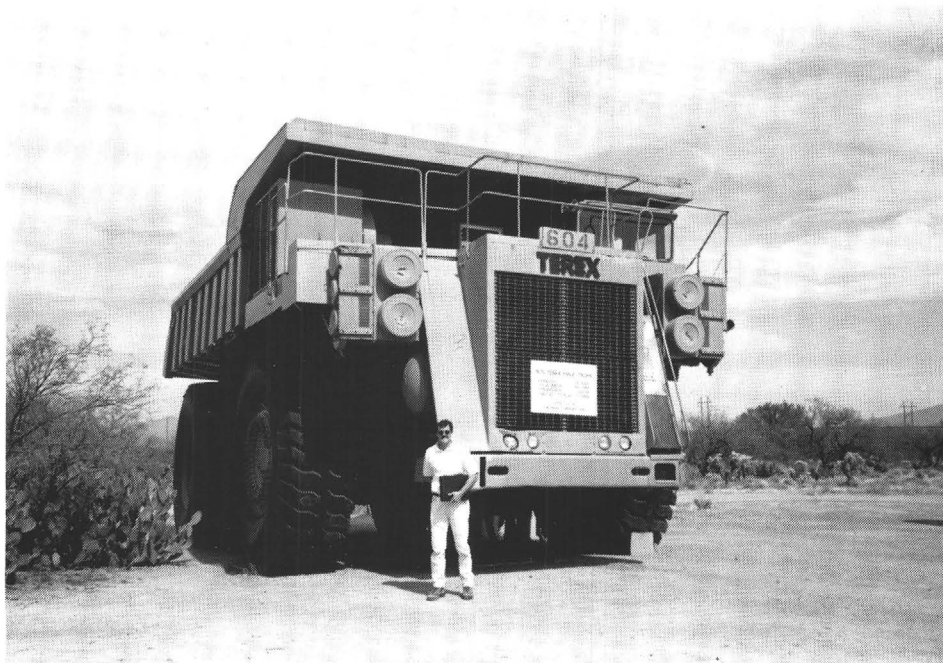


ARIZONA DEPARTMENT OF MINES & MINERAL RESOURCES

Annual Report 1998 - 99



W. Douglas 'Doug' Sawyer provides scale for the 170-ton haul truck displayed at the Asarco Mineral Discovery Center at the Mission Mine, Pima County. Sawyer was appointed director of ADMMR in January of 1999. He is an Arizona native who attended the University of Arizona; earning his Masters Degree in Geological Engineering.

Sawyer had worked for Phelps Dodge, Kennecott Copper, and Dames and Moore before coming to the Department from the Department of Environmental Quality.

DEPARTMENT OF MINES AND MINERAL RESOURCES



60th Annual Report FY1998/1999



STATE OF
ARIZONA



Arizona Department of Mines and Mineral Resources

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Honorable Jane Dee Hull, Governor
State of Arizona
1700 West Washington
Phoenix, Arizona 85007

December 1, 1999

Dear Governor Hull:

The Annual Report for the Arizona Department of Mines and Mineral Resources for the fiscal year 1998/1999 is herein submitted in compliance with A.R.S. Section 27-106.

This fiscal year has been one of change for our department as H. Mason Coggins retired as the director and the Board of Governors selected a new director. We also added a former director, Leroy Kissinger, to the Board of Governors.

This year we also witnessed the opening of several new mining/mineral developments. Applied Chemical Magnesias Corporation (ACMC) culminated over 10 years of pre-development work with the opening of the White House mine and processing plant in Mohave County. This new brucite mine started as an information inquiry to our department in 1988. Brucite is used to neutralize acids in a number of industrial applications.

Omya Corporation is completing construction of a plant in Superior that will process limestone into chemical and food-grade calcium carbonate. The limestone is mined north of the town on forest service land. Our department published an industrial minerals study that lead to the exploration and investment in the mine and new \$3,000,000 plant.

Cambior continues its arduous task of obtaining the necessary federal approvals to begin mining copper at the Carlotta Mine located near Miami. In the late 1980's Cambior's exploration team approached our department and asked about favorable copper exploration areas. We pointed them to the Carlotta mine area and our involvement lead directly to the \$60,000,000 investment in design, permitting, equipment, personnel, and land acquisition that has been spent in the Miami area. Cambior is now awaiting a recovery of copper prices before opening the mine.

Late in the fiscal year, a major consolidation of copper mining began with the merger of Cyprus and Phelps Dodge Corporation and the acquisition of Asarco by Grupo Mexico. Arizona is now home to the second largest copper mining company in the world. These mergers will likely change the landscape of the copper mining industry in Arizona for years to come. The rock products industry has also experienced a number of acquisitions and mergers under the banner of several large multi-national companies.

