

**CR Minerals Company
Rocky Mountain Mine
Mining Permit Application and Close Out Plan**
Permit No. RA004RE

June 1999

Prepared for:

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CERTIFICATION

I certify that I have personally examined and am familiar with the information submitted herein, and based on my inquiry of those individuals responsible for obtaining the information, I believe the submitted information is true, accurate, and complete.

Authorized Agent

Date

TABLE OF CONTENTS

1.0 Introduction	1-1
1.1 Location and Description	1-1
1.2 Regulatory Applicability	1-3
1.3 Application Fee	1-3
1.4 Public Notice	1-3
2.0 Operator and Legal Information	2-1
3.0 Mining Site Assessment	3-1
3.1 Operation Status	3-1
3.2 Identification of the Proposed Permit Area	3-1
3.3 Existing Permits	3-1
3.4 Regulatory Requirements	3-1
3.5 Ground Water and Surface Water Information	3-1
3.6 Mining Impact to Surface and Ground Waters	3-1
3.7 Description of the Geologic Regime	3-2
3.8 Overburden and Waste Materials	3-2
3.8.1 Overburden	3-2
3.8.2 Product Stockpiles	3-2
3.8.3 Pumice Waste	3-2
3.9 Waste Impacts on the Environment	3-3
3.9.1 Hydrologic Balance	3-3
3.9.2 Drainage	3-3
3.9.3 Air Quality	3-3
3.10 Impacts to Local Communities	3-3
3.10.1 Taxes	3-3
3.10.2 Employment	3-3
3.10.3 Traffic	3-4
3.10.4 Social Services	3-4
3.11 Wildlife and Wildlife Habitat	3-4
3.12 Impacts to Wildlife	3-4
3.13 Existing Mining Operation Description and Unit Design Limits	3-4
4.0 Other Environmental Information	4-1
4.1 Vegetation	4-1
4.2 Climate	4-1
5.0 Closeout Plan	5-1
5.1 Post Mining Land Use	5-1
5.2 Reclamation Work Description	5-1
5.2.1 Backfilling	5-1
5.2.2 Grading and Contouring	5-2

5.2.3 Growth Media Placement	5-2
5.2.4 Seed Bed Preparation	5-2
5.2.5 Seeding	5-2
5.2.6 Revegetation Success	5-3
5.3 Other Permits	5-3
5.4 Surface Water and Erosion Control	5-3
5.5 Post Mining Water Quality Sampling	5-3

TABLES

5-1 Reclamation Work Schedule	5-1
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FIGURES

1-1 General Location Map	1-2
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MAPS

MPA-01 Existing Topography
MPA-02 Post Mining Topography

EXHIBITS

- 1 Aerial Photograph
- 2 Land Patent
- 3 Public Notice Information
- 4 Hydrologic Information
- 5 Geologic Information
- 6 Environmental Studies
- 7 General Environmental Information
- 8 Climatological Information

1.0 Introduction

CR Minerals Company New Mexico LLC (CR Minerals) own and operates the Rocky Mountain Mine, a pumice mine, located about 5.5 miles west of Española, New Mexico. The mine has two primary customers; the CR Minerals pumice mill in Santa Fe, and to the Lafarge cinder block plant in Santa Fe. It has several smaller, regular customers, and also sells to "walk in" customers. The mine produces three pumice products; a coarse product at 3/8 inch plus, a medium product at 3/8 inch X 1/4 inch, and a fine product at 1/4 inch minus.

The mine has been through a number of ownership changes. A rough chronology of the mine ownership is as follows: Mr. R.W. Alley operated the mine under the name General Pumice from its inception in the early 1960s until he sold it to Colony Materials in 1995. Exhibit 1, Aerial Photograph, shows the site as it appeared in the early 1960s. In January 1996, Colony Materials sold the mine to Western Mobile who in turn sold the mine to CR Minerals Corporation at the end of 1997. The following year, CR Minerals Corporation sold the mine to CR Minerals Co. NM LLC. Despite the similarity in names between the last two owners, their ownership is entirely separate.

