. This unit, located on a designated mine area, is managed in accordance with the CAMU Approval Memorandum dated December 12, 2001 and the Operation Manual (NewFields 2003).
Missouri Metallic Minerals Waste Management Act	–	Yes	10 CSR 45	Actions involving placement of metallic mineral waste shall be performed according to permit.	All excavated yard soils will be disposed of in an onsite CAMU – BRMTS Repository. This unit, located on a designated mine area, is managed in accordance with the CAMU Approval Memorandum dated December 12, 2001 and the Operation Manual (NewFields 2003).

Standard, Requirement or Criteria	Applicable	Relevant and Appropriate	Citation	Description	Comment
Missouri Solid Waste Regulations	Potentially	--	11 CSR 80-11.010	Actions involving solid waste disposal areas shall not cause degradation to wetlands or jeopardize existence of endangered or threatened species protected under the Endangered Species Act of 1973 or violate any requirement under the Marine Protection, Research, and Sanctuaries Act of 1972.	Relevant and appropriate to actions that generate solid waste. All excavated yard soils will be disposed of in an onsite CAMU – BRMTS Repository. This unit is managed in accordance with the CAMU Approval Memorandum dated December 12, 2001 and the Operation Manual (NewFields 2003).

TABLE 4. FEDERAL AND STATE ACTION - SPECIFIC ARARs

Action	Applicable	Relevant and Appropriate	Citation	Description	Comment
FEDERAL					
Hazardous and Solid Waste: Criteria for Classification of Solid Waste and Disposal Facilities and Practices	Yes	--	40 CFR Part 257	Establishes criteria for use in determining solid wastes and disposal requirements.	Excavated soil is a solid waste.
1. Criteria for Classification of Hazardous Waste and Disposal Facilities and Practices	Potentially	--	40 CFR Part 264	Establishes criteria for use in determining hazardous wastes and disposal requirements.	All excavated yard soils will be disposed of in an onsite CAMU – BRMTS Repository. This unit, located on a designated mine area, is managed in accordance with the CAMU Approval Memorandum dated December 12, 2001 and the Operation Manual (NewFields 2003). This regulation would potential apply if any of the wastes were disposed of off-site.
2. Hazardous Materials Transportation Regulations	Potentially	--	49 CFR Parts 107, 171-177	Regulates transportation of hazardous materials.	Applicable only if the remedial action involves off-site transportation of hazardous materials. The regulations affecting packaging, labeling, marking, placarding, using proper containers, and reporting discharges of hazardous materials would be potential ARARs.

Action	Applicable	Relevant and Appropriate	Citation	Description	Comment
Air Emission Control:					
1. National Ambient Air Quality Standards (NAAQS)	No	Yes	40 CFR Part 50	Establishes ambient air quality standards for certain "criteria pollutants" to protect public health and welfare. Standards are: 150 µg/m^3 for particulate matter for a 24 hour period; 50 µg/m^3 for particulate matter – annual arithmetic mean; 0.15 µg/m^3 maximum – arithmetic mean averaged over a 3 month rolling average.	NAAQS are implemented through the New Source Review Program and State Implementation Plans (SIPs). The federal New Source Review Program addresses only major sources. Emissions associated with the remedial action would be limited to fugitive dust emissions associated with earth moving activities during construction. These activities will not constitute a major source. Therefore, attainment and maintenance of NAAQS pursuant to the New Source Review Program are not applicable. However, the standards relating to particulate matter and to lead are relevant and appropriate.
STATE					
Hazardous and Solid Waste:					
1. Solid waste determination	Yes	--	Missouri Solid Waste Regulations 11 CSR 80-11	A solid waste is any discarded material that is not excluded by Regulation.	Applicable to soil excavated from residential yards.
2. Determination of hazardous waste.	Potentially	--	Missouri Hazardous Waste Regulations 10 CSR 25-7.264 - 270	If an extract from a solid waste, tested using the Toxicity Characteristic Leaching Procedure (TCLP, Test Method 1311 in "Test Methods for Evaluating Solid Waste, Physical/ Chemical Methods", EPA publication SW 846), contains concentrations of any of the materials above the listed level (5 mg/L for lead), the waste is considered hazardous.	Applicable to soil excavated from residential yards and disposed of offsite. All excavated yard soils would be disposed of in an onsite CAMU.

Action	Applicable	Relevant and Appropriate	Citation	Description	Comment
3. Transportation of Hazardous Waste	Potentially	--	Missouri Solid Waste Regulations 11 CSR 80-11	Rules regarding Transportation of Hazardous Substances.	Applicable only if the remedial action involves off-site transportation of hazardous materials. The regulations affecting packaging, labeling, marking, placarding, using proper containers; and reporting discharges of hazardous materials would be potential ARARs.
Air Emission Control:					
1. Particulate emissions during excavation and backfill.	Yes	--	Missouri Code of State Regulations 10 CSR 010-06	Missouri air pollution regulations require persons that emit fugitive particulates to minimize emissions through use of all reasonable precautions. In addition, no visible fugitive dust transport is allowed beyond the lot line of the property where the emissions originate.	Applicable to actions that entail excavation, moving, storing, transportation of redistribution of soil.
2. Ambient Air Standard for Total Suspended Particulate Matter	No	Yes	Missouri Code of State Regulations 10 CSR 010-06	Missouri uses the NAAQS as the state standards for airborne emissions. The NAAQS air quality standards for particulates, as PM_{10}, are 50 $\mu g/m^3$ (annual geometric mean) and 150 $\mu g/m^3$ (24 hour), as $PM_{2.5}$ they are 15 $\mu g/m^3$ (annual geometric mean) and 65 $\mu g/m^3$ (24 hour).	Remedial activities will not constitute a major source and therefore regulations are not applicable. Relevant and appropriate to actions that generate fugitive dust at individual properties and the staging area.
3. Ambient Air Standards	No	Yes	Missouri Code of State Regulations 10 CSR 010-06	Missouri uses the NAAQS as the state standards for airborne emissions. Excavation and backfill of soils could potentially cause emission of hazardous air pollutants. The NAAQS emission limit for lead is 0.15 $\mu g/m^3$ averaged over a rolling 3 month average.	Relevant and appropriate to actions that generate fugitive dust at individual properties and the staging area.

Action	Applicable	Relevant and Appropriate	Citation	Description	Comment
Storm water Controls:					
1. Storm water NPDES Permit	No	Yes	Missouri Clean Water Commission 10 CSR 020-06	Missouri has established General NPDES Storm Water Permit for a land disturbance site such as would be encountered during the soil remedial action at the Site. The permit requires the establishment of best management practices (BMP) to control runoff.	This project is being performed under CERCLA as an Emergency Removal Action and therefore does not require a permit. However, the substantive requirements of the Missouri General Permit will be implemented at the site including CBMP, routine inspections and record keeping.

Table 5

Detailed Cost Estimate
Alternative 2 - Soil Removal with 12-Inch Subgrade Visual Barrier
St. Francois County Mined Areas - Residential Feasibility Study

Item/Description		Quantity		Est. per each costing unit	Costing Unit Quantity	Unit	Unit Cost	Total Cost
CAPITAL COSTS								
Sampling								
Sampling and Analysis								
Access		4,540	properties		148	days	$680.00	$100,640
Education Materials		4,540	properties		4,540	property	$1.50	$6,810
Sampling		3,587	properties		180	days	$1,700.00	$308,000
Sampling Analysis					36	days	$1,700.00	$61,200
XRF					1	XRF	$15,500.00	$15,500
Calibration Samples to Analytical Laboratory		897	samples		897	sample	$28.00	$25,116
Data Management		4,540	properties		227	hours	$95.00	$21,565
Result Letter Mailing		3,587	properties	150 letters per	24	mailings	$711.00	$17,064
Best Effort Letters for Sampling Refusal		954	properties	48 letters per	20	mailings	$909.00	$18,180
SUBTOTAL DIRECT CAPITAL COSTS - Sampling								***$572,075***
Sampling								
Mob/Demob							10%	$57,208
Engineering/Administration Costs							10%	$57,208
Health & Safety							3%	$17,162
SUBTOTAL INDIRECT CAPITAL COSTS - Sampling								***$131,577***
TOTAL ESTIMATED CAPITAL COST SAMPLING								**$703,652**
Removal								
Interim Action Sampled Yards (Known Yards)								
Removal Access		1,001	properties					
Access and Property Documentation	100%	1,001	properties		1,001	properties	$75.00	$75,075
Best Effort Letters for Refusals	14%	140	letters		140	letters	$5.50	$770
Excavation & Placement of Clean Fill		1,001	properties	Even though 14% of all yards are expected to refuse access, the cost assumes 100% participation				
Yard Quadrants/Areas		2,471						
One Quad		218	properties	3,000	654,000	SF	$2.87	$1,876,980
Two Quads		242	properties	6,000	1,452,000	SF	$2.11	$3,063,720
Three Quads (yards reduced by 2011 yards)		295	properties	9,000	2,655,000	SF	$2.11	$5,602,050
Four Quads (yards reduced by 2011 yards)		221	properties	12,000	2,652,000	SF	$1.63	$4,322,760
Driveway								
With yard quads								
One Quad		18	areas	1,000	18,000	SF	$2.87	$51,660
Two Quads		16	areas	1,000	16,000	SF	$2.11	$33,760
Three Quads (yards reduced by 2011 yards)		18	areas	1,000	18,000	SF	$2.11	$37,980
Four Quads (yards reduced by 2011 yards)		25	areas	1,000	25,000	SF	$1.63	$40,750
Only		15	areas	1,000	15	LS	$2,870.00	$43,050
Garden (assumes 24 inch depth excavation)		Gardens are assumed to be located in excavated quads in properties with more than two quads removed; therefore,						
With yard quads				Only 12 to 24 inch excavation included when 3 or 4 yard quadrants are remediated				
One Quad		6	areas	625	3,750	SF	$5.74	$21,525
Two Quads		8	areas	625	5,000	SF	$4.22	$21,100
Three Quads (yards reduced by 2011 yards)		15	areas	625	9,375	SF	$2.11	$19,781
Four Quads (yards reduced by 2011 yards)		18	areas	625	11,250	SF	$1.63	$18,338
Only		4	areas	625	4	LS	$2,870.00	$11,480
Play Area								
With yard quads		Play areas are assumed to be located in excavated quads in properties with more than two quads removed						
One Quad		15	areas	150	2,250	SF	$2.87	$6,458
Two Quads		27	areas	150	4,050	SF	$2.11	$8,546
Only		5	areas	150	5	LS	$2,870.00	$14,350
Final Close-out documentation		1,001	properties		1,001	properties	$75.00	$75,075
Lawn Watering (Known Yards)		1,001	properties	7,420,050 SF	2,315,056	gallons	$2.60 /1000 gal	$6,019
Non-Interim Action Sampled Yards (Potential)		Percent estimates based on the above known yards						
Removal Access		3,012	properties	Assumes 84% of sampled properties will require some soil removal				
Access and Property Documentation	100%	3,012	properties		3,012	properties	$37.50	$112,950
Best Effort Letters for Refusals	14%	421	letters		421	letters	$5.50	$2,316
Excavation & Placement of Clean Fill		3,012	properties	Even though 14% of all yards are expected to refuse access, the cost assumes 100% participation				
Yard Quadrants/Areas		8,581	quads					
One Quad (17%)	17%	512	properties	3,000	1,536,000	SF	$2.87	$4,408,320
Two Quads (19%)	19%	572	properties	6,000	3,432,000	SF	$2.11	$7,241,520
Three Quads (26%)	26%	783	properties	9,000	7,047,000	SF	$2.11	$14,869,170
Four Quads (38%)	38%	1,144	properties	12,000	13,728,000	SF	$1.63	$22,376,640
Driveway								
With yard quads								
One Quad	8%	40	areas	1,000	40,000	SF	$2.87	$114,800
Two Quads	7%	40	areas	1,000	40,000	SF	$2.11	$84,400
Three Quads	8%	62	areas	1,000	62,000	SF	$2.11	$130,820
Four Quads	11%	125	areas	1,000	125,000	SF	$1.63	$203,750
Only	1.2%	36	areas	1,000	36,000	SF	$2.87	$103,320
Garden (assumes 24 inch depth excavation)		Gardens are assumed to be located in excavated quads in properties with more than two quads removed; therefore,						
With yard quads				Only 12 to 24 inch excavation included when 3 or 4 yard quadrants are remediated				
One Quad	3%	15	areas	625	9,375	SF	$5.74	$53,813
Two Quads	3%	17	areas	625	10,625	SF	$4.22	$44,838
Three Quads	5%	28	areas	625	17,500	SF	$2.11	$36,925
Four Quads	8%	45	areas	625	28,125	SF	$1.63	$45,844
Only	0.3%	9	areas	625	9	LS	$2,870.00	$25,830
Play Area								
With yard quads		Play areas are assumed to be located in excavated quads in properties with more than two quads removed						
One Quad	7%	35	areas	150	5,250	SF	$2.87	$15,068
Two Quads	11%	62	areas	150	9,300	SF	$2.11	$19,623
Only	0.4%	12	areas	150	12	LS	$2,870.00	$34,440

Table 5

Detailed Cost Estimate
Alternative 2 - Soil Removal with 12-Inch Subgrade Visual Barrier
St. Francois County Mined Areas - Residential Feasbility Study

Item/Description	Quantity		Est. per each costing unit	Costing Unit Quantity	Unit	Unit Cost	Total Cost
Final Close-out documentation	3,012	properties		3,012	properties	$75.00	$225,900
Lawn Watering (Potential Additional Yards)	3,012	properties	25,759,350 SF	8,036,917	gallons	$2.60 /1000 gal	$20,896
SUBTOTAL DIRECT CAPITAL COSTS - Known Yards							$15,351,226
SUBTOTAL DIRECT CAPITAL COSTS - Potential Additional Yards							$50,171,181
SUBTOTAL DIRECT CAPITAL COSTS - Removal							***$65,522,407***
Interim Action Sampled Yards (Known Yards)							
Mob/Demob						10%	$1,535,123
Engineering/Administration Costs						10%	$1,535,123
Construction Management Costs						10%	$1,535,123
Health & Safety						3%	$460,537
Non-Interim Action Sampled Yards (Potential)							
Mob/Demob						10%	$5,017,118
Engineering/Administration Costs						10%	$5,017,118
Construction Management Costs						10%	$5,017,118
Health & Safety						3%	$1,505,135
SUBTOTAL INDIRECT CAPITAL COSTS - Known Yards							$5,065,905
SUBTOTAL INDIRECT CAPITAL COSTS - Potential Additional Yards							$16,556,490
SUBTOTAL INDIRECT CAPITAL COSTS - Removal							***$21,622,394***
Scope and Bid Contingencies - Removal only						35%	$30,500,680
TOTAL ESTIMATED CAPITAL COST REMOVAL							**$117,645,481**
TOTAL ESTIMATED CAPITAL COST (SAMPLING AND REMOVAL)							***$118,349,133***
ANNUAL O&M COSTS							
None							
PERIODIC COSTS							
Five-Year Review							$75,156
Sampling and Analysis = resampling surface soils at remediated properties (5 years x 574 yards/yr) at a 5% rate						$20,156	
Access	144	properties	1	days	$680.00	$680.00	
Sampling	144	properties	8	days	$1,700.00	$13,600.00	
Sampling Analysis			2	days	$1,700.00	$3,400.00	
Calibration Samples to Analytical Laboratory	36	samples	36	sample	$28.00	$1,008.00	
Data Management	144	properties	8	hours	$95.00	$760.00	
Result Letter Mailing	144	properties	1	mailings	$708.14	$708.14	
Summary of Removal Action to date						1	$55,000
Remedial Action Report						$75,000	$75,000
TOTAL ESTIMATED PERIODIC COST							***$150,156***
TOTAL NON-DISCOUNTED COST							***$118,499,289***
TOTAL PRESENT WORTH (7% rate of return, 30 year period)							***$97,719,000***

NOTES:
Cost Assumptions are provided in Appendix A
Total Present Worth calculation presented in Table A-1

Table 6

Detailed Cost Estimate
Alternative 3 - Soil Removal with 24-Inch Excavation
St. Francois County Mined Areas - Residential Feasbility Study

Item/Description		Quantity		Est. per each costing unit	Costing Unit Quantity	Unit	Unit Cost	Total Cost
CAPITAL COSTS								
Sampling								
Sampling and Analysis								
Access		4,540	properties		148	days	$680.00	$100,640
Education Materials		4,540	properties		4,540	property	$1.50	$6,810
Sampling		3,587	properties		180	days	$1,700.00	$306,000
Sampling Analysis					36	days	$1,700.00	$61,200
XRF					1	XRF	$15,500.00	$15,500
Calibration Samples to Analytical Laboratory		897	samples		897	sample	$28.00	$25,116
Data Management		*4,540*	*properties*		*227*	*hours*	*$95.00*	$21,565
Result Letter Mailing		3,587	properties	150 letters per	24	mailings	$711.00	$17,064
Best Effort Letters for Sampling Refusal		954	properties	48 letters per	20	mailings	$909.00	$18,180
SUBTOTAL DIRECT CAPITAL COSTS - Sampling								***$572,075***
Sampling								
Mob/Demob							10%	$57,208
Engineering/Administration Costs							10%	$57,208
Health & Safety							3%	$17,162
SUBTOTAL INDIRECT CAPITAL COSTS - Sampling								***$131,577***
TOTAL ESTIMATED CAPITAL COST SAMPLING								**$703,652**
Removal								
Interim Action Sampled Yards (Known Yards)								
Removal Access		1,001	properties					
Access and Property Documentation	100%	1,001	properties		1,001	properties	$75.00	$75,075
Best Effort Letters for Refusals	14%	140	letters		140	letters	$5.50	$770
Excavation & Placement of Clean Fill		1,001	properties	Even though 14% of all yards are expected to refuse access, the cost assumes 100% participation				
Yard Quadrants/Areas		2,471						
One Quad		218	properties	3,000	670,350	CF	$2.87	$1,923,905
Two Quads		242	properties	6,000	1,488,300	CF	$2.11	$3,140,313
Three Quads (yards reduced by 2011 yards)		295	properties	9,000	2,721,375	CF	$2.11	$5,742,101
Four Quads (yards reduced by 2011 yards)		221	properties	12,000	2,718,300	CF	$1.63	$4,430,829
Driveway								
With yard quads								
One Quad		18	areas	1,000	18,450	CF	$2.87	$52,952
Two Quads		16	areas	1,000	16,400	CF	$2.11	$34,604
Three Quads (yards reduced by 2011 yards)		18	areas	1,000	18,450	CF	$2.11	$38,930
Four Quads (yards reduced by 2011 yards)		25	areas	1,000	25,625	CF	$1.63	$41,769
Only		15	areas	1,000	15,375	CF	$2.87	$44,126
Garden (assumes 24 inch depth excavation)		Gardens are assumed to be located in excavated quads in properties with more than two quads removed; therefore,						
With yard quads				Only 12 to 24 inch excavation included when 3 or 4 yard quadrants are remediated				
One Quad		6	areas	625	7,500	CF	$2.87	$21,525
Two Quads		8	areas	625	10,000	CF	$2.11	$21,100
Three Quads (yards reduced by 2011 yards)		17	areas	625	10,625	CF	$2.11	$22,419
Four Quads (yards reduced by 2011 yards)		41	areas	625	25,625	CF	$1.63	$41,769
Only		4	areas	625	4	LS	$2,870.00	$11,480
Play Area								
With yard quads		Play areas are assumed to be located in excavated quads in properties with more than two quads removed						
One Quad		15	areas	150	2,306	CF	$2.87	$6,619
Two Quads		27	areas	150	4,151	CF	$2.11	$8,759
Only		5	areas	150	5	LS	$2,870.00	$14,350
Final Close-out documentation		1,001	properties		1,001	properties	$75.00	$75,075
Lawn Watering (Known Yards)		1,001		7,420,050 SF	2,315,056	gallons	$2.60 /1000 gal	$6,019
Non-Interim Action Sampled Yards (Potential)		Percent estimates based on the above known yards						
Removal Access		3,012	properties					
Access and Property Documentation	100%	3,012	properties		3,012	properties	$37.50	$112,950
Best Effort Letters for Refusals	14%	421	letters		421	letters	$5.50	$2,316
Excavation & Placement of Clean Fill		3,012	properties	Even though 14% of all yards are expected to refuse access, the cost assumes 100% participation				
Yard Quadrants/Areas		8,581	quads					
One Quad (17%)	17%	512	properties	3,000	1,574,400	CF	$2.87	$4,518,528
Two Quads (19%)	19%	572	properties	6,000	3,517,800	CF	$2.11	$7,422,558
Three Quads (25%)	26%	783	properties	9,000	7,223,175	CF	$2.11	$15,240,899
Four Quads (37%)	38%	1,144	properties	12,000	14,071,200	CF	$1.63	$22,936,056
Driveway								
With yard quads								
One Quad	8%	40	areas	1,000	41,000	CF	$2.87	$117,670
Two Quads	7%	40	areas	1,000	41,000	CF	$2.11	$86,510
Three Quads	8%	62	areas	1,000	63,550	CF	$2.11	$134,091
Four Quads	11%	125	areas	1,000	128,125	CF	$1.63	$208,844
Only	1.2%	36	areas	1,000	36,900	CF	$2.87	$105,903
Garden (assumes 24 inch depth excavation)		Gardens are assumed to be located in excavated quads in properties with more than two quads removed; therefore,						
With yard quads				*Only 12 to 24 inch excavation included when 3 or 4 yard quadrants are remediated*				
One Quad	3%	15	areas	625	18,750	CF	$2.87	$53,813
Two Quads	3%	17	areas	625	21,250	CF	$2.11	$44,838
Three Quads	5%	28	areas	625	17,500	CF	$2.11	$36,925
Four Quads	8%	45	areas	625	28,125	CF	$1.63	$45,844
Only	0.3%	9	areas	625	9	LS	$2,870.00	$25,830
Play Area								
With yard quads		Play areas are assumed to be located in excavated quads in properties with more than two quads removed						
One Quad	7%	35	areas	150	5,381	CF	$2.87	$15,444
Two Quads	11%	62	areas	150	9,533	CF	$2.11	$20,114
Only	0.4%	12	areas	150	12	LS	$2,870.00	$34,440

Table 6

Detailed Cost Estimate
Alternative 3 - Soil Removal with 24-Inch Excavation
St. Francois County Mined Areas - Residential Feasibility Study

Item/Description	Quantity		Est. per each costing unit	Costing Unit Quantity	Unit	Unit Cost	Total Cost
Final Close-out documentation	3,012	properties		3,012	properties	$75.00	$225,900
Lawn Watering (Potential Additional Yards)	3,012	properties	25,759,350 SF	8,036,917	gallons	$2.60 /1000 gal	$20,896
SUBTOTAL DIRECT CAPITAL COSTS - Known Yards							$15,754,487
SUBTOTAL DIRECT CAPITAL COSTS - Potential Additional Yards							$51,410,366
SUBTOTAL DIRECT CAPITAL COSTS - Removal							***$67,164,854***
Interim Action Sampled Yards (Known Yards)							
Mob/Demob						10%	$1,575,449
Engineering/Administration Costs						15%	$2,363,173
Construction Management Costs						15%	$2,363,173
Health & Safety						3%	$472,635
Non-Interim Action Sampled Yards (Potential)							
Mob/Demob						10%	$5,141,037
Engineering/Administration Costs						15%	$7,711,555
Construction Management Costs						15%	$7,711,555
Health & Safety						3%	$1,542,311
SUBTOTAL INDIRECT CAPITAL COSTS - Known Yards							$6,774,430
SUBTOTAL INDIRECT CAPITAL COSTS - Potential Additional Yards							$22,106,458
SUBTOTAL INDIRECT CAPITAL COSTS - Removal							***$28,880,887***
Scope and Bid Contingencies - Removal only						35%	$33,616,009
TOTAL ESTIMATED CAPITAL COST REMOVAL							**$129,661,751**
TOTAL ESTIMATED CAPITAL COST (SAMPLING AND REMOVAL)							***$130,365,403***
ANNUAL O&M COSTS							
None							
PERIODIC COSTS							
Five-Year Review							$75,156
Sampling and Analysis = resampling surface soils at remediated properties (5 years x 574 yards/yr) at a 5% rate						$20,156	
Access	144	properties	1	days	$680.00	$680.00	
Sampling	144	properties	8	days	$1,700.00	$13,600.00	
Sampling Analysis			2	days	$1,700.00	$3,400.00	
Calibration Samples to Analytical Laboratory	36	samples	36	sample	$28.00	$1,008.00	
Data Management	144	properties	8	hours	$95.00	$760.00	
Result Letter Mailing	144	properties	1	mailings	$708.14	$708.14	
Summary of Removal Action to date					1	$55,000	
Remedial Action Report					$75,000		$75,000
TOTAL ESTIMATED PERIODIC COST							***$150,156***
TOTAL NON-DISCOUNTED COST							***$130,515,559***
TOTAL PRESENT WORTH (7% rate of return, 30 year period)							***$107,618,000***

NOTES:
Cost Assumptions are provided in Appendix A
Total Present Worth calculation presented in Table A-2

APPENDIX C

RESPONSIVENESS SUMMARY

Big River Mine Tailings Superfund Site

OU-1

Responsiveness Summary

This Responsiveness Summary has been prepared to present a summary of comments and EPA's responses to comments regarding the Proposed Plan for the Big River Mine Tailings Superfund Site, Operable Unit 1. The Proposed Plan was released for public comment on July 22, 2011. The public comment period ended on September 21, 2011. A public meeting was held on August 4, 2011. A transcript of the public meeting was prepared and is part of the Administrative Record. The response to comments offered in this Responsiveness Summary should be considered collectively. EPA attempted to strike a balance between repeating responses to recurring elements that appeared in many individual comments, and providing a detailed response to each element in a single location. This Responsiveness Summary has been prepared with the goal of assuring the public clearly understands the EPA's position on the issues raised in the comments received, and the rationale that supports EPA decision-making for the Selected Remedy for the Big River Mine Tailings Superfund Site.

The Responsiveness Summary consists of the following sections: Comments/Questions received during the public hearing on August 4, 2011; comments received from the Missouri Department of Natural Resources (MDNR); comments received from the general public; comments received from political subdivisions of the state of Missouri; and comments received from business and industry. A complete set of comments by business and industry is attached.

A. Comments/Questions Received During Public Hearing on August 4, 2011

The following questions/comments concerning the proposed remedy were raised during the public meeting held at the Mineral Area College on August 4, 2011. Other questions and comments raised during that public meeting which did not directly concern the proposed plan for OU-1 are not included in this responsiveness summary. There appeared to be acceptance of the Proposed Plan by those in attendance.

QUESTION: From Mr. Norm Lucas. I was just curious as to how the decision was arrived at to go with the 24 inch deep cover rather than the 12 inch cover since all the areas with yards appear to be in cities that have planning and zoning where institutional controls could include some things about digging deeper than 12 inches.

EPA RESPONSE: It was based on a subsurface investigation that was done which was part of the feasibility study. It showed by going down further than 12 inches, we could eliminate the need for institutional controls. Actually about 98 percent of the properties that were evaluated were less than 1,200 at 24 inches and we felt that that would be the best thing to do. We wouldn't have the residual risks.

QUESTION: From Mrs. Elois Hartsel. My name's Elois Hartsel. I was just curious. How are you going to get the message out to the families and the parents that the children need to be retested or tested again?

EPA RESPONSE: We are going to do community outreach along with the local health department. Not just the local health department, also the Agency for Toxic Substances and Disease Registry along with the state Health Department and the local health department to do community outreach and try to get more blood-lead analyzed in the county. We will focus on that next year.

QUESTION: From Mr. Larry Mathis. My name's Larry Mathis and I was wondering why the blood levels were just limited to children.

EPA RESPONSE: We see the most health effects in the children as far as permanent damage. Ages seven and less is when most of the development is going on in a child, and that's where lead usually has the most effect. That's the focus here. Adults can definitely get their blood-lead analyzed as well, but we focus on the younger children because that's where we see the main health effects. Now, if you want to get into more detail about that, there's a few experts here that can give you more detail that are from the health department.

QUESTION: From Mr. Bobby Hartsel. I'm Bobby Hartsel. I was just wondering is it going to be a mandatory type cleanup, or what type of cleanup are you proposing like voluntary?

EPA RESPONSE: We will request access for sampling and we have to request access for cleanup as well. That's the first step we take.

QUESTION: From Mr. Bobby Hartsel. So what if my neighbor doesn't want to get his done, and I get mine done, and it all blows back towards me? What's going to keep it from blowing back on me?

EPA RESPONSE: Well, then it gets complicated and that's actually a legal issue, and our site attorney, Julie, will be working on that. I do see your point, and that can be an issue. We've had that happen before, and we do our best to try to keep it from going on. That's really all I can tell you right now though until we get the legal issues broken down. We hope that people will grant us access, and they usually do.

EPA Follow Up Response: CERCLA section 104 gives EPA the authority to order access.

QUESTION: From Mr. David Hull. But didn't they run into a problem like at Lake Timberline of people not wanting them to come on their property? I mean, they had an issue out there of contamination, and some people didn't want to take care of the problem.

EPA RESPONSE: I'm not sure about Lake Timberline because I don't work on that site, but as far as St. Francois County in the past, just to give you an idea, we've had an 80 percent success rate for getting access, which is pretty good. I mean, that's better than a lot of the sites we've worked on in the past. So usually we'll get access.

QUESTION: From Ms. Donna Bidgood. It's been at least rumored that in the municipality if we don't grant access that when the property is sold, at that point, the city may require that that property be remediated at our -- at the owner's cost or at the buyer's cost, only because I think you're going to get compliance if that's true at all and the people --

EPA RESPONSE: I don't know about the rumor. I haven't heard anything.

QUESTION: Ms. Shirley Politte. My name's Shirley Politte, and I did have my yard done a few years ago. In fact, you have it on your picture up there, the one that was completed with the grass. That was my yard, and they did tell me -- I said, "What if I don't let you do it?" And he said, "If you don't, then we will have a lien over at the court house, and if your house, your property, is sold, you could have to replace it then or" –

EPA RESPONSE: It's possible it could come back on the landowner if you don't have it done. It's a good idea to have it done.

QUESTION: Mr. David Hull: Does your property hold some type of paperwork once it's done, and then you have to do this disclosure type thing if you decide to sell, or what is it?

EPA RESPONSE: I work on the excavation, the remediation part of it. What happens is we will come to your property and do a pre-remediation site sketch sheet. We will have a picture of your yard showing the existing contamination at the existing grade. We take photos of everything, and do a pretty complicated site walk with you also to do an inspection of your property to make sure that we don't damage anything. When we get through, we'll excavate. Then we'll take our samples at the base of the excavation. If you're clean at 12 inches, then we'll stop. We'll have that data with your post-remediation site sketch, and you'll have all that data as well. That will be yours to keep. Every piece of data we pick up at your property has to be transferred to you. And you'll have all that in your record, and we keep it on record too.

QUESTION: From Mr. Norm Lucas: Did I understand correctly that if the contamination ends at 12 inches of depth, the excavation also stops at 12 inches?

EPA RESPONSE: Right.

QUESTION: From Mr. Norm Lucas. So the 24 inch in Alternative 3 is only in the necessary cases?

EPA RESPONSE: Right. It's not automatic. We haven't come up with an exact work plan for this work. We may do a six inch lift and test and go another six inch lift. That's what we've done at past sites.

QUESTION: From Mr. David Hull. Your remediation process, help me understand. How does that eliminate water leaching into the groundwater affecting everyone's wells and even though this mine site is hundreds of yards from my home, I still have a well there. And there's still livestock in that area and things like that.

EPA RESPONSE: What we typically see in the wells in St. Francois County is a high level of dissolved zinc that comes off these piles. We're trying to put treatment systems in. They're passive bio-reactors that are basically wetlands, and we have them at the Elvins pile, and then we're going to build one at Leadwood as well for dissolved zinc. What we don't see is dissolved lead in the water, not very often at least. So I think the 189 wells, plus all the municipal water supplies in the county have been tested, and we haven't seen elevated lead in hardly any of them. So it's not been a major concern. There is a lot of limestone around here. So that keeps the water with a higher pH and keeps the lead from dissolving.

QUESTION: From Mr. Bobby Hartsel. If they decide to go with this proposal and stuff, say, for the city of Bonne Terre, where would they take the waste to?

EPA RESPONSE: Most all the waste in this proposed plan is going to go to either Leadwood or Desloge.

QUESTION: From Mr. Bobby Hartsel. So the stuff that they took from like Lake Timberline, it went to Bonne Terre, right?

EPA RESPONSE: It went to the Bonne Terre east side. That was just for that Lake Timberline stuff because it was so far for them to travel down to Desloge and to Leadwood. And there was an area over there that needed the cover anyway, and that's why we decided to place it over there.

QUESTION: From Mr. Bobby Hartsel. So what's going to keep it -- that contamination from getting into any of the wells basically?

EPA RESPONSE: Well, it's not gotten into any wells yet around Bonne Terre, and that's our primary reason for doing this, which stabilized it in place because it doesn't tend to leach into the water.

QUESTION: From Mr. Bobby Hartsel. Why would the EPA step up to the plate to take care of the responsibility that's really not theirs?

EPA RESPONSE: We are stepping up to the plate based on information we have, and as far as any types of negotiations with responsible parties, those will occur in the future. We'll have to go to the table with any potentially responsible parties.

QUESTION: From Ms. Shirley Politte. All right. I was born and raised here in Elvins. I played with lead, chunks of lead. My dad worked on the drills. He brought home ores, the rock, where they had drilled for lead. I played with those. We had lead paint in the house, and nothing was ever mentioned about it being contaminated. I guess I didn't get it because I'm still here and I'm 72 years old. So everybody is not going to get it.

EPA RESPONSE: You're right. It won't affect everybody. But it does affect some people.

QUESTION: From Ms. Donna Bidgood. I too would like to say it's not totally out of proportion because same experience. We had a sandbox that was that chat from the chat dump. Our dad would go and shovel buckets full of it, and we would climb on it. And we swam in that water coming directly out of that overflow, you know, with that in it. And while I don't want to minimize the danger or have any other children exposed more than necessary, I don't think it's a cause for panic among those of us who did survive it to this point.

EPA RESPONSE: That's why we address the highest risk first. The source piles are getting addressed and the yards are where the children are spending most of their time and that's where the most likelihood of getting an elevated blood lead.

QUESTION: From Mrs. Pamela Watkins. We have one more. This is Pam Watkins, and I'm actually a renter. I haven't been here that long, and my question on this is, what would happen if you come and test my property and I would like for you to do the cleanup, but my landlord says he doesn't want it done?

EPA RESPONSE: It's an agreement with the landowner.

B. Comments/Questions Received from MDNR

The MDNR concurred on the preferred remedial action alternative in the Proposed Plan by letter dated August 2, 2011. This letter also included two comments that merit formal recognition and response.

MDNR Comment #1: Operable Unit 01 (OU1) includes Residential Action and Source Control; however, there is no language in the Proposed Plan that addresses Source Control as part of the remedial action for OU1. The PP does not contain any remedial action objectives for Source Control. The Record of Decision (ROD) should evaluate whether and/or to what extent the non-time-critical removal action achieves Remedial Action Objectives (RAOs) for OU1. An evaluation to determine whether or not additional remedial action work would be required on the pile(s) itself to meet RAOs should be included.

EPA RESPONSE: The comment refers to the eight source areas of mine waste. Of these, the Desloge (Big River), Leadwood, Elvins, Bonne Terre and Hayden Creek piles or areas have been stabilized. Work is ongoing at the National and Federal piles. The Doe Run pile will be stabilized under a future, as yet undetermined, action. With the exception of the Doe Run pile, the piles have been addressed under Removal Authority. EPA does not agree that the piles should be addressed as part of the ROD because the focus of the remedial action is lead contaminated mine ore processing waste in residential areas. Source control of the piles will be evaluated as part of the requirements of the existing orders for the Removal Actions.

MDNR Comment #2: MDNR feels that cleaning up the residential yard soil to a level of 400 ppm should be included as a Remedial Action Objective (RAO).

