

## CHECKLIST ENVIRONMENTAL ASSESSMENT

**COMPANY NAME:** Signal Peak Energy, LLC (SPE)      **Project:** Permit Amendment No. 03, Life-of-Mine (LOM)

**OPERATING PERMIT #:** C1993017                      **Date:** October 16, 2013

**LOCATION:** Bull Mountain Mine No. 1 is approximately 15 miles southeast of Roundup, MT.  
T6N, R27E: Sections 3, 4, 5, 8, 9, 10, 11, 14, 15, 16, 17, 21, 22, 23, 26, 27, 28, 34

**County:** Musselshell/Yellowstone, MT

**SURFACE PROPERTY OWNERSHIP:**  Federal  State  Private

**MINERAL PROPERTY OWNERSHIP:**  Federal  State  Private

### **BACKGROUND**

Surface Mining Permit C1993017 was originally issued to Meridian Minerals on October 15, 1993, transferred to Glacier Park Company on September 25, 1995, transferred to Mountain Inc., on November 20, 1995, and to BMP Investments, Inc. on July 2, 2002. BMP Investments Inc. (BMPII) was renamed Bull Mountain Coal Mining, Inc. on December 13, 2006 and the permit was transferred to Signal Peak Energy, LLC on September 15, 2008.

This Checklist Environmental Assessment has been prepared to supplement the Environmental Impact Statement titled, Meridian Minerals Company, Bull Mountains Mine No. 1, Musselshell and Yellowstone Counties, Montana, November 1992, which covered the area known as life of mine. The area within proposed Permit Amendment No. 03 (AM3) was included in the LOM area addressed by the Environmental Impact Statement (EIS). The EIS can be viewed at <http://deq.mt.gov/ea/coal.mcp.x>.

### **TYPE AND PURPOSE OF ACTION:**

Proposed AM3 would increase the mine permit area (LOM) of their underground coal mine (Bull Mountain Mine No. 1) by adding 7,161 acres and expanding the mine from five longwall panels (approved under Amendment No. 02) to 14 longwall panels (Figure 1). This area is included in 18 sections within Township 6 North, Range 27 East as shown below.

No changes to the reclamation plan are proposed since AM3 only addresses expansion of the permit area to allow continuation of underground mining. 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 will be developed as they are identified.

SPE is the operator of Montana's only active underground coal mine. The proposed plan includes room and pillar mining to develop nine additional panels for longwall mining. If approved, AM3 would extend the Permit Boundary toward the northeast (see Figure 1) and increase the permit area by 7,161 acres for a total area of 14,896 acres. Total acreage of the underground mine plan (LOM) would be 10,569 acres. Approval of this amendment would further increase the potential of the ground surface (directly above the panels and within the angle of draw) to be adversely affected by subsidence caused by mining.

Approximately 20 acres of additional surface disturbance is expected as a result of this amendment. This amount of additional disturbance is necessary to construct temporary surface facilities that support underground mining. Temporary surface support facilities include boreholes, associated pads, power lines, and roads.

If approved, AM3 would add approximately 176 million tons of in-place coal reserves or 110 million tons of mineable coal. Of this, approximately 83 percent would be recoverable (91 million tons of coal).

The amended area includes the following:

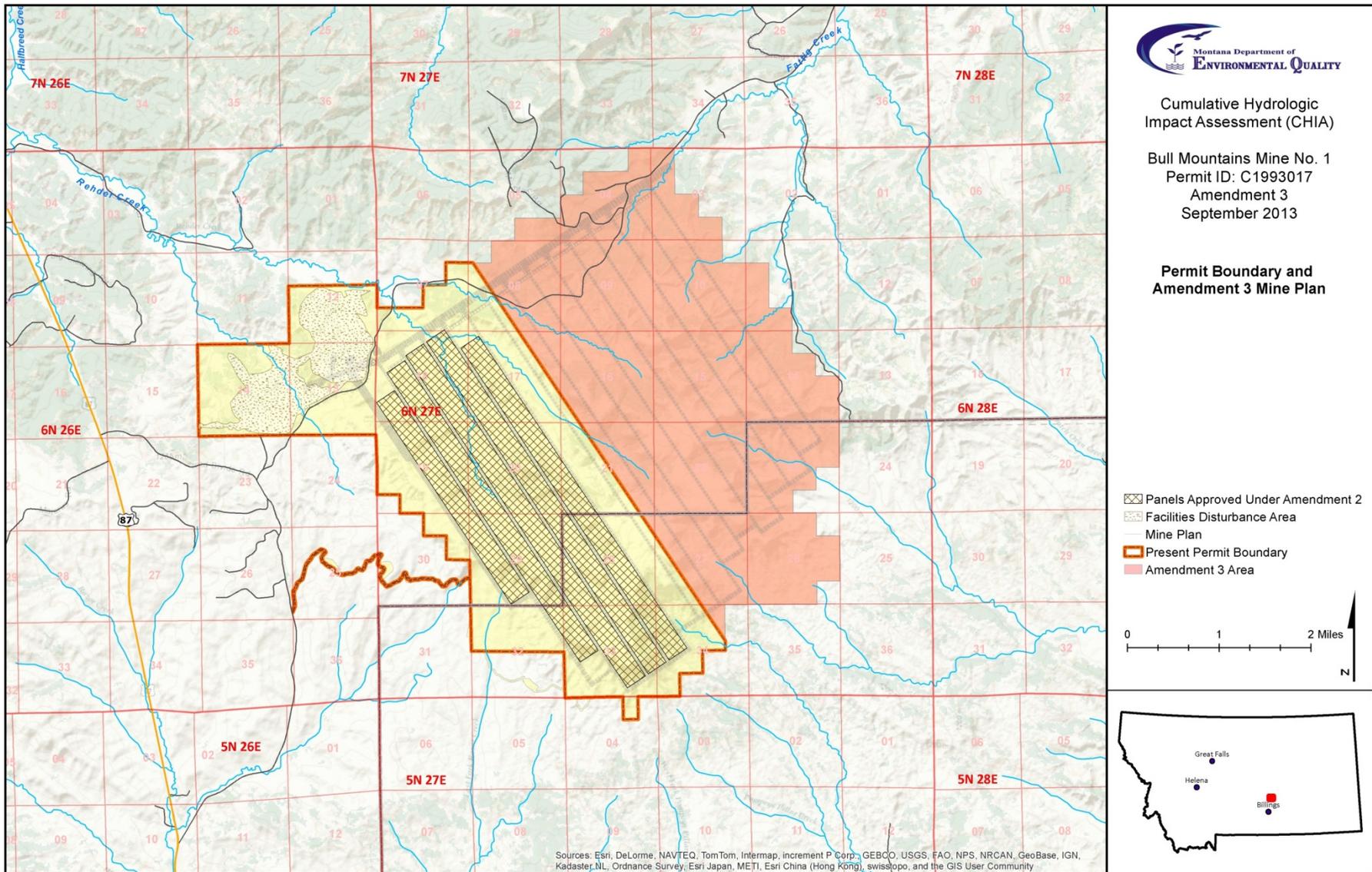
**PERMIT AMENDMENT NO. 3 AREA**

<b>Township 6 North, Range 27 East</b>		
Section 3	SW¼; SW¼SE¼; W¼NW¼	285
Section 4	S¼NE¼; NE¼NE¼; SE¼NW¼; S½	474
Section 5	S¼SE¼	79
Section 8	NE¼; E¼NW¼; Portion SW¼NW¼; Portion S½;	454
Section 9	ALL	637
Section 10	S½; NW¼; W¼NE¼; SE¼NE¼	601
Section 11	S¼SW¼; NW¼SW¼; SW¼NW¼	160
Section 14	S½; NW¼; SW¼NE¼	520
Section 15	ALL	641
Section 16	N¼; SE¼; E¼SW¼; Portion W¼SW¼	622
Section 17	Portion E½	101
Section 21	Portion N¼; Portion SE¼	306
Section 22	ALL	640
Section 23	N¼; SW¼; NW¼SE¼	520
Section 26	W½; W¼SE¼; NE¼SE¼; W¼NE¼; SE¼NE¼	559
Section 27	E½; Portion W½	518
Section 28	Portion NE¼NE¼	12
Section 34	Portion W¼NE¼	32
<b>TOTAL AMENDMENT NO. 3 AREA ACREAGE:</b>		<b>7,161</b>

	Mineral	Surface
Changes to Permit Acreage	Change Amount + or -	Change Amount + or -
Federal:	2,529	577
Tribal:	0	0
State:	622	622
Private:	4,010	5,962
County:	0	0
Total:	7,161	7,161

**Reclamation plan:**

Signal Peak Energy, LLC commits to a reclamation plan designed to restore the natural use and utility of the land affected by mining activities, including reclamation of supplemental surface support facilities and repair of any significant subsidence fractures. Additionally, ample permit commitments, permit designs, permit plans, and permit bonding exists to ensure all potential hydrologic subsidence impacts have been adequately addressed in this amendment application. The reclamation plan is in section 17.24.313 of the Mining Permit (C1993017).



**Figure 1:** Bull Mountains Mine: Amendment 3 Area Map

N = Not present or No Impact will occur.

Y = Impacts may occur (explain under Potential Impacts).

