



Freeport-McMoRan Cobre Mining Company  
P.O. Box 10  
Bayard, NM 88023

August 22, 2014

**Certified Mail #70132250000167309206**  
**Return Receipt Requested**

Mr. Holland Shepherd  
Mining Act Reclamation Program  
Mining and Minerals Division  
1220 South St. Francis Drive  
Santa Fe, NM 87505

Dear Mr. Shepherd

**Re: Revision to Permit GR002RE – Permit & Design Limit Boundaries**

Freeport-McMoRan Cobre Mining Company (Cobre) submits the enclosed application to the Mining and Minerals Division (MMD) to revise its Permit GR002RE to change the approved permit boundary and design limits. Please find enclosed the application and supporting closeout plan for this proposed revision. Also enclosed is a check for the application fee in the amount of \$4,500.

The change in the permit boundary will facilitate the construction of a haul road between Cobre and Freeport-McMoRan Chino Mines Company (Chino) in order to deliver ore mined from Cobre, as currently authorized under Permit GR002RE, to Chino for milling and leaching. A haul road, like other transportation facilities, is not listed as a “unit” as defined at 19.10.1.7.U NMAC. This haul road, however, is somewhat unique because it is located mostly away from existing mining disturbances and outside of existing approved design limits for mine and stockpile units that typically incorporate haul roads. Consequently, Cobre has voluntarily provided information in the attached application describing how the haul road will meet the applicable criteria set forth at 19.10.5.508 NMAC.

Further, while this request for a modification will change Cobre’s permit boundary and design limits, the proposed changes will not trigger any of the criteria at 19.10.5.505.B NMAC for a revision. The proposed changes will not result in “a significant environmental impact” (NMAC 19.10.1.7.R(2)). Due to the location of this project, the likely public interest, and the ongoing public process undertaken by the BLM, Cobre will, however, in this specific instance not object to MMD processing the enclosed application as a revision in order to allow for public notice and an opportunity for a public hearing on the application.

Cobre is currently in standby status, and Cobre acknowledges that approval of the enclosed application would not change that status such that Cobre could resume mining. Before mining is recommenced, Cobre will submit a separate application to change Permit GR002RE to come off of standby status.

August 22, 2014

Page 2

The delivery of ore from Cobre to Chino has been contemplated by mine planners for several years and now fits well within current mining plans. We appreciate your prompt review and approval. Should you have any questions on this submittal please contact me at 575-912-5907.

Sincerely,

A handwritten signature in cursive script, appearing to read "Bruce D. Taylor for:", written in dark ink.

Bruce D. Taylor, Manager  
Freeport-McMoRan Cobre Mining Company

BDT:kes  
Enclosures (2)  
c. w/ enclosures

Anne Maurer, Ground Water Quality Bureau, NMED

20140822-200



Freeport-McMoRan Inc.  
333 North Central Ave  
Phoenix AZ 85004

For inquiries, contact us via e-mail:  
AP@FMI.com<mailto:AP@FMI.com> Self-service  
website: http://partners.fmi.com



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NM ENRGY MNRLS & NAT RES DPT  
MINING ACT RECLAMATION BUREAU  
1220 SOUTH ST FRANCIS DR  
SANTA FE NM 87505

Page 1 OF 1

INVOICE NUMBER	INVOICE DATE	PURCHASE ORDER	COMPANY	GROSS AMOUNT	DISCOUNT	NET AMOUNT
081114 COBRE - NEW UNIT REV	08/11/14 SION FEE		FREEPORT-MCMORAN CORPORAT	4,500.00	0.00	4,500.00
Check Number		Date	Vendor Number	Name		Total Amount
0000822817		08/12/14	0000101184	NM ENRGY MNRLS & NAT RES DPT		\$4,500.00

CH249 v.0.02 01-12-2012

ORIGINAL DOCUMENT IS PRINTED ON CHEMICAL RESISTIVE PAPER WITH MICROBURNED BURRHOFF® OF NOT CASH IF THE WORD VOID IS VISIBLE



Freeport-McMoRan Inc.  
333 North Central Ave  
Phoenix AZ 85004

CHECK NO.  
0000822817

64-1278/611 G

DATE OF CHECK  
08/12/14

PAY: FOUR THOUSAND FIVE HUNDRED AND 00/100 DOLLARS

TO THE ORDER OF NM ENRGY MNRLS & NAT RES DPT  
MINING ACT RECLAMATION BUREAU  
1220 SOUTH ST FRANCIS DR  
SANTA FE NM 87505

CHECK AMOUNT  
\$4,500.00



Bank of America, N.A.

Authorized Signature

⑈0000822817⑈ ⑆061112788⑆ 3299998445⑈

Freeport-McMoRan Cobre Mining Company  
P.O. Box 10  
Bayard, NM 88023

August 22, 2014

**Certified Mail #70132250000167309176**  
**Return Receipt Requested**

Ms. Anne Maurer  
New Mexico Environment Department  
Ground Water Quality Bureau  
P.O. Box 5469  
Santa Fe, NM 87502

Dear Ms. Maurer:

**Re: Revision to Permit GR002RE – Permit & Design Limit Boundaries**

Enclosed, please see a copy of the Freeport-McMoRan Cobre Mining Company (Cobre) application to the Mining and Minerals Division (MMD) to revise its Permit GR002RE to change the approved permit boundary and design limits. The proposed changes will enable Cobre to construct the Cobre Haul Road (CHR).

Pursuant to communications between Freeport-McMoRan personnel and Mr. Kurt Vollbrecht, the subject haul road is not a discharging facility and therefore Cobre will not be submitting a change to its ground water discharge permits or the Cobre closure permit at this time.

If you require additional information or have any questions or concerns, please contact me at 575-912-5907.

Sincerely,



Bruce D. Taylor, Manager  
Freeport-McMoRan Cobre Mining Company

BDT:sbk  
Enclosures (1)

20140822-200





**Freeport-McMoRan Cobre Mining Company**  
**Revision to Mining Permit GR002RE to**  
**Change Permit Boundary and Design Limits**

Submittal Date: August 22, 2014

Submitted To: New Mexico Mining and Minerals Division

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FIGURE 2 – PROPOSED NEW PERMIT BOUNDARY

FIGURE 3 – PROPOSED NEW PERMIT BOUNDARY WITH BLM PARCLES ON CHR

FIGURE 4 – HISTORIC MINE WORKINGS

## APPENDICES:

APPENDIX A – CLOSEOUT PLAN

APPENDIX B – PRELIMINARY DESIGN FOR CHR

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## INTRODUCTION

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Freeport-McMoRan Cobre Mining Company (Cobre) owns and operates an existing mining operation located in southwestern New Mexico (Figure 1), including the Cobre Continental Mine and all associated facilities. This document supports Cobre's application to the Mining and Mineral Division (MMD) for changes to its permit GR002RE pursuant to New Mexico Administrative Code (NMAC) 19.10.5.505. This application requests changes to the approved permit boundary and design limits. The proposed changes will enable Cobre to construct the Cobre Haul Road (CHR). The CHR will be used to transport copper ore from Cobre's mining facilities to Freeport-McMoRan Chino Mines Company facilities (Chino) for beneficiation. The existing Cobre permit boundary will expand by approximately 31 acres (Figure 2) and the Cobre design limits will expand to include approximately 100 additional acres. The format of this application generally follows NMAC 19.10.5.508 to ensure completeness and timely approval of the application by MMD.

The proposed CHR will be located on the east side of the Hanover Valley and runs generally north to south from Cobre to Chino. The road will be approximately 3.5 miles long and 120 feet wide and will be used by mine personnel and equipment. The road will be fenced and not open to the public.

Pursuant to NMAC 19.10.5.506.A and B, a closeout plan for the CHR is attached as Appendix A and includes a cost estimate to serve as the basis to determine the amount of financial assurance. The closeout plan describes in detail how the expanded area will be reclaimed to achieve a post mining land use of wildlife habitat.

The proposed CHR covers approximately 105 acres including approximately 91 acres of land controlled by Cobre, 8.7 acres of U.S. Bureau of Land Management (BLM) administered lands, and approximately 5 acres of land controlled by Chino (see Figure 3). Cobre submitted to the BLM an amendment to its existing Mine Plan of Operations (MPO) in December 2012. An Environmental Assessment (EA) is also being developed for the MPO amendment. In the EA, no action and proposed action mining scenarios are being analyzed. The no action scenario uses unconstructed facilities authorized in the current Cobre Permit GR002RE with ore leaching and milling occurring at Cobre. In comparison, the proposed action analyzes mining at Cobre with ore deliveries to Chino for leaching and milling. The proposed action,



which relies upon the CHR to transport ore from Cobre to Chino, results in overall fewer environmental effects than the no action alternative.

## APPLICANT INFORMATION

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**Owner Name:**

Freeport-McMoRan Cobre Mining Company

**Permit:**

GR002RE, as revised

**Site Address:**

Mailing: PO Box 10, Bayard, New Mexico, 88023

Physical Address: 303 Fierro Road, Hanover, New Mexico, 88041

**Contact persons:**

Officer - John D. Brack, President

Site Manager - Bruce D. Taylor, Manager

Site Contact - Amber Rheubottom, Environmental Scientist

## PERMIT BOUNDARY AND DESIGN LIMITS

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Cobre is requesting a change to its permit boundary and design limits. Of the approximate 100 additional acres located on Cobre and BLM lands to be included in the new design limits, 31 acres are outside of the current Cobre permit boundary.

## CLOSEOUT PLAN

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Pursuant to NMAC 19.10.5.506, a closeout plan for the CHR is included as Appendix A of this application. The closeout plan details the methods to be used to achieve the post mining land use of wildlife habitat. The closeout plan elements include:



- Demolition of the crossing structures over the forest access road and Hanover Creek
- Minor grading to support proper drainage and to integrate berm material
- Ripping the surface of proposed CHR to a depth of 18 to 24 inches and seeding that surface
- Erosion control and maintenance for 6 days per year for the first year and 1 day per year for 11 years; totaling 12 years of maintenance
- Revegetation maintenance: Assuming a 2% failure, 2% of the area is revegetated every year for a total of 12 years, starting the year reclamation is completed

## STANDARDS FOR THE HAUL ROAD

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Cobre voluntarily provides the information required by NMAC 19.10.5.508 for the CHR, as described in each section below.

### NMAC 19.10.5.508.B(1) SIGNS, MARKERS, AND SAFEGUARDING

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Activities at Cobre are regulated by the Mine Safety and Health Administration. Cobre maintains security plans that define the approaches used to prevent unauthorized access to each property. Through mandated training programs, all employees and contractors are trained to observe and report suspicious or unusual activity that threatens safety or security. Security personnel control access to the facility 24-hours per day. These measures will be extended for the new permit boundary and the CHR.

### NMAC 19.10.5.508.B(2) WILDLIFE PROTECTION

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Existing wildlife protection measures by Cobre are effective at minimizing adverse impacts on wildlife and important habitat. The approved measures used within the current permit boundaries will be extended to include the CHR. Specifically, to restrict access of wildlife, domestic animals and the public from entering the CHR area, additional fencing will be installed around the perimeter of the CHR. Security personnel will daily monitor the CHR and property fence lines and inspect for wildlife entry. Once operations cease, the CHR will be reclaimed for a post-mining land use of wildlife habitat.

A joint letter to MMD and NMED, dated March 13, 2009, was submitted to document the closure and safeguarding of historic mine features in Hanover Valley and near the CHR route. The sites that are safe and suitable for bat habitat will have appropriate protection measures installed.

#### NMAC 19.10.5.508.B(3) CULTURAL RESOURCES AND GEOLOGY

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In 2012, a Class III cultural resource survey was completed for the proposed CHR corridor to satisfy NEPA and NHPA requirements for BLM approval of a mine plan of operations to authorize the use of federal public lands for the haul road. The survey identified eight sites of interest of which one was eligible under Criterion D of the National Register of Historic Places (NRHP). Cobre chose to redesign the CHR to avoid the one eligible site. Consequently, there are no sites listed on the NRHP or the State Register of Cultural Properties that will be affected by the project, and the proposed project will protect the one site determined to be eligible for listing by avoidance.

#### NMAC 19.10.5.508.B(4) HYDROLOGIC BALANCE

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The project is located within the Hanover Creek watershed of the larger Mimbres River Basin (Figure 7). The Hanover Creek watershed is drained by Hanover Creek. The CHR will cross Hanover Creek and multiple, ephemeral drainage features which convey storm water flows to Hanover Creek.

The CHR will not change existing watershed boundaries; storm water flows will be conveyed through engineered, culvert crossings where it crosses Hanover Creek and the ephemeral drainage features. The preliminary engineering design contains 15 culverts (generally designed as spanning arch culverts and corrugated metal pipes) and 16 sediment traps to effectively manage storm water flows resulting from the 100-year, 24-hour storm event. Appendix B includes preliminary designs for the CHR. The CHR has been designed by a professional engineer registered in the state of New Mexico, and the final engineering plans will be certified. As-built drawings will be completed promptly after construction and be retained on site.

In accordance with the requirements of the Multi-Sector General Permit (MSGP), the Cobre Storm Water Pollution Prevention Plan (SWPPP) mandates the implementation and use of temporary storm water controls and Best Management Practices (BMPs) during construction, such as berms, catchment basins, road grading, and wattles.



The SWPPP also mandates stormwater management and control during operations. The SWPPP establishes monitoring and inspection requirements, control measures, and BMPs to minimize the potential contribution of suspended solids and other pollutants to surface waters. Acid and other toxic substances will not be used on the CHR.

#### NMAC 19.10.5.508.B(5) STREAM DIVERSIONS

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No streams or drainages will be diverted as a result of construction or operation of the CHR.

#### NMAC 19.10.5.508.B(6) IMPOUNDMENTS

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Impoundments are not currently planned for construction and operation of the CHR.

#### NMAC 19.10.5.508.B(7) MINIMIZATION OF MASS MOVEMENT

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During construction of the CHR waste rock or ore stockpiles will not be constructed. To the extent practicable, top soil will be salvaged from the haul road during construction and stored appropriately.

#### NMAC 19.10.5.508.B(8) RIPARIAN AND WETLAND AREAS

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A jurisdictional determination (JD) was submitted to and accepted by the U.S. Army Corps of Engineers (Corps), affirming the extent of waters of the U.S. in the CHR project area. No wetland areas were identified. A nationwide 404 permit application will be filed with the Corps prior to construction for impacts to jurisdictional waters. Further, vegetation mapping conducted in preparation for the EA did not identify riparian areas within the boundary

### NMAC 19.10.5.508.B(9) ROADS

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The CHR will be constructed on mostly Cobre property with approximately 8.7 acres on Bureau of Land Management (BLM) land. In general the road follows current and historic roads used mostly for mining, monitor well access, and ranching activities. Material for the construction of the CHR will be native to the area, sourced directly from the CHR footprint.

The CHR will be constructed using standard engineering practice employing a balanced cut and fill design to minimize grade changes with the available construction material. An overpass will be constructed along the northern end of the road. The northern section will span a Forest Service road and Hanover Creek. The arch over the Forest Service road will continue to allow public access to the north onto Forest Service property.

The drainages along the haul road are ephemeral and flow in response to precipitation events with the exception of Hanover Creek which is intermittent at this reach. To manage storm water up and down gradient of the CHR, culverts will be installed beneath the road engineered for a 100-year 24-hour precipitation event. The culverts will be inspected following large precipitation events to ensure operation. The preliminary engineered design is included in Appendix B.

### NMAC.19.10.5.508.B(10) SUBSIDENCE CONTROL

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The CHR will not have any underground or in situ solution mining activities associated with it.

### NMAC 19.10.5.508.B(11) EXPLOSIVES

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Blasting will be required for some portions of the construction of the CHR. All explosive activities will be carried out by trained persons as required by federal law and in compliance with all regulations and rules specified by the Bureau of Alcohol, Tobacco, Firearms and Explosives.

## NMAC 19.5.508.C SITE STABILIZATION AND SURFACE CONFIGURATION

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The Cobre Closeout plan (Appendix A) describes the measures to minimize future impact to the environment to achieve a self-sustaining ecosystem. It is unlikely that construction of the haul road will result in acid drainage, based on many samples collected during the closing of historic workings in the vicinity of the CHR (Figure 4). The results of those closings are described in Appendix C of this application. If acid generating material is encountered on the road that may impact surface or groundwater, it will be encapsulated with three feet of non-acid generating material. These locations will be surveyed and retained for avoidance during closeout plan operations.