EPA RESPONSE: The RAO for the residential property soils at the Site is to:

> *Reduce the risk of exposure of young children (children under seven years old) to lead such that an individual child or group of similarly exposed children have no greater than a 5 percent chance of exceeding a blood lead level of 10 µg/dL.*

Based on Site-specific information, EPA's IEUBK model predicts that a young child residing at the Site will have greater than a 5 percent chance of having a blood lead level exceeding 10 µg/dL if the lead soil concentrations to which he or she is exposed are above 400 ppm under the assumed exposure conditions. Thus, 400 ppm lead in soil will be the cleanup level of the remedial action as measured in the bulk soil fraction using an XRF instrument.

The RAO is the primary goal. To achieve this goal, EPA will use 400 ppm to trigger the remedial action at each property.

C. Comments/Questions Received from the General Public

No comments or questions were received from the general public other than those listed in Section A above.

D. Comments/Questions Received from Political Subdivisions of the State of Missouri

No comments or questions were received from the political subdivisions of the state of Missouri.

E. Comments/Questions Received from Business and Industry

Comments were received from The Doe Run Resources Corporation (Doe Run) on September 21, 2011. A number of the issues raised in these comments were repetitive, and in some instances EPA addressed an issue only once in its response. Portions of Doe Run's comments are set out below followed by EPA's response. The complete set of Doe Run's comments is attached.

Comment 1. Page 2, Paragraph 2 continuing onto Page 3, Paragraph 1.

EPA has identified eight sources of mine waste in the former mining area of St. Francois County.[2] Since 1994, Doe Run has investigated and stabilized six of these large tailings Piles and a portion of the small Hayden Creek pile to minimize any further releases from those Piles. We understand EPA plans to address the Doe Run Pile, not associated with The Doe Run Resources Corporation, as part of another operable unit. Beginning in 2000, Doe Run began sampling and, where appropriate, remediating residential properties and child high-use areas (CHUAs). In 2004 Doe Run began remediating all residential properties and CHUAs with yard soil concentrations greater than 400 ppm located within 500 feet from each of the six major mill piles, 1,000 feet from the four identified smelters and 100 feet from the mine shafts identified in the Remedial Investigation. Additionally, Doe Run sampled and remediated yards where elevated blood-lead levels in children (EBLs) were detected, regardless of their distance from the Piles. As of January 2011, Doe Run has sampled a total of 2,057 residential properties and child high-use areas, and conducted total or partial removals at 586 of those properties.[3] Finally, Doe Run conducted the Focused Remedial Investigation efforts and the prepared the Feasibility Study as directed by EPA. Doe Run proactively did this work in response to EPA's requests regardless of the lead source.

Concurrent with these efforts, the State and County Departments of Health launched extensive educational programs both in the area and statewide directed to risks associated with lead and how to reduce exposure, particularly of young children, to lead from all sources, including in particular lead-based paint (LBP). As shown in Figure 5, infra, the occurrence of EBLs in St. Francois County has fallen substantially since 1997. In fact, the Missouri Department of Health and Senior Services (MDHSS) reports those occurrences of EBLs in St. Francois County have been less than 5 percent since 2006. In 2010, the rate of occurrence was reported to be 1 percent[4] In other words, the rate of occurrence in St. Francois County has already been reduced to a level consistent with EPA's Remedial Action Objective, and to a level less than the national average of EBL.

EPA RESPONSE:

EPA agrees that Doe Run has completed investigations of the following six large mine waste/ tailings piles in St. Francois County: Desloge; Bonne Terre; Elvins/Rivermines; Leadwood; National; and Federal. EPA also agrees that Doe Run has completed stabilization of the Desloge; Bonne Terre; Elvins/Rivermines; and Leadwood piles. EPA does not agree that stabilization is complete at either the

National or Federal piles. The work at Desloge; and Bonne Terre; as well as the upcoming work at Federal, were undertaken pursuant to a negotiated consent order. The work at Elvins/Rivermines; Leadwood; and the work to be completed at National, were all pursuant to Unilateral Orders issued by EPA.

EPA agrees that Doe Run entered into consent agreements in 2000 and 2004 for a soil testing and removal program and blood lead testing at the Site. EPA agrees that Doe Run entered into a consent agreement in 1997 to perform the RI/FS. The RI was completed in 2006; and the FS was completed in 2011.

EPA agrees that blood lead levels in St. Francois County have declined as a result of these actions. However, EPA does not agree that the reduction of reported blood lead levels means that work at St. Francois County is complete. The fact that the rate of elevated blood lead levels (EBLL) is declining is one important indicator that the actions being taken to address lead contaminated properties in St. Francois County are having the desired effect.

However, a measured EBL rate of 1 percent in St. Francois County is not consistent with EPA's Remedial Action Objective. A measured EBL rate of 1 percent means that of all children who are tested for blood lead levels in St. Francois County, 1 percent have a blood level of greater than 10 ug/dl. EPA's remedial action objective is based on a soil lead concentration that would result in a probability that no child or similarly exposed child would have greater than a 5 percent chance of having a blood lead level greater than 10 ug/dl based on the IEUBK modeling. The remedial action objective is not related to the total percentage of children with elevated blood lead levels; it is related to the probability that a child would have an elevated blood lead level if that child is exposed to lead contamination in residential soil. EPA remedial action objective does not mean that if less than 5 percent of children in St. Francois County have an elevated blood lead level then the remedial action objective is met, as Doe Run seems to suggest.

It should also be noted that ATSDR's position is that there is no safe lead level in blood.

Comment 2. Page 3, Paragraph 2:

This Operable Unit presents highly complex issues with regard to the nature and extent of the contamination and the potential risks resulting from it. These issues relate to the lack of correlation between EBLs and identified mine waste source areas; the large volume of mine chat and tailings and their varied uses; the widespread, yet unaccounted-for occurrence of LBP in residences in the area; and the abundance of naturally occurring lead in the area. These complex issues warrant very careful scrutiny in determining the appropriate use of CERCLA statutory authorities and resources.

EPA RESPONSE:

The 1997 Lead Exposure Study concluded the following:

- 17 percent of the children tested in the Response Area (around the piles) had EBLL's. The Response Area was compared to a control area (Salem, MO.) with regard to similar aged housing stock and prevalence of Lead-Based Paint (LBP). In the control area, EBLL rates were 3 percent. This finding triggered the actions on the mine waste piles and Halo area.

EPA does not agree that there is no correlation between EBLs and identified mine waste source areas; nor does EPA agree that the occurrence of lead based paint in residences was "unaccounted-for" in the investigation of the Site and development of the remedial action. The Human Health Risk Assessment evaluated indoor lead dust in residences.
The Conceptual Site Model included in the ROD as Figure 6 evaluated the indoor dust pathway. This pathway was found to be complete and the concentration of lead in the indoor dust includes a contribution from Lead-Based Paint (LBP). The dust sampling effort also justified using the default parameters of the IEUBK Model. EPA also conducted a Lead Speciation Study on residential soils and the tailings piles of St. Francois County. The Lead Speciation Study concluded the following:

- Lead in residential soils from the Big River area were primarily the result of activities associated with mining/milling operations and included some minor contribution from pyrometalurgical activity and LBP.

- The strong, galena-cerussite association found in the residential soil samples indicated that the tailings piles were the most likely source of contamination, however; small fractions (<2 percent RM Pb) of the bulk lead are also traceable to LBP and some pyrometalurgical activity (smelting).

- Neither LBP nor gasoline appeared to be significant lead contributors to the Site.

Based on the Lead Speciation Study, LBP was not considered a significant source of lead in the mid-yard.

On a particle concentration weighting basis, the median proportions observed in indoor dust taken from 235 residences were 21 percent from mining waste, 23 percent from paint, 8 percent from soil, and 29 percent could not be identified. EPA recognizes that LBP is part of the overall exposure but mine and smelter wastes are the most significant contribution to the overall exposure in residential soil at the Site.

Comment 3. Page 3, Paragraph 3 continuing onto Page 4:

Doe Run maintains that in a rush to complete the Feasibility Study EPA has failed to consider pertinent analysis of the data provided by Doe Run. In issuing its Proposed Plan with undue haste, EPA made unfounded and arbitrary assumptions regarding the source of contamination, disregarded serious questions regarding the associated potential risk, and disregarded the limits of EPA's CERCLA authorities to respond to conditions at the Site. As a result, EPA now proposes a remedy that 1) is beyond the scope of its CERCLA response action authorities to the extent it addresses naturally-occurring contamination, lead from building materials, including LBP, consumer products in consumer use, and normal fertilizer use; 2) has not demonstrated to be necessary to protect human health and the environment; and 3) is otherwise inconsistent with Section 121 of CERCLA and the National Contingency Plan ("NCP"). Accordingly, Doe Run urges EPA to take additional time as needed to carefully evaluate the source of the contamination, evaluate the extent to which unrelated sources, including sources over which EPA does not have CERCLA response action authority, are the true cause of EBLs, and more carefully evaluate the true nature of any remaining risk to human health resulting from mining activities. Only then can EPA develop a remedy that responds more directly to any remaining risk, presents a better balance of trade-offs and is consistent with CERCLA and the NCP.

EPA RESPONSE:

EPA does not agree that the investigation of the Site was "rushed" or that the Proposed Plan was issued with "undue haste." Doe Run entered into a consent agreement to complete the RI/FS in 1997. The work on the RI was not completed by Doe Run until 2006. Doe Run did not complete the FS until 2011, some fourteen years later. EPA does not agree that it is a rush to complete the Record of Decision some five years after the RI completion.

Nor is it true that EPA acted with undue haste in its work in St. Francois County. The development of the Proposed Plan is a result of over twenty years of experience in St. Francois County. When EPA began investigation of the Site, the mine waste piles were literally mountains of mine waste that dwarfed the towns of St. Francois County. The mine waste piles were uncovered and access to the mine waste piles was unrestricted.

EPA does not consider the proposed date of the Record of the Decision of September 30, 2011, to be an accelerated pace. Observed air releases of lead contaminated tailings dust from the mine waste areas in St. Francois County have been documented by EPA as early as 1988 (see Photos from the Listing Site Inspection included as Attachment A). The dust from the piles created a suspended particulate plume of lead contaminated dust that extended offsite for up to one mile. These observed air releases and the releases of lead contaminated mine waste into the Big River were the primary supporting documentation for the eventual listing of the Site on the National Priorities List.

EPA prioritized the work to stabilize the six major tailing piles using removal authority to expedite the work due to the ongoing exposures created by these air releases and the exposure to their deposition in residential areas in interior dust and surface soils. For decades the owners and former operators of the mine waste piles, including Doe Run, were well aware of these ongoing air releases as evidenced by the snow fencing shown in the photo included in Attachment A, which was used to reduce the migration of the lead contaminated fine tailings to nearby communities.

EPA carefully evaluated all data in the development of the Proposed Plan and followed the appropriate steps in selecting the final remedy for Operable Unit-1 (OU-1). EPA's decision is based on the risk that is associated with lead-contaminated residential soil at the Site. A Human Health Risk Assessment was conducted at the Site that, along with Doe Run's Site-Specific Blood Lead Study, showed an unacceptable risk at residential areas where lead contamination was present at or greater than 400 parts per million lead (ppm).

The fact that the rate of elevated blood- lead levels is declining is one important indicator that the actions being taken to address lead contaminated properties in St. Francois County are having the desired effect.

However, a measured EBL rate of 1 percent in St. Francois County is not consistent with EPA's Remedial Action Objective. A measured EBL rate of 1 percent means that of all children who are tested for blood lead levels in St. Francois County, 1 percent have a blood level of greater than 10 ug/dl. EPA's remedial action objective is based on a soil lead concentration that would result in a probability that no child or similarly exposed child would have greater than a 5 percent chance of having a blood lead level greater than 10 ug/dl based on the IEUBK modeling. The remedial action objective is not related to the total percentage of children with elevated blood lead levels; it is related to the probability that a child would have an elevated blood lead level if that child is exposed to soil lead contamination in

residential soil. EPA remedial action objective does not mean that if less than 5 percent of children in St. Francois County have an elevated blood lead level then the remedial action objective is met, as Doe Run seems to suggest.

Comment 4. Page 4, Section I.

I. EPA Erroneously Assumed the Piles/Mining Waste are Only Source and Principal Threat.

The NCP requires that EPA properly scope the project to ensure the RI/FS is properly designed. 40 CFR § 300.430(a)(2). "The investigative and analytical studies should be tailored to site circumstances so that the scope and detail of the analysis is appropriate to the complexity of the problems being addressed. 40 CFR § 300.430(b) EPA is required to develop a conceptual understanding of the site, or a conceptual site model. 40 CFR § 300.430(b)(2). Section 104(a)(3)(A) and (B) of CERCLA 40 CFR § 300.430(b)(1) and (2) specifically prohibit EPA from responding to a release of a naturally occurring substance or products that are part of the structure or result in exposure to residential buildings or business or community structures. Additionally, Section 101(9) and (22) of CERCLA exclude consumer products in consumer use and the normal use of fertilizer from EPA's response action authorities.

EPA RESPONSE:

EPA does not agree that the RI/FS was not properly designed. Nor does EPA agree that the lead contamination is naturally occurring. Further, Doe Run's recent depth data study refutes the claim that the contamination is naturally occurring. The Subsurface Soil Report found, when sampling was extended to depths greater than 12 inches that the contamination declined with depth in the vast majority of cases (98 percent) and was not present when native material was encountered. Much of the contamination was in the form of tailings and the result of mining and milling operations and not naturally occurring. It is well-documented in the RI that significant amounts of mine wastes have been mechanically moved for use on residential properties as well as by local communities for traction on icy roads. A recent EPA Removal Action at Central Middle School was indicative of this finding. When the obvious tailings material was removed to the native soil horizon, the lead levels dropped significantly. Additionally, the background lead level used for comparison in the RI for St. Francois County soil was 62 mg/kg, which is much lower than the proposed cleanup level. The lead levels found in the Response Area are considerably higher than the background levels.

Comment 5. Page 5, paragraph 2 and 3:

In its conceptual site model, EPA identified historic mining wastes as the only source of contamination at the Site. [5] *In violation of its obligation under the NCP, the Agency erroneously failed to consider alternative sources for contamination in yards, including LBP, other consumer products, the normal use of fertilizer and naturally-occurring lead. While EPA's conceptual site model does recognize human movement of chat from the piles, much of that use, including but not limited to the use of chat as agricultural lime, represents consumer use of a consumer product and/or normal fertilizer use over which EPA has no authority to conduct a response action.*

In its Proposed Plan, EPA ignores these sources, stating that Operable Unit 1 includes "lead-contaminated surface soils present at residential properties across the site that have been contaminated as a result of migration of metal-bearing materials from past mining practices via natural erosional processes, windblown mine waste and human activity." The Proposed Plan "addresses the risk to

human health and the environmental resulting from exposure to residential soils contaminated with lead mine waste." It further states, "(t)he eight mine waste areas are the source deposits and constitute the principal threat to human health and the environment," and that "(t)he sources of most of the lead contamination in the site are the large mine waste piles...." In fact, EPA's conceptual site model overestimates the extent of air dispersion from the Piles. This, coupled with EPA's arbitrary disregard of other sources for lead, result in a remedy that reaches outside the scope of EPA's response action authorities and without regard to the true cause of the risk the remedial action is intended to address.

EPA RESPONSE:

EPA disagrees with this comment to the extent that it states that EPA violated its obligations under the NCP to consider alternative sources of lead contamination in yards. The investigation of the Site supports EPA's finding that the primary source of lead contamination in residential areas is the large mine waste piles.

The listing of the Site on the National Priorities List in 1992 was based on the observed release of wind-blown tailings creating a suspended plume of lead contaminated fine particles migrating to the town of Desloge, Missouri (see Attachment A). The Desloge (Big River) pile and the other mine waste piles were the primary sources of residential lead contamination via wind, water, and anthropogenic movement of material. The uncontrolled migration though wind and water erosion and the uncontrolled mechanical movement of chat and tailings from the mine waste areas and piles does not constitute a consumer product in consumer use. These piles were considered the primary source due to uncontrolled movement of chat and tailings. Specific types of migration are listed below:

Transport via wind
During the January 1988 Site reconnaissance for the HRS Scoring, blowing of lead-laden dust was observed to be a serious problem. A dust plume originating from the Site appeared to be transporting dust at least one mile to the southeast. Wind speeds on that day included gusts up to 35 miles an hour. A photograph of the tailings blowing off-site is included in Attachment A.

Transport via water
Erosion to the Big River and its tributaries has been an issue with all the piles. The Site was listed on the National Priorities List due in part to an estimated 50,000 cubic yards of tailings that slumped into Big River during a high rainfall event in 1977. Tailings are presently in continuous contact with the Big River and its tributaries. The mine waste material has been transported downstream into the floodplain, where it can affect human and ecological receptors.

Transport via anthropogenic movement
The mine waste piles have been a continuous source of mine waste contamination via anthropogenic movement. Mine waste was used for traction control during the winter, agricultural lime, and aggregate. Access to the mine waste source piles was unrestricted for many years. Additionally, Doe Run allowed and profited from the inappropriate use of contaminated mine waste materials even though it was aware of the lead content and its potential negative impacts on human health and the environment. Despite the fact that the Site was listed on the National Priorities List in 1992, Doe Run did not cease its sale of mine waste until it was ordered to do so by EPA in 2003.

Other Sources
A Site-specific speciation study was done on residential yards which showed that in the mid-yard areas, <2 percent of the lead in soil samples could be attributed to LBP. Other sources such as leaded gasoline could have contributed a small amount in the road-side areas, but were not a significant factor in the mid-yard areas.

EPA's response action authorities are intended to address residential and child high-exposure areas that are above the Site specific action level determined by Doe Run's Site-specific Blood Lead Study and the HHRA.

Comment 6. Page 6 Section A. continuing to the first Paragraph of Page 8:

A. The RI Data Demonstrates that Air Dispersion Releases from the Piles are Limited to 200 Feet, and any Risk Associated with These Releases already have been Protectively Addressed.

EPA's first technical error is its assumption that wind dispersion from the Piles resulted in widespread contamination. The Proposed Plan states, "The mine waste ha(s) contaminated soil, sediment, surface water and groundwater. Mine waste also has been transported by wind and water erosion and manually relocated to other areas throughout St. Francois County. It has also been reported that mine waste has been used on residential properties for fill material and private driveways, used as aggregate for road construction."

1. RI data demonstrates that air dispersion releases from the piles are limited to a 200-foot area surrounding piles.

No studies conducted to date show a correlation between the residential properties yard soil lead concentrations and the processes of wind and erosion from the piles. As part of the Focused RI (NewFields 2006), the impact of particulate deposition from the mill waste piles was investigated. Shallow soil samples were collected along upwind transects and downwind transects at five large piles. Lead concentrations in near-pile soils in the downwind transects were found to be higher than background concentrations in a narrow "affected" zone about 200 feet wide around the piles, and then averaged beyond the 200 feet 180 mg/kg lead.

In concert with the RI near-pile sampling, EPA requested Idaho National Engineering and Environmental Laboratory (INEEL) to perform air dispersion and deposition modeling of airborne lead associated with mill waste piles, ***Air Dispersion Modeling of Mine Waste in the Southeast Missouri Lead Belt*** *(Abbott 1999). The air dispersion model was used to predict maximum lead concentrations in air and downwind soil lead concentrations, and to place the downwind transects. The model and soil sample results were matched and used to predict geometric mean lead concentrations assuming 80 years of deposition accumulating in a 2-inch soil column already containing 65 mg/kg lead. Predicted lead concentrations range from 300 – 500 mg/kg within 200 meters of the mill waste piles, and from 125 – 175 mg/kg out to 1 kilometer. The model-predicted soil lead concentrations apply only to the upper two inches of soil and to "generally undisturbed surface soils which have not been subjected to significant tillage, excavation, landscaping or flooding." (Abbott 1999). The model-predicted soil concentrations are generally consistent with the near-Pile soil sampling results. (Abbott 1999, NewFields 2006).*

It is also important to note that lead ambient air emissions in the Site area have been monitored for many years by Doe Run and other government agencies, beginning before the Piles were stabilized. Doe Run operated the "Big River Network" in the Site area from 1996 until 2005. The monitored lead ambient air concentrations for all monitors were well below the then applicable 1.5 ug/m3 lead NAAQS standard and in most all respects were also below the now much more stringent 0.15 ug/m3 lead NAAQS standard. More recent air monitoring conducted by Doe Run and MDNR within the Site area show consistent compliance with the 0.15 ug/m3 standard. [6]

These predicted soil lead concentrations do not explain the observed lead concentrations in yard soils. In fact, lead concentrations averaged above 700 mg/kg in the residential yard sampling programs conducted. Therefore, the Focused RI concluded that particulate deposition of lead from the mill waste piles was not the major contributor to lead in yard soils.

EPA RESPONSE:

EPA agrees the elevated lead levels in St. Francois County cannot entirely be attributed to wind-blown mine waste, but it's evident that wind-blown mine waste is a very significant factor. It is evident from the speciation study and by visual observation that the primary source of lead exposure is from the mine waste. The Record of Decision will address soil that has been impacted by mine waste. The RI showed that the lead levels were elevated well beyond 200 feet from the piles. For instance, the Bonne Terre East transect had lead levels of up to 376 mg/kg at 550 feet from the pile. The Desloge East transect had lead levels of up to 447 mg/kg at 1,150 feet from the pile. The Elvins Northeast transect had lead levels of up to 411 mg/kg at 650 feet from the pile. Some of the piles showed decreased contamination beyond 200 feet from the piles, but in most cases transects had lead levels above the background lead level of 62 mg/kg (mean concentrations of 180 mg/kg).

Comment 7. Page 8, Subsection 2.

2. Interim Action and Halo Removals Reached Beyond Potential Risk Posed by Air Dispersion from Waste Piles.

EPA RESPONSE:

EPA disagrees with the comment because the evidence shows that average residential soil lead contamination is higher in the Halo, which by definition is closer in proximity to the mine waste piles. The average soil lead concentration in the Halo was 718 mg/kg lead, which is well above background concentrations for St. Francois County.

Comment 8. Page 9, Subsection 3 continuing onto Page 11.

3. Interim Action and Halo Removal Data Shows No Correlation Between Lead Levels and Proximity to Piles.

Figure 1 presents the average yard soil lead concentrations relative to distance to the closest Pile. This figure demonstrates that there is no correlation of yard soil lead concentrations to the Piles. Furthermore, Figure 2, drip zone soil lead concentrations relative to distance from the closest Pile, also shows no correlation or trend indicating that the drip zone lead concentrations likely are not derived from an airborne source.

Sampling of the drip zone soil and screening for outdoor lead-based paint (LBP) conducted during the Interim Action was reported in the ***Removal Action Report for Interim Action.*** [9] *The report stated that drip zone soils would be greater than 400 ppm lead in 93 percent of the homes with measurable outdoor LBP. 33 percent of those homes' drip zone soils would be greater than 2,000 ppm (NewFields 2004).*

EPA RESPONSE:

EPA disagrees with the comment because the evidence shows that average residential soil lead contamination is higher in the Halo, which by definition is in closer proximity to the mine waste piles. The average soil lead concentration in the Halo was 718 mg/kg lead, which is well above the background soil lead concentration for St. Francois County. Eighty-four percent of these properties are elevated in the mid-yard areas outside of the drip zone. The Lead Speciation Study showed very little evidence that the lead contamination in the mid-yard areas could be attributed to LBP.

While EPA is not addressing residential properties that have only a drip zone exceedance of the Site-specific cleanup level for lead, it should be recognized that the drip zone lead concentration is most likely to be a combination of decades of mine waste deposition along with a contribution from those homes with deteriorating exterior LBP.

Comment 9, Page 11, Subsection 4.

> ***4. Even within the "Halo" the data show no correlation between the Blood Lead Levels and the Proximity to piles.***

EPA RESPONSE:

EPA does not agree that there is no correlation between EBLs and the proximity to the identified mine waste source areas. See response to Comment 2.

Comment 10. Page 14, Subsection 5, continuing onto page 16, Paragraph 1:

> ***5. Blood Lead Levels in St. Francois County Have Already Been Reduced to Levels Below EPA's Remedial Action Objective.***

The Missouri Department of Health and Senior Service ("MDHSS"), formerly Missouri Department of Health ("MDOH"), has maintained a data set of children, less than six years of age, who have been tested for BLLs since 1997. Note the percent of the population with elevated BLL identified in the Lead Exposure Study and the Interim Action cannot be compared directly to the MDHSS yearly statistics as these studies' statistics range over multiple years and are limited only to the study participants and therefore probably do not completely represent the area's unbiased population. The MDHSS data set is reported by county and may include the same child in multiple years due to possible yearly or biyearly testing. Figure 5 presents the percent of EBL children compared to the cumulative number of complete[11] *yard soil removals conducted in the Response Area. As seen in this figure, the decline in St. Francois County's child EBL percentage dropped dramatically prior to majority of the yard soil removals.*

Blood lead levels among US children age 1 to 5, the population at the highest risk for lead exposure and effects, have been monitored and reported by the CDC and EPA and have declined steadily since surveillance began in 1976. Early (1976-1980) study reported a geometric mean BLL of 14.9 µg/dL just over 88 percent of this high-risk population had EBLs. Data collected from 1991 to 1994 showed that the geometric mean BLL for children was 2.7 µg/dL, with 4.4 percent of the children having EBL. Children age 1 to 5 whose blood was sampled as part of the 2007-2008 survey had a geometric mean BLL of 1.5 µg/dL, with 0.9 percent of the children having EBLs. The data for St. Francois County presented in Figure 5 are consistent with national averages and the decline in the child BLLs with time. The discontinued use of LBP and leaded gasoline, as well as the decrease of lead in food and toys, are the primary contributing factors to these drops in BLLs. Performance of yard soil removals within the County does not appear to affect the natural downward decrease in the County's BLL for children, which further indicates the EBLs had been caused by sources other than mining waste.

EPA RESPONSE:

The fact that the rate of elevated blood lead levels is declining is one important indicator that the actions being taken to address lead contaminated properties in St. Francois County are having the desired effect.

However, a measured EBL rate of 1 percent in St. Francois County is not consistent with EPA's Remedial Action Objective. A measured EBL rate of 1 percent means that of all children who are tested for blood lead levels in St. Francois County, 1 percent have a blood level of greater than 10 ug/dl. EPA's remedial action objective is based on a soil lead concentration that would result in a probability that no child or similarly exposed child would have greater than a 5 percent chance of having a blood lead level greater than 10 ug/dl based on the IEUBK modeling. The remedial action objective is not related to the total percentage of children with elevated blood lead levels; it is related to the probability that a child would have an elevated blood lead level if that child is exposed to soil lead contamination in residential soil. EPA's remedial action objective does not mean that if less than 5 percent of children in St. Francois County have an elevated blood lead level then the remedial action objective is met, as Doe Run seems to suggest.

It should also be noted that ATSDR's position is that there is no safe lead level in blood.

The action level for lead in residential soil, 400 ppm lead is based on the Site-Specific Blood Lead Study and the Site-Specific Human Health Risk Assessment. The data shows that the action level is exceeded in 84 percent of the properties sampled (drip zones excluded). EPA's remedial action objective is based on a soil lead concentration that would result in a probability that no child or similarly exposed child would have greater than a 5 percent chance of having a blood lead level greater than 10 ug/dl based on the IEUBK modeling and the Site-Specific Blood Lead Study.

Comment 11. Page 16, Section B

B. EPA Failed to Identify, Characterize or Otherwise Consider Building Materials, Including LBP, as a Source of Lead Contamination or EBLs.

Section 104(a)(3)(B) expressly prohibits EPA from using its CERCLA response authorities to address releases from LBP. EPA's own directive states "Lead-based paint can be a significant source of lead exposure and needs to be considered when determining the most appropriate response action. Interior

paint can contribute to elevated indoor dust lead levels. In addition, exterior paint can be a significant source of recontamination of soil."[12] *Yet EPA has refused to acknowledge LBP's role as a source of contamination, much less evaluate the extent to which it is a source for contamination. EPA's refusal to do so is particularly arbitrary given the data at the Site that indicates LBP is a major source of contamination and a major cause of EBLs.*

EPA RESPONSE:

EPA disagrees with the comment. Doe Run misinterprets the prohibition in CERCLA Section 104(a)(3)(B), 42 U.S.C. § 9603(a)(3)(B), which prohibits response actions to a release from products that are part of the structure of, and result in exposure within residential buildings. CERCLA section 104(a)(3)(B) does not prohibit CERCLA response to releases of LBP in residential yards. The prohibition is for products that are part of the structure of a residence and where the release results in exposure within the residence. EPA acknowledges that LBP may be a significant source of indoor lead contamination at the Site. The Selected Remedy includes a HEPA vacuum loan out program to houses subject to remediation but does not include remediation of indoor lead contamination.

Comment 12. Page 17, Subsection 1 continuing onto Page 18, Figure 6

1. Significant amount of LBP was detected during the Interim Action

As reported in the Removal Action Report for Interim Action (NewFields 2004) and the Focused RI (NewFields 2006), many of the highest soil lead concentrations measured in the Interim Action sampling were in the drip zone. [13] *Specifically, more than 42 percent of the drip zone samples had higher lead concentrations than the corresponding yard soil lead concentrations. Drip zone samples were commonly (39 percent) over 1.5 times the average yard lead concentration, indicating the lead source to the drip zone was potentially different or closer to the drip zone source.*

Figure 6 presents a comparison of average lead soil concentrations in residential yards with (≥ 1 mg/cm^2) and without (<1 mg/cm^2) lead-based paint made in the Interim Action (NewFields 2004). The comparison shows that drip zone soil lead concentrations are influenced by the presence of LBP. Paint chips were observed in some drip zone samples. Many homes in the area have had exterior painted surfaces covered with vinyl siding, and therefore, may be incorrectly identified in the "houses without lead paint" category and thus the concentrations for this category have a higher uncertainty than the "houses with lead paint."

EPA RESPONSE:

EPA agrees that drip zone lead concentrations are often higher than mid yard soil lead concentrations. This is because drip zone soil lead concentrations are a result of both LBP and airborne mine waste deposition. All airborne mine waste depositions that land on the roof or siding of a structure is concentrated in the drip zone as it is washed off by rain or snow, because of this, drip zones are likely to have higher concentrations than mid-yard soils. The graph included in the comment as Figure 6 on page 18 illustrates that houses without LBP have additional contamination in the drip zone and that the average drip zone concentrations are higher than the average mid yard.

Comment 13. Page 19, Subsection 2 continuing onto Page 20, Paragraph 2:

> *2. More than 65.5 percent of homes in St. Francois County were constructed prior to 1978 and thus potentially contain LBP.*

Available age-of-housing data in the incorporated communities within the Response Area (see Table 1 and 2) indicated the housing within the Site is over 65.5 percent pre-1970's and therefore have a high potential for LBP. 15 The identification of outdoor LBP during the Interim Action and Halo Removals may underestimate its occurrence since many homes have been re-sided with vinyl siding, thus masking, but not eliminating, the presence of outdoor LBP. When EPA surveyed 22 homes for LBP as part of its speciation study, 16 of 22 homes had vinyl siding (73 percent). [16] *Of the four yards where paint was surveyed, three detected outdoor LBP (primarily on the house versus other outdoor structures).*

With the exceptions of Leadwood and Leadington, the percentage of EBL children correlates better to the percentages of measurable outdoor LBP than to any of the elevated yard soil lead concentrations. It should also be noted that the presence of outdoor LBP is probably an indicator of potential indoor LBP.

EPA RESPONSE:

EPA agrees that lead based paint may contribute to lead contamination in residential yard soils in St. Francois County. EPA has always recognized the potential contribution of lead-based paint to soil and dust lead levels at the Site and the speciation studies performed have indicated the presence of lead-based paint in yard soils and interior dust samples analyzed. This is because the speciation studies were designed to determine whether there were other sources of lead contamination present in residential soils and interior dust that contributed to the elevated lead levels in residential soils. The speciation studies performed at the Site clearly show that mining related wastes were present in both residential soils and interior dust. The speciation study also shows that mining related waste was the predominate source of lead in mid-yard samples (>90 percent Relative Mass) and was detected in significant quantities in drip zone samples and interior dust samples from the Site. The commenter fails to recognize that mid-yard samples at homes where lead-based paint was not present contained elevated lead levels and that very little lead-based paint (<2 percent Relative Mass) was detected in mid-yard samples in general.

Further, the conclusion drawn by the comment that one would expect higher EBLs where there is greater LBP is not supported by the evidence. In Table 2, Leadwood has the highest percentage by far of housing stock built prior to the 1970s (82.8 percent) and the highest percentage of homes with measurable outdoor LBP but the lowest number of EBLs identified during the interim action (5.7 percent of children tested had elevated blood lead levels). With the exception of Leadington, the two highest EBL rates (18.2 percent in Bonne Terre and 10.6 percent in Park Hills) also correspond to the two highest mid-yard sampling (92.0 percent and 90.0 percent, respectively).

It should also be noted that the city of Salem, Missouri was used as a control for the 1997 Exposure Study performed by MDOH for ATSDR. Salem has a similar housing stock but no history of mining. The EBLL rate in children from Salem was 3 percent compared to 17 percent from the Site.

Comment 14. Page 20, Subsection 3.

Conceptual model assumes indoor dust derives from mining waste. But the Lead Exposure Study indicates LBP is also a significant source of indoor dust.

EPA RESPONSE:

The EPA believes the Conceptual Site Model in the HHRA is appropriate for this Site. EPA agrees that LBP may be a significant source of indoor lead contamination. Interior dust is being addressed under the Selected Remedy through health education and distribution of HEPA vacuum cleaners to residents. While, EPA acknowledges that LBP is a significant source of indoor lead contamination, mine waste was also a significant source (21 percent on a particle concentration weighting basis). Additionally, the RI states that an estimated 36 percent of the lead contaminated dust found in vacuums in St. Francois County was derived from outdoor soil.

However, The IEUBK Model default soil to dust transfer was considered the most appropriate value for this assessment. The presence of elevated lead in indoor dust was evaluated in the HHRA but there was not enough indoor dust data in the RI to determine a Site specific parameters for dust for use as an IEUBK Model input.

Comment 15. Page 22, Section C.

C. Chat from Mining was Widely Used by Residents in St. Francois County and Other Areas as Fertilizer.

For a number of reasons, granular mine tailings ("chat"), when used as agricultural lime fertilizer, cannot and should not be addressed in EPA's Proposed Plan. Agricultural lime is not regulated under federal or state law with respect to contaminant remediation levels. More importantly, EPA does not have jurisdiction over this product because it is exempted from CERCLA: (1) because chat used as fertilizer is exempted from the definition of "release" under CERCLA; and (2) because the consumer use of chat as fertilizer exempts the product from the definition of "facility" under CERCLA. Because of these factors, EPA does not have the authority to respond to or conduct a remedial action to address releases from chat used as fertilizer.

EPA RESPONSE:

EPA does not agree with this comment that EPA does not have authority under CERCLA to address mine waste in St. Francois County because some mine waste was historically used as agricultural lime.

EPA agrees that the definition in CERCLA Section 101(22) of "release" exempts the "normal application of fertilizer." 42 U.S.C. § 9601(22). However, EPA does not agree that this provision of CERCLA prohibits EPA's authority to address lead contamination in residential yards under the Superfund. The remedial action does not address agricultural areas. The purpose of the remedial action is to address mine waste that has been transported by wind and erosion and manually transported to residential properties. Further EPA does not agree that all lead contaminated mine waste is exempt from regulation.

EPA also agrees that the definition in CERCLA Section 101(9) of "facility" excludes "any consumer product in consumer use." 42 U.S.C. § 9601(9). However, EPA does not agree that all mine waste that has come to be located in residential yards may not be addressed under EPA authority under the Superfund. The definition of "facility" under CERCLA provides in part that a facility includes "any site or area where a hazardous substance has been deposited, stored, disposed of, or placed, or otherwise come to be located..." 42 U.S.C. § 9601(9). The site inspection and site assessment for this Site identified potential sources of mine ore processing waste and established that the hazardous substance, lead, was present in elevated concentrations in samples from mine waste, groundwater, sediments and soil throughout the Site.

Further, Doe Run has known since the late 1980's that EPA considered the releases of mining wastes from the mine waste piles by wind and water erosion to be significant enough to warrant listing the Site on the National Priorities List of the highest priority sites for action in the country. Doe Run was also well aware of the negative health impacts to human health and the environment that result from lead exposure. Even with this knowledge, it was necessary for EPA in 2003 to order Doe Run to end the practice of providing lead contaminated tailings for sale as an agricultural amendment. Doe Run's assertion that because there was no regulation regarding lead contamination levels in the sale of a "product", it is necessarily exempt from Superfund authority, is incorrect.

