

**MINE PLAN**

**DEQ Exhibit 3**

**March 2021  
Revised September 2022**

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## **Mine Plan**

### **1.0 GENERAL DESCRIPTION OF MINING OPERATIONS**

#### **1.1 Mine Operator and Contact Information**

The operator of the mining operation is Black Hills Bentonite, LLC (BHB), P.O. Box 9, Mills, Wyoming, 82644. The Federal Tax Identification Number for Black Hills Bentonite, LLC is 83-0295902. Contact information for BHB and this mine is: Mike Thomas, Director Mining and Safety, P.O. Box 9, Mills, Wyoming 82644. Office Phone: 307-265-3740.

#### **1.2 Type of Mining Activities**

Mining will consist of small, open pit surface activities associated with the removal of bentonite.

#### **1.3 Life of Mining Activities**

The life of the mining operation including reclamation activities is expected to last approximately twenty (20) years. Approximately two hundred thousand (200,000) tons of bentonite will be removed from an estimated sixty-eight (68) acres. Approximately seventy-two (72) additional acres may be disturbed by related mine disturbances such as access roads, topsoil stockpiles, equipment parking areas and overburden stockpile areas.

Mining on the permit area will begin within one year of the approval of the permit application. The locations of proposed mining activities are illustrated on Mine Plan Map No. 1.

#### **1.4 Equipment and Machinery Used for Mining & Reclamation Activities**

Mining and reclamation will be conducted using the following equipment:

Caterpillar 627G Push-Pull Scrapers  
Caterpillar D8R/T Dozers  
Caterpillar 966 Front-End Loaders  
Caterpillar 14E Motor Graders  
John Deere 8220 Tractor  
Chisel Plows - Grain Drills

#### **1.5 Type of Bentonite Mined – Nature of Ore**

The bentonite mined on this permit area consists of bentonite beds within the Belle Fourche Shale. The beds average 36 inches in thickness.

## **1.6 Existing Underground Mines and Other Mining Activities**

No existing underground or surface mining activities are located within proposed permit area. Some past and "pre-law" mining disturbances are located in Section 16, T.50N., R.66W. Pre-law areas are defined as mining disturbances created prior to the passage of the Wyoming Environmental Quality Act of 1973.

## **2.0 MINING HYDROLOGY**

### **2.1 Impact to Groundwater**

Due to the shallow mining depths, no groundwater is expected to be encountered. No ground water has been encountered during the course of exploration drilling activities on the permit area. Additionally, seeps or springs that have been identified on the areas of proposed pits and other surface disturbances will not be generally impacted. Therefore, it is expected that impacts on groundwater resources will not occur in conjunction with mining activities on the permit area.

### **2.2 Impacts to Surface Waters**

Impacts to watersheds and surface water hydrology on the permit area are expected to be minimal. Surface runoff will be directed around and away from mining activities in order to prevent unnecessary erosion and sedimentation. Final contouring will be done in order to return the affected lands to the approximate original contour. No springs, seeps, or perennial streams will be affected by the proposed mining activities.

Proposed access roads have been developed to minimize the impact on the ephemeral drainages **by using existing roads in the permit area**. For situations where roads **may** cross ephemeral drainages, either low-water crossings will be constructed or culverts will be installed. The minimum culvert size allowed will be eighteen (18) inches in diameter. **Any ephemeral drainage crossings will be perpendicular to drainage.**

**Additionally, if the surface runoff is concentrated in an area which may impact surface water or adjacent watersheds, measures such as energy dissipaters and erosion control devices will be used to slow the flow of the runoff so that erosion and sediment transport are minimized in the runoff. Examples of energy dissipaters and erosional control devices include, but are not limited to, straw waddles, hay bales, and rock check dams.**

## **3.0 DESCRIPTION OF THE MINE FACILITIES**

### **3.1 Buildings, Processing Plants or Other Facilities**

No buildings, processing plants or other facilities will be constructed in conjunction with mining activities on this permit area. The bentonite produced from this area will be transported to existing processing facilities located several miles south of the permit area at the Thornton rail siding.

### **3.2 Access and Haul Roads**

Access to the permit area from the Thornton plant will be via Weston/Crook County Road 160 to Pine Ridge Road to Crook County Road 93 (Old Sundance Road). Once on Crook County Road 93, proceed for 2.8 miles and turn south. The permit area can also be accessed from Thornton by taking US-16 to Moorcroft to US-14 to WY State Highway 113 to Crook County Road 93.

