

# **ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES**

**66<sup>TH</sup> Annual Report  
FY 2004/2005**

Cover photo courtesy of Phelps Dodge

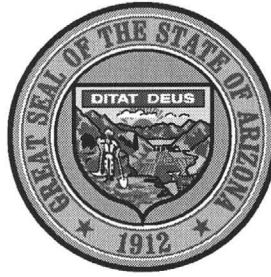
# DEPARTMENT OF MINES AND MINERAL RESOURCES

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Phoenix, AZ 85007

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## 66<sup>th</sup> Annual Report Fy2004/2005



State of  
Arizona

Janet Napolitano, Governor

## Message from the Director

Annual Report  
2004 - 2005  
Arizona Department of  
Mines & Mineral Resources



Susan Celestian,  
Acting Director

August 10, 2005

The Honorable Janet Napolitano  
State of Arizona  
1702 West Washington  
Phoenix, Arizona 85007

Dear Governor Napolitano:

The Board of Governors for the Arizona Department of Mines and Mineral Resources (ADMMR) is pleased to submit the Annual Report for the fiscal year 2004/2005. This report is submitted in compliance with A.R.S. Section 27-106.

ADMMR has the statutory directive to promote the development of Arizona's mineral resources through technical and educational processes. In 2004 over 22,000 jobs in Arizona were attributed to the copper industry alone. Over \$194 million in direct tax revenue was received by the State and its subdivisions last year from the copper industry.

Mining is a cyclic industry, and currently the industry is booming, especially the minerals Arizona mines – copper, sand and gravel, uranium, molybdenum. The Department plays an important role in attracting exploration money to Arizona and encouraging new mining ventures.

The Department functions with two operating divisions; the Mine Information Center and the Arizona Mining and Mineral Museum. In addition to the Mining Information Center's efforts in assisting development of Arizona's mineral resources, ADMMR strives to educate the public on the importance of minerals to society through the Arizona Mining and Mineral Museum.

The present staff of five FTEs, seven part-time employees, and a dedicated corps of volunteers, provide quality service to its patrons by focusing on the needs of the public and the mining industry.

The following report is a summary of the Department's quarterly reports for the fiscal year.

Respectfully yours,

Susan Celestian, Acting Director  
For the Board of Governors



Mining is an essential industry that promotes safety and education, and responsibly produces materials for products necessary to today's standard of living - with concern for the environment, the culture, and economic future of the state.

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## **Personnel**

### **Board of Directors**

David Ridinger

Tucson

Samuel Aubrey

Scottsdale

Ray Grant

Chandler

Rana Medhi

Casa Grande

Patrick O'Hara

Prescott

### **Staff**

Susan Celestian

Acting Director

Nyal Niemuth

Acting Chief Engineer

Diane Bain

Public Information

Officer

Jacqueline Hall,

Administrative Asst.

Tina Mendoza

Clerk/Typist

### **Part-Time Employees\***

Liz Anderson

Ann Baker

Shirley Coté

Doug Duffy

Joanne Hesterman

Laurette Kennedy

Alice Rosenfeld

\*Non-appropriated funds

## **2004/2005 Fiscal Year Financial Statement**

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### **Appropriated Fund #1000**

Appropriation..... \$658,400.00

Expenditures ..... 654,053.80

Reverted ..... 4,346.20

### **Mines and Mineral Resources Fund #3156**

Beginning Balance (7/1/2004)..... \$138,606.82

Income (store sales, donations,  
publication sales) ..... 182,742.69

Expenditures ..... 175,216.25

Ending Balance ..... \$146,133.26

## **Statutory Assignment**

The Arizona Department of Mines and Mineral Resources (ADMMR) is authorized by A.R.S. Section 27-101 to 27-110 to promote the development of the mineral resources of this state through technical and educational outreach. The purpose of this promotion is to encourage economic development in the mining and mineral resource industry. This task is accomplished through field investigations, publications, conferences, mineral displays, public seminars, and by providing mining, metallurgical, and other technical information and assistance to prospectors, operators of small mines, the mineral industry, and to all others interested in the mineral resources of Arizona.

## Donated Funds

FY 2004/2005

Donor	Purpose	Amount
Newcrest Resources, Inc.	Towards cataloging donated mine files	\$1,000.00
Maricopa Lapidary Society	In memory of Peggy Sil, for Education Fund	35.00
APS Foundation	Matching funds for volunteer hours for Charlie Connell	125.00
Elite Racing Team	For use of the building on 1/9/05	800.00
Apache Junction Rock & Gem Club	Donation	50.00
Mesa Spirit Rock & Gem Club	Donation	75.00
Pebble Pickin Posse	For inside exhibits	2,457.28
Tucson Gem & Mineral Society	For special exhibit in show	200.00
Roadrunner Rockhounds	For inside exhibits	25.00
Palo Cristi Presbyterian Church	For program	25.00
Maricopa Lapidary Society	Brick for Emily Cox	125.00
Arizona Prospectors Association	Brick for George Aguardo	75.00
Arizona Prospectors Association	Donation	749.25
Oak Creek Gem & Mineral Society	Travel costs for program	50.00
Hull Elementary School	From school children, for Education Fund	80.74
Pinnacle West	Matching funds for volunteer hours for Charlie Connell	125.00
	<b>Total</b>	<b>\$5,997.27</b>

### Funds Donated to the Friends of the Arizona Mining and Mineral Museum

Qwest	Publications of the Teacher Pacs	\$5,000.00
APS	Outreach Program	3,000.00
Phelps Dodge Corporation	Building the Copper Corner	10,000.00

### In-Kind Donations

In addition to the cash donations enumerated above, the Department has received a host of other items including mineral specimens, gemstones, construction materials, museum displays and so forth. Thanks to these many benefactors.