Comment 16. Page 26, Section D.

D. Naturally Occurring Lead is Abundant throughout St. Francois County

Section 104(a)(3)(A) and 40 CFR § 300.430(b)(1) specifically prohibit EPA from using its CERCLA authorities to respond to a release of naturally occurring substances. Yet, EPA has arbitrarily refused to evaluate the extent to which naturally occurring lead is contributing to the detected contamination. As a result, EPA's proposed remedy requires response action with respect to all lead detected, regardless of its source. This result is inconsistent with CERCLA and the NCP.

EPA RESPONSE:

EPA agrees that CERCLA section 103(a)(3)(A) prohibits response actions to a release of a "naturally occurring substance in its unaltered form". However, EPA disagrees that EPA has failed to evaluate the extent to which naturally occurring lead contributes to lead contamination in residential yards.

The Subsurface Soil Investigation showed that lead levels drop significantly from the surface down to 30 inches below ground surface (bgs) in 98 percent of the samples. This investigation covered the entire response area, which is outlined in Figure 1 of the ROD. Additionally, the background soil lead level used in the RI was 62 mg/kg. The lead levels found in the Response Area were much higher than this level.

EPA acknowledges the possibility of naturally occurring lead ores. EPA has addressed this comment by adding the following language to the ROD, "EPA will not intentionally address naturally occurring lead ores in their undisturbed state as part of this action. Although the Site has been heavily mined in the past, it may be possible to encounter naturally occurring lead ores during residential property excavation. Section 104(a)(3)(A) of CERCLA states that removal or remedial actions shall not be provided in response to a release or threat of release "of a naturally occurring substance in its unaltered form, or altered solely through natural processes or phenomena, from a location where it is naturally

found." Naturally occurring lead ores could be found at the bedrock interface. Another indicator of the presence of naturally occurring lead ores could be a high density of galena crystals in soils or unusually high concentrations of lead in excavated soils. When these conditions are encountered, they will be documented, excavation will stop, and backfilling will be initiated."

Comment 17, Page 31, Section E.

E. The EBL Data Shows no Correlation with the Mine Waste Sources or with Lead Detections in Yards.

1. The arbitrary nature of EPA's assumptions is supported by the Interim Action Report, the RI and the subsurface soil study, all of which show no correlation between BLLs and the piles or yard levels.

EPA RESPONSE:

EPA disagrees with this comment. See responses to Comments 2 and 5.

Comment 18. Page 38, Section II.

II. EPA's Proposed Cleanup Levels for Subsurface Soils and Their Application to Non-Residential Properties are Unsupported by the Data.

The risks in the HHRA are calculated based on the average soil lead level in a residential yard (consistent with lead risk assessment guidance) (EPA, 2009, see page 4-6). However, the Proposed Plan calls for excavation of any quadrant with a sample above 400 mg/kg even if the yard average (average of all quadrants) is below 400 mg/kg. This remediation strategy is not consistent with how the risk assessment was done, and requires more remediation than needed in order to achieve the Remedial Action Objective (RAO) (stated in the Proposed Plan) to: "Reduce the risk of exposure of young children (children under seven years old) to lead such that an individual child or group of similarly exposed children have no greater than a 5 percent chance of exceeding a blood lead level of 10 ug/dL."

Note that when a cleanup level represents a target average concentration for a property, the remediation should be conducted such that the post-remediation property average will be at or below the cleanup level. If every yard quadrant that exceeds the cleanup level is remediated, this may over-achieve the cleanup level on average. At the soil cleanup level of 400 mg/kg selected in the Proposed Plan, evaluating the need for remediation on the basis of risk (average concentration) rather than on the exceedance of a single sample would likely reduce the number of properties requiring remediation while still achieving the RAO. It will also serve to relieve homeowners of intrusion of unnecessary yard removals.

EPA RESPONSE:

EPA disagrees with this approach because it could potentially underestimate the risk, especially if a child uses one area of the yard more than others, such as play areas. Using yard wide averages could result in a scenario in which the yard wide average would be below 400 ppm lead, even where one quadrant is highly contaminated, for example: assuming four quadrants in which results are; 1200 ppm lead; 50 ppm; 50 ppm; and, 50 ppm; the yard wide average would be 337 ppm. In this example no

removal action would be conducted at the property because 337 ppm is less than 400 ppm. However, this situation would leave an entire quadrant contaminated with lead at the surface at 1200 ppm which is the default value for EPA to take prompt action in residential soils (OSWER 9285.7-50, Superfund Lead-Contaminated Residential Sites Handbook, 2003).

In addition, the sampling process for residential properties uses composite sampling which is an averaging technique. Performing additional averaging of composite results has the potential to mask higher detected concentrations and is not recommended (or can result in the above example being repeated).

Comment 19. Page 38, Section III, Subsection A.

III. The Boundary Area of the Proposed Remedy is not clearly defined and May Arbitrarily Extend Beyond Defined Response Area.

A. The EPA Must Clarify that the Proposed Remedy Pertains only to the Defined Response Area.

EPA RESPONSE:

The Response Area has been clearly defined by the RI/FS, however the definition of "facility" under CERCLA includes those areas where a hazardous substance comes to be located. The Selected Remedy will require additional sampling. At present, the Selected Remedy focuses on the Response Area but may move outside the Response Area based on further investigations.

The Selected Remedy is based on a large data set and provides a reasonable estimate of the extent of the number of contaminated properties that will require cleanup. At large lead mining and processing sites, it is not possible or necessary to sample every property and the site boundaries could grow as a result of future sampling as part of the design and implementation of the remedy. The same criteria will be used to determine the ultimate Site boundary as were used to make the estimate. Any property with mid-yard lead concentrations above the Site-specific cleanup level will be a candidate for action. The frequency of detections above the Site-specific cleanup level in a given area of the county will be used to establish the final boundary. It must be recognized that this material has migrated to residential properties by a combination of wind and water erosion and uncontrolled anthropogenic means.

Comment 20. Page 39, Section B.

B. EPA's Broad Definition of "Residential Properties" is unsupported by the Record.

For the purpose of the this proposed remedy, EPA broadly defines "residential property" as "properties that contain single- and multi-family dwellings, apartment complexes, vacant lots in residential areas, schools, daycare centers, playgrounds, parks and green ways." This definition is overly broad for several reasons. First, by including vacant lots and greenways, EPA is including potentially many more parcels than were included in the cost estimates for the remedial alternatives, thus invalidating the evaluation of those alternatives in light of the nine CERCLA criteria, particularly cost-effectiveness. The costs estimates were based on the number of residences provided by EPA. Additionally, EPA's proposal to apply its cleanup levels to these parcels is unsupported by the record and would be arbitrary and capricious.

The Feasibility Study Report states, "On April 14, 2010, EPA provided an estimate of '7,036 occupied houses total, not counting the houses in Doe Run,' based on the most recent census data for each city in the Response Area." 93 yards were added for the town of Doe Run, resulting in a total of 7,129 yards. By adding an unknown number of undefined "vacant lots" and "green ways" to the remedial action will greatly affect the costs and fundamentally alter and invalidate EPA's evaluation of the remedial alternatives, particularly with regard to the cost-effectiveness of the proposed remedy. The Focused RI defined "residential yards" to be the area within 200 feet of the house on each property. The Proposed Plan offers no such definition for vacant lots or green ways, which can and in fact do, encompass many acres throughout the Response Area and St. Francois County.

EPA RESPONSE:

EPA disagrees with this comment. The cost estimate for the Selected Remedy is based on the EPA Guidance ("A Guide to Developing and Documenting Cost Estimates During the Feasibility Study" OSWER 9355.0-75, 2000) which states that costs are to be developed such that accuracy of the estimates are anticipated to fall within the acceptable range for typical feasibility study evaluations of +50 percent to -30 percent.

It is appropriate to include vacant lots in the definition of residential properties. Vacant lots are potential future residential yard and current play areas. They would not be the highest priority for action but will be addressed in otherwise (or areas zoned) residential areas. Further, vacant lots will not significantly affect the cost of the Selected Remedy.

Comment 21. Page 40, Section C.

C. EPA's Proposed Cleanup Levels for Vacant Lots, Parks and Green Ways is Unsupported by the Record and Contrary to Guidance.

EPA RESPONSE:

EPA disagrees with this comment. The definition of residential properties is in accordance with EPA guidance. Residential properties are defined in the Handbook (OSWER 9285.7-50, Superfund Lead-Contaminated Residential Sites Handbook, 2003) as any area with high accessibility to sensitive populations, and includes properties containing single- and multiple-family dwellings, apartment complexes, vacant lots in residential areas, schools, day-care centers, community centers, playgrounds, parks, green ways, and any other areas where children may be exposed to Site-related contaminated media.

Comment 22. Page 41, Section D.

D. EPA's Application of Residential Cleanup Levels to Non-Residential Properties is Contrary to HUD Guidance.

EPA RESPONSE:

Please see response to comment 18 above. EPA is addressing only residential properties as defined in the Handbook.

Comment 23. Page 42, Section A.

A. EPA misstated Alternative 2 as it was presented in the FS.

In its description of Alternative 2, EPA erroneously states that a visual barrier will only be place if subgrade soils are greater than 1,200 ppm rather than greater than 400 ppm as stated in the FS. Alternative 2 as set forth in the FS, is consistent with the yard soil removals that have been conducted in St. Francois County since 2000 under the Interim Action and Halo Removals. EPA's Plan states that only 7 percent or 280 yards would require these barriers and the accompanying institutional controls. However, the FS stated that under Alternative 2, up to 94 percent (approximately 3,760 yards), or potentially as few as 12 percent (approximately 480 yards) if barrier placement is based on 6-inch vertical subgrade composites rather than subgrade surface samples, would be required under Alternative 2 (NewFields 2011).

EPA RESPONSE:

Since the development of the FS, EPA has determined that lead concentrations below 1,200 ppm based on a 6 inch depth sample at greater than 12 inches below ground surface is protective. EPA has reflected this decision in the ROD. This is consistent with other mining sites in Region 7. The placement of orange-mesh plastic barrier on properties greater than 400 ppm would not significantly increase the protectiveness of Alternative 2 because it would not limit the concentration at 12 inches bgs. However, EPA has updated the ROD to reflect this comment.

Comment 24, Page 42, Section B.

B. EPA Ignored Aspects of Alternative 3 that do not compare favorable to Alternative 2.

EPA RESPONSE:

EPA believes that Alternative 3 is the most protective. EPA realizes there are negative aspects of all the alternatives and they are described in the ROD. EPA disagrees that the additional 32,700 cubic yards of waste soil will place a burden on the repository sites; each of the repository sites have enough capacity to accommodate the additional waste soil. The additional volume of top soil required for Alternative 3 is not significant in light of the total soil required for the remedy. Further, the additional required haul trips are not significant in light of the number of trips required overall for the remedy. While EPA agrees that the time for removals will increase for those properties that require additional excavation based upon a finding of lead contamination greater than 1,200 ppm at 12 inches, this is predicted to affect only approximately 280 properties and therefore should not increase the overall timeframe of the remediation beyond the goal of 7 years. EPA agrees that mixing could occur. The application of the action level requires consideration of the depths of excavation and other risk management elements. Due to the distribution of lead contamination in the soil profile at the Site, EPA has determined that backfilling of excavated areas to original grade with clean material after reaching a residual soil lead level less than 400 ppm in the upper 12 inches bgs, or a residual concentration of less than 1,200 ppm at a depth greater than 24 inches bgs, combined with other elements of the selected remedy, is protective of human health. These cleanup criteria are based upon a risk-management determination made by EPA in consideration of site-specific conditions at the Site and the experience gained in remediating thousands of properties using this strategy.

Comment 25, Page 43 Section C.

C. EPA Arbitrarily Disregarded ATSDR's recommendation regarding Maintenance of "One-Call" Database for Notification Purposes.

EPA RESPONSE:

The "One Call" Database has been evaluated at other sites and is not considered a viable alternative to cleanup. The nature of the visual barrier is unlike a buried electrical line or underground piping system in that it can cover an entire area of a property at varying depths and past inquiries with "one call" providers have not been successful with this type of problem. The region will seek to work with local agencies to provide records of contamination left in place for future development as informational controls.

Comment 26, Page 44, Section D.

D. EPA's evaluation against the Nine Criteria was flawed.

EPA RESPONSE:

- Alternative 1 would not be protective because it would not achieve the RAO based on the action level.
- Alternative 2 would be less protective than Alternative 3 because lead would remain at unlimited concentrations at 12 inches below ground surface (bgs). Alternative 3 would address lead levels greater than or equal to 1,200 ppm down to 24 inches bgs.
- Regarding contamination below 12 inches bgs, EPA agrees that 7 percent of remaining properties may be an underestimate. EPA based this on the only reliable data that has been collected based on 6 inch intervals; however, EPA has included all previously remediated properties greater than or equal to 1,200 ppm at 12 inches below ground surface in the ROD property counts.
- EPA agrees that Alternative 2 would be protective if there was a guarantee that there was no future disturbance of the overlying soil. Alternative 3 would go one step further to protect the residents even if disturbance occurred. This is explained in further detail in the ROD.

Comment 27, Page 47, Section V.

V. The Proposed Plan has numerous misstatements of facts and key omissions of fact.

EPA RESPONSE:

Subsection 1

1. There appears to be significant overlap between these OUs, and it is unclear how each operable unit relates to the others, or to this Proposed Plan, which is identified as addressing only OU 1. For example, as described in the Proposed Plan, OU-00, OU-1 and OU-3 all address residential properties

and CHUAs. The record is unclear as to how each Operable Unit is distinguished from the other, the extent to which this proposed remedy addresses risks being addressed in other OUs, and the extent to which this proposed remedy addresses residential risks in connection with the other OUs. EPA should clarify its record in its regard.

- **EPA has corrected the Operable Unit descriptions in the ROD.**

Subsection 2

2. The Proposed Plan states on Page 2 that mine wastes have contaminated soil, sediment, surface water and groundwater. Yet on Page 12, EPA concedes that elevate lead concentrations in groundwater (less than 15 ug/l) occur "sporadically and were limited to four wells and could not be linked to the mining activities at the Site." Any statement about mining waste contaminating groundwater should be removed from the Proposed Plan and any decision document.

- **Elevated lead levels were found in shallow groundwater around the Big River Mine Tailings Pile. Additionally, elevated zinc levels in groundwater can be attributed to mine waste. This statement does not affect the Selected Remedy.**

Subsection 3

3. The Proposed Plan (page 7) discusses the 1998 Lead Exposure Study conducted by MDOH and the high percentage of children in St. Francois County with elevated blood lead levels (17 percent). However, the plan does not discuss the most recent blood lead levels for the county that were reported in the FS, "Missouri Department of Health and Senior Services (MDHSS) reports that the percent of elevated blood lead in children less than 6 years of age in St. Francois County has dropped from 12 percent reported in the 2000 calendar year to 1 percent in the 2010 calendar year (MDHSS 2003, 2011b)." While we understand EPA's argument that the IEUBK model and the potential for high bioavailability for lead in yard soils predicts the potential for the children in St. Francois County to have elevated blood leads, the statistics for the county demonstrates the county's child EBL levels are dropping either without the benefit of soil yard remediation as proposed by EPA and are likely due to an improved education of lead issues.

- **This comment was addressed previously on page 7.**

Subsection 4

4. Page 7 of the Plan states, "the Subsurface Soil Report concluded that 93 percent of the elevated lead concentrations were found in the upper 12-inches of soil." This is a misrepresentation of the Subsurface Soil Report which actually concluded that "Seven (7) percent of the yard quadrants after a 1 foot excavation would have confirmation subgrade soil lead concentrations greater than 1,200 ppm." The FS uses this conclusion to assess the potential for an excavation to require further excavation under Alternative 3 (the EPA selected alternative). We find using this statistic as a conclusion regarding percentage of elevated lead concentrations confusing and misleading.

- **EPA agrees with the recommended language and has included the language in the ROD.**

Subsection 5

5. The Proposed Plan (page 7) states that the 2004 removal action (Halo) is ongoing and then (on page 10) states that 1,000 properties remain to be addressed under the Halo Removal Action. These are the yards sampled under the Interim Action but were not included in the Halo Removal Action as they were beyond the Halo (typically between 500 to 1000 feet from the piles). These 1000 yards appear to be in the 4000 yards that are covered under the Proposed Plan with the exception of this statement. As we (Doe Run) are implementing the Halo Removal Action and we find these statements confusing, we are unclear as to what EPA is trying to relay to the public by these statements.

- **EPA agrees with the comments and has updated the ROD accordingly.**

Subsection 6

6. Page 8 of the Plan states, "(a)t the end of the Interim Action (March 30, 2004), 1,955 residential yards had been sampled and 563 homeowners had refused sampling. Under the Halo Removal Order, 27 additional yards have been sampled; of these yards 22 were sampling refusals during the Interim Action, two were not within the Halo but were sampled due to the presence of a child with elevated blood-lead levels, and two were childcare facilities." It is unclear where EPA derived the statistics for yards sampled under the Halo Removal Action. The FS states, "At the end of the Interim Action (March 30, 2004), 1,955 yards had been sampled and 563 homeowners had refused sampling, for a 78 percent sampling rate. As of January 31, 2011, 2,057 residential yards and 12 CHUAs had been sampled and 532 property owners had refused yard soil sampling with a final residential yard sampling refusal rate of 21 percent." Using these statistics and noting that 45 yards were sampled as part of the Subsurface Soil Investigation, an additional 69 yards/CHUAs were sampled as part of the Halo Removal Action. Of these 69 yards and CHUAs, 3 were parks, 5 were child care or school playground facilities, 29 were previous residential yard refusals (all but one located within the Halo), 17 were non-Halo residential yards sampled due to the presence of a child with elevated blood-lead levels, and the remaining 15 yards were primarily new construction within the Halo.

- **EPA agrees with this comment and has updated the ROD accordingly.**

Subsection 7

7. The Plan makes the statement "The communities of Farmington, Bismarck and Iron Mountain Lake are outside of the mining area but will be included in future investigations." It is unclear what the purpose of this sentence is and its relation to the Site. As stated above, the FS, including cost estimates, were based on the Response Area only. These communities lie outside the Response Area. If EPA contemplates including them or other locations outside the Response Area, it will render the cost estimates inaccurate, as well as EPA's evaluation of the cost-effectiveness of the proposed remedy.

- **This comment was addressed previously on Page 21.**

Subsection 8

8. This Plan is confusing as to what would make a residence qualify for inclusion in the remedy. The Plan states on pages 14 and 16 that "Residential properties where no quadrant samples exceed 400 ppm lead would not be addressed under this alternative [2-3]". And then later in Alternative 2 on page 14

states, "Excavation of a residential property would be triggered when the highest recorded soil sample for any defined area of the property contains greater than or equal 400 ppm lead." Alternative 3 does not include this statement. However the cost tables included in the Proposed Plan are from the FS and they show driveway only, garden only, and play area only yards in both alternative costs.

- **EPA agrees with this comment and has updated the ROD accordingly.**

Subsection 9

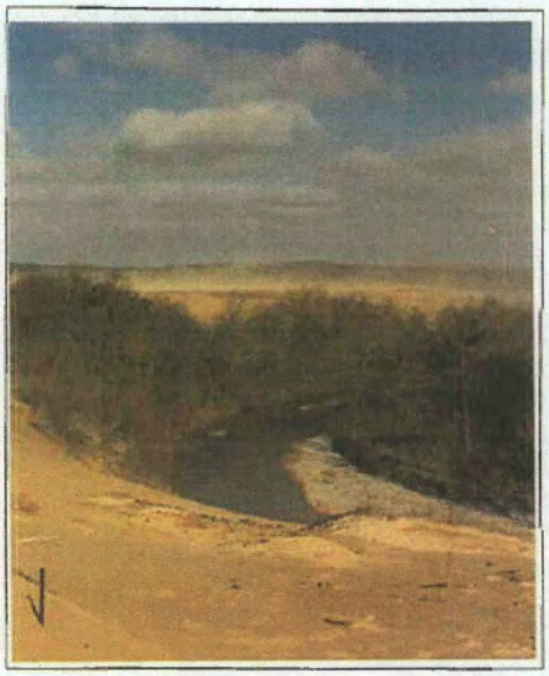
9. The Plan states "The physical barrier will function as a warning that digging deeper will result in exposure to soils contaminated with lead at a level that EPA has determined to be a human health concern." The concentration for which a visual barrier is placed under the Proposed Plan is 1,200 ppm. However, in the HHRA summary and discussion the plan states on page 12 that "a lead soil concentration of 400 ppm to ensure that a child has less than a 5 percent probability of having a blood-lead level exceeding 10 ug/dL." And the only mention of the 1,200 ppm in the HHRA is in the statement "In past experience at Superfund sites where lead is the contaminant of concern, the EPA generally selects a residential soil cleanup level within the range of 400 ppm to 1,200 ppm for lead..." The RAO section of the Proposed Plan (pages 12-13) makes it clear that exposures above 400 ppm lead under the assumed exposure conditions would create an unacceptable risk for a child. We believe EPA needs to clearly state its rationale for the acceptance of soil lead concentrations between 400 an d1200 ppm lead at depth; as mentioned above we do not necessarily agree with EPA's interpretation of the ATSDR document especially in regard to the lack of institutional controls under these conditions.

- **EPA agrees with this comment and has updated the ROD accordingly.**

ATTACHMENT A

Ecology and Environment, Inc.

PHOTOGRAPHIC RECORD



SITE NAME: Big River Mine Tailings

SITE LOCATION: Desloge, Missouri

TDD/PAN#: F-07-9004-011/FM00616XA

No: 3

Subject

Tailings migrating via wind erosion. Proximity of site to Big River on east side of site.

Photographer
Overfelt

Witness
Gene Gunn

Date/Time
January 1988

Direction
Northwest

No: 4

Subject

Dune features migrating west to east in east central meander area.

Photographer
Overfelt

Witness
Williams

Date/Time
7/26/90
1540 hours

Direction
North

COMMENTS ON THE BIG RIVER MINE TAILINGS SITE OPERABLE UNIT NO. 1

JULY, 2011 PROPOSED PLAN

The Doe Run Resources Corporation offers the following comments in response to the Proposed Plan issued in July 2011 by the U.S. Environmental Protection Agency Region 7 ("EPA") for Operable Unit No. 1 at the Big River Mine Tailings Site ("Site") in St. Francois County, Missouri. EPA issued the Proposed Plan for a 30-day public comment period on July 22, 2011, and extended the comment period an additional 30 days until September 21, 2011. In its Plan, EPA proposes to address potential risk to human health posed by lead mining wastes in residential yards. Specifically, EPA proposes a remedy that includes excavating soil in residential properties with surface soil lead detected at levels greater than or equal to 400 parts per million ("ppm") to a depth of 12 inches, greater than or equal to 1200 ppm lead to a depth of 24 inches, and installing a visual barrier at 24 inches where lead greater than or equal to 1200 ppm is detected at that depth. EPA estimates the proposed remedy will address approximately 4,000 residential properties at an estimated present worth cost of $107.62 million.[1]

The Doe Run Resources Corporation conducts metals mining and processing activities in Missouri, where it employs approximately 3,000 people. As an active employer and member of the Missouri Lead Belt community, Doe Run has worked closely and cooperatively with EPA since the early 1990s to investigate and remediate residual contamination from historic mining activities in the Region in order to ensure that any risks are appropriately addressed. Since 1994, Doe Run has spent approximately $62 million on response actions in St. Francois County. It has devoted significant

[1] For cost estimating purposes, the Feasibility Study assumed 4,540 yards would be addressed. The FS estimated a present worth cost of the proposed Alternative 3 at $108.68 million.

resources and expertise to identifying and defining potential risks to human health and the environment that may exist as result of historic mining activities in the County, and has conducted extensive removal actions to cooperation with EPA, the State and St. Francois County.

EPA has identified eight sources of mine waste in the former mining area of St. Francois County.[2] Since 1994, Doe Run has investigated and stabilized six of these large tailings Piles and a portion of the small Hayden Creek pile to minimize any further releases from those Piles. We understand EPA plans to address the Doe Run Pile, not associated with The Doe Run Resources Corporation, as part of another operable unit. Beginning in 2000, Doe Run began sampling and, where appropriate, remediating residential properties and child high-use areas ("CHUAs"). In 2004 Doe Run began remediating all residential properties and CHUAs with yard soil concentrations greater than 400 ppm located within 500 feet from each of the six major mill piles, 1,000 feet from the four identified smelters and 100 feet from mine shafts identified in the Remedial Investigation. Additionally, Doe Run sampled and remediated yards where elevated blood-lead levels in children ("EBLs") were detected, regardless of their distance from the Piles. As of January 2011, Doe Run has sampled a total of 2,057 residential properties and child high-use areas, and conducted total or partial removals at 586 of those properties.[3] Finally, Doe Run conducted the Focused Remedial Investigation efforts and the prepared the Feasibility Study as directed by EPA. Doe Run proactively did this work in response to EPA's requests regardless of the lead source.

---

[2] The Proposed Plan identifies eight areas, collectively referred to herein as the "Piles:" Desloge Pile, National Pile, Leadwood Pile, Elvins/Rivermines Pile, Bonne Terre Pile, Federal Pile (St. Joe State Park), Doe Run Pile and Hayden Creek.

[3] These numbers are from the Feasibility Study. The numbers contained in the Proposed Plan are incorrect.

Concurrent with these efforts, the State and County Departments of Health launched extensive educational programs both in the area and statewide directed to risks associated with lead and how to reduce exposure, particularly of young children, to lead from all sources, including in particular lead-based paint ("LBP"). As shown in Figure 5, infra, the occurrence of EBLs in St. Francois County has fallen substantially since 1997. In fact, the Missouri Department of Health and Senior Services ("MDHSS") reports that occurrence of EBLs in St. Francois County have been less than 5% since 2006. In 2010, the rate of occurrence was reported to be 1%[4] In other words, the rate of occurrence in St. Francois County has already been reduced to a level consistent with EPA's Remedial Action Objective, and to a level less than the national average of EBL.

This Operable Unit presents highly complex issues with regard to the nature and extent of the contamination and the potential risks resulting from it. These issues relate to the lack of correlation between EBLs and identified mine waste source areas; the large volume of mine chat and tailings and their varied uses; the widespread, yet unaccounted-for occurrence of LBP in residences in the area; and the abundance of naturally occurring lead in the area. These complex issues warrant very careful scrutiny in determining the appropriate use of CERCLA statutory authorities and resources.

Doe Run maintains that in a rush to complete the Feasibility Study EPA has failed to consider pertinent analysis of the data provided by Doe Run. In issuing its Proposed Plan with undue haste, EPA made unfounded and arbitrary assumptions regarding the source of contamination, disregarded serious questions regarding the associated potential risk, and disregarded the limits of EPA's CERCLA authorities to respond to conditions at the Site. As a result, EPA now proposes a remedy that 1) is beyond the scope of its

[4] See Exhibit 1. MDHSS 2010 Calendar year Blood Lead Testing Data.

CERCLA response action authorities to the extent it addresses naturally-occurring contamination, lead from building materials, including LBP, consumer products in consumer use, and normal fertilizer use; 2) has not been demonstrated to be necessary to protect human health and the environment; and 3) is otherwise inconsistent with Section 121 of CERCLA and the National Contingency Plan ("NCP"). Accordingly, Doe Run urges EPA to take additional time as needed to carefully evaluate the source of the contamination, evaluate the extent to which unrelated sources, including sources over which EPA does not have CERCLA response action authority, are the true cause of EBLs, and more carefully evaluate the true nature of any remaining risk to human health resulting from mining activities. Only then can EPA develop a remedy that responds more directly to any remaining risk, presents a better balance of trade-offs and is consistent with CERCLA and the NCP.

I. EPA ERRONEOUSLY ASSUMED THE PILES/MINING WASTE ARE ONLY SOURCE AND PRINCIPAL THREAT.

The NCP requires that EPA properly scope the project to ensure the RI/FS is properly designed. 40 C.F.R. § 300.430(a)(2). "The investigative and analytical studies should be tailored to site circumstances so that the scope and detail of the analysis is appropriate to the complexity of site problems being addressed. 40 CFR § 300.430(b). EPA is required to develop a conceptual understanding of the site, or a conceptual site model. 40 CFR § 300.430(b)(2). Section 104(a)(3)(A) and (B) of CERCLA and 40 CFR § 300.400(b)(1) and (2) specifically prohibit EPA from responding to a release of a naturally occurring substance or products that are part of the structure or result in exposure to residential buildings or business or community structures. Additionally,

Section 101(9) and (22) of CERCLA exclude consumer products in consumer use and the normal use of fertilizer from EPA's response action authorities.

In its conceptual site model, EPA identified historic mining wastes as the only source of contamination at the Site.[5] In violation of its obligation under the NCP, the Agency erroneously failed to consider alternative sources for contamination in yards, including LBP, other consumer products, the normal use of fertilizer and naturally-occurring lead. While EPA's conceptual site model does recognize human movement of chat from the piles, much of that use, including but not limited to the use of chat as agricultural lime, represents consumer use of a consumer product and/or normal fertilizer use over which EPA has no authority to conduct a response action.

In its Proposed Plan, EPA ignores these sources, stating that Operable Unit 1 includes "lead-contaminated surface soils present at residential properties across the site that have been contaminated as a result of migration of metal-bearing materials from past mining practices via natural erosional processes, windblown mine waste and human activity." The Proposed Plan "addresses the risk to human health and the environmental resulting from exposure to residential soils contaminated with lead mine waste." It further states, "(t)he eight mine waste areas are the source deposits and constitute the principal threat to human health and the environment," and that "(t)he sources of most of the lead contamination in the site are the large mine waste piles...." In fact, EPA's conceptual site model overestimates the extent of air dispersion from the Piles. This, coupled with EPA's arbitrary disregard of other sources for lead, result in a remedy that reaches outside the scope of EPA's response action authorities and without regard to the true cause of the risk the remedial action is intended to address.

[5] *See* 2009 EPA Human Health Risk Assessment.

A. The RI Data Demonstrates that Air Dispersion Releases from the Piles are Limited to 200 Feet, and any Risk Associated with These Releases already have been Protectively Addressed.

EPA's first technical error is its assumption that wind dispersion from the Piles resulted in widespread contamination. The Proposed Plan states, "The mine waste ha(s) contaminated soil, sediment, surface water and groundwater. Mine waste also has been transported by wind and water erosion and manually relocated to other areas throughout St. Francois County. It has also been reported that mine waste has been used on residential properties for fill material and private driveways, used as aggregate for road construction."

1. RI data demonstrates that air dispersion releases from the piles are limited to a 200-foot area surrounding piles.

No studies conducted to date show a correlation between the residential properties yard soil lead concentrations and the processes of wind and erosion from the piles. As part of the Focused RI (NewFields 2006), the impact of particulate deposition from the mill waste piles was investigated. Shallow soil samples were collected along upwind transects and downwind transects at five large piles. Lead concentrations in near-pile soils in the downwind transects were found to be higher than background concentrations in a narrow "affected" zone about 200 feet wide around the piles, and then averaged beyond the 200 feet 180 mg/kg lead.

In concert with the RI near-pile sampling, EPA requested Idaho National Engineering and Environmental Laboratory (INEEL) to perform air dispersion and deposition modeling of airborne lead associated with mill waste piles, *Air Dispersion Modeling of Mine Waste in the Southeast Missouri Lead Belt* (Abbott 1999). The air dispersion model was used to predict maximum lead concentrations in air and downwind

soil lead concentrations, and to place the downwind transects. The model and soil sample results were matched and used to predict geometric mean lead concentrations assuming 80 years of deposition accumulating in a 2-inch soil column already containing 65 mg/kg lead. Predicted lead concentrations range from 300 – 500 mg/kg within 200 meters of the mill waste piles, and from 125 – 175 mg/kg out to 1 kilometer. The model-predicted soil lead concentrations apply only to the upper two inches of soil and to "generally undisturbed surface soils which have not been subjected to significant tillage, excavation, landscaping or flooding." (Abbott 1999). The model-predicted soil concentrations are generally consistent with the near-Pile soil sampling results. (Abbott 1999, NewFields 2006).

It is also important to note that lead ambient air emissions in the Site area have been monitored for many years by Doe Run and other government agencies, beginning before the Piles were stabilized. Doe Run operated the "Big River Network" in the Site area from 1996 until 2005. The monitored lead ambient air concentrations for all monitors were well below the then applicable 1.5 ug/m3 lead NAAQS standard and in most all respects were also below the now much more stringent 0.15 ug/m3 lead NAAQS standard. More recent air monitoring conducted by Doe Run and MDNR within the Site area show consistent compliance with the 0.15 ug/m3 standard.[6]

These predicted soil lead concentrations do not explain the observed lead concentrations in yard soils. In fact, lead concentrations averaged above 700 mg/kg in the residential yard sampling programs conducted. Therefore, the Focused RI concluded

[6] See Exhibit 2. Various Information Regarding Ambient Lead Monitoring Stations and Lead Monitoring Results in and Around the Response Area.

that particulate deposition of lead from the mill waste piles was not the major contributor to lead in yard soils.

2. *Interim Action and Halo Removals Reached Beyond Potential Risk Posed by Air Dispersion from Waste Piles.*

Based on its long-held assumption that wind dispersion from the Piles were the principal source of contamination, EPA determined that sampling and soil removal of yards near the Piles was necessary to protect human health. In response, Doe Run agreed in 2000 to conduct soil sampling, blood lead sampling and soil removals from residential yards in the near vicinity of the Piles.[7] This work was done under the 2000 "Interim Action" administrative order on consent, and was continued in 2004 under the "Halo" administrative order on consent. These removal actions included work that was consistent with Alternative 2 in the Feasibility Study.[8]

Under the 2000 Interim Action, extensive surface soil sampling was performed at residential yards surrounding the Piles, and was designed to identify residences where soil removal or other actions might be required. At that time, yards and areas within yards with soil lead concentrations greater than 2,000 ppm were removed. The Halo Removal Action, which began in 2004, was conducted within the areas jointly called the "Halo" around the six major Piles located in St. Francois County. The Halo Removal Action included sampling of yards within the Halo that had not previously been sampled during the Interim Action and sampling of any identified yard outside of the Halo but within the Response Area at which an EBL child resided.

---

[7] These activities also were conducted in areas located within 1000 feet of the smelters and 100 feet from identified shafts.

[8] The Proposed Plan misrepresents Alternative 2 in the Feasibility Study to the extent it describes the alternative as placing the visual barrier only if the subgrade soils are greater than or equal to 1,200 ppm rather that greater than or equal to 400 pm, as was proposed in the FS's Alternative 2, and as has been conducted for 10 years as part of the Interim Action and Halo Removals.

In the Interim Action and Halo Removals, if a portion of the yard qualified for yard soil removal, the soil was removed to a depth of one foot. The subgrade soils were screened with an XRF; and if subgrade soil lead concentrations were above 400 ppm, then a visual barrier was placed across the subgrade. The excavation was backfilled with clean soil (less than 240 ppm lead). Remedial Alternative No. 2 in the Feasibility Study is consistent with the removal methodology used in the Interim Action and Halo Removals.

To date, 387 yards have been completely remediated (all surface yard soil greater than 400 ppm have been removed). 55 homeowners within the Halo have refused yard removal, and 71 homeowners within the Halo have refused yard sampling. Of these 387 remediated yards, a visual barrier has been placed in at least some portion of 369 yards or almost 95%. The purpose of the visual barrier is to provide notice and reminder to property owners of the potential presence of lead at depth, so ensure that exposure to soil can be properly managed. An additional 188 residential yards have had some partial yard soil removal and almost 95% of those yards also have a visual barrier. Therefore, 543 yards within the Response Area or Site have existing visual barriers.

As of January 31, 2011, 2,057 residential yards and 12 Child High-Use Areas ("CHUAs") had been sampled. 532 property owners had refused yard soil sampling, resulting in a final residential yard sampling refusal rate of 21 percent. Some portion of the yard soils (yard quadrant, drive way, garden, play area, or drip zone) was above 400 ppm lead in 87 percent of all yards sampled (up through January 2011), or 84 percent when elevated drip zones only yards are excluded.

