

## 4. Public Involvement, Consultation, and Coordination

Various federal laws require the BLM to consult with Native American tribes, the SHPO, USFWS, and EPA during the NEPA decision-making process. This section describes the specific actions taken by the BLM to consult and coordinate with the public, Native American tribes, and state and federal government agencies. In addition to formal scoping, the BLM conducted public involvement and implemented collaborative outreach by inviting agencies to be cooperative partners for the NEPA process.

### 4.1. Public Involvement

This Draft EA will be available to the public for review and comment for 30 days. The BLM sent notification of the availability of the document to individuals, organizations, or agencies by postcard or email. All comments received will be reviewed and categorized by the BLM. Although not required for an EA by regulation, an agency may respond to and summarize substantive and timely comments received as a part of an appendix to the Final EA (BLM 2008).

### 4.2. Consultation and Coordination

Early coordination was conducted by the BLM and USFS with various state and federal agencies as well as American Indian Tribes to obtain feedback regarding potential environmental impacts. Agencies and tribes consulted include:

- USFWS
- Missouri SHPO
- The Shawnee Tribe
- The Eastern Shawnee Tribe of Oklahoma
- The Delaware Nation
- The Delaware Tribe of Indians
- The Kialegee Tribal Town of the Creek Nation of Oklahoma
- Cherokee Nation
- The Absentee Shawnee Tribe
- The Otoe-Missouria Tribe
- The Wyandotte Nation
- The Miami Tribe of Oklahoma
- The Muscogee (Creek) Nation
- The Osage Nation
- The Ponca Tribe of Nebraska
- The Ponca Tribe of Indians of Oklahoma
- The United Keetoowah Band of Cherokee in Oklahoma

In addition, as a cooperating agency the USFS provided input on the development of the Draft EA.

In accordance with the ESA, the BLM contacted USFWS regarding federally listed special status species. Determination statements for federally listed species were provided by the BLM and are reflected in this EA. In an email dated May 11, 2022, the USFWS concurred with the determination statements made by the BLM (Appendix D).

In accordance with Section 106 of the NHPA, the SHPO was also contacted and provided with an opportunity to comment on the effects of this project. In a letter dated April 11, 2022, the SHPO concurred with the determination statements made by the BLM (Appendix D).

The results of this consultation are described in the Cultural Resources section of this EA. Concurrently, the BLM initiated formal consultation with Indian tribes through issuance of consultation letters that were sent to Indian tribes that have expressed potential interest in archaeological resources located in the Project Area. To date, the only response received was from the Cherokee Nation on April 19, 2022 (Appendix D).

#### *4.3. 36 CFR 218 Pre-Decisional Objection Process*

As described in 36 CFR 218, subparts A and B, USFS-proposed actions concerning projects and activities implementing land and resource management plans documented with a Record of Decision or Decision Notice are subject to a pre-decisional administrative review (objections) process. Eligible entities include individuals, non-governmental organizations, businesses, partnerships, state and local governments, Alaska Native Corporations, and Indian Tribes.

Regulations at 36 CFR 218 state that in order to be eligible to object under the Objections process, entities must submit timely “specific written comments” (36 CFR 218.2) during any period “designated for public comment” (36 CFR 218.5(a)). The following public opportunity to submit written comments will be provided for this project:

1. 30-Day Notice and Comment Period: Those who submit comments during the formal 30-day notice and comment period for this Draft EA for public comment will have standing to file an objection. This 30-day period has been initiated by a legal notice in the USFS newspaper of record, the Milwaukee Journal Sentinel, as well as the local newspaper, the Rolla Daily News. Comments submitted during this period will be used to identify any issues with the proposal or associated environmental analysis. All comments received will be reviewed and considered during preparation of the Final EA. Upon finalization of the EA, a draft Decision Notice will be prepared.
2. The opportunity to comment ends 30 days following the date of publication of the legal notice in the newspaper of record (see § 218.25(a)(2)).
3. To be eligible to submit an objection, individuals and entities must provide the following during this comment period:
  - i. Name and postal address. Email address in addition is recommended but not required.
  - ii. Title of the proposed project or activity.

- iii. Specific written comments as defined in § 218.2 regarding the proposed project or activity, along with supporting reasons.
  - iv. Signature or other verification of identity upon request and identification of the individual or entity who authored the comment(s). For comments listing multiple entities or multiple individuals, a signature or other means of verification must be provided for the individual authorized to represent each entity and for each individual in the case of multiple names. A scanned signature or other means of verifying the identity of the individual or entity representative may be used for electronically submitted comments.
  - v. Individual members of an entity must submit their own comments to establish personal eligibility; comments received on behalf of an entity are considered as those of the entity only.
4. Anyone who submits timely, specific written comments during this designated opportunity for public comment will be eligible to file objections during a future designated 45-day objection period.

All public comment and objections, including names and addresses of those who comment, will become part of the public record for this project and will be subject to review pursuant to the Freedom of Information Act.

#### *4.4. Preparers and Contributors*

This Draft EA was developed by an interdisciplinary team made up of the BLM and USFS staff specialists listed in Table 4-1. The BLM also worked with a third-party contractor, Wood Environment & Infrastructure Solutions, Inc. (Wood), as shown in Table 4-1, to assist in development of the content and analysis in the EA. Portions of the EA were also developed by the BLM contractor SC&A, Inc.

**Table 4-1. List of Preparers and Reviewers**

<b>Entity</b>	<b>Name</b>	<b>Role</b>
BLM	Kurt Wadzinski	Air Quality/ NEPA Coordinator
BLM	Timothy Howell	Geology/Soils
BLM	Danielle Donkersloot	Water Resources, Wildlife, Vegetation and Aquatic Resources
BLM	Wes Willoughby	Cultural Resources
BLM	Lindy Nelson	Project Manager
USFS	Patricia Coffman	Safety, Socioeconomics, NEPA Coordinator
USFS	John LaCoste	Geology
USFS	Kyle Steele	Soils
USFS	Kelly Whitsett	Water Resources
USFS	Chad Keith	Wildlife and Aquatic Resources
USFS	Brian Davidson	Vegetation
USFS	Brian Merkel	Timber Management
USFS	Lester Lakey	Cultural Resources

---

<b>Entity</b>	<b>Name</b>	<b>Role</b>
USFS	Chris Bland	Transportation
USFS	Cecelia Lepa	Recreation and Visual Resources
Wood	Stephanie Miller	Project Manager
Wood	Ray Finocchiaro, PhD	Soils
Wood	Robin Ledford	Surface Water, Threatened and Endangered Species
Wood	Paul Ivancie	Geology and Groundwater
Wood	Gordon Kersten	Wildlife and Aquatic Resources, Visual Resources
Wood	Chris Mausert-Mooney	Vegetation
Wood	Kathy Warner	Cultural Resources
Wood	Erin Alsop	Health and Safety, Recreation, Environmental Justice
Wood	Richard Weber	Socioeconomics
Wood	Rebecca Porath	Transportation
SC&A	Margaret Overton	Air Quality and Climate Change
SC&A	Andrew Shroads	Air Quality and Climate Change

---

## 5. References

- Brookshire, B.L.; Jensen, R.; Dey, D.C. 1997. The Missouri Ozark Forest Ecosystem Project: past, present, and future. In: Brookshire, Brian L.; Shifley, Stephen R., eds. Proceedings of the Missouri Ozark Forest Ecosystem Project symposium: an experimental approach to landscape research; 1997 June 2-5; St. Louis, MO. Gen. Tech. Rep. NC-193. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station: 1- 25.
- BLM (Bureau of Land Management). 2008. BLM National Environmental Policy Act Handbook H-1790-1. U.S. Department of the Interior, Bureau of Land Management. January 2008.
- \_\_\_\_\_. 2019. Copper Flat Copper Mine Final Environmental Impact Statement. Volume 1. Las Cruces, NM, U.S.A. Accessed: March 2022. Retrieved from: [https://eplanning.blm.gov/epl-front-office/projects/nepa/75353/169629/206199/Copper\\_Flat\\_Final\\_EIS.pdf](https://eplanning.blm.gov/epl-front-office/projects/nepa/75353/169629/206199/Copper_Flat_Final_EIS.pdf)
- \_\_\_\_\_. 2020. 2020 BLM Specialist Report on Annual Greenhouse Gas Emissions and Climate Trends from Coal, Oil, and Gas Exploration and Development on the Federal Mineral Estate. Accessed June 2022. <https://www.blm.gov/content/ghg/>
- \_\_\_\_\_. 2022. BLM National NEPA Register. Accessed February 2022. Retrieved from: <https://eplanning.blm.gov/eplanning-ui/home>
- Chapman, S.S., Omernik, J.M., Griffith, G.E., Schroeder, W.A., Nigh, T.A., and Wilton, T.F. 2002. Ecoregions of Iowa and Missouri (color poster with map, descriptive text, summary tables, and photographs): Reston, Virginia, U.S. Geological Survey (map scale 1:1,800,000). Accessed: December 28, 2021. Retrieved from: <https://www.epa.gov/eco-research/ecoregion-download-files-state-region-7#pane-23>.
- CEQ (Council on Environmental Quality). 1997. Environmental Justice Guidance under the National Environmental Policy Act, Executive Office of the President, Washington, DC. Accessed: May 2022. Retrieved from: [https://www.epa.gov/sites/production/files/2015-02/documents/ej\\_guidance\\_nepa\\_ceq1297.pdf](https://www.epa.gov/sites/production/files/2015-02/documents/ej_guidance_nepa_ceq1297.pdf)
- County Office. 2022. Public Schools in Reynolds, Shannon, Dent Counties, Missouri. Accessed April 2022. Retrieved from: <https://www.countyoffice.org/>
- Doe Run. 2016. U.S. BLM Five Year Exploration Plan – 2017 – 2021. October 18, 2016.
- \_\_\_\_\_. 2017. U.S. BLM Five Year Operating Plan – 2017 – 2021. January 1, 2017
- \_\_\_\_\_. 2021. 2020 Sustainability Report. St. Louis, MO, U.S.A. Accessed: March 2022. Retrieved from: <http://doerun.com/wp-content/uploads/2021/07/Doe-Run-2020-Sustainability-Report-Final.pdf>.
- EKU (Eastern Kentucky University) 2012. Gray Bat (*Myotis grisescens*). Kentucky Bat Working Group. Accessed: March 2022. Retrieved from: <http://biology.uku.edu/bats/graybat.htm>.
- EPA (U.S. Environmental Protection Agency). 1974. Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety, EPA-550/9-74-004, Washington, DC.