No secondary entrance access road will be constructed.

The access road associated with the permit is illustrated on Mine Plan Map No. 1. Road construction will consist of a crowned and ditched road. Typical cross sections for the construction of access roads associated with this permit application are presented in Figure MP-1.

The construction of new roads within the permit area will be limited to secondary access roads as illustrated on the mine plan map. These roads will have a top width of twenty feet and a total width of fifty feet to allow for ditches along the roadside. Ditches will be approximately twelve (12) to eighteen (18) inches in depth to allow for drainage. Water turnouts will be constructed along the side ditches in order to disperse runoff and to minimize erosion. Special efforts will be made to prevent water from running down roadways and ditches into drainages at crossings.

Topsoil will be salvaged from the access roads and adjacent ditches [based on Appendix D7 depth data and on-the-ground observations during salvaging operations](#).. Topsoil removed from the access roads will be stockpiles adjacent to the access roads. All access roads will be reclaimed upon the completion of mining activities.

As stated previously, either low water crossings will be constructed or properly sized culverts will be installed, as needed, during the construction of the access roads. Typical construction details associated with the low-water crossing are illustrated in Figure MP-2. Construction details associated with culvert installations are illustrated in Figure MP-3.

The following criteria will be utilized in calculating peak storm water discharges for culvert sizing determinations:

Type II Storm Distribution  
Land Use: Pasture or range (No mechanical treatment)  
Hydrologic Condition: Fair  
Hydrologic Soils Group: D (From SCS Handbook NEH-4)

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Slopes: Moderate

Rainfall Event: 25 Year, 24 Hour, NOAA Wyoming Isopluvials = 3.2"

Curve Number: 85

### **3.3 Power Transmission Lines, Communication Lines and Pipelines**

No power lines or communication lines will be constructed in conjunction with the development of mining activities on the permit area. No power lines or communication lines will be affected by the proposed mining activities.

Black Hills Bentonite will not mine within a 25 foot radius of any power pole within the area in order to maintain a stable pedestal around each pole.

### **3.4 Sedimentation and Treatment Ponds**

No sedimentation or treatment ponds will be constructed in conjunction with the mining activities on this permit area.

### **3.5 Mill and Tailings Disposal Sites**

No mill or tailings disposal sites will be constructed or created in conjunction with the development of mining operations on this permit area.

### **3.6 Drainage Diversions**

No permanent drainage diversions are proposed for the permit area. Surface flow may be diverted on the up-slope side of pits and other affected area to prevent accumulation of water in pits and to prevent down slope sedimentation. The diversion of surface flows will be accomplished by constructing small v-ditches on the up-slope side of pits to divert surface flows away from these areas. These small v-ditches will normally be constructed with a motor grader, *scraper*, or a dozer. Topsoil will be removed and stockpiled prior to constructing drainage diversions. If erosion occurs on the diversion areas, these sites will be seeded with a temporary seed such as barley or winter wheat to provide soil stabilization. Straw bales or water bars may also be used to stabilize erosion.

### **3.7 Spill Contingency and Countermeasure Plan**

If a fuel spill were to occur on the permit area as a result of a mechanical failure, damage to a piece of heavy equipment, storage tank or a fuel delivery truck, mine personnel are instructed to make sure the site is safe, stop additional leakage or spillage, ensure the containment of any spilled fuels or oils, and immediately contact the company's Regulatory Compliance Group.

Containment of a diesel fuel spill or a lubricating oil spill would most likely be contained

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utilizing the native earthen materials present at the site. Depending upon the size of the spill and the volume of contaminated earthen materials, the contaminated material would be removed with shovels or with the appropriate size of earth moving equipment. Disposal of the contaminated earthen material would be coordinated by BHB environmental personnel at an approved land farm in accordance with state and federal regulations.

In the event that the volume of a spill is greater than twenty-five gallons, BHB will report the spill to the Wyoming Department of Environmental Quality-Water Quality Division (WDEQ/WQD) within twenty-four hours of the spill and a written report will be submitted to the WDEQ/WQD within seven days of the spill.

