Request for Revision 26-1
GCC Rio Grande Tijeras Mine and Mill

PERMIT NO. BE001RE

Prepared for
GCC Rio Grande, Inc

Prepared by
Barr Engineering Co.

May 2026

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Salt Lake City, UT 84101
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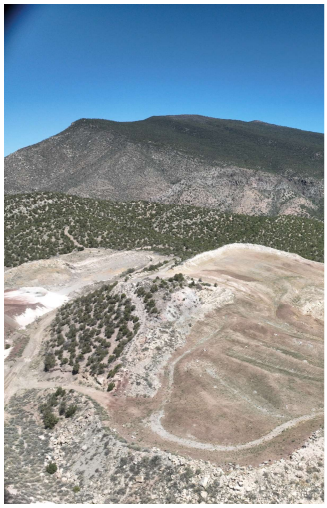

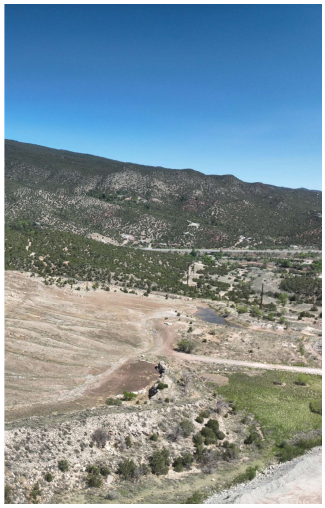

Request for Revision 26-1
GCC Rio Grande, Inc., Tijeras Mine and Mill

May 2026

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1 Background

GCC Rio Grande, Inc. (GCC Rio Grande) owns and operates the Tijeras Mine and Mill, which consists of a Portland cement plant and multiple open-pit limestone quarries. GCC Rio Grande submits this application to the New Mexico Energy, Minerals and Natural Resources Department, Mining and Minerals Division (NM MMD) for a modification to Mining Act Permit No. BE001RE, pursuant to 19.10.12 NMAC.

The Tijeras site is an active quarry operation located in Bernalillo County, New Mexico. Mining and reclamation activities have progressed to a stage where portions of the site are eligible for partial and final reclamation release, and a reference area is needed to support future reclamation evaluations. Figure 1 shows the site location, and Figure 2 shows the areas included in this application.

The site also requests a disturbance expansion of 77 acres for the mining of Quarry 9.

This application is consistent with previously approved permits and modifications and is intended to document completed reclamation work, request release of reclamation liability for qualifying areas, and establish a designated reference area for long-term performance comparison.

2 Purpose of Modification

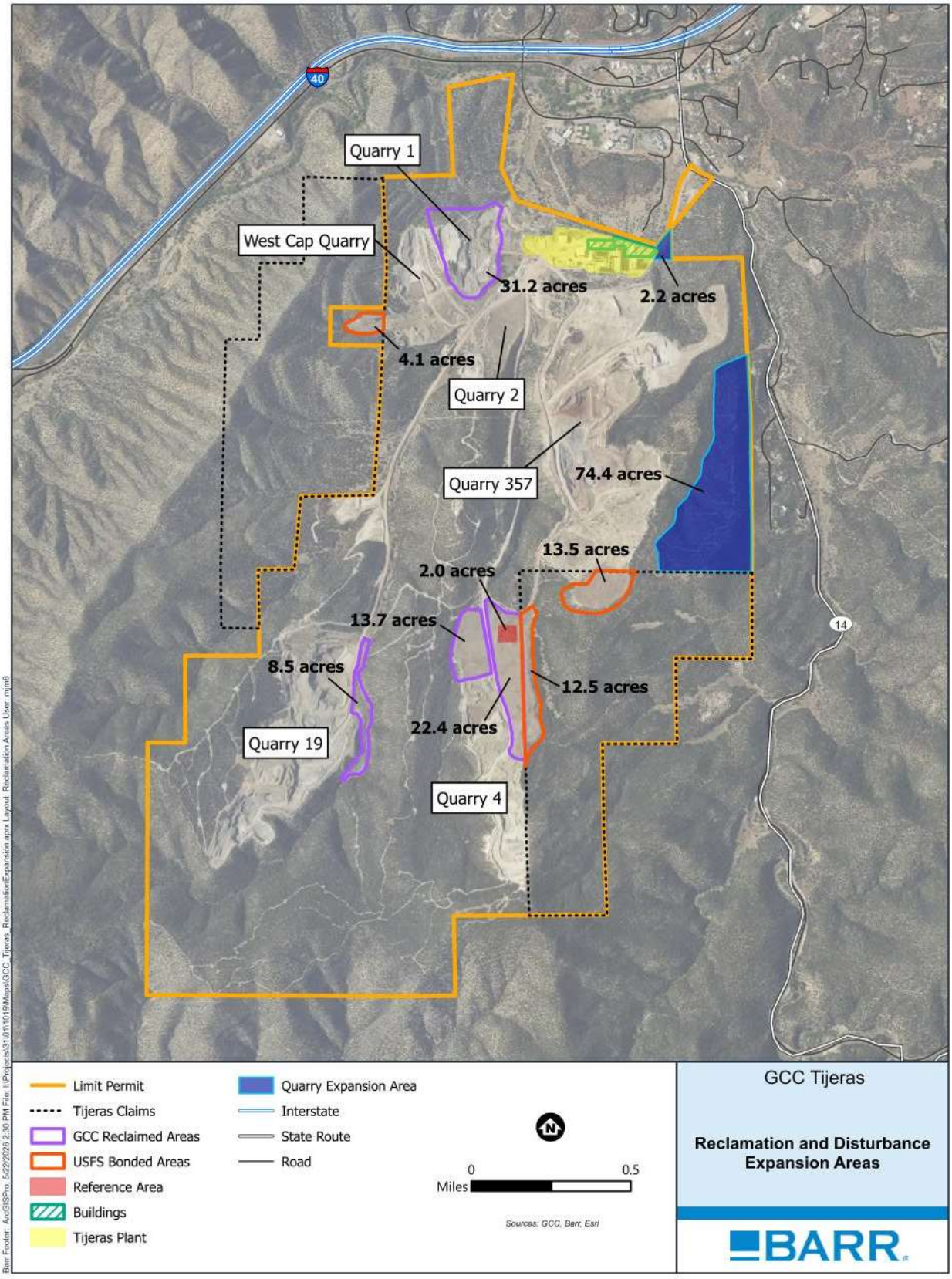
The purpose of this modification is to:

1. Request a partial reclamation release for portions of Quarry 1 that have completed grading and reclamation activities
2. Request a full reclamation release for approximately 74 acres of fully reclaimed land
3. Expand the permitted disturbance area to include approximately 77 acres of Quarry 9
4. Establish and document a reference area within Quarry 4 to support future reclamation performance evaluations
5. Update financial assurance to reflect completed reclamation work and current cost conditions.

This modification does not request release of financial assurance funds.

Figure 1 Project Location

Figure 2 Reclamation and Disturbance Expansion Areas



3 Quarry 1 – Partial Release Modification

3.1 Overview

GCC requests a partial release of reclamation liability for portions of Quarry 1 where reclamation activities have been completed. This request is based on a review of existing reclamation documentation and field verification of current site conditions. Pre and post-grading photos are shown in Figures 3 and 4

3.2 Description of Work Completed

Reclamation activities in Quarry 1 have included grading, contouring, and stabilization of mined areas to achieve stable landforms consistent with the approved reclamation plan.

- Areas have been regraded to promote stable slopes and positive drainage;
- Surfaces have been stabilized to minimize erosion potential; and
- Reclaimed areas have been prepared for revegetation or have been seeded where applicable.

3.3 Basis for Partial Release

The areas included in this request have achieved the applicable reclamation milestones necessary for partial release of reclamation liability, including:

- Completion of earthwork and grading;
- Demonstrated surface stability; and
- No evidence of significant erosion or drainage issues.
- Supporting figures and documentation are included in Figures 2, 3, and 4

Figure 3 Quarry 1 Pre-Grading

Figure 4 Quarry 1 Post-Grading

4 74-Acre Area – Full Reclamation Release

4.1 Overview

GCC requests full reclamation release for approximately 74 acres of fully reclaimed land within the Tijeras Site. These areas have completed all required reclamation activities and have met applicable performance standards.

4.2 Description of Work Completed

Reclamation activities for the 74-acre area included:

- Final grading and contouring to establish stable, natural-appearing landforms;
- Replacement and/or redistribution of growth media where applicable;
- Seeding and revegetation using approved methods; and
- Implementation of erosion control measures as needed.

4.3 Reclamation Performance

Based on available reclamation records and field verification:

- Reclaimed surfaces are stable and resistant to erosion;
- Drainage patterns are functioning as intended;
- Vegetation has been established consistent with site conditions and post-mining land use; and
- The areas appear to support self-sustaining vegetation communities.

4.4 Basis for Final Release

The 74-acre area has satisfied the requirements for final reclamation release, including completion of the applicable liability period and demonstration of long-term stability and revegetation success.

Supporting documentation is provided in Figure 5 and Attachment 3.

Further documentation will be provided at a later date as an addition to this application package. The 2022 vegetation surveys were not finalized at the time of the survey and will be provided when the data has been reviewed and compiled into a memo summarizing the results.

5 Quarry 4 – Reference Area Establishment

5.1 Overview

GCC proposes to establish a designated reference area within Quarry 4 to support future reclamation evaluation and comparison, consistent with NM MMD guidance.

5.2 Reference Area Selection

The reference area has been selected to represent appropriate baseline conditions for evaluating revegetation success, including:

- Similar soil and substrate conditions;
- Comparable topography and aspect; and
- Representative native vegetation communities.

5.3 Documentation and Use

After inspection and approval from NM MMD, the reference area will be used as a benchmark for evaluating reclamation success based on:

- Vegetative cover;
- Species composition and diversity;
- Shrub density; and
- Overall ecosystem function and stability.

Because the reference area is within Quarry 4, documentation of the reference area and characterization is included in Attachment 3.

6 Quarry 9 – Disturbance Expansion

6.1 Overview

GCC proposes to expand the disturbed mining area to include Quarry 9, encompassing approximately 77 acres. This expansion is requested to support continued quarry operations and maintain long-term resource availability within the Tijeras Site. This expansion also includes a small area near the mine site buildings for a road expansion.

The proposed Quarry 9 area is located within the mines' permitted area and is contiguous with or adjacent to existing permitted disturbance areas.

6.2 Description of Proposed Disturbance

The Quarry 9 expansion will include typical quarry development and extraction activities consistent with existing operations at the Tijeras Site. Proposed activities include:

- Clearing and grubbing of vegetation within the disturbance footprint;
- Topsoil stripping, salvage, and stockpiling for future reclamation use;
- Drilling and blasting of rock materials;
- Excavation and hauling of mined materials;
- Construction of access roads and internal haul routes; and
- Development of associated drainage and stormwater controls.

Total new disturbance associated with Quarry 9 is approximately 77 acres.

6.3 Reclamation Plan

Reclamation of Quarry 9 will be conducted in accordance with the approved reclamation plan for the Tijeras Site and applicable NM MMD requirements.

Reclamation activities will include:

- Regrading of disturbed areas to achieve stable slopes and compatible landforms;
- Replacement of salvaged growth media where feasible;
- Installation of erosion and sediment control measures;
- Seeding and revegetation using approved seed mixes; and
- Long-term stabilization to support the approved post-mining land use.

Reclamation will be conducted progressively where practicable and completed following cessation of mining activities in Quarry 9.

6.4 Drainage and Stormwater Management

Surface water management within Quarry 9 will be designed to integrate with existing site drainage systems and minimize erosion and sediment transport.

Measures will include:

- Diversion of upgradient runoff away from disturbed areas where feasible;
- Construction of sediment control features (e.g., berms, sediment basins, or check structures); and
- Stabilization of drainage channels and slopes.

Drainage patterns will be designed to promote long-term stability and compatibility with surrounding topography.

6.5 Environmental Considerations

The proposed expansion area has been evaluated for environmental and reclamation considerations. Key factors include:

- Salvage and reuse of available topsoil or growth media;
- Minimization of disturbance footprint where practicable;
- Protection of surrounding undisturbed areas; and
- Implementation of reclamation practices consistent with site-specific conditions.

Additional environmental protection measures will be implemented as required by permit conditions.

6.6 Financial Assurance Implications

The addition of Quarry 9 will increase the total bonded disturbance at the Tijeras Site by approximately 77 acres. Financial assurance will be updated to reflect:

- New disturbance associated with Quarry 9;
- Reclamation cost estimates for grading, growth media replacement, and revegetation; and

Revised financial assurance calculations are provided in Attachment 1 – NM MMD Reclamation Cost Model and summarized in Table 1.

7 Reclamation Status and Performance

7.1 General Site Stability

Based on review of existing data and field verification, reclaimed areas addressed in this application exhibit stable slopes, appropriate drainage patterns, and no evidence of significant erosion.

7.2 Vegetation Performance

Available monitoring data and field observations indicate that vegetation in reclaimed areas is establishing in a manner consistent with site conditions and approved reclamation objectives.

Detailed vegetation monitoring data, where available, is provided in Attachment 3. Further documentation will be provided at a later date as an addition to this application package. The 2022 vegetation surveys were not finalized at the time of the survey and will be provided when the data has been reviewed and compiled into a memo summarizing the results.

8 Financial Assurance

8.1 Current Financial Assurance

The current financial assurance amount for the Tijeras Site is $12,152,220

8.2 Proposed Adjustments

This modification includes the following updates:

- Partial release of reclamation liability for portions of Quarry 1;
- Full release of approximately 74 acres of reclaimed land;
- Addition of approximately 77 acres of new disturbance associated with Quarry 9;
- Reallocation of disturbance within the permitted area

8.3 Revised Financial Assurance

The revised financial assurance amount will be calculated using the NM MMD reclamation cost model and will reflect current reclamation obligations following the requested releases.

Table 1 – Financial Assurance Summary

Facility Current FA	Revised FA
$12,152,220	$11,148,280

- Supporting calculations are provided in Attachment 1.

9 Public Notice

Public notice for this application will be provided in accordance with:

- 19.10.12.1210 NMAC
- 19.10.902 NMAC
- 19.10.903 NMAC

Documentation will include:

- Certified mail notifications to landowners and agencies;
- Newspaper publication affidavits; and
- Posted notices at public locations.

Details will be provided in Attachment 2.

10 Conclusions and Request for Approval

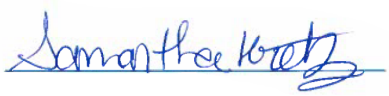
GCC respectfully requests NM MMD approval of this modification to:

- Acknowledge completion of reclamation activities in Quarry 1 and approve partial release of reclamation liability
- Approve final reclamation release for approximately 74 acres of reclaimed land;
- Approve the addition of Quarry 9, consisting of approximately 77 acres of new disturbance;
- Approve the establishment of a reference area within Quarry 4; and
- Approve the updated financial assurance amount.
- A check in the amount of $6,000.00 will be submitted with this application.

If you have any questions or require additional information, please contact:

Leanne Lam, Environmental Engineer, Tijeras Plant, 505-651-5210, llam@gcc.com

Sincerely,



Samantha Kretz
Environmental Manager- South Region
GCC Rio Grande, Inc

Maps

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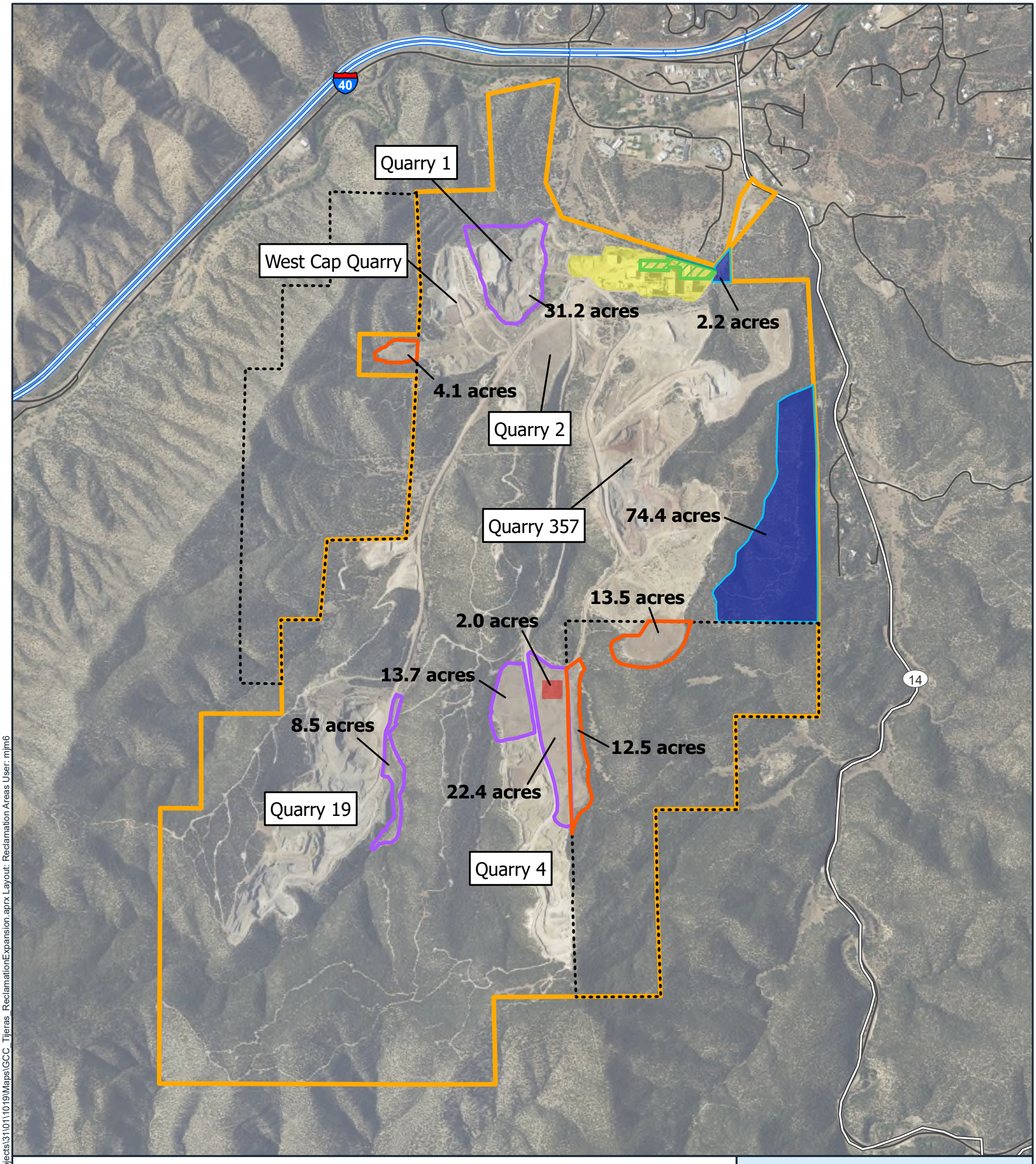

Limit Permit
Tijeras Claims
GCC Reclaimed Areas
USFS Bonded Areas
Reference Area
Buildings
Tijeras Plant
Quarry Expansion Area
Interstate
State Route
Road

0 0.5
Miles

Sources: GCC, Barr, Esri

GCC Tijeras

Reclamation and Disturbance Expansion Areas

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Attachment 1 – NM MMD Reclamation Cost Model

BOND AMOUNT CALCULATION — Tijeras Cement Plant
New Mexico Mining and Minerals Division
General Information — 05/29/22

Applicant	GCC Rio Grande, Inc. PO Box 100 Tijeras, NM 87059-0100	Contact: Samantha Kretz 505/286-6081
Permit Number	BE001RE	
Number of Acres	101.29	
Type of Operation	Cement/Regular/Existing	
Location	Bernalillo County	
Prepared by	Quentin Vandal	
Recommended Bond	**$844,618**	

Describe worst-case reclamation scenario:

Earthmoving

Scrapers transport redbed from locations where exposed to all areas
Local haul by dozers in each New Unit to cover edges and steep areas

Grading

Dozers spread, grade, and shape redbed soil

Revegetation

Reveg all disturbed areas (seeding, monitoring, etc.)

Other

Mobilization is 2% on 1-5% range due to close proximity to
Albuquerque where contractors and equipment are available.

BOND AMOUNT CALCULATION
New Mexico Mining and Minerals Division
Material Handling Plan Summary Sheet

Tijeras Cement Plant
Worksheet #3
05/29/22

Item	Description	Volume (cy)	Origin	Destination	Haul Distance (ft)	Grade	Equipment	
1	Move Redbed	128,700.87	Quarries 3, 5 & 7	Quarry 4	5,000	10%	CAT 631-G	Scraper
2	Move Redbed	-	Quarries 3, 5 & 7	Quarry 5	500	0%	CAT 631-G	
3	Move Redbed	244,700.00	Quarry 3	Quarry 9	2,600	10%	CAT 631-G	
		373,401	***loose cy***	***=***	***298,721***	***bank cy***		
4	Move Redbed	12,870.09	Quarries 3, 5 & 7	Quarry 4	300	10%	CAT D-8T Dozer w/SU Blade	10%
5	Move Redbed	-	Quarries 3, 5 & 7	Quarry 5	300	10%	CAT D-8T Dozer w/SU Blade	10%
6	Move Redbed	24,470.00	Quarry 3	Quarry 9	300	10%	CAT D-8T Dozer w/SU Blade	10%

Description: Spread 10% redbed in Quarry 6 after scrapers

Equipment: ***CAT D-8T Dozer w/SU Blade -Quarry 4***

Volume	**12,870**	**cy**	**Time**	**26**	**hours**
			Productivity	**502**	**cy/hr-dozer**
PERFORMANCE FACTORS					
material	1.20		operator	0.75	
grade	1.10		work hour	50	min/hr
soil weight correction	2648	lb/cy	visibility	1.00	
prod. method/blade	1.00		elevation	1.00	
normal production	700	cy/hr	direct drive trans.	1.00	

Description: Spread 20% redbed in steep areas of Quarry 8 after scrapers

Equipment: ***CAT D-8T Dozer w/SU Blade - Quarry 5***

Volume	**0**	**cy**	**Time**	**0**	**hours**
			Productivity	**90**	**cy/hr-dozer**
PERFORMANCE FACTORS					
material	1.20		operator	0.75	
grade	0.55		work hour	50	min/hr
soil weight correction	2648	lb/cy	visibility	1.00	
prod. method/blade	1.00		elevation	1.00	
normal production	250	cy/hr	direct drive trans.	1.00	

Description: Spread 20% redbed in steep areas of Quarry 9 after scrapers

Equipment: ***CAT D-8T Dozer w/SU Blade - Quarry 9***

Volume	**24,470**	**cy**	**Time**	**60**	**hours**
			Productivity	**410**	**cy/hr-dozer**
PERFORMANCE FACTORS					
material	1.20		operator	0.75	
grade	0.90		work hour	50	min/hr
soil weight correction	2648	lb/cy	visibility	1.00	
prod. method/blade	1.00		elevation	1.00	
normal production	700	cy/hr	direct drive trans.	1.00	

BOND AMOUNT CALCULATION
New Mexico Mining and Minerals Division
Productivity and Hours Required for Dozer Use---Grading

Tijeras Cement Plant
Worksheet #6
05/29/22

Description: Spread and track-in rock, all Sections (except Plant)

Equipment: D8R w/ SU blade - rock, all Sections (except Plant)

Area	**101**	**ac** [1]	**Time**	**46**	**hours**
			Productivity	**2.20**	**ac/hr-dozer**
PERFORMANCE FACTORS					
material	1.20		operator	0.75	
grade	1.10		work hour	50	min/hr
soil weight correction	2700	lb/cy	elevation	1.00	
prod. method/blade	1.00		elevation	1.00	
effective blade width	12.9	feet	direct drive trans.	1.00	
speed	2	miles/hr			

[1] This number represents total new unit acreage disturbed for Quarry 1, Quarry 4, Quarry 5 and Quarry 9.

