Montana Department of
ENVIRONMENTAL QUALITY

Brian Schweitzer, Governor

P.O. Box 200901 • Helena, MT 59620-0901 • (406) 444-2544 • www.deq.mt.gov

September 14, 2006

Dear Reader:

Enclosed for your review and comment is the Draft Environmental Assessment (EA) for the Big Horn Limestone Company (Big Horn), Operating Permit 00008, Amendment for Limestone Quarry Expansion.

Big Horn Limestone filed an application on June 20, 2005 for an amendment to Operating Permit 00008 from the Montana Department of Environmental Quality (DEQ), Environmental Management Bureau (EMB) in Helena. The Proposed Action would extend the quarry life, expand the quarry area by 283 acres, and disturb an additional 188.1 acres. The Draft EA analyzes the potential impacts of the Proposed Action, as well as alternatives: 1) No Action (continuing with the currently approved plan), and 2) the Proposed Action with Agency Modifications Alternative.

Public comments concerning the adequacy and accuracy of the Draft EA will be accepted until October 30, 2006. Written comments may be sent to Herb Rolfes, Operating Permit Section Supervisor, DEQ/EMB, P.O. Box 200901, Helena, MT 59620-0901, or e-mailed to hrolfes@mt.gov.

The Draft EA is on a CD in PDF format because of the detailed figures. If you would like a hard copy, with small black and white figures, please call Herb Rolfes at 406-444-3841.

Since the Final EA might only contain public comments and responses and changes to the Draft EA, please keep this Draft EA for future reference.

Sincerely,

Warren D. McCullough

Warren D. McCullough
Chief Environmental Management Bureau

File 00008.70

WM/PP/sf

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DRAFT ENVIRONMENTAL ASSESSMENT

I. COMPANY NAME

Big Horn Limestone Company, 3900 E. Mexico Ave. Suite GL-10, Denver, Colorado 80210

II. PROJECT

Operating Permit 00008 Amendment for Limestone Quarry Expansion, Warren, MT Area

III. LOCATION

The quarry site is located approximately six miles northeast of Warren, MT at the base of the Pryor Mountains (EXHIBIT A). The site is accessible from the northeast via an existing public road. The rail load-out area is located adjacent to US Highway 310 at the town site of Warren, MT. The permit area is located in Sections 24 and 25, Township 8 South, Range 25 East, Sections 19 and 30, Township 8 South, Range 26 East, and Section 9, Township 9 South, Range 25 East, Principal Meridian.

IV. COUNTY

Carbon.

V. PROPERTY OWNERSHIP

[ ] Federal [ ] State [x] Private

VI. TYPE AND PURPOSE OF ACTION

Big Horn Limestone Company (Big Horn) wants to expand its existing limestone quarry (EXHIBIT B). After a draft review by DEQ, Big Horn applied for an operating permit amendment on June 20, 2005 and DEQ started the amendment review process. DEQ published a legal notice in the *Carbon County News* and *Billings Gazette* newspapers in July 2005 and issued a press release on July 11, 2005 notifying the public of Big Horn's application. DEQ received public comments on the amendment at that time from the US Forest Service (USFS). The Montana Department of Fish, Wildlife, and Parks (FWP) also commented on the Proposed Action (See Attachment 1). DEQ has addressed the USFS and FWP comments in Section X below. No comments were received from the general public at that time.

DEQ sent Big Horn a deficiency review letter on July 26, 2005. Big Horn responded to the comments on October 26, 2005. The operating permit application has been modified to address DEQ, and USFS concerns. The application is now complete.

DEQ has decided to complete an environmental assessment (EA) to analyze the impacts of the quarry. Another legal notice and press release will be issued with this Draft EA. This Draft EA evaluates the potential impacts from the quarry expansion and rail load-out area. DEQ must decide whether to approve the Applicant's Proposed Plan (See Section VII), deny the Applicant's Proposed Plan (the No Action Alternative) or approve the Applicant's Proposed

Plan with Agency Modifications. This Draft EA is tiered to the past environmental assessments produced for Operating Permit 00008 and 00008A on March 18, 1977, September 1, 1995, and December 12, 2002.

The operating permit reclamation bond would be reviewed every five years as part of the MMRA-required five-year bond review process. DEQ would inspect the site annually to ensure that it continues to comply with Operating Permit 00008 requirements.

The existing limestone quarry and amendment area is on private land near Warren, MT. EXHIBIT A shows the general location of the project within the Pryor Mountains area of Montana. EXHIBIT B shows the project area and principal topographic, drainage and nearby cultural features. Also included in this amendment, is the area used by the quarry to load processed limestone into rail cars (EXHIBIT A). The rail load-out area is not an expansion of the operation. It had been used for many years prior to passage of the MMRA change requiring load-out facilities to be included in operating permits. The rail load-out area is shown in EXHIBIT L.

Big Horn has an operator working the limestone quarry on a year around basis. Approximately 600,000 tons of limestone material are produced from the quarry each year. The limestone material is used by sugar companies during their beet sugar production at factories located in Billings and Sydney, MT, Lovell and Worland, WY, Scottsbluff, NE, and Fort Morgan, CO. The factories operate from August to February each year. The limestone is also used by a lime kiln located near Frannie, WY which produces calcium oxide (CaO) for electric power plant sulfur dioxide (SO_2) removal. Two electric co-generation facilities utilize the limestone directly in recirculating fluidized bed combustion. These two facilities are located in Billings and Colstrip, MT. Other uses of the quarried limestone are riprap for stream and river erosion control, construction aggregate for road base, concrete, asphalt production, landscaping, and as agricultural feed supplements for a source of calcium.

The proposed expansion area would simply extend the life of the quarry. The expansion is not intended at this time to result in any additional increase in production, employment or other socioeconomic effects to Carbon County.

Geologic reconnaissance and continuous mining for 50+ years have demonstrated the suitability of the proposed limestone source. The limestone material is economically obtained by surface mining.

Three major expansion and two minor revisions have been approved since the quarry was permitted in 1972. The current permitted conditions represent the No Action Alternative in this EA. Major facilities at the quarry include the active quarry, a series of waste rock dumps, a crusher, ore stockpile areas, access and haul roads, and reclamation material stockpiles. A rail load-out area exists at Warren.

Big Horn is requesting a 283 acre increase in the existing quarry permit area and inclusion of 10 acres of the existing rail load-out area. The proposed amended permit boundary for the quarry area encompassing all previously disturbed ground plus the expansion area is shown on EXHIBIT D. The rail load-out area is shown on EXHIBIT L.

Comparison of Permit Conditions
Before and After the Proposed Expansion
(Big Horn 2005 Annual Report).

	Current Conditions	After Expansion
Permit Area	198.9 acres	491.9 acres
Permitted Disturbance	198.9 acres	387.0 acres
Current Disturbance (as of December 2005)	126.8 acres	136.8
Acreage Currently Bonded	135.0 acres	*to be determined*
Current Bond	$284,490	*to be determined*

The entire proposed operating permit quarry expansion area is contained within Big Horn's approximate 1,515 acres of surface and mineral ownership. This land is adjacent to public lands administered by the Bureau of Land Management (BLM) and the USFS as well as other privately owned land (EXHIBIT C). All corners of the proposed permit boundary would be marked in the field with posts and signs to prevent trespass. The land associated with the rail load-out area is owned by Montana Limestone Company, the operator of the quarry, Burlington Northern Santa Fe Railway, and Montana Department of Transportation.

Access to the property boundary is by public road which has been utilized for quarry access over the past 50+ years. The access road has been paved and maintained by the applicant.

The permit area expansion would allow quarry operation to continue through 2025 at current production rates. Specification limestone with a minimum calcium carbonate ($CaCO_3$) content of 96 percent would continue to be produced.

VII. PROPOSED PLAN

A. Affected Environment

The quarry site is located at the base of the Pryor Mountains (EXHIBIT A). The Pryor Mountains are a northern extension of the Big Horn Mountains in Wyoming, a foreland uplift of Precambrian crystalline basement, broken into four sections with Paleozoic sedimentary limestone draped over the east, west and north flanks (Lopez 2000). The northwestern-most section is the Pryor Mountains, separated from the Big Horn Mountains by the Big Horn River Canyon. Northwest-southeast trending Paleozoic limestone ridges make up most of the Pryor Mountains, which are also broken into four major fault blocks. The southwestern Pryor Mountains are generally composed of moderately southwest-dipping Paleozoic limestone. Stratigraphy in the area surrounding the quarry site consists of 1,200 foot thick Mississippian Madison Limestone overlain by 350 foot thick Pennsylvanian Amsden Formation shales and sandstones, and 100 foot thick Tensleep Sandstone.

1. Climate

The area has a semiarid climate characterized by long cold winters, cool summers, and

moderate to high winds. Annual average precipitation is 8 12 inches (USDA 1975)

2. Air Resources

The airshed classification of the project area is Class II. Air quality is better than applicable standards because of the absence of major development in and adjacent to the quarry area. The quarry has been operating for 50 + years. Big Horn has a current Air Quality Permit and operates within the guidelines established by that permit.

Air Quality Permit fees have been assessed in accordance with emission inventories. Current measures taken to control fugitive dust emissions include wetting of quarry traffic areas, covering of transfer points, chemically treating haul roads, paving haul roads and dust suppressant sprays at the quarry and rail load-out area. Blasting operations are conducted to minimize dust emissions by using the proper controls and techniques as prescribed by law and the blasting industry. The current quarry operator, Montana Limestone Company, has implemented a dust emissions monitoring program to ensure compliance with the current Air Quality Permit. This program consists of an in house certified visible emissions evaluator monitoring emissions on a random basis. Big Horn commits, through the quarry operator, to continually implement the best available technologies to control dust emissions within the permit limits.

The pavement on the access road is breaking up from years of use. Big Horn plans to repave the road in 2006. Air quality impacts would be similar to existing operations. The air quality issue is not carried forward in the Draft EA analysis.

3. Geology

The quarry area is located in the upper unit of the Madison Formation of Mississippian Age (Lopez 2000). This formation is on a dip slope of about 10° southwest and strikes northwest to southeast. The dominant landform in the area is terraces cut with sheer canyon walls. The area to be quarried is between King Canyon on the north and the Piney Creek drainage on the south.

The Madison Formation is about 1,200 feet thick in this area and the upper unit being quarried is called the Bull Ridge Member. The Bull Ridge Member is about 110 feet thick here. It is locally overlain by Amsden Formation that consists of red shale and siltstone, and underlain by a 40 foot zone of reddish-yellow clay matrix breccia. The Bull Ridge Member is a buff to grey, fine grained lithographic limestone with zones of fracturing that have stained surfaces with clay gouge and chert. The top 20 to 50 feet of the limestone formation is normally weathered and contains higher percentages of clay, iron, and silica. The lower 70 to 90 feet of limestone is unweathered and generally runs 95 to 97 percent calcium carbonate.

There are no known landslides or active fault systems in the permit and adjacent areas. The geologic map indicates no fault zones in the permit area (Lopez 2000).

Low-grade uranium prospects are found in the upper regions of the southwest slope of the Pryor Mountains. The prospects are located 7 to 8 miles to the southeast of the permit area. These prospects are currently not producing uranium for commercial production. Uranium deposits are not found in the immediate area of the quarry site. Radioactivity in the quarry

area is below the level of concern. This finding is based on an evaluation conducted in October 2002 and updated in September 2005 (R. Jackson 2005). US Geological Survey Bulletin 1723 supports the 2005 evaluation.

4. Hydrology

a. Surface Water Resources

Almost all drainages throughout the southwest Pryor Mountains are ephemeral, and experience flows during snowmelt and intense summer storms. The nearest perennial stream, Piney Creek, originates at Piney Creek Spring, one mile south of the site. Infiltration of snowmelt and precipitation into Madison Limestone outcrops on the west flank of the Pryor Mountains accounts for the entire annual discharge from the spring. Surface water rights from the Piney Creek drainage are owned by the Loyning Ranch and are utilized for their cattle ranching operation.

Surface water flow has never been observed in the undisturbed areas of the existing drainages that converge on the quarry site. During intense rainfall events and snowmelt, flows have been observed in the compacted lower reaches of the quarry area.

b. Ground Water Resources

Where saturated, the Paleozoic limestone that outcrops at the site comprises two aquifers and a confining unit. These are the Madison aquifer, the Horseshoe Shale confining unit, and the Tensleep aquifer.

i. Madison Aquifer

The Madison aquifer is composed of the Madison Formation (Mission Canyon and Lodgepole members) and the underlying Darby Formation and Big Horn Dolomite. The Mission Canyon Limestone portion of the Madison aquifer typically has small intergranular permeability. In the absence of solution-enlarged fractures or other karst features, this section of limestone lacks the ability to transmit large volumes of ground water.

The Madison aquifer is recharged by precipitation and snowmelt on the southwest flank of the Pryor Mountains to the north and east of the site. Perennial discharge from the Madison aquifer occurs at Piney Creek Spring. The water table beneath the site is at approximately 5,020 feet above sea level. Because no other discharge sites for the Madison aquifer exist in the area, ground water beneath the site can be assumed to flow southward to Piney Creek Spring.

Piney Creek Spring is the largest Madison aquifer discharge point within 10 miles of the site. The discharge rate from Piney Creek Spring is variable. Base flow measurements from September to March indicate a flow of 1.5 to 2.5 cubic feet per second (cfs) with no turbidity. During spring runoff, maximum flows from the spring can exceed 35 cfs. Based on the large discharge rate of Piney Creek Spring, it is likely that ground water flow in the Madison aquifer converges on Piney Creek Spring from the northeast (Hydrometrics 2004). A hydrological study was conducted of the area from April 2003 to July 2004. As part of this study, a flume was placed in Piney Creek just below the spring discharge point to measure flows. Big Horn

commits, through the quarry operator, to continue to monitor the flow and quality of the discharge from the Piney Creek Spring on a regular basis for the life of the quarry. A monitoring plan has been developed in conjunction with DEQ.

ii. Horseshoe Shale Confining Unit

Typically, the Horseshoe Shale Member of the Amsden Formation is a confining unit to the underlying Madison aquifer. The fact that Piney Creek Spring discharges ground water near this contact reveals that this is the case in the vicinity of the site.

iii. Tensleep Aquifer

The Tensleep aquifer is composed of the Tensleep Sandstone, but can also include the upper parts of the Ranchester Limestone Member of the Amsden Formation. Although the Tensleep Sandstone outcrops near the quarry site, it does not underlie the site and is not of concern.

Currently Big Horn has two permitted water wells located in the operating permit area. The well located near the shop is the only well that is active. It is used to supply water for the office and shop as well as dust control for the quarry operations. On the adjacent property owned by Yellowstone Electric Limited Partnership (YELP), four wells are used in their operation. The YELP wells are used to control dust and hydrate the ash as required in their ash disposal process (see below).

Big Horn is not proposing any expansion of the use of water with the increase in the size of permit area. Water usage would be maintained at the level of use necessary to stay in compliance with the current air quality permit.

5. Wildlife/Fisheries

There are no known or suspected occurrences of threatened and endangered species or critical habitat in the quarry area. Coyote and mule deer have been observed in the area between the quarry site and Highway 310, six miles west, at Warren, MT.

Wildlife studies were conducted during 1993 and 1994 by YELP in relation to their ash disposal pit, located immediately west of the current quarry site. The YELP ash disposal pit is a permitted facility for the disposal of ash from the fluidized-bed combustion process used by YELP in their petroleum coke or carbon based electric generation plant located in Billings, MT. These wildlife studies were submitted to the Montana Department of Natural Resources and Conservation (DNRC) and are filed as part of the YELP project application. In addition, portions of the studies have been provided by Big Horn in previous submittals to DEQ.

Big Horn completed a wildlife study of the expansion area of the quarry. Search for potential threatened and endangered species and critical habitat was conducted with the Natural Resource Heritage Program. The result of their investigation of the area found that there is no critical or sensitive habitat or threatened or endangered species in the quarry operating permit area. The report did state that the Yellowstone cutthroat trout is a species of concern for the area as it has been found in Piney Creek below the spring.

