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DRAFT Closeout Plan

GCC Rio Grande – Tijeras Mine and Mill



Prepared for:

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Abbreviations and Acronyms

cfs	cubic feet per second
EPA	U.S. Environmental Protection Agency
GCC Rio Grande	GCC Rio Grande, Inc.
MMD	Mining and Minerals Division
MSGP	multi-sector general permit
NMAC	New Mexico Administrative Code
NMSA	New Mexico Statutes Annotated
NPDES	National Pollutant Discharge Elimination System
TCLP	toxic characteristic leaching procedure

Executive Summary

GCC Rio Grande, Inc. (GCC Rio Grande) owns and operates the Tijeras Mine and Mill, consisting of a Portland cement plant and multiple open pit limestone quarries. The company projects that it has sufficient reserves to continue to operate the Tijeras Mine and Mill at current production levels for the next 70 years.

GCC is submitting this revised closeout plan to the New Mexico Energy, Minerals and Natural Resources Department, Mining and Minerals Division (MMD) as an revision to MMD Permit # BE001RE, which authorizes mining and reclamation activities on the site. The goal of this plan is to provide for the reestablishment of a self-sustaining ecosystem on the permit area following closure that is consistent with the surrounding area and post-mining land use.

The Tijeras Mine and Mill are located in Bernalillo County approximately 0.5 of a mile south of the Village of Tijeras, New Mexico, on approximately 2,119 acres. The facility is bordered on the west and east by U.S. Forest Service land within the Cibola National Forest. The U.S. Department of Energy also owns land adjacent to the southern boundary. The site is bordered by private land on the north and east.

GCC Rio Grande is in the process of preparing a new long-term mine development plan which is expected to be completed later in 2016. To date, approximately 585 acres within the property have been impacted by past and current mining activities, including mined areas, the cement plant site, and haul and access roads. Of that total, approximately 74 acres have been reclaimed.

This closeout plan includes the following:

- A project description, a project explanation, and site history;
- Site specific characteristics, including a discussion of past and current mining, geology and hydrology, soils and vegetation, wildlife, and cultural resources;
- A discussion of post-closure land use;
- A statement that no waiver from either establishing a self-sustaining ecosystem or for the proposed post-mining closure land use is necessary, or being requested;
- A description of closeout activities;
- A discussion of how the facility complies with environmental standards;
- A schedule for closeout plan activities;
- A review of permitting requirements for site closure;
- Maps displaying the anticipated surface configuration upon completing the closeout plan; and
- A cost estimate to achieve final closure.

1. Project Description

1.1 Introduction

GCC Rio Grande, Inc. (GCC Rio Grande) owns and operates the Tijeras Mine and Mill, consisting of a Portland cement plant and multiple surface limestone quarries, located near the Village of Tijeras, New Mexico.

GCC Rio Grande is submitting this revised closeout plan to the New Mexico Energy, Minerals and Natural Resources Department, Mining and Minerals Division (“MMD”) as an revision to MMD Permit #BE001RE, which authorizes mining and reclamation activities on the site. This plan has been prepared by GCC Rio Grande to meet the requirements of the New Mexico Mining Act, § 69-36-11, New Mexico Statutes Annotated (NMSA) and its implementing regulations including 19.10.5.506, New Mexico Administrative Code (NMAC).

The goal of this plan is to provide for the reestablishment of a “self-sustaining ecosystem” on the permit area following closure that is consistent with the surrounding area and post-mining land use. This plan describes the disturbances caused by mining operations and the measures that have been and will be taken to reclaim disturbances at the site, establish a self-sustaining ecosystem, and meet environmental standards.

1.2 History

The Tijeras Mine and Mill permit area consists of approximately 2,219 acres and is located at approximately 35.07171° North Latitude, 106.39780° West Longitude.

The Tijeras Mine and Mill have been in operation since 1959 at 11783 State Highway 337, Tijeras, New Mexico, 87509. Ideal Basic Industries began construction and development of the site in 1958. Holnam, Inc. acquired the property and its operations in 1990. In 1995, GCC Rio Grande purchased the site and the facility.

The New Mexico Mining Act, enacted in 1993 at 69-36-1 et seq., NMSA, required existing mining operations to submit a permit application and a closeout plan. A permit application was submitted, and the agency issued MMD Permit #BE001RE on May 23, 1996. This permit authorizes the permittee to conduct mining and reclamation operations at the facility.

The required closeout plan was submitted to MMD as an revision to MMD Permit #BE001RE. On June 30, 1998, MMD issued Permit Revision 98-1 approving the closeout plan and incorporating it as a permit requirement. Permit Revision 98-1 also required the permittee to submit an approved test plot plan and to provide erosion protection of soil stockpiles.

A test plot plan was submitted to MMD in 1999. After review, MMD issued Permit Modification 03-1 on November 24, 2003, which revised the closeout plan to allow for the construction and reclamation of test plots consisting of approximately 30 acres within Quarry 2.

On September 12, 2007, MMD approved Permit Modification #06-1. This modification approved retention of three post-mining highwall segments in Quarry 3, Section F & G with the following conditions:

- Installation of benches of no more than 30 feet wide, inclined 1 to 5 percent (0.57-2.86 degrees) toward the interior portion of the outslope face above, with a longitudinal slope not to exceed 5 percent (2.86 degrees); and
- Implementing public safety measures including limiting access to only authorized persons, posting warning signs, annual inspections of the highwall segments, and requirements to mitigate any identified hazard within 30 days.

On October 5, 2007, MMD approved Permit Modification #07-1, which modified the closeout plan to allow the reclamation of approximately 3.4 acres along the Corral Canyon according to a restoration plan approved by the U.S. Army Corps of Engineers.

On April 28, 2009, GCC Rio Grande submitted a report titled GCC Rio Grande Inc., Tijeras Limestone Quarry: Vegetation Test Plots 2008 Final Monitoring Report (2009) prepared by Habitat Management, Inc. The report documented the results of experimental reclamation on 48 test plots at Quarry 2 using “Redbed” material supplemented with organic amendment over a five-year period.

On July 6, 2015, MMD issued Permit Modification #14-01, which was a modification for FA instrument replacement of 3,750,000.

On August 19, 2015, MMD requested in a letter that GCC Rio Grande provide an updated closeout plan along with an updated cost estimate and related financial assurance. GCC Rio Grande is submitting this revised plan including the updated reclamation cost estimate in response to that request as a revision to MMD Permit #BE001RE.

On November 6, 2016, MMD approved Permit Modification #16-2, which approved new design limits of 86.2 acres, new units Quarry 357NE, 357NW and 19 N.

On June 1, 2017, MMD issued Permit Modification 1#7-1, which was a modification for FA instrument replacement of 867,000.00.

2. Site-specific Characteristics

2.1 General

The Tijeras Mine and Mill are located in Bernalillo County in the East Mountain area approximately fifteen miles east of Albuquerque, New Mexico, near the Village of Tijeras. The Village of Tijeras has a population of nearly 600 residents. The community is situated along Interstate 40 and historic Route 66 within Tijeras Canyon at an altitude of 6,322 feet above sea level. The Tijeras area was originally settled in the 19th Century. The Village of Tijeras was not, however, incorporated until 1973.

The Tijeras Mine and Mill are situated south of the Village of Tijeras on approximately 2,118.67 acres, of which 1705.77 acres are patented claims, 119.19 acres are owned in fee, and 293.71 acres are leased. The cement plant is located in the S ½ of the SW ¼ of SE ¼ of Section 22 and the N ½ of the NW ¼ and NW ¼ of NE ¼ of Section 27, Township 10 North, Range 5 East. The quarry and the patented claim areas include parts of Sections 21, 22, 26, all of 27, and parts of Sections 33 and 34 of Township 10, Range 5 East and the North ¼ of Section 4, Township 9 North, Range 5 East.

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The facility is bordered on the west and east by U.S. Forest Service land within the Cibola National Forest. The U.S. Department of Energy also owns land adjacent to the southern boundary. The site is bordered by open space to the north. Roosevelt Middle School, the Bernalillo County sheriff's department East Command Center a community center, and other development along historic Route 66 are located approximately 0.5 of a mile to the north. State Highway 337 runs approximately 0.5 of a mile east of the Tijeras Mine and Mill. The Sandia Ranger Station, the Tijeras Pueblo Archaeological Site, and both residential and commercial properties are located along Highway 337. A site location map is provided as Figure A-1.

The Tijeras Mine & Mill lies at the north end of the Manzano Mountains, in an area often referred to as the Manzanita Mountains. The permit area is situated on the eastern flank of these mountains ranging from 6,225 feet above sea level on the northern end of the property to 7,328 feet on the south. Natural slopes along the site are steep often ranging from 10 to nearly 40 percent (5.71 to 21.8 degrees). The physiographic features of the facility and surrounding area are shown in Figure A-2, developed from the United States Geological Survey 7.5-minute quadrangle for Tijeras, New Mexico.

2.2 Past, Current, and Planned Mining

Ideal Basic Industries began construction and development of the site in 1958, and the Tijeras Mine and Mill began operation in 1959. Holnam, Inc. purchased the facility in 1990. The Tijeras Mine and Mill were acquired by GCC Rio Grande in 1995.

Its operations include a Portland cement manufacturing plant equipped with coal-fired kilns. The cement plant produces various types of cement used in concrete, mortar, and other construction material. The primary raw material used in this process is limestone which is mined from its on-site quarries. Other raw materials include silica, alumina, and iron, which are transported to the site. Up to 750,000 tons of limestone can be mined each year, which produces about 500,000 tons of cement annually. Table 2-1 delineates the past and current plant activities.

2-1. Location and reclamation status of various plant activities at the GCC Rio Grande Tijeras Mine and Mill

LOCATION	DISTURBED ACRES	RECLAIMED ACRES	RECLAIMED STATUS
PLANT FACILITIES	19.64	-	0.00%
PLANT ROAD ENTRANCE	6.60	-	0.00%
PLANT PATIOS	7.16	-	0.00%
HAULING ROADS	44.38	-	0.00%
SECONDARY ROADS AND EXPLORATION PADS	56.73	-	0.00%
CEMENT KILN DUST DISPOSAL			
	2.95	-	0.00%
QUARRY 1			
	45.00	-	0.00%
QUARRY 2			
	24.24	11.93	49.22%
QUARRY 3			
	100.93	12.06	11.95%
QUARRY 4			
	86.41	47.05	54.45%

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<i>QUARRY 5</i>	41.61	-	0.00%
<i>QUARRY 7</i>	52.66	-	0.00%
<i>QUARRY 19</i>	113.34	6.46	5.70%
<i>WEST CAP QUARRY</i>	31.68	5.80	18.31%
<i>EAST CAP QUARRY</i>	3.58		0.00%
TOTAL DISTURBED AREA (INCLUDING RECLAIMED)	636.91	83.30	13.08%
HISTORICAL RECLAMATION CAMPAIGNS			
LOCATION	ACTIVITY	AREA	DATE
<i>WEST CAP QUARRY</i>	Reclaimed USFS West Cap Quarry	3.25	Reclaimed (1994)
<i>QUARRY 2</i>	Reclaimed Quarry 2 & Test Plots	11.93	Reclaimed (2003)
<i>QUARRY 4</i>	Reclaimed Quarry 4 (East of haul road)	32.83	Reclaimed (2008)
<i>QUARRY 4</i>	Reclaimed Quarry 4 (West of haul road)	14.22	Reclaimed (2003)
<i>QUARRY 19</i>	Reclaimed Corral Canyon Drainage	6.46	Reclaimed (2007)
<i>QUARRY 3</i>	Reclaimed South End Quarry 3	12.06	Reclaimed (2011)
5 YEARS RECLAMATION PLAN			
LOCATION	YEAR START	YEAR COMPLETION	ACRES RECLAIMED
<i>QUARRY 1</i>	2019	2022	22.50

Limestone for cement production is mined from the on-site quarries. Quarry locations include the West Cap Quarry and Quarries 1, 2, 3, 5, 4, 7, and 19. Approximately 585 of the site's 2,119 acres have been disturbed during mining and production activities. Reclamation has occurred on about 74 acres. Bond release has not yet been sought for any of these areas.

Figure A-3 is a satellite map displaying areas the permit area and the current mine footprint impacted by the past and current mining activities, including mined areas, reclaimed areas, haul roads, and other access roads. The figure also shows the cement plant and the surrounding area.

GCC Rio Grande has a mine schedule completed for the next 5 years that was completed in 2016. The company projects that it has sufficient reserves to continue to operate the Tijeras Mine and Mill at current production levels for the next 70 years. However, only those resources for which a mining plan has been defined are identified in this Closeout Plan. For the next 11 years (2-1), the mining footprint is expected to increase as shown in Figure A-3, located in Appendix A - Maps.

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2-2. Planned Disturbance at Tijeras Mine and Mill.

