DEQ
Montana Department of Environmental Quality

Air, Energy & Mining Division

Signal Peak Energy, LLC
Surface Mining Permit C1993017

Bull Mountains Mine #1
Amendment 4
Roundup, MT

November 3, 2023
Final Environmental Assessment

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Montana Department of Environmental Quality
Air, Energy, & Mining Division
Mining Bureau
ENVIRONMENTAL ASSESSMENT (EA)

COMPANY NAME: Signal Peak Energy, LLC
EA DATE: November 3, 2023
PROJECT: Bull Mountains Coal Mine No. 1
PERMIT/LICENSE: Surface Mining Permit C1993017
AMENDMENT #: 4
LOCATION: 46.243250°, -108.405422° **COUNTY:** Musselshell and Yellowstone
PROPERTY OWNERSHIP: FEDERAL X STATE _____ PRIVATE X
MINERAL OWNERSHIP: FEDERAL ___ STATE _____ PRIVATE X

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 mine amendment 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. In this Environmental Assessment (EA), DEQ 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 will decide whether to issue the pending amendment to permit C1993017 pursuant to the requirements of MSUMRA alone. DEQ may not withhold, deny, or impose conditions on the permit based on the information contained in this Environmental Assessment. § 75-1-201(4), MCA.

PROPOSED ACTION

DEQ would approve Amendment 4 (AM4) to Surface Mining Permit (SMP) C1993017, if DEQ has determined that Signal Peak Energy, LLC (SPE) has met the criteria set forth for amendments in Section 82-4-225, Montana Code Annotated (MCA). If approved, the amendment to the permit would be granted to expand mining operations within and outside of the current Bull Mountains Coal Mine No. 1 permit area and add 435 acres to the existing permit area.

PURPOSE AND NEED

DEQ's purpose and need in conducting this environmental review is to act upon SPE's application for a permit amendment for continued mining in compliance with the Strip and Underground Mine Reclamation Act. On February 17, 2023, SPE submitted an application for AM4 to SMP C1993017. DEQ provided an initial completeness deficiency review on March 31, 2023. Deficiency responses and updates to the application were submitted by SPE on April 14, 2023, followed by a second completeness deficiency review from DEQ on May 24, 2023. SPE submitted a second deficiency response on June 30, 2023. Pursuant to ARM 17.24.401(2), DEQ determined, on July 10, 2023, that the deficiency responses and application updates provided are administratively complete to meet the

requirements for amendments in ARM 17.24.401. A public comment period on the administratively complete permit ended on September 8, 2023.

DEQ provided an initial acceptability deficiency review on August 1, 2023. Deficiency responses and updates to the application were submitted by SPE on August 18, 2023. Pursuant to ARM 17.24.404(1), DEQ determined the application acceptable on September 20, 2023.

The applicant's purpose and need in proposing this action is to expand mine production through the addition of one coal mine cut, named Panel 0 "Zero" Right (hereinafter "Panel 0"), to the southwestern part of the current permit area. SPE is the operator of the only active underground coal mine in Montana and the surface of the permit area is a mix of private, state, and federally owned land. The Life-of-Mine (LOM) plan approved by DEQ as Amendment No. 3 (AM3) on July 12, 2016, was estimated to extend mine production for 11.5 years, and included areas that would be mined under federal coal leases. The AM3 mine plan authorization issued by the Office of Surface Mining Reclamation and Enforcement (OSMRE) in 2018 was vacated by the U.S. District Court for the District of Montana on February 10, 2023. This required SPE to immediately stop mining any remaining federal coal authorized under the vacated mining plan. OSMRE will now complete a new Environmental Impact Statement (EIS) under the National Environmental Policy Act (NEPA) to analyze the potential environmental effects of AM3 and an additional proposed mine expansion called AM5.

As an interim measure to provide continued mining capacity at the site, the proposed plan for AM4 includes an expansion to develop one additional panel for longwall mining. The location of the proposed underground mine expansion would connect to the southwest of the five longwall panels approved under Amendment 2 (AM2) in 2012. If approved, AM4 would add 435 acres to the existing permit area of 15,052 acres (new total permit area of 15,487 acres), representing an increase of less than 3% of the current permit area. The legal description for the amended permit area within the AM4 application is provided in Table 1.

Table 1: Legal Description for Amendment No. 4 Area

Section	Portion of Township 6 North, Range 27 East	Acres
19	SW4SW4	39
30	NW4, SW4NE4, SE4 Less Road Corridor Already in Permit Area	356
31	NE4NE4 Less Road Corridor Already in Permit Area	40
	TOTAL	**435**

Mining at the Bull Mountains Mine No. 1 consists of longwall mining and continuous ("room and pillar") mining. The two types of mining work in conjunction. Longwall mining first must have underground access tunnels ("gate roads") developed bordering the future longwall panel. These gate roads are developed by the continuous miner in a room and pillar style. The gate roads are used to move equipment into the panel, convey fresh air to the miners in the panel, and for a conveyor to be installed into the panel for carrying the extracted coal back to the facilities area. Mining in Panel 0 would commence from the northwestern edge of the panel and move down the panel to the

southeast. Mining would go back and forth along the short edge of the panel, traveling down the length to the southeasterly most gate road.

The longwall miner consists of a series of support jacks, called shields, that support the overlying rock ("roof") at the coal face and a cutting arm called the shearer. The shields support the entirety of the overburden above the longwall miner, and they also act to protect workers from roof falls. As the longwall miner cuts coal, it is removed by conveyors. Once a pass of the coal face has finished, the shields advance forward to set for the next cut. Without any support left behind the shields, the overburden over the mined-out area immediately starts to collapse into the void left by the longwall miner and results in subsidence. The collapsed material in the former coal seam is called gob. After mining and subsidence, groundwater will eventually saturate the gob and re-establish groundwater flow paths through the mine area. From observations over past panels, subsidence usually takes two or more years to finish. Gate roads are not designed to immediately subside because pillars of coal are left in place. Gate roads may or may not subside at some point in the future. Backfilling of the mine voids, be it the gate roads or the longwall panel, with mine waste is not currently approved for the Bull Mountains Mine No. 1 permit. All mine processing waste is stored in above ground waste disposal areas (WDAs). However, MSUMRA does allow for an operator to backstow or backfill voids with approval from DEQ to mitigate subsidence and/or to permanently store mine waste; any change to the handling of mine waste would require a revision to the permit and a separate environmental analysis.

The proposed expansion of the permit area would increase by 435 acres across privately owned land; additional mining would also occur inside the already approved permit area underneath BLM land. The proposed underground mine cut—Panel 0—would occur beneath 420 acres and approximately 280 acres of coal would be mined within the proposed panel. The mine cut area includes approximately 103 acres of private land within the expanded permit area, approximately 19 acres beneath Bureau of Land Management (BLM) land that is already contained within the permit area, and the remainder is private land already contained within the permit area. No specific surface disturbance features are proposed with this amendment; however, previous longwall mining indicates that approximately 5 acres of disturbance may occur for additional boreholes, small pads, minor roads, and crack repair. Potential surface disturbance and the associated impacts are discussed in this EA, but the exact location of any boreholes, pads, roads, subsidence cracks, and/or crack repair actions cannot yet be determined. Construction of any surface infrastructure would require a minor revision to the permit, and an additional EA would be completed during review of the borehole and pad design. Bond amounts would be reviewed at the time of permitting, and additional bond may be required for construction of boreholes or crib pads. SPE would be required to submit specific permit revisions and supplemental information, including maps certified by a professional engineer, before the surface features and activities would be authorized by DEQ under MSUMRA.

If approved, AM4 would add the reserves listed in Table 2 below.

Table 2: Additional Minable and Recoverable Coal (Tons)

Type of Mining	Coal Tons in Place	Percent Minable	Minable Tons	Percent Recoverable from Wash Plant	Recoverable / Saleable Tons
Longwall Miner	4,157,000	100%	4,157,000	83%	3,450,000
Continuous Miner	1,942,000	36%	699,000	83%	580,000
Total	6,099,000		4,856,000		4,030,000

No conceptual changes to the reclamation plan are proposed since AM4 only addresses expansion of the permit area to allow continuation of underground mining. The existing requirements for reclamation would apply to current surface features and potential disturbance associated with this amendment. General plans for the mitigation of impacts to springs, seeps, and drainages were included in SMP C1993017 when originally approved. Site specific plans for the repair or mitigation of impacts related to subsidence or other mining impacts would be developed as they are identified.

TIER AND INCORPORATE BY REFERENCE

The proposed modifications through AM4 to the previously evaluated permit include the addition of 435 acres to the permit area and the expansion of underground mining through Panel 0. The impacts of these changes are disclosed in this EA. For the project features that would not change as part of the Proposed Action, DEQ is tiering and incorporating by reference the previously completed Final Environmental Impact Statement completed in 1992 for the Meridian Minerals Company Bull Mountains Mine No. 1 (DSL, 1992a); the EA completed in 2016 for AM3, LOM (DEQ, 2016); and the EA completed in 2017 for TR3 – Major Revision for Waste Disposal Area (WDA) 2 (DEQ, 2017).

Table 3: Summary of Activities Proposed in Application

Summary of Proposed Activities in Application	
General Overview	The Bull Mountains Coal Mine No. 1 is an underground mine. Through AM4, SPE proposes the addition of one coal mine cut, named Panel 0, to the southwest part of the permit area. The underground mining on site consists mainly of longwall mining, supported by some continuous miner (room and pillar) mining. The proposed expansion of the permit area would increase by 435 acres across privately owned land, increasing the total permit area from 15,052 acres to 15,487 acres (<3% change from current). The proposed mine cut area would occur underneath 420 acres, with approximately 280 acres of coal to be mined within the proposed panel. No specific surface disturbance features are proposed with this amendment, however previous longwall mining indicates that approximately five acres of surface disturbance may occur for additional boreholes, small pads, minor roads, and potential crack repair. The exact location of any boreholes, pads, roads, subsidence cracks, or crack repair actions cannot yet be determined. Any surface infrastructure would require a revision to the permit and separate environmental impact analysis. The new panel would be mined immediately upon approval and production would occur for approximately one year. The current surface land uses within the amendment area consist of grazing and wildlife habitat. Grazing and wildlife habitat are also the approved post-mine land uses.
Proposed Dimensions	
Total new permit area (acres)	435
New underground mine cut area (acres)	420
Current disturbance (acres)	742
LOM approved disturbance (acres)	1,102
Total new surface disturbance	No new disturbance is proposed with this application.
Specific Proposed Activities	
Duration and Timing	Panel 0 would be mined immediately upon approval and production would occur for approximately one year. This activity would not represent an extension of the LOM timeframe approved by DEQ for AM3 in 2016, which could extend through 2024 or 2025 depending on production rates.
Equipment	There would be no changes to the current equipment used at the site. Above ground equipment currently includes: 1 ATV, 1 compactor, 1 crane, 11 dozers, 6 excavators, 6 forklifts, 1 grader, 9 haul trucks, 25 light duty trucks, 4 loaders, 2 manlifts, 14 skid steers, 2 telehandlers, and 2 water trucks. Underground equipment currently includes: 1 longwall miner, 1 continuous miner, 34 mantrips, 2 graders, 1 petitto mule (longwall shield retriever), 3 scoops, and 10 tractors.
Location and Analysis Area	Panel 0 would extend to the southwest of the current permit area, with an increase of 435 acres across privately owned land. The proposed mine cut area would occur underneath 420 acres, with approximately 280 acres of coal to be mined within the proposed panel. This area includes approximately 103 acres within the expanded permit area, approximately 19 acres underneath BLM land that is already contained within the permit area, and the remainder is private land already contained within the permit area. Unless specifically stated in the following discussion of resources, the analysis area for this EA includes the area contained by the expanded permit boundary, which encompasses any area that may overly the underground mine expansion.
Personnel On-site	The expansion of underground mining would not change the current personnel or employment at the site, which includes 255 employees and 30 full-time, temporary contractors.

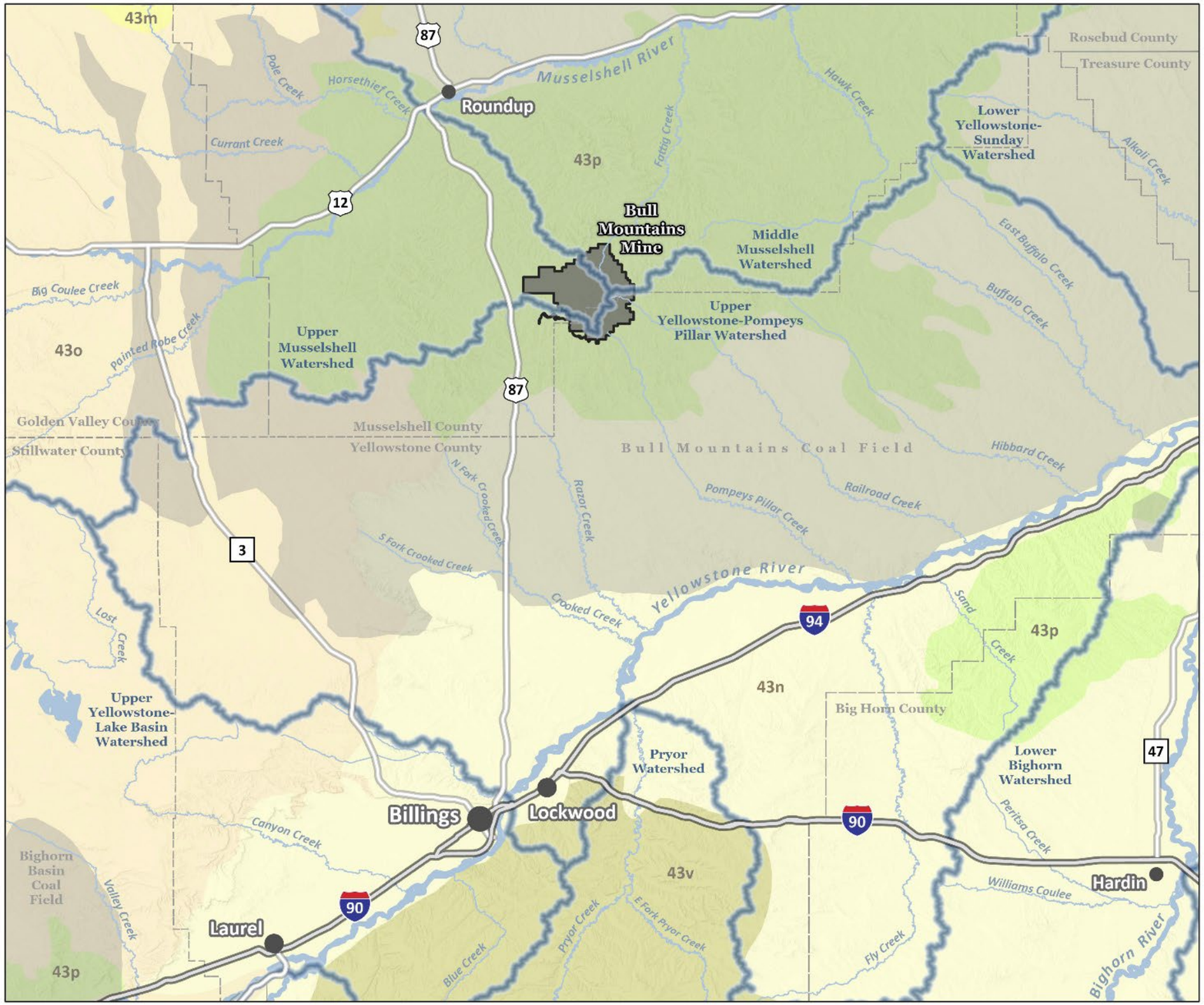
Structures	The expansion of underground mining would not change the current structures and facilities at the site, which include offices and bath house, shops and warehouses, fueling pads, a rail loop and loadout, sediment control ponds, a conveyor, prep-plant, and plant press, power line substations, explosives magazine, storage silos, thickener plant, stack tubes, and crusher. These facilities can be generalized into three categories: 1) support for underground mining, 2) processing of extracted coal for loading onto trains, 2) processing of waste material to remove water and ready for compaction and disposal in the waste disposal area (WDA).
Project Water Source	The expansion of underground mining would not change the current use of water at the site, which is currently provided by Mammoth Coal water produced while dewatering the mine. Deep Madison wells have been used in the past for production water and may be used again if Mammoth Coal water is not sufficient. Potable water is supplied to the office area from a deep underburden well in the facilities area.
Supplemental Lighting	The expansion of underground mining would not change the current use of surface lighting at the site, which includes 24-7 fixed lighting of the main facilities area and the occasional use of supplemental lighting. Two to three mobile light plants are used in dark hours in the WDA; their locations move depending on where the coal processing waste is being placed. Equipment lights are used on operating equipment in dark hours throughout the facilities area. Mobile light plants are infrequently used for emergency projects and urgent repairs such as borehole drilling and equipment maintenance. The limited surface activities that may be associated with the underground mine expansion (borehole drilling, minor roads, subsidence cracks, repair actions) would not occur at night unless an emergency borehole or crib pad construction was required.
Air Quality	The expansion of underground mining would be a continuation of current site activities that may affect air quality, which include mobile equipment, facilities, roads, boilers, coal stockpiles and fugitive dust from wind erosion of soil and spoil stockpiles. The applicant is required to comply with the applicable local, county, state, and federal requirements pertaining to air quality. The operator maintains an air quality permit with Montana DEQ (MAQP #3179-12) for the coal preparation plant and coal handling facilities.
Water Quality and Quantity	The expansion of underground mining would be a continuation of current site activities that may affect water quality and quantity. Potential impacts to surface waters are generally confined to those impacts resulting from land subsidence, facilities area and WDA disturbance, and peripheral infrastructure (permit areas not including the main facilities and WDAs). These potential impacts are evaluated by monitoring water quantity and quality from a network of spring, stream and pond monitoring stations. The applicant is required to comply with the applicable local, county, state, and federal requirements pertaining to water quality and quantity. The operator maintains an industrial multi-sector general industrial permit (SWPPP MTR000499), a multi-sector general construction permit (SWPPP MTR106575, MTR110051, MTR110025, and MTR109874), and a surface water individual permit (MPDES MT028983). Permit MTR000499 covers storm water discharges from access roads, the rail loop, and overland conveyor belt. Permit MTR106575 covers storm water discharges from construction of the rail spur, MTR110051 covers storm water discharges from construction of Crib Pad 9, MTR110025 covers storm water discharges from Crib Pad 8, and MTR109874 covers storm water discharges from construction of Portal 4. Permit MT028983 covers mine discharges from outfalls at the main facilities area. A septic tank / drain field treats sewage and other wastewater from potable systems at the facilities area, and the mine also treats water from the deep under burden for use as a public water supply for the office area.