3. *Interim Action and Halo Removal Data Shows No Correlation Between Lead Levels and Proximity to Piles.*

Figure 1 presents the average yard soil lead concentrations relative to distance to the closest Pile. This figure demonstrates that there is no correlation of yard soil lead concentrations to the Piles. Furthermore, Figure 2, drip zone soil lead concentrations relative to distance from the closest Pile, also shows no correlation or trend indicating that the drip zone lead concentrations likely are not derived from an airborne source.

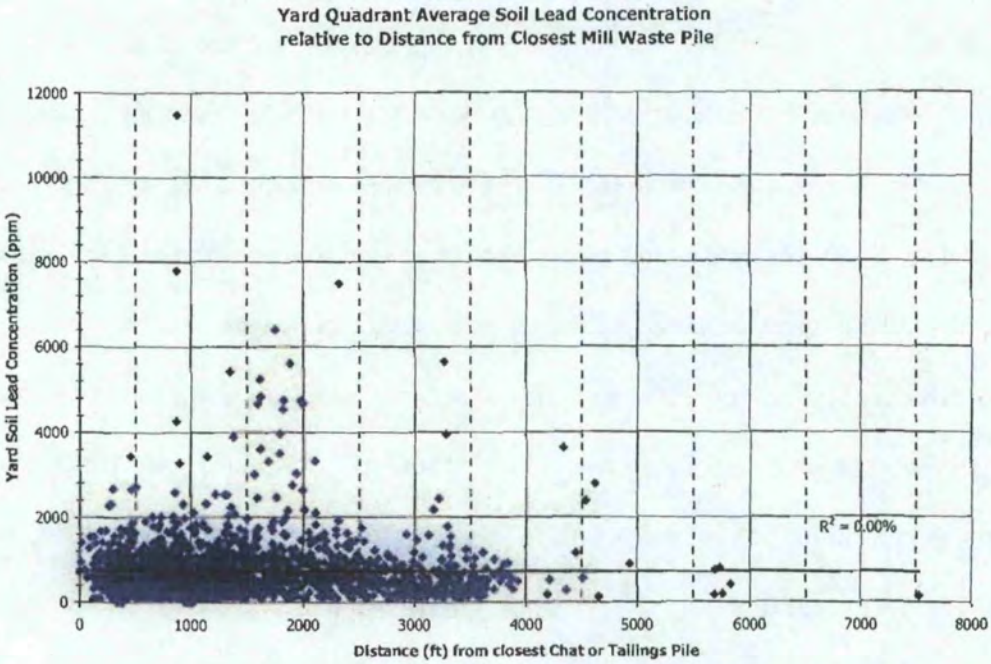


Figure 1 Average Yard Soil Lead Concentrations in the yard quadrants relative to Distance from the Closest Mill Waste Piles

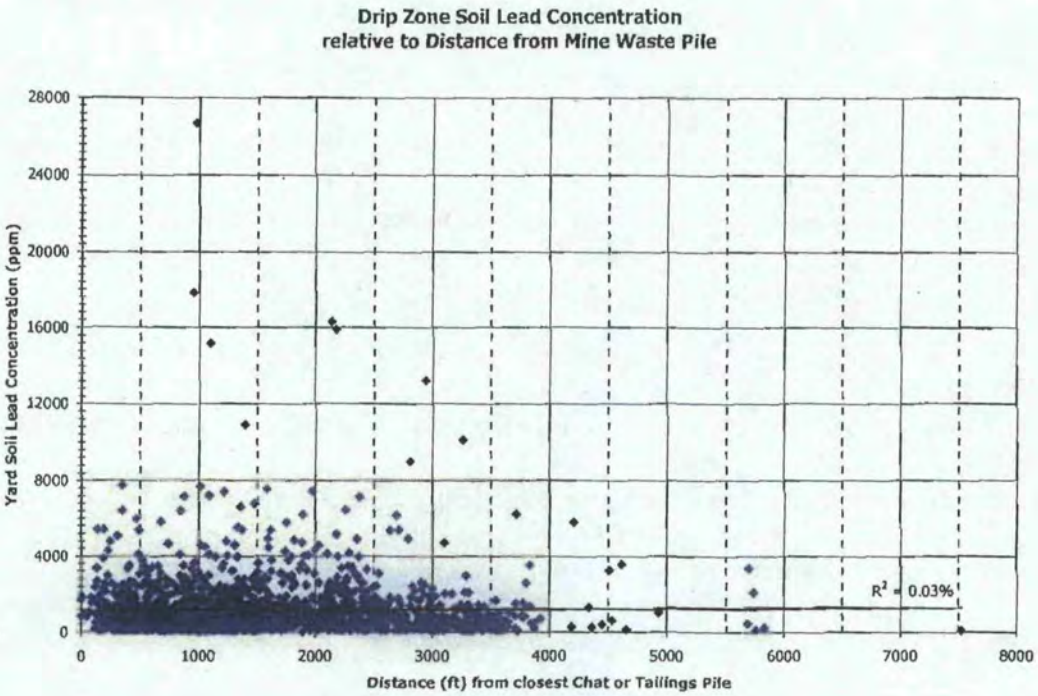


Figure 2 Drip Zone Soil Lead Concentrations relative to Distance from the Closest Mill Waste Piles

Sampling of the drip zone soil and screening for outdoor lead-based paint (LBP) conducted during the Interim Action was reported in the *Removal Action Report for Interim Action.*[9] The report stated that drip zone soils would be greater than 400 ppm lead in 93% of the homes with measureable outdoor LBP. 33% of those homes' drip zone soils would be greater than 2,000 ppm (NewFields 2004).

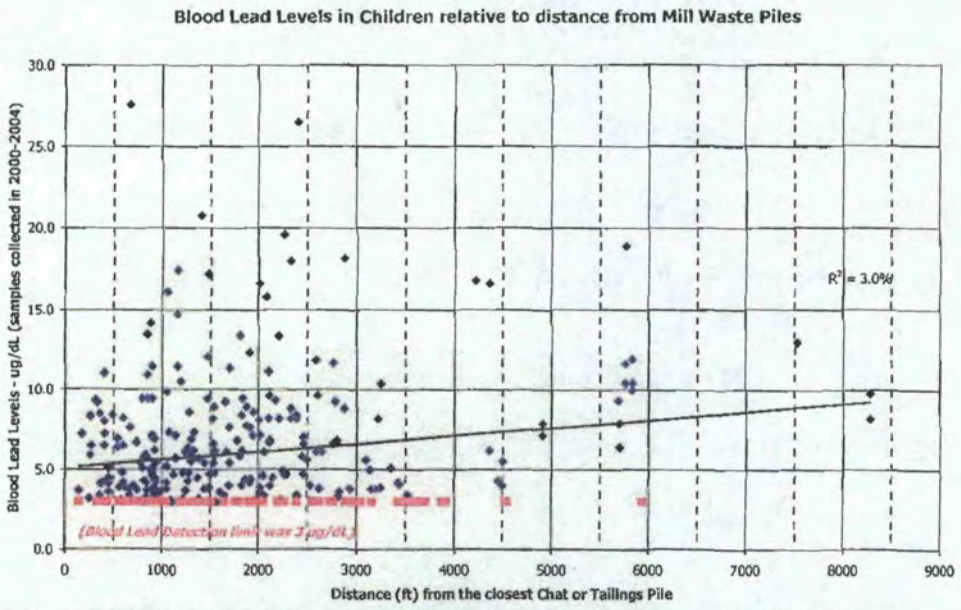
4. Even within the "Halo," the data show no correlation between the Blood Lead Levels and proximity to piles.

More than 300 children's blood lead levels ("BLLs") were sampled during the Interim Action's blood lead sampling program. Approximately 29% of the qualifying children (less than 84 months of age) identified within the Response Area were sampled. The average BLL in the Interim Action Response Area was 5.8 μg/dL. Of the children sampled, 11% had elevated EBLs greater than 10 μg/dL. These statistics are probably

[9] See Exhibit 3. *Removal Action Report Interim Action Removal* (Newfields 2004).

biased by the high rate of sample refusal (71%). Many of the program's blood lead sampling refusals were due to previous testing (most would not retest if a previous testing was found to be low) or parents deciding to have the child's doctor or health department tested the child (non-elevated results were unlikely to be, and were not reported to the study program as yard soil would not need to be addressed).

Of the children tested during the Interim Action, 32 resided in homes within the Halo (within 500 feet of the Piles). (See Figure 3). Of these, only one child was found to have an EBL. Notably, this child's corresponding yard soil lead concentrations were below 400 ppm in all parts of the yard (NewFields 2004). All other EBL children identified in the Interim Action, as well as any EBL children identified post-Interim Action, resided in homes with yards outside the Halo.



No child is represented more than once on the data set - blood lead concentration is either the initial blood draw or if a child less than one year that was sampled previously was resampled (a minimum of a year later) and the no action had occurred in the yard, the second sample result was included. Multiple children residing at one location, if sampled, are included in the data set. (NewFields and Gradient March 9, 2010)

Figure 3 Blood Lead Levels in Children (less than 84 months of age) relative to Distance from the Closest Mill Waste Piles

The lack of EBL yards within the Halo further supports the Interim Action's findings that BLL could not be correlated or appeared to have a direct relationship to yard soil lead concentrations. Figure 4 presents the soil lead data grouped into two data sets, elevated and non-elevated BLL. There is essentially no difference between the two groups except that the average lead concentration in drip zone soils is slightly higher in the elevated BLL subset.

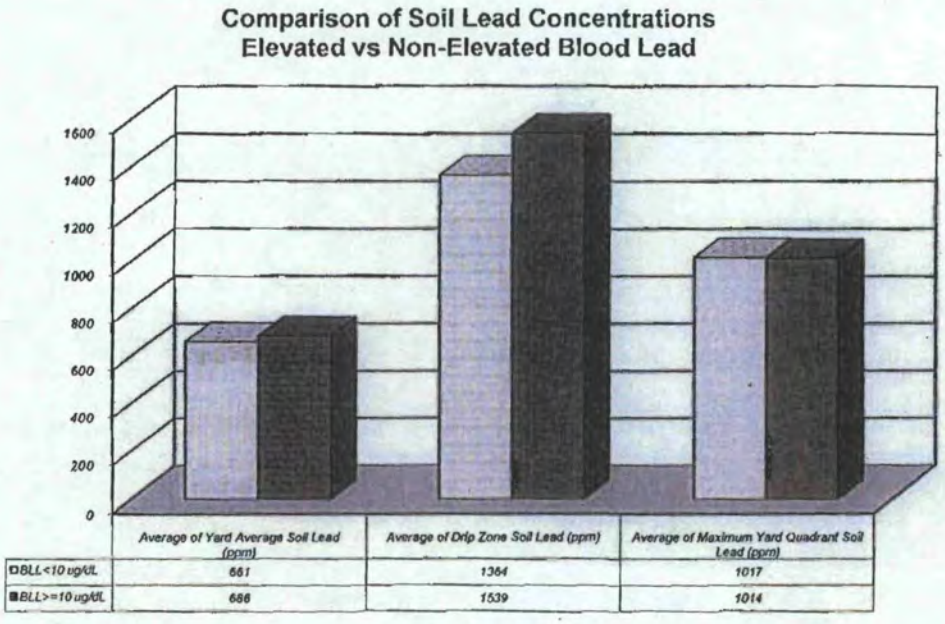


Figure 4 Comparison of Yard Soil Lead Concentrations and BLLs measured during the Interim Action

Correlation analyses were conducted using paired data sets to evaluate the relationship between BLL and play area maximum soil lead, yard average soil lead, drip zone soil lead, driveway soil lead and outdoor LBP. The correlation coefficients (R^2) for each sample population are listed below in order of increasing magnitude.

Blood Lead Correlations

BLL vs. Play Area Maximum Soil Lead	R^2=0.00
BLL vs. Yard Average Soil Lead	R^2=0.01
BLL vs. Drip Zone Soil Lead	R^2=0.01

BLL vs. Driveway Soil Lead	R^2=0.11
BLL vs. Outdoor Lead-Based Paint	R^2=0.145

The correlation coefficients are low for all the sample populations tested. For the regression BLL vs. Outdoor LBP, assays of lead that were greater than or equal 1 mg/cm^2 were taken as an indicator of LBP. These correlations were presented in the *Removal Action Report for the Interim Action.*[10]

Average blood lead concentrations from the Interim Action compare well to the previous blood lead study conducted in St. Francois County. The Lead Exposure Study in St. Francois County (MDOH 1998) found the average BLL to be 6.52 µg/dL with 17 percent of the population with elevated BLL. The Interim Action, conducted 3 to 5 years later in the same general area, found a decrease in BLLs with 5.8 µg/dL average BLL with 11% of the sample group with elevated BLL. The participation rate during the two studies was approximately 30%.

5. *Blood Lead Levels in St. Francois County Have Already Been Reduced to Levels Below EPA's Remedial Action Objective.*

The Missouri Department of Health and Senior Services ("MDHSS"), formerly Missouri Department of Health ("MDOH"), has maintained a data set of children, less than six years of age, who have been tested for BLLs since 1997. Note the percent of the population with elevated BLL identified in the Lead Exposure Study and the Interim Action cannot be compared directly to the MDHSS yearly statistics as these studies' statistics range over multiple years and are limited only to the study participants and therefore probably do not completely represent the area's unbiased population. The MDHSS data set is reported by county and may include the same child in multiple years

[10] See also Exhibit 4. Blood Lead Levels Measured during the Interim Action (2000-2004) by City and Distance to the Closest Pile, Railroad, and Highway.

due to possible yearly or biyearly testing. Figure 5 presents the percent of EBL children compared to the cumulative number of complete[11] yard soil removals conducted in the Response Area. As seen in this figure, the decline in St. Francois County's child EBL percentage dropped dramatically prior to majority of the yard soil removals.

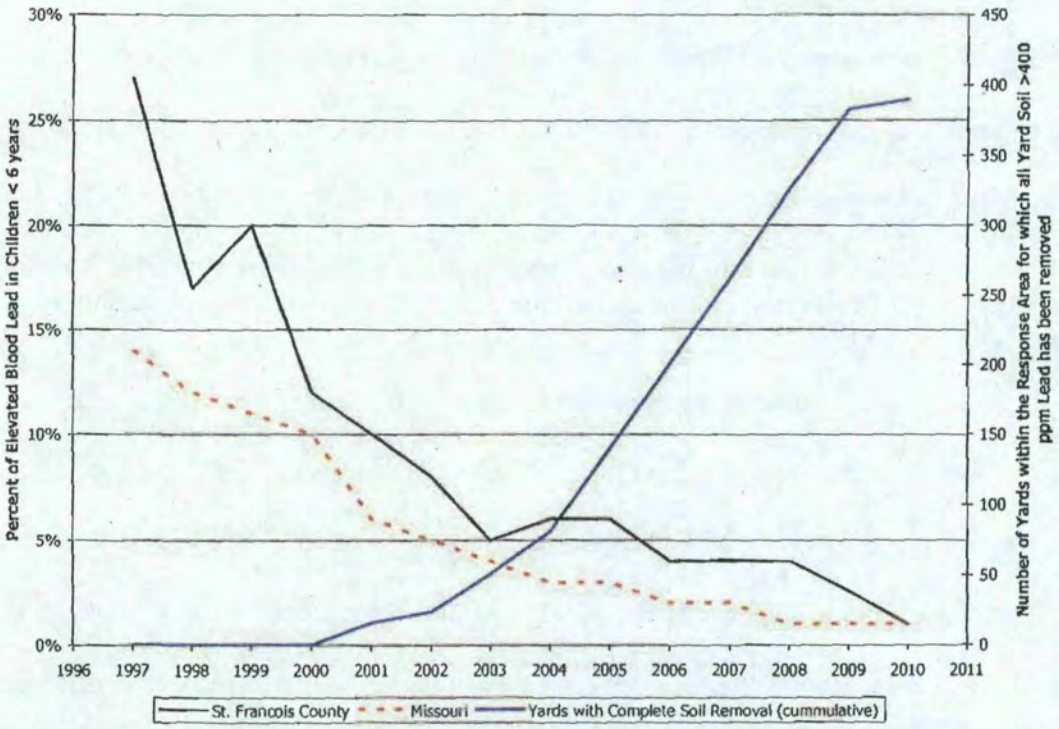


Figure 5 St. Francois County and Missouri yearly elevated blood lead percentages and cumulative complete yard soil removals

Blood lead levels among US children age 1 to 5, the population at the highest risk for lead exposure and effects, have been monitored and reported by the CDC and EPA and have declined steadily since surveillance began in 1976. Early (1976-1980) study reported a geometric mean BLL of 14.9 µg/dL just over 88% of this high-risk population had EBLs. Data collected from 1991 to 1994 showed that the geometric mean BLL for children was 2.7 µg/dL, with 4.4% of the children having EBL. Children age 1 to 5

[11] "Complete" yard soil removal is defined as all surface soil with lead concentrations greater than 400 ppm have been removed. "Partial" yard soil removal indicates that all surface soil with lead concentrations greater than 2,000 ppm have been removed.

whose blood was sampled as part of the 2007-2008 survey had a geometric mean BLL of 1.5 μg/dL, with 0.9% of the children having EBLs. The data for St. Francois County presented in Figure 5 are consistent with national averages and the decline in the child BLLs with time. The discontinued use of LBP and leaded gasoline, as well as the decrease of lead in food and toys, are the primary contributing factors to these drops in BLLs. Performance of yard soil removals within the County does not appear to affect the natural downward decrease in the County's BLL for children, which further indicates the EBLs had been caused by sources other than mining waste.

B. EPA failed to Identify, Characterize or Otherwise Consider Building Materials, Including LBP, as a Source of Lead Contamination or EBLs.

Section 104(a)(3)(B) expressly prohibits EPA from using its CERCLA response authorities to address releases from LBP. EPA's own directive states "Lead-based paint can be a significant source of lead exposure and needs to be considered when determining the most appropriate response action. Interior paint can contribute to elevated indoor dust lead levels. In addition, exterior paint can be a significant source of recontamination of soil."[12] Yet EPA has refused to acknowledge LBP's role as a source of contamination, much less evaluate the extent to which it is a source for contamination. EPA's refusal to do so is particularly arbitrary given the data at the Site that indicates LBP is a major source of contamination and a major cause of EBLs.

The Lead Exposure Study (MDOH 1998) identified both outdoor and indoor LBP at the Site and reported 64% of the homes had detectable outdoor LBP, 55% of the homes had detectable indoor LBP, and more than 51% of the homes in the study were older than

[12] Revised Interim Soil Lead Guidance for CERCLA sites and RCRA Corrective Action Facilities, OSWER Directives No. 9355, 4-12, August 1994.

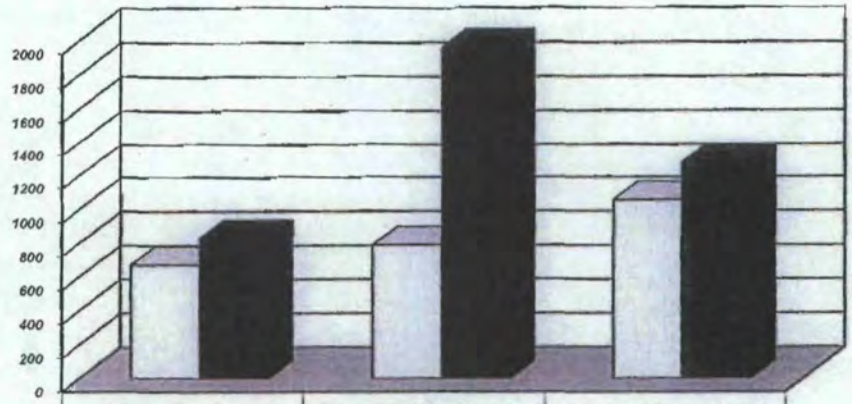
1970. The study noted that the strongest correlation of BLLs in the study area was to lead in dust on the floor, followed by indoor paint lead levels, and then lead on the window sills. Further correlations indicate that both indoor and outdoor LBP contributes to dust lead concentrations.

1. Significant amount of LBP was detected during the Interim Action

As reported in the Removal Action Report for Interim Action (NewFields 2004) and the Focused RI (NewFields 2006), many of the highest soil lead concentrations measured in the Interim Action sampling were in the drip zone.[13] Specifically, more than 42% of the drip zone samples had higher lead concentrations than the corresponding yard soil lead concentrations. Drip zone soil samples were commonly (39%) over 1.5 times the average yard lead concentration, indicating the lead source to the drip zone was potentially different or closer to the drip zone source.

Figure 6 presents a comparison of average lead soil concentrations in residential yards with ($\geq$1 mg/cm^2) and without (<1 mg/cm^2) lead-based paint made in the Interim Action (NewFields 2004). The comparison shows that drip zone soil lead concentrations are influenced by the presence of LBP. Paint chips were observed in some drip zone samples. Many homes in the area have had exterior painted surfaces covered with vinyl siding, and therefore, may be incorrectly identified in the "houses without lead paint" category and thus the concentrations for this category have a higher uncertainty than the "houses with lead paint."

[13] Drip zone is defined as the area within 2.5 feet of the house .



	Average of Yard Average Soil Lead	Average of Drip Zone Soil Lead	Average of Maximum Yard Quadrant Soil Lead
Houses w/o Lead Paint	670	787	1046
Houses w/ Lead Paint (>1mg/cm2)	828	1955	1276

Figure 6 Comparison of Yard Soil Lead Concentrations with measurable LBP (data set from the Interim Action)

Regardless of the uncertainty in the houses without outdoor LBP, the correlation between outdoor LBP and the drip zone samples indicates that LBP is a source of lead to yard soils. As discussed in Section 2.1, without an air-deposition source, the elevated lead concentrations in the drip zone soil would not be associated with airborne materials washing off the roof but rather an in-yard source. This same relationship of elevated drip zone soils to outdoor LBP was identified in the Lead Exposure Study (MDOH 1998).

Studies of LBP in urban soils with no mining influences indicate paint undergoes a relatively rapid transformation and redistribution with consequent loss of its potentially distinctive individual particle identity (Johnson and Hunt 1995).[14] The lead adsorption to ion and manganese phases in soil makes the degraded LBP resemble the soil matrix

[14] See Exhibit 5. Johnson, D.L. and A. Hunt, 1995. "Analysis of Lead in Urban Soils by Computer Assisted SEM/EDX- Method Development and Early Results", *Lead in Paint, Soil and Dust: Health Risks, Exposure Studies, Control Measure, Measurement Methods and Quality Assurance. ASTM STP 1226.* Michael E Beard and SD Allen Iske, Eds., American Society for Testing and Materials, Philadelphia 1995, pp 283-302.

material. Thus only within soils near the LBP source might the lead derived from LBP be easily identified.

In EPA's speciation study of yard soil, the sampling methodology recognized the high potential for LBP within the soils. Yard soil samples were specifically selected such that "(n)o samples were collected from within approximately 10 feet of on-site structures, in order to avoid the potential for soil-lead concentrations being influenced by lead-based paint." (HGL & Drexler 2006). This speciation study went on to conclude that "paint is unlikely to be a major source to the residential yard, as a whole," when the "whole" yard had not been characterized by the sampling methodology. The EPA sponsored study was designed to bias the study's ability to identify LBP within the yard soil. Having intentionally designed its study to avoid detection of LBP, EPA cannot validly conclude that LBP is not a major contributor to soil contamination.

2. *More than 65.5% of homes in St. Francois County were constructed prior to 1978 and thus potentially contain LBP.*

Available age-of-housing data in the incorporated communities within the Response Area (see Table 1 and 2) indicate the housing within the Site is over 65.5% pre-1970's and therefore have a high potential for LBP.[15] The identification of outdoor LBP during the Interim Action and Halo Removals may underestimate its occurrence since many homes have been re-sided with vinyl siding, thus masking, but not eliminating, the presence of outdoor LBP. When EPA surveyed 22 homes for LBP as part of its speciation study, 16 of the 22 homes had vinyl siding (73%).[16] Of the four yards where

[15] The Consumer Product Safety Commission banned the use of lead-based paint in housing effective in 1978.

[16] See Exhibit 6. "Table 3-1 Summary of Screening Results from Locations Where Samples were Collected," Speciation and Bioaccessability of Anomalous Lead Concentrations in Soils, Big River Mine Tailings Site (HGL & Drexler, 2006).

paint was surveyed, three detected outdoor LBP (primarily on the house versus other outdoor structures).

Table 1
Percentage of Age of Housing in the Incorporated Cities and Towns of the Response Area and St. Francois County

Incorporated City:	Bonne Terre	Desloge	Park Hills	Leadington	Leadwood	County Wide
Built 2005 or later	0.8%	1.9%	2.6%	1.1%	0.0%	3.0%
Built 2000 to 2004	7.0%	7.5%	6.5%	14.2%	2.9%	10.3%
Built 1990 to 1999	7.0%	16.6%	10.0%	40.4%	4.2%	17.7%
Built 1980 to 1989	10.3%	14.6%	10.4%	12.0%	5.9%	14.1%
Built 1970 to 1979	9.4%	11.0%	14.6%	5.5%	4.2%	15.4%
Built 1960 to 1969	7.2%	13.2%	7.1%	10.9%	6.6%	8.2%
Built 1950 to 1959	12.9%	9.2%	8.1%	2.2%	7.8%	9.1%
Built 1940 to 1949	11.4%	12.3%	7.8%	1.6%	18.8%	6.6%
Built 1939 or earlier	34.0%	13.7%	32.9%	12.0%	49.6%	15.7%
Pre 1970's	65.5%	48.4%	55.9%	26.7%	82.8%	39.6%

Source: 2005-2009 American Community Survey 5-Year Estimates, http://factfinder.census.gov/servlet/ADPGeoSearchByListServlet?_lang=en&_ts=332956084339

Table 2
Age of Housing and Yard Soil and Outdoor LBP in the Incorporated Cities and Towns of the Response Area and St. Francois County

Census City/Town	Homes Built Pre-1970's	Yards Tested	Yards with Elevated Yard Quadrants	Yards with Elevated Drip Zones	Homes with Measurable Outdoor LBP	EBL Children (Identified During the Interim Action)
Bonne Terre	65.5%	10.2%	92.0%	85.9%	34.4%	18.2%
Desloge	48.4%	20.2%	72.8%	62.5%	15.2%	6.9%
Park Hills[a]	55.9%	23.5%	90.0%	79.0%	34.2%	10.6%
Leadwood	82.8%	51.3%	73.3%	73.8%	42.6%	5.7%
Leadington	26.7%	1.1%	100.0%	0.0%	0.0%	25.0%

With the exceptions of Leadwood and Leadington, the percentage of EBL children correlates better to the percentages of measureable outdoor LBP than to any of the elevated yard soil lead concentrations. It should also be noted that the presence of outdoor LBP is probably an indicator of potential indoor LBP.

3. *Conceptual model assumes indoor dust derives from mining waste. But the Lead Exposure Study indicates LBP is also a significant source of indoor dust.*

Even though the Lead Exposure Study indicated that children's BLLs were more likely influenced and thus impacted by indoor dust and indoor LBP, EPA arbitrarily continues to ignore this source of lead contributing to the EBLs. EPA does not include any other source expect the "Tailings/Chat Piles" in the Conceptual Site Model in the Human Health Risk Assessment for the Site.[17]

MDOH's Lead Exposure Study assessed the source contribution of lead in house dust from mine waste. It was noted that paint contributed at least 23% of the lead in household dust, mine waste contributed 21%, and soil contributed 37% (Sterling, et al., 1998). The authors went on to state their belief that the soil lead was from the mine waste; therefore, the contribution of mining waste to indoor soil was greater than paint. Location of the homes relative to the Piles was not presented in the Lead Exposure Study, but a later speciation study conducted by HGL and John Drexler (2006) on soils within the Site did provide soil sample locations. HGL and Drexler's conclusion that "tailings piles are the most likely source of contamination" was based on samples collected from 4 yards (5 out of the 21 samples examined) which were located within the Halo and 3 of the 4 yards have undergone a complete soil removal (fourth yard refused soil removal). The remaining 16 samples were overwhelmingly dominated by natural soil-forming minerals with no significant relationship to chat.[18] Of the 16 yards from which the 21 speciation samples were collected, all but one yard were located within the Halo.

Despite being obligated under the NCP to do so, EPA has made no effort to study the identified and abundance presence of LBP and all the various exposure pathways within homes that would affect child BLLs. In fact, using the speciation study as an

[17] See Exhibit 7. Figure 3.2 Conceptual Site Exposure Model, EPA Human Health Risk Assessment, 2009.
[18] HGL and Drexler (2006).

example, EPA appears to be going out of its way to exclude any evidence of LBP. EPA's failure in this regard is arbitrary, capricious and inconsistent with 40 CFR § 300.430(b).

C. Chat from Mining was Widely Used by Residents in St. Francois County and Other Areas as Fertilizer.

For a number of reasons, granular mine tailings ("chat"), when used as agricultural lime fertilizer, cannot and should not be addressed in EPA's Proposed Plan. Agricultural lime is not regulated under federal or state law with respect to contaminant remediation levels. More importantly, EPA does not have jurisdiction over this product because it is exempted from CERCLA: (1) because chat used as fertilizer is exempted from the definition of "release" under CERCLA; and (2) because the consumer use of chat as fertilizer exempts the product from the definition of "facility" under CERCLA. Because of these factors, EPA does not have the authority to respond to or conduct a remedial action to address releases from chat used as fertilizer.

The sale of Old Lead Belt ("OLB") chat as agricultural lime ("ag-lime") began in 1925. The volume sold was huge, roughly estimated at 35 million tons, or about one-third by volume of all chat sales. For decades, it was sold both locally and by the train-load for use in farm fields in some 10 different central states. Not until August 1, 2003 were ag-lime sales actually stopped, as part of the clean-up negotiations on the Elvins/Rivermines Chat Pile.[19]

As an initial matter, no federal law specifies contaminant levels for OLB ag-lime. See "Background Report on Fertilizer Use, Contaminants and Regulations," U.S. Environmental Protection Agency, EPA 747-R-98-003, January 1999, pp. i-ii, 60, 62 and

[19] See Exhibit 8. "Engineering Evaluation/Cost Analysis Report, Elvins/Rivermines Tailings Site" ("Elvins/Rivermines EE/CA"), Barr Engineering, June 2003, pp. 1-2.

64. Moreover, all chat and its products, such as ag-lime, are exempt from regulation as hazardous waste. 40 C.F.R. § 261.4(b)(7).[20]

Similar to federal law, Missouri's Agricultural Liming Materials Act, Section 266.500, R.S.Mo. et seq., and its implementing regulations, 6 CSR § 250-1.020, et seq., set no contaminant levels for ag-lime. The section on "Quality Standards of Agricultural Liming Materials" address correction of soil acidity, furnishing calcium or magnesium as plant nutrients, and meeting minimum specifications for calcium carbonate equivalent and fineness of grind. Section 266.525, R.S.Mo.[21] Furthermore, in 1976 the Agricultural Liming Materials Act and its implementing regulations created a certification process for ag-lime. For over 25 years, the OLB ag-lime was listed as being provided by registered producers and as properly meeting all state standards.[22]

In support of this lack of regulation regarding contaminant remedial action levels, during all the years chat was used as ag-lime, no studies called for any cessation in sales. See, e.g., "Further Characterization and Use of Tailings and Chat from Missouri's Old Lead Belt as Agricultural Lime," B.G. Wixson and B. E. Davies, in Trace Substances in Environmental Health XVIII (1984), p. 260; and "A Study on the Possible Use of Chat and Tailings from the Old Lead Belt of Missouri for Agricultural Limestone", B.G. Wixson, N.L. Gale and B.E. Davies, University of Missouri-Rolla, (December 1983), pp. 92-93. In the end, as noted above, EPA shut down the sale of OLB tailing as part of clean-up negotiations, not based upon any scientific studies on its actual use as ag-lime.

---

[20] EPA has confirmed that chat from lead mining in the Tri-State Mining District "is a 'Bevill-exempt" waste and is not subject to regulation under RCRA Subtitle C." 72 Fed. Reg. 39325, July 18, 2007, p. 39334.

[21] Similarly, the ASTM Standard Specification for Agricultural Liming Materials requires calcium carbonate equivalent, percentage moisture, percentage calcium and magnesium, and sieve analysis. ASTM C602-07, June 15, 2007.

[22] "Missouri Agricultural Liming Materials Report," Agricultural Experiment Station, University of Missouri-Columbia, 1976-2003.

Regardless of whether the constituents of ag-lime are regulated in terms of contaminant remediation levels, ag-lime used as fertilizer is not subject to jurisdiction under CERCLA, as evidenced by the definition of "release." The CERCLA exemption for "normal application of fertilizer" is found in the definition of "release":

> The term "release" means any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment..., **but excludes...(D) the normal application of fertilizer.**

42 USC § 9601(22) (Emphasis added).

Because "normal application of fertilizer" is not defined in CERCLA, the terms should be construed in accordance with their ordinary meaning. U.S. v. Telluride, Co., 146 F.3d 1241, 1245 (10th Cir. 1998):

> "Normal" - 1. usual; regular; or typical state, degree or form.
>
> ****
>
> "Application" - the act of applying to a particular purpose or use . . . the act of putting something, such as a lotion or paint, into a surface.
>
> ****
>
> "Fertilizer" - any substance, such as manure or a mixture of nitrates, added to soil to increase its productivity.

"Collins English Dictionary." (10th ed.)

EPA itself, in discussing the application of the CERCLA fertilizer exemption to SARA reporting, stated that the exemption would "eliminate reporting of fertilizers...and other chemical substances when applied, administered or otherwise used as part of routine agricultural activities....". 52 Fed. Reg. 38344, 38349 (October 15, 1987) (emphasis added) (considering ag-lime to be a "chemical," because its active ingredients are $CaCO_3$

and $MgCO_3$, which are clearly chemicals). Even EPA's "Background Report on Fertilizer Use, Contaminants and Regulations" specifically combines liming materials with fertilizers and refers to them both as "fertilizers." Supra, at "Executive Summary," p. i.

Even if the use of chat as agriculture lime was not considered "normal use of fertilizer" within the meaning of Section 101(22) of CERCLA, to the extent it is used by property owners for that purpose, it is a consumer product in consumer use, and thus is excluded from the definition of "facility" under Section 101(9) of CERCLA. Similar to the definition of "normal application of fertilizer," the term "consumer product in consumer use" is not defined in CERCLA. Uniroyal Chem. Co., Inc. v. Deltech Corp., 160 F.3d 238, 243 (5th Cir. 1999). Following the ordinary meanings of the terms, courts have found that "[t]he sale of a hazardous substance for a purpose other than its disposal does not expose defendant to CERCLA liability." Dayton Indep. School Dist. v. U.S. Mineral Prod. Co., 906 F.2d 1059, 1065 (5th Cir. 1990) (citing cases) (stating that "Congress did not intend CERCLA to target legitimate manufacturers or sellers of useful products"); See also Kane v. United States, 15 F.3d 87, 89 (8th Cir. 1994) (agreeing with the Fifth Circuit's holding in Dayton, stating that Congress "intended to provide recovery only for releases or threatened releases from inactive or abandoned waste sites, not releases from useful consumer products") (quoting Dayton at 1066). Because consumers used chat in St. Francois County and other areas as a fertilizer product, the product is exempt from the definition of "facility" under CERCLA and is thus not subject to CERCLA jurisdiction.

The effect of the two exclusions discussed above is the same: EPA does not have the statutory authority under CERCLA to take or compel response action with respect to releases that result from these or other consumer uses of chat.[23] Further, federal and state laws excluding ag-lime from specific contaminant-level regulations further indicate that ag-lime should not be managed under CERCLA. EPA's proposal to require remediation of lead contamination resulting from the use of chat as ag-lime, or by consumers for other consumer uses, is prohibited by statute and is arbitrary and capricious.

D. Naturally Occurring Lead is Abundant throughout St. Francois County

Section 104(a)(3)(A) and 40 CFR § 300.400(b)(1) specifically prohibit EPA from using its CERCLA authorities to respond to a release of naturally occurring substances. Yet, EPA has arbitrarily refused to evaluate the extent to which naturally occurring lead is contributing to the detected contamination. As a result, EPA proposed remedy requires response action with respect to all lead detected, regardless of its source. This result is inconsistent with CERCLA and the NCP.