Information was also solicited from Montana Fish, Wildlife and Parks (FWP) concerning

wildlife and fish in the area (See ATTACHMENT 1). FWP comments indicate that wildlife would not be affected by the proposed expansion of the quarry operating permit area. FWP does have some concern regarding the Yellowstone cutthroat trout population contained in Piney Creek. As Piney Creek Spring is the only continual source of water for Piney Creek, it is important that the spring is maintained. The source of water for the spring is addressed in Hydrometrics 2004. As the expansion is moving north away form the spring, the expansion should not affect the water that is necessary for the trout population to exist. The water monitoring plan would also enable Big Horn to help monitor this water source.

Big Horn commits to contacting DEQ if sensitive animal species are found during quarry life.

6. Vegetation/Agriculture

The quarry area plant community consists of native woody plants, cushion plants and grasses. The operating permit area and adjacent areas are used as wildlife habitat and rangeland for cattle. Common species in the area are rubber rabbitbrush, perennial bunchgrasses, sagebrush, juniper, Douglas fir, wheat grasses, various perennial forbs, and prickly pear cactus. There are no riparian lands or croplands within the site boundary. No cropland would be taken out of production by operation of the expanded quarry area nor would riparian lands be disturbed.

Big Horn obtained a list of potential rare and sensitive plants in this area from the Natural Resource Heritage Program. Sweetwater milkvetch (*Astragalus aretioides*) was listed as a species of concern. Big Horn recently conducted a survey of the expansion area and concluded that there are no Sweetwater milkvetch or other rare or sensitive plants in the proposed project area (Bighorn Environmental Sciences 2005). There would not be any major impacts to the plant communities as a result of the expansion of the mining permit area. Big Horn believes that there is no critical or sensitive plant habitat within the permit expansion area. Big Horn commits to contacting DEQ if sensitive plant species are found during the life of the quarry.

In addition to the above reports, vegetation studies were conducted by YELP during the same period as the wildlife studies previously discussed. As indicated before, these studies were submitted to the DNRC and are on file. Those reports reinforce the findings stated in this application.

7. Soils

A soil survey conducted in Carbon County indicates that Limestone Outcrop and Lap-Rock Outcrop Association type soils are present in the permit area (USDA 1975). These soil types are not good candidates for crop production but are able to sustain plant life for rangeland use as is indicated by the existing natural vegetation. The soils exist at the site in scattered pockets between limestone outcrops. These soil pockets are typically shallow, from one to six inches in depth. Big Horn commits to salvage as much soil as possible regardless of depth between the outcrops.

In addition to the soil, the Amsden Formation removed as overburden has been found to sustain plant life. Over the last eight years, Big Horn has experimented with using Amsden material as a growth medium for revegetation in reclaimed areas of the operating permit. Big

Horn has found the Amsden material is able to sustain plant life in the permit area as well as natural soils. It is Big Horn's intent in the reclamation process to utilize Amsden material to help supplement the natural soil found in the permit area.

8. Land Use

The entire quarry area is used as rangeland and wildlife habitat. Upon completion of the proposed project, the area would be reclaimed as rangeland and wildlife habitat.

9. Electrical Supply

All necessary power lines to the property are in place and are currently used to support existing operations. There is a possibility that power lines would have to be extended to support operations in the proposed permit expansion area.

Big Horn Rural Electric Company (BHREC) is the owner of the power lines and associated distribution equipment. BHREC is responsible for the installation of all overhead power equipment and the removal of the equipment at closure of the quarry site. The electrical supply issue will not be carried forward in the analysis.

10. Transportation

Access to the area is via an existing public road to the ownership boundary, then on existing private road owned by Big Horn in the current operating permit area. The quarry road is owned by Carbon County but is maintained by Big Horn through the quarry operator. The quarry operator has upgraded the quarry access road to an oiled surface with a 24 foot top width. The existing private road that accesses the quarry would remain following closure of quarry operations. Big Horn has committed to repave the quarry access road in 2006 as discussed above under air resources.

11. Aesthetics and Noise Levels

The existing permit area and the proposed permit expansion area are located on the base of the west slope of Big Pryor Mountain. The nearest public lands from which the operating permit expansion area can be viewed are from BLM land approximately ¼ mile to the south. It is also viewed from USFS lands approximately ¼ mile to the southeast and south and immediately adjacent on the north and northeast (EXHIBIT C). A 100-foot buffer zone along the property lines would be maintained between all adjoining landowners to ensure that Big Horn does not trespass. The buffer zone would be marked with posts and signs to help ensure compliance. This area of the Pryor Mountains is used for recreation. The quarry is primarily hidden from view on Highway 310 by the surrounding natural ridges of Tensleep Sandstone. Aesthetic issues will be addressed in the analysis.

The natural ridges of Tensleep Sandstone help contain noise from the quarry operations. Noise level readings taken at Big Horn property boundary ranged from less than 68-75 decibels (dB). All readings are well within acceptable noise levels. Blasting does produce noise that can be heard for several miles depending on the atmospheric conditions. To help decrease the distances noise travels, blasting is typically done late in the afternoon when atmospheric conditions help contain the noise level. The closest ranchhouse is located

approximately 3 miles to the southwest. Currently, blasts can be heard at this residence but are not found to be annoying. The operator does notify the ranchers in advance of each blast and would continue to do so. Noise impacts would be the same as current operations. The noise issue will not be carried forward in the analysis.

12. Socioeconomics

Current operations require employment of personnel on a full-time, year round basis. Permit expansion enables continued employment in a remote area where few other jobs exist. There would not an increase in population due to operation of the permit expansion area. Socioeconomic benefits from employment and taxes in Carbon County would continue. Socioeconomic issues will not be carried forward in the analysis.

13. Cultural Resources

The Pryor Mountains area has long been known for its cultural resources. Because of these resources, Big Horn has committed to contacting the State Historic Preservation Office (SHPO) immediately if the operator discovers an unknown cultural resource site. The operator would cease operations until SHPO has inventoried and recorded the site resources and concludes that the operator can continue operations on the site.

To help insure that a site does not exist in the proposed permit area, two cultural resource surveys have been conducted for Big Horn (Beckes 1986; Burns 2004). Three other surveys have been conducted in the pertinent sections and are filed with SHPO. The surveys did not found any significant cultural resource in the proposed permit area. Due to the barren terrain and the limited soil found in the proposed permit area, the probability of finding surface or buried cultural resources is considered minimal to nonexistent (Burns 2004.) The USFS commented that one heritage site on USFS lands is located adjacent to the proposed quarry expansion area (See ATTACHMENT 1). No problems with the heritage site are anticipated by the USFS archaeologist as a result of the proposed expansion.

VIII. OPERATING PLAN

A. Introduction

Limestone would continue to be quarried from the proposed expanded permit area on a year round basis. Specification limestone is limestone that contains at least 96 percent calcium carbonate ($CaCO_3$), less than two percent magnesium carbonate ($MgCO_3$) and less than two percent silica. Limestone has many uses throughout the region. The limestone would continue to be utilized by sugar factories located in Montana, Wyoming, Nebraska, and Colorado. These sugar factories use the limestone by converting it to quick lime (CaO) in individual kilns at each factory. The quick lime is used to clean sugar during the manufacturing process.

The limestone would continue to be used by a quick lime manufacturing company and several electric power plants. The quick lime produced by the manufacturer and the raw limestone used by the electric power plants all serve the same purpose. Lime or limestone is used to remove sulfur dioxide from the emissions created by burning coal in the electric power generation process. Without the use of this lime or limestone, the electric power generation

companies would not be able to meet the air quality standards.

Commercial livestock feed customers would continue to purchase crushed limestone as a source of calcium in livestock feed. Limestone and lime kiln dust (LKD) is effective in helping to clean up heavy metal-contaminated mine sites by raising the pH of the mine waste products which immobilizes the metals. This mine waste remediation process has utilized only a small portion of the limestone produced by Big Horn to date. Crushed screened limestone is also used for landscaping rock mulches.

The quarried limestone would continue to be crushed by mechanical means to meet the different size specifications required by the customers. Currently the limestone is crushed to the following approximate size gradations:

Size	Gradation
1	3" - 5½"
2	2" - 3½"
3	1⅞" - 2¾"
4	¾" - 2"
chips	⅝" - ⅞"
¾" minus	¾" minus

Big Horn essentially sells all limestone it currently crushes. Historic waste piles do exist at the quarry site. These waste piles of limestone were generated over 50 years of operating the quarry without a market for finely crushed limestone. The crushed limestone piles are currently used to supplement the needs of the power companies when their demand is high. This practice would continue until the crushed limestone has been exhausted.

The existing crushed limestone has also been used for road base material by public and private entities in the area. The selling of the existing crushed limestone for road base would continue as a means to deplete the previous generated waste. If non-commercial limestone is generated, it would continue to be used as backfill the previously quarried areas. If Big Horn does not sell all old limestone piles, they would be regraded, soiled, and seeded according to the existing reclamation plan.

The overburden that is present over the specification limestone consists of Amsden Formation material and weathered limestone with seams of breccia. This overburden is 20-35 feet thick. Weathered limestone overburden would continue to be removed and placed in previously quarried areas as backfill material. The Amsden Formation would continue to be stockpiled for use as a growth medium to support revegetation. In addition to the overburden, occasional pockets of non-specification limestone are encountered during production. This non-specification limestone is treated the same as overburden.

Oversized material is produced in the quarry process. Oversized material would continue to be sold as riprap to help stabilize stream and river banks as well as for landscaping uses. Some oversized material would continue to be broken down with a hydraulic hammer to an appropriate size to feed the crusher and be used as specification limestone. The rest of the oversized material is used as quarry backfill.

Lime kiln dust is a by-product from the lime kiln located north of Frannie, WY. This lime kiln

dust would continue to be backhauled from the kiln and placed in the bottom of a quarry and wetted with water to control dust emissions and hydrate the residual lime present in the dust. Once the quarry is backfilled with lime kiln dust, it would be covered with growth medium, regraded, and seeded according to the approved reclamation plan. The quarry does not accept power plant ash for disposal.

B. Quarry Plan

Specification limestone would continue to be quarried from the upper 80 feet of the Madison Limestone after overburden removal. Currently, 2.5-3 acres are disturbed each year. Over the last 50 plus years of quarry operations, 127 acres have been disturbed (Big Horn 2005 Annual Report). Six acres have been reclaimed to date. During the life of the quarry, the total area that would be disturbed including the proposed expansion area and rail load-out area would be approximately 387 acres (EXHIBIT D).

Overburden is drilled for blasting approximately 12 weeks of the year. Operations consist of drilling 3½ to 35 feet deep by 3 ½ to 6 inch diameter holes in the overburden for blasting. Specification limestone 6-inch diameter, 50 feet deep, blast holes would continue to be drilled. Approximately 350 feet of blast holes would continue to be drilled each day. The drill utilizes an electrostatic dust collector rated at 98 percent+ removal efficiency. Drill patterns are typically based on a 10-foot by 10-foot pattern.

The 80-foot thick layer of specification limestone is typically removed in two 40-foot high benches to control quality and provide a safe highwall for the employees per Federal Mine Safety and Health Administration (MSHA) regulations (Figure 1). The overburden is drilled, blasted and removed. This leaves the specification limestone exposed on the upper bench. Then a 40- foot deep production shot is drilled and the limestone removed. This second shot exposes the next 40 feet of the specification limestone on the lower bench. Limestone removal is repeated for this layer. The process is then repeated producing a stair-step pattern.

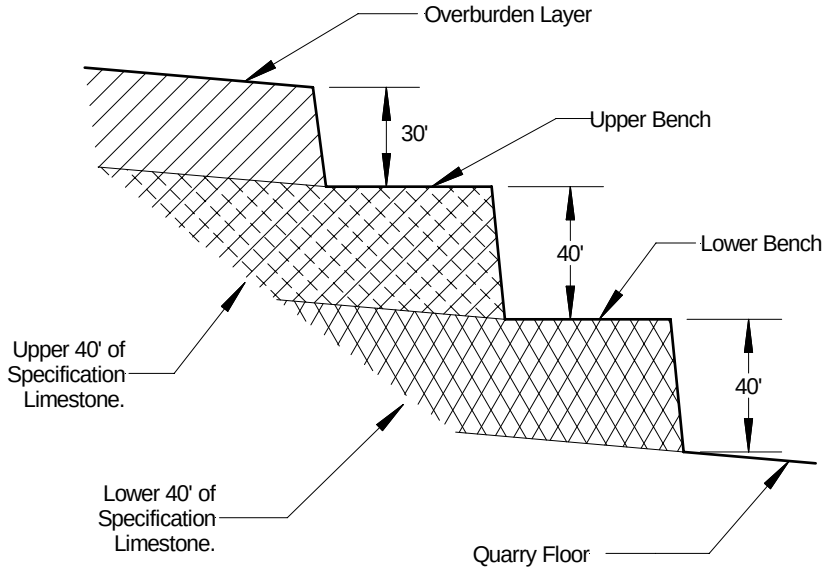


FIGURE 1.

The lowest elevation of the proposed quarry floor in the proposed expansion area of the quarry would be approximately 5310 feet AMSL. This elevation is approximately 291 feet above the elevation of the Piney Creek Spring (Table 1). No surface water or ground water exists in the current or proposed quarry area. No seeping in the highwall has been observed at any time during the 50+ year quarry life. The water table in the quarry area would continue to be monitored at wells currently in place. The elevation of the water table varies from well to well but the highest elevation encountered is in monitoring well #2 at 5015 feet. Big Horn commits to notifying DEQ if surface water or ground water would be encountered during quarry operations.

Current blasting practices have not shown any impact to the area ground water system or Piney Spring. Current blasting practices that help minimize the potential impact to the ground water include using relatively small blast events and by keeping the bottom elevation of the blast hole at the bottom of the limestone formation being quarried. As the quarry expands into the proposed expansion area, operations would move farther away from the Piney Spring area and farther away from the confining Horseshoe Shale Member. This would help to minimize the potential of the blasting operations to impact the ground water flow system in the quarry area.

Blasting agents typically used are bagged ammonium nitrate and fuel oil (ANFO). Cast primers are detonated by non-electric blasting caps which are initiated by one electrical blasting cap. Blast patterns utilize delays between holes and rows to control noise, seismic transmission, fly limestone and dust while seeking adequate breakage. Blasting occurs late in the afternoons. The only residents that live within a five mile radius of the blast area are notified of each blast.

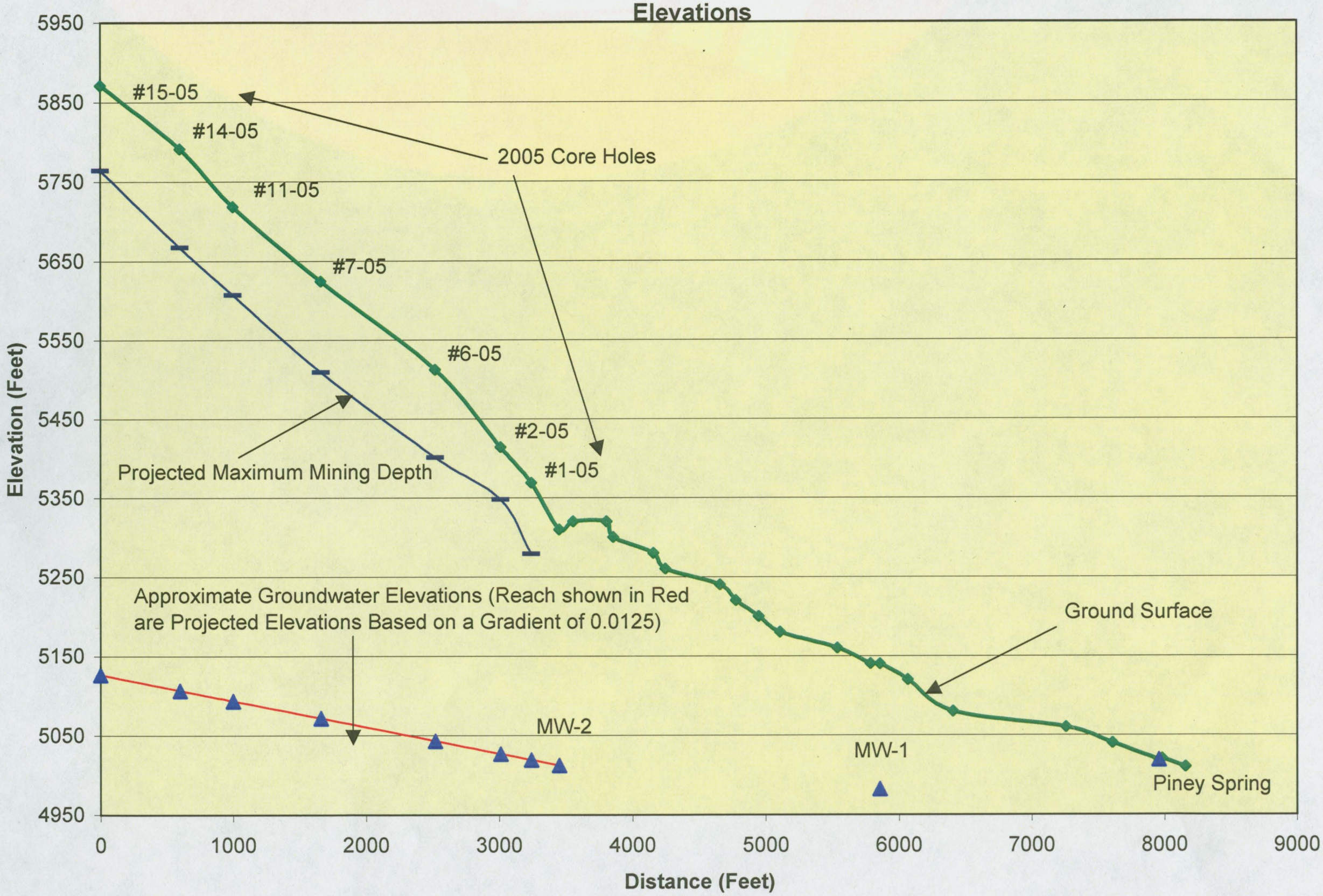
Currently, there are approximately 110,000 tons of limestone shipped by rail to various customers annually. This limestone is loaded into trucks in the quarry and transported by public road to the rail load-out area. The limestone is usually loaded directly onto rail cars for delivery. Some stockpiling of materials especially riprap does occur in the rail load-out area. This is to maximize truck productivity and to meet the future riprap needs of the customers.