QUARRY	YEAR	ACRES
<i>WEST CAP</i>	2042	4.00
	2043	4.00
	2044	4.00
	2045	4.00
	2046	4.00
<i>SUBTOTAL TO BE DISTURBED</i>		<i>20.00</i>
<i>EAST CAP</i>	2058	5.00
	2059	5.00
	2060	5.00
	2061	5.00
<i>SUBTOTAL TO BE DISTURBED</i>		<i>20.00</i>
<i>QUARRY 2 - ABO BLOCK</i>	2019	3.00
	2020	3.20
<i>SUBTOTAL TO BE DISTURBED</i>		<i>6.20</i>
<i>QUARRY 19</i>	2019	3.00
	2020	3.00
	2021	4.00
	2022	4.00
	2023	4.00
	2024	4.00
	2025	4.00
	2026	4.00
	2027	4.00
	2028	4.00
	2029	4.00
	2030	4.00
	2031	4.00
2032	4.00	
<i>SUBTOTAL TO BE DISTURBED</i>		<i>58.00</i>
<i>Total</i>		<i>104.2</i>

GCC Rio Grande will propose to delay reclamation in areas subject to further mining until it is certain that these areas do not need to be re-disturbed. Finally, changes or expansions in the planned footprint of operations will be detailed in the next iteration of this Closeout Plan.

2.3 Climate

The Tijeras Mine and Mill is located in a transitional zone between mountain shrub and semi-arid coniferous forest ecosystems and is surrounded by steep foothills and rocky outcrops. The area is characterized by a

semiarid climate with the high temperatures in July averaging 84.8 degrees Fahrenheit and low temperatures in January averaging 18.0 degrees (1939 - 2005, Western Regional Climate Center 2016). Historic annual precipitation for the Tijeras region averages 16.4 inches with the majority falling in July through October.

2.4 Geology

The Tijeras Mine and Mill permit area are situated above Tijeras Canyon. The ground surface consists of a thin cover of soil with frequent rock outcroppings. Beneath the permit area is the Madera Formation, consisting of sedimentary limestone from the Upper and Middle Pennsylvanian period and the Permian Abo formation. The geology is relatively complex with as a result of considerable folding and numerous faults and fractures. The most recent faulting occurred approximately 10 million years ago, and no active faulting has been identified (Holnam 1994).

Limestone for cement production is mined from the Madera Formation. The Madera Formation is typically divided into a lower grey limestone member and an upper arkosic limestone member. Present quarry locations include the West and East Cap Quarry and Quarry 1, 2, 3,4, 5, 7 and 19.

Between the layers of limestone within the Madera Formation are a reddish claystone with embedded sandstone and shale of Pennsylvanian Age, known as "Redbed." The Redbed is salvaged during mining operations to be used both as fill and in developing soil cover for disturbed areas. Its past use at the site indicates that the Redbed material performs well in minimizing erosion and as a plant growth medium.

Slopes are steep within the permit area, often ranging from 10 to nearly 40 percent (5.71 to 21.8 degrees), but generally stable to date. There is little indication of mass movement or concentrate erosion, such as rills or gullies, on undisturbed slopes. The quarries were developed along the slopes and, as a result, have had the effect of lowering the elevations of the mined terrain without significantly changing the area's natural topography.

2.5 Hydrology

The site and facility are situated in a semi-arid environment with an average annual precipitation of 12.5 inches. Precipitation, however, may range from 7 to 16 inches a year. More than one-half of the annual precipitation occurs during the "monsoon season" of July through early October usually as brief, but sometimes heavy thunderstorms. Winter precipitation is normally light. Surface water throughout the permit area is ephemeral in nature and only flows during and immediately after these heavy storm events.

Surface runoff from disturbed areas within the permit area flows into one of two major channels: Apachitos Canyon and Corral Canyon, which flow south from the Manzanita Mountains toward the north. The western drainage, Apachitos Canyon, joins the eastern channel, Corral Canyon, west of the cement plant and flows into a retention area within Quarry #1, known as "Sediment Pond No. 1." This area also currently receives runoff from plant operations, including non-contact cooling water, plant storm water runoff, vehicle and equipment cleaning water, and artesian well water flowing to the process area. From there, surface water normally evaporates. Any overflow from the area below "Sediment Pond No. 1," Outfall 001, discharges into Corral Canyon, which flows into Tijeras Arroyo, a tributary to the Rio Grande. This occurs only rarely; over the last 5 years, fewer than 5

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discharges have occurred. The most recent discharge from “Sediment Pond No. 1” occurred in September of 2015.

A hydrological analysis prepared for the 1996 closeout report indicates that discharges from Apachitos Canyon and Corral Canyon during a 100-year, 24-hour storm event would be 535 and 1,294 cubic feet per second (cfs), respectively. The results of this study were presented in Appendix C of the original 1996 closeout plan. A hydrologic analysis with up to date software will be performed as a part of each reclamation design.

Stormwater from the northeast corner of the plant site, encompassing less than 160 acres, discharges to Outfalls 002 and 003 (Figure A-3). Any discharge from these outfalls would also flow into Tijeras Arroyo.

No water quality data is available for ephemeral or intermittent streams in smaller watersheds like Apachitos Canyon and Corral Canyon. Designated uses for these drainages is livestock watering, wildlife habitat, marginal warm water aquatic life, and primary contact. The New Mexico Environment Department lists Tijeras Arroyo as not supporting warm-water aquatic life. Identified causes include nutrient, eutrophication, and benthic macro-invertebrate impairment.

The only known groundwater located within the permit area occur along fault zones and rock fractures in the Madera Formation and the underlying geologic units. Recharge of groundwater is by direct infiltration of rainfall and snowmelt into the fractured systems of rock up-gradient of the plant area.

Two wells within the permit area were drilled in 1958 to depths of approximately 1,150 feet. The wells produce water of sufficient quantity and quality to support plant operations.

The New Mexico Environment Department has determined the GCC Rio Grande does not require a discharge permit base on the test results found in Table 2-3. See the New Mexico Environment Department No Discharge Permit Required Letter in Appendix C.

2-3: Field Parameters

Field Parameters	NMWQCC Standard	Well #3	Cooling Tower (CT) Out	Plant Water Drain
pH	6 to 9	7.4	8.7	8.4
SpC(μS/cm)	None.	1.03	1.57	1.22
Temp (°C)	None.	25.8	19.2	20.6

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Table 2-4-Drinking Water Analytical Results

Analyte	NM WQCC Standard	Unit	Well # 3	CT Out	Plant Water Drain
Aluminum	5	mg/L	<0.02	<0.02	<0.02
Arsenic	0.1	mg/L	<0.005	<0.0050	<0.005
Barium	1	mg/L	0.11	0.14	0.1
Bicarbonate (As CaCO ₃)	None	mg/L CaCO ₃	258.7	386.7	215.1
Boron	0.75	mg/L	0.08	0.2	0.084
Cadmium	0.01	mg/L	<0.002	<0.002	0.002
Calcium	None	mg/L	120	180	99
Carbonate (as CaCO ₃)	None	mg/L CaCO ₃	<2	86.48	<2
Chloride	250	mg/L	67	130	71
Chromium	0.05	mg/L	<0.006	<0.006	<0.006
Cobalt	0.05	mg/L	<0.006	<0.006	<0.006
Copper	1	mg/L	0.0012	0.0092	0.001
Fluoride	1.6	mg/L	0.24	0.98	0.51
Iron	1	mg/L	0.032	0.13	<0.02
Lead	0.05	mg/L	<0.0005	<0.0005	<0.0005
Magnesium	None	mg/L	38	82	38
Manganese	0.2	mg/L	<0.002	0.0088	<0.002
Molybdenum	1	mg/L	<0.008	0.029	<0.008
Nickel	0.2	mg/L	<0.01	<0.01	<0.01
Nitrogen, Nitrate (as N)	10	mg/L	4.2	4.5	3.9
Organic Carbon, Total	None	mg/L	1.1	9.6	2.2
Perchlorate	None	µg/L	1.9	3.6	1.7

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Analyte	NM WQCC Standard	Unit	Well # 3	CT Out	Plant Water Drain
pH	6 to 9	su	7.56	8.86	8.04
Phosphorus, Orthophosphate (As P)	None	mg/L	<0.5	<0.5	<0.5
Potassium	None	mg/L	2.2	5.6	6.3
Selenium	0.05	mg/L	0.0066	0.014	0.012
Silver	0.05	mg/L	<0.005	<0.005	<0.005
Sodium	None	mg/L	37	100	40
Specific Conductance	None	µmhos/cm	1,000	1700	950
Sulfate	600	mg/L	140	280	150
Total Alkalinity (CaCO ₃)	None	mg/L CaCO ₃	258.7	473.2	215.1
Total Dissolved Solids	1,000	mg/L	636	1,200	614

2.6 Soil and Vegetation

Native soils present within the Tijeras Mine and Mill permit area have been described as “Seis loams” by the U.S. Soil Conservation Commission. These native soils were gathered and evaluated during the preparation of the 1996 closeout plan to determine the feasibility of preserving them for use in reclamation. The soil investigation was carried out by Mr. Paul M. Boden in February and March 1996. One of the objectives of the investigation was to determine whether the native soils could be used as topdressing in reclamation. Another was to confirm the information provided by the U.S. Soil Conservation Service soil survey.

According to the site investigation, native soil within the permit area is only sufficiently deep to warrant salvage within the site drainages. The report states that in the upland areas, the soil is so thin that it is nearly unrecoverable after the vegetation is removed before mining. As a result, for the purposes of reclamation and revegetation, native soils are salvaged only from drainage areas disturbed by mining. Instead, topdressing material for reclamation consists of the Redbed geologic material. The site investigation states that Redbed is found throughout the permit area in sufficient quantities to provide an adequate rooting material for revegetation. It indicates that the Redbed claystone breaks down to a clay loam.

The Tijeras Mine and Mill is located in a transitional zone between mountain shrub and semi-arid coniferous forest ecosystems. The U.S. Forest Service classifies nearly all of the permit area as Piñon-Juniper Woodland. The agency indicates that only the highest 100 to 200 feet along the western and southern boundaries may extent into the Pine life zone. The U.S. Natural Resources Conservation Commission describes the permit area as a Limestone Hills Ranges Site, a Piñon-Juniper Woodland.

Undisturbed vegetation within the permit boundary indicates a principal plant community dominated by piñon pine (*Pinus edulis*) and juniper (*Juniperus monosperma*). The predominant grass is blue grama (*Bouteloua gracilis*). Other less frequent species include side-oats grama (*B. curtipendula*), black grama (*B. eriopoda*), hairy grama (*B. hirsuta*), bush muhly (*Muhlenbergia porteri*), sand dropseed (*Sporobolus cryptandrus*), mountain mahogany (*Cercocarpus montanus*), snakeweed (*Gutierrezia sarothrae*), cholla (*Cylindropuntia* sp.), prickly pear (*Opuntia* sp.), and yucca (*Yucca* sp.).

2.7 Wildlife

Wildlife in the area is similar to that found in other upland and mountainous areas of New Mexico. Mammal species often found in Piñon-Juniper Woodlands include, white-throated wood rat (*Neotoma albigula*), ring-tailed cat (*Bassariscus astutus*), rock squirrel (*Spermophilus variegatus*), the Western spotted skunk (*Spilogale gracilis*), piñon mouse (*Peromyscus truei*), ground squirrel (Sciuridae family), black bear (*Ursus americanus*), mule deer (*Odocoileus hemionus*), porcupine (Erethizontidae or Hystricidae families), striped skunk (*Mephitis mephitis*), Colorado chipmunk (*Neotamias quadrivittatus*), bobcat (*Lynx rufus*), coyote (*Canis latrans*), grey fox (*Urocyon cinereoargenteus*), mountain lion (*Puma concolor*), pocket gopher (*Thomomys* sp.), and several species of bats.

Migratory birds are common since the area is located along one of the major continental flyways. Birds often found in the area include the scrub jay (*Aphelocoma californica*), piñon jay (*Gymnorhinus cyanocephalus*), ash-throated flycatcher (*Myiarchus cinerascens*), mountain chickadee (*Poecile gamebeli*), mockingbird (*Mimus* spp.), raven (*Corvus corax*), juniper titmouse (*Baeolophus ridgwayi*), brown towhee (*Pipilio fuscus*), broad-tailed hummingbird (*Selasphorus platycercus*), red-shafted flicker (*Colaptes auratus*), grey-headed junco (*Junco hyemalis*), turkey vulture (*Cathartes aura*), and red-tailed hawk (*Buteo jamaicensis*). The golden eagle (*Aquila chrysaetos*) and bald eagle (*Haliaeetus leucocephalus*) may occur in the vicinity of the permit area as transient species but are very rare. Reptiles commonly found nearby include the patch-nosed snake (*Salvador hexalepis*), striped whip snake (*Masticophis taeniatus ornatus*), wandering garter snake (*Thamnophis elegans vagrans*), and rattlesnakes (Crotalinae subfamily).