As CR Minerals understands matters, a permit application was originally submitted by the December 31, 1995 filing deadline. It was subsequently amended by various owners using different formats. This document is designed to consolidate the prior filings and produce a single comprehensive permit application document. This is not a new permit application, it is merely a restatement of the existing application with updates as necessary to address questions raised by MMD. Because of its complex history, errors or omissions may occur in this document. CR Minerals is committed to working with the New Mexico Mining and Minerals Division to resolve any outstanding matters.

There is a distinct advantage to writing a permit application for an operation with such a long history behind; virtually all of the questions regarding environmental impact can be answered by direct observation of the existing operation. There is very little, if any, projection or anticipation required.

1.1 Location and Description

The mine is located in Rio Arriba County, approximately 5.5 miles west of Española, New Mexico on the Santa Clara Indian Reservation Road (State Highway SP-2541 (900)). See Figure 1, General Location Map. Mine property is bounded by Santa Clara Indian Reservation lands to the south, City of Española owned lands to the south and west, and BLM administered lands to the north and east. The city owned lands are not within the city limits.

The mine is developed on patented mining claims (see Exhibit 2, Land Patent) and includes pits worked and abandoned in the 1960s, as well as the current operations. The site is on a high plateau (approximately 6,700 ft elevation) on the northeastern flank of the Jemez Caldera volcanic field. The plateau is up to 2 miles wide and four miles long and consists of several east-west trending fingers defined by deeply incised arroyos.

