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