Diesel fuel and lubricating oils are stored within secondary containment structures on the staging areas. These containment structures will be constructed in order to sufficiently contain 110% of the volume of the fuel or oil storage container.

### **3.8 Solid Waste Disposal**

Wastes and trash which will be generated as a result of mining activities will be collected in trash containers and hauled to a municipal landfill for disposal. Trash and other solid waste will not be allowed to accumulate at the site. Used oil from heavy equipment will also be collected and properly disposed of or recycled.

### **3.9 Railroads and Conveyor Systems**

No railroad lines or conveyor systems will be constructed in conjunction with the mining activities associated with this permit area.

### **3.10 Overburden and Bentonite Stockpiles**

Out-of-pit overburden and bentonite stockpiles will be constructed in conjunction with the mining activities conducted on this permit area. Out-of-pit overburden stockpiles are normally only constructed in conjunction with the overburden removed from the first pit mined in an adjoining series of connected pits (multiple cut sequence).

Bentonite stockpiles will be developed in order to field dry the bentonite exposed in each pit. These bentonite stockpiles are placed on either the overburden stockpile or the backfilled portion of previously mined pits in order to reduce impacts to the land.

[Locations of these stockpiles can be found on Mine Plan Map MP-1.](#)



### **3.11 Access Control**

Due to the remoteness of the area and limited size of this mining operation, no access control features are planned. Any potential hazards to humans, livestock, or wildlife which may develop, will be addressed on a site-specific basis using fencing or other methods determined to be appropriate for the conditions. The mined lands will be completely reclaimed following the completion of mining, which will eliminate potential hazards such as highwalls and open pits.

## **4.0 MINING METHODS AND SCHEDULE**

### **4.1 Mining Methods**

Bentonite mining on the permit area will consist of a series of pits arranged in multiple cut sequences. Topsoil will be removed from all affected areas utilizing scrapers and dozers. Topsoil will be placed in stockpiles for future use in the reclamation of the mined or disturbed lands. In some instances, the topsoil may be spread directly onto backfilled areas instead of being placed in stockpiles.

Following the removal of topsoil, the exposed overburden will be ripped using dozers. The overburden will then be removed from the pit using scrapers. Overburden from the first pit in a multiple cut series of pits will be placed in an out-of-pit overburden stockpile. Overburden from each subsequent pit will be directly backfilled into the adjacent open pit.

Once all the overburden is removed and the bentonite is exposed, the bentonite is either field dried in the pit or on an out-of-pit bentonite stockpiles which will be constructed on the backfilled pit areas and the overburden stockpile.

### **4.2 Topsoil Removal and Handling**

Topsoil will be salvaged prior to overburden removal or construction activities. Topsoil will be salvaged from the following areas if present: 1) overburden stockpile areas; 2) pits areas; 3) roads; 4) equipment parking areas, and any other area where it is deemed necessary to remove topsoil in order to protect this resource. **Topsoil baseline salvage depths shall be considered soil depth estimates, and actual salvage depths will be assessed and adjusted during salvage operations to ensure salvage of only suitable materials.** If insufficient suitable topsoil or subsoil is available for salvage or redistribution, then it may be used as a topsoil substitute, if it meets the criteria for suitable material through analysis or test plots per Chapter 3, Section 2(c)(iii)(A) requirements. Any topsoil substitute stockpiles will be segregated from topsoil and overburden piles and will be identified as substitute material. Identification signs will be placed within 150 feet of the stockpile and be in place at the time stockpiling begins.

The removal of topsoil will be accomplished using 627G push-pull scrapers. In some instances where the topography may be too steep for the safe operation of scrapers, topsoil will be

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removed and stockpiled using D8R/T dozers. Typically, salvaged topsoil will be placed in stockpiles. If graded and contoured areas exist, the topsoil may be applied directly (live-spread) instead of being stockpiled.

Topsoil salvage under frozen or muddy conditions will not occur. Every attempt will be made to salvage topsoil with scrapers, as control of the depth of topsoil removal is greatly improved with the use of scrapers versus dozers. Typically, salvaged topsoil will be placed in stockpiles. If graded and contoured areas exist, the topsoil may be applied directly (haul back) instead of being stockpiled.