Centuries before the first chat was piled, before St. Joe Lead Company was formed, before any settlers arrived, and before even the first European explorers paddled on the Mississippi, Native Americans in this area were gathering the lead mineral, galena, off the ground. Reportedly, during the Cahokia mound building era, circa 1200-1300 C.E., the shiny galena with its cubic shapes were collected as keepsakes, decoration or to fashion art objects.

[23] It is well documented that other chat was used in the Site area on a widespread basis for other consumer uses, including foundation fill, asphalt mix, road de-icing and gravel driveways. See for example, Exhibit 9. "Waste Products in Missouri with Potential Highway Applications." Missouri Department of Highway and Transportation. 1982.

Once the local Native Americans observed the value that Europeans placed on lead, they would even crudely smelt the galena. The mineral would be thrown onto a burning pile of wood. When the galena melted, the lead would separate, sink down and run out onto the ground. In Bonne Terre, one of these early Native American furnaces was found, surrounded by tons of slag, from which the lead had been melted.

The name of the town itself, Bonne Terre, is a graphic example of this area's long history with lead. Early French explorers and settlers noted that a certain band of soil, which stretched a half-mile to a mile long and several hundred yards to a half a mile wide, ran through portions of what is now Bonne Terre. This soil was so rich in lead ore that it was called "good earth," or Bonne Terre for the amount of lead to be dug out.

As for how the early digging was done, a pick, a wooden shovel and a bucket were the only tools. Anyone would be a miner, depending on time of year or inclination. The Spanish and French did not generally require the legalities of mining claims, as it was more important to obtain the lead, so that it could then be taxed. Farmers would dig, when crops had been harvested. Hunters would mine, between hunts or when game was scarce. The more well-to-do would send their slaves to mine. Middle-men would drive wagons around the diggings, purchase whatever lead ore had been unearthed by individuals, then haul the lead ore to the nearest smelter or rail line, and sell it for a profit.

Generally, the depth of the digging was determined by where the ore stopped, the depth became too great to throw out dirt, or bedrock was hit, whichever was first. Tools to drill into or explore bedrock did not exist. Deep mines with related mills did not occur prior to the Civil War, so chat piles did not exist. Instead of digging down, the diggings would spread out laterally. For example, at Mine-a-Joe (aka Bogy Mine), first discovered

circa 1735 just west of Desloge, the diggings eventually covered an expanse a mile long and a hundred yards wide.

By the early 1800's, in addition to the diggings at Bonne Terre and Mine-a-Joe, other diggings in the area included;

- Flat River Mines (Park Hills area), with 15 hands and rich ore yields of 65%;
- Gumbo (aka Grunbo) Mines (Gumbo area), at one time thought to be the best mines in the neighborhood;
- Yankee Diggings (Leadwood area) with 28 hands and mineral yield of 60%;
- McKee Mines (Leadwood area); and,
- Butcher Diggings (Park Hills area, in or around Missouri Mines State Historic Site/St. Joe State Park)

In 1864, St. Joe Lead Company bought property in Bonne Terre and subsequently began deep mining, using shafts to haul up ore and mills to process that ore. Only then, did chat come into being, as what was left after the milling process.

This history illustrates the fundamental truth, ignored by EPA, that lead is abundantly naturally occurring throughout the Old Lead Belt. The only basis in the record on which EPA relies is the 2006 Soil Speciation Study (HGL 2006). But that study failed to even mention the possibility of naturally occurring lead, much less evaluate it as a potential source. More specifically, that study was flawed in that

- The study's conclusions only allege that residential soils "have lead forms that are common to the Big River tailings piles". There is NO discussion of how such residential soils might compare to naturally occurring lead.
- The study does not even mention naturally occurring lead as one of the "numerous sources of lead in the site area."
- The study contained numerous other flaws, some of which are discussed, supra, including
  - Only 20 yards were sampled over a 34,200 acre area, in which the agency estimates 4,500 yards are affected.
  - The study asserts that 31 residential samples were speciated for lead. However, the table that is cited for the speciation results only reports on 21 residential samples. Ten (10) samples from 5 houses are missing.
  - A galena-cerussite mineral association is alleged to be representative of the chat piles. However, significant evidence of such an association was only found in 4 yards of the 20 sampled.
  - Speciation from the other 11 reported houses were overwhelmingly dominated by natural soil-forming minerals, with no significant relationship to chat.
  - Of the 20 houses were sampled, the results for five houses are missing. 11 houses had no significant mineral association with chat. Only four yards, 20% of those sampled, had significant evidence of indicating a link to chat.

- Even for these four houses, the alleged galena-cerussite association is actually no proof of chat in these yards. This same galena-cerussite association of minerals also represents the weathering of naturally occurring lead.

In other words, this study provides insufficient support for EPA's far-reaching assumption that mining waste from the Piles is the primary source of lead contamination at the Site.

Although EPA has ignored the issue of naturally occurring lead in St. Francois County, it did not do so when facing a similar residential soil remediation project in adjacent Washington County, Missouri. Specifically, In EPA's July 2, 2010 Proposed Plan for Residential Property Soils in the Washington County Lead District,[24] EPA stated that it "will not intentionally address naturally occurring lead ores in their undisturbed state as part of this action. Although the Site has been heavily mined in the past, it may be possible to encounter naturally occurring lead ores during residential property excavation. Section 104(a)(3)(A) of CERCLA states that removal or remedial actions shall not be provided in response to a release or threat of release 'of a naturally occurring substance in its unaltered form, or altered solely through natural processes or phenomena, from a location where it is naturally found" . . . When these soil conditions are encountered, they will be documented, excavation will stop, and backfilling will be initiated." Proposed Plan for Residential Property Soils – Operable Unit 1, at the Washington County Lead District Old Mines Superfund Site in Washington County, Missouri, p. 11.

[24] See Exhibit 10. Proposed Plan, Washington County Lead District – Old Mines Superfund Site, July 2, 2010.

Attached as Exhibit 11 is summary of references on the natural occurrence of surficial soils with lead at the Site. This information shows that the area where the upper Bonne Terre formation meets the surface, surface soils have high levels of naturally occurring lead without manmade interference. As a result, true background within the Response Area is higher than it will be outside the Response Area. Also included as Exhibit 12 is a map depicting the existence of naturally occurring lead-bearing minerals in soils in the vicinity of the Site.

The high percentage of samples with greater than 400 ppm lead in areas near where pre-Civil War surface digging occurred shows lead is naturally occurring in the surface soils in those areas.

CERCLA and the NCP require that EPA fully evaluate the occurrence of naturally occurring lead at the Site and develop a remedial alternative that appropriately excludes it from its scope so as not to require response action with respect to such materials. EPA's failure to acknowledge, much less evaluate and characterize the extent to which naturally occurring lead contributes to lead detected in yards, is arbitrary, capricious, inconsistent with the NCP and contrary to CERCLA.

E. The EBL Data Shows no Correlation with the Mine Waste Sources or with Lead Detections in Yards.

1. The arbitrary nature of EPA's assumptions is supported by the Interim Action Report, the RI and the subsurface soil study, all of which show no correlation between BLLs and the piles or yard levels.

From the beginning of its response actions at the Big River Mine Tailings Site, EPA has assumed that all lead detected was related to the mill waste Piles associated with the mining activities of the late 1800 and 1900s. At no point in its investigation and characterization of the Site has EPA given any regard to, or made any effort to

characterize the extent to which other sources of contamination exist. As the Site characterization progressed, it became apparent that a proper analysis of the data must be done to determine whether other sources of lead were contributing to soil contamination and to the occurrence of EBLs in and around the Response Area. It became indisputable that EPA's failure to comply with its obligation under the NCP to evaluate other sources would result in a remedial action that exceeded its statutory and regulatory authority and that was not necessary to protect human health and the environment. Yet, when Doe Run presented its analyses of the data to EPA, first in the 2004 Interim Action Removal Report, and later in the 2010 draft Feasibility Study and the 2011 Draft Subsurface Investigation Reports, EPA ignored the data. In fact, with regard to the draft Feasibility Study and Subsurface Investigation Reports EPA went further and compelled Doe Run to remove any discussion of alternative sources or analysis of data that suggested a lack of correlation between EBLs and mine waste. Remarkably, with regard to the Feasibility Study, EPA stated :

> Much of this section appears to argue that high lead concentrations in subsurface soils and soils away from the tailings piles may be the result of naturally occurring mineralization or processes or sources unrelated to mining. The entire area contained a highly industrialized complex of many mine, mill processing, transportation and other facilities in addition to the waste disposal area, all of which could be sources of soil contamination away from the tailing piles and subsurface soil. Therefore, generalized conclusions about contamination sources should be avoided in the FS."[25]

In addition, Doe Run's 2011 Draft Subsurface Soil Investigation in Residential Areas[26] presented an assessment of potential sources for the elevated lead concentrations in residential soil, using both the thickness of elevated lead concentrations detected in the

[25] See Exhibit 13. Letter to Doe Run from Jason Gunter, EPA, dated July 9, 2010, and enclosed comments and report.
[26] See Exhibit 14. Draft Subsurface Soil Investigation in Residential Areas (NewFields 2011).

58 yard soil vertical sampling profiles as well as the relationship of lead concentrations to distance from the identified potential sources (the Piles, railroad ballast, highway de-icing). EPA demanded this analysis be removed from the final Report, stating it believed the analysis was "a lot of speculative language which is uncharacteristic of a technical report...and revise...how the data will be used based on the purpose and objectives of the study." [27] EPA failed to consider that one of the objectives of the Sampling and Analysis Plan – Subsurface Soil in Residential Area, St. Francois County Mined Areas included "potentially identifying the source or cause of elevated lead concentrations that are found in the subsurface (especially if lead concentrations are found at higher concentrations at depth compared to the surface)."

The discussion that EPA identified as "speculative" was prepared to address this objective and was highly relevant to development of an accurate conceptual site model. As discussed above, the question of the "source or cause of elevated lead concentrations" is complex due to both naturally-occurring and man-made nature of the sources for and transportation of lead at the Site. This data was presented to further understand the nature of this complexity and the resulting uncertainties. Yet EPA arbitrarily refused even to allow it in the record, much less give it any consideration. By refusing to allow Doe Run to include such information in its reports, or give the analysis any consideration, EPA has failed to identify all potential sources as required by the NCP.

The data presented in the Interim Action Removal Report (NewFields 2004) demonstrate that the BLLs measured in St. Francois County's Mined Areas (Response Area) have no correlation to yard soil lead concentrations or distance from the Piles. As seen in Figure 7, the distribution of the elevated lead concentrations within the surface

[27] See Exhibit 15. Letter to Doe Run from Jason Gunter, EPA, dated June 22, 2011.

soils does not appear primarily attributable to natural transport processes (wind or water) but continues to confirm the Focused RI assessment that elevated lead in residential yards is due primarily to mechanical redistribution by man and LBP and naturally occurring mineralization, and is widely distributed over the residential areas.

Figure 2 of the Subsurface Soil Report 11x17

Figure 7 Average Surface Soil Lead Concentrations in Yard Quadrant Samples

The lack of correlation between soil lead detections and known sources of mining waste, and the lack of correlation between EBLs and known sources, demonstrates that EPA has insufficiently evaluated or addressed the complexities of this Site, particularly with regard to evaluating the extent to which LBP, the use of chat as agriculture lime and naturally occurring lead, have contributed and are continuing to contribute to contamination at the Site, and thus contributing to the potential risks at the Site.

This fundamental failure is reinforced by the fact that for the past five years, BLLs in St Francois County have been below the level sought by EPA in its Remedial Action Objective. As a result, EPA is proposing a remedy that 1) it has not demonstrated to be necessary to protect human health; 2) responds to and would require remediation of contamination over which EPA has no authority under CERCLA; and 3) is inconsistent with the NCP.

The following presents the entire dataset from the Interim Action, Halo and Draft Subsurface Soil Investigation correlation charts showing the relationship of average yard lead concentration and BLLs (as measured during the Interim Action) versus distance from the Piles, from railroads (historic and active), and from major highways (previous Figures 1 and 3 have been repeated for ease of comparison).

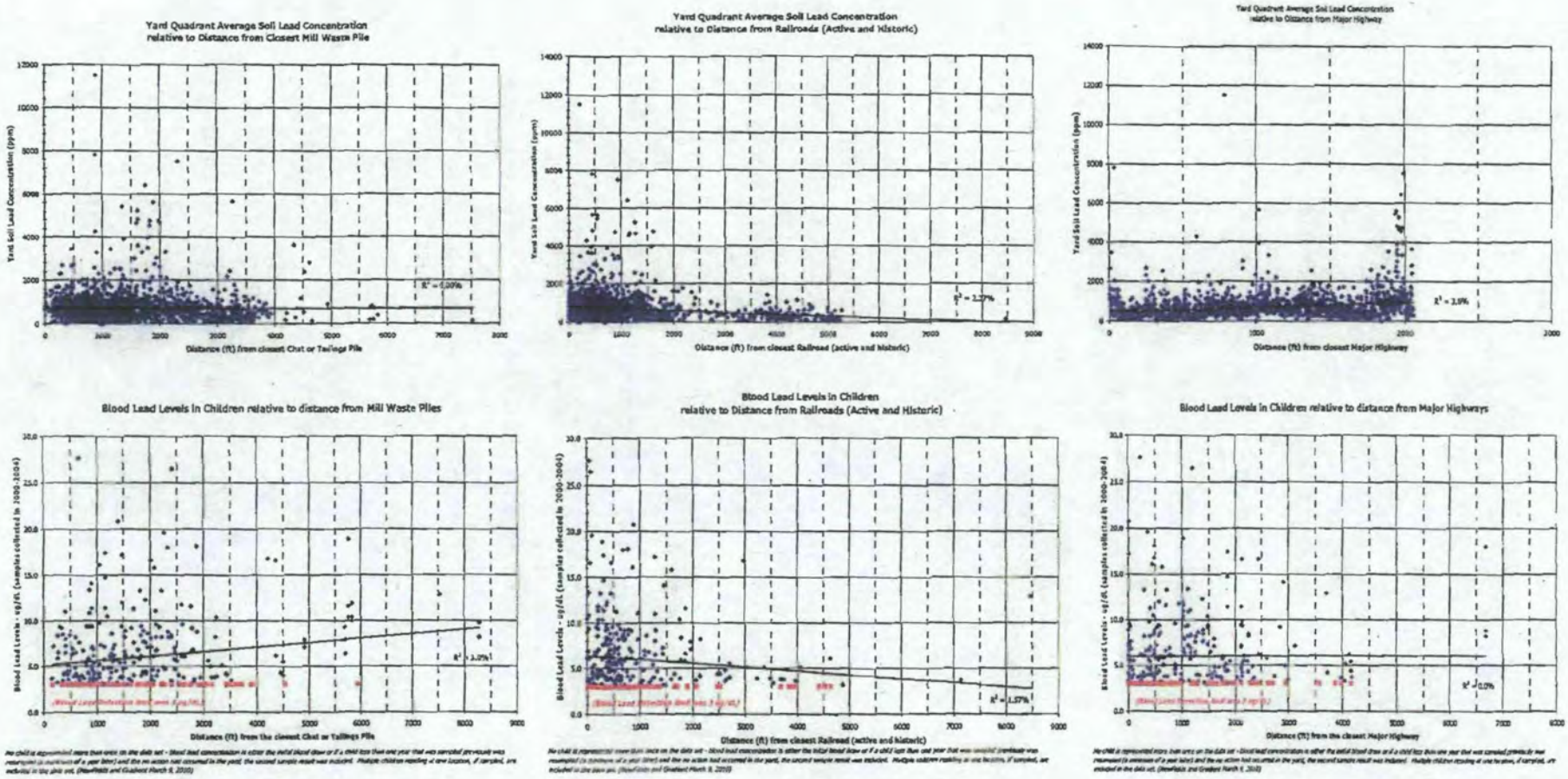


Figure 8 Correlation of Average Yard Soil Lead Concentrations and BLLs to closest Mill Waste Pile, Railroad, and Major Highway

II. EPA'S PROPOSED CLEANUP LEVELS FOR SUBSURFACE SOILS AND THEIR APPLICATION TO NON-RESIDENTIAL PROPERTIES ARE UNSUPPORTED BY THE DATA.

The risks in the HHRA are calculated based on the average soil lead level in a residential yard (consistent with lead risk assessment guidance) (EPA, 2009, see page 4-6). However, the Proposed Plan calls for excavation of any quadrant with a sample above 400 mg/kg even if the yard average (average of all quadrants) is below 400 mg/kg. This remediation strategy is not consistent with how the risk assessment was done, and requires more remediation than needed in order to achieve the Remedial Action Objective (RAO) (stated in the Proposed Plan) to: "Reduce the risk of exposure of young children (children under seven years old) to lead such that an individual child or group of similarly exposed children have no greater than a 5% chance of exceeding a blood lead level of 10 µg/dL".

Note that when a cleanup level represents a target average concentration for a property, the remediation should be conducted such that the post-remediation property average will be at or below the cleanup level. If every yard quadrant that exceeds the cleanup level is remediated, this may over-achieve the cleanup level on average. At the soil cleanup level of 400 mg/kg selected in the Proposed Plan, evaluating the need for remediation on the basis of risk (average concentration) rather than on the exceedance of a single sample would likely reduce the number of properties requiring remediation while still achieving the RAO. It will also serve to relieve homeowners of intrusion of unnecessary yard removals.

III. THE BOUNDARY AREA OF THE PROPOSED REMEDY IS NOT CLEARLY DEFINED AND MAY ARBITRARILY EXTEND BEYOND DEFINED RESPONSE AREA.

A. EPA Must Clarify that the Proposed Remedy Pertains only to the Defined Response Area.

The Interim Action and Halo administrative orders on consent defined the "Response Area" to include generally the distances from the Piles discussed above and the historic mining area of St Francois County. The Response Area, which is depicted in Figure 1 in the Proposed Plan, is the area designated by EPA to be studied for the purpose of planning a remedial action. The Focused RI gathered data from within the Response Area. The cost estimates presented and evaluated in the Feasibility Study are based on the number of residences within the Response Area. The evaluation of remedial alternatives in light of the nine criteria was based on the Response Area representing the boundary of OU 1.

Yet the Proposed Plan is unclear as to the geographic scope of the OU 1 proposed remedy. The Plan states that the "communities of Farmington, Bismarck and Iron Mountain Lake are outside the mining area but will be included in future investigations." It is unclear whether EPA intends that such investigation occur as part of this proposed remedy. Including in this remedy any areas outside the Response Area will invalidate the cost estimates for the alternatives, and thus will render the evaluation of the nine criteria required by CERCLA and the NCP invalid and arbitrary.

B. EPA's Broad Definition of "Residential Properties" is unsupported by the Record.

For the purpose of this proposed remedy, EPA broadly defines "residential property" as "properties that contain single- and multi-family dwellings, apartment complexes, vacant lots in residential areas, schools, daycare centers, playgrounds, parks and green ways." This definition is overly broad for several reasons. First, by including vacant lots and greenways, EPA is including potentially many more parcels than were included in the cost estimates for the remedial alternatives, thus invalidating the evaluation of those alternatives in light of the nine CERCLA criteria, particularly cost-effectiveness. The costs estimates were based on the number of

residences provided by EPA. Additionally, EPA's proposal to apply its cleanup levels to these parcels is unsupported by the record and would be arbitrary and capricious.

The Feasibility Study Report states, "On April 14, 2010, EPA provided an estimate of '7,036 occupied houses total, not counting the houses in Doe Run,' based on the most recent census data for each city in the Response Area.'" 93 yards were added for the town of Doe Run, resulting in a total of 7,129 yards. By adding an unknown number of undefined "vacant lots," and "green ways" to the remedial action will greatly affect the costs and fundamentally alter and invalidate EPA's evaluation of the remedial alternatives, particularly with regard to the cost-effectiveness of the proposed remedy. The Focused RI defined "residential yards" to be the area within 200 feet of the house on each property. The Proposed Plan offers no such definition for vacant lots or green ways, which can and in fact do, encompass many acres throughout the Response Area and St. Francois County.

C. EPA's Proposed Cleanup Levels for Vacant Lots, Parks and Green Ways is Unsupported by the Record and Contrary to Guidance.

In addition to the cost uncertainties, EPA relies on its Human Health Risk Assessment in support of its proposed cleanup levels. The Risk Assessment is based on exposure scenarios that do not apply to vacant lots, parks and green ways, resulting in an arbitrary and capricious decision with regard to those properties. There is no information in the administrative record to support EPA's conclusion that applying the proposed cleanup levels to these properties is necessary to protect human health. Children may not be exposed to vacant lots, parks, or greenways every day of the year, or obtain 100% of their daily soil/dust ingestion from an area that is visited for only a portion of the day. Therefore, exposures in these areas are not accurately described by using a residential scenario, and risks should be evaluated using a recreational scenario. There is no data or other basis in the record for determining that these parcels warrant

remediation. Even if there were, separate cleanup levels should be derived for these non-residential areas as a cleanup level of 400 mg/kg is not be appropriate for areas with a lower frequency of contact.

D. EPA's Application of Residential Cleanup Levels to Non-Residential Properties is Contrary to HUD Guidance.

US Department of Housing and Urban Development, which has primary responsibility over abatement of lead in households, has issued guidance on soil-lead hazardous for play areas. Specifically, the HUD Guidance states the "soil-lead hazard for play areas frequented by children under six years of age is bare soil with lead equal to or exceeding 400 parts per million." 24 CFR § 35.1320(b)(2)(ii)(A). However, for the remainder of the yard, no soil lead hazard exists where bare soil does not total more than 9 square feet per property with lead "equal to or exceeding an average of 1,200 parts per million." 24 CFR § 35.1320(b)(2)(ii)(B). In applying its proposed cleanup levels to vacant lots, parks and green ways without regard to existence of bare soil or child impact, EPA has ignored this guidance, and done so without any site-specific justification. The result is an arbitrary and capricious application of cleanup levels without regard to whether they are necessary to protect human health or the environment.

IV. EPA's PROPOSED SELECTION OF ALTERNATIVE 3 DOES NOT PRESENT THE BEST BALANCE OF TRADE-OFFS AND IS INCONSISTENT WITH SECTION 121 AND THE NCP.

Section 121 of CERCLA and 40 CFR § 300.430(e)(9) identify criteria against which EPA must evaluate alternatives for remedy selection. EPA must also identify other pertinent advisories, criteria or guidance in a timely manner. The Agency must do a detailed analysis consisting of an assessment of individual alternatives against each of the nine evaluation criteria and a comparative analysis that focuses upon the relative performance of each alternative against those criteria. The following are the nine criteria EPA is required to evaluate:

1. Overall protection of human health and the environment
2. Compliance with ARARs
3. Long-term effectiveness and permanence
4. Reduction in toxicity, mobility and volume through treatment
5. Short-term effectiveness
6. Implementability
7. Cost
8. State Acceptance
9. Community Acceptance

In its Proposed Plan, EPA offered a flawed evaluation of the remedial alternatives in support of its decision to select Alternative 3.

A. EPA misstated Alternative 2 as it was presented in the FS.

In its description of Alternative 2, EPA erroneously states that a visual barrier will only be placed if subgrade soils are greater than 1,200 ppm rather than greater than 400 ppm as stated in the FS. Alternative 2 as set forth in the FS, is consistent with the yard soil removals that have been conducted in St Francois County since 2000 under the Interim Action and Halo Removals. EPA's Plan states that only 7% or 280 yards would require these barriers and the accompanying institutional controls. However, the FS stated that under Alternative 2, up to 94% (approximately 3,760 yards), or potentially as few as 12% (approximately 480 yards) if barrier placement is based on 6-inch vertical subgrade composites rather than subgrade surface samples, would be required under Alternative 2 (NewFields 2011).

B. EPA Ignored Aspects of Alternative 3 that do not compare favorably to Alternative 2.

Under Alternative 3, the excavations would be as deep as 24 inches and visual barriers would be placed where the subsurface soil exceeds the 1,200 ppm lead. The following aspects of this alternative do not compare favorably with Alternative 2:

- Alternative 3 generates an additional estimated 32,700 cubic yards of (untreated) waste soil that would place a burden on the repository sites;
- Alternative 3 requires a matching volume of additional topsoil for fill;
- Transport of the additional volumes requires an estimated 5,460 extra haul trips, increasing the risk of traffic accidents and fatalities and increasing road damage from heavy trucks on county streets and roadways;
- Time to excavate and test at the 12" depth would potentially lengthen yard removals and therefore may lengthen the overall time frame beyond 7 years and may prompt decisions to make further excavation decisions with XRF *in situ* or horizontal composite sampling of the subgrade versus a 6 inch depth profile. This could significantly increase the number of removals at depth than predicted by the final Subsurface Soil Investigation analysis increasing the predicted waste production, clean soil consumption, and truck haul mileage being used to justify Alternative 3; and
- The use of visual barriers only for soils exceeding 1,200 ppm lead may allow exposure and transport to the surface of subsurface soils that, even when mixed with surface soils, will exceed the 400 ppm lead.

C. EPA Arbitrarily Disregarded ATSDR's recommendation regarding Maintenance of "One-Call" Database for Notification Purposes.

The Agency for Toxic Substances and Disease Registry ("ATSDR") issued a Health Consultation for the Omaha Lead Site (ATSDR 2000) that recommends the location of **all**

remediated yards where surface and subsurface soils greater than 400 ppm remain in place be maintained in a countywide database and be accessible for "one-call" type notification (a form of institutional control) so that if large excavations occur in the yard the homeowner is aware of the possible recontamination.[28] Adherence to ATSDR's recommendation would be a reasonable and implementable form of institutional control, coupled with the visual barriers, that would alert the excavator to these controls.

D. EPA's evaluation against the Nine Criteria was flawed.

With regard to protection of human health and the environment, EPA's analysis of this criterion was fundamentally flawed. First, EPA summarily concluded that the "no action" alternative would not be protective. Based on the information set forth above, particularly the reduction of EBLs in the Response Area, which has occurred despite, not because of the yard removal work, and in fact is more related to reduction in LBP, lead gas, lead in toys, etc., and to the State and County educational efforts, it is unclear that extensive additional yard remedial work will provide the presumed risk reduction. The record does not support EPA's conclusion that "no action" with respect to yards would not be protective. In other words, the data shows that EPA's Remedial Action Objective can be achieved without expenditure of more than $100 million in yard soil remediation.

With regard to protectiveness, the only distinction EPA draws between Alternatives 2 and 3 is that Alternative 3 would be less reliant on institutional controls. First, EPA's conclusion is flawed in that it underestimates the number of yards that will require further action at 12 inches. EPA makes no mention of the uncertainty behind its estimate that only 7 percent of yards would have greater than 1200 ppm at the 12 inch subgrade. The June 13, 2011 Draft Subsurface Soil Investigation in Residential Areas, St. Francois County Mined Areas (Draft Subsurface Soil

[28] Exhibit 16. Health Consultation for Omaha Lead Site. ATSDR 2000.

Report) provided a comparison of subgrade data for the benefit of assessing the uncertainty of this statistic. This statistic, as presented in both versions of the Subsurface Soil Report as well as mentioned in the Proposed Plan, is based on 58 yards out of the estimate of 7,036 yards in the Site or less than 1 percent. The Draft Subsurface Soil Report stated that "one point per yard may predict a highly optimistic view that only 7 percent of yards would actually require further action at a 12-inch subgrade. An assumption of 27 percent based on previously remediated yards with multiple yard quadrants should be considered as a reasonable conservative assumption for the purposes of the Feasibility Study regarding required action at 12 inches." In comments on this draft EPA stated that all conclusions should be stated in terms of the 58 sampling locations and that the discussion was "speculative" and should be removed from the report. While Doe Run disagreed that a discussion was "uncharacteristic of a technical report," it removed the discussion as well as other conclusions to which EPA took exception. Much of the discussion and the resulting conclusions presented the uncertainty behind using statistics exclusively from the 58 sampling locations rather than comparisons to all the subgrade data that had been collected over the last 10 to 11 years of yard soil removals. This was another example of EPA's prejudice to the belief that the mine waste piles within the county are the sole source of the lead and that elevated lead concentrations in residential yards will decrease with relative distance from the waste piles. The Draft Subsurface Soil Report provided both a discussion of the uncertainty of the subgrade statistics as well as a discussion of potential other source relationships to residential yards.

Also with regard to protectiveness, EPA had already made the determination, in conjunction with the Interim Action and Halo Removals, that the removal methodology presented in Alternative 2 was protective. EPA has provided no support in the record for determining it is no longer protective, and that Alternative 3 is warranted instead, or that

Alternative 3 presents enough added protectiveness to justify the estimated minimum of $10 million in added costs associated with that alternative.

Finally, in 2010 EPA determined, in connection with the Washington County Lead District – Old Mines Superfund Site in Washington County, Missouri that a remedial alternative substantially equivalent to Alternative 2 would be protective.[29] EPA offers no explanation for why it would be protective in Washington County, but somehow less so in St. Francois County.

With regard to short-term and long-term effectiveness, Doe Run disagrees with EPA's conclusion that excavating to 24 inches will be more effective. On the contrary, placement of a visual barrier at 12 inches will serve as a constant reminder to property owners of the potential presence of lead below that level. Moreover, if combined with a "one-call" type database, as recommended by ATSDR, this alternative would be more protective in the long-term.

With regard to cost, Alternative 3 comes at a significantly higher cost, but with no corresponding added protection to justify the expenditure of an estimated extra $10 million. In addition, because Alternative 3 involves excavation to a greater depth than was done in the Interim Action and Halo Removals, Alternative 3 appears to require that those yards be revisited. The significant cost that would be associated with that work is not included in the estimate for Alternative 3.

But most significantly with regard to cost-effectiveness, as demonstrated in these comments, EPA has failed to show that the lead from mining wastes, and not other sources, continues to pose an unacceptable risk to human health. Nor has EPA shown that expenditure of $100 million in additional yard removal is the most cost-effective means of addressing whatever residual risk may remain as a result of mining waste.

---

[29] See Exhibit 10.

V. THE PROPOSED PLAN HAS NUMEROUS MISSTATEMENTS OF FACTS AND KEY OMISSIONS OF FACT.

The Proposed Plan contains several key errors and/or omission of key facts that warrant correction and clarification for the record. These errors and omissions further demonstrate the arbitrary and capricious nature of EPA's proposed remedy selection.

1. The Proposed Plan's description of the Site's Operable Units ("OUs") is confusing, particularly in terms of how each operable unit relates to the others, and the extent to which they appear to overlap. The Proposed Plan identifies the OUs as follows:

- OU- 00 – Consists of the removal actions at the pile locations (Bonne Terre, Leadwood, Federal, Elvins and National), time-critical residential properties, and high child exposure areas (i.e. playgrounds, daycare facilities).
- OU-1 – consists of the stabilization of the Desloge Pile (stabilized in 2000) and remediation of residential properties and high childe exposure areas exceeding screening levels of 400 ppm in St Francois County. OU-1 also focuses on properties in the towns of Park Hills, Desloge, Bonne Terre, Leadwood, Leadington, and Doe Run. This also includes the rural residential properties surrounding these communities.
- OU-2 - includes the remedial action to address terrestrial ecological risks and impacted watersheds associated with the mine wastes. OU-2 will also include future work on the Doe Run Pile.
- OU-3- consists of the Interim Program and Halo Removal Action to address elevated Blood lead at the site. The final ROD for the other OUs will be issued in the future.

There appears to be significant overlap between these OUs, and it is unclear how each operable unit relates to the others, or to this Proposed Plan, which is identified as addressing only OU 1. For example, as described in the Proposed Plan, OU-00, OU-1 and OU-3 all address residential properties and CHUAs. The record is unclear as to how each Operable Unit is distinguished from the other, the extent to which this proposed remedy addresses risks being addressed in other OUs, and the extent to which EPA anticipates additional records of decision to address residential risks in connection with the other OUs. EPA should clarify its record in this regard.

2. The Proposed Plan states on Page 2 that mine wastes have contaminated soil, sediment, surface water and groundwater. Yet on Page 12, EPA concedes that elevate lead concentrations in groundwater (less than 15 ug/l) occur "sporadically and were limited to four wells and could not be linked to the mining activities at the Site." Any statement about mining waste contaminating groundwater should be removed from the Proposed Plan and any decision document.

3. The Proposed Plan (page 7) discusses the 1998 Lead Exposure Study conducted by the MDOH and the high percentage of children in St. Francois County with elevated blood lead levels (17 percent). However, the plan does not discuss the most recent blood lead levels for the county that were reported in the FS, "Missouri Department of Health and Senior Services (MDHSS) reports that the percent of elevated blood lead in children less than 6 years of age in St. Francois County has dropped from 12 percent reported in the 2000 calendar year to 1 percent in the 2010 calendar year (MDHSS 2003, 2011b)." While we understand EPA's argument that the IEUBK model and the potential for high bioavailability for lead in yard soils <u>predicts</u> the <u>potential</u> for the children in St. Francois County to have elevated blood leads, the statistics for

the county demonstrates that the county's child EBL levels are dropping either without the benefit of soil yard remediation as proposed by EPA and are likely due to an improved education of lead issues.

4. Page 7 of the Plan states, "the Subsurface Soil Report concluded that 93 percent of the elevated lead concentrations were found in the upper 12-inches of soil." This is a misrepresentation of the Subsurface Soil Report which actually concluded that "Seven (7) percent of the yard quadrants after a 1 foot excavation would have confirmation subgrade soil lead concentrations greater than 1,200 ppm." The FS uses this conclusion to assess the potential for an excavation to require further excavation under Alternative 3 (the EPA selected alternative). We find using this statistic as a conclusion regarding percentage of elevated lead concentrations confusing and misleading.

5. The Proposed Plan (page 7) states that the 2004 removal action (Halo) is ongoing and then (on page 10) states that 1,000 properties remain to be addressed under the Halo Removal Action. These are the yards sampled under the Interim Action but were not included in the Halo Removal Action as they were beyond the Halo (typically between 500 to 1000 feet from the piles). These 1000 yards appear to be in the 4000 yards that are covered under the Proposed Plan with the exception of this statement. As we (Doe Run) are implementing the Halo Removal Action and we find these statements confusing, we are unclear as to what EPA is trying to relay to the public by these statements.

6. Page 8 of the Plan states, "(a)t the end of the Interim Action (March 30, 2004), 1,955 residential yards had been sampled and 563 homeowners had refused sampling. Under the Halo Removal Order, 27 additional yards have been sampled; of these yards 22 were sampling refusals during the Interim Action, two were not within the Halo but were sampled due to the

presence of a child with elevated blood-lead levels, and two were childcare facilities." It is unclear where EPA derived the statistics for yards sampled under the Halo Removal Action. The FS states; "At the end of the Interim Action (March 30, 2004), 1,955 yards had been sampled and 563 homeowners had refused sampling, for a 78 percent sampling rate. As of January 31, 2011, 2,057 residential yards and 12 CHUAs had been sampled and 532 property owners had refused yard soil sampling with a final residential yard sampling refusal rate of 21 percent." Using these statistics and noting that 45 yards were sampled as part of the Subsurface Soil Investigation, an additional 69 yards/CHUAs were sampled as part of the Halo Removal Action. Of these 69 yards and CHUAs, 3 were parks, 5 were child care or school playground facilities, 29 were previous residential yard refusals (all but one located within the Halo), 17 were non-Halo residential yards sampled due to the presence of a child with elevated blood-lead levels, and the remaining 15 yards were primarily new construction within the Halo.

7. The Plan makes the statement "The communities of Farmington, Bismarck and Iron Mountain Lake are outside of the mining area but will be included in future investigations." It is unclear what the purpose of this sentence is and its relation to the Site. As stated above, the FS, including cost estimates, were based on the Response Area only. These communities lie outside the Response Area. If EPA contemplates including them or other locations outside the Response Area, it will render the cost estimates inaccurate, as well as EPA's evaluation of the cost-effectiveness of the proposed remedy.

8. This Plan is confusing as to what would make a residence qualify for inclusion in the remedy. The Plan states on pages 14 and 16 that "Residential properties where no quadrant samples exceed 400 ppm lead would not be addressed under this alternative [2-3]". And then later in Alternative 2 on page 14 states, "Excavation of a residential property would be triggered

when the highest recorded soil sample for any defined area of the property contains greater than or equal 400 ppm lead." Alternative 3 does not include this statement. However the cost tables included in the Proposed Plan are from the FS and they show driveway only, garden only, and play area only yards in both alternatives costs.

