



PIPESTONE QUARRY, LLC

HARD ROCK MINING OPERATING PERMIT NO. 00148

PIPESTONE QUARRY

PIPESTONE, MT

April 29, 2024

Final Environmental Assessment

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PROJECT OVERVIEW

COMPANY NAME: Pipestone Quarry, LLC
EA DATE: April 29, 2024
PROJECT: Pipestone Quarry
PERMIT/LICENSE: Operating Permit No. 00148
AMENDMENT #: Minor Amendment 005 (AMD5)

Location

45.916°, -112.246° County: Jefferson County
PROPERTY OWNERSHIP: FEDERAL (BLM) STATE PRIVATE

Compliance with the Montana Environmental Policy Act

Under the Montana Environmental Policy Act (MEPA), Montana agencies are required to prepare an environmental review for state actions that may have an impact on the human environment. The proposed action is considered to be a state action that may have an impact on the human environment and, therefore, the Department of Environmental Quality (DEQ) must prepare an environmental review. This Environmental Assessment (EA) will examine the proposed action and alternatives to the proposed action and disclose potential impacts that may result from the proposed and alternative actions. DEQ will determine the need for additional environmental review based on consideration of the criteria set forth in Administrative Rules of Montana (ARM) 17.4.608. DEQ may not withhold, deny, or impose conditions on the permit based on the information contained in this Environmental Assessment. § 75-1-201(4), MCA.

Proposed Action

DEQ would approve Minor Amendment 005 (AMD5; submitted as MR24-001) to Hard Rock Mining Operating Permit (OP) No. 00148 if DEQ has determined that Pipestone Quarry, LLC (PQ) has met the criteria set forth in Section 82-4-342, Montana Code Annotated (MCA). If approved, the revision to conduct mining activities would be granted for the remaining operational life of the Pipestone Quarry, which is estimated to be approximately 23 years.

Purpose and Need

DEQ's purpose and need in conducting this environmental review is to act upon PQ's application for a permit revision for continued mining in compliance with the Metal Mine Reclamation Act. On February 1, 2024, PQ submitted the application for revision MR24-001 to OP No. 00148. Upon adequacy review of previous environmental analyses per ARM 17.24.120 (1)(c), DEQ determined that PQ's application met the definition of a minor amendment to the permit rather than a revision, because no prior EAs for the project had reviewed the potential for impacts to groundwater quality. DEQ has determined that PQ's application is adequate to meet the requirement for minor amendments described in ARM 17.24.119(3), so the application is renamed Minor Amendment 005 (AMD5).

The applicant's purpose and need in proposing this action is to create a source-specific groundwater mixing zone within the existing permit boundary, to allow elevated nitrate and nitrite (N+N) concentrations until additional information is acquired to resolve the elevated N+N levels that have been observed. PQ would continue remedial efforts to reduce N+N concentrations in groundwater (via

pumping of the production well and irrigation of extracted groundwater), and to institute a groundwater monitoring program. The EA conducted in 2015 for the Pipestone Quarry under OP No. 00148 examined impacts of the impacts of developing and mining the rock quarry. The impacts of the proposed changes from a source-specific groundwater mixing zone are disclosed in this EA.

Tier and Incorporate by Reference

DEQ is tiering and incorporating by reference the previously completed EA conducted in 2015 for the Pipestone Quarry for project features that have not changed (DEQ, 2015). The previous EA was completed for OP No. 00148 under the permittee at that time, URS Energy & Construction, Inc. OP No. 00148 was originally issued to Conda Mining, Inc. on December 11, 1992. The permit was transferred to URS Energy & Construction Inc. on May 21, 2010, and subsequently transferred to Pipestone Quarry, LLC, on September 16, 2015.

Table 1: Summary of Activities Proposed in the Application

Summary of Proposed Activities	Amendment 004 (AMD4) - 2015	Amendment 005 (AMD5)- 2024	Difference Between AMD4 and AMD5
General Overview	The permittee proposed increasing the permit area from 94.7 acres to 98.5 acres, increasing the disturbance area from 62.5 acres to 64.6 acres, extending the mine life by approximately 4 years with a Phase 2 and Phase 3 schedule, changing the drainage plan for stormwater, and revising the final grading effort with fines from Phase 2 and Phase 3 mining.	PQ proposes creating a source-specific groundwater mixing zone from the production well to two monitoring wells to the south (downgradient) to allow elevated N+N concentrations until additional information is acquired to resolve the elevated N+N levels. A Field Sampling and Analysis Plan (FSAP) is included along with the source-specific groundwater mixing zone.	The same project, but allowance for a source-specific groundwater mixing zone within the existing permit boundary and a groundwater sampling plan.
Disturbance/ Permit Area	Amendment 004 (AMD4) - 2015	Amendment 005 (AMD5)- 2024	Difference Between AMD4 and AMD5
Permit area	98.5 acres	0 acres of new permit area.	No difference
Total new surface disturbance	64.6 acres	0 acres of new disturbance.	No difference
Specific Proposed Activities	Amendment 004 (AMD4) - 2015	Amendment 005 (AMD5)- 2024	Difference Between AMD4 and AMD5
Duration and timing	Four additional years, and 1,240,000 tons of additional railroad ballast, to be mined through the year 2025.	The source-specific groundwater mixing zone would be active for life of mine, or until either (1) the N+N concentration has stabilized below the 10 mg/L Human Health water quality standard, or (2) the N+N concentrations outside of the proposed mixing zone boundary	No difference. An additional quarry expansion was approved in 2020 (via MR18-001) which added 10 acres of disturbance area and extended the projected mine life through 2047. No EA was required.