- \_\_\_\_\_. 2010. Consent Decree: U.S. and State of Missouri v. The Doe Run Company. Accessed: March 2022. Retrieved from: <https://www.epa.gov/sites/default/files/documents/doerun-cd.pdf>
- \_\_\_\_\_. 2016. What Climate Change Means for Missouri. Accessed: March 2022. Retrieved from: <https://19january2017snapshot.epa.gov/sites/production/files/2016-09/documents/climate-change-mo.pdf>
- \_\_\_\_\_. 2018. Environmental Justice. Accessed: May 2022. Retrieved from: <https://www.epa.gov/environmentaljustice/learn-about-environmental-justice>
- \_\_\_\_\_. 2021. 2017 National Emissions Inventory. Accessed: March 2022. Retrieved from: <https://www.epa.gov/air-emissions-inventories/2017-national-emissions-inventory-nei-data>.
- \_\_\_\_\_. 2022a. National Ambient Air Quality Standards Table. Accessed: March 2022. Retrieved from: [https://www3.epa.gov/airquality/greenbook/anayo\\_mo.html](https://www3.epa.gov/airquality/greenbook/anayo_mo.html).
- \_\_\_\_\_. 2022b. Lead 2008 Nonattainment Area Partial County Descriptions. Accessed: March 2022. Retrieved from: <https://www3.epa.gov/airquality/greenbook/mnp.html#Lead.2008.Iron>.
- \_\_\_\_\_. 2022c. Toxic Release Inventory Search. Accessed: March 2022. Retrieved from: <https://www.epa.gov/enviro/tri-search>.
- \_\_\_\_\_. 2022d. Watershed Assessment, Tracking & Environmental Results System (WATERS). Accessed: March 2022. Retrieved from: <https://www.epa.gov/waterdata/viewing-waters-data-using-google-earth>.
- \_\_\_\_\_. 2022e. Peer Review of “Technical Support Document: Social Cost of Greenhouse Gas Estimates.” Accessed June 2022. <https://www.epa.gov/environmental-economics/scghg-tsd-peer-review>
- FHWA (Federal Highway Administration). 2011. Highway Traffic Noise: Analysis and Abatement Guidance. FHWA-HEP-10-025. Accessed: March 2022.
- \_\_\_\_\_. 2016. Construction Noise Handbook. Accessed: March 2022. Retrieved from: [http://www.fhwa.dot.gov/environment/noise/construction\\_noise/handbook/handbook09.cfm](http://www.fhwa.dot.gov/environment/noise/construction_noise/handbook/handbook09.cfm)
- Fenneman, N.M. 1938. Physiography of eastern United States: New York, London, McGraw-Hill Book Company, Inc., 714 p.
- Fenneman, N.M., and Johnson, D.W. 1946. Physiographic divisions of the conterminous U.S.: USGS Water Resources NSDI Node. Accessed: September 11, 2015. Retrieved from: <http://water.usgs.gov/GIS/metadata/usgswrd/XML/physio.xml>.
- Foulger, G. R., Wilson, M., Gluyas, J., Julian, B. R., & Davies, R. 2018. Global review of human-induced earthquakes. *Earth-Science Reviews*, 178, 438-514.
- GAO (U.S. Government Accountability Office). 2020. Mining on Federal Lands: More Than 800 Operations Authorized to Mine and Total Mineral Production Is Unknown. Washington, D.C., U.S.A. Accessed: March 2022. Retrieved from: <https://www.gao.gov/assets/gao-20-461r.pdf>.

- GCRP (U.S. Global Change Research Program). 2017. Climate Science Special Report: Fourth National Climate Assessment, Volume I. Washington, DC, U.S.A.  
[https://science2017.globalchange.gov/downloads/CSSR2017\\_FullReport.pdf](https://science2017.globalchange.gov/downloads/CSSR2017_FullReport.pdf)
- Goddard Institute for Space Studies. 2020. Analysis Graphs and Plots. Annual Mean Temperature Change for Three Latitude Bands – Northern Extratropics. Accessed: February 2020. Retrieved from: [https://data.giss.nasa.gov/gistemp/graphs\\_v4/](https://data.giss.nasa.gov/gistemp/graphs_v4/).
- Imes, J.L., and Emmett, L.F. 1994. Geohydrology of the Ozark Plateaus aquifer system in parts of Missouri, Arkansas, Oklahoma, and Kansas: U.S. Geological Survey Professional Paper 1414–D, 140 p.
- Interagency Working Group. 2021. Technical Support Document: Social Cost of Carbon, Methane, and Nitrous Oxide. Interim Estimates under Executive Order 13990. Accessed: March 2022. Retrieved from: [https://www.whitehouse.gov/wp-content/uploads/2021/02/TechnicalSupportDocument\\_SocialCostofCarbonMethaneNitrousOxide.pdf](https://www.whitehouse.gov/wp-content/uploads/2021/02/TechnicalSupportDocument_SocialCostofCarbonMethaneNitrousOxide.pdf)
- Intergovernmental Panel on Climate Control (IPCC). 2021. Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge, United Kingdom and New York, NY, U.S.A. <https://www.ipcc.ch/report/ar6/wg1/>
- Kansas Geological Survey. 2010. Upper Cambrian and Lower Ordovician Rocks: Description and Correlation of Subdivisions. Accessed: August 2022. Retrieved from: [https://www.kgs.ku.edu/Publications/Bulletins/72/04\\_subd.html](https://www.kgs.ku.edu/Publications/Bulletins/72/04_subd.html).
- Kartesz, J.T., The Biota of North America Program (BONAP). 2015. *North American Plant Atlas*. (<http://bonap.net/napa>). Chapel Hill, N.C. [maps generated from Kartesz, J.T. 2015. Floristic Synthesis of North America, Version 1.0. Biota of North America Program (BONAP). (in press)].
- Kleeschulte, M. 2001. Effects of Lead-Zinc Mining on Ground-Water Levels in the Ozark Aquifer in the Viburnum Trend, Southeastern Missouri. Water Resources Investigations Report 00-4293.
- Krusekopf, H. H. 1962. Major Soil Areas of Missouri, 1962. University of Missouri Agricultural Experiment Station, B785. May 1962.
- Lee M, Beard J, Thompson F. 2011. Recreation Opportunity Spectrum. Page 30. Northern Arizona University; Coconino National Forest; US Forest Service. Accessed: March 8, 2022. Retrieved from: [https://www.fs.usda.gov/Internet/FSE\\_DOCUMENTS/stelprdb5412128.pdf](https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5412128.pdf).
- Market Data. 2021. Five largest lead mines in US in 2020. Accessed: March 2022. Retrieved from: <https://www.mining-technology.com/marketdata/five-largest-lead-mines-the-us-2020/>.
- MDC (Missouri Department of Conservation). 2021. Missouri Species and Communities of Conservation Concern Checklist. January 2021.
- \_\_\_\_\_. 2022a. Small Game Hunting and Fishing Permit. Accessed: March 7, 2022. Retrieved from: <https://mdc.mo.gov/hunting-trapping/permits/small-game-hunting-fishing-permit>.

- \_\_\_\_\_. 2022b. Missouri Fish and Wildlife Information System. Accessed: March 21, 2022. Retrieved from: [https://mdc12.mdc.mo.gov/applications/mofwis/mofwis\\_search1.aspx](https://mdc12.mdc.mo.gov/applications/mofwis/mofwis_search1.aspx).
- National Council for Air and Stream Improvement, Inc. 2004. *Effects of heavy equipment on physical properties of soils and on long-term productivity: A review of literature and current research*. Technical Bulletin No. 887. Research Triangle Park, N.C.: National Council for Air and Stream Improvement, Inc.
- Missouri Business. June 16, 2015. Doe Run – The Lead Belt Heavyweight. Accessed: March 2022. Retrieved from: <https://mobizmagazine.com/2015/06/16/doe-run-the-lead-belt-heavyweight/>.
- Missouri Secretary of State. 2022. Title 10 of the Code of State Regulations, 10-6.010 Ambient Air Quality Standards. Accessed: March 2022. Retrieved from: <https://www.sos.mo.gov/cmsimages/adrules/csr/current/10csr/10c10-6a.pdf>
- MoDNR (Missouri Department of Natural Resources). 2013a. Permit to Construct 052014-004 for the Doe Run Company - Brushy Creek Mine & Mill. Accessed: March 2022. Retrieved from: <https://dnr.mo.gov/air/business-industry/air-permits/doe-run-brushy-creek-mine-052014-004>.
- \_\_\_\_\_. 2013b. Permit to Construct 082014-003 for the Doe Run Company – Sweetwater Mine & Mill. Accessed: March 2022. Retrieved from: <https://dnr.mo.gov/air/business-industry/air-permits/doe-run-sweetwater-082014-003>.
- \_\_\_\_\_. 2014. Permit to Construct 042016-008 for the Doe Run Company – Fletcher Mine & Mill. Accessed: March 2022. Retrieved from: <https://dnr.mo.gov/air/business-industry/air-permits/doe-run-fletcher-mine-mill-042016-008>.
- \_\_\_\_\_. 2019. Missouri State Operating Permit for The Doe Run Company, Fletcher Mine/Mill, Permit No. MO-0001856. MoDNR Missouri Clean Water Commission. May 1, 2019. Accessed: March 2022. Retrieved from: <https://dnrservices.mo.gov/env/wpp/permits/issued/docs/0001856.pdf>.
- \_\_\_\_\_. 2020a. Missouri State Operating Permit for Doe Run, Brushy Creek Mine/Mill, Permit No. MO-0001848. MoDNR Missouri Clean Water Commission. July 1, 2020. Accessed: March 2022. Retrieved from: <https://dnrservices.mo.gov/env/wpp/permits/issued/docs/0001848.pdf>.
- \_\_\_\_\_. 2020b. Missouri Integrated Water Quality Report and Section 303(d) List, 2020, Clean Water Act Sections 303(d), 305(b), and 314, MoDNR Water Protection Program, Jefferson City, Missouri, June 23, 2020. Approved by EPA on September 13, 2021. Retrieved from: <https://dnr.mo.gov/document/2020-missouri-integrated-water-quality-report-305b-report>.
- \_\_\_\_\_. 2021. Missouri State Operating Permit for Doe Run Company, Sweetwater Mine/Mill Site, Permit No. MO-0001881. MoDNR Missouri Clean Water Commission. February 1, 2021. Accessed: March 2022. Retrieved from: <https://dnrservices.mo.gov/env/wpp/permits/issued/docs/0001881.pdf>.
- \_\_\_\_\_. 2022a. Groundwater Observation Wells. Accessed: March 2022. Retrieved from: <https://gis-modnr.opendata.arcgis.com/pages/dnr-missouri-geological-survey>.