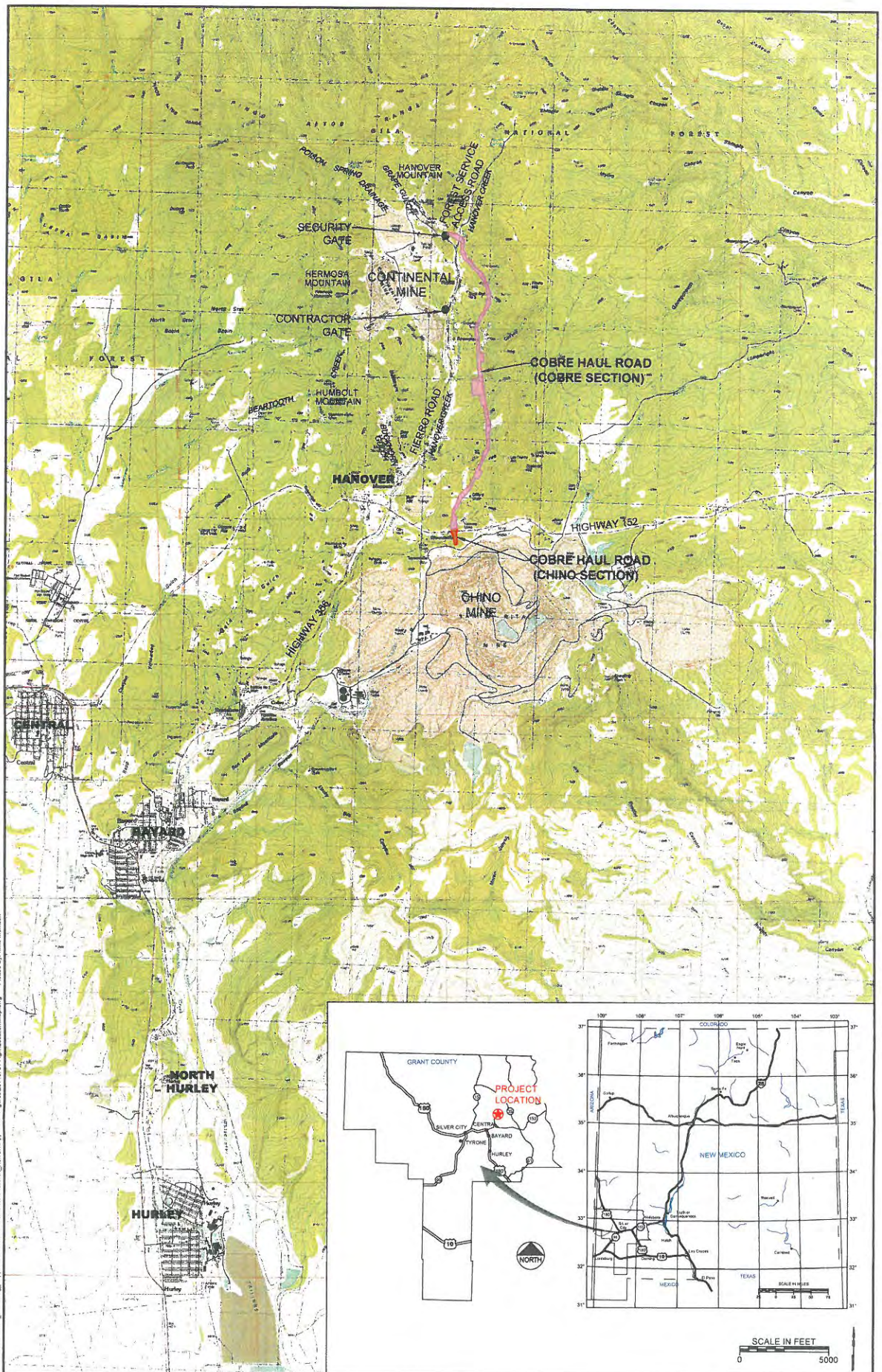
## NMAC 19.5.508.D EROSION CONTROL

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When the CHR is no longer required for operation it will be closed out in a manner that controls erosion. The Closeout Plan (Appendix A) describes the measures to control erosion after reclamation. BMP's will be utilized during construction and operation of the CHR to limit sediment transport. Long-term erosion control measures may include the installation of berms, designed channels, and sediment traps, as necessary. Short-term erosion control measures may include, but not limited to: silt fences, hay bales, water bars, and mulching. Runoff will be diverted into natural drainages and final shaping will stabilize all disturbed areas.



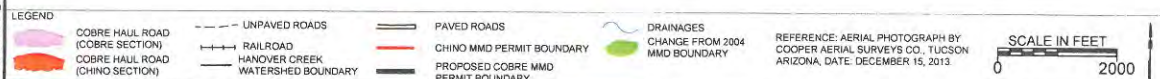
## FIGURES



Date: 8/1/2014 2:25:09 PM R:\Cobres\Res\Permitting\_Support\Products\Document\Figure\02140721\_Fig. 1 Location Map.dwg Plotted By: Mike Morrison

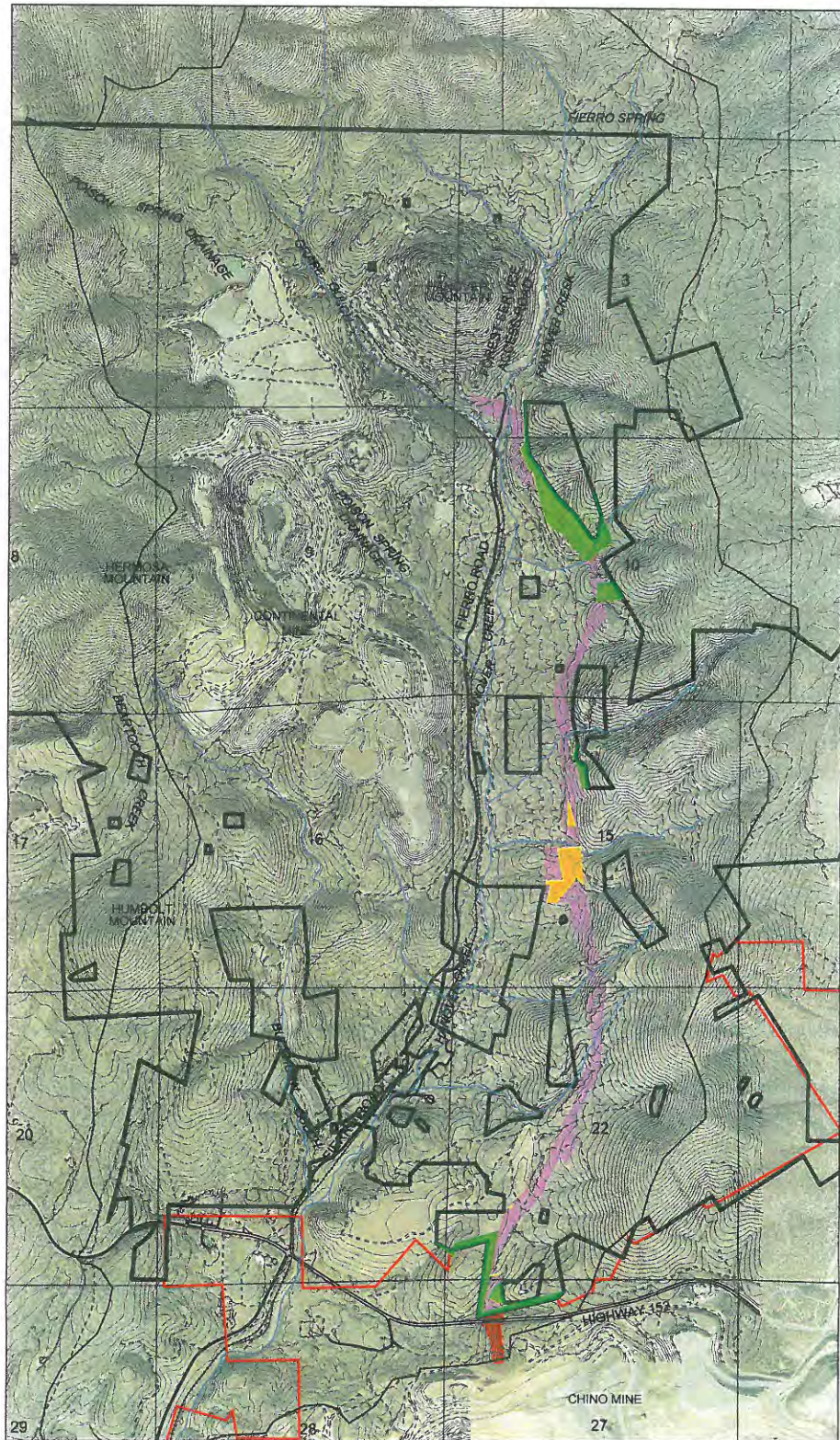
**FIGURE 1**  
 LOCATION MAP  
 APPLICATION FOR GR002RE





Prepared For  
 **FREEPORT-McMoRAN**  
**Cobre Mining Company**





#### LEGEND

COBRE HAUL ROAD  
(COBRE SECTION)  
COBRE HAUL ROAD  
(CHINO SECTION)

UNPAVED ROADS  
RAILROAD  
HANOYER CREEK  
WATERSHED BOUNDARY

PAVED ROADS  
CHINO MMD PERMIT BOUNDARY  
PROPOSED COBRE MMD  
PERMIT BOUNDARY

DRAINAGES  
CHANGE FROM 2004  
MMD BOUNDARY  
BLM LAND AFFECTED  
BY COBRE HAUL ROAD

REFERENCE: AERIAL PHOTOGRAPH BY  
COOPER AERIAL SURVEYS CO., TUCSON  
ARIZONA, DATE: DECEMBER 15, 2013.

SCALE IN FEET  
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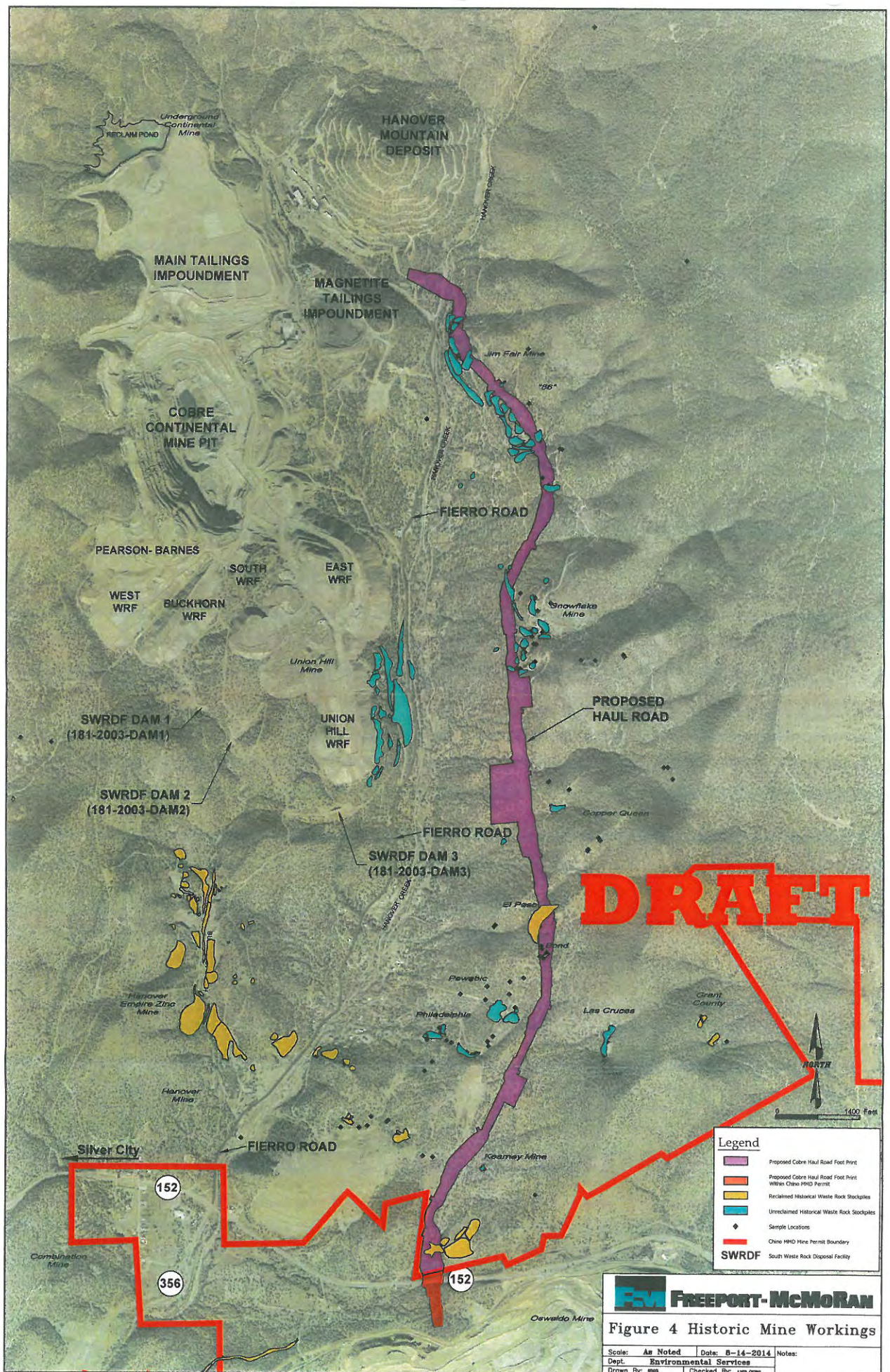
PROJECT: 200189 TASK: 001

**TELESTO**  
SOLUTIONS INCORPORATED

**FIGURE 3**  
**PROPOSED MMD BOUNDARY WITH BLM PARCELS**  
**APPLICATION FOR GR002RE**

Prepared For  
**FREEPORT-McMORAN**  
Cobre Mining Company







**APPENDIX A:**  
**CLOSEOUT PLAN**

# **2014 Cobre Haul Road Closeout Plan**

*Prepared for*  
**Freeport-McMoRan Copper & Gold  
Cobre Mining Company  
303 Fierro Road  
Hanover, New Mexico 88041**

*Prepared by*  
**Telesto Solutions Inc.  
2950 East Harmony Rd. Suite 200  
Fort Collins, Colorado 80528**

**August 22, 2014**



# Signature Page

## 2014 Cobre Haul Road Closeout Plan

August 22, 2014



### *Report Authors and Contributors*

*Telesto Solutions, Inc.*

A handwritten signature in black ink, appearing to read "April Tischer".

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April Tischer P.E. – Primary Author

A handwritten signature in black ink, appearing to read "Jennifer Davis".

---

Jennifer Davis – Report Review

#### *Contributors:*

Jon Cullor  
Michael Morison

Walt Niccoli

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## 1.0 INTRODUCTION

Freeport-McMoRan Cobre Mining Company (Cobre) is proposing a change to its existing permit, GR002RE, to enable construction of the Cobre Haul Road (CHR). The road will be used by haul trucks to transport ore from Cobre's facilities to Chino.

The proposed CHR includes current and new disturbances that will cover approximately 105 acres including approximately 91 acres of land controlled by Cobre, 8.7 acres of Bureau of Land Management (BLM) administered land and 5 acres of land controlled by Chino. The haul road will be approximately 3.5 miles long. In general the road follows current and historic roads used mostly for mining, monitor well access, and ranching activities.

The proposed CHR will be constructed using standard engineering practices that employ a balanced cut and fill design to minimize grade changes and to utilize locally available material. The proposed CHR includes spanning arch road crossings over the Hanover Creek and the forest service access road (forest access road) that extends off of Fierro Road.

This document provides the Closeout Plan (CP) and reclamation cost estimate to support the permit change associated with the CHR located within Cobre's proposed new permit boundary.

This CP complies with all applicable regulations and requirements stipulated in the New Mexico Mining and Mineral Act (19.10.5 NMAC). In addition, this CP conforms with all applicable mine reclamation regulations set forth by the BLM (43 Code of Federal Regulations (CFR) 3809).

Cobre is preparing an updated Closure/Closeout Plan for its other mining activities. That plan will be submitted in the near future.



## **2.0 REGULATORY LAND STATUS/Framework**

Pursuant to NMAC 19.10.5.506.B(2), this section lists those regulatory permits relevant for pre- or final closeout activities.

### **2.1 State Permits**

Discharges from Cobre's facilities are regulated under groundwater discharge permits (DPs) issued under the New Mexico Water Quality Control Commission Regulations (WQCC; 20.6.2.3101 *et seq.* NMAC). The proposed CHR is not a discharging unit; therefore the WQCC regulations governing closure requirements for copper mines do not apply to the CHR reclamation.

### **2.2 Federal Permits**

The proposed CHR is expected to cross five isolated fragments of BLM land totaling approximately 8.7 acres. This Closeout Plan for the CHR meets the requirements of BLM Surface Management Regulations, 43 CFR 3809.

Compliance with the Environmental Protection Agency (EPA) National Pollutant Discharge Elimination System (NPDES) permitting program will be maintained through modification of Cobre's Stormwater Pollution Prevention Plan (SWPPP) to include the proposed CHR Closeout Plan as necessary.

The stormwater from ephemeral drainages will be conveyed under the haul road using culverts sized for the 100-year 24-hour storm event. Stormwater sediment traps and other best management practices (BMPs) useful for closeout purposes will be left in place or constructed as part of closeout. Stormwater runoff will be directed to the inside edge of the proposed CHR to run into the natural water channels and culverts that will remain in place during the post-closeout period and discharged through the BMPs.

An amendment to Cobre's SWPP for the closeout activities will ensure the proposed CHR will not contribute suspended solids or other stormwater and surface water

pollutants to the hydrologic system. The MSGP will establish the monitoring and inspection requirements, in addition to control measures and BMPs used to minimize suspended solids and other pollutants.

### **3.0 EXISTING CONDITIONS**

Pursuant to NMAC 19.10.5.506.A, the following sections describe site-specific characteristics of the proposed expanded permit area.

#### **3.1 Climate**

Meteorological data collected at the Fort Bayard, New Mexico, National Weather Service Station are used to describe the climate at Cobre. This station is located approximately five miles west of the Chino Mine and is considered to be representative of the site area. Cobre's Amended MPO provides a detailed description of climate information. The area is considered representative of a dry desert climate with an average annual rainfall of 15.7 inches with July and August being the wettest months, months having average rainfalls between 3.2 and 3.4 inches. Annual snowfall is 10.4 inches falling mostly between December and March. Average maximum temperature varies from 52 degrees Fahrenheit in December and January to 87 degrees Fahrenheit in June and July. Average minimum temperatures vary between 25 degrees Fahrenheit in January and 58 degrees Fahrenheit in July. Evaporative demand in this region is high and annual evaporation far exceeds annual precipitation.

#### **3.2 Geology**

The proposed CHR route would cross over several geologic units (Figures A-1 and A-2). As shown in Figure A-3, the primary mineralized zones that the proposed CHR would encounter are skarn deposits, which generally have a low potential to generate acid. Based on the geology at the site, the haul road material will make suitable reclamation substrate for closeout activities.

### **3.3 Soils and Vegetation**

The soils in Grant County were previously mapped by the Soil Conservation Service (Cobre, 2012). The area mainly consists of Santa Fe-Rock outcrop complex, which is typically made up of shallow, gravelly sandy loam or barren bedrock.

### **3.4 Hydrology**

The proposed CHR is located within the Hanover Creek watershed of the larger Mimbres River Basin. There are no perennial waters in the Hanover Creek watershed. The proposed CHR will cross Hanover Creek and several ephemeral drainages. The ephemeral drainages flow to Hanover Creek, which flows to Whitewater Creek near Chino. The CHR Closeout Plan will not change any existing watershed boundaries. Stormwater runoff from the closed CHR will be managed under a NPDES MSGP permit, and thus, BMPs and other controls will limit the potential to impact surface waters.

Due to the geochemistry of the rocks in the area (Cobre, 2009), the meteoric water that comes into contact with the closed CHR is not anticipated to affect existing groundwater quality.