Typical quarry equipment and facilities include:

Portable Jaw Crusher(s)	**Motor Grader**
Portable Cone Crusher(s)	**Excavator w/ Hydraulic Hammer**
Portable Screens	**Service Truck**
Conveyors	**Water Truck**
Front-End Loaders	**Pickups**
Automated Load-out Systems	**Platform Scale**
Off Road Haul Trucks	**Office**
Crawler Dozer	**Maintenance Shop**
Rock Drills	**Fuel Tanks with Containment**
Portable Diesel Generator Set	**Used Equipment Salvage Area**
Crusher Control Building	

Currently, 16 people are employed at the quarry. Personnel requirements would continue at

TABLE 1. Profile of Piney Creek Drainage and Proposed North Expansion Area Showing Surface Topography, Projected Maximum andMining Depth and Approximate Groundwater Level Elevations



current levels.

The quarry would continue to be operated 10 hours per day, 5 days per week, year round. Trucking of lime products would continue to occur 24 hours per day, 7 days week, year round. Independent trucking firms contracted by the quarry operator and individual customers transport the lime products.

C. Water Consumption and Source

The water supply for operations is derived from wells. Another water well was installed in 2003 to help Big Horn control fugitive dust emissions. Big Horn is in compliance with the Air Quality Permit. Water is also purchased from adjacent landowners for the purpose of wetting the access road and quarry area as necessary to control dust. Expanding the size of the quarry would not result in an increase in water consumption or dust emissions.

D. Electrical Service Requirements

Electrical power is obtained from Big Horn Rural Electric Cooperative and is generated on site by a portable diesel powered generating plant. Portable generator-operated lighting systems are utilized when needed during night time hours. An increase in the size of the quarry permit would not result in an increase of electrical power required to operate the quarry.

E. Sewage and Solid Waste Disposal

Portable toilet facilities are provided in the quarry area for the operator's employees, customers and contractors. The main office and maintenance shop have septic tank facilities. No changes in sewage treatment systems would be needed for the proposed quarry expansion.

Waste oils are recycled through the oil burning heating system in the maintenance shop. All other waste lubricants are transported offsite for disposal in accordance with federal, state and local solid waste regulations.

F. Quarry Roads

Haul roads within the permit expansion area would continue to progress to the work areas through quarry areas. All other required roads are in place to support existing and future operations.

All but one road within the quarry area would be closed as part of the reclamation plan. The central road through the mining area would remain to provide access to future grazing operations. Roads would be disked and cuts/or shoulders would be covered to a 4-inch minimum depth with soil or other approved growth medium. Road areas would then be seeded with the approved seed mix. Water checks would be built to control erosion after reclamation.

G. Special Systems, Impoundments, and Diversions

The permit expansion boundaries have been drawn to exclude the surface expression of the

Piney Creek drainage as much as possible. Impoundments for containment of stormwater in the quarry area are in place on unnamed drainages of Sage Creek (EXHIBIT F).

No stormwater leaves the quarry site. Stormwater from road surfaces is diverted away from the road and infiltrates into the ground into broken and/or fractured limestone shortly after leaving the roadway. To date, no existing impoundment has received any measurable water.

The quarry office was converted from an existing ranch house. Upon completion of quarry operations, the office, maintenance shop, water wells, septic tank, parking areas, and fences would stay in place and be used in ranch operations.

All explosive storage magazines are US Department of Alcohol, Tobacco and Firearms certified magazines owned by the explosive supplier. All storage magazines would be removed from the site by the explosive supplier upon completion of quarry operations. Fuel storage facilities are all above ground, skid mounted portable units which would also be removed upon completion of quarry operations.

Existing bone yards are periodically cleaned for scrap steel. Upon completion of quarry operations, all bone yard material would be removed and the area would be reclaimed according to the quarry reclamation plan.

All stormwater diversions would be removed after revegetation has been established to control erosion.

The platform scales would remain in place upon completion of quarry operations. The platform scales could then be utilized by the ranching operation.

There are one diesel fuel and one gasoline storage area located on the quarry site. The diesel fuel storage site contains two diesel fuel tanks. The tanks have a capacity of 10,000 gallons and 17,000 gallons respectively. The diesel fuel tanks are located in a containment area with a maximum 35,000 gallon storage capacity. The gasoline storage site has a 1,000 gallon gasoline tank. The containment area is capable of holding a minimum of 2,000 gallons. These containment areas are constructed with two foot high berms. The entire storage area and berm are lined with an impermeable synthetic liner to ensure containment of any fuel.

In the event of a fuel spill outside of spill containment areas, Big Horn would utilize limestone fines to absorb the fuel spill. The contaminated limestone fines and underlying material would then be picked up and deposited in a land farm. The contaminated materials would be turned and aerated every three months until the spill material has been biologically mitigated. The fuel contaminated materials would be used where feasible in road repair.

H. Soil Salvage and Stockpiles

Soils and the Amsden growth medium would be stockpiled by scraping with a crawler type tractor. Vegetation is not cleared before salvaging the soil. Soil stockpiles are typically very stable due to extremely low rainfall. Soils contain large quantities of limestone rock fragments which inhibit wind and water erosion.

Salvageable soils are typically one to six inches in depth. Limestone outcrops are covered

with minimal soil or only contain soil in cracks and on ledges. The current disturbed ground was 50 to 90 percent bare limestone prior to mining. The soil survey indicates that the soil in the new permit area is mainly classified as LH Limestone Outcrop with a small section of soil classified as LE Lap-Rock Outcrop Association in the extreme north edge of the permit area (USDA 1975). The soil survey does not contain any technical or non-technical data regarding the LH Limestone Outcrop. The Lap-Rock Outcrop Association soil has channery loam soil at a depth of 10 to 20 inches and is rated as poor for agricultural purposes. The soil is good for quarry reclamation.

The Amsden Formation forms an average overburden depth of 20 feet on approximately 50 percent of the area proposed for mining. Amsden Formation materials support vegetation in undisturbed surrounding areas and readily revegetate in disturbed stockpiles. Big Horn proposes to utilize Amsden material to supplement limited soil during reclamation. In excess of 200,000 tons of Amsden Formation materials are currently stored in previously quarried areas. All future Amsden overburden removed would be placed in previously quarried areas and be available for reclamation.

Sugar beet factories wash soil from beets each fall in preparation for sugar manufacture. This soil may be used if needed to enhance establishment of vegetation. This soil is stockpiled at the sugar beet factories and can be backhauled to the quarry. The soil would be placed directly on areas that are ready for reclamation. All sugar beet wash soil would be certified to be free of any noxious weed seed. Big Horn believes that sufficient materials are available to reclaim all disturbances.

Big Horn commits to covering reclaimed slopes less than eight percent (>12:1) with six inches of material utilizing soil, Amsden Formation material and/or sugar beet wash soils upon closure of the quarry site. Big Horn would utilize rocky native soils on slopes steeper than eight percent.

I. Fire Protection

The potential for fire hazards based on the level of operations and the limited amount of vegetation is low. Policies regarding health and safety matters require that all the operator's employees and contractors/subcontractors comply with applicable local, state and federal ordinances, codes, rules, and regulations. The quarry operator has implemented a comprehensive safety/operations program which includes safety and health plans on a project-specific basis.

A safety and health plan has been implemented for work activities in the quarry operation. The health and safety plan addresses a wide array of potential work hazards, including fire hazards, and the manner in which work activities must be conducted. The quarry operation activities are conducted in accordance with all applicable MSHA regulations.

The closest fire station is located in Frannie, WY 6 miles south of Warren and is associated with the Park County Fire Protection District #1. The fire fighting equipment at the quarry is owned by the operator. This equipment includes three loaders, a dozer, an excavator, a water truck and various hand shovels. Since the permit area is adjacent to BLM and USFS lands, all fires would be reported to both agencies and fire fighting activities would be coordinated with the agencies involved.

J. Public Nuisance and Noise

Public nuisance and noise are minimal due to the distance from nearby communities and rural residences. The closest residence is located less than three miles to the southwest. No noise complaints have been received by Big Horn or DEQ. Quarry operations would continue in the same manner and noise levels remain the same. Fugitive dust emissions from the quarry area haul road would be controlled by asphalt surfacing and dust suppressant materials. The haul road leading to the quarry entrance has been marked and posted with appropriate warning signs.

K. Protection of Historical and Archaeological Values

There are no known archaeological sites within the access road corridor or quarry area permit boundary (Section VII. A.13). Big Horn commits to contacting SHPO if any historical or archaeological sites are encountered during quarry operations.

L. Prevention of Wind Erosion

All surface disturbances would be subject to some degree of wind erosion or fugitive dust emissions. Control of fugitive dust emissions is accomplished by dust suppression materials and asphalt paving of the haul road to the quarry. The chemical agent most commonly used for dust suppression is magnesium chloride.

Lime kiln dust is imported from the Wyoming Lime Producers kiln at Frannie, WY and is placed in the lower reaches of the quarry to backfill previously quarried areas. This material is brought into the quarry site by covered truck, dumped and immediately wetted with water to hydrate and control fugitive dust emissions.

Two automated load-out systems are currently being utilized in the quarry. To help control fugitive dust emissions, transfer points are hooded and the elevation of the load-out conveyor belt is kept to a minimum to limit the exposure of the product to the wind.

M. Avoidance of Impacts to Offsite Flora and Fauna

The public and private land outside the perimeter of the quarry property and through which the access corridor crosses is off limits to quarry operations personnel. Use of the haul road would be limited to essential personnel during the scheduled hours of quarry operation. The haul road, quarry and staging area are wetted and chemical dust control agents applied as necessary along with haul road asphalt paving to minimize potential offsite impacts from fugitive dust emissions. The prevailing wind direction is from northwest to southeast.

N. Activities in Undisturbed Land within Permit Area

Activities in undisturbed areas in the permit area would not be allowed. Designated areas that would not be disturbed would be clearly posted and operator personnel along with contractors and subcontractors would be instructed to stay out of those areas.

O. Water Monitoring

There is no surface water within the existing permit or in the permit expansion area. During a storm event, no surface water leaves the permit area. The quality of surface and ground water would not be affected by the operation. Surface water is diverted away from roads and infiltrates within a maximum of 20 feet into broken and/or fractured limestone.

The limestone being produced is utilized to provide products that are used to improve air, water and land quality. Limestone products improve air quality by removing sulfur dioxide from emissions produced in coal fired electric generation plants. Water and land quality is improved by the use of limestone for control of pH levels. Limestone products are also used to improve land quality in the reclamation of heavy metal mine sites. Limestone is utilized for its ion exchange properties to help immobilize the heavy metals in contaminated soils. The soil can then be used for revegetation.

Big Horn proposes to use YELP's well and spring monitoring as well as its own monitoring plan to monitor water quality. Big Horn has contractual assurances from YELP that indemnify Big Horn against air, water or other contamination from YELP's ash disposal operation. To ensure compliance, YELP samples all wells and springs in the area on a quarterly basis. The sampling began in March of 1998 and a review of the data shows that the water quality has remained relatively constant over the last seven year period.

Highwalls would continue to be observed for fractures or dissolution cavities that could potentially have an impact on ground water resources in the area. In addition, boreholes would be logged to identify fractures, dissolution cavities, and the occurrence of ground water.

Big Horn commits to monitoring discharge flow and quality from Piney Creek Spring for the life of the quarry as outlined in the water monitoring plan. Data collected would be submitted in each Annual Report. Any impact to surface and ground water in the quarry area due to quarry operations would be mitigated.

P. Rail Load-out Area

The rail load-out facility is used by the operator to load rail cars with specification limestone. The area is also used to load riprap for use by the railroad. The 10 acres included in the permit is the area Big Horn considers necessary for continued operation of the rail load-out facility (EXHIBIT L). The rest of the disturbed area located to the south of the proposed permit area is associated with the operator's fine grind operation. The operator would be responsible for any reclamation that is needed in that area. The old disturbance in the area is grandfathered from regulation by the MMRA. Portions of the operator’s area are currently being reclaimed. The necessary area needed for continued operation would remain disturbed.

The rail load-out facility consists of a dump hopper, conveyor belts, screen deck, belt scales, rail car mover and a control shack. The facility would be operated by one person 10 hours per day, 5 days per week. Shipping by rail usually starts in the month of March and continues through January to the conclusion of the sugar beet processing campaign.

The rail load-out operation consists of transporting the product from the quarry in a bottom

dump truck. Trucks are driven over the hopper and dump product directly in the hopper. The product is then conveyed to a screen deck where it is cleaned of any rock fragments and dirt accumulated in the hauling process. The product is then conveyed to the belt scale where it is weighed and loaded into individual rail cars. The waste product generated by the screen is loaded back into a truck and transported to the operator's fine grind operation or back to the quarry for backfill of depleted areas of the quarry.

Riprap rock is trucked from the quarry and stockpiled in the northwest end of the rail load-out area. Stockpiling of the rock is necessary until the need arises due to wash-outs of the rail line. The typical amount of riprap stockpiled is approximately 1,500 tons.

The existing topography of the rail load-out area consists of relatively flat ground except for the earth berms on each side of the rail load-out facility. A small earth berm has also been constructed to contain any runoff that might occur and direct overflow to a detention pond located to the south end of the permit area.

Upon closure of the quarry, the rail load-out facility would be removed. The earth berms used at the facility would be graded to a slope of 4 horizontal to 1 vertical (4:1) along with any remaining product stockpiled at the location. All riprap would be hauled back and placed in the depleted quarry. The rail load-out area would then be covered with six inches of soil material and seeded with the same seed mix as used by the quarry. The soil material used would be excess Amsden Formation material or sugar beet wash soils.

IX. RECLAMATION PLAN

A. Introduction

The objective of the reclamation plan is to reclaim land disturbed by limestone operations in the permit area for future rangeland and wildlife use. The post mining topography of the quarry site would closely resemble and blend into the surrounding area with cliffs up to 100 feet high and slopes to 45 degrees. There would be exposed outcrops and areas where soil was placed on lower slopes. EXHIBIT H details the estimated final reclamation contour after quarrying is complete. All roads within the quarry would be reclaimed except one access road 15 feet wide as shown in EXHIBIT H. Reclamation of the roads would be accomplished by ripping the road bed and then covering with six inches of soil and seeded with the appropriate seed mix. The rail load-out area would be reclaimed by removal of all loading equipment and structures, grading of stockpiles and ramps, and covering the disturbed land with six inches of soil. The area would then be seeded with the approved seed mix. Table 2 summarizes the categories of disturbance upon closure of the quarry. The categories of disturbance are shown on EXHIBIT F.