<b>IMPACTS ON THE PHYSICAL ENVIRONMENT</b>	
RESOURCE	[Y/N] POTENTIAL IMPACTS AND MITIGATION MEASURES
<p>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?</p>	<p>[Y] The permit and proposed amendment area of Bull Mountains Mine No.1 are situated in the Bull Mountains that range in elevation from about 3,700 feet to 4,700 feet in the permit area. Topography of the area is rugged and the terrain is generally mountainous, dissected by ephemeral streams with higher areas or plateaus commonly capped by resistant sandstone and clinker.</p> <p>Tertiary age continental rocks (alternating sandstones, siltstones, shales, clinker, and coals) of the Tongue River Member of the Fort Union Formation are the principal rock units that would be disturbed by expanded longwall coal mining under AM 3. Field inspection by the Department of Environmental Quality (DEQ) indicated that these geologic rock units are not unusual or unstable.</p> <p>Soil survey data, as described in section 17.24.304(1)(k) of the permit, identified nine well developed soil series in the permit area and vicinity that are dominated by silty or sandy loams. Susceptibility of these soils to wind and water erosion ranges from moderate to high. However, expansion of underground mining would leave the soil resource in place and relatively undisturbed as successive subsurface coal panels are mined. Disturbance would consist of previously approved facility areas (e.g., office buildings, roads, a rail loop, ponds, and support for the processing of the coal) including disturbance associated with construction of borehole pads and roads. Much of the area required for these activities is already disturbed and currently permitted.</p> <p>Soil and suitable material salvage associated with development of the waste disposal area (WDA) created the largest surface disturbance outside the facilities area. Soil and suitable material salvage was conducted specific to the WDA. Salvage was within the bounds of law and rules while following permit commitments for soil handling and protection of the soil resource.</p> <p>Expanded mining operations could create surface subsidence features similar to those recorded during extraction of the first and second series of mining panels associated with Amendments No. 1 and 2 (Figure 1), respectively. Shallow sink-like depressions, linear surface fractures, and minor rockslides associated with subsidence have not had a noticeable effect upon the soil profile. 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. All areas of 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).</p>
<p>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?</p>	<p>The main hydrologic issues surrounding the Bull Mountains Mine No. 1 are the potential for loss or diminution of the quantity and quality of groundwater and surface water, and the resulting impacts to wells, springs, ponds, and stream reaches within and in the vicinity of the mined area. These potential impacts are described below and would be expected if mining is expanded under AM3.</p>

## IMPACTS ON THE PHYSICAL ENVIRONMENT

### [Y] Groundwater

Five groundwater systems or aquifers are identified in the mined area and vicinity: the alluvial aquifer, the overburden aquifer, the Mammoth coal aquifer, the upper underburden aquifer, and the deeper underburden aquifer. Mining is expected to affect the water levels of these aquifers except the alluvial aquifer and deeper underburden aquifer. Groundwater direction in all but the alluvial aquifer is generally toward the north-northwest; alluvium within the permit boundary is generally dry except during and after significant storm events. Generally, groundwater associated with the deeper underburden, upper underburden, and Mammoth coal aquifers occurs under confined conditions and groundwater is unconfined in the overburden and alluvial aquifer systems.

Groundwater enters the mine as the Mammoth coal aquifer is removed, and by development of subsidence fractures (series of vertical conduits or drains) in the overburden aquifer. Water is removed from the mine by dewatering pumps and through evaporation by ventilation fans. As the longwall panel advances, unsupported overburden rocks flex (subside), fracture (fractured zone), and begin to collapse (caved zone) into the void formally occupied by coal. The collapsed material in the mine voids is known as gob. Development of near vertical subsidence fractures in the overburden is likely responsible for much of the water in the mine as they intercept, drain, and partially dewater shallow groundwater above the mined area. Currently, the calculated drawdown (2004-2011) within the permit boundary in the Mammoth coal and upper underburden aquifers is approximately 45 feet and 25 feet, respectively [Analysis of Probable Hydrologic Consequences (PHC) addendum, 2013].

During mining, groundwater drainage into the mine voids may temporarily reduce shallow groundwater elevations and spring discharge in the immediate vicinity of the mined area. However, settling and compression of overburden rocks (e.g., low permeability shales) after mining is expected to close or seal most subsidence fractures and spring flow is expected to return to near premining discharge. If spring flow is impacted, the permittee is committed to replacing the flow using one of the methods discussed in Surface Mine Permit Volume 3, *Section 314 - 5.0 Mitigation Plans*, or another alternative approved by the DEQ.

Litsky Spring (Station No. 17415), the first known spring to be affected, was undermined in late-March/early-April of 2012. Adjacent monitoring wells recorded the drop in overburden well levels as the area under Litsky Spring was mined, followed by recharge of monitoring wells as subsidence fractures healed and well levels returned to expected levels. More recent undermining of springs occurred in 2013 when several springs (17115, 17145, 17165, 17185, & 17315) were undermined as the longwall miner advanced through panel 3. While spring 17185 exhibited a brief interruption of flow immediately after undermining, flow resumed within two weeks and has shown no discernible interruption in flow since recovery. Weekly flow monitoring showed no discernible loss or interruption of spring flow for the remainder of the recently undermined springs. Continued monitoring of wells and springs will allow additional evaluation of potential impacts as longwall mining advances and additional springs are undermined.