## **4.0 PROPOSED CHR CONFIGURATION**

The 120-foot wide road surface will be flanked by single or dual berms, depending upon their location on the haul road with respect to the cut and fill slopes. Each berm will measure approximately 24-feet wide and 8-feet tall to accommodate the largest haul trucks that will be using the road (Figure A4). Blasted rock faces will comprise some of the cut slopes. The proposed CHR will be cleared of spilled ore as part of operations.

## **5.0 RECLAMATION PRACTICES**

Reclamation will provide for the establishment of a self-sustaining ecosystem consistent with the designated post-mining land uses, which is wildlife habitat. The proposed CHR will be reclaimed through minor regrading and revegetation, which includes ripping and

seeding. There will be no substantial change in topography. A smaller road (approximately 12 to 14 feet in width) equaling roughly 5 acres will remain on the footprint of the original CHR for post-closure maintenance vehicles and activities. Figures A5-A11 illustrate the conceptual plans for reclamation (i.e., closeout). Closeout of the proposed CHR will comply with all applicable permits.

The travel surfaces of the proposed CHR will be ripped to a depth of 18 to 24 inches. Minor grading will consist of incorporating berm material into the road. Surfaces will be seeded according to approved methods and seed mixes. The road crossing over the forest access road and Hanover Creek will be removed and demolished. Culverts in ephemeral drainages will remain in place. Road embankments will be monitored for erosion until vegetation is established.

## **6.0 POST CLOSEOUT MONITORING**

Erosion, vegetation, and wildlife monitoring are required following completion of reclamation. Details can be found in the permits and the approved work plans for monitoring activities. The reclaimed proposed CHR will be visually inspected for signs of erosion (i.e. gullyng or extensive rilling), and any significant erosion features will be mitigated to prevent future degradation. Inspections and repair will follow the practices currently in use by Cobre, which are outlined in existing permits. Revegetated slopes are designed to be stable by meeting all applicable standards.

Vegetation establishment monitoring of seeded areas will be conducted in accordance with Condition O and Appendix C of Revision 01-1 of the MMD Permit, GR002RE. The vegetation monitoring plan and results will be provided to MMD according to the permits.

Wildlife monitoring, as well as surface and groundwater quality monitoring, will be detailed in the 2014 Cobre Closure/Closeout Plan update for the mine as a whole.

## **7.0 CLOSEOUT COST ESTIMATE (CAPITAL AND O&M)**

This section provides a description of the capital and operation and maintenance reclamation cost estimates for the CHR-Cobre Section. The reclamation cost estimate is used in determining the required amount of financial assurance. Details of the reclamation cost estimate can be found in Appendix A of this CP. The reclamation cost estimate is summarized as follows:

- Demolish the forest access road and Hanover Creek crossing structures
- Minor grading to support proper drainage and to integrate berm material
- Rip surface of proposed CHR to a depth of 18 to 24 inches and seed
- Erosion control and maintenance crew: 6 days a year for the first year and 1 day a year for 11 years, for a total of 12 years of maintenance
- Revegetation maintenance: 2% failure (2% of area is revegetated) every year for a total of 12 years, starting the year reclamation is completed

The reclamation cost estimate for the 8.7 acres of BLM land within the proposed CHR footprint totals \$23,000. The reclamation cost estimate for the proposed CHR on Cobre property totals \$279,000, for a combined total of \$302,000 for the CHR-Cobre Section (in current dollars; see Table 1).



## 8.0 REFERENCES

- Cobre, 2009. *Letter to NMED dated March 13, 2009 Re: Cobre Mining Company Shaft and Adit Program Completion Continental Mine-Conditions 29 and 63(c), of DP-1403 and 7J of GR002RE*, Hurley, New Mexico: Freeport-McMoRan Copper and Gold Cobre Mining Company.
- Cobre, 2012. *Freeport-McMoRan Cobre Mining Company Mine Plan of Operations Amendment No. 5*, Bayard, New Mexico: Freeport-McMoRan Cobre Mining Company.
- Jones, W., Hernon, R. & Moore, S., 1967. *General Geology of Santa Rita Quadrangle, Grant County, New Mexico*, s.l.: USGS Professional Paper 555.
- Telesto, 2011. *Continental Mine Interim Stage 1 Ground Water Abatement Plan Report and Expanded Work Plan, Condition 32, DP-1403*, Fort Collins, Colorado: Telesto Solutions Inc.

## TABLES

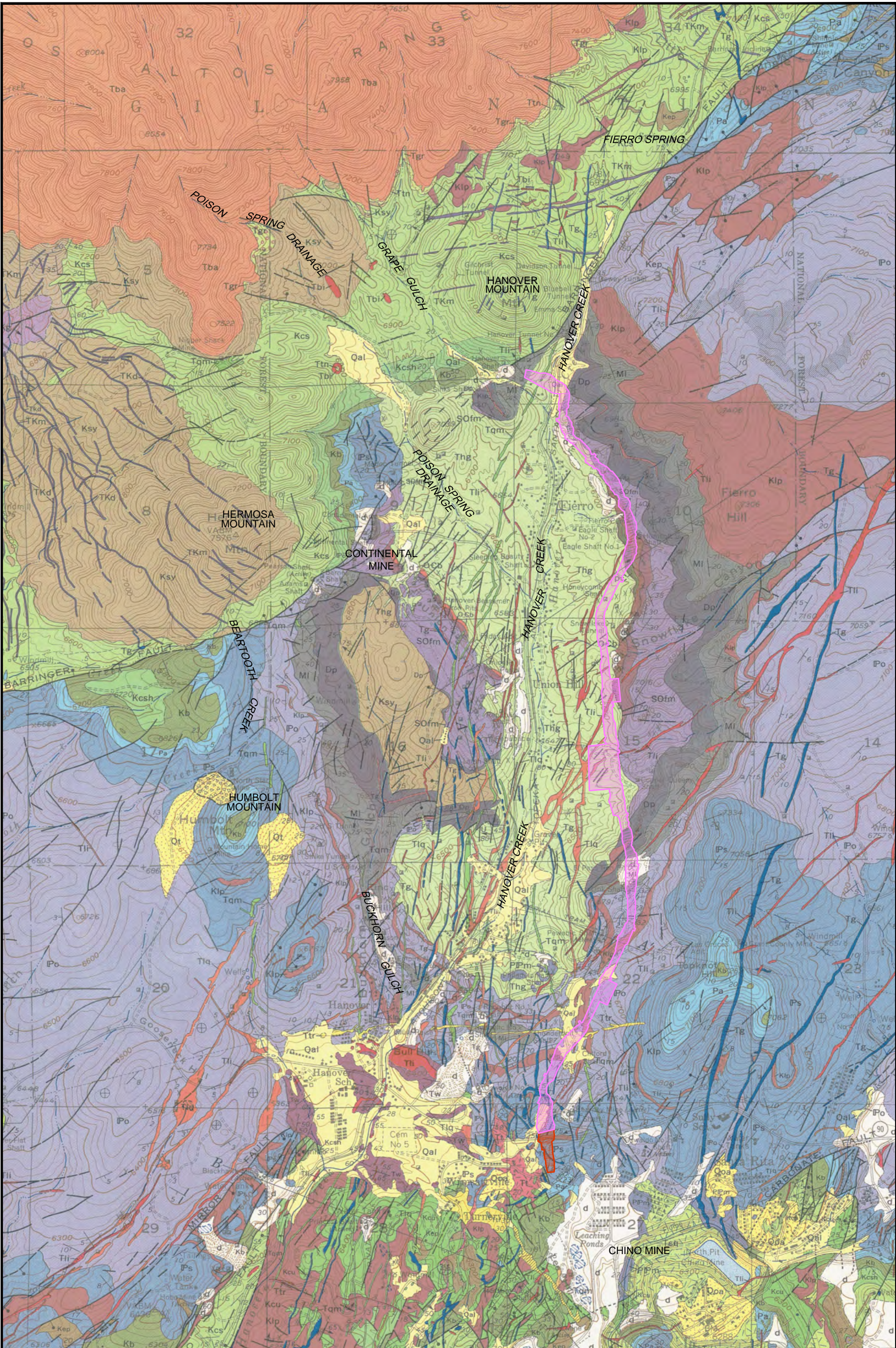
**Table 1 Cobre Haul Road Cobre Section**

Item	Subtotal, Direct Costs	Subtotal, Indirect Costs 28.3%	Total Cost
Capital			
Hanover Creek and Forest Service Road Crossing Spanning Arch Demolition	\$34,576	\$9,785	\$44,000
Grade Surface CHR-Cobre Section	\$18,503	\$5,236	\$24,000
Grade Surface CHR BLM Land	\$1,749	\$495	\$2,000
Revegetation CHR-Cobre Section	\$77,169	\$21,839	\$99,000
Revegetation BLM Land	\$7,729	\$2,187	\$10,000
<b>Total Capital Cost</b>	<b>\$140,000</b>	<b>\$40,000</b>	<b>\$180,000</b>
Operations and Maintenance			
		23.3%	
Veg Maintenance CHR-Cobre Section	\$19,272	\$4,490	\$23,762
Veg Maintenance CHR BLM Land	\$1,930	\$450	\$2,380
Erosion Control CHR-Cobre Section*	\$71,718	\$16,710	\$88,428
Erosion Control BLM Land*	\$7,183	\$1,674	\$8,856
<b>Total Operations and Maintenance</b>	<b>\$100,000</b>	<b>\$23,000</b>	<b>\$123,000</b>
CHR-Cobre Section	\$221,000	\$58,000	\$279,000
CHR BLM Land	\$19,000	\$5,000	\$23,000
<b>Total Current Dollar Cost</b>	<b>\$240,000</b>	<b>\$63,000</b>	<b>\$302,000</b>

\*Erosion Control was calculated for the entire CHR-Cobre Section, the costs for BLM land were broken out based on percentage of BLM Land.

## FIGURES





**LEGEND**

COBRE HAUL ROAD (COBRE SECTION)

COBRE HAUL ROAD (CHINO SECTION)

**REFERENCE:**  
MAP: GEOLOGY OF THE SANTA RITA QUADRANGLE, NEW MEXICO-GRANT COUNTY GO-306, PREPARED BY THE DEPARTMENT OF THE INTERIOR UNITED STATES GEOLOGICAL SURVEY, DATED 1964.

**SCALE IN FEET**

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**FIGURE A1**  
**GENERALIZED GEOLOGY**

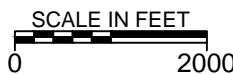
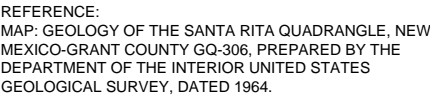
Prepared For

**FREEPORT-McMoRAN**

Cobre Mining Company

Date: 8/14/2014 2:24:52 PM R:\Cobre\Restart\_Permitting\_Support\Products\CP\_Appendix A\Calculations\Autocad\2014\0701-Fig A1\_Geology.dwg Plotted By: Mike Morrison





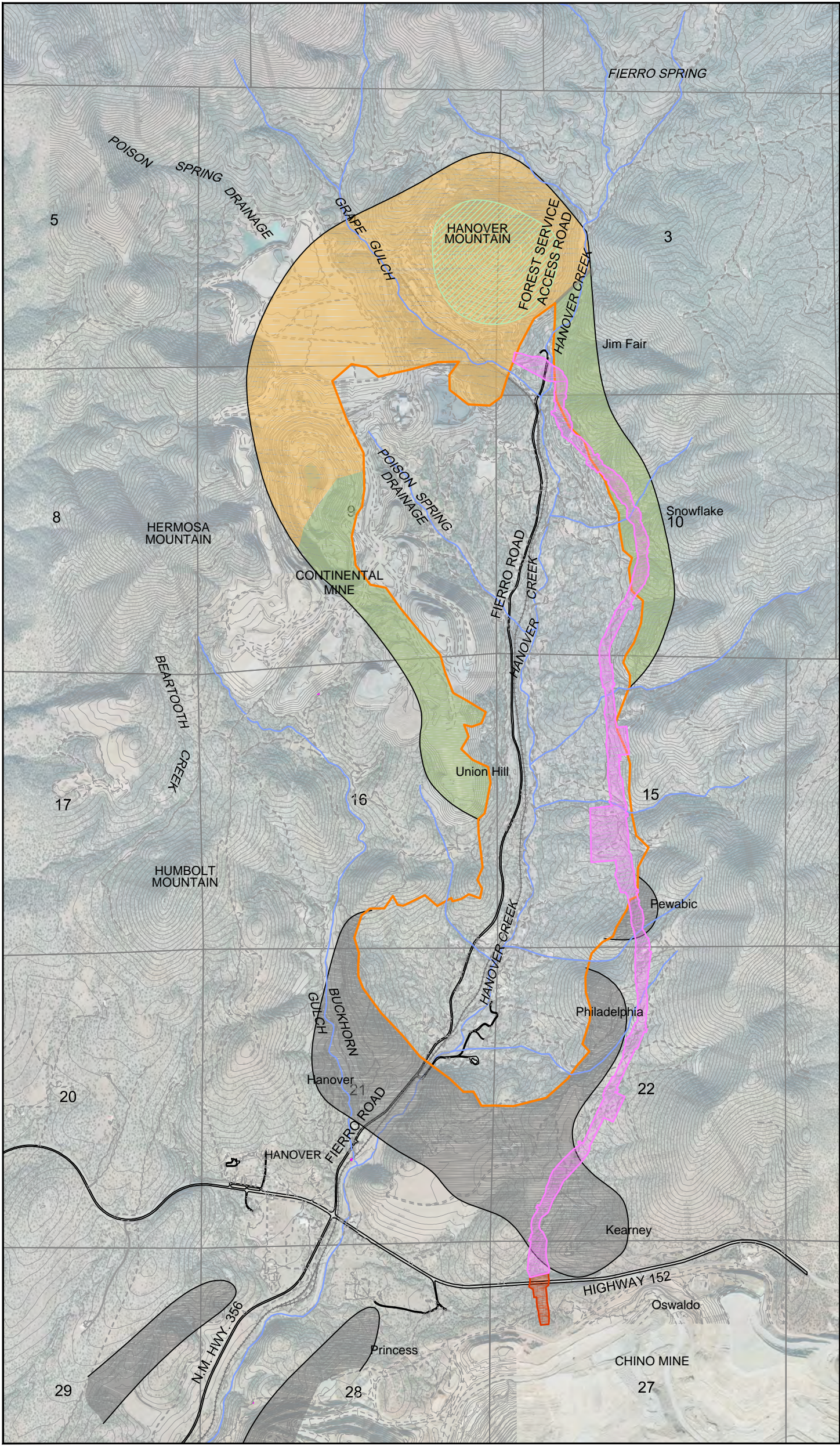
Prepared For

 **FREEPORT-McMoRAN**

**Cobre Mining Company**



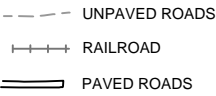
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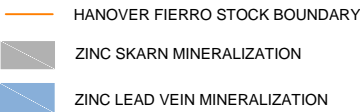
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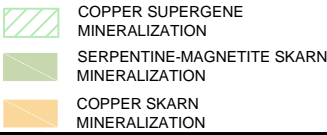
COBRE HAUL ROAD  
(COBRE SECTION)  
COBRE HAUL ROAD  
(CHINO SECTION)  
DRAINAGES



UNPAVED ROADS  
RAILROAD  
PAVED ROADS



HANOVER FIERRO STOCK BOUNDARY  
ZINC SKARN MINERALIZATION  
ZINC LEAD VEIN MINERALIZATION



COPPER SUPERGENE  
MINERALIZATION  
SERPENTINE-MAGNETITE SKARN  
MINERALIZATION  
COPPER SKARN  
MINERALIZATION

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PROJECT: 200189

TASK: 001

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FIGURE A3  
GENERAL ORE TYPES

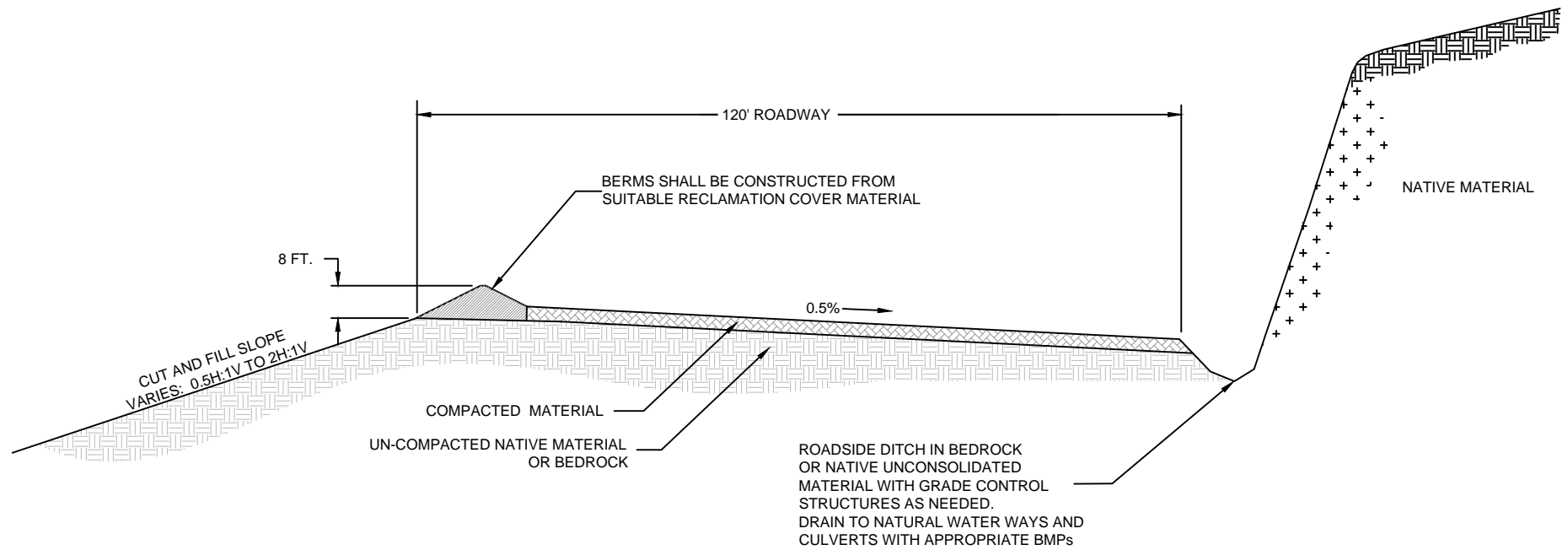
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Fm FREEPORT-McMoRAN