The U.S. Fish and Wildlife Service list of threatened, endangered, and proposed species which may occur within the project area were reviewed to determine potential wildlife and plant species that may occur within the permitted area. No critical habitat for these species exists within the permitted area. Threatened, endangered, or proposed wildlife (special status) that may occur or have potential habitat in the project area listed in Table 2-5. Species whose habitats do not occur in the project area were not considered further.

Table 2-5. Special status species potentially occurring within the project area

Taxon	Status	Habitat Type
Southwestern willow flycatcher (<i>Empidonax traillii extimus</i>)	Endangered	Riparian – Occurs in lower elevation boggy riparian areas with an overstory of cottonwood and willows. This habitat does not occur within the analysis areas.
Rio Grande silvery minnow (<i>Hybognathus amarus</i>)	Endangered	Aquatic – There is no direct connection for water to flow from the project area into silvery willow habitat.
Mexican spotted owl (<i>Strix occidentalis lucida</i>)	Threatened	Mixed conifer – Occurs in mixed conifer and montane riparian habitat. This habitat does not occur within the analysis areas.
New Mexico meadow jumping mouse (<i>Zapus hudsonius luteus</i>)	Endangered	Riparian – Occurs in areas adjacent to flowing water with saturated soils dominated by tall sedges and forbs with relatively low canopy cover near uplands for hibernation.
Yellow-billed cuckoo (<i>Coccyzus americanus</i>)	Threatened	Riparian – Occurs in extensive, moist, lower elevation riparian habitat with large blocks of cottonwood and willows mixed with other shrubs. This habitat does not occur within the analysis area.

2.8 Cultural Resources

The following is a general description of the cultural resource setting in the general vicinity of the Tijeras Mill and Mine site.

Native American people lived in Tijeras Canyon, previously known as Cañon de Camué, approximately 700 years ago. Many ancient Indian villages located throughout Tijeras Canyon. An archeological survey identified three or four major pueblos along with 40 other archaeological sites (Bernalillo County PDSO 2006).

The Tijeras Pueblo, located approximately 0.50 mile from the permit area, included about 200 rooms formed in a “U” shape. Pueblo Indians, migrating from the Four Corners region, constructed the Pueblo in the early 1300s. Most of the original inhabitants left around 1360 for unknown reasons. A second wave of inhabitants rebuilt the in the 1390s, but on a smaller scale. They permanently abandoned the Pueblo in about 1425. The site remains. Today it is managed by the Friends of Tijeras Pueblo.

After the Spanish arrived, Tijeras Canyon continued to serve as an important passage between the mountains for Native American, Hispanic, and Anglo travelers. Apache and Comanche raiding parties frequented the canyon, effectively discouraging Spanish settlement. In 1763, the Spanish colonial government issued the Cañon de Camué land grant, providing land ownership incentives to establish a buffer community to protect Spanish interests to the east. An Apache raid in 1770 ended that attempt, and the survivors fled back to Albuquerque. Despite raids that continued into the 1860s, efforts to settle the canyon in the early 1800s endured.

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The canyon was used by both Union and Confederate troops during the Civil War. In 1868, approximately 6,000 Navajo marched from Fort Sumner, where they had lived in exile for over four years, through Tijeras Canyon during their “Long Walk” home.

Fifteen families had settled near present day Tijeras, New Mexico, area by 1880s. Economic activities included farming and ranching along with a few small gold and silver mines.

A Catholic church, now Santo Niño, was constructed in present day Tijeras in 1870, and it is now listed on the National Register of Historic Places. The Santo Niño cemetery is located nearby. Also, several historic lime kilns were located in the area. The remains of three of these are still visible, and two of these are located near Tijeras. The third is near Sedillo, New Mexico. The kilns were made of sandstone and were used to burn limestone by early settlers to manufacture quicklime, which was used as mortar in buildings.

There are significant historic and cultural resources in the vicinity of the Tijeras Mine and Mill (Bernalillo County PDSO 2006). However, no known historic and cultural resource sites exist within the permit area. Likewise, no marked or unmarked human burial sites have been identified within the permit boundaries.

2.9 Other Site Aspects

There are no mine portals, vertical openings, subsidence, recurrent flooding, ground saturation, or water quality contamination issues that currently pose a concern or are likely to pose a concern in the future. Likewise, all mine equipment and associated facilities will be removed upon site closure.

Most industrial wastes including used oil, greases, reagents, cleaning materials, and other chemicals are temporarily stored on-site in appropriate containers. All waste chemicals are removed and disposed offsite at approved facilities. Similarly, any remaining chemicals will be shipped offsite to permitted and approved facilities upon closure.

Cement kiln dust (CKD), which consists of a fine powder, is a byproduct of cement manufacturing and is managed in a fill area west of the plant. This material tends to absorb moisture and solidifies into a hard material resembling light grey shale. Samples of the material have been collected and analyzed to determine if they exhibit the hazardous characteristic of toxicity using the toxic characteristic leaching procedure (TCLP). The laboratory analysis revealed that the samples were all considerably below TCLP levels and are not regulated as a hazardous waste. The analysis also revealed that the cement kiln dust is high in calcium with significant levels of magnesium, aluminum, iron, and potassium. Concentrations of other heavy metals are very low and essentially insoluble.

Cement kiln dust is removed from the system by be loaded into a haul truck. The haul truck takes CKD material to be pelletized, nodulized or otherwise agglomerated to prevent fugitive dust in excess of 10 percent opacity, in these form CKD is allowed to be placed in the monofill. Vehicular traffic and compaction of the monofill will be avoided by periodic wetting with water sufficient to control emission from disturbed and undisturbed monofill surface. Weekly inspection is conducted to confirm fugitive dust emissions from CKD monofills are not visible at the property boundary. Areas with 6 months or more inactive monofill will be covered with at least 12 inches of overburden and wetted as needed to minimize exposed monofill area. GCC has developed this plan based on EPA’s solid waste guidance and regulations (e.g., EPA, Guide For Solid Waste Management, Classification

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of Solid Waste Management Disposal Facilities and Practices, 40 CFR Part 257, and Criteria For Municipal Solid Waste Landfills, 40 CFR Part 258). The groundwater monitoring program for each facility is based on the EPA's Guide for Industrial Waste Management, EPA530-R-03-001 (February, 2003). GCC Rio Grande had tested the kiln dust see results in Appendix B.

Around 1985, cement kiln dust was mistakenly disposed of on U.S. Forest Service land west of the West Cap Quarry. The agency was notified and agreed to allow the material to be stabilized in place. The site was reclaimed in the early 1990s.

The U.S. Environmental Protection Agency (EPA) identified bricks used in the Tijeras kilns as a potential concern because of the presence of chromium. These kiln bricks had apparently been disposed of in a closed section of the quarry in Section 27. Ideal Basic recovered approximately 24,000 cubic yards of the material and returned it to the raw feed stream of the plant and burned into "clinker."

The New Mexico Environment Department performed a preliminary site assessment and Hazard Ranking System pre-score site evaluation of the facility, under the federal Comprehensive Environmental Response Compensation & Liability Act. The agency recommended "no further action ... due to absence of evidence for the presence of hazardous waste." It also concluded that environmental hazards are "minimal."

A slope stability analysis and plan for the mine site is in developed. The mine has two slope failures on site see in Figure A-6. See Figure A-10 for slope stability analysis and plan approach and estimated timeline.

3. Post-closure Land Use

GCC Rio Grande manages the 2,119 acres of the property constituting the Tijeras Mine and Mill. The Tijeras Mill area including the plant and its entrance road, consisting of approximately 38 acres, is zoned by Bernalillo County, New Mexico, as "M-2 heavy manufacturing." The remainder of the GCC Rio Grande property is zoned as "A-2 rural agricultural" except that the mined and disturbed locations have been permitted as "special use" areas. According to Bernalillo County, the purposes of an A-2 rural agricultural designation are

"... [T]o preserve the scenic and recreational values in the National Forests and similar adjoining land, to safeguard the future water supply, to provide open and spacious development in areas remote from available public services...."

The current land uses of surrounding properties include:

- North – commercial, residential, and open space;
- East – residential and open space/federal land (U.S. Forest Service);
- South – federal land (U.S. Department of Energy); and
- West – federal land (U.S. Forest Service).

3.1 Proposed Post-Mining Land Uses

GCC Rio Grande has proposed the following final post-closure land uses for the permitted area: industrial/commercial, wildlife habitat, and recreation. Selected post-mining land uses are identified in Figure A-4. It is anticipated that the property will be reclaimed in increments while operations continue.

The proposed industrial designation is limited to the existing plant and entrance road area. The plant area will be reclaimed for industrial or commercial use, such as an industrial park. This is appropriate considering its proximity to the Village of Tijeras and a major transportation corridor, Interstate 40.

Areas with minimal disturbance, primarily old exploration roads, cover approximately 1,530 acres. The primary post-mining use for these areas is wildlife habitat with recreation identified as an associated compatible use.

Areas that have been significantly disturbed by mining activities comprise approximately 551 acres. The interim primary post-mining use for these areas is recreation and wildlife habitat. Recreation is identified as an associated, compatible use for the wildlife habitat areas.

3.2 Future Land Use and Ownership

No changes in zoning and land use are being proposed for the permitted area. The successful reclamation of the test plots demonstrates that reclamation of the property to meet its proposed land uses are feasible and can be fully achieved.

Once its operations cease and reclamation is successfully completed, GCC Rio Grande is not currently planning on retaining ownership of the permitted area. Future land ownership may include either a private party or a governmental agency. If current trends continue, the property could become desirable for residential use. However, if this occurs at some future date, it would occur after GCC Rio Grande sells the land and the next owner would be responsible for any development and costs associated with the land use revision.

4. Waiver from Self-Sustaining Ecosystem or Post-Mining Land Use

No such waiver is being requested. After reclamation, a self-sustaining ecosystem can be established and the identified post-mining land uses can be met.

5. Description of Closeout Activities

5.1 Plant Facilities

Commercial or industrial use has been identified as the primary post-mining land use for the plant area of the project site. Thus, all buildings and other structural components of the cement plant will be demolished at the end of plant operation except for the office building and warehouse, as well as the roads, underground utilities, and drainage systems that support them (Figure A-5). Foundations of removed buildings that are at or below grade will be left in place to serve as potential foundations for future new structures constructed by subsequent owners. Otherwise they will be covered with at least two feet of soil. Re-grading will be minimal and limited to the crusher pit, coal hopper pits, and other similar below-grade features that have no post-mining use.

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All plant components, including both stationary and mobile equipment, will be salvaged or scrapped for recycling into other materials or products off-site.

Clean fill debris, such as broken concrete, brick, rock, stone, glass, reclaimed or uncontaminated soil, will be disposed of on-site in a disposal area in the east part of quarry 1 (section B) directly west of the plant area. As the material is stacked in place, Redbed fill material or other clean fill, including rock, will be placed to form a matrix surrounding debris fragments. Alternatively, a weak soil-cement slurry grout may be used to encapsulate and stabilize the debris. After the demolition is complete and the debris is fully in place, the debris pile will be covered with at least two feet of soil, prepared, and revegetated (See section 5.3.4 – Revegetation).

While the preference is to dispose debris and demolition material on site as described above, if the selected quarry does not have the necessary capacity at the time of mine closure, offsite disposal will be required. As a conservative effort, the bond for the closeout plan has been adjusted to cover cost of disposal for all debris and demolition material at the time of closure.

Waste materials encountered during plant decommissioning will be properly collected, packaged, and transported off-site for disposal at a permitted facility. At this time, the only waste material that is anticipated to require off-site disposal is residual oil and sludge in the decommissioned 400,000-gallon oil tank. GCC Rio Grande, Inc. plans to use this decommissioned tank for a future purpose in operations.

5.2 Channel Restoration

In the Plant area, the existing sedimentation basin and overflow pit will be retained. An outlet from the overflow structure to the arroyo directly north of the pit will be constructed and lined with rock as described in Section 5.3.3 for the diversions in quarry 19 (section J.) This outlet channel will be excavated at a uniform gradient from the existing grade to the permit area boundary adjacent to the arroyo north of the overflow pit. The outflow channel from the pit will be excavated to be five feet wide with a ratio of 3 Horizontal to 1 Vertical (3H:1V) bank slopes.

The channels of Corral Canyon and Apachitos Canyon will be restored to their approximate original channel locations and configurations. The restored channels will be shaped to conform to and blend smoothly into the locations and configurations of the still-intact portions of the natural channels upstream and downstream of the restoration locations. These channels, which will replace the original channels, will be 50 feet wide across the channel bottom except for the upstream portion of reconstructed Apachitos channel, which will begin at the transition point to the restoration section with a 23-foot-wide channel bed. From this location, the channel bed will expand downstream to a width of 50 feet.