Most private water supply wells in the area of the mine are completed in

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relatively deep sandstones of the deeper underburden aquifer that are likely hydraulically isolated from shallow aquifers (e.g., upper Underburden, Mammoth coal and Alluvial aquifers) and effects of mining. Aquifer test data (Hydrometrics, 2009) indicated that these relatively deep sandstones occur under confined conditions and are not expected to be influenced by mining. SPE has committed to an additional study of the deeper underburden aquifer to confirm these conclusions. These relatively deep underburden sandstones have been identified as a source of replacement water if shallower supplies are impacted and must be replaced.

Three industrial supply wells, currently used for mining operations are completed in carbonate rocks of the Madison Group, at depths greater than 8,700 feet. These wells produce hot (approximately 165°F) and highly mineralized water that is isolated from the shallow aquifers of the Fort Union Formation by thousands of feet of confining rock units. The water contains concentrations of fluoride and radionuclides in excess of drinking water standards for groundwater that make the deep Madison well water unsuitable as potable water. This industrial-use water from the Madison wells is stored in Madison Pond No. 1, a lined pond used by the mine for coal processing in the preparation plant, and to control road dust and underground dust generated during mining. Wastewater generated from the preparation plant and underground dust control is filtered and re-used in a closed-loop system. Coal processing waste and underground mine wastes are disposed of in the WDA.

Due to the use of deep Madison well water for coal processing, the potential for the accumulation of constituents from Madison wells in coal processing waste emplaced in the WDA exists, however it is not anticipated to approach levels of concern for groundwater or surface waters. Groundwater flow through the WDA is controlled to inhibit groundwater flow from the WDA to underlying aquifers, thereby limiting their potential for contamination due to WDA materials. Likewise, surface water runoff is controlled through MPDES-permitted outfalls. As stated earlier, runoff from the WDA is rare and only occurs during significant precipitation events, which would provide significant dilution of any constituent concentrations that may be present in WDA runoff water. Therefore, it is not anticipated that constituents in coal processing wastes will contribute significantly to groundwater or surface water quality conditions.

A groundwater flow model (MODFLOW, 3-dimensional transient flow model) developed for SPE by Nicklin Earth & Water (March 2013) predicts that the majority of impacts or drawdown at the end of mining will be in Mammoth coal and upper underburden aquifers in the immediate vicinity of the mine and extending down gradient several miles beyond the permit boundary toward the north-northwest. The drawdown northwest of the mine (within the Mammoth coal and upper underburden aquifers) is expected to dissipate over time after mining ceases. The integrity of underground workings affects the recovery of groundwater levels after mining ceases. If the mine gate roads remain intact after mining then pooling of water in open workings would lead to raised groundwater levels in these aquifers in the northern part of the mine compared to premine water levels. By contrast, collapse of the gate roads would lead to the return of groundwater levels to near premine levels due to more uniform flow and lower tendency to pool. In any case, residual drawdown within the LOM boundary is predicted to persist for at least 50 years after mining and decreased water levels in

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the southern part of the mine may be permanent due to the increased permeability of the mine gob.

After mining, groundwater flow intercepted by subsidence fractures and drained into the mine voids could: 1) emerge as portal discharge, 2) increase the water levels in alluvial, or underburden units, 3) increase flow at springs or streams existing at lower elevations, and/or 4) emerge as new or relocated springs or streams. Any of these effects which occur would likely be more pronounced if the gate roads remain intact and fill with water, than they would if the gate roads collapse. Currently there is no evidence that mining has affected the water levels in stock or domestic water supply wells outside the permit area. Groundwater levels in all aquifers are monitored regularly in a network of 119 groundwater monitoring wells to evaluate the potential for impacts or material damage.

A decline in water quality is expected in groundwater that comes into contact with the fresh mineral surfaces created by fractured rocks in and immediately above the mined out area, mainly due to increases in TDS, sodium, and sulfate. Quality of groundwater that does not come into contact with the fracture system or gob material is not expected to be affected by mining. The Montana Bureau of Mines and Geology (MBMG) (Reiten and Wheaton, 1989; Wheaton and Van Voast, 1989) conducted a hydrogeologic reconnaissance of abandoned coal mines near Roundup, Montana to study the potential for beneficial development of waters contained in the mines. Results indicated that groundwater in these abandoned mines is dominantly sodium-sulfate type with respective TDS, sulfate, and specific conductance concentrations ranging from 793 to 5,155 mg/L, 339 to 3,010 mg/L and 1,730 to 6,430 microsiemens per centimeter (uS/cm) that average 2,042 mg/L, 1,106 mg/L and 3,038 uS/cm. These results indicate that post-mining groundwater quality of mine pool water within the Bull Mountain Mine No. 1 would likely degrade from baseline groundwater quality where the average respective TDS, sulfate, and specific conductance concentrations within the Mammoth coal were 1,608 mg/L, 798 mg/L, and 2,272 uS/cm (Table 3 of the PHC).

Composition of groundwater quality in abandoned mines near Roundup was found by the MBMG to be generally suitable for agricultural and livestock use. Water in the upper underburden aquifer (defined as the aquifer that extends 30 feet below the base of and likely hydraulically connected to the Mammoth coal) is also considered generally suitable for these uses.

