DEQ
Montana Department of Environmental Quality

Air, Energy & Mining Division

GOLDEN SUNLIGHT MINES INC.

HARD ROCK MINING OPERATING PERMIT #00065

GOLDEN SUNLIGHT MINE

WHITEHALL, MT

April 2, 2025
Environmental Assessment

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PROJECT OVERVIEW

COMPANY NAME: Golden Sunlight Mines Inc.
EA DATE: April 2, 2025
PROJECT: Golden Sunlight Mine- Replacement Dewatering Well
PERMIT/LICENSE: OP#00065
AMENDMENT #: Minor Amendment 018 (AMD 018)

Location

Lat/Long: 45.904220, -112.018736 County: Jefferson

PROPERTY OWNERSHIP: FEDERAL ☒ STATE ☐ PRIVATE ☒

Note: The dewatering well location would be entirely on private land, but other portions of the permit area and permitted activities occur on federal land administered by the Bureau of Land Management (BLM)

The Golden Sunlight Mine is an open-pit and underground gold mine located in Jefferson County, Montana (**Figure-1** and **Figure-2**). The mine is within all or portions of Sections 16, 17, 18, 19, 20, 21, 28, 29, 30, 31, 32, and 33 of Township 2 North, Range 3 West; Sections 4, 5, and 6 in Township 1 North, Range 3 West; and Sections 13, 24, 25, and 36 in Township 2 North, Range 4 West, Montana Meridian. The site is located 5 miles northeast of Whitehall, Montana. The mine has a permitted disturbance area of 3,400 acres within a total permit area of 6,205 acres.

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), Montana Code Annotated (MCA).

Proposed Action

On December 31, 2024, Golden Sunlight Mines, Inc. (GSM) submitted an application for Minor Amendment 018 (AMD 018) to Hard Rock Mining Operating Permit (OP) No. 00065. The AMD 018 Proposed Action would allow GSM to install a replacement dewatering well at a new location and elevation within the Mineral Hill Pit area (South Ramp Well: 16-inch diameter, collar elevation of 5,308 feet[1], intake elevation of 4,815 feet), compared to the existing failed well (South Well: 8-inch diameter well, collar elevation of 4,950 feet, bottom elevation of 4,335 feet and pump elevation of 4,390 feet) (**Figure-3** and **Figure-4**). The South Ramp Well would be located on an existing bench on the southern highwall of the

[1] Unless otherwise stated, all elevations cited in this EA are referenced to the site-specific mine datum established by GSM, which is 91.4 feet above mean sea level datum.

pit, so new ground disturbance would not be required. Under this amendment, GSM would utilize the replacement well to maintain a hydrologic cone-of-depression and thus capture groundwater inflow and tailings pool water that occur in the pit. GSM would continue to dewater at a rate that results in zero outflow and maintains a water elevation below 4,850 feet, modified from the currently approved control elevation of 4,750 feet. This groundwater control elevation would be maintained through the remaining operational period for the Tailings Reprocessing Project (TRP) and the reclamation and post-mining site management time periods. Consistent with the current Consolidated Operations and Reclamation Plan (CORP), long-term water management and water treatment would be performed, as necessary, to prevent impacts to off-site water resources (GSM, 2022).

The AMD 018 application includes updates to the anticipated operations schedule but does not propose changes to the tailings excavation and reprocessing activities or associated facilities. While initially estimated to take 12 years to excavate and reprocess approximately 26.2 million tons (Mt) of tailings, the updated schedule indicates a total timeline of 16 years to complete TRP operations, with tailings deposition ending around 2038. The extended timeline for ongoing TRP operations would be due to current infrastructure and reduced daily production rate, and it would not be a direct result of the Proposed Action. A replacement pit dewatering well is critical for maintaining hydrologic control around the pit and preventing impacts to downgradient water quality, as required in the current permit conditions. As demonstrated in the past 12 months without a functioning South Well, a replacement dewatering well does not preclude the feasibility of TRP operations, but it is required for permit compliance and future protection of downgradient water quality.

The residual tailings being placed within the pit would reach a maximum elevation of 5,083 feet and the tailings mass would consolidate to a final elevation of 5,067 feet within about 26 years after final deposition. This is approximately 106 feet lower than what was approved for the TRP under AMD 017, which anticipated upper and consolidated elevations of 5,191 feet and 5,173 feet, respectively. This would result in a reduced footprint for the tailings surface in the pit bottom to be reclaimed at the end of TRP operations, from approximately 50 acres in AMD 017 to 30 acres in AMD 018. The tailings would have an approximate grade of 1% to the northeast at the end of the reprocessing period, and no permanent pond would occur after the remaining pool infiltrates and evaporates. GSM would plug remaining underground mine portals prior to the tailings or pit water reaching the portal elevation (Portal #3) or at the end of TRP operations (Portal #4). See **Figure-3** and **Figure-4** for the primary components for TRP operations and water management in the pit area.

After tailings consolidation allows safe equipment access, four feet of capping material (comprising two feet of oxidized overburden and limestone and two feet of growth media) sourced from the East Pit Borrow site would be placed over the final tailings surface. This cap would reduce the net infiltration of precipitation and influx of oxygen into tailings material, as well as support the establishment of vegetation. No changes to the use of soil amendments described in the current CORP (GSM, 2022) are proposed, GSM may use organic matter and/or fertilizer to condition growth media to support revegetation, as needed. Reclamation of the pit roads, benches, and highwalls would remain as detailed in the CORP (GSM, 2022).

The Proposed Action would not increase the size of the mine permit boundary (6,205 acres) or the currently approved disturbance boundary (3,400 acres), which are shown in **Figure 1**. All activities would occur on currently disturbed land and would not result in new disturbance. Other aspects of site operations, reclamation, and water management are not being modified by this amendment and activities would proceed as approved through AMD 017 and previous permitting actions.

Purpose and Need

DEQ's purpose and need in conducting this environmental review is to act upon GSM's application to amend OP No. 00065 to conduct mining activities in compliance with the Metal Mine Reclamation Act (MMRA). On March 4, 2025, GSM submitted a complete application to amend OP No. 00065. DEQ would approve AMD 018 if it's determined that GSM has met the criteria set forth in Sections 82-4-337 and 82-4-342, MCA.

GSM's purpose and need in proposing this permit modification is to install a replacement dewatering well at a new location and elevation within the Mineral Hill Pit area, as outlined in the Proposed Action above. The South Well is no longer functioning, following periodic setbacks and operational challenges over the past few years, outlined in bullets below.

- In late 2021 through 2022, several challenges arose during the TRP commissioning process related to the dewatering system and tailings thickening and discharge systems. These issues resulted in the water elevation rising above the bottom of the pit and eventually above the deposited tailings.
- Through 2023, GSM continued to optimize the TRP systems and developed corrective actions which included ongoing lime treatment to maintain a pH of 9 standard units (s.u.) or greater in the pit tailings discharge, and a series of benchmarks to ensure continued containment of the pit groundwater, efforts to create hydrologic separation between the tailings pool water and groundwater, and protection of wildlife (DEQ, 2024). Several system improvements were made to manage the tailings pool pH and hydrologic separation was achieved in December 2023.
- During late 2023 and early 2024, increased volumes of fine sediment derived from tailings discharged to the pit began to enter the South Well. Following the suspension of open pit mining in 2015, GSM conducted underground mining beneath the Mineral Hill Pit until 2019. This left behind an open stope which was subsequently buried by coarse rock raveling from the unstable west highwall of the pit. Tailings discharged into the pit are believed to have entered the underground workings through this deposit of coarse rock debris, eventually reaching and filling the void into which the South Well had been drilled.
- In late February 2024, the South Well succumbed to the increasing sediment buildup and could not be flushed or thinned enough to allow continued pumping.
- On June 27, 2024, GSM provided a summary of the situation and indicated that the South Well could not be rehabilitated, but that plans and designs were being developed for a replacement dewatering well and pumping system.
- DEQ issued a Warning Letter (#WLHRM20240717-00006) on July 31, 2024, for GSM's departure from the conditions of the approved Operations and Reclamation Plans, in violation of Section 82-4-336(2), MCA, and ARM 17.24.117(1). The current permit conditions require that a dewatering system be maintained and operated during operations and for post-mining site management. The Warning Letter included a corrective action to install a replacement system and maintain hydrologic containment around the pit area.

As groundwater and tailings solution continue to fill the pit in the absence of dewatering, the water level has risen from an elevation of 4,592 feet in February 2024 to 4,701 feet in January 2025. Modeling by GSM indicates that the currently permitted groundwater control elevation (4,750 feet) would likely be reached in July 2025 without any interim measures for dewatering. The maximum elevation threshold at which rising pit water would equilibrate with surrounding ambient groundwater and result in outflow is estimated to be approximately 5,008 feet (**Figure-4**). Based on the elevation of the accessible underground workings that would be targeted by the replacement dewatering well, the water level would rise to

approximately 4,820 feet before the intake of the dewatering system (at 4,815 feet) could be utilized. Modeling by GSM indicates that this water elevation would likely be reached in June 2026. Following the installation and commissioning of the replacement dewatering well, GSM would continue to dewater at a rate that results in zero outflow from the pit area, with the water elevation maintained below a maximum elevation of 4,850 feet instead of 4,750 feet.

A replacement dewatering well was approved as a contingency measure for Amendment 017 (AMD 017), which was a continuation of the existing permit requirements to maintain a dewatering system for operations and post-mining site management (GSM, 2014). However, the system was presumed to mimic the existing South Well and any changes to the well location, intake elevation, and water control elevation were not described within the AMD 017 application (GSM, 2021) or the analysis of the Final EIS (DEQ, 2021). For the South Well, it was assumed that the well casing and dewatering system well would be sequentially raised in lifts to stay above the rising surface of deposited tailings. The sequential lifts and casing extensions would not be necessary for the AMD 018 Proposed Action, based on the anticipated location and elevation of the replacement well. DEQ has determined that the proposed changes in AMD 018 constitute modifications to the plans approved through AMD 017 and reflected in the CORP.

GSM also has an approved Plan of Operations with the Bureau of Land Management (BLM) (No. MTM-82855). The changes to operations and reclamation approved for the TRP through AMD 017 occurred largely on private land, with only a small area (1.4 acres) of BLM land that would be covered by a portion of the tailings in the pit after reaching an elevation of 5,060 feet (**Figure-4**). There would be no direct disturbance or activities on other BLM land under the changes proposed for AMD 018. Tailings deposition on BLM land in the pit would occur as previously approved, although the reduced surface area and lower elevation for the final consolidated tailings footprint under AMD 018 would only impact about 0.1 acre of BLM land. BLM's action on the permit amendment application is governed by the mining regulations found in the Code of Federal Regulations (CFR), Title43 Part 3809. The BLM's analysis of the amendment application and determination will be issued separately from this EA.

No Action Alternative

The No Action Alternative forms the baseline from which the impacts of the Proposed Action can be measured. Under the No Action Alternative, the South Ramp Well would not be installed and the currently permitted groundwater control elevation (4,750 feet) would not be modified. The TRP operations would be authorized to continue under the conditions approved through AMD 017. As demonstrated in the past 12 months without a functioning South Well, a replacement dewatering well does not preclude the feasibility of TRP operations, but it is required for permit compliance and future protection of downgradient water quality.

Modeling by GSM indicates that the currently permitted groundwater control elevation (4,750 feet) would likely be reached in July 2025, without any interim measures for dewatering (Barrick, 2025). If water were to reach this elevation under the No Action Alternative, GSM would be in further violation of the permit conditions for OP. No. 00065 and DEQ would issue a violation notice requiring corrective actions. The corrective actions would include the installation of a replacement dewatering system and could also include stipulations for the reduction or cessation of tailings reprocessing and pit deposition until sufficient water management were achieved.

There would be no immediate risk to downgradient water quality under this scenario, as the maximum elevation at which rising pit water would equilibrate with surrounding ambient groundwater and result in

outflow is estimated to be approximately 5,008 feet (**Figure-4**). Current model projections indicate that in the absence of pumping, the pit water level would reach an elevation of 4,850 feet by mid-2026 and an elevation of 5,008 feet by mid-2028. The AMD 017 application included modeling results that indicate potential plume migration away from the pit area would be very slow in the absence of any groundwater pumping (i.e., not reaching the permit boundary about one mile away within 100 years). However, DEQ does not consider this potential impact to be an acceptable alternative to the installation and continued operation of a replacement dewatering.

DEQ would require the installation and operation of a replacement dewatering system prior to the water level reaching the elevation where pit outflow could occur. It is likely that TRP operations would be prematurely suspended or cease entirely under this scenario, whether by GSM voluntarily or as a requirement of DEQ's violation notice. Although not specifically modeled and quantified for this EA, it is assumed that the consolidated tailings surface under this scenario would occur at a lower elevation and smaller footprint than the conditions of the Proposed Action for AMD 018 (30 acres at 5,067 feet). This would correspond to decreased volumes of capping materials and soil required for reclamation, as well as a smaller area for potential terrestrial wildlife habitat in the pit bottom. Employment associated with TRP operations would cease and the reduction in workforce to the level necessary for the reclamation phase (estimated to be 12 individuals in AMD 017) would occur more quickly than anticipated under the Proposed Action for AMD 018 (approximately 2038).

As discussed previously, DEQ issued a Warning Letter (#WLHRM20240717-00006) to GSM for the departure from the requirements of the approved Operations and Reclamation Plans to maintain a pit dewatering system (GSM, 2022). The No Action Alternative would continue GSM's current status of noncompliance with the permit requirements to maintain a dewatering system, with potential for additional noncompliance in the future by exceeding the established groundwater control elevation. Therefore, the No Action Alternative is considered unacceptable and is dismissed from further analysis and consideration for individual resources.

Tier and Incorporate by Reference

DEQ is tiering and incorporating by reference the previously completed EIS conducted in 2021 for baseline information and the project features that would not be changed by AMD 018 (DEQ, 2021). DEQ published the Final EIS on August 27, 2021, and the Record of Decision (ROD) on September 13, 2021. The BLM published a separate Final EA and Decision Record on October 14, 2021, and November 10, 2021 (BLM, 2021a).

Table 1: Summary of Activities Proposed in Application

Summary of Proposed Activities	Major Amendment 017 (AMD 017) - 2021	Minor Amendment 018 (AMD 018)- 2025	Difference Between AMD 017 and AMD 018
General Overview	GSM proposed the Tailings Reprocessing Project (TRP) to excavate and reprocess 26.2 Mt of tailings from TSF-1 to recover a fine gold and sulfur concentrate. Excavated tailings would be mixed with water in a Re-Pulping Plant and the resulting slurry would be pumped uphill to a Flotation Plant within the existing mill. Gold and sulfide minerals would be recovered in the flotation circuit as a concentrate. Reprocessed tailings slurry would be pumped to a thickener plant to increase the solids content of the slurry to 65% solids. Lime would be added to increase the pH of the solids before pumping the thickened slurry to the Mineral Hill Pit for final disposal. Water accumulating on top of the deposited tailings would be pumped back to the mill for use in tailings reprocessing or pumped to TSF-2 for disposal. Groundwater would also be pumped from an 8-inch diameter well (South Well) completed in a sump of the underground workings below the pit bottom, in order to maintain the local groundwater cone of depression at or below the control elevation of 4,750 feet. This water would also be used for tailings reprocessing or disposal in TSF-2. The	TRP operations would be conducted as approved under AMD 017, with no changes to the methods for tailings excavation, conveyance, beneficiation, or waste disposal. Reclamation of the area underlying TSF-1 would not change from the plans approved under AMD 017. Groundwater in the Mineral Hill Pit area would be pumped from a replacement 16-inch well (South Ramp Well) completed in a sump of the underground workings above the pit bottom, in order to maintain the local groundwater cone of depression at or below the control elevation of 4,850 feet. The groundwater pumped from the South Ramp Well would be used for tailings reprocessing or disposal in TSF-2. The removal of the 26.2Mt of tailings material from TSF-1 would take approximately 16 years based on production rates to date. The failed South Well would be plugged and abandoned in accordance with GSM's reclamation plan. Tailings deposition in the Mineral Hill Pit would result in a final consolidated surface elevation of 5,067 feet and 30 acres of capped and vegetated reclaimed tailings surface. Portals would be plugged prior to the tailings or pit water reaching the portal elevation (Portal #3) or at the end of TRP operations (Portal #4).	The South Ramp Well (larger diameter) would be drilled in a different location within the pit and completed at a higher elevation. This well would maintain groundwater at or below a control elevation higher than the level in AMD 017, but still preventing outflow. Additional portal plugging would occur compared to the plans under AMD 017. The final tailings surface in the pit would occur at a lower elevation with a smaller footprint, due to greater than expected tailings migration into the underground workings and updated estimates for tailings mass consolidation and density. This would result in a smaller area to be reclaimed and lesser volumes of capping material would be needed. The extended timeline for ongoing TRP operations would be due to current infrastructure and reduced daily production rate, and it would not be would

	removal of the 26.2Mt of tailings material from TSF-1 would take 12 years, excavating from northeast to southwest. Reclamation of the area underlying TSF-1 would happen concurrently with excavation, returning the area to original pre-mine topography. Tailings deposition in the Mineral Hill Pit would result in a final surface elevation of 5,173 feet and 50 acres of capped and vegetated reclaimed tailings surface. See **Figure-3** and **Figure-4**.		not be a direct result of the Proposed Action.
Disturbance/ Permit Area	**Major Amendment 017 (AMD 017) - 2021**	**Minor Amendment 018 (AMD 018)- 2025**	**Difference Between AMD 017 and AMD 018**
Permit area	6,205 acres total, no new acres	0 acres of new permit area.	No difference.
Total permitted surface disturbance area	3,399 acres, no new acres (currently at 3,400 acres due to other modifications after this amendment)	0 acres of new disturbance.	No difference.
Specific Proposed Activities	**Major Amendment 017 (AMD 017) - 2021**	**Minor Amendment 018 (AMD 018)- 2025**	**Difference Between AMD 017 and AMD 018**
Duration and timing	The TRP would take 12 years to process 26.2 Mt of tailings from TSF-1. Reclamation of the TSF-1 would be completed within two years after tailings removal ceases. Approximately five years of pit tailings consolidation would occur before reclamation could commence, final consolidation would take approximately 26 years.	Drilling the replacement South Ramp Well would take approximately 15 days. The timeline for ongoing TRP operations would be extended to a total of 16 years (approximately 2038), accounting for current infrastructure and reduced daily production rate. This estimate would add approximately four years to the total time anticipated through AMD 017, but the relative timelines estimated for tailings	The timeline for ongoing TRP operations would be extended to a total of 16 years (approximately 2038), but not as a direct result of AMD 018. A replacement dewatering well does not preclude the feasibility of TRP operations, but it is required for permit compliance

