U.S. Department of the Interior
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McCune Bar placer sapphire mining

Preliminary Environmental Assessment – Chapters 1 and 2

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CHAPTER 1. INTRODUCTION

1.1. Background

The Missouri River has a long history of mining, beginning in 1865 when miners prospecting for gold discovered sapphires (Berg and Landry, 2018). Between 1938 – 1947, a bucket-line dredge owned by the Perry Schroeder Mining Company was used to mine several sapphire-rich gravel bars in the northern vicinity of present-day Hauser Lake. Between 1983 – 1986, a large suction dredge was used to recover gold and sapphires from Hauser Lake.

Despite many decades of research, the bedrock source of sapphires remains unknown to Montana geologists. The leading hypothesis for the source of the sapphires found around Hauser Lake is intrusive diorite rocks found in the Big Belt Mountains, northeast of Hauser Lake (Berg and Landry, 2018).

This project is a publicly proposed small mining operation to recover sapphires from gravels over a 5-year period from the McCune Bar with a project footprint of approximately 5.1 acres within the 8-acre planning boundary (Map 1). The project proponent has conducted exploration in the vicinity under an exploration Notice.

1.2. Purpose and Need

The need for the action is established by the BLM's responsibility under the Mining Law of 1872, the Federal Land Policy and Management Act of 1976 (FLPMA), and the BLM's surface management regulations at 43 CFR 3809. Under these statutes and regulations, the BLM is required to review the proposed Plan to ensure that mining activities include appropriate reclamation and do not cause unnecessary or undue degradation[1] of public lands.

The BLM's purpose is to consider and analyze the reasonably foreseeable environmental effects associated with approving, denying, or conditionally approving the Montana Sapphire Mining Company's Plan of Operations to use placer mining techniques to recover sapphires from gravels over a 5-year period from the McCune Bar (Map 1).

1.3. Decision to be Made

The BLM's decision is to determine whether the Plan would or would not result in unnecessary and undue degradation of public lands and whether any mitigation measures would be required. Unnecessary and undue degradation is defined by the Surface Management Regulations using the specific performance standards described in 43 CFR 3809.420 as criteria.

[1] Under 43 CFR 3809.5, *unnecessary or undue degradation* is defined to mean conditions, activities, or practices that: (1) Fail to comply with one or more of the following: the performance standards found at 43 CFR 3809.420, the terms and conditions of an approved plan of operations, operations described in a complete notice, and other Federal and state laws related to environmental protection and the protection of cultural resources; (2) Are not "reasonably incident" to prospecting, mining, or processing operations as defined in 43 CFR 3715.0-5; or (3) Fail to attain a stated level of protection or reclamation required under specific laws in areas such as the California Desert Conservation Area, Wild and Scenic Rivers, BLM-administered portions of the National Wilderness System, and BLM-administered National Monuments and National Conservation Areas.

In addition, the BLM would need to determine whether use and occupancy is reasonably incident to operations consistent with the regulations as described in 43 CFR 3715. Because the Plan proposes occupancy on public lands longer than 14 days within a 90-day period, the Authorized Officer will include a concurrence or non-concurrence determination with the decision.

The BLM's decision is to consider the following: 1) approval of the Plan of Operations to authorize the proposed activities without modifications or mitigation measures; 2) approval of the Plan with mitigation measures that the BLM deems necessary to prevent unnecessary or undue degradation of public lands; or 3) denial of the Plan and associated activities if the BLM determines that the proposal does not comply with 43 CFR 3809, 43 CFR 3715, and 43 CFR 2800 regulations.

1.4. Relationship to Statutes and Regulations and Executive Orders

1.4.1. Statutes

The following is a list and summary of major legal authorities relevant to the Proposed Action; it is not an exhaustive list of all BLM authorities.

1. The General Mining Law of 1872, as amended (30 U.S.C. 22, 26, and 28), established all valuable mineral deposits in land belonging to the United States to be free and open to exploration and purchase. This law provides citizens of the United States the opportunity to explore for, discover, and develop certain valuable mineral deposits on federal lands that are open to mineral entry.