		have increased above the 10 mg/L standard and the permittee applies and is approved for an adjustment to the mixing zone boundary.	
Equipment	<ul style="list-style-type: none"> -Three Rubber-tired front end loaders (12 cy, 8 cy, 4 cy) -One Dozer (Cat D8) -Three End Dump Trucks (50 ton) -One Motor Grader (Cat 14H) -One Trackhoe Excavator (3 cy) -Water Truck, Water Tanks & Pumps -Crusher Set-up -Service/Maintenance Trucks 	No additional on-site mobile equipment is proposed, existing light/passenger vehicle would be used to conduct monitoring according to the FSAP.	No difference
Location and analysis area	<p>The permit area increased by 3.8 acres from 94.7 acres to 98.5 acres in the upstream direction of the easterly natural drainage channel.</p> <p>-The disturbance area increased by 2.1 acres from 62.5 acres to 64.6 acres due to the Out-of-Pit Fines Storage Area and the upstream extension of the fill in the easterly natural drainage channel to accommodate final reclamation drainage.</p>	<ul style="list-style-type: none"> -The proposed source-specific groundwater mixing zone would extend from approximately 100 feet upgradient of the Production Well to the two downgradient (southward) monitoring wells (PQMW-1 and PQMW-3) and encompass approximately 2.25 acres public and on private land in the southwest corner of the PQ permit boundary. -The analysis area includes the mixing zone area as well as the immediate downstream water sources and surrounding lands. 	No difference
Personnel on-site	<ul style="list-style-type: none"> -One Quarry Superintendent -One Foreman -One Crusher Operator -One Loader Operator -One Dozer Operator -Two Truck Drivers -Three Mechanics 	No new full-time personnel proposed for the actions being requested, existing personnel would conduct monitoring according to the FSAP.	No difference

	-One Laborer -One Driller -One Office Clerk		
Structures	-Loadout Facility -Generator Sets -Baghouse	No new structures proposed.	No difference
Project water source	Production well supplies water for quarry operations including dust control and ballast product rinsing. Estimated maximum production rate of 10-acre feet per year.	No new water source proposed.	No difference
Supplemental lighting	During night activities, work areas are illuminated with artificial light utilizing mobile light plants and light towers which are energized by diesel powered generators. The light sources are shielded from Interstate 90 by the “artificial ridge” and the quarry highwall on the south perimeter.	No new supplemental lighting proposed.	No difference
Air quality	The air shed classification of the project is Class II. The DEQ Air Quality Bureau has issued air quality permit Nos. 2675 and 2751 for the crushing operation at the quarry. Air Quality is monitored and kept in compliance by operations personnel trained in EPA method 9 opacity testing whenever a dust or smoke plume is suspected of approaching opacity limits. Dust is produced by these operations due to travel on unpaved roads, as well as from the crushing operation and stockpiles. A water truck is used for dust control, sourced from the existing production well. Possible air emissions are limited to emissions related to surface equipment. These emissions come from combustion sources including mobile equipment and generator sets. The permittee is required to comply with applicable local, county,	No new air emission sources proposed, existing light/passenger vehicle would be used to conduct monitoring according to the FSAP.	No difference

	state, and federal requirements pertaining to air quality.		
Water quality	<p>Potential sources of water quality impacts include process water from dust control, product rinsing, and stormwater runoff.</p> <p>The site is dry with no springs and only ephemeral drainages. The permittee is required to comply with applicable local, county, state, and federal requirements pertaining to water quality.</p>	<p>No new sources of water quality impacts are being proposed. A source-specific mixing zone is proposed to allow for elevated levels of N+N in a localized portion of the Pipestone Quarry. An additional groundwater monitoring plan is included with this proposal to ensure the elevated N+N levels do not exceed the mixing zone boundary.</p>	<p>No impacts to groundwater quality due to operation of the quarry were proposed, or predicted, in association with AMD4 or any prior version of the OP. Monitoring for N+N concentrations in the production well and the nearby settling pond became a requirement of the Operating Plan through AMD4. Under AMD5, PQ requests authorization to allow elevated N+N concentrations in groundwater within a mixing zone contained within the OP boundary, to continue remedial efforts to reduce N+N concentrations in groundwater (via pumping of the production well and irrigation of extracted groundwater), and to expand the ongoing groundwater monitoring program.</p>
Erosion control and sediment transport	<p>Potential areas for erosion or sediment are any disturbed areas of the site, including laydown areas, soil stockpiles and access roads. The permittee is required to comply with applicable local, county, state, and federal requirements pertaining to erosion control and sediment transport.</p>	<p>No new erosion or sediment transport sources proposed.</p>	<p>No difference</p>

Solid waste	The permittee is required to comply with the applicable local, county, state, and federal requirements pertaining to solid waste.	No new solid waste sources proposed.	No difference
Cultural resources	One cultural resource site was identified within the quarry expansion area. Mitigation of the adverse effects of the mine expansion has been accomplished through a memorandum of Agreement between the BLM, the State Historic Preservation Office, and URS, which provided financial remedy to the affected native tribes. The permittee is required to comply with the applicable local, county, state, and federal requirements pertaining to cultural resources.	No new cultural resource impacts proposed.	No difference
Hazardous substances	The permittee is required to comply with the applicable local, county, state, and federal requirements pertaining to hazardous substances.	No new hazardous substance impacts proposed.	No difference
Reclamation Plans	Reclamation of the site would reduce visual impacts. Soil would be replaced after stockpiles and other facilities have been removed and then the areas would be reseeded. Soil would not be replaced on the quarry highwall due to its steepness. The permittee is required to comply with the applicable local, county, state, and federal requirements pertaining to reclamation plans.	No new reclamation plans proposed.	No difference
Cumulative Impact Considerations			
General setting	Isolated rural area on private and BLM land. The major recreational uses in the region are hunting and fishing. Interstate 90 is south of the quarry with intermittent sightings of the quarry area from the interstate.		
Past actions	The surrounding land use has historically been livestock grazing and off-road recreation. Mining in the area began after OP No. 00148 was issued to Conda Mining, Inc. in 1992.		
Present actions	The quarry provides a source of crushed rock for railroad ballast, construction materials for mining operations in Butte, and other uses that might arise in the area.		
Related future actions	Continued mining at the quarry for Life of Mine.		

Figure 1: Groundwater Monitoring Sites Map



From February 1, 2024, Application- FSAP

Figure 2: Proposed Mixing Zone Boundary



From February 1, 2024, Mixing Zone Application

SUMMARY OF POTENTIAL IMPACTS

The impact analysis will identify and estimate whether the impacts are direct or secondary impacts. Direct impacts occur at the same time and place as the action that causes the impact. Secondary impacts are a further impact to the human environment that may be stimulated, or induced by, or otherwise result from a direct impact of the action (ARM 17.4.603(18)). Where impacts would occur, the impacts will be described.

