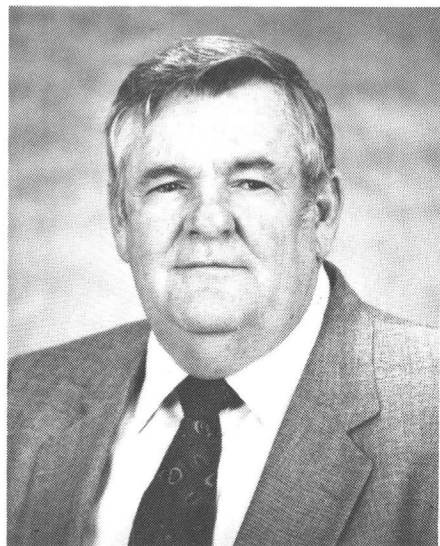




ARIZONA DEPARTMENT OF MINES & MINERAL RESOURCES

Annual Report 1993- 1994

LEADERSHIP



H. Mason Coggin was appointed director of ADMMR in August of 1993. Coggin is an Arizona native who worked his way through college as a mucker and miner in Bisbee. He received a B.S. in Mining Engineering from the University of Arizona in 1961.

He became senior vice president of mining for Coe and Van Loo Consulting Engineers in 1970 and, in 1981, started his own consulting firm.

Coggin is committed to the wise development of Arizona natural resources for the benefit and enrichment of mankind.

DEPARTMENT OF MINES AND MINERAL RESOURCES



55th ANNUAL
REPORT
FY1993/1994



STATE OF
ARIZONA



STATE OF ARIZONA

DEPARTMENT OF MINES AND MINERAL RESOURCES
ARIZONA MINING AND MINERAL MUSEUM

Phone (602) 255-3791 1-800-446-4259 (IN ARIZONA ONLY)

FAX (602) 255-3777

August 13, 1994

State of Arizona
1700 West Washington
Phoenix, Arizona 85007

Dear Governor Symington:

I am pleased to submit the Annual Report of the Arizona Department of Mines and Mineral Resources (ADMMR) for Fiscal Year of 1993/94. The report provides an overview of the agency and highlights of activities during the fiscal year.

ADMMR has the statutory directive to promote the development of the Arizona's mineral resources through technical and educational processes. Currently Arizona's mining industry employs over 13,000 people directly and generates gross revenues of over \$3 billion dollars. Over \$122 million in direct tax revenue was recieved from the mining industry by the State and its subdivisions.

The department functions with two operating groups, the Mining 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 inform the public about the importance of minerals to society through the Arizona Mining and Mineral Museum.

The present staff of seven FTE's and a dedicated corps of volunteers provides quality service to its patrons by focusing on the needs of the public and the mining industry. Towards this continuing objective ADMMR has begun designing and implementing a Strategic Plan and is committed to a program of Excellence in Government.

Respectfully yours,

A handwritten signature in dark ink, appearing to read "H. Mason Coggin".

H. Mason Coggin, Director
For the Board of Governors

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1993/94 Fiscal Year Financial Statement

Appropriated Funds, Account # 1000

Appropriation	\$607,600.00
Expenditures	606,790.83
Reverted	809.17

Mines and Mineral Resources Fund, Account # 3156

Balance Forward 7/1/93	\$27,473.00
Store Sales, Donations	136,468.60
Expenditures	105,057.84
Balance	58,883.76

Printing Revolving Fund, Account # 4004

Balance Forward 7/1/93	\$7,722.35
Publication Sales	10,512.49
Publication Expenses	10,047.79
Balance	8,187.05

PERSONNEL

Board of Directors

Ken C. Bennett
Chairman - Phoenix

Eric A. Nordhausen
Vice Chairman - Phoenix

Richard Oldham
Secretary - Quartzsite

Roy Miller
Member - Phoenix

Clifford Altfeld
Member - Tucson

Staff

H. Mason Coggin - Director
B.S., University of Arizona

- Administrator
- Registered mining engineer
- Registered land surveyor
- Legislative liaison

Kenneth A. Phillips - Chief Engineer
B.S., Calif. State Polytechnic University

- Industrial minerals & minor metals
- Commodity market research
- Technical writing

Nyal J. Niemuth - Mining Engineer
B.S., University of Wisconsin

- Precious and base metals
- Registered geologist
- Network administrator
- Technical writing

Glenn Miller - Curator
B.A., University of Arizona

- Museum management
- Exhibits
- Education and outreach

Ann Turney - Administrative Assistant

- Administration and accounting
- Budget officer
- Operations manager

Diane R. Bain - Clerk/Typist
B.A., University of Arizona
M.A., University of California, Irvine

- Editor
- Technical information officer
- Layout design
- Technical research

Marianne Charnauskas - Clerk/Typist

- Publication sales
- Clerical support
- Accounting assistant

Part-time Employees*

Ann Baker - Tour Guide

Doug Duffy - Tour Guide

Joe McIntosh - Tour Guide

Jerry Myers - Tour Guide

Alice Rosenfeld - Tour Guide

Jeff Scovil - Tour Guide

* Non-appropriated funds

Ninety-eight volunteers contributed over 7,000 hours to the Department last year.

THE DEPARTMENT OF MINES AND MINERAL RESOURCES

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 processes including field investigations, public seminars, publications, conferences, mineral displays 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 this state.

Mining Information Center

Mineral Development

Mining is a \$3.12 billion per year business in Arizona. This revenue ranks Arizona as the top producer of non-fuel minerals in the United States. Through interaction with individuals and companies around the world, ADMMR's Mining Information Center's staff collects, analyzes, and disseminates information to foster and expand the industry. ADMMR makes field contacts and mineral deposit evaluations and studies markets and technology to encourage private sector investment in prospecting, exploration, development and production of minerals in Arizona. Information is distributed through technology transfer, personal contact, seminars, publications and operation of the Arizona Mining and Mineral Museum. The information is made available to prospectors, members of industry, entrepreneurs, historians, and the general public.

Industry uses this data to make discoveries and develop projects that generate revenue, provide jobs and add to the state's economy. Successful projects contribute the

largest benefits to the economy in general and tax revenues to state and county treasuries. Exploration projects, however, also make a significant contribution to the state's economy in the form of purchased labor and supplies. Estimated exploration expenditures were over \$12 million during 1993. The Department also provides a wide range of information and assistance on mining and related technical matters to city, county, state, and federal agencies to aid them in resource management and implementation of regulations.

Mining Library

ADMMR's library includes the Arizona mine file collection and a reference library. The mine file collection consists of the AzMILS database with 10,500 records, about 4,000 hard copy files, and many thousands of mine maps. 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 ADMMR's library. Newly developed information is added and additional files/records are created as new mineral occurrences are documented. Staff-

ing/funding limitations contribute to a growing backlog of entries and limit the amount of literature abstracted and field work conducted.

The reference library contains an estimated 15,000 volumes that includes the publications of ADMMR, mineral resource related publications and maps of the U.S. Geological Survey, U.S. Bureau of Mines, Arizona Geological Survey, and other state and federal agencies. Also included are technical works covering economic geology, mining and mineral recovery methods, mining law, land reclamation, mining history and commodity data. Current and historical collections of mining periodicals are also maintained. Unfortunately, only a small portion of the library has been catalogued. The efforts of a librarian (part time or contract) would improve retrieval for ADMMR patrons.

Recent Acquisitions

Among the more significant additions made to the ADMMR library holdings during the past year were:

- * William Crutchfield Jr's mine files and library, emphasizing northwestern Arizona;
- * Richard Meritz collection of property reports and over 500 maps; and
- * Over 3,000 A. L. Flagg photographic negatives and documentation, from the Arizona Mineral and Mining Foundation.