   When referring to the *mining laws* within this document, these include: Lode Law of July 26, 1866, as amended (14 Statute 251); the Placer Law of July 9, 1870, as amended (16 Stat. 217); and the General Mining Law of May 10, 1872, as amended (17 Stat. 91).

2. The Federal Land Policy and Management Act (FLPMA) of 1976, as amended (43 U.S.C. 1701 *et seq*.), did not amend the 1872 Mining Law but provides for the management, protection, development, and enhancement of the public lands.

   a. a. Sections 102(a) (7) and (8) set forth the policy of the United States concerning the management of the public lands, including management according to multiple use and sustained yield, and the protection of specified values.

   b. Section 302(a) requires the Secretary to manage public lands under the principles of multiple use and sustained yield, in accordance with available land use plans developed under section 202.

   c. Section 302(b) requires the Secretary, by regulation or otherwise, take any action necessary to prevent unnecessary or undue degradation of public lands.

3. The National Environmental Policy Act (NEPA) of 1969, as amended (42 U.S.C. 4321 *et seq.*), requires the consideration and public availability of information regarding the environmental impacts of major federal actions significantly affecting the quality of the

human environment. This includes the consideration of alternatives and mitigation of impacts.

4. The Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 *et seq*.) provides a means to conserve the ecosystems upon which endangered and threatened species depend and provides a program for the conservation of such endangered and threatened species.

    a. Section 1531(c)(1) requires all federal agencies to seek to conserve endangered and threatened species and use applicable authorities in furtherance of the purposes of this act.

    b. Section 1536(a) requires all federal agencies to avoid jeopardizing the continued existence of any species listed or proposed for listing as threatened or endangered or destroying or adversely modifying any designated or proposed critical habitat.

    c. Section 1536 [Section 7] (a) and 50 CFR 402 require all federal agencies to consult with the Secretary of the Interior, through the Fish and Wildlife Service to ensure that any federal actions or activities are not likely to jeopardize the continued existence of any species listed or proposed to be listed under the provisions of the ESA or result in the destruction or adverse modification of designated or proposed critical habitat.

5. National Historic Preservation Act (NHPA) of 1966 (16 U.S.C. 470 *et seq*.) requires review of any project funded, licensed, permitted, or assisted by the federal government for impact on significant historic properties. The BLM must allow the State Historic Preservation Office and the Advisory Council on Historic Preservation to comment on a proposed federal undertaking.

    a. Section 106 ensures that cultural resources are managed according to their relative importance, and that the BLM works to protect these valuable resources against impairment, destruction, and inadvertent loss, while encouraging and accommodating the uses determined appropriate through planning and public participation.

1.4.2. Regulations

1. 43 CFR 3809 – Surface Management
2. 43 CFR 3715 – Use and Occupancy Under the Mining Laws

1.5. Conformance with the Resource Management Plan

This project is in conformance with the Butte Field Office Resource Management Plan (April 2009). Specifically, this project conforms with the following goals, objectives, allowable uses and management actions:

Energy and Minerals (Butte RMP, p. 71):

Goal EM1 – Ensure that federal minerals are available for energy and mineral exploration and development.

Goal EM2 – Manage exploration and development of mineral resources and ensure they are conducted in an environmentally sound manner.

Actions – Locatable Minerals (Butte RMP, p. 75)

1. BLM will provide opportunities for mineral exploration and development. (Goals EM1, SE1)
2. BLM will ensure accessibility to mineralized areas for exploration and development. (Goals EM1, TM1)
4. BLM will strive to provide for timely permit evaluation and processing of federal energy and solid mineral exploration and development proposals. (Goal EM1)
6. BLM will develop and implement measures to prevent unnecessary and undue degradation from exploration, mining, and reclamation activities. BLM will also develop conditions of approval and implementation guidelines (best management practices) to minimize impacts to natural resources including significant cultural resource sites and fossil localities caused by locatable mineral development. (Goals EM1, EM2, WF2, WF3, WF4, WF5, CP1, SE1)
7. Reclamation and restoration activities will be monitored to determine effectiveness of the practices. (Goals EM2, SE1)
8. For locatable minerals, especially placer mining operations, reclamation activities will be required to restore stream channels and riparian habitats to functioning condition as close to pre-mining conditions as possible. (Goals EM2, RV1, RV2, WF3, WR1, WR3, WR4)