Table 2. Disturbance Categories

CATEGORY	ACRES
Facilities	1.0
Roads	2.2
Quarry Disturbance	373.8
Rail Load-out	10.0
Undisturbed	104.9

TOTAL	491.9

Spring and late fall are the two best seasons of the year for implementation of reclamation seeding. In the spring, seeding is most successful after the ground has thawed but before May 1 to take advantage of spring precipitation. Late fall is best for dormant seeding. Revegetation would be accomplished in the first appropriate season after all available limestone is removed and final grading has taken place without further potential of disturbance in a particular area. Revegetation is expected to be successful due to current experience of volunteer native species moving into existing disturbed areas.

Noxious weeds would be controlled on a continuous basis throughout the life of the quarry and until vegetation has been re-established and the reclamation bond returned to Big Horn. Noxious weeds would be controlled using appropriate herbicides as recommended by the Carbon County Noxious Weed Control District.

B. Soil Replacement

Big Horn commits to covering all disturbed land with slopes less than 2:1 with six inches of soil upon termination of quarry operations. This soil would support vegetative growth and consist of salvaged soil, Amsden Formation material, spent limestone and sugar beet wash soils or a combination of each. Sugar beet wash soils would not be used on slopes less than 12:1. The disturbed ground was 50 to 90 percent bare limestone prior to mining operations. Bare limestone is common in the surrounding undisturbed ground. Final reclamation of the quarry site would recreate this natural feature of limestone and boulder outcrops. Bare limestone faces 20 to 40 feet high would be utilized with a minimum of 4:1 slopes contoured in at the base. These features would help the quarry blend into the natural topography. Soil would be distributed as outlined in Table 3.

Table 3. Soil Distribution Table

Description	Slope	Soil Type
High Walls	≥ 2:1	None
Talus Slopes	4:1	Amsden
Grade Slopes	4:1 to 12:1	Soil & Amsden
	> 12:1	Soil, Amsden or Beet Wash Soil

Soil would be salvaged from the permit expansion area and stockpiled for later use. These soils would be spread in those areas capable of holding soil and which resemble the surrounding natural areas. Any shortfalls of soil would be made up with stockpiled Amsden material and/or sugar beet wash soil.

Some Madison limestone is covered with portions of the Amsden Formation. This Amsden material is stripped prior to quarrying the Madison limestone and would be utilized to establish base slopes in quarried areas. The Amsden material is very rocky and would help control erosion from runoff. All Amsden overburden removed would be placed in previously quarried areas. This material would be available for reclamation.

Limestone from the quarry is utilized by sugar beet factories in the manufacture of food grade

products from beets. Upon completion of the sugar beet process, the limestone exits in a non-hazardous, finely ground form and stockpiled at the sugar beet factories. This spent limestone may be used if economically feasible for establishing back slopes.

Big Horn believes that sufficient materials are available to reclaim all disturbances. Soil volumes in stockpiles are reported to DEQ annually. Sugar beet wash soil and spent limestone materials may be used to revegetate if they are needed and available. An estimate of the total amount of reclamation soil material estimated needed upon closure of the quarry is shown in Table 4.

Table 4. Soil Balance

Soils Required		Cubic Yards		
Slope	Acreage	Amsden	Soil	Sugar Beet Wash Soil
Cliffs	31.3			
4:1	55.6	44,851		ONLY
4:1 to 12:1	238.3	192,229		IF
> 12:1 (including load-out area)	61.8	12,864	36,988	NEEDED
Undisturbed	104.9			
Total	491.9	249,944	36,988	
Soils Available For Use				
Existing Stockpiles		155,900	4,116	
Estimated Future Stockpiles		381,100	32,872	
	Total	537,000	36,988	

C. Vegetation

1. Weed Control

Spotted knapweed and whitetop have encroached in limited areas along the access road to the quarry. Halogeton is common in the area along Highway 310 moving up from the Bighorn basin in Wyoming. Spotted knapweed and halogeton are also found in limited quantities in the quarry. Big Horn has committed to continue spot spraying as needed to control these and any other noxious weeds during the life of the quarry. Weeds would be controlled by the application of the appropriate herbicides as recommended by the Carbon County Noxious Weed Control District. Control of weeds would be contracted out to qualified personnel. Weed control activities are detailed in each Annual Report submitted to DEQ.

2. Method of Seeding/Seed Mixture.

Revegetation would be done by broadcast, mechanical drilling and/or hydro seeding. Hydro seeding is advantageous because the seed mixture is applied with a fibrous material which serves as a tackifier to stabilize the slope during the early stages of plant establishment.

The seed mix includes:	PLS*lbs/acre
Goldar Bluebunch Wheatgrass	4.21
Rimrock Indian Ricegrass	4.18
Critana Thickspike Wheatgrass	2.55
Pryor Slender Wheatgrass	5.68
Needle-and-Thread Grass	0.51
Dragon Sagewort	0.06
Wyoming Big Sagebrush,	0.05
Thunder Creek Rubber Rabbitbrush	0.20
Falcata Alfalfa (Inoculated to fix nitrogen)	0.56
TOTAL	18.00

*PLS=Pure Live Seed

D. Reclamation of Existing Disturbance

Big Horn has committed to reclaim all grandfathered pre-MMRA disturbances in the permit area (EXHIBIT H).

Area 1 includes 10.9 acres of a pre-MMRA limestone fines waste pile. Most of the fines pile has been sold and removed from the permit area. A portion of the remaining fines has been recontoured and covered with soil and Amsden material. Organic material has also been added to some of the soil. The remaining reclamation includes recontouring of remaining fines, covering with soil, seeding and weed control.

Areas 2, 3, and 4 contain approximately 2.5 million tons of 1 1/2 inch minus formerly non-commercial limestone. The entire amount has been sold and shipping began in May 1995 at the rate of 140,000 tons per year. Shipping is expected to continue over the life of the quarry as the market demands resulting in the elimination of the non-commercial limestone piles.

Area 2 includes non-commercial limestone piles north of the office. After the piles are removed, the area would be graded, soiled and seeded.

Screening and shipping has been completed in Area 3 which is the north quarry stockpile area. The area would be graded with stockpiled Amsden material, soiled, and seeded.

Screening and shipping is continuing in the area southeast side of the quarry in Area 4. The area would be graded, soiled with stockpiled Amsden material, organics added as needed, and seeded annually.

Area 5 is located south of the shop building. The area would be graded, covered with minus ½ inch limestone, soiled and seeded.

Big Horn commits to grading any non-commercial limestone remaining at closure of quarry operations to a maximum slope of 3:1, covering the slope with six inches of soil type material and seeding with the approved seed mixture.

X. DRAFT ENVIRONMENTAL ASSESSMENT

N = Not present or no impact would occur.
Y = Impacts may occur and are explained under Potential Impacts.
NA = Not Applicable

IMPACTS ON THE PHYSICAL ENVIRONMENT	
RESOURCE	**[Y/N] POTENTIAL IMPACTS AND MITIGATION MEASURES**
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?	**[Y] The proposed expansion would disturb 283 more acres of limestone rock outcrops, native poorly developed soil over bedrock and remove vegetation including trees on the site. This would create a disturbance that would result in a visual contrast with adjacent lands by exposing fresh unweathered rock surfaces. Reclamation activities would include regrading concurrently and at closure, resoiling all disturbances except rock faces, and revegetating with forbs and grasses. This would minimize the visual contrast with adjacent lands as required by the MMRA and would reduce those impacts to acceptable levels. The reclaimed areas would look disturbed for a long period of time. Some trees and shrubs would reestablish on the rocky sites over time. This disturbed look is an unavoidable impact of quarrying activities in areas visible from nearby roads and adjacent higher elevation areas. For more discussion on visual impacts see Section X. 8 below.** **Improper quarrying activities could create unsafe conditions below rock outcrops and highwalls (See Figure 1 for a typical highwall left by quarrying). MSHA regulates mine safety issues during operations.** **The USFS expressed concerns that the northwest and northeast corners of the proposed expansion area encroach on the rim overlooking King Canyon. The north-facing slopes in the canyon are very steep cliffs and there may be potential that blasting, excavation, etc. could have some effect on the stability of the canyon walls on USFS lands. DEQ would require that Big Horn meet with DEQ and USFS personnel to review the ultimate highwall location and develop a stability monitoring plan, a modified blasting plan if needed, and a plan to increase the buffer area further from the rim if needed to prevent stability concerns near the King Canyon walls to address this concern.** **DEQ would determine the potential for safety with the ultimate highwalls at closure. Many cliffs exist in the area surrounding the quarry. DEQ does not expect greater safety concerns at closure over those which currently exist in the foothills of the Pryor Mountains.**

IMPACTS ON THE PHYSICAL ENVIRONMENT	
	Quarry activities would remove a large volume of limestone from the 387 acres to be disturbed over quarry life. This is an unavoidable impact of the proposed operation. This is a direct and irreversible impact of the limestone industry. **Disturbance of native soil is an unavoidable impact from quarrying limestone. Soil is limited on the quarry site. Soil would be salvaged where feasible and placed in stockpiles. The soil would be used to reclaim as much of the quarry as possible to facilitate future revegetation and to limit noxious weeds. Big Horn has committed to using Amsden overburden and sugar beet wash soil as needed to ensure revegetation of reclaimed areas. The proposed reclamation plans would set the stage for new soil development to begin.** ***Cumulative Impacts*: The quarry would create 387 acres of geologic and soil impacts. The only other cumulative disturbance in the area is the existing YELP ash disposal site in an adjacent canyon. Eventually, the YELP area would be filled to capacity and a new area would be proposed for development. No other developments have been proposed in the surrounding areas. There is some potential for future post and pole logging in the Pryor Mountains on USFS administered lands but that would not be near the limestone quarry.**
2. WATER QUALITY, QUANTITY AND DISTRIBUTION: Are important surface or ground water resources present? Is there potential for violation of ambient water quality standards, drinking water maximum contaminant levels, or degradation of water quality?	**[Y] Only minimal water quality impacts would result from quarry activities. Ground water impacts would be limited to impacts from: 1) nitrates because ammonium nitrate (ANFO) being used as a blasting agent and from fertilizers used to enhance revegetation success, 2) petroleum products resulting from accidental spills from equipment and vehicle fuel tanks, hydraulic lines, etc., and 3) the use of herbicides used to control noxious weeds. Blasting and quarrying would not impact Piney Spring because the water confining Horseshoe Shale geologic unit would not be damaged by quarry activities. Surface water impacts would not occur from sediment production from traffic on access roads as stormwater does not leave the permit area.** **Most of the ground water that feeds Piney Spring comes from areas east of the quarry and not from the north. The lowest elevation of the proposed quarry floor in the proposed expansion area of the quarry would be at an elevation of**

IMPACTS ON THE PHYSICAL ENVIRONMENT	
	approximately 5310 feet. This elevation is approximately 291 feet above the elevation of the Piney Creek Spring (Table 1). No surface water or ground water exists in the current or proposed quarry area at the bottom of the quarry. No seeping in the highwall has been observed at any time during the 50 plus year quarry life. The water table in the quarry area would continue to be monitored at wells currently in place. The elevation of the water table varies from well to well but the highest elevation encountered is in monitoring well #2 at 5015 feet. Big Horn commits to notifying DEQ if surface water or ground water would be encountered during quarry operations. **Current blasting practices have not shown any impact to the area ground water system. Current blasting practices that help minimize the potential impact to the ground water include using relatively small blast events and by keeping the bottom elevation of the blast hole at the base of the limestone formation being quarried. As the quarry expands into the proposed expansion area, operations would move farther away from Piney Spring. This would help minimize the potential for the blasting operations to impact the ground water flow system in the quarry area.** **Blasting agents typically used are bagged ammonium nitrate and fuel oil (ANFO). Monitoring has not shown any impacts to Piney Spring or ground water quality during 50 years of operations. DEQ and Big Horn sampled the water in Piney Spring and aged it by using radioactive isotopes. The water is young water meaning that it reports to Piney Spring in a short period of time. Any impacts from existing quarry operations would have shown up in current monitoring efforts.** **Monitoring would continue in area wells and Piney Spring. The proposed quarry expansion is moving away from Piney Spring.** **Impacts would be limited from fertilizer use if Big Horn applies fertilizers at recommended rates.** **Petroleum product spills are largely avoidable but they do occur whenever equipment use is required and fuel must be delivered to remote areas. DEQ would require reporting and cleanup of spilled petroleum based products and contaminated material. DEQ inspectors would look for areas where petroleum spills have occurred. After review of the**

IMPACTS ON THE PHYSICAL ENVIRONMENT	
	spill on a site-specific basis, the contaminated materials would have to be removed to another disturbed area that could be regularly tilled during quarry operations. Landfarming or tilling helps utilize natural bacteria to destroy the petroleum products over time. If this practice would not be feasible on site, the contaminated materials would have to be hauled to a licensed landfill. **Herbicides would be used to control noxious weeds on the sites. Big Horn has an approved Carbon County noxious weed control plan. Big Horn hires licensed weed control services for spraying weeds. If herbicides are applied properly and not in areas close to Piney Spring, impacts would be limited to acceptable levels.** ***Cumulative Impacts:* The only other potential impact to Piney Spring water quality and quantity is from cattle grazing in the area, especially if they have uncontrolled access to the spring and creek. This grazing has been continuous for many years and no changes are proposed in local management systems. DEQ does not expect any impacts to surface water quality as long as the number of cattle does not increase.**
3. AIR QUALITY: Will pollutants or particulate be produced? Is the project influenced by air quality regulations or zones (Class I airshed)?	**Y] Impacts to air quality would continue at existing levels in the mine area. Big Horn has approved plans for dust control and monitoring of air quality. Big Horn is in compliance with its Air Quality Permit.** **Traffic levels would continue at existing levels if the expansion were approved. Big Horn has committed to repave the access road in 2006. This would limit nuisance dust along the access road.** ***Cumulative Impacts:* The only other cumulative impact to air quality in the area is the YELP ash disposal site. Dust occasionally blows on the site until new deposits of ash loads are watered.**
4. VEGETATION COVER, QUANTITY AND QUALITY: Will vegetative communities be significantly impacted? Are any rare plants or cover types present?	**[Y] Vegetation on most sites is scattered because of the rock outcrops, limited soils, and the lack of rainfall. Plant communities are dominated by scattered native tree, shrub, forb, and grass species. Noxious weeds have been documented on the sites as a result of past quarry and road disturbance activities. Noxious weeds are present along the access road and are spreading in the surrounding area as in**

IMPACTS ON THE PHYSICAL ENVIRONMENT	
	the rest of Montana. The proposed quarry expansion would result in a total of 387 acres of native vegetation being destroyed and replaced by a different plant community dominated by native species. This is an unavoidable impact of quarrying limestone. The existing plant communities would never be replaced. This is an unavoidable impact of disturbing native plant communities. **No threatened and endangered or sensitive plant species have been found on the proposed expansion area. The only species of concern identified in the surrounding area is Sweetwater milkvetch. Big Horn has committed to contacting DEQ if sensitive plant species are found during any quarry operations for the life of the quarry.** **Noxious weeds would increase on the disturbed area as in any disturbed area. Big Horn has committed to control weeds on the site as part of regular operations. Big Horn has a noxious weed control plan which is approved by the local Carbon County Noxious Weed Control District.** **The USFS has been monitoring and controlling weeds on surrounding National Forest System lands in the Pryor Mountains. DEQ would monitor weed control activities during its inspections of the sites. Halogeton (*Halogeton glomerata)* is common in the surrounding area and is spreading in the quarry area. DEQ would require Big Horn to spot spray for halogeton control on the site and along the access road disturbances. DEQ would require Big Horn to reseed areas that have had halogeton controlled in the quarry area.** **Noxious weed control activities result in loss of native plant species, especially forbs and young trees which are sprayed in the process of killing noxious weeds. On the rocky site, weed control applicators could spot spray noxious weeds which would limit impacts to native plant species. Spot spraying is usually not done along roadsides where populations are thickest. Loss of native plant species is an unavoidable impact of disturbance and weed control activities.** ***Cumulative Impacts:* If the YELP site expands in the future, more native vegetation would be destroyed and the potential for noxious weed invasion would increase. Weed control would limit the spread of noxious weeds but would also remove some native forbs and small shrubs and trees**