Description: Rip haul roads, service roads, and plant area to prepare for grading and reveg

Equipment: D8R w/ multi-shank ripper

	Area	**0**	**ac**	**Time**	**0**	**hours**
	Volume	**0**	**cy**	**Productivity**	**4.25**	**ac/hr-dozer**
PERFORMANCE FACTORS						
ripping length		1,000	ft	turn time	0.25	min/pass
ripper penetration		30.7	in	work hour	50	min/hr
pocket spacing		43.0	in			
no. of pockets		3				

Description: Rip redbed for scraper transport

Equipment: D8R w/ multi-shank ripper

	Area	**0**	**ac**	**Time**	**0**	**hours**
	Volume	**300**	**cy**	**Productivity**	**4.25**	**ac/hr-dozer**
PERFORMANCE FACTORS						
ripping length		1,000	ft	turn time	0.25	min/pass
ripper penetration		30.7	in	work hour	50	min/hr
pocket spacing		43.0	in			
no. of pockets		3				

BOND AMOUNT CALCULATION
New Mexico Mining and Minerals Division
Productivity and Hours Required for Scraper Use

Tijeras Cement Plant
Worksheet #11
05/29/22

Description: Haul from West Cap and spread redbed in Quarry 2

Equipment: ***CAT 631-G - Quarry 4***

Volume	**128,701**	**cy**	**Time**	**698**	**hours**
			Productivity	**184**	**cy/hr-scraper**
PERFORMANCE FACTORS					
struck capacity	21	cy	load time	0.60	min
heaped capacity	31	cy	loaded trip time	4.75	min
grade (loaded)	10	%	manuever and	0.70	min
rolling resistance	3	%	spread time		
haul distance	2,500	ft	return trip time	1.00	min
work hour	50	min			

Description: Spread redbed in Quarry 2

Equipment: ***CAT 631-G - Quarry 5***

Volume	**0**	**cy**	**Time**	**0**	**hours**
			Productivity	**529**	**cy/hr-scraper**
PERFORMANCE FACTORS					
struck capacity	21	cy	load time	0.60	min
heaped capacity	34	cy	loaded trip time	1.00	min
grade (loaded)	10	%	manuever and	0.70	min
rolling resistance	3	%	spread time		
haul distance	500	ft	return trip time	0.30	min
work hour	50	min			

Description: Spread redbed in Quarry 9

Equipment: ***CAT 631-G - Quarry 9***

Volume	**244,700**	**cy**	**Time**	**427**	**hours**
			Productivity	**573**	**cy/hr-scraper**
PERFORMANCE FACTORS					
struck capacity	21	cy	load time	0.60	min
heaped capacity	34	cy	loaded trip time	0.60	min
grade (loaded)	0	%	manuever and	0.70	min
rolling resistance	3	%	spread time		
haul distance	2,600	ft	return trip time	0.50	min
work hour	50	min			

BOND AMOUNT CALCULATION
New Mexico Mining and Minerals Division
Summary Calculation of Earthmoving Costs

Tijeras Cement Plant
Worksheet #13
05/29/22

Total Cost $340,177

Equipment Type	Owning and Operating Cost [1] ($/hr)	Labor Cost [2] ($/hr)	Time Req'd (hrs)	Total Cost ($)	Total Production	Prod. Unit	Unit Cost ($/unit)
Dozers-Earthmoving							
CAT D-8T Dozer w/SU Blade -Quarry 4	215.23	65.90	26	7,213	12,870	cy	0.56
CAT D-8T Dozer w/SU Blade - Quarry 5	215.23	65.90	0	0	0	cy	0.00
CAT D-8T Dozer w/SU Blade - Quarry 9	215.23	65.90	60	16,762	24,470	cy	0.69
Dozers-Grading							
D8R w/ SU blade - rock, all Sections	215.23	65.90	46	12,940	101	ac	127.75
Rippers							
D8R w/ multi-shank ripper	216.61	65.90	0	0	0	ac	0.00
D8R w/ multi-shank ripper	216.61	65.90	0	0	0	ac	0.00
Scrapers							
CAT 631-G - Quarry 4	203.65	65.90	698	188,134	128,701	cy	1.46
CAT 631-G - Quarry 5	203.65	65.90	0	0	0	cy	0.00
CAT 631-G - Quarry 9	203.65	65.90	427	115,128	244,700	cy	0.47
			1,231	**$340,177**			
Total Labor Cost				**$81,104**			

Data Source:

[1] Cost Reference Construction Equipment Ownership and Operating Expense Schedule Region VI, US Army Corps of Engineers No. 2016

[2] 2026 GCC Operator Labor hourly plus 40% benefits $47.07 $18.83 $65.90

BOND AMOUNT CALCULATION
New Mexico Mining and Minerals Division
Revegetation Costs

Tijeras Cement Plant
Worksheet #14
05/29/22

Change settings

Description:

Apply seed mix to areas and chain and plow.

Location Adjust.	Albuq.	101.7%
Total Cost		**$77,586**

Area	Area (acres)	Unit Cost ($/acre)	Subtotal Cost ($)
Quarry 1 [1]	22.00	621	13,666
Quarry 4 [2]	2.15	621	1,335
Quarry 5 [3]	1.31	621	814
Quarry 9 [4]	75.83	621	47,103
Potential interseeding	10.1	$340	$3,448
Annual monitoring		$9,924	$9,924
Total	**101.29**		**$76,289**

[1] reconciled acreage - revegetation only
[2] reconciled acreage - earthwork and revegetation
[3] *new additional disturbance* - revegetation only
[4] *new additional disturbance* - earthwork and revegetation

BOND AMOUNT CALCULATION — Tijeras Cement Plant
New Mexico Mining and Minerals Division — Worksheet #16
Reclamation Bond Summary — 05/29/22

DIRECT COSTS	Facility and Structure Removal		$0
	Earthmoving		$340,177
	Revegetation @ percent bonded	160%	$124,138
	Other		$0
	Subtotal		**$464,315**
	Cost Escalation Period (years) [1]	5	
	Cost Escalation Rate [2]	2.6%	
	Adjusted Subtotal		**$527,126**
INDIRECT COSTS	Construction Indirect Costs [3]	60%	$316,275.67
	Liability Insurance *(1.5% of $81,104 labor costs)*		$1,217
TOTAL BOND AMOUNT			**$844,618**

Data Source:

[1] Guidance for Calculating Capital Indirect Costs for Mine Reclamation and Closure Cost Estimates. New Mexico Mining & Minerals Division (November 2016).

[2] U.S. Inflation Rate by Year. Adjusted 20 year inflation rate period to Jan 2005- Jan 2026.
See https://www.usinflationcalculator.com/inflation/current-inflation-rates/ (Accessed on May 14, 2026).

[3] Breakdown of Construction Indirect Costs

Category	%	Rationale
contract administration	3%	Reflects the lowest category of direct cost of reclamation ($0-1MM)
mobilization and demobilization	5%	Reflects the lowest category of direct cost of reclamation ($0-1MM)
engineering redesign	4%	Reflects the lowest category of direct cost of reclamation ($0-1MM)
profit and overhead	20%	Reflects the lowest category of direct cost of reclamation ($0-1MM)
procurement costs	4%	Reflects the lowest category of direct cost of reclamation ($0-1MM)
closeout plan management	4%	Reflects the lowest category of direct cost of reclamation ($0-1MM)
contingencies	20%	Reflects the lowest category of direct cost of reclamation ($0-1MM)
sum	60%	

Attachment 2 – Public Notice Documentation

Legal Notice

Pursuant to the New Mexico Mining Act Rules at 19.10.12.1210 NMAC, GCC Rio Grande, Inc. (GCC) has submitted an application to the Mining and Minerals Division, New Mexico Energy, Minerals and Natural Resources Department (NM MMD), for a revision to Mining Act Permit No. BE001RE, as previously approved and subsequently modified ("Permit").

GCC operates the Tijeras Mine and Mill, an active quarry operation located in Bernalillo County, New Mexico. Mining and reclamation activities have progressed such that portions of the site are eligible for partial and final reclamation release, and the application also includes a proposed expansion of mining operations.

A copy of the application is available during normal business hours at:

New Mexico Mining and Minerals Division
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

The application can also be viewed or downloaded from the NM MMD website at:
http://www.emnrd.state.nm.us/MMD/MARP/PermitPendMineRegEx.html - to come from NMMD

This application is available for public comments, objections, and a request for a public hearing as provided below.

Permittee Address: GCC Rio Grande, Inc., P.O. Box 100, Tijeras, New Mexico 87059

Location: The Tijeras Mine is located in Bernalillo County, New Mexico.

Type of Surface Subject to Partial Release of Financial Assurance Application: GCC is requesting partial and final release of reclaimed areas and modification of the permit to include additional disturbance acreage under Permit No. BE001RE.

Written comments, objections, or requests for a public hearing shall be submitted to:

David Ennis, Program Manager
Mining Act Reclamation Program
NM Mining and Minerals Division
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

Comments and requests for a public hearing can be submitted to the above listed address within 30 days of the publication of the notice.

Aviso legal

De acuerdo con las Reglas de la Ley de Minería de Nuevo México en el 19.10.12.1210 NMAC, GCC Rio Grande, Inc. (GCC) ha presentado una solicitud a la División de Minería y Minerales, Departamento de Energía, Minerales y Recursos Naturales de Nuevo México (NM MMD), para una revisión del Permiso de la Ley de Minería No. BE001RE, tal como se aprobó previamente y posteriormente se modificó ("Permiso").

GCC opera la Mina y Molino de Tijeras, una actividad de cantera situada en el condado de Bernalillo, Nuevo México. Las actividades de minería y recuperación han avanzado de tal manera que partes del sitio son elegibles para liberación parcial y final de recuperación, y la solicitud también incluye una propuesta de ampliación de las operaciones mineras.

Una copia de la solicitud está disponible durante el horario laboral habitual en:

División de Minería y Minerales de Nuevo México
1220 South St. Francis Drive
Santa Fe, Nuevo México 87505

La solicitud también puede consultarse o descargarse desde la página web del MMD de NM en: http://www.emnrd.state.nm.us/MMD/MARP/PermitPendMineRegEx.html - venir de NMMD

Esta solicitud está disponible para comentarios públicos, objeciones y solicitud de audiencia pública como se indica a continuación.

Dirección del titular: GCC Rio Grande, Inc., P.O. Box 100, Tijeras, Nuevo México 87059

Ubicación: La mina Tijeras está situada en el condado de Bernalillo, Nuevo México.

Tipo de superficie sujeto a liberación parcial de garantía financiera: El GCC solicita la liberación parcial y definitiva de áreas recuperadas y la modificación del permiso para incluir superficie adicional por perturbación bajo el Permiso No. BE001RE.

Los comentarios escritos, objeciones o solicitudes de audiencia pública deberán ser sometidos a:

David Ennis, Director de Programas
Programa de Recuperación de Minerales según la Ley de Minería
División de Minería y Minerales de Nuevo México
1220 South St. Francis Drive
Santa Fe, Nuevo México 87505

Los comentarios y solicitudes de audiencia pública pueden enviarse a la dirección mencionada anteriormente dentro de
30 días desde la publicación del aviso.

May 8, 2026

Name
Address
City, State, Zip

To Whom It May Concern:

Re: Tijeras Mine, Permit No. BE001RE, Revision 26-1 Application

GCC Rio Grande, Inc. (GCC) operates the Tijeras Mine and Mill, an active quarry operation located in Bernalillo County, New Mexico. The mining area is located within permitted lands associated with Permit No. BE001RE.

GCC has submitted an application to the New Mexico Energy, Minerals and Natural Resources Department, Mining and Minerals Division (NM MMD) for a revision to Permit No. BE001RE. This revision (Revision 26-1) includes requests for partial and final reclamation release, establishment of a reclamation reference area, and expansion of the permitted disturbance area.

Specifically, the application includes:

- Partial release of reclamation liability for portions where reclamation activities have been completed;
- Final reclamation release for approximately 74 acres of fully reclaimed land;
- Expansion of the permitted disturbance area by approximately 77 acres for development

As a nearby property owner or stakeholder, you are being provided the attached public notice concerning this permit revision request.
If you have any questions, please feel free to contact the New Mexico Energy, Minerals and Natural Resources Department, Mining and Minerals Division in Santa Fe at (505) 476-3400.
Sincerely,

Leanne Lam

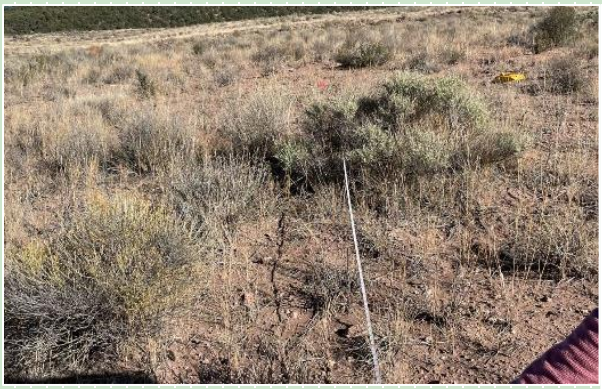
Leanne Lam
Environmental Engineer
Tijeras Plant
GCC Rio Grande, Inc.

Attachment 3 – Vegetation Monitoring Data

February 2022

2021 Reclamation Monitoring Report

GCC Tijeras Mine and Mill



Prepared for:

GCC Rio Grande, Inc.
Tijeras Mine and Mill
P.O. Box 100
Tijeras, New Mexico, 87059

Prepared by:

Ecosphere Environmental Services, Inc.
320 Osuna Rd. NE
Albuquerque, NM 87107
(505) 954-1570

Ecosphere Environmental Services

Durango, CO
Pagosa Springs, CO
Albuquerque, NM
Farmington, NM

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Table of Contents

List of Tables

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 open pit limestone quarries in Bernalillo County, New Mexico (Appendix A – Map A-1). The Tijeras Mine and Mill operates under New Mexico Energy, Minerals and Natural Resources Department, Mining and Minerals Division (MMD) Permit # BE001RE. To date, approximately 658.77 acres within the permit boundary 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. GCC Rio Grande has proposed industrial/ commercial (for the plant site) and wildlife habitat and recreation (for remaining areas) as final post-closure land uses for the permitted area.

Tijeras Mine and Mill was permitted by the MMD after substantial earth disturbing activities had already occurred. Thus, methods typically used to monitor reclamation at new mines, (i.e., baseline data or the use of a reference area), were not used to establish revegetation standards. In 1996, a technical standard (RGPCC 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 (Habitat Management 2009). The results of both studies yielded information about the most effective methods for revegetation at the Tijeras site. Additionally, parameters evaluated in the most effective reclamation treatment plots – vegetative cover, herbaceous production, woody plant density, and species richness – were used to establish vegetation success criteria for reclaimed areas at the Tijeras Mine and Mill Site, (i.e., to be considered successful, vegetation parameters measured on the reclaimed areas must be equal to or greater than the performance standard). This presented several challenges for achieving reclamation success, including, but not limited to: 1) the parameters measured during the 2003 plot study represent a best-case scenario for revegetation and do not capture typical variability in revegetation success, 2) the parameters were measured in 2008 only and represent a snapshot in time for weather conditions, and 3) vegetation sampling would have to be identical to the 2003 study and insufficient detail was provided for the methods employed in 2008.

To address these challenges, GCC Rio Grande retained Ecosphere Environmental Services, Inc. (Ecosphere) to draft a Reclamation Monitoring Plan (Plan) that proposed a reference area and associated monitoring methods to capture reclamation success at the Tijeras site. GCC Rio Grande subsequently submitted the Plan to MMD. MMD reviewed the plan and requested that GCC Rio Grande apply for a permit modification regarding the proposal of the reference area and monitoring plan and provide the results of the first round of vegetative monitoring in the reference area.

In 2021, Ecosphere completed vegetation monitoring of the reference area and areas that were reclaimed in 1994, 2003, 2007, 2008, and 2011. This report presents the monitoring results, as well as

estimates of numerical sampling adequacy and statistical tests to demonstrate conformance with the proposed Plan. An assessment of the Plan and recommendations for changes, if necessary, are also included.

2. Methods

Sampling and monitoring methods accepted and recommended by MMD were used to evaluate cover, diversity, and woody plant and shrub density. All calculations, including cover, shrub density, diversity, sample adequacy, and test statistics were performed in Microsoft Excel.

2.1 Parameter Estimates

On October 26 and 27, 2022, Ecosphere biologists Tara Harris and Nicasio Gonzalez conducted vegetation monitoring at the Tijeras Quarry. Fifty-nine reclamation monitoring transects and 5 reference vegetation community transects with respective azimuths were determined prior to the field investigation using the "Random" tool in ArcGIS (Appendix A, Map 1). Vegetative cover was measured by the Line-Intercept Method (Cook and Bonham 1977). At each predetermined location, a 25-foot-long transect was established along the assigned azimuth. The plant species encountered at each 0.1 foot was recorded. Only those living plants or seedlings touched by the line or lying under or over it were considered. Bare ground and litter were also recorded.

Woody plant density was evaluated by moving down one side of the tape and returning on the other counting the number of all individuals of shrubs/woody species in an area 3 feet perpendicular to the tape. This sampled an area 6 feet wide by 25 feet long, or 150 square feet. Data are reported as number of shrubs per acre.

The Simpson's index was used to estimate species diversity (Simpson 1949). Simpson's index emphasizes the dominant and abundant species rather than the rare species that vary in their occurrence from place to place (Barbour et al. 1987).

$$C = \sum_{l=1}^{S} (p_i)^2$$

where: C is the index number,
s is the total number of species in the sample, and
p_i is the proportion of all individuals in the sample (plot, transect) that belong to species I.

2.2 Sample Adequacy

All cover estimates were arcsine square root transformed before analysis. Sample adequacy was determined using the Cochran (1977) formula:

$$n_{min} = t^2 s^2 / (0.1\bar{x})^2$$

where: t is the tabular t value for a preliminary sample with n-1 degrees of freedom and a two-tailed significance level of α = 0.10 (P = 0.90),
s is the standard deviation of the preliminary sample, and
$\bar{x}$ is the sample mean of the preliminary sample.

Sample adequacy is the minimum number of samples required to estimate cover with a 90% confidence that the sample mean for cover represents the true population mean.

2.3 Statistical Testing

All cover estimates were arcsine square root-transformed and shrub density estimates were log-transformed before analysis. Parameter estimates were compared to the reference area (technical standard in equation below) using the one-sample, one-sided t-test:

$$t^* = \frac{\bar{x} - 0.9(\text{technical standard})}{s/\sqrt{n}}$$

where: t^* is the calculated t-statistic,
$\bar{x}$ is the sample mean,
s is the standard deviation of the sample, and
n is the sample size.

The α-level of the test is 0.10 by regulation, and the decision rules for testing the reverse null hypothesis are as follows:

- if $t^* < t\,(1-\alpha; n-1)$, conclude failure to meet the performance standard
- if $t^* \geq t\,(1-\alpha; n-1)$, conclude that the performance standard was met

Because it is a composite parameter of average percent cover per area, species diversity in the reclamation areas cannot be compared statistically to the reference area. A simple comparison (i.e., greater than or less than) is provided.

3. Reclamation Monitoring Results

3.1 Vegetation Cover

3.1.1 Reclamation Areas

Thirty-eight species were identified during the 2021 monitoring of the Tijeras Mine and Mill reclamation area (Table 3-1). Plant species observed in each reclamation area are presented in Appendix B. Nomenclature and duration information was obtained from the Natural Resources Conservation Service (NRCS) PLANTS database (NRCS 2021).

Table 3-1. Plant Species Observed at all Reclamation Areas, October 2021

Scientific Name	Common Name	Duration
Grasses		
Achnatherum hymenoides	Indian ricegrass	Perennial
Andropogon hallii	sand bluestem	Perennial
Aristida purpurae	purple threeawn	Perennial
Bouteloua gracilis	blue grama	Perennial
Bouteloua hirsuta	hairy grama	Perennial
Bromus tectorum	cheatgrass	Annual
Bouteloua curtipendula	sideoats grama	Perennial
Elymus elymoides	squirreltail	Perennial
Pseudoroegneria spicata	bluebunch wheatgrass	Perennial
Sporobolus cryptandrus	sand dropseed	Perennial
Pleuraphis jamesii	galleta grass	Perennial
Pascopyrum smithii	western wheatgrass	Perennial
Muhlenbergia torreyi	ring muhly	Perennial
Forbs		
Centaurea stoebe	spotted knapweed	Perennial
Helianthus annuus	common sunflower	Annual
Heliomeris multiflora	Showy goldeneye	Perennial
Heterotheca villosa	hairy goldenaster	Perennial
Bassia scoparia	burningbush	Annual
Marrubium vulgare	white horehound	Perennial
Melilotus albus	white sweet clover	Perennial
Mentzelia sp.	blazingstar	Perennial
Penstemon angustifolius	broadbeard beardtongue	Perennial
Portulaca oleracea	common purslane	Annual
Salsola tragus	Russian thistle	Annual
Sphaeralcea coccinea	scarlet globemallow	Perennial
Tragia nepetifolia	catnip noseburn	Perennial

Scientific Name	Common Name	Duration
Shrubs		
Artemisia frigida	fringed sagebrush	Perennial
Atriplex canescens	four-wing saltbush	Perennial
Cercocarpus montanus	mountain-mahogany	Perennial
Ericameria nauseosa	chamisa	Perennial
Fallugia paradoxa	Apache plume	Perennial
Gutierrezia sarothrae	broom snakeweed	Perennial
Purshia tridentata	antelope bitterbrush	Perennial
Quercus gambelii	Gambel oak	Perennial
Rhus aromatica	fragrant sumac	Perennial
Krascheninnikovia lanata	winterfat	Perennial
Cacti, Yucca		
Opuntia polyacantha	plains prickly pear	Perennial
Cylindropuntia imbricata	tree cholla	Perennial

Cover estimates, the most frequently observed species, and that species average cover for each reclamation year are presented in Table 3-2.