Public Inquiries

Inquiries from the public for information and assistance consume a large portion of staff time. These requests fall into the following categories:

- * prospecting and recreational gold panning
- * determination of land status, mining law and acquisition of mineral rights
- * acquiring properties and purchasing mineral commodities
- * researching mineralization and prior activity/history of mine sites
- * investment and mining technology advice
- * assistance with permitting and regulatory procedures

Talks Given

Copper and Gold Zonation Associated with Metallogenic Provinces in the Transition Zone and Basin and Range, Arizona State Conference of the Society for Mining, Metallurgy, and Exploration, by N.J. Niemuth

Functional Minerals, Minerals in Society Workshop for Teachers, Globe, Arizona, by K.A. Phillips and G. Miller

Functional Minerals, Minerals in Society Workshop for Teachers, Tempe, Arizona, by K.A. Phillips and G. Miller

Metal and Industrial Minerals Production in Arizona, Society for Mining, Metallurgy and Exploration, Maricopa Section, by H.M. Coggin, K.A. Phillips, and N.J. Niemuth

Arizona Mining, Apache Junction Prospectors, Apache Junction, Arizona, by H.M. Coggin

Arizona Mining, Bisbee Gem & Mineral Society, Bisbee, Arizona, by H.M. Coggin

Arizona Mining, Tucson Section, Arizona Institute of Mining Engineers, Tucson, Arizona, by H.M. Coggin

Gold Mining in Africa, Wickenburg Gem & Mineral Club, Wickenburg, Arizona, by H.M. Coggin

Gold Mining in Africa, Sun City Gem and Mineral Society, Sun City, Arizona, by H.M. Coggin

Gold Mining in Africa, Leaverites Gem & Mineral Club, at Museum, by H.M. Coggin

Gold Mining in Africa, Roadrunners Prospectors Club, at Museum, by H.M. Coggin

Mined Land Reclamation in Arizona, Joint Legislative Study Committee on Mined Land Reclamation, Phoenix, Arizona, by H.M. Coggin

Identifying Rocks and Minerals, Scottsdale Gem & Mineral Club, Scottsdale, Arizona, by H.M. Coggin

Sanchez Project Support, Arizona Department of Environmental Quality Sanchez Project hearing, Phoenix, Arizona, by H.M. Coggin

Gold Mining in Arizona, 2nd Annual Mineral Symposium, at Museum, by H.M. Coggin

Gold Mining in Arizona, Maricopa Gem and Mineral Society, at Museum, by H.M. Coggin

Mining in Arizona, People for the West, Camp Verde, Arizona, by H.M. Coggin

Minerals, In-Service Training for teachers, (three sessions) at Museum, by G. Miller, K.A. Phillips and staff

Arizona's Mining Industry, Sun City Rock Club, by N.J. Niemuth

Mining in the Greater Phoenix Area, Roadrunner Prospectors Association, by K.A. Phillips

Mining and Mineral Museum

The department operates the Arizona Mining and Mineral Museum as the official repository for the identification, cataloging and displaying of mineral specimens, ores, gemstones and lapidary materials. Museum visitation exceeded 34,000 in fiscal year 93/94. 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 directed at teachers, that in turn reaches thousands of Arizona school children. The museum also includes a gift shop that offers mineral specimens, mineral jewelry and publications related to mining and minerals. Revenues from this shop provide funding for the museum tour guides.

New Museum Displays

- * H.K. Porter circa 1900 steam locomotive was restored and installed on site as the first outdoor exhibit.
- * Security fence for outdoor exhibits was erected.
- * Car Made of Rocks - A 6-month loan demonstrating how minerals are used in the manufacturing of automobiles.

- * *Nature's Art - the Beauty of Arizona's Minerals*, photo panels of enlarged mineral photographs, have been mounted and hung in the main gallery.

Education

Through the museum's programs school teachers in Arizona are provided with text and materials to illustrate that rocks and minerals have functional uses essential to society and were necessary for the formation of civilization. This program will be greatly facilitated by the full time curator of education that was approved by the legislature for FY 1994/95. The new curator of education will continue to develop a minerals education program in cooperation with the Arizona Mining Association, the Museum Educators of Central Arizona (MECA), and the Department of Education.

Activities

- * Sponsored second annual Arizona Mineralogical Symposium
- * Hosted the Arizona Commission on the Arts annual legislative luncheon
- * Hosted the Arizona Community College Association legislative reception
- * Hosted the 3rd Annual Prospectors' Day
- * Participated in the Historic Preservation Month Architecture Tour of Buildings
- * Participated in Phoenix's Fabulous Fourth
- * Provided exhibits for the Tucson Gem and Mineral Show, Tucson
- * Provided exhibits for the Maricopa Lapidary Society Show
- * Provided exhibits for the Sun City Gem & Mineral Society
- * Provided exhibits for the Mineralogical Society of Arizona
- * Participated with programs and exhibits for the Maricopa County Fair
- * Provided displays for the Arizona State Fair
- * Prepared a display for Douglas Mansion State Park at Jerome
- * Exhibited at Phoenix Sky Harbor Airport
- * Provided an exhibit and week-long demonstration for the Bank One Plaza
- * Computerization of the Museum's catalogue of approximately 15,000 permanent items continues (in progress)
- * Sponsored "Mineral Trophy" at State Fair
- * Dedication of 1882 H.K. Porter Steam Locomotive
- * Participated in Jacob Walsh Day Celebration
- * Provided displays for the Sun City Mineral Museum

Programs

Nature's Art - The Beauty of Arizona Minerals, Phippen Museum of Western Art, by G. Miller

How We Use Minerals, Tour Directors' Convention Services Seminar, by G. Miller

Nature's Art - The Beauty of Arizona Minerals, Val Vista Rockhound Club, by G. Miller

Nature's Art - The Beauty of Arizona Minerals, Maricopa Lapidary Society, by G. Miller

Review of Museum, What We Do and Why, Arizona City Gem and Mineral Club, by G. Miller

Nature's Art - The Beauty of Arizona Minerals, Braggin Rock Club, Black Canyon City, Arizona, by G. Miller

Brick Sales - Our Outside Exhibit Program, Maricopa Lapidary Club, by G. Miller

Nature's Art - The Beauty of Arizona Minerals, Scottsdale Gem and Mineral Club, by G. Miller

Brick Sales, Our Outside Exhibit Program, Scottsdale Gem and Mineral Club, by G. Miller and staff

Brick Sales, Our Outside Exhibit Program, Arizona Prospectors' Club, by G. Miller and staff

Nature's Art - The Beauty of Arizona Minerals, Trailer Village Rock and Gem Club, by G. Miller

Identifying Minerals in a Classroom Setting, Arizona State University Ed. 401, by G. Miller (2 sessions)

Minerals in Unusual Places in Everyday Life, Apache Junction Rock and Gem Club, by G. Miller

Minerals in Arizona, Children's Program, Cholla Library, by G. Miller

Minerals in Arizona, WAIME's, Globe-Miami chapter, by G. Miller

Minerals and Their Uses, National Science Teachers Association - Arizona, California, Nevada, and Utah, by G. Miller and staff

Minerals in the Classroom Sitting, Minerals in Society Workshop, Tucson, by G. Miller

Minerals in the Classroom Sitting, Minerals in Society Workshop, Globe, by G. Miller

Real World Mathematical Models, Glendale Union High School, 6 sessions, by G. Miller and staff

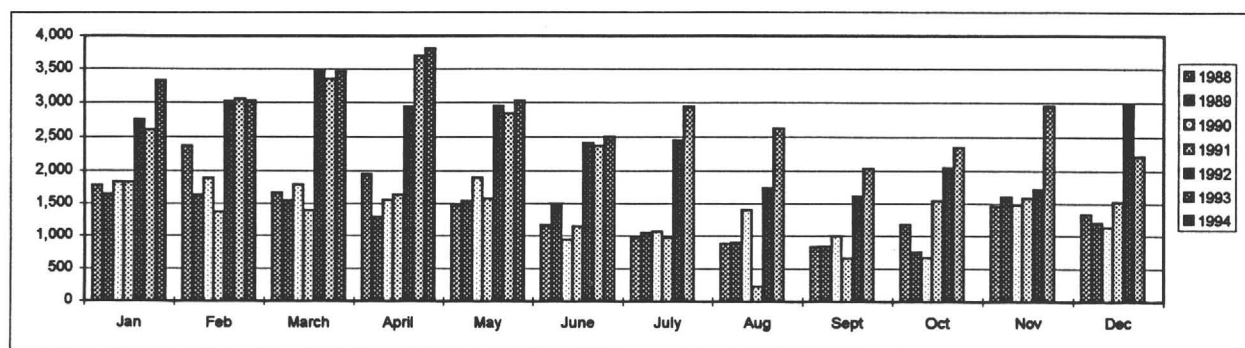
Mining in Bisbee, Bank One Show, Valley Bank Center, a collection of historic photographs, by H.M. Coggin