IMPACTS ON THE PHYSICAL ENVIRONMENT	
	sensitive to the weed control chemicals. **Surrounding USFS and BLM lands would become more and more important as refuges for native plant species dominated communities. Growing demands for recreational use within the Pryor Mountains could accelerate the potential loss of native plant species and spread noxious weeds. Big Horn would be required to contact the USFS and BLM and develop a coordinated noxious weed control program for the quarry area.**
5. TERRESTRIAL, AVIAN AND AQUATIC LIFE AND HABITATS: Is there substantial use of the area by important wildlife, birds or fish?	**[Y] Wildlife species that would use the expansion area or travel through the area would be displaced around the quarry during operations. Wildlife habitat would be fragmented. Most existing wildlife habitat would be destroyed or modified on the acres disturbed by quarry activities.** **Quarry areas in Montana have become refuges for big game and other wildlife during hunting season. This has also occurred at the Warren Quarry as hunting is not allowed in the permit area.** **Some rock outcrops would remain on the disturbed site. Regeneration of native plants on the sites over time would limit some of the long-term wildlife habitat impacts. Revegetation on acres resoiled after quarry activity ceases would minimize some of the wildlife habitat impacts over time. Native plant species would be reduced and introduced plant species would increase.** **The increase in introduced plant species as a result of the reseeding would favor some wildlife species over others that may have existed on the sites before quarrying started. Wildlife habitat on the sites would be modified permanently. This is an unavoidable impact of quarry activities.** **Noxious weeds would increase in the disturbance areas as happens on and around all disturbed areas in Montana. Big Horn has committed to control noxious weeds on the site. Noxious weed control activities also limit native plant species as described in Section X. 4 above. Loss of some native plant species and wildlife habitat on the proposed sites is an unavoidable impact of disturbance.** **Big Horn researched wildlife presence and habitat of the quarry expansion area. A list of potential threatened and endangered species and critical habitat was obtained from**

IMPACTS ON THE PHYSICAL ENVIRONMENT	
	the Natural Resource Heritage Program. The result of its investigation of the area found that there is no critical or sensitive habitat, or threatened or endangered animal species found in the quarry operating permit area. Big Horn has committed to contact DEQ if sensitive animal species are found during any quarry operations for the life of the quarry. **The report from the Natural Resource Heritage Program did state that the Yellowstone cutthroat trout is a species of concern in the surrounding area as it has been found in Piney Creek below the spring.** **Information was solicited from FWP concerning wildlife and fish in the area. FWP comments indicated that wildlife would not be affected by the proposed expansion of the quarry operating permit area (See Attachment 1). FWP does have some concern regarding the Yellowstone cutthroat trout population contained in Piney Creek. As Piney Creek Spring is the only continual source of water for Piney Creek, it is important that the spring be maintained. See the discussion on potential impacts to water quality and quantity in Section X. 2. above. As the expansion is moving north away from the spring, the expansion should not affect the quantity of water that is necessary for the trout population to exist. The water monitoring plan would also enable Big Horn to help protect this water source.** ***Cumulative Impacts:* Expansion of the YELP facility in the future and increased recreational use of the Pryor Mountains would also impact wildlife use and habitat. USFS and BLM lands would become more and more important as refuges for native plant dominated wildlife habitats especially for threatened and endangered and sensitive plant species.** **Cattle grazing would continue at existing levels on private and surrounding public lands. Impacts to wildlife habitat from cattle grazing would continue at existing levels.**
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?	**[N] No threatened and endangered wildlife or plant species and important habitats used by those species have been found in the proposed expansion area.** ***Cumulative Impacts:* Potential growth of the YELP site in the future and continued growth of recreational use in the Pryor Mountains could continue to impact habitats used by threatened and endangered and sensitive wildlife and plant species. USFS and BLM lands would become more and more**

IMPACTS ON THE PHYSICAL ENVIRONMENT	
	important as refuges for these species.
7. HISTORICAL AND ARCHAEOLOGICAL SITES: Are any historical, archaeological or paleontological resources present?	**[N] The Pryor Mountains area is known for its cultural resources. A State Historic Preservation Office file search was conducted for the area and indicated that there are no recorded cultural properties within the proposed permit area. One of the cultural surveys conducted for the quarry area concluded that due to the barren terrain and the limited soil found in the proposed permit area, the probability of finding surface or buried cultural resources is considered minimal to nonexistent (Burns 2004).** **DEQ has no regulatory authority to prevent impacts to cultural sites on private land. Big Horn has committed to contact the State Historic Preservation Office immediately if the quarry operator discovers an unknown cultural resource site. The operator would cease operations until a cultural resource expert has inventoried and recorded the site resources and concluded that the quarry operator can continue operations on the site.** **The Piney Spring area would have been a traditional use area. Big Horn has no plans to disturb the spring location.** **No impacts to on-site important historic or archaeological resources would occur if the proposed expansion plan were implemented. There is some potential that the disturbance in the area could be visible from off-site archaeological sites such as vision quests. Big Horn contacted SHPO twice to ensure that no known cultural resources were in the surrounding area (Big Horn 2006). No comments were received from Native Americans on the legal notice and press release about the quarry expansion. Copies of this Draft EA will be copied to the USFS list of Native American tribes that traditionally used the area. Based on comments received, DEQ would consider and discuss potential mitigations with Big Horn to reduce visual impacts.** **Comments from the USFS on the proposed expansion area identified one heritage site adjacent to the project area. No impacts to the heritage site are anticipated by the USFS archaeologist as a result of the expansion.** ***Cumulative Impacts:* The only other cumulative impact to cultural resources would be the potential for future expansion of the neighboring YELP facility. Growth in south-**

	central Montana would continue to impact archaeological and historical sites on private lands. Lack of land use controls and regulations to limit development on private lands would result in impacts to historic and cultural sites. Private landowners can disturb these areas without mitigations. USFS and BLM land would become more and more important to protect archaeological and historical sites. Conservation easements on private lands would be one way to limit development of important archaeological and historical sites. Developments on State of Montana lands would require plans to mitigate impacts to these sites.
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?	[Y] The existing permit area and the proposed permit expansion area are located on the base of the west slope of Big Pryor Mountain. The nearest public land from which the permit expansion area can be viewed from is BLM land approximately ¼ mile to the south. The quarry is also viewed from USFS lands approximately ¼ mile to the southeast and south and immediately adjacent on the north and northeast. A 100-foot buffer zone along the property lines would be maintained between all adjoining landowners to ensure that Big Horn does not trespass. The buffer zone would be marked with posts and signs to help ensure compliance. This area of the Pryor Mountains is infrequently used for recreation, due to the low population of the surrounding areas and the remote, rugged nature of the region. The quarry is primarily hidden from view on Highway 310 by the surrounding natural ridges of Tensleep Sandstone. In spite of this remote location, the proposed quarry expansion would create additional aesthetic impacts. The visual impacts from the quarry would be typical of activities that remove natural resources. The expansion would disturb rock outcrops and native soils visible from other lands not owned by Big Horn. Disturbance would remove the limited trees and vegetation on the site. Limestone and Amsden Formation overburden not removed for commercial purposes would be disturbed revealing rock and soil surfaces that have not weathered and are much more noticeable than undisturbed material from a distance. As a result, the quarry site would look disturbed and would be visible from various viewpoints, especially from higher elevations and Highway 310.

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	Soil and Amsden Formation material would be salvaged and stockpiled for reclamation. Disturbed areas would be reclaimed which would limit visual impacts over time. Reclamation would limit visual contrast of reclaimed quarries with adjacent lands to acceptable levels as required by the MMRA. Even with recontouring and revegetation of the sites after closure, the sites would look disturbed for a long time. The rocks would weather and vegetation including some trees would eventually regenerate, limiting visibility of the sites over time. Regardless of reclamation and revegetation over time, the quarry would always look like a man-made feature in the landscape. **Visual impacts are an unavoidable impact of quarrying rock outcrops in mountainous terrain. The rail load-out area would not increase visual impacts as it is not to be expanded.** **DEQ received a comment from the USFS about visual impacts from the highwall created just south of National Forest System lands on the Custer National Forest in the northern portion of the proposed expansion area and overall visual effects of the expanded project. The USFS suggested identification and incorporation of mitigation measures to minimize the effects. The USFS suggested reclamation, revegetation and recontouring concurrent with operations.** **Big Horn does reclaim, revegetate and recontour concurrently with operations. DEQ cannot require an operational modification of the proposed highwall. During operations, highwalls must meet MSHA requirements for safety.** **DEQ would require Big Horn to develop a mitigation plan to reduce the visual impact of the highwall at closure which would include backfilling some of the highwall cuts with rock to create talus slopes, to cast blast some highwalls at closure to create a more natural looking highwall, and to create an undulating rather than straight engineered highwall as shown on EXHIBIT L. DEQ will meet with the USFS and Big Horn on site to try to develop a modified quarrying plan for the ultimate highwalls.** **The natural ridges of Tensleep Sandstone also help contain noise from quarry operations. Noise level readings taken at the Big Horn property boundary were well within accepted noise levels. Blasting does produce noise that can be heard**

IMPACTS ON THE PHYSICAL ENVIRONMENT	
	for several miles depending on the atmospheric conditions. To help decrease the distances the noise travels, blasting is typically done late in the afternoon when atmospheric conditions help contain the noise level. The closest residence is located approximately three miles to the southwest. Production blasts can be heard from the residence but DEQ has received no complaints. The quarry operator notifies the rancher in advance of each blast and would continue to do so. **Development of the expansion area would create noise from use of heavy equipment handling rock and operating on solid rock surfaces and from traffic along the access road. The quarry and rail load-out area are away from homes and hours of operation would be limited. The quarry would not operate 24 hours a day. No sites would be operated in the dark with the aid of artificial lights. Trucks do haul 24 hours a day and seven days a week.** ***Cumulative Impacts:* The only cumulative aesthetic and noise impact would from potential expansion of the YELP site in the future. Visual and noise impacts would be unavoidable if the site expanded. DEQ is unaware of any other development proposed in the surrounding area.**
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?	**[Y] The proposed project would impact limestone resources but limestone is common in the Pryor Mountains. The operator would remove limestone from the sites as discussed above under Section X. 1. This is an irreversible commitment of the resources. There are many other rock outcrops in the area on other private lands, USFS, and BLM lands.** ***Cumulative Impacts:* No other quarries are proposed in the area. The Montana Department of Highways periodically resurfaces Highway 310 creating sand and gravel pits in the process.**
10. IMPACTS ON OTHER ENVIRONMENTAL RESOURCES: Are there other activities nearby that will affect the project?	**[Y] No other activities in this area would affect other environmental resources.** ***Cumulative Impacts:* No other activities in this area would cumulatively affect other environmental resources.**

IMPACTS ON THE HUMAN POPULATION	
11. HUMAN HEALTH AND SAFETY: Will this project add to health and safety risks in the area?	**[Y] Improper quarrying activities could create unsafe conditions below highwalls. MSHA regulates mine safety issues during operations. DEQ would inspect and review reclamation plans for the quarry and incorporate some buttressing of slopes at closure to minimize exposure to quarry rock faces.** **Traffic on area roads would continue at current levels as a result of the quarry expansion as discussed in Section X. 3 above.** ***Cumulative Impacts:* No other health and safety risks have been identified in the surrounding area.**
12. INDUSTRIAL, COMMERCIAL AND AGRICULTURAL ACTIVITIES AND PRODUCTION: Will the project add to or alter these activities?	**[Y] The proposed expansion would supply limestone for various commercial purposes. This would influence commercial and industrial development in the region. Agriculture would not be affected in south central Montana by Big Horn's proposed operations.** ***Cumulative Impacts:* Limestone use would continue to grow as the western US population increases and the need for air quality controls expands in power plants.**
13. QUANTITY AND DISTRIBUTION OF EMPLOYMENT: Will the project create, move or eliminate jobs? If so, estimated number.	**[Y] The proposed expansion would continue to produce the full time jobs provided by existing operations.** ***Cumulative Impacts:* No other cumulative impacts to area employment have been identified.**
14. LOCAL AND STATE TAX BASE AND TAX REVENUES: Will the project create or eliminate tax revenue?	**[Y] The proposed expansion would continue to produce full time jobs as described in Section X. 13 above and resultant revenue from income taxes in southcentral Montana. Big Horn would profit from the limestone products removed from its lands.** ***Cumulative Impacts:* No other cumulative impacts to area tax revenues have been identified.**
15. DEMAND FOR GOVERNMENT SERVICES: Will substantial traffic be added to existing roads? Will other services (fire protection, police, schools, etc.) be	**[N] The proposed project would not add additional traffic along the access roads that would increase noise, dust and increase maintenance of those roads over existing levels.** **Local fire protection services, police and schools should not have additional impacts from the expansion.**

IMPACTS ON THE HUMAN POPULATION	
needed?	*Cumulative Impacts:* No other cumulative impacts to area government services have been identified.
16. LOCALLY ADOPTED ENVIRONMENTAL PLANS AND GOALS: Are there State, County, City, USFS, BLM, Tribal, etc. zoning or management plans in effect?	[Y] The Big Horn property is generally surrounded by private, USFS and BLM lands, and scattered tracts of State of Montana lands. The public management agencies have management plans in effect. County land management plans are less common in the rural area where the site is located. Private landowners in the area have management plans as well. Big Horn would coordinate with the agencies and landowners if needed to limit impacts to area resources and the human environment as it has done in the past. *Cumulative Impacts:* No cumulative impacts to area land management plans have been identified as a result of the proposed expansion.
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?	[N] Access through Big Horn lands is limited by the lack of roads in the area. Big Horn does not allow public recreational use of its property during operations. There is limited recreational potential on the property for hunting and hiking. *Cumulative Impacts:* No cumulative impacts to recreation were identified by DEQ except for the visual impacts seen from other areas.
18. DENSITY AND DISTRIBUTION OF POPULATION AND HOUSING: Will the project add to the population and require additional housing?	[N] No increase in employment levels is proposed by Big Horn. *Cumulative Impacts:* Over the 50-year permit life, growth in southcentral Montana would continue. People moving to Montana would add to growth in this area and require new housing. This is an unavoidable impact of growth in south-central Montana.
19. SOCIAL STRUCTURES AND MORES: Is some disruption of native or traditional lifestyles or communities possible?	[Y] The native or traditional lifestyles in the areas surrounding the Warren Quarry included extensive use of the Pryor Mountains by Native Americans and ranchers. The quarry may be visible from some cultural sites as discussed in Section X.7 above. Ranching and quarrying have co-existed in the area for years. *Cumulative Impacts:* No cumulative impacts were identified by DEQ.

IMPACTS ON THE HUMAN POPULATION	
20. CULTURAL UNIQUENESS AND DIVERSITY: Will the action cause a shift in some unique quality of the area?	**[N]**
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] Big Horn has voluntarily committed to DEQ requests to minimize impacts during the operating permit review process. DEQ has proposed six modifications to limit potential impacts.** **DEQ would require that Big Horn meet with DEQ and USFS personnel to review the ultimate highwall location and develop a stability monitoring plan, a modified blasting plan if needed, and a plan to increase the buffer area farther from the rim if needed to minimize stability concerns near King Canyon walls from blasting on National Forest System lands (See Section X.1).** **DEQ would require Big Horn to spot spray for halogeton control on the site and along the access road disturbances. DEQ would require Big Horn to reseed areas that have had halogeton controlled in the quarry area if. Big Horn would be required to contact the USFS and BLM and develop a coordinated noxious weed control program for the quarry area (See Section X.4).** **DEQ would require Big Horn to develop a mitigation plan to reduce the visual impact of the highwall at closure which would include backfilling some highwall cuts with rock to create talus slopes, to cast blast some highwalls down at closure to create a more natural looking highwall, and to create an undulating rather than the straight engineered highwall shown on EXHIBIT H (See Section X.8).** **DEQ would inspect and review reclamation plans for the quarry and incorporate some buttressing of slopes at closure to minimize exposure to quarry rock faces if needed (See Section X.1).**
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.	**[N] DEQ has imposed six modifications which would be restrictions that would add to the cost of implementing the proposal (See Sections X.1, 4, and 8). The additional costs would be not be substantial.**

IMPACTS ON THE HUMAN POPULATION	
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.	**[N] The modifications imposed in Sections X. 1, 4 and 8 are within DEQ's authority under MMRA. No other alternatives or restrictions were proposed that would be needed to achieve the objectives identified in the alternatives. DEQ would work with Big Horn, private ranchers, and other land management agencies to resolve impacts if needed.**
24. OTHER APPROPRIATE SOCIAL AND ECONOMIC CIRCUMSTANCES:	**[N]**

XI. ALTERNATIVES CONSIDERED:

A. NO ACTION, DENY THE APPLICANT'S PROPOSED PLAN

DEQ reviewed Big Horn's proposed operating and reclamation plans. If the Proposed Action were denied, then Big Horn would operate under the current approved operating permit until the mineable limestone runs out.