Erosion Control and Sediment Transport	The expansion of underground mining would be a continuation of current site activities that may require controls for erosion and sediment transport, which include use of existing sediment control ponds in the facilities area to hold, at minimum, the 10-year, 24-hour precipitation event and ditching in the facilities area to route runoff to a designed pond. The limited surface activities that may be associated with the underground mine expansion (borehole drilling, minor roads, subsidence cracks, repair actions) would occur under currently approved methods for controlling erosion and sediment transport. This strategy includes permit commitments to use straw wattles and or silt fences adjacent to fill slopes where necessary, diverting runoff around drill pads, containing runoff from drill pads within the footprint of the site, and separating the toe of any fill material used for pad construction from the strip perimeter to prevent sediment from moving onto undisturbed ground. The applicant is required to comply with the applicable local, county, state, and federal requirements pertaining to erosion control and sediment transport.
Solid Waste	The expansion of underground mining would be a continuation of current site activities that may include the generation, management, and disposal of solid waste. These activities include the placement of some non-coal rock in the WDA, and the placement of garbage and non-mineral waste in commercial dumpsters to be disposed of by a licensed commercial trash service. The applicant is required to comply with the applicable local, county, state, and federal requirements pertaining to solid waste.
Cultural Resources	The expansion of underground mining would be a continuation of current site activities that may affect cultural resources in the area. Cultural sites have been identified within the mine expansion area and some are located over the panel where subsidence could occur. Eleven sites have been identified above the underground mining disturbance area, including over the gate roads (room and pillar mining used to access the longwall panel) and longwall panel. Two additional sites are identified to be near the panel, but not directly above, so may require archeological monitoring. Of the eleven sites, six are identified as Historic Properties and thus eligible for listing in the National Register of Historic Places (NRHP) and would require mitigation. The limited surface activities that may be associated with the underground mine expansion (borehole drilling, minor roads subsidence cracks, repair actions) would occur under currently approved plans for mitigating impacts to cultural resources. The applicant is required to comply with the applicable local, county, state, and federal requirements pertaining to cultural resources.
Hazardous Substances	The expansion of underground mining would be a continuation of current site activities that may include the generation, management, and disposal of hazardous substances. Grease, lubricants, paints, and flammable liquids are stored in steel drums at a designated area in the facilities and periodically picked up by, or delivered to, an appropriately licensed and bonded liquid waste disposal company. Accidental spills of contaminants are handled by mine personnel by removing contaminated soil and placing the material in leak proof containers for processing by a licensed facility; contaminated soils are not retained or treated on site. The permittee has no plans to generate any hazardous waste at the mine operations that would require handling according to the Resource Conservation and Recovery Act. If the permittee handles any such waste materials that are listed as hazardous, these materials would be picked up at the mine site by a licensed agent and transported to a licensed disposal site. Records of contaminated soil disposal are kept for a minimum of one year on site. The applicant is required to comply with the applicable local, county, state, and federal requirements pertaining to hazardous substances.

Reclamation Plans	No conceptual changes to the currently approved reclamation plan are proposed, since AM4 only addresses expansion of the permit area to allow continuation of underground mining. The existing requirements for reclamation would apply to the current surface features and potential disturbance areas associated with this amendment. The reclamation steps include removal of topsoil in two lifts, grading of subsidence features and/or supplemental facilities areas and roads, replacement of soil in two lifts, seeding of the area with an approved seed mix, and temporary sediment control measures around the disturbance area until vegetation is reestablished. Site specific plans for the repair or mitigation of impacts related to subsidence or other mining impacts would be developed as they are identified.
Cumulative Impact Considerations	
Past Actions	The Roundup area has had numerous small surface and underground coal mines. These mines existed prior to the enactment of MSUMRA and were not regulated by DEQ. The largest mines were the Divide (or Carlson) Mine and the adjacent Gildroy Mine, each with about 70 to 80 acres of underground room and pillar mining. These mines are approximately 1.5 miles south of the Bull Mountains Mine No. 1 facilities portals area, and the operators extracted Mammoth coal. The Divide Mine also had a small surface mine operation. Other small mines near the permit area include the Akenson Mine, Buckey Mine, Holland Mine, and a few locations for Northern Pacific Mining. Two mines, the PM Mine and Meridian Test Pit, are the predecessors of Bull Mountains Mine No. 1. The PM Mine included 51 acres of room and pillar mining. The Meridian test pit included 90 acres of strip mining that were reclaimed upon completion of mining. The PM Mine was operated as an underground coal mine in the 1930's that was converted to a surface mine in 1972 by the Maged Family. In 1989, Meridian Minerals Company (Meridian) opened the Meridian Test Pit surface mine to the southeast. P.M. Coal Company then reopened the underground mine in 1991. The Meridian Test Pit surface mine and the underground mine combined were termed the Bull Mountains Mine. The remaining mines in the area were all much smaller underground operations that used room and pillar or other simple mining techniques and have been abandoned. The majority of mines are located where the Mammoth coal crops out at the surface, and that seam is the coal seam that was most likely mined. The operator is currently permitted to mine 15 longwall panels and their associated gate roads. Each longwall panel at the Bull Mountains Mine No. 1 consists of a large block of coal, approximately 1,250 feet in width by 15,000 feet to 23,300 feet in length. Some small areas of room and pillar mining, through the use of a continuous miner, are also approved in areas near the facilities. As of July 2023, Panels 1 through 9 have been mined, and work on Panel 10 has been started. Gate roads for Panel 10 have been fully developed. Due to a temporary moratorium on mining federal coal, Panel 9 was abandoned 2,600 feet short of its full length, and Panel 10 would likewise be shortened to avoid federal coal sections. Approximately 5,000 acres of longwall panels and 700 acres (not including pillars) of continuous miner room and pillar mining have been mined as of July 2023. Subsidence has been measured over Panels 1 through 7. Most subsidence has been between five and seven feet in depth and has been mostly confined to the footprint of each panel. Areas that experience a greater amount of subsidence are generally associated with areas of thicker overburden, while areas that experience a smaller amount of subsidence are generally associated with areas of thinner overburden. Some minor subsidence (less than three feet in depth) has been measured over a few gate roads, especially between Panels 2 and 3 and again between Panels 4 and 5, but this subsidence was from the longwall panels; no gate roads have collapsed or subsided to date. Surface expression of subsidence includes linear surface fractures, minor rockslides, and small sink-like depressions (approximately five feet in depth).

Present Actions	Although the federal mine plan has been recently vacated until a revised federal EIS is published, the mine still retains an approved mine plan for Panels 1 through 15 under Montana DEQ. Underground mining would continue where possible and the existing surface facilities would continue to be utilized to support mining operations, manage and dispose waste materials, and to prepare, load, and transport coal away from the site. If authorization to access federal coal is reinstated, the mine would resume its plan to mine the remainder of Panels 10 through 15. Current land uses on the surface of the permit area consist primarily of grazing and wildlife habitat. Some residential land parcels are located in the northern portion of the mine area. One domestic well owned by Dale Wallace is planned to be undermined and replaced with the development of Panel 12. Numerous residential homes are located in rural subdivisions to the north and to the west of the mine. Facilities discharge permit MT028983 has been administratively continued since 2018. An update to the discharge permit is currently under review by DEQ. A modification to air permit MAQP #3179-12 is currently under review by DEQ. Changes to the air permit would undergo a separate Environmental Assessment by DEQ.
Related Future Actions	Unplanned potential surface disturbance may be associated with this amendment and the impacts are discussed in this EA, but the exact location of any boreholes, pads, roads, subsidence cracks, and/or crack repair actions cannot yet be determined. SPE would be required to submit specific permit revisions and supplemental information, including maps certified by a professional engineer, and a review of bonding, before the surface features and activities would be authorized by DEQ under MSUMRA. Repair of subsidence cracks does not always require a minor revision. Before mining of federal coal can continue, OSMRE must complete an updated EIS under NEPA to analyze the potential environmental effects of the AM3 mine plan, including potential effects on climate from project-related greenhouse gas emissions. The EIS would analyze the potential environmental effects of mining all the federal coal under the originally proposed AM3 mine plan, including the mining that already occurred under the now-vacated approval, and the mining of the remaining federal coal. The OSMRE EIS would also consider an additional amendment (AM5) currently pending with DEQ, which would add 7.1 million tons of federal coal to the mining plan. SPE submitted the application for AM5 on June 2, 2023; this application is under review by DEQ for administrative completeness. AM5 would expand Panel 15 from a half panel to a full panel and add room and pillar mining via the continuous miner to the northern and eastern perimeter of the current permit boundary. AM5 would expand the permit boundary to the east/northeast by 3,713 acres while adding 1,330 acres to the underground mine plan footprint with an estimated addition of 14.2 million tons of coal, approximately half of which is federal coal. The proposed LOM could be extended by approximately four years beyond what was previously approved in AM3. SPE submitted to DEQ an application for a major permit revision (TR4) on September 12, 2022, that would raise the elevation of the waste disposal area by 180 feet and increase capacity by 28.5 million tons. This application is currently under deficiency review and has not been approved. This proposed revision would expand the capacity of waste disposal to allow future operations, but it is not required for the implementation of the Proposed Action in this EA (AM4), and the revision would be analyzed as a separate action for DEQ's review of potential environmental impacts.

Figure 1: General Location Map



Signal Peak Energy, LLC
Bull Mountains Mine
AM4 Amendment Application

Regional Overview

- Mine Permit Area
- Coal Field
- Watershed (HUC 8)

Ecoregion (Level IV)*

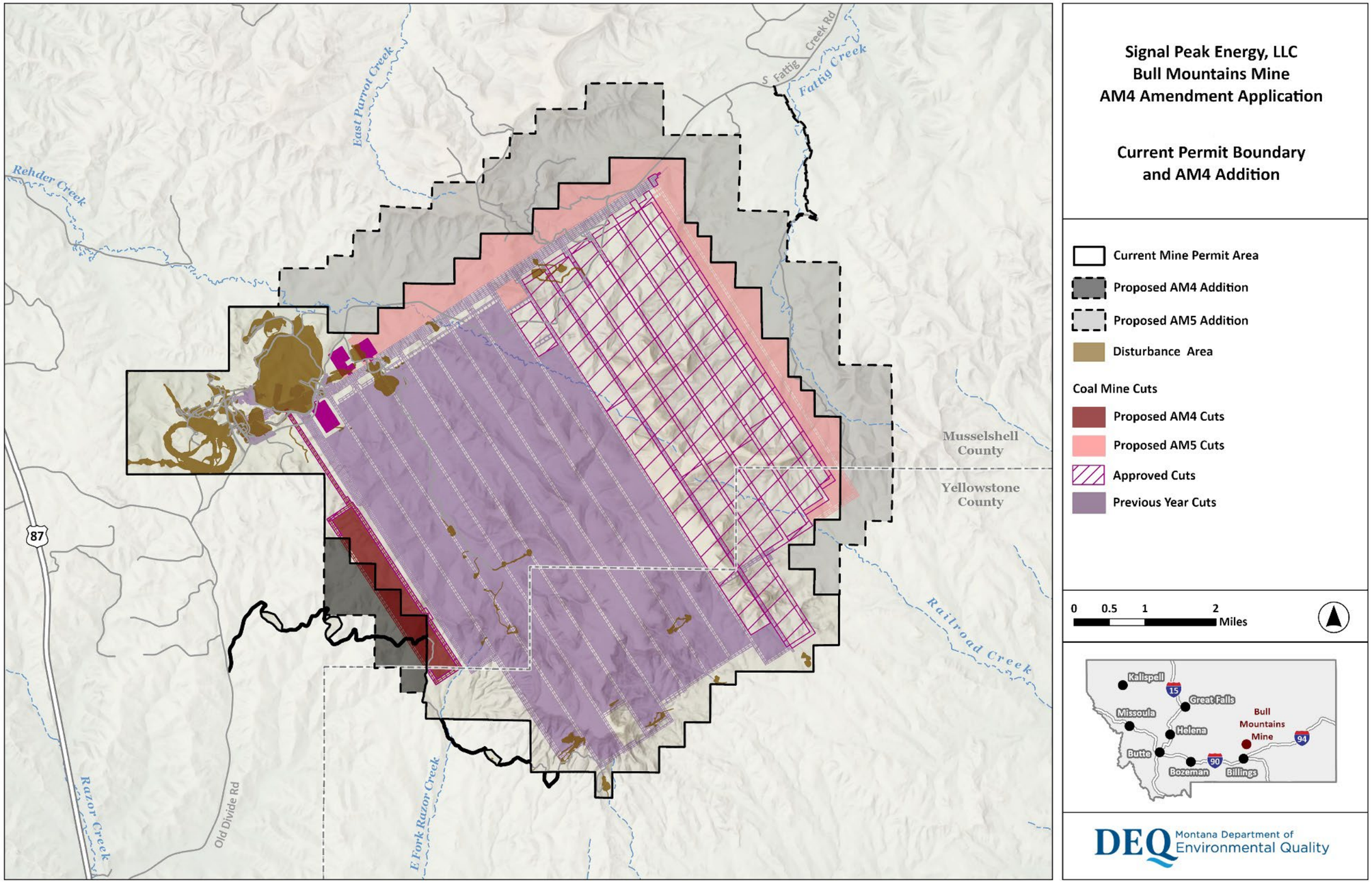
- 43m: Judith Basin Grassland
- 43n: Montana Central Grasslands
- 43o: Unglaciated Montana High Plains
- 43p: Pine Scoria Hills
- 43v: Pryor-Bighorn Foothills
- Town (Population > 1,000)

* The entire area of interest is within the Northwestern Great Plains Level III Ecoregion.