All reconstructed channel banks will be 4 horizontal to 1 vertical (4H:1V), except where terrain requires steeper bank slopes. The depth of the reconstructed channels will be generally 5.0 feet, but may vary due to terrain effects. In no case will these channels be less than 3.5 feet deep. The reconstructed canyon channels will converge at the stilling basin. This basin will be retained and its banks modified to conform with those of the reconstructed channels. The surface water discharges of Corral Canyon and Apachitos Canyon will combine in the stilling basin from which the combined flow will discharge through a 50-foot-wide channel to the Outfall 001 located near the north boundary of the permit area. None of the reconstructed channels will require riprap

where they are constructed in natural rock or soil or where the Redbed or other fill material placed to construct channel banks has compacted densities of not less than 95% Standard Proctor dry density (ASTM D698).

5.3 Quarries, Roads, and Kiln Dust Disposal Area

Reclamation of active mining areas at the Tijeras Mine and Mill has occurred and will continue to occur concurrently with mining operations up to the time of closure. Thus, the procedures outlined below will be performed to simultaneously achieve an interim wildlife habitat post-mining land use and a final post-mining land use of wildlife habitat with recreation identified as an associated, compatible use once active mining operations have ceased.

5.3.1 Geomorphic Grading and Backfilling

As described above, the limestone members that are quarried for cement production are oriented such that quarrying advances along dip slopes, leaving behind a surface which is similar to, but lower than, the original ground surface. Therefore, very little backfilling or other earthfill will be needed to recreate original surface forms and mimic the natural drainage patterns of Corral and Apachitos Canyons. Some sections, such as the southern portion of quarry 3 NE section D and the middle portion of quarry west cap section E (Figure A-4), may require some shape modification to achieve the goals of geomorphic reclamation, i.e. to create functional watershed systems like those that develop naturally; to produce landforms that do not require on-going maintenance to prevent erosion; and to produce a finished site that is in a stable hydrologic equilibrium that minimizes soil erosion, is visually appealing, and promotes a self-sustaining ecosystem. Geomorphic techniques will also be applied in Quarry 3, 5 and 7, where nearly all Redbed materials will be excavated to allow the quarrying of the upper portion of the Knobby Member of the Madera Formation. Precise terrain modification needs will be determined when quarrying has exposed the final rock surfaces.

Highwalls (vertical or very steep slopes 20 feet or more in height) will be created by operations in Quarries 3, 5 and 7, 4, and 19 (Figure A-4) in competent limestone that should support vertical faces without substantial raveling or risk of mass movement. These should fit in well with the numerous natural cliffs that form the local Sandia and Manzano limestone mountain scarps and provide ample raptor habitat. Thus, highwalls may be left behind when the limestone quality is inadequate for the cement manufacturing process. The main concern is the potential risk of gravity sliding. Sliding occurs when a given rock mass has open fractures up-dip from the highwall and the toe of the rock mass has been removed. To date, no new open fractures have been located, making the removal of the toe the main issue of concern. This is easily solved by back-filling the abandoned quarry with overburden, Redbed, or other material, blocking the open space in front of the quarry highwall. This procedure “restores” the toe of the potential block and effectively stops any subsequent gravity sliding.

Rock slopes other than highwalls will be evaluated to determine their potential for long-term instability. The evaluation will include a review of observed movements in the history of quarry operations, as well as on-site observations that will include the presence of toe slope rock debris, visible displacements of rock blocks along rock fracture surfaces, and other physical evidence of rock slope displacement. Any slopes that are identified as potentially unstable will be flattened to final slopes not steeper than 2.5 horizontal to 1 vertical (2.5H:1V), with the exception that any rotational or translational mass movement that has been identified may require flattening of the rock slope to a final configuration of not steeper than 3 horizontal to 1 vertical (3H:1V) or to

another configuration determined by a qualified professional engineer. Surface water runoff will be diverted as necessary to minimize the development of hydrostatic pressures within unstable slopes.

The maximum slope gradient of 38 degrees applies to all reclamation areas, not only to rock outcrops that will be left. The maximum height of the outcrops will be 10 meters. Safeguarding the crest of an outcrop will be achieved by leaving the “arroyo-facing scarp” untouched, while the “pit-facing scarp” can be stabilized with red bed by creating an artificial toe.

All haul roads adjacent to reclaimed active mine areas will be regraded to match the surrounding landform. Roads that are not adjacent to quarries (exploration roads) typically follow the existing, adjacent undisturbed contour. These will be scarified and seeded according to the methods outlined below; otherwise, exploration roads will be shaped to mimic nearby, undisturbed portions of Corral and Apachitos Canyons. Redbed material used for road construction will be redistributed and spread as part of the soil cover. All haul roads will be blocked to prevent any further disturbance to the area; further detail will be provided with each reclamation plan.

Kiln dust generated during the operations of the Tijeras cement plant is encapsulated in the West Cap quarry (Figure A-3). These areas will be graded, covered with 2 feet of soil material and reclaimed along with the surrounding quarry sections.

5.3.2 Soil Cover Excavation, Stockpiling, and Placement

After a stable and natural topographic geomorphology has been achieved, a soil cover of 2 feet of Redbed material will be placed over all disturbed or exposed rock surfaces, except highwalls, steep rock slopes, and bottoms of drainage features.

Cover soil will be exported from Quarry 3,5 and 7 for placement in Quarries 4 and 19 (Figure A-3), in the Plant area, and in some locations of roads and exposed rock where local soil is absent or not able to support vegetation. Imported soil cover is not required in the West Cap Quarry and other sections of Quarry 3,5 and 7. In these quarries, Redbed occurs naturally and will be derived from the exposures of Redbed within the quarry areas, provided that the Redbed material in such locations is at least two feet thick. Where the remaining in-place Redbed is not at least two feet thick, the material may be obtained from other sections or redistributed within the same section from locations where the Redbed is naturally thicker than 2 feet. Where Redbed occurs naturally, the final Redbed surface—i.e., the surface left after the removal of the limestone resource—must be ripped to a depth of at least 12 inches and allowed to weather at least one year prior to final grading and revegetation.

Excavated material not needed in the near term will be stockpiled at locations in the quarry of origin, at location in the destination quarries, or both. To encourage weathering of the Redbed material to soil consistency, the stockpiles will be relatively low in height with larger footprints and will be shaped to retain rain water rather than shed it. Where run-on from uphill slopes is a concern, stockpiles will be revegetated and further protected from erosion by larger rock or hay bales.

5.3.3 Surface Water Runoff and Erosion Control

Because the Redbed materials proposed for use as a plant growth medium are susceptible to erosion from concentrated surface flow and are essentially devoid of organic material, it is important that care be exercised to ensure that the newly-contoured acreage is adequately protected against excessive erosion. Concentrated flows will be routed through reclamation areas in suitably protected channels and potentially disruptive overland flow from areas above the reclamation areas will be diverted similarly as necessary. In quarry 19 section J operational diversions will be left in place for reclamation. They may be lined with rock riprap with a D_{50} of at least 3.0 inches and a total rock layer thickness of not less than two times the D_{50} . Alternatively, the channel bed may be established on the in-place rock surface of the quarry floor, with riprap as described above placed on the soil cover banks of the diversion structures. Rock used to form channel bed and bank protection will be placed to create a uniform surface to avoid causing flow concentrations and turbulence. The primary surface water diversion channels that run along the toes of the north and south highwalls in quarry 19 section J will be routed to the existing quarry 19 pit at the toe of the slope of section J. This pit will serve as a stilling basin and sedimentation basin for discharge from the section J slope and will discharge and, in turn, into the restored channel of Corral Canyon.

Where excessively long reclaimed slope lengths are created, fascines or erosion blanket vegetative filters may be placed, either singly or in combination, to control such erosion and runoff within the reclamation area. These types of surface structures have demonstrated their adequacy to control excessive erosion and runoff on other reclaimed areas in New Mexico.

Based on previous soil and test plot studies, it has been demonstrated that preparing a stable, suitable plant growth medium is the most important goal for quarry reclamation. Providing a fertile, stable growth medium for the germination, establishment and normal growth of plant species adapted to the area is critical to establishing vegetation cover that will stabilize soil material and is capable of supporting the designated post-mining land uses and meeting revegetation success standards. Therefore, reclamation at the Tijeras Mine and Mill will be focused on methods, practices and techniques that will serve to improve the fertility, suitability and stability of the Redbed material as a plant growth medium.

5.3.4 Revegetation

5.3.4.1 Background

The Tijeras Mine and Mill was first permitted in Bernalillo County after substantial earth disturbing activities had already occurred. Thus, methods typically used at new mines, i.e., baseline data or the use of a reference area, could not be used to establish revegetation standards. In 1996, a technical standard (RGPC 1996) was developed that incorporated: 1) the results of a sampling effort to characterize the vegetation communities at the Tijeras Mine and Mill site and 2) ecological site descriptions developed by the U.S. Department of Agriculture Natural Resources Conservation Service. In 2003, 48 test plots were established to evaluate the effects of varying seeding density, woody transplants, and organic amendment treatments on revegetation efforts (GCCRG 2002). Redbed soil parameters were also measured to verify its suitability as a seed bed medium. The results of both studies yielded information about the most effective methods for revegetation at the Tijeras site.

5.3.4.2 Methods

Seed Bed Preparation – The geomorphic methods described in Section 5.3.1 above will result in range of slopes reflective of the original pre-mining topography with a two-foot deep Redbed topdressing. The 2008 test plot study indicated that the application of fertilizer or organic amendments is not cost effective and that the native Redbed soils is a suitable, effective plant growth medium (Habitat Management 2009). Thus, the re-contoured surface will be conditioned only by surface roughening. A rough final surface facilitates seed entrapment, moisture retention, and erosion control. Surface roughening operations can be conducted either immediately before (contour furrowing) or after (land imprinting) broadcast seeding. Seed will be adequately covered and the seedbed firmed up through the land imprinting process. Localized and natural sloughing, and movement of the soil will also assist in “setting” the seedbed if contour furrowing is used. All sites with a final geomorphic grade will be scarified using a bulldozer equipped with small harrows. Scarification will be done in two perpendicular passes with the final pass on the contour for added erosion control.

Seeding – A 1994 site assessment, the 1996 revegetation study, and the 2008 test plot study were used to support the development of seed mixtures. Seed will be as locally-sourced as possible and weed-free certified, with each seed bag tagged and labeled with certification information. If primary plant species in Table 5-1 are not available at time of purchase, replacement species will be also native to the area. All revegetation areas will be broadcast seeded as soon as practicable after Redbed materials have been prepared for planting with three native seed mixtures at a rate of 40 pure live seeds per square foot (Table 5-). These rates are significantly lower than traditionally recommended application rates; however, they are based upon observation of plant density at the site, expected germination failures and seedling mortality, and the physical characteristics of seeds typically included in arid and semi-arid rangeland revegetation seed mixtures. Mature vegetation communities on arid and semi-arid lands normally have five or fewer plants growing within one square foot.

Due to seed size variability and slope variability, most areas will be hand-seeded. Rice hulls will be used as a seed extender to allow for the even application of the seed. Smooth, medium and large sized seeds that are easily broadcast will be placed in one sub-mixture. Species with small seeds will be placed in their own sub-mixture to avoid differential settling during planting. This facilitates more even distribution of all seed materials across the planting area. Seeds that have physiological adaptations that inhibit their even flow through the broadcaster will be planted in the third sub-mixture. This sub-mixture will be applied separately (different broadcasters or at different times) from sub-mixtures 1 and 2 in an effort to ensure the even distribution of plant seeds across the reclamation areas. Seed will be applied during the summer before monsoon rains establish, likely in June. A second window of opportunity exists in early November to seed.

Table 5-1. Reclamation Seed Mixture

Species	Common Name	Desired %	PLS/ SqFt	Lbs. PLS/ Acre
Grasses				
<i>Pascopyrum smithii</i>	Western wheatgrass	5	1	.396
<i>Pseudoroegneria spicata</i>	bluebunch wheatgrass	5	2	0.622

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Species	Common Name	Desired %	PLS/ SqFt	Lbs. PLS/ Acre
<i>Andropogon hallii</i>	sand bluestem	5	1	0.385
<i>Bouteloua curtipendula</i>	sideoats grama	5	2	0.456
<i>Bouteloua gracilis</i>	blue grama	5	2	0.106
<i>Pleuraphis jamesii</i>	James's galleta	5	1	0.274
<i>Achnatherum hymenoides</i>	Indian ricegrass	5	1	0.309
<i>Sporobolus cryptandrus</i>	sand dropseed	5	2	0.016
<i>Stipa neomexicana</i>	New Mexican feathergrass	5	1	0.379
Grass Total		45	9	2.94
Forbs				
<i>Achillea millifolium</i>	western yarrow	3.5	2	0.031
<i>Dalea purpurea</i>	Purple Prairie Clover	3.5	1	0.207
<i>Gaillardia aristata</i>	Indian blanket flower	3.5	1	0.104
<i>Linum lewisii</i>	Lewis (Blue) flax	3.5	2	0.66
<i>Lupinus argenteus</i>	silver mountain lupine	3.5	2	4.760
<i>Fallugia paradoxa</i>	Apache Plume	3.5	2	0.224
<i>Penstemon angustifolia</i>	narrow-leaf penstemon	3.5	2	0.224
<i>Ratibida columnifera</i>	coneflower	3.5	1	0.0354
<i>Sphaeralcea coccinea</i>	scarlet globemallow	3	2	0.174
Forb Total		31	6.2	6.49
Shrubs				
<i>Atriplex canescens</i>	four-wing saltbush	3	1	0.837
<i>Krascheninnikovia lanata</i>	winterfat	3	1	0.768
<i>Cercocarpus montanus</i>	mountain mahogany	3	2	1.476
<i>Ericameria nauseosa</i>	rubber rabbitbrush	3	1	0.109
<i>Chrysothamnus viscidiflorus</i>	yellow rabbitbrush	3	1	0.056
<i>Purshia mexicana</i>	New Mexico cliffrose	3	2	1.348
<i>Purshia tridentata</i>	antelope bitterbrush	3	2	5.808
<i>Rosa woodsii</i>	Wood's rose	3	2	1.923
Shrub Total		24	4.8	12.326

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Species	Common Name	Desired %	PLS/ SqFt	Lbs. PLS/ Acre
	Seed Mixture Total	100	40	21.764

Notes: pure live seeds = PLS; % = percent

Monitoring - Sampling and monitoring methods accepted and recommended by the Mining and Minerals Division will be used to evaluate seedling germination and establishment and vegetation community development. Vegetation monitoring within each reclamation year will be performed according to the schedule presented in Table 5-2 (adapted from MMD 1999).