B. APPROVE THE APPLICANT'S PROPOSED PLAN

Big Horn has responded to almost all of DEQ's concerns with the original application through the operating permit review process. Big Horn has proposed subsequent changes that were used to develop the Proposed Action Alternative in this Draft EA.

C. APPROVE THE APPLICANTS'S PROPOSED PLAN WITH AGENCY MODIFICATIONS

As mentioned above, Big Horn has committed to many requests by DEQ during the operating permit review process. DEQ has identified six mitigations to address concerns with the Proposed Action.

Modification 1. To prevent stability concerns near the King Canyon walls, DEQ would require that Big Horn meet with DEQ and USFS personnel in the proposed expansion area to review the ultimate highwall location and develop a stability monitoring plan, a modified blasting plan if needed, and a plan to increase the buffer area further from the rim if needed.

Modification 2. DEQ would require Big Horn to spot spray for halogeton control on the site and

along the access road disturbances.

Modification 3. DEQ would require Big Horn to reseed areas that have had halogeton controlled in the quarry area.

Modification 4. Big Horn would be required to contact the USFS and BLM and develop a coordinated noxious weed control program for the quarry area.

Modification 5. DEQ would require Big Horn to develop a mitigation plan to reduce the visual impact of the highwall at closure which would include backfilling some highwall cuts with rock to create talus slopes, to cast blast some highwalls down at closure to create a more natural looking highwall, and to create an undulating rather than the straight engineered highwall which is shown on EXHIBIT L. DEQ will meet with the USFS and Big Horn on site to try to develop a modified quarrying plan for the ultimate highwalls.

Modification 6. DEQ would inspect and review reclamation plans for the quarry and incorporate some buttressing of slopes at closure to minimize exposure to quarry rock faces to address potential safety concerns.

XII. PUBLIC INVOLVEMENT

DEQ published a legal notice the *Carbon County News* and the *Billings Gazette* and issued a press release in August 2005 when the quarry expansion was submitted. Big Horn has modified its permit application in response to DEQ concerns as part of the completeness review process. Comments were received from the USFS and FWP on the original permit application public notice (See ATTACHMENT 1). Concerns raised in the comments have been discussed in this Draft EA. The operating permit application is now complete. DEQ will publish another legal notice and press release in the same newspapers about the availability of this Draft EA.

This Draft EA has been distributed to the mailing list developed for the Warren Quarry, to all landowners adjacent to the proposed sites, to the USFS list of Native American tribes that traditionally used the area and to those who commented on the operating permit application public notice. Extra copies of this Draft EA can be obtained from DEQ offices in Helena. This Draft EA will also be posted on the DEQ web page: http://www.deq.mt.gov/**. For copies of the Draft EA or to submit comments, write or call the Montana Department of Environmental Quality c/o Herb Rolfes, P. O. Box 200901, Helena, MT 59620, telephone (406) 444-3841 or e-mail at hrolfes@mt.gov. Comments will be accepted for 30 days after the date of the signature below.**

XIII. OTHER GOVERNMENTAL AGENCIES WITH JURISDICTION

County and State of Montana public roads would be used for access and hauling rock products from the quarries. Operators would have to comply with speed limits and other restrictions placed on use of these public roads. The Carbon County Weed Control District regulates noxious weed control activities.

XIV. MAGNITUDE AND SIGNIFICANCE OF POTENTIAL IMPACTS

Impacts from quarry expansion have been discussed above in Section X. 1-24. The major impacts are summarized here. Up to 387 acres of limestone in the foothills of the Pryor Mountains

would be disturbed by quarrying areas over the 20-year permit life. Impacts to rock outcrops and talus slopes, soils, vegetation and wildlife habitat as well as impacts to the human environment from dust and noise and to the aesthetics of the area are unavoidable impacts from allowing quarrying operations. Reclamation would limit the visual impacts to acceptable levels as required by MMRA, but the sites would look disturbed for a long time.

Socioeconomic benefits from the jobs created by the continued operations would result.

XV. CUMULATIVE EFFECTS

As mentioned in Section VI, Big Horn proposes to disturb up to 387 acres over the life of the operating permit. Physical, biological, visual and human environment impacts would result from these disturbances. The overall environmental impacts of these disturbances would be limited. The socioeconomic impacts resulting from the quarries would benefit the economy of southcentral Montana and northern Wyoming.

The increased recreational use of the Pryor Mountains would cumulatively add to the disturbance in the Pryor Mountains. Increasing use of the area by recreational vehicles and impacts from camping would continue to increase soil disturbance, erosion, and potential for noxious weed invasion.

Another activity that could cumulatively affect Big Horn's proposed quarry expansion is a future expansion of YELP's ash disposal site. No expansion has been proposed to date.

Future US Forest Service post and pole sales and firewood gathering permits on adjacent lands could add to cumulative impacts in the drainages from sediment production, traffic, dust, and loss of native rock, soil and vegetation and increased visual impacts. No timber sales are proposed (Pierson 2006).

Continued development of private property for subdivisions would also add to the cumulative impacts to area resources.

XVI. RECOMMENDATION FOR FURTHER ENVIRONMENTAL ANALYSIS AND/OR TENTATIVE DECISION

[ ] EIS [ ] More Detailed EA [X] No Further Analysis.

The agencies have selected the Proposed Plan with Agency Modifications as the preliminary Preferred Alternative. This is not a final decision. This conclusion may change based on comments received from the public on this Draft EA, new information, or new analysis that may be needed in preparing the Final EA.

XVII. PREPARERS AND REVIEWERS

This Draft EA was prepared by:

Patrick Plantenberg, DEQ EMB Reclamation Specialist
Herb Rolfes, DEQ EMB Operating Permit Section Supervisor
Sue Fairchild, DEQ EMB Administrative Assistant

This Draft EA was reviewed by:

Warren McCullough, DEQ, Chief, Environmental Management Bureau
Greg Hallsten, DEQ MEPA Coordinator

XVIII. DRAFT EA APPROVED BY

Warren D. McCullough 9/14/06

Signature Date

Warren D. McCullough, Chief, Environmental Management Bureau, DEQ

XIX. REFERENCES CITED

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G:/emb/op/mepa/ea/Big Horn/bighorndraftea09/11/06.doc

ATTACHMENT 1

Comment Letters from Montana Fish, Wildlife, and Parks
And
US Forest Service

Montana Fish, Wildlife & Parks

2300 Lake Elmo Drive
Billings MT 59105

January 31, 2005

William Bridges
Pryor Mountain Engineering
P.O. Box 671
Cowley, WY 82420

Dear William:

I consulted with FWP area biologist Shawn Stewart and FWP non-game biologist Allison Puchniak concerning potential impacts to terrestrial and avian wildlife species from the expansion of the Big Horn Limestone Company quarry. Our opinion is that the expansion of the mine as proposed will have minimal to no impact on these species.

Thanks for providing FWP with the opportunity to comment on this proposal.

Sincerely,

Ray Mulé

Ray Mulé
FWP Region 5 Wildlife Manager

Montana Fish, Wildlife & Parks

Mr. William Bridges, P.E.
Pryor Mountain Engineering
P O Box 671
Cowley, WY 82420

November 30, 2004

Dear Mr. Bridges:

I am writing concerning your request for wildlife and fisheries comments on the proposed expansion of the Big Horn Limestone quarry near Warren. I am sorry it has taken us so long to respond. Your request passed from Allison to me, back to the wildlife biologist in Red Lodge, and has now come back to me since there are no wildlife concerns with the proposed expansion of the quarry.

There are some fisheries concerns with this project because Piney Creek supports an isolated population of pure Yellowstone cutthroat trout. The entire stream is dependent upon the Piney Creek spring for water. Our main concern has been that ongoing blasting at the quarry could disrupt the aquifer that feeds this spring and dry up the creek. The expansion is actually moving away from the spring, which is probably good, but it would be nice to see some kind of geologic/groundwater study that identified the source of the water for the spring and how it flows in relation to the proposed expansion. That kind of data could tell us if there are any legitimate fisheries concerns with this proposed project.

I know some limited groundwater studies were conducted during the last proposed expansion of the quarry in the mid-1990s, but I don't know what information was collected. I would appreciate talking with you about what groundwater data are available, and the need or potential for expanding past studies. You can reach me at (406) 247-2963. Thank you for the opportunity to comment on this project.

Sincerely,

Ken Frazer

Ken Frazer
Regional Fisheries Biologist

OP 00008.

United States Department of Agriculture | Forest Service | Custer National Forest | 1310 Main Street Billings, MT 59105

File Code: 2810

Date: August 29, 2005

Patrick Plantenberg
Montana Department of Environmental Quality
P.O. Box 200901
Helena, MT 59620-0901

RECEIVED
AUG 31 2005
Dept. Environmental Quality
Env. Management Bureau

Dear Mr. Plantenberg:

I am writing in response to your July 1, 2005 request for comments on Big Horn Limestone Company's application for limestone quarry expansion, northeast of Warren, Montana adjacent to the National Forest System (NFS) lands on the Custer National Forest (CNF). My staff and I reviewed the application package and have the following comments:

- Potential effects to visual resources could occur as a result of the quarry expansion adjacent to NFS lands – specifically; there is concern associated with highwall creation just south of NFS lands on the CNF in the northern portion of the proposed expansion area and with visual effects of expanded operations. We suggest identification and incorporation of mitigation measures that would minimize such effects. Suggestions include reclamation, revegetation, and recontouring concurrent with operations.
- We suggest that Big Horn Limestone or DEQ contact U.S. Fish and Wildlife Service to verify that no known Threatened or Endangered species or habitats are present in the expansion area.
- We request that NFS lands boundaries be more clearly delineated on maps associated with any subsequent environmental analysis associated with this project.
- Ensure that private land boundaries are posted on the ground.
- There is one heritage site on the CNF that is adjacent to the current proposed quarry expansion project area – no problems with this site are anticipated by the archaeologist as a result of the proposed quarry expansion.
- The NW and NE corners of the proposed expansion area that encroach onto the rim overlooking King Canyon are of some concern. Those north-facing slopes into the Canyon are very steep cliffs and there may be potential that blasting, excavation, etc. could have some effect on the stability of the canyon walls on NFS lands. A potential mitigation would be to provide an increased buffer area further from the rim.
- Noxious weeds are a concern with any activity involving ground disturbance. We suggest that quarry expansion plans include the application of standard Best Management Practices, such as those detailed in the Montana Weed Management Plan (posted online at http://agr.state.mt.us/weedpest/pdf/2005weedPlan.pdf), for prevention and minimization of weed infestation and spread on private and National Forest lands. The CNF has been

O-PF
C-PP

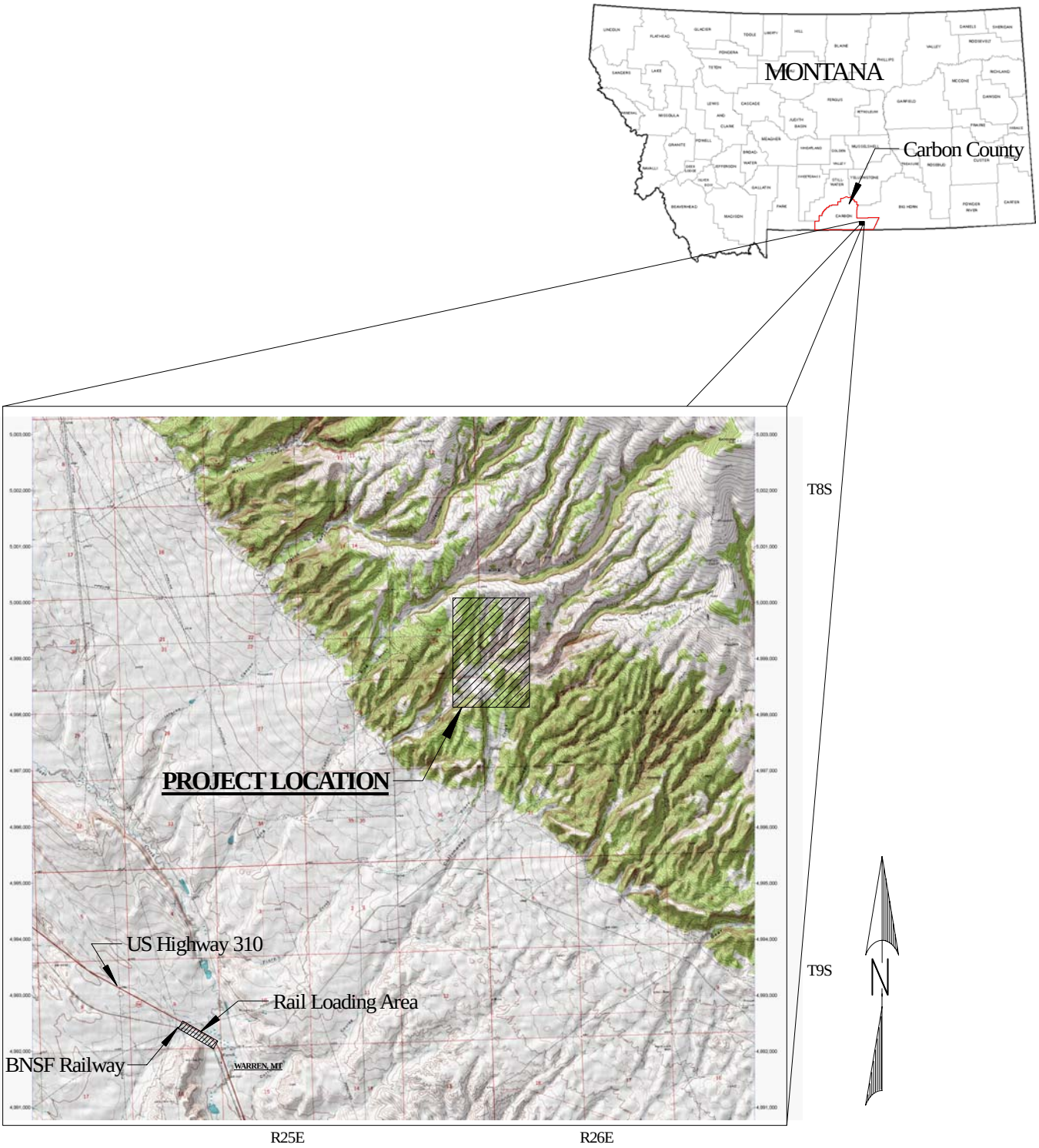
monitoring and treating noxious weeds on nearby National Forest System lands in the Pryors. Please contact Terry Jones, Rangeland Management Specialist, at the Beartooth Ranger District if DEQ and/or Big Horn Limestone are interested in coordinating weed monitoring and treatment activities with CNF personnel.

Thank you for the opportunity to comment on this application for quarry expansion. Please contact Dan Seifert at 406-446-2103 if you have any questions related to this letter or any other issues associated with coordination of land management activities between DEQ, Big Horn Limestone and the CNF. I look forward to continued cooperation and coordination.