Currently, there is no evidence that groundwater quality on or off the permit area has been impacted by mining. Groundwater quality impacts are not expected during mining because mine drawdown causes groundwater to flow towards the mine. The groundwater quality of all aquifers is monitored regularly by a network of 84 groundwater monitoring wells to evaluate the potential for impacts or material damage.

Particle tracking was conducted using the groundwater model to estimate the rate of movement of lower quality groundwater away from the mine in the Mammoth coal aquifer after mining ceases. The results of this modeling showed that particles placed near the edge of the mine voids traveled less than 2,000 feet in 50 years for the scenario where the gate roads remained intact forming a mine pool. Particle transport in

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the scenario where gate roads collapsed was less than 1,000 feet in 50 years. Because the particle tracking model uses conservative assumptions which increase particle transport rates, the actual distance of movement of lower quality water from the mine pool should be less than these estimates. Particle tracking also does not consider dilution or attenuation of lower quality groundwater which would occur during transport away from the mine. Because of these factors, no degradation of groundwater quality outside the permit area is expected to occur after mining.

### [Y] Surface Water: Streams & Springs

Stream reaches in the amendment area are typically dry. Notwithstanding storm events or unusually high precipitation, streamflow only occurs where shallow groundwater flow intersects stream channels, resulting in springs. Springs may form streamflow for a short reach downstream of the spring issue point, and wet or ponded surface conditions may be observed, particularly where springs have been developed for stock water use (via constructed in-channel ponds or impoundments). Spring flows and issue points within the permit area are highly variable and dependent upon local precipitation and geologic controls. Thus, the extent of flowing, wet, or ponded in-channel conditions from year to year can be attributed to the amount of recent precipitation and the recharge or diminution of shallow perched aquifers that contribute to spring flow.

Springs and stream channels in the amendment area that have the potential to be impacted by mining operations include 1) those that occur in the undisturbed surface areas within the permit boundary; and, 2) those that occur within the disturbed surface areas of the Bull Mountain Mine No. 1. Undisturbed surface areas are those areas above planned longwall panels where subsidence features (fractures, depressions, and subsurface deformation) in overburden may alter the flow of surface water or shallow groundwater. Undisturbed surface areas include all mine lands within the permit that do not include the mine facilities area or waste disposal area. Disturbed surface areas of the Bull Mountain Mine No. 1 include the facilities area and the waste disposal area in the northwest portion of the permitted area.

### Undisturbed Areas

In the Bull Mountains, subsidence fracture hydraulic conductivities are expected to be buffered by thick shales; however some increases in both vertical and horizontal hydrologic conductivities may occur as a result of subsidence. Subsidence fractures in areas of shallow overburden cover may cause diversion of the shallow groundwater, and some increased lateral drainage from higher overburden units to lower springs also may occur temporarily as a result of flow along subsidence fractures. Settling and compression after mining are expected to close most subsidence fractures, thereby returning the shallow groundwater flow directions, including flow to springs, to approximately the premining orientation. If, however, flow to the springs is impacted, the permittee is committed to replacing the flow using one of the methods discussed in Surface Mine Permit Volume 3, *Section 314 - 5.0 Mitigation Plans*.

Seventy-two (72) mapped springs lie within the permit area. Of these 72 springs, 31 have been identified as significant springs that may potentially be impacted by mining operations (the others are wet seeps

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	<p>or are dry during most years). To date, mining has occurred under only the first three longwall panels, and has progressed under three (3) of these 31 'significant' springs. Of these three springs, only one (Spring 17185) recorded a response to undermining. As shown from weekly monitoring data, Spring 17185 ceased to flow soon after undermining in mid-May of 2013, but within two weeks returned to normal flowing conditions. It appears that subsidence had a temporary effect on spring flow at station 17185, but, as expected, flows returned after a short period of settling and healing of subsurface subsidence cracks.</p> <p>Currently, there is no evidence that spring or surface water quality or quantity in undisturbed areas has been permanently affected or impacted by mining. A network of springs and surface water monitoring sites are monitored regularly to evaluate the potential for impacts or material damage during or post-mining. For significant springs with the potential to be effected by undermining, flow monitoring frequencies are increased prior to undermining, and increased monitoring frequencies are maintained up to a year following undermining.</p> <p><u>Disturbed Areas</u>          No permanent effects to the quantity and quality of stream flow would be anticipated from disturbed surface areas within the existing and proposed mine permit area. All flow from disturbed areas would be captured by sedimentation ponds, and is regulated under DEQ's MPDES permitting section. With the exception of extreme events, the effects of sediment pond discharges on stream water would be negligible. All sediment ponds are designed to contain the 10-year / 24-hour runoff plus sediment. Due to the low precipitation in the area, pond discharges are very infrequent (wet-weather discharges in 2011 and 2013 were the first discharges recorded since 1991). In the event that a sediment pond discharge should occur, sampling, effluent limits, and reporting will comply with DEQ requirements. Routine maintenance of the ponds maintains the storage capacity. Where practical, runoff from undisturbed areas will be diverted around the sedimentation ponds in order to decrease the quantity of water to be treated within the ponds. Some undisturbed area waters would enter the ponds, however, and would be treated and discharged under permit requirements.</p> <p>During the life of the mining operation, ditches and culverts would be employed to handle surface runoff within and around the mine facilities area. All ditches and culverts would be routinely inspected to ensure that accelerated erosion is not occurring at the outfalls. No long term or permanent water quality impacts are anticipated due to the emplacement of these structures.</p>
<p>3. AIR QUALITY: Will pollutants or particulate be produced? Is the project influenced by air quality regulations or zones (Class I airshed)?</p>	<p>[N] No direct impact to air quality is expected due to expansion of mining operations. Some increase in fugitive dust is anticipated due to the proposed increase in production (e.g. run-of-mine storage, coal processing, and haulage). These impacts to air quality would be addressed through review of the air quality permit.</p>
<p>4. VEGETATION COVER, QUANTITY AND QUALITY: Will vegetative communities be significantly impacted? Are any rare plants or cover types present?</p>	<p>[N] Underground expansion of mining activities within the proposed amendment would have no direct impact on vegetative communities. 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 the first two</p>