- \_\_\_\_\_. 2022b. Missouri Geological Survey GeoSTRAT. Accessed: August 2022. Retrieved from:  
<https://modnr.maps.arcgis.com/apps/webappviewer/index.html?id=3ac3a61da4af4834811503a24a3cb935>
- MoDOT (Missouri Department of Transportation). 2022. Traffic Volume Maps. Accessed: March 7, 2022. Retrieved from <https://www.modot.org/traffic-volume-maps>.
- MSDIS (Missouri Spatial Data Information Service). 2011.  
MO\_2011\_Land\_Use\_Land\_Cover\_img. Remote Sensing Spatial Data Version 6.2 (Build 9200); Esri ArcGIS 10.4.0.5524, Created by the MSDIS using data from the National Land Cover Dataset (NLCD). Missouri Spatial Data Information Service, University of Missouri. Accessed: March 30, 2022. Retrieved from [https://msdis-archive.missouri.edu/archive/Missouri\\_Vector\\_Data/Environment\\_Conservation/](https://msdis-archive.missouri.edu/archive/Missouri_Vector_Data/Environment_Conservation/)
- NatureServe. 2022. NatureServe Explorer [web application]. NatureServe, Arlington, Virginia. Accessed: January 3, 2022. Retrieved from: <https://explorer.natureserve.org/>.
- Nottmeier, Anna M. 2015. Regional Potentiometric Surface of the Ozark Aquifer in Arkansas, Kansas, Missouri, and Oklahoma, November 2014-January 2015, United States Geologic Survey, Groundwater Resources Program, Scientific Investigations Map 3348.
- National Oceanic and Atmospheric Administration (NOAA) Fisheries. 2022. Endangered Species Conservation – Critical Habitat. Retrieved from:  
<https://www.fisheries.noaa.gov/national/endangered-species-conservation/critical-habitat>.
- NRCS (Natural Resources Conservation Service). 2016. Natural Resources Conservation Service, United States Department of Agriculture (USDA). Official Soil Series Descriptions. Accessed: December 29, 2021. Retrieved from:  
[http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/survey/geo/?cid=nrcs142p2\\_053587](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/survey/geo/?cid=nrcs142p2_053587).
- \_\_\_\_\_. 2022. Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Soil Survey Geographic (SSURGO) Database. Accessed March 2022. Retrieved from: <https://sdmdataaccess.sc.egov.usda.gov>
- The Ozark Trail Association. 2022a. History. Accessed: March 7, 2022. Retrieved from: <https://ozarktrail.com/history/>.
- The Ozark Trail Association. 2022b. Frequently Asked Questions. Accessed: March 7, 2022. Retrieved from: <https://ozarktrail.com/faq/>.
- USCB (U.S. Census Bureau). 2020a. American Community Survey 5-Year Estimates, 2016-2020, Detailed Tables, U.S. Census Bureau, Accessed: May 2022. Retrieved from <https://data.census.gov/cedsci/>.
- \_\_\_\_\_. 2020b. 2020 Decennial Census Redistricting Data, Detailed Tables, U.S. Census Bureau, Accessed: May 2022. Retrieved from <https://data.census.gov/cedsci/>.
- \_\_\_\_\_. 2020c. QuickFacts. United States. Accessed: April 2022. Retrieved from <https://www.census.gov/quickfacts/fact/table/US/PST045221>

- \_\_\_\_\_. 2021. Poverty Thresholds. 2021. Accessed: May 2022. Retrieved from: <https://www.census.gov/data/tables/time-series/demo/income-poverty/historical-poverty-thresholds.html>.
- USFS (U.S. Forest Service). 1990. Recreation Opportunity Spectrum Primer and Field Guide. Page 6. R6-REC-021–90. USDA Forest Service.
- \_\_\_\_\_. 1995. Landscape Aesthetics. Page 104. Agriculture Handbook Number 701, A Handbook for Scenery Management. USDA Forest Service.
- \_\_\_\_\_. 2005a. 2005 Land and Resource Management Plan – Mark Twain National Forest. USDA Forest Service, Eastern Region Office, Milwaukee, Wisconsin. September 2005.
- \_\_\_\_\_. 2005b. Final Environmental Impact Statement to Accompany the 2005 Land and Resource Management Plan. USDA Forest Service, Eastern Region Office, Milwaukee, Wisconsin. September 2005.
- \_\_\_\_\_. 2013. Final Environmental Impact Statement for the Rosemont Copper Project. Volume 2. Tucson, AZ, U.S.A. Accessed: March 2022. Retrieved from: <https://www.rosemonteis.us/document-types/final-eis>.
- \_\_\_\_\_. 2022a. Blair Creek section of the Ozark Trail. Accessed: March 7, 2022. Retrieved from: <https://www.fs.usda.gov/recarea/mtnf/recarea/?recid=21660>.
- \_\_\_\_\_. 2022b. Karkaghne Section of the Ozark Trail. Accessed: March 7, 2022. Retrieved from: <https://www.fs.usda.gov/recarea/mtnf/recreation/recarea/?recid=21662>.
- \_\_\_\_\_. 2022c. Mark Twain National Forest – Home. USDA, Forest Service. Accessed: March 7, 2022. Retrieved from: <https://www.fs.usda.gov/main/mtnf/home>.
- \_\_\_\_\_. 2022d. Salem Ranger District. Accessed: March 7, 2022. Retrieved from: <https://www.fs.usda.gov/recarea/mtnf/recreation/hunting/recarea/?recid=21646&actid=55>
- \_\_\_\_\_. 2022e. Sutton Bluff ATV, UTV, and Motorcycle Trail System. Accessed: March 7, 2022. Retrieved from: <https://www.fs.usda.gov/recarea/mtnf/recarea/?recid=21658>.
- \_\_\_\_\_. 2022f. MTNF Visual Quality Objective SensitivityLevel.shp. Geospatial Data (shapefile), Visual Quality Objective, Sensitivity Level, Forest Plan. Mark Twain National Forest, Salem Ranger District, 1301 South Main St Salem, MO 65560.
- \_\_\_\_\_. 2022g. MTNF\_ Visual Quality Objective VarietyClass.shp. Geospatial Data (shapefile), Variety Class, Visual Quality Objective, Forest Plan. Mark Twain National Forest, Salem Ranger District, 1301 South Main St Salem, MO 65560.
- USFWS (U.S. Fish and Wildlife Service). 2003. Mead’s Milkweed (*Asclepias meadii*) Recovery Plan. U.S. Fish and Wildlife Service, Great Lakes - Big Rivers Region (Region 3). Fort Snelling, Minnesota. 131 pp. Available at: USFWS 2003b. Accessed: March 2022. Retrieved from: [https://ecos.fws.gov/docs/recovery\\_plan/030922b.pdf](https://ecos.fws.gov/docs/recovery_plan/030922b.pdf).
- \_\_\_\_\_. 2005. Programmatic Biological Opinion for the Mark Twain National Forest 2005 Forest Plan, Missouri, USFWS, Columbia Missouri Ecological Services Field Office, Columbia, Missouri.

- \_\_\_\_\_. 2007a. Gray Bat (*Myotis grisescens*) 5-year Review: Summary and Evaluation. U.S. Fish and Wildlife Service, Midwest Region, Columbia, Missouri Ecological Services Field Office. Accessed: March 2022. Retrieved from: [https://esadocs.defenders-cci.org/ESAdocs/five\\_year\\_review/doc2625.pdf](https://esadocs.defenders-cci.org/ESAdocs/five_year_review/doc2625.pdf)
- \_\_\_\_\_. 2007b. Indiana Bat (*Myotis sodalis*) Draft Recovery Plan: First Revision. U.S. Fish and Wildlife Service, Fort Snelling, MN. 258 pp. Accessed: March 2022. Retrieved from: <https://ecos.fws.gov/ServCat/DownloadFile/45796?Reference=44940>.
- \_\_\_\_\_. 2010a. Hine's Emerald Dragonfly (*Somatochlora hineana*) Fact Sheet. Accessed: March 2022. Retrieved from: <https://fws.gov/species/hines-emerald-somatochlora-hineana>.
- \_\_\_\_\_. 2010b. Final Revised Critical Habitat for Hine's Emerald Dragonfly (*Somatochlora hineana*): Final Rule. FR Vol 75, No. 78, pgs. 21394-21453, April 23, 2010, Rules and Regulations. Department of the Interior, Fish and Wildlife Service, 50 CFR Part 17 Revised: 26 October 2011. Accessed: March 2022. Retrieved from: <https://www.govinfo.gov/link/fr/75/21394?link-type=pdf>
- \_\_\_\_\_. 2014. NLEB Interim Conference and Planning Guidance. USFWS Regions 2, 3, 4, 5, & 6. January 6, 2014.
- \_\_\_\_\_. 2015a. Biological Opinion on Ongoing Activities on the Mark Twain National Forest. May 2015. Retrieved from: [https://esadocs.defenders-cci.org/ESAdocs/consultation/15\\_MO\\_MarkTwainNFOngoingActivities.pdf](https://esadocs.defenders-cci.org/ESAdocs/consultation/15_MO_MarkTwainNFOngoingActivities.pdf)
- \_\_\_\_\_. 2015b. Northern Long-eared Bat (*Myotis septentrionalis*) Fact Sheet. Accessed: March 2022. Retrieved from: <https://www.fws.gov/midwest/endangered/mammals/nleb/nlebFactSheet.html>.
- \_\_\_\_\_. 2018. Eastern Hellbender (*Cryptobranchus alleganiensis alleganiensis*). Species Status Assessment Report, Final Version 1.1 July 20, 2018. Accessed: March 2022. Retrieved from: <https://www.fws.gov/species/eastern-hellbender-cryptobranchus-alleganiensis-alleganiensis>
- \_\_\_\_\_. 2019a. Gray Bat Fact Sheet. Accessed: March 2022. Retrieved from: [http://www.fws.gov/midwest/Endangered/mammals/grbat\\_fc.html](http://www.fws.gov/midwest/Endangered/mammals/grbat_fc.html)
- \_\_\_\_\_. 2019b. 2019 Indiana Bat (*Myotis sodalis*) Population Status Update. June 27, 2019. USFWS Indiana Ecological Services Field Office.
- \_\_\_\_\_. 2019c. Pollinators. Monarch Butterfly Fact Sheet. Accessed: March 2022. Retrieved from: <https://www.fws.gov/initiative/pollinators/monarchs>.
- \_\_\_\_\_. 2019d. Eastern hellbender (*Cryptobranchus alleganiensis alleganisensis*). Accessed: March 2022. Retrieved from: [https://www.fws.gov/midwest/endangered/amphibians/eastern\\_hellbender/](https://www.fws.gov/midwest/endangered/amphibians/eastern_hellbender/).
- \_\_\_\_\_. 2019e. Eastern hellbender (*Cryptobranchus alleganiensis alleganisensis*). ECOS Environmental Conservation Online System. Accessed: March 2022. Retrieved from: <https://ecos.fws.gov/ecp/species/9039>.
- \_\_\_\_\_. 2019f. Proposed Rules, Federal Register. 12-Month Petition Finding and Endangered Species Status for the Missouri Distinct Population Segment of Eastern Hellbender Vol. 84, No 65. April 4, 2019.