Sincerely,

Frederick W Ranger (for)

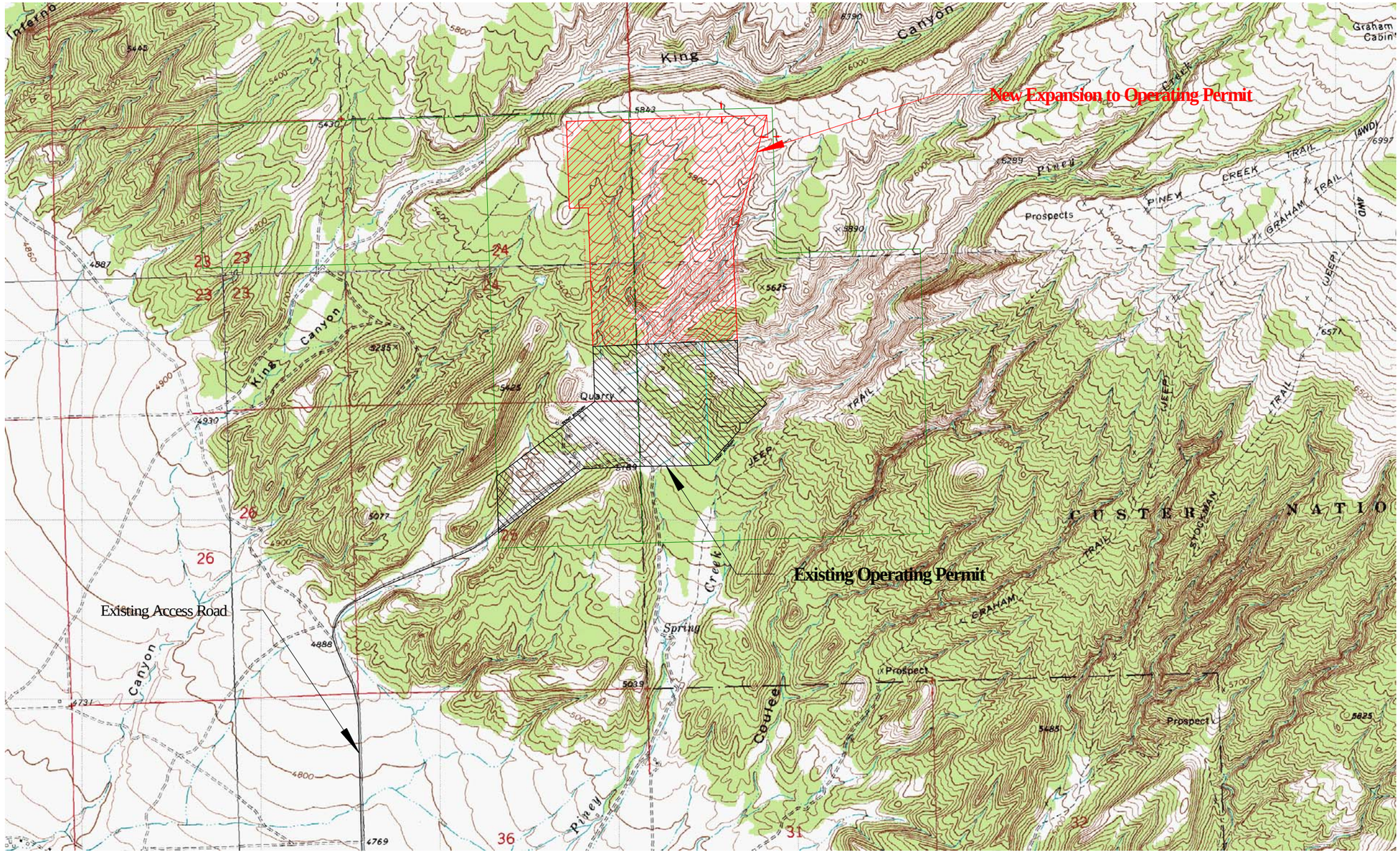
NANCY T. CURRIDEN
Forest Supervisor



PROJECT LOCATION
Big Horn Limestone Company
Warren Limestone Quarry
Carbon County, Montana

EXHIBIT A

8/2/2006



To Warren, MT

N

MONTANA LIMESTONE COMPANY

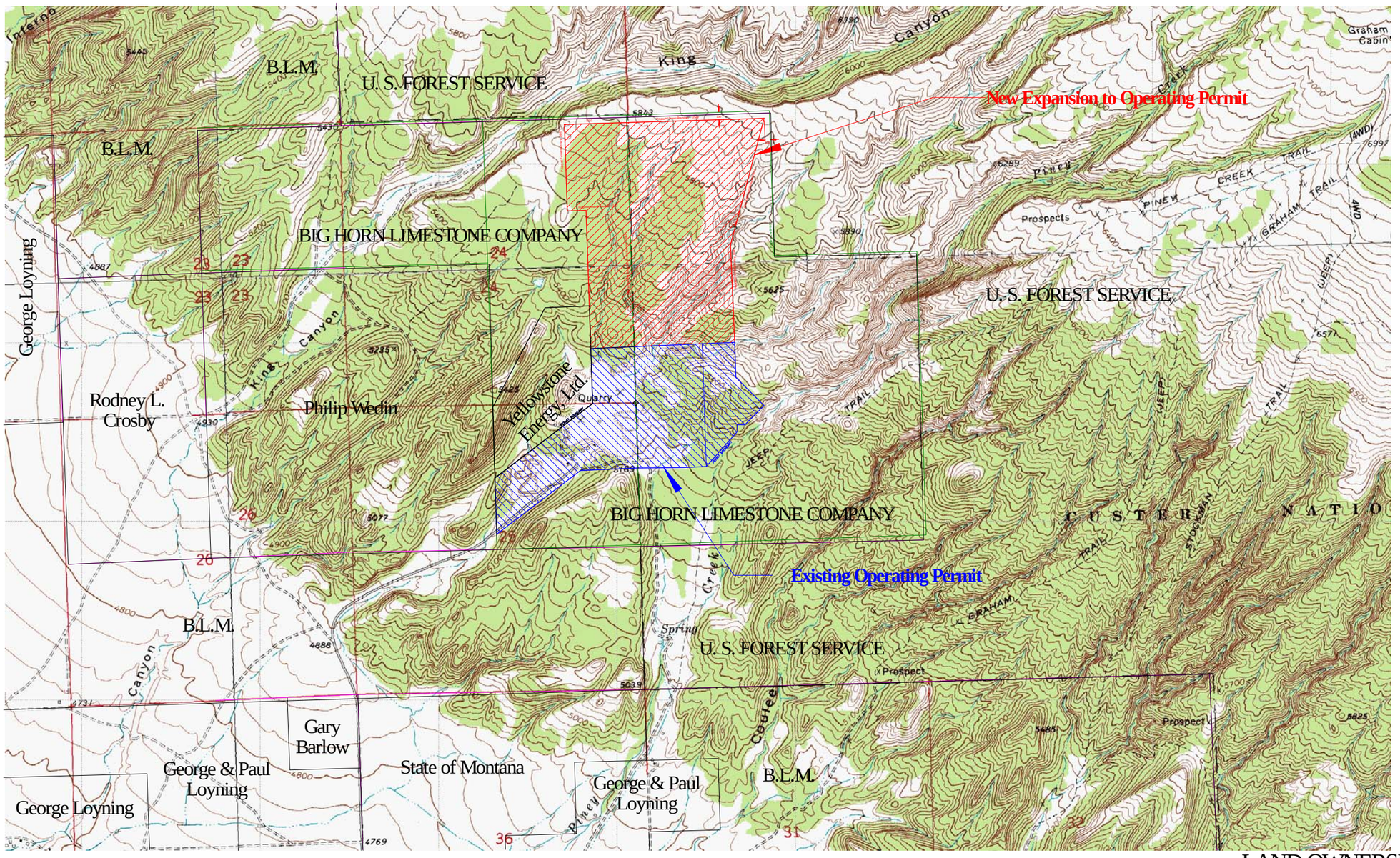
A subsidiary of Dakota Coal Company

PROJECT AREA
Big Horn Limestone Company
Warren Limestone Quarry
Carbon County, Montana
E½ SEC 24, NE¼ SEC 25, T8S, R25E, PM
W½ SEC 19, NW¼ SEC 30, T8S, R26E, PM

Scale: 1" = 2000'

8/4/2005

EXHIBIT B



N

Scale: 1" = 2000'

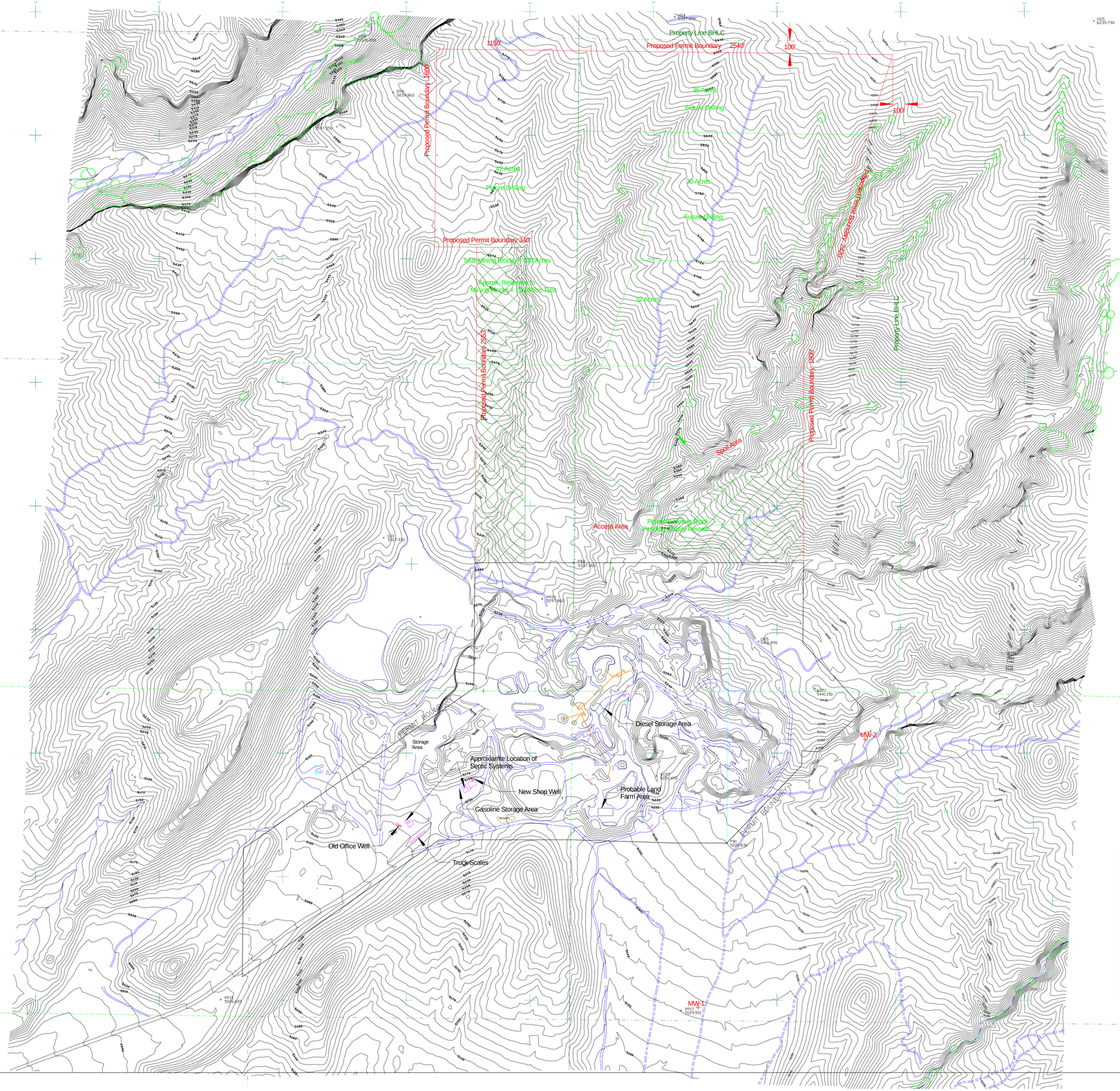
MONTANA LIMESTONE COMPANY

A subsidiary of Dakota Coal Company

LAND OWNERSHIP
Big Horn Limestone Company
Warren Limestone Quarry
Carbon County, Montana
E½ SEC 24, NE¼ SEC 25, T8S, R25E, PM
W½ SEC 19, NW¼ SEC 30, T8S, R26E, PM

6/29/2006

EXHIBIT C



LEGEND

- EXISTING PERMIT BOUNDARY
- PROPOSED PERMIT BOUNDARY
- PROPERTY LINE
- SECTION 1/4 LINE
- FUTURE POWER LINE
- NON-DISTURBANCE AREA
- 2005 CORE HOLE LOCATION

BIG HORN LIMESTONE COMPANY
WARREN LIMESTONE QUARRY
Warren, Montana

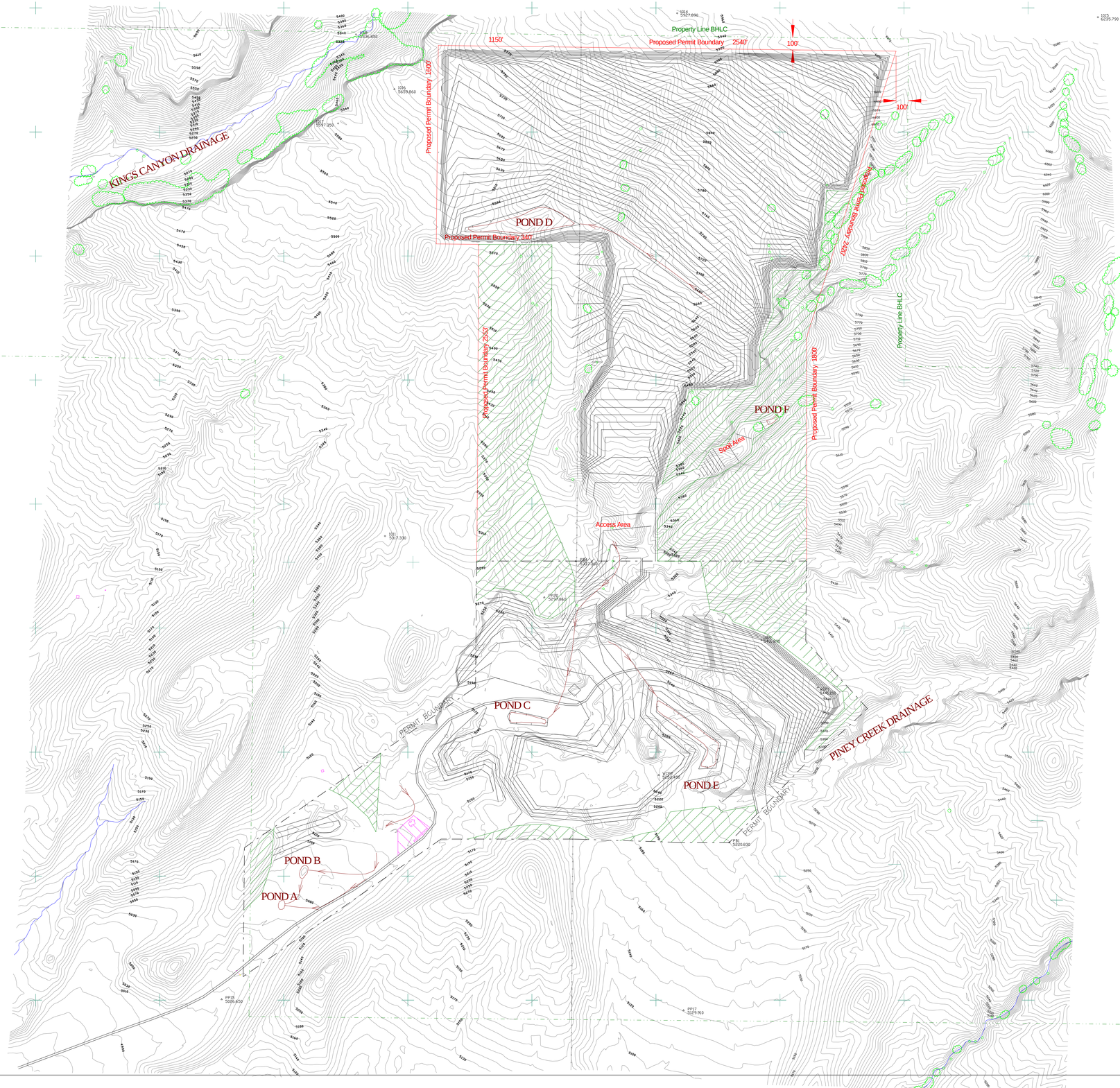
CONSOLIDATED PERMIT BOUNDARY
EXHIBIT D

Mine Operator: **Montana Limestone Company** **PO Box 166** **Frannie, WY 82423** **(406) 764-2513**	**Date: Aug 16, 2005** **Rev.:** **Designed by:** **Drawn by: WEB**

MONTANA

A subsidiary of Dakota Coal Company

Scale: 1" = 400'
Contour Interval = 10'



LEGEND

- EXISTING PERMIT BOUNDARY
- PROPOSED PERMIT BOUNDARY
- PROPERTY LINE
- DRAINAGE
- UNDISTURBED AREA
- FACILITIES AREA
- ROAD TO REMAIN
- RECLAMATION AREAS