Cumulative impacts are the collective impacts on the human environment within the borders of Montana of the Proposed Action when considered in conjunction with other past and present actions related to the Proposed Action by location and generic type. Related future actions must also be considered when these actions are under concurrent consideration by any state agency through pre-impact statement studies, separate impact statement evaluation, or permit processing procedures. The projects identified in Table 1 were analyzed as part of the cumulative impacts assessment for each resource.

1. **Geology and Soil Quality, Stability, and Moisture**

Baseline geology and soils at the project site do not differ from the description provided in Amendment 004.

Direct Impacts:

No direct impacts to geology and soil quality, stability and moisture are expected from this proposed action. The significance assessment is presented in Table 2.

Secondary Impacts:

No secondary impacts to geology and soil quality, stability and moisture are expected from this proposed action.

Cumulative Impacts:

No cumulative impacts to geology and soil quality, stability and moisture are expected from this proposed action.

2. **Water Quality, Quantity, and Distribution**

The project area receives an average of 9.9 inches of precipitation annually (USGS Stream Stats, 2022). Precipitation would generally be expected to infiltrate into the quarry area or be retained in the storm water retention basin located north of the railroad tracks adjacent to the quarry. This retention basin is described in the previous EA as a settling/storage pond, located less than 30 feet to the west of the production well (DEQ, 2015)(Figure 2). Storm water does not leave the quarry site and all drainages in the immediate area are ephemeral. The nearest surface water to proposed disturbance is Pipestone Creek, which is located approximately 0.8 miles south of the Pipestone Quarry site. No impacts to Pipestone Creek are anticipated to result from this project.

Project water is sourced from a production well located within the permit boundary. This water is used for dust suppression around the site, in addition to rinsing the crushed rock product. The production well was drilled to a total depth of 180 feet in 1995, but it is completed to only 80 feet due to the collapse of the borehole below the bedrock-Tertiary sediment contact (PQ

application, 2024). The production well has a static water level that averages 7 feet below surface, while the depth to water in the surrounding three monitoring wells ranges from 100 to 130 feet below surface (PQ-MW 1, PQ-MW 2, and PQ-MW 3). It's unclear whether this indicates an upward groundwater gradient in the bedrock in the immediate area of the production well or locally saturated conditions in the Tertiary sediments for other reasons (PQ application, 2024). Three domestic wells located south of the quarry area, but north of Interstate 90, are also monitored and have water levels ranging from 63 to 150 feet below surface based on measurements collected during 2023 (PQ application, Attachment 2, 2024). All production and monitoring well locations are shown in Figure 1.

Monitoring conducted during 2023 indicates that all wells in the area produce water that meets groundwater quality standards for all parameters tested, with the exception of the quarry's production well. Water from the production well had nitrate + nitrite (N+N) concentrations of 20.1 to 21.4 mg/L in 2023, compared with the Circular DEQ- 7 (DEQ-7, 2019) Human Health standard limit of 10.0 mg/L and Montana non-degradation (ARM 17.30.715(1)(d)) limit of 7.5 mg/L for groundwater. When first sampled in 2013, the concentration of N+N in the production well was 8.6 mg/L and it has ranged from 7.7 to 21.4 mg/L since that time (average 15.1 mg/L; PQ Annual Report, 2023). Since 2013, the N+N concentrations in the settling pond have ranged from 14.8 to 39.3 mg/L, with an average of 19.6 mg/L. Water from the adjacent monitoring wells have N+N concentrations ranging from 1.2 to 4.6 mg/L (PQ Annual Report, 2023). None of the three domestic wells located downgradient of the quarry site had detectable concentrations of N+N in 2023 (i.e., less than 0.01 mg/L), and previous sampling in March 2021 measured low concentrations (0.02 mg/L) in two of the wells.

- PQ has implemented mitigation measures to address the elevated N+N concentrations and conducted additional studies and monitoring to investigate potential source(s) of N+N loading, including leach tests for ballast rock and gravel stockpiles. In April 2021, the area around the production wellhead was excavated to a depth of approximately 15 feet and backfilled with bentonite, the well casing was extended to approximately four feet above grade, and the area was graded to prevent ponding and potential infiltration around the well.
- In August 2021, a new liner was placed over the existing liner in the wash plant settling pond to prevent potential pond leakage. The original (pre-2015) liner reportedly had some minor tears which may have allowed for leakage of pond water prior to 2015.
- Extended pumping tests were conducted on the production well in 2022 and 2023 to further assess possible effects of long-term pumping on N+N concentrations. The concentrations remained elevated after extended pumping, suggesting that the reservoir of elevated N+N in the quarry area is relatively large, and/or an active source of loading exists.

Potential sources of N+N at the production well include, but may not be limited to, leakage from the storage pond, infiltration of wash plant and/or dust suppression water derived from the production well, an upgradient source, or other on-site source. Investigations through 2023 suggest a lack of seasonal trends in the locally elevated concentrations, with little effect from the wellhead and pond liner upgrades (PQ Annual Report, 2023).

PQ's proposed monitoring of groundwater quality includes tri-annual (spring, summer, fall) sampling of the production well and three other on-site wells, in addition to semi-annual sampling at the three downgradient private wells (PQ FSAP, 2024). Two additional wells will be installed as authorized from a 2023 permit revision (MR23-001) and the potential need for additional wells would be assessed and permitted separately in the future. Monitoring would occur in conjunction with periodic pumping of the production well and seasonal irrigation of water in a vegetated area in order to promote the uptake of nitrate (a plant nutrient) by the vegetation, which is expected to prevent the degradation of groundwater quality beyond the proposed groundwater mixing zone.

Direct Impacts:

The Pipestone Quarry has been in operation since 1992. The mining process involves drilling and blasting to break up the basalt bedrock in order to extract the material from the quarry. The use of explosives commonly produces a nitrate-rich residue which can increase the concentration of N+N in storm water runoff and in underlying groundwater. Although the source of N+N in groundwater beneath the Pipestone Quarry site has not been positively identified, it is likely related to the use of explosives during the mining process over the past 32 years. Despite this long-term nitrate source, elevated N+N concentrations in groundwater appear to be contained within a small region within the project permit boundary, and no N+N has been detected in domestic wells beyond the permit boundary. There are no water users within the proposed mixing zone other than the water used by PQ from the production well.