Governor Hull
December 1, 1999
page 2

The present staff consists of eight FTE's funded by the general fund, five part-time employees (funded by profits from the Museum Gift Shop), and a dedicated group of volunteers provide quality service to the Department's customers and visitors. During the 1998-99 school year over 25,000 children visited and toured our museum. We also assisted the Arizona Mining Association as they educate teachers about the importance minerals in our society.

As we look to and prepare for the future, members of the department and several key stakeholders have identified the following key tasks. The first is making our mineral and mining information more accessible to the public. Our belief is that the mines and mineral resources of the next fifty years are contained in these files and must be made available to exploration geologists and others. With the advent and explosion of internet information, we are planning to turn our much of our hard copy "information" into electronic files that are accessible from our website. Another area that has been identified is the need to expand our museum and make it more educational about the mineral resources of the state and how modern-day miners are harvesting these resources. We are working with key stakeholders to develop plans and a funding source.

Should you have any questions or need additional information, please do not hesitate to contact me. I wish you the best in all your endeavors.

Sincerely,


Doug Sawyer
Director ADMMR

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98/99 FISCAL YEAR FINANCIAL STATEMENT

Appropriated Fund #1000

Appropriation	\$765,445.00
Expenditures	765,186.99
Reverted	258.01

Mines and Mineral Resources Fund #3156

Beginning Balance 7/1/98	63,808.40
Store Sales and Donations	87,684.53
Expenditures	83,269.52
Ending Balance 6/30/99	68,223.41

Printing Revolving Fund #4004

Beginning Balance 7/1/98	4,987.99
Publication Sales	7,248.17
Expenses	8,467.32
Ending Balance 6/30/99	3,768.84

**Note: The Legislature combined the Printing Revolving Fund with the Mines & Mineral Resources Fund at end of Fiscal Year 1999.

GITA Y-2K Fund #50,000

Beginning Balance	10,000.00
Expenses	8,353.49
Ending Balance 6/30/99	1,646.51

PERSONNEL

Board of Governors

Eric Nordhausen
Chairman – Tucson

Sydney Hoff-Hay
Vice-chairman – Phoenix

Leroy Kissinger
Secretary– Tucson

Ken C. Bennett
Member – Phoenix

William J. Miller
Member - Phoenix

Staff

Willis D. (Doug) Sawyer
Director

Mineral Resources Information Center

Ken A. Phillips -Chief Engineer

Nyal J. Niemuth - Mining Engineer

Ann Turney – Administrative Assistant

Diane Bain – Public Information
Officer

Marianne Charnauskas – Clerk/Typist

Arizona Mining & Mineral Museum

Glenn Miller – Curator

Susan Celestian – Education Curator

*Part-time Employees**

Ann Baker – Tour Guide

Shirley Coté – Tour Guide

Alice Rosenfeld – Tour Guide

* Non-appropriated funds

Department of Mines & Mineral Resources

Agency Mission

It is the mission of the Arizona Department of Mines and Mineral Resources (ADMMR) to promote the development of the mineral resources of the state through technical outreach and education. The purpose of this promotion is to encourage economic development in the mining and mineral resources industry. Our patrons or customers are the minerals industry, operators of small mines, prospectors, educators, the general public, elected officials and other state, local, and federal agencies.

Agency Description

The ADMMR has three primary functions. The first function is to provide technical assistance to miners, exploration geologists, prospectors and others who are developing our state's mineral resources. This technical assistance includes studies of opportunities and problems facing small miners and investigation of their properties to assist in their development.

The second function is to maintain an information bank and library of mineral and mining information. The information consists of books, studies, maps, films and videotapes, individual mine files, and other archival documents.

The third function is to manage the mineral museum as the state's depository for collecting, cataloging, and displaying mineral specimens, various ores, gemstones, and lapidary material. ADMMR is a non-regulatory agency. The Arizona Department of Mines and Mineral Resources is divided into two functional programs to fulfill the agency's statutory duties. These programs are the Mineral Resources Information Center and the Arizona Mining and Mineral Museum.

Mining & Mineral Resource Development

Arizona leads the nation in the production of nonferrous metals. The value of Arizona's mineral production in calendar 1998 for metals, coal,

and nonmetals are estimated at approximately \$3.2 billion, a 16 percent decrease from 1997. Copper was the number one product representing about two thirds of the U.S production and 75 percent of Arizona's non-fuel mineral production. Together with copper industry byproducts molybdenum, silver, and gold, the Arizona copper industry accounts for 81 percent of the state's total. Revenues to the state and its legal subdivisions were \$385 million dollars in taxes. The industry employed over 15,000 and over 60,000 indirectly. Copper mine shut downs and cutbacks due to low copper prices dominated Arizona's mining news during the later part of the fiscal year.