Cobre Mining Company



Date: 8/14/2014 2:24:52 PM R:\Cobre\Restart\_Permitting\_Support\Products\CP\_Appendix A\Calculations\Autocad\20140701-Fig.A4 Cross Section.dwg Plotted By: Mike Morrison



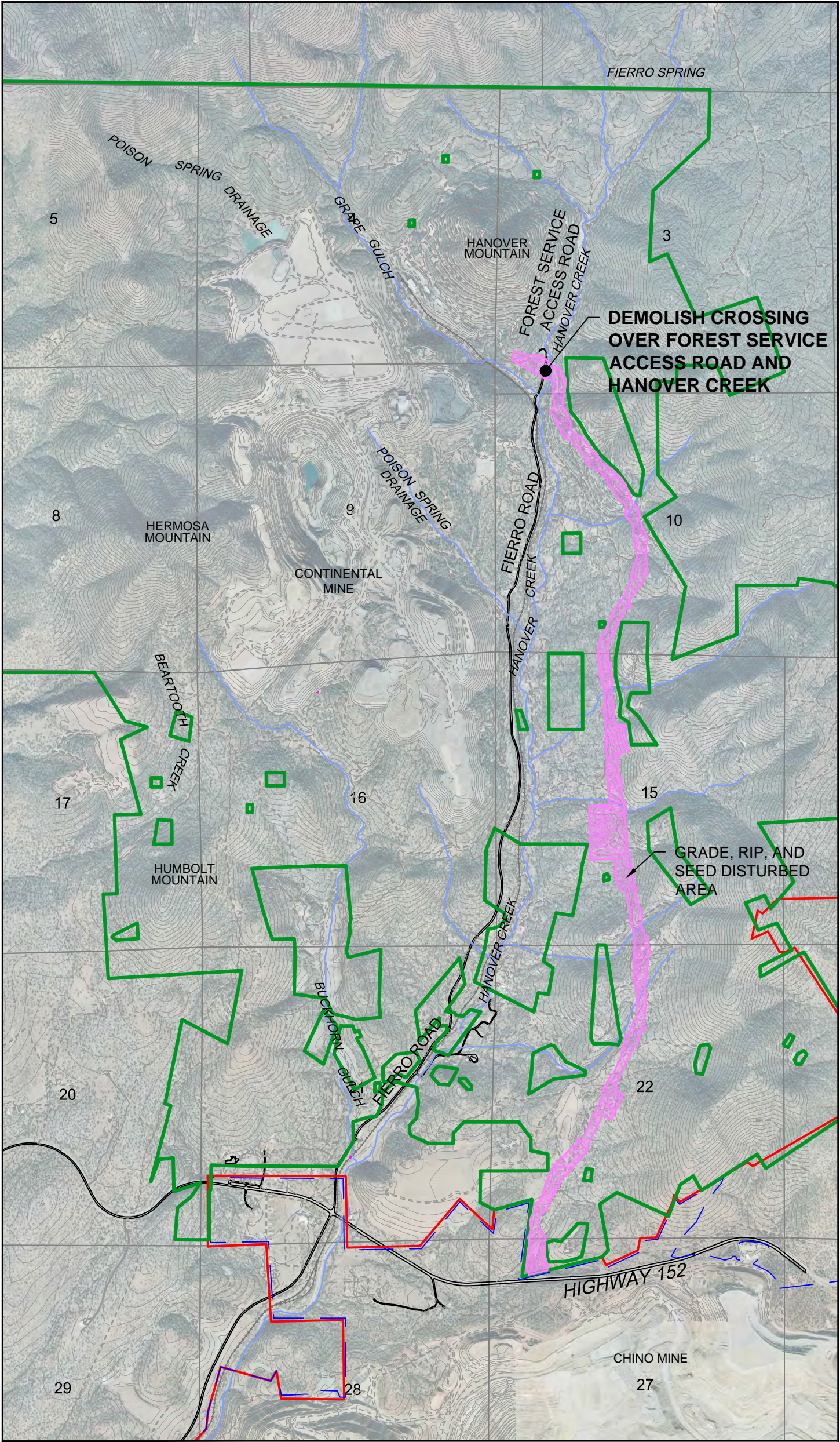
NOT TO SCALE

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PREPARED BY:	
<b>TELESTO</b> SOLUTIONS INCORPORATED	

**FIGURE A4**  
**PROPOSED COBRE HAUL ROAD GENERAL CROSS-SECTION**

PREPARED FOR:
<b>FREEPORT-McMoRAN</b>
Cobre Mining Company





LEGEND

- |  |                                 |  |               |  |                                    |  |           |
|--|---------------------------------|--|---------------|--|------------------------------------|--|-----------|
|  | COBRE HAUL ROAD (COBRE SECTION) |  | UNPAVED ROADS |  | PAVED ROADS                        |  | DRAINAGES |
|  | CHINO MMD PERMIT BOUNDARY       |  | RAILROAD      |  | PROPOSED COBRE MMD PERMIT BOUNDARY |  |           |

REFERENCES:  
1. AERIAL PHOTOGRAPH BY COOPER AERIAL SURVEYS CO., TUCSON ARIZONA, DATE: DECEMBER 15, 2013.

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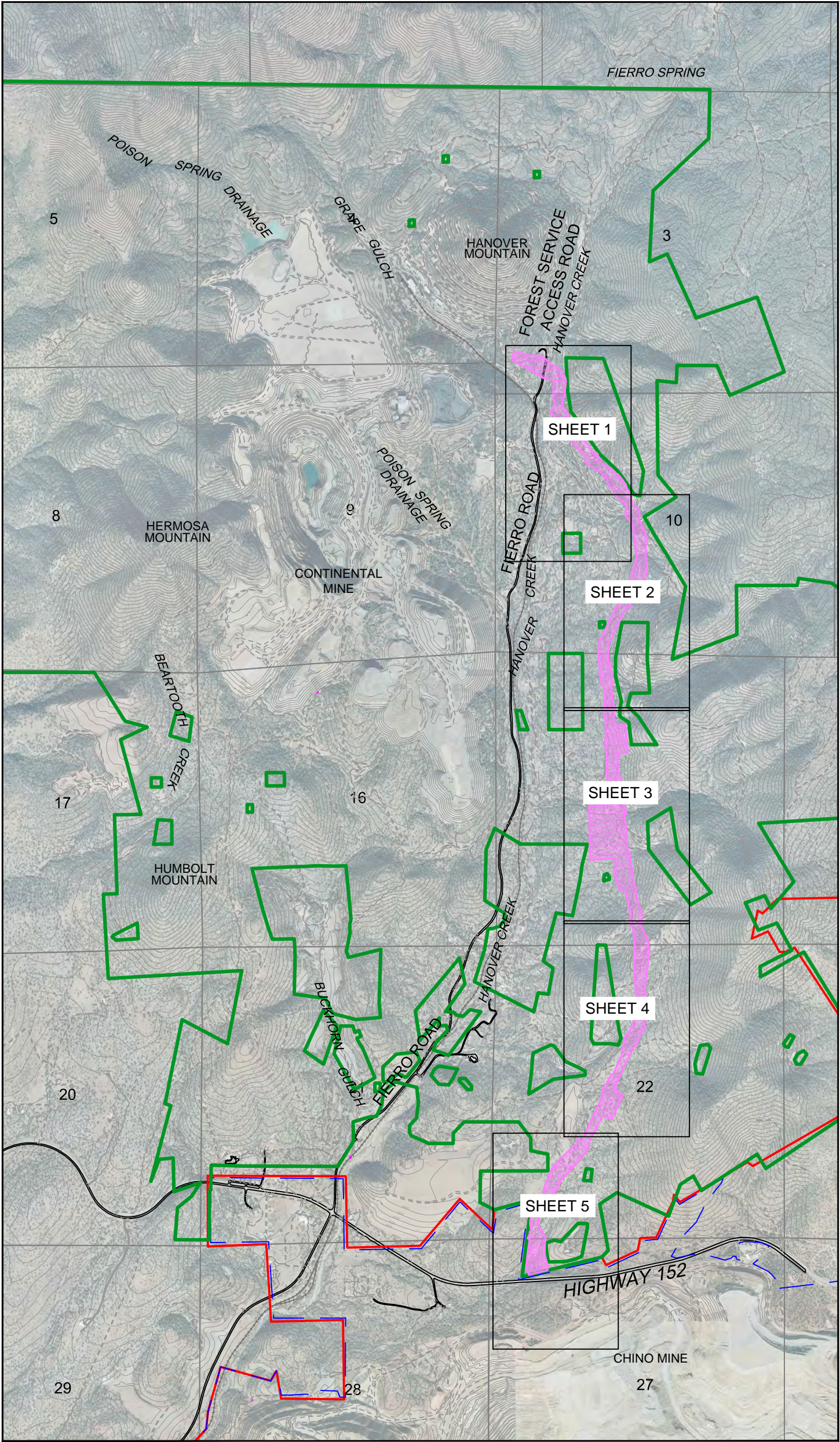
**TELESTO**  
SOLUTIONS INCORPORATED

**FIGURE A5**  
**RECLAIMED PROPOSED COBRE HAUL ROAD (COBRE SECTION)**

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**FREEPORT-McMoRAN**  
Cobre Mining Company



Date: 8/19/2014 7:21:35 AM \\192.168.199.12\data\new\Cobre\Restart\_Permitting\_Support\Products\CP\_Appendix A\Calculations\Autocad\20140815-Fig A6 Reclaimed Haul Road.dwg Plotted By: Mike Morrison



LEGEND

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|--|---------------------------------|--|---------------|--|------------------------------------|--|-----------|
|  | COBRE HAUL ROAD (COBRE SECTION) |  | UNPAVED ROADS |  | PAVED ROADS                        |  | DRAINAGES |
|  | CHINO MMD PERMIT BOUNDARY       |  | RAILROAD      |  | PROPOSED COBRE MMD PERMIT BOUNDARY |  |           |

REFERENCES:  
1. AERIAL PHOTOGRAPH AND TOPOGRAPHY BY COOPER AERIAL SURVEYS CO., TUCSON ARIZONA, DATE: DECEMBER 15, 2013.

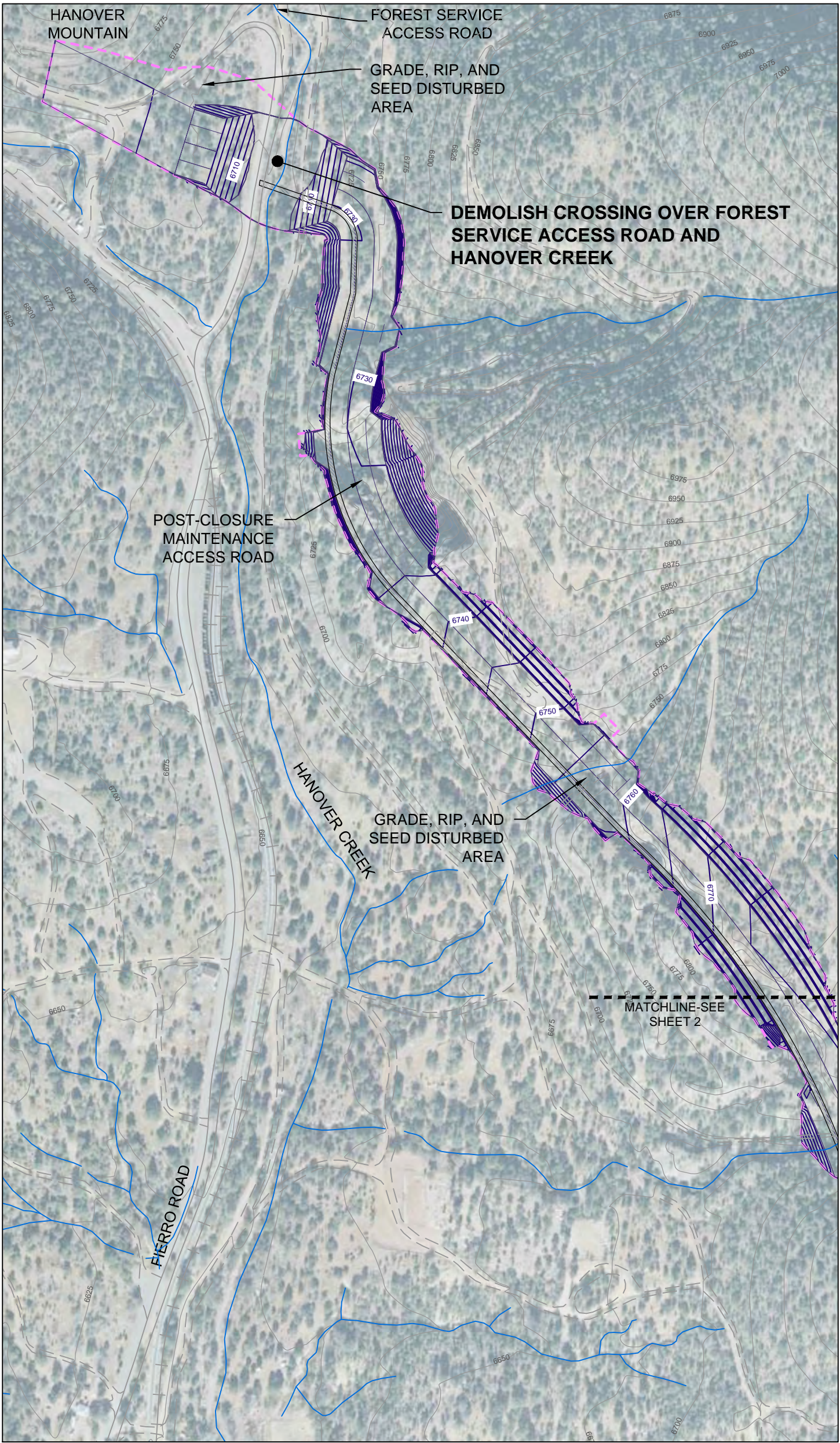
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FIGURE A6  
RECLAIMED PROPOSED COBRE HAUL ROAD OVERALL SHEET OVERVIEW

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Cobre Mining Company





LEGEND			
	COBRE HAUL ROAD (COBRE SECTION)		UNPAVED ROADS
	RAILROAD		PAVED ROADS
	DRAINAGES		EXISTING TOPOGRAPHIC CONTOURS (25' INT. AMSL)
	PROPOSED HAUL ROAD CONTOURS (5' INT. AMSL)		

REFERENCES:  
1. AERIAL PHOTOGRAPH, TOPOGRAPHY AND DRAINAGES BY COOPER AERIAL SURVEYS CO., TUCSON ARIZONA, DATE: DECEMBER 15, 2013.

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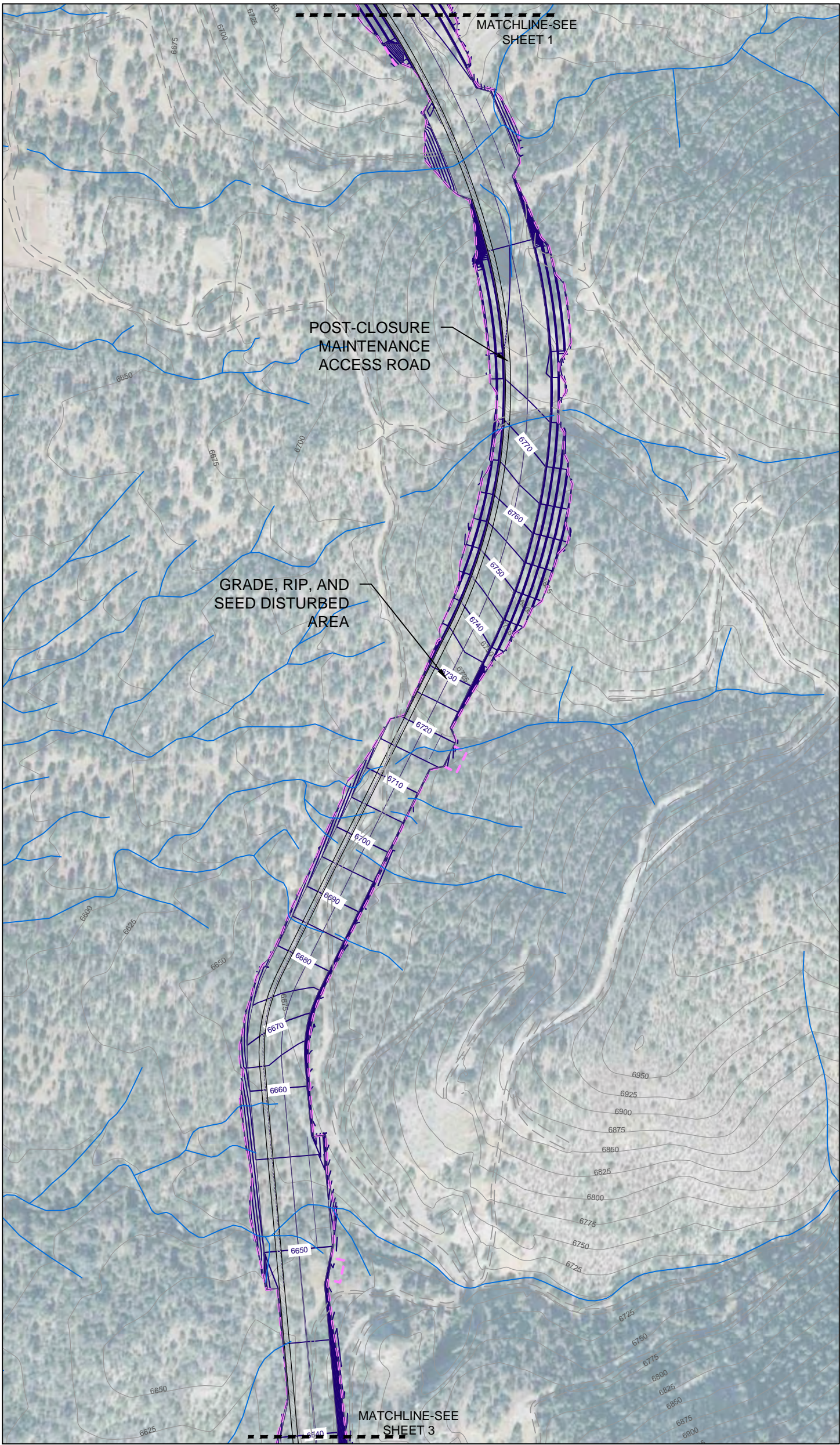
FIGURE A7  
RECLAIMED PROPOSED COBRE HAUL ROAD, SHEET 1