Topsoil will also be removed from the edges of all pits in order to create a topsoil "buffer area" approximately ten to thirty feet wide. This "buffer" is necessary in order to protect the topsoil resources from the possibility of sloughing of high-walls or low-walls on the edges of pits. These buffer areas also facilitate the safe operation of heavy equipment and complete salvage of topsoil along the edges of advancing multiple cut pit sequences.

All topsoil stockpiles will be conspicuously identified with signs. Topsoil stockpiles which will remain in place for more than one year will be seeded with the approved permanent seed mixture. Seeding of stockpiles will be conducted in the spring or fall, whichever season follows the placement of the stockpile.

Topsoil salvage depths on proposed disturbance areas range from zero (0) to fifty-five (55) inches.

[Locations of these stockpiles can be found on Mine Plan Map MP-1.](#)

#### **4.3 Overburden Handling**

Overburden removed from the pit areas will be either stockpiled or directly backfilled into previously mined pits in the advancing pit series. Overburden removed from the first pit in a multiple cut pit series will be placed immediately adjacent to the pit to form an out-of-pit overburden/bentonite stockpile. A portion of this material may be returned to the pit areas to complete backfilling, or in some specific instances, all or a portion of the overburden will remain as a permanent reclamation feature.

If overburden conditions warrant it, the top eighteen inches of overburden will be removed with scrapers and stockpiled separately from the remainder of the overburden strata. This material will be identified and signed as "Segregated Overburden". If there is segregated overburden, it will be spread on top of the backfilled overburden prior to the application of topsoil, in order to create an improved plant root zone as well as a buffer between the topsoil and the poorest quality overburden.

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If an out-of-pit overburden stockpile is left as a reclamation feature, it will be graded and contoured to blend with the existing topography and all slopes will be reduced to 4(H):1(V) or less. Overburden stockpiles which will remain as a permanent reclamation feature will have a maximum height of ten (10) feet and will also be oriented in the same direction as nearby topographic features. Salvaged "Segregated Overburden" will also be placed on out-of-pit stockpile areas after grading and prior to the application of topsoil.

Overburden will be backfilled in order to restore mined and affected areas to their approximate original contour (AOC). Once the overburden is backfilled, it will be graded and contoured to achieve AOC. Final slopes will be no steeper than 4(H):1(V) and all reclaimed areas will drain in order to prevent ponding of water. Topsoil will be reapplied to the approximate original depth.

Waste bentonite, commonly referred to as "cleanings," which remain on the overburden stockpile areas after the stockpiled bentonite has been removed, will be disposed of by placing this material at the base of a highwall prior to backfilling. This is done to prevent this highly bentonitic material from being placed directly on the surface prior to the application of topsoil.

#### **4.4 Bentonite Handling and "Field-Drying"**

The "field-drying" of bentonite is a process which utilizes the radiant heat of the sun to reduce the natural moisture content of the mined bentonite. This "field-drying" procedure reduces the amount of fuel consumed in both the hauling of the material to the processing plant and in the drying of the bentonite as it is being processed.

During the summer months, the exposed bentonite is plowed using farm tractors and chisel plows. As a plowed layer of bentonite becomes dried by the sun and wind, this dried layer is removed with scrapers and placed in a stockpile. The plowing process in the pit is then repeated until the entire seam of exposed bentonite is eventually dried, removed from the pit, and stockpiled.

"Field-dried" bentonite is loaded from the stockpiles into twenty-five (25) and thirty-five (35) ton belly-dump trucks and hauled to the BHB processing plant for processing.

#### **4.5 Mining Sequences, Descriptions and Schedule**

Twenty-two mining features are planned for development on this permit area. These proposed mine development features consist of fourteen pits; one overburden & bentonite stockpile area; four topsoil piles areas; two access roads; and one staging area. The total area of these twenty-two proposed mining features is 140 acres. Mine Plan Map MP-1 illustrates these proposed mine development features. Table MP-1, Volumetric Calculations, provides detailed information for each proposed mine development feature, and [Table MP-2 lists the pits and the proposed year that each pit will be mined.](#)