Table 3-2. 2021 Cover Estimates for Reclamation Areas.

Area	Cover (%)	*s*	*n*	Most Frequent Species; Associated Percent Cover
1994	46.20	0.214	5	western wheatgrass (*Pascopyrum smithiii*); 10.86%
2003	49.49	0.193	20	four-wing saltbush (*Atriplex canescens*); 13.72%
2007	51.38	0.195	6	four-wing saltbush (*Atriplex canescens*); 13.27%
2008	67.74	0.116	20	Indian ricegrass (*Achnatherum hymenoides*); 11.91%
2011	52.01	0.319	8	western wheatgrass (*Pascopyrum smithii*); 9.53%

Note: *s* = standard deviation; *n* = number of transects sampled.

3.1.2 Reference Area

Ten species were identified during the 2021 monitoring of the Tijeras Mine and Mill reference area (Table 3-3).

Table 3-3. Plant Species Observed at the Reference Area, October 2021

Scientific Name	Common Name	Duration
Grasses		
Bouteloua gracilis	blue grama	Perennial
Pleuraphis jamesii	galleta grass	Perennial
Shrubs		
Artemisia frigida	fringed sagebrush	Perennial
Gutierrezia sarothrae	broom snakeweed	Perennial
Cacti, Yucca		
Cylindropuntia imbricata	tree cholla	Perennial
Opuntia polyacantha	plains prickly pear	Perennial
Yucca baccata	banana yucca	Perennial
Yucca glauca	small soapweed	Perennial
Trees		
Juniperus monosperma	oneseed juniper	Perennial
Pinus edulis	Colorado piñon	Perennial

Vegetation cover averaged 62.0%. Blue grama grass contributed the highest cover of any species (29.6%) and litter made up 4.7% of the cover (Table 3-4).

Table 3-4. Cover Estimates for the Reference Area, October 2021

Scientific Name	Common Name	Cover (%)	*s*
Grasses			
Bouteloua gracilis	blue grama	29.549	0.242
Pleuraphis jamesii	galleta grass	0.163	0.004
Forbs			
Artemisia frigida	fringed sagebrush	0.245	0.005

Scientific Name	Common Name	Cover (%)	*s*
Gutierrezia sarothrae	broom snakeweed	3.203	0.037
Cacti, Yucca			
Cylindropuntia imbricata	tree cholla	2.080	0.047
Opuntia polyacantha	plains prickly pear	6.678	0.051
Yucca baccata	banana yucca	0.720	0.016
Yucca glauca	small soapweed	3.360	0.047
Trees			
Juniperus monosperma	oneseed juniper	14.000	0.207
Pinus edulis	Colorado pinon	2.000	0.045
Other			
	Total Vegetation Cover	61.998	0.137
	Litter	4.720	0.071
	Bare Ground	33.282	0.122
	Total cover	66.718	0.122

3.2 Shrub Density

3.2.1 Reclamation Areas

Twelve shrub species were observed in the reclamation areas during 2021 monitoring (Table 3-1). Shrub densities for each reclamation year are presented in Table 3-5.

Table 3-5. 2021 Shrub Density Estimates for Reclamation Areas.

Area	Shrubs per acre	*s*	*n*
1994	580.8	681.05	5
2003	2991.1	1309.26	20
2007	2274.8	1077.48	6
2008	914.8	633.96	20
2011	1306.8	580.80	8

3.2.2 Reference Area

Eight woody species, including shrubs, cacti, yucca, and trees, were observed in the reference area during 2021 monitoring (Table 3-4). Shrub density averaged 1,393.9 total shrubs per acre for the reference area; plains prickly pear (*Opuntia polyacantha*) had the highest density at 464.6 shrubs per acre (Table 3-6).

Table 3-6. 2021 Shrub Density Estimates for the Reference Area

Species	Common Name	Shrubs Per Acre
Artemisia frigida	fringed sagebrush	58.08
Opuntia polyacantha	plains prickly pear	464.64
Cylindropuntia imbricata	tree cholla	116.16
Yucca baccata	banana yucca	58.08
Yucca glauca	small soapweed	290.4
Juniperus monosperma	oneseed juniper	232.32
Pinus edulis	Colorado piñon	116.16
Echinocereus sp.	hedgehog cactus sp.	58.08
	Total	**1,393.92**

3.3 Diversity

Species diversity, as estimated by the Simpson's index, was highest in the reference area. Area 2003 exhibited the highest diversity of all reclamation areas (Table 3-7).

Table 3-7. 2021 Species Diversity in Reclamation and Reference Areas

Area	Simpson's Index
1994	0.038
2003	0.050
2007	0.043
2008	0.029
2011	0.018
Reference	0.114

3.4 Sampling Adequacy

Table 3-8 presents the sample adequacy calculations for cover and shrub density estimates the 2021 monitoring effort in the reclamation and reference areas.

Table 3-8. Cochran's n_{min} for Cover and Shrub Density Estimates

Area	*n*	Cochran's n_{min}	
		Cover	Shrub Density
1994	5	38.5	10.1
2003	20	14.9	0.6
2007	6	25.1	1.7
2008	20	5.0	2.2
2011	8	68.7	1.1
Reference	5	8.4	1.6

3.5 Statistical Testing

3.5.1 Cover Estimates

The Student's *t*-test of the transformed data indicated mean percent vegetation cover was not significantly less than 0.9*x* of the cover in the reference area (55.8%) in all reclamation areas (i.e., $t_{calculated} > t_{critical}$; Table 3-9).

Table 3-9. Student's *t*-Statistics (One-tailed *t*-test, α=0.1) for Transformed Vegetation Cover for Reclaimed Areas vs. Reference Area at GCC Tijeras Mine and Mill

Area	Cover (%)	*s*	*n*	$t_{calculated}$	*P*
1994	46.20	0.214	5	-0.856	0.208
2003	49.49	0.193	20	-0.905	0.193
2007	51.38	0.195	6	-0.457	0.330
2008	67.74	0.116	20	2.025	0.027
2011	52.01	0.319	8	-0.217	0.417

3.5.2 Shrub Density Estimates

The Student's t-test of the transformed data indicated mean shrub density was not significantly less than 0.9x of shrub density in the reference area (1,254 shrubs per acre) in all reclamation areas (i.e., $t_{calculated} > t_{critical}$; Table 3-10).

Table 3-10. Student's *t*-Statistics (One-tailed *t*-test, α=0.1) for Transformed Shrub Density for Reclaimed Areas vs. Reference Area at GCC Tijeras Mine and Mill

Area	Shrubs per Acre	*s*	*n*	$t_{calculated}$	*P*
1994	580.8	681.05	5	-0.652	0.271
2003	2991.1	1309.26	20	7.976	0.000
2007	2274.8	1077.48	6	4.234	0.001
2008	914.8	633.96	20	0.930	0.181
2011	1306.8	580.80	8	2.937	0.007

4. Conclusion

Estimates of percent cover and shrubs per acre were significantly equal to or greater than the reference area in all reclamation areas (areas reclaimed in 1994, 2003, 2007, 2008, and 2011) (Tables 3-9 and 3-10). Species diversity in all reclamation areas was less than in the reference area. However, while the shrub density sampling effort was adequate for all areas except 1994, sampling adequacy fell short in estimates of percent cover in reclamation areas 1994, 2008, and 2011 (Table 3-8). Thus, the results of statistical tests comparing percent cover in these areas to percent cover in the reference area should be interpreted with caution.

Despite their smaller areas, additional sampling effort is recommended for future estimates of vegetation cover in reclamation areas 1994, 2008, and 2011. Additional sampling will likely not require as many transects as the initial sampling effort in 2021 indicates (Table 3-8), but will decrease as more data are collected.

5. Certification

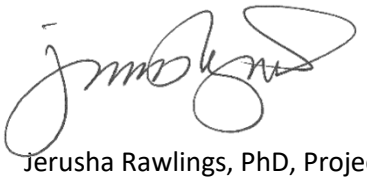
Conclusions are based on actual field examinations and are correct to the best of my knowledge.

Signature of Field Biologist:

Nicasio Gonzalez, Biologist
Ecosphere Environmental Services, Inc.
320 Osuna Road Ne Suite C-1
Albuquerque, New Mexico 87107
505-954-1570

Date: February 27, 2022

Analysis and Reporting:



Jerusha Rawlings, PhD, Project Manager and Senior Biologist
Ecosphere Environmental Services, Inc.
320 Osuna Rd NE, Suite C-1
Albuquerque, NM 87107
(505) 954-1570

Date: February 28, 2022

6. References

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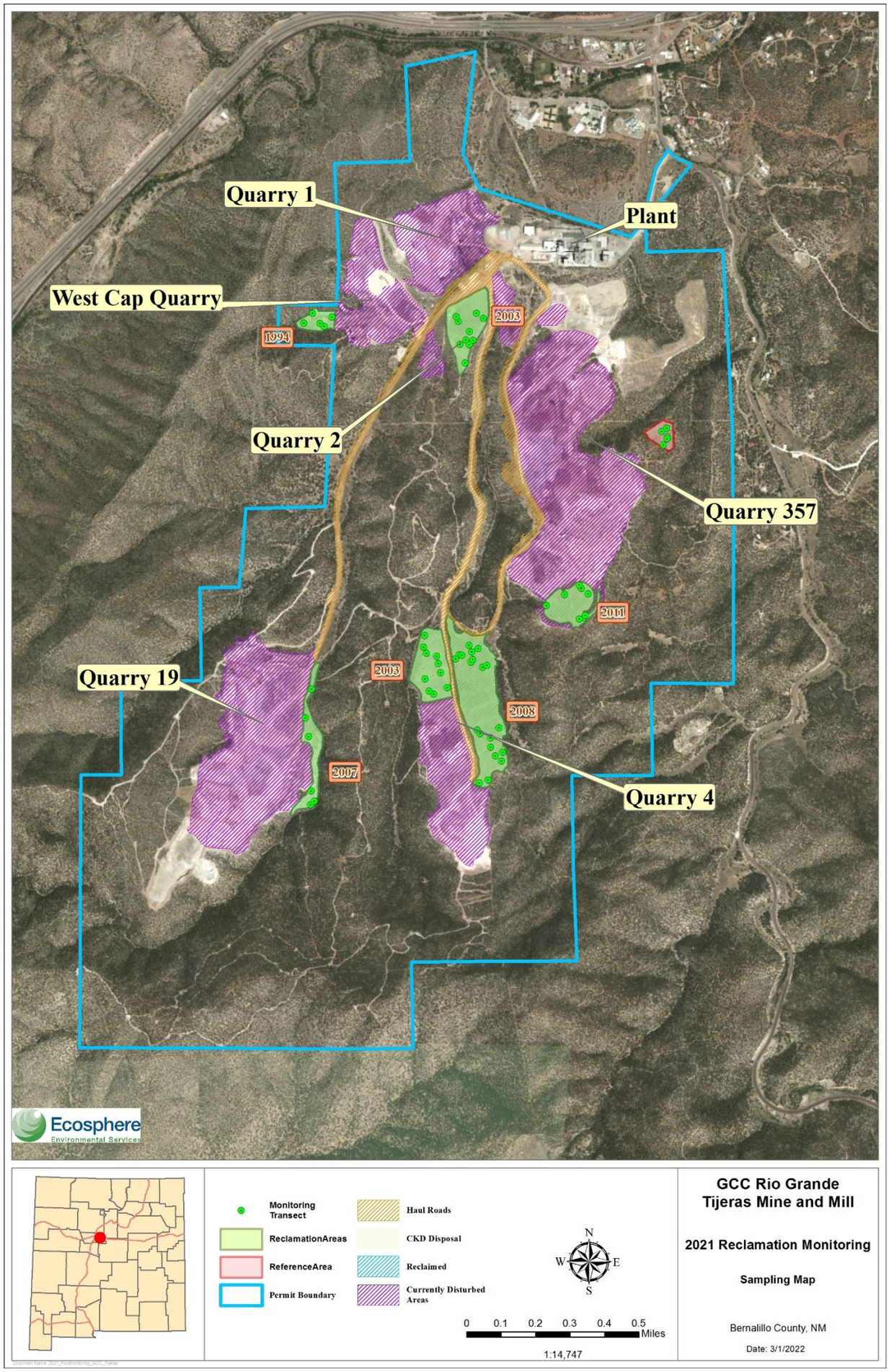
Appendix A – Map


Quarry 1
Plant
West Cap Quarry
1994
2003
Quarry 2
Quarry 357
2011
Quarry 19
2003
2008
2007
Quarry 4
Ecosphere
Environmental Services
Monitoring Transect
ReclamationAreas
ReferenceArea
Permit Boundary
Haul Roads
CKD Disposal
Reclaimed
Currently Disturbed Areas
N
W
E
S
0 0.1 0.2 0.3 0.4 0.5 Miles
1:14,747
GCC Rio Grande
Tijeras Mine and Mill
2021 Reclamation Monitoring
Sampling Map
Bernalillo County, NM
Date: 3/1/2022

Appendix B - Species Tables

Table B-1. Average Cover Values for Transects in the Reference Area.

Reference Cover (n=5)		
Species	**Common Name**	**Average Percent Cover (%)**
Bouteloua gracilis	blue grama	29.55
Pleuraphis jamesii	galleta grass	0.16
Artemisia frigida	fringed sagebrush	0.24
Gutierrezia sarothrae	broom snakeweed	3.20
Cylindropuntia imbricata	tree cholla	2.08
Opuntia polyacantha	plains prickly pear	6.68
Yucca baccata	banana yucca	0.72
Yucca glauca	small soapweed	3.36
Juniperus monosperma	oneseed juniper	14.00
Pinus edulis	Colorado pinon	2.00
Total Vegetation	**Total Vegetation**	**62.00**
Litter	**Litter**	**4.72**
Bare Ground	**Bare Ground**	**33.28**

Table B-2. Average Cover Values for Transects in Areas Reclaimed in 1994.

1994 Reclamation Cover (n=5)		
Species	**Common Name**	**Average Percent Cover (%)**
Achnatherum hymenoides	Indian ricegrass	8.12
Aristida purpurae	purple threeawn	8.13
Bouteloua curtipendula	sideoats grama	1.76
Muhlenbergia torreyi	ring muhly	0.24
Pseudoroegneria spicata	bluebunch wheatgrass	10.86
Sporobolus cryptandrus	sand dropseed	0.43
Helianthus annuus	sunflower	0.26
Marrubium vulgare	white horehound	0.16
Salsola tragus	Russian thistle	10.61
Sphaeralcea coccinea	scarlet globemallow	1.02
Tragia nepetifolia	catnip noseburn	0.88
Cercocarpus montanus	mountain-mahogany	1.04
Gutierrezia sarothrae	broom snakeweed	2.68
Total Vegetation	**Total Vegetation**	**46.20**
Litter	**Litter**	**7.30**
Bare Ground	**Bare Ground**	**46.50**

Table B-3. Average Cover Values for Transects in Areas Reclaimed in 2003.

2003 Reclamation Cover (n=20)		
Species	**Common Name**	**Average Percent Cover (%)**
Achnatherum hymenoides	Indian ricegrass	7.00
Bouteloua curtipendula	sideoats grama	5.38
Bouteloua hirsuta	hairy grama	5.97
Bromus tectorum	cheatgrass	0.16
Muhlenbergia torreyi	ring muhly	1.92
Pascopyrum smithii	western wheatgrass	10.02
Pleuraphis jamesii	galleta grass	3.85
Pseudoroegneria spicata	bluebunch wheatgrass	2.91
Sporobolus cryptandrus	sand dropseed	0.47
Heliomeris multiflora	Showy goldeneye	1.94
Melilotus albus	white sweet clover	1.77
Atriplex canescens	four-wing saltbush	13.72
Ericameria nauseosa	chamisa	8.07
Fallugia paradoxa	Apache plume	0.38
Gutierrezia sarothrae	broom snakeweed	0.93
Krascheninnikovia lanata	winterfat	0.86
Cylindropuntia imbricata	tree cholla	0.72
Total Vegetation	**Total Vegetation**	**66.06**
Litter	**Litter**	**8.28**
Bare Ground	**Bare Ground**	**25.66**

Table B-4. Average Cover Values for Transects in Areas Reclaimed in 2007.

2007 Reclamation Cover (n=6)		
Species	**Common Name**	**Average Percent Cover (%)**
Achnatherum hymenoides	Indian ricegrass	0.53
Aristida purpurae	purple threeawn	1.40
Bouteloua curtipendula	sideoats grama	4.60
Elymus elymoides	squirreltail	1.27
Pascopyrum smithii	western wheatgrass	3.11
Pleuraphis jamesii	galleta grass	11.99
Pseudoroegneria spicata	bluebunch wheatgrass	0.47
Sporobolus cryptandrus	sand dropseed	0.20
Bassia scoparia	burningbush	0.80
Heliomeris multiflora	Showy goldeneye	1.75
Melilotus albus	white sweet clover	0.34
Salsola tragus	Russian thistle	0.33

2007 Reclamation Cover (n=6)		
Atriplex canescens	four-wing saltbush	13.27
Ericameria nauseosa	chamisa	7.63
Gutierrezia sarothrae	broom snakeweed	0.53
Krascheninnikovia lanata	winterfat	3.15
Total Vegetation Cover	**Total Vegetation Cover**	**51.38**
Litter	**Litter**	**11.87**
Bare Ground	**Bare Ground**	**36.75**

Table B-5. Average Cover Values for Transects in Areas Reclaimed in 2008.

2008 Reclamation Cover (n=20)		
Species	**Common Name**	**Average Percent Cover (%)**
Achnatherum hymenoides	Indian ricegrass	11.91
Andropogon hallii	sand bluestem	0.28
Aristida purpurae	purple threeawn	0.38
Bouteloua curtipendula	sideoats grama	3.30
Bouteloua gracilis	blue grama	0.52
Bromus tectorum	cheatgrass	0.12
Elymus elymoides	squirreltail	0.58
Pascopyrum smithii	western wheatgrass	6.31
Pleuraphis jamesii	galleta grass	5.66
Pseudoroegneria spicata	bluebunch wheatgrass	0.63
Helianthus annuus	sunflower	0.08
Heliomeris multiflora	Showy goldeneye	0.68
Melilotus albus	white sweet clover	0.70
Mentzelia sp.	blazingstar	0.08
Penstemon angustifolius	broadbeard beardtongue	2.00
Salsola tragus	Russian thistle	0.14
Atriplex canescens	four-wing saltbush	6.82
Ericameria nauseosa	chamisa	0.70
Fallugia paradoxa	Apache plume	0.80
Gutierrezia sarothrae	broom snakeweed	0.20
Purshia tridentata	antelope bitterbrush	0.80
Quercus gambelii	Gambel oak	0.48
Rhus aromatica	fragrant sumac	3.35
Total Vegetation Cover	**Total Vegetation Cover**	**46.53**
Litter	**Litter**	**21.22**

2008 Reclamation Cover (n=20)		
Bare Ground	**Bare Ground**	**32.26**

Table B-6. Average Cover Values for Transects in Areas Reclaimed in 2011.

2011 Reclamation Cover (n=8)		
Species	**Common Name**	**Average Percent Cover (%)**
Achnatherum hymenoides	Indian ricegrass	7.82
Bouteloua curtipendula	sideoats grama	0.95
Bouteloua hirsuta	hairy grama	0.29
Elymus elymoides	squirreltail	2.51
Pascopyrum smithii	western wheatgrass	9.53
Pleuraphis jamesii	galleta grass	1.30
Pseudoroegneria spicata	bluebunch wheatgrass	0.49
Sporobolus cryptandrus	sand dropseed	2.83
Heterotheca villosa	hairy goldenaster	0.15
Melilotus albus	white sweet clover	3.24
Penstemon angustifolius	broadbeard beardtongue	0.59
Salsola tragus	Russian thistle	0.35
Atriplex canescens	four-wing saltbush	0.15
Fallugia paradoxa	Apache plume	1.18
Gutierrezia sarothrae	broom snakeweed	1.30
Total Vegetation Cover	**Total Vegetation Cover**	**32.69**
Litter	**Litter**	**19.32**
Bare Ground	**Bare Ground**	**47.99**

Attachment 4 – Closeout Plan

Closeout Plan

GCC Rio Grande Tijeras Mine and Mill

Prepared for
GCC Rio Grande, Inc.

Prepared by
Barr Engineering Co.

May 2026

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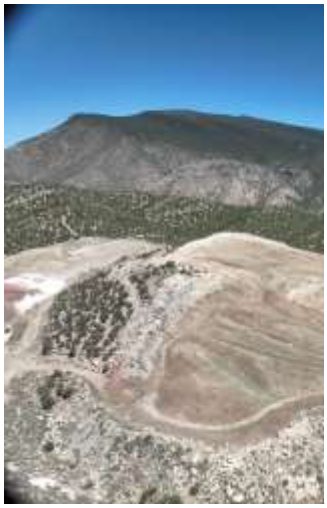

Tijeras Mine and Mill Closeout Plan

May 2026

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Abbreviations

cfs	cubic feet per second
USEPA	U.S. Environmental Protection Agency
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, which consists of a Portland cement plant and multiple open-pit limestone quarries. The company projects that it has sufficient reserves to continue operating the Tijeras Mine and Mill at current production levels for several more decades.

GCC is submitting this revised closeout plan to the New Mexico Energy, Minerals and Natural Resources Department, Mining and Minerals Division (MMD) as a revision to MMD Permit # BE001RE, which authorizes mining and reclamation activities on the site. The goal of this plan is to provide for the re-establishment 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 is 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 has a completed long-term mining plan. To date, approximately 750 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, and an additional 22 acres are in the process of being reclaimed in 2023.

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 is 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
- 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, which consists of a Portland cement plant and multiple surface limestone quarries located near the Village of Tijeras, New Mexico [1].

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 a 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).

This plan aims to provide for the re-establishment of a "self-sustaining ecosystem" in the permit area following closure, consistent with the surrounding area and post-mining land use. It 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 a 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 and 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 #17-1, which was a modification for FA instrument replacement of 867,000.00.

On October 10,2019, MMD issued Permit Modification #18-1, which completed the August 19,2015 requested from MMD updating the closeout plan and associated financial assurance.

On July 15, 2020, MMD issued Permit Modification 20-1, which defined exploration activities and off-spec coal management.

On May 17, 2021, MMD issued Permit Modification 21-1, which increased the total allowable hole depth for exploration drilling activities.