Attributes that will be monitored include cover, diversity, woody plant and shrub density, and production. The development of vegetation after it has germinated and established on all plots will be monitored using the methods described in this subsection. Sampling transects will be located and configured to obtain unbiased samples from the reclamation year areas where they are taken. The number of transects measured within each reclamation year (sampling adequacy) will be determined after collecting a set of preliminary samples, testing the data for normality, and calculating the Cochran formula for sample adequacy.

Table 5-2 . Revegetation sampling schedule

Years*	Evaluation Method
1-3	Visual evaluation of germination, growth, establishment and species composition of revegetated areas.
4	Relative percent cover of perennial grasses, forbs and shrubs.
5	Visual evaluation of plant density, cover and production.
6	Cover, production, and diversity using the same methodology as the historic record.
7,8	Visual evaluation of plant density, cover and production.
9-12	Cover and production measurements for determining revegetation success for bond release.

* The number of years after seeding is completed

Cover will be measured using the line intercept method. Transect locations are determined randomly from a grid system overlay placed over the most current map showing areas to be sampled. A 100-foot tape, subdivided into 1.0-foot intervals, is then stretched between two points at the position found on the map. The sampler moves along the line and for each interval, records the plant species found, as well as litter, rock, and bare ground, and the distance it covers along that portion of the line intercept. Measurements of individual plants are read to the nearest inch. The sampler considers only those plants or seedlings touched by the line or lying under or over it. For floral canopies below eye level, the distance each species covers along the line at ground level will be measured. For canopies above eye level, the distance covered by the downward projection of the foliage will be measured. Multiple vegetation levels are included for cover measurements. Cover measurements include absolute cover, relative cover, frequency, and relative frequency. These data will be used to evaluate species diversity on the plots. Also, an inventory of plant species observed within each reclamation year, but not necessarily measured in the transect, will be recorded.

Tijeras Mine and Mill Closeout Plan

Woody plant density will be evaluated by moving down one side of the tape and returning on the other counting the number of woody stems for all shrub and woody species in an area three feet perpendicular to the tape. This samples an area 6 feet wide by 100 feet long, or 600 square feet. Data are reported as number of stems per acre.

Measurements of productivity will be made using a double sampling technique. Production quadrat size is a 0.25-meter square. Four random points are located along the 100-foot tape. Weights in grams per 0.25-meter square are estimated ocularly by species. Clipped plots are estimated ocularly, then clipped and weighed by species. Yields are corrected to oven dried weights before reporting, and all figures are reported in pounds of dry matter per acre. Measurements of production for the sampled plant community are predicted from the regression of ocularly estimated and clipped plots of the corrected yields. A ratio of one (1) clipped plot to three (3) ocular plots will be used at each sampling site to generate all productivity data. Productivity values will be obtained for each species.

Evaluation of Revegetation Success – Beginning in the 10th year after seeding, revegetation success will be tested against the approved performance standard. The 1994 site assessment, the 1996 revegetation study, and the 2008 test plot study were used to support the development of the following success criteria:

5-3. Proposed vegetation success criteria

Category	Standard
Vegetative Cover	31.5% of total area
Grass 1	5% of vegetative cover
Grass 2	5% of vegetative cover
Herbaceous Production	1075 pounds per acre
Woody Plant Density	5300 stems per acre
Shrub 1	17.5% of shrub density
Shrub 2	17.5% of shrub density
Species richness	16.7 species

The parameters to be measured on the reclaimed sites shall be equal to or greater than the approved performance standard. The appropriate test is a one-tailed *t* test with a 90% confidence interval. The test statistic is:

$$X_r - 0.90 (X_h)$$

$$t = \frac{S_r}{\sqrt{n_r}}$$

Where

x_r is the reclamation mean

x_h is the approved performance standard

Tijeras Mine and Mill Closeout Plan

Ecosphere Environmental Services, Inc.

- s_r is the reclamation standard deviation
- n_r is the reclamation sample size

If the mean values of the sample parameters from the reclaimed sites are equal to or greater than those of the historical record with the appropriate confidence level, the revegetation shall be deemed successful. To use the above test, the assumptions must be valid that the data is drawn from a normal population. Fortunately, the t test remains relatively valid for non-normal populations which possess a mound shaped probability distribution.

6. Environmental Standards Compliance

6.1 Air Quality Standards

GCC Rio Grande was issued a Title V operating permit, AIRS #NM/001/00008, for its Tijeras Mine and Mill under the federal Clean Air Act from the Albuquerque/Bernalillo County Air Quality Control Board on May 30, 2012. Total potential criteria pollutant emissions for the facility are shown in Table 6-1.

6-1 Total potential criteria pollutant emissions

Pollutant	Emissions (tons per year)
Nitrogen oxides (NOx)	1,526.72
Carbon monoxide (CO)	1,493.23
Particulate matter (TSP)	645.28
Particulate matter (PM10)	252.90
Particulate matter (PM2.5)	116.19
Volatile organic compounds (VOC)	78.68

Tijeras Mine and Mill is situated in the eastern portion of Bernalillo County. The EPA currently considers this area to be an attainment area for total suspended particulate matter, particulate matter of less than 10 microns (PM10), and particulate matter of less than 2.5 microns (PM2.5). See 40 CFR § 81.332.

Closure of the Tijeras Mine and Mill will result in shutdown, disassembly, and removal of the cement manufacturing plant. Once plant operations cease, the primary source of gaseous and particulate air emissions associated with project will terminate.

Likewise, once disturbed areas within the quarries have been reclaimed and cover vegetation has been reestablished, fugitive particulate emissions will be reduced to natural background levels. This will further reduce particulate emissions below current levels, which are already below established standards.

6.2 Surface Water Quality

GCC Rio Grande has obtained permit coverage for water discharges from the Tijeras Mine and Mill under the federal Clean Water Act from the EPA, Region 6 under:

1. An individual point source National Pollutant Discharge Elimination System (NPDES) permit, #NM000116; and
2. The multi-sector general permit for stormwater discharges associated with industrial activity (MSGP).

NPDES permit, #NM000116 became effective on June 1, 2016 and will expire on May 31, 2021. Important changes in the new permit term include the construction of new retention ponds along with a new discharge point, Outfall 004. Outfall 004 and the new ponds will be designed to receive only process (cooling) water and stormwater runoff from the cement plant area. Runoff from quarry areas will generally be reused and will not be discharged. At that point, Outfall 001 can be covered under the facility's MSGP, which also includes Outfall 002 and Outfall 003 located on the northeastern end of the plant site near the facility's access road.

The facility discharges into Corral Canyon, and then into Tijeras Arroyo, an intermittent stream, which is a tributary to the Rio Grande Basin. Designated uses for intermittent streams include wildlife habitat, livestock watering, marginal warm water aquatic life, and primary contact. See § 2.6.4.98, NMAC.

The EPA indicates that the Tijeras Arroyo has been impacted by nutrient, eutrophication, and benthic macro-invertebrate impairment. The probable causes have been identified as channelization, drought-related impacts, on-site treatment systems, rangeland grazing, wastes from pets and unknown sources. The EPA states that it does not consider GCC Rio Grande as a probable contributor to the impairment because of the nature of operation and the frequency of discharges.

Discharges from the Tijeras Mine and Mill will continue to be covered under these permits until reclamation is completed and revegetation cover has been established. GCC Rio Grande will continue to capture and manage surface water discharges until the site returns to natural conditions and MMD releases the property. At that time, the capture of sediment will no longer be necessary. Once the reclamation is completed, the existing NPDES and MSGP permits will longer be necessary, unless required for a post-mining land use by a future land owner.

6.3 Ground Water Quality

The only known groundwater located within the permit area occur along fault zones and rock fractures in the Madera Formation and underlying geologic units. Recharge of groundwater is by direct infiltration of rainfall and snowmelt into the fractured systems of rock up-gradient of the plant area.

Two wells within the permit area have been drilled to depths of approximately 1,150 feet. GCC Rio Grande has maintained a routine ground water sampling and testing program. No adverse impacts to ground water quantity or quality have been identified from plant or mining operations.

7. Closeout Plan Schedule

See Closeout Plan Spreadsheet.

8. Closeout Plan Permitting Requirements

GCC Rio Grande projects that it has the reserves to continue operating the Tijeras Mine and Mill at current production levels for the next 70 years. However, only those resources for which a mining plan has been defined are identified in this Closeout Plan. For the next 11 years, the mining footprint is expected to increase as shown in Figure A-3. GCC Rio Grande will propose to delay reclamation in areas subject to further mining until it is certain that these areas do not need to be re-disturbed. The Closeout Plan for the Tijeras Mine and Mill will be updated 5 years after the approval of this plan.

Technology and market conditions could change significantly in the next 70 years. Likewise, the federal and New Mexico environmental regulatory and permitting requirements applicable to a quarry and cement plant could be very different than the existing regulatory scheme. The following discussion describes current requirements potentially applicable to a closure based upon existing regulatory and permitting standards.

8.1 Mined Land Reclamation Requirements

The Tijeras Mine and Mill was an “existing” mining operation when the New Mexico Mining Act was enacted. It was, therefore, required to submit a mining permit application and a closeout plan to continue to conduct mining and reclamation operations at the facility.

The permit and plan describe the measures that have been, and will be, taken to reclaim the property, establish a “self-sustaining” ecosystem, and meet environmental standards.

8.2 Air Quality Requirements

The Tijeras Mine and Mill is considered a “major source” under the federal Clean Air Act and, as a result, has obtained a Title V air quality permit, AIRS #NM/001/00008, from the Albuquerque/Bernalillo County Air Quality Control Board, which must be renewed every five years.

The permit describes emission controls and practices that GCC Rio Grande is required to implement to reduce and mitigate air emissions including fugitive emissions from mined and disturbed areas. Compliance with these requirements will continue until the site has been successfully reclaimed and the vegetative cover has been established.

The Albuquerque/Bernalillo County Air Quality Board has adopted regulations potentially applicable to facility closure and building demolition activities. These regulations require a permit for the demolition of:

- Any building of over 10,000 square feet, and
- Any paved surface of over 0.75 of an acre.

8.3 Water Quality Requirements

The Tijeras Mine and Mill currently hold two permits under the federal Clean Water Act. Both have been issued by EPA, Region 6 and must be renewed every five years.

One permit is NPDES permit #NM000016, which covers discharges of process water from the cement plant into Corral Canyon and then into Tijeras Arroyo. The permitted discharges include non-contact cooling water, plant storm water runoff, vehicle and equipment cleaning water, and artesian well water flowing to the process area.

The second is the general stormwater permit, or MSGP, which covers discharge of storm water from mined or disturbed areas. One of the requirements of the MSGP is developing a stormwater pollution prevention plan, which describes "best management practices" that must be undertaken minimize pollutants in storm water runoff.

Compliance with these permits will be required until reclamation has been completed and vegetative cover has been successfully established.

8.4 Waste Management

The federal Resource Conservation and Recovery Act established the regulatory framework to regulate solid wastes throughout the country including hazardous waste, universal waste, used oil, electronic waste, and municipal solid waste. The State of New Mexico has also established additional regulatory standards for managing special wastes within the state. Special wastes are defined to include asbestos wastes, industrial solid waste, and petroleum contaminated soils.

The Tijeras facility is currently regulated as a conditionally exempt small quantity generator of hazardous waste and manages all wastes at approved facilities. As the facility nears final closure, GCC Rio Grande will conduct a comprehensive review of potential wastes, including materials generated from closure and demolition activities, and recyclable materials to ensure that all wastes and materials are managed in accordance with federal and New Mexico requirements.