Traveling Exhibits

- * Phippen Museum of Western Art, Prescott
- * Mohave Middle School, Scottsdale
- * Robson Properties, Pebble Creek, with program
- * Mesquite Junior High School
- * Green Gables Neighborhood SPIN Project, with program

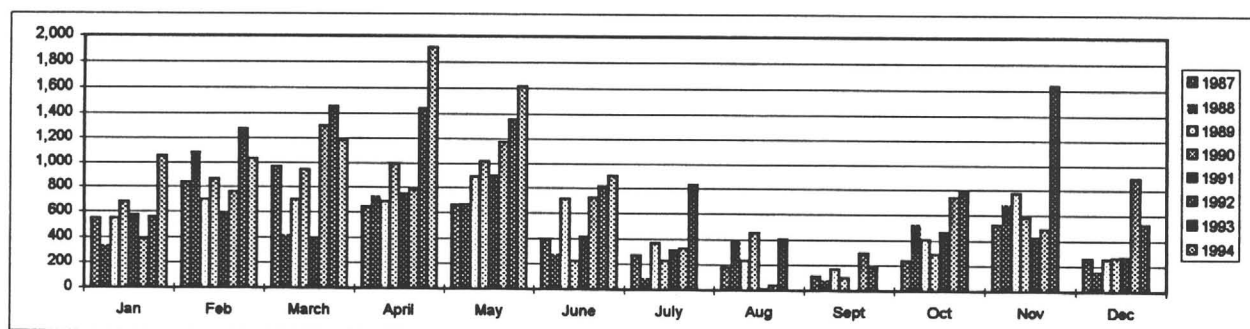
Museum Visitation 1988 - 1994

Year	1988	1989	1990	1991	1992	1993	1994	Total Visitation
Jan	1,779	1,653	1,834	1,829	2,745	2,603	3,322	15,765
Feb	2,365	1,634	1,891	1,382	3,020	3,055	3,028	16,375
March	1,669	1,556	1,792	1,400	3,475	3,353	3,458	16,703
April	1,948	1,297	1,561	1,635	2,942	3,700	3,810	16,893
May	1,481	1,545	1,894	1,583	2,946	2,844	3,030	15,323
June	1,177	1,508	947	1,158	2,408	2,373	2,504	12,075
July	980	1,051	1,066	976	2,445	2,941	--	9,459
Aug	885	910	1,412	228	1,747	2,626	--	7,808
Sept	835	848	998	666	1,620	2,031	--	6,998
Oct	1,188	760	675	1,552	2,048	2,339	--	8,562
Nov	1,469	1,611	1,481	1,587	1,725	2,947	--	10,820
Dec	1,338	1,218	1,144	1,531	2,991	2,220	--	10,442
Total	17,114	15,591	16,695	15,527	30,112	33,032	19,152	147,223



Student Visitation 1987 - 1994

Year	1987	1988	1989	1990	1991	1992	1993	1994	Total Students
Jan	548	333	550	679	578	386	561	1,056	4,691
Feb	838	1,086	698	864	585	761	1,275	1,034	7,141
March	969	422	698	941	399	1,303	1,455	1,180	7,367
April	650	730	689	996	751	786	1,439	1,912	7,953
May	665	676	887	1,018	901	1,173	1,357	1,613	8,290
June	399	276	713	228	424	724	815	902	4,481
July	273	92	370	233	314	329	834	--	2,445
Aug	180	385	239	457	9	43	407	--	1,720
Sept	115	84	170	105	0	299	196	--	969
Oct	240	526	410	291	470	741	794	--	3,472
Nov	526	682	776	587	431	495	1,636	--	5,133
Dec	263	158	256	268	270	893	528	--	2,636
TOTAL:	5,666	5,450	6,456	6,667	5,132	7,933	11,297	7,697	56,298



Moved to present location during August to September 1991. Opened for general visitation October 1, 1991.

PUBLICATIONS

Directories

D41 Arizona Mining Consultants, by N.J. Niemuth, 1993. A listing of registered consultants for the following mining related disciplines: assayers, geologists, geological engineers, geophysical engineers, metallurgical engineers and mining engineers. Approved U.S. Mineral Surveyors are also included. 21 p.

D42 Directory of Active Mines in Arizona - 1994, Lists company name, address, key personnel, mine name, type of operation, number of employees, and location. A separate listing of sand and gravel operations is provided. Includes 1:1,000,000 map showing the locations of the active mines and mine offices. 24 p.

Special Reports

SR19 From the Ground Up, by Gov. Jack Williams, 2nd ed. 1994. Colorful stories of Arizona's early mineral discoveries and the men who made them. Includes tales of the Vulture, United Verde, Harquahala, Bisbee and others. 36 p.

SR20 The Primary Copper Industry of Arizona, 1992, by N.J. Niemuth. Summarizes activity in Arizona's copper industry during 1992. Contains detailed statistics on the copper industry, including production by mine, and a reserve table providing grade and tonnage for over 67 deposits. 54 p.

County Mine Map Series

The County Mine Map series consists of sets of 20" x 24" maps showing the locations of mines, prospects, quarries, and processing mills and plants. They are plotted on Arizona Department of Transportation base maps (scale 1" = 2 miles) by the Department's Arizona Mineral Industry Location System (AzMILS) number. Each map set includes a geographically sorted mine index that lists AzMILS number, primary mine name, alternate names, a file reference, topographic quadrangle name, township, range, section, quarter section, and up to 7 commodities. Over

10,400 locations cover the entire series of 12 sets for Arizona's 15 counties.

The data in this series was initially compiled from a study done in cooperation with the U. S. Bureau of Mines. The data is computerized and updated on a continuous basis by the Department in a series of county databases known as AzMILS.

Number	County	Number of maps	Index pages	Mines
CM-1	Apache	18	8	353
CM-2	Cochise	9	21	698
CM-3	Coconino	28	14	594
CM-4	Gila	9	25	731
CM-5	Graham/Greenlee	12	21	516
CM-6	La Paz/Yuma	15	19	583
CM-7	Maricopa	11	27	915
CM-8	Mohave	20	43	1,411
CM-9	Navajo	17	6	232
CM-10	Pima/Santa Cruz	14	46	1,487
CM-11	Pinal	9	39	1,024
CM-12	Yavapai	12	60	1,948

Complete databases, bibliographies, and custom searches of the AzMILS database are available. The databases can be sorted on any field or combination of fields, including commodities. Bibliographies include reference information on individual mines.

Open-file Reports

OFR93-12 Economic Geology of the Sierra Estrella, Maricopa and Pinal Counties, Arizona, by E.B. Melchiorre, 1993. Includes site descriptions of metallic and nonmetallic resources. 29 p.

Circulars

C16 Arizona Rockhound Information, by D. Bain, revised, 1994. Includes information on mine tours, mineral collecting fee areas, gold panning, and a short bibliography.

C46 Assayers and Assay Offices in Arizona, by N.J. Niemuth, 1993. List of commercial assay laboratories in Arizona with registered assayers.

C48 County Agencies Concerned with Mining and Mineral Resources in Arizona, 1993. Includes a listing of all County Recorders' addresses.

C49 Federal Agencies Concerned with Mining and Mineral Resources in Arizona, 1993. Contains addresses of Bureau of Land Management, Forest Service offices, and other Federal agencies.

C50 State Agencies Concerned with Mining and Mineral Resources in Arizona, 1993. Contains names, addresses, and contacts at state agencies concerned with mines and mineral resources.

C51 Pertinent Data for New or Prospective Mining Operations in Arizona, by N.J. Niemuth, 1993. Briefly discusses permits and regulatory requirements of state, federal, and county agencies for mining operations.

C53 Earth Science Clubs - 1994, Includes rockhound, lapidary, and prospecting organizations.

C54 Arizona Gem Shows - 1994-95, Includes date, location, sponsoring group, contact person.

C55 Arizona Mining Update - 1994. A review of current mining activity in Arizona. Includes gold, copper, uranium, gemstone, industrial mineral, and coal activity.

