

Aurichalchite—Kelly mine. Photo by Jeff Scovil

District Id, County

DIS215, Hop | Socorro

DIS223, North | Socorro

DIS231, Water Socorro

DIS207, Bear | Socorro

Socorro

Council Rock

Mountains

DIS209, Cat

District or

Prospect Area

Magdalena

MINING IN THE MAGDALENA AREA, SOCORRO COUNTY, NEW MEXICO

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Smithsonite— Kelly mine. Photo by Jeff Scovil.

INTRODUCTION

From 1866 to 1970, 7 mining districts in the Magdalena Mountains (Magdalena, Hop Canyon, North Magdalena, Water Canyon, Cat Mountain, Council Rock, Bear Mountain districts) produced more than \$46 million worth of zinc, lead, copper, silver, manganese, gold, and barite from carbonate-hosted lead-zinc replacement and volcanic-epithermal vein deposits. Nearly all of the mineral production was from the Magdalena mining district, where three mines accounted for much of the production (Kelly, Juanita, and Graphic mines).

(Synonyms) Discovery

Mill Canyon,

Magdalena Kelley, Kelly

Springs, Sar

St. Viciente

Pueblo,

Spring Hill,

metals

Production-

1913-1941

1904-1956

Production (al commodities)

\$1,000

\$10,000

\$0

1866-1970 | >\$46,000,000

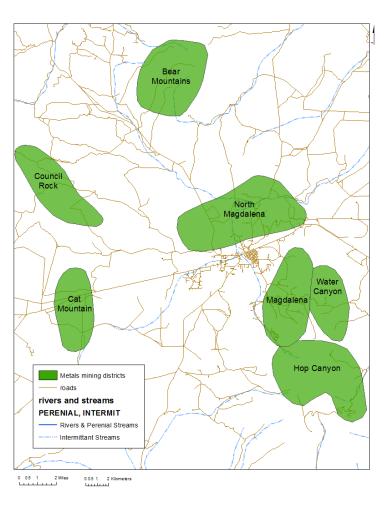
Au, Ag, Cu,

Ag, Pb, Ba,

Cu, Au

Cu, Pb, Au,

Pb, Fe, Ag



Types of Deposits

carbonate-hosted Pb-Zn

carbonate-hosted Pb-Zn

Ba, Mn, F, Cu, volcanic-epithermal veir

Ag, Sb, Zn, Cu volcanic-epithermal veii

Ag, Cu, Au F, Ba, W, U volcanic-epithermal vein

(Cu, Ag) replacement,

Zn, Ba, U volcanic-epithermal vein

commodities

Zn, Pb, Cu, F, Ba, W, V, carbonate-hosted Pb-Zn

Ag, Mn, Au | Mo, asbestos (Cu, Ag) replacement,

	Bear Mountains	1
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	puncil Rock	
	North 3	\geq
7	Magdalena	
		\geq
	Water	\
	Magdalata Canyon	•
7		-
		/
J.		
	■ mines Hop Canyon	
	Metals mining districts	<u>-</u> ر
	rivers and streams	
(PERENIAL, INTERMIT	٠
	Rivers & Perenial Streams	-
1	Intermittant Streams	
0 05 1	2 Miles 0 0.5 1 2 Kilometers	

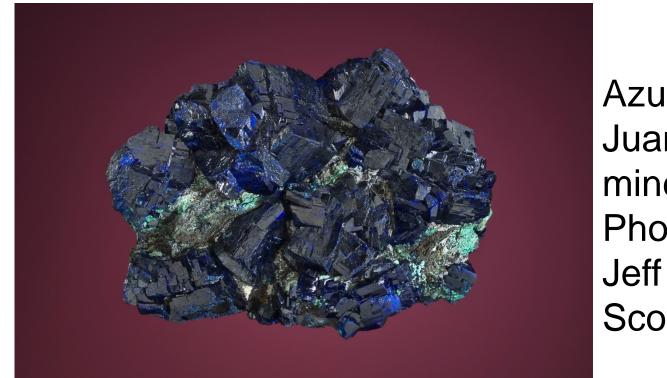
Schematic of formation of volcanic-epithermal districts related to calderas and geothermal activity

Most of the mineral deposits in the Magdalena area were formed from hydrothermal fluids associated with volcanic rocks. The most productive mineral deposits are lead-zinc with some silver and gold found in the Kelly Limestone of the Magdalena Group, mostly as pods and replacements, minor skarns, and minor veins in carbonate rocks that are adjacent to intrusive rocks. They are typically leadzinc dominant, with a by-product of copper, silver, and gold, consisting predominantly of galena and sphalerite with lesser amounts of chalcopyrite and other minerals.