0 5 10 20 Miles

DEQ Montana Department of Environmental Quality

Figure 2: Amendment 4 Proposed Action



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 of the Proposed Action when considered in conjunction with other past and present actions related to the Proposed Action by location and generic type. ARM 17.4.603(7). 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. *Id.* The projects identified in Table 1 were analyzed as part of the cumulative impacts assessment for each resource.

1. GEOLOGY AND SOIL QUALITY, STABILITY AND MOISTURE

Are soils present, which are fragile, erosive, susceptible to compaction, or unstable? Are there unusual or unstable geologic features? Are there special reclamation considerations?

The area of proposed mining would be in Musselshell County, near the town of Roundup, Montana and approximately 50 miles north of Billings, Montana. The permit area for Bull Mountains Mine No. 1 and the proposed amendment area are situated in the Bull Mountains that range in elevation from about 3,700 feet to 4,700 feet. Geologic information is described in previous environmental reviews (DSL, 1992a) (DEQ, 2016) (DEQ, 2017) and summarized here to provide background information for AM4. Tertiary age continental rocks (alternating sandstones, siltstones, shales, clinker, and coals) of the Tongue River member of the Fort Union Formation outcrop in the area and are the principal rock units that would be disturbed by expanded longwall coal mining under AM4. Topography of the area is a rugged, generally mountainous terrain, dissected by ephemeral streams with higher areas or plateaus commonly capped by resistant sandstone and clinker. Resistant clinker is formed when coal burns in situ, causing metamorphic changes to the overburden.

Soil survey data are described in previous environmental reviews (DSL, 1992a) (DEQ, 2016) (DEQ, 2017) and in section 17.24.304(1)(k) of the permit. There are nine well developed soil series in the permit area and vicinity that are dominated by silty or sandy loams. Some of these soils are reported to have moderate to high susceptibility to wind and water erosion. The area has been previously disturbed through fire, grazing, and general rangeland use.

Areas of currently approved surface disturbance include facility areas like office buildings, roads, a rail loop, ponds, and support for the processing of the coal. Soil and suitable material salvage associated with development of the waste disposal area

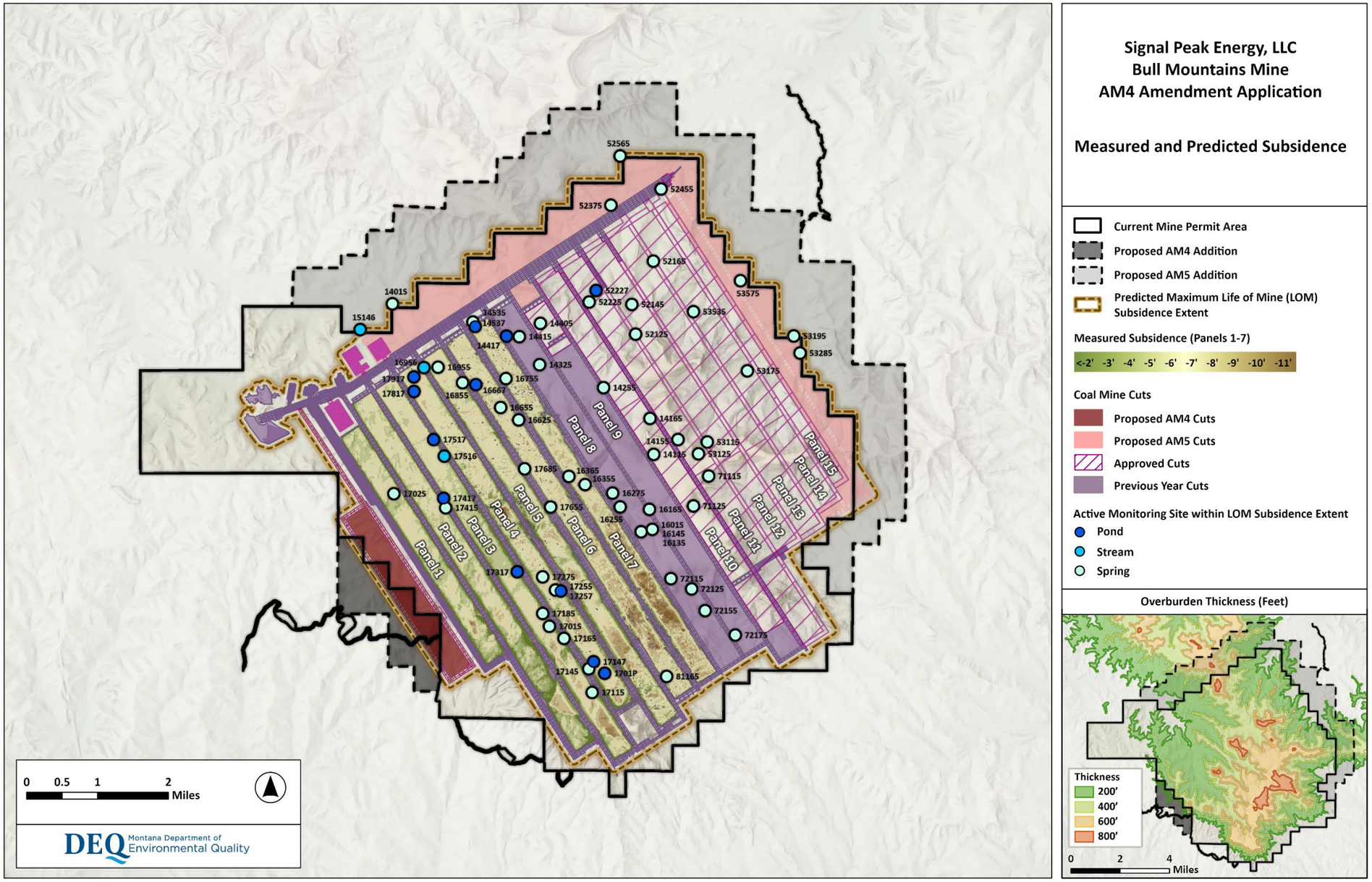
(WDA) created the largest surface disturbance outside the facilities area. Salvage was conducted within the conditions of law and rules while following permit commitments for soil handling and protection of the soil resource (DEQ, 2017). The reclamation requirements for various surface features and the replacement of suitable materials and soil are further described within previous analyses (DSL, 1992a) (DEQ, 2016) (DEQ, 2017).

Direct Impacts:

Resembling previously mined areas, the Mammoth coal seam would be the primary target for mine production in the 420-acre mine cut area proposed through AM4. Mining would occur beneath approximately 280 acres within the proposed panel. Coal in Panel 0 is approximately eight feet thick, thinner than in panels that have been previously mined. This material would be permanently removed during mining under the proposed action. Panel 0 is near the Mammoth coal outcrop, and the seam thins to the west of Panel 0. Overburden ranges from 200 to 600 feet thick, with most of the area under 400 feet or less of overburden. The coal in Panel 0 has less overburden than areas that have been previously mined.

Other areas of existing disturbance (e.g. facilities areas) were previously permitted with a reclamation plan that follows applicable rules and regulations set forth in the Administrative Rules of Montana (ARM). The operation of these facilities would continue through the mine activities proposed for Panel 0, within the previously approved LOM timeframe. No disturbance or salvaging of soil or suitable material is being requested through this amendment, and the existing permit requirements for material replacement and reclamation of surface features would not change under this amendment.

Figure 3: Overburden Thickness and Subsidence measured over Panels 1 through 7



Secondary Impacts:

The expansion of underground mining under AM4 could result in very little surface disturbance, which may include an area up to 5 acres for borehole drilling, minor roads, and subsidence crack repair actions. The installation of boreholes may be required for a few reasons: 1) emergency breathable air boreholes, 2) utility boreholes, and 3) mitigation boreholes. Emergency breathable air boreholes are constructed to provide air to underground workings. These are no longer required by MSHA because the mine is designed with rescue chambers at specific underground locations. However, MSHA may still direct the operator to install an air borehole. Utility boreholes are constructed to provide operational surface support, such as a supply of pumpable cribbing material, communications, electricity, or compressed air to the underground workings. Mitigation boreholes are constructed to maintain compliance with MSHA ventilation or roof control plans, in response to underground roof falls, or as otherwise directed by MSHA. These boreholes may be used for lowering equipment such as thermal cameras, air sampling equipment, injection of nitrogen gas, and/or concrete. All three types of boreholes require approval through a minor revision process, and an additional EA would be completed during review of the borehole and pad design. Bond amounts would be reviewed at the time of permitting, and additional bond may be required for construction of boreholes or crib pads. However, in the event of an immediate emergency where there is an immediate risk to health and safety and/or an immediate need to protect the facilities (such as the need for an emergency breathable air borehole), a borehole may be constructed without prior approval. In such cases, DEQ would be notified at the earliest opportunity of the location and construction of the borehole.

Secondary impacts may occur in surface soil disturbance through subsidence cracks. These impacts to date have been very localized and low frequency. Where cracks occur in steep terrain of southern aspect slopes the greatest impacts occur. These slopes are challenging for access and repair, and the southern aspect proves difficult to establish vegetation. These crack surfaces may experience increased soil erosion compared to adjacent areas until filling with sediment or equilibrating naturally, but the extent would be relatively small.

Previous mining experience shows that upon removal of the Mammoth coal seam (10 to 12 feet thick), the thinly bedded overburden fractures and collapses into the mine void. Subsidence features generally include minor surface cracks, although cracks with widths of a few feet wide or scarps with a few feet of differential movement may occur. Maps of subsidence from previous mining panels were submitted with the AM4 application, and they indicate vertical displacement that ranges from less than one foot up to eleven feet, with an average of five to nine feet. This degree of subsidence has been observed over the open voids in recovery rooms and longwall panels, while narrower gate roads and access adits may or may not collapse.

Based on subsidence monitoring results found on permit Maps 901-F (A-G) Mine Subsidence, areas with greater subsidence values are generally associated with areas of thicker overburden and thicker coal seams, while areas that sustain smaller subsidence values are generally associated with thinner overburden and thinner coal seams (see Figure 3). Due to the shallower overburden and thinner coal seam associated with Panel 0, it would be expected that subsidence would be on the lower side of what has been observed to date. Based on subsidence measured in Panels 1 and 2, Panel 0 would be expected to generally have 6 feet or less of subsidence; however, it could sustain up to 9 feet of subsidence in some areas.

Proposed mining activities under AM4 would further increase the potential of the ground surface directly above the panel and within the angle of draw to be adversely affected by subsidence. Shallow sink-like depressions, linear surface fractures, and minor rockslides associated with previous subsidence have not had a noticeable effect upon the soil profile. Upon the completion of mining, cracks that interrupt the flow of water or sustain soil disturbance and that can be safely accessed without causing damage to the existing land surface would be repaired. Repairs consist of windrowing topsoil to allow room for repair work, crack manipulation or filling if necessary, and then respreading topsoil. This practice has been observed for current mining crack repairs and demonstrates no discernable loss of topsoil into these features. Repair of subsidence features may create additional damage to soils and may not be warranted. However, repair or mitigation of subsidence features would be completed when necessary to restore stream profiles, drainages and ensure that premine land use is maintained.

The exact location of any boreholes, pads, roads, subsidence cracks, and/or crack repair actions cannot yet be determined. SPE would be required to submit specific permit revisions and supplemental information, including maps certified by a professional engineer before the surface features and activities would be authorized by DEQ under MSUMRA.

Cumulative Impacts:

Cumulative impacts to soil and geology consist of the continuation of mining activity adjacent to previously mined areas, causing collapse of the overburden into the mine void and any resultant secondary impacts from surface cracking. The longwall method of mining employed at the Bull Mountains Mine No. 1 has been in place for more than 10 years.

A more detailed discussion of the impacts to date from subsidence, with particular emphasis on hydrologic impact can be found in the Cumulative Hydrologic Impact Assessment (CHIA) attached to DEQ's Written Findings.

2. WATER QUALITY, QUANTITY, AND DISTRIBUTION

Are important surface or groundwater resources present? Is there potential for violation of ambient water quality standards, drinking water maximum contaminant levels, or degradation of water quality?

The project area receives an average of 14 inches of precipitation annually. Surface waters in the Bull Mountains include springs/seeps, streams, and stock ponds. The region is drained by tributaries of the Musselshell and Yellowstone rivers north and south of the permit area, respectively. The nearest intermittent or perennial stream is lower Halfbreed Creek which flows into the Musselshell River approximately 18 miles to the north. Streams within the permit area are ephemeral, flowing in response to precipitation and snowmelt. Surface waters in the region are classified as C-3 waters by the state. The marginal nature of the water quality of C-3 waters in the Bull Mountains limits their ability to naturally support all beneficial uses established for C-3 waters. Ponds in the area are created by landowners to water cattle, and most are instream dams. A wetland survey in the Panel 0 subsidence area was conducted in June 2023, and no wetlands were identified.

The presence of an alluvial valley floor (AVF) is determined by the presence of geologic, hydrologic, and biologic properties necessary to support agriculture, meeting the definition of Section 82-4-203(3)(a) and (b), MCA. An AVF determination was made for Rehder Creek in 1992. This determination found that Rehder Creek north of the WDA down to the confluence with Halfbreed Creek met the criteria for a significant alluvial valley floor (DSL, 1992b). AM4 is partially within the upper watershed of a tributary to Rehder Creek, and mining of AM4 would utilize the facilities area that has MPDES outfall locations that discharge to the AVF.

Numerous springs and seeps are located throughout the permit area, 83 of which are currently monitored for discharge and water quality. A total of 166 springs and seeps have been inventoried by the operator, and most have some water quality or quantity data collected by the permittee. The volume and unpredictable production of water by most of the springs limits their uses to livestock and wildlife. Based on hydrographs and water quality data that cover decades of frequent measurement, few springs have shown negative effects to discharge or water quality from undermining. The variable discharge at all springs appears responsive to precipitation. Most springs have been identified in the permit as sourced from overburden, although Mammoth coal and underburden units are also identified as sources. Baseline water quality conditions have been affected by livestock use and grazing in the Bull Mountains, with most wet areas exhibiting impacts from livestock use.