		consolidation and completion of reclamation activities would be the same as AMD 017.	and future protection of downgradient water quality.
Equipment	The TRP would utilize conventional excavation, loading, and haulage equipment (i.e., dozers, excavators, front-end loaders, and haul trucks).	Conventional excavation, loading, and haulage equipment would not change for TRP activities. Equipment used for preparing the South Ramp Well drill pad, drilling and constructing the well, plugging the failed South Well, and plugging of mine portals within Mineral Hill Pit would include: - One drill rig and support telehandler - One frontend loader - One excavator - One blade - One dozer - One haul truck - One crane - One water truck - One light vehicle - One welder/generator	Additional equipment would be required for drilling and constructing the replacement dewatering well, in addition to plugging the existing underground mine portals prior to tailings reaching the portal elevations.
Location and analysis area	The Golden Sunlight Mine is located in a rural area in Jefferson County (legal description provided in Location section above). The Golden Sunlight Mine permit area includes land that is privately owned as well as controlled by BLM. All analyzed activities would occur within the existing permit area and permitted disturbance area.	No difference. All analyzed activities would occur within the existing permit area and permitted disturbance area, specifically within the Mineral Hill Pit area.	No difference.
Personnel on-site	As part of TRP operations, the total number of full-time employees would increase from 16 to 35, approximately 10 additional mining contractors would be retained on site (from 40 to 50), and an	The employment levels associated with AMD 017 would be maintained through the extended TRP operations period (total of 16 years), meaning that the anticipated reduction in workforce for the reclamation timeframe would	Employment period for workforce would continue through the extended TRP operations timeline (4 additional years). The extended timeline

	estimated 30 contracted trucking positions would be needed for concentrate haulage. This increase in employment and contracted services would be maintained over the entire project period (approximately 12 years). The number of full-time employees would revert to previous levels (i.e., 16 employees) after TRP completion; employment would then be further reduced to complete the reclamation and water-management activities.	also be delayed by approximately 4 years. A contract drilling crew would be employed for approximately 15 days to drill and construct the proposed South Ramp Well. No other changes to onsite personnel would occur.	for ongoing TRP operations would be due to current infrastructure and reduced daily production rate, and it would not be a direct result of the Proposed Action.
Structures	Structures and facilities related to the TRP would include: - Re-Pulping Plant (new) near TSF-1 - Flotation Plant (new) within the existing mill complex facilities - Pit thickener, support facilities, and tailings discharge pipeline to pit (new) - Pumping system and return water pipeline for pond above pit tailings (new) - South Well for pit dewatering and associated pump(s), pipeline, and infrastructure (existing)	A replacement pit dewatering well would be drilled (South Ramp Well) to replace the failed South Well, with comparable infrastructure. No new structures proposed.	No long-term difference for structures or facilities.
Project water source	The project water source for the TRP would be the Freshwater Pump Shack pulling water from the Freshwater Lagoon in the Jefferson Slough, which also supplies water used for dust suppression, fire control, potable use, and the mill processing circuit. Internal recirculation and use of recycle water throughout the	No new water source proposed. Any recirculation of water from the South Ramp Well would be used in a similar manner as water from the South Well in AMD 017.	No difference for project water sources and recirculation systems.

	TRP would reduce the GSM's reliance on this freshwater source.		
Supplemental lighting	During night activities, work areas would be illuminated with artificial light utilizing light towers located around the Repulping Plant and the Mill Complex, which would be energized by existing grid power.	No new supplemental lighting proposed. Some supplemental lighting may be used by the drilling crew during the estimated 15-day period to drill and complete the South Ramp Well within Mineral Hill Pit.	No difference
Air quality	The air shed classification of the project area is Class II. The DEQ Air Quality Bureau has issued Montana Air Quality Permit (MAQP) #1689-10 and Title V Operating Permit #OP1689-02 for the operations at Golden Sunlight Mine. Dust would be produced by TRP operations due to travel on unpaved roads, excavation, loading, haulage, and other heavy equipment use. A water truck would be used for dust control, sourced from the existing freshwater supply. Possible air emissions would be limited to emissions related to surface equipment. These emissions would come from combustion sources including mobile equipment and generator sets. The permittee would be required to comply with applicable local, county, state, and federal requirements pertaining to air quality.	Potential dust emissions from TRP operations would be the same as under AMD 017, although the estimated timeline is extended by four years. There may be fugitive dust associated with vehicles and equipment required to drill the replacement South Ramp Well within Mineral Hill Pit. Ongoing operations of the replacement well would not affect GSM's existing air quality permit or dust control program.	Prolonged dust and vehicle emissions associated with the extended timeline of ongoing TRP operations for a total of 16 years (approximately 2038) would not be a direct result of AMD 018. A replacement dewatering well does not preclude the feasibility of TRP operations, but it is required for permit compliance and future protection of downgradient water quality. The extended timeline for ongoing TRP operations would be due to current infrastructure and reduced daily production rate, and it would not be a direct result of the Proposed Action.
Water quality	The proposed TRP would excavate and reprocess tailings contained within the unlined TSF-1 to eliminate the continued release of TSF-1 pore water into down-gradient groundwater. Groundwater that	A pit dewatering well (South Ramp Well) would be installed to replace the failed South Well. The South Ramp Well would pump groundwater from a sump located in the underground mine workings above the Pit floor	The local groundwater cone of depression created by the replacement pit dewatering well would be maintained at a modified groundwater control

	has been in contact with tailings contained in TSF-1 is currently intercepted and recovered by an array of pump back wells to prevent downgradient contamination. After flotation reprocessing to reduce the sulfide mineral content, residual tailings would be mixed with lime at the Pit Thickener prior to deposition in the Mineral Hill Pit. The lime would maintain a pH of 9.0 s.u. or higher in the slurry and a pH around 7.6 s.u. within the shallow pond overlying the tailings surface. The lime addition would partially neutralize acidity generated by the oxidation of mineralized surfaces on pit walls and underground workings. The pit dewatering well (South Well) would pump groundwater from a sump located in the underground mine workings below the pit floor, maintaining a local groundwater cone of depression at or below a control elevation of 4,750 feet. This would ensure meteoric water falling within the pit, acidity from the oxidation of exposed mineralization, and process solution from deposited tailings would be captured. Water collected by the South Well would be discharged to TSF-2 via pipeline and allowed to evaporate. A water treatment plant would be constructed in the future to provide long-term treatment of water collected from the TSF-1 pumpback well system, TSF-2	(intake at 4,815 feet) to maintain a local groundwater cone of depression at or below a groundwater control elevation of 4,850 feet. This would ensure meteoric water falling within the pit, acidity from the oxidation of exposed mineralization, and process solution from deposited tailings are captured. Water collected by the South Well would be discharged to TSF-2 using a slightly modified pipeline route for disposal. No other activities that would influence water quality are proposed.	elevation (4,850 feet). This would be 100 feet higher than the elevation proposed in AMD 017 (4,750 feet), but still below the upper equilibrium elevation for ambient groundwater (5,008 feet). This would prevent groundwater outflow from the pit area and potential downgradient contamination. Additional ongoing monitoring would continue, while further contingency measures are proposed to ensure that the pit water level would be managed below the upper control elevation of 4,850 feet.

	underdrain collection system, pit dewatering, and water from the waste rock dump capture system.		
Erosion control and sediment transport	Mining TSF-1 would expose areas to direct precipitation, erosion, and runoff. This activity would occur in phases followed by concurrent reclamation to minimize the area of exposed tailings. Temporary lined stormwater ponds would capture and store stormwater within the exposed active excavation panel. This captured stormwater would be used for re-pulping of tailings or routed to TSF-2 for disposal. Minimal erosion and sedimentation would be possible as a result of dust suppression activities. Fresh water would be applied to roadways and stockpiles to reduce the generation of dust from these sources. If water were applied in excess, it may behave similarly to storm water and could cause erosion and sedimentation. The stormwater management features in place on site are constructed with sufficient capacity to contain any excess dust suppression water. The pit tailings surface would be deposited or graded to a final 1% grade at the time of final reclamation. The shallow grade and vegetated final tailings surface would not allow significant erosion to occur. All sediment deposited into the pit	No new erosion or sediment transport sources are proposed. No changes are proposed to TRP operations associated with activities at TSF-1 and the Mill Complex. All activities related to drilling and constructing the South Ramp Well would occur within areas currently managed for runoff controls and within the local groundwater cone of depression maintained around the pit area.	No difference.

	would be contained within the pit eliminating the opportunity for sedimentation.		
Solid waste	The permittee would be required to comply with the applicable local, county, state, and federal requirements pertaining to solid waste. Any solid waste disposal associated with the TRP would comply with existing permit conditions, which allows on-site disposal of non-hazardous waste within rock disposal areas and within the tailings beach of TSF-2.	No proposed changes to current solid waste disposal plans, which would be applicable to any solid wastes associated with drilling a replacement dewatering well.	No difference.
Cultural resources	All land area within the mine permit boundary has been previously surveyed for cultural resources. The proposed TRP would result in no new disturbance areas and would not affect any cultural resources identified in those surveys.	No new disturbance would be proposed, all activities would occur within the existing pit footprint.	No difference.
Hazardous substances	The permittee would be required to comply with the applicable local, county, state, and federal requirements pertaining to hazardous substances.	No new hazardous substance use or disposal would be proposed.	No difference.
Reclamation Plans	Reclamation activities associated with the TRP would involve two primary areas, TSF-1 and the Mineral Hill Pit. The reclamation plans for TSF-1 are detailed within the AMD 017 application and Final EIS. For the reclamation of tailings placed in the pit: at the time of final placement, the tailings surface would reach an elevation of 5,191 feet and eventually consolidate to an elevation of approximately 5,173 feet, leaving an	TSF-1: The Proposed Action would not affect activities at TSF-1, and no changes are proposed to the reclamation plans. Mineral Hill Pit: Consistent with the existing permit conditions, the South Well would be plugged and abandoned in accordance with state regulations, following the installation of the South Ramp Well. At the completion of TRP, the tailings surface would reach an elevation of 5,083 feet and eventually consolidate to an	No difference in the reclamation plans for TSF-1. The tailings in Mineral Hill Pit would have a lower final surface elevation and smaller footprint. The extended timeline for ongoing TRP operations would be due to current infrastructure and reduced daily production rate, and it would not be a direct

	estimated tailings surface area of 50 acres. This tailings surface would be reclaimed by placing four feet of capping material (upper two feet would be growth media) and seeding with an approved seed mix. The upper portions of the pit highwalls would remain unchanged and follow the currently approved reclamation plan.	elevation of approximately 5,067 feet, leaving an estimated tailings surface area of 30 acres. This would result in a small area to be reclaimed and lesser volumes of capping material would be needed, but the reclamation method would not change (four feet of capping material and growth media, revegetation).	result of the Proposed Action. This would add approximately four years to the total time anticipated for completion of reclamation of facilities. The reclamation of TSF-1 would still occur concurrently with the excavation of tailings. Reclamation of pit tailings would still rely on sufficient consolidation for safe equipment access prior to placement of capping material and revegetation.
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. The surrounding land use has historically been livestock grazing and recreation.		
Past actions	Mineral prospecting and small-scale mining began in the region in the late 19th century. OP No. 00065 was issued in 1975, resulting in decades of mining and milling activities, along with on-site disposal of waste rock and tailings. The Final EIS for AMD 017 provides a comprehensive summary of conditions and permit modifications over the site's history. Open pit mining ceased in 2015 and underground mining, which occurred in multiple phases since 2011, ceased in 2019. Reclamation has occurred concurrently around the site, while the reprocessing of tailings in TSF-1 was authorized through AMD 017 in 2021. The South Well was utilized to maintain a local groundwater cone of depression in the pit area until it became inoperable in early 2024.		
Present actions	Continued reprocessing of the tailings contained within (TSF-1) and maintaining the local groundwater cone of depression around the Mineral Hill Pit area at or below the control elevation of 4,750 feet.		
Related future actions	Continued reprocessing of the tailings contained within (TSF-1) and maintaining the local groundwater cone of depression around the Mineral Hill Pit area at or below the new control elevation of 4,850 feet. Like the conditions under AMD 017, reclamation of disturbed areas and facilities would occur concurrently or be completed at the cessation of TRP operations. Post-mining site management, water collection, and water treatment would continue after the completion of reclamation in accordance with the current permit conditions (GSM, 2022).		