On November 16, 2021, MMD issued Permit Modification 21-2, which increased the design limits by 270.17 acres in existing quarries 2, 4, 6, 8, 10, 15 and 18(19N) and new unit Quarry 17.

On August 5, 2022, MMD issued Permit Modification 22-01, establishing and stipulating new vegetative success criteria for reclamation associated with BE001RE.

2 Site-specific Characteristics

2.1 General

The Tijeras Mine and Mill are located in Bernalillo County in the East Mountain area, approximately 15 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.

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 Map 1.

The Tijeras Mine and 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 the surrounding area are shown in Map 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 materials. 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.

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

Location	Distrubed 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	49.32	-	0.00%
Secondary Roads and Exploration Pads	58.8	-	0.00%
Cement Kiln Dust Disposal	4.76	-	0.00%
Quarry 1	45.00	23.00	51.11%
Quarry 2	24.24	11.93	49.22%
Quarry 3	104.4	12.06	11.55%
Quarry 4	109.81	107.66	98.04%
Quarry 5	42.92	-	0.00%
Quarry 7	52.66	-	0.00%
Quarry 9	75.83	-	0.00%
Quarry 17/18	18.5	-	0.00%
Quarry 19	119.24	6.46	5.42%
West Cap Quarry	31.68	5.80	18.31%
East Cap Quarry	3.58	-	0.00%
Total Disturbed Area (Including Reclaimed)	772.83	209.83	27.15%

Table 2-2 Historical Reclamation Campaigns

Location	Activity	Area	Date
West Cap Quarry	Reclaimed USFS West Cap Quarry	3.25	Reclaimed (1994)
Quarry 2	Reclaimed Quarry 2 and Test Plots	11.93	Reclaimed (2003)
Quarry 4	Reclaimed Quarry 4 (East of haul road)	32.83	Reclaimed (2008)
Quarry 4	Reclaimed Quarry 4 (West of haul road)	14.22	Reclaimed (2003)
Quarry 19	Reclaimed Corral Canyon Drainage	6.46	Reclaimed (2007)
Quarry 3	Reclaimed South End Quarry 3	12.06	Reclaimed (2011)

Table 2-3 5-Year Reclamation Plan

Location	Year Started	Year Completed	Acres Reclaimed
Quarry 1	2019	2023	22.50
Quarry 5	2024	2028	41.61

Limestone for cement production is mined from the on-site quarries. Quarry locations include the West Cap Quarry and Quarries 1, 2, 3, 4, 5, 7, 17, and 19. Approximately 750 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.

Map 3 is an aerial map showing the permit area and the current mine footprint, impacted by past and current mining activities, including mined areas, reclaimed areas, haul roads, and other access roads. Map 3 also shows the cement plant and the surrounding area.

GCC Rio Grande has a mine schedule for the next 5 years, completed in 2022. The company projects that it has sufficient resources to continue to operate the Tijeras Mine and Mill at current production levels for several more decades. However, only those resources for which a mining plan has been defined are identified in this Closeout Plan. For the next 11 years (Table 2-4), the mining footprint is expected to increase, as shown in Map 3

Table 2-4 Planned Disturbance at Tijeras Mine and Mill

Quarry	Year	Acres
Quarry 17N	2038	4.00
	2039	4.00
	2040	4.00
	2041	4.00
	2042	2.00
Subtotal to be Disturbed		**18.00**
Quarry 3	2023	4.00
	2024	4.50
Subtotal to be Disturbed		**8.50**
Quarry 2 - ABO Block	2035	3.00
	2036	3.20
Subtotal to be Disturbed		**6.20**
Quarry 19	2026	3.00
	2027	3.00
	2028	4.00
	2029	4.00
	2030	4.00
	2031	4.00
	2032	4.00
	2033	4.00
	2034	4.00
	2035	4.00
	2036	4.00
	2037	4.00
Subtotal to be Disturbed		**46.00**
Total		**78.70**

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 Exploration and Blasting Activities

The Tijeras Mine and Mills exploration activities are conducted only within the permit area of BE001RE Permit. If GCC plans to explore outside of the permit area, it will apply for a separate exploration permit, a separate minimal-impact exploration permit, or a minimal-impact exploration operation.

The Tijeras Mine and Mill exploration shall not exceed 2 acres of surface disturbance and a total hole depth of 7,170 feet at any given time. Once the exploration campaign is completed the drill holes will be reclaimed to MMD drill plugging standards or the Office of State Engineer.

Stratigraphic and structural geology is complex; continued exploration drilling is necessary to better understand the limestone deposit. Exploration drilling and mapping will be ongoing at the Tijeras Mine during the life of the operation. Tijeras Mine and Mill has a current exploration campaign in progress.

Tijeras Mine and Mill has ongoing blasting activities to maintain operations. GCC has two permanent seismographs on site to measure all seismic activities. Tijeras Mine and Mills provides notification to the Village of Tijeras at least 24 hours prior to the scheduled blast occurring.

2.4 Climate

The Tijeras Mine and Mill is 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.

2.5 Geology

The Tijeras Mine and Mill permit area is 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 due to considerable folding, 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 is 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 concentrated 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.

2.6 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 water runoff from the permit area flows into three major channels: Apachitos Canyon, Corral Canyon, and Cedro Canyon. Apachitos Canyon flows into Corral Canyon west of the cement plant, and then flows into Sediment Pond No. 1 (Outfall 001). Outfall 001 discharges into Corral Canyon, which then flows into Tijeras Arroyo and eventually into the Rio Grande. Stormwater from the northeast corner of the plant site, encompassing less than 160 acres, discharges to Outfalls 002 and 003 (Map 3). Stormwater runoff from Outfall 002 flows northerly, eventually discharging into Tijeras Arroyo. Outfall 001 only rarely discharges; over the last 5 years, fewer than 5 discharges have occurred. The most recent discharge from "Sediment Pond No. 1" occurred in September of 2015

Outfall 003 is located in the northeast corner of the permit boundary, receiving runoff from the plant access road and discharging into Cedro Canyon. The Cedro Canyon Watershed is approximately 12,555 acres at its confluence with Tijeras Arroyo (Map 4), and about 476 acres of the Cedro Canyon watershed are within the Tijeras Mine permit boundary.

No water quality data is available for ephemeral or intermittent streams in smaller watersheds like Apachitos Canyon, Cedro 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 macroinvertebrate impairment.

The only known groundwater located within the permit area occurs 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 upgradient 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. These wells will remain in place after the mine closes.

The New Mexico Environment Department has determined the GCC Rio Grande does not require a discharge permit based on the test results found in Table 2-5. See the New Mexico Environment Department No Discharge Permit Required Letter in Appendix A.

Drinking water analytical results are shown in Table 2-6.

Table 2-5 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

Table 2-6 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 CaCO3)	None	mg/L CaCO3	<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
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

Analyte	NM WQCC Standard	Unit	Well # 3	CT Out	Plant Water Drain
Specific Conductance	None	µmhos/cm	1,000	1700	950
Sulfate	600	mg/L	140	280	150
Total Alkalinity (CaCO3)	None	mg/L CaCO3	258.7	473.2	215.1
Total Dissolved Solids	1,000	mg/L	636	1,200	614

2.7 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 extend 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.).

2.8 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 auritus*), 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 (*Thanmnophis elegans vagrens*), 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 are listed in Table 2-7. Species whose habitats do not occur in the project area were not considered further.

Table 2-7 Special status species potentially occurring within the project area

Taxon	Status	Habitat Type
Southwestern willow flycatcher (*Empidonax traillii extimus*)	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 (*Hybognathus amarus*)	Endangered	Aquatic – There is no direct connection for water to flow from the project area into the silvery willow habitat.
Mexican spotted owl (*Strix occidentalis lucida*)	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 (*Zapus hudsonius luteus*)	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 (*Coccyzus americanus*)	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.

2.9 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 PDSD 2006).

The Tijeras Pueblo, located approximately 0.50 miles 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 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.

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 the present-day Tijeras, New Mexico, area by the 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 PDSD 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.

2.10 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 waste, including used oil, greases, reagents, cleaning materials, and other chemicals, is temporarily stored on-site in appropriate containers. All waste chemicals are removed and disposed of off site at approved facilities. Similarly, any remaining chemicals will be shipped off site 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 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 being 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 this 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 emissions from the 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 six 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 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 due to their chromium content. 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 it 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 and 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 being developed. The mine has two slope failures on site, see Map 6. See Map 7 for the slope stability analysis, 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. Map 4 identifies selected post-mining land uses. 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 750 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 to zoning or land use are proposed for the permitted area. The successful reclamation of the test plots demonstrates that reclamation of the property to meet its proposed land uses is feasible and can be fully achieved.

Once its operations cease and reclamation is successfully completed, GCC Rio Grande does not currently plan to retain 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 (Map 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.

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 (Section 5.3.5).

While the preference is to dispose of 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, off-site disposal will be required. As a conservative effort, the bond for the closeout plan has been adjusted to cover the 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 operational purpose.

5.2 Channel Restoration

In the Plant area, the final grading to the sediment basin (Sediment Pond 1) and Corral Canyon will be completed. Once reclamation is completed in the upgradient watershed, Sediment Pond 1 will not be necessary as a treatment feature. Sediment Pond 1 may remain as a wildlife feature; however, Corral Canyon will be restored such that it bypasses Sediment Pond 1. Therefore, Sediment Pond 1 will not interrupt sediment continuity of the restored Corral Canyon Channel.

Corral and Apachitos Canyons drain most of the permit area, with a total tributary area of approximately 2,000 acres. During Mine Closeout and post-restoration, Corral Canyon and its tributary, Apachitos Canyon, will be reconstructed and connected to an undisturbed reach of Corral Canyon near the downstream permit boundary. The conceptual design for channel restoration (Map 8, Map 9 and Map 10) was developed with consideration of the pre-mining drainage configuration of Apachitos Canyon and Corral Canyon. The pre-mining drainage configuration is visible in an aerial image from 1951, and a 1954 USGS topographic map provides relevant pre-disturbance contours (Map 11). Review of the pre-mining

mapping indicates that Corral Canyon was most likely a combination sand- and gravel-bed ephemeral channel with a moderate longitudinal gradient between 3 and 4 percent. Furthermore, Corral Canyon appears to have had at least some reaches with a wide terrace or floodplain and a smaller, more sinuous inset channel. Apachitos Canyon drains a much smaller watershed (about 1/3 the size of Corral Canyon's) and did historically include a moderate nick point (3.2 percent bedslope transitioning to 5.0 percent bedslope) near its confluence with Corral Canyon. Given the regional setting and the aerial photography, Corral Canyon and Apachitos Canyon would have delivered significant sediment loading (and runoff) to downstream arroyos such as Tijeras Arroyo. The pre-mining channel dimensions shown in Table 5-1 include some error since they are based upon historic contour mapping with a 40-foot contour interval, hand-drawn stream centerlines, and channel shape features that are not clearly distinguishable on the 1951 aerial photograph.

Table 5-1 Pre-Mining Stream Channel Widths

Stream Attribute	1951 Conditions
Corral Canyon Floodplain Width	60 ft to 160 ft
Corral Canyon Inset Channel Width	20 ft to 30 ft
Apachitos Canyon Floodplain Width	20 ft to 80 ft
Cedro Canyon Inset Channel Width	25 ft to 35 ft
Tijeras Arroyo Inset Channel Width	40 ft to 70 ft

Based on measurements from the 1951 aerial photograph, the pre-mining Corral Canyon channel bottom width varied from roughly 20 to 30 feet wide. The current conceptual channel design for Corral Canyon proposes a 20-foot bottom width, which is consistent with the channel's pre-mining characteristics. Apachitos Canyon has a much smaller watershed area, approximately 1/3 as large as Corral Canyon's, and the pre-mining channel bottom width was indistinguishable from the 1951 aerial photograph. The conceptual channel design for Apachitos Canyon includes a bottom width of 10 feet.

The goals of restoration for Corral Canyon and Apachitos Canyon are to re-establish the channels and re-establish functions that were impacted by mining, specifically hydrologic continuity and sediment transport continuity. Historically, these channels had sand or sand and gravel channel beds that would mobilize during significant storms, which is diametrically opposed to the theory of riprap installation, where the goal is to prevent any movement of particles (stones). Therefore, the conceptual design restores Apachitos and Corral Canyon to their pre-mining geometry and longitudinal gradients so that riprap is not necessary for stabilization.

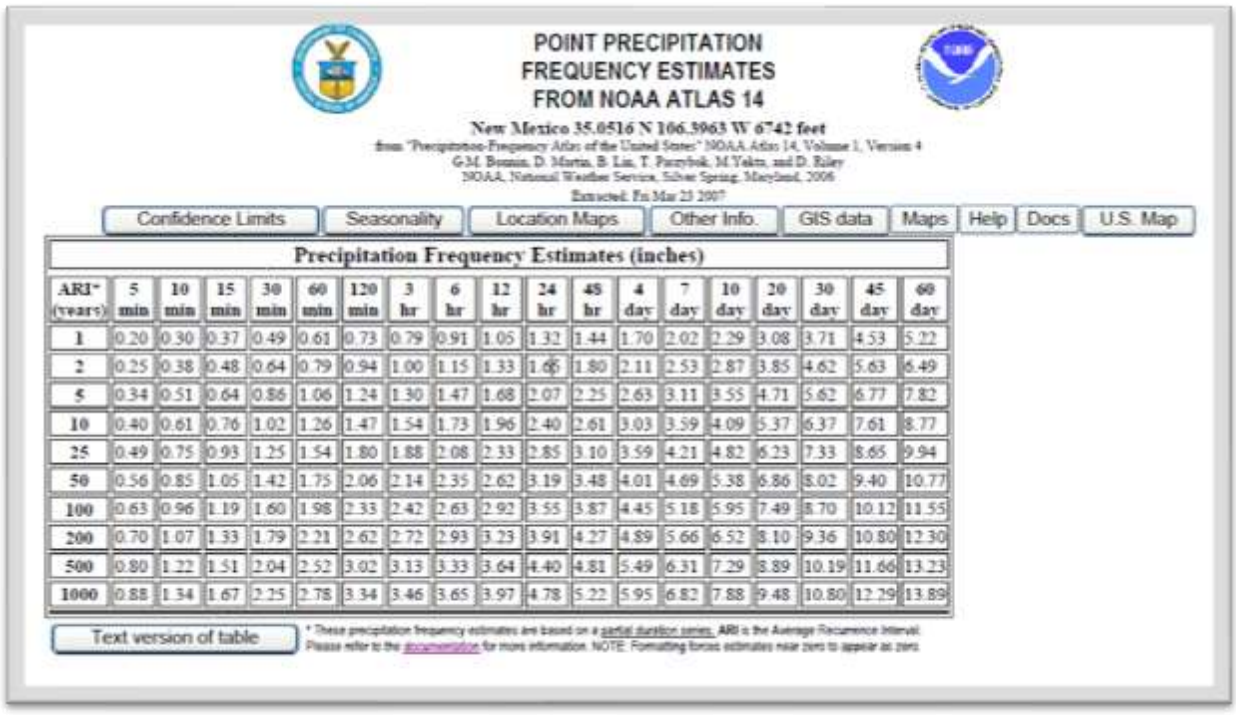
Apachitos Canyon will be restored to its approximate original alignment and gradient. Corral Canyon will be restored to a different alignment than pre-mining to minimize excavation, but with a longitudinal gradient similar to pre-mining conditions. Given that Apachitos Canyon and Corral Canyon will be restored with channel dimensions and longitudinal gradients similar to pre-mining conditions, riprap should not be necessary to stabilize the channels. Anywhere the restored channels deviate from the pre-mining alignments, those deviations do not result in a significantly steeper channel or include an abrupt change in channel gradient that would produce a severe nick point.

Channel width was variable prior to mining, and the final design channel width should be similar to values observed during pre-mining times (20- to 30-feet wide for Corral Canyon). The reconstructed side slopes in Corral Canyon and Apachitos Canyon may vary to fit the terrain. It is recommended that the

reconstructed side slopes not exceed 3h:1v for construction safety; however, the restored channel side slopes should be allowed to adjust after flow events.

The restored channel beds will be densely compacted; however, the restored channel side slopes should not be compacted so densely that it inhibits riparian vegetation development. The channel substrate will likely change after construction as a result of episodic storm events that produce sediment. The restored channels should be allowed to migrate laterally and develop point bars and cut banks, which are normal processes for ephemeral streams in this environment.

Hydrology estimates will be supported by at least one of the methodologies described below. Methods for hydrologic modeling may include USGS Regional Regression Equations developed for New Mexico by the USGS (Waltemeyer, 2008), or rainfall runoff methods that use unit hydrograph methodology and rainfall distribution curves developed specifically for New Mexico (such as SEDCAD 4.0™ with the New Mexico Type II-70 rainfall distribution), or other methodologies, provided they are documented for each design situation. If rainfall runoff relationships are used for hydrologic calculations, then rainfall depths from NOAA Atlas 14 (Bonnin, et al, 2004) should be used for calculations (Figure 5-1), unless site-specific data become available.



POINT PRECIPITATION FREQUENCY ESTIMATES FROM NOAA ATLAS 14

New Mexico 35.0516 N 106.3963 W 6742 feet

from "Precipitation-Frequency Atlas of the United States" NOAA Atlas 14, Volume 1, Version 4
G.M. Bonnin, D. Martin, B. Lin, T. Parzybok, M.Yekta, and D. Riley
NOAA, National Weather Service, Silver Spring, Maryland, 2006

Extracted: Fri Mar 23 2007

Confidence Limits | Seasonality | Location Maps | Other Info. | GIS data | Maps | Help | Docs | U.S. Map

Precipitation Frequency Estimates (inches)

ARI* (years)	5 min	10 min	15 min	30 min	60 min	120 min	3 hr	6 hr	12 hr	24 hr	48 hr	4 day	7 day	10 day	20 day	30 day	45 day	60 day
1	0.20	0.30	0.37	0.49	0.61	0.73	0.79	0.91	1.05	1.32	1.44	1.70	2.02	2.29	3.08	3.71	4.53	5.22
2	0.25	0.38	0.48	0.64	0.79	0.94	1.00	1.15	1.33	1.65	1.80	2.11	2.53	2.87	3.85	4.62	5.63	6.49
5	0.34	0.51	0.64	0.86	1.06	1.24	1.30	1.47	1.68	2.07	2.25	2.63	3.11	3.55	4.71	5.62	6.77	7.82
10	0.40	0.61	0.76	1.02	1.26	1.47	1.54	1.73	1.96	2.40	2.61	3.03	3.59	4.09	5.37	6.37	7.61	8.77
25	0.49	0.75	0.93	1.25	1.54	1.80	1.88	2.08	2.33	2.85	3.10	3.59	4.21	4.82	6.23	7.33	8.65	9.94
50	0.56	0.85	1.05	1.42	1.75	2.06	2.14	2.35	2.62	3.19	3.48	4.01	4.69	5.38	6.86	8.02	9.40	10.77
100	0.63	0.96	1.19	1.60	1.98	2.33	2.42	2.63	2.92	3.55	3.87	4.45	5.18	5.95	7.49	8.70	10.12	11.55
200	0.70	1.07	1.33	1.79	2.21	2.62	2.72	2.93	3.23	3.91	4.27	4.89	5.66	6.52	8.10	9.36	10.80	12.30
500	0.80	1.22	1.51	2.04	2.52	3.02	3.13	3.33	3.64	4.40	4.81	5.49	6.31	7.29	8.89	10.19	11.66	13.23
1000	0.88	1.34	1.67	2.25	2.78	3.34	3.46	3.65	3.97	4.78	5.22	5.95	6.82	7.88	9.48	10.80	12.29	13.89

Text version of table

* These precipitation frequency estimates are based on a partial duration series. ARI is the Average Recurrence Interval.
Please refer to the documentation for more information. NOTE: Formatting forces estimates near zero to appear as zero.

Figure 5-1 NOAA Atlas 14 Precipitation Estimates for GCC Tijeras Mine

5.2.1 Floodplain and Channel Width Consideration

Corral Canyon and Apachitos Canyon conceptual channel floodplain widths will be restored. Both reconstructed channels will have similar longitudinal gradients and channel geometry as pre-mining conditions. Additionally, the reclaimed channel geometry will consider and be compatible with their respective geomorphological conditions at the time they are reclaimed.

As examples, there have been considerable changes to other nearby streams that weren't impacted by mining operations (e.g., Cedro Canyon and Tijeras Arroyo). Currently, the channel bed and banks of Cedro Canyon and Tijeras Arroyo are significantly colonized with vegetation, with a narrower active channel width than they had in 1951 (Map 12). More changes may occur by the time restoration commences on Corral Canyon and Apachitos Canyon.

The conceptual restoration plan specifies trapezoidal channel geometry for Corral Canyon and Apachitos Canyon. It is noted that the restored channels may be expected to change in response to future hydrologic events, with potential formation of point bars, cutbanks, and floodplain benches.

The active channel bottom and top of bank cross-section widths approximate their pre-mining conditions. Current conceptual dimensions for these two channels are provided in (Table 5-2).

Table 5-2 Summary of Active Channel and Floodplain Widths for Corral and Apachitos Canyons

Channel Location	Active Channel Cross-Section Width (Linear Feet)	Floodplain Cross-Section Width (Linear Feet)
Corral Canyon	20	50
Apachitos Canyon	10	40

A 10-foot bottom width was chosen for Apachitos Canyon for the following reasons:

- It has a smaller watershed area than Corral Canyon
- A 10-foot bottom width is readily constructed using earth-moving equipment in service at the quarry.

The design bottom width is at least as wide as several similar watersheds/channels nearby. The Apachitos Canyon channel design is for the 100-year, 24-hour storm. Additionally, downstream hydraulic geometry relationships were computed for Coral Canyon and then applied to Apachitos Canyon.

Tunnel Canyon and another unnamed tributary of Cedro Canyon are nearby, with similar watershed areas as Apachitos Canyon. These drainages are somewhat impacted by hiking trails, but serve as a least-disturbed analog for channel width. The channel bottom width varies considerably, but there are reaches with bottom widths ranging from 5 to 10 feet wide. There were no observable reaches with these watersheds with channel bottom widths greater than 10 feet.

For the purpose of analyzing downstream hydraulic geometry, Corral Canyon and Apachitos Canyon peak discharges were calculated using USGS regional regression equations (Waltemeyer, S.D., 2008) for the 10-year storm (Q10) and the 100-year storm (Q100).

$$Q10 = 490.6 * A0.383$$

$$Q100 = 1374 * A0.359$$

Table 5-3 Peak Discharges for the Q10 and Q100 Using USGS Regional Regression Equations

Parameter	Corral Canyon	Apachitos Canyon
Watershed Area (acres)	1,829	445
Peak Discharge at Q10 (cubic feet per second)	734	427
Peak Discharge at Q100 (cubic feet per second)	2,003	1,206

The downstream hydraulic geometry equation for channel width is:

$$W = a * Q0.5$$

Where:

W is channel width
a is a coefficient influenced by vegetation, soils, sediment load, flow regime, etc.
Q is discharge.