Currently, 87 groundwater wells are monitored: 32 alluvial, 22 overburden, 15 Mammoth coal, and 18 underburden. Bedrock groundwater flow is generally toward the north-northwest. Groundwater sources include alluvium, overburden, Mammoth coal and underburden. Alluvium is commonly dry in the upper drainages except following precipitation or snow melt; however, alluvium becomes more saturated with distance down Rehder Creek. Perched groundwater is found in the overburden and is limited in quantity. More substantial groundwater sources are the Mammoth coal and two underburden units. Due to the limited thickness of the Mammoth coal, quantity is not adequate for domestic or agricultural uses, and no domestic or stock wells are known that rely upon the Mammoth coal. Reliable and more substantial groundwater sources are found in the underburden units, particularly the confined deep underburden aquifer, which provides domestic needs in the area.

Removal of the Mammoth coal causes drawdown in the aquifer and it is dry where it has been mined. Panel 0 would remove one additional cut (1,200 ft x 9,800 ft) of Mammoth coal to the west of existing mining. Monitoring wells indicate that both the overburden and Mammoth coal in the area of proposed mining typically contain one to two feet of water except during periods of above average precipitation. Drawdown from AM4 in overburden, Mammoth coal, and upper underburden units is predicted to be small due to the current unsaturated state of the coal unit. As overburden collapses into the void where Mammoth coal has been removed, groundwater monitoring wells would be installed in the gob (the postmine water and rock-filled underground mine voids) to monitor the quality and quantity of water as the gob saturates.

Eleven surface water monitoring stations are actively monitored within and outside of the current permit area. Small areas of two ephemeral drainages, Rehder Creek and Razor Creek, would be undermined by Panel 0, creating the potential for subsidence. Impacts to channelized surface flow associated with runoff events are expected to be minimal due to the limited area of drainage affected. Any offsets are considered short-term as they are routinely repaired by the mine. Potential impacts to surface waters from the longwall panels and gate roads are confined to those impacts resulting from land subsidence for drainages and ponds that do not receive spring contributions. Springs may be additionally impacted by groundwater drawdown. Two springs overlying Panel 0 would be undermined. Monitoring at both springs has been suspended as they are consistently dry and would not be impacted.

Ponds for livestock use are likewise monitored at 18 locations across the Bull Mountains. Most ponds are in stream stock dams that fill in response to precipitation runoff events. However, some ponds provide a more consistent supply of water because they are partially or fully sourced by springs. There are no ponds within the Panel 0 footprint, but one pond was identified within the AM4 permit boundary expansion area.

Direct Impacts:

Groundwater is sporadic in the mine area and the surrounding region. The climate is semi-arid, which limits recharge, and the sediments of the Tongue River member of the Fort Union Formation are variable and mostly in the siltstone to very fine sandstone range. Typically for continental lacustrine sediments, natural salinity and sulfate concentrations are fairly high. The Mammoth coal acts as a marginal aquifer, and in some areas localized sandstone units may supply some groundwater from the overburden and underburden. A fairly persistent sandstone unit is found 300-350 feet below the Mammoth coal, generally described as the "deep underburden". As mining proceeds, the Mammoth coal is dewatered and removed. When the longwall equipment is removed, material above the mined-out area subsides. The rocks immediately above the void are fragmented and fall to the mine floor, creating a broken and chaotic zone referred to as "gob". Above the fragmented zone is an interval of fractured rock that mostly subsides as a unit. Above the fractured zone, rocks deform slightly as they subside, but generally do not fracture except at the edges of the panel, where subsided and undisturbed areas meet.

The direct effects of mining include higher hydraulic conductivity in the gob, potentially higher vertical conductivity in the fractured zone, and possible minor changes in gradient within the deformed zone. In the immediate mine footprint and within a short distance around it, flow directions and velocities may change somewhat. Increased vertical conductivity may alter recharge in some areas. Geochemical impacts are likely to occur in the gob and in semisaturated areas. In the natural environment, groundwater flows through preferential paths within the rock. Ion exchange within these pathways is at a fairly stable rate. When the intact rock fractures into gob, the flow pathways change. New opportunities for ion exchange are available, and the system is out of equilibrium. Sodium and sulfate, in particular, would increase in the groundwater as the geochemical regime responds to the changes. Eventually, the groundwater chemistry would establish a new equilibrium level. This new equilibrium is likely to be somewhat higher in salinity and sulfate than the baseline, as increased surface area in the gob would remain. Simple dilution calculations provide a conservative estimate of eventual salinity, and suggest that the final SC will be within the range of pre-mine values. The difference between pre-mine and post-mine salinity will likely be a slightly higher median SC within a similar minimum to maximum range.

There are no springs located over Panel 0. Two springs were identified in baseline downgradient of groundwater flow from Panel 0 near the gate road to access the panel. These springs were monitored in the mid to late 2000s and were consistently recorded as dry, and likely issue from an overburden unit above the Mammoth coal. Because these springs are not located under a zone at risk of subsidence and are above the Mammoth coal, no water quality or quantity impacts to the springs are predicted from mining AM4.

Alluvial and overburden groundwater is only present in scattered areas, and these groundwater units may be temporarily impacted directly over the subsided

panels. The Mammoth coal is almost entirely unsaturated in the area of Panel 0, so most direct impacts would be minimal in that region. The underburden, particularly the deep water producing unit, would show little or no impact from mining.

Secondary Impacts:

Where subsidence features occur within established ephemeral watercourses, the profiles of these drainages may be modified by small ridges held up over barriers, pillars, mains, and gate roads, and by depressions over the longwall panels. Changes to water quality in ephemeral drainageways would be anticipated to be limited to a temporary increase in sediment caused by a change in the drainage profile or from subsidence reclamation activities. Changes in water quantity in ephemeral drainageways would be anticipated to be limited to temporary changes in grade from subsidence causing either an increase or decrease in velocity and ponding of water in drainages over the longwall panels. AM4 would create subsidence over minor unnamed headwaters drainages to Razor Creek and Rehder Creek. Based on subsidence impacts measured to date, the drainage profiles are expected to sag over the longwall panel between the gate roads. Abrupt changes in the drainage profiles are not expected.

Stock ponds are most likely to be impacted by underground mining from subsidence causing cracks in the ponds or disturbing the contributing drainage leading to the pond. AM4 would not undermine any stock ponds, and therefore the application would not have an impact on pond water quality and is unlikely to have any effect on pond water quantity.

Any changes in recharge rate due to fracturing above the fragmented zone would be temporary, as the fractures fill with dislodged sediments or are cemented by precipitation of mineral material.

In some areas, subsidence may bring formerly unsaturated materials below the water table. Increased ion exchange and solution of these materials may raise salinity and sulfate levels in shallow groundwater; the duration of impact and the establishment of a new equilibrium cannot be predicted precisely. Similar to the gob, a new equilibrium would develop, likely slightly higher than baseline.

Secondary impacts to surface water are mostly related to indirect impacts to instream stock ponds. Pond water quality changes are expected to be limited to mostly increased Total Suspended Solids (TSS) and accompanying total metals associated with an increase in suspended solids. TSS may increase if subsidence causes increased erosion in upstream drainages from a change in channel gradient. If continued monitoring reveals impacts to pond water quantity due to subsidence, the operator would be required to reclaim the upstream drainage basin in order to re-establish the premine drainage gradient.

Cumulative Impacts:

Processing waste from AM4 would be placed in the previously permitted waste disposal area (WDA) and would be processed in the previously permitted facilities area. Discharges from outfalls, regulated under DEQ's MPDES program, flow into two ephemeral drainages: P.M. Draw and Rehder Creek. Approval of AM4 would continue the use of the facilities area and WDA. During the life of the mining operation, ditches and culverts are employed to handle surface runoff within and around the mine facilities area. All ditches and culverts are routinely inspected to ensure that accelerated erosion is not occurring at the outfalls. Mining disturbance in the drainage basin above the Rehder Creek AVF has been limited to minor disturbances such as culverts for road crossing, crib pads, and small areas of subsidence reclamation. None of these impacts would measurably impact runoff quantity or quality to the Rehder Creek AVF. Increases in Sodium Adsorption Ratio (SAR) and Specific Conductivity (SC) from surface water discharges under the approved MPDES permit have not created a change in water quality that would significantly impact the capability of the Rehder Creek AVF to support agricultural activities. No additional crib pads or roads for facilities access is proposed with AM4; any disturbance from mine reclamation is predicted to be small and minor.

The additional mining proposed with AM4 is expected to produce the same type of waste coal and rock byproducts which would be added to the approved WDAs. No major changes to the design, operations, or closure of WDA1 or WDA2 were proposed as part of AM4. Water quality samples have been collected from surface water and ground water monitoring sites directly downgradient of the WDA. Water quality samples from the alluvial wells have had total acidity either below detection or one to two orders of magnitude smaller than total alkalinity indicating that the water still maintains a high buffering capacity. There is no indication that the WDA is acid producing. Mining of AM4 is highly unlikely to change the existing geochemistry of the WDA, and it is not predicted to produce acid.

Existing mining from Panels 1 through 9 have already resulted in drawdown in the Mammoth coal in the area of Panel 0. Additional mining would remove more of the Mammoth coal, and this marginal groundwater source is predicted to be eventually replaced with groundwater moving through gob. Gob is the collection of void space and collapsed rock in the longwall panel. Postmine water quality in the gob from mining AM4 is predicted to be a continuation of the postmine water quality predicted from existing approved mining. Mine gob water is predicted to be somewhat higher in total dissolved solids (TDS) than the premine Mammoth coal water quality. The broken overburden filling the mine area would expose a greater surface area of overburden rock to water resulting in greater cation and anion exchange than premine. These newly exposed mineral surfaces increase TDS until dissolution of the minerals is complete and in equilibrium. TDS is predicted to decrease over time and distance from the mine as gob water mixes

with other groundwater sources outside of the mine permit area and with recharge sources. Groundwater outside the permit area is not expected to be significantly affected by the cumulative creation of gob mine water. AM4 is bounded by coal outcrops to the south and west of the panel, which limits the potential for gob water to interact with hydrogeologic units outside of the permit boundary. The deeper confined aquifer in the underburden is forecast to show small but widespread drawdowns at the end of mining. These drawdowns would have a cumulative effect with increasing exploitation of the deep underburden aquifer by expanding subdivisions and residential development near the permit area. Cumulative impacts of mining, residential, and agricultural use of the deep underburden aquifer would not interfere with future development.

Facilities discharge permit MT028983 has been administratively continued since 2018. An update to the discharge permit is currently under review by DEQ. Changes to the discharge permit include but are not limited to removal of outfalls that are no longer needed by the operator in the facilities area.

A more detailed discussion of water quality and quantity impacts to date and the expected interaction between the proposed mining in AM4 and previous and anticipated mining can be found in the Cumulative Hydrologic Impact Assessment (CHIA) attached to DEQ's Written Findings.

3. AIR QUALITY:

Will pollutants or particulate be produced? Is the project influenced by air quality regulations or zones (Class I airshed)?

The closest Class 1 airshed to the project site is the Northern Cheyenne Reservation, approximately 75 miles from the permit area. The immediate area is in compliance with the National Ambient Air Quality Standards.

Direct Impacts:

No direct impacts to air quality are expected due to the proposed action and continuation of mining operations. Some fugitive dust may be anticipated due to the ongoing operations (e.g. run-of-mine storage, coal processing, and haulage), as well as emissions from mobile equipment. SPE must operate within the confines of the approved Air Quality Permit, MAQP #3179-12. The significance assessment is presented in Table 5. Changes to the air permit would undergo a separate Environmental Assessment by DEQ.

Secondary Impacts:

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

Cumulative Impacts:

Impacts to air quality from the proposed action would add to existing impacts from historic mining, current mining, and other industrial activity in the area. A

modification to air permit MAQP #3179-12 is currently under review by DEQ. Proposed changes to the air permit include:

- Increase coal shipping tonnage via semi-truck from 150,000 tons to 700,000 tons annually
- Addition of stoker coal loadout infrastructure (up to 10,000 tons which is included in 700,000 total)
- Addition of two small stoker/clean coal stockpiles (2.4 acres and 1.6 acres) near the Preparation Plant
- Update the air permit mapping and emissions calculations to include Plate Press Building #2 and associated conveyor
- Administrative removal of Ambient Air Monitoring Station previously approved for removal by DEQ in 2017.

4. VEGETATION COVER, QUANTITY AND QUALITY:

Will vegetative communities be significantly impacted? Are any rare plants or cover types present?

The baseline land cover in the project area varies and is dominated by grassland and shrub grassland communities, along with minor areas of thin breaks and rock outcrops located on the surface above the proposed new mine cut. Baseline communities in the mine area are further described in the Final EIS completed for the initial permit application (DSL, 1992a). There are two grazing allotments administered by the BLM in the general area for AM4, known as Dunn Mountain (#05337) and Coal Mine (#03195), which cover approximately 3,222 acres and 6,447 acres, respectively. In addition to public lands under the jurisdiction of the BLM, allotments may include private lands, State lands, and lands under the jurisdiction of other federal agencies.

Direct Impacts:

Expansion of underground mining activities within the proposed amendment would have no direct impact on vegetative communities or ongoing grazing activities in the area.

Secondary Impacts:

Subsidence resulting from underground mining would result in local areas of surface disturbance (e.g. fractures, areas of sloughing, etc.) similar to subsidence features recorded during extraction of previous panels. Areas of surface disturbance would be evaluated and a site-specific repair-mitigation plan developed and implemented unless it was determined that natural healing was the best alternative. Repair could include soil salvage, grading, soil replacement, and seeding with an approved seed mix. Subsidence of the additional panel associated with this amendment would result in sequential subsidence that would have minimal effect on deep rooted plant species, such as ponderosa pine;

some trees may be damaged, especially if they are located on a slough, subsidence fracture, or depression. Along with any subsidence, small pads, boreholes, and roads associated with the project may disturb up to five acres within the proposed project area. The exact location of any boreholes, pads, roads, subsidence cracks, and/or crack repair actions cannot yet be determined. SPE would be required to submit specific permit revisions and supplemental information, including maps certified by a professional engineer before the surface features and activities would be authorized by DEQ under MSUMRA.

Land disturbance at the site may result in propagation of noxious weeds. Any surface disturbances would be reclaimed and seeded with an appropriate seed mix. If the action were approved, weed control during and after the activity would be a requirement. The permit requires the operator to control weeds under their approved weed control plans. SPE has two weed control plans, both updated in 2020, for the two counties that the mine spans: Musselshell County and Yellowstone County. In addition, in areas of the permit that are also within the General Habitat for sage grouse, reclamation of surface disturbed areas would also include control of cheatgrass and Japanese brome.

Cumulative Impacts:

Impacts to vegetation cover, quantity, and quality from the proposed action would add to existing impacts from mining and agricultural use (i.e. grazing) in the area. For a comprehenvise discussion on existing impacts from mining and agricultural use, please refer to the previous EIA (DSL, 1992a), and previous EAs (DEQ, 2016; DEQ, 2017).

5. TERRESTRIAL, AVIAN AND AQUATIC LIFE AND HABITATS:

Is there substantial use of the area by important wildlife, birds or fish?

Based on habitat associations reported in Hart et al. (1998), about 155-165 birds, 50-52 mammals, 6 amphibians and 9-11 reptiles might reasonably be expected to be observed at least seasonally in the Wildlife Monitoring Area (WMA) which includes the existing permit area, the proposed amendment, and a 1-mile buffer (Westech, 2009). During 2022, the mine recorded the presence of 80 bird species (not including three unidentified species of duck, swallow, and waterfowl), 23 mammal species (including likely bat detections), 2 amphibian species, and 2 reptile species (Catena Consulting LLC, 2023).