- \_\_\_\_\_. 2022a. *National Wetland Inventory*. Accessed: March 2022. Retrieved from: <https://www.fws.gov/wetlands/data/mapper.html>.
- \_\_\_\_\_. 2022b. United States Department of the Interior USFWS. Missouri Ecological Services Field Office. IPaC. Project Code: 2022-0006074. Issued March 2, 2022.
- \_\_\_\_\_. Undated. Decision Tree for Indiana Bat Consultations. Missouri Ecological Services Field Office (MOFO).
- USGS (United States Geological Survey). 2020. Karst Map of the Conterminous United States. Retrieved from: <https://www.usgs.gov/media/images/karst-map-conterminous-united-states-2020>
- \_\_\_\_\_. 2021. Karst Aquifers. Accessed: March 2022. Retrieved from: <https://www.usgs.gov/mission-areas/water-resources/science/karst-aquifers>.
- \_\_\_\_\_. 2022a. National Hydrography Dataset. Accessed: March 2022. Retrieved from: <https://www.usgs.gov/national-hydrography>.
- \_\_\_\_\_. 2022b. National Water Dashboard. Accessed: July 2022. Retrieved from: <https://dashboard.waterdata.usgs.gov/app/nwd/?region=lower48&aoi=default>.
- Vandike, J.E. 1992. A hydrologic analysis of the Ozark aquifer in the Rolla area, Missouri: Missouri Department of Natural Resources, Division of Geology and Land Survey, Water Resources Report No. 41, 84 p. Accessed: March 2022. Retrieved from: <http://link.library.missouri.edu/portal/A-hydrologic-analysis-of-the-Ozark-aquifer-in-the/-kDCMoPIGYg/>.
- Washington University of St. Louis. 2020. Geology of Missouri. Accessed August 2022. Retrieved from: <https://sites.wustl.edu/monh/geology-of-missouri/>.
- Water Resources Council. 1978. Floodplain Management Guidelines for Implementing EO 11988. Accessed March 2022. Retrieved from: [https://www.energy.gov/sites/default/files/2015/09/f26/Floodplain%20Management%20Guidelines\\_1978.pdf](https://www.energy.gov/sites/default/files/2015/09/f26/Floodplain%20Management%20Guidelines_1978.pdf)
- Weary, D.J., Harrison, R.W., Orndorff, R.C., Weems, R.E., Schindler, J.S., Repetski, J.E., and Pierce, H.A., 2014, Bedrock geologic map of the Spring Valley, West Plains, and parts of the Piedmont and Poplar Bluff 30'×60' quadrangles, Missouri, including the upper Current River and Eleven Point River drainage basins: U.S. Geological Survey Scientific Investigations Map 3280, 2 sheets, scale 1:100,000, and 55-p. pamphlet, <http://dx.doi.org/10.3133/sim3280>.
- Wilson, M. P., Foulger, G. R., Gluyas, J. G., Davies, R. J., & Julian, B. R. 2017. HiQuake: The human-induced earthquake database. *Seismological Research Letters*, 88(6), 1560-1565. [inducedearthquakes.org](http://inducedearthquakes.org), 2021. The Human-Induced Earthquake Database (HiQuake). Accessed: April 11, 2022. Retrieved from: <http://inducedearthquakes.org/>.
- Wood Environmental. 2021. Waters of the U.S. Delineation & Threatened & Endangered Species Report. Ameren MTNF: Fletcher to Sweetwater, and Clark to Pilot Knob Transmission Line Maintenance Projects. Ameren Corporation.
- Yatskievych, G. 2006. *Steyermark's Flora of Missouri Volume 2*. Jefferson City, Missouri: The Missouri Department of Conservation.

\_\_\_\_\_. 2013. *Steyermark's flora of Missouri. Volume 3*. St. Louis, Mo: Missouri Botanical Garden Press.

Zippia. 2022. Average The Doe Run Company Salary. Accessed: March 2022. Retrieved from: <https://www.zippia.com/the-doe-run-resources-corporation-company-careers-41024/salary/>

## **6. Appendices**

---

**Appendix A: Existing Leases**

## Leasing Notices and Stipulations

### Hardrock Permit and Leasing Notices and Stipulations

- The following standard stipulations should be attached to all leases:

**USDA – FOREST SERVICE  
STANDARD STIPULATIONS - LEASE  
(FSM 2820)**

Serial No.: MOBLMA-046975  
Lessee: Doe Run  
National Forest: Mark Twain

The lessee is notified and agrees:

All work and any operations authorized under this permit shall be done according to an approved operating plan on file with the BLM at 626 E. Wisconsin Ave, Suite 200 Milwaukee, WI 53202. Plans generally require a minimum of 45 days for Forest Service review. Bureau of Land Management must also review and also approve.

Operating plan will contain information the Forest Officer determines reasonable for assessment of (1) public safety, (2) environmental damage, and (3) protection for surface resources. Content of such plans will vary according to location and type of activity and may contain:

1. Steps taken to provide public safety.
2. Location and extent of areas to be occupied during operations.
3. Operation methods including size and type of equipment.
4. Capacity, character, standards of construction and size of all structures and facilities to be built.
5. Location and size of areas where vegetation will be destroyed or soil lay bare.
6. Steps taken to prevent and control soil erosion.
7. Steps taken to prevent water pollution.
8. Character, amount, and time of use of explosives or fire, including safety precautions during their use.
9. Program proposed for rehabilitation and revegetation of disturbed land.

Copies of all permits obtained from State or Federal agencies pertaining to work might be required. Archeological studies, if required, will accompany plan.

The Forest Supervisor or his/her designated agent has authority to temporarily suspend or modify operations in whole or in part due to emergency forest conditions such as high fire danger or other unsafe situations.

The lessee must keep the Mark Twain National Forest authorized Officer (Forest officer) informed about progress of operations to the extent reasonably necessary for assuring public safety. This is especially important with geophysical inventory and testing activities because of their mobile nature. The Forest Officer will alert the lessee to circumstances, which may affect safe and efficient conduct of work activities.

Terms of this lease are considered violated if not done according to these stipulations.

See Special Stipulations & Notifications



- **Attach the following special stipulation to applicable leases:**

### **Special Stipulation for Leasing**

Pursuant to the provisions of the Act of March 4, 1917 (16 USC Sec. 520), Section 402 of the Reorganization Plan No. 3 of July 16, 1946 (60 Stat. 1097, 1099), the Act of August 7, 1947 (30 USC sec. 352), and the National Environmental Policy Act of 1969 (42 USC Sec. 4321 et seq.) as said authorities have been or may hereafter be amended, consent to this preference right lease as required by law and regulation (43 CFR Sec. 3501.2-6(a) is given subject to the express stipulation that the lessee is prohibited from using the surface of the lease area for the construction of tailings ponds or other forms of mine waste disposal, and/or construction of a mill or a main mine shaft without the prior approval of the USDA Forest Service and the proper rendition of an environmental analysis in accordance with the National Environmental Policy Act of 1969, the findings of which shall determine whether or not and under what terms and conditions these facilities may be developed.

## **Special Notifications for Lead Mining Operations**

- **The following special notifications provide guidance and direction for lead mining operations. These notifications will become part of the lease to ensure compliance with the Forest Plan.**


1. All activities authorized on the lease area are subject to the Mark Twain National Forest Management Plan, as amended.
2. Heritage resource surveys are required prior to any earth disturbing activities.

If the lessee decides to provide a heritage resource survey, the lease's archaeological contractor must obtain from the Mark Twain National Forest (MTNF) a Special Use Permit for Heritage Resources Investigations. The permit must be obtained prior to the initiation of any heritage resource investigations on the Forest. All regulations and policies of the MTNF must be followed with respect to the issuance of the Special Use Permit to the lease's archaeological contractor. The archaeological contractor will submit the report on the investigations to the Forest Archaeologist following the conditions of the Special Use Permit, and the MTNF will initiate and carry to completion all regulatory consultation with the Missouri State Preservation Officer as required by the National Historic Preservations Act of 1966, as amended through 1992, and the accompanying regulations as found in 36 CFR 800.

3. To further define and clarify the interaction between the lessee and the authorized Forest Officer that is necessary to protect and restore the surface resources and maintain an acceptable environmental situation within the lease area, the following is required:
  - a. Site Avoidance: Archaeological, historic, and architectural sites that are eligible for inclusion in the National Register of Historic Places, as well as sites whose National Register significance has not been evaluated, will be avoided and protected from all project activities. Avoidance of heritage resources will be understood to require the retention of such properties in place and their protection from effects resulting from the undertaking (Memorandum of Understanding between the Mark Twain National Forest and the Missouri State Historic Preservation officer).

- b. Discovery of Heritage Resources during Project Implementation: Pursuant to the provisions found in 36 CFR 800.11, should any previously unrecorded heritage resources be discovered during project implementation, activities that adversely affect that resource will be stopped immediately. A professional archaeologist will evaluate the resource. Consultation will be initiated with the Missouri State Historic Preservation Officer (SHPO), as well as with the Advisory Council on Historic Preservation, if required, to determine appropriate actions for protecting the resource, and for mitigating the adverse effects on the resource. Project activities will not be resumed until the resource is adequately protected and agreed-upon mitigation actions are implemented with SHPO approval.
  - c. Prior approval from the authorized Forest Officer for use of existing roads.
  - d. Prior approval from the authorized Forest Officer for the locations and specifications of all roads to be constructed and for the relocation of existing roads. This approval shall ensure that temporary roads are located so as to limit views into clearings.
  - e. Prior approval from the authorized Forest Officer for all drill site and vent shaft locations and other use areas.
  - f. As required by the authorized Forest Officer, topsoil will be stock piled for reclamation, from drill sites and vent shaft locations.
  - g. As required by the authorized Forest Officer, drill sites will be restored to original contours insofar as possible, topsoil replaced, and the site revegetated.
  - h. As directed by the authorized Forest Officer, all roads, drill, and vent shaft sites will be closed and decommissioned at the close of operations.
  - i. Drilling mud will not be allowed to flow into intermittent or live stream courses, or into sinkholes.
  - j. Trees and shrubs cut or pushed over during construction shall be disposed of as prescribed by the authorized Forest Officer Resource. Management activities must meet, as a minimum, the Visual Quality Objective (VQO).
  - k. As required by the authorized Forest Officer, drill sites will be water barred and ditched to provide proper drainage into filter strips.
  - l. Drilling is prohibited within buffer zones associated with perennial streams, springs, or wetlands. On slopes greater than 12%, drilling is prohibited within 50 feet of the stream bank plus four times the percent slope. The location of floodplains, filter strips, and buffer zones for riparian areas will be determined by field investigation as needed.
  - m. Any scrap material or litter will be removed from the site.
  - n. Spot surfacing such as gravel, planking or mats will be allowed and removed if the Authorized Officer deems necessary.
4. There are exclusion and/or constraint areas within the lease area that require special considerations and operation procedures to protect the unique values for which each has been established. The lessee must contact the authorized Forest Officer to determine the specific locations and requirements of each such area that will be affected. These requirements must then be incorporated in the Operation Plan required in Section 2(c) of these leases.