No direct impacts to surface water quality or surface water and groundwater quantity or distribution are expected from the proposed action. The monitoring and mitigation measures proposed via this permit amendment are expected to prevent impacts to groundwater outside of the immediate area of the project. The significance assessment is presented in **Table 2**.

Secondary Impacts:

No secondary impacts to water quality, quantity, or distribution are expected from the proposed action.

Cumulative Impacts:

No cumulative impacts to water quality, quantity, and distribution are expected from this proposed action.

3. Air Quality

Impacts to air quality at the project site do not differ from the description provided in AMD4.

Direct Impacts:

No direct impacts to air quality are expected from this proposed action. The significance assessment is presented in **Table 2**.

Secondary Impacts:

No secondary impacts to air quality are expected from this proposed action.

Cumulative Impacts:

No cumulative impacts to air quality are expected from this proposed action.

4. Vegetation Cover, Quantity, and Quality

Impacts to vegetation cover, quantity and quality at the project site do not differ from the description provided in AMD4.

Direct Impacts:

The potential for land application of water being pumped from the production well would promote growth for existing vegetation by providing additional irrigation and N+N loading (nutrients). This impact would occur within the small area shown on Figure 2 (<0.10 acre). No direct impacts to vegetation cover, quantity and quality are expected elsewhere at the site from this proposed action. The significance assessment is presented in **Table 2**.

Secondary Impacts:

No secondary impacts to vegetation cover, quantity and quality are expected from this proposed action.

Cumulative Impacts:

No cumulative impacts to vegetation cover, quantity and quality are expected from this proposed action.

5. Terrestrial, Avian, and Aquatic Life and Habitats

Impacts to terrestrial, avian, and aquatic life and habitats at the project site do not differ from the description provided in AMD4.

Direct Impacts:

No direct impacts to terrestrial, avian, and aquatic life and habitats are expected from this proposed action. The significance assessment is presented in **Table 2**.

Secondary Impacts:

No secondary impacts to terrestrial, avian, and aquatic life and habitats are expected from this proposed action.

Cumulative Impacts:

No cumulative impacts to terrestrial, avian, and aquatic life and habitats are expected from this proposed action.

6. Unique, Endangered, Fragile, or Limited Environmental Resources

Impacts to unique, endangered, fragile or limited environmental resources at the project site do not differ from the description provided in AMD4.

Direct Impacts:

No direct impacts to unique, endangered, fragile or limited environmental resources are expected from this proposed action. The significance assessment is presented in **Table 2**.

Secondary Impacts:

No secondary impacts to unique, endangered, fragile or limited environmental resources are expected from this proposed action.

Cumulative Impacts:

No cumulative impacts to unique, endangered, fragile or limited environmental resources are expected from this proposed action.

7. Historical and Archaeological Sites

Impacts to historical and archaeological resources at the project site do not differ from the description provided in AMD4.

Direct Impacts:

No direct impacts to historical and archaeological resources are expected from this proposed action. The significance assessment is presented in **Table 2**.

Secondary Impacts:

No secondary impacts to historical and archaeological resources are expected from this proposed action.

Cumulative Impacts:

No cumulative impacts to historical and archaeological resources are expected from this proposed action.

8. Aesthetics

Aesthetic impacts at the project site do not differ from the description provided in Amendment 004.

Direct Impacts:

No direct impacts to aesthetics are expected from this proposed action. The significance assessment is presented in **Table 2**.

Secondary Impacts:

No secondary impacts to aesthetics are expected from this proposed action.

Cumulative Impacts:

No cumulative impacts to aesthetics are expected from this proposed action.

9. Demands on Environmental Resources of Land, Water, Air, or Energy

Demands on environmental resources of land, water, air or energy at the project site do not differ from the description provided in AMD4.

Direct Impacts:

No direct impacts to demands on environmental resources of land, water, air or energy are expected from this proposed action. The significance assessment is presented in **Table 2**.

Secondary Impacts:

No secondary impacts to demands on environmental resources of land, water, air or energy are expected from this proposed action.

Cumulative Impacts:

No cumulative impacts to demands on environmental resources of land, water, air or energy are expected from this proposed action.

10. Impacts on Other Environmental Resources

DEQ searched the following websites or databases for nearby activities that may affect the project, however no other projects were identified:

- Montana Department of Natural Resource and Conservation (DNRC)
- Montana Department of Environmental Quality (DEQ)
- Montana Department of Transportation (MDT)
- Jefferson County
- United States Department of Interior, Bureau of Land Management (BLM)
- United States Forest Service (USFS)

Impacts on other environmental resources at the project site do not differ from the description provided in AMD4.

Direct Impacts:

No direct impacts on other environmental resources are expected from this proposed action. The significance assessment is presented in **Table 2**.

Secondary Impacts:

No secondary impacts on other environmental resources are expected from this proposed action.

Cumulative Impacts:

No cumulative impacts on other environmental resources are expected from this proposed action.

11. Human Health and Safety

The applicant would be required to adhere to all applicable state and federal safety laws. Industrial work such as the work proposed by the applicant is inherently dangerous. The Mine

Safety and Health Administration (MSHA) has developed rules and guidelines to reduce the risks associated with this type of labor. Few, if any, members of the public would be in the general project proximity during operations.

Direct Impacts:

There are no water users within the proposed mixing zone other than the water used by PQ from the production well. No direct human health and safety impacts are expected from this proposed action. The significance assessment is presented in **Table 2**.

Secondary Impacts:

No secondary human health and safety impacts are expected from this proposed action.

Cumulative Impacts:

No cumulative human health and safety impacts are expected from this proposed action.

12. Industrial, Commercial, and Agricultural Activities and Production

It is not anticipated that the proposed action would add to the impacts of mining and mineral exploration.

Direct Impacts:

No direct impacts to industrial, commercial, and agricultural activities and production are expected from this proposed action.