C56 Annual Assessment Work Requirements Under Arizona Statute, 1994. An explanation of assessment work requirements by John C. Lacy. An example of a filled-out form and a blank form is included.

Arizona Mineral Resource (newsletter)

No. 3, December, 1993. Mining Law Changes

No. 4, March, 1994. Active Mines Directory Release

No. 5, June, 1994. Decomposed Granite Market

Outside Publications

The Mineral Industry of Arizona, 1992, U.S. Bureau of Mines, H.M. Coggin, co-author

Subsidence of the Tiger, the 1901 Mine Collapse at Mammoth, Casa Grande Valley Histories, Casa Grande Historical Society, 1994, by H.M. Coggin

Arizona Exploration Review, in *Mining Engineering*, May, 1994 by N. J. Niemuth

Roots of the Calumet and Arizona Mining Company, *Cochise Quarterly*, Spring, 1995, by H.M. Coggin

Mineral Resource

H. Mason Coggin, Director
Fall, 1993 Quarterly Report

Mining Law Changes Cost State Millions. The State of Arizona has lost over fifteen million dollars in economic benefits through the action of Congress. The first loss of \$9.5 million occurred when assessment work for the 95,000 mining claims was excused last September by recent changes in the mining law. The second loss was the outright payment to the BLM of six million dollars in claim "rentals" for the 30,000 claims remaining after the August 30, 1993 deadline.

The loss of over 60,000 mining claims in Arizona orphaned many properties that contained shafts, adits, prospect pits and other workings on the public domain. These abandoned claims no longer have a claim holder who may be held accountable for public liability, reclamation or environmental degradation. The liability has now passed to the state and federal government by default. There is no way to estimate the eventual cost of this acquired liability.

Confusion over interpretation and implementation of the changes has been great. The Department has fielded over 1,100 phone calls and visitors questions on the new rental fee requirements. To address some of the questions we produced a circular, *Annual Assessment Requirements Under Arizona Statute*. The Department gave a seminar on the subject to the State Association of County Recorders.

The anticipated "clean sheet" land status resulting from the loss of 60,000 claims simply did not happen. Many claim holders dropped all but one or two claims in a group which originally comprised a mineable block of claims. This resulted in a minor staking rush and a rash of new claim holders in some critical areas. The land status situation in some areas is now complicated by additional claim holders.

Mining Law Changes. At this writing it looks as if the 1872 mining law will be changed early next year. H.R. 322 the Mineral Exploration and Development Act has passed the House by an alarming majority while the Craig bill has cleared the Senate. A House Senate conference committee will be convened next year to iron out differences between the two versions.

H.R. 322 contains these articles that are particularly offensive to the mining industry.

- The system of patenting claims is abolished.
- A cumbersome new permitting process is established.
- An 8% royalty on gross value will be assessed.
- Stringent new reclamation requirements that may not be achievable are included.

These articles will impose significant new costs and regulatory burdens on the mining industry and will lead to significant job losses and a loss of revenue to the state and federal governments. The outlook is particularly gloomy for future mining on public lands. Mining interests are now looking for properties on private lands with proven reserves of minerals that can be leached, free milled or readily marketed. Most of the properties that meet this criteria have been acquired or have special problems that will keep them from being developed. Many mining companies have simply moved their exploration efforts out of the United States.

The antimining law propaganda has centered on the erroneous belief that under the law anyone can purchase valuable mineral land for a mere \$2.50 or \$5.00 an acre. Although that amount is a fee paid in one step of the patenting process it is in no way the total cost. Before land can be purchased under the mining law there are claim fees, application fees, surveying fees, title fees, and the cost of proving the deposit. The cost of proving the deposit runs from hundreds of dollars per acre to thousands. Most attempts to prove a deposit fail, but the exploration must be done anyway.

Library and Archives. The Department has recently gained the entire collection of mineral deposit information from the William C. Cruchfield Trust. This collection weighed 2800 pounds on the scale at the New Mexico state line. Department personnel are in the process of cataloging and identifying this extensive collection but this is going very slowly. Volunteers to catalog this collection will be needed. Priorities will be rearranged to accommodate this great resource collection as soon as possible.

Former Department Director Leroy Kissinger donated copies of all of his privately produced reports on mines and prospects in Arizona and a portion of his technical library to the Department. William Chenoweth donated maps and files on many Arizona mines. Additional individuals too numerous to list, including prospectors, claim owners, and potential developers and investors donated reports on their properties.

Donated information, reports, maps, and books make up a very important portion of the mining and mineral resource information obtained by the Department. We actively encourage the donation of retired professionals' files, reports, and libraries. Information donated is used by those seeking to develop new mines in Arizona. Unlike many libraries and historical societies, mining and mineral resource information donated to the Arizona Department of Mines and Mineral Resources is used proactively by the agency's staff and the public.

Reviews of 1,717 files on mines, prospects, and mineral deposits were made by property owners and potential developers of mines in search of new targets for development. The Department staff meets with these individuals and corporate representatives to discuss Arizona's potential and to encourage private investment in this potential. Files on copper occurrences were of most interest followed by those on gold.

The library and archives needs conservation and preservation. The library has never been cataloged completely and there are many duplicates that should be pulled from the shelves and stored. Cataloging will require at least one additional staff member for approximately 6 months. The wooden bookcases should be replaced with open steel shelving extending from the floor to the ceiling. The wooden book cases give off gasses that can decrepitate the publications. There are many acid paper articles on

file that should be copied onto non-acid paper, laminated or otherwise protected. Help in preservation may be available through the state archives and several historical preservation groups.

A. L. Flagg Photos A collection of an estimated 2,000 photo negatives were donated to the department by Ed Flagg through the Arizona Mineral and Mining Foundation shortly before his death last fall. The photographs were made by Arthur L. Flagg during his adult life. Subjects include mines in Arizona, Mexico, Colorado and Idaho, as well as family and culture during the period from about 1909 to the 1940's. Several groups have shown an interest in printing these photographs and publishing them. Included in this group are the Capitol Times and Arizona Highways. It is the intention of the department to get as much exposure as possible from these photographs.

GSPED (Governors Strategic Partnership for Economic Development) and NAFTA (North American Free Trade Agreement) The director was the guest of the Arizona Public Service Company and the Phelps Dodge Corporation at a Mineral Reunion between the Mining Cluster of GSPED and their counterparts in Guymas, Sonora Mexico on November 16. Mexico offers many advantages for mineral producers in Arizona. The port of Guymas, an undeveloped resource, is connected to Arizona by rail and a modern four lane highway from Tucson. This may give Arizona an edge on exports that it does not now have through ports in California.

An opportunity is available to mine minerals in Arizona and send them to Mexico for additional processing to add value before exporting to Asia and Europe. An example of this type of product is gem stone production. Arizona leads the nation in this commodity. Development of this market will require some promotional work that could be done through the Department. A spirit of friendship and cooperation has been established between the Department and its counterpart in Sonora. It is the intention of the director to maintain this relationship through networking with his newly found connections in Sonora and Sinaloa.

Some products, such as graphite, are not found in Arizona but are found in Mexico. This source of new materials may potentially support development of mineral deposits and new uses of minerals in Arizona.

BADCT (Best Available Demonstrated Control Technology) The director is participating in a committee to rewrite the BADCT requirements for the Aquifer Protection Permits required by the Arizona Department of Environmental Quality. It is the BADCT interpretation that is currently delaying many Arizona mining operations and threatens to bring a halt to many others. Currently they are allowing the operators to design BADCT to suit specific site conditions. This has resulted in a disagreement between operators and the DEQ.

Minerals Marketing. Consumers of industrial minerals in electrical power plant air and water quality control were visited and interviewed. The need for a new source of limestone for the planned flue gas desulfurization facility at Salt River Project's Navajo Generating Station spurred a small "gold rush" for limestone deposits in the northern part of the state. Users of industrial minerals in paper processing and water treatment were also visited and interviewed.

The Department continues to receive inquiries for sources of industrial minerals for many applications. In particular we have received requests for information on zeolites for odor control, stone for decorative and landscape uses, pumice for garment finishing, and garnet for abrasives.

Arizona Mined Land Reclamation Bill.