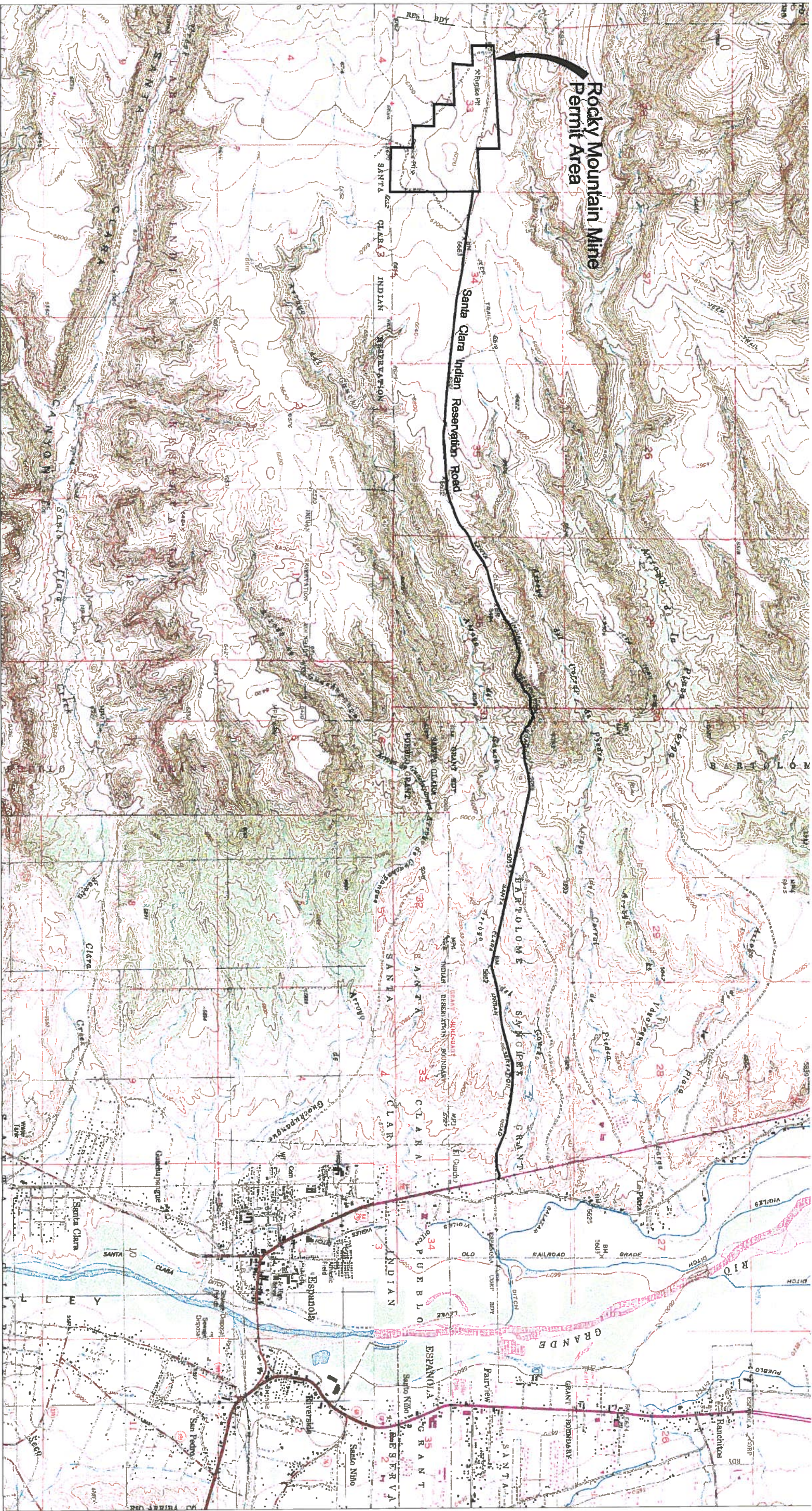


Figure 1
Rocky Mountain Mine
General Location Map

1.2 Regulatory Applicability

The regulations found at 19 NMAC 10.2 subpart 5 outline the requirements for permitting and close out of existing operations. In addition, the MMD has prepared a permit checklist for existing mining operations. The following application addresses all appropriate items from the checklist and the regulations.

1.3 Application Fee

CR Minerals understands that the application fee was paid by previous operators.

1.4 Public Notice

Exhibit 3, Public Notice Information, contains documentation of the public notice activity for this permit application.

2.0 Operator and Legal Information

Applicant, Owner, and Operator:

CR Minerals Company New Mexico LLC
Corner of St. Francis and Zia Road
P.O. Box 4305
Santa Fe, New Mexico 87502

Property Ownership (basis of the right to enter):

CR Minerals acquired the mining operation and real property underlying the operation. CR Minerals owns the surface and mineral rights to the entire property in fee simple. Map MPA-01, Existing Topography, shows the permit area.

Agent for Service of Process:

Corporation Service Co.
121 E. Palace Avenue
Santa Fe, NM 87501

Contact Person:

Mr. Robert Fullerton
Southwest Corner St. Francis Drive and Zia Road
P.O. Box 4305
Santa Fe, NM 87501
(505) 471-9132

3.0 Mining Site Assessment

3.1 Operation Status

The Rocky Mountain Mine is an existing mine.

3.2 Identification of the Proposed Permit Area

The permit area is located on a 193 acre tract of land in Sec. 33, T 21 N, R 7 E, and comprises all of CR Minerals' ownership including: Lots 7, 10, 12, 14, 15, 16, 25, 26, 27, and 29. Map MPA-01, Existing Topography, shows the permit area. The mine is reached by driving 5.5 miles west from the intersection of State Highway SP-2541 (900) and US highway 84/285. (In addition to the state highway designation, the road to the mine is also identified in various documents as the Santa Clara Indian Reservation Road and 31 Mile Road.)

3.3 Existing Permits

The U.S. Environmental Protection Agency ("EPA") issued an NPDES Storm Water Permit to the Rocky Mountain Mine on April 20, 1999.

3.4 Regulatory Requirements

The only known state and federal regulatory requirements for the Rocky Mountain Mine are this permit, and the NPDES Storm Water Permit discussed above. CR Minerals will submit, within 60 days, a Notice of Intent pursuant to 20 NMAC 2.73 documenting air emissions from the facility and requesting Environment Department concurrence on our finding that the mine does not need an air permit.