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| Table MP-2 Mine Sequences |                  |              |
|---------------------------|------------------|--------------|
| Pit #                     | Mining Year      | Area (acres) |
| 1                         | 2022-2023        | 4.4          |
| 2                         | 2022-2023/2024   | 5.0          |
| 3                         | 2024-2025        | 5.0          |
| 4                         | 2025-2026        | 5.0          |
| 5                         | 2026-2027        | 5.0          |
| 6                         | 2027-2028        | 5.0          |
| 7                         | 2028-2029        | 5.0          |
| 8                         | 2029-2030        | 5.0          |
| 9                         | 2030-2031        | 5.0          |
| 10                        | 2031-2032        | 5.0          |
| 11                        | 2032-2033        | 5.0          |
| 12                        | 2033-2034        | 5.0          |
| 13                        | 2034-2035        | 4.5          |
| 14                        | 2035-2036        | 4.5          |
| <b>Total</b>              | <b>2022-2036</b> | <b>68.4</b>  |

Mining features which will be developed during the first year of operations include initial development activities associated with Pit #1 and Pit#2,

The following information provides a description of each mine development feature which will be developed during the first year on the permit area:

**First Year Mine Development Activities**

Access Roads to Mining Areas – 4.7 Acres

Prior to the development of any pits in the mining area, the two access roads, as shown on the Mine Plan Map, must be constructed.

Access to Pit #1 and Overburden/Bentonite Stockpile Area

Access to this area will be via the access roads that will be constructed first to the permit area as shown on the mine plan map. These roadways will provide access to all of the proposed mine activities within the Keyhole State Project.

Topsoil Stockpile Area #1 – 6.2 Acres

Topsoil salvaged from Pits #1 and #2 will be placed on this area.

Topsoil Stockpile Area #2 – 1.8 Acres

Any topsoil that may be present at the Overburden and Bentonite Stockpile Area will be placed at the Topsoil Pile #2 area.

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Overburden and Bentonite Stockpile – 13.6 Acres

This is a barren area from previous mining that took place in the area. If any topsoil is salvaged from this area, it will be placed on Topsoil Stockpile Area #2. The overburden removed from Pits #1 and possibly Pit#2 will then be placed in this area to form an overburden and bentonite stockpile area.

Staging Area – 2.7 Acres

If necessary, topsoil removed from the Staging Area will be placed in Topsoil Stockpile Area #1.

Pit #1 – 4.4 Acres

Topsoil salvaged from Pit #1 will be placed on Topsoil Stockpile Area #1. Overburden from this area will be placed on Overburden and Bentonite Stockpile Area. The exposed bentonite in Pit #1 will be either field dried in the pit or removed and stockpiled on the Overburden and Bentonite Stockpile Area.

Pit #2 – 5.0 Acres

Work may begin on Pit #2. Topsoil salvaged from Pit #2 will be placed on Topsoil Stockpile Area #1. Overburden from this area will be placed in Pit #1. The exposed bentonite in Pit #2 will either be field dried in the pit or removed and stockpiled on the Overburden and Bentonite Stockpile Area.

**4.6 Jurisdictional Wetlands**

As reported in Appendix D10 - Wetlands, included in this permit application, the only jurisdictional wetland or other waters of the U.S. that were identified within the permit area are the unnamed tributaries to Mule Creek E and F, WET 4, and WET 8. These areas will not be impacted by mining activities. All streams within the area are classified as ephemeral and flow water continuously for less than one month of the year.

Non-jurisdictional wetlands were delineated within the permit area. A total of 3.04 acres of aquatic resources were identified within the proposed permit area. Approximately 2.16 acres of palustrine wetlands were identified: 2.04 associated with unnamed tributaries of Mule Creek and 0.12 acres associated with off-channel reservoirs. Approximately 0.04 acres were identified in association with seep/springs. Approximately 0.84 acres (4,941 linear feet) of ephemeral streams were identified in association with unnamed tributaries of Mule Creek.

**4.7 Wildlife Protection and Monitoring**

As discussed in Appendix D-9 of this application, mining activities conducted on this permit area will not disturb any critical or crucial wildlife habitat for big game species known to inhabit the area.

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Three raptor nest sites were active with one productive on lands adjacent to the permit area. One inactive nest site was also located adjacent to the permit area. Two of the nests, one active and one inactive, are located within the USFWS recommended buffers of 0.25 and 0.33 mile for the species that use the nests. Future mining will be conducted in a manner that will minimize impact to nests, if active, during the breeding season from February 15 through August 31. The times are also dependent on which species of raptor are present at the nesting locations.