Miners on private lands in Arizona will be burdened with yet another permitting requirement according to legislation proposed by Arizona Mining Association's lobbyist James Bush. This bill calls for mine operators to submit reclamation plans to an as yet unnamed agency for approval according to guidelines that have not yet been written. This bill is considered necessary to avoid expected federal legislation that could include the phrase, "Those states not having a mined land reclamation program will comply with the following ..." It is expected that the rules and regulations from this federal mandate will be directed toward coal mining. There is a concern that they will not be applicable to hard rock mining.

The proposed regulation will only involve current mines on private property. The bill is somewhat self funding by requiring a payment of \$1.00 per acre on mined lands. The amount of reclamation required by the bill is not clearly mandated by the legislation. It doubtful that this bill will be presented or passed without many changes.

Arizona Number One Mining State. On a more positive note, Arizona continues to rank as the nation's leading metal mining state. Despite heavy winter rains that hampered production at most of the major copper mines and low copper prices, Arizona continues to produce about 70 percent of the country's copper. In 1992 Arizona produced \$3,429,938,000 worth of minerals, including 213,995 ounces of gold and 1,271,220 tons of copper. Expansion projects are ongoing at several of Arizona's mines. Proposed new mines are continuing the slow permitting process. Arizona's rank as a top mining state is expected to continue for the foreseeable future.

PUBLICATIONS

OFR93-12 *Economic Geology of the Sierra Estrella, Maricopa and Pinal Counties, Arizona*, E.B. Melchiorre, 1993, 29 p. \$2.50

D41 *Arizona Mining Consultants*, N.J. Niemuth, 1993, 23 p. \$2.00

C47 *Annual Assessment Work Requirements Under Arizona Statue*, J.C. Lacy, 1993 3 p. \$.25

C48 *County Agencies Concerned with Mining and Mineral Resources in Arizona*, 1993, 4 p. \$.25

C49 *Federal Agencies Concerned with Mining and Mineral Resources in Arizona*, 1993, 5 p. \$.25

C50 *State Agencies Concerned with Mining and Mineral Resources in Arizona*, 1993, 5 p. \$.25

C51 *Pertinent Data for New or Prospective Mining Operations*, 1993, 5 p. \$.25

SR19 *From the Ground Up*, by former Governor Jack Williams, has been revised and is ready for publication. The funds for this publication have been provided by Phelps Dodge Corporation, 37 p. \$3.50

If ordering by mail, please add \$1.50 for postage, except for circulars (C).

MUSEUM AND EDUCATION

Visitation Statistics. Almost 13,000 visitors came through the Museum from July through November. This included over 4,000 students. Totals from 1993 are expected to exceed 32,000 students. Several special exhibits and events contributed to these statistics.

Museum News. The restoration of the H. K. Porter Baby Gauge Locomotive was completed, the locomotive delivered and installed. A dedication for the locomotive was held on September 15, 1993. Approximately 100 people attended the dedication, presided over by Leroy Kissinger who returned from retirement for the event. Governor Rose Mofford, Representative Polly Rosenbaum and Edna Vinck were among those who spoke and lightly roasted Mr. Kissinger.

Advertising efforts donated to the museum by Nancy Turney, NTV Productions, Inc., Las Vegas, Nevada, resulted in an excellent public service announcement on the museum that was televised on Dimension Cable during the summer and early fall.

A collection of large, colored photographs of some of the museum minerals has been donated for display. These photographs have been hung in the museum where they add color and appeal. Some of the photographs depict mining's past and present.

The masonry-wrought iron fence to contain the outside exhibits, including the locomotive and headframe, has been designed and is now out for bid. It is slated for completion by the end of February. A temporary construction fence has been rented until the new one is completed.

The sale of the Commemorative Bricks and other donations has raised \$7,600 for the development of outside exhibits.

The Museum contributed to the Fabulous Fourth celebration over the Fourth of July and provided drinks and seating for dignitaries.

An exhibit of minerals, along with a collection of photographs on Bisbee, Arizona, were displayed for one week at Bank One. A display was also made for the Sun City Museum. Two cases of minerals and mining artifacts are currently being exhibited at Sky Harbor International Airport.

The Mineral and Mining Museum Foundation held a sale of their surplus minerals in October, raising nearly \$3,700 for the Museum.

One additional full time staff position has been requested for the position of Curator of Education for the museum. This person will preform a great number of duties including setting up educational programs and press releases. The request for this position was included in the 1994-95 budget proposal.



Arizona Department of Mines and Mineral Resources
1502 West Washington
Phoenix, Arizona 85007

Mineral Resource

MINING

Active Mines Directory Released

Arizona is the Nation's leading producer of non-fuel minerals. The Directory of Active Mines in Arizona - 1994, released by the Department in February, reflects the strength and diversity of the Arizona mining industry. Fifty-six companies, operating 105 mines are listed in this year's directory. Eighty-seven sand and gravel operations are also included. The value of minerals produced in Arizona for 1993 was in excess of \$3.1 billion. The mining industry directly employs over 16,000 people in Arizona.

As it has since 1910, Arizona leads the Nation in copper production, contributing over 2.3 billion pounds of copper, or 65 per cent of the U.S. total. Arizona is first or among the leading states in the production of molybdenum, gold, silver, rhenium, and gemstones.

Industrial minerals mined in the State last year include salt, cinders, stone, silica flux, hydrofrac sand, tile and brick clay, bentonite, sand and gravel, pumice, zeolites, perlite, gypsum, pyrite, micaceous hematite, and calcium carbonate.

The directory lists company name, corporate address and key personnel, mine, mill, or smelter location, and a description of the operation.

Metal mines, non-metal mines (excluding sand and gravel), smelters, and company offices or plants are plotted on a 1:1,000,000 scale map that accompanies the publication. The directory is available from the Department office in Phoenix, 1502 West Washington, Phoenix, Arizona 85007 for \$4.00. If mailed the directory is \$5.50.

Richard Oldham Named to Board

Governor Fife Symington has appointed Richard Oldham to the Board of Governors of the Department. The appointment began February 1, 1994 and continues until January 31, 1999.

MINERAL PRODUCTION IN ARIZONA - 1992

COMMODITY	QUANTITY	VALUE
Clay(tons)	112,808	\$463,000
Copper (tons)	1,271,220	2,731,152,000
Gemstones		5,416,000
Gold (tr. ounces)	213,995	73,818,000
Sand & gravel (tons)	33,842,000	123,517,000
Silver (tr. ounces)	5,304,865	20,873,000
Stone-crushed (tons)	5,500,000	26,300,000
Pigments (tons)	85	62,000
Coal (tons)	12,500,000	275,000,000
Other*		184,337,000
TOTAL		\$3,440,938,000

Non-fuel figures from U.S. Bureau of Mines.
* Cement, clays (bentonite), gypsum, lime, molybdenum, perlite, pumice, pyrites, salt, sand & gravel (industrial), dimension stone, lead, tin.

Oldham is an Arizona native. He was born in Flagstaff, but was raised in Quartzsite where his family ran a bee business. After high school in Parker and Salome, Oldham attended the University of Arizona, majoring in Agricultural Engineering.

After Oldham moved back to Quartzsite, he built the Desert Gardens Mobil Home and R.V. Park and the Desert Gardens Mobil Home and R.V. Sales. Through the efforts of Oldham and others, Quartzsite became incorporated in 1988 and he became the town's first mayor. Oldham also serves on the Arizona Historical Society Board and the Arizona Employment and Training Council. On his appointment to the Board Oldham says, "I will enjoy carrying on the legacy of my father and grandfather in promoting mining in Arizona."

Sanchez Project Obtains Permit!

AZCO Mining Inc. is scheduled to receive its final public hearing for an Aquifer Protection Permit for its Sanchez copper mine and leach project April 20 at 7:00 pm at the Safford library. Obtaining this permit has required nearly two years of effort. It appears that public input was one of the keys to ending the delays by the Arizona Department of Environmental Quality (ADEQ). Although the Environmental Impact Statement has been approved for the project an air quality permit must still be received from ADEQ before construction can begin.

When in production the Sanchez mine will produce 12 million tons of copper ore annually while providing over two hundred high-paying jobs. AZCO plans to develop an open pit mine/heap leach operation that will reduce costs by using conveyors to transport oxide copper ore to the heap leach pads. The pads will be built on a 300-foot-thick lacustrine clay formation. The pad will consist of a 6-inch clay layer overlain by a 40-mil liner and 12-inch crushed filter cushion. Leach liquors will be ponded and pumped through a solvent extraction electrowinning plant to produce marketable cathode copper.