3.5 Ground Water and Surface Water Information

There is no surface water within the mine permit boundary. Approximately 1/4 mile north of the permit area is a dry branch of Arroyo de la Plaza Larga. Approximately 1/4 mile southeast of the permit area is a dry branch of Arroyo del Gaucho. The nearest perennial water is found about 1 1/4 miles south of the permit area in Santa Clara Creek.

There are no water wells on the mine property. The nearest known well is about 1 mile to the northwest of the mine and encountered water at a depth of 800 feet. Exhibit 4, Hydrologic Information contains information on wells in the area. A well of about 400 ft depth was drilled on a property adjacent to the permit area and no water was found (see Exhibit 5, Geologic Information).

3.6 Mining Impact to Surface and Ground Waters

No chemicals are used in mining or processing of the pumice, thus there is no threat of contamination from the mining operation. Sediment transport from the site is addressed in the NPDES Storm Water Permit.

No water is used in the mining and processing of the pumice so there is no potential for depletion of water supplies as a result of mining. The mine pit does not encounter ground water and therefore will not impact ground water levels.

Water quantities should not be affected as the current surface soil on the site is relatively coarse grained and subject to high infiltration. The overburden, ore, and substrate are all also highly permeable and thus there should be no change in infiltration rate as a result of mining.

3.7 Description of the Geologic Regime

At one time the City of Española considered constructing a landfill on property adjacent to the Rocky Mountain Mine. Technical reports (*Geologic Report Española Landfill*, author unknown, and *City of Española Landfill Phase II Studies*, Tierra Engineering Consultants Inc.) were commissioned as part of the City's research into the site. The reports contain a very complete geologic description of the adjacent landfill site. Since the mine site and the landfill site are virtually identical geologically, the City's reports serve as a geologic description of the mine site and adjacent areas. The reports are included in Exhibit 5, Geologic Information.

3.8 Overburden and Waste Materials

There are three kinds of material present at the mine site: (1) overburden, (2) product stockpiles, and (3) pumice waste. Locations for each of the materials is found on Map MPA-02, Post Mining Topography, and each is described in the sections that follow.

3.8.1 Overburden

Overburden consists of unconsolidated materials that are suitable for use as topsoil (see *Backfill Material, Revegetation Monitoring Plan and Public Notice Components for Rocky Mountain Pumice Mine Permit Application*, Metric Corporation, in Exhibit 6, Environmental Studies). It is placed either on undisturbed ground adjacent to the initial cut, or it is placed in mined-out pits. Overburden piles range up to 40 ft. high. Some of the initial cut material, placed by operators prior to CR Minerals' ownership, was placed outside the permit boundaries on land owned by others. CR Minerals is not responsible for this material.

3.8.2 Product Stockpiles

There are several product stockpiles at the mine site. They consist entirely of pumice screened to different sizes. The most common sizes are: (1) put run, (2) 3/8 in. plus, (3) 3/8 in. X 1/4 in., (4) 1/4 in. minus. These sizes are based on the needs of the mine's customers. If customer demand changes at any time, additional stockpiles could be added. None of the product stockpiles will remain in the post mining environment.

3.8.3 Pumice Waste

Periodically, waste material is hauled from the Santa Fe processing plant back to the mine and placed in mined out areas where it is subsequently covered by overburden. The waste material consists of crystalline material (quartz and feldspar) present in the raw pumice but undesirable in the finished products, and off-specification fine pumice. The processing plant does not use any chemicals in processing the pumice, and the pumice itself contains no chemically active ingredients (i.e. acid forming materials).

3.9 Waste Impacts on the Environment

The materials described in section 3.8 are not expected to have any by de minimis impacts on the environment. The following sections describe impacts to hydrologic balance, drainage and air quality.

3.9.1 Hydrologic Balance

Expected impacts to water quality are addressed in section 3.5, this section will concentrate on impacts to ground water quantity. Impacts to the hydrologic balance are expected to be minimal to non-existent. Undisturbed, the site is characterized by high surface infiltration rates and highly transmissive, bedded sedimentary rocks with some interbedded basalt flows possible. No basalt flows have been found on the mine site to date. The post mining environment will have the same physical characteristics. Moreover, since there are no introduced chemicals in any of the waste products, and the waste products are not, themselves, chemically active, the waste piles are not expected to have any effects on ground water quality.