9. References

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Tijeras Mine and Mill Closeout Plan

Ecosphere Environmental Services, Inc.

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Holnam, Inc., Site Assessment, Tijeras Cement Plant and Limestone Quarry (Report). Albuquerque, NM.

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Western Regional Climate Center (WRCC) 2016. Monthly Climate Summary: Sandia Park, New Mexico. Online at: <http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?nm8015>. Accessed May 17, 2016.

10. List of Preparers

Name	Title	Role
Keith Fox	Project Manager	<ul style="list-style-type: none"> ▪ Project Management
Paul Nazaryk	Project Lead	<ul style="list-style-type: none"> ▪ Regulatory framework review ▪ Environmental permit review
Jerusha Rawlings	Biologist	<ul style="list-style-type: none"> ▪ Fieldwork planning and supervision ▪ Project Support ▪ Vegetation ▪ Wildlife ▪ Threatened and Endangered Species ▪ Technical Review ▪ GIS Support/Mapping
Danielle Sullivan	Senior Technical Editor	<ul style="list-style-type: none"> ▪ Document Formatting ▪ Editing ▪ Quality Control
Samantha Kretz	GCC Environmental Engineer	<ul style="list-style-type: none"> ▪ Environmental ▪ Editing ▪ Updating Information

Tijeras Mine and Mill Closeout Plan

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Appendix A

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Map

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Tijeras Mine and Mill Closeout Plan

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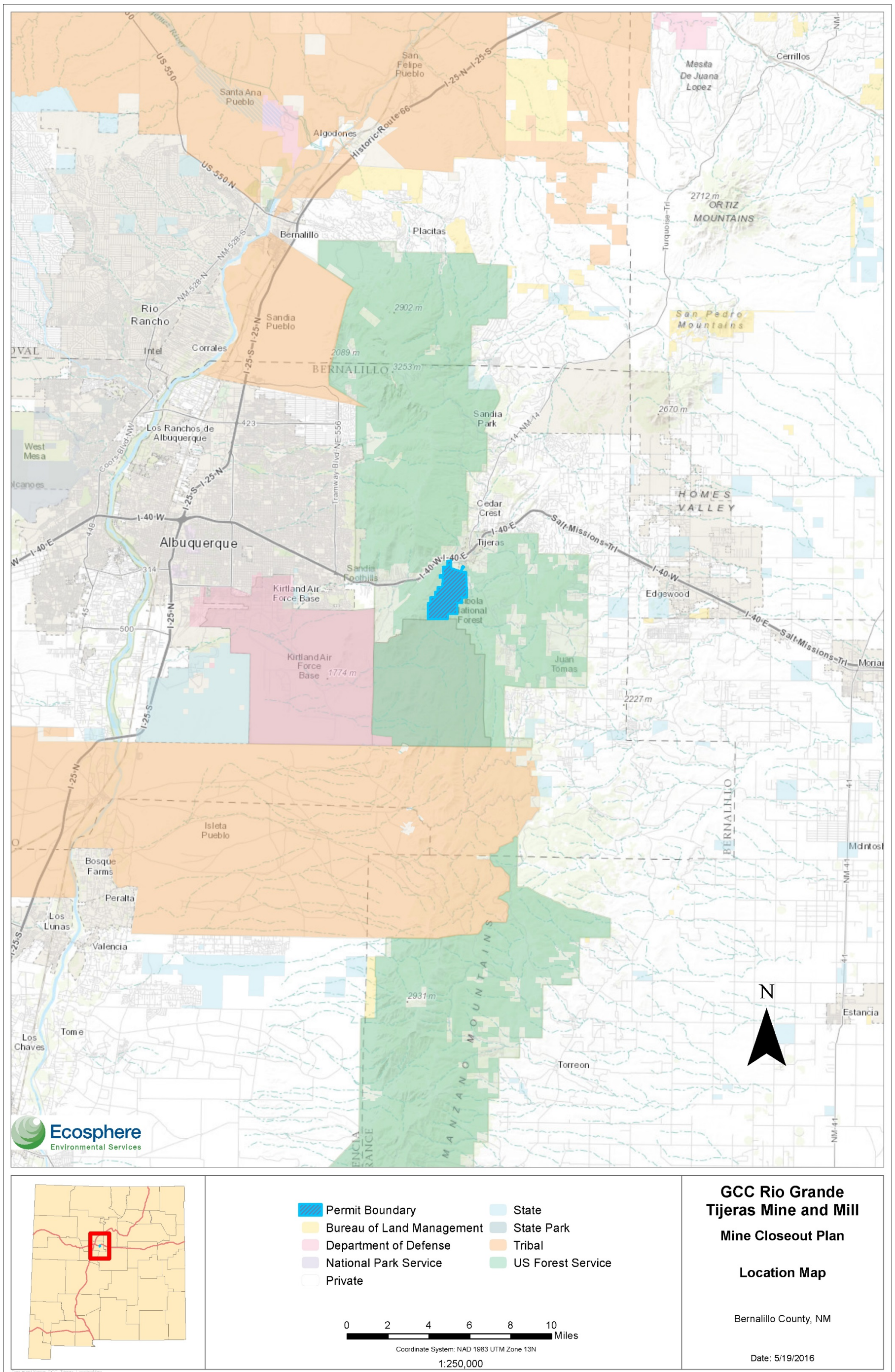


Figure A-1. GCC Tijeras Mine and Mill Location Map

Tijeras Mine and Mill Closeout Plan

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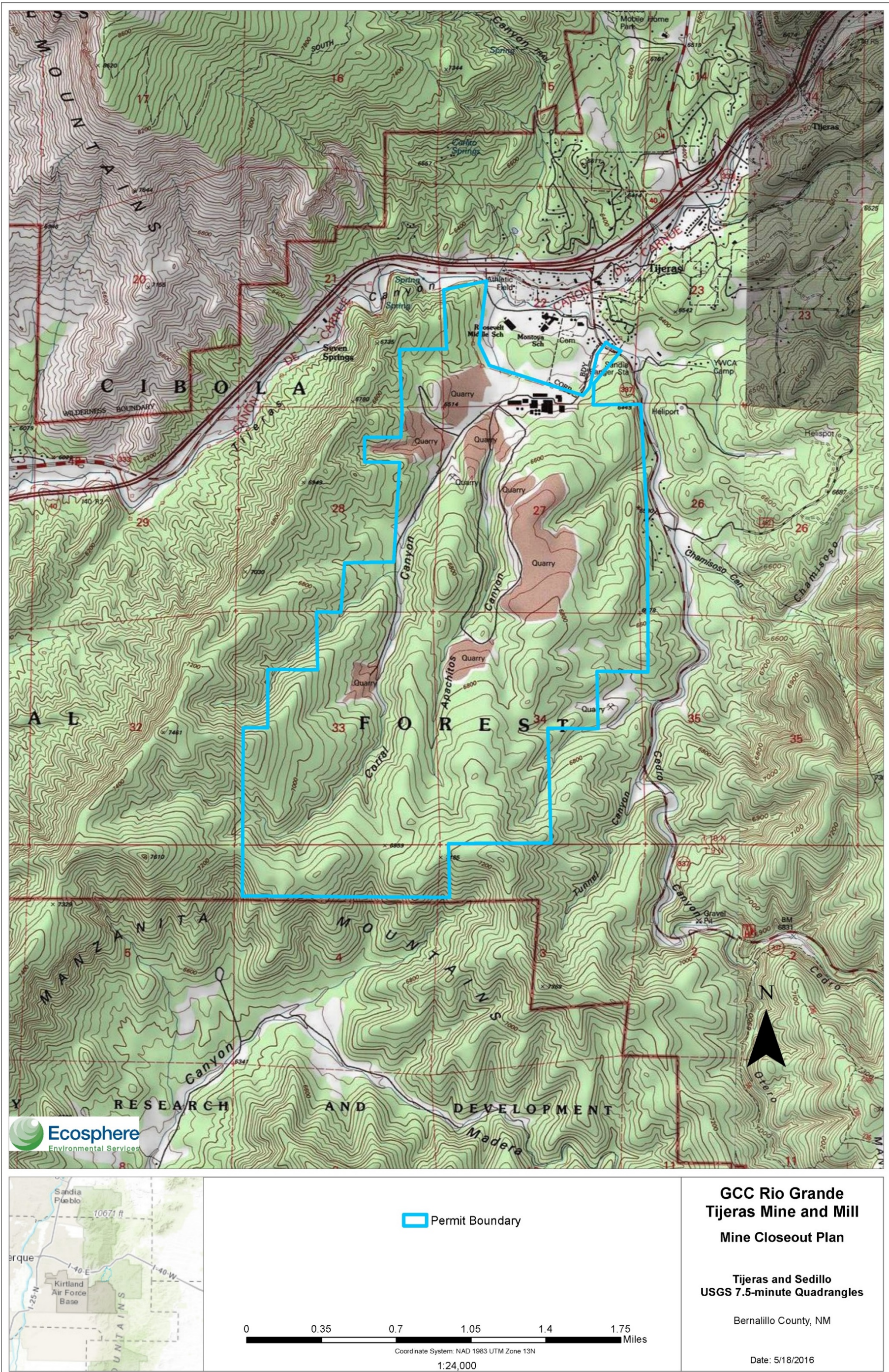