Fuel production in Arizona was an important part of Arizona's contribution to the nation's energy consumption. In 1998 Arizona produced 12,398,000 tons of coal valued at an estimated \$370 million dollars and minor amounts of other fuels. Most of these fuels were used in Arizona and Nevada to generate electricity.

Public Inquiries

Inquiries from the public for information and assistance consume a large portion of staff time. The ADMMR technical staff responded to more than 3500 requests for information and helped 1661 visitors during the fiscal year.

Public contacts are the primary process through which the objectives of the agency are carried out. Information requests generally fall into the following categories:

- ◆ Determination of land status and mining law
- ◆ Acquiring mineral rights or rights to develop and mine mineral deposits
- ◆ Purchasing mineral commodities
- ◆ Researching mineralization, geology, prior activity, and history of mine sites

- ◆ Requests for information to assist in evaluating involving investments in mining companies and properties
- ◆ Mining and mineral recovery technology
- ◆ Assistance with permitting and regulatory functions
- ◆ Prospecting and recreational gold panning

Lifetime Mineral Demand

Mineral resources are mined because society needs and demands them. The common mineral resource commodities tabulated below are consumed during the average life span of a resident of the United States. Important, but smaller quantities of many more minerals are also used.

Copper	1,725 pounds
Petroleum	60,308 gallons
Coal	568,575 pounds
Cement	55,650 pounds
Aluminum	6,975 pounds
Natural gas	6,200,000 cubic feet
Iron ore	45,225 pounds
Lead	975 pounds
Clays	24,250 pounds
Stone, sand & gravel	1,400,000 pounds
Zinc	900 pounds
Salt	30,300 pounds

Advocacy

The ADMMR maintains a proactive role in encouraging the development of Arizona's mineral resources. ADMMR's advocacy roles include involvement with the Arizona Mining Association, Arizona Rock Products Association (ARPA), AMIGOS (Arizona Mining Industry Gets Our Support), Arizona Association of Industries (member), State, county, and local industrial development agencies and commissions, and chambers of commerce throughout Arizona.

Plans were developed to revitalize the GSPED Mining Cluster to emphasize development and market opportunities for producers of industrial minerals in Arizona.

Public testimony was given at numerous regulatory hearings and community meetings for permits at current and planned Arizona mining operations.

Special interest earth science clubs and natural resource organizations' monthly meeting are hosted by the ADMMR. Such groups have membership's whose interests are parallel with ADMMR's duties to promote the development of the mineral resources of the state through outreach and education. These clubs and organizations include: Mineralogical Society of Arizona, Arizona Prospectors Association, Maricopa Lapidary Society, People for the USA, Arizona Mineral and Mining Museum Foundation, Arizona Treasure Unlimited, the Bead Society, and Leaverites.

Mine developers planning new operations in Arizona were contacted, introduced to legislators, business associations, industry lobbyists, appropriate consultants, and regulators.

The Agency represents Arizona mining at non-mining symposiums, such as the Arizona Association of Industries Environmental Summit and the Highway Geology Association.

ADMMR responds with official letters and written statements of support for mine development to scooping letters, environmental impact statements, "letters to editors," and anti-mining news items.

Speeches And Programs

The technical staff of the Mining and Mineral Museum and the Mineral Information Center provides programs, speeches, workshops, and lectures for professional, civic, educational, and recreational and special interest clubs. Fifty-seven speeches and programs were given in fiscal 1998-99. Total attendance was 833.

The Mining and Mineral Museum hosted more than 500 school and special interest field trips totaling 29,069 students to the Museum. The schools and groups visiting the Museum from January, 199 to September, a999 are listed in Appendix A. Field trip students are introduced to the importance of minerals in their daily lives and provided with a self guided museum tour through the use of a "Treasure Hunt." The

Treasure Hunt is a grade relevant single page of questions which can be answered by touring the Museum and studying the Museum displays. Students submit completed Treasure Hunts to the museum staff for checking completeness and correctness.

Publications

D-47 *Directory of Active Mines in Arizona*
C-81 *Arizona Mining Update – 1999*
C-82 *Arizona Gem Shows, 1999-2000*
C-83 *Earth Science Clubs 1999-2000*
Mineral Resource, 1st quarter newsletter, No. 20
Mineral Resource, 2nd quarter newsletter, No. 21
Mineral Resource, 3rd quarter newsletter, No. 22
Mineral Resource, 4th quarter newsletter, No. 23
SR-12 reprint of Laws and Regulations Governing Mineral Rights in Arizona
59th Annual Report of the Arizona Department of Mines and Mineral Resources
Active Mines Map
Mining and Mineral Museum color brochure
Press Releases

The *Directory of Active Mines in Arizona* is the premier publication of the agency and has become a model for many of the Western mining states. The publishers of *Southwest Contractor Magazine* also include the directory without the map with subscriptions to that publication.