Figure 1: General Location Map

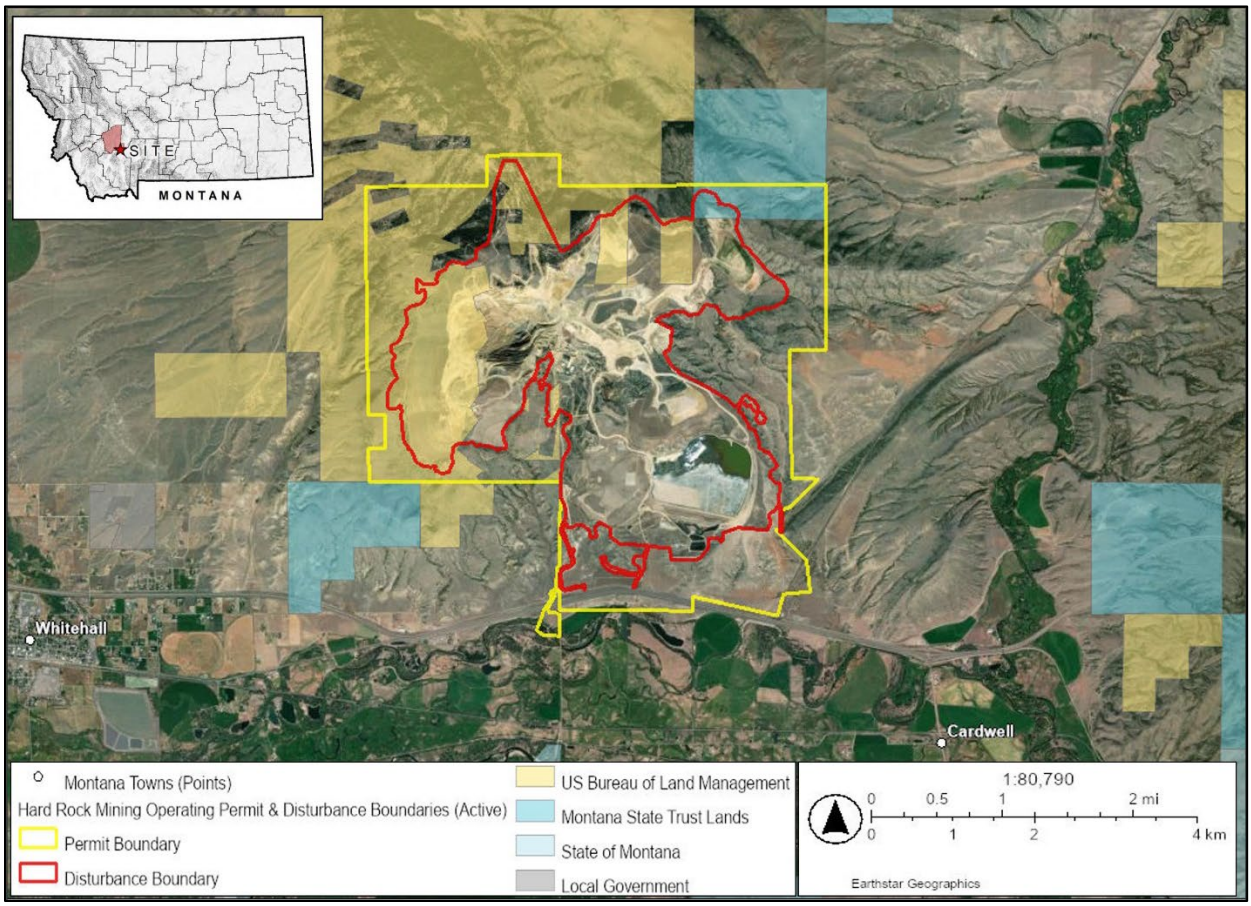


Figure 2: Site Boundaries and Primary Features

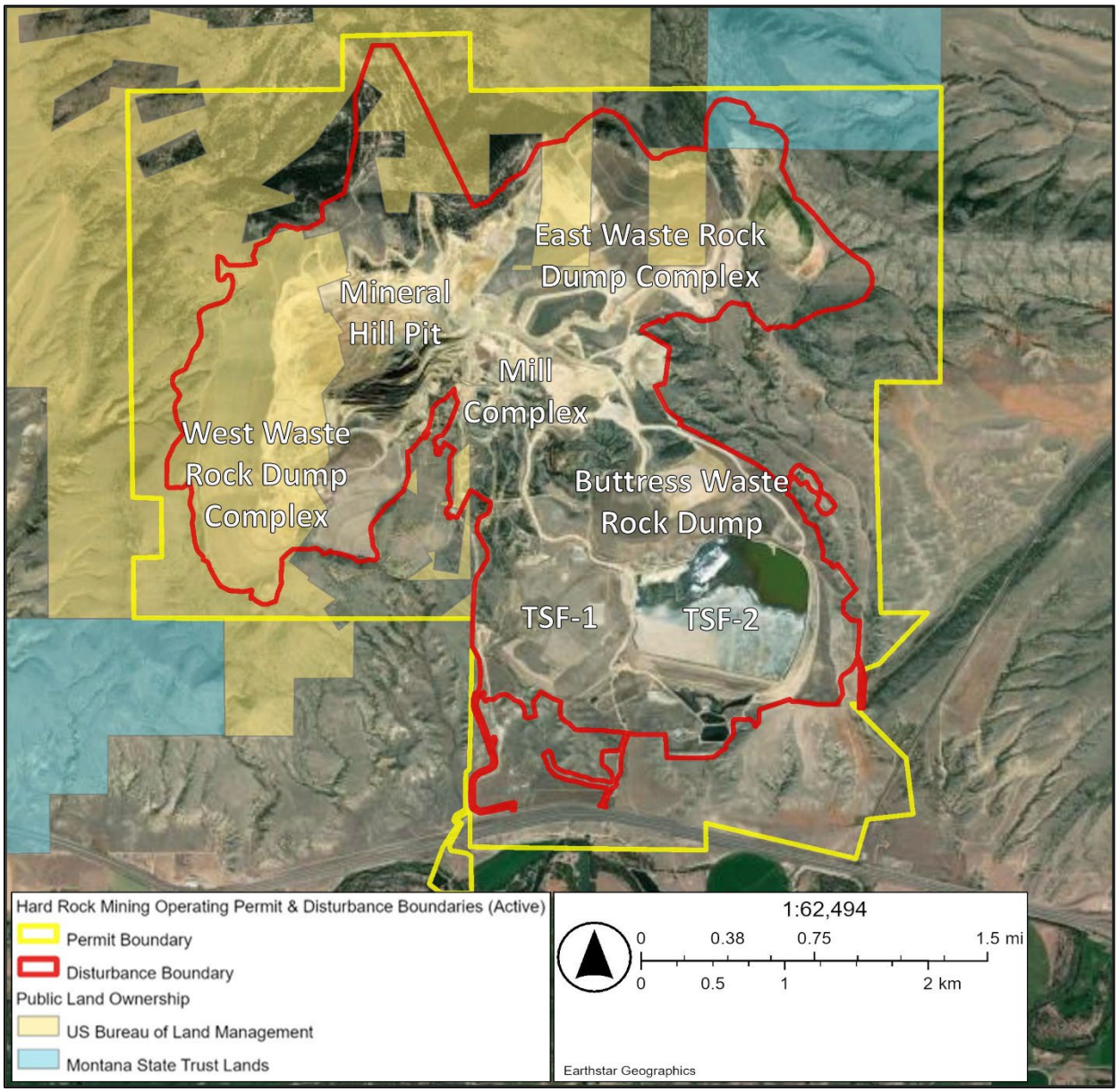
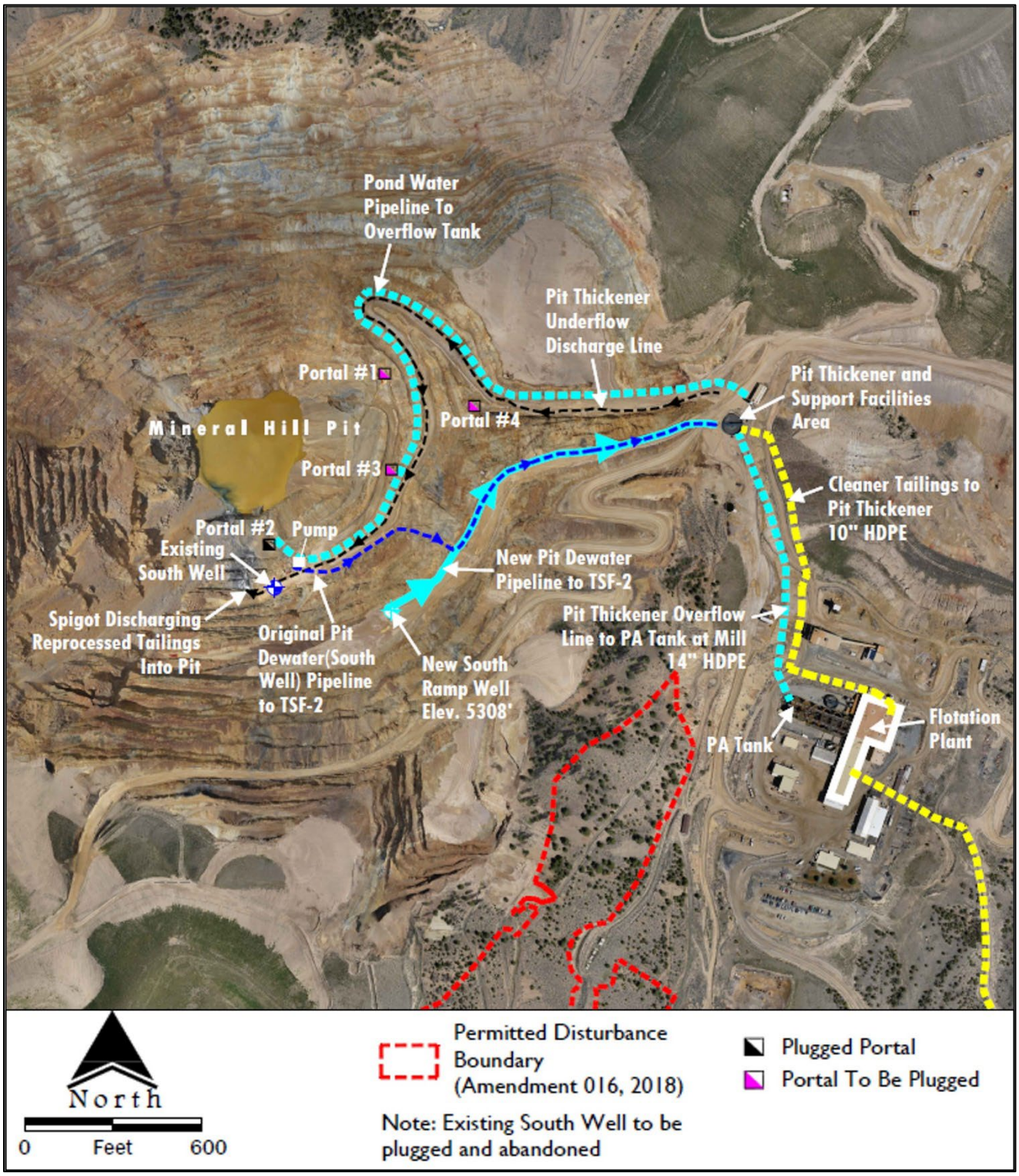
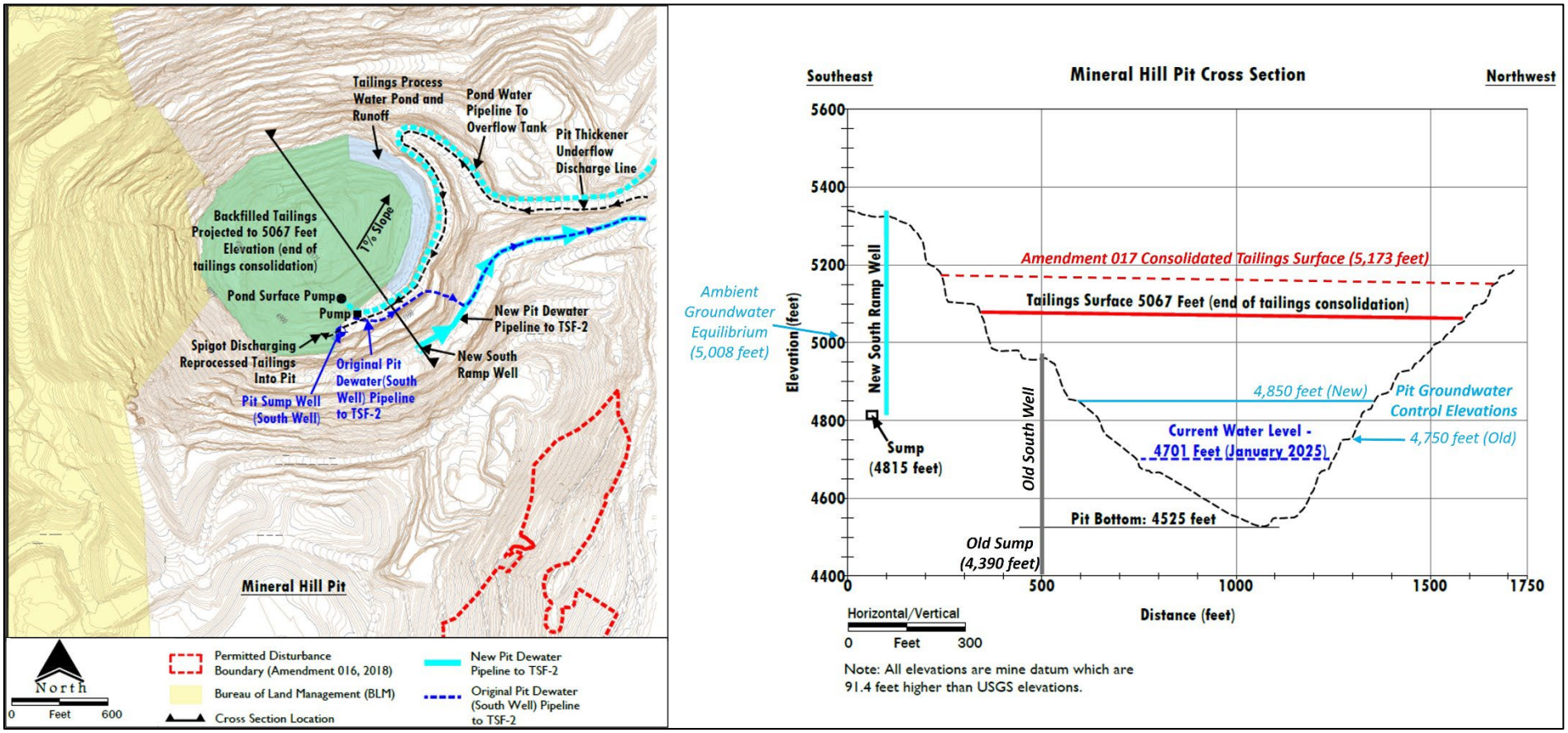


Figure 3: Dewatering System, Water and Tailings Pipelines, and Processing Facilities



Modified from AMD 018 Application (Barrick, 2025)

Figure 4: Aerial View of Consolidated Tailings Surface and Cross Section of Mineral Hill Pit



Modified from AMD 018 Application (Barrick, 2025)

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. The significance assessments for each resource topic described below are presented in **Table 2.**

1. Geology, Geochemistry, Soil Quality, and Stability

The Proposed Action for AMD 018 is located entirely within the permitted disturbance area of Golden Sunlight Mine as previously authorized under OP No. 00065. A temporary drilling contractor (three people) would be employed for approximately 15 days to drill and complete the proposed South Ramp Well, and there would be no new disturbance associated with the installation or operation of the replacement dewatering well. There would be no changes to the areas susceptible to potential erosion or to the methods that would be employed to limit erosion. The site geology, geochemistry, geotechnical stability, and soil characteristics have been described in several publications and maps, as summarized in the AMD 017 application (GSM, 2021), and previous amendment applications and related environmental review documents.

Geology

The Final EIS from 1998 (DEQ and BLM, 1998) includes a detailed discussion on the regional and local geology of the mine site as well as the geotechnical aspects of earth block movement. The Mineral Hill Pit (pit) covers a total area of 258 acres (plan view) and surface mining operations within the pit were suspended in November 2015, while underground mining beneath the pit area was suspended in April 2019.

In addition to evaluation of potential impacts related to TRP operations, the Final EIS for AMD 017 provides a summary of background information regarding the geologic, geochemical, and geotechnical aspects of the TSF-1 and Mineral Hill Pit areas. The ore body and surrounding mineralized zones at the Golden Sunlight Mine can produce acidity or “acid rock drainage” (ARD) naturally, due to the oxidation of sulfide minerals, predominantly pyrite (FeS_2). Mining of this area has exposed mineralized surfaces in the pit highwalls and underground workings, which contribute to the acidity of runoff and groundwater within Mineral Hill Pit (Schafer Limited LLC, 2020a).

The Proposed Action for AMD 018 would include drilling a replacement dewatering well in the pit area to manage groundwater and process solution during TRP operations, but would not include further mining or geologic disturbance beyond the scope of activities approved in AMD 017.

Soil Resources

The soil resources at the site and details about reclamation objectives are described in the Final EIS for AMD 017 (DEQ, 2021), supplemented by background information in the Final EIS from 1998 (DEQ and BLM, 1998) and Final EIS from 2013 (DEQ, 2013). Final reclamation at the Golden Sunlight Mine would return the reclaimed areas to similar utility, vegetative cover, and stability as compared to adjacent undisturbed lands. The Proposed Action for AMD 018 does not include changes to the TRP operations approved in AMD 017, which addressed the soil resources salvaged from TSF-1 and the soil resources utilized for reclamation of TSF-1 or the tailings in Mineral Hill Pit.

Reclamation of the consolidated tailings surface within the pit would include four feet of capping material (two feet of oxidized overburden and limestone and two feet of growth media) sourced from the East Pit Borrow site. This corresponds to 96,800 yd^3 for each layer of capping material for a 30-acre footprint, which is a reduction from the volumes necessary for reclamation of 50 acres under AMD 017.

This cap would reduce the net infiltration of precipitation and influx of oxygen into tailings material, as well as support the establishment of vegetation. Consistent with the approved closure plan, no permanent pond would remain in the Mineral Hill Pit after completion of drain-down of process solutions to the underground mine workings and collection system and establishment of a vegetation cover. No changes to the use of soil amendments described in the current CORP (GSM, 2022) are proposed; GSM may use organic matter and/or fertilizer to condition growth media to support revegetation, as needed. Current requirements for reclamation of other features at the site, including pit roads, benches, and highwalls, would remain as detailed in the CORP (GSM, 2022).

Geotechnical Stability

The Final EIS for AMD 017 evaluated geotechnical aspects of tailings placement in Mineral Hill Pit, in addition to the removal of tailings from TSF-1 and the potential influence on earth block movement in the central portion of the site and the common embankment between TSF-1 and TSF-2. The Proposed Action for AMD 018 does not include any changes to the TRP operations that require additional consideration for the TSF-1 area or upgradient earth blocks. Sitewide geotechnical and ground movement monitoring programs would continue as required in the current permit conditions.

Under AMD 018, the tailings surface within the pit would rise in conjunction with the overlying water level over the course of TRP operations. Groundwater would contribute to this water level until the South Ramp Well (at 4,815 feet) would be capable of dewatering and creating hydrologic separation between the rising tailings process solution pond (up to 5,083 feet) and underlying groundwater. The rising water level prior to dewatering would not result in geotechnical instability within the pit. Any groundwater below an elevation of 4,950 feet would occur in the more competent breccia units, and any driving forces that may form in the highwall would reach equilibrium with the deposited tailings. Similar to the conditions evaluated for AMD 017, long-term highwall stability would be improved with the deposition of tailings in the Mineral Hill Pit under AMD 018. Analyses have shown that placement of reprocessed tailings would incrementally provide confinement in the lower slope of the west highwall (breccia) and provide buttressing to slopes in sedimentary rock once it reaches an elevation of 4,950 feet (Subterra LLC, 2020). The elevation range from 4,925 to 4,950 feet represents the contact between breccia and sedimentary

units. The tailings mass would function as a buttress that provides stability to the pit highwalls during and after the TRP operations.

Tailings Reprocessing and Deposition

While initially estimated to take 12 years to excavate and reprocess approximately 26.2 Mt of tailings, the AMD 018 application (Barrick, 2025) includes an updated schedule that indicates a total of 16 years to complete TRP operations, with tailings deposition ending around 2038. The extended timeline for ongoing TRP operations would be due to current infrastructure and reduced daily production rate, and it would not be a direct result of the Proposed Action.

As part of continued TRP operations under the conditions of AMD 017, thickened tailings would continue to be conveyed via pipeline to a spigot system located in the Mineral Hill Pit (**Figure-3**). Spigot operations would be managed to distribute tailings into the pit from one or more discharge points along the south side of the pit, which would eventually direct formation of a pond comprised of process solution on top of the tailings, to the eastern portion of the pit surface. As explained in the "Purpose and Need" section, fine sediment from tailings deposition likely entered the underground workings through a stope in the pit bottom near an elevation of 4,520 feet and flowed downward into the drift where the South Well is located (4,390 feet, 130 feet in elevation below the open stope). The proposed South Ramp Well would be drilled into a sump in the underground workings at an elevation of 4,815 feet, above the open stope that would allow ingress of tailings. This would help to reduce the potential for similar tailings ingress issues at the new well and the larger diameter of the South Ramp Well (16 inches) would allow the use of slurry pumps if necessary to handle potential sediment loads. As clarified by the AMD 018 application, GSM would plug remaining underground mine portals prior to the tailings or pit water reaching the portal elevation (Portal #3) or at the end of TRP operations (Portal #4). As described in "Water Quality, Quantity, and Distribution" section, other contingency actions are proposed to limit downtime from interrupted pumping operations and ensure that the groundwater control elevation (4,850 feet) can be maintained through TRP operations.

The AMD 018 application (Barrick, 2025) also provides updated modeling projections for the residual tailings placed within the pit, but the changes in anticipated tailings elevations are not a direct result of the Proposed Action. The revised projections are based on estimates for tailings infiltration to the underground workings (approximately 30% of total volume) and updated estimates for the consolidation and density of the tailings mass. The pit tailings backfill would reach a maximum elevation of 5,083 feet at the end of the estimated 16-year reprocessing period (completed in approximately 2038). The tailings mass would consolidate to a final elevation of 5,067 feet within about 26 years after final deposition, although sufficient consolidation to allow safe access to conduct reclamation would occur within approximately five years after final deposition. This is approximately 106 feet lower than what was approved for the TRP under AMD 017, which anticipated upper and consolidated elevations of 5,191 feet and 5,173 feet, respectively, but the associated consolidation timeframes would be similar.

The Proposed Action would result in a reduced footprint for the tailings surface to be reclaimed at the end of TRP operations, from approximately 50 acres in AMD 017 to 30 acres in AMD 018. The tailings would have an approximate grade of 1% to the northeast at the end of the reprocessing period, and no permanent pond would occur after the remaining pool infiltrates and evaporates (**Figure-4**). The area of land administered by the BLM that would be impacted by tailings placement under the projection in AMD 018 (0.1 acre) is less than the area previously

analyzed (1.4 acres). Consolidation modeling would be periodically updated and calibrated over the life of the TRP as additional data and information become available to refine these estimates, as necessary.