Secondary Impacts:

No secondary impacts to industrial, commercial, and agricultural activities and production are expected from this proposed action.

Cumulative Impacts:

No cumulative impacts to industrial, commercial, and agricultural activities and production are expected from this proposed action.

13. Quantity and Distribution of Employment

It is not anticipated that the proposed action would create, move, or eliminate jobs.

Direct Impacts:

No direct impacts to quantity and distribution of employment are expected from this proposed action.

Secondary Impacts:

No secondary impacts to quantity and distribution of employment are expected from this proposed action.

Cumulative Impacts:

No cumulative impacts to quantity and distribution of employment are expected from this proposed action.

14. Local and State Tax Base and Tax Revenues

It is not anticipated that the proposed action would create or eliminate tax revenue.

Direct Impacts:

No direct impacts to local and state tax base and tax revenues are expected from this proposed action.

Secondary Impacts:

No secondary impacts to local and state tax base and tax revenues are expected from this proposed action.

Cumulative Impacts:

No cumulative impacts to local and state tax base and tax revenues are expected from this proposed action.

15. Demand for Government Services

It is not anticipated that substantial traffic or services would be necessary as part of the proposed action.

Direct Impacts:

No direct impacts to demand for government services are expected from this proposed action.

Secondary Impacts:

No secondary impacts to demand for government services are expected from this proposed action.

Cumulative Impacts:

No cumulative impacts to demand for government services are expected from this proposed action.

16. Locally Adopted Environmental Plans and Goals

The proposed activities would occur on private and Bureau of Land Management (BLM) land. The project area would be subject to any plans or rules set forth by BLM, Jefferson County and the 2017 Montana Noxious Weed Management Plan.

Direct Impacts:

No direct impacts to locally adopted environmental plans and goals are expected from this proposed action.

Secondary Impacts:

No secondary impacts to locally adopted environmental plans and goals are expected from this proposed action.

Cumulative Impacts:

No cumulative impacts from or to locally adopted environmental plans and goals are expected from this proposed action.

17. Access to and Quality of Recreational and Wilderness Activities

The proposed activities would occur on private and Bureau of Land Management (BLM) land. Access to and quality of recreational and wilderness activities do not differ from those described in AMD4-2015.

Direct Impacts:

No direct impacts to access to and quality of recreational and wilderness activities are expected from this proposed action.

Secondary Impacts:

No secondary impacts to access to and quality of recreational and wilderness activities are expected from this proposed action.

Cumulative Impacts:

No cumulative impacts to access to and quality of recreational and wilderness activities are expected from this proposed action.

18. Density and Distribution of Population and Housing

The proposed action is not expected to add to the population or require additional housing.

Direct Impacts:

No direct impacts to density and distribution of population and housing are expected from this proposed action.

Secondary Impacts:

No secondary impacts to density and distribution of population and housing are expected from this proposed action.

Cumulative Impacts:

No cumulative impacts to density and distribution of population and housing are expected from this proposed action.

19. Social Structures and Mores

It is not anticipated that the proposed action would disrupt native or traditional lifestyles or communities.

Direct Impacts:

No direct impacts to social structures and mores are expected from this proposed action.

Secondary Impacts:

No secondary impacts to social structures and mores are expected from this proposed action.

Cumulative Impacts:

No cumulative impacts to social structures and mores are expected from this proposed action.

20. Cultural Uniqueness and Diversity

It is not anticipated that the proposed action would cause a shift in some unique quality of the area.

Direct Impacts:

No direct impacts to cultural uniqueness and diversity are expected from this proposed action.

Secondary Impacts:

No secondary impacts to cultural uniqueness and diversity are expected from this proposed action.

Cumulative Impacts:

No cumulative impacts to cultural uniqueness and diversity are expected from this proposed action.

21. Private Property Impacts

The proposed action would take place on Bureau of Land Management property and private land owned by the applicant. DEQ's approval of AMD5 to OP No. 00148 would affect the applicant's real property. DEQ has determined, however, that the permit conditions are reasonably necessary to ensure compliance with applicable requirements under the Metal Mine Reclamation Act and demonstrate compliance with those requirements or have been agreed to by the applicant. Further, if the application is complete, DEQ must take action on the permit pursuant to ARM 17.24.119. DEQ, therefore, does not have discretion to take alternative action that would have less impact on private property. Therefore, DEQ's approval of Amendment 005 to Operating Permit No. 00148 would not have private property-taking or damaging implications.

Montana's Private Property Assessment Act, Section 2-10-101, et seq., MCA establishes an orderly and consistent internal management process for state agencies to evaluate their proposed actions under the "Takings Clauses" of the United States and Montana Constitutions, as those clauses are interpreted and applied by the United States and Montana Supreme Courts. Section 2-10-104, MCA required Montana's Attorney General to develop guidelines, including a checklist, to assist state agencies in identifying and evaluating proposed agency actions that may result in the taking or damaging of private property. In turn, Section 2-10-105(1) and (2), MCA set out a process for each State Agency to evaluate whether a State action may result in an unconstitutional taking of private property. Those provisions direct that:

- A. Each state agency shall assign a qualified person or persons in the state agency the duty and authority to ensure that the state agency complies with this part. Each state agency action

with taking or damaging implications must be submitted to that person or persons for review and completion of an impact assessment. The state agency may not take the action unless the review and impact assessment have been completed, except that the action with taking or damaging implications may be taken before the review and impact assessment are completed if necessary to avoid an immediate threat to public health or safety.

- B. Using the attorney general's guidelines and checklist, the person shall prepare a taking or damaging impact assessment for each state agency action with taking or damaging implications that includes an analysis of at least the following:
- i. the likelihood that a state or federal court would hold that the action is a taking or damaging;
 - ii. alternatives to the action that would fulfill the agency's statutory obligations and at the same time reduce the risk for a taking or damaging; and
 - iii. the estimated cost of any financial compensation by the state agency to one or more persons that might be caused by the action and the source for payment of the compensation.