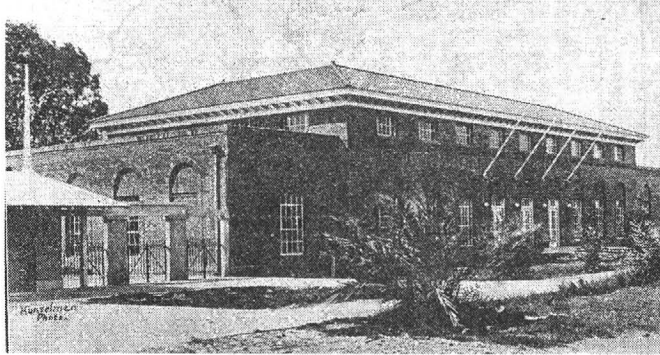
We would like to express our sincere gratitude to all our donors – cash or otherwise - and, and hope they will continue to provide their assistance in the future.



## Historical Overview

The roots of the Department and Museum go back to 1884 to the first Arizona State Fair when the mineral displays were so popular that the State Legislature appropriated \$30,000 for a permanent mineral building to be built on the State Fairgrounds.

The \$30,000 legislative commitment did not materialize until 1917 when Since the initial appropriation by the legislature in 1917 was insufficient, the major mining companies came up with the additional money for the original mineral building to be built and also provided funding to staff it. This building was to house the Museum and Department for the next 65 years.



**1922**

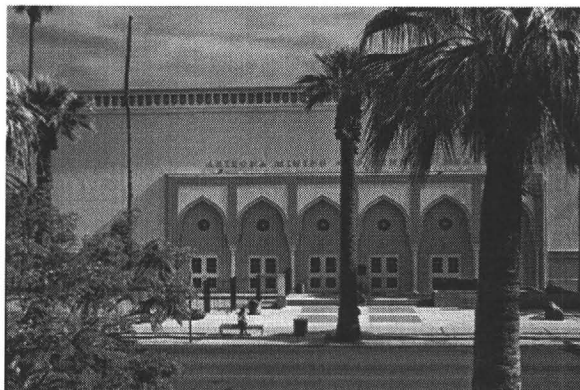
The Department of Mines was officially established by law in 1939.

The mandate of the agency is to promote the development of Arizona's mineral resources.



**1941**

Thanks to the efforts of many, but especially of Polly Rosenbaum, a legislator, and then-Governor Rose Mofford, the Department is quartered in the graceful and attractive former El Zaribah Shrine building, partially remodeled for the Department in 1991.



**1991**

## Statutory Duty:

The Department shall serve as a center of mining information for this state in matters relating to its mineral resources and monitor current mining and exploration activity.

## Mine Information Center

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The Mining Information Center manages the mine files, databases, and library collections, responds to thousands of requests for information, produces the Department's publications, maintains the ADMMR website, and provides assistance and co-operation on projects with other government agencies.

It is logical that in this Information Age, a major focus of the Department is information: collecting it, analyzing and cataloging it, and disseminating it. Information is gathered by field visits, verbal information, and research. Information is evaluated, cataloged, entered into mine files, databases, and library collections. Distribution of information is accomplished through personal contact, seminars, publications, technology transfer, and the operation of the Arizona Mining and Mineral Museum. The information is made available to members of the industry, prospectors, historians, educational institutions, students, environmentalists, other government agencies, and the general public.

ADMMR makes field contacts and mineral deposit evaluations and studies market trends and technology to encourage investment in prospecting, exploration, development, and production of minerals in Arizona.

Industry uses this data to make discoveries, generate jobs, and ultimately adds to the State's economy. Successful projects contribute the largest benefit to the economy in general and tax revenues to state and county treasuries. Exploration projects in themselves, however, also make a significant contribution to the state's economy in the form of purchased labor, equipment, services, supplies, utilities, and tax revenues. This is especially important in the rural communities.

**Website.** The Department's website, [www.admmr.state.az.us](http://www.admmr.state.az.us) contains general information on the Mine Information Center and the Museum, as well as technical information and data on mining, prospecting, geology, and mineral rights and mining law. The website is an excellent way to disseminate information while relieving phone, fax, and visitation traffic. The site contains 56 on-line ADMMR publications, news of Museum events, and over 200 links to mining and mineral related sites. In FY2004-05 the website was hit 407,871 times. Nyal Niemuth is the webmaster.

On June 9, 2005, ADMMR finally obtained high-speed Internet access through a fiber optic connection to MAGNET.



### **Statutory Duty:**

The Department shall make surveys of potential economic mineral resources and conduct field and other investigations which may interest capital in the development of the state's mineral resources.

### **Statutory Duty:**

The Department shall conduct studies of the economic problems of prospectors and operators of small mines for the purpose of assisting in their solution and investigate their properties to assist in development.

### **Statutory Duty:**

The Department shall oppose duty-free imports of foreign minerals.

### **Statutory Duty:**

The Department shall use its authority in other ways to assist in more extensive exploration and development of the mineral resources of the state.

## **Economic Surveys for Capital Development**

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Examples of surveys performed by the Department include studies of copper deposits resources, industrial mineral commodities, construction materials and their applications, coal deposits, salt and other evaporite deposits, and other mineral commodities. This data is available as Department publications such as *Copper Reserves*, Open-File Report 01-17, as databases and listings, and as data gathered and held in library and mine files.

It is worthy of note that the development of the Safford deposit by Phelps Dodge is expected to infuse an estimated \$570 million in the Arizona economy before production. In June 2005, Phelps Dodge also approved \$210 million for additional construction at Morenci. Development of the Resolution deposit, perhaps the biggest copper deposit in North America, may cost Resolution Copper Company \$2 billion before production actually begins.