9. The Plan states "The physical barrier will function as a warning that digging deeper will result in exposure to soils contaminated with lead at a level that EPA has determined to be a human health concern." The concentration for which a visual barrier is placed under the Proposed Plan is 1,200 ppm. However, in the HHRA summary and discussion the plan states on page 12 that "a lead soil concentration of 400 ppm to ensure that a child has less than a 5 percent probability of having a blood-lead level exceeding 10 ug/dL." And the only mention of the 1,200 ppm in the HHRA is in the statement "In past experience at Superfund sites where lead is the contaminant of concern, the EPA generally selects a residential soil cleanup level within the range of 400 ppm to 1,200 ppm for lead..." The RAO section of the Proposed Plan (pages 12-13) makes it clear that exposures above 400 ppm lead under the assumed exposure conditions would create an unacceptable risk for a child. We believe EPA needs to clearly state its rationale for the acceptance of soil lead concentrations between 400 and 1200 ppm lead at depth; as mentioned above we do not necessarily agree with EPA's interpretation of the ATSDR document especially in regard to the lack of institutional controls under these conditions.

VI. CONCLUSIONS

Doe Run has worked cooperatively with EPA since the early 1990s to respond to potential risks to human health and the environment that might have been posed as a result of historic mining activities in the Old Lead Belt. As a member of that community, Doe Run places a high priority on the health and welfare of its residents. Since 1994, Doe Run has spent

approximately $62 million toward stabilization of the Piles, investigation and remediation of residential yards, and BLL sampling in children. Doe Run has been fully responsive to EPA's demands with regard to response actions at the Site.

At the same time, EPA has continually refused to consider, much less evaluate the extent to which sources of lead other than mining wastes are contributing to the potential threat to human health and the environment, including, in particular, blood lead levels. Doe Run does not disagree with EPA's desire to reduce BLLs in children. The efforts of EPA, HUD and state and local governments to reduce lead levels in children are important and worthwhile. However, EPA's continuing resistance to consider and evaluate the extent to which sources other than mining wastes are contributing to blood lead levels is a mis-application of its CERCLA authorities.

The significant amount of work already performed at the Site has already substantially abated much, if not all the potential risk from historic mining wastes. State and local programs directed to lead education and lead paint remediation have been dramatically successful both nationwide and locally, as shown by the significant reduction in blood lead levels in the Old Lead Belt area. But it must be noted that these reductions appear unrelated to the yard cleanup work that has been performed to date. This, coupled with the lack of correlation between identified mining waste sources and BLLs, calls into doubt EPA's assumptions that spending another $100 million to conduct removals at more than 4,000 yards will provide substantial additional protection.

Based the foregoing, Doe Run strongly urges EPA to take additional time to more carefully evaluate the available data and more carefully evaluate the extent to which mining waste, and not other sources of lead, contribute to the risk. Only then can EPA select a remedy

that more accurately presents the best balance of trade-offs as required by CERCLA, is protective with regard to the risk actually posed, and is implementable and cost effective.

APPENDIX B

REMEDIAL DESIGN/REMEDIAL ACTION

STATEMENT OF WORK

OPERABLE UNIT 01

BIG RIVER MINE TAILINGS SUPERFUND SITE

St. Francois County, Missouri

EPA Region 7

TABLE OF CONTENTS

1. INTRODUCTION 1
2. COMMUNITY INVOLVEMENT 2
3. REMEDIAL DESIGN 3
4. REMEDIAL ACTION 3
5. REPORTING 8
6. DELIVERABLES 9
7. SCHEDULES 15
8. RELATED ORDERS 16
9. STATE PARTICIPATION 17
10. REFERENCES 17

1. INTRODUCTION

1.1 **Purpose of the SOW**. This Statement of Work (SOW) sets forth the procedures and requirements for implementing the Work.

1.2 **Structure of the SOW**.

- Section 2 (Community Involvement) sets forth EPA's and Settling Defendant's (SDs) responsibilities for community involvement.
- Section 3 (Remedial Design) sets forth the RD.
- Section 4 (Remedial Action) sets forth requirements regarding the completion of the RA, including primary deliverables related to completion of the RA.
- Section 5 (Reporting) sets forth SD's reporting obligations.
- Section 6 (Deliverables) describes the content of the supporting deliverables and the general requirements regarding SD's submission of, and EPA's review of, approval of, comment on, and/or modification of, the deliverables.
- Section 7 (Schedules) sets forth the schedule for submitting the primary deliverables, specifies the supporting deliverables that must accompany each primary deliverable, and sets forth the schedule of milestones regarding the completion of the RA.
- Section 8 (Related Orders) addresses outstanding requirements of Related Orders.
- Section 9 (State Participation) addresses State participation.
- Section 10 (References) provides a list of references, including URLs.

1.3 The Scope of the Remedy includes, with respect to the CD Properties to Be Remediated, the actions described in Section II, I. Description of Alternatives, Alternative 3: Soil Removal with 24 inch Excavation with limited Institutional Controls, of the ROD, which requires remediation of residential properties where a quadrant sample result shows greater than or equal to 400 parts per million (ppm) lead. The selected remedy includes excavation of residential soil until lead concentrations are below 400 ppm lead in the top 12 inches, or below 1,200 ppm below 12 inches down to 24 inches below ground surface (bgs). Excavation will continue until either a maximum depth of 24 inches; or until underlying soils at the bottom of the excavation are below 1,200 ppm lead. The remedy requires placement of a visual barrier if at 24 inches bgs the lead soil concentration is greater than 1,200 ppm lead. The remedy requires transportation of contaminated soil to on-site soil repositories, replacement of contaminated soil with clean backfill and vegetative cover and institutional controls. The contaminated soil will be placed in soil repositories. After final use as a soil repository, each repository will be capped with a clean 12 inch layer of soil, and revegetated.

1.4 It is a goal of this SOW to define the approach to remedial action so as to maximize, to the extent practicable, efficiency in implementation of the remedy over time. Toward that end, SD is provided flexibility to organize sampling and remediation in ways that maximize geographic efficiency, including grouping properties for purposes of sampling and remediation to minimize repeated disruptions to affected communities. SD and EPA

will cooperate to effectuate this goal in the planning and implementation of sampling and remediation action.

1.5 The terms used in this SOW that are defined in CERCLA, in regulations promulgated under CERCLA, or in the Consent Decree (CD), have the meanings assigned to them in CERCLA, in such regulations, or in the CD, except that the term "Paragraph" or "¶" means a paragraph of the SOW, and the term "Section" means a section of the SOW, unless otherwise stated.

2. COMMUNITY INVOLVEMENT

2.1 Community Involvement Responsibilities

(a) EPA has the lead responsibility for developing and implementing community involvement activities at the Site. Previously, EPA developed a Community Relations Plan (CRP) for the Site. Pursuant to 40 C.F.R. § 300.435(c), EPA shall review the existing CRP and determine whether it should be revised to describe further public involvement activities during the Work that are not already addressed or provided for in the existing CRP.

(b) If requested by EPA, SD shall participate in community involvement activities, including participation in (1) the preparation of information regarding the Work for dissemination to the public, with consideration given to including mass media and/or Internet notification, and (2) public meetings that may be held or sponsored by EPA to explain activities at or relating to the Site. SD's support of EPA's community involvement activities may include providing online access to initial submissions and updates of deliverables to (1) any Community Advisory Groups, (2) any Technical Assistance Grant recipients and their advisors, and (3) other entities to provide them with a reasonable opportunity for review and comment. EPA may describe in its CRP SD's responsibilities for community involvement activities. All community involvement activities conducted by SD at EPA's request are subject to EPA's oversight. Upon EPA's request, SD shall establish a community information repository at or near the Site to house one copy of the administrative record.

(c) **SD's CI Coordinator**. If requested by EPA, SD shall, within 30 days, designate and notify EPA of SD's Community Involvement Coordinator (SD's CI Coordinator). SD may hire a contractor for this purpose. SD's notice must include the name, title, and qualifications of the SD's CI Coordinator. SD's CI Coordinator is responsible for providing support regarding EPA's community involvement activities, including coordinating with EPA's CI Coordinator regarding responses to the public's inquiries about the Site.

(d) SD shall participate in community involvement activities by developing a Health Education Program as required by the ROD. The Health Education Program shall be conducted in cooperation with EPA, the Agency for Toxic Substances and Disease Registry (ATSDR), the State, the Missouri Department of Health and

Senior Services (MDHSS) and the St. Francois County Health Department. The Health Education Program shall be described in a Health Education Program Plan, which will call for education activities that will primarily be conducted by the St. Francois County Health Department. Examples of education activities that may be included in the Health Education Program include: Working with the St. Francois County Health Department to track instances of elevated blood levels in children; Distribution of prevention information and literature; HEPA Vacuum cleaner loan program to houses subject to remediation with lead concentrations greater than or equal to 800 ppm and with young children present; Outreach to area physicians; Community education meetings; Family assistance; and special projects to increase awareness of heavy metal health risks; other projects developed in coordination with the government agencies set forth in this Paragraph.

3. REMEDIAL DESIGN

3.1 Remedial Design. A map and list of properties will be provided to SD.

4. REMEDIAL ACTION

4.1 RA Work Plan.

(a) SD shall submit a RA Work Plan (RAWP) for EPA approval. This site-specific plan gives a description of how the project will be managed. This includes, but is not limited to, the approach used, the general schedule, which includes the timeline and number of properties the Respondent expects to complete in monthly intervals, the resources required, the intended communication process with EPA, the Respondent's points of contact and responsibilities, a description of how property owner complaints or issues will be handled, how the Respondent shall interact with the respective road authority and maintain the roads, and when and how the Respondent shall employ dust suppression measures. The RAWP shall also describe the protocols and methods that will be employed to ensure quality landscaping and establishment of lawn growth. The RAWP shall also require that SD ensure the remediation work remains effective at a Residential Property for a minimum of 30 days after the property is revegetated; however, long-term O&M shall not be required at a Residential Property after the property has been revegetated. The RAWP shall also include the Repository Operation Plans, which describe the designated Soil Repositories. EPA's approval of the RAWP must be received by the Respondent before starting field activities. The RAWP must include the following specific information.

(1) Proposed RA Construction Schedule (MS Project or similar program) that lists the addresses of the properties planned to be sampled and remediated in the first season of RA implementation.

(i) The goal of the RA Construction Schedule is for SD to identify and refine the approach for efficiently implementing the remedy at the number of properties set forth in the Initial RA Construction

Schedule below by December 31 of each year. This Initial RA Construction Schedule shall be modified to account for the completion of the 2016 UAO Work in accordance with subparagraph (e) of this Section. Assuming 84% of the properties sampled by SD require remediation (the historical rate), the Initial RA Construction Schedule would be as follows, provided that if the Effective Date is on or after January 1, 2019 this schedule will be modified by mutual agreement of the SD and EPA:

Number of Properties To Be Completed	By December 31 of Year	Cumulative Number
150	2019	150
150	2020	300
250	2021	550
383	2022	933
383	2023	1316
383	2024	1699
383	2025	2082
383	2026	2465
383	2027	2848
383	2028	3231
383	2029	3614
383	2030	3997

(2) On an annual basis, by December 30 of each year, SD shall submit to EPA for approval a proposed revised RA Construction Schedule that lists the addresses of the properties planned to be sampled and remediated in the following season of RA implementation, taking account of new sampling data. The revised RA Construction Schedule shall include an annual update of the estimated capacity of its soil repositories, including the Leadwood Soil Repository. To maximize geographic flexibility and

minimize community disruption, SD may deviate from the RA Construction Schedule in any year provided that the cumulative number of properties completed by SD to date does not fall more than fifteen (15) percent below the cumulative number of properties to be completed by that date identified in the RA Construction Schedule, and provided further that the total number of properties to be completed is reached by December 31, 2030.

(3) For scheduling purposes, the number of homes per year for years 2022 through 2030 will be calculated, for inclusion in the submittal of the 2022 revised RA Construction Schedule, by evenly distributing the estimated number of properties remaining to be remediated over the nine years. The estimated number of properties remaining to be remediated will be calculated by multiplying the number of homes remaining to be sampled by the percentage of properties sampled by SD during the years 2018-2021 inclusive that are determined to require remediation, and adding the number of properties known to require remediation that, as of 2022, have not yet been remediated.

(b) The initial RAWP submission will include an updated health and safety plan that covers activities during the RA.

4.2 Meetings and Inspections

(a) **Preconstruction Conference**. SD shall hold a preconstruction conference with EPA and others as directed or approved by EPA and as described in the *Remedial Design/Remedial Action Handbook*, EPA 540/R-95/059 (June 1995). SD shall prepare minutes of the conference and shall distribute the minutes to all Parties.

(b) **Periodic Meetings**. During the construction portion of the RA (RA Construction), SD shall meet quarterly with EPA, and others as directed or determined by EPA, to discuss construction issues. If requested by EPA, SD shall distribute an agenda and list of attendees to all Parties prior to each meeting, and shall prepare minutes of the meetings and shall distribute the minutes to all Parties. EPA may reduce the frequency of such meetings.

(c) **Inspections**

(1) EPA or its representative may conduct periodic inspections of the Work. At EPA's request, the Supervising Contractor or other designee shall accompany EPA or its representative during inspections.

(2) Upon notification by EPA of any deficiencies in the RA Construction, SD shall take all necessary steps to correct the deficiencies and/or bring the RA Construction into compliance with the approved RAWP and any approved design changes. If applicable, SD shall comply with any schedule provided by EPA in its notice of deficiency.

4.3 Emergency Response and Reporting

(a) **Emergency Response and Reporting**. If any event occurs during performance of the Work that causes or threatens to cause a release of Waste Material on, at, or from the Site and that either constitutes an emergency situation or that may present an immediate threat to public health or welfare or the environment, SD shall: (1) immediately take all appropriate action to prevent, abate, or minimize such release or threat of release; (2) immediately notify the authorized EPA officer (as specified in ¶ 4.3(c)) orally; and (3) take such actions in consultation with the authorized EPA officer and in accordance with all applicable provisions of the Health and Safety Plan, the Emergency Response Plan, and any other deliverable approved by EPA under the SOW.

(b) **Release Reporting**. Upon the occurrence of any event during performance of the Work that SD 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, SD shall immediately notify the authorized EPA officer orally.

(c) The "authorized EPA officer" for purposes of immediate oral notifications and consultations under ¶ 4.3(a) and ¶ 4.3(b) is the EPA Project Coordinator, the EPA Alternate Project Coordinator (if the EPA Project Coordinator is unavailable), or the Regional Duty Officer at the Regional 24-hour telephone number (913) 281-0991, if neither Project Coordinator is available.

(d) For any event covered by ¶ 4.3(a) and ¶ 4.3(b), SD shall: (1) within 14 days after the onset of such event, submit a report to EPA describing the actions or events that occurred and the measures taken, and to be taken, in response thereto; and (2) within 30 days after the conclusion of such event, submit a report to EPA describing all actions taken in response to such event.

(e) The reporting requirements under ¶ 4.3 are in addition to the reporting required by CERCLA § 103 or EPCRA § 304.

4.4 Off-Site Shipments

(a) SD may ship hazardous substances, pollutants, and contaminants from the Site to an off-Site facility only if they comply with Section 121(d)(3) of CERCLA, 42 U.S.C. § 9621(d)(3), and 40 C.F.R. § 300.440. SD will be deemed to be in compliance with CERCLA § 121(d)(3) and 40 C.F.R. § 300.440 regarding a shipment if SD obtains a prior determination from EPA that the proposed receiving facility for such shipment is acceptable under the criteria of 40 C.F.R. § 300.440(b).

(b) SD may ship Waste Material from the Site to an out-of-state waste management facility only if, prior to any shipment, it provides notice to the appropriate state environmental official in the receiving facility's state and to the EPA Project Coordinator. This notice requirement will not apply to any off-Site shipments

when the total quantity of all such shipments does not exceed 10 cubic yards. The notice must 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. SD 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. SD shall provide the notice after the award of the contract for RA construction and before the Waste Material is shipped.

(c) SD may ship Investigation Derived Waste (IDW) from the Site to an off-Site facility only if they comply with Section 121(d)(3) of CERCLA, 42 U.S.C. § 9621(d)(3), 40 C.F.R. § 300.440, *EPA's Guide to Management of Investigation Derived Waste*, OSWER 9345.3-03FS (Jan. 1992), and any IDW-specific requirements contained in the ROD. Wastes shipped off-Site to a laboratory for characterization, and RCRA hazardous wastes that meet the requirements for an exemption from RCRA under 40 CFR § 261.4(e) shipped off-site for treatability studies, are not subject to 40 C.F.R. § 300.440.

4.5 Certification of RA Completion

(a) **RA Completion Inspection**. The RA is "Complete" for purposes of this ¶ 4.5 when it has been fully performed and the Performance Standards (PS) have been achieved at the CD Properties To be Remediated, regardless of whether other properties remain to be addressed. SD shall schedule an inspection for the purpose of obtaining EPA's Certification of RA Completion. The inspection must be attended by SD and EPA and/or their representatives.

(b) **RA Report**. Following the inspection, SD shall submit a RA Report to EPA requesting EPA's Certification of RA Completion. The report must: (1) include a certification by SD's Project Coordinator that the RA is complete; (2) be prepared in accordance with Chapter 2 (Remedial Action Completion) of EPA's *Close Out Procedures for NPL Sites* guidance (May 2011); and (3) be certified in accordance with ¶ 6.5 (Certification).

(c) If EPA concludes that the RA is not Complete with respect to the CD Properties to Be Remediated, EPA shall so notify SD. EPA's notice must include a description of any deficiencies. EPA's notice may include a schedule for addressing such deficiencies or may require SD to submit a schedule for EPA approval. SD shall perform all activities described in the notice with respect to the CD Properties to Be Remediated in accordance with the schedule.

(d) If EPA concludes, based on the initial or any subsequent RA Report requesting Certification of RA Completion, that the RA is Complete, EPA shall so certify to SD. This certification will constitute the Certification of RA Completion for purposes of the CD, including Section XVI of the CD (Covenants by Plaintiffs].

Certification of RA Completion will not affect SD's remaining obligations under the CD.

4.6 **Periodic Review Support Plan (PRSP)**. SD shall submit the PRSP for EPA approval. The PRSP addresses the studies and investigations that SD shall conduct to support EPA's reviews of whether the RA is protective of human health and the environment in accordance with Section 121(c) of CERCLA, 42 U.S.C. § 9621(c) (also known as "Five-year Reviews"). SD shall develop the plan in accordance with *Comprehensive Five-year Review Guidance*, OSWER 9355.7-03B-P (June 2001), and any other relevant five-year review guidances.

4.7 **Certification of Work Completion**

(a) **Work Completion Inspection**. SD shall schedule an inspection for the purpose of obtaining EPA's Certification of Work Completion. The inspection must be attended by SD and EPA and/or their representatives.

(b) **Work Completion Report**. Following the inspection, SD shall submit a report to EPA requesting EPA's Certification of Work Completion. The report must: (1) include certification by SD's Project Coordinator that the Work, including all revegetation activities related to the CD Properties to Be Remediated, is complete; and (2) be certified in accordance with ¶ 6.5 (Certification). If the RA Report submitted under ¶ 4.5(b) includes all elements required under this ¶ 4.7(b), then the RA Report suffices to satisfy all requirements under this ¶ 4.7(b).

(c) If EPA concludes that the Work is not complete, EPA shall so notify SD. EPA's notice must include a description of the activities that SD must perform to complete the Work. EPA's notice must include specifications and a schedule for such activities or must require SD to submit specifications and a schedule for EPA approval. SD shall perform all activities described in the notice or in the EPA-approved specifications and schedule.

(d) If EPA concludes, based on the initial or any subsequent report requesting Certification of Work Completion, that the Work is complete, EPA shall so certify in writing to SD. Issuance of the Certification of Work Completion does not affect the following continuing obligations: (1) activities under the Periodic Review Support Plan; (2) obligations under Sections VIII (Property Requirements), XX (Retention of Records), and XIX (Access to Information) of the CD; (3) Institutional Controls obligations as provided in the ICIAP; (4) and reimbursement of EPA's Future Response Costs under Section X (Payments for Response Costs) of the CD.

5. REPORTING

5.1 **Progress Reports**. Commencing with the first day of the third month following entry of the CD and until EPA approves the RA Completion, SD shall submit progress reports to EPA on a quarterly basis, or as otherwise requested by EPA. The reports must cover all activities that took place during the prior reporting period, including:

(a) The actions that have been taken toward achieving compliance with the CD;

(b) A summary of all results of sampling, tests, and all other data received or generated by SD;

(c) A description of all deliverables that SD submitted to EPA;

(d) A description of all significant activities relating to RA Construction that are scheduled for the next twelve weeks;

(e) An updated RA Construction Schedule, together with information regarding percentage of completion, 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) A description of any modifications to the work plans or other schedules that SD has proposed or that have been approved by EPA;

(g) A description of all significant activities undertaken in support of the CRP during the reporting period and those to be undertaken in the next twelve weeks;

(h) A description of all refusals of access and SD's best efforts to gain access to Affected Properties, including number of attempts to gain access; and

(i) A description of all significant activities undertaken to support the Health Education Program during the reporting period and those to be undertaken in the next twelve weeks.

5.2 **Notice of Progress Report Schedule Changes**. If the schedule for any activity described in the Progress Reports, including activities required to be described under ¶ 5.1(d), changes, SD shall notify EPA of such change at least 7 days before performance of the activity.

6. DELIVERABLES

6.1 **Applicability**. SD shall submit deliverables for EPA approval or for EPA comment as specified in the SOW. If neither is specified, the deliverable does not require EPA's approval or comment. Paragraphs 6.2 (In Writing) through 6.4 (Technical Specifications) apply to all deliverables. Paragraph 6.5 (Certification) applies to any deliverable that is required to be certified. Paragraph 6.6 (Approval of Deliverables) applies to any deliverable that is required to be submitted for EPA approval.

6.2 **In Writing**. As provided in **¶ 90** of the CD, all deliverables under this SOW must be in writing unless otherwise specified.

6.3 **General Requirements for Deliverables.** All deliverables must be submitted by the deadlines in the RD Schedule or RA Schedule, as applicable. SD shall submit all deliverables to EPA in electronic form. Technical specifications for sampling and

monitoring data and spatial data are addressed in ¶ 6.4. All other deliverables shall be submitted to EPA in the electronic form specified by the EPA Project Coordinator. If any deliverable includes maps, drawings, or other exhibits that are larger than 8.5" by 11", SD shall also provide EPA with paper copies of such exhibits.

6.4 Technical Specifications

(a) Sampling and monitoring data should be submitted in standard regional Electronic Data Deliverable (EDD) format, including one copy in PDF and one copy in MS Excel. Other delivery methods may be allowed if electronic direct submission presents a significant burden or as technology changes.

(b) Spatial data, including spatially-referenced data and geospatial data, should be submitted: (1) in the ESRI File Geodatabase format; and (2) as unprojected geographic coordinates in decimal degree format using North American Datum 1983 (NAD83) or World Geodetic System 1984 (WGS84) as the datum. Submissions should include the collection method(s). Projected coordinates may optionally be included but must be documented. Spatial data should be accompanied by metadata, and such metadata should be compliant with the Federal Geographic Data Committee (FGDC) Content Standard for Digital Geospatial Metadata and its EPA profile, the EPA Geospatial Metadata Technical Specification. An add-on metadata editor for ESRI software, the EPA Metadata Editor (EME), complies with these FGDC and EPA metadata requirements and is available at https://edg.epa.gov/EME/.

(c) Each file must include an attribute address for each Affected Property submitted. Consult https://www.epa.gov/geospatial/geospatial-policies-and-standards for any further available guidance on attribute identification and naming.

(d) Spatial data submitted by SD does not, and is not intended to, define the boundaries of the Site.

6.5 Certification. All deliverables that require compliance with this ¶ 6.5 must be signed by the SD's Project Coordinator, or other responsible official of SD, and must contain the following statement:

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 have no personal knowledge that the information submitted is other than 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.

6.6 Approval of Deliverables

(a) **Initial Submissions**

(1) After review of any deliverable that is required to be submitted for EPA approval under the CD or the SOW, EPA shall: (i) approve, in whole or in part, the submission; (ii) approve the submission upon specified conditions; (iii) disapprove, in whole or in part, the submission; or (iv) any combination of the foregoing.

(2) EPA also may modify the initial submission to cure deficiencies in the submission if: (i) EPA determines that disapproving the submission and awaiting a resubmission would cause substantial disruption to the Work; or (ii) 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 deliverable.

(b) **Resubmissions**. Upon receipt of a notice of disapproval under ¶ 6.6(a) (Initial Submissions), or if required by a notice of approval upon specified conditions under ¶ 6.6(a), SD shall, within 30 days or such longer time as specified by EPA in such notice, correct the deficiencies and resubmit the deliverable for approval. After review of the resubmitted deliverable, EPA may: (1) approve, in whole or in part, the resubmission; (2) approve the resubmission upon specified conditions; (3) modify the resubmission; (4) disapprove, in whole or in part, the resubmission, requiring SD to correct the deficiencies; or (5) any combination of the foregoing.

(c) **Implementation**. Upon approval, approval upon conditions, or modification by EPA under ¶ 6.6(a) (Initial Submissions) or ¶ 6.6(b) (Resubmissions), of any deliverable, or any portion thereof: (1) such deliverable, or portion thereof, will be incorporated into and enforceable under the CD; and (2) SD shall take any action required by such deliverable, or portion thereof. The implementation of any non-deficient portion of a deliverable submitted or resubmitted under ¶ 6.6(a) or ¶ 6.6(b) does not relieve SD of any liability for stipulated penalties under Section XV (Stipulated Penalties) of the CD.

6.7 **Supporting Deliverables**. SD shall submit each of the following supporting deliverables for EPA approval, except as specifically provided. SD shall develop the deliverables in accordance with all applicable regulations, guidances, and policies (see Section 10 (References)). SD shall update each of these supporting deliverables as necessary or appropriate during the course of the Work, and/or as requested by EPA.

(a) **Health and Safety Plan**. The Health and Safety Plan (HASP) describes all activities to be performed to protect on site personnel and area residents from physical, chemical, and all other hazards posed by the Work. SD shall develop the HASP in accordance with EPA's Emergency Responder Health and Safety and Occupational Safety and Health Administration (OSHA) requirements under 29 C.F.R. §§ 1910 and 1926. The HASP should cover RD activities and should be, as appropriate, updated to cover activities during the RA and updated to cover

activities after RA completion. EPA does not approve the HASP, but will review it to ensure that all necessary elements are included and that the plan provides for the protection of human health and the environment.

(b) **Emergency Response Plan**. The Emergency Response Plan (ERP) must describe procedures to be used in the event of an accident or emergency at the Site (for example, power outages, water impoundment failure, treatment plant failure, slope failure, etc.). The ERP must include:

(1) Name of the person or entity responsible for responding in the event of an emergency incident;

(2) Plan and date(s) for meeting(s) with the local community, including local, State, and federal agencies involved in the cleanup, as well as local emergency squads and hospitals;

(3) Spill Prevention, Control, and Countermeasures (SPCC) Plan (if applicable), consistent with the regulations under 40 C.F.R. Part 112, describing measures to prevent, and contingency plans for, spills and discharges;

(4) Notification activities in accordance with ¶ 4.3(b) (Release Reporting) in the event of a release of hazardous substances requiring reporting under 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; and

(5) A description of all necessary actions to ensure compliance with Paragraph 7 (Emergencies and Releases) of the CD in the event of an occurrence during the performance of the Work that causes or threatens a release of Waste Material from the Site that constitutes an emergency or may present an immediate threat to public health or welfare or the environment.

(c) **Field Sampling Plan**. The Field Sampling Plan (FSP) addresses all sample collection activities. The FSP must be written so that a field sampling team unfamiliar with the project would be able to gather the samples and field information required. SD shall develop the FSP in accordance with *Guidance for Conducting Remedial Investigations and Feasibility Studies*, EPA/540/G 89/004 (Oct. 1988).

(d) **Quality Assurance Project Plan**. The Quality Assurance Project Plan (QAPP) augments the FSP and addresses sample analysis and data handling regarding the Work. The QAPP must include a detailed explanation of SD's quality assurance, quality control, and chain of custody procedures for all treatability, design, compliance, and monitoring samples. SD shall develop the QAPP in accordance with *EPA Requirements for Quality Assurance Project Plans*, QA/R-5, EPA/240/B-01/003 (Mar. 2001, reissued May 2006); *Guidance for Quality*

Assurance Project Plans., QA/G-5, EPA/240/R 02/009 (Dec. 2002); and *Uniform Federal Policy for Quality Assurance Project Plans*, Parts 1-3, EPA/505/B-04/900A though 900C (Mar. 2005). The QAPP also must include procedures:

(1) To ensure that EPA and the State and their authorized representative have reasonable access to laboratories used by SD in implementing the CD (SD's Labs);

(2) To ensure that SD's Labs analyze all samples submitted by EPA pursuant to the QAPP for quality assurance monitoring;

(3) To ensure that SD's Labs perform all analyses using EPA-accepted methods (i.e., the methods documented in *USEPA Contract Laboratory Program Statement of Work for Inorganic Analysis*, ILM05.4 (Dec. 2006); *USEPA Contract Laboratory Program Statement of Work for Organic Analysis*, SOM01.2 (amended Apr. 2007); and *USEPA Contract Laboratory Program Statement of Work for Inorganic Superfund Methods (Multi-Media, Multi-Concentration)*, ISM01.2 (Jan. 2010)) or other methods acceptable to EPA;

(4) To ensure that SD's Labs participate in an EPA-accepted QA/QC program or other program QA/QC acceptable to EPA;

(5) For SD to provide EPA and the State with notice at least 10 days prior to any sample collection activity to determine lead concentration at the surface of an Affected Property;

(6) For SD to provide split samples and/or duplicate samples to EPA and the State upon request;

(7) For EPA and the State to take any additional samples that it deems they deem necessary;

(8) For EPA and the State to provide to SD, upon request, split samples and/or duplicate samples in connection with EPA's and the State's oversight sampling; and

(9) For SD to submit to EPA and the State all sampling and tests results and other data in connection with the implementation of the CD.

(e) **Health Education Program Plan.** The purpose of the Health Education Program Plan (HEPP) is to reduce potential adverse health effects from exposure to lead. The HEPP must include:

(1) Description of the proposed coordination with EPA, the Agency for Toxic Substances and Disease Registry (ATSDR), the State, the Missouri Department of Health and Senior Services (MDHSS) and the St. Francois

County Health Department. The Health Education Program shall be described in a Health Education Program Plan.

(2) Description of the types of education activities that may be conducted as set forth in the ROD, including: Working with the St. Francois County Health Department to track instances of elevated blood levels in children; Distribution of prevention information and literature; HEPA Vacuum cleaner loan program to houses subject to remediation with lead concentrations greater than or equal to 800 ppm and with young children present Outreach to area physicians; Community education meetings; Family assistance; and special projects to increase awareness of heavy metal health risks.

(f) **Quality Management Plan (QMP)**. The primary objective of the QMP is to document how an organization will plan, implement, and assess the effectiveness of its quality assurance and quality control operations. Specifically, it describes how an organization structures its quality system, the quality policies and procedures, areas of application, and roles, responsibilities, and authorities. The elements of a quality system are documented in a QMP. The QMP must follow the EPA Requirements for Quality Management Plans (QA/R-2) (EPA/240/B-01/002, 03/2001).

(g) **O&M Plan**. The O&M Plan describes the requirements for inspecting, operating, and maintaining the RA at the designated soil repositories after the completion of the Work. SD shall develop the O&M Plan in accordance with *Operation and Maintenance in the Superfund Program*, OSWER 9200.1 37FS, EPA/540/F-01/004 (May 2001). The O&M Plan must include the following additional requirements:

(1) Description of PS required to be met to implement the ROD;

(2) Description of activities to be performed: (i) to provide confidence that PS will be met; and (ii) to determine whether PS have been met;

(3) **O&M Reporting**. Description of records and reports that will be generated during O&M, laboratory records, records of operating costs, maintenance records, monitoring reports, and monthly and annual reports to EPA and State agencies;

(4) Description of corrective action to be implemented in the event that PS are not achieved; and a schedule for implementing these corrective actions.

(h) **O&M Manual**. The O&M Manual serves as a guide to the purpose and function of the equipment and systems that make up the remedy. SD shall develop the O&M Manual in accordance with *Operation and Maintenance in the Superfund Program*, OSWER 9200.1 37FS, EPA/540/F-01/004 (May 2001).

(i) **Storm Water Pollution Prevention Plan (SWPPP)**. This plan outlines how the SD and its subcontractor(s) shall meet the storm water pollution prevention and management requirements of the federal, state, and local laws, regulations, and other requirements, including the Clean Water Act, for both the residential properties, backfill/topsoil source locations and the designated repositories. In general, a SWPPP is a site-specific, written document that identifies potential sources of storm water pollution at the construction site (residential properties, backfill source areas, and the Soil Repository) and describes BMPs (Best Management Practices) to contain pollutants (sediment, soil, tailings, etc.) in storm water discharges from the residential properties, backfill source area(s), and the Soil Repositories. The SWPPP shall also document how the SD plans to ensure no tracking of material onto any road from residential properties and the Soil Repository. The final SWPPP must be received by EPA prior to the SD starting field activities. Two websites for guidance on storm water pollution prevention, management, and SWPPPs are http://www.epa.gov/npdes/pubs/sw_swppp_guide.pdf and http://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=2000469L.txt

(j) **Institutional Controls Implementation and Assurance Plan**. The Institutional Controls Implementation and Assurance Plan (ICIAP) describes plans to implement, maintain, and enforce the Institutional Controls (ICs) at the Site. SD shall develop the ICIAP in accordance with *Institutional Controls: A Guide to Planning, Implementing, Maintaining, and Enforcing Institutional Controls at Contaminated Sites*, OSWER 9355.0-89, EPA/540/R-09/001 (Dec. 2012), and *Institutional Controls: A Guide to Preparing Institutional Controls Implementation and Assurance Plans at Contaminated Sites*, OSWER 9200.0-77, EPA/540/R-09/02 (Dec. 2012). The ICIAP must include the following additional requirements:

(1) Locations of recorded real property interests (e.g., easements, liens) and resource interests in the property that may affect ICs (e.g., surface, mineral, and water rights) including accurate mapping and geographic information system (GIS) coordinates of such interests; and

(2) Legal descriptions and survey maps that are prepared according to current American Land Title Association (ALTA). Survey guidelines and certified by a licensed surveyor.

7. SCHEDULES

7.1 **Applicability and Revisions**. All deliverables and tasks required under this SOW must be submitted or completed by the deadlines or within the time durations listed in the RD and RA Schedules set forth below. SD may submit proposed revised RD Schedules or RA Schedules for EPA approval. Upon EPA's approval, the revised RD and/or RA Schedules supersede the RD and RA Schedules set forth below, and any previously-approved RD and/or RA Schedules.

7.2 RA Schedule

	Description of Deliverable / Task	**¶ Ref.**	**Deadline**
1	Award RA contract		60 days after Effective Date
2	RAWP	4.1	45 days after Award of RA contract
3	Pre-Construction Conference	4.2(a)	21 days after Approval of RAWP
4	Start of Construction		30 days after Pre-Construction Conference
5	Completion of Number of Properties Annually		As set forth in the table in ¶ 4.1(a)(1) as modified in accordance with ¶ 4.1(a)(2) and (3).
6	Completion of Construction		December 31, 2030
7	Final Inspection		30 days after Completion of Work
8	RA Report	4.6(b)	60 days after Final Inspection
	Periodic Review Support Plan	4.7	Five years after Start of RA Construction
10	Work Completion Inspection (ONLY IF REQUIRED IN ADDITION TO FINAL INSPECTION)	4.8(a)	30 days after Completion of Work
11	Work Completion Report (ONLY IF RA REPORT DOES NOT INCLUDE ALL ELEMENTS REQUIRED BY ¶ 4.8(b))	4.8(b)	60 days after Completion of Work, if required
12	Monthly Progress Report	5.1	Every 30 days after entry of CD

8. RELATED ORDERS

8.1 There are existing orders within the boundaries of the Site that have work remaining before all obligations have been met and the subject orders can be considered complete. The remaining work for each of the following orders is required. All source area orders have required Post Removal Site Control per the Post Removal Site Control Plan (PRSCP) for each source area. Post Removal Site Control shall continue at each source area consistent with the approved PRSCP.