Tailings Geochemistry

The Final EIS for AMD 017 provides a summary of tailings geochemistry and the anticipated beneficial long-term impacts from TRP operations on water quality downgradient of TSF-1 and groundwater in the Mineral Hill Pit area. By removing the sulfide-bearing tailings from TSF-1, the potential for long-term pyrite oxidation and associated acid formation would be removed, as well as other contaminants that might be mobilized from the tailings and degrade downgradient water quality. The TRP operations and flotation reprocessing were anticipated to reduce total sulfide content of the tailings in TSF-1 from an average of 4% to a proposed design criterion of ≤0.5% for the residual tailings disposed in the pit. As noted in the Purpose and Need section, challenges during the TRP commissioning process and ongoing infrastructure limitations have affected the total production rate for TRP operations, the effectiveness of sulfide removal, and the management of water in the pit area.

Based on quarterly monitoring data provided by GSM from July 2022 through December 2024, the monthly total sulfur concentrations in the residual tailings have ranged from 0.7% to 2.4%, with an average of 1.3%. These total sulfur results from the on-site assay laboratory do not differentiate between sulfide or other sulfur species, but additional analyses at third-party laboratories confirm that the total sulfide fraction is not meeting the design criterion from AMD 017. As required for AMD 017, the Tailings Sampling and Analysis Plan (TSAP) states that lime treatment of the pit tailings may be necessary if the pit pool pH level falls below target levels. GSM committed to monitor the pH of the ponded water on top of the pit tailings surface and to add lime as needed to keep pond's pH at approximately 7.6 s.u. for re-use in the reprocessing circuit. During tailings placement, lime would be added to the tailings underflow from the thickener to keep the tailings slurry pH around 9.0 s.u., to offset the expected decline in pH in the ponded water due to accumulated salts on the pit bottom and highwalls.

With the exception of one monthly average (pH 8.8 in February 2023), GSM has consistently complied with the TSAP requirement to add lime to the tailings slurry discharge, with an average pH of 9.2 s.u. since January 2023. However, the design criterion for total sulfide (≤0.5%) has not yet been attained and the pit pond pH did not exceed 7.0 s.u. until September 2024. The average monthly pH values observed from October to December 2024 ranged from 7.2 to 8.1 s.u., in compliance with the AMD 017 target.

DEQ issued a Warning Letter (#WLHRM20240717-00006) on July 31, 2024, for GSM's departure from the conditions of the approved Operations and Reclamation Plans, in violation of Section 82-4-336(2), MCA, and ARM 17.24.117(1). The Warning Letter included a corrective action to install a replacement dewatering system and maintain hydrologic containment around the pit area, which would likely be necessary to facilitate pH management of the pit tailings pond during TRP operations. DEQ suggested that GSM alternatively could submit a permit modification for the stated criteria for tailings sulfide content and/or pond water quality and any necessary contingencies, while ensuring these metrics and resulting site conditions are protective of downstream water quality and potential wildlife exposure.

For AMD 018, GSM has not proposed changes to the total sulfide target in the residual tailings or the target pH for the pit tailings pond. GSM would continue to add lime to the thickener outflow so that the deposited tailings have a monthly average pH of 9.0 s.u. or greater. GSM would also retain the current commitment to monitor the pH of the pit tailings pond and add lime as needed to keep pH at approximately 7.6 s.u. Based on established incremental performance benchmarks (DEQ, 2024), GSM has committed to conduct further studies and evaluate the differences between analytical laboratories and methods. Studies have been initiated to further evaluate the geochemical properties and sulfide content of residual tailings and the water quality objectives for the process solution pond (GSM, 2025). Based on the results of these ongoing studies, GSM may prepare a separate permit modification in the future to revise the target tailings sulfide content and pond water quality targets, but no changes are proposed under AMD 018. Such a modification request would require information sufficient to demonstrate that proposed metrics would be protective of downstream water quality and potential wildlife exposure, based on geochemical test work and supporting studies (GSM, 2024).

Direct Impacts:

The Proposed Action for AMD 018 would be limited to drilling a well in the Mineral Hill Pit area on an existing bench and access road, and it would not directly impact TSF-1 or the Mill Complex. The proposed activities would not directly impact the soil resources or the geologic, geochemical, or geotechnical aspects of TRP operations as approved through AMD 017. No new production of ore or reprocessed materials would occur beyond what is currently approved.

Secondary Impacts:

The estimated timeline for TRP operations is clarified in the AMD 018 application and extended by an additional four years to approximately 2038. However, continued tailings reprocessing and extending the timeframes for concurrently reclaiming TSF-1 and reclaiming the pit tailings surface are not a direct result of the Proposed Action. The application for AMD 018 (Barrick, 2025) also provides updated modeling projections for the residual tailings placed within the pit, but the changes in anticipated tailings elevations are not a direct result of the Proposed Action.

The tailings mass would still provide buttressing support for pit highwalls and improve geotechnical stability after placement above 4,950 feet, as anticipated in the Final EIS for AMD 017. There would be no secondary impacts to geotechnical stability from the Proposed Action. The decrease in elevation for final tailings deposition (5,083 feet) and consolidated surface (5,067 feet) would result in a smaller footprint for final reclamation of the pit bottom. The reclamation methods that would be completed for the final tailings mass under the AMD 018 conditions (30 acres) would be the same as AMD 017 (50 acres), although a secondary impact would be the proportional decrease in the required volumes of capping material and soil.

Under ongoing TRP operations, lime-amended process water within the pit area would provide a source of acid-buffering that was not present prior to tailings reprocessing, which would help to flush and mitigate stored acidity and metals on the pit wall surfaces. After tailings placement, the primary sources of potential acid generation and metal loading would be the reaction products that remain in the weathered highwall zones and minor loading from underground. Pit walls would be covered by the low-permeability tailings, which would reduce oxygen ingress and considerably mitigate acidity and metals production at the Pit wall surface. Consolidation of tailings over time

would reduce downward water infiltration and, therefore, reduce acidity and metals from being transported to the subsurface.

Under the conditions described above, the reduced-sulfide tailings would likely improve the chemical quality of water pumped from the dewatering well. However, the residual tailings disposed in the pit to date have a higher sulfide fraction than what was projected for AMD 017 (≤0.5%) and this may continue for future TRP operations in the absence of further process optimization. This would slightly increase the acid-generating potential of the tailings. If tailings porewater alkalinity and the residual neutralization potential (lime) within the disposed tailings were to be consumed by neutralizing surface acidity stored in the pit wall materials or pit groundwater, then the reprocessed tailings may become net acid-generating over time. The impacts from this would likely be minimal in comparison to current water quality because disposed tailings are expected to settle quickly and become a barrier to downward oxygen ingress, limiting the long-term acid generating potential of the bulk of the tailings mass. Simulations provided with AMD 017 indicate that any groundwater quality effects from the tailings would be confined to the immediate vicinity of the pit. The model results do not indicate that surrounding groundwater quality would be affected by long-term dewatering, because all groundwater flowing to the pit or tailings would be captured with zero outflow to the ambient groundwater system.

Cumulative Impacts:

No new cumulative impacts to soil resources or the geologic, geochemical, or geotechnical aspects of TRP operations would be expected from the Proposed Action for AMD 018. The activities are consistent with the site's operational history and the long-term site management activities that have been approved and evaluated for cumulative impacts under previous EIS reviews (DEQ and BLM, 1998; DEQ, 2013, DEQ, 2021).

2. Water Quality, Quantity, and Distribution

The Proposed Action for AMD 018 is located entirely within the permitted disturbance area of Golden Sunlight Mine as previously authorized under OP No. 00065. A temporary drilling contractor (three people) would be employed for approximately 15 days to drill and complete the proposed South Ramp Well, and there would be no new disturbance associated with the installation or operation of the replacement dewatering well. The site surface water and groundwater characteristics have been described in several publications and maps, as summarized in the AMD 017 application for the TRP (GSM, 2021), and previous amendment applications and related environmental review documents (DEQ, 2021; BLM, 2021a; DEQ, 2013; DEQ and BLM, 1998). The Final EIS for AMD 017 describes the impacts from TRP operations on water quality and quantity near TSF-1 and Mineral Hill Pit. The Proposed Action for AMD 018 does not include changes to excavation, concurrent reclamation, or water management activities around TSF-1.

Surface water

Riverine surface water features near the Golden Sunlight Mine consist of the Jefferson River, Boulder River, and Whitetail Creek. Jefferson Slough contains surface water but is generally fed by groundwater in the floodplain of the Jefferson River except during high flows. Surface water quality monitoring is ongoing for the Jefferson Slough. Water quality in the Jefferson Slough is monitored by GSM at one site upgradient and two sites downgradient of the mine. Water quality is not significantly impacted in the Jefferson Slough from the mine.

The primary fresh water source for the TRP is the existing Freshwater Lagoon in the Jefferson Slough. This source supplies GSM with water for dust suppression, fire control, potable use, and the mill processing circuit. As anticipated in the Final EIS, the internal recirculation and use of recycle water through the first few years of TRP operations has reduced, although not entirely eliminated, GSM's reliance on water sourced from the Freshwater Lagoon.

Surface water resources in the mine area include ephemeral stream channels, seeps, and springs. The mine area contains springs and seeps that are generally associated with geologic contacts, topographical depressions, bedrock fractures, and collapsed adits. These springs and seeps generally flow at less than 1 gallon per minute (gpm). The Proposed Action for AMD 018 does not include expanding the permitted disturbance area, as an existing bench and access road within the Mineral Hill Pit would be utilized to install and operate a replacement dewatering well.

Surface water resources are monitored as part of GSM's current monitoring program (GSM, 2022). GSM also holds a Multi-Sector General Permit for Storm Water Discharges Associated with Industrial Activity (Permit No. MTR00498), which is regulated by the DEQ Water Protection Bureau. Outfall locations are sampled and inspections conducted per requirements of that permit and the approved Storm Water Pollution Prevention Plan.

The installation and operation of a replacement dewatering well is not anticipated to alter surface water discharges from the site; therefore, modifications to GSM's existing stormwater permit are not required. The Proposed Action does require a surface water-management strategy to remain in compliance with existing permits, primarily in managing storm water under the Storm Water Pollution Prevent Plan under Multi-Sector General Permit Number MTR00498.

Groundwater

Groundwater occurs in limited quantities in the bedrock and mineralized zones at the mine, within fractures and faults in the otherwise solid rock, and within sedimentary deposits flanking the Bull Mountains. Groundwater flow direction is generally towards the south, southwest, and southeast toward the Jefferson Slough. The ore body and surrounding mineralized zones at the Golden Sunlight Mine can produce acidity or "acid rock drainage" (ARD) naturally, due to the oxidation of sulfide minerals, predominantly pyrite (FeS_2). Mining of this area has exposed mineralized surfaces in the pit highwalls and underground workings, which contribute to the acidity of runoff and groundwater within Mineral Hill Pit (Schafer Limited LLC, 2020a). Previous permit amendments for operational expansions and associated environmental reviews have resulted in requirements for GSM to dewater the pit and maintain a local groundwater cone of depression around the pit area. This precludes contamination of downgradient resources and prevents the formation of a permanent pit lake upon site closure (DEQ, 2013; DEQ, 2021).

Under the TRP operations approved in AMD 017, tailings in TSF-1 are recovered via conventional loading and hauling equipment and then converted to a slurry to facilitate flotation reprocessing in the existing Mill Complex. The residual tailings are thickened, amended with lime, and pumped as a slurry to a spigot system located within the Mineral Hill Pit. The process solution from the deposited tailings has the potential to contact and mix with the groundwater flowing into the underground workings and lower portion of the pit. Operation of the South Well prevented impacts to downgradient groundwater and water removed from the pit was routinely monitored and discharged to TSF-2 after any necessary pH adjustment.

As groundwater and tailings solution continue to fill the pit in the absence of dewatering from the South Well, the water level has risen from an elevation of 4,592 feet in February 2024 to 4,701 feet in January 2025. Modeling by GSM indicates that the currently permitted groundwater control elevation (4,750 feet) would likely be reached in July 2025 without any interim measures for dewatering. The maximum elevation threshold at which rising pit water would equilibrate with surrounding ambient groundwater and result in outflow is estimated to be approximately 5,008 feet (**Figure-4**).

Direct Impacts:

No new project water sources or activities that would directly impact surface water quality, quantity, or distribution are expected from the Proposed Action. The water management and mitigation measures proposed in AMD 018 are expected to prevent impacts to groundwater quality outside of the Mineral Hill Pit area. The potential impacts to water quality within the pit from the deposited tailings mass are described in the Final EIS for AMD 017 (DEQ, 2021) and in "Section 1. Geology, Geochemistry, Soil Quality, and Stability."

Under the Proposed Action for AMD 018, the local groundwater cone of depression that has been created over decades of mining would be maintained through pit dewatering via the South Ramp Well. GSM would continue to dewater at a rate that results in zero outflow and would maintain a water elevation below 4,850 feet, modified from the currently approved control elevation of 4,750 feet. There are no potential water users in close proximity to the pit area, but preventing outflow from the pit groundwater system precludes any exposure route for human health to be affected by degraded water quality.

Tailings deposition and water level rise within the Mineral Hill Pit would occur without active dewatering in between the current elevation (pond at 4,701 feet in January 2025) and the proposed pumping elevation for the South Ramp Well (4,820 feet). This expanded pond would last for a short duration until continued tailings deposition raises the settled tailings surface within the pit above 4,820 feet. Lime would continue to be added throughout this period of increased water volume to maintain the pH around 7.6 s.u., thus reducing the contaminant pathway risk to any wildlife that may come in contact with the pond. This period of increased pond volume would only occur within the first few years following the approval of AMD 018.

Once the South Ramp Well becomes operational, the average annual pumping rate from the pit sump during operations is estimated to vary between 200 to 400 gpm during the initial recovery and normal operations period. The groundwater level would be stabilized at an elevation of 4,820 feet in approximately 10 months with a pumping rate of 400 gpm. The pumping rate would be nearly equal to the sum of the tailings slurry discharge into the pit, tailings draindown rate, and groundwater inflow. About 200 million gallons would be pumped in the first year of dewatering, after which rates and volumes would decrease. Once stabilized, pumping would be reduced to approximately 200 gpm for the remainder of TRP operations to maintain a groundwater elevation of 4,820 feet. The pumped water would be routed to the Mill Complex and treated with lime to raise the pH before being pumped to TSF-2, which would also be used for recirculated process water. The capacity in TSF-2 (240 million gallons) is greater than the anticipated pumping volume, with additional volume available (approximately 60 million gallons) due to mechanically forced and natural evaporation of the TSF-2 pond.

As the tailings surface rises above 4,820 feet, the only remaining surface water within the pit during TRP operations would be a much smaller perched pond overlying the tailings (to upper elevation of 5,083 feet). Under this scenario of hydrologic separation, groundwater from the South Ramp Well and the process solution pond overlying the tailings could be recirculated and used in a similar manner as water from the South Well in AMD 017.

To reduce the potential for failure of the South Ramp Well, the Proposed Action includes filling underground mine portals with an engineered waste rock plug to prevent tailings from migrating to the pump intake location. The South Ramp Well would be completed with a 16-inch diameter casing (twice the diameter of the South Well), which would allow the installation of slurry-type pumps that can handle higher water densities, in case there is still sediment entrainment. Other proposed contingencies and management steps include having a second slurry pump readily available, with an anticipated downtime of approximately eight hours for replacing the system. A barge pump could also be deployed on the pit tailings pond if necessary to control the elevation (**Figure-3**), with flow being routed back to the Mill Complex and reprocessing circuit. Should the South Ramp Well casing be compromised, GSM would drill a back-up well in the same general location to reestablish groundwater control. In the case of long-term pump failure or other unforeseen issues with identified contingencies, GSM would reduce tailings deposition rates if the operational water level reached 4,830 feet. Tailings deposition would cease if the operational water level reached 4,844 feet, until pumping could be re-established or contingencies successfully applied.

Secondary Impacts:

The extended timeline for ongoing TRP operations would be due to current infrastructure and reduced daily production rate, and it would not be a direct result of the Proposed Action. As demonstrated in the past 12 months without a functioning South Well, a replacement dewatering well does not preclude the feasibility of TRP operations, but it is required for permit compliance and future protection of downgradient water quality.

The extended timeline for TRP operations means that operational water management for the pit tailings pond, and the eventual disappearance of the pond at completion of tailings deposition, would be extended by approximately four years. Dewatering from the South Ramp Well would maintain groundwater below an elevation of 4,850 feet and convey water to the Mill Complex and TSF-2 through the remaining operational period for the TRP and the reclamation and post-mining site management time periods. Consistent with the current CORP, long-term water management and water treatment would be performed, as necessary, to prevent impacts to off-site water resources (GSM, 2022).

Cumulative Impacts:

No new cumulative impacts to surface water or groundwater resources would be expected from the Proposed Action for AMD 018. Dewatering associated with the Proposed Action would maintain a local groundwater cone of depression under the Mineral Hill Pit area. These activities are consistent with the site's operational history and the long-term water management activities that have been approved and evaluated for cumulative impacts under previous EIS reviews (DEQ and BLM, 1998; DEQ, 2013, DEQ, 2021).

3. Air Quality

The immediate area is classified as unclassifiable/attainment for National Ambient Air Quality Standards (NAAQS) with the National Ambient Air Quality Standards. The Golden Sunlight Mine location is approximately 55 miles due east of the Anaconda Pintler Wilderness and approximately 62 miles due south of the Gates of the Mountains Wilderness Class 1 airsheds. Air emissions associated with TRP (AMD 017) were incorporated into MAQP #1689-10. Possible air emissions associated with the drilling of the South Ramp Well would be limited to emissions related to mobile surface equipment and fugitive dust. These emissions would come from combustion sources including from the drill rig, light trucks and equipment used the access the drill location, heavy machinery used for Portal #3 plugging activities, and fugitive dust generated while drilling. While there may be some short-term fugitive dust associated with vehicles and equipment required to drill the replacement well, the future operation of the South Ramp Well would not affect GSM's existing air quality permit or dust control program. GSM would continue to use water spray and chemical treatment (magnesium chloride) on roads to control fugitive dust.

Direct Impacts:

The Proposed Action would not increase the impacts to air quality appreciably from the current operational impacts. Dust particulate would be produced or become airborne during drilling operations. Mechanized equipment would produce some exhaust fumes. Dust would also be produced while driving on and off site. The operator would be expected to maintain compliance with their Montana Air Quality Permit (MAQP) #1689-10 and Title V Operating Permit #OP1689-02 for the operations at Golden Sunlight Mine and Montana's Air Quality Act regarding the need to take reasonable precautions to control airborne particulate matter. Impacts to air quality would not be significant as a result of the proposed operations.