## **Economic Surveys for Prospectors**

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The Department deals with the economic problems of small mines and mine owners on a daily basis. Small mine operators are assisted in a variety of ways and are a major focus of the Department. Field visits and investigations of the small mine properties themselves has been limited by cuts in the Department travel budget. The total Department travel budget for FY 2003-2004 was \$100.

## **Oppose Duty-Free Imports**

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With the advent of NAFTA, CAFTA, and other global free trade agreements, this statute is no longer applicable. The Federal government no longer supports tariffs.

## **Use Authority in Other Ways**

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This statute was added by the Legislature to ensure the Department had enough flexibility to promote the development of the mineral resources of the State, and not be limited by the more specific statutes.



### **Statutory Duty:**

The Department shall provide quality mining data, evaluation and assistance relating to mineral development to the legislature and other state and county agencies.

### **Statutory Duty:**

The Department shall promote the development of the mineral resources and industry of this state by participating in conferences, seminars, forums, speaking engagements.

## **Mining Data Evaluation and Assistance**

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As requested by each entity, mining data is provided to the Legislative Council, legislators and their staffs, the Joint Legislative Budget Committee economic analysts, the Arizona State Land Department, Department of Administration, Arizona Revenue Department, county boards of supervisors, county planning and zoning agencies, and county and city business and industrial development entities.

Details of these some of activities are mentioned elsewhere in the report.

## **Conferences, Seminars, and Talks**

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Examples of some of the varied types of presentations are given below:

**Society of Mining Engineers, Grand Canyon Section of SME at Prescott.** Presentation topic: *Industrial Minerals of Arizona*

**Apache Junction Gem Club.** Presentation topic: *Metal Mining in Arizona*

**Arizona History Convention.** Presentation topic: *ADMMR's Special Collections*

**Northwest Mining Conference in Spokane.** Presentation topic: *Review of Arizona's Geology, Metals, and Industrial Minerals*

**Phoenix Park Rangers.** Presentation topic: *Mining in the Phoenix Area*

**Roadrunners Prospectors.** Presentation topic: *ADMMR's Special Collections*

**Sedona Rock & Mineral Club.** Presentation topic: *Treasure in the Desert*

**Gold Prospectors of America.** Presentation topic: *The Golden Frog of Stanton*

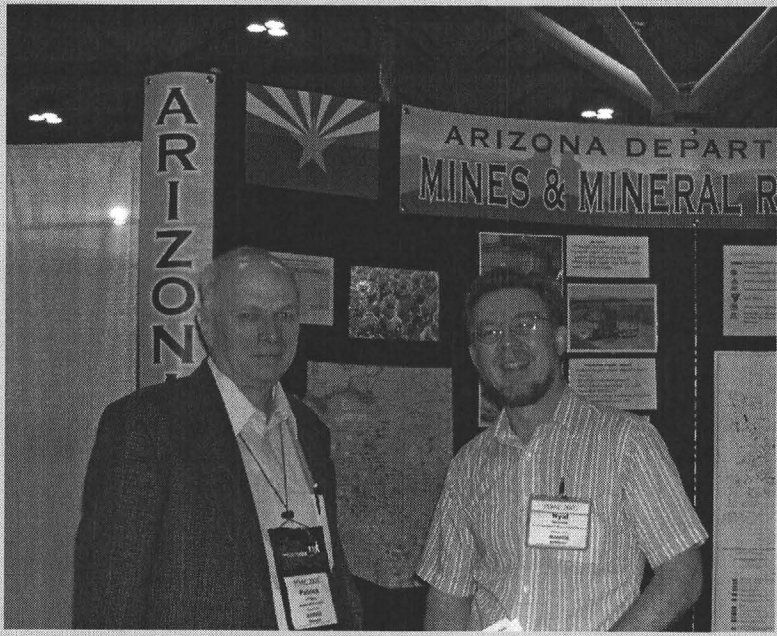
**Rockhounds West.** Presentation topic: *Mineral ID*

**APS Retirees.** Presentation topic: PowerPoint *Tour of the Museum*

**Litchfield Park Pack 209.** Presentation topic: *Rocks and Minerals*

**Lowell Elementary School Science Night.** Presentation topic: *Fluorescence*

**Motorola Rockhound Club.** Presentation topic: *Crystal Imperfections*



ADMMR Board of Governors' member, Dr. Patrick O'Hara (left), and ADMMR Mining Engineer, Nyal Niemuth, at the Prospectors and Developers Conference.

**Prospectors and Developers Association of Canada (PDAC).**

ADMMR was an exhibitor at this year's PDAC International Convention, Trade Show and Investors Exchange held in Toronto. This function, the 73<sup>rd</sup> annual, is the premier event of its kind. Mineral exploration and mining companies from all over the world assemble here each year. The Department's partners included the Arizona Bureau of Land Management, the Arizona Department of Commerce, the Arizona Geological Society, the Arizona Geological Survey, the Arizona Mining Association, the Arizona State Land Department, and

the University of Arizona Institute for Mineral Resources.

**Pinnacle Peak Park Docents.** Presentation topic: Tour of Museum  
**Palm Valley Elementary School Science Night.** *Fluorescence*

**Smithsonian Culture Fest** at Arizona Science Center. Exhibitor and Presentation topic: *Arizona Minerals*

**Apache Wells Gem & Mineral Club.** Presentation topic: *Crystal Imperfections*

**Note:** Talks to some of the smaller groups, apart from its educational value, encourages individual participation in prospecting and in the minerals industry of the State.

### **Statutory Duty:**

The Department shall maintain an information bank and library of mineral and mining information, including books, periodicals, films, videotapes, and individual mine files.

### **Statutory Duty:**

The Department shall maintain an underground mine map repository files, mining district data and an archive of mine data.

A portion of the Department's USGS 1904 Globe folio - hand drawn and hand colored.