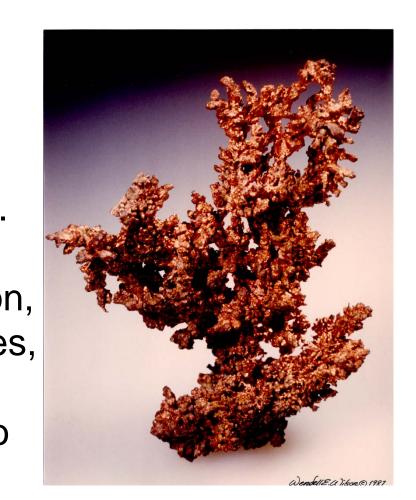
MINERAL COLLECTING

GEOLOGIC PROCESSES

Tony Otero with a prize Smithsonite, photo by Al Tlush. New Mexico Bureau of Geology and Mineral Resources, Historic Photograph Archives, Socorro, NM



Native Copper— Kelly mine, 1987. Azurite— Courtesy of Juanita mine. Wendell E. Wilson, Photo by Historical Archives, NM Bureau of Scovil Geology, Socorro NM

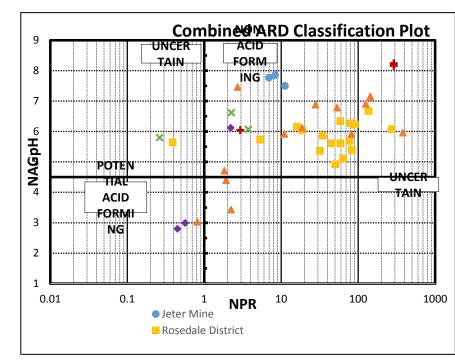


ENVIRONMENTAL ISSUES

- Mine workings, rock piles, tailings, and heap leach facilities can result in physical hazards
- Acid rock drainage and contamination by metals and other constituents is a problem at some sites in the Magdalena area and can result in potential water quality issues

Lead is present in many districts

Since there is no complete inventory of the mines, we do not know the extent of any problems



Acid Rock Drainage (ARD) plot of waste rock pile at mines examined during the NMBGMR AML project

NMBGMR is conducting research on inactive/ abandoned mine features in New Mexico. The objective of our research is to develop a better procedure to inventory and characterize inactive or abandoned mine features in New Mexico. For more information see https://geoinfo.nmt.edu/geoscience/research/home.cfml?id=13

WHY STUDY MINING DISTRICTS?

- History
- Mineral collecting
 - Minerals Environmental issues
 - Mineralogy and geochemistry
- Mineral-resource potential
 - Are there any minerals left to mine today or in the future?
- Understanding geologic processes

Graphic Mining and Smelter Company's smelter and mill at Magdalena, ca 1900. Courtesy of Frank and Merriweather Pickard, Historical Archives, NM Bureau of Geology

MINING HISTORY

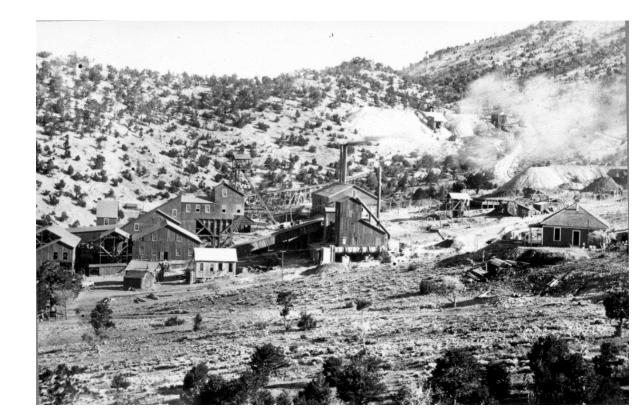
1866—J.S. Hutchason discovered ore and started the Kelly, Juanita and Graphic mines and began producing silver

1885—Railroad built between Socorro and Magdalena to ship ore to the Billings smelter in Socorro

1903—Re-discovery of zinc carbonate (smithsonite, a vital ingredient for paint) and new processing techniques began producing lead-zinc from the Magdalena mines

1970—End of mineral production in the Magdalena area

1972—Last cattle drive to Magdalena and the railroad was abandoned



View, looking northeast, of Tri-Bullion mill near Kelly, New Mexico, ca 1910. courtesy of Mrs. Rowan Keith

MINERAL-RESOURCE POTENTIAL

Most of the mineral deposits have been mined out. There is only moderate potential for gold and copper in some districts.