3.9.2 Drainage

In the post mining environment, the surface will be overburden material, which is essentially undifferentiated from area soils. The surface will also be revegetated to a condition similar to the pre mining environment. There will be some topographic differences between the pre and post mining environments, but due to the high infiltration rates in both environments, it is anticipated that most precipitation will infiltrate on site, with little runoff, and therefore, little change between the pre and post mining states.

3.9.3 Air Quality

The ore stockpiles are relatively coarse materials and are not expected to influence air quality. Overburden is essentially the same material as the topsoil, and will similarly behave essentially the same as the topsoil. Pumice waste is finer material than found in the pre mining environment, but is placed in the pit bottoms and covered up with overburden. While exposed in the pit bottom, the pumice waste is protected from wind erosion by the pit walls. While the pumice waste may contribute some small amount of particulate matter to the air, it is expected to be minimal.

3.10 Impacts to Local Communities

Since the mine is an ongoing operation, it is expected to have little impact on local communities. The mine is in Rio Arriba County and the nearest community is the City of Española.

3.10.1 Taxes

The mine is well outside the City of Española and is not expected to have any effects on taxes in that city. Because the mine is so small, it is similarly not expected to affect Rio Arriba County taxes.

3.10.2 Employment

The mine provides two full time jobs and one part time job. This low level of employment is not expected to significantly impact either Española or Rio Arriba County.

3.10.3 Traffic

The mine ships approximately 30,000 tons of pumice each year. Using an average of 15 tons per truck, this comes to an average of about 5 to 6 truck trips per day. This constitutes most of the truck traffic on the Santa Clara Reservation Road. CR Minerals maintains the road to the mine on an as-needed basis, relieving the county of the responsibility. Mine production may vary significantly from the figures used above. These figures are for reference to current operations only, and are not a limit on mine production.

Once the trucks reach the main highway (US Highway 84/285), they are an insignificant portion of the traffic on this main artery.

3.10.4 Social Services

Because the mine is so small, there is little impact on the population related services provided by local governments.

3.11 Wildlife and Wildlife Habitat

Wildlife habitat on the site is described in detail in "*Vegetation, Wildlife, and Revegetation Components for Rocky Mountain Mine Pumice Mine Permit Application*" prepared by Metric Corporation (the "Metric Study") and found in Exhibit 6, Environmental Studies.

The Metric Study found three habitat types in the permit area: (1) mining disturbance, (2) pinyon-juniper woodland, and (3) grassland. No wetland or riparian habitat is found in the permit area.

The investigators conducted survey transects and set live traps for small animals. While a number of species were encountered in the surveys, the Metric Study found no threatened or endangered species on the site, and further found that no threatened or endangered species is likely to occur on the site. A more complete discussion is found in Exhibit 6, Environmental Studies.

3.12 Impacts to Wildlife

The impacts to wildlife are best described in the conclusory words of the Metric Study (Exhibit 6). "Minimal loss of individuals [animals] will not have a long-term impact on wildlife populations.... No listed species is likely to occur in the project area. No impacts [to threatened or endangered species] are predicted."

3.13 Existing Mining Operation Description and Unit Design Limits

The mine is a very simple operation and consists only of pits, overburden piles, and pumice stockpiles. There are no impoundments or leach piles on site. The pit also serves as a location for the disposal of dry pumice waste. Unit design limits for the pits, overburden piles and pumice stockpiles are shown on Map MPA-02, Post Mining Topography. Pumice stockpiles may also be constructed inside the pit, if appropriate for operations.