## **Mine Library**

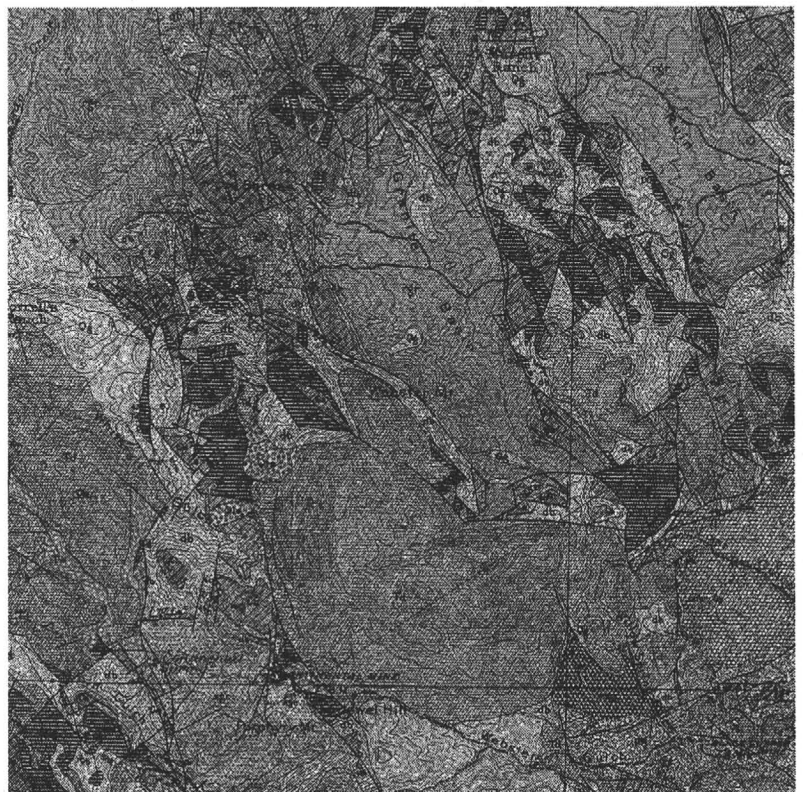
ADMMR's library includes the Arizona mine file collection, reference library, map archive, and photo collection.

### **Mine Files and Special Collections**

The mine file collection consists of the AzMILS database with over 11,000 records and over 5,000 hard copy files. The files contain information about mine location, mineral content, size, assay and drill data, technical and economic production potential and bibliographies. This data is unique and by far the most-used portion of the ADMMR library. Newly developed information is added and additional files/records are created as new mineral occurrences are documented. Effort is underway to begin digitize this information.

### **Map Archive**

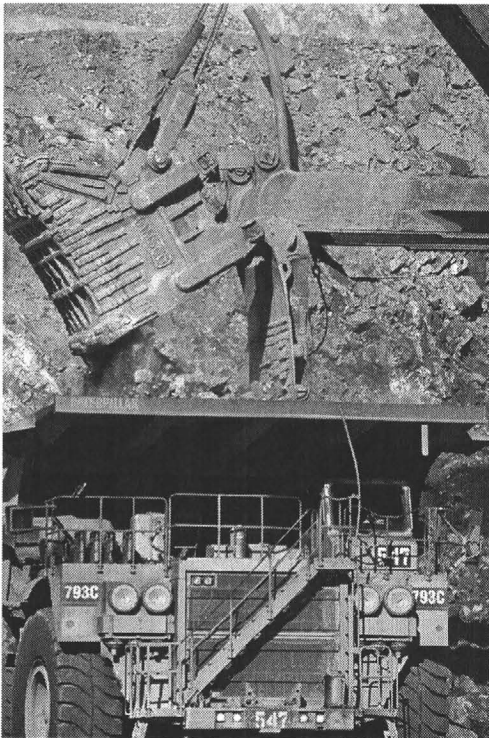
The Department has over 1,700 cataloged mine maps, 3,000 cataloged microfiche maps, over 5,000 mine maps awaiting cataloging, and over 5,000 published mineral resource, geology, and topographic maps.





## Photo Archives

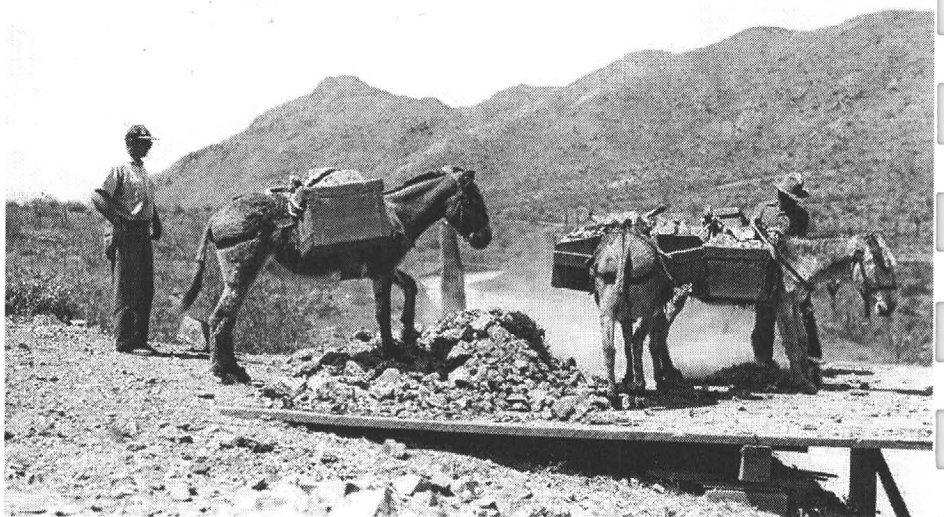
Thanks to volunteers Keith Halsey, who began cataloging Department photographs in 1996, and Kevin Hart, who began scanning the images in 2003, cataloging of ADMMR's historic photo collection achieved near-completion this year. An estimated 4000 photos, negatives, and slides have been cataloged and have been scanned into digital format. This formidable task, overseen by staffer Nyal Niemuth, involved determining the date of each photograph, labeling, photocopying, cataloging, and then scanning each image. The images were photocopied to relieve use of the originals by the public and eventually to provide widespread access via the Department website.