Migratory Birds of High Federal Interest (MBHFI) were not common on the permit area but will be protected wherever they are found. All attempts will be made to strip topsoil outside of the spring breeding and nesting season.

No known sage grouse leks or wild turkey strutting sites occur within the survey area or the expanded survey area.

No threatened and endangered species (T & E) are known to frequent or exist on the study area. No prairie dog towns were present on the permit area, but three occupied colonies were located within the expanded survey area. Suitable habitat for the Ute ladies'-tresses orchid is not present.

In the event that a threatened or endangered species is observed on or immediately adjacent to the permit area, the U.S. Fish and Wildlife Service - Endangered Species Office located in Cheyenne, Wyoming will be contacted and the observations will be reported.

In the event that a raptor nest is established on or immediately adjacent to the permit area and it becomes necessary to "take" or remove a raptor nest, the U.S. Fish and Wildlife Service will be contacted as soon as a "take" situation is anticipated. Sufficient lead time will be allowed for developing and implementing a mitigation plan, and to avoid disrupting the mining operation.

#### **4.8 Protection of Cultural and Paleontological Resources**

During the cultural resources inventory of the project area, four prehistoric sites were updated, and one multicomponent site and one prehistoric site were recorded. The four prehistoric sites are not eligible for registry in the National Register of Historic Places, and the other two sites are considered destroyed. Eight isolated resources were recorded within the inventory area. These sites lacked the significance and historic integrity necessary to be considered eligible for the National Register of Historic Places. As such, the proposed project and development would not affect any known historic properties.

If any cultural or resource (historic or prehistoric site or object or fossil) is discovered during development, all work in the vicinity of the discovery will halt and would not resume until a qualified archaeologist has examined the discovery. Once an evaluation of the discovery is made,

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the qualified archeologist will determine appropriate actions to prevent the loss of significant cultural or scientific materials.

#### **4.9 Federal Lands Within the Permit Area**

No mining or reclamation activities proposed will be on federal lands within this permit area. A Right of Way application has been submitted to the Bureau of Reclamation for approximately 450 feet of access road that will be located in the permit area. The access road will be constructed in the same manner as previously proposed in this Mine Plan. Once the Right of Way application has been approved, it will be submitted and included into this permit application.

The federal surface ownership within the permit area can be found in Appendix A on Exhibit A-1, Surface and Mineral Ownership Keyhole State Project.

### **5.0 PUBLIC NUISANCE AND SAFETY**

#### **5.1 Procedures to Avoid Public Nuisance and Endangerment**

Mining activities will not result in a public nuisance or endangerment to public safety, human or animal life, or property. BHB has been conducting ongoing bentonite mining operations in the area since the 1950's and has no knowledge of any instances where its mining activities have resulted in a public nuisance or an endangerment to the public, human life, or property. This is primarily due to the rural setting and the remoteness of the site, coupled with the small size and scope of the mining operation. The closest incorporated community or subdivision to the permit area is the town of Pine Haven, Wyoming, located approximately two and 1/2 miles from the northwestern portion of the permit area.

The development of mining activities on the permit area will not change the number of workers needed to mine the permit area as a crew is already mining BHB Permit to Mine 745 and License to Mine 621-L7 located in the same area. The numbers of vehicles entering and exiting the mine site, as well as the amount of machinery operating on the site will be the same as it is for Permit to Mine 745 and License to Mine 621-L7.

Access to the active mining areas can be restricted through signage in the area. Where deemed necessary by BHB, fences may be constructed above highwalls in order to protect the public, wildlife or livestock from the dangers of a fall. No conflicts with grazing are expected to result in conjunction with the development of mining activities. *When mining activities are not being conducted at the project location, roads into any open pits will be blockaded with dirt berms to not allow vehicle entry. These measures have been effective with BHB's current mining operation that is located on a state section of land that has a major public roadway going through the mine permit area.*

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Fugitive dust that may occur during the mining activities will be minimal. If fugitive dust does become an issue when hauling of bentonite occurs, water will be used to wet down the road to prevent fugitive dust.