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SCALE IN FEET  
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LEGEND

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|--|------------------------------------|--|--|--|---|
|  | COBRE HAUL ROAD<br>(COBRE SECTION) |  | UNPAVED ROADS                              |  | EXISTING TOPOGRAPHIC CONTOURS (25' INT. AMSL) |
|  | DRAINAGES                          |  | PROPOSED HAUL ROAD CONTOURS (5' INT. AMSL) |  |   |

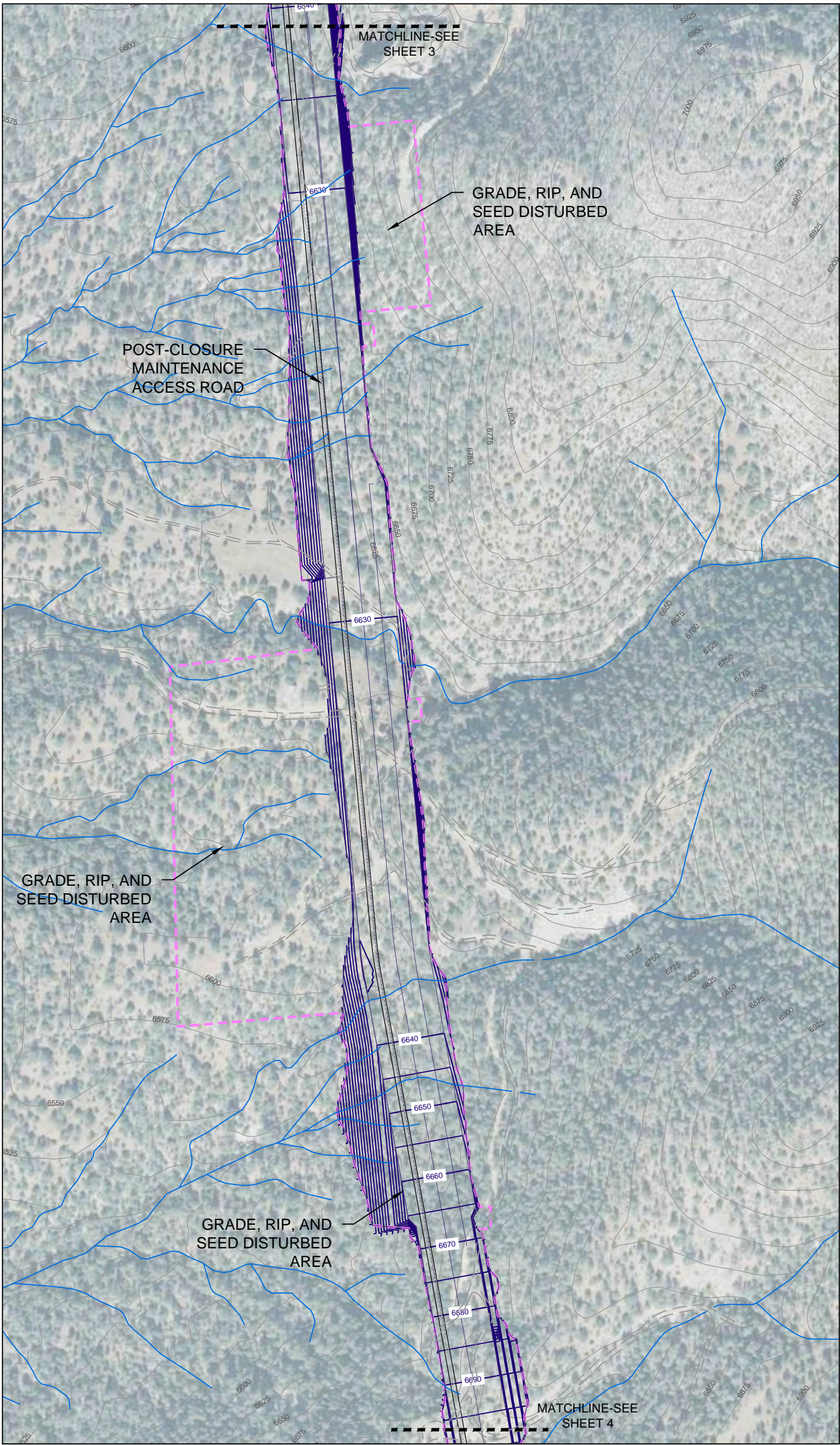
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DECEMBER 15, 2013.

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FIGURE A8  
RECLAIMED PROPOSED COBRE HAUL ROAD, SHEET 2

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Cobre Mining Company





LEGEND			
	COBRE HAUL ROAD (COBRE SECTION)		UNPAVED ROADS
	PAVED ROADS		EXISTING TOPOGRAPHIC CONTOURS (25' INT. AMSL)
	DRAINAGES		PROPOSED HAUL ROAD CONTOURS (5' INT. AMSL)

REFERENCES:  
1. AERIAL PHOTOGRAPH, TOPOGRAPHY AND DRAINAGES BY COOPER AERIAL SURVEYS CO., TUCSON ARIZONA, DATE: DECEMBER 15, 2013.

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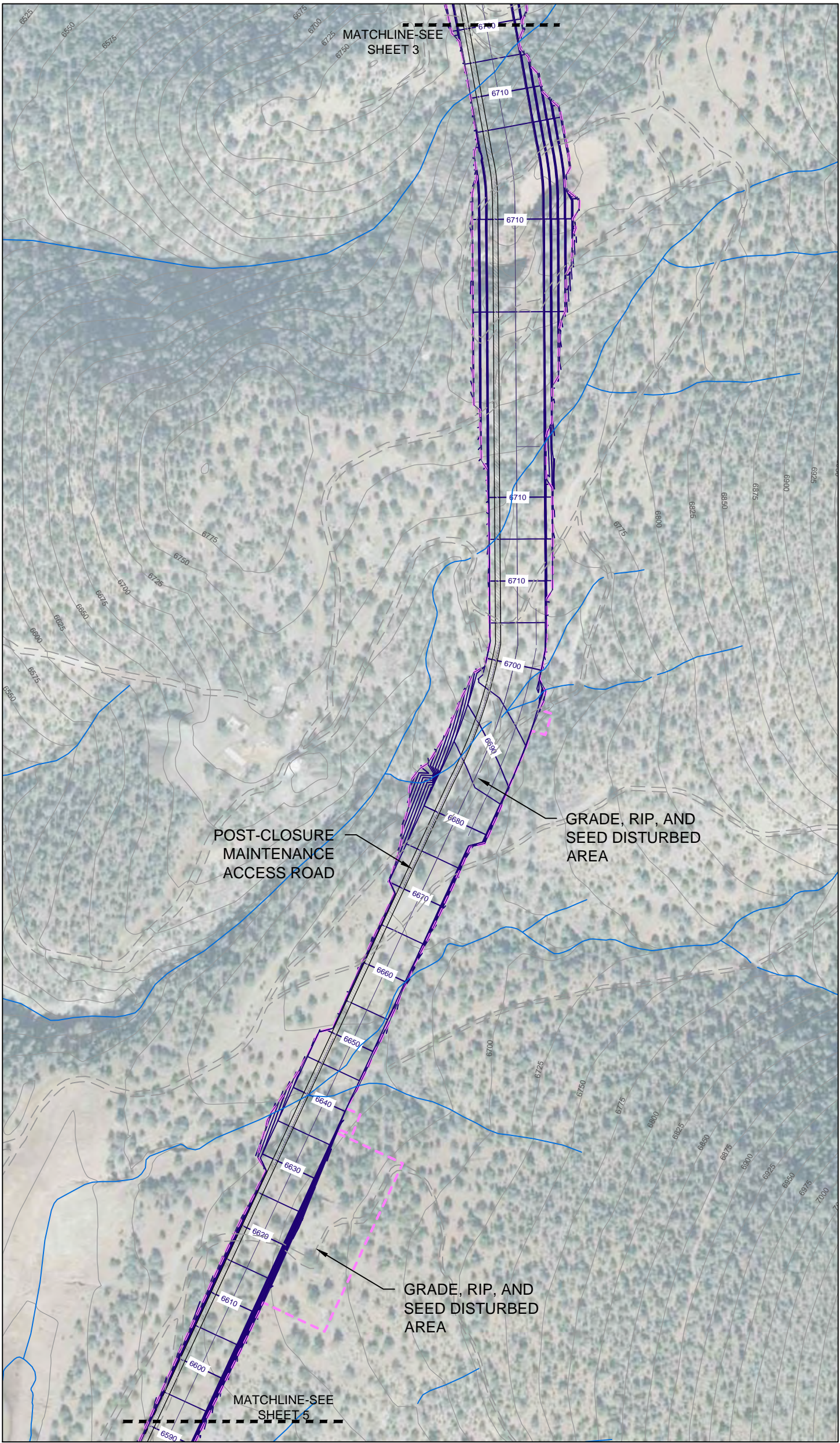
FIGURE A9  
RECLAIMED PROPOSED COBRE HAUL ROAD, SHEET 3

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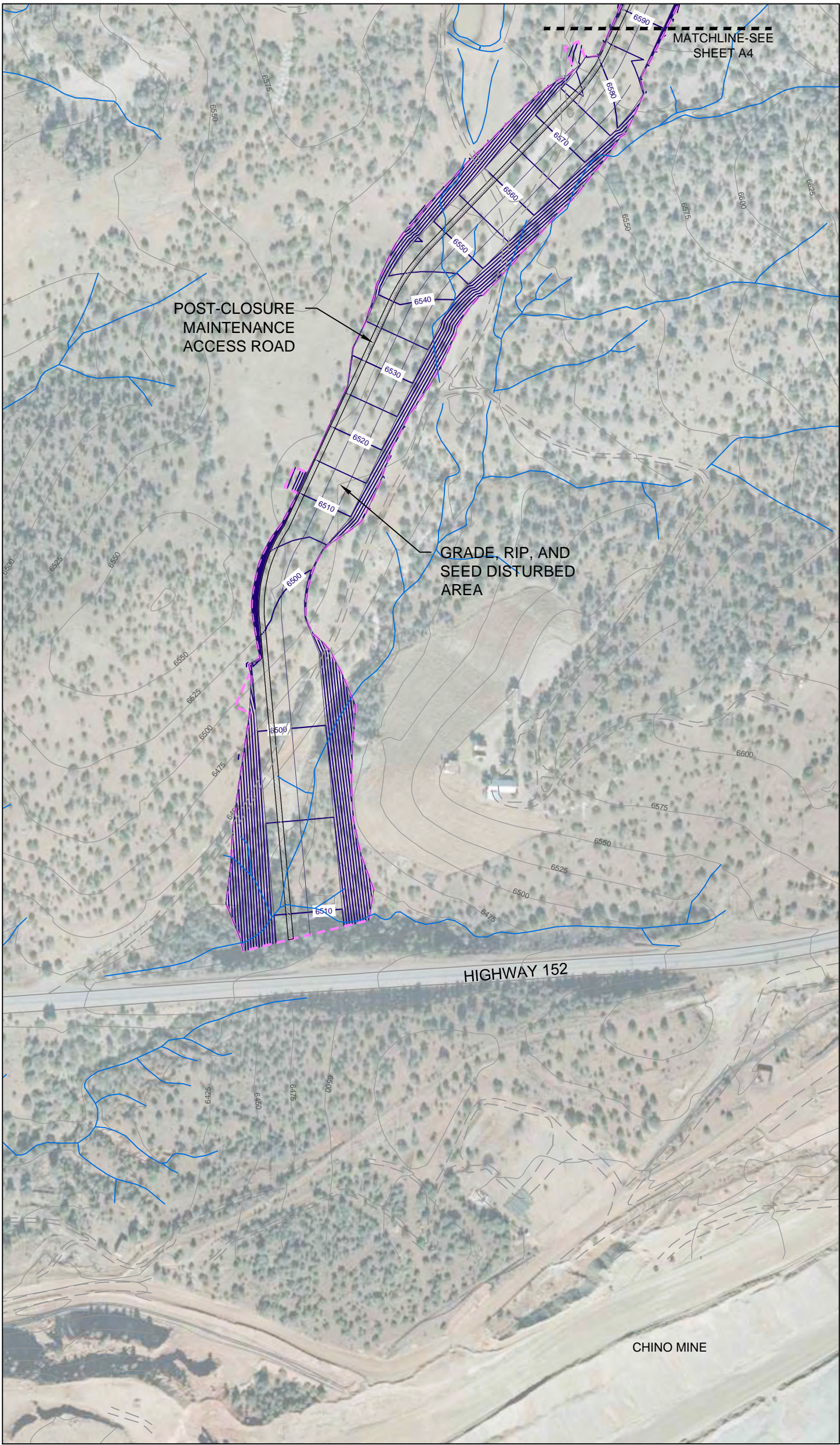




- LEGEND**
- |                                    |  |   |
|------------------------------------|--|---|
| COBRE HAUL ROAD<br>(COBRE SECTION) | UNPAVED ROADS                              | EXISTING TOPOGRAPHIC CONTOURS (25' INT. AMSL) |
| DRAINAGES                          | PROPOSED HAUL ROAD CONTOURS (5' INT. AMSL) |   |

REFERENCES:  
1. AERIAL PHOTOGRAPH, TOPOGRAPHY  
AND DRAINAGES BY COOPER AERIAL  
SURVEYS CO., TUCSON ARIZONA, DATE:  
DECEMBER 15, 2013.





SCALE IN FEET  
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LEGEND

- |                                 |               |             |   |
|---------------------------------|---------------|-------------|---|
| COBRE HAUL ROAD (COBRE SECTION) | UNPAVED ROADS | PAVED ROADS | EXISTING TOPOGRAPHIC CONTOURS (25' INT. AMSL) |
| DRAINAGES                       |               |             | PROPOSED HAUL ROAD CONTOURS (5' INT. AMSL)    |

REFERENCES:  
1. AERIAL PHOTOGRAPH, TOPOGRAPHY AND DRAINAGES BY COOPER AERIAL SURVEYS CO., TUCSON ARIZONA, DATE: DECEMBER 15, 2013.



## **APPENDIX A**

### **Cost Estimate**

The reclamation cost estimate is developed based on a template originally created by MMD (1996). Cost calculations are located in the Cobre\_CHR\_RCE\_2014.xlsx spreadsheet. PDF's of the cost spreadsheets are attached. The following describe the basis and assumptions used in the cost estimate. Specific unit cost documentation is available upon request.

- **Labor Rates:** All labor rates were developed based on the New Mexico Department of Labor (DOL) Type H (Heavy Engineering) labor rates effective January 1, 2014. These rates include the base, fringe benefit, and apprenticeship contribution rates. The following were added to the labor rates to obtain the total per hour labor rate: FICA (6.2%), Medicare (1.45%), Federal un-employment (0.6% on first \$7,000), State un-employment (2% on first \$23,400), and Workman's Compensation Insurance.
- **Equipment Rates:** The earth-moving equipment used in the estimate would commonly be available to a contractor. The equipment unit operating costs were taken from EquipmentWatch Custom Cost Evaluator (Penton Media, Inc., 2014).
- **Fuel Costs:** The off-road diesel fuel cost of \$3.22/gal is based on a quote obtained on June 18, 2014 from Western Refining for delivery of dyed ultra-low sulfur diesel to Hurley, NM.
- **Capital Indirect Costs:** Total indirect costs of 28.3% were applied to the capital direct costs per MMD (1996) and OSM (2000) guidance. The indirect costs are comprised of: Mobilization and Demobilization (3.8%), Contingencies (4.0%), Engineering Redesign Fee (2.5%), Contractor Profit and Overhead (15.0%), and Project Management Fee (3.0%). Indirect cost percentages are identical to the percentages presented to MMD and the New Mexico Environment Department (NMED) in meetings with Tyrone on September 20, 2012, and on November 2, 2012.
- **Operations and Maintenance Indirect Costs:** Total indirect costs of 23.3% were applied for longer term operations and maintenance per MMD (1996) and OSM (2000) guidance and comprise the same values and factors as the capital indirect costs with exception of Contractor Profit and Overhead. Contractor Profit and Overhead for long term operations and maintenance is 10.0%, to account for the long term contract and repetitive annual work. Indirect cost percentages are identical to the percentages presented to MMD and the NMED in meetings with Tyrone on September 20, 2012, and on November 2, 2012.
- **Equipment Production Factors:** Productivity factors are consistent with factors used in past closure cost estimates and with Caterpillar Performance Handbook.
- **Dust Suppression and Site Maintenance:** Assume there is a water truck running 1 hour twice a day when the dozers are running over an 8 hour work day.
- **Revegetation Unit Costs:** The revegetation unit cost was based on a quote obtained on June 18, 2014 from Rocky Mountain Reclamation of Laramie, WY, and includes: scarifying, disking, rangeland drill seeding, mulching, crimping, and daily per diem.

- **Miscellaneous Demolition Costs:** Miscellaneous unit costs were taken from R.S. Means Heavy Construction Cost Data Edition 26 (R.S. Means, 2014). All costs taken from R.S. Means were adjusted using the location factor for Las Cruces (84.7%).



Table A2 - 1  
Demolition

Item	Activity	Quantity	Unit	Unit Cost (\$/unit)	Direct Item Cost (\$)	Reference	Means Line Item	Means Page	Description
Hanover Creek and Forest Service Road Crossing Spanning Arch Demolition	Earth Fill Removal (dozer excavate, haul, spread)	6,600	cy	\$4.73	\$31,193	R.S. Means	312316.46-6070	234	Earth fill is hauled an average of 300 feet and spread over the haul road or other nearby area, assume 15% swell. Conceptual spanning arch dimensions available upon request. Excavating Bulk Dozer 700 HP 300' haul common earth
Hanover Creek and Forest Service Road Crossing Spanning Arch Demolition	Concrete Foundation (excavate and load)	625	cy	\$1.41	\$879	R.S. Means	312316.46-6010	234	Concrete is excavated and loaded onto a truck. A 60% swell factor was used for the concrete foundations. Excavating Bulk Dozer 700 HP 50' haul common earth
Hanover Creek and Forest Service Road Crossing Spanning Arch Demolition	Concrete Foundation (haul and dump)	625	cy	\$4.01	\$2,504	R.S. Means	312323.20-5040	253	Concrete haul and disposal. A 60% swell factor was used for the concrete foundations. 22 cy off road, 15 min. cycle time, 5 mph, 1 mile cycle.