*Two methods of ore transport are contrasted in the Department's photo archive.*

Morenci Mine - 2003

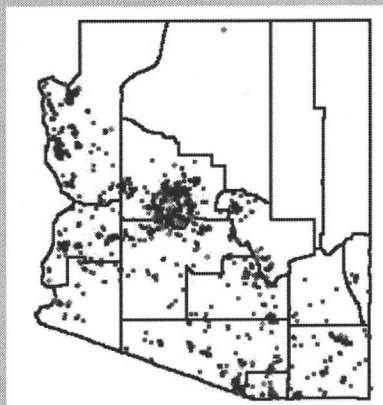
Max Delta Mine, South Mountain, Phoenix, 1935



## Statutory Duty:

Publish and disseminate information and data necessary or advisable to attain its objectives.

"Arizona's cumulative gold production exceeds 16 million ounces."



Primary and by-product gold occurrences.

From: *Arizona's Metallic Resources – Trends and Opportunities, 2005*

## Publications

### Newsletters

*Arizona Mineral Resource*, No. 39, November 2004  
Copper mining contributes \$2.7 billion to Arizona economy; Mining Consultant directory released; American Sandstone sold to Natrock Corp.; BLM claim fees increased; Morenci Mine tours resume; Richard Bideaux tribute

*Arizona Mineral Resource*, No. 40 – May 2005  
Arizona Mineral Production 2004; Review of PDAC Conference in Toronto; Patrick O'Hara named to Board; Carlota Copper for sale by Cambior

### Circulars

- C108 – *Arizona Mining Update - 2002 and 2003*
- C109 – *State Agencies Concerned with Mining and Mineral Resources in Arizona*
- C110 – *Federal Agencies Concerned with Mining and Mineral Resources in Arizona*
- C111 – *County Agencies Concerned with Mining and Mineral Resources in Arizona*
- C112 – *Arizona Gem Shows – 2005-06*
- C113 – *Earth Science Clubs – 2005-06*

### Open File Reports

- OFR04-21 – *Publications of the Department 1990 – 2004*, by Diane Bain
- OFR05-22 – *Arizona's Metallic Resources – Trends and Opportunities, 2005*, by Nyal J. Niemuth



Diane Bain, Public Information Officer, holding a 400-ounce gold bar.

## Statutory Duties:

The Department shall cooperate with the Federal and other agencies in matters related to developing mineral resources in this state.

*The following are some examples of assistance ADMMR gives to government agencies and organizations:*

## Cooperation with Federal Agencies

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**Bureau of Land Management.** The Department agreed to standardize and distribute mining claims forms for claimants to complete their filings with the Bureau of Land Management. BLM is no longer allowed to distribute these, because the courts have ruled this to be a States' Rights issue. The Department has so far produced a standardized *Affidavit of Performance of Annual Labor, Notice of Intent to Hold, and Maintenance Fee Payment* forms. The forms are also compliant with recordation requirements for the Arizona county recorders.

\_\_\_\_\_. Provide information on criminal activity on public lands and mine fraud.

\_\_\_\_\_. Provide information for their 20-year Resource Management Plan. Also applied for a grant to digitize data used by BLM personnel for this purpose.

**U.S. Geological Survey.** Worked in cooperation with USGS on joint ADMMR/USGS open-file report of digital data of ADOT material inventory series.

\_\_\_\_\_. Wrote the Arizona review article for 2003 for the *USGS Minerals Information Series*, including updating the map for publication.

\_\_\_\_\_. Provided information to the Western Mineral Resources Tucson Office of the USGS with mining and mineral deposit information on numerous occasions.

**Federal Bureau of Investigation.** Provided assistance and data to FBI agent Brian Witt of the Sierra Vista office investigating Great America Gold at Luzena Alluvium Cochise County.

**Bureau of Indian Affairs.** Lakewood, CO. provided information on aggregate. Sent an Active Mines Directory.

\_\_\_\_\_. Provided BIA out of Tuba City with information on all uranium mining that has been conducted on Indian lands in Arizona since 1950.



### Statutory Duty:

The Department shall Cooperate with the State Land Department to encourage mining activity on state lands.

### Statutory Duty:

Cooperate with the State Geologist and deliver to the Arizona Geological Survey problems which the field work of the Department shows to be within the scope of the activities of the Arizona Geological Survey.

### Statutory Duty:

Cooperate with the Corporation Commission in its investigations, and administration of laws relating to the sale of mining securities.

## Cooperate with the State Land Department

**State Land Department.** Worked in cooperation with Arizona State Land Department to post a web page on our site concerning mineral rights on state trust lands information, *Mining Activities on State Trust Land*

\_\_\_\_\_. Prompted companies and individuals to negotiate for the state lease at the Camp Grant for a landscaping quarry to add to their catalog of properties.

\_\_\_\_\_. Supplied State Land Department with minerals and display materials for their exhibit in Gilbert.

## Cooperate with the Arizona Geological Survey

**Arizona Geological Survey.** Respond to inquiries referred to our agency by the AGS dealing with mineral resources and mining-related questions.

\_\_\_\_\_. Suggest areas for geologic mapping and refer public inquiries on geologic mapping to the agency.

\_\_\_\_\_. Refer inquiries on geologic problems to the AGS that involve hazards such as land subsidence, earth fissures, and flooding.

\_\_\_\_\_. Refer inquiries on geological hazards, quaternary features, and radon gas to the AGS.

## Cooperate with Corporation Commission

**Securities Division, Corporation Commission** – Identify suspect mining activity and cooperate and supply information for their investigations. Gather complaints, provide and technical investigation and economic review.