Secondary Impacts:

As noted elsewhere, the estimated timeline for TRP operations is clarified in the AMD 018 application (extended to approximately 2038). However, continued tailings reprocessing and extending the duration of emissions associated with those activities are not a direct result of the Proposed Action. The potential for fugitive dust emissions and the ongoing implementation of dust control activities would be extended by approximately four years.

Cumulative Impacts:

Cumulative impacts to air quality from the Proposed Action would add to existing impacts from general industrial and recreational activity in the area.

4. Vegetation Cover, Quantity, and Quality

The vegetation resources at the site and details about the reclamation and vegetation objectives are described in the Final EIS for AMD 017 (DEQ, 2021) and supplemented by background information in the Final EIS from 1998 (DEQ and BLM, 1998). The Golden Sunlight Mine lies within the Boulder/Elkhorn Mountains ecological unit (Nesser *et al.*, 1997). This ecological unit consists of mountains that formed in granitic and volcanic bedrock. Much of the area has been glaciated. Elevations in this ecological unit range between 4,500 and 9,400 feet. Mean annual precipitation ranges from 13 to 30 inches with approximately 20% of the precipitation falling as snow. Soil temperature and moisture regimes are described as frigid and typic ustic, respectively. The

primary natural disturbance is fire. Land use is predominantly grazing, timber harvest, mining, and suburban development (Nesser *et al.,* 1997).

The Montana Natural Heritage Program (MTNHP) environmental summary report for the Project area identifies "Quarries, Strip Mines, and Gravel Pits" as the only land-cover type present within the mine permit boundary (MTNHP, 2021a). However, reclaimed areas within the permit boundary more closely resemble land-cover types found immediately adjacent to the mine, including Rocky Mountain Lower Montane, Foothill, and Valley Grassland, Montane Sagebrush Steppe, and Rocky Mountain Montane Douglas-fir Forest and Woodland.

The Mineral Hill Pit covers an area of 258 acres (plan view). Highwalls in the Pit extend from an elevation of 4,525 feet at the pit bottom to 6,240 feet along the northwest highwall. Mining in the Pit and underground workings was suspended in November 2015 and April 2019, respectively (GSM, 2021). Seeding has not occurred in the pit, on benches, or highwalls, and little to no vegetation has been established on these areas. The upper portion of the northwest highwall is lined with coniferous trees, including ponderosa pine (*Pinus ponderosa*) and Douglas-fir (*Pseudotsuga menziesii*).

The AMD 018 Proposed Action would not change the current approved reclamation plan objectives and revegetation goals outlined in AMD 017 and Section 5.0 of the CORP under OP No. 00065 (including soil salvage and replacement; and vegetation and wildlife habitat establishment) (GSM, 2022). The South Ramp Well would be located on areas previously disturbed in Mineral Hill Pit that have not been reclaimed. Major benches with sufficient width to allow machinery access, like the proposed location of the South Ramp Well, may be capped with three feet of soil cover and revegetated. Oxidized benches containing enough fine material from the raveling upper slope would be seeded or planted with trees where safety allows.

Direct Impacts:

No new land disturbance would result from the AMD 018 Proposed Action. All surface disturbance associated with proposed drilling activities would occur on an existing bench and access road within the footprint of Mineral Hill Pit. The associated disturbance may result in limited propagation of noxious weeds. Any surface disturbances would be reclaimed and seeded with an appropriate seed mix. The entire mine area is subject to the 2017 Montana Noxious Weed Management Plan and GSM would continue to implement noxious weed control measures for the Proposed Action area in conjunction with the Jefferson County Weed Control program.

Secondary Impacts:

The estimated timeline for TRP operations is clarified in the AMD 018 application (Barrick, 2025) and extended by an additional four years to approximately 2038. The AMD 018 application also provides updated modeling projections for the residual tailings placed within the pit, but the changes in anticipated tailings elevations are not a direct result of the Proposed Action.

The pit tailings backfill would reach a maximum elevation of 5,083 feet at the end of the estimated 16-year reprocessing period. The tailings mass would consolidate to a final elevation of 5,067 feet within about 26 years after final deposition, which is approximately 106 feet lower than what was approved for the TRP under AMD 017. The Proposed Action would result in a reduced footprint for the tailings surface to be reclaimed at the end of TRP operations, from approximately 50 acres

in AMD 017 to 30 acres in AMD 018. The area of land administered by the BLM that would be impacted by tailings placement under the projection in AMD 018 (0.1 acre) is less than the area previously analyzed (1.4 acres). Consolidation modeling would be periodically updated and calibrated over the life of the TRP as additional data and information become available to refine these estimates, as necessary.

Sufficient consolidation to allow safe access to conduct reclamation would occur within approximately five years after final deposition. The tailings surface would be graded so that water does not accumulate on the reclaimed surface. After grading, reclamation would include the placement of four feet of capping material (two feet of oxidized overburden and limestone and two feet of growth media) sourced from the East Pit Borrow site

This capping layer would reduce the net infiltration of precipitation and influx of oxygen into tailings material as well as support the establishment of vegetation. After placing the capping materials, the reclaimed tailings surface would be seeded as specified in the Reclamation Seed List (for north-facing slopes) within the AMD 017 application (GSM, 2021) and CORP (GSM, 2022). The seed mix would contain a variety of perennial grasses similar to other reclaimed areas of the mine, as well as forbs such as common yarrow (*Achillea millefolium*) and shrubs such as four-wing saltbrush and Wyoming big sagebrush (*Artemisia tridentate spp. Wyomingensis*).

Final reclamation at the Golden Sunlight Mine would return the reclaimed areas to similar utility, vegetative cover, and stability as compared to adjacent undisturbed lands. Current requirements for reclamation of other features at the site, including pit roads, benches, and highwalls, would remain as detailed in the CORP (GSM, 2022). The extended timeline for TRP operations means that reclamation and revegetation of the tailings surface would also be extended by approximately four years. The potentially beneficial long-term impacts to revegetation of the tailings surface area would remain post-mining on the reduced surface footprint.

Cumulative Impacts:

Cumulative impacts to vegetation cover, quantity, and quality from the Proposed Action would add to existing impacts from recreational use in the area.

5. Terrestrial, Avian, and Aquatic Life and Habitats

Information regarding wildlife within the AMD 018 Proposed Action area does not differ significantly than the description presented in the Final EIS for AMD 017. According to the Final EIS, 65 mammal species, 218 bird species, 7 reptile species, 5 amphibian species, and 16 fish species are known to occur in Jefferson County (MTNHP, 2021a). Species likely to occupy the mine permit area are those associated with grassland, sagebrush steppe, cliff, and coniferous forest habitats. Due to the activities proposed in AMD 018 and the lack of connectivity of the temporary tailings process pond in Mineral Hill Pit to any nearby surface waters, amphibians and fish are not discussed further because aquatic habitat would not be impacted by the Proposed Action. The focus of potential impacts review is on birdlife, due to the inherent depth to water within the Mineral Hill Pit that limits access for terrestrial fauna and the lack of connectivity to water sources that that might be utilized by aquatic life.

Through the addition of lime to the thickened tailings being deposited into the pit, GSM has increased and maintained the pH of the pit tailings pond from 7.2 to 8.1 s.u. (October to December

2024). Maintaining this alkalinity in the pond reduces the mobility and availability of metals and other contaminants that might be detrimental to wildlife, thus mitigating concerns of wildlife contact with the pond before it eventually disappears at the conclusion of TRP operations. The consolidated tailings surface would then be reclaimed and revegetated, which could potentially serve as habitat for terrestrial fauna.

Mammals

Mammal species observed on or near the mine property during previous surveys include big game such as mule deer (*Odocoileus hermionus*), elk (*Cervus elaphus*), and moose (*Alces alces*); carnivores such as black bear (*Ursus americanus*), mountain lion (*Puma concolor*), and coyote (*Canis latrans*); small mammals including mountain cottontail (*Sylvilagus nuttallii*); and several species of bats (Garcia and Associates, 2014). Mine personnel report regular sightings of mule deer and elk at the site, which often use previously reclaimed areas such as the East Buttress Dump Extension and the West and East Waste Rock Dump complexes. Other mammal species with the potential to occur on site include meadow vole (*Microtus pennsylvanicus*), pronghorn (*Antilocarpa americana*), and Richardson's ground squirrel (*Urocitellus richardsonii*) (MTNHP, 2021a).

The area of the mine that would be affected by AMD 018 is an existing bench and access road within the Mineral Hill Pit. The pit covers an area of 258 acres, with highwalls that extend from an elevation of 4,525 feet at the bottom to 6,240 feet along the northwest highwall. The pit has not been seeded and little to no vegetation has been established. This lack of vegetation and the steepness of the highwalls surrounding the pit provide limited habitat and make access to the temporary pit tailings pond difficult for terrestrial mammals. Suitable bat-roosting habitat occurs within crevices and holes found in the Pit highwalls, although no acoustic or night video surveys have been conducted to determine if bats are using this habitat (NewFields, 2019).

Birds

Previous wildlife studies documented 26 species of birds that occur on or near the mine property (Garcia and Associates, 2014). Common bird species that are likely to occur within and above the Mineral Hill Pit include the Townsend's Solitaire (*Myadestes towsendi*), Dark-eyed Junco (*Junco hyemalis*), Orange-crowned Warbler (*Leiothlypis celata),* Chipping Sparrow (*Spizella passerine*), Mountain Bluebird (*Sialia currucoides*), Violet-green Swallow (*Tachycineta Thalassina*), and the Rock Wren (*Salpinctes Obsoletus*) (GSI Environmetal, 2024).

NewFields (2015) found that the highwalls of the pit provide suitable nesting and foraging habitat for five raptor species: golden eagle (*Aquila chrysaetos*), prairie falcon (*Falco mexicanus*), red-tailed hawk (*Buteo jamaicensis*), great horned owl (*Bubo virginianus*), and American kestrel. Potential nesting sites are primarily in the upper third of highwall surfaces, rather than occurring deeper in the pit. Rock pigeons (*Columba livia*) have been observed using crevices and depressions within the pit highwalls for nesting, and GSM employees have observed golden eagles preying on the pigeons (NewFields, 2019). Violet-green Swallows (*Tachycineta Thalassina*) were also observed nesting on the southeast highwall (GSI Environmental, 2024). No other nests, scat, dens, or burrows were observed. The swallows did not fly within 100 feet or less of the pit tailings pond (GSI Environmental, 2024). Birds with potential to use the pond as habitat are primarily beach foraging and wading birds. Although the temporary pond could potentially attract some species of waterbirds, the physical features of the pit, including the long distance to surface water, lack of littoral areas, low productivity and overall lack of foraging opportunities, suggest that birds are

unlikely to attempt to use the pond. Furthermore, high quality suitable habitat is located proximal to the pit along the Jefferson River (to the south) and Boulder River (to the east).

Reptiles

The Mineral Hill Pit area could provide suitable habitat for several snake species, including the common garter snake (*Thamnophis sirtalis*) and prairie rattlesnake (*Crotalus viridis*). Reptile use of the pit is likely limited because of a lack of access and suitable habitat.

Direct Impacts:

Potential impacts to terrestrial and avian species and habitats would include increased ambient noise levels from drilling and portal plugging activities, and temporary displacement in the Proposed Action area.

It is possible that the 15-day drilling and portal plugging activities would create sufficient noise to displace potential wildlife within the pit area (primarily birds), but the activities would occur on an existing bench and access roads and would not influence the upper portions of pit highwalls where habitat is likely to occur. Impacts to noise levels are further discussed in "Section 8. Aesthetics." The estimated timeline for TRP operations is clarified in the AMD 018 application (extended to approximately 2038). Under the Proposed Action, tailings deposition and water level rise within the Mineral Hill Pit would occur without active dewatering in between the current elevation (pond at 4,701 feet in January 2025) and the proposed pumping elevation for the South Ramp Well (4,820 feet).

This expanded pond would last for a short duration until continued tailings deposition raises the settled tailings surface within the pit above 4,820 feet. Lime would continue to be added throughout this period of increased water volume to maintain the pH around 7.6 s.u., thus reducing the contaminant pathway risk to any wildlife that may come in contact with the pond. This period of increased pond volume would only occur within the first few years following the approval of AMD 018. After the tailings surface has risen above 4,820 feet, the only remaining surface water within the pit through the completion of TRP operations would be a much smaller perched pond overlying the tailings (to upper elevation of 5,083 feet).

The long distance to surface water, lack of littoral areas, low productivity, and overall lack of foraging opportunities suggests that birds and other wildlife are unlikely to attempt to use the pond or tailings surface. Similar to the analysis in the Final EIS for AMD 017, the ongoing management of the pond pH would limit the potential contaminant pathway risk to wildlife. Furthermore, high quality suitable habitat is located proximal to the pit lake along the Jefferson River (to the south) and Boulder River (to the east), as described above.

Secondary Impacts:

The estimated timeline for TRP operations is clarified in the AMD 018 application and extended by an additional four years to approximately 2038. However, continued tailings reprocessing and extending the timeframes for concurrently reclaiming TSF-1 and reclaiming the pit tailings surface are not a direct result of the Proposed Action. As a potential secondary impact, the duration of the perched pond above the tailings surface and potential wildlife contact would be extended by four years, before the pond eventually disappears and the tailings surface is reclaimed.

The residual tailings being placed within the pit would reach a maximum elevation of 5,083 feet and the tailings mass would consolidate to a final elevation of 5,067 feet within about 26 years after final deposition. This is approximately 106 feet lower than what was approved for the TRP under AMD 017, which anticipated upper and consolidated elevations of 5,191 feet and 5,173 feet, respectively. This means that approximately 106 feet of additional highwall surfaces would remain exposed and not covered by tailings. These surfaces could potentially provide habitat for avian species, but as noted above, the upper third of highwalls may have greater habitat potential than the bottom of the pit. The decrease in elevation for final tailings deposition (5,083 feet) and consolidated surface (5,067 feet) would also result in a smaller footprint for final reclamation of the pit bottom than what was approved for AMD 017. This would result in a smaller area for potential terrestrial fauna habitat following the completion of reclamation, although access to the revegetated area would continue to be limited, with the tailings surface occurring at a lower elevation within the pit.

The short-term impacts related to removal of TSF-1 and reclamation of the remaining area could include ambient noise from heavy equipment involved with tailings removal and subsequent reclamation. These activities would be extended by approximately four years. The potentially beneficial long-term impacts to wildlife habitat through landform restoration and revegetation of this area would remain as approved through AMD 017.

Cumulative Impacts:

Cumulative impacts to wildlife species and habitat from the Proposed Action would add to existing impacts from recreational use in the area.

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

Information regarding unique, endangered, fragile or limited environmental within the AMD 018 Proposed Action area does not differ significantly than the description presented in the in the Final EIS for AMD 017. Special-status species include those listed under the Endangered Species Act as Threatened and Endangered (T&E) by the United States Fish and Wildlife Service (USFWS) and species of concern (SOC) that are tracked by the MTNHP. The SOC represents plants and animals that are rare or have declining populations and, as a result, are potentially at risk of becoming federally listed as threatened or endangered or are at risk of extinction in Montana. Special-status species that are not federally listed as T&E are not offered the same regulatory protection as T&E species, but a designation as an SOC provides resource managers and decision-makers the information needed to make informed, proactive decisions regarding species conservation.

An environmental summary report prepared by MTNHP (2021b) contains information pertaining to threatened, endangered, and SOC animal species observed or thought to occur in the Proposed Action area. The USFWS (2021) Information for Planning and Consultation (IPaC) database was queried for T&E species that could potentially occur in the Project area and to identify designated critical habitat in the vicinity of the Project area.

Special-Status Species

The MTNHP environmental summary report for the area lists elemental occurrence records for eight bird SOC and four mammal SOC within 1 mile of the mine (MTNHP, 2021b). Most of these observations were made near the Jefferson River to the south; however, several of the species listed have the potential to occur within the mine area. Three of the four mammal SOC observed

near the site are bats with the potential to use highwall habitat within the Pit (NewFields, 2019). These species include Townsend's big-eared bat (*Corynorhinus townsendii*), spotted bat (*Euderma maculatum*), and little brown myotis (*Myotis lucifugus*). Other bird SOC observed or with the potential to occur in the mine area include golden eagle, sharp-tailed grouse (*Tympanuchus phasianellus*), Brewer's sparrow (*Spizella breweri*), and sagebrush sparrow (*Artemisiospiza nevadensis*) (MTNHP, 2021b).

In addition to the bat SOC identified by the MTNHP, three bat species identified as sensitive by the U.S. Bureau of Land Management are known to occur at abandoned mine sites in western Montana and have the potential to occur in the mine area (Tigner, 2011). These species include Townsend's big-eared bat, long-legged myotis (*Myotis volans*), and long-eared myotis (*Myotis evotis*). Suitable bat-roosting habitat occurs within crevices and holes found in the Pit highwalls, although no acoustic or night video surveys have been conducted to determine if bats are using this habitat (NewFields, 2019).

The USFWS IPaC database identified one listed threatened mammal species, Canada lynx (*Lynx canadensis*), with the potential to occur in the mine area (USFWS, 2021). Canada lynx typically occupy high-elevation subalpine forest habitat, and while the occasional lynx may pass through the general mine area, lynx would not be expected to regularly occur in the area. The Proposed Action does not occur within designated critical habitat for the Canada lynx.

Through the addition of lime to the thickened tailings being deposited into the pit, GSM has increased and maintained the pH of the pit tailings pond from 7.2 to 8.1 s.u. (October to December 2024). Maintaining this alkalinity in the pond reduces the mobility and availability of metals and other contaminants that might be detrimental to wildlife, thus mitigating concerns of wildlife contact with the pond before it eventually disappears at the conclusion of TRP operations.