DEQ has utilized the Montana Attorney General's Checklist and analytical Flowchart revised in January 2011 to evaluate the legal impact to property rights resulting from the proposed action. These flowchart questions have been applied by DEQ to the proposed project area, which takes place on Bureau of Land Management property and private land owned by the applicant, as follows:

- Does the action pertain to land or water management or environmental regulation affecting private real property or water rights? Answer: Yes.
- Does the action result in either a permanent or indefinite physical occupation of private property? Answer: No.
- Does the action deprive the owner of all economically beneficial use of the property? Answer: No.
- Does the action require a property owner to dedicate a portion of property or to grant an easement? Answer: No.
- Does the action deny a fundamental attribute of ownership? Answer: No.
- Does the action have a severe impact on the value of the property? Answer: No.
- Does the action damage the property by causing some physical disturbance with respect to the property in excess of that sustained by the public generally? Answer: No.

Given the results from the legal flowchart questions, DEQ has determined that the permit conditions are reasonably necessary to ensure and demonstrate compliance with applicable requirements of the Metal Mine Reclamation Act, Section 82-4-301, et seq., MCA, and have been sought by the applicant. Therefore, no taking or damaging of private property rights will occur because of DEQ's approval of the Permit Application.

22. Other Appropriate Social and Economic Circumstances

Due to the nature of the proposed activities, and the limited project duration, no further direct or secondary impacts would be anticipated from this project.

23. Greenhouse Gas Analysis

The analysis area for this resource is limited to the activities regulated by the issuance of AMD5 to OP No. 00148 which requests operation of a source-specific groundwater mixing zone and an associated monitor well sampling plan. Approval of the minor amendment would require the use of site passenger vehicles to sample groundwater monitoring wells tri-annually in accordance with the submitted Field Sampling and Analysis Plan. This includes driving to four operator-owned and maintained well locations (Production Well, PQ MW-1, PQ MW-2, and PQ MW-3) three times per year, and three private landowner wells (Kountz Well, Cold Water Well, and Woodland Well 1) twice per year to collect groundwater samples.

Based on information provided by the permittee, passenger vehicles would use gasoline and travel approximately 11 miles annually. The estimated gasoline usage for these activities would be approximately 0.42 gallons annually. The permittee's current plan is to continue mine operations and sample the selected wells through 2047, but the proposed action in AMD5 would not extend the mine life. The amount of gasoline to fulfil the sampling plan for the life of project would be approximately 9.5 gallons.

For the purpose of this analysis, DEQ has defined greenhouse gas emissions as the following gas species: carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), and many species of fluorinated compounds. The range of fluorinated compounds includes numerous chemicals which are used in many household and industrial products. Other pollutants can have some properties that also are similar to those mentioned above, but the EPA has clearly identified the species above as the primary GHGs. Water vapor is also technically a greenhouse gas, but its properties are controlled by the temperature and pressure within the atmosphere, and it is not considered an anthropogenic species.

The combustion of gasoline fuel at the site would release GHGs primarily being carbon dioxide (CO₂), nitrous oxide (N₂O) and much smaller concentrations of uncombusted fuel components including methane (CH₄) and other volatile organic compounds (VOCs).

DEQ has calculated GHG emissions using the EPA Simplified GHG Calculator version May 2023, for the purpose of totaling GHG emissions. This tool totals carbon dioxide (CO₂), nitrous oxide (N₂O), and methane (CH₄) and reports the total as CO₂ equivalent (CO₂e) in metric tons CO₂e. The calculations in this tool are widely accepted to represent reliable calculation approaches for developing a GHG inventory.

Direct Impacts

Operation of gasoline-fueled vehicles for groundwater monitoring throughout the life of the proposed project would produce exhaust fumes containing GHGs.

DEQ estimates that the proposed action would require the permittee to utilize approximately 0.42 gallons of additional gasoline fuel per year. Using the Environmental Protection Agency's (EPA) simplified GHG Emissions Calculator for mobile sources, approximately 4.24 kilograms of CO₂ or 0.00431 metric tons of CO₂e (MTCO₂e) would be produced per year. For the life of mine, through 2047, the proposed activities would produce 0.0992 MTCO₂e.

Secondary Impacts

GHG emissions contribute to changes in atmospheric radiative forcing, resulting in climate change impacts. GHGs act to contain solar energy loss by trapping longer wave radiation emitted from the Earth's surface and act as a positive radiative forcing component (BLM 2021). The impacts of climate change throughout the Rocky Mountain region may include changes in flooding and drought, rising temperatures, and the spread of invasive species (BLM 2021).

Cumulative Impacts

Montana recently used the EPA State Inventory Tool (SIT) to develop a greenhouse gas inventory in conjunction with preparation of a possible grant application for the Community Planning Reduction Grant (CPRG) program. This tool was developed by EPA to help states develop their own greenhouse gas inventories, and this relies upon data already collected by the federal government through various agencies. The inventory specifically deals with carbon dioxide, methane, and nitrous oxide and reports the total as CO₂e. The SIT consists of eleven Excel based modules with pre-populated data that can be used as default settings or in some cases, allows states to input their own data when the state believes their own data provides a higher level of quality and accuracy. Once each of the eleven modules is filled out, the data from each module is exported into a final "synthesis" module which summarizes all of the data into a single file. Within the synthesis file, several worksheets display the output data in a number of formats such as emissions by sector and emissions by type of greenhouse gas.

DEQ has determined the use of the default data provides a reasonable representation of the greenhouse gas inventory for the various sectors of the state, and an estimated annual greenhouse gas inventory by year. The SIT data is currently only updated through the year 2021, as it takes several years to validate and make new data available within revised modules.

Future GHG emissions from operations such as this site would be represented within the module Carbon Dioxide Emissions from Fossil Fuel Combustion, and emissions from the Transportation Sector within the Commercial and Industrial sectors. At present, the Transportation Sector accounts for 8.08 million MTCO₂e annually¹. The estimated annual emissions of 0.00431 MTCO₂e (a total of 0.0992 MTCO₂e over 23 years of mine life) would contribute approximately 0.00000053% of Montana's annual emissions from the Transportation sector.

The requested AMD5 to OP No. 00148 would not have any surface disturbance and therefore DEQ does not expect any loss of vegetation to impact GHG emissions.

GHG emissions that would be emitted as a result of the proposed activities would add to GHG emissions from other sources. The current quarry utilization¹ or No Action Alternative of the site also produces GHGs.