Industrial Minerals for Navajo County

Chief Engineer, Ken Phillips and Director, H. Mason Coggin met with representatives from Navajo County, regarding the potential for using several Arizona industrial materials to manufacture building materials. The process would use gypsum, diatomaceous earth, Portland cement, and industrial waste from processing recycled paper. Sources and availability were the main topics of discussion. The Department continues to assist in the development of this project.

Gold Panning Permits

The Bradshaw Ranger District, Prescott National Forest, is requesting recreational gold panners and sluicers to obtain permits. The permits are free and can be obtained from the district office at 2230 E. Highway 69, Prescott, Arizona 86301, or by mail. Doug Vandergon of the Bradshaw District office says the permits are one way to help the rangers deal with the huge volume of recreational gold panners and to distribute information on responsible prospecting. The permits allow the use of a pan, sluice, rockerbox, metal detector, and a pick and shovel. Dredging is not covered by the permit. A plan of

Edna Vinck Retires from Board

Edna Vinck, a member of the Department's Board of Governors for over 13 years, has retired. Vinck, a 50-year resident of Globe, has served on the Board in all capacities, including a term as Chairman in 1984 and Vice-Chairman from 1987 to 1992. Vinck was instrumental in getting the Department moved from the old Mineral Building on the State Fairgrounds to the Polly Rosenbaum Building. She unselfishly gave of her time and energy. Whenever the Department was in need, she was there. All of us, the Board and the staff of the Department, wish to thank her and to let her know she will be missed.

operation and a small bond are required for operation of a dredge. Panners are asked to confine their activity to below the high-water mark within the stream channel. For more information contact the district office at 602-445-7253.

Department Continues to Perform Valuable Function in Arizona

When Magma Copper opened the newest major copper mine in Arizona, the San Manuel open pit in 1976, the Department had 13 full time employees, a Tucson field office and sufficient travel budget to conduct field work and contact mine owners. Since then, coping with several austerity programs, the Department's Tucson office has been closed, the travel budget severely curtailed and full time employees cut to 7.

The prime legislated directive of the Department is to promote the development of the mineral resources of the state of Arizona. To accomplish this the agency maintains a reference library and a mineral property database and gathers the technical information needed to mine and process the State's mineral resources. Additionally, we publish information on Arizona's mines and mineral resources and conduct public meetings and seminars to assist and encourage development of the State's mineral resources. The enabling legislation also prescribes a mineral museum as a repository of the state's minerals for study and identification.

By legislative decree the Department is obligated to monitor mining activities and provide evaluation of mineral development within the state.

The Department actively represents the extractive industries and acts on their behalf in dealing with regulatory agencies. The Department has developed a proactive approach of providing input representing the mining industries' needs to the regulatory process of other governmental agencies. We welcome input to help direct our efforts. Promulgation of reasonable regulations is necessary to preserve a healthy industry and a healthy environment. Without mined products, society as we know it could not exist.

Gold Mining In West Africa

A slide presentation on alluvial placer gold exploration and mining operations in the west African nations of Guinea, Ghana and Sierra Leone has been shown recently to prospecting groups throughout out the valley and Wick-enburg. The program reviews exploration efforts during the period 1987 to 1992 in which our new director H.

Mason Coggin was involved. It reveals many of the problems encountered exploring and mining in Africa and other foreign countries.

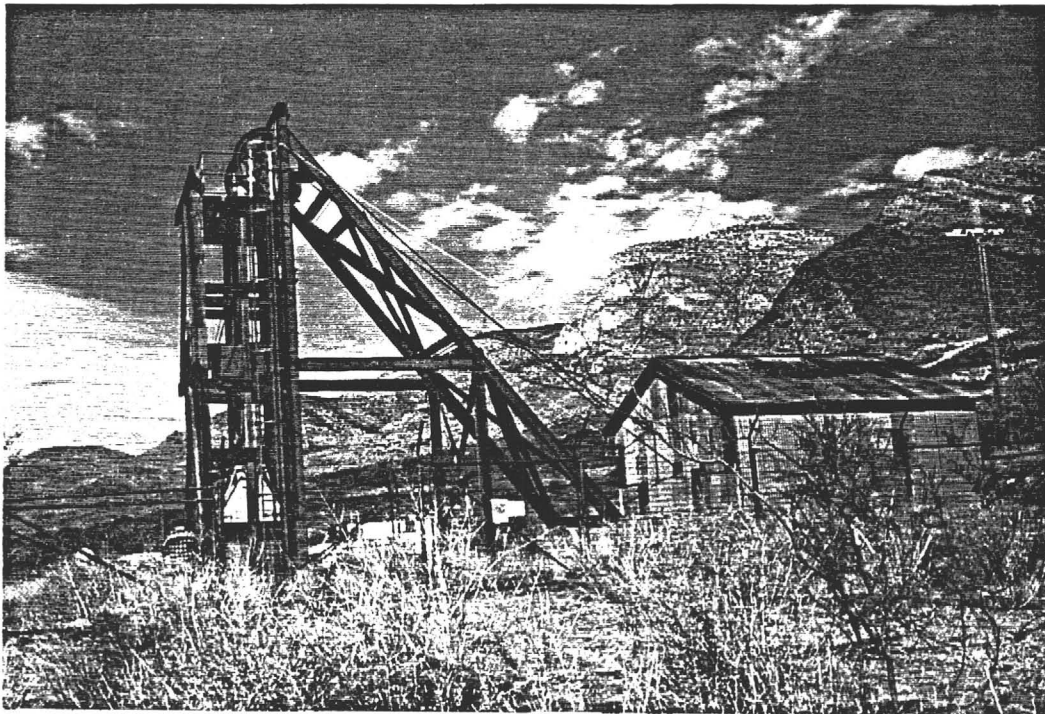
LEGAL IMPACT

Arizona Mine Land Reclamation

Two bills concerning mine reclamation have been introduced by the Arizona legislature this spring. Bill SB 1153 is being sponsored by the mining industry and HB 2490 is supported by the environmental coalition. Arizona is the only state without local statutes specifying reclamation of mining lands. Your input is requested. To obtain copies of the bills call the Arizona Legislature Billroom at 542-4379.

Federal Mining Law

The American Mining Congress reports 42 U.S. Senators have signed a letter to the Chairman of the Senate Energy and Natural Resources Committee asking



The Boras headframe, a gift from the Phelps Dodge Corporation, will be dismantled to allow shipment from Bisbee to Phoenix. APS is generously providing transportation to the museum. It will be reerected west of the Museum along with the hoist and hoist house. The cages, turn sheets, and the controls will also be salvaged and moved to the museum.

the following issues be resolved in drafting legislation that revises the 1872 Mining Law:

1. Reform that amends existing law without unduly interrupting the existing body of judicial, administrative and regulatory precedents.
2. Corrections to patenting without jeopardizing the tenure establishment required for the financial commitments necessary to develop a claim.
3. A fair royalty that will encourage development, recognize the risks of exploration, and accommodate the cyclical nature of commodity economics.
4. Regulations that preserve valid existing rights and provide for a smooth transition.
5. Consideration for all miners including individuals and small operators.
6. Achievable permitting procedures with clearly defined criteria allowing a fast track permitting process.
7. Provisions that are specific to mining type and the many types of mining and mineral deposits.

Steamboats Impact State Aggregate Industry

The Arizona Navigable Streambed Adjudication Committee continued its appraisal of Arizona's navigable streambeds. Property that is determined to have been navigable at the time of Statehood in 1912 will revert to the State of Arizona automatically, without due process or condemnation proceedings. Thus, in addition to the burden of a complex permitting process, aggregate producers may have to lease or buy back their property from the state.

Army Corps of Engineers 404 Permits

A new report on wetlands permitting by the law firm of Beveridge and Diamond P.C. reveals the problems of getting a permit under the "404 permit" requirements.

Representative James Hayes (D-LA) has introduced legislation that would put a limit on the amount of time that the COE would have to act on a permit. This bill has gained the support of the American Mining Congress.