The Bull Mountains are outside of the range of the Northern Long-eared Bat (NLEB) species as delineated with verified records. Despite extensive acoustic and mist net surveys performed by regional bat experts familiar with NLEBs and western *Myotis* bat species, no evidence has emerged that the species occurs within this area. Identification of NLEBs remains challenging with considerable potential for misidentification of both acoustic recordings and in-hand animals. Previous records

that locate the species within this area appear to be spurious based on review of identification methods used during these surveys and data quality. Additional survey effort targeting areas where the species was reported and following best practices for detection of the species has failed to detect the species. The weight of evidence is that the species is not present in this area.

There are no aquatic habitats or associated aquatic life within the proposed amendment area. The ephemeral drainages do not have sufficient hydrology to support aquatic life.

Direct Impacts:

The removal of habitat can impact species through direct habitat loss, habitat fragmentation, and avoidance of the mining operation and presence of humans. Habitat removal could directly cause loss of nests, loss of lekking habitat, loss of individuals during removal, and displacement of animals. No direct impacts to wildlife or aquatic life and habitat are expected.

Secondary Impacts:

Subsidence from underground mining, minor roads, and small pads and boreholes associated with the proposed action could result in approximately 5 acres of surface disturbance. Construction of any surface infrastructure would require a minor revision to the permit, and an additional EA would be completed during review of the borehole and pad design. This review would include an assessment of impacts on wildlife and any mitigation that may be required. The avoidance of this limited mining activities including human presence and noise can reduce the carry capacity of an area similar to that of direct habitat destruction by reducing vital rates and thereby population abundance. Noise can interfere with courtship and reduce reproductive success. This disturbance could result in potential loss of terrestrial and avian habitat in the proposed Panel 0 area. The potential disturbance is relatively small in comparison to the mine facilities and other existing surface disturbance.

Secondary impacts could include changes in habitat quality (increase in invasive species, woody encroachment, and reduction in food availability), changes in predator communities, and increase of diseases. These impacts can reduce vital rates by lowering nest survival, causing brood failure, reducing adult and juvenile survival, along with other vital rates. Secondary impacts to terrestrial and avian life and habitat would be similar to existing secondary impacts from currently approved mining activities. No secondary impacts to aquatic life are expected.

Cumulative Impacts:

Small impact areas have occurred during longwall mining at the Bull Mountains

Mine. An additional longwall panel could induce additional surface disturbance areas associated with subsidence of that panel, which would add to cumulative impacts to wildlife from mining and agriculture in the project area.

6. UNIQUE, ENDANGERED, FRAGILE OR LIMITED ENVIRONMENTAL RESOURCES:
Are any federally listed threatened or endangered species or identified habitat present? Any wetlands? Species of special concern?

Consultation with the United States Fish and Wildlife Service (USFWS) determined that there are no Threatened or Endangered Species, Proposed Species, or Critical Habitat within the project area (USFWS, 2023b). The Monarch Butterfly is a Candidate Species that may occur within the proposed amendment and existing permit area (Catena Consulting LLC, 2023) (USFWS, 2023b). All three species of milkweed expected to occur in the Bull Mountains were incidentally observed and recorded in or near the mine Permit Area in 2022 (Catena Consulting LLC, 2023). Should a Threatened or Endangered Species be observed, the mine would immediately contact the USFWS and DEQ to determine appropriate actions.

Based on the MTNHP data, habitat conditions, and historical and recent monitoring records at Bull Mountains Mine No. 1, 47 Species of Concern (13 mammals, 28 birds, 2 amphibians, and 4 reptiles) could occur in the habitats of the WMA at least occasionally, although some are likely very rare if they occur at all (e.g., whooping crane) (Catena Consulting LLC, 2023).

Golden eagles and bald eagles have been observed on the project site and there has been documentation of golden eagles nesting within the WMA. There are no eagle nests within 2 miles of the project area. Sixteen species of raptors were previously recorded in the permit and surrounding area, including 14 diurnal species and 3 species of owls. A possible prairie falcon nest may occur within the proposed amendment area.

The proposed action for AM4 would add 435 acres to an existing coal mine permit area in designated General Habitat for sage grouse. Of the 435 acres, approximately 406 acres are within designated General Habitat for sage grouse and 41 acres are outside of designated sage grouse habitat. DEQ and SPE consulted with the Montana Sage Grouse Habitat Conservation Program (DNRC, 2023) regarding potential sage grouse habitat within the Project area. The Project is located beyond two miles of any active sage grouse lek. The closest General Habitat lek is located approximately 8.3 miles south of the Project location. SPE has never observed a sage grouse during the annual wildlife monitoring survey (Catena Consulting LLC, 2023).

Direct Impacts:

There are no Threatened and Endangered Species within the proposed area and therefore no direct impacts to those species are expected. The project would not

contribute to the listing of the species. Montana is generally considered to be in between the main Monarch Butterfly populations across the US and does not represent high significance habitat. There are no direct impacts to sage grouse expected. There are no wetlands within the project area and therefore no impacts are expected.

Secondary Impacts:

Subsidence from underground mining, small pads, minor roads, and boreholes associated with the proposed action could result in approximately 5 acres of surface disturbance. Construction of surface infrastructure would require a minor revision to the permit, and an additional EA would be completed during review of the borehole and pad design. This review would include an assessment of impacts on wildlife and any mitigation that may be required. The removal of habitat through surface disturbance could impact species through direct habitat loss, habitat fragmentation, and avoidance of the mining operation and presence of humans. There is a very low chance that those 5 acres may cause direct removal of Monarch Butterfly habitat or individuals.

There are no Threatened and Endangered Species, sage grouse, or wetlands within the proposed area and therefore there are no secondary impacts expected. Weed spraying efforts would be conducted in adherence to the county weed plans and consist of spot spraying target weeds while native species are avoided. This would limit impacts on important habitat and protect it from competition associated with noxious weeds.

Cumulative Impacts:

There are no Threatened and Endangered Species or sage grouse within the proposed area and therefore there are no cumulative impacts to Threatened and Endangered species, sage grouse, or wetlands expected. Impacts to the Monarch Butterfly could add to cumulative impacts from mining and agriculture in the project area.

7. HISTORICAL AND ARCHAEOLOGICAL SITES:

Are any historical, archaeological or paleontological resources present?

Cultural resource evaluations of the project area were conducted by Aaberg and Crofutt (2014) (2013), Ferguson and McElroy (2023) and Hogan (1982). In addition, an ethographic study of the SPE mine area was conducted by Kooistra-Manning and Deaver (1993). Much of these investigations included areas outside of the proposed AM4 area, with the Ferguson and McElroy being conducted specifically to capture un-surveyed areas within AM4. Analysis of cultural resources would be restricted to sites within or near the AM4 project area. See Table 4 below for a summary of these findings.

A total of 11 cultural resources are located within the proposed mine area of AM4. Sites 24ML0114, 24ML0912, 24ML1108 and 24LM1109 are determined not eligible for the NRHP and would require no further work. Sites 24ML0146, 24ML0913 and 24ML0914, and 24ML0918 are NRHP eligible sites that consists of a prehistoric petroglyph and three historic rock art sites, respectively. These sites would require mitigation prior to the start of mining.

Mitigation planning for 24ML0146 is currently in progress after a field visit with the Crow THPO (Tribal Historic Preservation Officer) conducted on August 14, 2023. Based on information gained from the field visit and from Kooistra-Manning and Deaver (1993), the site may be eligible as a Traditional Cultural Property (TCP). The current draft mitigation plan would be submitted to SHPO after consideration of comments received from the Crow.

Three sites are located at the southern end of the mine area on land owned by BLM. Site 24YL1936 is evaluated as not eligible. Sites 24YL1935 and 24YL1938 are historic rock art sites that have been evaluated as eligible to the NRHP. The BLM has authority for treatment or mitigation, and consultation with SHPO is underway for the mitigation of these two sites.

Two additional sites (24ML0934 and 24ML0916) are located near the edge of the proposed mining area and would require archeological monitoring. Both of these sites are currently unevaluated for NRHP eligibility, so are to be treated as eligible.

Table 4: Cultural Resource Sites

Site	*Site Type*	*NRHP Status*	*Action Required*
24ML0114	Petroglyph	Not Eligible	None
24ML0146	Petroglyph	Eligible	**Requires Mitigation**
24ML0912	Lithic Scatter	Not Eligible	None
24ML0913	Historic Rock Art	Eligible	**Requires Mitigation**
24ML0914	Historic Rock Art	Eligible	**Requires Mitigation**
24ML0916	Lithic Scatter	Unevaluated	Near Project area, monitor
24ML0918	Historic Rock Art	Eligible	**Requires Mitigation**
24ML0934	Lithic Scatter	Unevaluated	Near Project Area, monitor
24ML1108	Lithic Scatter	Not Eligible	None
24ML1109	Lithic Scatter	Not Eligible	None
24YL1935	Lithic Scatter	Eligible	**BLM: Requires Mitigation**
24YL1936	Lithic Scatter	Not Eligible	BLM: None
24YL1938	Lithic Scatter	Eligible	**BLM: Requires Mitigation**

Direct Impacts:

Expansion of underground mining activities within the proposed amendment would have no direct surface disturbance or impact to Historic Properties. The significance assessment is presented in Table 5.

Secondary Impacts:

Potential surface disturbance and the associated impacts are discussed in this EA, but the exact location of any boreholes, pads, roads, subsidence cracks, and/or crack repair actions cannot yet be determined. Construction of any surface infrastructure would require a minor revision to the permit, and an additional EA would be completed during review of the borehole and pad design, including additional assessment of the impact on Historic Properties. Subsidence from longwall mining beneath cultural sites may impact the integrity of the site. Surface cracks and any associated reclamation could disturb surface features and in situ artifacts. For sites located in cliffs and steep terrain, subsidence has a potential to cause cliff failures thereby destroying or altering a site.

Cumulative Impacts:

Cumulative impacts to Historic Properties from the proposed action would add to existing impacts from historic and current mining and agriculture.

8. AESTHETICS:

Is the project on a prominent topographic feature? Will it be visible from populated or scenic areas? Will there be excessive noise or light?

No surface facilities would be added under the proposed amendment. Mining

associated with proposed action could lower the relief of the undermined area by approximately 0 to 6 feet or up to 70 percent of the extraction height. Generally, this amount of subsidence is minor compared to the amount of topographic relief in the area and should not be noticed, especially from a distance. However, there may be noticeable changes to the topography if subsidence and associated surface disturbance is greater than expected.

Direct Impacts:

The proposed activities would not significantly increase surface disturbance. The proposed project may be visible to or heard by the sparsely populated surrounding area and to receptors located at observation points that are unobstructed by topography or forested vegetation. Aesthetic impacts from mining activities would not be excessive to receptors in the area. The significance assessment is presented in Table 5.

Secondary Impacts:

Disturbance up to approximately 5 acres from subsidence features on the surface above the added mine cut, including cracks and scarps, as well as additional boreholes, small pads, and minor roads, is possible. Construction of any surface infrastructure would require a minor revision to the permit, and an additional EA would be completed during review of the borehole and pad design. Subsidence cracks on steep slopes may be visible to some landowners adjacent to the Panel 0 area. Cracks are expected to heal over time by closing naturally, filling in gradually with sediment, or through direct reclamation by the operator. Subsidence cracks may be visible on steep terrain for years; cracks on slopes greater than 20% will be allowed to heal naturally. Reclamation of subsidence cracks would cause areas of disturbance that would be visible until vegetation was established to premine densities. Final reclamation of surface disturbance would be required to occur a minimum of ten years prior to final bond release.

Cumulative Impacts:

Noise and light from the proposed project would be a continuation of the current noise and light from approved mining activities, including operation of the facilities area. Cumulative impacts to aesthetic resources from the proposed action would add to existing impacts from historic and current mining and agriculture.

9. DEMANDS ON ENVIRONMENTAL RESOURCES OF LAND, WATER, AIR OR ENERGY:
Will the project use resources that are limited in the area? Are there other activities nearby that will affect the project?

The proposed project would use water supplied from existing wells drilled on site as well as water produced during the extraction of the Mammoth Coal for mining use. Impacts from this water use are described in the EA prepared for Amendment 3 (DEQ,

2016). Mining under the proposed action contemplates economic exploitation of coal resources that would not result in significant decrease in the total amount of exploitable coal reserves in Montana.

Direct Impacts:

Impacts to water and energy resources would continue as part of the proposed action. No additional impacts on land or air would be expected from the proposed action. The significance assessment is presented in Table 5.

Secondary Impacts:

Secondary impacts on the environmental resources of land, water, air, or energy are not expected from the proposed action.

Cumulative Impacts:

Cumulative impacts from the proposed action to the environmental resources of water and energy would add to existing impacts from historic and current mining and agriculture in the area. No additional cumulative impacts on the environmental resources of land or air are expected from the proposed action.

10. IMPACTS ON OTHER ENVIRONMENTAL RESOURCES:

Are there other activities nearby that will affect the project?

DEQ queried the following websites, databases, and organizations for nearby activities that may affect the project.

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

The MDT website shows the Yellowstone County Line North maintenance project on US 87 adjacent to the permit area. The project, epoxy striping, is scheduled for calendar year 2024. This maintenance project does not have any anticipated effects on the proposed action.

Direct Impacts:

Impacts on other environmental resources are not likely to occur as a result of the proposed action.

Secondary Impacts:

Secondary impacts to other environmental resources are not expected from the proposed action.

Cumulative Impacts:

Cumulative impacts to other environmental resources are not expected from the proposed action.

11. HUMAN HEALTH AND SAFETY:

Will this project add to health and safety risks in the area?

The applicant would be required to adhere to all applicable state and federal safety laws. Industrial work such as the work proposed by the applicant is inherently dangerous. The Mine Safety and Health Administration (MSHA) has developed rules and guidelines to reduce the risks associated with this type of labor. Few, if any, members of the public would be in the general project area during mining operations.

Direct Impacts:

There would be a continuation of potential impacts to human health and safety, primarily in the occupational setting rather than the general public, with extended mining capacity as a result of the proposed action. The significance assessment is presented in Table 5.

Secondary Impacts:

Secondary impacts to health and human safety are not expected from the proposed action.

Cumulative Impacts:

Cumulative impacts to health and human safety are not expected from the proposed action.

12. INDUSTRIAL, COMMERCIAL AND AGRICULTURAL ACTIVITIES AND PRODUCTION:

Will the project add to or alter these activities?

Land above the proposed mine panel is currently used for livestock production; livestock use would continue during mining. The project area is remote and, with the exception of livestock grazing, there are no industrial or commercial activities near the proposed amendment area. There are two grazing allotments administered by the BLM in the general area for AM4, known as Dunn Mountain (#05337) and Coal Mine (#03195), which cover approximately 3,222 acres and 6,447 acres, respectively. In addition to public lands under the jurisdiction of the BLM, allotments may include private lands, State lands, and lands under the jurisdiction of other federal agencies.

Direct Impacts:

Direct impacts on the industrial, commercial, and agricultural activities and production in the area are not expected from the proposed action.

Secondary Impacts:

Disturbance up to approximately 5 acres from subsidence features on the surface

above the added mine cut, including cracks and scarps, as well as additional boreholes, small pads, and minor roads, is possible. Construction of any surface infrastructure would require a minor revision to the permit, and an additional EA would be completed during review of the borehole and pad design. Grazing or pre-mining land use would not be significantly impacted by any subsidence associated with the proposed action. Subsidence features have not impacted livestock production in current mined areas and are not expected to impact production under AM4. It is expected that any surface impacts would be short-term; the operator would be required to repair the damage if it were to be extensive or impact the post-mine land use. Final reclamation of surface disturbance would be required a minimum of ten years prior to final bond release. The significance assessment is presented in Table 5.

Cumulative Impacts:

Cumulative impacts on the industrial, commercial, and agricultural activities and production in the area are not expected from the proposed action.