5. Air vent facilities constructed within the lease areas shall have sound barriers, deflectors, or other such devices necessary to minimize adverse impact on the surface environment, including measures to protect wildlife from the downdraft of vent shafts. The motor/fan may be above ground for a short period of time, after which the unit will be at underground mine level. Surface discharge will be vertical; Vent shafts will be grouted, as needed, to prevent excessive leakage of groundwater into the mine.
6. Surface disturbing activities must comply with the Forest Plan regarding endangered and/or threatened species habitat, and with the most recent Biological Opinion on the impacts of MTNF management activities issued by the U.S. Fish and Wildlife Service.
7. Hydrological assessments will be made on a lease-by-lease basis based upon the situation within the lease area. The authorized Forest Officer will review the situation with the company prior to the assessment.
8. All temporary roads, drill sites, and vent shafts shall meet the Visual Quality Objectives designated for the area by the Forest Plan.
9. Following the completion of all drilling, the drill casing shall be removed and down-hole wood and cement plugs shall be placed in the drill holes. Plugging procedures outlined in the Missouri State Code of Regulations (10 CSR 20-7.010) shall be followed. Separate plugs shall be set at the base of the Davis Formation and at the base of the overburden to separate and isolate groundwater aquifers and prevent down-hole contamination.
10. These notifications are subject to changes/amendments based on operations.



5/28/15

Authorized Representative

Date

## Leasing Notices and Stipulations

### Hardrock Permit and Leasing Notices and Stipulations

- The following standard stipulations should be attached to all leases:

**USDA – FOREST SERVICE  
STANDARD STIPULATIONS - LEASE  
(FSM 2820)**

Serial No.: MOBLMA-047477  
Lessee: Doe Run  
National Forest: Mark Twain

The lessee is notified and agrees:

All work and any operations authorized under this permit shall be done according to an approved operating plan on file with the BLM at 626 E. Wisconsin Ave, Suite 200 Milwaukee, WI 53202. Plans generally require a minimum of 45 days for Forest Service review. Bureau of Land Management must also review and also approve.

Operating plan will contain information the Forest Officer determines reasonable for assessment of (1) public safety, (2) environmental damage, and (3) protection for surface resources. Content of such plans will vary according to location and type of activity and may contain:

1. Steps taken to provide public safety.
2. Location and extent of areas to be occupied during operations.
3. Operation methods including size and type of equipment.
4. Capacity, character, standards of construction and size of all structures and facilities to be built.
5. Location and size of areas where vegetation will be destroyed or soil lay bare.
6. Steps taken to prevent and control soil erosion.
7. Steps taken to prevent water pollution.
8. Character, amount, and time of use of explosives or fire, including safety precautions during their use.
9. Program proposed for rehabilitation and revegetation of disturbed land.

Copies of all permits obtained from State or Federal agencies pertaining to work might be required. Archeological studies, if required, will accompany plan.

The Forest Supervisor or his/her designated agent has authority to temporarily suspend or modify operations in whole or in part due to emergency forest conditions such as high fire danger or other unsafe situations.

The lessee must keep the Mark Twain National Forest authorized Officer (Forest officer) informed about progress of operations to the extent reasonably necessary for assuring public safety. This is especially important with geophysical inventory and testing activities because of their mobile nature. The Forest Officer will alert the lessee to circumstances, which may affect safe and efficient conduct of work activities.

Terms of this lease are considered violated if not done according to these stipulations.

See Special Stipulations & Notifications

- **Attach the following special stipulation to applicable leases:**

### **Special Stipulation for Leasing**

Pursuant to the provisions of the Act of March 4, 1917 (16 USC Sec. 520), Section 402 of the Reorganization Plan No. 3 of July 16, 1946 (60 Stat. 1097, 1099), the Act of August 7, 1947 (30 USC sec. 352), and the National Environmental Policy Act of 1969 (42 USC Sec. 4321 et seq.) as said authorities have been or may hereafter be amended, consent to this preference right lease as required by law and regulation (43 CFR Sec. 3501.2-6(a) is given subject to the express stipulation that the lessee is prohibited from using the surface of the lease area for the construction of tailings ponds or other forms of mine waste disposal, and/or construction of a mill or a main mine shaft without the prior approval of the USDA Forest Service and the proper rendition of an environmental analysis in accordance with the National Environmental Policy Act of 1969, the findings of which shall determine whether or not and under what terms and conditions these facilities may be developed.

## **Special Notifications for Lead Mining Operations**

- **The following special notifications provide guidance and direction for lead mining operations. These notifications will become part of the lease to ensure compliance with the Forest Plan.**

1. All activities authorized on the lease area are subject to the Mark Twain National Forest Management Plan, as amended.
2. Heritage resource surveys are required prior to any earth disturbing activities.

If the lessee decides to provide a heritage resource survey, the lease's archaeological contractor must obtain from the Mark Twain National Forest (MTNF) a Special Use Permit for Heritage Resources Investigations. The permit must be obtained prior to the initiation of any heritage resource investigations on the Forest. All regulations and policies of the MTNF must be followed with respect to the issuance of the Special Use Permit to the lease's archaeological contractor. The archaeological contractor will submit the report on the investigations to the Forest Archaeologist following the conditions of the Special Use Permit, and the MTNF will initiate and carry to completion all regulatory consultation with the Missouri State Preservation Officer as required by the National Historic Preservations Act of 1966, as amended through 1992, and the accompanying regulations as found in 36 CFR 800.

3. To further define and clarify the interaction between the lessee and the authorized Forest Officer that is necessary to protect and restore the surface resources and maintain an acceptable environmental situation within the lease area, the following is required:
  - a. **Site Avoidance:** Archaeological, historic, and architectural sites that are eligible for inclusion in the National Register of Historic Places, as well as sites whose National Register significance has not been evaluated, will be avoided and protected from all project activities. Avoidance of heritage resources will be understood to require the retention of such properties in place and their protection from effects resulting from the undertaking (Memorandum of Understanding between the Mark Twain National Forest and the Missouri State Historic Preservation officer).

- b. Discovery of Heritage Resources during Project Implementation: Pursuant to the provisions found in 36 CFR 800.11, should any previously unrecorded heritage resources be discovered during project implementation, activities that adversely affect that resource will be stopped immediately. A professional archaeologist will evaluate the resource. Consultation will be initiated with the Missouri State Historic Preservation Officer (SHPO), as well as with the Advisory Council on Historic Preservation, if required, to determine appropriate actions for protecting the resource, and for mitigating the adverse effects on the resource. Project activities will not be resumed until the resource is adequately protected and agreed-upon mitigation actions are implemented with SHPO approval.
  - c. Prior approval from the authorized Forest Officer for use of existing roads.
  - d. Prior approval from the authorized Forest Officer for the locations and specifications of all roads to be constructed and for the relocation of existing roads. This approval shall ensure that temporary roads are located so as to limit views into clearings.
  - e. Prior approval from the authorized Forest Officer for all drill site and vent shaft locations and other use areas.
  - f. As required by the authorized Forest Officer, topsoil will be stock piled for reclamation, from drill sites and vent shaft locations.
  - g. As required by the authorized Forest Officer, drill sites will be restored to original contours insofar as possible, topsoil replaced, and the site revegetated.
  - h. As directed by the authorized Forest Officer, all roads, drill, and vent shaft sites will be closed and decommissioned at the close of operations.
  - i. Drilling mud will not be allowed to flow into intermittent or live stream courses, or into sinkholes.
  - j. Trees and shrubs cut or pushed over during construction shall be disposed of as prescribed by the authorized Forest Officer Resource. Management activities must meet, as a minimum, the Visual Quality Objective (VQO).
  - k. As required by the authorized Forest Officer, drill sites will be water barred and ditched to provide proper drainage into filter strips.
  - l. Drilling is prohibited within buffer zones associated with perennial streams, springs, or wetlands. On slopes greater than 12%, drilling is prohibited within 50 feet of the stream bank plus four times the percent slope. The location of floodplains, filter strips, and buffer zones for riparian areas will be determined by field investigation as needed.
  - m. Any scrap material or litter will be removed from the site.
  - n. Spot surfacing such as gravel, planking or mats will be allowed and removed if the Authorized Officer deems necessary.
4. There are exclusion and/or constraint areas within the lease area that require special considerations and operation procedures to protect the unique values for which each has been established. The lessee must contact the authorized Forest Officer to determine the specific locations and requirements of each such area that will be affected. These requirements must then be incorporated in the Operation Plan required in Section 2(c) of these leases.

5. Air vent facilities constructed within the lease areas shall have sound barriers, deflectors, or other such devices necessary to minimize adverse impact on the surface environment, including measures to protect wildlife from the downdraft of vent shafts. The motor/fan may be above ground for a short period of time, after which the unit will be at underground mine level. Surface discharge will be vertical; Vent shafts will be grouted, as needed, to prevent excessive leakage of groundwater into the mine.
6. Surface disturbing activities must comply with the Forest Plan regarding endangered and/or threatened species habitat, and with the most recent Biological Opinion on the impacts of MTNF management activities issued by the U.S. Fish and Wildlife Service.
7. Hydrological assessments will be made on a lease-by-lease basis based upon the situation within the lease area. The authorized Forest Officer will review the situation with the company prior to the assessment.
8. All temporary roads, drill sites, and vent shafts shall meet the Visual Quality Objectives designated for the area by the Forest Plan.
9. Following the completion of all drilling, the drill casing shall be removed and down-hole wood and cement plugs shall be placed in the drill holes. Plugging procedures outlined in the Missouri State Code of Regulations (10 CSR 20-7.010) shall be followed. Separate plugs shall be set at the base of the Davis Formation and at the base of the overburden to separate and isolate groundwater aquifers and prevent down-hole contamination.
10. These notifications are subject to changes/amendments based on operations.



5/28/15

Authorized Representative

Date



## Leasing Notices and Stipulations

### Hardrock Permit and Leasing Notices and Stipulations

- The following standard stipulations should be attached to all leases:

**USDA – FOREST SERVICE  
STANDARD STIPULATIONS - LEASE  
(FSM 2820)**

Serial No.: MOBLMA-079252  
Lessee: Doe Run  
National Forest: Mark Twain

The lessee is notified and agrees:

All work and any operations authorized under this permit shall be done according to an approved operating plan on file with the BLM at 626 E. Wisconsin Ave, Suite 200 Milwaukee, WI 53202. Plans generally require a minimum of 45 days for Forest Service review. Bureau of Land Management must also review and also approve.

Operating plan will contain information the Forest Officer determines reasonable for assessment of (1) public safety, (2) environmental damage, and (3) protection for surface resources. Content of such plans will vary according to location and type of activity and may contain:

1. Steps taken to provide public safety.
2. Location and extent of areas to be occupied during operations.
3. Operation methods including size and type of equipment.
4. Capacity, character, standards of construction and size of all structures and facilities to be built.
5. Location and size of areas where vegetation will be destroyed or soil lay bare.
6. Steps taken to prevent and control soil erosion.
7. Steps taken to prevent water pollution.
8. Character, amount, and time of use of explosives or fire, including safety precautions during their use.
9. Program proposed for rehabilitation and revegetation of disturbed land.

Copies of all permits obtained from State or Federal agencies pertaining to work might be required. Archeological studies, if required, will accompany plan.

The Forest Supervisor or his/her designated agent has authority to temporarily suspend or modify operations in whole or in part due to emergency forest conditions such as high fire danger or other unsafe situations.