Clean Water and Endangered Species Acts

Representative Bill Tauzin (D-LA) has introduced H.R. 3875 which would define the basic rights of property owners with respect to environmental actions under two other acts; Clean Water and Endangered Species. If this bill passes, it will require notice and written consent

for entry onto private property by government officials and will allow the property owner to review and challenge the information gained from access and compensation for taking of the private property.

Arizona Department of Environmental Quality (ADEQ) BADCT

Final drafts of the proposed revisions to ADEQ's BADCT (Best Available Demonstrated Control Technology) are being studied and will be sent to the review committee for final disposition. Mason Coggin has been involved in the revision procedure and has worked hard to streamline the APP (Aquifer Protection Permit) process.

Mine Permitting Problems

Mining companies that are starting new projects in Mexico, South America, Africa, and even Eastern Europe are claiming that the environmental requirements in those areas are not any easier to meet than those in the U.S. The major difference is that the agencies in these countries have the authority to negotiate directly with the company to reach a favorable level of mitigation, usually within 30 days. Both sides know, from the beginning, what will be required and how it should be presented. Once agreement is reached the permit is signed and the program moves forward. Most of the permitting requirements in the U.S. require years or even decades and there is no assurance that any program will be acceptable.

MUSEUM NOTES

Pippen Art Museum Features Mining

An open house was held in January at the Pippen Art Museum in Prescott. The event featured a special exhibit, on display through March 15, of art, sculptures, and photographs of mining in Arizona. Approximately 250 people enjoyed the talents of artists and sculptures including George Ann Tognoni, Frank Pippen, and others. The Arizona Mining and Mineral Museum contributed 9 enlarged, framed photographs along with several mineral specimens.



PHOTO ARCHIVE. Additions are being solicited for the Department's collection of Arizona mining photographs. Volunteers to sort, catalog, and store the voluminous collection would also be welcome. The above photograph shows miners at the Silver King Mine, Pinal County, circa 1900.

Martin Koning Collection

The museum is interested in arranging for the acquisition and preservation of selected materials from the Martin Koning collection of Arizona gemstones. We believe the acquisition will preserve his unique lapidary art and showcase gem minerals from exhausted Arizona locations.

Fence for Outdoor Exhibit

Through gifts to the museum and funds provided by the State of Arizona, the Department was able to fully fund a fence around the outdoor exhibits area. The fence will be wrought iron with masonry pillars and will have three gates to facilitate access for the handicapped and for equipment. Bids were accepted and the fence should be erected soon.

Museum Visitation

Museum visitation for calendar year 1993 totaled 33,032 compared to 30,112 for calendar year 1992. The

number of students visiting rose from 7,933 in 1992 to 11,297 in 1993. These numbers show a considerable increase since the museum moved to the new building. Excluding visitors during the State Fair, the museum has had a growth rate in visitation exceeding 10% per year since 1988 and the number of students visiting the museum has doubled. Total cash contributions to the Department since moving into the new building have been \$93,000 dollars. An additional \$70,227 dollars are needed to complete the outdoor exhibit program scheduled for calendar year 1994. A fund-raising campaign is now underway to achieve that goal.

Mineral Car

The "car made of minerals" exhibit has returned to the museum after being displayed at the Tucson Gem and Mineral Show.

The exhibit shows the use and necessity of minerals in the manufacture of a modern automobile. It features a full-size Chevrolet Lumina Minivan with cut outs to show

the mineral resources used in its manufacture. Samples of ore minerals and refined products also are included.

The car was originally scheduled for display in the museum for November 1993 through January 1994. We have been allowed to keep the car for an additional six months. The necessary funds to keep the exhibit were donated by Glenn Miller, Curator, Ann Turney, Administrative Assistant and Douglas Duffy, Tour Guide and lapidary shop supervisor. We are very grateful for their donations.

The car was transported to and displayed at the Maricopa County Fair from March 17 through March 27. Several staff members volunteered to serve as hosts at the exhibit during the County Fair.

Volunteers

Over 16,500 hours of volunteer time have been logged at the Department since moving to the new building. Calculated at \$10.00 per hour, this donated time is valued at over \$165,000.

Ray Kopman, one of the many Museum volunteers, has produced some interesting and attractive jewelry from chunks of recycled ghost town pottery. Some of Kopman's art has been donated to the museum store and is for sale.

Department Hosts Legislature

Several groups have used our new building for meetings and receptions attended by members of the Arizona legislature. Groups as diverse as the Arizona Arts Council and the Community College Association have arranged catered events, with attendance ranging from a few dozen to over two hundred. These groups have all responded well to meeting in the museum and are pleased with the ambiance provided by the displays. The Department hopes this exposure reminds the legislature of our role and the need to complete the renovation of the building.

PUBLICATIONS

OFR93-12 *Economic Geology of the Sierra Estrella, Maricopa and Pinal Counties, Arizona*, E.B. Melchiorre, 1993, 29 p. \$2.50

D41 *Arizona Mining Consultants*, N.J. Niemuth, 1993, 23 p. \$4.00

C47 *Annual Assessment Work Requirements Under Arizona Statue*, J.C. Lacy, 1993 3 p. 25 cents

D42 *Directory of Active Mines in Arizona - 1994*. 25 p. \$4.00

C51 *Pertinent Data for New or Prospective Mining Operations*, 1993, 5 p. 25 cents

SR19 *From the Ground Up*, by Jack Williams, 36 p. \$3.50

If ordering by mail, please add \$1.50 for postage.

Mineral Photographs

Through the Arizona Mineral and Mining Museum Foundation, Robert Jones is arranging for the Department to gain access to a collection of about 300 three by five inch color transparencies of minerals photographed by Jeffrey J. Kurtzman. Photographs from the collection have been published in *Arizona Highways* and *The Mineralogical Record*. The Department is considering publishing the photographs.

FROM THE GROUND UP

by Governor Jack Williams

From the Ground Up

Stories of Arizona's
Mines and Early
Mineral
Discoveries



By
GOVERNOR
JACK WILLIAMS



"The Apaches had struck during the night and made off with the best horses in the entire ranching area around Silver City, New Mexico. Led by Captain Chase of the United States Army, a band of cavalymen took off in hot pursuit."

So begins the story of the discovery of the Morenci Mine, one of many colorful early Arizona mining camp tales presented in this book written by former Arizona Governor Jack Williams and originally published by Phelps Dodge. Included are tales of the Vulture Mine, Bisbee, the Harquahala, Crown King and many others.

The Department has updated the stories and, with a donation from Phelps Dodge, has reprinted the 37-page book. Copies are available from the Department for \$3.50 or by mail (order form below) for \$5.00.

ORDER FORM: From the Ground Up

Please enclose \$5.00 total (\$3.50, plus \$1.50 postage and handling) and mail to :
Department of Mines & Mineral Resources, 1502 W. Washington, Phoenix, AZ 85007

Name _____

Address _____

City _____ State _____ Zip _____

Please allow 2 weeks for delivery.

ADMMR BOARD OF GOVERNORS

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Joe MacIntosh - Tour guide

Ann Baker - Tour Guide

Doug Duffy - Tour Guide



Arizona Department of Mines & Mineral Resources
1502 West Washington
Phoenix, Arizona 85007

Mineral Resource

MINING

INTERNATIONAL PLATINUM CORP.

One of the principle duties of the Department, mandated by State statute, is to investigate mining properties in Arizona. In keeping with that directive, on March 28, 1994 V.L.R. (Lee) Furlong, President of International Platinum Corporation, and three associates were invited to the Department to meet with Nyal Niemuth, Diane Bain, and Director, Mason Coggin. They provided the Department with information on their activities at the BRX claims in La Paz County. The company, International Platinum Corp., has had heavy trading on the Toronto Stock Exchange. The Exchange, and other interested parties, have grown uneasy about the validity of the press releases made by the company and asked the Department to investigate.

Lee Furlong explained the company has a widespread anomaly that has extremely high values of gold, platinum, silver, copper and other metals. The gold and other precious metals are encapsulated thus rendering them immune to standard fire assay methods. The assayers they use, however, reveal high values. They explained the metals are contained in what appears to be alluvium, (unconsolidated dirt), but is actually a more unusual, and as yet undetermined, geologic phenomena. They claim this material contains grains of petzite (a gold telluride), free gold, chalcopryrite, platinum group metals, plus many others. Furlong did not bring samples of the material, but said the grain size is so small that the precious metals cannot be seen anyway.