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	<p>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 additional panels 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.</p>
<p>5. TERRESTRIAL, AVIAN AND AQUATIC LIFE AND HABITATS: Is there substantial use of the area by important wildlife, birds or fish?</p>	<p>[Y] Numerous springs are located within the proposed amendment area. These springs are important to grazing livestock and to the local wildlife community. Water provided by these springs helps ensure livestock distribution throughout the grazing pastures and allows for overall grazing of the area, increasing the economic return to the land owner. A variety of wildlife species, including small mammals, bats, song birds, shorebirds, upland game birds, raptors, big game, and warm-water aquatic species utilize the springs and associated areas of ponded water.</p> <p>Aquatic plants (periphyton), macroinvertebrates (e.g. earthworms, insects etc.) and vertebrates (e.g. tiger salamanders, painted turtles) are associated with springs and ponds [304(1) j-27]. Fish have not been found in any of the ponds or stream reaches. Currently, there is no evidence that mining has impacted aquatic or other wildlife (birds, deer, coyotes, etc.) that depend on these water supplies.</p> <p>No threatened or endangered aquatic species or habitat has been identified in the area.</p> <p>Subsidence related fractures associated with the Fractured Zone may intercept and direct shallow groundwater into the Caved Zone which may alter spring discharge and ultimately land use. Currently, there is no evidence spring flow within or near the footprint of the permit boundary or proposed amendment boundary has been permanently impacted by mining.</p>
<p>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?</p>	<p>[N] No threatened, endangered, or sensitive plant species have been identified within the permit or amendment areas. Similarly, no endangered animal species have been identified within the proposed amendment area. Nineteen wildlife species of special concern have been observed in the wildlife monitoring area. These include the bald eagle, northern goshawk, Swainson's hawk, ferruginous hawk, long-billed curlew, Lewis's woodpecker, red-headed woodpecker, Cassin's kingbird, loggerhead shrike, Brewer's sparrow, lark bunting, grasshopper sparrow, chestnut-collared longspur, gray-crowned rosy finch, Townsend's big-eared bat, spotted bat, Great Plains toad, northern leopard frog, and sagebrush lizard. The majority of these species are considered transients or occasional visitors to the permit and proposed amendment areas. Three species (e.g. red-headed woodpecker, Cassin's kingbird, and northern leopard frog) have been observed on a regular basis and should be considered residents. Three other species (e.g. Townsend's big-eared bat, spotted bat, and sagebrush lizard) have been observed during regular surveys within the monitoring area; however, additional surveys are needed to better define whether or not they are residents of the area. Several of these species may be impacted if subsidence impacts springs and associated wetlands within the amendment area.</p>