The a-coefficient was computed for Corral Canyon using the known values for floodplain width (50-ft) and calculated using the Q10 and Q100. The Q10 and Q100 storm were chosen since both of these storms should be large enough to temporarily access the floodplain. The a-coefficient was then applied to the Q10 and Q100 for Apachitos Canyon. The calculated widths are 38.1 ft and 38.8 ft which are very near the designed floodplain width of 40 ft. The Apachitos trapezoidal channel with a 40-foot top width, a 5-foot depth and 3:1 side slopes results in a 10-foot channel bottom width.

In summary, the 10-foot Apachitos Canyon bottom width was chosen because it is constructible with large equipment, consistent with Corral Canyon on the basis of downstream hydraulic geometry, and similar in size to nearby analogous channels. Apachitos Canyon, and Corral Canyon, are the largest channels flowing through the permit area, with sufficient stream flow and sediment supply to become dynamic channels. The initially constructed trapezoid should be expected to change into a more complex shape with floodplain benches, cut banks and point bars, and a dynamic low-flow channel.
Watersheds within the permit area are ephemeral. Most of the reclaimed drainages are upland features with relatively steep gradients and nominal potential for infiltration. The depth to impermeable strata is characteristically well below riparian vegetation rooting depths. Furthermore, most of the upland drainages do not have sufficiently large watershed areas to support riparian vegetation. Never-the-less, as reclamation proceeds reconstructed drainages will be periodically evaluated for their potential as riparian habitat. If potential riparian habitat is identified, appropriate riparian plant species will be planted. Coral Canyon and Apachitos Canyon are the drainages that might potentially support riparian vegetation based on their lower positions in their respective watersheds. They also have lower channel gradients and have the largest watershed area(s) within the permit area, which increases their riparian habitat potential.

5.2.2 Riprap

Riprap is one possible treatment for stabilizing eroding channels, among a suite of design options. Riprap is not a sustainable, long-term solution for stabilizing the relatively large drainages such as Corral Canyon and Apachitos Canyon due to its interference with the normal fluvial process of sediment transport.

Additionally, riprap channel lining is unlikely to remain in place during major storm events. However, mining activities and subsequent reclamation work may result in steep channel gradients for tributary channels to Corral Canyon and Apachitos Canyon. In these cases, due to the relatively smaller watershed size, riprap may be used as a stabilization measure. Stable riprap implementation requires accurate hydrology estimates, as discussed in Section 5.2.2, suitable riprap sizing equations for design, and proper installation techniques.

Riprap sizing methods include software such as SEDCAD 4.0™ (which has been previously used for hydrology and riprap design at the GCC Tijeras Mine), or laboratory or empirical equations may be applied manually, such as Equation 1 (Abt and Johnson, 1991) shown below.

$$D_{50} = 5.23S^{0.43}q^{0.56}$$

Where:

D_{50} is the median riprap particle size (inches)
S is the longitudinal channel gradient (ft/ft)
q is unit discharge (cfs/ft). Unit discharge is equal to total discharge divided by flow width.

Riprap may be installed as traditional rock riprap or as Soil Riprap. Soil Riprap is a mixture of native soil and riprap that approximately consists of 35 percent soil and 65 percent riprap, by volume.

Future drainage structure design will account for climate change. The current rainfall totals for the 100-year, 24-hour storm are determined from NOAA Atlas 14 (Bonnin, et al, 2011). NOAA rainfall amounts will be increased by 7 percent to account for projected future increases in precipitation due to climate change. The 7 percent increase mirrors regulations from the Colorado State Engineer for designing jurisdictional dams (DNR, 2020). The Colorado State Engineers office developed the 7 percent increase by considering the summary report entitled Colorado–New Mexico Regional Extreme Precipitation Study (Mahoney, et al, 2018). Increasing the 100-year, 24-hour precipitation (3.51 inches) by 7 percent results in a design precipitation of 3.76 inches, which is about 2.6% less than the current 200-year, 24-hour precipitation event (3.86 inches).

5.2.3 Anticipated surface configuration

Per 19.10.5.506.B(3) NMAC, a topographic map with post-closure contours is provided in Map 13. The post-closure topography includes conceptual drainage patterns as agreed to during on-site discussions with MMD. The cut-fill volumes to achieve the post-mining topography include estimated limestone volumes that will be mined over this 5-year period. Therefore, there is a net excess cut volume that approximates the projected limestone mining.

Post-closure topography is provided for all major disturbance areas. Disturbed areas are grouped into the following categories:

- Disturbed–Areas disturbed by mining based on aerial imagery. Includes all disturbances, historic and current, and areas that are now reclaimed, as estimated from aerial imagery. Support and production facility disturbances are included.
- Passively Reclaimed–Disturbed land that is establishing primarily native vegetation through regrowth, colonization, or seed rain from adjacent lands. The area has positive drainage. Sparse areas may be supplemented during the Close Out Plan period with seeding, mulch, or other

surficial treatment as needed. No additional drainage structures or significant grading are anticipated.

- Reclamation Completed–Areas that have been backfilled and graded, drainage structures constructed, topdressing placed, and revegetated with permanent seed mixtures. Revegetation may be in various stages of development.

- Remaining Reclamation–Disturbed lands that are not reclaimed. Additional mining is ongoing or anticipated prior to final reclamation activities.

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 earth fill 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 (Map 3), 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 Quaries 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 (Map 3) 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 details 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 (Map 2). 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 (Map 2), 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 locations 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 rainwater 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 in 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 Roads

Roads will be retained or reclaimed as shown on Map 13. Roads were classified as either main haul roads or secondary roads with average road surface travel widths of 50 feet or 18 feet, respectively. Retained main and secondary roads will be narrowed to a target width of 12 feet or 8 feet, respectively. It is anticipated that earthen materials used in their safety berms and road fills will be a suitable plant growth medium and have adequate volumes to topdress road disturbances outside of the retained travel surface. Similarly, reclaimed main and secondary roads will use road fills and safety berm materials as topdressing. Decompaction will be accomplished by ripping the reclaimed road travel surface when necessary.

Exploration roads will use existing surface materials left in place when they were established as suitable topdressing. These surface materials are expected to provide a suitable plant growth medium. Ditches or berms along their sides will be graded to reestablish overland flow patterns. During reclamation operations, care will be taken to minimize disturbance to vegetation established within exploration roads and adjacent undisturbed land.

The linear footage of roads to be retained, reclaimed, or that are currently reclaimed are shown below in Table 5-4. Please note that existing roads to be reclaimed that are within individual quarry boundaries are excluded from Table 5-4. Those portions of road will be reclaimed during quarry reclamation.

Table 5-4 Road Retention and Reclamation Summary

Type of Road	Retained Length (LF)	Length to Reclaim (LF)	Length Currently Reclaimed (LF)	Total Length (LF)
Main Haul Road	14,343	0	0	14,343
Secondary Road	33,087	44,111	9,522	86,720
Totals	47,430	44,111	9,522	101,063

LF=linear feet

5.3.5 Reference Area

GCC has an approved reference area that allowed the facility to update the success criteria for the facility reclamation standard. Section 5.3.6 provides the information from the reference area. Map 14 shows the current location of the reference area.

GCC is proposing to select a new reference area (Map 15). Option 1 is the Quarry 4 reclamation area that is up for bond release. Option 2 is a mixture of juniper with some open areas of vegetation, shown on Photo C.1 and Photo C.2, in Appendix C, and Map 14 and Map 15, and also show the differences between the potential replacement options

5.3.6 Revegetation

5.3.6.1 Background

The Tijeras Mine and Mill was first permitted in Bernalillo County after substantial earth-disturbing activities had already occurred. A reference area was selected and approved in 2022.

5.3.6.2 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 are 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 harrowers. 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 5-5 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 5-5). 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 a more even distribution of all seed materials across the planting area. Seeds with physiological adaptations that inhibit even flow through the broadcaster will be planted in the third sub-mixture. This sub-mixture will be applied separately (to different broadcasters or at different times) from sub-mixtures 1 and 2 to evenly distribute 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 5-5 Reclamation Seed Mixture

Species	Common Name	Desired Percent	PLS/ SqFt	Lbs. PLS/ Acre
Grasses				
Pascopyrum smithii	Western wheatgrass	5	1	.396
Pseudoroegneria spicata	bluebunch wheatgrass	5	2	0.622
Andropogon hallii	sand bluestem	5	1	0.385
Bouteloua curtipendula	sideoats grama	5	2	0.456
Bouteloua gracilis	blue grama	5	2	0.106
Pleuraphis jamesii	James's galleta	5	1	0.274
Achnatherum hymenoides	Indian ricegrass	5	1	0.309
Sporobolus cryptandrus	sand dropseed	5	2	0.016
Stipa neomexicana	New Mexican feathergrass	5	1	0.379
Grass Total		**45**	**9**	**2.94**
Forbs				
Achillea millifolium	western yarrow	3.5	2	0.031
Dalea purpurea	Purple Prairie Clover	3.5	1	0.207
Gaillardia aristata	Indian blanket flower	3.5	1	0.104
Linum lewisii	Lewis (Blue) flax	3.5	2	0.66
Lupinus argenteus	silver mountain lupine	3.5	2	4.760
Penstemon angustifolia	narrow-leaf penstemon	3.5	2	0.224
Ratibida columnifera	coneflower	3.5	1	0.0354
Sphaeralcea coccinea	scarlet globemallow	3	2	0.174
Forb Total		**27**	**6.2**	**6.19**
Shrubs				
Atriplex canescens	four-wing saltbush	3	1	0.837
Fallugia Paradoxa	Apache Plume	3.5	2	0.224
Krascheninnikovia lanata	winterfat	3	1	0.768
Cercocarpus montanus	mountain mahogany	3	2	1.476
Ericameria nauseosa	rubber rabbitbrush	3	1	0.109
Chrysothamnus viscidiflorus	yellow rabbitbrush	3	1	0.056
Purshia mexicana	New Mexico cliffrose	3	2	1.348
Purshia tridentata	antelope bitterbrush	3	2	5.808
Rosa woodsii	Wood's rose	3	2	1.923
Shrub Total		**27.5**	**4.8**	**12.55**
	Seed Mixture Total	**100**	**40**	**21.764**

Notes: pure live seeds = PLS

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 5-6.

Attributes that will be monitored include cover, diversity, woody plant and shrub density. The development of vegetation after it has germinated and established on all reclamation areas will be monitored using the methods described below. 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 5-6 Revegetation Monitoring Schedule

Years	Evaluation Method
1-3	Visual evaluation of germination, growth, establishment, and species composition of revegetated areas.
4	Percent cover of perennial grasses, forbs, and shrubs.
5	Visual evaluation of cover and shrub density.
6	Percent cover, shrub density, and diversity.
7	Visual evaluation of cover and shrub density.
8+	Percent cover, shrub density, and diversity.

Note: (adapted from MMD 1999)
The number of years after seeding is completed

The cover will be measured using the line intercept method. Transect locations and azimuths will be determined randomly using tools contained in the ArcGIS software suite. A measuring tape, subdivided into 1.0-foot intervals, is stretched between two points at the position found on the map. Typically, for large continuous areas on the order of hundreds of acres, a 100-foot-long transect is used. In the case of the reclamation and reference areas at the Tijeras Mine and Mill, which vary from 1 to 29 acres, a 25-foot-long transect is proposed. 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. Two vegetation levels are included for cover measurements: basal and canopy. 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. Woody plant density will be evaluated by moving down one side of the tape and returning on the other, counting the number of all individuals of shrubs/woody species in an area three feet perpendicular to the tape. This samples an area 6 feet wide by 25 feet long, or 150 square feet. Data are reported as the number of shrubs per acre. The Simpson's index will be used to estimate species diversity (Simpson 1949). Simpson's index emphasizes the dominant and abundant species rather than the rare species that vary in their occurrence from place to place (Barbour et al. 1987).

$$C = \sum_{l=1}^{S} (pi)^2$$

Where:

C = the index number,

s = the total number of species in the sample, and
p_i = the proportion of all individuals in the sample (plot, transect) that belong to species I.

Evaluation of Revegetation Success – Beginning in the 10th year after seeding, revegetation success will be tested against the approved reference area.

Table 5-7 Proposed vegetation success criteria

Category	Standard
Foliage or Basal Cover	equal to 98% of the reference area to within a 80% statistical confidence
Shrub Density	80% statistical confidence
Diversity	considered reasonable based on physical environmental

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 80% confidence interval. The test statistic is:

$$x_{r-0.80(x_h)}$$

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

Where:

x_r is the reclamation mean
x_h is the approved performance standard
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 reference area 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 Reclamation Bond Release

6.1 GCC Tijeras Reclaimed Areas

GCC Rio Grande has 95.85 acres that have been successfully reclaimed. GCC is proposing a full bond release for the 74 acres that are fully reclaimed and is passing the reclamation success standards from the reference area. Also requesting a partial release for the 22 acres of Quarry 1 Reclamation. In Map 16 shows the areas that are fully reclaimed and the partial reclaimed area that are requested for release.

7 Environmental Standards Compliance

7.1 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 August 18th, 2023. Total potential criteria pollutant emissions for the facility are shown in Table 7-1.

Table 7-1 Total Potential Criteria Pollutant Emissions

Pollutant	Emissions (tons per year)
Nitrogen oxides (NO_X)	1,520.90
Carbon monoxide (CO)	1,464.1
Particulate matter (PM_{10})	120.0
Particulate matter ($PM_{2.5}$)	34.2
Volatile organic compounds (VOC)	78.7
Sulfur Dioxide (SO_2)	848.4
Total HAPs	50.7

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 (PM_{10}), and particulate matter of less than 2.5 microns ($PM_{2.5}$). 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 the 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.

7.2 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:

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

NPDES permit number NM000116 became effective on June 1, 2021, and will expire on May 31, 2026. Important changes in the new permit term include the removal of Outfall 004 from the permit that was never constructed. MSGP #NMR053190 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 macroinvertebrate 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 its operation and the frequency of its 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 no longer be necessary unless required for a post-mining land use by a future landowner.

7.3 Groundwater Quality

The only known groundwater located within the permit area occurs 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 upgradient 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 groundwater sampling and testing program. No adverse impacts to groundwater quantity or quality have been identified from plant or mining operations.

8 Closeout Plan Schedule

See Closeout Plan Spreadsheet.

9 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 several more decades. However, only those resources for which a mining plan has been defined are identified in this Closeout Plan. For the next 14 years, the mining footprint is expected to increase, as shown in Map 3. GCC Rio Grande will propose delaying 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 five years after its approval.

Technology and market conditions could change significantly in the next several decades. 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.

9.1 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.

9.2 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.

9.3 Water Quality Requirements

The Tijeras Mine and Mill currently holds 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 stormwater runoff, vehicle and equipment cleaning water, and artesian well water flowing to the process area.

The second is the general stormwater permit, or MSGP #NMR053190, which covers the discharge of stormwater 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 to minimize pollutants in stormwater runoff.

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

9.4 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 waste 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.

10 References

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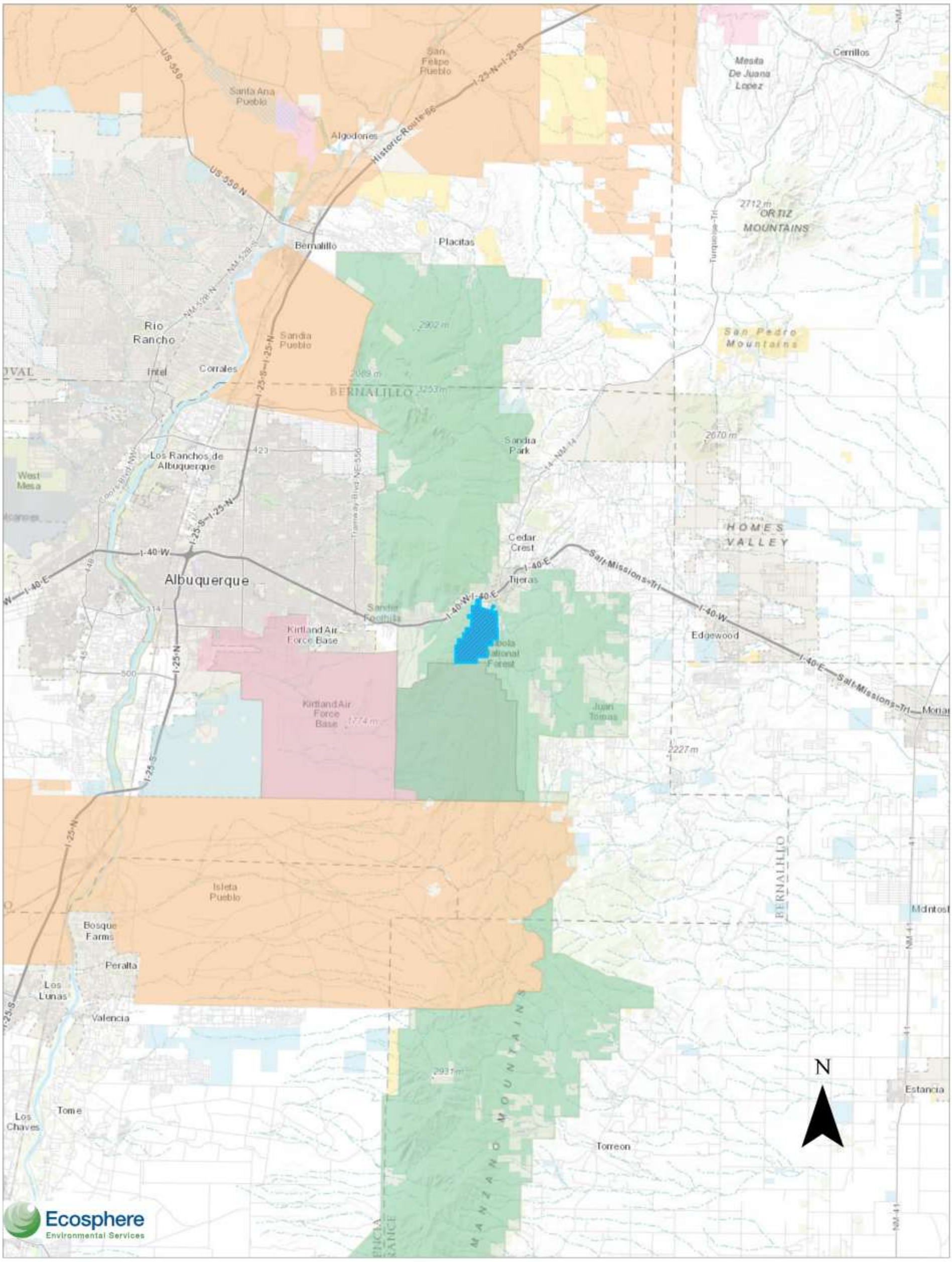
U.S. Department of Agriculture, U.S. Forest Service, 1985. Cibola National Forest Land and Resource Management Plan (Publication). Southwestern Region, New Mexico.

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.

Maps



Permit Boundary
Bureau of Land Management
Department of Defense
National Park Service
Private
State
State Park
Tribal
US Forest Service