The Department was invited to visit and sample the claims. On March 3 Nyal Niemuth examined the property and collected samples. They were delivered to Arizona-registered assayer James Roy

Weatherby. Analysis by the fire assay method of the five samples did not find gold or any evidence of the platinum group metals.

Of the assay results Coggin says, "One area of agreement between the Department and International Platinum is that precious metals cannot be found in their samples by standard fire assay; we differ on why this is so." A report of the property is available.

DECOMPOSED GRANITE MARKETS

The Department receives numerous requests for deposits of decomposed granite in Pima County indicating the existence of an unmet demand. As no inventory of potential deposits exists, we provide an exploration concept for those interested in prospecting for a suitable deposit.

Landscape rock can be described as any crushed, broken, or quarried blocks of rock and natural boulders used outdoors for ground cover and decorative purposes. Crystalline rock that has weathered to produce a "decomposed granite" is also included.

The major markets for crushed and decomposed granite produced in Arizona are the urban and suburban



On May 7 the Arizona Historical Foundation named Mason Coggin co-reipient of the Best Paper on Arizona History Award for his "Roots of the Calumet and Arizona, Bisbee." The above photograph shows miners in a cave in a Bisbee underground mine, circa 1917. Photo by Ida Mae Coggin.

areas of Tucson, Phoenix, and Las Vegas. Material for the Tucson market is currently produced at San Manuel; that for Phoenix is produced from outcrops and pediments surrounding the Salt River Valley; and that for Las Vegas from the Mineral Park area of Mohave County.

Landscape rock and decomposed granite are grouped with other forms of crushed and broken stone production by the U.S. Bureau of Mines. Thus, tonnage, total value, and typical unit value published includes material ranging from construction fill and levee rip-rap through landscape materials to finely ground filler-extender minerals. Data for 1989 shows 6.65 short tons produced in Arizona, valued at \$28.55 million (\$5.55/ton average).

Market factors include distance to market (transportation is usually the larger portion of delivered cost), color, and particle size. Available particle sizes often include $-.5" + .25"$, $-.25" + .125"$, and $-.375"$ (when excessive fines are not a factor). Colors include white, gray, tan, gold, red, and brown. Shades in the red-pink range are the most popular. Additional colors, especially shades of greens and blues, are considered special and usually command high prices.

COPPER REPORT

Special Report 20, *The Primary Copper Industry in Arizona in 1992*, by Nyal J. Niemuth, is now available. The report details concentrate and leach production, by-products, stripping ratios, ore grades, mill recoveries, reserves, employment and wages, and other statistics pertaining to Arizona's copper industry. National and world statistics are also included. A brief review of each Arizona producer's facilities and activities, including acquisitions and expansion, are covered.

The 6 operating companies in 1992 operated 18 mines that include 12 open pit properties, 3 underground mines, 5 leach only properties, and 3 smelters. Together they produced 2.53 billion pounds of copper. This represented about 65.4 percent of the primary copper production in the United States. Of this amount, 775 million pounds or 30.5 percent was produced by leaching oxide ores and low-grade dumps and 98 percent of the leached copper was extracted by solvent extraction-electrowinning (SX-EW). Nearly 300 million tons of ore with a weighted average grade of 0.53 percent copper was mined. The open pit operations maintained an average stripping ratio-waste to ore of 1:26:1.

PUBLICATIONS

OFR93-12 *Economic Geology of the Sierra Estrella, Maricopa and Pinal Counties, Arizona*, E.B. Melchiorre, 1993, 29 p. \$2.50
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D42 *Directory of Active Mines in Arizona - 1994*, 25 p. \$4.00
SR19 *From the Ground Up*, by Jack Williams, 36 p. \$3.50
SR20 *The Primary Copper Industry in Arizona in 1992*, by N.J. Niemuth, 56 p. \$8.00
C51 *Pertinent Data for New or Prospective Mining Operations*, 1993, 5 p. 25 cents

If ordering by mail, please add \$1.50 postage.

In addition to the copper, over 30 million pounds of molybdenum was produced as a co-product or by-product and over 5 million troy ounces of silver and 60 thousand troy ounces of gold were produced as by-products.

Special Report 20 is available at the Department for \$8.00 or may be ordered by mail for \$10.00

ARIZONA MINE EMERGENCY ASSOCIATION FORMED

The Department Director, H. Mason Coggin, has been appointed to the board of directors of the Arizona Mine Emergency Association. This organization was formed in a response to a decree by the U.S. Mines Safety and Health Administration. Under the provision of this decree all underground mines are required to have a mine rescue team and a back-up team on-site while the mine is working. The only exception is for small and remote operations which must have a back-up rescue team within a two-hour response time of the property. The Mine Emergency Association was formed to provide this mine rescue support for underground miners in Arizona who join the organization.

MUSEUM NOTES

MINERALS COURSE FOR ARIZONA TEACHERS

Curator, Glenn Miller and Chief Engineer, Ken A. Phillips are participating in a summer course for school teachers. The course, *Minerals in Society*, is a multidisciplinary study of Arizona's geology, mining, and mineral use and is sponsored by the Arizona Mining Association. It is being presented in cooperation with Arizona State University College of Education, the University of Arizona College of Engineering & Mines and College of Education, and Northern Arizona University Center for Excellence in Education and Continuing Education.

Ken Phillips is providing an introduction to mineral usage in daily life through a slide and lecture presentation entitled *Uncommon, Common Minerals in Uncommon, Common Places*. Glen Miller's contribution, *Mineral Identification in a Classroom Setting*, is a hands-on program designed to give teachers a basic background in mineral identification. Heft, color, relative hardness, and appearance are covered.



Richard Flagg visited the Museum in April. Flagg is the son of Arthur L. Flagg, former curator of the Museum and founder of the Arizona Mining and Mineral Foundation Collection that is housed in the Museum. A taped interview with Richard Flagg was done for the Museum's oral history collection.

Photo by Genie Howell

Dear mining and Mineral museum,
I liked
when we watched
the film strip. Because
I never knew that
people were called
horma dogs if they
hunted rocks. sincerely
Relsk.

The week long courses are being held in Tucson, Globe, Tempe, Prescott, and Morenci. The free course is sponsored by the Mining Association and its 4 member companies, ASARCO Incorporated, Cyprus Climax Metals Comapny, Magma Copper Company, and Phelps Dodge Corporation.

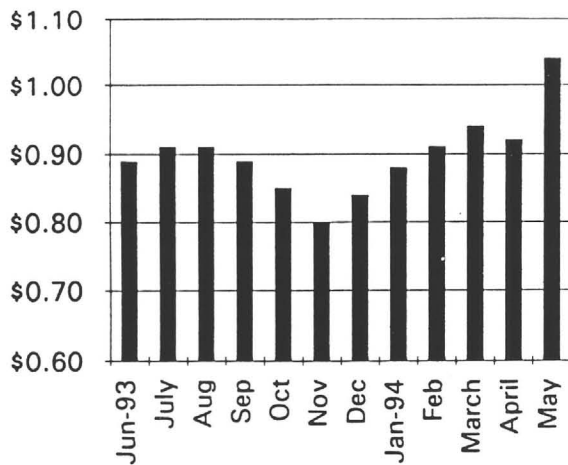
MUSEUM GETTING BRIGHTER

Improved lighting of specimens and displays, an urgent need since the Museum opened in its new quarters, is becoming a reality with the help of donated funds.

Quartz halogen lamps, producing a brighter, whiter light, with the added bonus of lower energy consumption for the same intensity as standard incandescent lamps, have been purchased for the existing general and spot lighting fixtures. It is hoped that once the initial lamp replacements have been completed the Department of Administration will replace the new lamps with the same type bulbs. The quartz halogen lamps are more costly to purchase but will save \$3,110 per year in electricity over the additional cost of the bulbs.

Ken Phillips, our Chief Engineer, experienced in electrical engineering and theatrical lighting and effects, has been working with Glenn Miller on the project for many months. Come in and see the difference!

Monthly Copper Prices, \$/lb.



A six-month strengthening of copper prices is reflected in the price of U.S. producer cathode copper.

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