Demolition Total Direct Cost: \$34,576

Data Sources:  
RS Means Heavy Construction Cost Data (28th Annual Edition 2014)

Location adjustment:  
New Mexico Las Cruces  
84.7%

Table A2 - 2  
Productivity and Hours Required for Dozer Use--Grading

Task Description	Location	Equipment	Area (acres)	Productivity (acres/hr)	Task Time (hours)	Owning and Operating Cost (\$/hr)	Labor Cost (\$/hr)	Direct Cost (\$)	PERFORMANCE FACTORS											
									Material Factor	Grade Factor	Soil Weight (lb/cy)	Production Method/ Blade	Effective Blade Width (feet)	Speed (miles/hr)	Work Hour (min/hr)	Visibility Factor	Elevation Factor	Direct Drive Trans.	Grade Factor (%)	Operator Factor
Grade Surface	CHR-Cobre Section	D11R CD	91	3.0	31	\$509.12	\$47.58	\$16,997	1.2	1.0	3,300	1.20	16.00	2.50	50	1.00	1.00	1.00	1.0	0.75
Grade Surface	CHR BLM Land	D11R CD	9	3.0	3	\$509.12	\$47.58	\$1,606	1.2	1.0	3,300	1.20	16.00	2.50	50	1.00	1.00	1.00	1.0	0.75
Water Truck*	CHR-Cobre Section	Water Truck			8	\$171.97	\$25.34	\$1,506												
Water Truck*	CHR BLM Land	Water Truck			1	\$171.97	\$25.34	\$142												
Grading Total Direct Cost \$20,252																				

\* Assume there is a water truck running 1 hour twice a day when the dozers are running over an 8 hour work day.

EQUIPMENT	Equipment Description	Fuel Consumption (gal/hr)	Fuel Cost (\$/hr)	Owning and Operating Cost (w/out fuel) (\$/hr)	Fuel Adjusted Own/Op Cost (\$/hr)	Task Reference
Cat D11T CD Bulldozer		29.8	\$95.65	\$413.47	\$509.12	1
Off-Hwy Water Tanker Truck, 10,000-gal.		15.3	\$49.33	\$122.64	\$171.97	1
FUEL						
Oil Broker Quote				\$3,215	per gallon	2
LABOR						
Labor Description	NMDOL Type A				Nominal Total	
Cat D11T CD Bulldozer	Operator Group				Rate (\$/hr)	
Off-Hwy Water Tanker Truck, 10,000-gal.	Equipment Operator IV				\$47.58	3
	Operator Classification				\$25.34	3
	Bulldozer (mult. Units)					
	N/A					

1. Equipment unit rates from EquipmentWatch Custom Cost Evaluator Version 6.15.08 (<http://www.equipmentwatch.com>)
2. Western Refining Quote, Lordsburg NM (June 18, 2014).
3. Labor rates based on NM Department of Labor Type H (Heavy Engineering) labor rates. Rate development available upon request.

Table A2 - 3  
Revegetation Costs

Cobre Haul Road Cobre Section  
Revegetation  
08/21/14

**Description:**

Includes scarifying (ripping), disking, rangeland drill seeding, mulching, crimping, and daily per diem

Unit or Disturbance	Area (acres)	Unit Cost* (\$/acre)	Direct Cost (\$)
<b>Revegetation Areas</b>			
CHR-Cobre Section	86	\$ 899	\$ 77,169
CHR BLM Land	8.6	\$ 899	\$ 7,729
	<b>Reveg Total Direct Cost</b>		<b>\$84,898</b>

\*Rocky Mountain Reclamation Quote June, 18 2014, \$1153/acre minus 28.3% indirect costs. Quote includes cost for scarifying (ripping) surface.



**Table A2 - 4**  
**Reclamation Summary**

Cobre Haul Road Cobre Section  
Capital Cost Summary  
8/21/2014

**Cobre Mine**

			Current Value
<b>DIRECT COSTS</b>	Facility and Structure Removal		\$34,576
	Earthmoving		\$20,252
	Revegetation		\$84,898
	<b>Subtotal, Direct Costs</b>		<b>\$140,000</b>
<b>INDIRECT COSTS<sup>1</sup></b>	Mobilization and Demobilization	3.8%	\$5,320
	Contingencies	4.0%	\$5,600
	Engineering Redesign Fee	2.5%	\$3,500
	Contractor Profit and Overhead	15.0%	\$21,000
	Project Management Fee	3.0%	\$4,200
	State Procurement Cost	0.0%	\$0
	Indirect Percentage Sum =	28.3%	
	<b>Subtotal, Indirect Costs</b>		<b>\$40,000</b>
<b>TOTAL COST</b>			<b>\$180,000</b>

Data Sources:

- MMD. 1996. Closeout Plan Guidelines for Existing Mines, Mining Act Reclamation Bureau Mining and Minerals Division  
New Mexico Energy, Minerals and Natural Resources Department. April 30, 1996.
- OSM. 2000. U.S. Department of the Interior, Office of Surface Mining Reclamation and Enforcement  
Handbook for Calculation of Reclamation Bond Amounts. April 5, 2000.

Notes:

- 1) Indirect costs are based on the guidance available from MMD (1996) and OSM (2000).

**Table A2 - 5**  
**Vegetation Maintenance Costs**  
 Cobre Haul Road Cobre Section  
 O&M Vegetation Maintenance  
 8/21/2014

Activity	Total Area (acres)	# yrs veg Maint.	% loss per year	Quantity	Unit	Unit Cost* (\$/unit)	Item Cost (\$)
CHR-Cobre Section	86	12	2%	1.7	acres	\$935	\$19,272
CHR BLM Land	9	12	2%	0.2	acres	\$935	\$1,930

**Veg Maintenance Total Direct Cost: \$21,202**

\*Rocky Mountain Reclamation Quote June, 18 2014, \$1153/acre minus 23.3% indirect costs.  
 Quote includes cost for scarifying (ripping) surface. \$ 935 (\$/acre)



**Table A2 - 6**  
**Operations & Maintenance**

Cobre Haul Road Cobre Section  
O&M Erosion Control  
8/21/14

EROSION CONTROL [1]

	Year 1	Years 2-11
Base:	\$5,723	\$5,723 \$/day
Time:	6	1 day/yr
Annual:	\$34,336	\$5,723 \$/yr

Year	Annual Current Cost (\$)
0	\$34,336
1	\$5,723
2	\$5,723
3	\$5,723
4	\$5,723
5	\$5,723
6	\$5,723
7	\$5,723
8	\$5,723
9	\$5,723
10	\$5,723
11	\$5,723
<b>Capital Cost</b>	<b>\$97,285</b>

[1] Erosion Control

Modified Crew B-13A (1 Labor Foreman, 2 laborers, 2 equip. operators (med.),  
2 truck drivers (heavy), 1 crawler loader (4 cy), 2 dump trucks (8 cy, 220 HP)  
RS Means Heavy Construction Cost Data (28th Annual Edition, 2014)

	#	\$/hour	\$/day
Labor Foreman (outside)	1	\$ 38.65	\$ 309.20
Laborers	2	\$ 36.65	\$ 586.40
Equipment Operators med.	2	\$ 48.90	\$ 782.40
Truck Drivers (heavy)	2	\$ 37.55	\$ 600.80
		\$/day	\$/day
Crawler Loader, 4 C.Y.	1	\$ 1,532.00	\$ 1,532.00
Dump Trucks, 8 C.Y., 220 H.P.	2	\$ 834.40	\$ 1,668.80

Subtotal	\$5,480 \$/day
	84.70% Location Adjustment
Total Direct Cost	\$4,641 \$/day
Indirect Cost Percentage	23.30%
Total Cost	\$5,723 \$/day

**Table A2 - 7**  
**Operations and Maintenance Summary**

Cobre Haul Road Cobre Section  
O&M Summary  
8/21/2014

<b>Cobre Mine</b>		Current Value
<b>DIRECT COSTS</b>	Facility and Structure Removal	\$0
	Earthmoving	\$0
	Vegetation	\$0
	Other	\$100,102
	<b>Subtotal, Direct Costs</b>	<b>\$100,000</b>
<b>INDIRECT COSTS<sup>1</sup></b>	Mobilization and Demobilization	3.8% \$3,800
	Contingencies	4.0% \$4,000
	Engineering Redesign Fee	2.5% \$2,500
	Contractor Profit and Overhead	10.0% \$10,000
	Project Management Fee	3.0% \$3,000
	State Procurement Cost	0.0% \$0
	Indirect Percentage Sum =	23.3%
	<b>Subtotal, Indirect Costs</b>	<b>\$23,000</b>
<b>TOTAL COST</b>		<b>\$123,000</b>

Data Sources:

- MMD. 1996. Closeout Plan Guidelines for Existing Mines, Mining Act Reclamation Bureau Mining and Minerals Division  
New Mexico Energy, Minerals and Natural Resources Department. April 30, 1996.
- OSM. 2000. U.S. Department of the Interior, Office of Surface Mining Reclamation and Enforcement  
Handbook for Calculation of Reclamation Bond Amounts. April 5, 2000.

Notes:

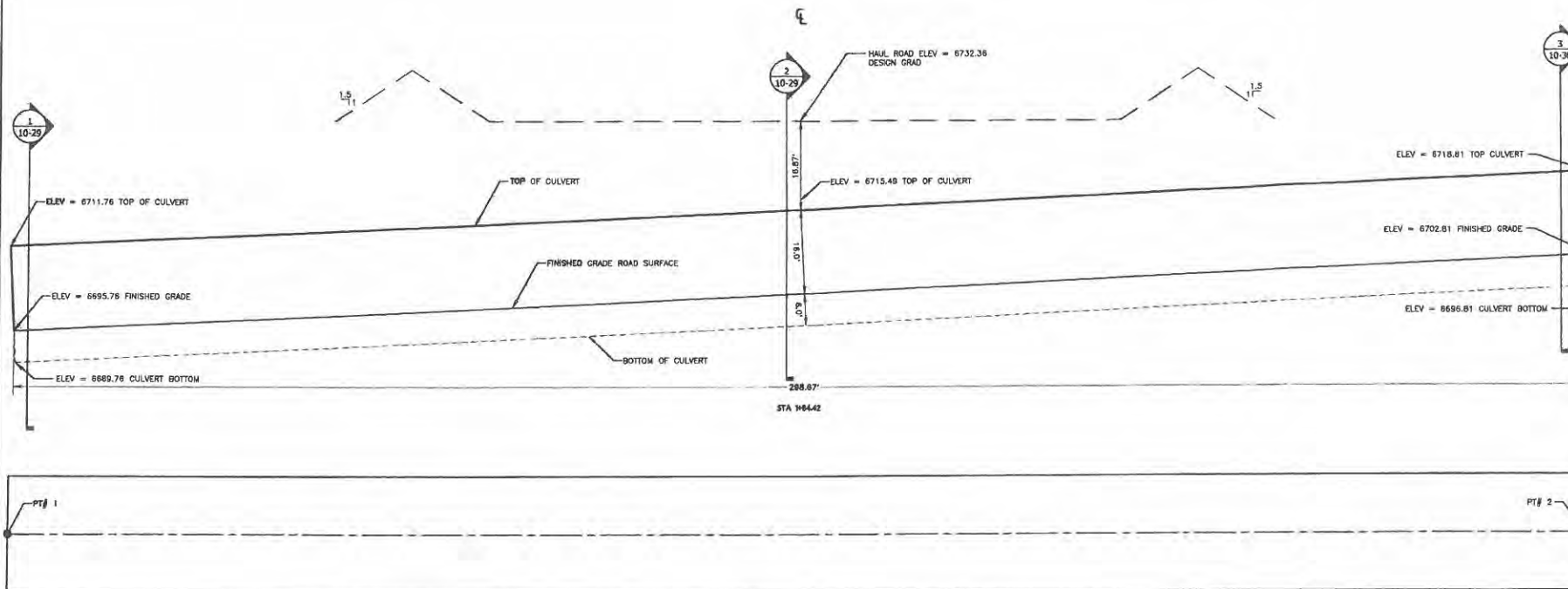
- 1) Indirect costs are based on the guidance available from MMD (1996) and OSM (2000).



**APPENDIX B:**  
**PRELIMINARY ENGINEERING DESIGN FOR CHR**

**APPENDIX B:**  
**PRELIMINARY ENGINEERING DESIGN FOR CHR**





1 SOUTH TO NORTH SECTION - LOOKING WEST, FOREST ROAD 22' CULVERT  
 Scale: 1" = 20' HORIZ. SCALE / 1" = 10' VERT. SCALE

CENTER START OF 22' CULVERT LOOKING NORTH ON FOREST ROAD					CENTER END OF 22' CULVERT LOOKING NORTH ON FOREST ROAD				
PT #	OFFSET	ELEV =	NORTHING	EASTING	PT #	OFFSET	ELEV =	NORTHING	EASTING
1	0.00	6695.76	19078.73	-2885.97	2	0.00	6702.81	19370.72	-2823.19

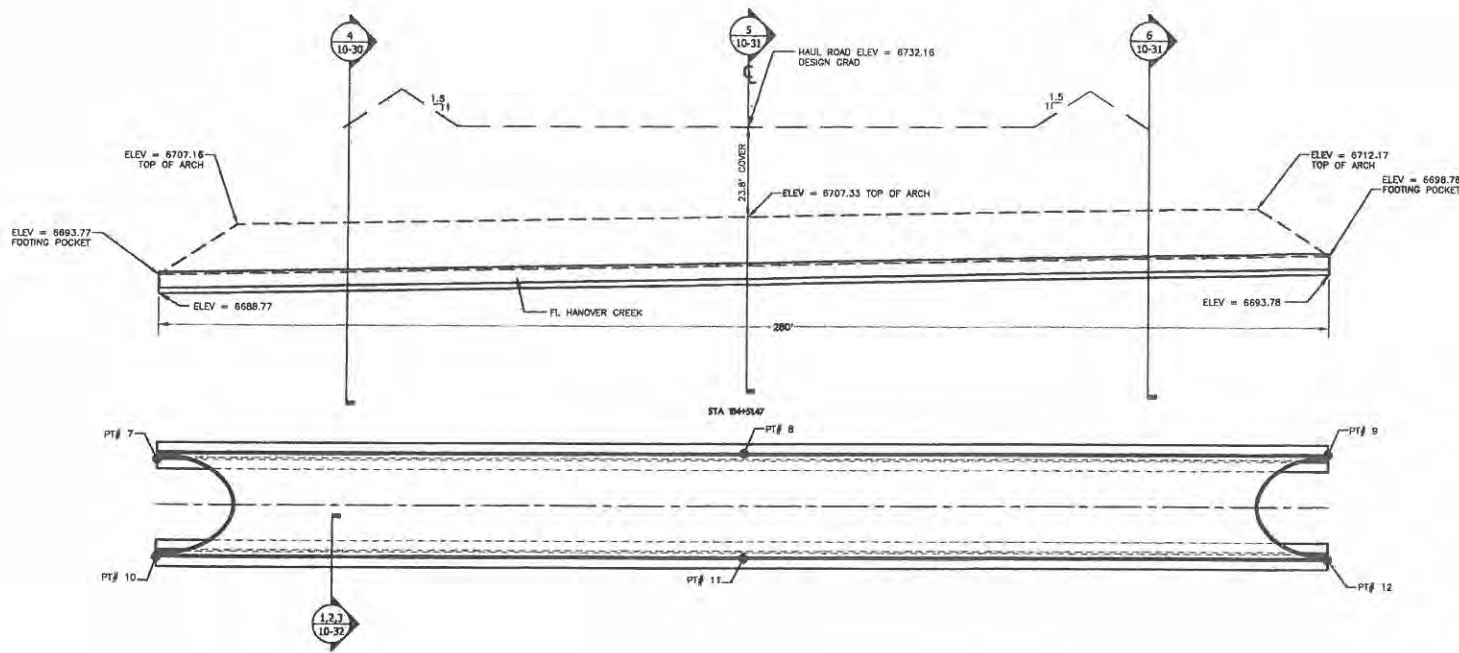
FIELD STAKEOUT AT CENTER LINE OF 22' CULVERT

2 FOREST ROAD 22' CULVERT ELEVATIONS ALONG STATIONS  
 NOTE: ALL COORDINATES IN MINE LOCAL COORDINATES ELEVATION = MINE DATUM  
 Scale: 1" = 20'

**PRELIMINARY**

CULVERT & ARCH CROSSING -  
 FOREST ROAD & HANOVER CREEK  
 CROSS SECTIONS - LOOKING  
 NORTH

10-27



1 SOUTH TO NORTH SECTION - LOOKING WEST, HANOVER CREEK FOUNDATION WALL  
 Scale: 1" = 16' FULL SCALE / 1" = 32' HALF SCALE

NOTE:  
 FOOTINGS TO BE CONSTRUCTED ON  
 UNDISTURBED ROCK.