0 2 4 6 8 10 Miles

Coordinate System: NAD 1983 UTM Zone 13N

1:250,000

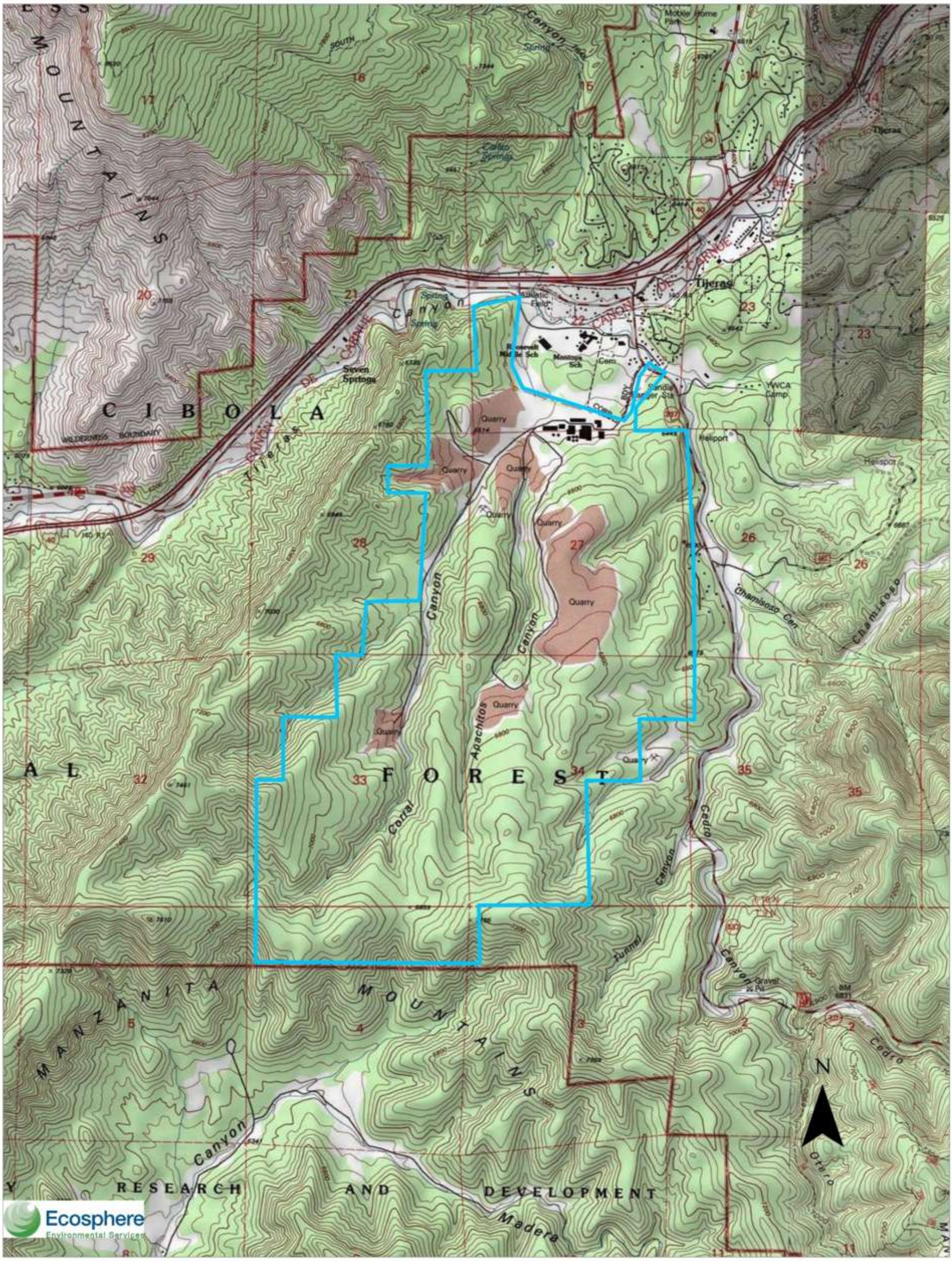
GCC Rio Grande Tijeras Mine and Mill

Mine Closeout Plan

Map 1 GCC Tijeras Mine and Mill Location

Bernalillo County, NM

Date: 5/19/2016



Permit Boundary

0 0.35 0.7 1.05 1.4 1.75 Miles

Coordinate System: NAD 1983 UTM Zone 13N

1:24,000

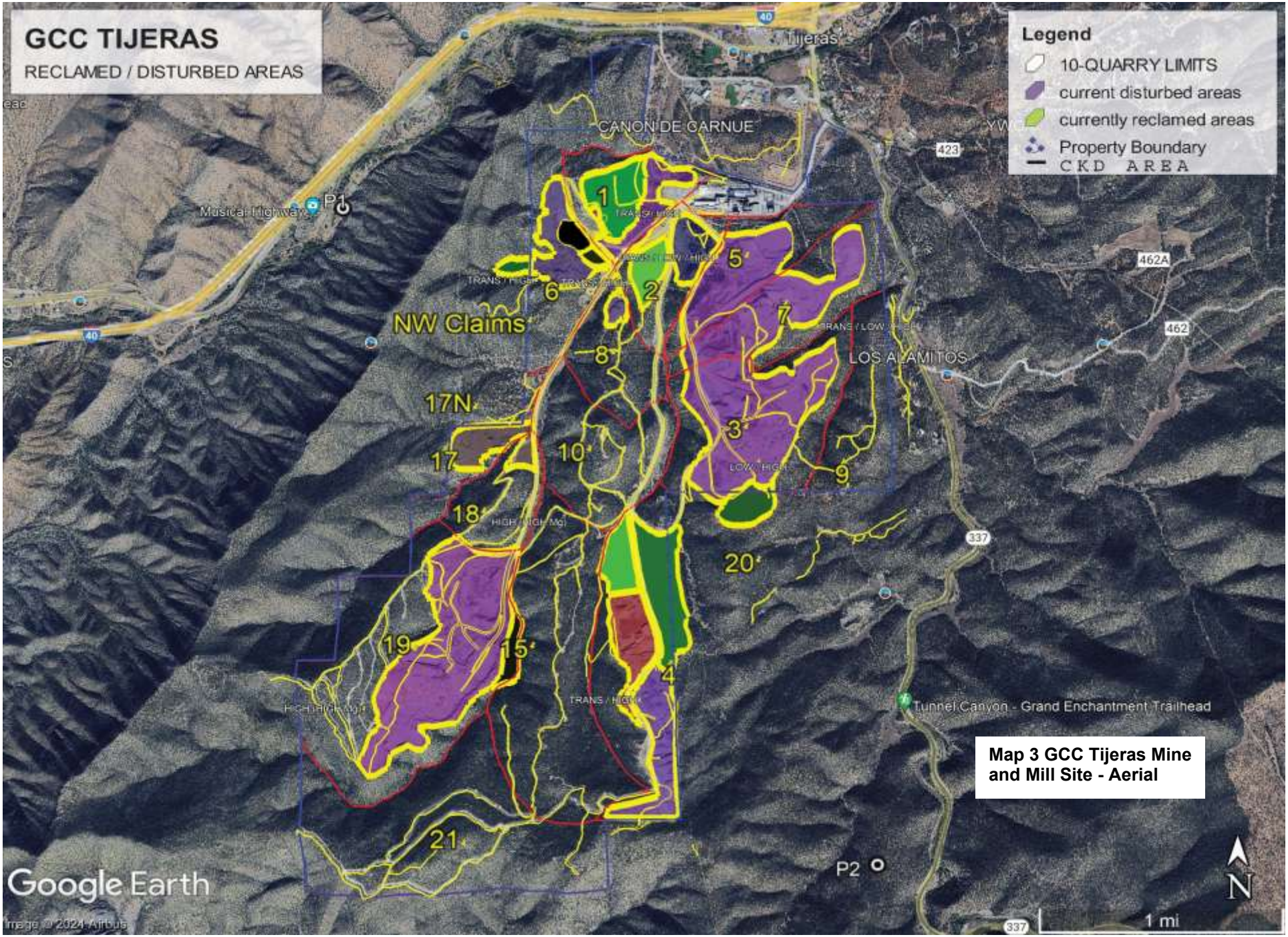
GCC Rio Grande Tijeras Mine and Mill

Map 2 GCC Tijeras Mine and Mill Location

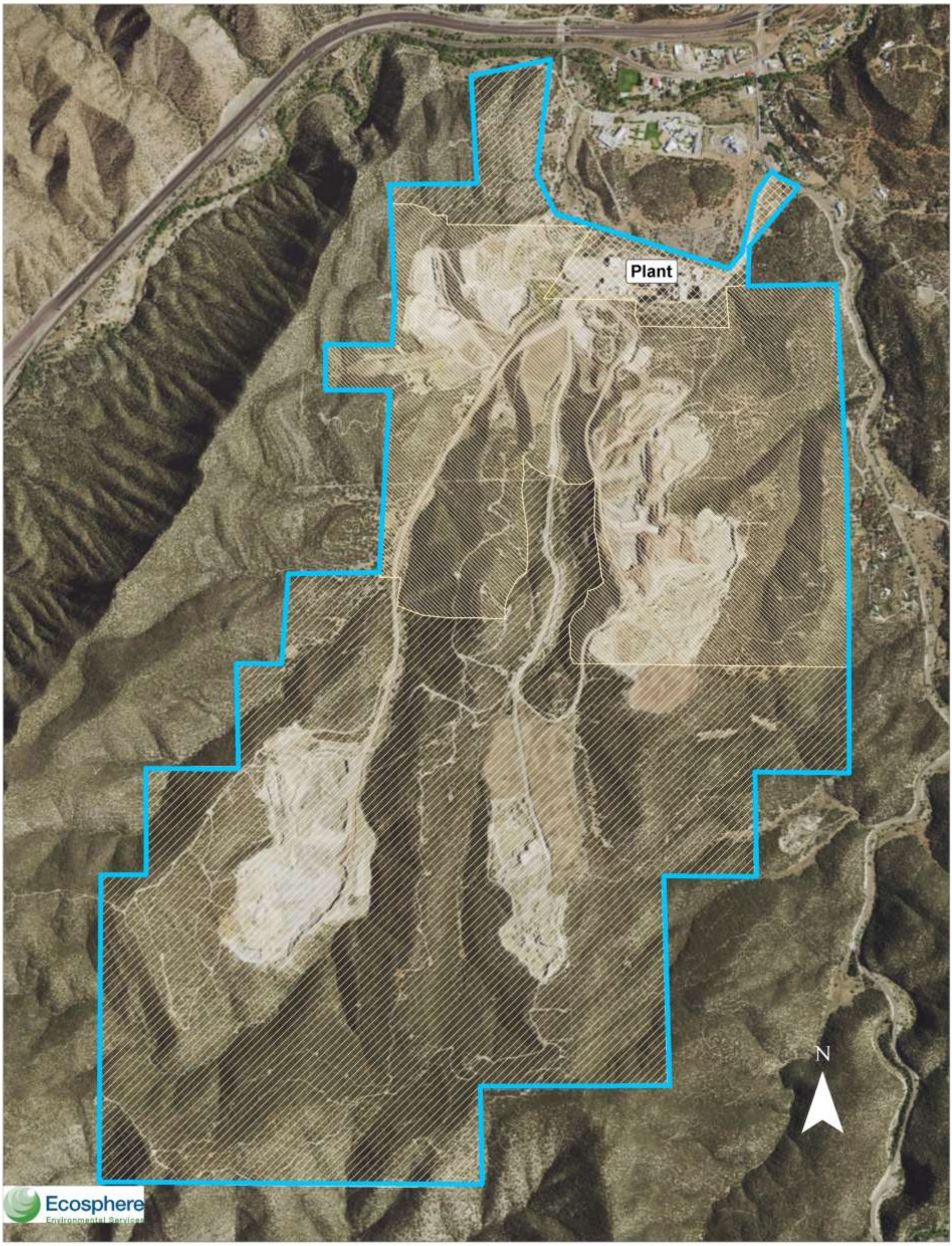
Tijeras and Sedillo USGS 7.5-minute Quadrangles

Bernalillo County, NM

Date: 5/18/2016



Map 3 GCC Tijeras Mine and Mill Site - Aerial



Permit Boundary

Post-mining land uses

- Industrial/Commercial
- Recreation
- Wildlife habitat

0 0.2 0.4 0.6 0.8 1 Miles

Coordinate System: NAD 1983 UTM Zone 13N

1:14,050

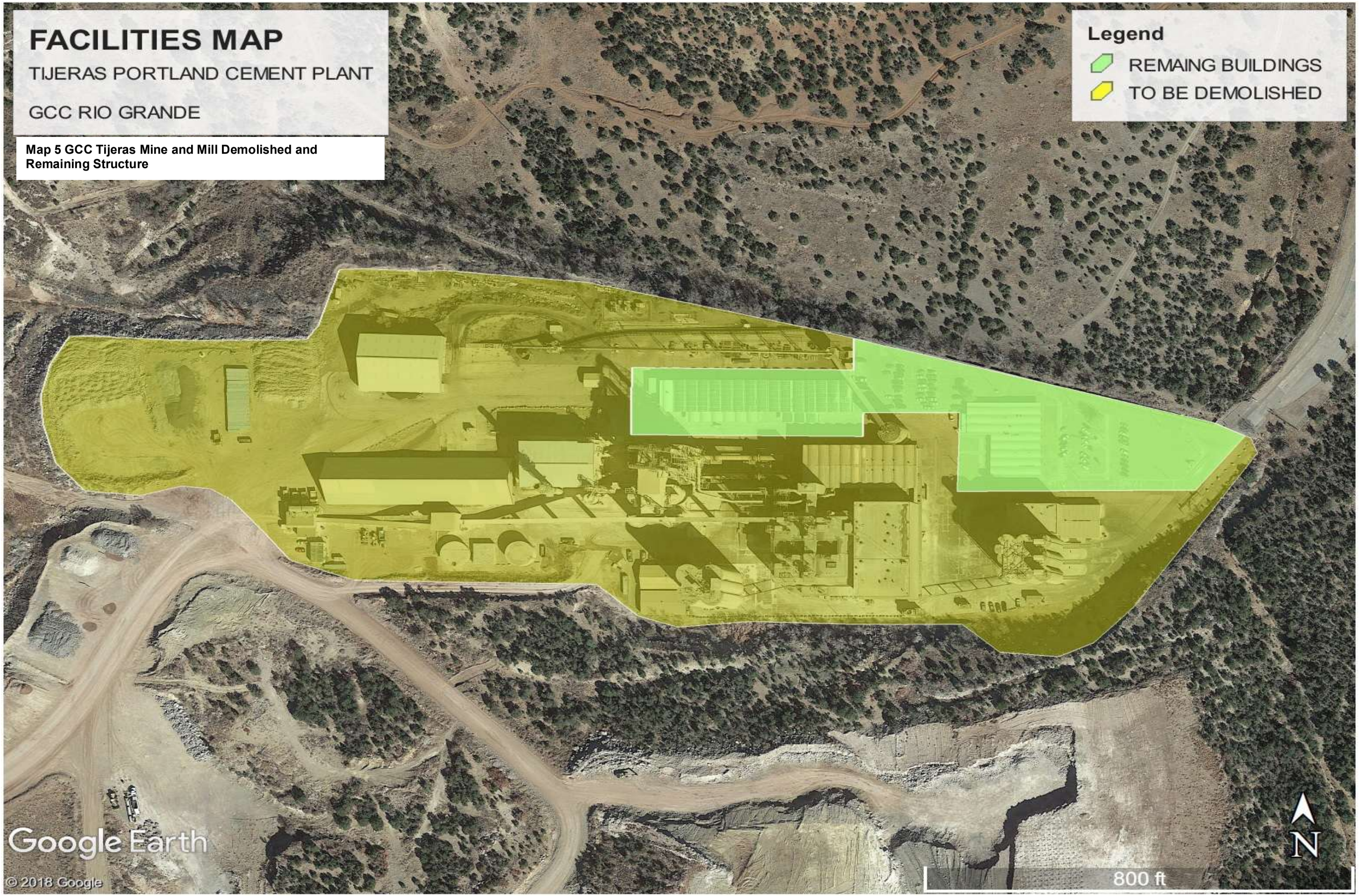
GCC Rio Grande Tijeras Mine and Mill

Mine Closeout Plan

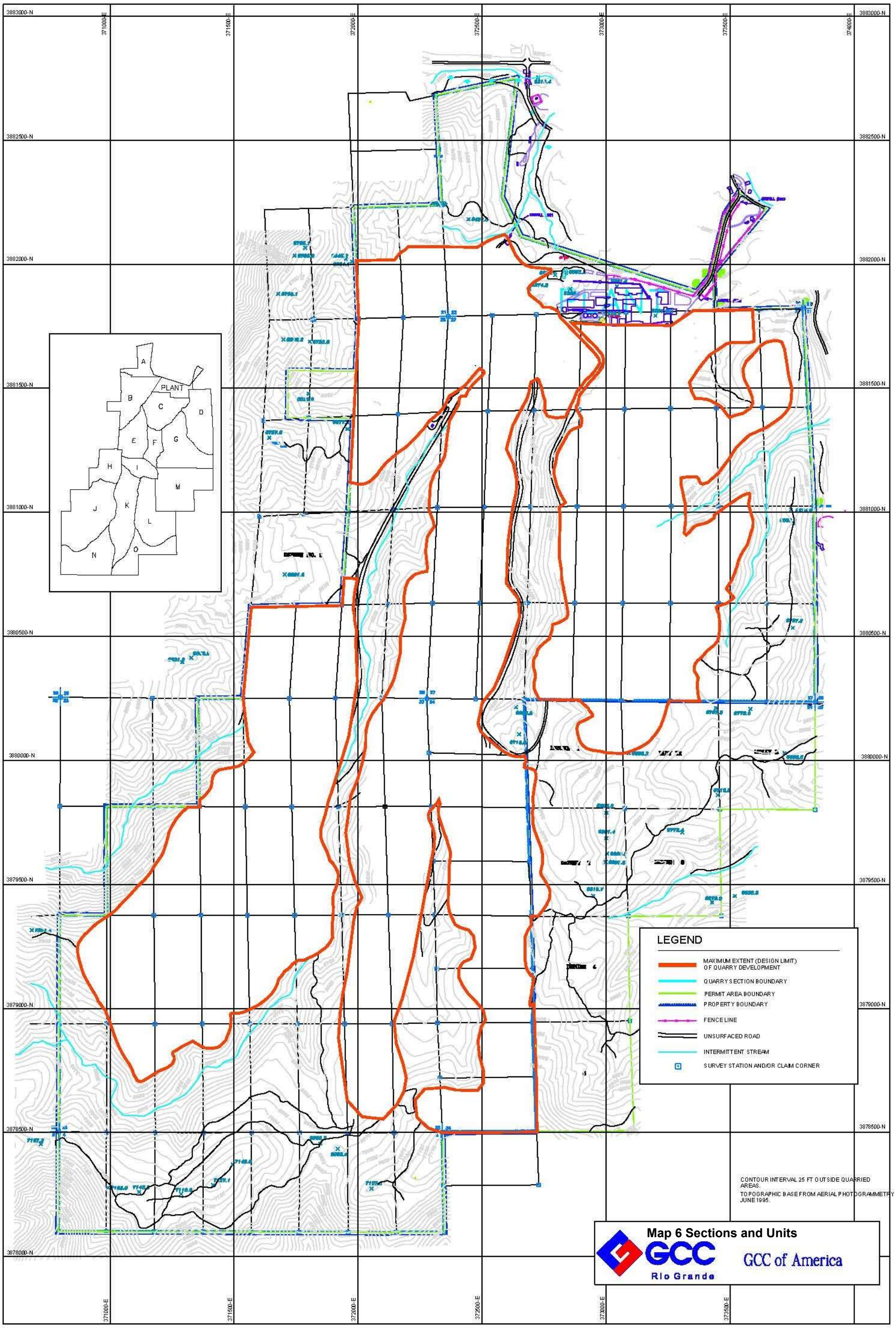
Map 4 GCC Tijeras Mine and Mill Post-Mining Land Uses

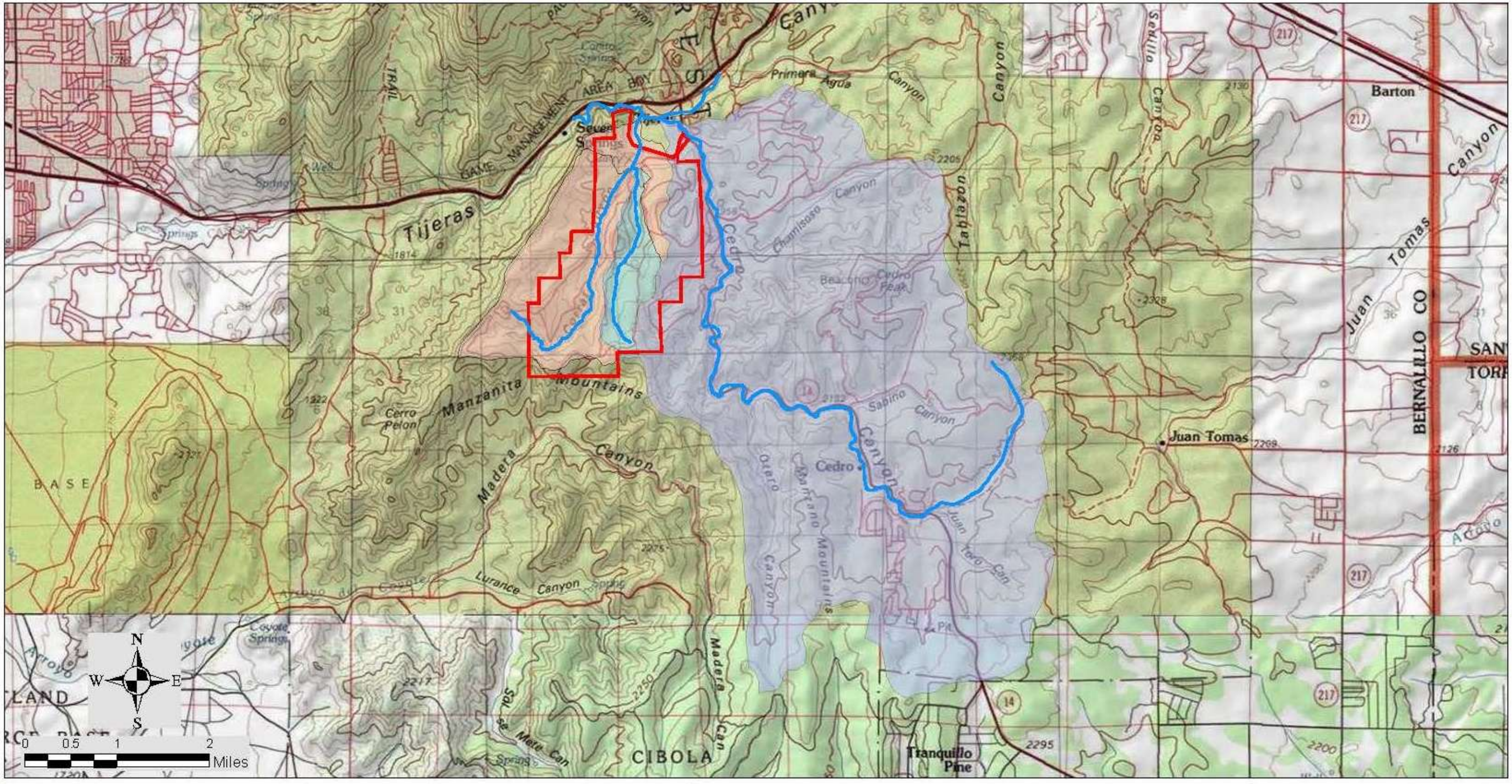
Bernalillo County, NM

Date: 6/10/2016



Map 5 GCC Tijeras Mine and Mill Demolished and Remaining Structure


3883000-N
3882500-N
3882000-N
3881500-N
3881000-N
3880500-N
3880000-N
3879500-N
3879000-N
3878500-N
3878000-N
371000-E
371500-E
372000-E
372500-E
373000-E
373500-E
374000-E
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
PLANT
LEGEND
MAXIMUM EXTENT (DESIGN LIMIT) OF QUARRY DEVELOPMENT
QUARRY SECTION BOUNDARY
PERMIT AREA BOUNDARY
PROPERTY BOUNDARY
FENCE LINE
UNSURFACED ROAD
INTERMITTENT STREAM
SURVEY STATION AND/OR CLAIM CORNER
CONTOUR INTERVAL 25 FT OUTSIDE QUARRIED AREAS.
TOPOGRAPHIC BASE FROM AERIAL PHOTOGRAMMETRY JUNE 1995.
Map 6 Sections and Units
GCC
Rio Grande
GCC of America



Legend

- GCC Permit Boundary
- Primary Drainages
- Apachitos Canyon Watershed (445 ac)
- Cedro Canyon Watershed (12,555 ac)
- Corral Canyon Watershed (Upper: 1503 ac, Lower: 326 ac)

GCC

Water & Earth TECHNOLOGIES

Map 7 Watershed

APRIL 2, 2019

End Corral Canyon Restoration Into Intact Reach of Corral Canyon

Excavate Corral Canyon and Restore at Final Grade

Excavate Apachitos Canyon and Restore at Final Grade

Restore Corral Canyon at Existing Road Grade

Begin Corral Canyon Restoration

6350
6375
6400
6425
6450
6475
6500
6525
6550
6575
6600

N

0' 400' 800' 1200'

Legend

- Existing Drainage
- Restored Channel Alignment
- Permit Boundary
- Excavation Boundary
- Existing Countour (25-ft interval)
- Proposed Contour (25-ft interval)
- Runoff Flow Path