Management Actions

General

1. All Energy and Minerals exploration, development, and production activities will be managed to prevent unnecessary or undue degradation. (Goals EM1, EM2, SE1, SE5)
2. For all exploration and mining proposals BLM will ensure operations take all practical measures to maintain, protect, or minimize disturbances to resources. (Goals EM1, EM2, SE1, SE5)
3. Future changes to Endangered Species Act listings of species or occupied habitats may require changes or modifications of proposed activities to comply with the requirements of the act. (Goals EM1, EM2, SE1, SE5)
4. Where no alternative to road construction exists, roads (including roads in riparian areas) will be kept to the minimum necessary for the approved mineral activity. When no longer required for mineral or land management activities, roads and facilities will be closed, and the landscape rehabilitated. (Goal EM2)

Socioeconomics (Butte RMP, p.80)

Goal SE1 – Provide opportunities for economic benefits while minimizing adverse impacts on resources and resource uses.
Goal SE5 – Make resource commodities available to provide a sustainable flow of economic benefits within the capability of the ecosystem.

1.5.1. Tiered Documents

This EA tiers to the Butte RMP and associated Final Environmental Impact Statement (EIS).

1.6. Scoping and Issues

The BLM interdisciplinary team developed a list of four key issues to analyze in detail as a part of this Environmental Assessment.

Issue 1: How would the project affect soil erosion?
Issue 2: How would the project affect McKewen's Bar Ditch[2]?
Issue 3: How would the project affect scenic qualities of the landscape?

CHAPTER 2. ALTERNATIVES

2.1. Alternative A – No Action Alternative

The No Action Alternative would be to not approve this Plan of Operations for the proposed placer sapphire mining operation. BLM's authority to implement the No Action Alternative is limited; BLM can only deny the Plan if the proposal would create undue or unnecessary degradation that BLM was unable to mitigate.

2.2. Alternative B – Proposed Action

Under the Proposed Action Alternative, the Montana Sapphire Mining Company would conduct placer mining and processing to recover sapphires from McCune Bar gravels from 2.5 acres over a 5-year period as described in their complete Plan of Operations. The Plan of Operations was developed in accordance with the Montana Placer Mining Best Management Practices (MBMG 1993).

2.2.1. Project footprint

The project footprint would be a total of 5.1 acres (Map 1). The project footprint includes 2.5 acres where mining operations and reclamation would occur plus the 2.4 miles of access roads, including 0.5 miles of Ward Ranch Road (BLM Road #050133a) past the current route closure and 1.9 miles of the BLM Primitive Road #EH052. The operator would be authorized for overland travel limited to 0.9 miles of an existing linear disturbance that is a user-created two-track. The 2.4 miles of access roads plus the 0.9 miles of overland travel along the linear disturbance total approximately 3.6 acres. No road maintenance would be authorized for the 2.4 miles of access roads.

2.2.2. Mining Operations

The applicant would sequentially mine three panels comprising a total area of 2 acres (Map 2). For each panel, the operator would use a backhoe (Case 580M) to dig down to the layer of pay

[22] McKewen's Bar Ditch is the spelling used in the cultural site record. The name is understood to be a historic alternate spelling to McCune Bar Ditch. Both spellings have the same meaning and they both geographically refer to the McCune Bar.

gravel which lies on top of bedrock. Hand tools including shovels and brooms would be used to collect the pay gravels estimated at 2-3 cubic yards (CY) removed per week. A dump truck (5-yard capacity) would be used to store stockpiled gravel until there is enough to run through the trommel, which is set up to process 50 CY per hour. When the truck contains a full load, it would be transported to the wash plant, and gravel would be fed from the dump truck into the wash plant. Pay gravels are approximately 12" thick and overburden is approximately 8 feet at the deepest. Overburden would be stockpiled behind the operation as it moves. Topsoil would be stockpiled separately from overburden at the north-central portion of the operation and contained to a 20 yd x 15 yd area. Topsoil would be seeded with native grasses and sterile wheat.