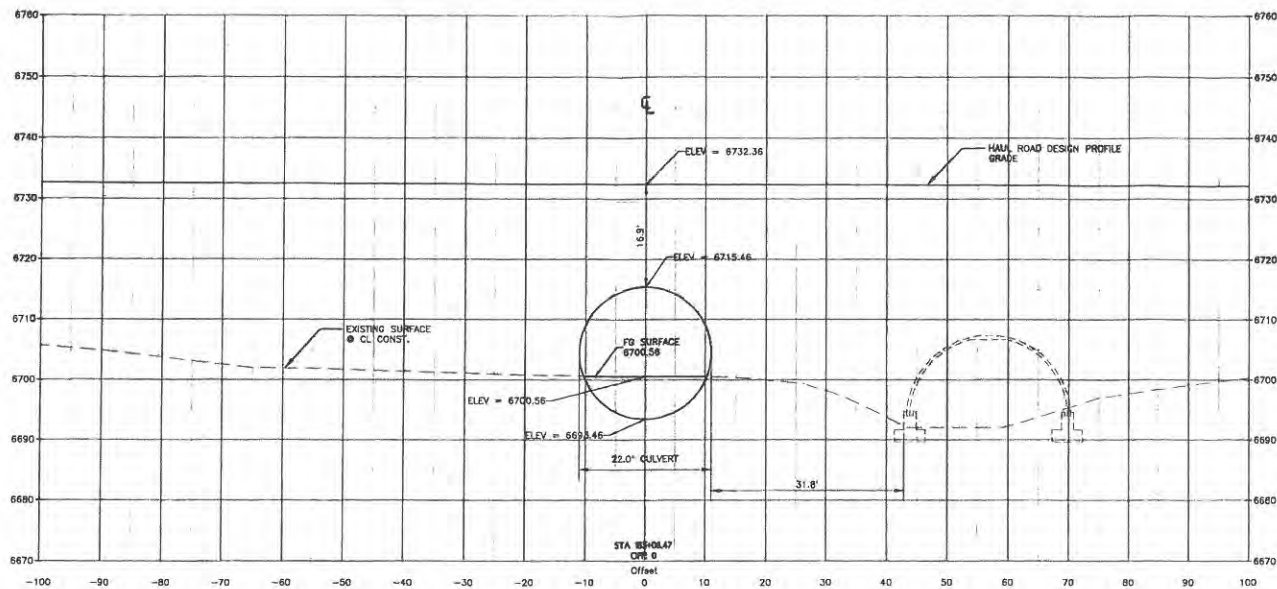
LEFT SIDE OF FOUNDATION LOOKING NORTH OF HANOVER CREEK					RIGHT SIDE OF FOUNDATION LOOKING NORTH OF HANOVER CREEK				
PT #	OFFSET	ELEV =	NORTHING	EASTING	PT #	OFFSET	ELEV =	NORTHING	EASTING
7	14.00L	6693.77	19064.51	-2848.98	10	14.00R	6693.77	19058.00	-2823.74
8	14.00L	6694.00	19218.98	-2812.04	11	14.00R	6694.00	19212.47	-2784.81
9	14.00L	6698.78	19365.52	-2777.00	12	14.00R	6698.78	19358.99	-2749.78

FIELD STAKEOUT AT OUTSIDE TOP OF STEM WALL

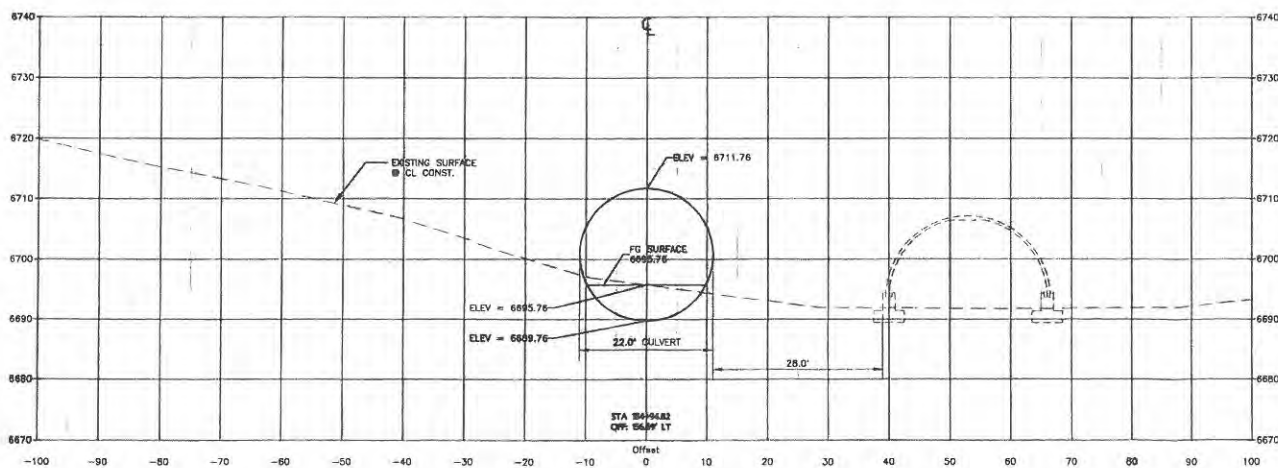
2 T.O.S.W. - FOUNDATION ELEVATIONS ALONG STATIONS  
 NOTE: ALL COORDINATES IN MINE LOCAL COORDINATES ELEVATION = MINE DATUM  
 Scale: 1" = 20'

**PRELIMINARY**



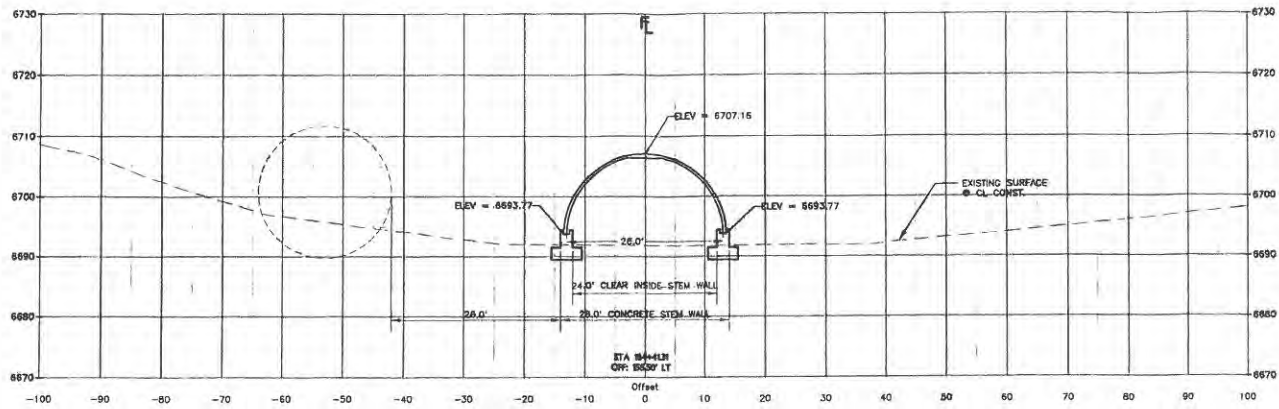


2 CULVERT CROSSING - FOREST ROAD - LOOKING NORTH  
MIDDLE Scale: 1" = 10' FULL SCALE / 1" = 10' HALF SCALE



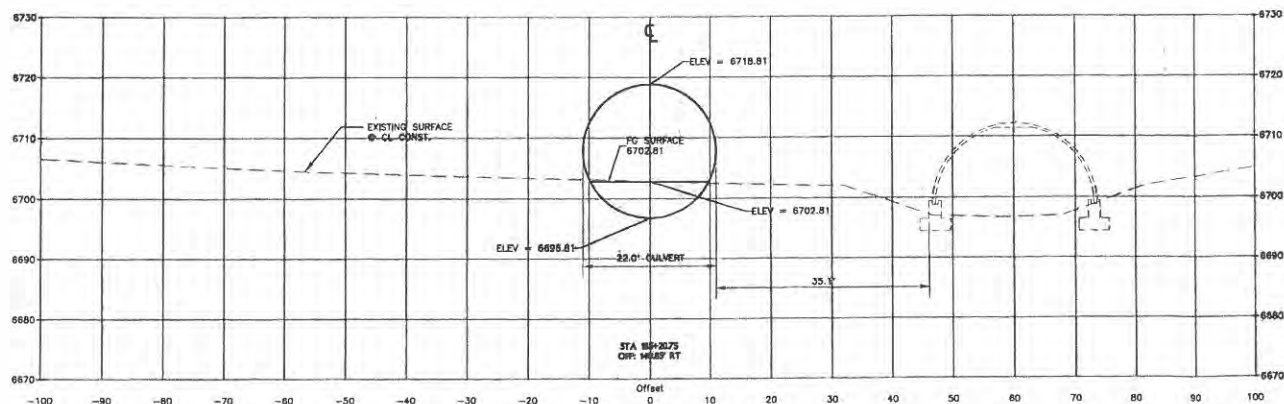
1 CULVERT CROSSING - FOREST ROAD - LOOKING NORTH  
SOUTH END Scale: 1" = 10' FULL SCALE / 1" = 10' HALF SCALE

**PRELIMINARY**



4 ARCH CROSSING - HANOVER CREEK - LOOKING NORTH  
SOUTH END  
Scale: 1" = 10' FULL SCALE / 1" = 20' HALF SCALE

NOTE:  
FOOTINGS TO BE CONSTRUCTED ON  
UNDISTURBED ROCK.



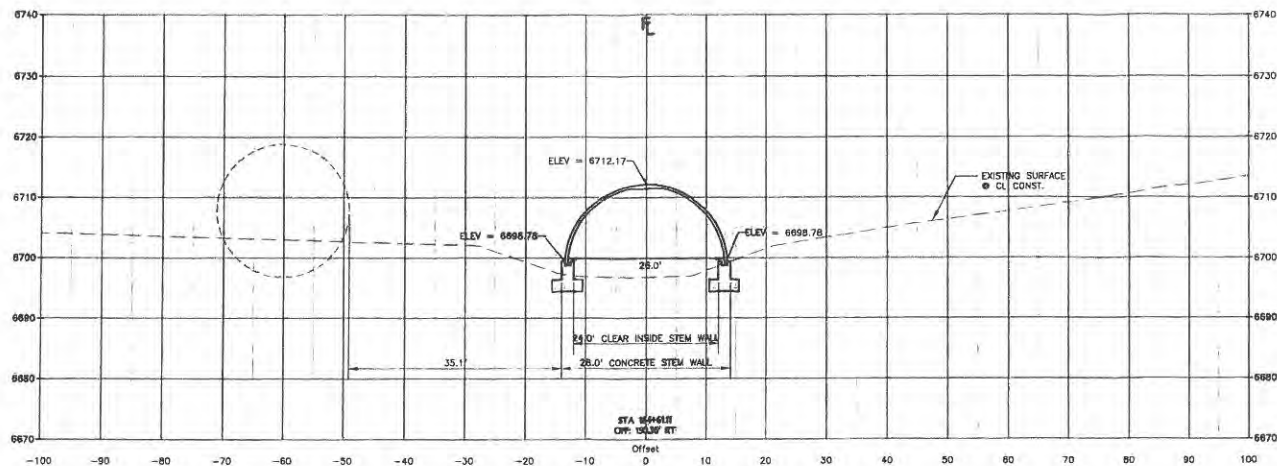
3 CULVERT CROSSING - FOREST ROAD - LOOKING NORTH  
NORTH END  
Scale: 1" = 10' FULL SCALE / 1" = 20' HALF SCALE

NOTE:  
FOOTINGS TO BE CONSTRUCTED ON  
UNDISTURBED ROCK.

**PRELIMINARY**

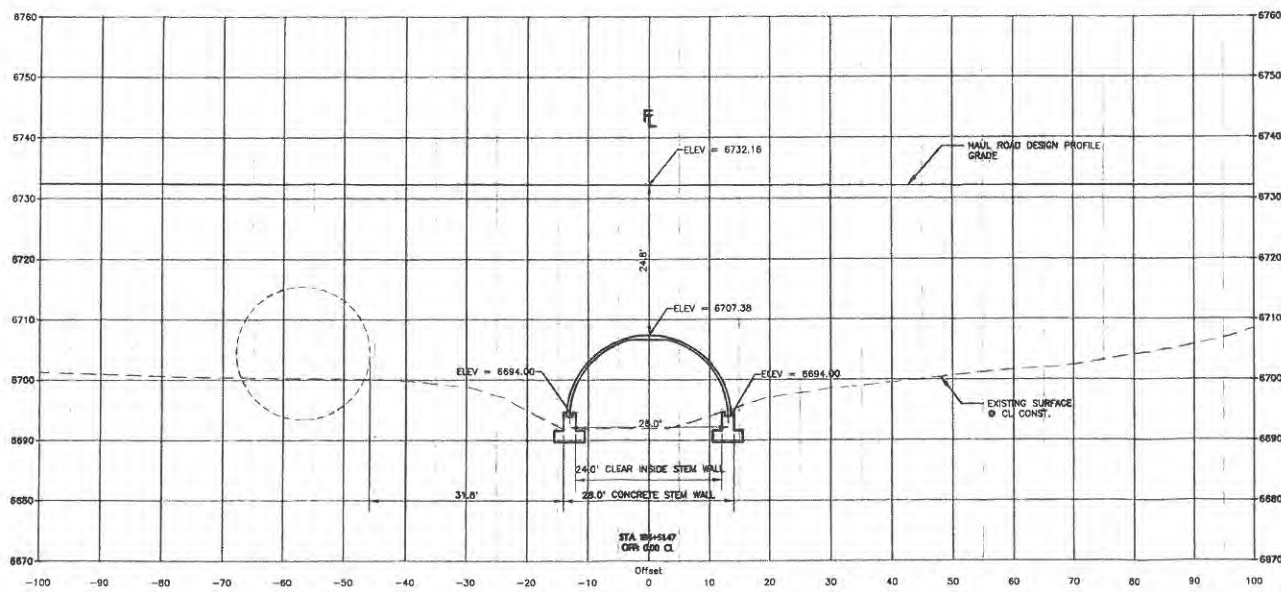
DATE	8/20/11
DWG. BY	PM1110P
REVISIONS	
BY/DATE	10/12/12
CHK	TM
PROJECT	
CHINO/COBRE HWY 152 AND THE USFS ROAD CROSSING GRANT COUNTY, NEW MEXICO	
ENGINEERS INC.	
1011 1ST AVE. SUITE 1 SILVER CITY, NM 88301 (505) 538-4400 (OFFICE) (505) 538-4400 (FAX)	
CULVERT & ARCH CROSSING - FOREST ROAD & HANOVER CREEK CROSSING SECTIONS - LOOKING NORTH	
SHEET 10-30	





6 ARCH CROSSING - HANOVER CREEK - LOOKING NORTH  
SOUTH END  
Scale: 1" = 10' FULL SCALE / 1" = 20' HALF SCALE

NOTE:  
FOOTINGS TO BE CONSTRUCTED ON UNDISTURBED ROCK.



5 ARCH CROSSING - HANOVER CREEK - LOOKING NORTH  
MIDDLE  
Scale: 1" = 10' FULL SCALE / 1" = 20' HALF SCALE

NOTE:  
FOOTINGS TO BE CONSTRUCTED ON UNDISTURBED ROCK.

**PRELIMINARY**

**APPENDIX C:**  
**MEMO ON ACID GENERATING POTENTIAL**





Cobre Mining Company

**Interoffice Memorandum**

**To:** Ms. Amber Rheubottom, Environmental Scientist  
Ms. Lynn Lande, EA Lead

**Subject:** Acid Generation Potential along the Connecting Haul Road Route

**From:** Walter L. Niccoli, P.E. Cobre Closure Technical Lead      **Date:** May 15, 2014

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Dear Amber and Lynn,

In an effort to take a look at the acid generating potential along the proposed Connecting Haul Road to Chino from Cobre's Continental Mine, I did a quick search of Cobre's database for acid-base accounting (ABA) samples taken in the proposed footprint, or very near (within about 100 feet). The ABA samples taken were from historical waste rock piles and thus represent the most likely mineralized materials in the area. Although these samples are not representative of the bulk of the rock (which is non-mineralized) through which the haul road will pass, their ABA data provides a preliminary and conservatively high estimate of what is likely to be encountered (i.e., they should represent the more negative neutralizing materials in the area).

Of the 34 waste rock samples considered, 4 had a negative net neutralizing potential (and were not in the direct footprint). The median net neutralizing potential was 66 tons of  $\text{CaCO}_3/\text{Kton}$  rock. So, this means that if the haul road were made solely out of waste rock, we would expect that around 12% of the area would have the potential to generate acid locally; however, due to the mixing that takes place during construction, these spots would be mixed with waste rock that had more than enough neutralizing capacity to ensure that acid drainage would be mitigated. Again, that's if the entire road were made of historical **waste rock**. Knowing that the majority of the road will not be in mineralized/historical waste rock increases the chances for the road to be overwhelmingly net neutralizing with enough material locally to mitigate any mineralized rock encountered.

In the near future, I will complete a calculation set to document these findings (with graphics etc.). At that time, the calculation set can be attached to this memorandum for your records.

**Kind Regards,**  
**Walt**

**Problem Statement:**

Cobre Mining Company (Cobre) is planning on re-opening operations in 2016. The first step is to construct the Cobre Haul Road (CHR) to Chino. The permitting for the CHR is underway. Concerns have been raised as to the chances of building the CHR through acid generating areas and/or encountering other hazards along the route.

**Objectives:**

1. Describe the probability of the CHR being net acid generating
2. Describe sampling procedures to reduce potential uncertainty with estimating the acid generating potential along the CHR

**Approach:**

Obtain available data from Cobre's database for existing samples in or near the proposed CHR foot print. Analyze the data for potential presence and location of potentially acid generating (PAG) material based on net neutralizing potential (NNP).