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<p>7. HISTORICAL AND ARCHAEOLOGICAL SITES: Are any historical, archaeological or paleontological resources present?</p>	<p>[N] The originally approved permit area cultural resource obligations involved a Class III (Intensive) archeological/cultural inventory on all of the proposed surface disturbance area, plus a Class I literature search and rock art and standing-structure evaluation of the area overlying underground mining through life of mine. This was completed in 1989 (Rood 90 report), with supplemental intensive inventory of all known springs in 1992. Native American consultation (under AIRFA authority) was completed in 1993. In addition, the permit included a stipulation that steep-slope areas (&gt;25%) would be upgraded to Class III before starting longwall mining.</p> <p>Amendment No. 03 is for extension of underground activities of an existing mine, and the only significant surface disturbance anticipated is the possibility of some surface failure in areas of steep slopes. Roads and pads will be located above the panels; however, Class III archaeological surveys are required to be completed two panels in front of mining and will allow for the identified sites to be avoided or mitigated with approval from the Montana State Historical Preservation Office (SHPO). No additional archeological or historical sites have been discovered, and no impacts to known archeological or historical sites should occur. Protection of any incidentally discovered sites is stipulated in the approved mining permit.</p>
<p>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?</p>	<p>[Y] Work associated with proposed permit AM3 would lower the relief of the undermined area by approximately 7 feet or 70 percent of the extraction height (PHC). This was confirmed in August 2011 when Dunn Mountain subsided 7 feet as Panel 2 advanced beneath the mountain. 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.</p>
<p>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?</p>	<p>[N] Water used by the mine offices and for locker room showers is supplied by the Office Well that is completed in relatively deep underburden sandstones. This well is permitted by DEQ as a public water supply system (PWS No. 04676). Two wells completed in the Madison Formation (each approximately 8,600 feet in depth) provide water for industrial uses at the mine. An additional well has been drilled into the Madison Formation, but the casing failed and it is not producing water. Aquifer test results indicate that stock wells and domestic wells in the area will not be affected by production from these wells. For example, calculated drawdown (Hydrometrics, 2009) in monitoring well 62614-100-UB (BMP-121 - underburden monitoring well approximately one mile from the Office Well) was just over three feet after 20 years of continuous pumping (6 gpm). Similarly, pump test data (Hydrometrics, 2006) from Madison Well No.1 indicate that 18 feet of drawdown is predicted in a hypothetical well 1,000 feet from the pumping well after two years of pumping and 340 feet of drawdown after 20 years of pumping. This indicates that production (360 gpm) from the isolated Madison aquifer will not affect the yield of other Madison wells since the nearest Madison well to the mine site is approximately 17 miles.</p> <p>The proposed activity contemplates economic exploitation of coal resources that will not result in significant decrease in the total amount</p>

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	<p>of exploitable coal reserves in Montana.</p> <p>There are no activities nearby that will affect the proposed work.</p>
<p>10. IMPACTS ON OTHER ENVIRONMENTAL RESOURCES: Are there other activities nearby that will affect the project?</p>	<p>[Y] Livestock production and wildlife habitat would require the operator to minimize or repair subsidence features as necessary. The project area is remote and except for ranching and some hunting activities, there are no human activities in the area that would be affected by underground mining operations proposed under Amendment No. 03.</p>

<b>IMPACTS ON THE HUMAN POPULATION</b>	
11. HUMAN HEALTH AND SAFETY: Will this project add to health and safety risks in the area?	[Y] There is potential for injury to humans, livestock, and wildlife as subsidence features appear on the surface. A mining schedule must be published by the Operator for the respective landowners at least six months before their lands are undermined to minimize and warn of potential impact to humans and structures [ARM 17.24.911(5)].
12. INDUSTRIAL, COMMERCIAL AND AGRICULTURAL ACTIVITIES AND PRODUCTION: Will the project add to or alter these activities?	[N] Grazing or premining land use would not be significantly impacted by the expansion of underground mining activity and associated subsidence. Evidence of subsidence may include damaged fences, roads, minor rockslides, sink-like depressions, linear or en- echelon surface fractures. These features have not impacted livestock production while the first series of panels were mined and are not expected to impact production under AM3. It is expected that these surface impacts would be short-term; the operator would be required to repair the damage if extensive or impacted the postmine land use.  Subsidence could impact existing wells and springs; loss of these water sources would result in development and implementation of a plan to replace them. This area is remote and with the exception of livestock grazing there are no industrial or commercial activities near the proposed amendment area.
13. QUANTITY AND DISTRIBUTION OF EMPLOYMENT: Will the project create, move or eliminate jobs? If so, estimated number.	[N] Approval of AM3 would not create, move, or eliminate jobs. Approval would add a significant amount of acreage and tonnage to the permit, which will allow mining to continue at the current rate, thus, continuing employment at approximately the current level for an additional 9 years.
14. LOCAL AND STATE TAX BASE AND TAX REVENUES: Will the project create or eliminate tax revenue?	[Y] Additional mining would increase the amount of coal severance tax available to the state. Employment of the current and projected workforce would result in additional federal and state 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.
15. DEMAND FOR GOVERNMENT SERVICES: Will substantial traffic be added to existing roads? Will other services (fire protection, police, schools, etc.) be needed?	[N] Proposed work would not add substantial traffic to existing roads and the demand for government services would not exceed that required for review and approval of AM3.
16. LOCALLY ADOPTED ENVIRONMENTAL PLANS AND GOALS: Are there State, County, City, USFS, BLM, Tribal, etc. zoning or management plans in effect?	[N] No locally adopted environmental plans and goals are in effect.
17. ACCESS TO AND QUALITY OF RECREATIONAL AND WILDERNESS ACTIVITIES: Are wilderness or recreational areas nearby or accessed through this tract? Is there recreational	[N] Wilderness, recreational areas, public parks, or historic sites are not nearby or accessed through the proposed permit area. Expanded mining would not adversely affect any publicly owned park or place included in the national register of historic sites. The area is controlled by private landowners. Except for limited hunting and camping, the