Unfortunately, this activity has become more prevalent with advantage of opportunities provided by rising commodity prices and the internet. The Department now devotes considerably more time and resources to these inquiries related activities.

In fulfilling the Department's Statutory Objective, the Department through technical and educational processes provides information and assistance to prospectors and other organizations.

## Cooperation with Other Organizations

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**Arizona Mine Inspector's Office.** Serve their abandoned mines program with our files and maps.

\_\_\_\_\_. Track industry activity

**Arizona Department of Environmental Quality.** Provided information on prior mining activity in locations in the State on numerous occasions. They require detailed information on the type of mining that occurred, the commodities recovered, and the chemicals used in recovery.

**Society for Mining, Metallurgy, and Exploration Inc. (SME).** Hosted the October Maricopa meeting.

\_\_\_\_\_. Served as Secretary of Maricopa section.

\_\_\_\_\_. Presented a program on metal mining at Grand Canyon Section.

**Rock Products Association.** Provided production figures for aggregates and crushed stone for 2003 for one of their publications.

**McDowell Sonora Land Trust Gateway Area.** Provided information on the old mines within the trust for use in their programs.

**Flanders Science Center.** Provided information on turquoise occurrences to assist in developing the new science center for downtown Tucson.

**Arizona Republic.** Provided statistics on the copper industry to David Fritze, business editor.

\_\_\_\_\_. Supplied lengthy background and update on Arizona copper industry to Max Jarmand and Richard Nilson.

**Arizona Highways.** Reviewed four articles and provided information for additional features.

**National Geographic.** Provided information for feature on the San Juan plateau.

**Mohave County Sheriff's Office.** Provided maps and information to assist in missing person search.

### Statutory Duty:

The Department shall maintain a mineral museum as the state depository for collecting, cataloging and displaying mineral specimens of various ores, gemstones, lapidary material and other valuable mineral specimens.

Doug Duffy Lapidary Shop Manager, prepares a cabochon

## Mining and Mineral Museum

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**Museum Visitation: 41,999 in FY 2004/5**

**Each year over 20,000 school children tour the Museum.**

The Museum addresses the needs of many facets of the industry and the hobbyist – prospectors, educators, rockhounds, lapidaries, and the general public – through the education program, museum exhibits, and special events.

The message of the Museum is that civilization is dependent on minerals, that minerals must be mined, and that Arizona is a major mining state. Of all the minerals used by society, copper has had the most profound effect.

### Education

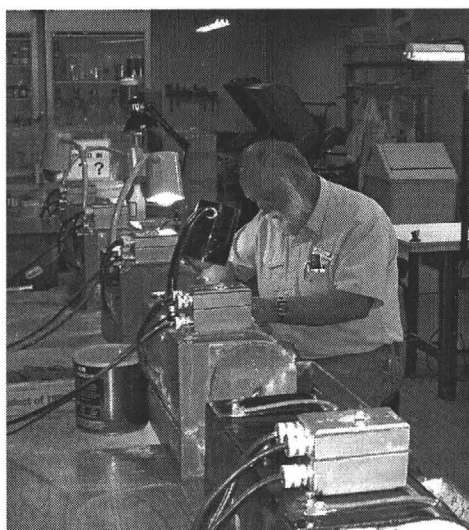
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#### School Tours

Tours and classes for students and teachers are offered as part of the effort to educate the public about the use and importance of minerals. The museum has developed a comprehensive minerals education program that reaches thousands of Arizona school children. During 30-minute programs, children are introduced to the beauty and utility of minerals – themes that continue during their activities in the exhibit halls. In FY 2004/2005, **22,057** students visited the Museum for a program.

#### Outreach Program

In FY 2004/2005 the Museum Outreach Program visited 24 Arizona schools that, for financial or other reasons, could not come to the Museum. This program underscores the beauty and utility of minerals, like the in-house programs.



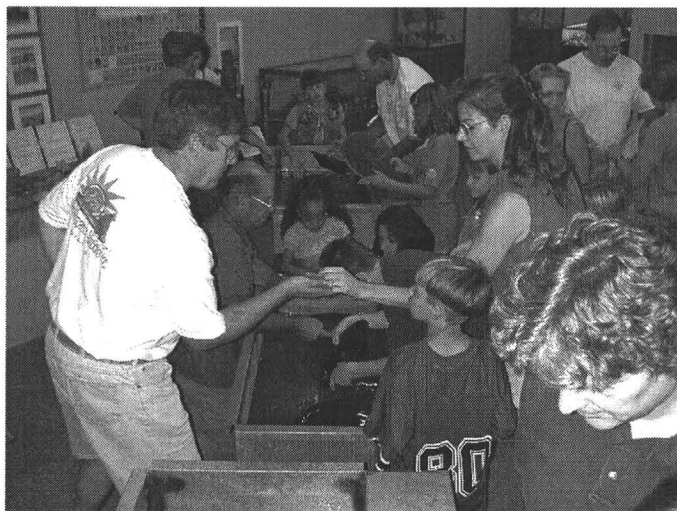
#### Lapidary Classes

The Museum is proud of its lapidary shops, with facilities for cutting, faceting, polishing, and sphere-making. Classes are offered in silversmithing, wire wrapping, lost wax casting, and lapidary.



## Teacher Workshops

Throughout the year free workshops are offered on a variety of subjects, such as rock identification, mineral identification, uses of rocks and minerals, crystals and crystal forms. These classes are available to public school, charter, and home school teachers.



## Family Day/Prospectors Day

These twice-yearly Museum functions have proven immensely popular. Events include lapidary demonstrations, jewelry-making, gold panning, and metal detecting. There were 633 participants at the February 2005 Family Day.

Family Day - at the  
gold panning  
station.