The compilation of the necessary data and publication of the *Directory of Active Mines in Arizona* is a major project by the agency each 2nd quarter. To update information for the directory a member of the technical staff personally contacts each company and often each mine when a company operates more than one. This contact provides another opportunity to remind the companies of our services and review industry events. The Directory includes an entry for every full-time operating mine in Arizona. The Directory includes a map at the scale of 1:1,000,000 of the metal and nonmetal mines excepting sand and gravel mines. The Directory also includes a brief review of significant activities in Arizona's mining industry. Nearly 600

hours of staff time are devoted to this publication.

John Lacy has updated the third edition of the *Manual for Determination of Status and Ownership, Arizona Mineral and Water Rights*. The graphics for the new edition are being assembled, with the co-operation of the BLM, and the publication should be ready for printing sometime in the next quarter.

Projects

Computer systems Update

The Department's computer system was completely updated during the fiscal year. Nyal Niemuth, Department Mining Engineer, obtained funding for hardware, software, and technical assistance from the Government Information Technology Agency (GITA) and the Department of Administration to replace the agency's server, software, operating system, and some workstations. As a result of Nyal's work the agency will have access to the World Wide Web, e-mail, and soon, the ability to update the agency's website, www.admmr.state.az.us.

Water Permits

The ADMMR continues to represent the small miner in the unified water permits subcommittee. The subcommittee consists of representatives of the Arizona Mining Association, Arizona Rock Products Association, environmental consultants, ADEQ, and legal community. The mining subcommittee meets approximately every two weeks and has prepared draft General Aquifer Protection Permits (APPs) for vehicle wash facilities associated with mining activities, non-process, storm water ponds, and intermediate stockpiles. These draft permits will be reviewed by the ADEQ, submitted for public comment and incorporated into rule by 2001. The intent of the general permits is to provide mine operators with the flexibility to design, construct and operate certain facilities without obtaining an individual APP. This flexibility will allow the miners to avoid the costly and time-consuming individual APP process.

Land Disposal Restrictions

The ADMMR has been asked to represent small miners on a working group of representatives of the AMA, ADEQ, EPA, consultants, and legal counsel to provide rules to implement the Land Disposal Restrictions (LDR), Phase IV of the Resource Conservation Recovery Act (RCRA). By way of summary, in 1980, the EPA promulgated restrictions on the storage and disposal of waste materials. In general, there are two categories of solid waste: municipal waste and hazardous waste. Mining operations generate a number of hazardous wastes. In 1980, in response to industry concerns over the implementations of hazardous waste management at mine sites, Congress passed the Bevill Amendment. The Bevill Amendment essentially provided a 10-year "exclusion" for certain wastes generated during the beneficiation of minerals. In Arizona, the Bevill exclusion has applied mostly to copper concentrating, smelting, and SX-EW operations. The 10-year Bevill Amendment has come and gone and under court order, the EPA has been instructed to proceed with implementation. Because Arizona has significant mining activities, the ADEQ has volunteered to develop rules to implement this federal requirement. This work group in Arizona is essentially a test case of the cooperation between industry and regulatory agencies to implement the regulations.

Museum Construction

Final interior construction of the Museum mezzanine was begun near the end of the fiscal year. When the first stage of this construction is completed in the early part of the second quarter of fiscal 1999-2000, the upstairs mezzanine will be carpeted and have sufficient lighting and outlets installed.

Initial planning for utilization of the Museum mezzanine display space has begun with meetings between the Director, agency staff, and industry representatives.

Library

The Department of Mines and Mineral Resources library is the largest research collection of Arizona-related mining and mineral informa-

tion in Arizona. The library continues to grow by additions of current periodicals, new purchases, and donations of private collections. A volunteer is currently making a computerized catalog of the library.

Volunteers

The Arizona Department of Mines and Mineral Resources and its Arizona Mining and Mineral Museum are the grateful recipient of thousands of volunteer hours each year. In Fiscal 1998-99 volunteers donated 13,596 hours. Without the help from volunteers, the agency would be unable to perform its duties and customer service at the levels our patrons have learned to expect. Examples of volunteers work include:

- Assisting at teacher's workshops
- Assisting visitors at Family Day, Prospectors' Day, and Arizona Mineral Symposium
- Assisting with gift shop customers
- Cataloging library volumes
- Cataloging mine maps
- Changing lights and repairing cabinets
- Cleaning, arranging, and stocking gift shop shelves
- Collecting rocks and minerals for Teacher's Kits
- Collecting, purchasing, and hauling gift shop and Teacher's Kit materials
- Conducting lapidary shop classes
- Constructing exhibits
- Crushing specimens for teacher's kits
- Demonstrating mineral, lapidary, and geology techniques and principles at special events
- Erecting and constructing Boras head frame hoist house
- Fabricating and assembling Teacher's Kits
- Finding and resolving miss filed specimens, files, index cards, books, and computer database records
- Handling donations
- Improving the Museum's mineral specimen catalog database
- Labeling rock and mineral specimens for Teacher's Kits

- Maintaining, cleaning, and repairing lapidary shop and equipment
- Making improvements to the Department's facilities by installing shelves, electrical outlets, etc.
- Making jewelry for Museum gift shop
- Making new exhibit labels
- Managing gift shop
- Monitoring and making initial contact with Museum visitors
- Monitoring the lapidary shop
- Moving and rearranging furniture
- Moving items in to and out onsite and remote area storage
- Pricing and packaging gift shop items
- Printing and compiling manuals for Teacher's Kits and special events
- Providing information to agency visitors and callers
- Repairing and reorganizing mine data files
- Setting up outside displays and off site displays
- Setting up, taking down, and cleaning for special functions
- Sorting and rearranging the Museum's storage minerals

Activities

The objectives of the Arizona Department of Mines and Mineral Resources are 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.

Agency activities are compiled in the following Statistical Table for Arizona Department of Mines and Mineral Resources July 1, 1998 through June 30, 1999.

Financial data is given in the Department of Mines and Mineral Resources Expenditure Report – Fiscal Year 1998 – 1999

ADMMR employees have duties beyond agency job descriptions. The operation of a small agency like the ADMMR requires that employees handle duties in addition to their ordinary ones.

The agency's Mining Engineer, Nyal Niemuth, is also the Department's computer network administrator and manages the department's computer systems. Projects and problems range from solving or verifying year 2000 problems, to specifying new equipment, to helping other employees and volunteers solve problems and learn to effectively use the data processing system.

The agency's Chief Engineer, Ken Phillips, is also the technical staff manager, part time facility and physical plant manager, and museum lighting designer. Projects and problems range from lighting and electrical repairs to coordination of building improvements with the Department of Administration to acquiring materials for volunteers building new displays.

The department's Public Information Officer, Diane Bain, is also technical writer, photographer, and publication editor. Diane also identifies minerals for the public and supervises Department volunteers.

The agency's Education Curator, Susan Celestian, has also taken on many of the responsibilities of the Curator, Glenn Miller, who is on medical leave. She has been evaluating the Museum collection, a two-year project, while supervising work on the collection database.

One of the museum's tour guides, Ann Baker, is also the gift store buyer that requires her to travel to mines, specimen venders, and vender shows.

Examples of additional staff activities are given below:

Attending personnel training and information classes such as sexual harassment avoidance, ethics training, strategic plan development, and employee evaluations.

Providing general mineral resources and mining information to students writing school reports, journalists writing general interest stories, industrial development agencies, etc.

Assisting claim owners understand mineral rights regulation, procedures, special exemptions, annual filing requirements, Federal and County fees, questions about mineral rights when the surface and mineral estates are severed, etc.

Hosting special events such as the Rose Mofford and Eddie Basha's 99th birthday party for Polly Rosenbaum, the People for the USA (PFUSA) – Capital Chapter monthly meetings, Fine Art Council Legislative Luncheon, etc.

Collecting mining and mineral resource information through attending association meeting such as formerly known as, September meeting at ADMMR. Steve Radvak's lecture on permitting requirements for mining from a mining industry viewpoint at a People for the West meeting and Steve Reynolds' program about the geologic evolution of Arizona at a meeting of the Maricopa Section of Society of Mining Engineers.

Connecting ADMMR with the Arizona Mining Association and the Arizona State University to jointly present a program to the State Library and Archives on how scientific developments in the mining industry have made changes in the lives of people in Arizona.

Acquiring information by attending seminars, conventions, and symposiums such as the 49th Highway Geology Symposium, the Society of Mining Engineers State Conference, and the Arizona Association of Industries Environmental Summit.

Reviewing collections of mineral specimen donations received by other museums to assist them in determining the best disposition of donations.

Educating the public about Arizona minerals and gemstones, for example, explaining terminology like 'ant-hill garnet', Apache Tears, and other local names for gemstones from Arizona.

Attending and fostering the Arizona Mine Emergency Association of underground mining operations that have joined together to form underground emergency rescue teams to comply with MSHA requirements by forming an association no single small mining operation must fund the total cost to maintain a fully equipped underground emergency rescue team.

Supplying information to land management and regulatory agencies on past mining activity and future mineral resource potential on proposed withdrawals, recreation areas, etc.