13. QUANTITY AND DISTRIBUTION OF EMPLOYMENT:

Will the project create, move or eliminate jobs? If so, estimated number.

The AM4 Proposed Action would be a continuation of mining operations within the previously approved LOM time frame. It would not change the existing workforce at the mine, which includes 255 employees and 30 full-time, temporary contractors. SPE was listed as the top employer of Musselshell County as of 2021 (DLI, 2023). It is not anticipated that this project would create, move, or eliminate jobs.

Direct Impacts:

The Proposed Action impacts on quantity and distribution of employment would not likely result from this project. The Proposed Action would not extend the LOM timeframe, but rather would expand mining capacity on lands with private mineral estates for the Bull Mountains Mine No. 1. No lasting adverse impacts to employment would be expected from this project.

Under the No Action alternative, the extent of remaining mining activities would be limited to the permit area, coal volumes, LOM timeframe (2024 or 2025), and reclamation plan approved through previous amendments (DEQ, 2016). It is anticipated that employment would decrease when coal production ceases and it would further decline as reclamation is completed. The significance assessment is presented in Table 5.

Secondary Impacts:

Secondary impacts on the quantity and distribution of employment are not expected from the proposed action.

Cumulative Impacts:

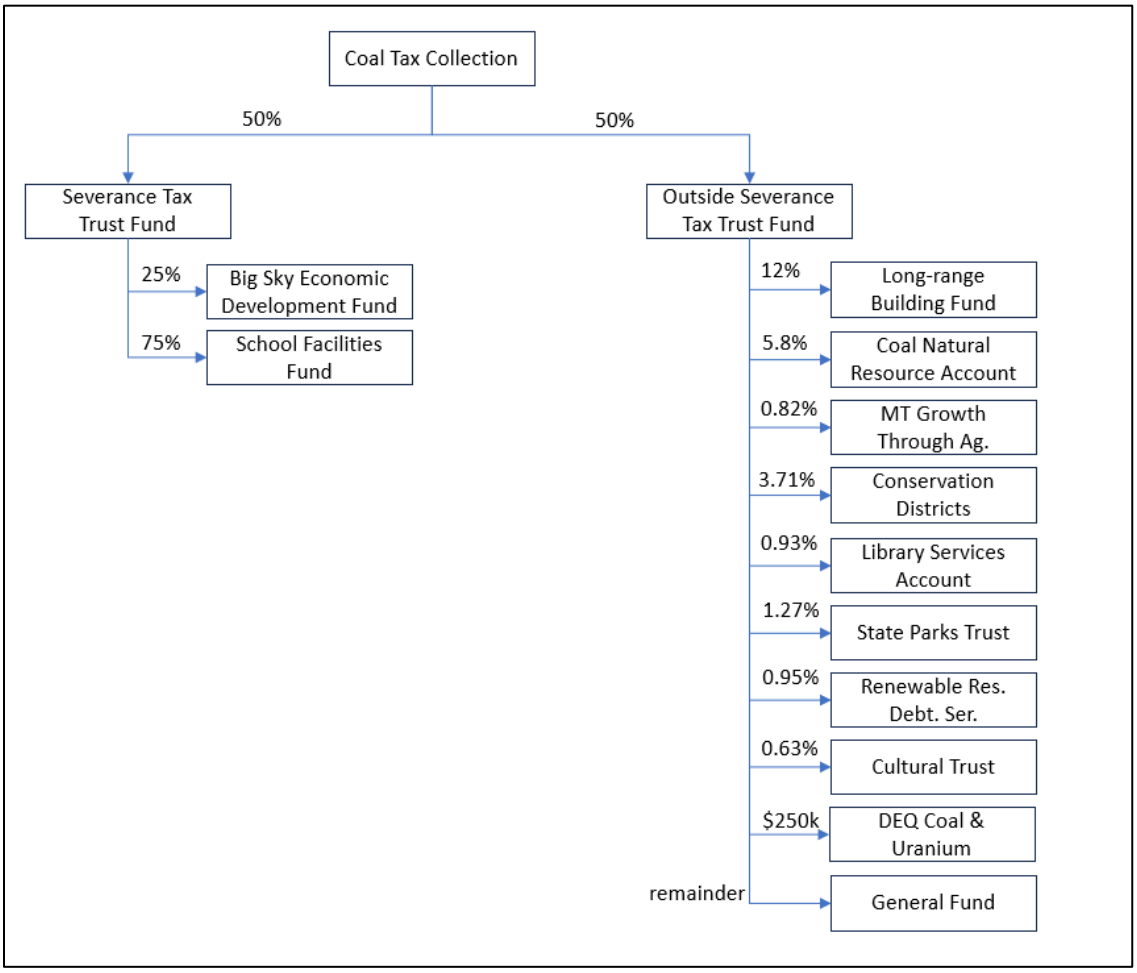
Cumulative impacts on the quantity and distribution of employment are not expected from the proposed action.

14. LOCAL AND STATE TAX BASE AND TAX REVENUES:

Will the project create or eliminate tax revenue?

The AM4 Proposed Action would be a continuation of mining operations on private mineral estates within the previously approved LOM timeframe and it would not change the workforce, the rate of coal production, or tax revenue related to the payroll taxes from the project. Montana also collects a tax on mined coal. The tax is divided among multiple state funds as shown in the diagram below (Figure 4), based on the 2021 distributions (Montana Legislative Branch, 2021). Previous distributions of funds have also created large funds that now earn interest but are not currently directly funded by coal sales, such as the Treasure State Endowment Fund, TSEF Regional Water System Fund, and Coal Severance Tax Permanent Fund.

Figure 4: 2021 Distribution of Coal Tax



Direct Impacts:

The AM4 Proposed Action would be a continuation of mining operations on private mineral estates within the previously approved LOM timeframe. The positive, yet limited, impacts to the local and state economy would continue similarly to current conditions.

Additional mining would continue to provide the coal severance tax available to the state. Employment of the current workforce, which includes 255 employees and 30 full-time, temporary contractors, would result in continued income taxes. Musselshell and Yellowstone counties would collect taxes based on the mine development within the respective county. Property taxes would be collected on the mine facilities and equipment based on its location. It is possible that lands within the amendment area may be reassessed and taxed at a lower rate if the county determines that the value of the land has been impacted by subsidence.

Under the No Action alternative, the extent of remaining mining activities would be limited to the permit area, coal volumes, LOM timeframe (2024 or 2025), and reclamation plan approved through previous amendments (DEQ, 2016). It is anticipated that payroll taxes and coal taxes would cease or greatly decrease when coal production ends and the reclamation plan is completed. The significance assessment is presented in Table 5.

Secondary Impacts:

Secondary impacts to local and state tax base and tax revenue are not expected from the proposed action.

Cumulative Impacts:

Cumulative impacts to local and state tax base and tax revenue are not expected from the proposed action.

15. DEMAND FOR GOVERNMENT SERVICES:

Will substantial traffic be added to existing roads? Will other services (fire protection, police, schools, etc.) be needed?

The proposed project would not add substantial traffic to existing roads and the demand for government services would not exceed demands previously disclosed in the Final EIS (DSL, 1992a) and AM3 EA (DEQ, 2016).

Direct Impacts:

Direct impacts on the demand for government services are not expected from the proposed action.

Secondary Impacts:

Secondary impacts to demand on government services are not expected from the proposed action.

Cumulative Impacts:

Cumulative impacts to demand on government services are not expected from the proposed action.

16. LOCALLY ADOPTED ENVIRONMENTAL PLANS AND GOALS:

Are there State, County, City, USFS, BLM, Tribal, etc. zoning or management plans in effect?

The proposed additional activities would occur on private land and a portion of BLM land. The project area would be subject to the 2017 Montana Noxious Weed Management Plan and to any plans or rules set forth by Musselshell and Yellowstone Counties, including the Musselshell County Weed Management Plan and the Yellowstone County Weed District Weed Management Plan. The mine has weed control plans last updated in 2020 for Musselshell and Yellowstone counties in their permit.

The Montana Forest Action Plan was created in 2010 as a response to the federal 2008 Farm Bill, which required states and territories to develop an assessment of state forest conditions (both privately and publicly owned) and work to address issues identified through that assessment. The most recent version of the plan, updated in 2020, identifies "Priority Areas for Focused Attention" across the state. Areas are broken into three categories: areas with elevated fire risk, areas with degraded forest health, and areas with both elevated fire risk and degraded forest health. Approximately 31,635 acres of land designated under "Priority Areas for Focused Attention" are located within 20 miles of the proposed action boundary; two of these areas overlap the currently approved mine permit boundary (see Figure 5). Designation of priority areas under the Forest Action Plan is for planning purposes only; there are no required actions or mitigations from the mine for the priority areas in or adjacent to the permit area (Holzwarth, 2023).

Direct Impacts:

Weed control in the proposed project area is expected to prevent weed infestations. The mine has an approved fire control plan which would not change with the proposed action. Impacts from or to locally-adopted environmental plans and goals would not be expected as a result of this project.

Secondary Impacts:

Secondary impacts from or to locally-adopted environmental plans and goals are not expected from the proposed action.

Cumulative Impacts:

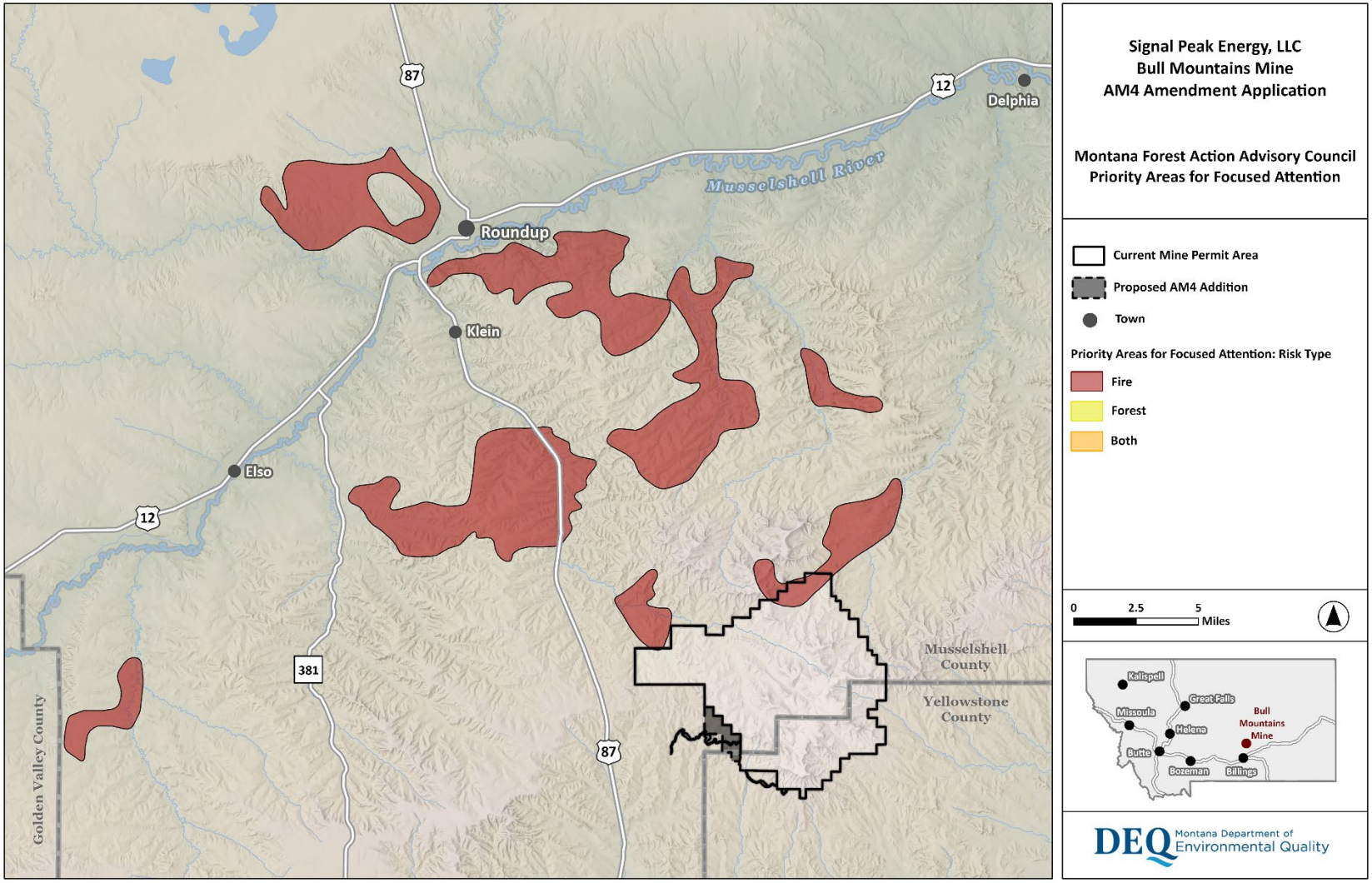
Cumulative impacts from or to locally-adopted environmental plans and goals are not expected from the proposed action.

17. ACCESS TO AND QUALITY OF RECREATIONAL AND WILDERNESS ACTIVITIES:

Are wilderness or recreational areas nearby or accessed through this tract? Is there recreational potential within the tract?

The proposed activities would occur on private land and a portion of BLM land. Wilderness, recreational areas, public parks, or historic sites are not nearby or accessed through the proposed permit area. Expanded underground mining would not adversely affect any publicly owned park or place included in the national register of historic sites. Except for limited hunting and camping on private land, the area is not typically used for recreational activities. One section that would have additional underground mining, which is already within the existing permit boundary, is owned by the BLM. This area is Township 6N, Range 27E, Section 32.

Figure 5: Montana Forest Action Plan – Priority Areas for Focused Attention



Direct Impacts:

Direct impacts to access or quality of recreational and wilderness activities are not expected from the proposed action.

Secondary Impacts:

The areas where the permit boundary would be expanded are on private land, and therefore the expansion would not impact the public's access to public land areas. The portion of BLM land that would have additional mining from Panel 0 is already in the permit area and therefore has already been signed and posted as an active mine permit area. This section is also surrounded by private land and therefore access to the BLM land was already partially restricted prior to mining. The proposed action would have potential secondary impacts to the quality of the BLM land via potential subsidence from underground mining of Panel 0. Any surface disturbance caused by the subsidence would be reclaimed. The significance assessment is presented in Table 5.

Cumulative Impacts:

Cumulative impacts from the proposed action to the quality of recreational and wilderness activities would add to existing impacts from historic and current mining and agriculture in the area. For a more comprehenvisve discussion of existing impacts, please see DSL, 1992(a), DEQ, 2016, and DEQ, 2017. No additional cumulative impacts on the access to recreational and wilderness activities are expected from the proposed action.

18. DENSITY AND DISTRIBUTION OF POPULATION AND HOUSING:

Will the project add to the population and require additional housing?

The nearest community of Roundup had a total population of 1,723 in 2020 (Census Bureau, 2020). The AM4 Proposed Action would be a continuation of mining operations on private and public land within the previously approved LOM timeframe and it would not change the existing workforce at the mine.

Direct Impacts:

The AM4 Proposed Action would not change the workforce necessary to continue operations, which includes 255 employees and 30 full-time, temporary contractors, nor would it extend the projected LOM timeframe. There would be no direct impacts to population density or housing in the area from this project.

Under the No Action alternative, the extent of remaining mining activities would be limited to the permit area, coal volumes, LOM timeframe (2024 or 2025), and reclamation plan approved through previous amendments (DEQ, 2016). It is anticipated that employment would decrease when coal production ceases and it would further decline as reclamation is completed. The reduction in employment could result in declining population and housing demand in the

area, in the absence of employment provided elsewhere. The significance assessment is presented in Table 5.