8.2 AOC, CERCLA Docket No. 07-2000-0025 (Bonne Terre Eastern Portion). The remaining work under this order includes the submission and EPA approval of the Removal Action Report (RAR). The PRSCP was submitted and will be approved upon the completion of the RAR.

8.3 AOC, CERCLA Docket No. 07-2004-0167 (Halo Order). The work remaining under this order includes the submission and EPA approval of the Halo RAR.

8.4 UAO, Docket No. 07-2005-0169 (Elvins UAO). Under this order, the remaining work includes the submission and EPA approval of the RAR. The PRSCP has been submitted and will be approved upon completion of the RAR.

8.5 UAO, Docket No. 07-2006-0272 (Leadwood UAO). Under this order, the remaining work includes the submission and EPA approval of the RAR. The PRSCP has been submitted and will be approved upon completion of the RAR.

9. STATE PARTICIPATION

9.1 **Copies**. SD shall, at any time they send a deliverable to EPA, send a copy of such deliverable to the State. EPA shall, at any time it sends a notice, authorization, approval, disapproval, or certification to SD, send a copy of such document to the State.

9.2 **Review and Comment**. The State will have a reasonable opportunity for review and comment prior to:

(a) Any EPA approval or disapproval under ¶ 6.6 (Approval of Deliverables) of any deliverables that are required to be submitted for EPA approval; and

(b) Any approval or disapproval of the Construction Phase under ¶ 4.5 (RA Completion), and any disapproval of, or Certification of Work Completion under ¶ 4.7 (Certification of Work Completion).

10. REFERENCES

10.1 The following regulations and guidance documents, among others, apply to the Work. Any item for which a specific URL is not provided below is available on one of the two EPA Web pages listed in ¶ 10.2:

(a) A Compendium of Superfund Field Operations Methods, OSWER 9355.0-14, EPA/540/P-87/001a (Aug. 1987).

(b) CERCLA Compliance with Other Laws Manual, Part I: Interim Final, OSWER 9234.1-01, EPA/540/G-89/006 (Aug. 1988).

(c) CERCLA Compliance with Other Laws Manual, Part II, OSWER 9234.1-02, EPA/540/G-89/009 (Aug. 1989).

(d) Guidance on EPA Oversight of Remedial Designs and Remedial Actions Performed by Potentially Responsible Parties, OSWER 9355.5-01, EPA/540/G-90/001 (Apr.1990).

(e) Guidance on Expediting Remedial Design and Remedial Actions, OSWER 9355.5-02, EPA/540/G-90/006 (Aug. 1990).

(f) Guide to Management of Investigation-Derived Wastes, OSWER 9345.3-03FS (Jan. 1992).

(g) Permits and Permit Equivalency Processes for CERCLA On-Site Response Actions, OSWER 9355.7-03 (Feb. 1992).

(h) National Oil and Hazardous Substances Pollution Contingency Plan; Final Rule, 40 C.F.R. Part 300 (Oct. 1994).

(i) Guidance for Scoping the Remedial Design, OSWER 9355.0-43, EPA/540/R-95/025 (Mar. 1995).

(j) Remedial Design/Remedial Action Handbook, OSWER 9355.0-04B, EPA/540/R-95/059 (June 1995).

(k) EPA Guidance for Data Quality Assessment, Practical Methods for Data Analysis, QA/G-9, EPA/600/R-96/084 (July 2000).

(l) Operation and Maintenance in the Superfund Program, OSWER 9200.1-37FS, EPA/540/F-01/004 (May 2001).

(m) Comprehensive Five-year Review Guidance, OSWER 9355.7-03B-P, 540-R-01-007 (June 2001).

(n) Guidance for Quality Assurance Project Plans, QA/G-5, EPA/240/R-02/009 (Dec. 2002).

(o) Institutional Controls: Third Party Beneficiary Rights in Proprietary Controls (Apr. 2004).

(p) Quality management systems for environmental information and technology programs -- Requirements with guidance for use, ASQ/ANSI E4:2014 (American Society for Quality, February 2014).

(q) Uniform Federal Policy for Quality Assurance Project Plans, Parts 1-3, EPA/505/B-04/900A though 900C (Mar. 2005).

(r) Superfund Community Involvement Handbook, SEMS 100000070 (January 2016) available at https://www.epa.gov/superfund/community-involvement-tools-and-resources.

(s) EPA Guidance on Systematic Planning Using the Data Quality Objectives Process, QA/G-4, EPA/240/B-06/001 (Feb. 2006).

(t) EPA Requirements for Quality Assurance Project Plans, QA/R-5, EPA/240/B-01/003 (Mar. 2001, reissued May 2006).

(u) EPA Requirements for Quality Management Plans, QA/R-2, EPA/240/B-01/002 (Mar. 2001, reissued May 2006).

(v) USEPA Contract Laboratory Program Statement of Work for Inorganic Analysis, ILM05.4 (Dec. 2006).

(w) USEPA Contract Laboratory Program Statement of Work for Organic Analysis, SOM01.2 (amended Apr. 2007).

(x) EPA National Geospatial Data Policy, CIO Policy Transmittal 05-002 (Aug. 2008), available at https://www.epa.gov/geospatial/geospatial-policies-and-standards and https://www.epa.gov/geospatial/epa-national-geospatial-data-policy.

(y) Summary of Key Existing EPA CERCLA Policies for Groundwater Restoration, OSWER 9283.1-33 (June 2009).

(z) Principles for Greener Cleanups (Aug. 2009), available at https://www.epa.gov/greenercleanups/epa-principles-greener-cleanups.

(aa) USEPA Contract Laboratory Program Statement of Work for Inorganic Superfund Methods (Multi-Media, Multi-Concentration), ISM01.2 (Jan. 2010).

(bb) Close Out Procedures for National Priorities List Sites, OSWER 9320.2-22 (May 2011).

(cc) Recommended Evaluation of Institutional Controls: Supplement to the "Comprehensive Five-Year Review Guidance," OSWER 9355.7-18 (Sep. 2011).

(dd) Construction Specifications Institute's MasterFormat 2012, available from the Construction Specifications Institute, http://www.csinet.org/masterformat.

(ee) Updated Superfund Response and Settlement Approach for Sites Using the Superfund Alternative Approach , OSWER 9200.2-125 (Sep. 2012)

(ff) Institutional Controls: A Guide to Planning, Implementing, Maintaining, and Enforcing Institutional Controls at Contaminated Sites, OSWER 9355.0-89, EPA/540/R-09/001 (Dec. 2012).

(gg) Institutional Controls: A Guide to Preparing Institutional Controls Implementation and Assurance Plans at Contaminated Sites, OSWER 9200.0-77, EPA/540/R-09/02 (Dec. 2012).

(hh) EPA's Emergency Responder Health and Safety Manual, OSWER 9285.3-12 (July 2005 and updates), https://www.epaosc.org/_HealthSafetyManual/manual-index.htm.

(ii) Broader Application of Remedial Design and Remedial Action Pilot Project Lessons Learned, OSWER 9200.2-129 (Feb. 2013).

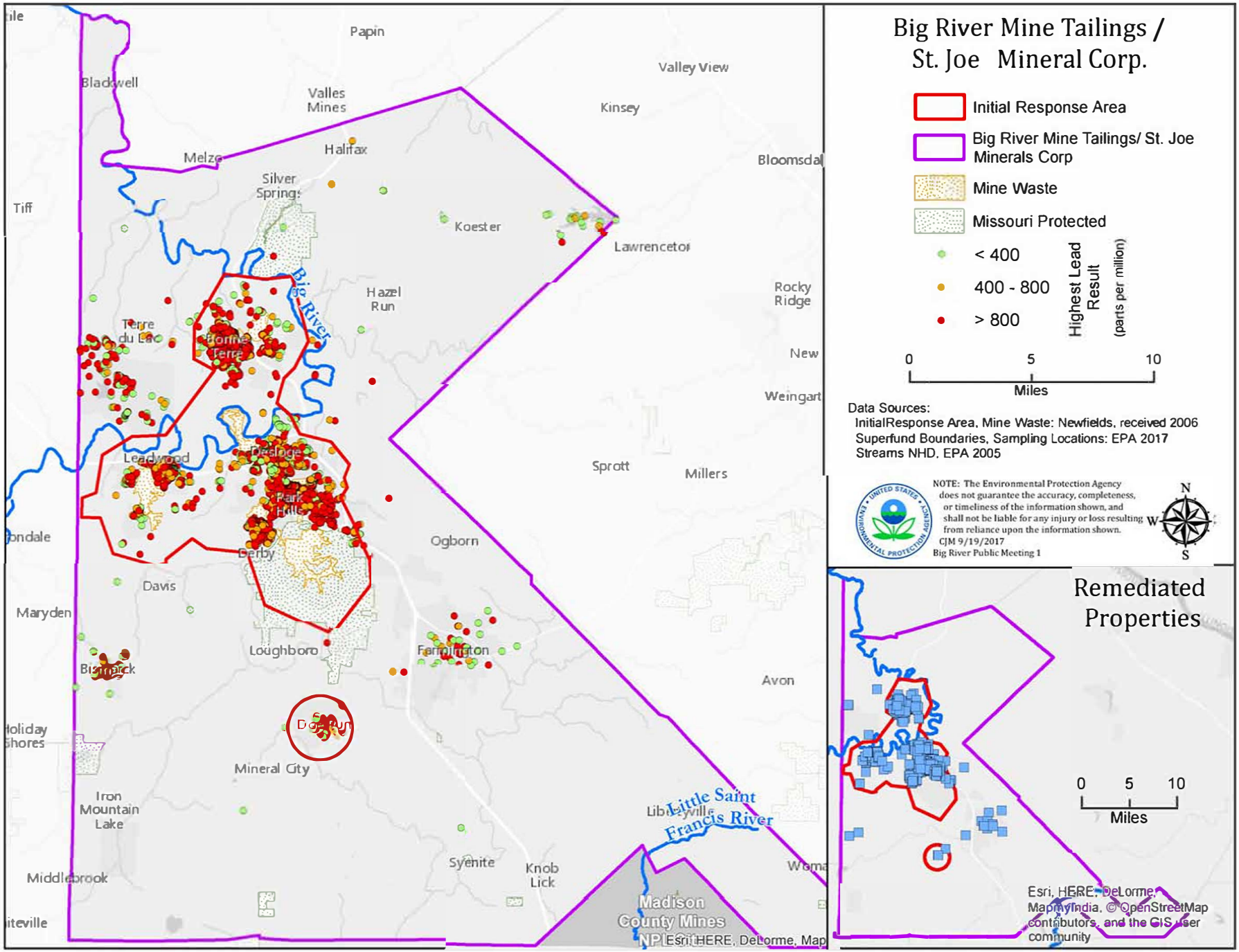
10.2 A more complete list may be found on the following EPA Web pages:

Laws, Policy, and Guidance: https://www.epa.gov/superfund/superfund-policy-guidance-and-laws

Test Methods Collections: https://www.epa.gov/measurements/collection-methods

10.3 For any regulation or guidance referenced in the CD or SOW, the reference will be read to include any subsequent modification, amendment, or replacement of such regulation or guidance. Such modifications, amendments, or replacements apply to the Work only after SD receive notification from EPA of the modification, amendment, or replacement.

Appendix C


Big River Mine Tailings / St. Joe Mineral Corp.
Initial Response Area
Big River Mine Tailings/ St. Joe Minerals Corp
Mine Waste
Missouri Protected
< 400
400 - 800
> 800
Highest Lead Result (parts per million)
0 5 10
Miles
Data Sources:
InitialResponse Area, Mine Waste: Newfields, received 2006
Superfund Boundaries, Sampling Locations: EPA 2017
Streams NHD, EPA 2005
NOTE: The Environmental Protection Agency does not guarantee the accuracy, completeness, or timeliness of the information shown, and shall not be liable for any injury or loss resulting from reliance upon the information shown.
CJM 9/19/2017
Big River Public Meeting 1
N
W
S
Remediated Properties
0 5 10
Miles
Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, and the GIS User community
Papin
Valley View
Blackwell
Valles Mines
Kinsey
Halifax
Melze
Bloomsdal
Silver Springs
Tiff
Koester
Lawrencetor
Big River
Hazel Run
Rocky Ridge
Terre du Lac
Bonne Terre
New
Weingart
Leadwood
Desloge
Sprott
Millers
Park Hill
Ogborn
Derby
Davis
Maryden
Loughboro
Farmington
Bismarck
Avon
Doe Run
Holiday Shores
Mineral City
Iron Mountain Lake
Little Saint Francis River
Libertyville
Syenite
Knob Lick
Middlebrook
Madison County Mines NP
Esri, HERE, DeLorme, Map

APPENDIX D
TO CONSENT DECREE IN
UNITED STATES AND STATE OF MISSOURI V. DOE RUN RESOURCES CORPORATION FOR OU-1

FINANCIAL ASSURANCE DEPOSIT SCHEDULE

Deposit to Trust On or Before Date	Amount of Deposit	Principal Balance in Trust After Deposit
October 15, 2018 or 150 days after the Effective Date, whichever is later	$1,000,000	$1,000,000
6 months after previous deposit	$1,000,000	$2,000,000
6 months after previous deposit	$6,500,000	$8,500,000
6 months after previous deposit	$6,500,000	$15,000,000
6 months after previous deposit	$2,600,000	$17,600,000
6 months after previous deposit	$2,600,000	$20,200,000
6 months after previous deposit	$2,600,000	$22,800,000
6 months after previous deposit	$2,600,000	$25,400,000
6 months after previous deposit	$2,600,000	$28,000,000
6 months after previous deposit	$2,600,000	$30,600,000
6 months after previous deposit	$2,600,000	$33,200,000
6 months after previous deposit	$2,600,000	$35,800,000

APPENDIX E

Decision Document
Preauthorization of a CERCLA Section 111(a) Claim

Decision Document
Preauthorization of a CERCLA Section 111(a) Claim

Big River Mine Tailings Superfund Site
Desloge, St. Francois, Missouri

I. STATEMENT OF AUTHORITY

Section 111 of the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended (CERCLA), 42 U.S.C. § 9611, authorizes the reimbursement of response costs incurred in carrying out the National Oil and Hazardous Substances Pollution Contingency Plan, as amended (NCP), 40 C.F.R. Part 300. Section 112 of CERCLA, 42 U.S.C. § 9612, directs the President to establish the forms and procedures for filing claims against the Hazardous Substance Superfund (Superfund). Executive Order 12580 (52 Fed. Reg. 2923, January 29, 1987) delegates to the Administrator of the Environmental Protection Agency (EPA) the responsibility for CERCLA claims and for establishing forms and procedures for such claims. The forms and procedures can be found in the Response Claims Procedures for the Hazardous Substance Superfund, 40 C.F.R. Part 307, 58 Fed. Reg. 5460 (January 21, 1993). Executive Order 12580 also delegates to the EPA Administrator the authority to reach settlements pursuant to Section 122(b) of CERCLA, 42 U.S.C. § 9622(b). EPA Delegation 14-9 (July 24, 2002) delegates to EPA's Regional Administrators the authority to preauthorize claims against the Superfund and to approve reimbursement for claimed response costs.

II. SITE BACKGROUND

The Big River Mine Tailings Site (Site) is located in southeastern Missouri in St. Francois County, approximately 70 miles southwest of St. Louis, Missouri. The first recorded mining in St. Francois County occurred at Mine-a-Gabore between 1742 and 1762. Discoveries of disseminated lead in the Bonne Terre, Leadwood, and Flat River areas occurred in 1864. The introduction of the diamond drill in 1869 facilitated the discovery of additional reserves and output from the mines increased dramatically in the late 1800s. Mine output from St. Francois County peaked in 1942 when the concentrate equivalent of 197,430 tons of lead was produced. Mining ceased in the county in 1972 with the closing of St. Joe Lead Company's Federal mine.

The Site resides within the Old Lead Belt, which is on the northeastern edge of the Precambrian igneous core of the St. Francois Mountains. This area is one of the world's largest lead mining districts, having produced more than nine million tons of pig lead. It has been estimated that some 250 million tons of mill waste tailing and chat were produced in the Old Lead Belt from ore milling and beneficiation processes. The chat has been used extensively as aggregate for ballast in railroads, aggregate in concrete and asphalt, and fill. Some chat is used today as aggregate and fill. Tailings have been used as agricultural amendments due to the lime content.

Chat deposits include sand to gravel-sized material resulting from the crushing, grinding, and dry separation of the ore material. Tailings deposits include sand and silt-sized material resulting from the wet washing or flotation separation of the ore material. The mine waste may contain elevated levels of lead and other heavy metals. These deposits may have contaminated soils, sediment, surface water, and groundwater. These materials also may have been transported by wind and water erosion or manually relocated to other areas throughout the county. It has been reported that mine waste may have been used on residential properties for fill material and private driveways, used as aggregate for road construction, and placed on public roads around St. Francois County to control snow and ice in the winter.

Much of the waste from the mining operations in the county was located in eight major mine waste areas. They are:

- Desloge Pile (Big River Pile)
- National Pile
- Leadwood Pile
- Elvins Pile
- Bonne Terre Pile
- Federal Pile (St. Joe State Park)
- Doe Run Pile
- Hayden Creek

Almost 30 years ago, when EPA and the State of Missouri began investigations in St. Francois County, the mine waste piles were predominately barren of vegetation, unstable and subject to wind erosion. Access to the waste piles was unrestricted. EPA and the Missouri Department of Health and Senior Services (MDHSS) began investigating the Site in 1988. The investigations focused on the effects of the mine waste from the Big River Pile which was adjacent to the Big River and as a result of rain and erosion had released lead mine waste into the Big River. EPA conducted a Listing Site Inspection in 1991 and a Site Assessment in 1992 which resulted in the listing of the Big River Mine Tailings Site on the National Priorities List (NPL) in 1992. These studies identified potential sources of mine ore processing waste in the Big River watershed, determined the composition of these sources, and determined that there had been a release of mine-related contaminants (heavy metals) to media within the Big River watershed. The studies also identified uses of mine waste in the area and provided analytical data on soil, tailings, sediment, air, surface water, and groundwater near the mine waste piles. Overall the results indicated elevated concentrations of a number of heavy metals in samples of mine waste, groundwater, sediment, and soil.

Studies conducted by MDHSS including a Preliminary Public Health Assessment in 1994 and a lead exposure study in 1997 concluded that 17 percent of children tested in the mining area of St. Francois County had elevated levels of lead in their blood. As a result of the elevated blood

lead levels in children, in 1997 and 1998, MDHSS followed the Exposure Study with the St. Francois and Jasper Counties Lead Intervention Study in 2000 as an effort to reduce the percentage of elevated blood lead in children at the Site.

In 1997, EPA entered into an Administrative Order on Consent for the development of the Remedial Investigation/Feasibility Study (RI/FS) with The Doe Run Resources Corporation (Doe Run) and ASARCO Incorporated. The RI/FS was completed and released in 2011. The FS developed the alternatives for the remedial action for the residential properties. As part of the FS, an investigation of lead contamination in the subsurface soils was conducted. This investigation focused on the subsurface soils at 58 residential properties in the mining areas. Soil core samples were collected in 6-inch intervals, moving down in the soil profile to 30 inches below ground surface (bgs). The subsurface Soil Report concluded that seven percent of the yard quadrants after a 12 inch bgs excavation would have confirmation subgrade soil lead concentrations greater than 1,200 parts per million (ppm). The results of the subsurface investigation are part of the FS and the alternatives developed and evaluated in the FS formed the basis for the Record of Decision that was signed on September 30, 2011.

In 2000, EPA entered into an Administrative Order on Consent (2000 Order) with Doe Run, for implementation of a soil testing and removal program and blood lead testing and control program within the Site. This 2000 Order, called the Interim Program, provided that these programs would end when either EPA issued a Record of Decision (ROD) for residential yards or after four years. At the end of the Interim Program (March 30, 2004), 1,955 residential yards had been sampled and 563 homeowners had refused sampling, for a 78 percent sampling rate.

In 2004, EPA entered into another Administrative Order on Consent (2004 Order) with the Doe Run for a Removal Action to replace the expiring 2000 Interim Program. The 2004 Order was called the Halo Removal Order. The Halo Removal Order designated six of the mine waste areas in St. Francois County: National; Elvins; Bonne Terre; Federal; Desloge; and, Leadwood. The Halo Removal Order required removal actions within the halo around each of these waste areas. The "Halo" was defined as the area within 500 feet of chat and tailings waste, 1,000 feet from four identified smelters/calciners, and 100 feet from mine shafts.

Under the Halo Removal Order 69 additional yards were sampled; of these, 3 were parks, 5 were childcare facilities or school playground facilities, 29 were sampling refusals during the Interim Action, 17 were not within the Halo but were sampled due to the presence of a child with elevated blood lead levels, and the remaining 15 yards were primarily new construction within the Halo. Of the total yards sampled, 387 were completely remediated (all areas <400 ppm) and 188 were partially remediated (part of the yard remains >400 ppm). EPA also remediated seven schools, 16 daycares, and two parks under removal authority.

EPA divided the Site into four Operable Units (OUs) to manage and organize the cleanup work. OU 1 addresses lead contaminated mine ore processing waste in residential areas. OU 2 addresses terrestrial ecological risks and impacted watersheds associated with the mine wastes. OU 3 consists of the Interim Program and Halo Removal Action to address elevated blood lead at the Site. This included time-critical residential properties and high child exposure areas (i.e.,

playgrounds and daycare facilities). The ROD for OU 1, issued in 2011, selected the remedy to address OU 1, residential properties and high child exposure areas at the Site. OU 1 includes surface soils with elevated lead levels present at residential properties across the Site that may have been contaminated as a result of migration of metal-bearing materials from past mining and ore processing practices via natural erosional processes, wind-blown mine waste, and human activities. As noted in the ROD, the action is not intended to address elevated levels of lead in soils that are due to lead paint or are naturally occurring. EPA is addressing certain residential properties as the first remedial action to expedite cleanup of properties where there may be an elevated blood lead, higher levels of lead in the soils or young children present. This remedial action for the Site is a continuation of the residential soil removal actions that have been ongoing in St. Francois County since the 2000 Interim Action. Additional remedial actions at the Site to address residual risk, such as actions for protection of the Big River watershed and stabilization of the Doe Run pile, will be addressed under future decision documents.

The remedial action objective of the OU 1 remedy is to reduce risk of exposure of young children (children under seven years old) to lead, such that an individual child or group of similarly exposed children have no greater than a 5 percent chance of exceeding a blood lead level of 10 mg/dl. The lead soil cleanup level for the remedial action is 400 ppm lead as measured in the bulk soil fraction using an XRF instrument. The components of the OU 1 remedy includes:

- excavation of soil until lead concentrations are below 400 ppm in the top 12 inches, or below 1,200 ppm below 12 inches down to 24 inches bgs;
- transportation of contaminated soil to on-Site soil repositories;
- replacement of contaminated soil with clean backfill, vegetative cover; and
- institutional controls

The estimated total number of residential properties with lead-contaminated soil that will be addressed under this settlement is 3,945. This is based upon the number of contaminated properties sampled to date that require remediation and an estimate as to the number of additional properties that will be sampled under the settlement that potentially could exceed 400 ppm lead in soil.

Pursuant to the terms of the Consent Decree (CD), the party that is performing the work, Doe Run (Settling Defendant) will implement the remedial action selected in the OU 1 ROD. Pursuant to the terms of the CD, EPA has agreed to provide the Settling Defendant with funds, subject to availability, to implement the action. As such, EPA has elected preauthorized mixed funding as the vehicle to provide this funding to the Settling Defendant. On September 27, 2017 the Settling Defendant submitted an Application for Preauthorization of a CERCLA Response Action as required by Section 300.700(d) of the NCP and 40 C.F.R. § 307.22.

This Preauthorization Decision Document (PDD) approves the Settling Defendant's request for preauthorization, subject to the terms of this PDD, and performance of the Work, as defined in the CD and the ROD.

III. FINDINGS

Preauthorization (i.e., EPA's prior approval to submit a claim against the Superfund for reasonable and necessary response costs incurred as a result of carrying out the NCP) represents EPA's commitment to reimburse a claimant from the Superfund, subject to any maximum amount of money set forth in this PDD, if the response action is conducted in accordance with the preauthorization and costs are reasonable and necessary. Preauthorization is a discretionary action by the Agency taken on the basis of certain determinations.

EPA has determined, based on its evaluation of relevant documents and the Settling Defendant's Application for Preauthorization of a CERCLA Response Action (Application) pursuant to 40 C.F.R. § 300.700(d) that:

(A) A release or potential release of hazardous substances warranting a response under Section 300.415 of the NCP exists at the Site;

(B) The Settling Defendant has agreed to implement the remedy selected by EPA to address the threat posed by the release at the Site;

(C) The Settling Defendant has demonstrated engineering expertise and knowledge of the NCP and attendant guidance;

(D) The activities proposed by the Settling Defendant, when supplemented by the terms and conditions contained herein, are consistent with the NCP;

(E) The Settling Defendant has demonstrated efforts to obtain the cooperation of the State of Missouri; and

(F) Consistent with 40 C.F.R. § 307.23, the Application submitted by the Settling Defendant demonstrates a knowledge of relevant NCP provisions, 40 C.F.R. Part 307, and EPA guidance sufficient for the conduct of the required response action at the Site.

The Settling Defendant is generally obligated to comply with all provisions and representations in the Application, and to notify EPA of any changed circumstances which alter those provisions. If circumstances change between the time the Application is submitted and the time of remedy implementation, it is in EPA's discretion to determine which Application provisions are still valid and which provisions no longer apply. The CD, including the terms and conditions of this PDD and the ROD, shall govern the conduct of response activities at the Site. In the event of any ambiguity or inconsistency between the Application and this PDD with regard to claims against the Fund, this PDD and the CD shall govern. In the event of any ambiguity or inconsistency between the CD and the PDD, the CD shall govern.

IV. PREAUTHORIZATION DECISION

A. EPA preauthorizes the Settling Defendant to submit claim(s) against the Superfund for "necessary and actual expenditures" in designing and implementing the remedial action, in an amount not to exceed the lesser of:

(i) $31.56 million, or

(ii) 40% of eligible response costs

(iii) After the Effective Date of the Consent Decree $5.26 million will be preauthorized by EPA (and eligible for reimbursement). The Settling Defendant will then be allowed to amend this application for preauthorization biennially after the Effective Date by an additional $5.26 million until the cumulative preauthorized amount is $31.56 million.

(iv) The Settling Defendant shall submit such amendments whenever the projected reimbursement claims against the Fund for the succeeding six months exceed the amount eligible for reimbursement set forth in the most current amended PDD. (See IV.A.iii).

(v) At no time will an amount above $31.56 million be preauthorized (including cumulative).

This preauthorization is subject to the Settling Defendant's compliance with the CD and the provisions of this PDD.

V. AUDIT PROCEDURES

The Settling Defendant shall develop and implement audit procedures which will ensure their ability to obtain and implement all agreements to perform preauthorized response actions, in accordance with sound business judgment and good administrative practice as required by 40 C.F.R. § 307.32(e). Those requirements shall include but not necessarily be limited to the following procedures:

A. The Settling Defendant will develop and implement procedures for procurement transactions that: (1) provide maximum open and free competition; (2) do not unduly restrict or eliminate competition; and (3) provide for the award of contracts to the lowest, responsive, responsible bidder. 40 C.F.R. § 307.21(e). Except for services provided by the Settling Defendant and affiliated companies, the Settling Defendant and their contractor(s) shall use free and open competition for supplies, services, and construction with respect to the Work performed at the Site. There are a number of ways that the Settling Defendant can meet these requirements, including but not limited to the following:

1. For example, if the Settling Defendant awards a fixed price contract to a prime contractor, the Settling Defendant has satisfied the requirement of open and free competition with regard to any subcontracts awarded within the scope of the prime contract.

2. The Settling Defendant is not required to comply with the Federal procurement requirements found at 40 C.F.R. Part 33 or EPA's guidance entitled *Procurement Under Superfund Remedial Cooperative Agreements* (OSWER Directive 9375.1-11, June 1988), in meeting these requirements. However, EPA does require that the Settling Defendant use these documents for general guidance in developing

procurement procedures for small purchases, formal advertising, competitive negotiations and noncompetitive negotiations as each may be appropriate to the Remedial Action at the Site.

B. The Settling Defendant will develop and implement procedures which provide adequate public notice of solicitations for offers or bids on contracts. Solicitations must include evaluation methods and criteria for contractor selection. The Settling Defendant shall notify EPA of the qualifications of all contractors and principal subcontractors hired to perform preauthorized response actions. EPA shall have the right to disapprove the selection of any contractor or subcontractor selected by the Settling Defendant. EPA shall provide written notice to the Settling Defendant of the reasons for any such disapproval.

C. The Settling Defendant may use a list or lists of prequalified persons, firms, or products to acquire goods and services. The Settling Defendant shall make each pre-qualification using evaluation methods and criteria which are consistent with such selection and evaluation criteria developed pursuant to Section V., Paragraph A., above, as are appropriate. Such list(s) must be current and include enough qualified sources to ensure maxim open and free competition. The Settling Defendant shall not preclude potential offerors not on the prequalified list from qualifying during the solicitation period.

D. The Settling Defendant shall develop and implement procedures to settle and satisfactorily resolve all contractual and administrative matters arising out of agreements to perform preauthorized response actions, in accordance with sound business judgment and good administrative practice as required by 40 C.F.R. § 307.32(e).

All of the following actions shall be conducted in a manner to assure that the preauthorized response actions are performed in accordance with all terms, conditions and specifications of contracts as required by EPA: (l) invitations for bids or requests for proposals; (2) contractor selection; (3) subcontractor approval; (4) change orders and contractor claims (procedures should minimize these actions); (5) resolution of protests, claims, and other procurement related disputes; and (6) subcontract administration.

E. The Settling Defendant shall develop and implement a change order management policy and procedure generally in accordance with EPA's guidance entitled *Procurement Under Superfund Remedial Cooperative Agreements* (OSWER Directive 9375.1-11, June 1988).

F. The Settling Defendant shall develop and implement a financial management system that consistently applies generally accepted accounting principles and practices and includes an accurate, current, and complete accounting of all financial transactions for the project, complete with supporting documents, and a systematic method to resolve audit findings and recommendations.

VI. CLAIMS PROCEDURES

A. Pursuant to Section 111(a)(2) of CERCLA, EPA may reimburse necessary response costs incurred as a result of carrying out the NCP that satisfy the requirements of 40 C.F.R. § 307.21, subject to the following limitations:

1. Costs may be reimbursed only if incurred after the Effective Date of this PDD;

2. Qualified costs may cover only those costs incurred in implementing the work associated with implementing the remedy in the ROD for OU1, including costs for Settling Defendant's personnel and equipment only to the extent that such costs are directly necessary for the implementation of the remedial action, and may include attorney's fees only to the extent that such fees are directly necessary for the implementation of the remedial action; and.

3. Qualified costs shall exclude, among other indirect costs as EPA shall identify, attorney fees or costs, costs relating to litigation, settlement, or responsible parties search activities, and other internal or transaction costs.

Claims will be reviewed by EPA's Project Coordinator, as designated in the Consent Decree, and EPA's Superfund Legal Office to determine compliance with the terms of this PDD. EPA's Headquarters (or its designee) will review the claim for consistency with generally accepted accounting practices.

B. In submitting claims to the Superfund, the Settling Defendant shall:

1. Document that response activities were preauthorized by EPA;

2. Substantiate all claimed costs through an adequate financial management system that consistently applies generally accepted accounting principles and practices and includes an accurate, current and complete accounting of all financial transactions for the project, complete with supporting documents, and a systematic method to resolve audit findings and recommendations; and

3. Document that all claimed costs were eligible for reimbursement, consistent with applicable requirements of 40 C.F.R. Part 307.

C. (1) Claims may be submitted against the Superfund by the Settling Defendant only while the Settling Defendant is in compliance with the terms of the CD.

(2) The Settling Defendant may submit up to 2 claims annually (preferably every six months), maximum.

(3) At no time may any claim exceed the amount currently preauthorized (including all preauthorized amendments).

(4) At no time may Settling Defendant submit a claim after the cumulative amount reimbursed reaches $31,560,000.

D. EPA shall deposit any funds paid on account of a claim submitted against the Superfund by the Settling Defendant into the financial assurance trust required by the CD until either the balance of the financial assurance trust is equal to or greater than $35,800,000 or EPA approves a reduction in the amount of financial assurance in accordance with Paragraph 22.b of the CD. After the first such reduction, EPA shall make all payments on account of a claim for reimbursement directly to the Settling Defendant. *Please note that the amount of $35,800,000 is*

related to the financial assurance requirements under the CD and is not related to the cap amount of this PDD which is $31,560,000.

VII. OTHER CONSIDERATIONS

A. This PDD is intended to benefit only the Settling Defendant and EPA. It extends no benefit to nor creates any right in any third party.

B. If any material statement or representation made in the Application for Preauthorization is false, misleading, misrepresented, or misstated and EPA relied upon such statement in making its decision, the preauthorization by EPA may be withdrawn following written notice to the Settling Defendant. Disputes arising out of EPA's determination to withdraw its preauthorization shall be governed by Section XIV (Dispute Resolution) of the CD. Criminal and other penalties may apply as specified in 40 C.F.R. § 307.15.

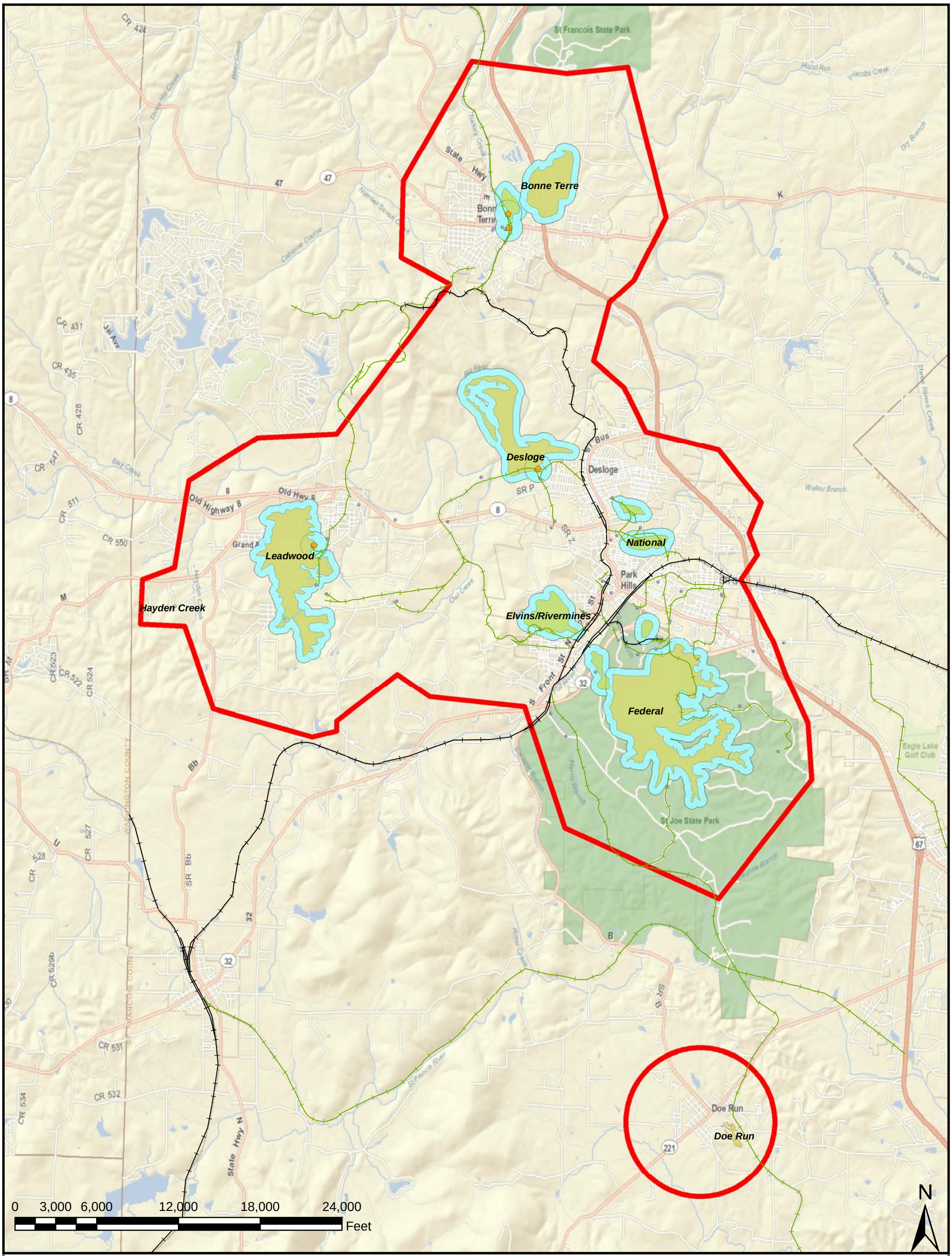
C. The Superfund's obligation in the event of failure of the remedial action shall be governed by Section 122(b)(4) of CERCLA, and 40 C.F.R. § 307.42. EPA may require the Settling Defendant to submit any additional information needed to determine whether the actions taken were in conformance with the CD, and were reasonable and necessary.