Directing inquiries about mining company stock values, and stock promotion activity to appropriate exchanges and State and Federal regulatory agencies.

Presenting general interest programs on minerals, and mining to civic, hobby, and services clubs.

Disseminating information to the print, radio, and video media.

Advocating for the importance of Arizona's mining industry, future mineral potential, and availability of public and school trust lands for mineral development.

Disseminating mining and mineral resource information through contact with other Federal, state, and local economic development.

Collecting and analyzing data to use in promoting development of Arizona sources of raw mineral materials for Arizona consuming industries

Collecting information and status of activities on small mine, exploration, and development activities for permanent archives and dissemination.

Compiling reports and educating prospectors about mineral rights, property acquisition, prospecting methods, potential markets, and mining methods.

Providing marketing data for potential new developers of mineral commodity supplies.

Assisting local and tribal governments with past mining activity data for their land use planning needs.

Encouraging new developers of mines.

Cooperating with other regulatory and non-regulatory agencies to assemble a comprehensive manual on mine permitting.

Industry Trends

Current low metal prices have discouraged exploration for new deposits. This situation has caused some independent exploration geologists to look at rock product and other industrial mineral opportunities. The ADMMR technical staff

has provided individualized background material and exploration suggestions to numerous professionals.

World, US, and Arizona mining industry trends and economics affect the activities of the ADMMR's Mineral Information Center. High metal prices and high demand for potential new deposits and exploration targets translate directly into increased inquiries and demands for agencies services related to commodities in demand. Prices for copper, gold, and silver are most influential. When metal prices are relatively low, and the general economy is otherwise robust, non-metals and rock products with relatively high place value become the subject of increased industrial mineral inquiries.

Copper

Despite a continued high demand for copper, the industry suffered widespread losses in the last six quarters because of an 11-year low in copper prices. The Asian economic troubles and heavy production from South America are being blamed for the price drop. In the first nine months of 1998 copper was 32 cents lower than in the first nine months of 1997. Despite this, it should be noted that 1997 production from Arizona copper mines was near an all-time high of 2.7 billion pounds with a value of \$2.93 billion. Arizona production reacted to the market in calendar 1998 by falling 28 percent.

Copper and its by-products represent over 80 percent of Arizona's non-fuel mineral value. Production comes primarily from four major companies. Expected strong future demand and a large Arizona copper resource base are encouraging other companies to pursue exploration and development in Arizona. The Western Economic Analysis Center reports that Arizona's economy received more than \$9.2 billion and nearly 73,000 Arizona residents had jobs in 1998 as a result of the direct and indirect contributions of the copper industry.

Coal

Coal ranks second only to copper in economic importance in the State. In 1998 Arizona's coal production was 11,723,000 short tons, having an estimated value of \$279 million. All pro-

duction is from land leased from the Navajo and Hopi Nations by Peabody Western Group.

The National Mining Association in their September 14, 1998 *NMA Mining Week* reports that the Energy Information Administration predicts the U.S. will have an increase of electrical demand of 2.5 percent this year while coal production is expected to reach 1.116 billion short tons. On the same basis the growth in 1999 is expected to be 2.0 percent of the 1998 level. Arizona has very large low sulfur coal reserves to supply new power plants as well as limestone and lime production capability to feed sulfur dioxide abatement equipment. Coal mined in Arizona currently fuels only two power plants, one at Page and the other in Nevada. Other Arizona power plants and industrial users of coal obtain their supply from New Mexico and Colorado.

Gold and Silver

Arizona's 1998 gold production was 67,515 troy ounces. There were no major operating primary gold mines in Arizona in 1998-99. Nearly all of Arizona's gold production was by-product recovery of gold from the sulfide operations of the copper mines. Silver production totaled 5.6 million ounces, also recovered as a by-product of copper mining.

The gold price declined \$35 during the first nine months of 1998. It averaged \$296 per ounce in 1998 and continued to decline in 1999 as a result of announcements by central banks to sell their reserves.

Depressed base and precious metals prices have impacted both the subjects and quantity of inquiries to our office.

Rock Products and Industrial Minerals

Although the mining of copper and its by-products accounts for 80 percent of the State's mineral production by value, mining in Arizona continues to be a diversified activity. Coal, rock products, and industrial minerals largely account for the remaining 20 percent. Sand and gravel for construction aggregates, cement, and lime for chemical and construction material uses make up the majority of industrial mineral value. Other industrial minerals mined in the state are more interesting in terms of their variety than their

dollar value. These include limestone and marble, bentonite, diatomite, common clays, salt, cinders, smelter slag, pumice, zeolites, crushed stone, decomposed granite, perlite, gypsum, silica flux, hematite, sandstone, dimension stone, industrial sand, and mine tailings.