Secondary Impacts:

Secondary impacts to population density and housing are not expected from the proposed action.

Cumulative Impacts:

Cumulative impacts to population density and housing are not expected from the proposed action.

19. SOCIAL STRUCTURES AND MORES:

Is some disruption of native or traditional lifestyles or communities possible?

An ethnographic study was conducted prior to the development of the Bull Mountains Mine No. 1 by Kooistra-Manning and Deaver (1993). The study found that many interested tribes were concerned with adverse impacts to the spiritual environment, cultural resources, and wildlife habitat. The prior study encompassed the general area included in AM4 and concerns would be similar to what were previously identified. Other local communities or lifestyles are typically related to ranching and agricultural practices.

Direct Impacts:

The continued mining of coal may be seen as an adverse impact to traditional lifestyles as it affects the spiritual environment. Though the concern for affects to the spiritual environment is recognized, the project is primarily located on private lands with limited potential surface disturbance, and the areas are unlikely to be utilized by any native groups as a traditional area. Impacts to social structures and mores are not expected from the proposed action. It is not anticipated that this project would disrupt native, traditional, or other lifestyles or communities, given the remote location of the proposed permit expansion and minimal level of human activity in the area (i.e. ranching).

Secondary Impacts:

Secondary impacts to social structures and mores are not expected from the proposed action.

Cumulative Impacts:

Cumulative impacts to social structures and mores are not expected from the proposed action.

20. CULTURAL UNIQUENESS AND DIVERSITY:

Will the action cause a shift in some unique quality of the area?

The general area is known to the Crow and other Tribal groups as a sacred area and was used historically by Tribal members for spiritual and communal purposes. A famous Crow leader, Two Leggings, is known to have performed vision quests in the Bull Mountains. Other human activities and lifestyles in the general area include ranching and agricultural practices, which are not culturally unique compared to the surrounding region. The nearest community of Roundup has ethnic diversity that is similar to other areas in Montana, which includes approximately 91.3% White (non-Hispanic), 2.5% Multiracial (non-Hispanic), 1.8% Asian (non-Hispanic), 1.2% Native American, and remaining fractions of Hispanic or Other ethnicities (Census Bureau, 2020).

Direct Impacts:

Impacts to cultural uniqueness and diversity in the area are not expected from the proposed action, which is primarily located on private lands with limited potential surface disturbance. The continuation of mining would not change the existing population or demographics of the mine workforce or nearby communities.

Secondary Impacts:

Secondary impacts to cultural uniqueness and diversity are not expected from the proposed action.

Cumulative Impacts:

Cumulative impacts to cultural uniqueness and diversity are not expected from the proposed action.

21. PRIVATE PROPERTY IMPACTS

The mineral estate in the AM4 permit expansion area and underneath Panel 0 is privately owned coal owned by Bull Mountain Coal or Bull Mountain Coal with patent restrictions. Surface ownership consists of one section of federal BLM land, and the remainder of private land: Musselshell Resources, LLC and My Green Earth, LP. By issuing the permit, there is no regulatory impacts on the surface estate, but only regulatory impacts affiliated with SPE's private mineral interests.

Development of SPE's privately owned coal is subject to the regulatory restrictions as set forth in the permit conditions and MSUMRA. DEQ has determined that the permit conditions are reasonably necessary to ensure compliance with applicable requirements under MSUMRA and demonstrate compliance with those requirements or have been agreed to by the applicant. Further, if the application is complete, DEQ must take action on the permit pursuant to ARM 17.24.404. DEQ, therefore, does not have discretion to take alternative action that would have less impact on private property. DEQ's approval of Operating Permit No. C1993017 would not have private property-taking or damaging implications. DEQ will prepare a final assessment of private property takings to be included in the final decision documents.

22. OTHER APPROPRIATE SOCIAL AND ECONOMIC CIRCUMSTANCES:

Due to the nature of the proposed mining activities, and the limited project duration, no

further direct or secondary impacts would be anticipated from this project.

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 AM4. The applicant would lack the authority to expand mine production through the addition of the Panel 0 coal mine cut to the southwestern part of the current permit area. Any potential impacts that would be authorized under AM4 would not occur. The extent of remaining mining activities would be limited to the permit area, coal volumes, LOM timeframe, and reclamation plan approved through previous amendments (DEQ, 2016). However, DEQ does not consider the “No Action” alternative to be appropriate because the applicant has demonstrated compliance with all applicable rules and regulations as required for approval. The No Action alternative forms the baseline from which the impacts of the proposed action can be measured.

CONSULTATION:

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

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

- Montana State Historic Preservation Office (SHPO)
- Montana Department of Natural Resource and Conservation (DNRC) (DNRC, 2023) (Holzwarth, 2023)
- Montana Department of Environmental Quality (DEQ) (DEQ, 2023)
- Montana Department of Labor and Industry (DLI)
- Montana Department of Transportation (MDT) (MDT, 2023a) (MDT, 2023b)
- Musselshell County and Yellowstone County
- Montana Cadastral Mapping Program
- Montana Groundwater Information Center (GWIC) (MBMG, 2023)
- United States Department of Interior, Bureau of Land Management (BLM) (BLM, 2023)
- United States Forest Service (USFS) (USFS, 2023)
- United States Fish and Wildlife Service (USFWS) – Montana Ecological Services Helena Field Office (USFWS, 2023a) (USFWS, 2023b)
- Natural Resources Conservation Service (NRCS) (NRCS, 2023)
- Federal Emergency Management Agency (FEMA) (FEMA, 2023)
- Environmental Protection Agency (EPA) (EPA, 2023)
- Crow Tribe of Indians: Tribal Historic Preservation Office (THPO)
- Blackfeet Tribe: Tribal Historic Preservation Office

PUBLIC INVOLVEMENT:

On September 8, 2023 comments on the completeness determination were received. The Notice of Acceptability was published on September 20 and 27, 2023 in the Billings Gazette. The public comment period for acceptability ended on October 10, 2023. Comments were received October 8 and 10, 2023.

OTHER GOVERNMENTAL AGENCIES WITH JURSIDICTION:

The proposed project would be located on private and public 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.

This environmental review analyzes the proposed project submitted by the applicant. The majority of impacts from the project would be short term and would be fully reclaimed at the conclusion of the project and thus, would not contribute to the long-term cumulative effects of mining in the area. Final reclamation of surface disturbance would be required a minimum of ten years prior to final bond release.

In Montana, DEQ retains primacy under the Surface Mining Control and Reclamation Act (SMCRA) and thereby enjoys "exclusive" regulatory authority over the environmental effects of surface coal mining (SMCRA, Section 503(a)) in Montana. Exclusive jurisdiction was vested in the states, specifically, "because of the diversity in terrain, climate, biologic, chemical, and other physical conditions" in the mining regions of the country (SMCRA, Section 101(f)). DEQ's program is authorized under The Montana Strip and Underground Mine Reclamation Act (MSUMRA) 82-4-201, Montana Code Annotated (MCA), et.seq. The federal Office of Surface Mining Reclamation and Enforcement (OSMRE) has federal oversight of Montana's program with an obligation to inspect and monitor the operations of Montana's program.

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 applicant is proposing to expand mining capacity on lands with private mineral estates for the Bull Mountains Mine No. 1. The proposed action would result in the expansion of the permit area by 435 acres, less than 3% of the current total permit area, and the extent of potential new surface disturbance would be up to 5 acres. Any additional surface infrastructure would require a minor revision with an additional EA review. Bond amounts would be reviewed at the time of permitting, and additional bond may be required for construction of boreholes or crib pads. Subsidence cracks would be covered by existing bond amounts for repair of subsidence associated with the progression of the mining. This activity would not represent an extension of the LOM timeframe approved by DEQ for AM3 in 2016, which could extend through 2024 or 2025 depending on production rates. The land that may be disturbed does not contain unique, endangered, fragile, or limited environmental resources. Final reclamation of surface disturbance would be required a minimum of ten years prior to final bond release.

As discussed in this EA, DEQ has not identified any significant impacts associated with the proposed mining activities for any environmental resource. DEQ does not believe that the proposed mining activities by the applicant would have any growth-inducing or growth-inhibiting aspects, or significant contribution to cumulative impacts. The proposed operating permit site does not contain unique or fragile resources. There would be minor impacts to geology through removal of rock product, although limited in area. The site would be reclaimed “to make those lands capable of supporting the uses that those lands were capable of supporting prior to any mining or to higher or better uses” per 82-4-203(43), MCA.

All drainages within the proposed permit amendment area are ephemeral and only flow in response to precipitation or snow melt. No springs have been found over the Panel 0 area, and the two nearest springs were dry for the entirety of their baseline monitoring period. There are no ponds within the Panel 0 footprint, but one pond was identified within the AM4 permit boundary expansion area. Groundwater in the Mammoth coal and overburden units are unsaturated with little water. There are no private wells in the Panel 0 area utilizing water from the Mammoth coal or overburden units. The main impact to water resources would be from subsidence potentially altering the gradient of ephemeral channels and from mining of the Mammoth coal and the resulting subsidence fracturing of the overburden. Due to the lack of substantive surface water or groundwater resources in the area, impacts to water resources from mining are minor.

No direct impacts to air quality are expected due to the proposed action and continuation of mining operations. Some fugitive dust may be anticipated due to the ongoing operations (e.g. run-of-mine storage, coal processing, and haulage), as well as emissions from mobile equipment. SPE must operate within the confines of the approved Air Quality Permit, MAQP #3179-12.

No direct impacts to vegetation communities are expected due to the proposed action and continuation of mining operations. Subsidence resulting from underground mining would result in local areas of surface disturbance (e.g. fractures, areas of sloughing, etc.) similar to subsidence features recorded during extraction of previous panels. Areas of surface disturbance would be evaluated and a site-specific repair-mitigation plan developed and implemented unless it was determined that natural healing was the best alternative. Weed control would take place and meet county standards as described in the approved weed management plan with both Musselshell and Yellowstone Counties.

There may be minor impacts to terrestrial and avian habitats, estimated at approximately 5 acres, if additional surface disturbance is required for subsidence crack repair or supporting infrastructure. Any additional surface infrastructure would require a minor revision with an additional EA review. The potential disturbance is relatively small in comparison to the mine facilities and other existing surface disturbance. No direct impacts to aquatic life and habitat are expected, as there are no aquatic habitats or associated aquatic life within the proposed amendment area. The ephemeral drainages do not have sufficient hydrology to support aquatic life. Unique, endangered, fragile, or limited environmental resources have been evaluated. There are no unique or endangered fragile resources in the project area.

Cultural resource evaluations to date have identified six (6) Historic Properties that would require treatment or mitigation to reduce anticipated impacts to the level of No Adverse Effect, or no significant impact. Mitigations would be required to be complete before mining occurs beneath each site.

There would be minor impacts to viewshed aesthetics, as no surface facilities would be added under the proposed amendment. Mining associated with proposed action could lower the relief of the undermined area by approximately zero to six feet or up to 70 percent of the extraction height. Generally, this amount of subsidence is minor compared to the amount of topographic relief in the area and should not be noticed, especially from a distance.

Demands on environmental resources of land, water, air, or energy would be minor. The proposed project would use water supplied from existing wells drilled on site as well as water produced during the extraction of the Mammoth Coal for mining use. Existing impacts to water and energy resources would continue as part of the

proposed action. No additional impacts on land or air would be expected from the proposed action.

Impacts to human health and safety would be minor as the inherent occupational risks of underground coal mining and support activities at the surface would continue for the mine workforce. Few, if any, members of the public would be in the general project area during mining operations. The applicant would be required to adhere to all applicable state and federal safety laws. The Mine Safety and Health Administration (MSHA) has developed rules and guidelines to reduce the risks associated with this type of labor.

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

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

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

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

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

Table 5: Assessment of Significance for Proposed Action (ARM 17.24.608)

Affected Resource and Section Reference	Potential Impact	Severity[1], Extent[2], Duration[3], Frequency[4], Uniqueness and Fragility (U/F)	Probability[5] impact will occur	Cumulative Impacts	Measures to reduce impacts as proposed by applicant	Significance (yes/no)
1) Geology and Soil Quality, Stability and Moisture	Soil disturbance or loss related to subsidence cracks.	**Severity**- Low: Approximately 420 acres of ground would be directly over the proposed mine cut (including mine void, gate roads, access adits) and susceptible to possible subsidence cracks. Subsidence cracks can create localized, limited soil disturbance. Most cracks would close on their own and would not require reclamation. Cracks that appear on hillsides of >20% slope may not be reclaimed and may be left due to safety consideration. **Extent**- Small: The potential area for crack formation due to subsidence is estimated at less than 5 acres, within an expanded mine footprint of 420 acres. Disturbance would only be realized where surface cracks develop. Current mining shows cracking limited to localized areas of linear cracks up to a few feet wide. These sites are generally equal to or less than a few acres per occurrence. **Duration**- Short-term and long-term- Most subsidence cracks would close within 2 years of panel completion. Cracks that appear on hillsides >20% slope may not be reclaimed due to safety; these cracks would gradually erode and fill in with material naturally. Cracks that have not closed within 2 years after panel completion and are on shallower slopes <20% would be repaired and revegetated. **Frequency**- Low: Where cracks have developed an occasional storm event may cause soil disturbance. **Unique/Fragile**- Low: No unique or particularly fragile soils or geologic features were identified in baseline studies.	Possible	Disturbance or soil loss from subsidence cracks would add to cumulative impacts associated with potential soil loss for existing surface disturbances of mine roads, facilities surfaces, and other historical disturbances in the proposed project area.	- BMPs include hydroseeding, straw wattles, or erosion matting on exposed and disturbed surfaces including subsidence cracks appearing in areas >20% in slope with high erosion potential. - Seeding would be performed by the first favorable season after any repair work to these disturbance sites.	No
2) Water Quality, Quantity, and Distribution	Subsidence impacts to surface drainage features and overburden groundwater resources; removal of the mammoth coal aquifer; replacement of coal with mine gob water.	**Severity**- Medium: A relatively small area of the headwaters to Rehder Creek and Razor Creek overlie Panel 0 Right. Impacts to ephemeral runoff in these drainage basins from subsidence would be negligible. Two springs in the Panel 0 Right area are dry. The Mammoth Coal aquifer is currently dry to nearly dry in the Panel 0 Right area. Mining of the coal in Panel 0 would not increase the drawdown in the aquifer. **Extent**- Medium: Panel 0 Right would remove 280 acres of the Mammoth coal aquifer and expose an equal area of overburden to subsidence. The extent of drawdown in the Mammoth coal is not expected to increase as the crop limit of the coal is 1,000 to 6,300 ft west of the panel; monitoring wells show the coal is currently dry or has little water. Overburden units are relatively thin and discontinuous with perched, isolated groundwater. Multiple smaller coal units subcrop or outcrop in the Panel 0 Right area above the Mammoth coal and are dry. No springs are expected to be impacted by Panel 0 Right mining. The extent of stream and pond impacts would be limited to the subsidence area. No flowing streams or ponds have been identified in the subsidence area for Panel 0 Right. Ephemeral streams may be impacted by subsidence within the Panel 0 Right area. **Duration**- Short-term to long-term- Any areas subject to subsidence would be reclaimed if deemed necessary. Impacts to ephemeral drainageways would be short-term. Recovery of a postmine aquifer in place of the Mammoth Coal would be long-term. Recovery is not expected to change from the currently approved recovery time of over fifty years after the end of mining. **Frequency**- Occasionally: Runoff in ephemeral drainageways that have experienced subsidence may be impacted during occasional storm events until subsidence cracks have been reclaimed. **Unique/Fragile**- Not unique or particularly fragile.	Impacts to ephemeral drainages – possible Impacts to springs – unlikely Impacts to stock water ponds - unlikely Impacts to groundwater - certain	Removal of the Mammoth coal would convert more of the Mammoth coal aquifer to gob thereby increasing the area of geochemical and physical changes to the aquifer. Other ephemeral headwater drainages of Rehder Creek have already been undermined by coal mining, however no measurable impacts have been recorded.	-SPE would repair/mitigate damage from subsidence to springs, wells, ponds, and streams. Mitigation will be determined successful if at the time the liability period has expired, SPE has demonstrated mitigation measures can provide water for consumptive use by livestock and wildlife of seasonal quality and quantity. -SPE has an approved hydrologic monitoring plan; impacts from mining must be monitored until final bond release.	No