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potential within the tract?	area is not typically used for recreational activities.
18. DENSITY AND DISTRIBUTION OF POPULATION AND HOUSING: Will the project add to the population and require additional housing?	[N] Field inspection by DEQ confirmed that few buildings or manmade structures are near or within the area proposed for expansion of the permit. Approval of AM3 would not add to the local population; additional housing would not be required.
19. SOCIAL STRUCTURES AND MORES: Is some disruption of native or traditional lifestyles or communities possible?	[N] Inspection by DEQ confirmed that the area is remote from most human activities and communities. Disruption of lifestyles is not expected since there is minimal human activity (i.e., ranching) within or near the proposed permit area.
20. CULTURAL UNIQUENESS AND DIVERSITY: Will the action cause a shift in some unique quality of the area?	[N] The project is not expected to significantly impact any inventoried Historic and Archeological Sites (see Item 7, above).
21. PRIVATE PROPERTY IMPACTS: Are we regulating the use of private property under a regulatory statute adopted pursuant to the police power of the state? (Property management, grants of financial assistance, and the exercise of the power of eminent domain are not within this category.) If not, no further analysis is required.	[Y] Private property would be undermined and impacted by subsidence pursuant to the Strip and Underground Reclamation Act (ARM 17.24.901). (See Discussion Above)
22. PRIVATE PROPERTY IMPACTS: Does the proposed regulatory action restrict the use of the regulated person's private property? If not, no further analysis is required.	[Y] Surface uses could be limited during a period of time when mining is proceeding and risk of subsidence is present. Proposed state government activities would place some restrictions on the owner's use of the surface property, but not sufficient enough to constitute a taking because the owner is not deprived of property or all economic uses of that property.
23. PRIVATE PROPERTY IMPACTS: Does the agency have legal discretion to impose or not impose the proposed restriction or discretion as to how the restriction will be imposed? If not, no further analysis is required. If so, the agency must determine if there are alternatives that would reduce, minimize or eliminate the restriction on the use of private property, and analyze such alternatives.	[Y] DEQ has limited of discretion in its permitting decisions.
24. OTHER APPROPRIATE SOCIAL AND ECONOMIC CIRCUMSTANCES:	[N]

25. Alternatives Considered:

No Action: The proposed mine area within Application AM3 would remain undisturbed and outside the boundaries

of SMP 1993017. Mining and reclamation would continue within the remainder of the Bull Mountains Mine No.1 as currently permitted and would be completed within three to four years, but the potential of the coal reserve would be much reduced.

The effect of no-action alternative on drawdown of groundwater and impacts to surface and groundwater quality would remain the same as current mining with no additional impacts.

Social and economic impact of no-action alternative would keep employment at the mine near the same levels for three to four years until current permitted coal reserves are depleted. After the coal was mined the mine would begin a shutdown process and eventually no longer employ workers. The area surrounding the facilities would remain working cattle ranches.

Approval: Coal mining operations would continue under authority of SPE's permit (SMP C1993017) and subject to its requirements which include reclamation described in the Reclamation Plan.

26. Public Involvement: Availability of this Environmental Assessment was published in *The Billings Gazette*. The EA will also be available on the DEQ Internet site (<http://www.deq.mt.gov>). Copies of the application are available for public review at the Bull Mountain Mine No.1 office, the Musselshell County Courthouse in Roundup, the Yellowstone County Courthouse in Billings, and at the DEQ offices in Helena and Billings.
27. Other Governmental Agencies with Jurisdiction: USDI, Bureau of Land Management (mineral lease and surface), Montana Department of Environmental Quality, Water Protection Bureau (MPDES), Air Resources Management Bureau (air quality permit), Montana Department of Natural Resources and Conservation (water rights and mineral lease), and Office of Surface Mining.
28. Magnitude and Significance of Potential Impacts: There would be no significant impacts associated with this expansion that were not previously addressed in the EIS.
29. Cumulative Effects: SPE is currently conducting exploration activities adjacent to the permitted area. DEQ has determined that prospecting activities including drilling, overland travel, etc. will not create a significant impact as no substantial disturbance is permitted as defined by ARM 17.24.301(121). Future mining of the area being prospected is unknown at this time; therefore, is not considered a cumulative effect for this permitting action. No additional activities have been identified in the area.

The current WDA may reach capacity prior to completion of the longwall panels contained in AM3. If a second WDA area is needed, SPE would be required to submit plans for creation of a new WDA, including location, size, and operation. It is anticipated that this application would result in a significant increase in the reclamation bond as well as a change to the hydrologic balance; therefore, the application would be a major revision. A major revision would include an additional environmental review, as well as opportunity for public comment. SPE has not proposed a plan and location for a second WDA; therefore, DEQ is unable to fully analyze the environmental impacts at this time.

**Recommendation for Further Environmental Analysis:**

EIS     More Detailed EA     No Further Analysis

**EA Checklist Prepared By:** Montana DEQ in cooperation with Montana DNRC.  
Pete Schade and Martin Van Oort: Staff Hydrologists  
Dave Adair: Engineer  
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