The Department of Mines and Mineral Resources continues to note interest in deposits of numerous industrial mineral commodities. These include perlite, clays, industrial sand, mica, limestone, vermiculite, specialty aggregates, and the raw materials containing iron, aluminum, and silica for cement manufacture. Arizona's two cement plants currently source these raw materials from clay, shale, or volcanic zones in their own limestone quarries, from other quarries they own, importers, and waste products from secondary metal processors.

A robust economy with an attendant high level of new residential, commercial, institutional, and industrial construction continues to spur interest in developing additional sources of sand and gravel for construction aggregate.

Gemstones

Arizona is a leading state in the value of mined gemstones in the United States. Approximately \$4 million worth of commercial gemstone production is reported for Arizona annually. Turquoise, peridot, and petrified wood account for most of the value, with amethyst, chrysocolla, azurite, malachite, and fire agate making up the remainder.

Recreational Mining:

Collecting of gem material, mineral specimens, and fossils and gold panning and operation of small hobby-type suction dredges are an important recreation activity in Arizona.

Government News

Mine fraud is of increasing concern to stock exchanges, government security regulators, the mining industry, and mineral resource information agencies. Bre-X, and its Indonesian property Busang, may be the most infamous of recent scandals. Others have had connections to Arizona. The Arizona Corporation Commission issued a cease and desist order to some in Arizona

and are investigating others. These and other companies' activities were the impetus for the Ontario Securities Commission and the TSE to form the mining standards task force to review standards governing the conduct of mineral exploration programs and reporting of results. The task force's interim report, *Setting New Standards*, made four key recommendations: 1) designate a qualified person to sign off on exploration disclosures, 2) establish best exploration and field practices to ensure integrity of results, 3) raise disclosure standards, and 4) improve regulatory oversight.

An all too common occurrence is the reporting of gold or other precious metals where none exists. Investors seem vulnerable to promotions that claim to be able to detect or recover gold that reputable laboratories cannot detect. Despite regulatory agencies investigations and shutdowns, investors should remain wary as the proposed improvements are expected to discourage, but not stop, mine fraud.

Providing the investing public information about valid mining ventures and explanations about how to determine the validity of promotional data is a necessary, but time consuming, task of the Department's staff.

Pending changes in Federal mining laws, proposed Department of Interior regulations, and withdrawal of areas to mineral entry are of continuing concern to prospectors, claim holders, explorationists, and domestic mining companies. Nearly all changes and proposed changes will have negative affects.

The Department staff disseminates information about proposed law and regulation changes and responds to Federal agency proposals as part of the Department's advocacy role.

It is a statutory duty of the Arizona Department of Mines and Mineral Resources to monitor prospecting, mining, and mineral exploration activity in the state. The following table contains summaries of example activities

Mine(s) & County	Activities and/or Status
Arizona Portland Cement Pima County	Arizona Portland Cement Plant at Rillito announced they have received permits to expand the plant's capacity in phases. Over the next five years the Arizona plant's capacity will be increased to 2,300,000 tons of cement per year. The initial phase will increase capacity to 1,560,000 tons per year and involves installing a new raw feed roller mill and converting the existing raw feed mill into a finish mill. The second phase, planned for completion in 2003, requires installing a second pre-calcining tower. When completed this expansion along with one planned by Phoenix Cement (see below) will significantly reduce the need to import Portland Cement into Arizona from Mexico, Texas, and California.
AZCO Mica Yavapai and Maricopa County	AZCO acquired the Black Canyon Mica's claims and deposit southwest of Black Canyon City, drilled a reserve, erected a pilot plant, and is obtaining necessary operating plan approval. Initial plans announced are for an annual production of 10,000 tons of high value fine, water-ground, muscovite.
Carlota Gila County	The Carlota Copper Co. announced the start of preliminary construction on the Carlota Copper Project, located west 6 miles west of Miami, on October 15, 1998. The Tonto Forest Supervisor authorizing construction activities on public land signed the Plan of Operations September 30. Initial work will consist of road construction, establishment of monitoring equipment, and installing test trenches on the alignment of the Powers Gulch diversion channel. Although this was among the last of the major federal permits to obtain, permitting continues. The EPA's NPDES permit public hearing was scheduled for November 12 in Globe. They have received approved plan of operations from Forest Service and have begun construction of road access and monitoring facilities. Hearings on environmental groups' lawsuit set for March. 8, 1999. They are still awaiting Arizona Department of Water Resources Dam Safety Permit. The Carlota mine will be a significant contributor to the local and state economy.
Casa Grande AAC Plant Pinal County	Environ-Crete Products Inc. is constructing a factory to produce lightweight concrete using mine tailings at the sight of the Sacaton pit west of Casa Grande. The plant would make a high-silicon product from mine tailings, lime and other materials that "rises like a dough and becomes a fluid with consistency of butter," The mixture can be poured into steel molds to make a concrete that is 60 percent air and will float on water. It has a high insulation capability. The material will be formed into large bricks and fitted together with grooves and mortar.
Cochise Deposit, Cochise County	Phelps Dodge is gathering environmental baseline data needed for permit applications. No announcements of development plans have been made.
Copper Creek Pinal County	In July 1998 AMT announced plans to purchase BHP's 50% interest in the project and subsequently acquired all of BHP's interest. AMT established a joint venture with GTN Copper. Tonnage and grade has been updated to 43 million tons; 10 million at a grade of 1.73% Cu; 5 million at a grade of 2.0%