Additionally, the nearest community to the Keyhole State Project is Pine Haven. The town of Pine Haven is located approximately two and a half miles to the Northwest of the project area. Based on wind data obtained from Water Resources Data System and Wyoming State Climate Office for Gillette from 2006-2015, Eagle Butte Coal Mine from 1995-2013, and the Strata Ross Uranium Mine from 2010-2013, the area has a predominate wind direction from the Northwest to the Southeast and from the South. Since the Keyhole State Project lies to the Southeast of Pine Haven, fugitive dust will not impact Pine Haven

## **5.2 Occupied Dwellings, Homes, Public Buildings, Churches within 300 Feet of Affected Lands**

No occupied dwellings, homes, public buildings, churches, community or institutional buildings, parks or cemeteries are located within three hundred feet of land which will be affected by mining activities. The nearest occupied dwelling is located approximately 400 feet from the nearest active mining area on the permit area.

## **5.3 Hours of Operation, Routes of Haulage, Access Routes, and Estimated Truck Traffic**

Mining and reclamation activities will typically be conducted Monday through Friday from 7:00 A.M. until 5:00 P.M. Overburden removal usually occurs from November through June. Once the overburden is removed and the bentonite is exposed, the heavy equipment fleet will conduct bentonite field-drying activities on various sites within the permit area. This "field-drying" fleet of equipment generally consisting of two to four Caterpillar 627G push-pull scrapers; a Caterpillar D8R/T dozer; a Caterpillar 140 motor grader and a John Deere 8000 series tractor with various tillage implements. Field-drying will be conducted for approximately three months, from June through early September.

Following the completion of bentonite field-drying activities around the early part of September, reclamation activities generally begin, lasting approximately two months. During the reclamation phase, areas where the overburden has been previously backfilled will undergo final grading and contouring, ripping or scarification (if required), topsoil application, topsoil tillage, and seeding.

BHB estimates that approximately 25,000 tons of bentonite will be hauled from the permit area on an annual basis using over-the-road, belly-dump trucks with a capacity of twenty-five to thirty-five tons. This would result in a total 715 to 1,000 trucks entering and leaving the mine site for one to two months each year of mining. It is estimated, based on a hauling schedule of five

MP-13

Received

DEQ 3 - 00016

TFN 7 2/139  
REC'D NOV 15 2022

NOV 21 2022

WDEQ-LQD  
Cheyenne



Black Hills Bentonite, L.L.C.  
Keyhole State Project

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days per week, that approximately four truckloads per day would be required in order to transport 25,000 tons per year from the permit area to the processing plant. The over-the-road, belly-dump trucks typically operate during the daylight hours. The bentonite will be hauled to the BHB Thornton Plant.

MP-14

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NOV 21 2022

DEQ 3 - 00017

TFN 7 2/139 WDEQ-LQD  
REC'D NOV 15, 2022  
St. Joseph

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WDEQ/LQD Permit to Mine Application - Keyhole State Project