Mining is conducted in much the same fashion as surface coal mining. Mining operations in order of occurrence are: (1) Overburden is removed from an initial cut and placed on adjacent undisturbed land. This step uses either bull dozers, or scrapers, or trucks and

loaders or any other standard earth moving equipment. This step exposes the pumice which is the target of the operation; (2) Exposed pumice is then removed from the cut. Pumice is removed using any standard earth moving equipment; (3) The pumice is screened and stockpiled for shipment; (4) Overburden from the next cut is placed in the mined out area (this is the beginning of reclamation); and (5) The area is contoured and revegetated.

4.0 Other Environmental Information

4.1 Vegetation

The Metric Study (Exhibit 6), contains requested information on vegetation communities and community composition. Two vegetation communities are identified within the permit area; the pinyon-juniper-blue grama grass community and the blue grama-broom snakeweed community. The Metric Study provides a map of the communities' occurrence within the permit area. Species lists and cover values are found in the Metric Study. Supplemental information in the form of a USDA Soil Conservation Service range site description appears in Exhibit 7, General Environmental Information.

Also in the Metric Study is a description of 5 species of concern that could occur on site. None of the species were sited during the course of field work for the study.

4.2 Climate

Information on climate can be found in Exhibit 8, Climatological Information.

5.0 Closeout Plan

5.1 Post Mining Land Use

CR Minerals, as owner of the land, has determined that the post mining land use will be livestock grazing.

5.2 Reclamation Work Description

Reclamation will consist of several activities, not all of which are required on any given location of the mine site. Reclamation activities include backfilling of mined areas with overburden from un-mined areas, grading and contouring of the surface to be reclaimed, placement of growth media, seed bed preparation, and seeding. Each of these activities is explained below and will be conducted in accordance with the following schedule.

Table 5.1, Reclamation Work Schedule

Activity	Begin	Duration	End
Backfilling	Ongoing	Life of mine	End of mine life
Grading and Contouring	Ongoing	Life of mine plus 1 year	One year after end of mine life
Growth Media Placement	1 year prior to completion of mining	Two years	One year after end of mine life
Seed Bed Preparation	1 year prior to completion of mining	Two years	One year after end of mine life
Seeding	At first favorable season after completion of mining	1 month	First favorable season following one year after end of mine life

5.2.1 Backfilling

Mining proceeds by removing overburden from an area to be mined and placing this material in adjacent, mined-out areas. Thus, backfilling of mined out pits is an ongoing feature of mine operations. CR Minerals is currently extracting pumice from an area near the center of the eastern boundary of the permit area. We expect the excavation to proceed in a westerly direction, with overburden being pushed to the south into mined-out areas. Overburden is moved using any combination of dozers, scrapers, trucks and loaders. The last cut will not be backfilled, as there is no ready source of backfill material.

The backfilled surface is shown on Map MPA-02, Post Mining Topography. Post Mining contours are not definite. They will vary depending on many things,

including but not limited to: ore quality, overburden swell, and stripping sequence. Only overburden that must be moved to extract pumice will be used in the backfilling operation. There will be no attempt to replicate pre-mine contours.

5.2.2 Grading and Contouring

Grading and contouring consists of manipulating the surface of the area to be reclaimed to provide a smooth, undulating surface consistent with the post mining contours. It will be accomplished using any combination of dozers, scrapers, loaders, and trucks.

Highwall areas that are to be reduced in slope will be recontoured by either dozing down the highwall crest and placing the material at the toe of the highwall, or by bringing overburden material in from another area and placing it at the toe of the highwall, or by some combination of these activities.

Short highwalls up to 10 feet may be left in some places, consistent with local topography. The local landscape is made up of steep sided mesas with short cliffs that are part of the natural ecosystem.

5.2.3 Growth Media Placement

Available testing (see Metric Study, Exhibit 6) shows that topsoil, stockpile material, and overburden is all suitable for use as growth media. Moreover, many of the abandoned stockpiles have revegetated entirely on their own, with no human intervention. Thus, since all topsoil and overburden is suitable for use as growth media, it will not be necessary to segregate and salvage topsoil as growth media. Instead, virtually all overburden becomes growth media, meaning that most reclaimed surfaces will not require placement of growth media. Growth media (overburden), averaging one foot thick, will be placed on the floors of mined-out pits that are not backfilled, it will also be placed on any other surfaces that have pumice as their predominant surface material. Placement will be accomplished using any combination of dozers, scrapers, loaders, and trucks.