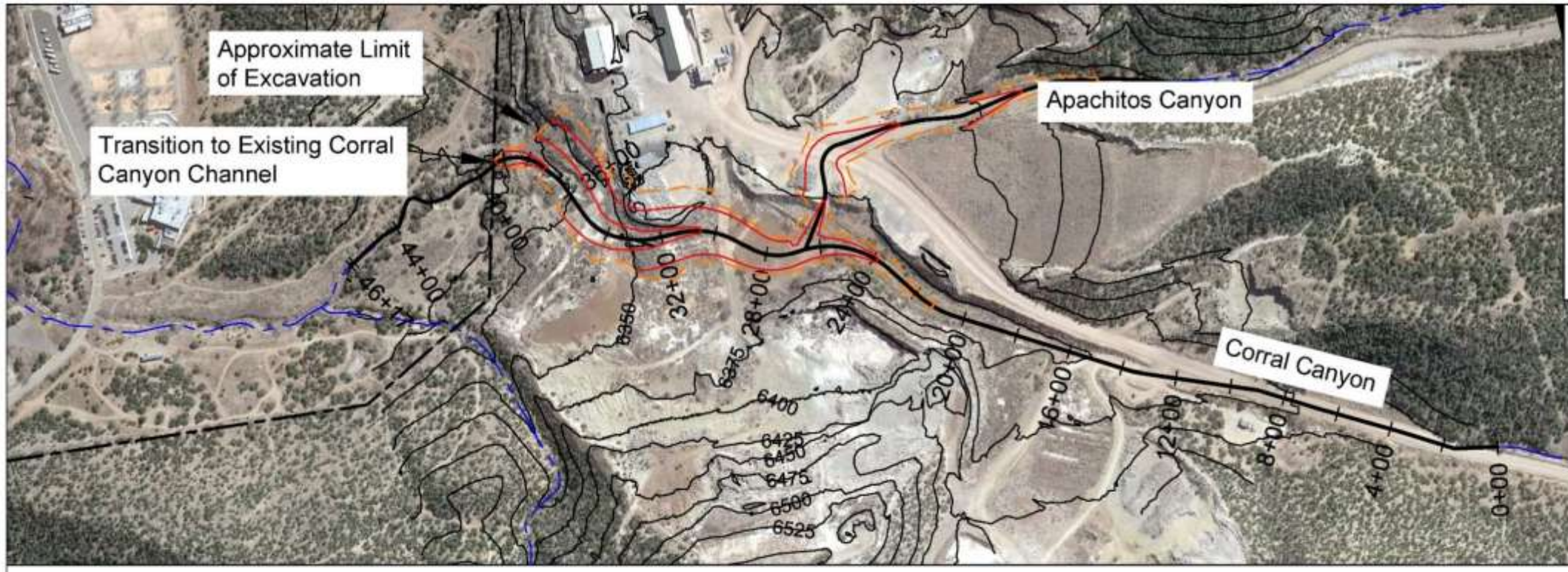
GCC

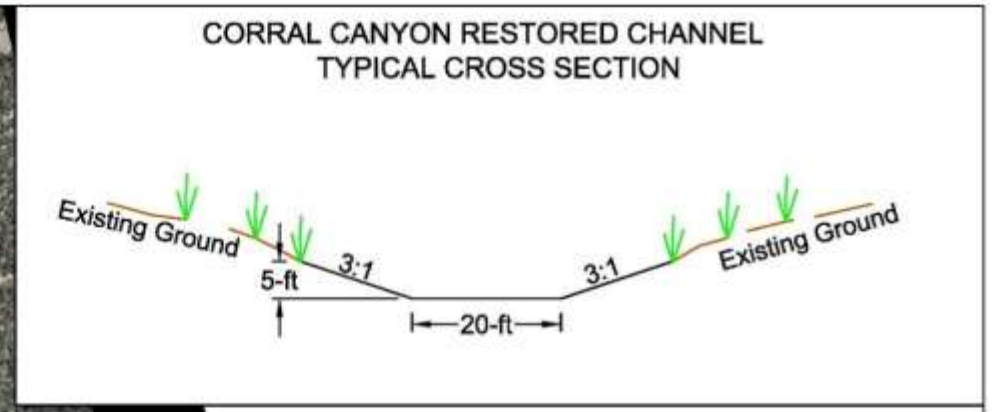
Water & Earth TECHNOLOGIES

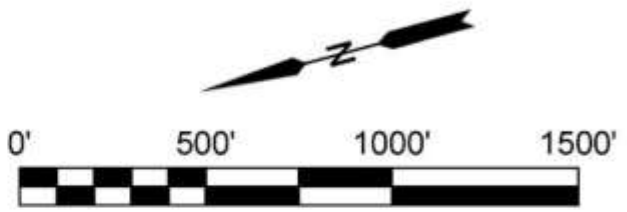
Map 8

Conceptual Reclamation of Corral Canyon & Apachitos Canyon

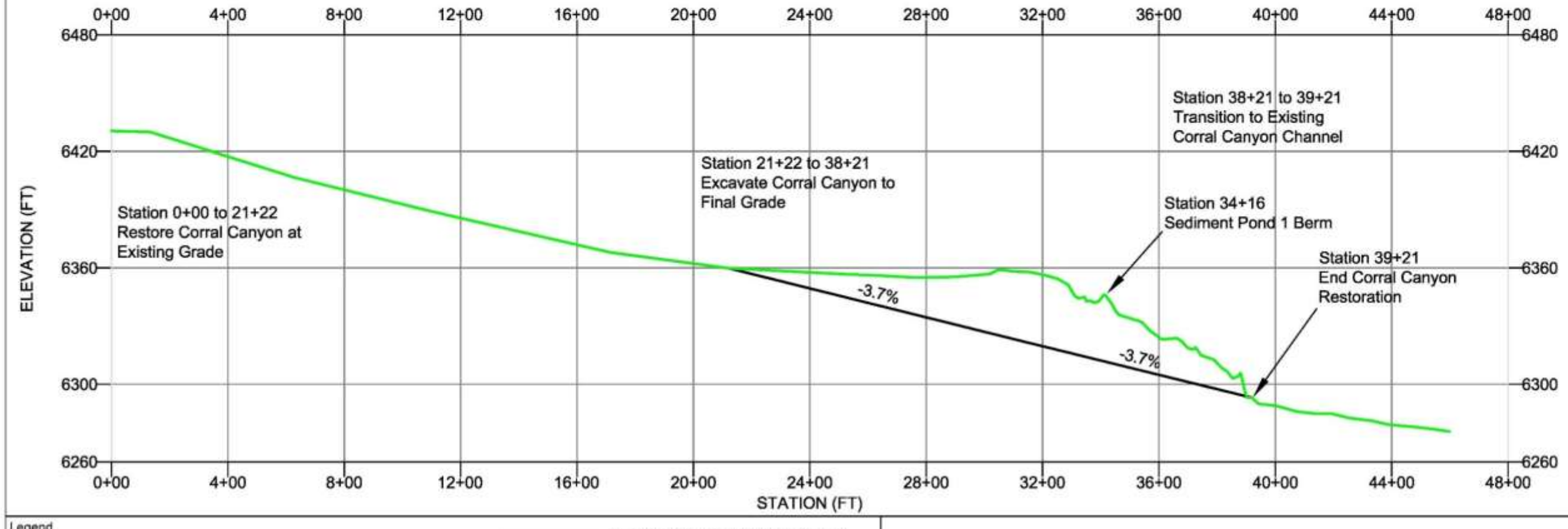
April 2, 2019







CORRAL CANYON PROFILE



Legend

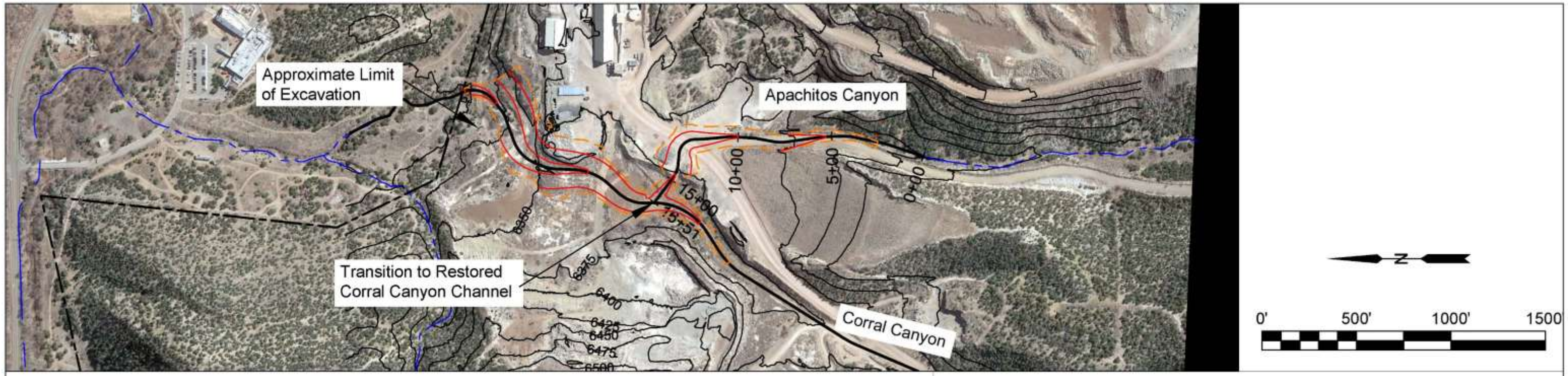
- Existing Ground Profile
- Restored Channel Profile
- Restored Channel Alignment
- Permit Boundary
- Excavation Boundary
- Existing Countour (25-ft interval)
- Proposed Contour (25-ft interval)

GCC

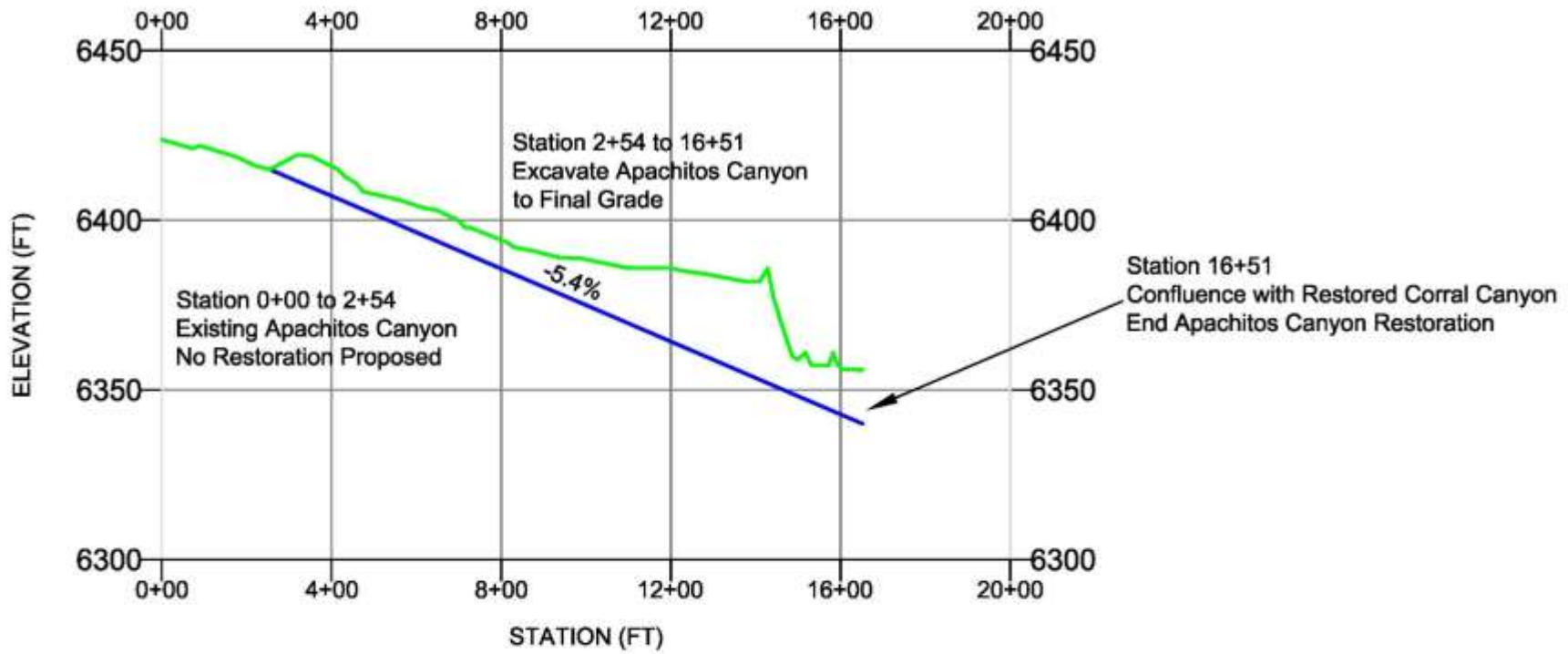
Water & Earth TECHNOLOGIES

Map 9
Conceptual Plan & Profile for Corral Canyon Restoration

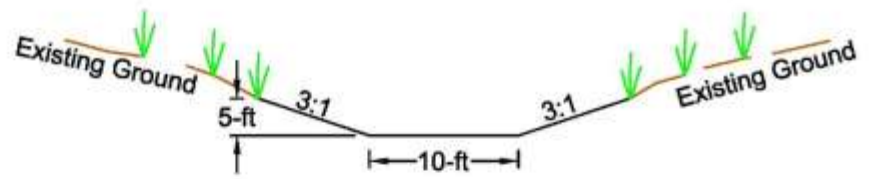
April 2, 2019



APACHITOS CANYON PROFILE



APACHITOS CANYON RESTORED CHANNEL TYPICAL CROSS SECTION



Legend

- Existing Ground Profile
- Restored Channel Profile
- Restored Channel Alignment
- Excavation Boundary
- Existing Countour (25-ft interval)
- Proposed Contour (25-ft interval)

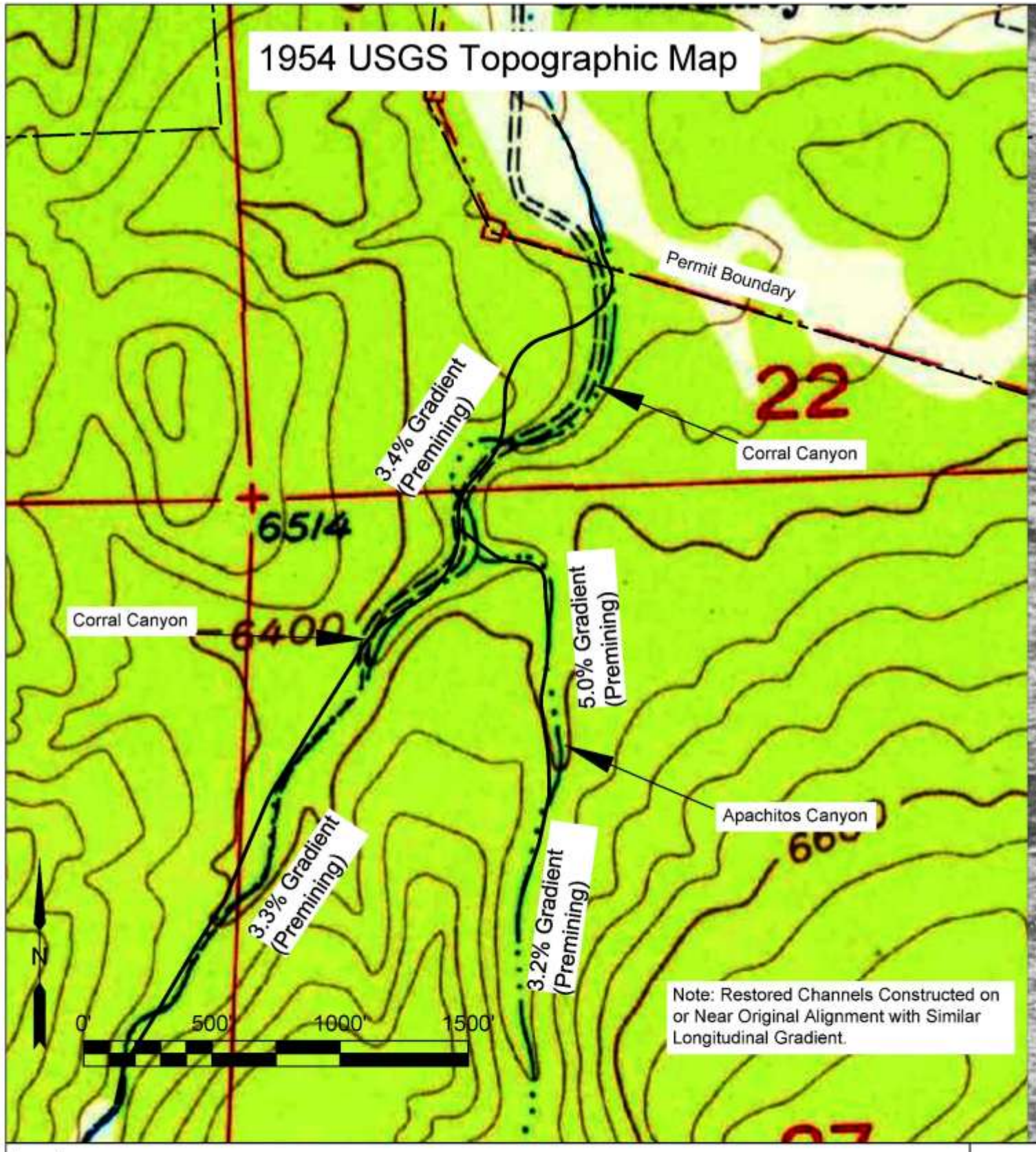
GCC

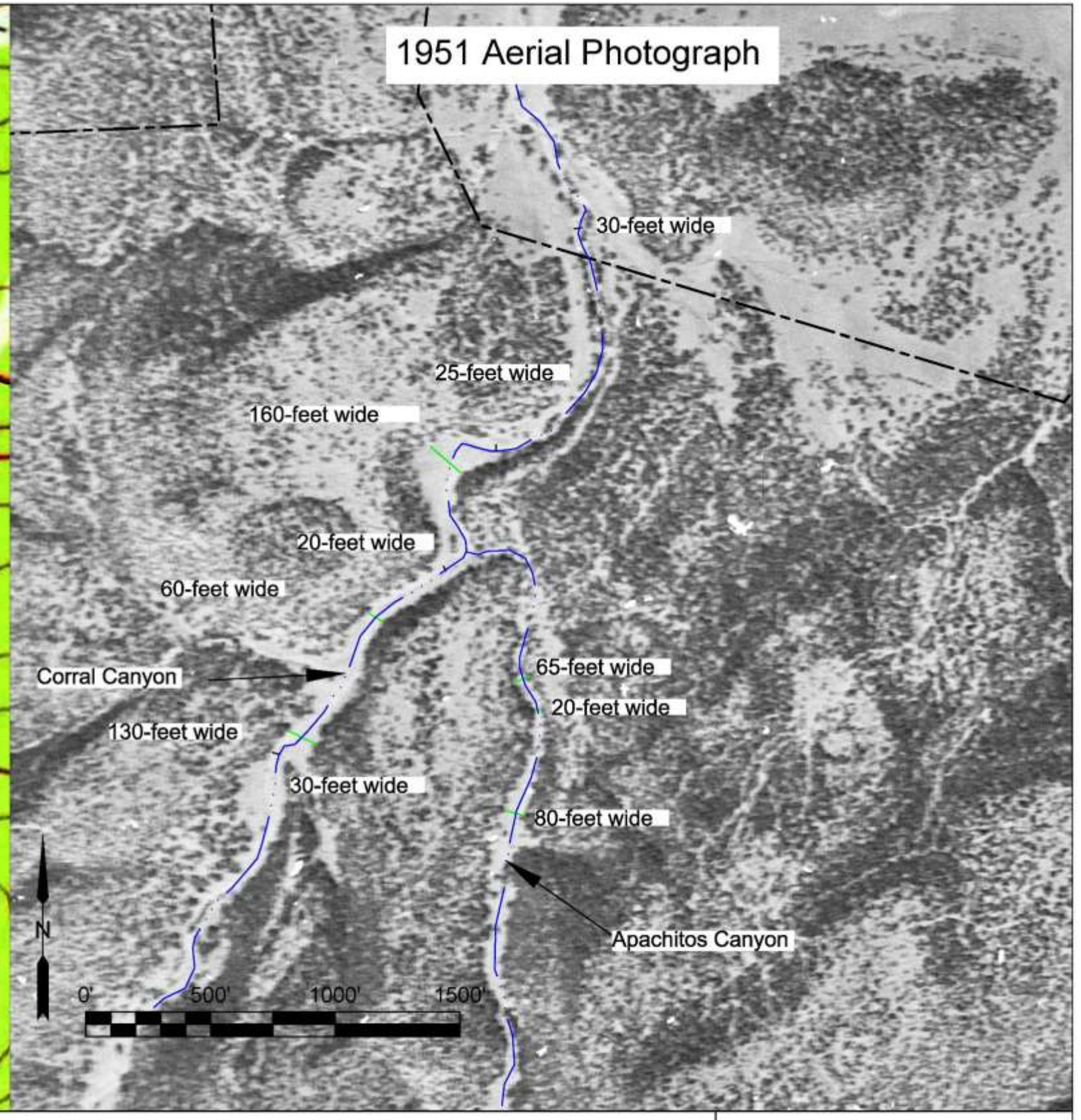
Water & Earth TECHNOLOGIES

Map 10

Conceptual Plan & Profile for Apachitos Canyon Restoration

April 2, 2019





Legend

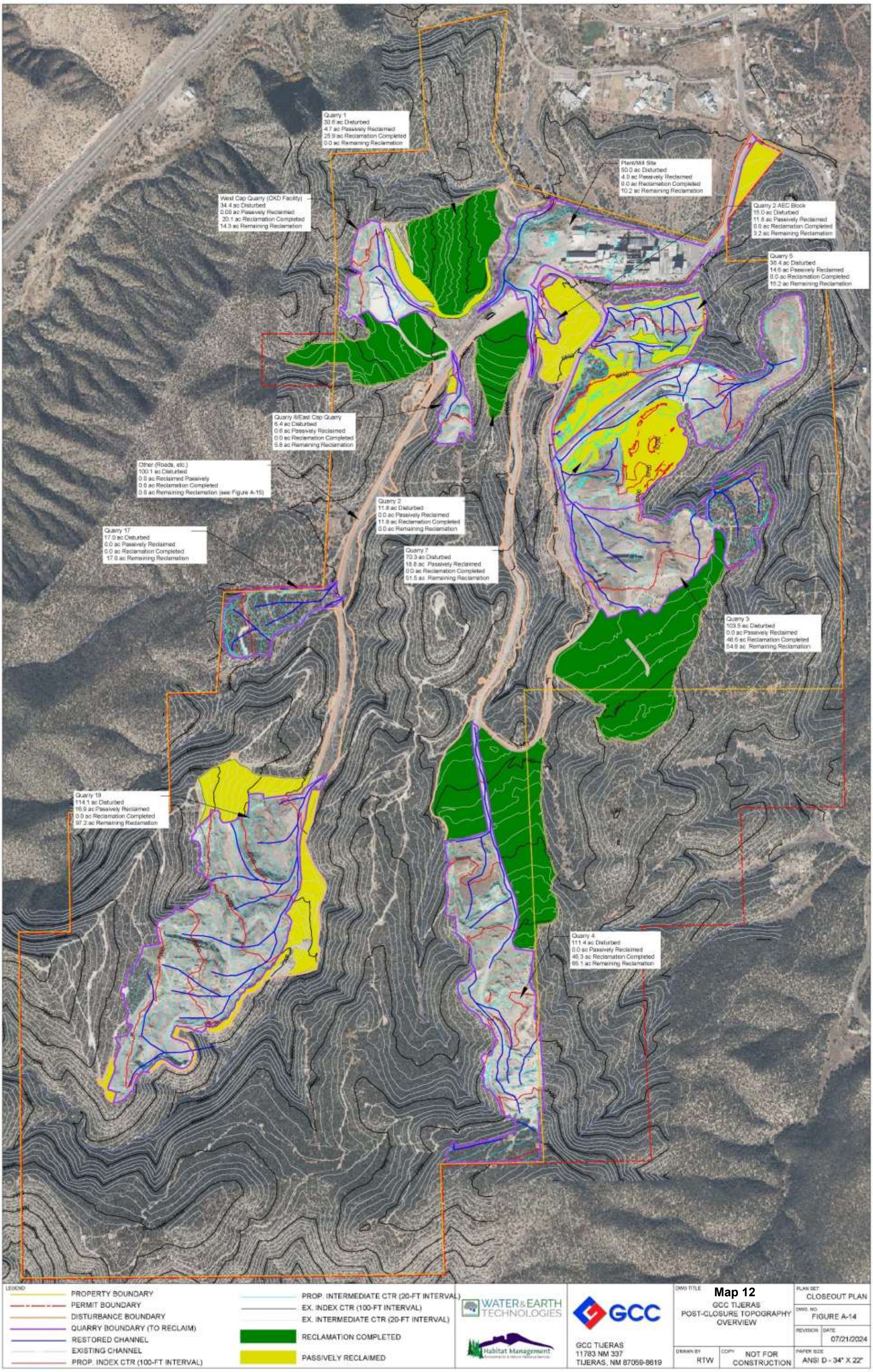
- Restored Channel Alignment
- Pre-Mining Channel Bottom Width Measurement
- Pre-Mining Channel Floodplain Width Measurement