The wash plant would include a grizzly, trommel, jig, and sluice box, and would be contained to a 30' L x 8' W x 10' H trailer. A portable generator (Generac GP9200E) would be used to power the wash plant. It would be bolted to the shipping container to prevent heat and exhaust near conductive materials. The shipping container (40' L x 8' W x 9.5' H) would be used to store tools, supplies, a hazmat kit, fire extinguisher, pump and parts.

Any excavation deeper than 8' would be fenced for safety. The site would be kept in an organized manner at all times, and when mining is not ongoing, all tools and supplies would be stored in the container or in a neat and organized manner. No hazardous materials or toxic materials would be stored onsite. Fuel and gasoline would be stored inside the container, and secondary containment measures would be used. Two fire extinguishers would be kept on site at all times: one with the trommel and one in the container. All operating equipment would be equipped with a fire extinguisher. The site would be monitored by cellular cameras.

2.2.3. Water management plan

A settling pond and freshwater pond would be constructed within the existing disturbance footprint of the previously mined area, in the southwest corner of the project footprint (Map 2). The two ponds would be adjacent and would be connected by an overflow pipe which feeds water from the settling pond into the freshwater pond, after the silt has settled out. The ponds together would have dimensions of 20' W x 24' L x 5' D. The ponds would be unlined, and silt and sediment would be removed as needed from the settling pond and incorporated as growth medium with the topsoil.

A well would be drilled to supply water to the freshwater pond, water areas being revegetated, and aid in dust suppression. The operator proposed a 300’ finishing depth with a 6” steel casing but expects a finishing depth closer to 100’ with a 2” PVC casing. The DNRC permit would only allow up to 18 gallons per minute to be pumped from the well. A gas-powered 3" trash pump (301cc) would be used to transport water from the settling pond to the wash plant and sprinklers. All water for the wash plant would be contained to the ponds and there will be no routine runoff. Water in the pond would be recycled and reused for the wash plant if it does not evaporate. Approximately 50’ of 3” flexible rubber hose will be used to build the water circuit.

2.2.4. Access

The applicant would use 2.4 miles of existing road to access the site (5.1 acres) including 0.5 miles of Ward Ranch Road (BLM road #050133a) past the current route closure and 1.9 miles of the BLM primitive road #EH052. The operator would be authorized for overland travel limited to 0.9 miles of an existing user-created two-track that is not included in the East Helena Travel

Management Plan (otherwise known as a linear disturbance). The 2.4 miles of access roads plus the 0.9 miles of overland travel along the user created two-track would be 3.3 miles linearly and represent approximately 3.6 square acres. No road maintenance would be authorized for the 2.4 miles of access roads. Under the proposed action, the applicant would be authorized to utilize motorized equipment on the routes described above. This authorization exempts the motorized equipment from being classified as an off-highway vehicle (OHV) under 43 CFR 8340.

2.2.5. Reclamation

Mining panels would be reclaimed concurrently with ongoing mining operations. Disturbed areas would be reclaimed to restore natural contours. Backfill would occur in the following sequence: screened materials, followed by overburden, then topsoil combined with organic matter. Earthen berms and straw wattles would be used to mitigate erosion in the active mining area. The ponds would be reclaimed when the project is complete, including restoration to natural contours and revegetation. Topsoil stockpiles would be treated with herbicides for weed management prior to backfill. Reseeding would be done with native seed mix specified by BLM. Reseeding would occur in the fall to ensure successful germination. Weed mitigation would be conducted as needed with herbicides and biological treatments recommended by BLM. A Pesticide Application Record will be submitted to BLM for any weed treatments on the project footprint. The well would be abandoned using a licensed well drilling company when no longer needed for the placer mining operations and reclamation by Montana Sapphire Mining Company.

Project Design Features

Project Design Features would become part of the Condition of Approval. Project Design Features will be included in Appendix B.