The lessee must keep the Mark Twain National Forest authorized Officer (Forest officer) informed about progress of operations to the extent reasonably necessary for assuring public safety. This is especially important with geophysical inventory and testing activities because of their mobile nature. The Forest Officer will alert the lessee to circumstances, which may affect safe and efficient conduct of work activities.

Terms of this lease are considered violated if not done according to these stipulations.

See Special Stipulations & Notifications



- **Attach the following special stipulation to applicable leases:**

#### **Special Stipulation for Leasing**

Pursuant to the provisions of the Act of March 4, 1917 (16 USC Sec. 520), Section 402 of the Reorganization Plan No. 3 of July 16, 1946 (60 Stat. 1097, 1099), the Act of August 7, 1947 (30 USC sec. 352), and the National Environmental Policy Act of 1969 (42 USC Sec. 4321 et seq.) as said authorities have been or may hereafter be amended, consent to this preference right lease as required by law and regulation (43 CFR Sec. 3501.2-6(a) is given subject to the express stipulation that the lessee is prohibited from using the surface of the lease area for the construction of tailings ponds or other forms of mine waste disposal, and/or construction of a mill or a main mine shaft without the prior approval of the USDA Forest Service and the proper rendition of an environmental analysis in accordance with the National Environmental Policy Act of 1969, the findings of which shall determine whether or not and under what terms and conditions these facilities may be developed.

### **Special Notifications for Lead Mining Operations**

- **The following special notifications provide guidance and direction for lead mining operations. These notifications will become part of the lease to ensure compliance with the Forest Plan.**

1. All activities authorized on the lease area are subject to the Mark Twain National Forest Management Plan, as amended.
2. Heritage resource surveys are required prior to any earth disturbing activities.

If the lessee decides to provide a heritage resource survey, the lease's archaeological contractor must obtain from the Mark Twain National Forest (MTNF) a Special Use Permit for Heritage Resources Investigations. The permit must be obtained prior to the initiation of any heritage resource investigations on the Forest. All regulations and policies of the MTNF must be followed with respect to the issuance of the Special Use Permit to the lease's archaeological contractor. The archaeological contractor will submit the report on the investigations to the Forest Archaeologist following the conditions of the Special Use Permit, and the MTNF will initiate and carry to completion all regulatory consultation with the Missouri State Preservation Officer as required by the National Historic Preservations Act of 1966, as amended through 1992, and the accompanying regulations as found in 36 CFR 800.

3. To further define and clarify the interaction between the lessee and the authorized Forest Officer that is necessary to protect and restore the surface resources and maintain an acceptable environmental situation within the lease area, the following is required:
  - a. **Site Avoidance:** Archaeological, historic, and architectural sites that are eligible for inclusion in the National Register of Historic Places, as well as sites whose National Register significance has not been evaluated, will be avoided and protected from all project activities. Avoidance of heritage resources will be understood to require the retention of such properties in place and their protection from effects resulting from the undertaking (Memorandum of Understanding between the Mark Twain National Forest and the Missouri State Historic Preservation officer).

- b. Discovery of Heritage Resources during Project Implementation: Pursuant to the provisions found in 36 CFR 800.11, should any previously unrecorded heritage resources be discovered during project implementation, activities that adversely affect that resource will be stopped immediately. A professional archaeologist will evaluate the resource. Consultation will be initiated with the Missouri State Historic Preservation Officer (SHPO), as well as with the Advisory Council on Historic Preservation, if required, to determine appropriate actions for protecting the resource, and for mitigating the adverse effects on the resource. Project activities will not be resumed until the resource is adequately protected and agreed-upon mitigation actions are implemented with SHPO approval.
  - c. Prior approval from the authorized Forest Officer for use of existing roads.
  - d. Prior approval from the authorized Forest Officer for the locations and specifications of all roads to be constructed and for the relocation of existing roads. This approval shall ensure that temporary roads are located so as to limit views into clearings.
  - e. Prior approval from the authorized Forest Officer for all drill site and vent shaft locations and other use areas.
  - f. As required by the authorized Forest Officer, topsoil will be stock piled for reclamation, from drill sites and vent shaft locations.
  - g. As required by the authorized Forest Officer, drill sites will be restored to original contours insofar as possible, topsoil replaced, and the site revegetated.
  - h. As directed by the authorized Forest Officer, all roads, drill, and vent shaft sites will be closed and decommissioned at the close of operations.
  - i. Drilling mud will not be allowed to flow into intermittent or live stream courses, or into sinkholes.
  - j. Trees and shrubs cut or pushed over during construction shall be disposed of as prescribed by the authorized Forest Officer Resource. Management activities must meet, as a minimum, the Visual Quality Objective (VQO).
  - k. As required by the authorized Forest Officer, drill sites will be water barred and ditched to provide proper drainage into filter strips.
  - l. Drilling is prohibited within buffer zones associated with perennial streams, springs, or wetlands. On slopes greater than 12%, drilling is prohibited within 50 feet of the stream bank plus four times the percent slope. The location of floodplains, filter strips, and buffer zones for riparian areas will be determined by field investigation as needed.
  - m. Any scrap material or litter will be removed from the site.
  - n. Spot surfacing such as gravel, planking or mats will be allowed and removed if the Authorized Officer deems necessary.
4. There are exclusion and/or constraint areas within the lease area that require special considerations and operation procedures to protect the unique values for which each has been established. The lessee must contact the authorized Forest Officer to determine the specific locations and requirements of each such area that will be affected. These requirements must then be incorporated in the Operation Plan required in Section 2(c) of these leases.

5. Air vent facilities constructed within the lease areas shall have sound barriers, deflectors, or other such devices necessary to minimize adverse impact on the surface environment, including measures to protect wildlife from the downdraft of vent shafts. The motor/fan may be above ground for a short period of time, after which the unit will be at underground mine level. Surface discharge will be vertical; Vent shafts will be grouted, as needed, to prevent excessive leakage of groundwater into the mine.
6. Surface disturbing activities must comply with the Forest Plan regarding endangered and/or threatened species habitat, and with the most recent Biological Opinion on the impacts of MTNF management activities issued by the U.S. Fish and Wildlife Service.
7. Hydrological assessments will be made on a lease-by-lease basis based upon the situation within the lease area. The authorized Forest Officer will review the situation with the company prior to the assessment.
8. All temporary roads, drill sites, and vent shafts shall meet the Visual Quality Objectives designated for the area by the Forest Plan.
9. Following the completion of all drilling, the drill casing shall be removed and down-hole wood and cement plugs shall be placed in the drill holes. Plugging procedures outlined in the Missouri State Code of Regulations (10 CSR 20-7.010) shall be followed. Separate plugs shall be set at the base of the Davis Formation and at the base of the overburden to separate and isolate groundwater aquifers and prevent down-hole contamination.
10. These notifications are subject to changes/amendments based on operations.



5/28/15

Authorized Representative

Date

---

**Appendix B: Applicant-Committed Environmental Protection Design Features**

## Excerpts from the 2017 Exploration and Operation Plans

### Excerpts from the Exploration Plan

#### **Viburnum Trend Mining & Milling Operating Plan**

All mining taking place will be done underground. The mining method used is “Mechanized Room and Pillar” utilizing rubber tired trucks, loaders and drill jumbos. The mining occurs in three phases; primary, secondary, and tertiary.

Primary Mining: Drifts measuring approximately 32’ wide and averaging approximately 14’ high are cut creating pillars that are approximately 28’ X 28’. Ground conditions do cause this to vary. Where the ore thickness allows, additional mining passes may be cut utilizing overcut and undercut mining passes leaving approximately 15’ minimum thickness sills. Ground support where needed is accomplished by installing 6’ to 8’ long bolts. Various types of bolts are used which include resin bolts, split set bolts, and conventional bolts.

Secondary Mining: After the primary mining is complete, additional mining may be needed utilizing bottom cuts, back cuts, and sill cuts. These secondary cuts may range from approximately 5’ to 20’ depending upon the ore thickness in the area.

Tertiary Mining: Involves the extraction of ore left in the remaining pillars. This is accomplished with pillar drill jumbos and remote controlled loaders. The extraction percentage for these pillars is dependent upon the number of pillars that are required to be left behind to maintain pillar stability for safe extraction.

All broken ore materials are transported back to the main shaft by truck haulage and hoisted to the surface. Broken ore is then placed in storage bin from which it is then fed into the mill. Once in the mill the ore is then crushed down to the appropriate size for processing through the mill flotation circuits which produce

Pb, Zn and Cu concentrates. These concentrates are then transported by truck to a port facility where they are loaded onto barges. All tailings generated by the milling process are placed into monitored and permitted tailings storage ponds located adjacent to the four mill processing facilities.

Ventilation for the mines is provided utilizing vent shafts that are either intakes or exhausts. Most of these vent shafts have fans either at the surface or underground ranging from 800HP down to 50HP. Once fresh air arrives underground via the vent shafts it is moved into the work areas either by free flow or by utilizing auxiliary fans and vent bags. These auxiliary fans range in horsepower from 50HP up to 200HP. Future mining may require the installation of additional vent shafts from surface down to the ore horizon. These average approximately 1,000’ in depth and are typically approximately 6’ in diameter.

## Impact to Wildlife and Habitats

### Introduction:

Doe Run will be conducting exploration activities within and around the noted Federal leases and exploration permits. These areas are predominately managed forest with intermixed pasture and very small areas of row crop. Five species listed under the Endangered Species Act (ESA) have been identified as having the potential to occur within the exploration area based on geography. These include the Gray bat; the Indiana Bat; the Northern long-eared bat (proposed); the Hine's emerald dragonfly and Hine's emerald dragonfly habitat; and the Mead's milkweed (*Table 1.*). In the case of the Gray bat, Indiana bat, and Northern long-eared bat there no likely adverse affects on feeding and sheltering habitat due to exploration activities. In the case of the Hine's emerald dragonfly exploration activities are not allowed in the designated critical habitat. It is believed that the Mead's milkweed is unlikely to occur in the exploration area.

Species	Status	Effects	Determination Rationale
Gray bat ( <i>Myotis grisescens</i> )	Endangered	Not likely to adversely affect	Exploration activities will have minimal effects on feeding and sheltering habitat
Indiana bat ( <i>Myotis sodalis</i> )	Endangered	Not likely to adversely affect	Exploration activities will have minimal effects on feeding and sheltering habitat
Northern long-eared bat ( <i>Myotis septentrionalis</i> )	Proposed as Endangered	Not likely to adversely affect	Exploration activities will have minimal effects on feeding and sheltering habitat
Hine's emerald dragonfly ( <i>Somatochlora hineana</i> )	Endangered	No Effect	Exploration activities are not allowed in designated critical habitat.
Mead's milkweed ( <i>Asclepias meadii</i> )	Threatened	No Effect	Unlikely to occur within exploration area, no suitable habitat

*Table 1. Endangered and Threatened species that may potentially occur on PRL's within the explorations area controlled by Doe Run.*

As described in other parts of this five year exploration plan update, surface disturbance will be limited to relatively short and narrow access roads, laydown areas, drill pads and mud pits. For clarity of discussion, this section will specifically address impact to wildlife and habitats associated with Federal leases and exploration permits (exploration areas), but similar management strategies will be utilized for surface exploration activities. Doe Run maintains that disturbance to wildlife and habitat in exploration areas will be minor and temporary as drill pads are small, clearing minimized when possible, and drill sites revegetated based on timeframes noted in the exploration activities section of this five year exploration plan update. In

accordance with the Management Prescriptions within the Mark Twain National Forest Plan, exploration activities will meet applicable stipulations where mineral exploration is allowable.