PROPOSED ACTION ALTERNATIVES

In addition to the proposed action, DEQ also considered the "no action" alternative. The "no action" alternative would deny the approval of AMD5. The applicant would lack the authority to implement a source-specific groundwater mixing zone. Any potential impacts that would be authorized under AMD5

¹ Calculated by DEQ using the EPA SIT Tool.

would not occur. However, DEQ does not consider the “no action” alternative to be appropriate because the applicant has demonstrated compliance with all applicable rules and regulations as required for approval. The no action alternative forms the baseline from which the impacts of the proposed action can be measured.

CONSULTATION

DEQ engaged in internal and external efforts to identify substantive issues and/or concerns related to the proposed project. Internal scoping consisted of internal review of the environmental assessment document by DEQ staff.

External scoping efforts included queries to the following websites/ databases/ personnel:

- Montana Department of Natural Resource and Conservation (DNRC)
- Montana Department of Environmental Quality (DEQ)
- US Geological Society – Stream Stats (USGS)
- Montana Groundwater Information Center (GWIC)
- United States Department of Interior, Bureau of Land Management (BLM)

OTHER GOVERNMENTAL AGENCIES WITH JURISDICTION

The proposed project would be located on Bureau of Land Management (BLM) lands and is subject to BLM approval. All applicable state and federal rules must be adhered to, which, at some level, may also include other state, federal, or tribal agency jurisdiction.

This environmental review analyzes the proposed project submitted by the applicant. Any impacts from the project would be short-term and would be fully reclaimed at the conclusion of the project and thus, would not contribute to the long-term cumulative effects of mining in the area.

No USFS, DNRC, or other BLM regulated projects were identified in the project vicinity.

NEED FOR FURTHER ANALYSIS AND SIGNIFICANCE OF POTENTIAL IMPACTS

When determining whether the preparation of an environmental impact statement is needed, DEQ is required to consider the seven significance criteria set forth in ARM 17.4.608, which are as follows:

1. The severity, duration, geographic extent, and frequency of the occurrence of the impact;
2. The probability that the impact will occur if the proposed action occurs; or conversely, reasonable assurance in keeping with the potential severity of an impact that the impact will not occur;
3. Growth-inducing or growth-inhibiting aspects of the impact, including the relationship or contribution of the impact to cumulative impacts;
4. The quantity and quality of each environmental resource or value that would be affected, including the uniqueness and fragility of those resources and values;
5. The importance to the state and to society of each environmental resource or value that would be affected;
6. Any precedent that would be set as a result of an impact of the proposed action that would commit the department to future actions with significant impacts or a decision in principle about such future actions; and
7. Potential conflict with local, state, or federal laws, requirements, or formal plans.

The severity, duration, geographic extent, and frequency of the occurrence of the impacts associated with the proposed mining activities would be limited. The proposed action would result in the disturbance of no additional acres at the site. The applicant is proposing to incorporate a source-specific groundwater mixing zone within the operating permit boundary to allow for elevated levels of N+N between the production well and monitoring wells. The life of mine is not affected by this request. The land associated with the request does not contain unique, endangered, fragile, or limited environmental resources. The applicant is proposing a new Field Sampling and Analysis Plan in conjunction with the source-specific groundwater mixing zone request. There would be no impacts to local topography and the viewshed of nearby residents and visitors would not be altered.

As discussed in this Environmental Assessment, DEQ has not identified any significant impacts associated with the proposed activities for any environmental resource. DEQ does not believe that the proposed activities by the applicant would have any growth-inducing or growth-inhibiting aspects, or contribution to cumulative impacts. The site does not contain unique or fragile resources. There would continue to be minor impacts to geology through removal of rock product, although limited in area, as part of the previously approved mine life. The site would be reclaimed to provide comparable utility and stability of adjacent undisturbed areas.

No additional impacts to soil would occur requiring soil salvage.

Water resource impacts would be minor as the area with elevated N+N concentrations within the proposed source-specific groundwater mixing zone is limited in extent and contained within the OP boundary. Storm water would be controlled through best management practices under a Multi-Sector General Permit for Storm Water Discharges Associated with Industrial Activity (DEQ, Permit MTG490027). No water would be used on site except for dust control and rinsing rock products. There is no surface water to be impacted at the site.

Impacts to air quality would be minor due to the limited area of operation and use of water for dust control.

Impacts to vegetation would be minor due to concurrent reclamation with a DEQ approved seed mix. Weed control would take place and meet Jefferson County standards. The potential for land application of water being pumped from the production well would promote growth for existing vegetation by providing additional irrigation and N+N loading (nutrients). This impact would occur within the small area shown on Figure 2 (<0.10 acre). No direct impacts to vegetation cover, quantity and quality are expected elsewhere at the site from this proposed action.

There would be no impacts to terrestrial, avian, and aquatic life and habitats under the proposed activities. Previously identified impacts related to mine life would be reduced through concurrent reclamation to comparable utility and stability as adjacent undisturbed land.

Unique, endangered, fragile, or limited environmental resources have been evaluated. There are no unique or endangered fragile resources in the project area. SHPO has determined that, based on ground disturbance that currently exists, there is no need for a cultural resource inventory. If a resource is discovered, SHPO would be notified immediately, and the site left further untouched until a proper evaluation is made.

Viewshed aesthetics would not be impacted by the proposed operations.

Impacts to human health and safety would be minor because access roads would be closed to the public and the site is on private land. The public is not allowed on the mine site.

As discussed in this EA, DEQ has not identified any long-term or significant impacts associated with the proposed activities on any environmental resource.

Issuance of an OP or amendment to the applicant does not set any precedent that commits DEQ to future actions with significant impacts or a decision in principle about such future actions. If the applicant submits another operating permit, amendment, or revision application to conduct additional mining, DEQ is not committed to issuing those authorizations. DEQ would conduct an environmental review for any subsequent authorizations sought by the applicant that require environmental review. DEQ would make a permitting decision based on the criteria set forth in the Metal Mine and Reclamation Act.

Issuance of the permit to the applicant does not set a precedent for DEQ's review of other applications for permits, including the level of environmental review. The level of environmental review decision is made based on case-specific consideration of the criteria set forth in ARM 17.4.608.