3) Air Quality	Dust from roads, dust from erosion of subsidence disturbance, equipment exhaust	**Severity**- Low: The impacts would be limited to the proposed permit area of 435 acres. **Extent**- Small: Dust and equipment exhaust would be limited to roads and any additional surface infrastructure of subsidence repair work over the Panel 0 area. **Duration**- Short-term: Dust and production of equipment exhaust would cease upon final reclamation of the site. **Frequency**- Occasionally: Mining would be limited to underground, so there would be limited activity at the surface that would cause dust from roads and equipment exhaust within the proposed permit area. Subsidence features could potentially occur within the proposed permit area to an extent that would cause dust from erosion of the soil surface. **Unique/Fragile**- Not unique or particularly fragile.	Probable	Impacts to air quality would add to cumulative impacts associated with mining and other industrial activities in and around the permit area.	-SPE would comply with its existing Air Quality Permit MAQP #3179-12 issued by the State of Montana. -Fugitive emissions would be controlled by onsite water trucks or other dust suppression means.	No
4) Vegetation Cover, Quantity and Quality	Local areas of surface disturbance to vegetative communities from subsidence or surface activities	**Severity**- Low: Of the 435 acres of ground that would be added to the permit, up to five acres would be disturbed if those areas have subsidence related impacts or have roads, small pads, or boreholes. **Extent**- Small: Total surface area susceptible to vegetation impacts would be minimal. **Duration**- Short-term: Any areas subject to subsidence or surface disturbance would be reclaimed if deemed necessary. Those areas reclaimed would be seeded with native species and monitored for a minimum of 10 years before they would be eligible for final bond release. **Frequency**- Infrequently: Surface disturbance would occur where subsidence occurs and would likely happen shortly after mining with the longwall. **Unique/Fragile**- Not unique or particularly fragile. No threatened or endangered species are identified in the baseline area.	Probable	Impacts to vegetative cover, quantity, and quality would add to cumulative impacts associated with mining and agriculture in the project area.	-A site-specific repair-mitigation plan would be developed and implemented for areas of surface disturbance. Repair could include soil salvage, grading, soil replacement, and/or seeding with an approved seed mix	No
5) Terrestrial, Avian and Aquatic Life and Habitats	Local areas of surface disturbance to terrestrial and avian habitat from subsidence or surface activities	**Severity**- Low: Of the 435 acres of ground that would be added to the permit, only a small fraction (approximately 5 acres) would be disturbed if those areas suffer from subsidence related impacts and minimal operational activities such as boreholes. There are no substantial changes in human activity within the proposed project area expected. There are no wetlands or streams within the proposed area. The ephemeral drainages do not support aquatic life. **Extent**- Small: Total surface area susceptible to wildlife impacts would be minimal. **Duration**- Any areas subject to subsidence would be reclaimed if deemed necessary. Those areas reclaimed would be seeded with native species which would provide wildlife habitat. **Frequency**- Infrequently: Surface disturbance would occur where subsidence occurs and would likely happen shortly after mining with the longwall. **Unique/Fragile**- No threatened or endangered species are identified in the baseline area.	Probable	Impacts to terrestrial and avian life and habitats would add to cumulative impacts associated with mining and agriculture in the project area. No impacts to aquatic life and habitats are expected.	-Activities would be conducted in compliance with the 17.24.312 Fish and Wildlife Plan. -A site-specific repair-mitigation plan would be developed and implemented for areas of surface disturbance. Repair could include soil salvage, grading, soil replacement, and/or seeding with an approved seed mix.	No

6) Unique, Endangered, Fragile or Limited Environmental Resources	Local areas of surface disturbance to terrestrial and avian habitat from subsidence or surface activities	**Severity**- Low: No T&E species are identified in the baseline area. The Monarch Butterfly, a candidate species, may exist in the project area. Activities are not expected to impact the Monarch Butterfly. **Extent**- Small: Total surface area susceptible to vegetation and wildlife impacts and human activity would be minimal. **Duration**- Any areas subject to subsidence would be reclaimed if deemed necessary. Those areas reclaimed would be seeded with native species which would provide wildlife habitat. **Frequency**- Infrequently: Surface disturbance (approximately 5 acres) would occur where subsidence occurs and would likely happen shortly after mining with the longwall. **Unique/Fragile**- No T&E species are identified in the baseline area. The Monarch Butterfly, a candidate species, may exist in the project area. The proposed project area exists within approximately 406 acres of Sage Grouse General Habitat.	Unlikely	Impacts to unique, fragile, or limited environmental resources would add to cumulative impacts associated with mining and agriculture in the project area. No impacts to threatened resources are expected.	-Activities would be conducted in compliance with the 17.24.312 Fish and Wildlife Plan. If a Threatened or Endangered Species is observed, SPE would immediately contact DEQ and USFWS. -Focused weed management would occur within General Habitat for sage grouse. Reclamation of disturbed areas must include control of noxious weeds and invasive plant species, including cheatgrass and Japanese brome. No mitigations are needed for this project under the Montana Sage Grouse Habitat Conservation Program because of the lack of proximity to any active sage grouse lek	No
7) Historical and Archaeological Sites	Local areas of surface disturbance to Historic Properties from secondary subsidence or surface activities	**Severity**- High: Six Historic Properties, sites that are Eligible to the NRHP are located above the proposed mine area and may experience secondary impacts from underground mining. However, mitigation efforts are planned to reduce the impact on these sites to the level of No Adverse Effect which would reduce the Severity to Low. **Extent**- Small: Areas of secondary subsidence impacts (cracks, rock falls, etc) are localized and small; not all subsided areas experience a surface expression of subsidence. Locations of cracks or rock falls cannot be predicted ahead of mining. **Duration**- Long Term: Though subsidence occurs within two years after completion of mining, impacts to Historic Properties are permanent, and the resource is finite. Several of the identified Historic Properties consist of rock art on vertical surfaces. It is recognized that after the initial subsidence, future subsidence is not predicted to occur. However, any subsidence may affect the stability of identified rock surfaces and may accelerate natural processes that could cause collapse well after the life of the mine. **Frequency**- Infrequently: Subsidence impacts would happen shortly after completion of longwall mining and would not be sustained. **Unique/Fragile**- Six sites over the longwall panel have been identified as culturally significant (Historic Properties). These sites would require mitigation prior to undermining.	Possible	Impacts to Historic Properties would add to cumulative impacts associated with mining and agriculture in the project area.	-A mitigation plan for all six Historic Properties determined to be culturally significant and eligible to the NRHP are required to be approved and implemented prior to undermining. -All other sites above the longwall and gate roads have been determined to be ineligible for the NRHP, and no mitigation is required prior to undermining. -Two sites that are located adjacent to the longwall panel would require monitoring during and after undermining occurs.	No
8) Aesthetics	Local areas of surface disturbance from subsidence or surface activities	**Severity**- Low: Of the 435 acres of ground that would be added to the permit, only a small fraction (approximately 5 acres) would be disturbed if those areas suffer from subsidence related impacts and minimal operational activities such as boreholes, small pads, and minor roads. Subsidence cracks on steep terrain may be visible to nearby landowners. **Extent**- Medium: Mining would lower the relief of the undermined area of Panel 0 Right between 0 and 6 feet. Subsidence could occur throughout the added mining cut. **Duration**- Short- and Long-Term: Subsidence would be reclaimed if deemed necessary. Subsidence cracks may be visible on steep terrain for years; cracks on slopes greater than 20% will be allowed to heal naturally. Lowering the topographical relief of the undermined area would be permanent. **Frequency**- Infrequently: Regrade work for subsidence mitigation (approximately 5 acres) would occur where subsidence occurs and would likely happen shortly after mining with the longwall. Most subsidence cracks will naturally close or fill in with sediment. **Unique/Fragile**-Not unique or particularly fragile.	Probable	Impacts to aesthetic resources would add to cumulative impacts associated with mining and agriculture in the project area.	-A site-specific repair-mitigation plan would be developed and implemented for areas of surface disturbance. Repair could include soil salvage, grading, soil replacement, and/or seeding with an approved seed mix	No
9) Demands on Environmental Resources of Land, Water, Air or Energy	Water use from wells drilled on site and produced during mining; economic exploitation of coal resources	**Severity**- Medium: Water use and coal resource exploitation would be limited to 280 acres of coal mining within the proposed mine panel. **Extent**- Small: 280 acres of coal would be mined within the 420-acre mine cut of the proposed panel, relative to the 5,700 acres of coal that have been mined under the permit as of July 2023. **Duration**-: Short- and Long-Term: Water would be used during mining and would cease at the end of mine life. Economic exploitation of coal would be permanent. **Frequency**- Continuous through operations period. **Unique/Fragile**- Not unique or fragile.	Certain	Impacts to the environmental resources of water and energy would add to cumulative impacts associated with mining and agriculture in the project area.	-SPE would repair/mitigate damage from subsidence to springs, wells, ponds, and streams. Mitigation will be determined successful if at the time the liability period has expired, SPE has demonstrated mitigation measures can provide water for consumptive use by livestock and wildlife of seasonal quantity. -SPE has an approved hydrologic monitoring plan;	No

					impacts from mining must be monitored until final bond release.	
10) Impacts on Other Environmental Resources	No anticipated impacts	N/A	N/A	N/A	N/A	No
11) Human Health and Safety	Continuation of mining would include inherent occupational risks for the mine workforce, but with no anticipated impacts to general public.	**Severity**- High: Incidents could range from minor injuries to fatalities for the mine workforce, depending on the nature and severity of a particular situation. **Extent**- Small: The inherent occupational risks of underground coal mining and support activities at the surface would continue for the mine workforce. Few, if any, members of the public would be in the general project area during mining operations. **Duration**: Short-term: Through the continuation of mining within the previously approved LOM timeframe (2024 or 2025). **Frequency**: Continuous through operations period. **Unique/Fragile**: Not unique or fragile.	Possible	N/A	Mining activities and mitigation measures (e.g. engineering controls, notices and signage, operating procedures and protocols) must comply with state and federal safety and health regulations.	No
12) Industrial, Commercial, and Agricultural Activities and Production	Local areas of surface disturbance impacting livestock production from subsidence or surface activities	**Severity**- Low: Of the 435 acres of ground that would be added to the permit, up to five acres would be disturbed if those areas have subsidence related impacts or have roads, small pads, or boreholes. **Extent**- Small: Total surface area susceptible to impacts would be minimal. **Duration**- Short-term: Any areas subject to subsidence or surface disturbance would be reclaimed if deemed necessary. Those areas reclaimed would be seeded with native species and monitored for a minimum of 10 years before they would be eligible for final bond release. **Frequency**- Infrequently: Surface disturbance would occur where subsidence occurs and would likely happen shortly after mining with the longwall. **Unique/Fragile**- Not unique or particularly fragile. No threatened or endangered species are identified in the baseline area.	Probable	Impacts to agricultural production would add to cumulative impacts associated with mining and agriculture in the project area.	A site-specific repair-mitigation plan would be developed and implemented for areas of surface disturbance. Repair could include soil salvage, grading, soil replacement, and/or seeding with an approved seed mix.	No
13) Quantity and Distribution of Employment	The continuation of current conditions and benefits related to workforce employment.	**Severity**- Medium: The mine is the top employer in Musselshell County. Current employment at the site includes 255 employees and 30 full time temporary contractors. **Extent**- Medium: The continued employment associated with expanded mining activities would benefit the workforce at the local and county levels. **Duration**: Through the continuation of mining within the previously approved LOM timeframe (2024 or 2025), short term. **Frequency**: Continuous through mine operations period, based on individual duties **Unique/Fragile**: Not unique or fragile.	Probable	N/A	N/A	No
14) Local and State Tax Base and Tax Revenues	The continuation of current conditions and benefits related to revenue from property, payroll, and coal production taxes.	**Severity**- Medium: The mine is the top employer in Musselshell County. Current employment at the site includes 255 employees and 30 full time temporary contractors. **Extent**- Large: The tax revenue associated with continued mining activities would benefit various funds at the local, county, and state levels. **Duration**: Through the continuation of mining within the previously approved LOM timeframe (2024 or 2025), short term. **Frequency**: Variable, based on different tax collection cycles **Unique/Fragile**: Not unique or fragile.	Certain	N/A	N/A	No
15) Demand for Government Services	None	N/A	N/A	N/A	N/A	No

16) Locally Adopted Environmental Plans and Goals	None	N/A	N/A	N/A	N/A	No
17) Access to and Quality of Recreational and Wilderness Activities	Local areas of surface disturbance from subsidence or surface activities	**Severity**- Low: Of the 435 acres of ground that would be added to the permit, only a small fraction (approximately 5 acres) may be disturbed if those areas have subsidence related impacts and minimal operational activities such as boreholes, small pads, and minor roads. A small portion of this might occur on BLM land that is already part of the permit area and would now be undermined with Panel 0 Right. **Extent**- Small: Approximately 5 acres of potential impact, mostly on private land. **Duration**- Through the continuation of mining within the previously approved LOM timeframe (2024 or 2025), short term. **Frequency**- Continuous through the mine operations period. **Unique/Fragile**- Not unique or fragile.	Unlikely	Impacts to the quality of recreational and wilderness activities would add to cumulative impacts associated with mining and agriculture in the project area.	A site-specific repair-mitigation plan would be developed and implemented for areas of surface disturbance. Repair could include soil salvage, grading, soil replacement, and/or seeding with an approved seed mix.	No
18) Density and Distribution of Population and Housing	The continuation of current employment would likely maintain the population and associated housing demand.	**Severity**- Medium: The mine is a top employer of Musselshell County. Current employment at the site includes 255 employees and 30 full time temporary contractors. **Extent**- Medium: The continued employment associated with expanded mining activities would likely maintain the current population and associated housing demand at the local and county levels. **Duration**: Through the continuation of mining within the previously approved LOM timeframe (2024 or 2025), short term. **Frequency**: Continuous through mine operations period **Unique/Fragile**: Not unique or fragile.	Probable	N/A	N/A	No
19) Social Structures and Mores	None	N/A	N/A	N/A	N/A	No
20) Cultural Uniqueness and Diversity	None	N/A	N/A	N/A	N/A	No
21) Private Property Impacts	Development of SPE's private coal interest requires compliance with the conditions in the permit and MSUMRA.	N/A	Certain	N/A	N/A	No
22) Other Social and Economic Circumstances	None	N/A	N/A	N/A	N/A	No

1. Severity describes the density at which the impact may occur. Levels used are low, medium, high.
2. Extent describes the land area over which the impact may occur. Levels used are small, medium, and large.
3. Duration describes the time period over which the impact may occur. Descriptors used are discrete time increments (day, month, year, and season). Short term is defined as impacts that will last up to as long as the life of project. Long term is defined as impacts that extend beyond the life of project.
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

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