#### Bat Roosting Zone

Agreements exist with US Forest Service in regards to the nature and timing of exploration activities to minimize direct and indirect impact on the species within the larger habitat area indicated, direct impacts are minimized by limiting tree clearing from November 1 through March 31 to avoid bat mating and roosting (Refer to Chapter 2, pages 2-6 to 2-7 of the Mark Twain National Forest Plan of 2005). There are no critical habitats designated for the Gray bat or the Northern long-eared bat at this time, but direct impact on these species will be minimal given the disturbance will be minor; the effects on potential feeding and sheltering habitat will be even smaller, and there is ample habitat surrounding the drill sites to utilize.

#### Grasshopper Hollow Area:

The Grasshopper Hollow state natural area is listed in section 3. Management Prescriptions on page 3-50 as a state natural area in the 2005 Mark Twain National Forest management Plan. In addition, on page 3-53 under Minerals “Normally do not allow surface disturbing mineral activities”. However, some activities may be conducted in consultation with the USFS. Any exploration drilling proposed in areas near the critical habitat will require preliminary vetting by USFS before an on-site review of the drill spot is initiated.

#### Mead’s Milkweed:

Mead’s milkweed is present within southeast Missouri, but has only been identified in specific areas in which the natural habitat can support the species. The natural habitat of the Mead’s milkweed is generally limited to native tallgrass prairie more commonly found in the St. Francois Mountains and not associated with current exploration areas; therefore no direct or indirect impact is expected.

#### Conclusions:

Exploration activities are not expected to result in adverse effects of any of the three bat species as well as the Hine’s Emerald Dragonfly for several reasons, including the timing of construction activities, current special condition associated with exploration in critical habitats, and the availability of abundant suitable habitat nearby the exploration areas. Indirect effects of the exploration activities include temporary construction activity and noise, and the removal of very minor amounts of potential bat habitat, but are minimized by the scale of the clearing and exploration activities.

### **43 CFR 3562.3-3 (c) – Exploration Activities**

#### **Narrative of Operations Exploration Method Introduction:**

Exploration work conducted in the Viburnum Trend can be divided into surface exploration and underground exploration. Exploration for Pb-Zn-Cu mineralization in the Bonnetterre formation is conducted principally by surface diamond drilling. In addition to surface diamond

drilling, geochemical and geophysical surveys have been conducted at various times over the last decade. Underground exploration consists of underground diamond drilling and jackhammer drilling.

Exploration within the Viburnum Trend is carried out initially by surface diamond drilling.

Surface diamond drilling recovers core samples that are then delivered to our central core facility for processing. The drill location of surface holes is dictated by production needs of the underground operations and changes as the needs of the mines change relating to ore grade or specific mineral content. The following sections discuss technical information for a typical drill project and drill site. Each section includes exploration method description, equipment used, environmental and safety measures, plugging method, and reclamation measures (surface drilling only).

All proposed locations of surface boreholes, trenches, and roads on federal lands are approved by the Bureau of Land Management (BLM). Notice of staking letters are sent to both the BLM and USFS. The proposed drill site is staked and flagged. Representatives of the BLM and USFS typically visit each site to review the proposed drill hole location. All surface holes are constructed and plugged according to Missouri DNR Standards. For specifics on rules governing hole drilling and plugging see: Title 10 - Department of Natural Resources – Division 23 – Geology and Land Survey, Chapter 6 – Test Hole Construction and Plugging Code.

### **Surface Drilling**

#### **Exploration method:**

In general, Doe Run's surface drilling exploration program consists of two parts:

1. Rotary drilling and sleeve setting
2. Diamond Drilling

#### **Rotary Drilling:**

The overburden and Potosi Formation are a challenge to diamond drill through due to lower drilling production rates. In order to facilitate the surface exploration program, Doe Run utilizes a rotary rig to drill through the overburden and Potosi formation and set a sleeve. The bottom of the sleeve is usually set in the upper portion of the Derby Doe Run formation. Typically, in an eight hour shift, a rotary drill rig can drill up to 230 feet. In the north end of the Viburnum Trend, such as at Huzzah, the overburden is commonly less than 15 feet thick and the Potosi is commonly less than 250 feet thick; thus sleeves in the north end are set at a depth of 250 feet or less. In this instance a rotary rig can usually set up, drill and sleeve the hole, and move off in a day and a half. In the south end of the Viburnum Trend, the overburden may be up to 350 feet thick with a Potosi that is up to 550 feet thick; thus sleeves in the south end are set at a depth of up to 850 feet. In this instance a rotary rig can usually set up, drill and sleeve, and



move off the site in between 3 to 5 days. Bad ground conditions such as faults, fractures, and vuggy or cavernous ground may require the use of drilling muds (such as Quick Gel by Baroid or similar product) to condition the hole which may extend the time a rotary rig is on a drill site, sometimes up to several days.

#### Diamond Drilling:

Once the sleeve is set the rotary rig moves off the drill site and a diamond drill moves on to the site and completes the drilling process. The diamond drill will typically core the remainder of the Derby Doe-Run formation, the Davis formation, the Bonneterre formation, the upper 20 feet of the LaMotte formation, and/or the upper 10 feet of the Precambrian formation. Core size is typically BQ or NQ (46mm & 60mm). Total depth of the holes range from 1300' for standard drill hole to 3200' for Precambrian drilling. Standard drill site size is typically 100' by 90'. Exceptions to this size may be caused by:

- topography challenges
- drainage locations

Drill sites are reviewed by surface drill supervisor prior to construction. Adjustments must be approved by surface drill supervisor.

#### **Equipment to be used:**

#### Rotary Drilling:

Doe Run utilizes third party contractors (e.g., Pense Brothers Drilling and/or Ridge Runner Drilling) to complete the rotary drilling portion of the hole and set the sleeves. Sleeving is typically done in the southern Viburnum Trend and on an as-needed basis in the northern Viburnum Trend. In addition to rotary drilling, Doe Run also uses third party contractors (e.g., Pense Brothers) to build drill roads and drill sites, pull drill hole casing, and conduct remediation work on the drill sites. This is done throughout the Viburnum Trend. The equipment (or similar) that is used is listed below:

- Loaders and Dozers for site prep and rehab (D5N & D6D Cat Dozers, 939 Cat & 555 John Deere Loaders) or similar
- Churn Drill for pulling pipe
- Rotary Drill for rotary drilling (usually Schramm)
  - Air Compression Boosters
- Flatbed truck for hauling drill casing (usually International)
- Flatbed truck for hauling drill rods (usually international)
- Fuel Truck (commercial truck)
  - Track Hoe for building and rehabbing sumps (311 Cat)
- One ton truck for hydro seeding
- Dump trucks for hauling rock for roads and sites

Doe Run utilizes third party contractors to set shallow sleeves in the northern third of the Viburnum Trend. The equipment typically consists of a rotary drill, rod truck, and a pickup truck.

Doe Run and the third party contractors may replace or add equipment during the time frame of this plan. Such equipment will be similar to the equipment described in this section or equipment used in similar mining sites.

#### Surface Diamond Drilling:

Doe Run owns and operates truck mounted LF-70 (or similar) diamond drill rigs which form the backbone of its surface diamond drilling program. Depending on drilling activity during a given year, Doe Run may bring in additional contract diamond drilling companies to assist with its drilling program. Below is listed the typical equipment found on a diamond drill site.

- A truck mounted Longyear LF 70 drill rig or similar to drill the surface diamond drill holes
- A flatbed truck to haul rods
- A flatbed truck with mounted container to haul water
- A trailer mounted driller's shanty/doghouse
- A quarter ton pickup truck for transportation

Doe Run and the third party contractors may replace or add equipment during the time frame of this plan. Such equipment will be similar to the equipment described in this section or equipment used in similar mining sites.

#### **Environmental and Health/Safety Protection Methods:**

- **Fire Control/Prevention Measures:**
  - No person shall smoke or use an open flame within 25' of where flammable or combustible liquids are stored or handled. Warning signs shall be readily visible that prohibit smoking or open flame where fire hazards exist.
  - Flammable and combustible liquids shall be stored in accordance with the National Fire Protection Association in cabinets that are properly labeled flammable.
  - Heat sources capable of producing combustion shall be separated from combustible materials; this includes wood burning stoves in driller shanty. Wood burning stoves will be placed on at least 1" thick steel to separate stove from wood floor. Wood burning stoves will have appropriate insulated stove pipe installed to provide proper ventilation and heat resistance.
  - Type ABC fire extinguishers shall be on every drill site at the following locations; in the cab of all vehicles on site, on drill rig, and in driller shanty.
  - Fire extinguishers will be visually inspected to ensure that they are fully charged and operable. This will be done on a daily basis during the work area inspection.

Maintenance checks of mechanical parts, the amount and condition of extinguishing agent and expellant, hose condition, nozzle, and vessel shall be done at least once every 12 months. Fire extinguishers shall be replaced with a fully charged extinguisher promptly after any discharge.

- **Soil Erosion Prevention Measures:**

- Erodible areas are stabilized with the use of hay bales and silt fencing.
- Drill site will be recontoured to original state. When site is recontoured, a mixture of 50 lbs. agricultural lime, 1 lb. of P-K-N (13-13-13) fertilizer, 5 pounds of Profile<sup>®</sup> cover grow mulch (containing 58% cellulose fiber, 37% wood fiber, 5% tackifier), and 1 lb. of winter wheat, is applied to every 100 square feet of bare soil.

- **Subsidence Prevention Measures:**

- Potential subsidence is mitigated by the prompt plugging of the test hole upon completion of coring in accordance with applicable state regulations.

- **Surface and Groundwater Pollution Prevention:**

- Sumps will be made for the collection of drill cuttings and excess water created during drilling process.
- Location of sumps will be determined in regards to proximity to water sources and topography. Sumps will be adjacent to drainage ways.
- Sumps will be at least 6'-8' deep and a minimum of 10' in width. The length of the sumps will be equal to the length of the drill site.
- An overflow pipe will be placed at least 2' deep into the berm of the sump at the lowest end of the slope of the sump. Attached to the outer end of the overflow pipe will be a silt bag to capture any cuttings that may flow through pipe.
- Overflow pipes and silt bags will be checked daily during the work area inspection to ensure that they are working properly. Any issues will be reported to surface drill supervisor as soon as possible

- **Air Pollution Prevention:**

- All equipment used in the drilling process is properly maintained and in good working condition.