## Teachers Kits

Every Arizona teacher may receive a free Teachers' Kit containing samples of rocks and minerals, a teacher's manual, maps, posters, and other educational aids. Volunteers assemble the kits, using donated material that they have sized and numbered. The Museum has given out over 10,000 kits to Arizona teachers since the program started.

## Museum Visitation

July	2,030
August	1,680
September	2,371
October	3,887
November	3,463
December	3,177
January	3,194
February	4,484
March	5,254
April	5,143
May	4,202
June	3,214
<b>TOTAL</b>	<b>41,999</b>

**Annual Visitation for  
fiscal year 2004-2005**

## Volunteers

Last year volunteers dedicated over 11,000 dedicated hours to the Department!



Volunteers and APS staffers pose proudly in front of the Stamp Mill. The project has taken 22 years! to get to this point. The aim is to complete the mill and make it operational.

### VOLUNTEER ACTIVITIES

- |   |  |
|---|--|
| <input type="checkbox"/> Data entry   | <input type="checkbox"/> Catalog the photo collection                    |
| <input type="checkbox"/> Greet visitors                                     | <input type="checkbox"/> Serve as docents                                |
| <input type="checkbox"/> Create jewelry to sell in the Museum gift shop     | <input type="checkbox"/> Assemble Treasure Bags to sell in the gift shop |
| <input type="checkbox"/> Construct outside displays                         | <input type="checkbox"/> Prepare samples for Teachers' Kits              |
| <input type="checkbox"/> Repair cases and other items                       | <input type="checkbox"/> Assemble Teachers' Kits                         |
| <input type="checkbox"/> Catalog technical data for Mine Information Center | <input type="checkbox"/> Catalog specimens for the Museum collection     |
| <input type="checkbox"/> Teach silversmithing and lapidary arts             | <input type="checkbox"/> Photograph the Museum collection                |
| <input type="checkbox"/> Develop and install displays                       | <input type="checkbox"/> Work in the gift shop                           |
| <input type="checkbox"/> Outreach programs to schools                       | <input type="checkbox"/> Family Days activities                          |
| <input type="checkbox"/> General painting tasks                             | <input type="checkbox"/> Cut and polish lapidary material                |
| <input type="checkbox"/> Digitize the photo collection                      |  |

## New Museum Displays

### Internal

- Mercury
- Tiger Mine
- Fulgurites
- Cave Deposits
- Micromounts - Native Metals
- Volcanic Ejecta
- Banquet of Rocks
- Meteorites

### External

- Arizona State Fair  
"Meteorites & Meteor-wrongs"  
Banquet of Rocks  
Museum Gift Shop
- Rockfest - "Volcanic Ejecta"
- Tucson Gem & Mineral Show - "Minerals in China"
- Apache Junction Show - "Azurite in Arizona"
- Foothills Public Library - "It Must be Mined"
- Phoenix Gem & Mineral Show - "In Honor of Martin Koning and Jerry Muchna"



New cave deposits display, *Dripping Water*

## Activities/Events

**Sept. 12** Grandparent's Day — Museum open on a Sunday from 1-4, in partnership with Arizona Kinship Coalition

**Oct. 16** Family Day at the Museum, 723 in attendance

**Nov. 6** Teacher Workshop for Mesa Tribune

**Dec. 14** Qwest officials at Museum to present \$5000 check to Friends of the Arizona Mining and Mineral Museum for publication of Teacher Pacs

**Jan.** Assembled 800 Teachers' Kits

**Jan. 7-9** 13 Annual Minerals of Arizona Symposium, sponsored by the Arizona Mineral and Mining Museum Foundation and ADMMR

**Jan. 9** Rock and Roll Marathon

**Jan. 13-16** Booth at Flagg Show; hand out brochures, information

**Jan 29** Clean Up Day at the Museum

**Feb. 19** Prospector's Day at Museum, 633 attendees



## **13<sup>th</sup> Annual Minerals of Arizona Symposium**

The symposiums, sponsored by the Arizona Mineral and Mining Museum Foundation and the ADMMR, provide a forum for professionals and amateurs to share their knowledge of mineral occurrences, habit, and locations.

Each year mineralogists gather for the presentations and field trips.

The 2005 Mineral Symposium was dedicated to Richard Bideaux, renowned author, geologist, and icon of Arizona mineralogy.

**Feb. 20** APS award \$3000 to Friends of the Arizona Mining and Mineral Museum for Outreach Program

**Feb. 24** Phelps Dodge donates \$10,000 to Friends of the Arizona Mining and Mineral Museum for the Copper Corner

**April 1** Volunteer Recognition Banquet

**April 16** Minerals of Arizona 13<sup>th</sup> Annual Symposium, (see side bar)

**April 17** Booth at Rockfest; hands-on demonstrations

**May/June** Development of classroom materials for revision of Teacher Pacs; Decision made to put all three grade-appropriate Teacher Pacs on CD

**May** Participated in Central Arizona Museum Association (CAMA) May Museum Month Promotion

**May 27** Workshop for ASU Teacher Certification Program Inservice

**May 28** Manned a booth at Science Night at Palm Valley Elementary School

**June** Assembled 300 Teacher Kits

**June 17** Teacher workshop by Stan Celestian – Mineral ID

## Arizona Mining Overview

Copper prices are approximately 72 percent higher than a year ago. Copper reached over \$1.65 a pound on June 17, 2005, an all-time high.

Significant increases in metal prices and strong demand for industrial mineral commodities resulted in a 39 percent increase in the value of Arizona's mineral production. Arizona continues to rank 3<sup>rd</sup> nationally in the value of non-fuel mineral production. The total value for the year exceeded \$3.3 billion. A spectacular rise in copper prices, to record levels, resulted in an increase of \$780 million in the value of Arizona's copper production, bringing the 2004 total to \$2.13 billion. In 2004 Arizona produced over 60 percent of the nation's copper and was also a leading producer of molybdenum, sand and gravel, and gemstones.