5.2.4 Seed Bed Preparation

Seed bed preparation will consist of ripping the area to a depth of 1 to 2 feet to enhance water retention and root penetration. Slopes of 4h:1v or less will be contour plowed to minimize erosion. Seed bed preparation will be accomplished using either standard agricultural equipment or rippers on construction and mining type of equipment.

5.2.5 Seeding

Seeding will be accomplished using one of several widely accepted techniques. As appropriate, areas will be seeded using standard agricultural drills, broadcast techniques, or hydroseeding techniques. Reclaimed areas would be seeded using the seed mix found in Table 6, Reclamation seed mix for the Rocky Mountain Pumice Mine in Rio Arriba County, New Mexico, found in the Metric Corporation report "Vegetation, Wildlife, and Revegetation Components for Rocky Mountain Pumice Mine Permit Application" (see Exhibit 6, Environmental Studies).

If necessary and desirable, CR Minerals will conduct supplemental seeding on the naturally reclaimed areas. These areas would be broadcast seeded to prevent disturbing the naturally reclaimed surface.

5.2.6 Revegetation Success

CR Minerals proposes an interim revegetation success standard and a final revegetation standard. The interim standard would be based on the MMD recommendations in the August 4, 1999 letter from Mr. Fernando Martinez to Mr. Robert Fullerton and would be as follows:

Ground Cover, Grasses and forbs: 14 percent
Canopy Cover, Shrubs and half shrubs: 4 percent
Herbaceous production unfavorable years: 244 lb per acre
Diversity: At least 3 grasses with a relative herbaceous cover value equal to or greater than 2%, with no one grass species comprising more than 50 percent relative cover; three forbs with a relative herbaceous cover value equal to or greater than 2%, with no one forb species comprising more than 50% relative cover, and two shrubs with each species comprising no less than 5 percent or no greater than 95 percent of the relative density value.

The final revegetation success standard would also be based on the August 5, 1999 letter and would be as follows:

Total Cover, Perennial Species: Equal to or greater than 75 percent of the approved reference area with a 90% statistical confidence interval.
Shrub Density: Equal to or greater than 75 percent of the approved reference area with a 90% statistical confidence limit.
Total productivity: Equal to or greater than 75% of the approved reference area with a 90% statistical confidence limit.

5.3 Other Permits

The U.S. Environmental Protection Agency (EPA) issued an NPDES Storm Water Permit to the Rocky Mountain Mine on April 20, 1000. This is the only permit known to CR Minerals to be required for the close out plan.

5.4 Surface Water and Erosion Control

There are no drainage channels in the area, and much of the reclaimed surface will be internally drained. Final erosion control measures will be field-fit to the actual reclaimed topography and will be designed, constructed, and maintained to recognized professional standards (e.g. US Natural Resources Conservation Service).

5.5 Post Mining Water Quality Sampling.

There may be one or more permanent impoundments in the post mining surface. The disturbed area consists entirely of unconsolidated overburden suitable for use as soil, and inert pumice. There is no sulfur source, either organic or inorganic in the mining area. Therefore, aside from possible suspended solids (which are addressed under the terms of the NPDES Storm Water Permit currently in place), post mining water quality is expected to be

good. Rainfall in the area is low and the underlying sandstone layer is assumed to have a high infiltration rate. This leads to the conclusion that any impounded water would be ephemeral in nature. Keeping in mind these expectations, CR Minerals has designed a sampling program as follows:

The site will be visited during the early spring months of each year for the first 5 years following closure and searched for impounded water. If water is found it will be sampled. Samples will be analyzed for pH, SC, TDS, TSS, calcium, magnesium, sodium, potassium, total alkalinity, bicarbonate, carbonate as CO_3 , sulfate, total Kjeldahl nitrogen, and nitrate plus nitrite as N.