- **Fish and Wildlife Damage Prevention:**

- All materials will be removed from the site at the end of the drilling process. This includes all fencing, trash, core trays, tools, and other miscellaneous supplies and material.

- **Other Natural Resource Damage Prevention:**

- All materials will be removed from the site at the end of the drilling process. This includes all fencing, trash, core trays, tools, and other miscellaneous supplies and material.

- **Public Health and Safety Prevention:**

- Orange safety fencing will be installed around the perimeter of the drill site and the sumps. Fencing shall be staked and erected. No part of the fencing should be sagging on the ground.
- “Authorized Personnel Only” signage will be placed at the entrance to all occupied drill sites.

### **Plugging Method**

Mo DNR Hole Abandonment Procedures:

- Plugging methods shall be completed in accordance with applicable state regulations. Test holes with removable surface casing pipe shall be plugged using the following method:
  - a. If the Davis formation is penetrated, an expanding packer must be set in the bottom portion of the formation.
  - b. The hole must be filled with grout from the packer to the bottom of the interior casing pipe via tremie pipe. This grout plug must extend from near the bottom of the Davis Formation to at least fifty feet (50') above the top of the Davis Formation.
  - c. The hole must be backfilled with chlorinated clean fill such as varied sized agricultural lime, gravel or sand to the base of the surface casing pipe, while the interior casing is being pulled.
  - d. A fifty-foot (50')-grout plug must be pumped through the surface casing pipe as it is being removed, filling the hole to the top of bedrock.
  - e. Chlorinated clean fill must be used to backfill the hole above the upper plug while the surface casing pipe is being removed. The clean fill must extend from the top of the grout plug to within two feet (2') of the surface.
  - f. The top two feet (2') of the hole must be filled with on-site soil.
  - g. A registration report form must be submitted to the division which documents the method of plugging.
  - h. The test hole may be filled from total depth to surface with grout.
- Doe Run Plugging Method: Surface diamond drill holes are abandoned in two stages. The first is when the diamond driller completes the hole. After the diamond driller portion has been finished the pipe pulling rig moves onsite and the final hole abandonment is completed. Below is a description of the procedure that is used by Doe Run for hole abandonment:
  - a. Diamond Drill Portion: This portion generally takes a half a day to complete and is done once the hole has reached the desired TD.
    - i. There are two methods to plug holes – a twist-in plug or a Van Ruth plug. A twist-in plug is used if ground conditions are competent. A Van Ruth plug is used if ground conditions are broken and fractured.
    - ii. Either twist-in or Van Ruth plugs are set at 50 feet above the Bonnetterre/Davis contact.

- iii. Twist-in plugs are attached to the end of the drill string and lowered to the desired depth. Then the drill string is rotated manually with a 36" wrench until it no longer rotates. At this point the plug will support the entire weight of the drill string.
  - iv. With Van Ruth plugs a blank end is attached to the end of the drill string. Then the rods are lowered into the hole to the desired depth. The Van Ruth plug is prepped by lubing the outer tapered portion of the plug with grease and a small amount of water is pumped down the rods to lubricate the inside of the drill string. The plug is then placed in the drill string and the blow off valve on the water pump is turned down to 400 psi. The water head is attached and the plug is pumped down the drill string. The plug is set when the water chokes off and engages the blow off valve.
  - v. After either plug is set, 100 foot of Portland cement, mixed 6 gallons per 94 pound bag, is put on top of the plug via the tremie method.
  - vi. On top of the cement the remainder of the hole is filled with bentonite chips or other appropriate hole abandonment material. This is done to the bottom of the 3" casing. Concurrently a half pound of calcium chloride is added. The calcium chloride is dissolved in water and added to the hole.
  - vii. In the event the hole is cored from surface, the remainder of the hole to within 2 feet of the surface is filled with bentonite chips.
  - viii. The top two feet of the hole is then filled with on-site top soil when the drill site is reclaimed.
- b. Rotary Drill Portion: This portion may take a half a day to several days if the casing is difficult to remove. This portion may take place any time after the diamond drilling portion of the hole abandonment is completed or up to 60 days later.
- i. A churn drill is moved on location to remove the 3" and 7" casing. If there is difficulty removing either string of casing sometimes a rotary rig with a casing extraction hammer will be used.
  - ii. The 3" is bumped or pulled until it moves freely.
  - iii. As the 3" casing is being extracted from the hole, pea gravel is added to the well.
  - iv. While adding the pea gravel Calcium Chloride is also added for chlorination.
  - v. The chlorinated pea gravel is added until the base of the surface casing is reached.
  - vi. The 7" is bumped or pulled until it moves freely.
  - vii. Hole plug is then poured down the interior of the 7" casing.
  - viii. As the 7" casing is being removed from the hole the pea gravel and Calcium Chloride are once again added to fill the hole.
  - ix. The chlorinated pea gravel is brought to within approximately 2' from ground level. Typically 1 to 2 sacks of material are used per hole.
  - x. The rig is then removed from the location.

- xi. A flatbed truck or winch truck then removes the casing from the location.
  - xii. During the location reclamation the loader then fills the remaining 2' of open hole with onsite soil.
- c. Surface Drill Supervisor: Upon completion and abandonment of a surface drill hole, the surface drill supervisor completes a hole abandonment form. These reports are submitted every two months to the Missouri Department of Natural Resources.

**Surface reclamation** – Note: this section only pertains to the surface drilling exploration method and is not applicable to the other exploration methods.

- Typically reclamation is started within 60 days from the completion and plugging of the drill hole. Variation in this schedule can be due to weather conditions such as long periods of rain or snow. Seeding of the reclaimed sites is typically done in the spring and fall months of the year for better growth of replaced vegetation.
- Under ideal conditions, a D5N Cat Dozer (or equivalent) is used to contour and blend topsoil to its approximate original landform.
- Typically the method used for soil preparation and fertilizer application is a truckmounted hydro-seeder to apply a vegetation and fertilizer to the bare soil of the reclaimed sites.
- A mixture of agricultural lime, phosphorus(P) nitrogen(N) and potassium(K) fertilizer, cover grow mulch, and winter wheat is applied to bare soil.
- This mixture is applied using the hydro-seeder in the following quantity and spacing; 50 pounds of the agricultural lime, 1 pound of P-N-K fertilizer (13-13-13), 5 pounds of Profile<sup>®</sup> cover grow mulch (containing 58% cellulose fiber, 37% wood fiber, 5% tackifier), and 1 pound of winter wheat, per 100 square feet of bare soil.

After the initial mining pass, which was discovered with surface diamond drilling, is complete “secondary” prospecting is carried out from the underground workings so as to limit surface disturbance. Underground diamond drills and Jackhammer drills are used to identify not only ore grade mineralization but suitable geologic structure on the flanks of the mine openings. The following sections discuss technical information for a typical drill project according to the type of drilling to be performed.

### **Underground Diamond Drilling**

#### **Exploration method:**

Underground diamond drilling, although identical in method to surface diamond drilling, does not experience the difficulties relating to overburden or undesirable formation drilling that the surface drilling program does. The underground openings from which they operate are already in solid rock and in the ore zone. No sleeve pipe is required and core is generated immediately upon collaring the hole. Core size is typically BQ (46mm) but on occasion HQ (77.8mm) is used for rock mechanics testing as requested by the SEMO Technical Services group. Underground

diamond drill holes can be drilled at any angle from +90 degrees to -90 degrees and at any azimuth from 0-360 degrees. The mine geologist spots the desired hole locations and specifies the desired depth, angle, and azimuth of the proposed hole. As with the surface diamond drill holes, core samples are recovered and delivered to the central core room facility for processing.

### **Equipment to be used:**

#### Underground Diamond Drilling

Each underground diamond drill is self-contained and requires no supporting equipment. Electric power is generally provided from underground transformers. On occasion, where power is not available, an electric generator can be used to supply the necessary power. If applicable, generators are supplied by the mine.

Drill water is provided from mine water sumps distributed throughout the mine.

The drill contractors provide their own underground transportation to and from the drills. These consist of a pickup truck, tractor, or side by side.

Doe Run and their contract drillers may replace or add equipment during the time frame of this plan. Such equipment will be similar to the equipment described in this section.

### **Environmental and Health/Safety Protection Methods:**

- Fire Control/Prevention Measures:
  - No person shall smoke or use an open flame within 25' of where flammable or combustible liquids are stored or handled. Warning signs shall be readily visible that prohibit smoking or open flame where fire hazards exist.
  - Flammable and combustible liquids shall be stored in accordance with the National Fire Protection Association in cabinets that are properly labeled flammable.
    - Type ABC fire extinguishers shall be mounted on each piece of equipment.
  - Fire extinguishers will be visually inspected to ensure that they are fully charged and operable. This will be done on a daily basis during the work area inspection.

Maintenance checks of mechanical parts, the amount and condition of extinguishing agent and expellant, hose condition, nozzle, and vessel shall be done at least once every 12 months. Fire extinguishers shall be replaced with a fully charged extinguisher promptly after any discharge.

- Soil Erosion Prevention Measures:
  - The underground working areas are not subject to erosion, therefore no measures are undertaken.

- Subsidence Prevention Measures:
  - Potential subsidence is mitigated by the prompt plugging of the test hole upon completion where water is discharging from the hole.
- Surface and Groundwater Pollution Prevention:
  - All drill water is channeled to the main mine sumps and treated along with all other discharge water from the mine according to the operating permit.
- Air Pollution Prevention:
  - All equipment used in the drilling process is properly maintained and in good working condition.
- Fish and Wildlife Damage Prevention:
  - No contact with fish or wildlife occurs in the underground drilling process.
- Other Natural Resource Damage Prevention:
  - All materials will be removed from the underground site at the end of the drilling process. This includes all trash, core trays, tools, and other miscellaneous supplies and material.
- Public Health and Safety Prevention:
  - All standards required under 30CFR of the Federal Metal and Nonmetallic Mine Training and Health Standards are followed. All equipment and personnel involved in the execution of the underground diamond drill program are subject to regular inspection by MSHA.
- Plugging Method
  - Plugging methods shall be completed in accordance with applicable state regulations.
  - Upon completion of the test hole and if water discharge from the hole is evident an expandable packer will be set in the hole to stop water inflow to the mine.
- Surface reclamation:
  - These activities did not have an impact on the surface. Therefore, there was no need for surface reclamation.

**43 FR 3562.3-3 (d) – Exploration Activity Timeline**

**Timeline for each level of work**

BLM Approval of Drill Holes: Depending on whether a specific site has a heritage survey completed, it may be between 1 day to +90 days; approval of holes in the Czar Knob area at #29 Mine took over a year due to the heritage survey

Road Building/Site Prep: Depending on how much drill road must be built into a site this portion of the drilling process may take from 1 to +5 days to complete. This portion of the drilling process may occur within a day of approval of the drill site up to several months afterward depending on drilling priorities.

Rotary Drilling/Hole Casing: Refer to section c; Surface Drilling; Rotary Drilling section for