Figure A-2. GCC Tijeras Mine and Mill Area Map

Tijeras Mine and Mill Closeout Plan

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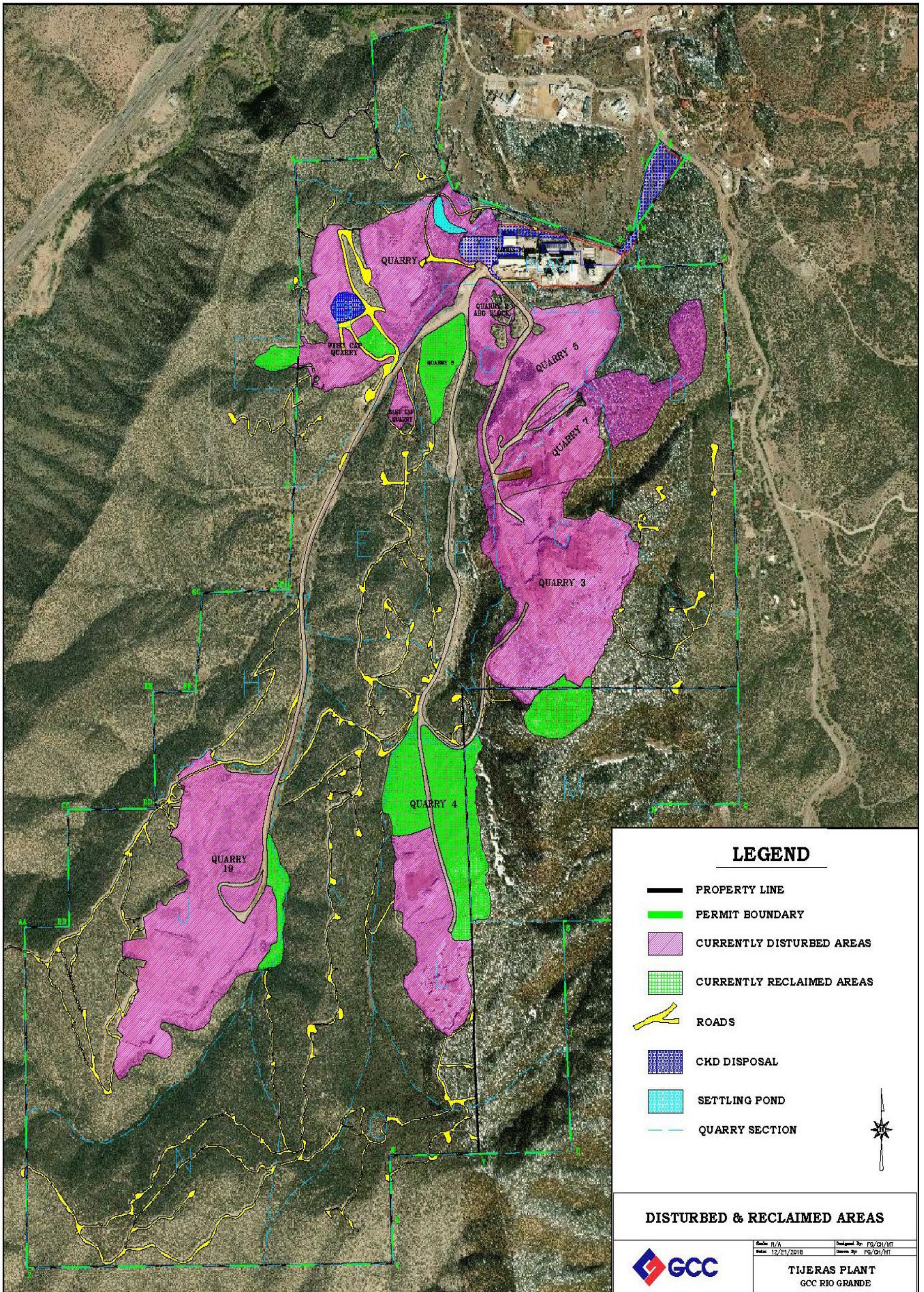
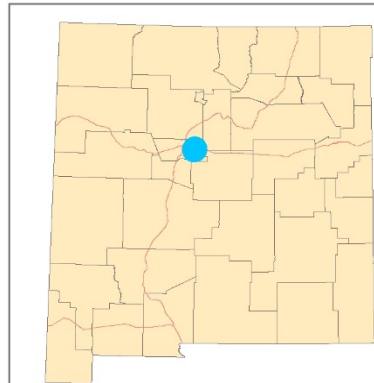
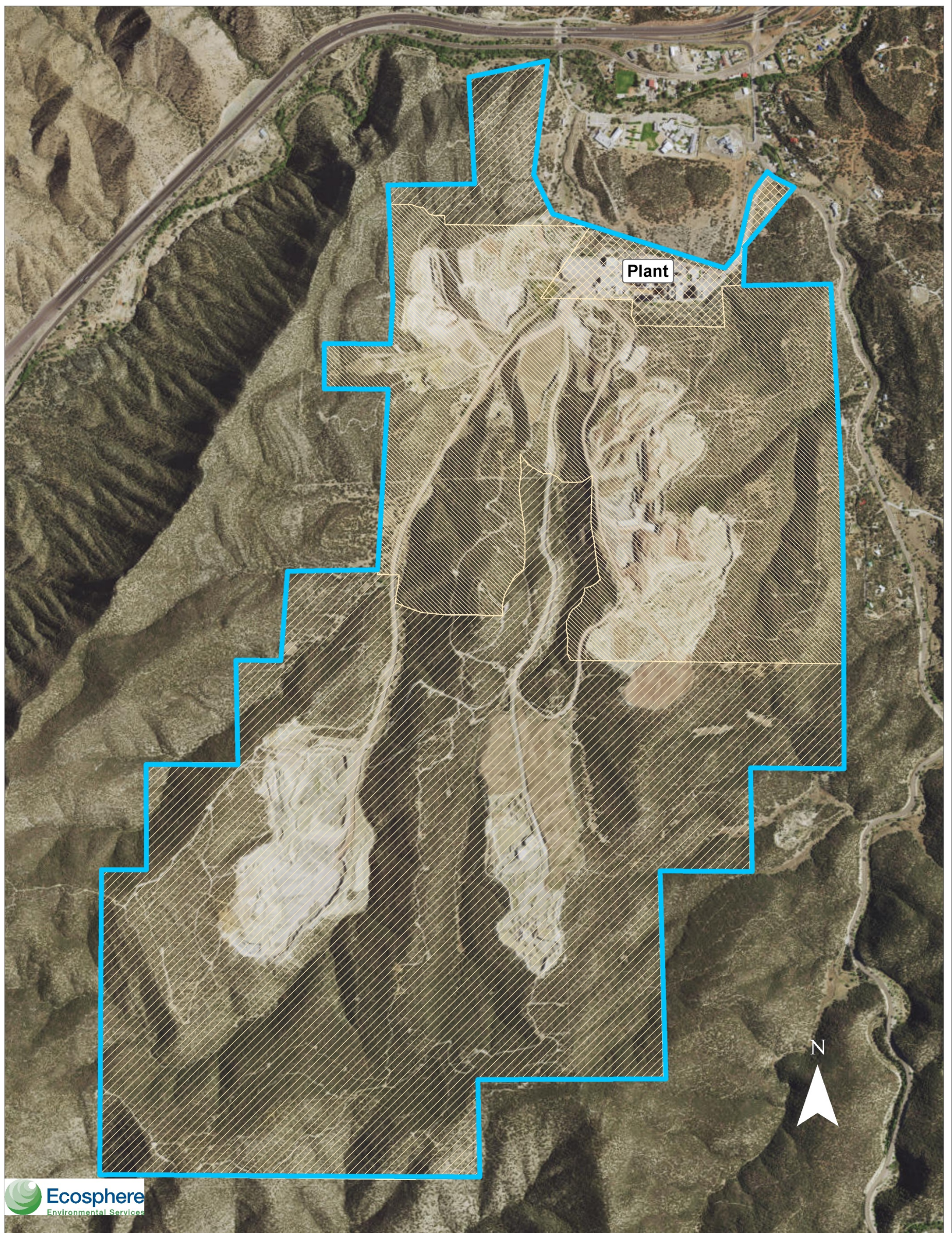
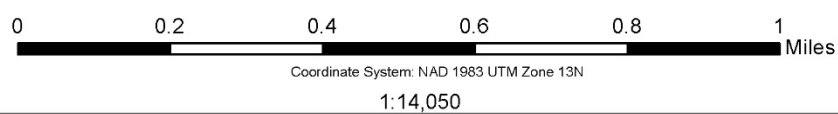


Figure A-3. GCC Tijeras Mine and Mill Site Map - Aerial



- Permit Boundary
- Post-mining land uses**
- Industrial/Commercial
- Recreation
- Wildlife habitat



GCC Rio Grande Tijeras Mine and Mill Mine Closeout Plan

Post-Mining Land Uses

Bernalillo County, NM

Date: 6/10/2016

Figure A-4. GCC Tijeras Mine and Mill Post-mining land uses

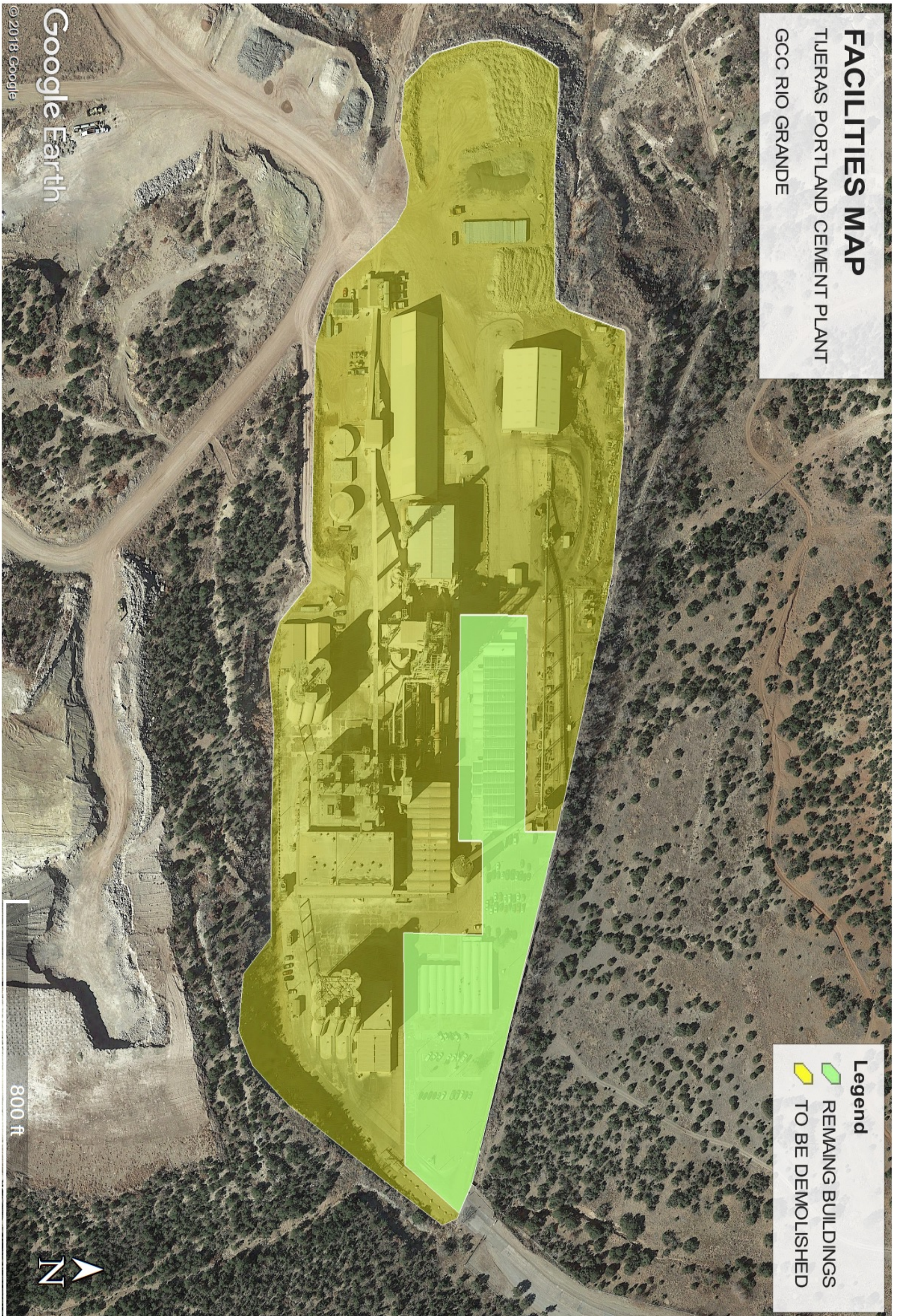


Figure A-5 GCC Tijeras Mine and Mill Demolished and Remaining Structure Map

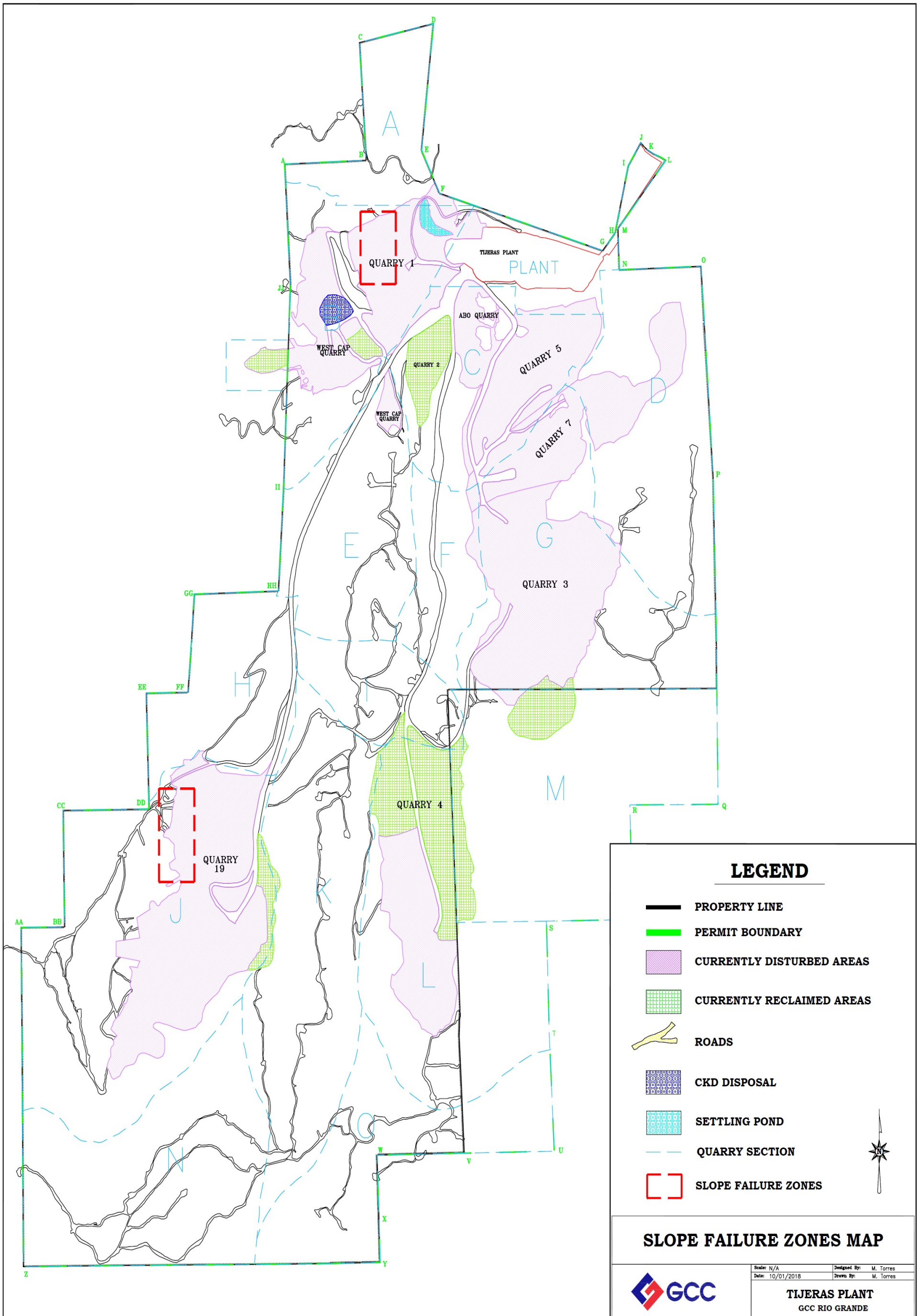


Figure A-6 Slope Failure Map

Tijeras Mine and Mill Closeout Plan

Ecosphere Environmental Services, Inc.