D. This preauthorization shall be effective as of the date of signature; provided, however, that no claim will be submitted to the Superfund prior to entry of the CD as modified consistent with this PDD, by the Court.

10/06/2017
DATE

James Woolford, Director
Office of Superfund Remediation and Technology Innovation
U.S. Environmental Protection Agency

APPENDIX F



Legend

- Halo - 100 ft from Shafts
- Halo - 1000 ft from Smelters
- Halo - 500 ft from TPonds
- Halo - 500 ft from Chat Piles
- Response Area
- Shafts
- Smelters
- Chat Piles
- Tailing Ponds
- Historic Railroads (inactive)
- Railroad
- World Street Map

Figure 1
Response Area and Halo

St. Francois Co. Mined Areas

APPENDIX G

FINANCIAL ASSURANCE TRUST AGREEMENT

Big River Mine Tailings Superfund Site, St. Francois County, Missouri, Operable Unit 01

Dated _____, 2018

This Trust Agreement (the "Agreement") relating to [**insert trustee-provided trust account number**] is entered into as of _____ between The Doe Run Resources Corporation, a corporation organized and existing under the laws of the State of New York ("Grantor"), and [**insert name of trustee**], [**insert as appropriate:** "incorporated in the state of [**insert name of state**]" or "a national bank"] (the "Trustee").

Whereas, the United States Environmental Protection Agency (EPA), an agency of the United States federal government, the State of Missouri, and the Grantor have entered into a Consent Decree dated ____ , Civil Action No. ("Consent Decree"), pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 U.S.C. §§ 9601-9675;

Whereas, the Consent Decree provides that the Grantor shall provide assurance that funds will be available as and when needed for performance of the Work required by the Consent Decree;

Whereas, in order to provide such financial assurance, Grantor has agreed to establish and fund the trust created by this Agreement; and

Whereas, the Grantor, acting through its duly authorized officers, has selected the Trustee to be the trustee under this Agreement, and the Trustee has agreed to act as trustee hereunder.

Now, therefore, the Grantor and the Trustee agree as follows:

Section 1. Definitions. As used in this Agreement*:*

(a) The term "Agreement" shall have the meaning assigned thereto in the first paragraph of this Agreement.

(b) The term "Beneficiary" shall have the meaning assigned thereto in Section 3 of this Agreement.

(c) The term "CERCLA" shall have the meaning assigned thereto in the second paragraph of this Agreement.

(d) The term "Claim Certificate" shall have the meaning assigned thereto in Section 4(a) of this Agreement.

(e) The term "EPA" shall have the meaning assigned thereto in the second paragraph of this Agreement.

(f) The term "Fund" shall have the meaning assigned thereto in Section 3 of this Agreement.

(g) The term "Grantor" shall have the meaning assigned thereto in the first paragraph of this Agreement, along with any successors or assigns of the Grantor.

(h) The term "Objection Notice" shall have the meaning assigned thereto in Section 4(b) of this Agreement.

(i) The term "Consent Decree" shall have the meaning assigned thereto in the second paragraph of this Agreement.

(j) The term "Site" shall have the meaning assigned thereto in Section 2 of this Agreement.

(k) The term "Trust" shall have the meaning assigned thereto in Section 3 of this Agreement.

(l) The term "Trustee" shall mean the trustee identified in the first paragraph of this Agreement, along with any successor trustee appointed pursuant to the terms of this Agreement.

(m) The term "Work" shall have the meaning assigned thereto in the Consent Decree.

(n) The term "Work Takeover" shall have the meaning assigned thereto in the Consent Decree.

Section 2. Identification of Site and Cost Estimate. This Agreement pertains to costs for Work required at the Big River Mine Tailings Superfund Site, Operable Unit 01, in St. Francois County, Missouri (the "Site"), pursuant to the Consent Decree.

Section 3. Establishment of Trust Fund. The Grantor and the Trustee hereby establish a trust (the "Trust"), for the benefit of EPA (the "Beneficiary"), to ensure that funds are available to pay for performance of the Work in accordance with the terms of the Consent Decree. The Grantor and the Trustee intend that no third party shall have access to monies or other property in the Trust except as expressly provided herein. The Trust is established initially as consisting of cash and/or cash equivalents in the amount of $1,000,000 and ultimately in the amount of $35,800,000 pursuant to the schedule described in Schedule A attached hereto which is acceptable to the Trustee. Such funds, along with any other cash and/or cash equivalents hereafter deposited into the Trust, and together with all earnings and profits thereon, are referred to herein collectively as the "Fund." The Fund shall be held by the Trustee, IN TRUST, as hereinafter provided. The Trustee shall not be responsible nor shall it undertake any responsibility for the amount or

adequacy of, nor any duty to collect from the Grantor, any payments necessary to discharge any liabilities of the Grantor owed to the United States.

Section 4. Payment for Work Required Under the Consent Decree. The Trustee shall make payments from the Fund in accordance with the following procedures.

(a) From time to time, but not more often than twice per calendar year, the Grantor and/or its representatives or contractors may request that the Trustee make payment from the Fund for Work performed under the Consent Decree by delivering to the Trustee and EPA a written invoice and certificate (together, a "Claim Certificate") signed by an officer of the Grantor (or the relevant representative or contractor). Any Claim Certificate should be in a form substantially identical to the sample provided in Exhibit A and, at a minimum, should:

(i) Specify the amount of funds requested from the Trust; and

(ii) Identify the payee(s) of the funds request.

(b) EPA may object to any payment requested in a Claim Certificate submitted by the Grantor (or its representatives or contractors), in whole or in part, by delivering to the Trustee a written notice (an "Objection Notice") within 30 days after the date of EPA's receipt of the Claim Certificate as shown on the relevant return receipt. An Objection Notice sent by EPA shall state (i) whether EPA objects to all or only part of the payment requested in the relevant Claim Certificate; (ii) the basis for such objection, (iii) that EPA has sent a copy of such Objection Notice to the Grantor and the date on which such copy was sent; and (iv) the portion of the payment requested in the Claim Certificate, if any, which is not objected to by EPA. EPA may object to a request for payment contained in a Claim Certificate only on the grounds that the requested payment is inconsistent with the terms and conditions of the Consent Decree.

(c) If the Trustee receives a Claim Certificate and does not receive an Objection Notice from EPA within the time period specified in Section 4(b) above, the Trustee shall, after the expiration of such time period, promptly make the payment from the Fund requested in such Claim Certificate.

(d) If the Trustee receives a Claim Certificate and also receives an Objection Notice from EPA within the time period specified in Section 4(b) above, but which Objection Notice objects to only a portion of the requested payment, the Trustee shall, after the expiration of such time period, promptly make payment from the Fund of the uncontested amount as requested in the Claim Certificate. The Trustee shall not make any payment from the Fund for the portion of the requested payment to which EPA has objected in its Objection Notice.

(e) If the Trustee receives a Claim Certificate and also receives an Objection Notice from EPA within the time period specified in Section 4(b) above, which

Objection Notice objects to all of the requested payment, the Trustee shall not make any payment from the Fund for amounts requested in such Claim Certificate.

(f) If, at any time during the term of this Agreement, EPA implements a "Work Takeover" pursuant to the terms of the Consent Decree and intends to direct payment of monies from the Fund to pay for performance of Work during the period of such Work Takeover, EPA shall notify the Trustee in writing of EPA's commencement of such Work Takeover. Upon receiving such written notice from EPA, the disbursement procedures set forth in Sections 4(a)-(e) above shall immediately be suspended for costs of Work taken over by EPA, and the Trustee shall thereafter make payments from the Fund only to such person(s) as the EPA may direct in writing from time to time for the sole purpose of providing payment for performance of Work required by the Consent Decree. Further, after receiving such written notice from EPA, the Trustee shall not make any disbursements to Grantor for costs of Work taken over by EPA from the Fund at the request of the Grantor, including its representatives and/or contractors, or of any other person except at the express written direction of EPA. If EPA ceases such a Work Takeover in accordance with the terms of the Consent Decree, EPA may so notify the Trustee in writing and, upon the Trustee's receipt of such notice, the disbursement procedures specified in Sections 4(a)-(e) above shall be reinstated.

(g) While this Agreement is in effect, disbursements from the Fund are governed exclusively by the express terms of this Agreement.

Section 5. Trustee Management. The Trustee shall invest and reinvest the principal and income of the Fund and keep the Fund invested as a single fund, without distinction between principal and income, in accordance with directions which the Grantor may communicate in writing to the Trustee from time to time, subject, however, to the provisions of this Section. In investing, reinvesting, exchanging, selling, and managing the Fund, the Trustee shall discharge its duties with respect to the Trust solely in the interest of the Beneficiary and with the care, skill, prudence, and diligence under the circumstances then prevailing which persons of prudence, acting in a like capacity and familiar with such matters, would use in the conduct of an enterprise of a like character and with like aims; except that:

(a) securities, notes, and other obligations of any person or entity shall not be acquired or held by the Trustee with monies comprising the Fund, unless they are securities, notes, or other obligations of the United States federal government or any United States state government or as otherwise permitted in writing by EPA;

(b) the Trustee is authorized to invest the Fund in time or demand deposits of the Trustee, to the extent such deposits are insured by an agency of the United States federal or any United States state government; and

(c) the Trustee is authorized to hold cash awaiting investment or distribution uninvested for a reasonable time and without liability for the payment of interest thereon.

Section 6. Commingling and Investment. The Trustee is expressly authorized in its discretion to transfer from time to time any or all of the assets of the Fund to any common, commingled, or collective trust fund created by the Trustee in which the Fund is eligible to participate, subject to all of the provisions hereof and thereof, to be commingled with the assets of other trusts participating therein.

Section 7. Express Powers of Trustee. Without in any way limiting the powers and discretion conferred upon the Trustee by the other provisions of this Agreement or by law, the Trustee is expressly authorized and empowered:

(a) to make, execute, acknowledge, and deliver any and all documents of transfer and conveyance and any and all other instruments that may be necessary or appropriate to carry out the powers herein granted;

(b) to register any securities held in the Fund in its own name or in the name of a nominee and to hold any security in bearer form or in book entry, or to combine certificates representing such securities with certificates of the same issue held by the Trustee in other fiduciary capacities, or to deposit or arrange for the deposit of such securities in a qualified central depositary even though, when so deposited, such securities may be merged and held in bulk in the name of the nominee of such depositary with other securities deposited therein by another person, or to deposit or arrange for the deposit of any securities issued by the United States federal government or any United States state government, or any agency or instrumentality thereof, with a Federal Reserve bank, but the books and records of the Trustee shall at all times show that all such securities are part of the Fund; and

(c) to deposit any cash in the Fund in interest-bearing accounts maintained or savings certificates issued by the Trustee, in its separate corporate capacity, or in any other banking institution affiliated with the Trustee, to the extent insured by an agency of the United States federal government.

Section 8. Taxes and Expenses. All taxes of any kind that may be assessed or levied against or in respect of the Fund shall be paid from the Fund. All other expenses and charges incurred by the Trustee in connection with the administration of the Fund and this Trust shall be paid by the Grantor.

Section 9. Annual Valuation. The Trustee shall annually, no more than 30 days after the anniversary date of establishment of the Fund, furnish to the Grantor and to the Beneficiary a statement confirming the value of the Trust. The annual valuation shall include an accounting of any fees or expenses levied against the Fund. The Trustee shall also provide such information concerning the Fund and this Trust as EPA may request from time to time.

Section 10. Advice of Counsel. The Trustee may from time to time consult with counsel with respect to any question arising as to the construction of this Agreement or any action to be taken hereunder; provided, however, that any counsel retained by the

Trustee for such purposes may not, during the period of its represenation of the Trustee, serve as counsel to the Grantor.

Section 11. Trustee Compensation. The Trustee shall be entitled to reasonable compensation for its services as agreed upon in writing with the Grantor and as notified in writing to the Beneficiary; provided, however, that the Trustee shall have minimal duties and shall be entitled to minimal compensation, if any, for time periods in which the Trustee does not make payments from the Fund for Work performed under the Consent Decree.

Section 12. Trustee and Successor Trustee. The Trustee and any replacement Trustee must not be affiliated with the Grantor. The Trustee may resign or the Grantor may replace the Trustee, but such resignation or replacement shall not be effective until the Grantor has appointed a successor trustee and this successor accepts such appointment. The successor trustee shall have the same powers and duties as those conferred upon the Trustee hereunder. Upon the successor trustee's acceptance of the appointment, the Trustee shall assign, transfer, and pay over to the successor trustee the cash and/or cash equivalents then constituting the Fund. If for any reason the Grantor cannot or does not act in the event of the resignation of the Trustee, the Trustee may apply to a court of competent jurisdiction for the appointment of a successor trustee or for instructions. The successor trustee shall specify the date on which it assumes administration of the Fund and the Trust in a writing sent to the Grantor, the Beneficiary, and the present Trustee by certified mail no less than 10 days before such change becomes effective. Any expenses incurred by the Trustee as a result of any of the acts contemplated by this Section shall be paid as provided in Section 8.

Section 13. Instructions to the Trustee. All orders, requests, and instructions to the Trustee shall be in writing, signed by such persons as are empowered to act on behalf of the entity sending such orders, requests, and instructions to the Trustee, including those designated in the attached Exhibit B or such other designees as the Grantor may designate by amendment to Exhibit B. The Trustee shall be fully protected in acting without inquiry on such written instructions given in accordance with the terms of this Agreement. The Trustee shall have no duty to act in the absence of such written instructions, except as expressly provided for herein.

Section 14. Amendment of Agreement. This Agreement may be amended by an instrument in writing executed by the Grantor and the Trustee, and with the prior written consent of EPA, or by the Trustee and EPA if the Grantor ceases to exist.

Section 15. Irrevocability and Termination. This Trust shall be irrevocable and shall continue until terminated upon the earlier to occur of (a) the written direction of EPA to terminate, consistent with the terms of the Consent Decree and (b) the complete exhaustion of the Fund comprising the Trust as certified in writing by the Trustee to EPA and the Grantor. Upon termination of the Trust pursuant to Section 15(a), all remaining Trust property (if any), less final Trust administration expenses, shall be delivered to the Grantor.

Section 16. Immunity and Indemnification. The Trustee shall not incur personal liability of any nature in connection with any act or omission, made in good faith, in the administration of this Trust, or in carrying out any directions by the Grantor or EPA issued in accordance with this Agreement. The Trustee shall be indemnified and saved harmless by the Grantor from and against any personal liability to which the Trustee may be subjected by reason of any act or conduct made by the Trustee in its official capacity, including all expenses reasonably incurred in its defense in the event the Grantor fails to provide such defense.

Section 17. Choice of Law. This Agreement shall be administered, construed, and enforced according to the laws of the State of Missouri.

Section 18. Interpretation. As used in this Agreement, words in the singular include the plural and words in the plural include the singular. The descriptive headings for each Section of this Agreement shall not affect the interpretation or the legal efficacy of this Agreement.

Section 19. Notices. All notices and other communications given under this Agreement shall be in writing, identify the Site, provide a contact person (and contact information), and be addressed to the parties as follows or to such other address as the parties shall by written notice designate:

(a) If to the Grantor, to [**insert name(s), title(s), address(es), and contact information (phone number(s), email address(es), etc.)**].

(b) If to the Trustee, to [**insert name(s), title(s), address(es), and contact information (phone number(s), email address(es), etc.)**].

(c) If to EPA, to [**insert name(s), title(s), address(es), and contact information (phone number(s), email address(es), etc.) of appropriate EPA official/staff (e.g., Superfund Division Director, Remedial Project Manager, and/or Office of Regional Counsel contact)**].

Section 20. Other. The Grantor shall provide a copy of the Consent Decree to the Trustee, and the Grantor shall submit an originally-signed duplicate of the executed Agreement to EPA.

[SIGNATURES ON FOLLOWING PAGE]

In Witness Whereof, the parties hereto have caused this Agreement to be executed by their respective officers duly authorized and attested as of the date first above written:

FOR THE GRANTOR:

Date: _____ By [signature]: _____
Printed name: _____
Title: _____

State of [**insert state**]
County of [**insert county**]

On this [**insert date**], before me personally came [**insert name of PRP/Settling Defendant's signatory**] to me known, who, being by me duly sworn, did depose and say that she/he is [**insert title**] of [**insert name of PRP/Settling Defendant**], the entity described in and which executed the above instrument; and that she/he signed her/his name thereto.

_____
[Signature of Notary Public]

FOR THE TRUSTEE:

Date: _____ By [signature]: _____
Printed name: _____
Title: _____

State of [**insert state**]
County of [**insert county**]

On this [**insert date**], before me personally came [**insert name of Trustee's signatory**] to me known, who, being by me duly sworn, did depose and say that she/he is [**insert title**] of [**insert name of Trustee**], the entity described in and which executed the above instrument; and that she/he signed her/his name thereto.

_____
[Signature of Notary Public]

Schedule A
Initial Trust Funding

Deposit to Trust On or Before Date	Amount of Deposit	Principal Balance in Trust After Deposit
October 15, 2018 or 150 days after the Effective Date, whichever is later	$1,000,000	$1,000,000
6 months after previous deposit	$1,000,000	$2,000,000
6 months after previous deposit	$6,500,000	$8,500,000
6 months after previous deposit	$6,500,000	$15,000,000
6 months after previous deposit	$2,600,000	$17,600,000
6 months after previous deposit	$2,600,000	$20,200,000
6 months after previous deposit	$2,600,000	$22,800,000
6 months after previous deposit	$2,600,000	$25,400,000
6 months after previous deposit	$2,600,000	$28,000,000
6 months after previous deposit	$2,600,000	$30,600,000
6 months after previous deposit	$2,600,000	$33,200,000
6 months after previous deposit	$2,600,000	$35,800,000

Exhibit A
Sample Claim Certificate

[**Insert date**]

[**Insert Trustee's name** pursuant to trust agreement's preamble]
[**Insert Trustee's address** pursuant to Section [19(b)] of trust agreement]

[**Insert authorized EPA official** pursuant to Sections [19(c)] of trust agreement]
[**Insert address** pursuant to Sections [19(c)] of trust agreement]

Re: Request for payment from the Trust [**insert trust account number or other identifying information**] established as financial assurance for the [**insert site name**] Site

Dear [**insert name of Trustee and authorized EPA official**]:

Pursuant to Section [4(a)] of the subject trust, the Grantor (as defined therein) and/or its representatives or contractors are authorized to request that the Trustee (as defined therein) make payment from the trust for Work (as defined therein) performed under the Consent Decree (as defined therein) by delivering to the Trustee and EPA (as defined therein) a written request for payment signed by an officer of the requesting entity. By this letter, [**insert requesting entity**] requests payment from the trust. The bases for the payment request are more fully described below.

1. Certification: [**insert certification from officer of requesting entity that the request is submitted for Work performed in accordance with the Consent Decree**].
2. Description of Applicable Work: [**insert description of the Work that has been performed**].
3. Amount of Payment Request: [**insert amount of funds requested from trust**].
4. Proposed Payee: [**insert identification of payee(s) of the funds requested**].

Please let me know if you have any questions. I can be reached at [**insert telephone number and email address**].

Sincerely,

_____
[**insert name of officer of the requesting entity**]
[**insert address of the requesting entity**]

[cc: [**Insert other EPA staff to receive payment requests pursuant to Section [19(c)] of trust agreement**]]

Exhibit B

Grantor-Designated Individuals Authorized for Orders, Requests, and Instructions

[**Grantor to insert person(s) (and relevant contact information) designated to provide/make orders, requests, and instructions to the Trustee pursuant to Section [13] of trust agreement**]

APPENDIX H

REQUIREMENTS FOR REMOVAL ACTION
HAYDEN CREEK WASTE AREA
BIG RIVER MINE TAILINGS/ST. JOE MINERALS CORP. SITE
ST. FRANCOIS COUNTY, MISSOURI

I. PURPOSE

This document, Appendix I, Requirements for Removal Action, sets forth the removal action requirements for The Doe Run Resources Corporation ("Settling Defendant") at the Hayden Creek Waste Area. The Hayden Creek Waste Area is a former mining site located one mile southwest of the town of Frankclay at 216 State Route M, Irondale, St. Francois County, Missouri. The Hayden Creek Waste Area is estimated at approximately 50 acres in size and contains several old concrete structures that remain from the former lead mining activities. *See* Figure 1. The area of the former mining operations is approximately eight acres. The state of Missouri completed a Preliminary Assessment/Removal Site Evaluation of the Hayden Creek Waste Area in September of 2011.

The geographic location of the Hayden Creek Site is NW ¼, NW ¼, SE ¼, of Section 7, Township 36 North, Range 4 East, Frankclay, Missouri Quadrangle in St. Francois County. The geographic coordinates are 37.845833° North latitude and 90.633611° West longitude.

The mine was owned and operated between 1949 and 1958 by the St. Joseph Lead Company. The area is surrounded by small tracts of forest and residential properties. Current land use is pasture.

II. REMOVAL ACTION WORK PLAN

Not later than two years after the effective date of the Consent Decree ("CD"), Settling Defendant shall prepare and submit to the Environmental Protection Agency ("EPA") and the State of Missouri ("State"), for review and approval, a Work Plan. The Work Plan shall identify all sources of site contamination; provide recommendations for an appropriate response action to address site contamination; and provide a schedule for completion of the investigation, and completion of the response action.

Assuming reasonable access can be arranged, the Work Plan shall include a schedule requiring Settling Defendant to complete the response action for the Hayden Creek Waste Area not later than five years after the effective date of the CD or three years after EPA's approval of the Work Plan, whichever is later. All deliverables submitted for the EPA and State approval or comment shall be subject to the CD, the SOW, including Section 6 (Deliverables) of the SOW, and this Appendix I.

The Work Plan shall be provided to the EPA in both paper and electronic format. Electronic format text shall be provided in Microsoft® Word® software.

Settling Defendant shall keep all property owners fully informed of the work to be performed and schedules. The Work Plan shall demonstrate sound engineering judgement. The Work Plan shall provide the following:

A. Management Chapter

The Management Chapter shall include a clear and concise description of roles, relationships and assignment of responsibilities among the Settling Defendant's Project Coordinator, Quality Assurance Officer, Construction Supervisor and Construction Personnel.

B. Construction Chapter

The Construction Chapter should include all relevant documents that demonstrate how the removal action will address all site contamination at the Hayden Creek Waste Area to health-based cleanup levels appropriate for the future use of the property. The Work Plan shall include information necessary to implement the removal action, including:

1. Designs, plans and specifications, and other construction documents that demonstrate how the cleanup will be achieved. The designs, plans and specifications, and construction documents must be consistent with the CD, the SOW, this Appendix I, as well as the findings in the September 2011 Preliminary Assessment/Removal Site Evaluation ("PA/RSE").

2. Field data collected, supporting calculations, designs, drawings and specifications which demonstrate that the construction will achieve long-term reduction in threat of release of hazardous substances. Among the design aspects to be addressed are the following:

    a. Specifications of materials (soil and rock), including its gradation and total lead, cadmium and zinc concentrations;

    b. Description of revegetation strategy including seeding, fertilizer, proposed amendments, off-site cover soil sources if on-site soil source is insufficient, and any temporary seeding strategy; seed mix shall consist of a mixture of perennial grasses, legumes and forbs; soil shall be rolled and prepped as appropriate for seeding; seeding schedule; identification of fertilizers, application rates and times; identification of soil amendments and application rates; hydromulching;

    c. Description of construction methods, equipment, and personnel;

    and,

    d. Any assumptions made by Settling Defendant in developing design parameters shall be clearly stated and supported by sound engineering practice.

3. Removal Action Schedule that describes each phase of the removal action. For each construction milestone the schedule shall provide specific time periods starting from the EPA approval of the Work Plan to completion of construction milestones and the project. Demolition, grading, and soil placement shall be completed within three years after the approval of the Work Plan.

4. Detailed description of site preparation activities, including access agreements, establishment of security and control, definition of clearing and grubbing limits, establishment of work and support areas, and definition of decontamination areas;

5. Description of construction quality control process necessary to successfully construct the design including grade control method and geotechnical sampling during construction;

6. Dewatering contingency plans and fluids management procedures including details for draining the wetland, if required;

7. Run-on and runoff controls during construction, including location of controls and frequency and methods for collecting water samples, if required;

8. Spill prevention and management;

9. Detailed description of on-site soil storage and waste processing methods;

10. Design of a dust suppression program to be used during site material handling activities, and description of the methods to be used to control fugitive dust and monitor air quality. The regrading and construction techniques must minimize the release of contaminants via airborne emissions and surface runoff. Water shall be used during site activities to minimize generation of airborne emissions.

11. List of types of heavy equipment and number of operators planned to be utilized in implementing the project and a description of decontamination procedures for heavy equipment.

12. Identification of the method of the method of transportation for contaminated materials to be removed from the site and material quantity accounting procedures.

13. A description of how the removal action will comply with applicable or relevant and appropriate requirements ("ARARs") and meet substantive permitting requirements;

C. Quality Assurance Project Plan (QAPP) Chapter

At the same time that Settling Defendant submits the Work Plan it shall also prepare and submit a Quality Assurance Project Plan ("QAPP") to the EPA and the State. For all chemical analyses, the Settling Defendant shall discuss the field sampling protocol, frequency of sampling, parameters to be analyzed, and the name and certification requirements for all laboratories to be used. Chemical analysis will be conducted for at least the following:

1. Compliance with ARARs (e.g. National Pollutant Discharge Elimination System ("NPDES") parameters);

2. Analysis to document clean cover materials, if required;

   and,

3. Analysis to confirm removal of lead contaminated soil.

III. Site Specific Health And Safety Plan ("HASP")

Settling Defendant is also responsible for developing and implementing a HASP that is in compliance with Occupational Safety and Health Administration ("OSHA") regulations and protocols. The HASP shall cover both design data collection and construction activities. The HASP shall be completed prior to intrusive field work. The EPA will review the plan to assure that all necessary elements are included, but will not provide formal approval.

IV. Execution

Settling Defendant shall execute the Removal Action in accordance with the approved Work Plan. As specified in Section 104(a)(1) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 ("CERCLA"), as amended by 1986 Superfund Amendments and Reauthorization Act ("SARA"), the EPA will provide oversight of the Settling Defendant's activities throughout the Removal Action. Settling Defendant shall support the EPA's initiation and conduct of activities related to the implementation of oversight activities.

V. Removal Action Report

Settling Defendant shall submit to the EPA and the State for review and approval, a Removal Action Report 60 days after the activities described herein have been accomplished. The Removal Action Report shall include as-built drawings of final constructed configurations; a description of measures taken on each portion the site; quality control and monitoring results during construction; documentation that removal action has been completed in accordance with the Work Plan; and empirical data, observations, photographs of site construction, and calculations which demonstrate that the removal action will provide long-term erosional stability of the site. The Removal Action Report shall include the following certification signed by a person who supervised or, directed the preparation of the Report:

> "Under penalty of law, I certify that to the best of my knowledge, after appropriate inquiries of all relevant persons involved with the preparation of this report, the information submitted is 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."

VI. Post-Removal Site Control

Settling Defendant shall provide operations and maintenance of the removal action area for a minimum of one year after the completion of activities.

If contamination remains on site, at the same time that Settling Defendant submits to the EPA and the State the Removal Action Report, Settling Defendant shall also submit to the EPA and the State for review and approval, a Post-Removal Site Control Plan in both paper copy and electronic format. This Plan shall provide, for all inspection, operation, and maintenance measures that are necessary to ensure the continued long-term effectiveness and integrity of the removal action for the site. The Plan shall provide a schedule for the implementation of repair and maintenance work at the site. Once approved by the EPA, the Settling Defendant shall provide the Post Removal Site Control Plan to the current property owners.

The Plan shall describe timing and details of sampling inspection processes, steps to develop corrective actions, process for notifying the EPA for non-routine issues, measures to enhance and repair vegetation growth, measures to repair rocked slopes, and any plans for development of the site. At a minimum, the Plan shall require that the site be inspected every 6 months. Settling Defendant shall provide the EPA with a written inspection report of the site conditions within 30 days of the end of each 6-month site inspection period. At a minimum, the inspection report shall provide a description of the condition of the removal action area. The report shall also provide all data results for samples collected at the site and describe the details of any damage/deterioration to the remediated area. The Inspection Reports shall be certified in writing as described in Section V of this Appendix I.

VII. Community Relations

Settling Defendant shall coordinate the design and proposed Work with the current property owners. In addition, Settling Defendant shall participate, as requested by the EPA, in meetings with the EPA and the community to discuss design issues.

VIII. Quarterly Progress Reports

Throughout the course of the removal action, until approval of the Removal Action Report by EPA, Settling Defendant shall submit to the EPA written quarterly progress reports in accordance with the CD, which may be included as part of the Progress Reports submitted to EPA pursuant to Consent Decree Appendix B (SOW) Section 5.1. The quarterly progress reports shall include, at a minimum:

1. A description of the significant actions completed during the reporting period;

2. A description of significant actions scheduled for completion during the reporting period which were not completed along with a statement indicating why such actions were not completed and an anticipated completion date;

3. Copies of all sampling and test results received during the reporting period;

4. Any proposed revisions to the project schedule for review and approval by the EPA;

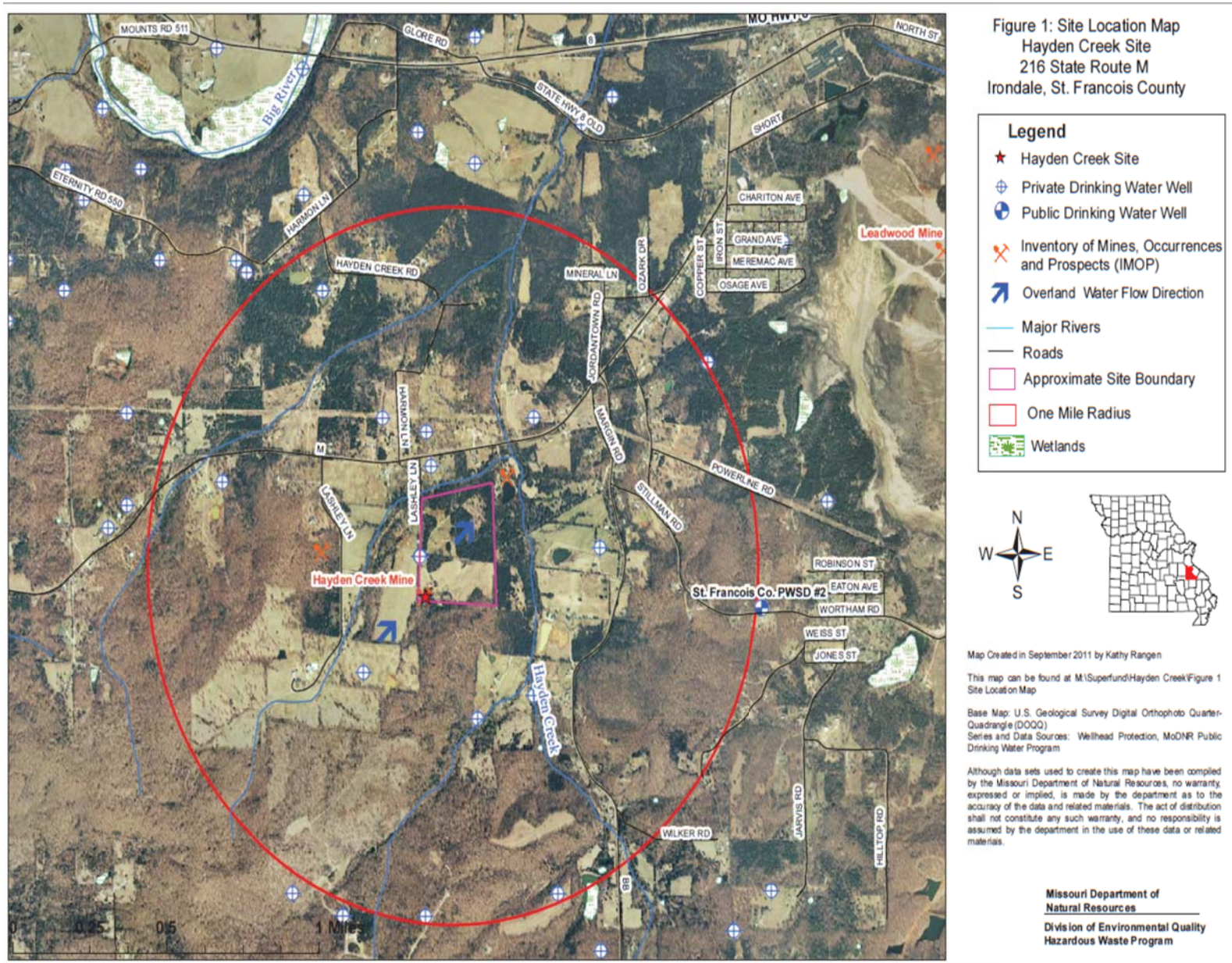
   and,

5. A description of the significant actions which are scheduled for completion during the next reporting period.

IX. Submittals to State

Settling Defendant shall submit copies of all submittals required by this Appendix I and all correspondence concerning the Hayden Creek Waste Area to the Missouri Department of Natural Resources ("MDNR"), Project Manager for the Site (currently Mr. Brandon Wiles) at P.O. Box 176, Jefferson City, Missouri 65102-0176, *Brandon.Wiles@dnr.mo.gov*.

FIGURE 1. Hayden Creek Waste Area



APPENDIX I
TO CONSENT DECREE IN
UNITED STATES AND STATE OF MISSOURI V. DOE RUN RESOURCES CORPORATION FOR OU-1

LIST OF NATIVE PLANT SPECIES FOR LEADWOOD REVEGETATION

Grasses

Andropogon scoparius	Little bluestem
Adropogon gerardii	Big bluestem
Panicum virgatum	Switchgrass
Sorghastrum nutans	Yellow Indian grass
Chasmanthium latifolium	Broad-leaf wood-oat
Elymus virginicus	Virginia wildrye

Forbs

Asclepias syriaca	Common milkweed (minimum 1/4 ounce per acre)
Desmanthus illinoensis	Illinois bundleflower
Rudbeckia hirta	Black-eyed-Susan
Strophostyles leiosperma	slick-seed wildbean
Verbena hastata	Blue verbena
Chamaecrista fasciculata	Showy partridge pea
Symphyotrichum novae-angliae	New England aster
Dalea purpurea	Purple Prairie Clover
Coreopsis lanceolata	Lanceleaf coreopsis
Penstemon digitalis	Foxglove Penstemon
Echinacea pallida	Pale Coneflower
Liatris pycnostachya	Thick-spike gayfeather

Signature Page for CD regarding OU-1 of the Big River Mine Tailings Superfund Site

FOR THE DOE RUN RESOURCES CORPORATION:

January 31, 2018
Dated

Matthew D. Wohl
Vice President - Law
1801 Park 270 Drive, Ste. 300
St. Louis, MO 63146

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

Name (print): _____
Title: _____
Company: CT Corporation System
Address: 120 South Central Avenue, Ste. 400
Clayton, MO 63105
Phone: 314.863.5545
email: _____