CONTOURS HAVE BEEN CREATED FROM A DIGITAL TERRAIN MODEL BY PHOTOGRAMMETRIC METHODS

BIG HORN LIMESTONE COMPANY
WARREN LIMESTONE QUARRY
Warren, Montana

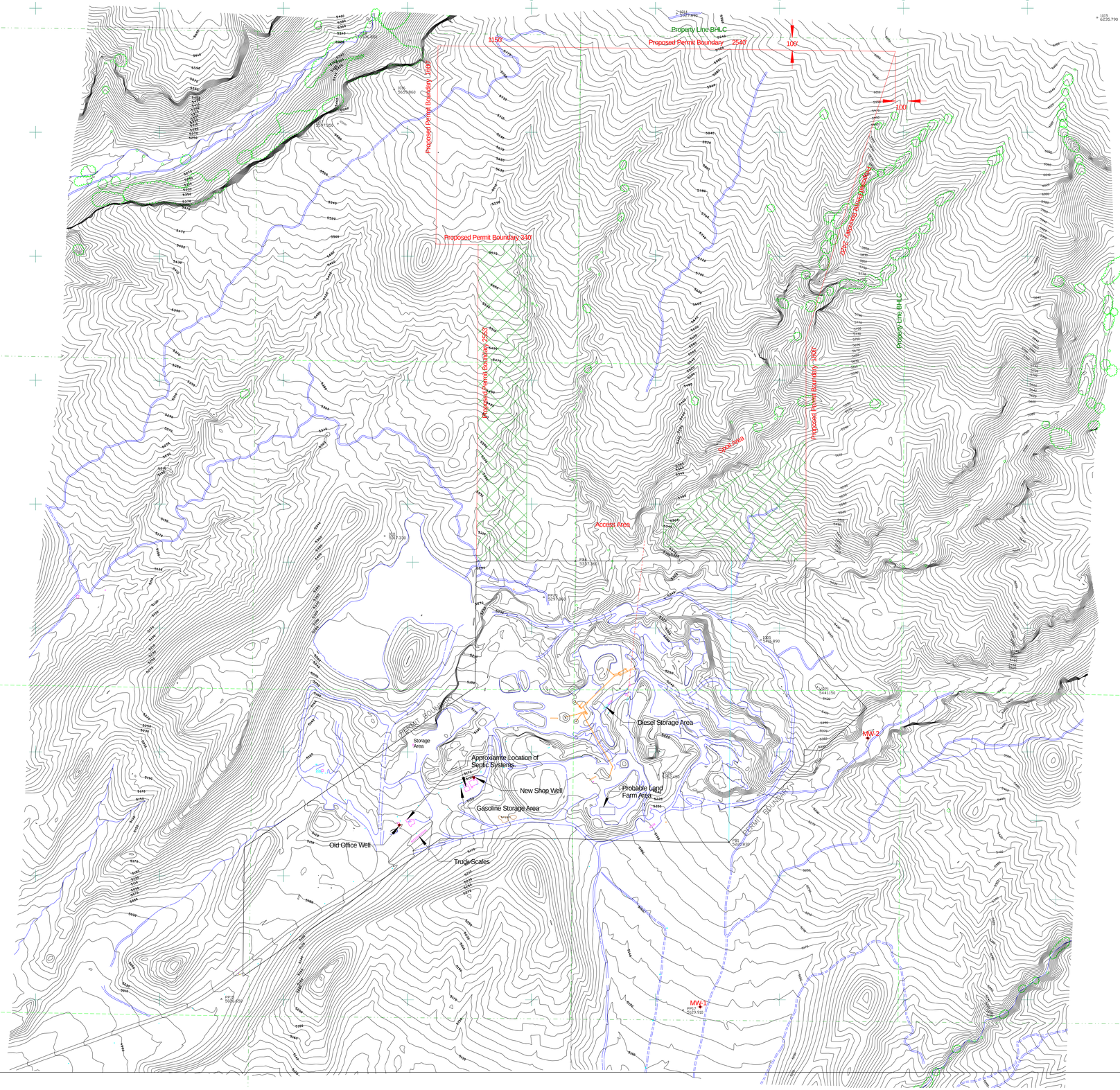
DRAINAGE PATTERNS
EXHIBIT F

Mine Operator: **Montana Limestone Company** **PO Box 166** **Frannie, WY 82423** **(406) 764-2513**	**Date: May 31, 2005** **Rev.: October 10, 2005** **Designed by:** **Drawn by: WEB**

MONTANA

A subsidiary of Dakota Coal Company

Scale: 1" = 400'
Contour Interval = 10'



LEGEND

- EXISTING PERMIT BOUNDARY
- PROPOSED PERMIT BOUNDARY
- PROPERTY LINE
- SECTION 1/4 LINE
- FUTURE POWER LINE
- NON-DISTURBANCE AREA
- 2005 CORE HOLE LOCATION

BIG HORN LIMESTONE COMPANY
WARREN LIMESTONE QUARRY
Warren, Montana

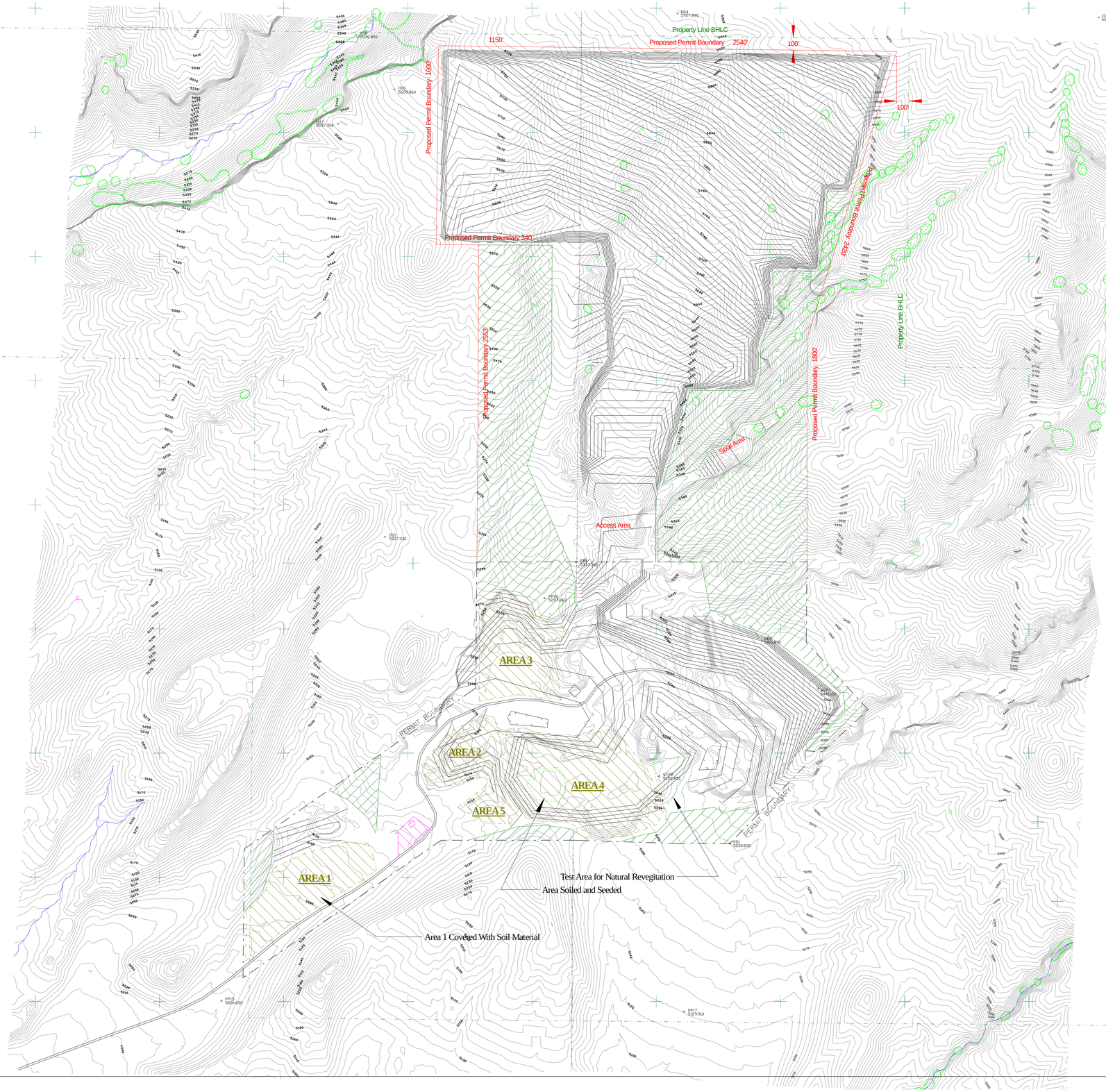
EXISTING TOPOGRAPHY
EXHIBIT G

Mine Operator: **Montana Limestone Company** **PO Box 166** **Frannie, WY 82423** **(406) 764-2513**	**Date: Aug 16, 2005** **Rev.:** **Designed by:** **Drawn by: WEB**

MONTANA

A subsidiary of Dakota Coal Company

Scale: 1" = 400'
Contour Interval = 10'



LEGEND

- EXISTING PERMIT BOUNDARY
- PROPOSED PERMIT BOUNDARY
- PROPERTY LINE
- DRAINAGE
- UNDISTURBED AREA
- FACILITIES AREA
- ROAD TO REMAIN
- RECLAMATION AREAS

CONTOURS HAVE BEEN CREATED FROM A DIGITAL TERRAIN MODEL BY PHOTOGRAMMETRIC METHODS

BIG HORN LIMESTONE COMPANY
WARREN LIMESTONE QUARRY
Warren, Montana

ESTIMATED FINAL TOPOGRAPHY
EXHIBIT H

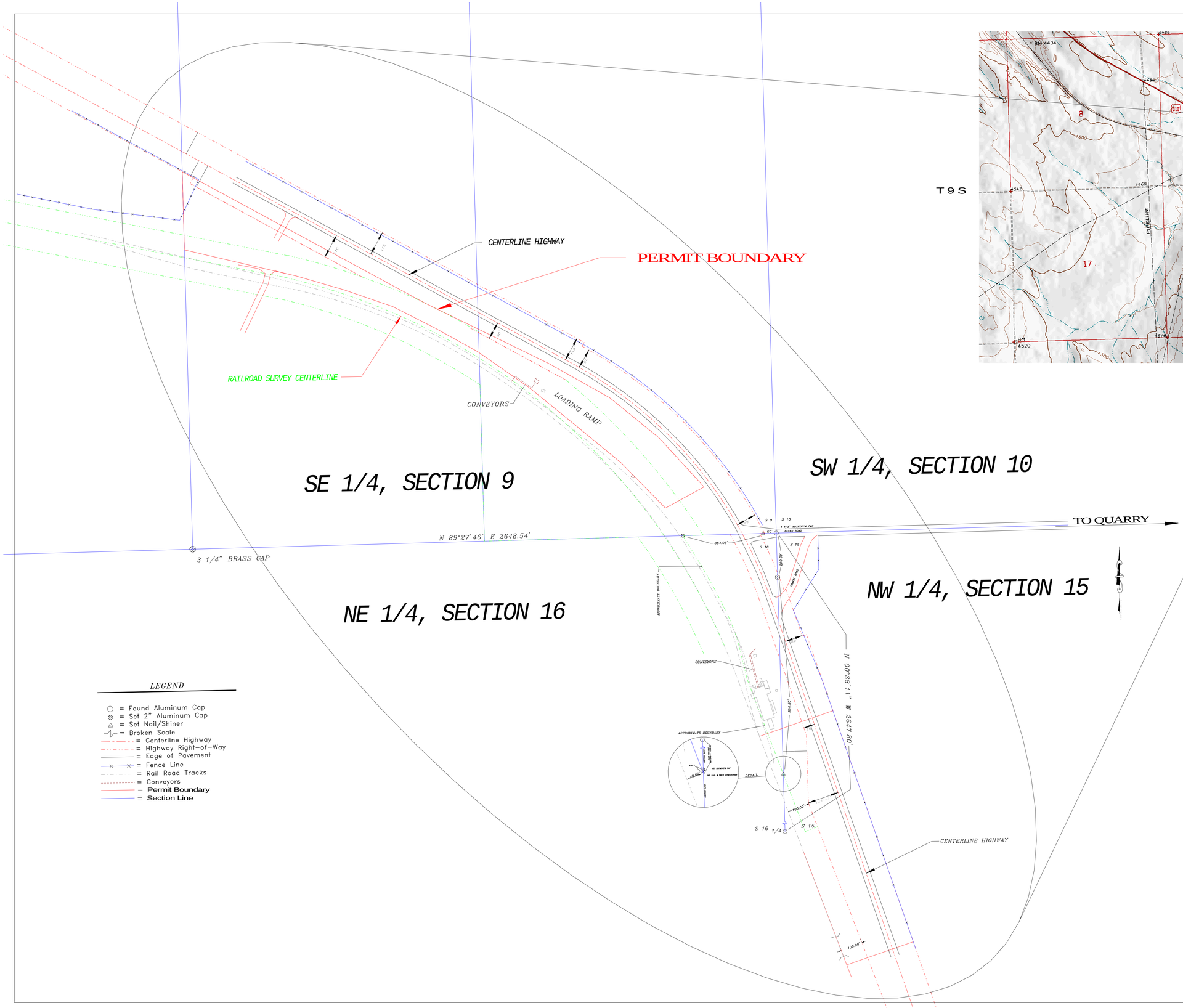
Mine Operator:
Montana Limestone Company
PO Box 166
Frannie, WY 82423
(406) 764-2513

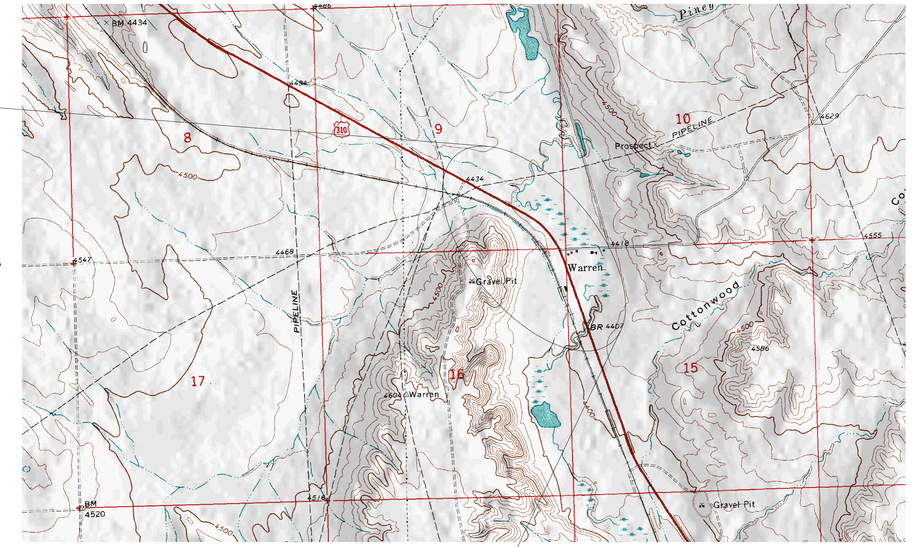
Date: May 31, 2005
Rev.: October 10, 2005
Designed by:
Drawn by: WEB

MONTANA

A subsidiary of Dakota Coal Company

Scale: 1" = 400'
Contour Interval = 10'





LEGEND

- ○ = Found Aluminum Cap
- ⊗ = Set 2" Aluminum Cap
- △ = Set Nail/Shiner
- = Broken Scale
- = Centerline Highway
- = Highway Right-of-Way
- = Edge of Pavement
- = Fence Line
- = Rail Road Tracks
- = Conveyors
- = Permit Boundary
- = Section Line

BIG HORN LIMESTONE COMPANY
WARREN LIMESTONE QUARRY
Warren, Montana

RAIL LOADING AREA
EXHIBIT L

Mine Operator: Montana Limestone Company PO Box 166 Frannie, WY 82423 (406) 764-2513	**Date:** May 31, 2005 **Rev.:** **Designed by:** **Drawn by:** WEB

MONTANA LIMESTONE COMPANY

A subsidiary of Dakota Coal Company

Scale: 1" = 200'
Contour Interval = 20'