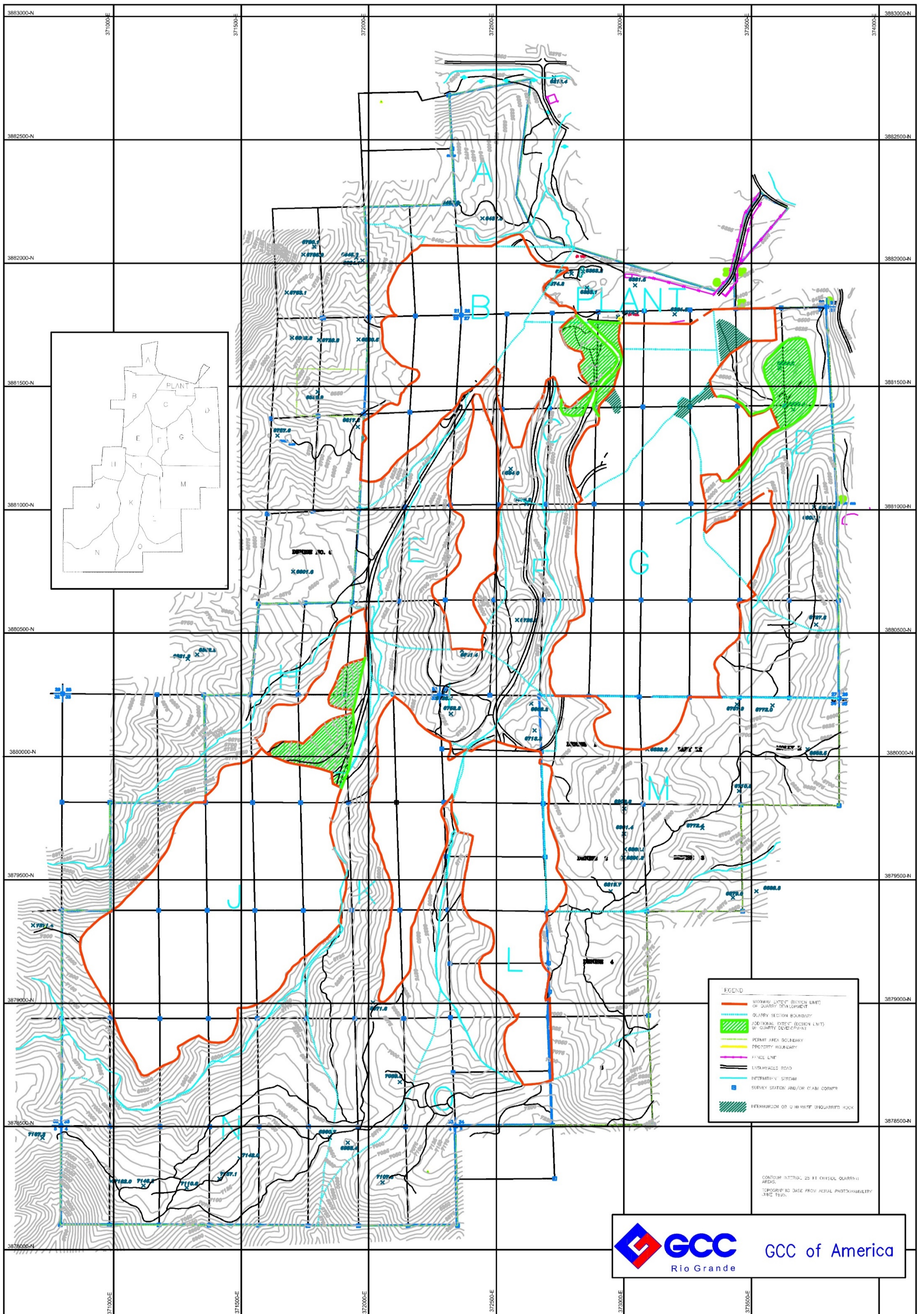


Figure A-7 Sections and Units

Appendix B- Test Results of Kiln Dust

ILFC LABORATORY REPORT

FOR:

GCC Rio Grande Inc.

ATTN: Jose Madera

Project PO No.: Not Given

Project No.: Not Given

Project Name: CKD

ILFC Batch No.: 2726

Prepared By: Cindy Krizovsky Date: March 15, 2010

Page 1 of 3

International Lubrication and Fuel Consultants Inc.
521 Quantum Rd, Rio Rancho, NM 87124

Phone # 1-800-237-4532
Fax # 1-505-892-9601

Client ID: GCC Rio Grande Inc.	Project Name: CKD	Sample ID: CKD	TCLP
Project Number: Not Given			
ILFC, Inc Batch Number: 2726	Laboratory Number: 12567	Date Sampled: 2/2010	
% Moisture: 0.1%	Temperature upon delivery: 19°C	Time Sampled: Not Given	
Matrix: <input type="checkbox"/> Soil <input type="checkbox"/> Other <input type="checkbox"/> Water		Date Received: 03/08/10	
Reporting in: <input checked="" type="checkbox"/> Dry Weight <input type="checkbox"/> Wet Weight <input type="checkbox"/> N/A		Time Received: 3:30 PM	

<u>Client I. D.</u>	<u>ILFC Lab#</u>	<u>Method</u>	<u>Test</u>	<u>Results</u>	<u>RL</u>	<u>Units</u>	<u>Date Completed</u>
CKD	12567	1311 6010B	As	< 0.2	0.2 ppm	mg/kg	3/12/2010
			Ba	0.249	0.1 ppm	mg/kg	3/12/2010
			Cd	<0.2	0.2 ppm	mg/kg	3/12/2010
			Cr	<0.1	0.1 ppm	mg/kg	3/12/2010
			Pb	<0.1	0.1 ppm	mg/kg	3/12/2010
			Se	<0.2	0.2 ppm	mg/kg	3/12/2010
			Ag	<0.1	0.1 ppm	mg/kg	3/12/2010
CKD	12567	1311/7471A	Hg	< 0.001	0.001	mg/kg	3/10/2010

These laboratory results are intended to be helpful and informative. They are based on our experience, current industry testing procedures, proper sampling procedure and information provided with the sample, which we believe to be reliable. We cannot assume responsibility for any loss or accident that may result from the use of the information given here. This report shall not be reproduced except in full, without the written approval of our laboratory.

Date: 3/15/2010
Time: 3:21 PM

Figure A-7 Kiln Dust Results Page 2

Tijeras Mine and Mill Closeout Plan

Ecosphere Environmental Services, Inc.

International Lubrication and Fuel Consultants Inc.
521 Quantum Rd, Rio Rancho, NM 87124

Phone # 1-800-237-4532
Fax # 1-505-892-9601

Client ID:	GCC Rio Grande Inc.		Project Name:	Sample ID:	QC Summary
Project Number:	Not Given		CKD		TCLP
ILFC, Inc Batch Number:	2726	Laboratory Number:	N/A	Date Sampled:	N/A
% Moisture:	N/A	Temperature upon delivery:	N/A	Time Sampled:	N/A
Matrix:	<input type="checkbox"/> Soil	<input checked="" type="checkbox"/> Other	<input type="checkbox"/> Water	Date Received:	N/A
Reporting in:	<input type="checkbox"/> Dry Weight	<input type="checkbox"/> Wet Weight	<input type="checkbox"/> N/A	Time Received:	N/A

<u>Client I. D.</u>	<u>ILFC Lab#</u>	<u>Method</u>	<u>Test</u>	<u>Recovery</u>	<u>Date Completed</u>
Method Blank	N/A	1311 6010B	As	< 0.2 ppm	3/12/2010
			Ba	< 0.1 ppm	3/12/2010
			Cd	< 0.2 ppm	3/12/2010
			Cr	< 0.1 ppm	3/12/2010
			Pb	< 0.1 ppm	3/12/2010
			Se	< 0.2 ppm	3/12/2010
			Ag	< 0.1 ppm	3/12/2010
Method Blank	N/A	1311/7471A	Hg	< 0.001 ppm	3/10/2010

				<u>% Recovery</u>	
Matrix Spike	N/A	1311 6010B	As	103	3/12/2010
			Ba	101	3/12/2010
			Cd	104	3/12/2010
			Cr	102	3/12/2010
			Pb	103	3/12/2010
			Se	111	3/12/2010
			Ag	64	3/12/2010
Matrix Spike	N/A	1311/7471A	Hg	146	3/10/2010

Matrix Spike Duplicate	N/A	1311 6010B	As	102	3/12/2010
			Ba	100	3/12/2010
			Cd	103	3/12/2010
			Cr	101	3/12/2010
			Pb	102	3/12/2010
			Se	111	3/12/2010
			Ag	59	3/12/2010
Matrix Spike Duplicate	N/A	1311/7471A	Hg	97	3/10/2010

Page # 3 of 3

These laboratory results are intended to be helpful and informative. They are based on our experience, current industry testing procedures, proper sampling procedure and information provided with the sample, which we believe to be reliable. We cannot assume responsibility for any loss or accident that may result from the use of the information given here. This report shall not be reproduced except in full, without the written approval of our laboratory.

Date: 3/15/2010
Time: 3:22 PM

Figure A-7 Kiln Dust Results Page 3

Appendix C– NMED No Discharge Permit Letter



SUSANA MARTINEZ
Governor

JOHN A. SANCHEZ
Lieutenant Governor

NEW MEXICO ENVIRONMENT DEPARTMENT

Ground Water Quality Bureau

1190 South St. Francis Drive (87505)
P.O. Box 5469, Santa Fe, New Mexico 87502-5469
Phone (505) 827-2900 Fax (505) 827-2965
www.env.nm.gov



BUTCH TONGATE
Cabinet Secretary

J. C. BORREGO
Deputy Secretary

January 23, 2018

Sarah Vance, Environmental Engineer
svance@gcc.com
GCC Rio Grande
Tijeras Mine and Mill
PO Box 100
Tijeras, NM 87509

RE: Response to Notice of Intent to Discharge; Discharge Permit Not Required for Tijeras Mine and Mill

Dear Ms. Vance:

The New Mexico Environment Department (NMED) sent a request for a Notice of Intent to you regarding discharges associated with the GCC Rio Grande Tijeras Mine and Mill (site) on February 17, 2017 in response to observations made during a site inspection on January 25, 2017. The site is a limestone mine, milling operation, and cement production facility located approximately one mile southwest of the village of Tijeras, in Sections 21, 22, 27, 28, 33, and 34 of Township 10N Range 5E, of Bernalillo County. Groundwater beneath the site is at a depth of 5 to over 100 feet and has a total dissolved solids concentration of less than 10,000 milligrams per liter.

The notice satisfies the requirements of Subsection A of 20.6.2.1201 NMAC, Ground and Surface Water Protection regulations, 20.6.2 NMAC.

The observed discharge is briefly described as unlined ponds receiving a mixed stream of impacted Storm Water and Mill Process Water.

Based on the information provided in your Notice of Intent, multiple sampling events and communications, NMED has determined that a Discharge Permit is not required as long as the discharge is as described and characterized. A Discharge Permit is not required at this time because the information provided indicates it is unlikely that the discharge will adversely affect ground water quality.

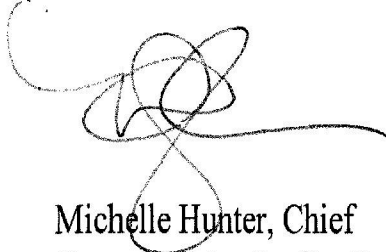
Vance
January 23, 2018
Page 2 of 2

Although a Discharge Permit is not being required at this time, for the site, you are not relieved of liability should your operation result in actual pollution of surface or ground waters. Further, this decision by NMED does not relieve you of your responsibility to comply with any other applicable federal, state, and/or local laws and regulations, zoning requirements, and nuisance ordinances.

If at some time in the future you intend to change the amount, character or location of your discharge, or if observation or monitoring shows that the discharge is not as described in your Notice of Intent, you must file a revised Notice of Intent with the Ground Water Quality Bureau.

If you have any questions, please contact either Amber Rheubottom at (505) 827-2754 or amber.rheubottom@state.nm.us or Kurt Vollbrecht, Program Manager of the Mining Environmental Compliance Section, at (505) 827-0195.

Sincerely,



Michelle Hunter, Chief
Ground Water Quality Bureau

MH:ar

cc: Kurt Vollbrecht, NMED, Program Manager MECS, kurt.vollbrecht@state.nm.us
Sarah Holcomb, NMED, Program Manager SWQB, sarah.holcomb@state.nm.us
Abe Franklin, NMED, Program Manager SWQB, abraham.franklin@state.nm.us
John Rhoderick, NMED District I Field Office, Manager, john.rhoderick@state.nm.us
Holland Shepherd, MMD Program Manager, holland.shepherd@state.nm.us

Appendix D- Slope Stability Approach and Schedule