Direct Impacts:

Potential impacts to unique, endangered, fragile, or limited environmental resources would include increased ambient noise levels from drilling and portal plugging activities and temporary displacement in the Proposed Action area. It is possible that the 15-day drilling and portal plugging activities would create sufficient noise to displace potential wildlife within the pit area (primarily birds), but the activities would occur on an existing bench and access roads and would not influence the upper portions of pit highwalls where habitat is likely to occur. Impacts to noise levels are further discussed in "Section 8. Aesthetics." The Proposed Action would not disturb wetlands, riparian habitat, or special-status species.

Secondary Impacts:

The secondary impacts to special-status wildlife species would be the same as described for other wildlife in "Section 5. Terrestrial, Avian, and Aquatic Life and Habitats," based on the extended timeline for TRP operations, temporarily expanding the pit pond volume during operations, and decreasing the reclaimed tailings surface area. There would be no secondary impacts to wetlands, riparian habitat, or other special-status species.

Cumulative Impacts:

Cumulative impacts to unique, endangered, fragile, or limited environmental resources from the Proposed Action would add to existing impacts from recreational use in the area.

7. Historical and Archaeological Sites

The Proposed Action is located entirely within the permitted disturbance area of Golden Sunlight Mine as previously authorized under OP No. 00065. All land within the permit area has been previously surveyed for cultural resources, as documented within the numerous environmental reviews completed over the past 50 years. The incremental expansions over the life of mine are summarized in the Final EIS for AMD 017, which also notes consultation with the Montana Cultural Resource Database under the State Historic Preservation Office (SHPO). Like the ongoing TRP operations, the AMD 018 Proposed Action would only occur in currently disturbed areas where historical and archaeological resources do not exist.

Direct Impacts:

No direct impacts to historical and archaeological resources would be expected from the Proposed Action.

Secondary Impacts:

No secondary impacts to historical and archaeological resources would be expected from the Proposed Action.

Cumulative Impacts:

No cumulative impacts to historical and archaeological resources would be expected from the Proposed Action.

8. Aesthetics

The Final EIS for AMD 017 evaluated the potential impacts to visual resources and aesthetics associated with the TRP, particularly for the process of removing TSF-1, as portions of the facility are visible from adjacent areas and public transportation routes. The uppermost highwalls of the pit are visible from long distances, with the exposed orange to tan-colored rock contrasting with the surrounding grassland. The majority of the pit, including the pit bottom and the area being backfilled with reprocessed tailings, are not visible from areas other than the crest edge of the pit.

Under the AMD 018 Proposed Action, a temporary drilling contractor (three people) would be employed for approximately 15 days to drill and complete the proposed South Ramp Well. The well collar and associated infrastructure would be located on a southern highwall of the pit that is below the elevation of the crest edge. This location is entirely on privately owned land and is more than one mile from the nearest edge of the permit area boundary and any potential public access area. The pit area can only be lawfully accessed through gated and controlled entry to the active mine site.

Direct Impacts:

Under the Proposed Action, the installation and operation of the South Ramp Well, plugging existing underground mine portals, and final reclamation of the pit tailings surface would not be visible to the public passing by on Interstate 90 or State Highway 2. Noise associated with the short-term drilling and portal plugging activities may be heard by receptors located in an area where sound related to the project has not been fully diminished by distance or another sound dampening feature. TRP operations would be conducted as approved under AMD 017, with no

proposed changes to the methods for excavation, conveyance, beneficiation, or waste disposal. No direct impacts to aesthetics would be expected from the Proposed Action.

Secondary Impacts:

The estimated timeline for TRP operations is clarified in the AMD 018 application (extended to approximately 2038). However, continued tailings reprocessing and extending the timeframe for concurrently reclaiming TSF-1, one of the few areas associated with the TRP that is visible to the public, are not a direct result of the Proposed Action. The short-term aesthetic impacts related to removal of TSF-1 and reclamation of the remaining area could include visual contrasts for disturbed areas and noise from heavy equipment involved with tailings removal and subsequent reclamation. These activities would be extended by approximately four years. The potentially beneficial long-term impacts to aesthetics through landform restoration and revegetation of this area would remain as approved through AMD 017.

Cumulative Impacts:

No cumulative impacts to human health and safety would be expected from the Proposed Action.

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

The Final EIS for AMD 017 evaluated the demands on environmental resources related to TRP operations. The primary fresh water source for the TRP is the existing Freshwater Lagoon in the Jefferson Slough. This source supplies GSM with water for dust suppression, fire control, potable use, and the mill processing circuit. Water used in the TSF-1 Re-Pulping Plant is sourced from fresh and recycle water from the flotation mill circuit and any available storm water collected in lined collection ponds within TSF-1 excavation panels. Processed tailings slurry leaving the flotation plant (mill complex) is pumped to the Pit Thickener to increase the solids concentration before final deposition in the Mineral Hill Pit. Clarified water from the Pit Thickener is reused in the mill flotation circuit. Mineral Hill Pit pool water would be used as a source of makeup water in the mill flotation circuit when needed, otherwise it would be disposed in TSF-2. Groundwater pumped from the South Ramp Well may be used in the mill flotation circuit when needed, otherwise it would be disposed in TSF-2. As anticipated in the Final EIS, the internal recirculation and use of recycle water through the first few years of TRP operations has reduced, although not entirely eliminated, GSM's reliance on water sourced from the Freshwater Lagoon.

The facilities and infrastructure associated with TRP operations utilize existing transmission lines for energy and disturbance activities only occur on previously disturbed lands within the existing permit boundary. The Proposed Action for AMD 018 does not include any new areas of land disturbance or require additional sources of water or energy to maintain ongoing TRP operations.

Direct Impacts:

Water from the South Ramp Well may be used in the mill flotation circuit when needed, similar to the prior function of the failed South Well. The existing energy transmission system would be utilized for operating the South Ramp Well. There would be no changes to the demands on environmental resources for ongoing TRP operations compared to the evaluation of AMD 017. No direct impacts to demands on environmental resources would be expected from the Proposed Action.

Secondary Impacts:

The estimated timeline for TRP operations is clarified in the AMD 018 application (extended to approximately 2038). However, continued tailings reprocessing and extending the associated demands on environmental resources through this time period are not a direct result of the Proposed Action. The current uses of water and energy would be maintained through the extended TRP operations period, meaning that the anticipated reduction for the reclamation timeframe would also be delayed by approximately four years.

Cumulative Impacts:

No cumulative impacts to demands on environmental resources would be expected from the Proposed Action.

10. Impacts on Other Environmental Resources

DEQ searched the websites and databases offered by the following entities to identify nearby activities that may affect, or be affected by, the Proposed Action:

- Montana Department of Natural Resource and Conservation (DNRC, 2025)
- Montana Department of Environmental Quality (DEQ, 2025)
- Montana Department of Transportation (MDT, 2025)
- Jefferson County (2025)
- United States Department of Interior, Bureau of Land Management (BLM, 2025)
- United States Forest Service (USFS), Beaverhead-Deerlodge National Forest (2025)

No other projects were identified when searching the above information resources. No other state or federally regulated projects were identified in the project vicinity, which is narrowly focused on the Mineral Hill Pit area. There are no known future projects that are under concurrent consideration by any state agency through preimpact statement studies, separate impact statement evaluation, or permit processing procedures.

Direct Impacts:

Based on the location of the Proposed Action within the current mine area and the continuation of previously approved site activities, no direct impacts to other environmental resources or associated projects are expected because of the Proposed Action, nor are there other nearby projects that could result in direct impacts on the Proposed Action.

Secondary Impacts:

No secondary impacts to other environmental resources are expected because of the Proposed Action or the continuation of previously approved site activities, nor are there other nearby projects that could result in secondary impacts on the Proposed Action.

Cumulative Impacts:

No cumulative impacts to other environmental resources are expected because of the Proposed Action or the continuation of previously approved site activities, nor are there other nearby projects that could result in secondary impacts on the Proposed Action.

11. Human Health and Safety

GSM is required to adhere to all applicable state and federal safety laws, as industrial work like mining 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. The South Ramp Well would be located on a southern bench of the pit, entirely on private land that can only be lawfully accessed through gated and controlled entry to the active mine site. No members of the general public would be in the project area during the installation of the replacement dewatering well, during the TRP operations, or during the reclamation of associated features. There are no potential water users in close proximity to the pit area, although the continuation of pit dewatering would also ensure there is zero outflow from the pit groundwater system and preclude any exposure route for human health to be affected by degraded water quality.

Direct Impacts:

No direct impacts to human health and safety would be expected from the Proposed Action.

Secondary Impacts:

No secondary impacts to human health and safety would be expected from the Proposed Action.

Cumulative Impacts:

No cumulative impacts to human health and safety would be expected from the Proposed Action.

12. Industrial, Commercial, and Agricultural Activities and Production

The Proposed Action is located entirely within the permitted disturbance area of Golden Sunlight Mine as previously authorized under OP No. 00065. Under the Proposed Action a temporary contract drilling crew (three people) would be employed for approximately 15 days to drill and complete the proposed South Ramp Well to dewater the Mineral Hill Pit and maintain a local groundwater cone of depression at or below an elevation of 4,850 feet. This groundwater control elevation would be maintained through the remaining operational period for the Tailings Reprocessing Project (TRP) and the reclamation and post-mining site management time periods.

All proposed activities would affect currently disturbed land and involve existing mine infrastructure. The current land use for the pit area is mining and the post-reclamation land use is approved for wildlife habitat. Based on the approved conditions of AMD 017, some of the existing structures and mill facilities related to TRP operations would remain in place for post-mining industrial use and/or economic development and would not be reclaimed.

Land outside of GSM's property is typically used for ranching and livestock grazing and provides wildlife habitat. Public lands, including BLM land outside the permit boundary, provide for public recreation opportunities. Other activities outside the permit area include early stages of commercial development in the Sunlight Business Park (Jefferson Local Development Corporation-JLDC, 2024). This area consists of a 200-acre light industrial and high-tech business park, located southeast of the mine along the Interstate 90 frontage road.

Direct Impacts:

All proposed activities would affect currently disturbed land and involve existing mine infrastructure. The post-reclamation land use for the pit would continue to be wildlife habitat and no changes would occur to the existing plans for retaining certain structures or facilities for post-mining industrial land use. Land outside of the GSM permit boundary would not be impacted for use by industrial, commercial, or agricultural development. No direct impacts to industrial, commercial, and agricultural activities and production would be expected from the Proposed Action.

Secondary Impacts:

No secondary impacts to industrial, commercial, and agricultural activities and production would be expected from the Proposed Action.

Cumulative Impacts:

No cumulative impacts to industrial, commercial, and agricultural activities and production would be expected from the Proposed Action.

13. Quantity and Distribution of Employment

The population estimates for Jefferson County totaled 13,048 people in July 2023, an increase of 8% since 2020 (U.S. Census Bureau, 2024). The Montana Department of Labor & Industry (2024) reports that the October 2024 unemployment rate in Jefferson County totaled 2.3%. This is lower than the unemployment rate for Montana (3.3%) and the United States (4.1%) for that same time period.

GSM employs 50 full-time employees and 25 contractors to maintain TRP operations associated with AMD 017, which were initially estimated to take a total of 12 years. Under the Proposed Action, a temporary drilling contractor (three people) would be employed for approximately 15 days to drill and complete the proposed South Ramp Well. The Proposed Action would not create, move, or eliminate jobs in Jefferson County. The estimated timeline for TRP operations is clarified in the AMD 018 application, based on the current infrastructure and reduced daily production rate (extended to a total of 16 years, approximately 2038). However, continued tailings reprocessing and extending the current employment through this time period would not be a direct result of the Proposed Action.

Direct Impacts:

Due to the short-term project duration and the temporary nature of the drilling activity proposed in AMD 018, no direct impacts to the quantity and distribution of employment would be expected from the Proposed Action.

Secondary Impacts:

The estimated timeline for TRP operations is clarified in the AMD 018 application (extended to approximately 2038). However, continued tailings reprocessing and extending the current employment through this time period are not a direct result of the Proposed Action. The current employment levels would be maintained through the extended TRP operations period, meaning that the anticipated reduction in workforce for the reclamation timeframe would also be delayed by approximately four years.

Cumulative Impacts:

No cumulative impacts to the quantity and distribution of employment would be expected from the Proposed Action.

14. Local and State Tax Base and Tax Revenues

The Final EIS for AMD 017 evaluated the economic impacts of initiating the TRP, considering the associated payroll, purchases, and taxes associated with approximately 12 years of tailings reprocessing. For AMD 018, GSM provided updated economic information to reflect the current conditions for TRP operations. GSM employs 50 full-time employees and 25 contractors, all of whom pay income tax and property taxes. In addition to income taxes paid by employees and contractors and payroll taxes paid by GSM, GSM's tax burden includes approximately $1.2 million per year in property taxes and a Resource Indemnity Tax on sulfur production ranging between $20,000 - $30,000 per year.

Under the Proposed Action, a temporary drilling contractor (three people) would be employed for approximately 15 days to drill and complete the proposed South Ramp Well. No other changes to onsite personnel are anticipated. The estimated timeline for TRP operations is clarified in the AMD 018 application, based on the current infrastructure and reduced daily production rate (extended to a total of 16 years, approximately 2038). However, continued tailings reprocessing and extending the current employment through this time period would not be a direct result of the Proposed Action.

Direct Impacts:

Due to the short-term project duration and the temporary nature of the drilling activity proposed in AMD 018, no direct impacts to employment or tax revenue would be expected from the Proposed Action.

Secondary Impacts:

The estimated timeline for TRP operations is clarified in the AMD 018 application (extended to approximately 2038). However, continued tailings reprocessing and extending the current employment and associated tax base or tax revenues through this time period are not a direct result of the Proposed Action. The current employment levels would be maintained through the extended TRP operations period, meaning that any associated tax base or tax revenues would continue for approximately four additional years.

Cumulative Impacts:

No cumulative impacts to the local and state tax base or tax revenues would be expected from the Proposed Action.

15. Demand for Government Services

Under the Proposed Action, a temporary drilling contractor (three people) would be employed for approximately 15 days to drill and complete the proposed South Ramp Well. No other changes to onsite personnel are anticipated. The estimated timeline for TRP operations is clarified in the AMD 018 application, based on the current infrastructure and reduced daily production rate (extended to a total of 16 years, approximately 2038). However, continued tailings reprocessing and

extending the current employment through this time period would not be a direct result of the Proposed Action.

Direct Impacts:

With no changes to employment or a substantial increase in traffic on the existing local roads, there would be no changes to current demands for government services due to the Proposed Action.

Secondary Impacts:

The estimated timeline for TRP operations is clarified in the AMD 018 application (extended to approximately 2038). However, continued tailings reprocessing and extending the current employment and associated demands for government services through this time period are not a direct result of the Proposed Action. The current employment levels would be maintained through the extended TRP operations period, meaning that any current demands on government services would continue for approximately four additional years.

Cumulative Impacts:

No cumulative impacts to the demand for government services would be expected from the Proposed Action.

16. Locally Adopted Environmental Plans and Goals

The Proposed Action is located entirely within the permitted disturbance area of Golden Sunlight Mine as previously authorized under OP No. 00065. No new disturbance would occur. The Proposed Action is limited in scope with installation of a replacement dewatering well in Mineral Hill Pit. The primary change to land use under the AMD 018 Proposed Action would be a reduction in the footprint of the reclaimed tailings surface (from 50 acres to 30 acres) due to tailings infiltration to the underground workings and updated estimates for consolidation and density of the tailings mass.

Direct Impacts:

Reclamation of the tailings surface in the pit would occur on a smaller area at the end of tailings placement than what was evaluated in the Final EIS for AMD 017. Consistent with existing requirements, GSM would continue to implement noxious weed control measures for this area in conjunction with the Jefferson County Weed Control program. DEQ is not aware of any other locally adopted environmental plans or goals that would impact this proposed project or the project area. No direct impacts from or to locally adopted environmental plans and goals would be expected from the Proposed Action.

Secondary Impacts:

No secondary impacts to locally adopted environmental plans and goals would be expected from the Proposed Action.

Cumulative Impacts:

No cumulative impacts to locally adopted environmental plans and goals would be expected from the Proposed Action.

17. Access to and Quality of Recreational and Wilderness Activities

Under the Proposed Action a temporary contract drilling crew (three people) would be employed for approximately 15 days to drill and complete the proposed South Ramp Well to dewater the Mineral Hill Pit and maintain a local groundwater cone of depression at or below an elevation of 4,850 feet. The well collar and associated infrastructure would be located on a southern highwall of the Mineral Hill Pit that is below the elevation of the crest edge. This location is entirely on privately owned land and is more than one mile from the nearest edge of the permit area boundary and any potential public access area. The pit area can only be lawfully accessed through gated and controlled entry to the active mine site. The current land use for the pit area is mining and the post-reclamation land use is approved for wildlife habitat. Land outside of GSM's property is typically used for ranching and livestock grazing and provides wildlife habitat. Public lands, including BLM land outside the permit, provide for public recreation opportunities.

The Final EIS for AMD 017 evaluated land use and recreation impacts for the land within the GSM permit boundary, especially the area of TSF-1 and Mineral Hill Pit, and land immediately adjacent to the GSM permit boundary. The Final EIS concluded that tailings placement in the pit and subsequent reclamation would not diminish the quality or access to recreational opportunities in the area surrounding the mine. Land outside of the GSM permit boundary would not be impacted for use by wildlife or humans over the long term. The primary change to land use under the AMD 018 Proposed Action would be a reduction in the footprint of the reclaimed tailings surface (from 50 acres to 30 acres) due to tailings infiltration to the underground workings and updated estimates for consolidation and density of the tailings mass.

Direct Impacts:

All proposed activities would affect currently disturbed land and involve existing mine infrastructure. Land outside of the GSM permit boundary would not be impacted for use by wildlife or humans over the long term. The post-reclamation land use for the pit would continue to be wildlife habitat, primarily nesting, rooting, and escape/cover on the upper third of pit highwalls, and potential habitat in the reclaimed 30 acres of pit floor. No direct impacts to access to and quality of recreational and wilderness activities would be expected from the Proposed Action.

Secondary Impacts:

No secondary impacts to access to and quality of recreational and wilderness activities would be expected from the Proposed Action.

Cumulative Impacts:

No cumulative impacts to access to and quality of recreational and wilderness activities would be expected from the Proposed Action.