GCC

Water & Earth TECHNOLOGIES

Map 11
Pre-Mining Topography with Restored Corral Canyon and Apachitos Canyon

April 2, 2019


Quarry 1
30.6 ac Disturbed
4.7 ac Passively Reclaimed
25.9 ac Reclamation Completed
0.0 ac Remaining Reclamation
Plant/Mill Site
50.0 ac Disturbed
4.0 ac Passively Reclaimed
0.0 ac Reclamation Completed
10.2 ac Remaining Reclamation
West Cap Quarry (CKD Facility)
34.4 ac Disturbed
0.00 ac Passively Reclaimed
20.1 ac Reclamation Completed
14.3 ac Remaining Reclamation
Quarry 2 AEC Block
15.0 ac Disturbed
11.8 ac Passively Reclaimed
0.0 ac Reclamation Completed
3.2 ac Remaining Reclamation
Quarry 5
36.4 ac Disturbed
14.6 ac Passively Reclaimed
0.0 ac Reclamation Completed
15.2 ac Remaining Reclamation
Quarry 8/East Cap Quarry
6.4 ac Disturbed
0.6 ac Passively Reclaimed
0.0 ac Reclamation Completed
5.8 ac Remaining Reclamation
Other (Roads, etc.)
100.1 ac Disturbed
0.0 ac Reclaimed Passively
0.0 ac Reclamation Completed
0.0 ac Remaining Reclamation (see Figure A-15)
Quarry 2
11.8 ac Disturbed
0.0 ac Passively Reclaimed
11.8 ac Reclamation Completed
0.0 ac Remaining Reclamation
Quarry 17
17.0 ac Disturbed
0.0 ac Passively Reclaimed
0.0 ac Reclamation Completed
17.0 ac Remaining Reclamation
Quarry 7
70.3 ac Disturbed
18.8 ac Passively Reclaimed
0.0 ac Reclamation Completed
51.5 ac Remaining Reclamation
Quarry 3
103.5 ac Disturbed
0.0 ac Passively Reclaimed
48.6 ac Reclamation Completed
54.9 ac Remaining Reclamation
Quarry 19
114.1 ac Disturbed
16.9 ac Passively Reclaimed
0.0 ac Reclamation Completed
97.2 ac Remaining Reclamation
Quarry 4
111.4 ac Disturbed
0.0 ac Passively Reclaimed
46.3 ac Reclamation Completed
65.1 ac Remaining Reclamation
LEGEND
PROPERTY BOUNDARY
PERMIT BOUNDARY
DISTURBANCE BOUNDARY
QUARRY BOUNDARY (TO RECLAIM)
RESTORED CHANNEL
EXISTING CHANNEL
PROP. INDEX CTR (100-FT INTERVAL)
PROP. INTERMEDIATE CTR (20-FT INTERVAL)
EX. INDEX CTR (100-FT INTERVAL)
EX. INTERMEDIATE CTR (20-FT INTERVAL)
RECLAMATION COMPLETED
PASSIVELY RECLAIMED
WATER&EARTH TECHNOLOGIES
Habitat Management
GCC
GCC TIJERAS
11783 NM 337
TIJERAS, NM 87059-8619
DWG TITLE
Map 12
GCC TIJERAS
POST-CLOSURE TOPOGRAPHY
OVERVIEW
PLAN SET
CLOSEOUT PLAN
DWG. NO.
FIGURE A-14
REVISION
DATE
07/21/2024
DRAWN BY
RTW
COPY
NOT FOR CONSTRUCTION
PAPER SIZE
ANSI D - 34" X 22"

Notes:
1. Main haul roads and Secondary roads to be reclaimed within a quarry boundary are not included in the Summary of Roads at GCC Tijeras table, since those roads will be reclaimed during quarry reclamation.
2. All Primary and Secondary roads to retain shall be narrowed to a 12-ft width.

Summary of Roads at GCC Tijeras

Type of Road	Length to Retain (ft)	Length to Reclaim (ft)	Length Currently Reclaimed (ft)	Total Length (ft)
Main Haul Road	14,343	-	-	14,343
Secondary	33,087	44,111	9,522	88,720
Total Length of Road	47,430	44,111	9,522	101,063

LEGEND
- PROPERTY BOUNDARY
- PERMIT BOUNDARY
- QUARRY BOUNDARY (TO RECLAIM)
- MAIN HAUL ROADS (TO RETAIN)
- SECONDARY ROADS (TO RETAIN)
- SECONDARY ROADS (TO RECLAIM)
- SECONDARY ROADS (RECLAMATION COMPLETED)

WATER & EARTH TECHNOLOGIES

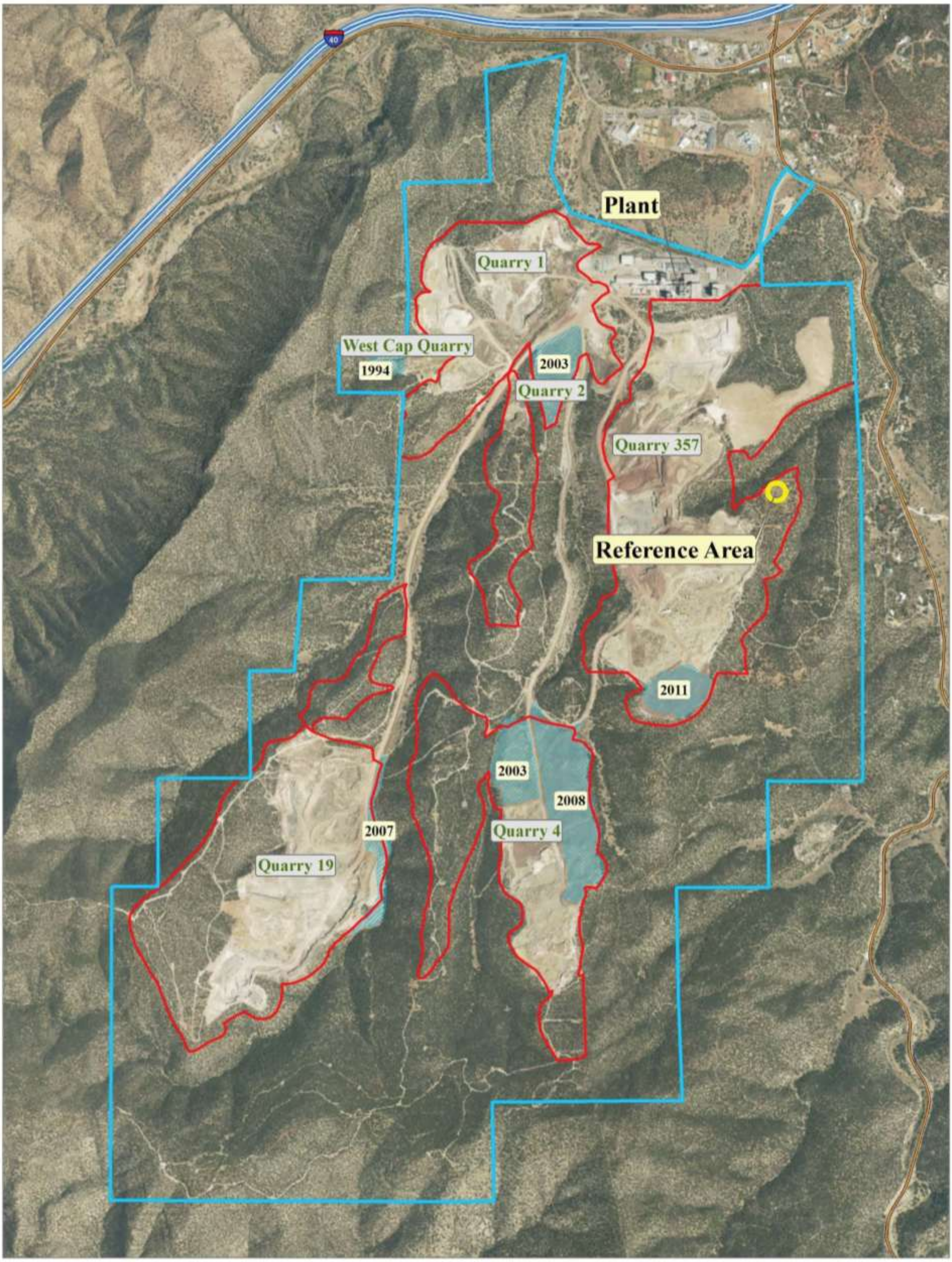
Habitat Management

GCC

GCC TIJERAS
11783 NM 337
TIJERAS, NM 87059-8619

DWG TITLE: **Map 13**
GCC TIJERAS
POST-CLOSURE ROAD NETWORK

PLAN SET: CLOSEOUT PLAN
DWG NO: FIGURE A-15
REVISION:
DATE: 07/21/2024
DRAWN BY: RTW
COPY: NOT FOR CONSTRUCTION
PAPER SIZE: ANSI D - 34" X 22"



Reference Area

Permit Boundary

Design Limits

Reclaimed Areas (Year seeded)

N

0 0.1 0.2 0.3 0.4 0.5 Miles

1:14,000

GCC Rio Grande
Tijeras Mine and Mill

Reclamation Monitoring Plan

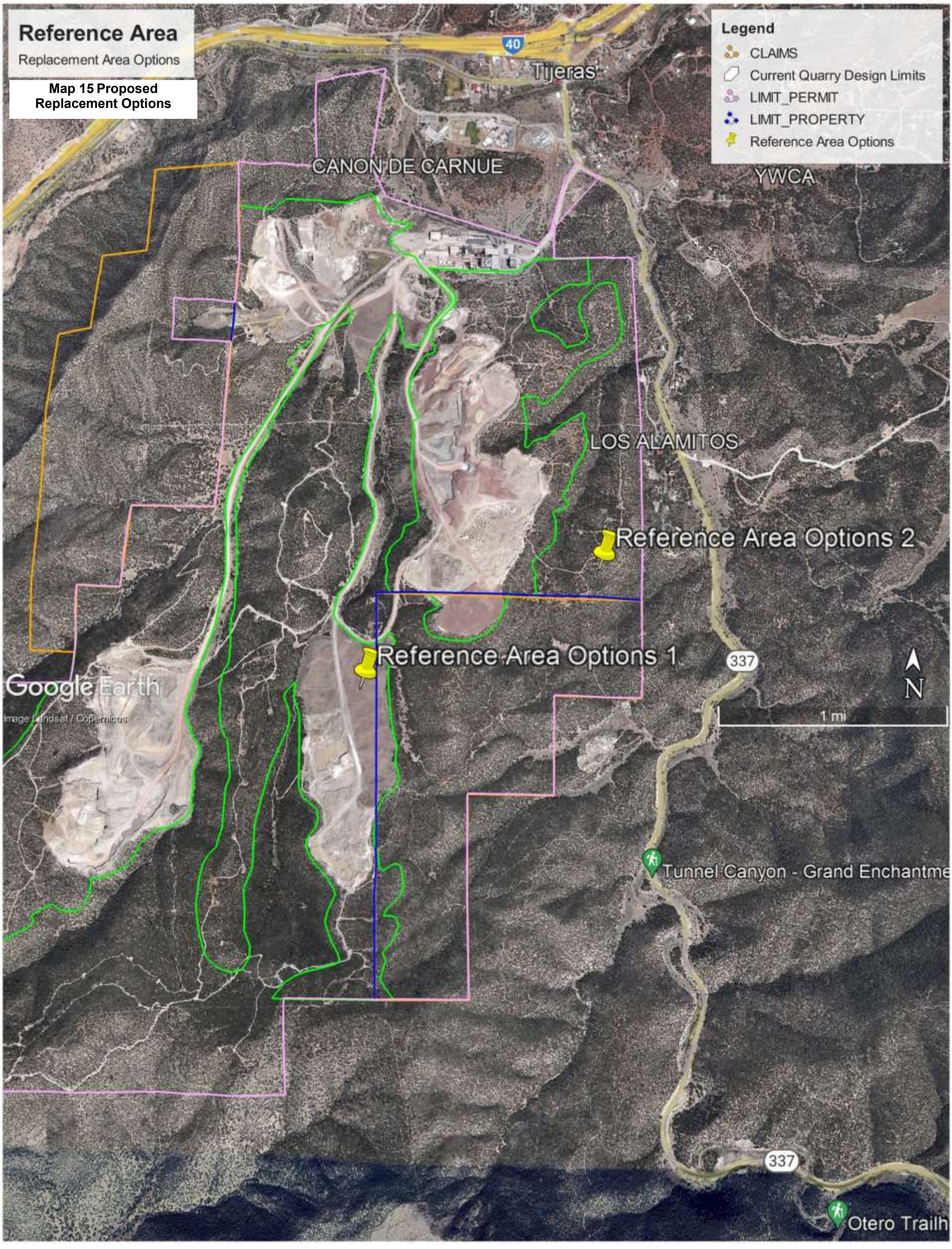
Map 14 Current Approved Reference Area

Bernalillo County, NM

Ecosphere Environmental Services

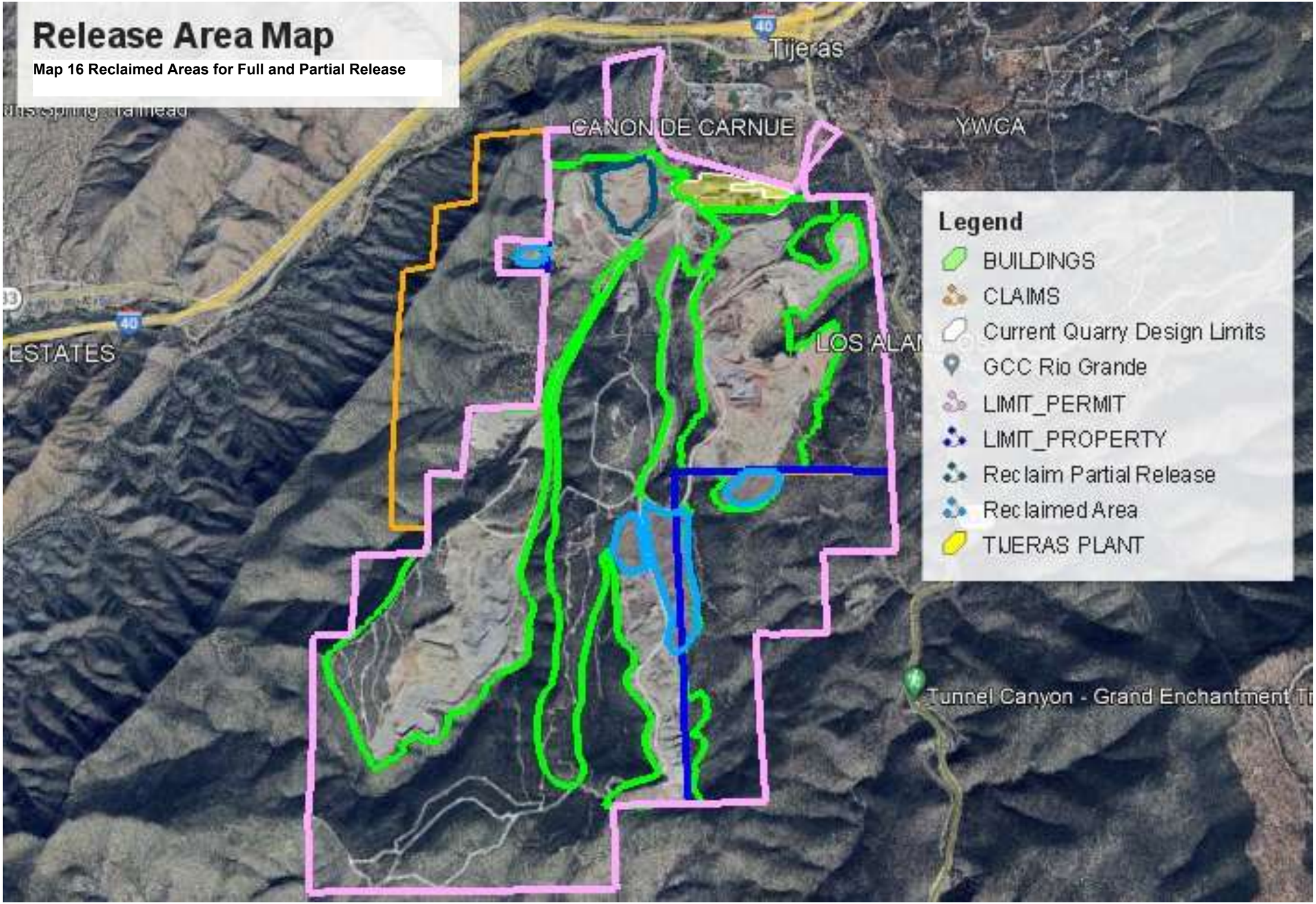
Date: 2/10/2020

Map 15 Proposed Replacement Options



Release Area Map

Map 16 Reclaimed Areas for Full and Partial Release



Appendices

Appendix A

New Mexico Environment Department No Discharge Permit Letter

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

SUSANA MARTINEZ
Governor

JOHN A. SANCHEZ
Lieutenant Governor

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.

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

Electronic Delivery Only

July 3, 2024

Samantha Kretz
GCC Rio Grande, Inc.
PO Box 100
Tijeras, NM 87059
skretz@gcc.com

Re: Response 2 to Notice of Intent to Discharge for Off-Spec Coal, No Discharge Permit Required, GCC Rio Grande, Inc., Tijeras Plant

Dear Samantha Kretz,

The New Mexico Environment Department (NMED) received a Notice of Intent to Discharge (NOI) from GCC Rio Grande, Inc. (GCC) for activities at the Tijeras Plant. The NOI addresses disposal of off-spec coal associated with the cement kiln dust operation. The NOI was requested by NMED and is a permit condition in the New Mexico Mining Act Permit No. BE001RE, Revision 20-1, issued by the Mining Act Reclamation Program of the Energy, Minerals and Natural Resources Department. NMED received the NOI on February 23, 2024, which included a description of activities that have the potential to discharge to surface water and groundwater and includes Toxicity Characteristic Leaching Procedure (TCLP) and Synthetic Precipitation Leaching Procedure (SPLP) material analytical results. Based on the submittal, NMED responded with a letter dated March 22, 2024.

GCC answered the questions in the March 22, 2024, letter via email, and performed the requested re-sample event on April 12, 2024, while NMED was present on-site. GCC submitted the re-sample results on June 6, 2024. Based on the results of the second sample event, GCC has fulfilled its commitments for the NOI. NMED recommends GCC continue with segregation of the material, appropriate interim cover for dust, groundwater and surface stormwater controls. NMED does not require a discharge permit at this time. However, NMED reserves the right to require one in the future if site conditions change, and this does not relieve GCC of its responsibility to comply with any other applicable federal, state and/or local laws and regulations. This decision conforms to the NMED Delegation Memorandum dated February 19, 2024, through which the Cabinet Secretary has delegated this authority to the Chief of the Ground Water Quality Bureau.

If you have any questions, reach out to Amber Rheubottom of my staff at 505-660-2379 and amber.rheubottom@env.nm.gov or Joseph Fox at 505-660-9060 and joseph.fox@env.nm.gov.

Samantha Kretz
July 3, 2024

Justin Ball

Digitally signed by Justin Ball
Date: 2024.07.03 13:02:48 -06'00'

Justin Ball, Chief
Ground Water Quality Bureau
New Mexico Environment Department

JF:ar

Ecc – Alaina Osimowicz Alaina.osimowicz@emnrd.nm.gov
Alan Klatt, alan.klatt@env.nm.gov

Appendix B

Kiln Dust Test Results

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

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:**	CKD
Project Number:	Not Given		CKD		TCLP
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:	___ Soil	___ Other	___ Water	**Date Received:**	03/08/10
Reporting in:	_X_ Dry Weight	___ Wet Weight	___ N/A	**Time Received:**	3:30 PM

Client I. D.	ILFC Lab#	Method	Test	Results	RL	Units	Date Completed
CKD	12567	1311	As	< 0.2	0.2 ppm	mg/kg	3/12/2010
		6010B	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

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

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:	___ **Soil**	_X_ **Other**	___ **Water**	**Date Received:**	N/A
Reporting in:	___ **Dry Weight**	___ **Wet Weight**	___ **N/A**	**Time Received:**	N/A

Client I. D.	ILFC Lab#	Method	Test	Recovery	Date Completed
Method Blank	N/A	1311	As	< 0.2 ppm	3/12/2010
		6010B	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
				% Recovery	
Matrix Spike	N/A	1311	As	103	3/12/2010
		6010B	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	As	102	3/12/2010
		6010B	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

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

Appendix C

Reference Area

Photo C.1 Reference Area Option 1 (1 of 2)

Photo C.2 Reference Area Option 1 (2 of 2)