Table MP-1  
Volumetric Calculations & Reclamation Costs

| Section Township Range | Disturbance             | Acres       | Year of Development or Construction | Topsoil Volume (Calculated) (Ave. Depth)<br>(Bank Cubic Yards) | Average Overburden Depth<br>(Feet) | Pit Area<br>(Acres) | Estimated Overburden Volume<br>(Bank Cubic Yards) | Average Bentonite Thickness<br>(Inches) | Calculated Bentonite Volume<br>(Bank Cubic Yards) | Total Pit Volume (OB & Bentonite) (Removed) For Box Cut Backfill<br>(Bank Cubic Yards) | Highwall Height or Stockpile Height<br>(Feet) | Highwall Length or Stockpile Perimeter Length<br>(Feet) | Overburden Volume Required to Establish 4h:1v Slopes<br>(Bank Cubic Yards) | Topsoil Replacement Costs 500' One Way Travel G12A Cost<br>(\$0.497/BCY) | Overburden Replacement or Movement Costs, 1500' One Way Travel, G12A Cost<br>(\$0.691/BCY) | Grading and Contouring Required<br>(Acres) | Grading and Contouring Costs G12A Cost<br>(\$57.676/Acre) | Seeding Requiring<br>(Acres) | Outcrop Area No Seeding Required | Seeding Costs<br>BHB Cost<br>(\$500/Acre) |
|------------------------|-------------------------|-------------|-------------------------------------|--|------------------------------------|---------------------|---|---|---|--|---|---|--|--|--|--|---|------------------------------|----------------------------------|---|
| Year 1                 |                         |             |                                     |  |                                    |                     |   |   |   |  |   |   |  |  |  |  |   |                              |                                  |   |
| 50/66 Sec 16           | Pit 1                   | 4.4         | 2022                                | 15,969   | 26.0                               | 4.0                 | 167,752   | 32                                      | 17,205  | 184,957  |   |   | 0  | \$7,936.44   | \$127,805.52   | 4.4  | \$253.77  | 1.8                          | 0.0                              | \$900.00                                  |
|                        | Overburden Stockpile #1 | 13.6        | 2022                                | 0  |                                    |                     | 0   | N/A                                     | 0   | 0.0  | 10.0  | 200   | 1,481  | \$0.00   | \$1,023.70   | 0.0  | \$0.00  | 0.0                          | 0.0                              | \$0.00                                    |
|                        | Topsoil Stockpile #3    | 6.2         | 2022                                | 0  |                                    |                     | 0   | N/A                                     | 0   | 0.0  |   |   | 0  | \$0.00   | \$0.00   | 0.0  | \$0.00  | 1.5                          | 0.0                              | \$750.00                                  |
|                        | Topsoil Stockpile #4    | 1.8         | 2022                                | 0  |                                    |                     | 0   |   | 0   | 0  |   |   | 0  | \$0.00   | \$0.00   | 0.0  | \$0.00  | 1.3                          | 0.0                              | \$650.00                                  |
|                        | Staging Area            | 2.7         | 2022                                | 0  |                                    |                     | 0   | 0                                       | 0   | 0  | 0.0   | 0   | 0  | \$0.00   | \$0.00   | 0.0  | \$0.00  | 0.0                          |                                  | \$0.00                                    |
|                        | Pit 2                   | 5.0         | 2022                                | 18,146   | 30.0                               | 1.5                 | 72,585  | 26                                      | 5,242   | 77,827   | 0.0   | 0   | 0  | \$9,018.69   | \$53,778.63  | 1.5  | \$86.51   | 1.5                          | 0.0                              | \$750.00                                  |
|                        | Access Roads            | 4.7         | 2022                                |  |                                    |                     | 0   | 0                                       | 0   | 0  | 0.0   | 0   | 0  | \$0.00   | \$0.00   | 4.7  | \$271.08  | 4.7                          | 0.0                              | \$2,350.00                                |
|                        | Topsoil Stockpile #1    |             |                                     | 4,839  |                                    |                     |   |   |   |  |   |   |  | \$2,404.98   | \$0.00   |  | \$0.00  |                              |                                  | \$0.00                                    |
|                        | Topsoil Stockpile #2    |             |                                     | 6,533  |                                    |                     |   |   |   |  |   |   |  | \$3,246.73   | \$0.00   |  | \$0.00  |                              |                                  | \$0.00                                    |
| Year 2                 |                         |             |                                     |  |                                    |                     |   |   |   |  |   |   |  |  |  |  |   |                              |                                  |   |
| 50/66 Sec 16           | Pit 2                   | 5.0         | 2022/2023                           | 7,259  | 30.0                               | 3.5                 | 169,365   | 26                                      | 12,232  | 181,597  | 0.0   | 0   | 0  | \$3,607.47   | \$125,483.47   | 2.5  | \$144.19  | 2.0                          |                                  | \$1,000.00                                |
|                        |                         |             |                                     |  |                                    |                     |   |   |   |  |   |   |  | \$0.00   | \$0.00   |  | \$0.00  |                              |                                  | \$0.00                                    |
| <b>TOTAL</b>           |                         | <b>43.4</b> |                                     | <b>52,745</b>  |                                    |                     | <b>409,702</b>                                    |   | <b>34,680</b>                                     | <b>444,382</b>   |   |   | <b>1,481</b>   | <b>\$26,214.31</b>   | <b>\$308,091.32</b>  | <b>13.1</b>                                | <b>\$755.56</b>   | <b>12.8</b>                  | <b>0.0</b>                       | <b>\$6,400.00</b>                         |

TOTAL COSTS \$341,461.19  
Contingency 31%  
TOTAL COSTS W/CONTINGENCY \$447,314.16  
ABBREVIATIONS - BCY = Bank Cubic Yards

TFN7 1/018  
RECD MAY 18, 2021