18. Density and Distribution of Population and Housing

The population for Jefferson County totaled 13,048 people in July 2023 (U.S. Census Bureau, 2024). GSM employs 50 full-time employees and 25 contractors, to maintain TRP operations associated with AMD 017, which were initially estimated to take a total of 12 years. Under the Proposed Action, a temporary drilling contractor (three people) would be employed for

approximately 15 days to drill and complete the proposed South Ramp Well. No other changes to onsite personnel are anticipated and the Proposed Action would not alter the density and distribution of population and housing in Jefferson County. The estimated timeline for TRP operations is clarified in the AMD 018 application, based on the current infrastructure and reduced daily production rate (extended to a total of 16 years, approximately 2038). However, continued tailings reprocessing and extending the current employment through this time period would not be a direct result of the Proposed Action.

Direct Impacts:

Due to the short-term project duration and the temporary nature of the drilling activity proposed in AMD 018, no direct impacts to employment, population density, and housing would be expected from the Proposed Action.

Secondary Impacts:

The estimated timeline for TRP operations is clarified in the AMD 018 application (extended to approximately 2038). However, continued tailings reprocessing and extending the current employment through this time period are not a direct result of the Proposed Action. The current employment levels would be maintained through the extended TRP operations period, meaning that the associated density and distribution of population and housing would continue for approximately four additional years, prior to the anticipated reduction in workforce for the reclamation timeframe.

Cumulative Impacts:

No cumulative impacts to the density and distribution of population and housing would be expected from the Proposed Action.

19. Social Structures and Mores

It is not anticipated that this project would disrupt native or traditional lifestyles, social structures, or communities. The Proposed Action is located entirely within the permitted disturbance area of Golden Sunlight Mine as previously authorized under OP No. 00065. A temporary drilling contractor (three people) would be employed for approximately 15 days to drill and complete the proposed South Ramp Well. The estimated timeline for TRP operations is clarified in the AMD 018 application, based on the current infrastructure and reduced daily production rate (extended to a total of 16 years, approximately 2038). However, continued tailings reprocessing and extending the current employment through this time period would not be a direct result of the Proposed Action.

Direct Impacts:

No direct impacts on social structures, mores, and/or social conventions would be expected from the Proposed Action. No changes in permanent employment would occur due to the Proposed Action, therefore no changes would occur to existing social structures and mores in communities proximal to the Permit Area.

Secondary Impacts:

No secondary impacts on social structures, mores, and/or social conventions would be expected from the Proposed Action.

Cumulative Impacts:

No cumulative impacts on social structures, mores, and/or social conventions would be expected from the Proposed Action.

20. Cultural Uniqueness and Diversity

This project is not anticipated to cause a shift in some unique quality of the area. The Proposed Action is located entirely within the permitted disturbance area of Golden Sunlight Mine as previously authorized under OP No. 00065. A temporary drilling contractor (three people) would be employed for approximately 15 days to drill and complete the proposed South Ramp Well. The estimated timeline for TRP operations is clarified in the AMD 018 application, based on the current infrastructure and reduced daily production rate (extended to a total of 16 years, approximately 2038). However, continued tailings reprocessing and extending the current employment through this time period would not be a direct result of the Proposed Action.

Direct Impacts:

No direct impacts to cultural uniqueness and diversity would be expected from the Proposed Action. No change in permanent employment would occur due to the Proposed Action, therefore no changes would occur to existing populations and any cultural uniqueness, diversity, or other social or cultural conditions in communities proximal to the Permit Area.

Secondary Impacts:

No secondary impacts to cultural uniqueness and diversity would be expected from the Proposed Action.

Cumulative Impacts:

No cumulative impacts to cultural uniqueness and diversity would be expected from the Proposed Action.

21. Private Property Impacts

The proposed drilling activity would take place on private land owned by the applicant (GSM), while a portion of land administered by BLM (0.1 acre) would be covered by tailings placement in the pit, similar to activities authorized under AMD 017. DEQ's approval of AMD 018 to OP No. 00065 would affect GSM'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 GSM. Further, if the application is complete, DEQ must take action on the permit pursuant to ARM 17.24.119. Therefore, DEQ does not have discretion to take alternative action that would have less impact on private property. DEQ's approval of AMD 018 to OP No. 00065 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 private land owned by GSM and BLM property, 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 GSM. Therefore, no taking or damaging of private property rights would occur because of DEQ's approval of the Proposed Action.

22. Other Appropriate Social and Economic Circumstances

There would be a short-term increase in contractors at the site (three contractors for approximately 15 days) to support installation of the South Ramp Well. As outlined above, there would be no long-term changes to employment due to the Proposed Action, therefore there would be no direct impacts to income, employment, taxes, population and housing, government services, fiscal impacts, or environmental justice populations.

The extended timeline for ongoing TRP operations would be due to current infrastructure and reduced daily production rate, and it would not be a direct result of the Proposed Action. Continued tailings reprocessing and extending the current employment and socioeconomic conditions would be a secondary impact of the Proposed Action. The current employment levels would be maintained through the extended TRP operations period, meaning that the current socioeconomic conditions would continue for approximately four additional years, prior to the anticipated reduction in workforce for the reclamation timeframe.

23. Greenhouse Gas Assessment

The analysis area for this resource is limited to the activities regulated by the issuance of AMD 018 to OP No. 00065 which requests the construction of a replacement well to dewater the Mineral Hill Pit and maintain a local groundwater cone of depression at or below an elevation of 4,850 feet. The analysis does not include the ongoing activities related to TRP operations or concurrent reclamation as approved through AMD 017. The amount of gasoline and diesel fuel utilized while drilling the well may be affected by a number of factors including seasonal weather impediments and equipment malfunctions. To account for these factors DEQ has calculated the range of emissions using the predicted gasoline and diesel fuel usage for on-site equipment provided by GSM and a factor of +10% to account for unplanned downtime and possible extensions to the drilling timeline.

Based on information provided by GSM, vehicles and equipment on site would use gasoline and diesel fuel. For the Proposed Action, GSM has estimated that 5,929 gallons of diesel and 150 gallons of gasoline would be utilized for the installation and operation of the South Ramp Well. The estimated gasoline and diesel fuel usage for the on-site equipment is similar to that of equipment at other short duration well drilling operations of a similar scale. For the purpose of this analysis, DEQ has defined greenhouse gas (GHG) emissions as the following gas species: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), 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 Environmental Protection Agency (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 diesel fuel at the site would release GHGs primarily being carbon dioxide (CO_2), nitrous oxide (N_2O) and much smaller concentrations of uncombusted fuel components including methane (CH_4) and other volatile organic compounds (VOCs).

DEQ has calculated GHG emissions using the EPA Simplified GHG Calculator version May 2023 (EPA, 2023), for the purpose of totaling GHG emissions. This tool totals carbon dioxide (CO_2), nitrous oxide (N_2O), and methane (CH_4) and reports the total as CO_2 equivalent (CO_2e) in metric tons CO_2e. The calculations in this tool are widely accepted to represent reliable calculation approaches for developing a GHG inventory. DEQ has determined EPA's Scope 1 GHG impacts as defined in the Inventory Guidance for Greenhouse Gas Emissions are appropriate under MEPA for the Proposed Action. Scope 1 emissions are defined as direct GHG emissions that occur from sources that are controlled or owned by the organization (EPA Center for Corporate Climate Leadership, 2025a). DEQ's review of Scope 1 emissions is consistent with the agency not evaluating downstream effects of other types of impacts.

Activities would occur entirely within the permitted disturbance area in Mineral Hill Pit. Drilling the replacement South Ramp Well is projected to take 15 days. There would be a short-term increase in fuel usage associated with South Ramp Well installation and plugging Portal #3. Operationally, the proposed South Ramp Well and pump system would operate with transmission line electricity (consistent with the South Well). Vehicles would be required to manage the system on varied frequency, consistent with that required for the South Well. Similarly, in the event of pump failure, heavy mobile equipment would be required to remove and replace the pump and piping.

Direct Impacts:

This review does not include an assessment of GHG impacts in quantitative economic terms, otherwise known as evaluating the social cost of carbon. DEQ instead calculates potential GHG emissions and provides a narrative description of GHG impacts. This approach is consistent with Montana Supreme Court caselaw and the agency's discussion of other impacts in this EA. *See Belk v. Mont. DEQ*, 2022 MT 38, ¶ 29.

Operation of diesel and gasoline-fueled vehicles throughout the life of the proposed project would produce exhaust fumes containing GHGs.

GSM estimates that approximately 5,929 gallons of diesel and 150 gallons of gasoline would be utilized over the life of the Proposed Action. To account for variability due to the factors described above, DEQ has calculated the range of emissions using a factor of +10% of GSM's estimate. Using the EPA's simplified GHG Emissions Calculator for mobile sources, between 63.5 and 69.8 metric tons of CO_2e would be produced over the life of the Proposed Action.

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, 2021b).

Per EPA's website "Climate Change Indicators", the lifetime of carbon dioxide cannot be represented with a single value because the gas is not destroyed over time (EPA, 2025b). The gas instead moves between air, ocean, and land mediums with atmospheric carbon dioxide remaining in the atmosphere for thousands of years, due in part to the very slow process by which carbon is transferred to ocean sediments. Methane remains in the atmosphere for approximately 12 years. Nitrous oxide has the potential to remain in the atmosphere for about 109 years (EPA, Climate

Change Indictors). The impacts of climate change throughout central Montana include changes in flooding and drought, rising temperatures, and the spread of invasive species (BLM, 2021b).

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 CO_2e. The SIT consists of eleven Excel based modules with pre-populated data that can be used with 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 GHG emissions by sector and GHG 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 the estimated total annual greenhouse gas inventory by year. The SIT data from EPA is currently only updated through the year 2021, as it takes several years to validate and make new data available within revised modules. DEQ maintains a copy of the output results of the SIT.

DEQ has determined that the use of the default data provides a reasonable representation of the GHG inventory for all of the state sectors, and an estimated total annual GHG inventory by year. At present, Montana accounts for 47.77 million metric tons of CO_2e based on the EPA SIT for the year 2021. The Proposed Action may contribute up to 69.8 metric tons of CO_2e, which accounts for an additional 10% from GSM's fuel estimate that would result in 63.5 metric tons. The estimated emission of 69.8 metric tons of CO_2e from this project would contribute 0.000146% of Montana's annual CO_2e emissions.

GHG emissions that would be emitted as a result of the proposed activities would add to GHG emissions from other sources. The No Action Alternative would contribute less GHG emissions than the Proposed Action, but the No Action Alternative would extend the absence of a functioning dewatering well and increase the potential for impacts to downgradient water quality in the future.

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 Amendment 018 to OP No. 00065. GSM would lack the authority to drill and install a new dewatering well and establish a new hydrologic control elevation for groundwater within the pit. Any potential impacts that would be authorized under AMD 018 would not occur. However, as described in the "No Action Alternative" section above, DEQ does not consider the No Action Alternative to be appropriate because in the absence of a functioning dewatering well, GSM would continue to violate the existing permit conditions that require management of groundwater as a means to

prevent downgradient water quality impacts. GSM has demonstrated compliance with all applicable rules and regulations as required for approval of the Proposed Action.

CONSULTATION

As detailed in the Final EIS for AMD 017, DEQ consulted with multiple state and federal agencies, tribes, county government, and public stakeholders to identify substantive issues and/or concerns related to the proposed TRP activities. For the AMD 018 Proposed Action, all of the activities related to the South Ramp Well would occur within the permitted disturbance boundary, exclusively around the Mineral Hill Pit area, and the extent of tailings placement in the pit would decrease from what was previously analyzed.

DEQ searched the websites and databases offered by the following entities to identify nearby activities that may affect, or be affected by, the Proposed Action:

- 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), Beaverhead-Deerlodge National Forest

PUBLIC INVOLVEMENT

For a minor amendment, DEQ shall not implement the application, notice and hearing requirements for new permits or major amendments, pursuant to Sections 82-4-337 and 82-4-353, MCA. The department shall provide the permittee with a notice of decision on the adequacy of the minor amendment application within 30 days of receipt of the application (ARM 17.24.119(4)). The decision notice and Final EA will be available to the public through the DEQ website, although there will not be a comment period associated with the Final EA.

OTHER GOVERNMENTAL AGENCIES WITH JURISDICTION

This environmental review analyzes the AMD 018 Proposed Action submitted by GSM. The proposed drilling activity and operation of the replacement dewatering well would occur entirely on private land. All applicable state and federal rules must be adhered to, which, at some level, may also include other state, federal, or tribal agency jurisdiction.

The excavation of tailings from TSF-1, the concurrent reclamation of TSF-1, the placement of tailings within Mineral Hill Pit, and the reclamation of the consolidated tailings surface were authorized by DEQ and BLM through AMD 017 in 2021. The area of land administered by the BLM that would be impacted under AMD 018 (0.1 acre) is less than the area previously analyzed (1.4 acres). The groundwater system that would continue to be managed under the conditions of AMD 018 occurs beneath land administered by the BLM, although the hydrologic control elevation would be increased by 100 feet from the elevation analyzed in AMD 017. State trust lands administered by DNRC occur in a small area in the northeast portion of the permit boundary and would not be affected by the Proposed Action. There are no areas of the permit boundary that occur within tribal agency jurisdiction.

No DNRC, BLM, or USFS regulated projects were identified in the Proposed Action area. There are no known future projects that are under concurrent consideration by any state agency through preimpact

statement studies, separate impact statement evaluation, or permit processing procedures. DEQ identified other environmental projects or permits under DEQ's authority in the general area, which include:

- One active Hard Rock Small Mine Exclusion (SME) site is located within one half mile from the eastern edge of the OP No. 00065 permit boundary, but approximately three miles from the Proposed Action location.
- One active Hard Rock Exploration License is held by GSM (No. 00297), but no other exploration projects occur within five miles of the Proposed Action location.
- One active Opencut (sand and gravel) mining permit is located within five miles from the OP No. 00065 permit boundary, but approximately 3 miles from the Proposed Action location.
- Many state-designated abandoned mine locations are located within five miles of the Proposed Action, primarily northwest of Mineral Hill Pit, but no further activities are anticipated at these sites.
- Besides GSM operations, the only air quality or water quality permits within five miles of the Proposed Action area are associated with private construction or municipal government projects around the communities of Whitehall and Cardwell.

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 not result in additional disturbance at the site. GSM is proposing to drill and operate a replacement dewatering well within the Mineral Hill Pit, but it would not be an exact replacement for the existing South Well that failed in early 2024. Groundwater in the Mineral Hill Pit area would be pumped from a replacement well (the South Ramp Well) completed in a sump of the underground workings above the pit bottom, in order to maintain the local groundwater cone of depression at or below a new groundwater control elevation of 4,850 feet. This water would also be used for tailings reprocessing or disposal in TSF-2. Additional contingencies are proposed to ensure that groundwater is managed below the new control elevation and the local groundwater cone of depression is maintained (e.g. redundant pumps for South Ramp Well, optional barge pump in pit tailings pond, criteria for decreasing or suspending tailings deposition in pit until water is controlled).

GSM would continue TRP operations as approved under AMD 017, with no changes to the methods for excavation, conveyance, beneficiation, or waste disposal. The removal of the 26.2Mt of tailings material from TSF-1 is expected to take 16 years, an extension of four years from the timeline anticipated for AMD 017. The extended timeline for TRP operations would be due to current infrastructure and reduced daily production rate, and it would not be a direct result of the Proposed Action. Reclamation of the area underlying TSF-1 would not change from the plans approved under AMD 017. Tailings deposition in the Mineral Hill Pit would result in a final consolidated surface elevation of 5,067 feet and approximately 30 acres of tailings surface would be capped with soil and vegetated during reclamation.

As discussed in this EA, DEQ has not identified any significant impacts associated with the proposed activities for any environmental resource. DEQ does not believe that the activities proposed by GSM would have any growth-inducing or growth-inhibiting aspects, or contribute to new cumulative impacts. The land associated with the Proposed Action does not contain unique, endangered, fragile, or limited environmental resources.

No direct impacts are anticipated to geology, geochemistry, or soil resources, although secondary impacts are expected from the updated estimates for the TRP operations timeline. This would result in a tailings surface which is smaller in area and a lower elevation than what was anticipated under AMD 017. The area would be reclaimed to provide comparable utility and stability of adjacent undisturbed areas, although a smaller volume of capping soil would be required.

No direct or secondary impacts are anticipated to surface water resources. Direct impacts to groundwater quality and quantity would be limited to the Mineral Hill Pit area, with the installation of a new pit dewatering well (the South Ramp Well) to replace the failed South Well. As TRP operations continue, the overlying pond volume would expand until water reaches the South Ramp Well, but no outflow would occur. The increased pond volume would only occur within the first few years following the approval of AMD 018. The groundwater control elevation would be modified from 4,750 feet to 4850 feet under the Proposed Action, but the South Ramp Well would maintain the local groundwater cone of depression under the pit area, as required by current permit conditions. Secondary impacts to groundwater in the pit area would include extending the timeline by four years for pit pond water management (level and pH) during TRP operations and eventual disappearance of pond and reclamation of tailings surface.

Impacts to air quality would be similar to current conditions, due to the limited area and duration of the proposed activities and use of water for dust control.

Impacts to vegetation would be similar to those described under AMD 017 due to the lack of new disturbance and the consistency in reclamation methods, which includes reclamation with a DEQ approved seed mix. Weed control would continue as required by permit conditions and Jefferson County plans.

There would be no impacts to aquatic life or habitat, given the location of proposed activities within the existing pit. There may be impacts to terrestrial and avian life and habitats, related to noise and displacement during drilling and portal plugging activities. Secondary impacts to wildlife in the pit area would include extending the timeline that the pit tailings pond is present by four years, although access to the pond would be limited and lime treatment of the water would minimize potential exposure to contaminants. These impacts would be reduced through reclamation of the tailings surface and establishment of potential habitat, although at a smaller surface area than was anticipated for AMD 017.

Unique, endangered, fragile, or limited environmental resources have been evaluated. There are no unique or endangered fragile resources in the project area. Based on existing ground disturbance in the Mineral Hill Pit area and the history of cultural resource inventories across the mine site, there is no need for additional cultural resource review. If a resource were to be discovered, GSM has committed to notify SHPO immediately and the site would be left further untouched until further evaluation is made.