### Copper Industry Economic Impact

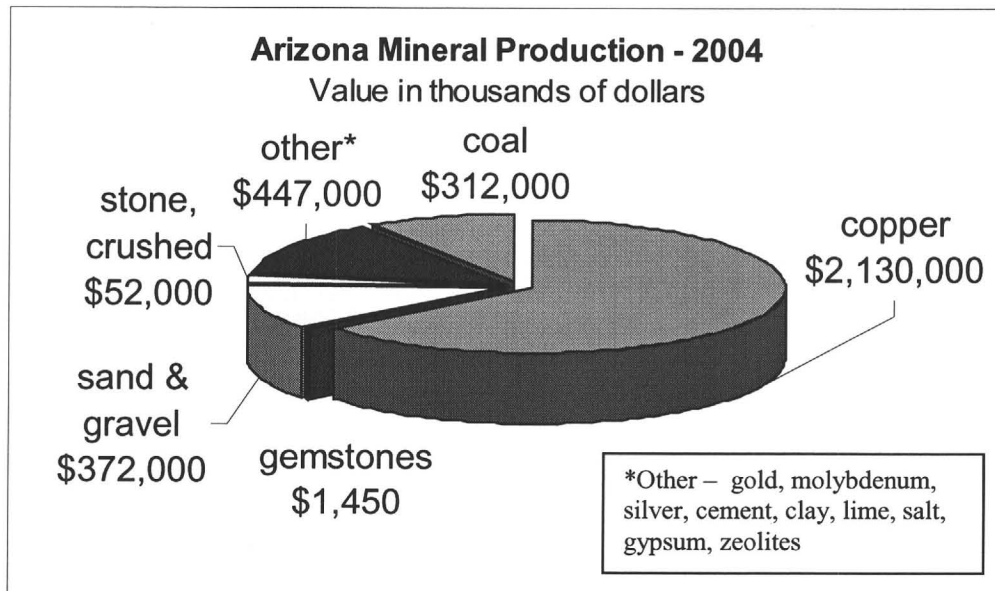
In 2004, there was a combined direct and indirect impact of \$3.3 billion on the Arizona economy from the copper industry. This combination includes personal income, \$1.05 billion, business sales, \$2.07 billion, and government revenues, \$194 million. Over 22,400 Arizona jobs were attributed to the combined direct and indirect contributions of the copper industry in 2004. Source: Western Economic Analysis Center, 2005

### Resolution Copper Company

A decision was made to spend \$200 million to begin developing a porphyry copper deposit discovered near Superior that may be the largest in North America. Resolution Copper Company will complete regional ground water studies, deal with surface land use concerns, and continue gathering baseline environmental data.

### Phelps Dodge Corporation

The U.S. Department of Interior, after 11 years of delays, made the decision on April 13, 2005 to approve a land exchange that will allow development of Phelps Dodge's Safford leach project in Graham County. The economic impact for the region is estimated at between \$43 to \$52 million per year.



**Value of Arizona Mineral Production<sup>1</sup>**  
(Quantity in short tons)

Commodity	2003		2004 <sup>4</sup>	
	Quantity	Value	Quantity	Value
<b>Copper</b>	823,426	\$1,350,000,000	na	\$2,130,000,000
<b>Gemstone</b>	na	1,4500,000	na	1,450,000
<b>Sand and Gravel</b>	63,934,056	319,000,000	na	372,000,000
<b>Crushed stone</b>	10,141	57,500,000	na	52,000,000
<b>Combined values<sup>2</sup></b>	xx	372,000,000	na	447,000,000
<b>Subtotal from USGS</b>	xx	<b>\$2,100,000,000</b>	xx	<b>\$3,000,000,000</b>
<b>Coal<sup>3</sup></b>	na	289,000,000	na	312,000,000
<b>Total</b>	xx	<b>\$2,389,000,000</b>	xx	<b>\$3,312,000,000</b>

1. US Geological Survey (USGS) data except as noted; totals rounded to nearest million

2. Includes cement, clay, lime, gypsum, gold, molybdenum, perlite, salt, silver, dimension stone, zeolites, and iron oxides

3. Arizona Department of Mines and Mineral Resources value for coal

4. Unpublished USGS data, subject to change; official preliminary 2004 and final 2003 data will be published in the Arizona Chapter of the USGS Mineral Yearbook, Area Reports: Domestic 2004, volume II.

**Construction Materials**

Arizona experienced a major economic expansion during the decade of the 1990s. The State ranks among the national leaders in job creation, personal income growth, business formations, and population gains. Between 1991 – 2003, the State's economy created more than 779,000 new jobs, an increase of 52.2 percent. The Arizona rock products industry has been a vital contributor to Arizona's economic development, providing critical resources for construction of residential, commercial, and public infrastructure needed to support this rapid growth. \*

**Economic Impacts of the Arizona  
Rock Products Industry, 2003\***

	Economic Activity	Payroll	Jobs
<b>Sand and Gravel/ Crushed Stone</b>	\$33,009,000	\$94,040,000	2,793
<b>Ready-Mix Concrete</b>	\$873,122,000	\$167,908,000	3,805
<b>Asphaltic/Concrete Products</b>	441,848,000	\$82,501,000	2,242
<b>Cement</b>	\$178,427,000	\$20,048,000	548
<b>Direct Impact</b>	<b>\$1,824,406,000</b>	<b>\$364,497,000</b>	<b>9,388</b>
<b>Indirect Impact</b>	<b>\$1,655,428,000</b>	<b>\$452,516,000</b>	<b>15,802</b>
<b>Total Impact</b>	<b>\$3,479,834,000</b>	<b>\$817,013,000</b>	<b>25,190</b>

\*Arizona Rock Products Association