Finally, DEQ does not believe that the proposed mining activities by the applicant would have any growth-inducing or growth-inhibiting aspects that would conflict with any local, state, or federal laws, requirements, or formal plans.

Based on a consideration of the criteria set forth in ARM 17.4.608, the proposed operation is not predicted to significantly impact the quality of the human environment. Therefore, preparation of an EA is the appropriate level of environmental review for MEPA.

Table 2: Assessment of Significance (ARM 17.4.608)

Affected Resource and Section Reference	Potential Impact	Severity ¹ , Extent ² , Duration ³ , Frequency ⁴ , Uniqueness and Fragility (U/F)	Probability impact will occur ⁵	Cumulative impacts	Measures to reduce impact as proposed by applicant	Significance (yes/no)
1. Geology and Soil Quality, Stability, and Moisture	No anticipated impacts	N/A	N/A	N/A	N/A	No
2. Water Quality, Quantity, and Distribution	Groundwater with elevated levels of N+N exceeds the source-specific groundwater mixing zone boundary.	S- Low: Use of monitoring wells to track source and downgradient path of groundwater with N+N levels that exceed Human Health standard within the permit boundary. Other monitoring wells within the mixing zone do not exceed the Human Health standard. E- Small: Minimal disturbance for installation of monitoring well locations already previously approved. A minimum boundary for the current mixing zone would be established in the permit boundary and include the monitoring wells. No impacts to off-site water users are anticipated. D- Short Term: Up to the end of the mine life at Pipestone Quarry. F- Continually. Tri-annual sampling of on-site monitoring wells, semi-annual sampling for off-site private wells . U/F- Not unique or particularly fragile.	Unlikely	None	Field Sampling and Analysis Plan; Contingencies may include pumping and land applying the water or extending the boundary of the mixing zone.	No
3. Air Quality	No anticipated impacts	N/A	N/A	N/A	N/A	No
4. Vegetation Cover, Quantity, and Quality	Land application of water from production well would promote growth of existing vegetation	S- Low: Potential land application of water being pumped from the production well would promote growth for existing vegetation by providing additional irrigation and N+N loading (nutrients). E- Small: This impact would occur within the small area shown on Figure 2 (<0.10 acre). No direct impacts to vegetation cover, quantity and quality are expected elsewhere at the site. D- Short Term: Up to the end of the mine life at Pipestone Quarry. F- Seasonal. Water may be land applied seasonally when pumping the production well. U/F- Not unique or particularly fragile.	Probable	N/A	N/A	No
5. Terrestrial, Avian, and Aquatic Life and Habitats	No anticipated impacts	N/A	N/A	N/A	N/A	No
6. Unique, Endangered, Fragile, or Limited Environmental Resources	No anticipated impacts	N/A	N/A	N/A	N/A	No
7. Historical and Archaeological Sites	No anticipated impacts	N/A	N/A	N/A	N/A	No
8. Aesthetics	No anticipated impacts	N/A	N/A	N/A	N/A	No
9. Demands on Environmental Resources of Land, Water, Air, or Energy	No anticipated impacts	N/A	N/A	N/A	N/A	No

Affected Resource and Section Reference	Potential Impact	Severity ¹ , Extent ² , Duration ³ , Frequency ⁴ , Uniqueness and Fragility (U/F)	Probability impact will occur ⁵	Cumulative impacts	Measures to reduce impact as proposed by applicant	Significance (yes/no)
10. Impacts on Other Environmental Resources	No anticipated impacts	N/A	N/A	N/A	N/A	No
11. Human Health and Safety	No anticipated impacts	N/A	N/A	N/A	N/A	No
12. Industrial, Commercial, and Agricultural Activities and Production	No anticipated impacts	N/A	N/A	N/A	N/A	No
13. Quantity and Distribution of Employment	No anticipated impacts	N/A	N/A	N/A	N/A	No
14. Local and State Tax Base and Tax Revenues	No anticipated impacts	N/A	N/A	N/A	N/A	No
15. Demand for Government Services	No anticipated impacts	N/A	N/A	N/A	N/A	No
16. Locally Adopted Environmental Plans and Goals	No anticipated impacts	N/A	N/A	N/A	N/A	No
17. Access to and Quality of Recreational and Wilderness Activities	No anticipated impacts	N/A	N/A	N/A	N/A	No
18. Density and Distribution of Population and Housing	No anticipated impacts	N/A	N/A	N/A	N/A	No
19. Social Structures and Mores	No anticipated impacts	N/A	N/A	N/A	N/A	No
20. Cultural Uniqueness and Diversity	No anticipated impacts	N/A	N/A	N/A	N/A	No
21. Greenhouse Gas Analysis	Emissions from existing vehicles to be used to conduct additional groundwater monitoring	S- Low: Use of existing light/passenger vehicles to conduct monitoring would result in low quantities of annual GHG emissions (0.00431 MTCO ₂ e) E- Small: Estimated vehicle travel for monitoring is limited to 11 miles per year. D- Short Term: Up to the end of the mine life at Pipestone Quarry. F- Continually. Tri-annual sampling of on-site monitoring wells, semi-annual sampling for off-site private wells . U/F- Not unique or particularly fragile.	Certain	Insignificant- The estimated annual emissions of 0.00431 MTCO ₂ e (a total of 0.0992 MTCO ₂ e over 23 years of mine life) would contribute approximately 0.00000053% of Montana's annual emissions from the Transportation sector (8.08 million MTCO ₂ e)	N/A	No

1. Severity describes the density at which the impact may occur. Levels used are low, medium, high.
2. Extent describes the land area over which the impact may occur. Levels used are small, medium, and large.
3. Duration describes the time period over which the impact may occur. Descriptors used are discrete time increments (day, month, year, and season).
4. Frequency describes how often the impact may occur.
5. Probability describes how likely it is that the impact may occur without mitigation. Levels used are: impossible, unlikely, possible, probable, certain

PREPARATION

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A black rectangular box containing a white handwritten signature that reads "Millie Olsen".

Signature

Millie Olsen, Hard Rock Mining Acting Section Supervisor
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4/29/2024

Date

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