No additional impacts to local topography and the viewshed of nearby residents and visitors would be anticipated beyond what was analyzed under AMD 017. The replacement South Ramp Well would be drilled within the Mineral Hill Pit on a bench on the southwestern highwall entirely on privately owned land. TRP operations would be conducted as approved under AMD 017, with no changes to the methods for excavation, conveyance, beneficiation, or waste disposal.

There would be no impacts to human health and safety due to the Proposed Action. GSM is required to adhere to all applicable state and federal safety laws, as industrial work like mining 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. The public is not allowed on the mine site and no members of the general public would be in the project area during the installation of the replacement dewatering well, during the TRP operations, or during the reclamation of associated features. There are no potential water users in close proximity to the pit area, although the continuation of pit dewatering would also ensure there is zero outflow from the pit groundwater system and preclude any exposure route for human health to be affected by degraded water quality.

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

Issuance of the minor amendment to GSM does not set a precedent for DEQ's review of other applications for permits or amendments, 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 activities proposed by GSM 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 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. Further, the definitions provided in Section 82-4-303(2), MCA a "major amendment is an amendment that may significantly affect the human environment," while "a minor amendment is an amendment that will not significantly affect the human environment." The complete application for AMD 018 submitted by GSM on March 4, 2025, satisfies the requirements for minor amendments in ARM 17.24.119(3). The Proposed Action would change the location and elevation of dewatering activities within Mineral Hill Pit, with some associated modifications to water management, tailings management, and reclamation at the end of operations. However, the activities in the Proposed Action are not anticipated to significantly affect the human environment and the protection of off-site water resources would continue as required by current permit conditions. Therefore, DEQ has evaluated the AMD 018 application as a minor amendment and the completion of a Final EA and

decision document within 30 days of complete application submittal 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 direct impacts. Secondary impact- reduced elevation for consolidated tailings surface and smaller footprint from reclamation and soil placement.	**S**- Minor: Lower elevation for tailings surface would occur, but still provide geotechnical stability for adjacent highwalls. Smaller volumes of capping material and soil would be needed for final reclamation of tailings surface. The residual tailings may have higher total sulfide content than analyzed previously, but lime treatment of tailings and overlying pond would continue. The consolidated tailings mass would have potential for reducing pyrite oxidation and improving long-term water quality within the pit. No new disturbances or changes to areas of potential erosion. **E**- Small: Total surface area of consolidated tailings would change from 50 acres to 30 acres. **D-** Long-term. The reclaimed tailings surface would occur at a lower elevation and smaller footprint than conditions under AMD 017, this pit area topography would persist post-mining. **F**- Erosion would be managed within the pit during occasional storm events. Changes to tailings surface topography and effects on pit water quality would be ongoing and persistent. **U/F**- Not unique or particularly fragile.	Certain	No new cumulative impacts from AMD 018. Previous MEPA reviews evaluated impacts from large-scale mining and long-term pit water management plans.	Lime treatment of pit tailings discharge and overlying pond. Additional modeling and surveys to be completed during TRP operations to assess tailings surface upon placement and consolidation.	No
2. Water Quality, Quantity, and Distribution	Direct impacts- Expanded pit pond volume during early TRP operations, groundwater in the pit would be managed below a modified control elevation. No direct impacts to surface water. Secondary impacts- Extended timeline for pit pond water management (level and pH) and eventual disappearance of pond and reclamation of tailings surface. No secondary impacts to surface water.	**S**- Minor: The overlying pond volume would expand until water reaches the South Ramp Well, but no outflow would occur. The groundwater control elevation would be modified from 4,750 feet to 4850 feet, but the local groundwater cone of depression would be maintained under the pit area. **E**- Small: The pit tailings pond, pond management, and dewatering activities would occur within the existing footprint of Mineral Hill Pit. **D-** Short-term and Long-term: The increased pond volume would only occur within the first few years following the approval of AMD 018. The ongoing TRP operations, pond water management, and subsequent reclamation after the pond disappears would be extended by four years. The new groundwater control elevation would be maintained through the remaining TRP operations and the reclamation and post-mining site management time periods. **F**- Pond water management would be ongoing during TRP operations. Changes to the groundwater control elevation would be ongoing and persistent during TRP operations and after reclamation is completed. **U/F**- Not unique or particularly fragile.	Certain	No new cumulative impacts from AMD 018. Previous MEPA reviews evaluated water quality impacts from large-scale mining and long-term pit water management plans.	Lime treatment of pit tailings discharge and overlying pond. Additional contingencies are proposed to ensure groundwater is maintained below the new control elevation (e.g. redundant pumps for South Ramp Well, optional barge pump in pond, criteria for decreasing or suspending tailings deposition in pit until water is controlled).	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)
3. Air Quality	Direct impacts - Dust particulate would be produced or become airborne during drilling and portal plugging. Mechanized equipment would produce some exhaust fumes. Dust would also be produced while driving on and off site. Secondary impacts – additional emissions associated with the extended TRP operations.	**S-** Negligible: The Proposed Action would not increase the impacts to air quality appreciably from the current operational impacts. **E-** Small: A limited disturbed area of the Mineral Hill Pit would produce dust particulate or become airborne during drilling operations. Mechanized equipment would produce some exhaust fumes. Dust would also be produced while driving on and off site. **D-** Short-term. Any impacts would be short term, as they would not last beyond the life of the Proposed Action, and minor, because impacts would be noticeable but would be relatively small and would not affect the integrity or function of the resource. **F-** Dust and emissions associated with the drilling and portal plugging activities would occur once for a short time period. Other potential emissions would be ongoing through the extended period of TRP operations, until reclamation is complete. **U/F**- Not unique or particularly fragile.	Certain	N/A	The use of water or chemical dust suppressants to limit the amount of dust generated by drilling and portal plugging activities.	No
4. Vegetation Cover, Quantity, and Quality	Direct impacts – potential propagation of noxious weed species. Secondary impacts – Reduced reclamation footprint and extended timeline for completing reclamation.	**S-** Negligible: The Proposed Action would not increase disturbance or noticeably impact vegetation from the current operational impacts. Weed control and reclamation methods would not change from AMD 017 and existing permit conditions. **E-** Small: Total surface area of consolidated tailings would change from 50 acres to 30 acres. **D-** Short-term and Long-term: Direct impacts to vegetation from drilling and portal plugging activities would be short-term (approximately 15 days). TRP operations and subsequent reclamation would be extended by four years. The smaller reclaimed tailings surface would persist post-mining. **F-** Disturbance of vegetation associated with drilling and portal plugging activities would occur once and for a short time period. Changes to tailings surface topography and associated vegetation would be ongoing and persistent after reclamation is completed. **U/F**- Not unique or particularly fragile.	Direct – Possible Secondary – Certain	N/A	N/A	No
5. Terrestrial, Avian, and Aquatic Life and Habitats	Direct impacts- potential noise and displacement during drilling and plugging. Secondary impacts- Expanded pit pond volume during early TRP operations, reduced reclamation footprint and lower	**S**- Minor: Noise or displacement could occur during drilling and portal plugging, although activities would not occur in the upper portions of the highwalls where more suitable habitat may exist. The overlying pond volume would expand until water reaches the South Ramp Well, but no outflow would occur. A lower elevation for tailings surface would occur, meaning some additional portions of highwalls would remain exposed for habitat. The reclaimed tailings surface may also provide potential habitat for terrestrial fauna, although access may remain limited. Extended timeline for completing removal and concurrent reclamation of TSF-1 and reclamation of pit tailings surface.	Direct- Possible Secondary- Certain	Cumulative impacts to wildlife species and habitat from the Proposed Action would add to existing impacts from recreational use in the area.	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)
	elevation for tailings, additional highwall surfaces would remain exposed, and extended timeline for completing reclamation.	**E**- Small: Total surface area of consolidated tailings would change from 50 acres to 30 acres. **D-** Short-term and Long-term. Noise and displacement during drilling and portal plugging would be short term (approximately 15 days). The increased pond volume would only occur within the first few years following the approval of AMD 018. The potential habitat associated with the reclaimed tailings surface and exposed highwalls would persist post-mining. TRP operations and subsequent reclamation would be extended by four years. **F**- The drilling and portal plugging activities would occur once for a short time period. Pond water management would be ongoing during TRP operations. Changes to tailings surface topography and potential habitat would be ongoing and persistent after reclamation is completed. **U/F**- Not unique or particularly fragile.				
6. Unique, Endangered, Fragile, or Limited Environmental Resources	Direct impacts- potential noise and displacement during drilling and plugging. Secondary impacts- Expanded pit pond volume during early TRP operations, reduced reclamation footprint and lower elevation for tailings, additional highwall surfaces would remain exposed, and extended timeline for completing reclamation.	**S-** Minor: Noise or displacement could occur during drilling and portal plugging, although activities would not occur in the upper portions of the highwalls where more suitable habitat for special-status species may exist. The overlying pond volume would expand until water reaches the South Ramp Well, but no outflow would occur. A lower elevation for tailings surface would occur, meaning some additional portions of highwalls would remain exposed for habitat. The reclaimed tailings surface may also provide potential habitat for terrestrial fauna, although access may remain limited. Extended timeline for completing removal and concurrent reclamation of TSF-1 and reclamation of pit tailings surface. **E-** Small: Total surface area of consolidated tailings would change from 50 acres to 30 acres. **D-** Short-term and Long-term. Noise and displacement during drilling and portal plugging would be short term (approximately 15 days). The increased pond volume would only occur within the first few years following the approval of AMD 018. The potential habitat associated with the reclaimed tailings surface and exposed highwalls would persist post-mining. TRP operations and subsequent reclamation would be extended by four years. **F**- The drilling and portal plugging activities would occur once for a short time period. Pond water management would be ongoing during TRP operations. Changes to tailings surface topography and potential habitat would be ongoing and persistent after reclamation is completed. **U/F**- Not unique or particularly fragile.	Direct- Possible Secondary- Certain	Cumulative impacts to unique, endangered, fragile, or limited environmental resources from the Proposed Action would add to existing impacts from recreational use in the area.	N/A	No
7. Historical and Archaeological Sites	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)
8. Aesthetics	No direct impacts. Secondary impacts- extended timeline for TRP operations and reclamation of visible features.	**S-** Minor. Proposed Action activities would occur within lower portions of the pit and have no direct impacts to aesthetics. The extended timeline for TRP operations (four additional years, until approximately 2038) would extend the timeframe for removal and concurrent reclamation of TSF-1 and secondary aesthetic impacts (visual contrasts, noise). Final landform restoration and revegetation would improve the long-term aesthetics of the area. **E**- None. There would be no changes to the current permit area or disturbance area from the Proposed Action, and no changes in area for the features associated with secondary aesthetic impacts from an extended timeline. **D-** Short Term. The extended timeline that would result in secondary aesthetic impacts (four years) would not extend beyond completion of reclamation work. The extension is one third of the previously anticipated timeline for TRP operations (12 years), but much shorter than the lifespan of all GSM operations to date (50 years). Beneficial impacts to landform restoration and revegetation would extend long-term, as analyzed in the AMD 017 Final EIS. **F-** Frequent. The potential secondary aesthetic impacts from removal and concurrent reclamation of TSF-1 would occur frequently during the additional four years of operation, but would cease once reclamation has been completed. **U/F**- Not unique or particularly fragile.	Certain	N/A	N/A	No
9. Demands on Environmental Resources of Land, Water, Air, or Energy	No direct impacts. Secondary impacts- extended timeline for TRP operations and associated water and energy use.	**S-** Minor. The extended timeline for TRP operations is based on updated production rate estimates and would not be a direct result of the Proposed Action. As a secondary impact, any current demands for environmental resources would be maintained through the extended TRP operations period. **E**- Small. The use of freshwater from the Jefferson Slough for TRP operations has been reduced, although not entirely eliminated, through internal recirculation and use of recycle water. This would continue through the extended TRP operations. The energy demands associated with facilities would continue through the extended TRP operations, and the use of the South Ramp Well would be comparable to the failed South Well. **D-** Short Term. The extended timeline that would result in secondary impacts (four years, until approximately 2038) would not extend beyond TRP operations. The extension is one third of the previously anticipated timeline (12 years), but much shorter than the lifespan of all GSM operations to date (50 years). Demands for environmental resources would be extended by approximately four years, until the anticipated reduction for the reclamation timeframe.	Certain	N/A	Continuation of AMD 017 plans to reduce the use of Jefferson Slough water, by utilizing internal recirculation and use of recycle water.	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)
		F- Continuous. Current resource demands would be maintained through the extended timeframe for TRP operations. **U/F**- Not unique or particularly fragile.				
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 direct impacts. Secondary impacts- extended timeline for TRP operations and employment.	**S-** Minor. The extended timeline for TRP operations is based on updated production rate estimates and would not be a direct result of the Proposed Action. As a beneficial secondary impact, current employment levels would be maintained through the extended TRP operations period. **E**- Medium. The retention of existing employment levels would include personnel living in different portions of Jefferson County and other nearby counties, but the extent of employment is not anticipated to change from current conditions. **D-** Short Term. The extended timeline that would result in secondary employment impacts (four years, until approximately 2038) would not extend beyond TRP operations. The extension is one third of the previously anticipated timeline (12 years), but much shorter than the lifespan of all GSM operations to date (50 years). Beneficial impacts to employment would be extended by approximately four years, until the anticipated reduction in workforce for the reclamation timeframe. **F-** Continuous. Current employment levels would be maintained through the extended timeframe for TRP operations. **U/F**- Not unique or particularly fragile.	Certain	N/A	N/A	No
14. Local and State Tax Base and Tax Revenues	No direct impacts. Secondary impacts- extended timeline for TRP operations, employment, and taxes.	**S-** Minor. As a beneficial secondary impact, the current employment and production levels, along with associated tax base and revenues, would be maintained through the extended TRP operations period. **E**- Medium. It is not anticipated that the retention of existing employment and production levels would change the extent of tax base and revenues from current conditions, which may include Jefferson County and other nearby counties. **D-** Short Term. The extended timeline that would result in secondary tax base and revenue impacts (four years, until approximately 2038) would not extend beyond TRP operations. The extension is one third of the previously anticipated timeline (12 years), but much shorter than the lifespan of all GSM operations to date (50 years). Beneficial impacts to tax base and	Certain	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)
		revenue would be extended by approximately four years, until the anticipated reduction for the reclamation timeframe. **F-** Continuous. Current employment and production levels would be maintained through the extended timeframe for TRP operations. **U/F**- Not unique or particularly fragile.				
15. Demand for Government Services	No direct impacts. Secondary impacts- extended timeline for TRP operations, employment, and demands for government services	**S-** Minor. The extended timeline for TRP operations is based on updated production rate estimates and would not be a direct result of the Proposed Action. As a secondary impact, current employment and any associated demands for government services would be maintained through the extended TRP operations period. **E**- Medium. The retention of existing employment levels would include personnel living in different portions of Jefferson County and other nearby counties, but the extent of demands on government services is not anticipated to change from current conditions. **D-** Short Term. The extended timeline that would result in secondary demands for government services (four years, until approximately 2038) would not extend beyond TRP operations. The extension is one third of the previously anticipated timeline for TRP operations (12 years), but much shorter than the lifespan of all GSM operations to date (50 years). Demands for government services would be extended by approximately four years, until the anticipated reduction for the reclamation timeframe. **F-** Continuous. Current employment and any associated demands for government services would be maintained through the extended timeframe for TRP operations. **U/F**- Not unique or particularly fragile.	Certain	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 direct impacts. Secondary impacts- extended timeline for TRP operations and employment.	**S-** Minor. The extended timeline for TRP operations is based on updated production rate estimates and would not be a direct result of the Proposed Action. As a secondary impact, current employment and the density and distribution of population and housing would be maintained through the extended TRP operations period. **E**- Medium. The retention of existing employment levels would include personnel living in different portions of Jefferson County	Certain	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)
		and other nearby counties, but the extent of population and housing is not anticipated to change from current conditions. **D-** Short Term. The extended timeline that would result in maintaining current employment levels (four years, until approximately 2038) would not extend beyond TRP operations. The extension is one third of the previously anticipated timeline for TRP operations (12 years), but much shorter than the lifespan of all GSM operations to date (50 years). Current employment levels would be maintained for approximately four years, until the anticipated reduction for the reclamation timeframe. **F-** Continuous. Current employment and the density and distribution of population and housing would be maintained through the extended timeframe for TRP operations. **U/F**- Not unique or particularly fragile.				
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 drilling equipment and mining equipment used to plug Portal #3.	**S-** Minor: Use of equipment for drilling and portal plugging activities associated with the Proposed Action would result in low quantities of GHG emissions (63.5 to 69.8 metric tons CO_2e) **E-** Small: GHG emissions would occur within the project area and areas beyond the project area where GHGs are emitted before being diluted into the atmosphere. **D-** Short Term: Drilling would conclude within approximately 15 days (less than mine life), while future use of the dewatering well (beyond mine life) does not directly increase potential emissions. **F-** Infrequent. Drilling would conclude within approximately 15 days. Additional replacement well drilling (similar duration) is considered unlikely, but this is considered as a contingency if the new replacement well is incapable of sufficient dewatering in the future. **U/F-** Not unique or particularly fragile.	Certain	Insignificant- The estimated emissions of 63.5 to 69.8 metric tons CO_2e would contribute up to approximately 0.000146% of Montana's annual emissions (47.77 million metric tons CO_2e).	N/A	No

1. **Severity** describes the density at which the impact may occur. Levels used are none, negligible, minor, moderate, major.
2. **Extent** describes the land area over which the impact may occur. Levels used are none, 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

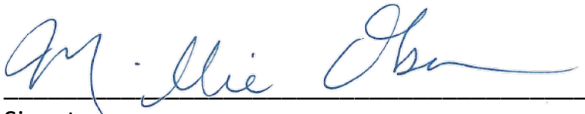
Environmental Assessment and Significance Determination prepared by:

Derrek Schultz
Reclamation Specialist, Hard Rock Mining Section, Mining Bureau

Garrett Smith
Mining Environmental Scientist- Geochemist, Hard Rock Mining Section, Mining Bureau

Environmental Assessment Reviewed By:
Wayne Jepson
Mining Environmental Scientist- Hydrologist, Hard Rock Mining Section, Mining Bureau

Approved By:



April 2, 2025

Signature Date
Millie Olsen, Hard Rock Mining Section Supervisor
Mining Bureau

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