**Data and Assumptions:**

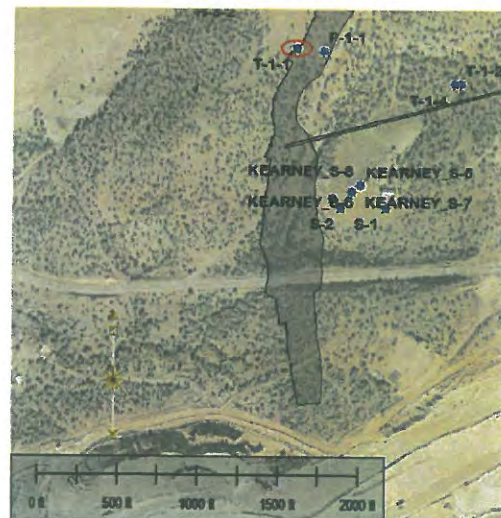
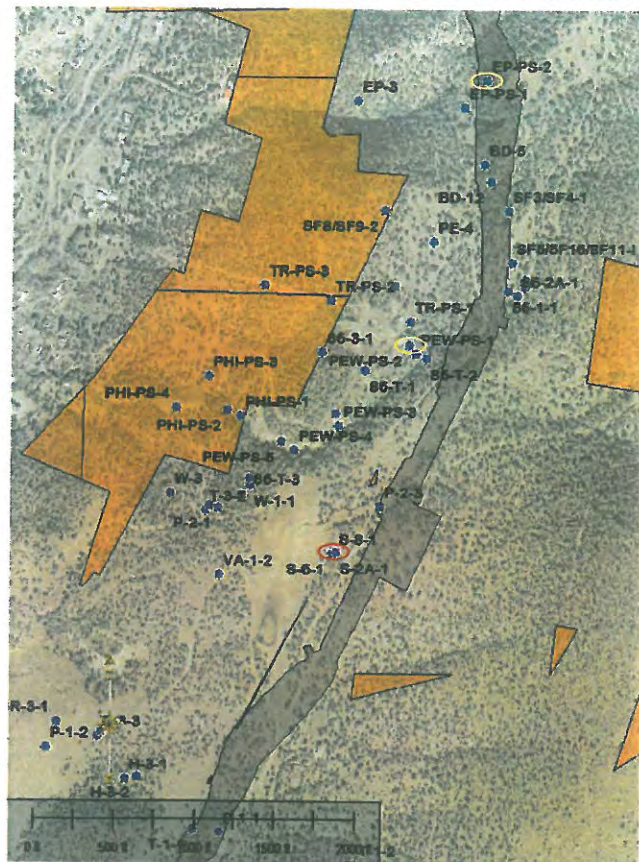
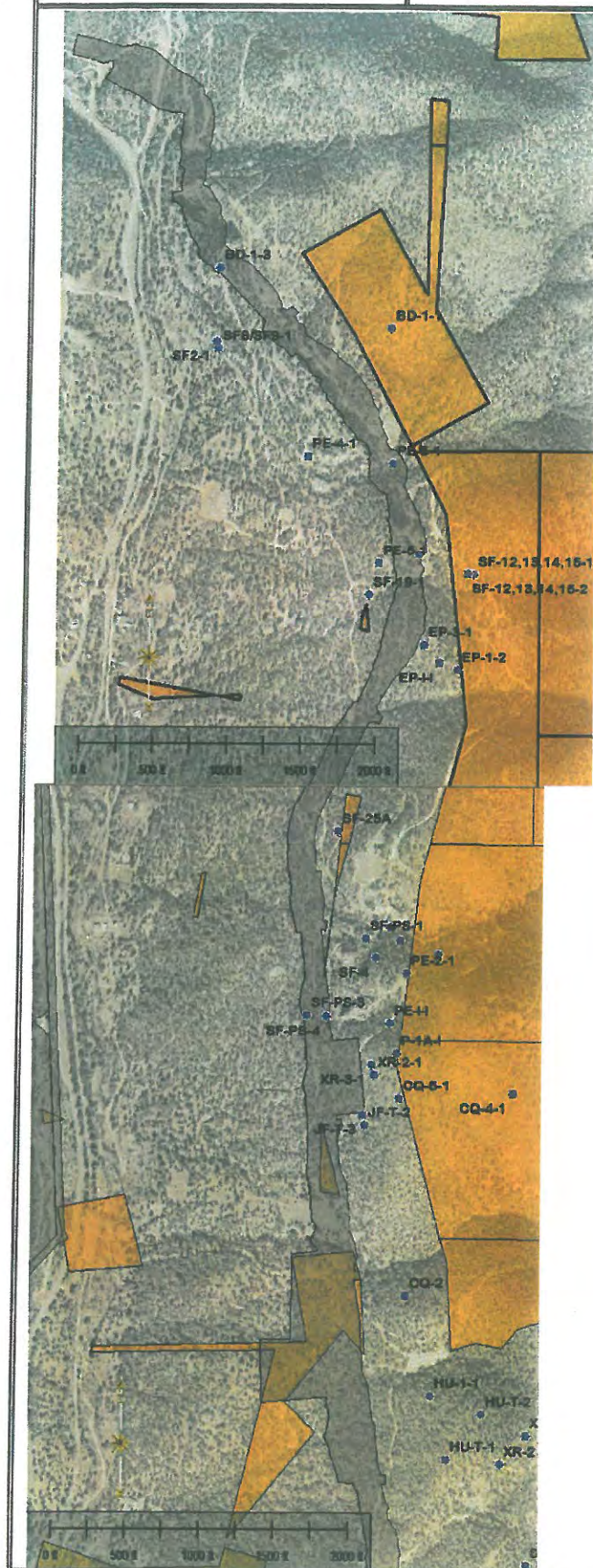
1. Golder and Telesto ABA data collected from historical stockpiles adjacent to the proposed CHR route (See Figure 1).
2. Samples tested for acid generating potential (AGP) and acid neutralizing potential (ANP) measured in tons per tons of  $\text{CaCO}_3$
3. NNP values of 0 or less are assumed to be PAG material.

**Calculations:****Xcel spreadsheet description**

1. Tabulate samples in Excel including Site Name, Site coordinates (Easting and Northing), AGP and ANP
2. Calculate NNP (NNP calculated as:  $\text{ANP} - \text{AGP} = \text{NNP}$ )
3. Calculate probability distributions using non-parametric techniques
4. Visualize results graphically



**FIGURE 1. SAMPLES NEAR CHR**





### Results:

All results and input files stored in :

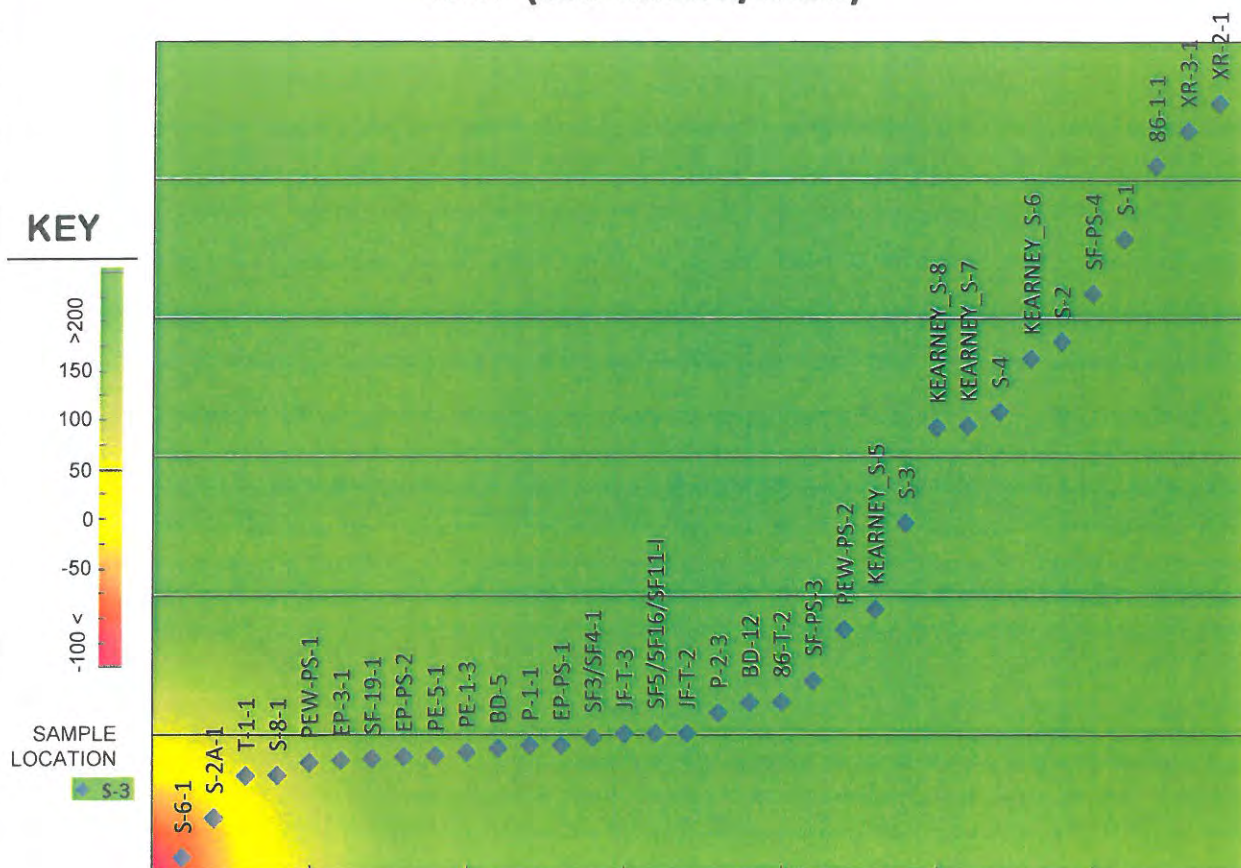
R:\Cobre\MPO\Products\Reports\EA\_Support\Walt'sListToWestland\HaulRoadGeochem

Four of 34 samples (12%), have a negative NNP. The mean NNP is 243.15 ton CaCO<sub>3</sub>/kTon. The Median NNP is 66, with a minimum value of -127.8, and a maximum value of 960.

Analysis Values	
%<0	11.76%
Min	-127.81
Max	959.99
Mean	243.15
Median	66

FIGURE 2. NNP OF SAMPLES NEAR CHR

NNP (ton CaCO<sub>3</sub>/kTon)





Results Con'd:

FIGURE 3. ANP & AGP OF SAMPLES NEAR CHR

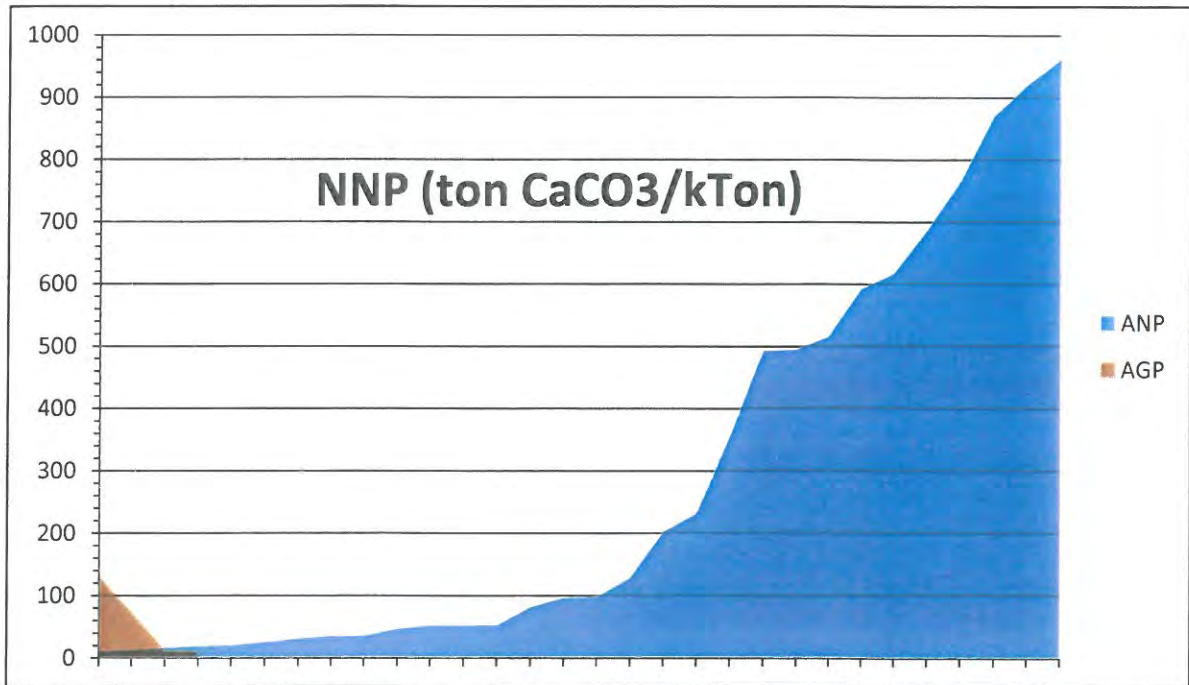
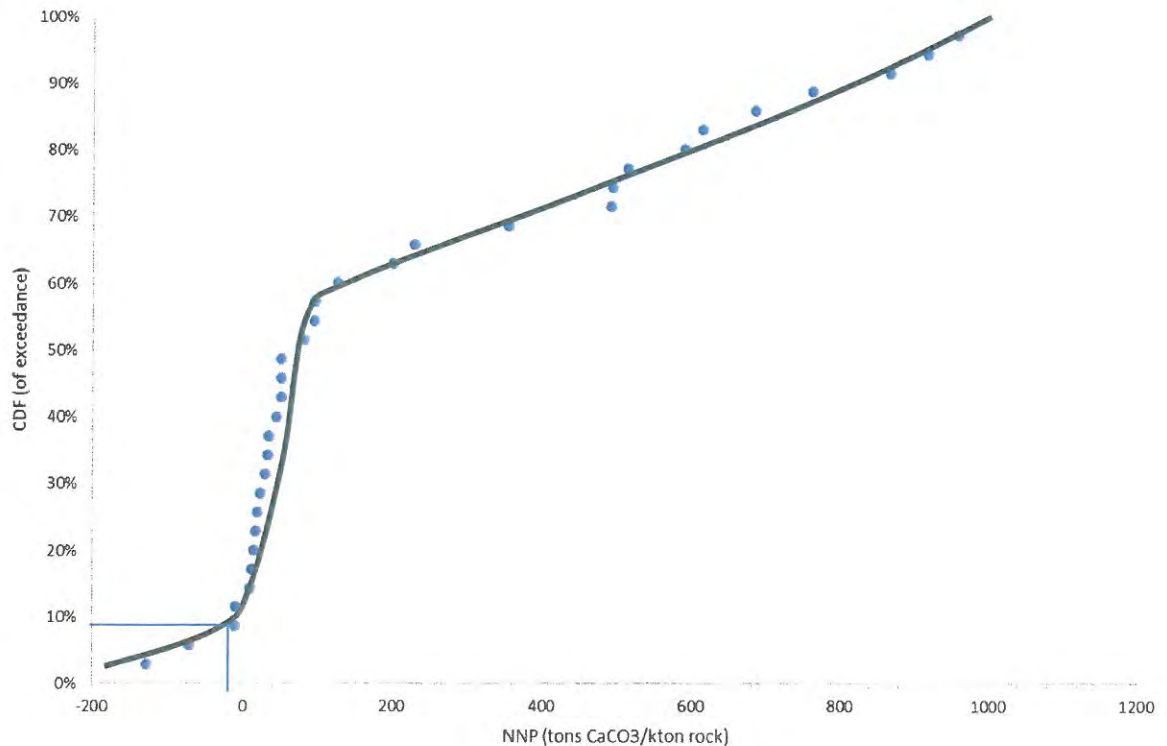


FIGURE 4. CUMULATIVE DISTRIBUTION FUNCTION OF CHR NNP



## FIGURE 5. SAMPLES WITH PAG TENDENCIES

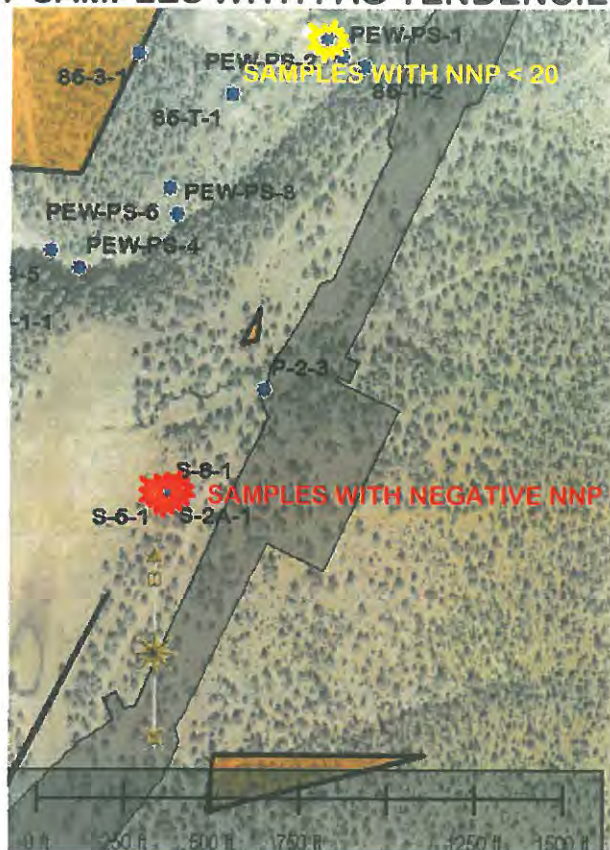
### Discussion and Recommendations:

Cobre's database was analyzed for existing ABA samples taken in or very near (within about 100 feet) the proposed haul road footprint. The ABA samples were from historical waste rock piles and represent the most likely mineralized material near the CHR, and are not representative of the bulk of the rock (which is non-mineralized) through which the CHR road will pass. Analysis of these samples indicate a 89% chance that any sample taken near the CHR will result in a positive ABA result.

The assumption of a negative NNP indicating PAG is a conservative assumption, as EPA Hardrock Mining guidance proposes -20 or lower as PAG, with NNP between -20 and 20 assumed to have uncertain AGP. Using this criteria, only two sample sites show PAG characteristics and that there is a 91% chance that samples along the CHR would be above -20.

Some areas of concentrated AGP exist, including three of the four sites with NNP in immediate proximity to each other. Overall, the sample sites demonstrate high ANP. Additional sampling will only show that in net, the CHR will be acid neutralizing. If confirmation sampling is desired, we recommend the following procedure:

1. Collect paste pH measurements at even intervals along the proposed CHR-staggered randomly across the width of the haul road. Take additional paste pH samples in the borrow areas.
2. Where paste pH is less than 5, target the area with a drill rig and composite sample to a depth at least as deep as the planned excavation for the area. If paste pH sample is on the fill portion of the proposed CHR, move drill location adjacent and into the cut portion. If no cut portion exists, do not drill for ABA.
3. Send composite drill hole samples off to SVL for ABA and meteoric water mobility leach testing
4. Coordinate drilling efforts to target areas near the Jim Fair, 86, Snowflake and El Paso areas to drill at least 100' deep to probe for shallow mine workings. Approximate locations recommended are shown in Figure 6 and target coordinates can be generated at a future date.





**Discussion and Recommendations Con'd:****FIGURE 6. GEOTECH BORING RECOMMENDATIONS****Conclusions:**

The calculation set achieved the objectives set forth through use of the available data and information. The current location of the haul road should not result in acid mine drainage, and is most likely to have a net neutralizing effect on the area as construction will tend to homogenize the rock along the CHR.