Mine(s) & County	Activities and/or Status
	Cu; and 28 million at a grade of over 2.00%, Cu. In mid September 1998 AMT has estimated a porphyry system at 300 million tons at a grade of 0.80% Cu. Under the terms of a joint venture agreement announced October 10, AMT and GTN will install new technology to produce copper at the Copper Creek Project located about 10 miles northeast of Mammoth, Arizona. The Intec process, reported to be the most advanced hydrometallurgical process available, can also recover gold, silver and elemental sulfur. The process developed and currently undergoing full-scale demonstration in Australia operates at atmospheric pressure and slightly elevated temperatures. Tests on Copper Creek concentrates have indicated a 99% recovery using the patented halide leaching technology. AMT and GTN plan an initial 30 million pound annual capacity plant. Estimated cash costs to produce refined copper are 30 cents per pound.
Dos Pobres/San Juan Project Graham County	Draft Environmental Impact Statement (EIS) was released for comment in September 1998. ADMMR submitted letters recognizing the future importance of the planned mine development and favoring the development. With this EIS Phelps Dodge plans to permit the largest non-producing copper reserve in the United States. The project may ultimately develop two open pit copper mines about 12 miles north of Safford, Arizona in an area where mining has been under consideration since the 1950's. The project will mine over one billion tons of oxide and sulfide ore and produce 2.9 billion pounds of saleable copper over its 16-year life. Copper production will come from a solvent extraction electrowinning plant to be built on the property. The project will create approximately 250 new jobs with an average annual payroll of \$36,000 in 1997 dollars. In addition, local contractors will provide an additional 100 jobs for an additional \$2.5 to \$3.0 million annually. The mine will pay approximately \$9 million dollars in taxes to Graham County. This will be a welcome addition to the 32,243 people in Graham County who have an annual per capita income of only \$8,955. Graham County's assessed property values will increase considerably from its present value of \$68,846,902. Adjacent Greenlee County has about 20% of Graham's land area but includes the Morenci mine is valued at \$228,467,780.
Florence Pinal County	BHP Copper continued permitting and had started an in situ leaching operation, then put it on hold until copper prices improve. BHP has put the 321 million ton, 0.34% Cu deposit amenable to in situ leaching up for sale.
Gold Road Mine Mohave County	On June 26, 1998 Addwest announced they are suspending operations at their Gold Road mine in Mohave County, Arizona due to low gold prices. The mine remain closed.
Johnson Mine Cochise County	Summo Minerals announced that completion of due diligence drilling (8 holes) confirms grade and tonnage at Johnson Camp's Copper Chief Ore body. Nord Resources purchased Johnson from Summo Minerals for 1.6 million shares of stock, \$310,000 in cash and 3 future payments of about \$500,000.
Magma Porphyry Pinal County	BHP announced a major copper discovery east of their Magma Mine mid 1998. The deposit is high grade, but very deep.
Cyprus Miami	Environmental Impact Statement accepted. Operating Plan approved June

Mine(s) & County	Activities and/or Status
Gila County	1998 for operations to continue through 2011. Record copper production achieved in 1997.
Mineral Park Mohave County	The Arizona Department of Environmental Quality issued an Aquifer Protection Permit to Equatorial Mineral Park, Inc. for its Mineral Park operation near Kingman, Arizona. The company will be permitted to recover copper from in situ leach solutions through a solvent extraction-electrowinning (SX-EW) process. The operations will incorporate process solution ponds, storm water runoff ponds, process pipelines, and ancillary maintenance operation facilities.
Mission Mine Pima County	Asarco Mission has received a notice of Preliminary Decision to Issue an APP necessary for continued operation.
Morenci Greenlee County	Production was increased and is working with new 320-ton truck fleet. Produced 1.084 billion pounds of copper in 1998. Phelps Dodge announced closure of Metcalf concentrator at Morenci and Hidalgo smelter in New Mexico. Closure expected to begin Sept. 1, 1999. 250 temporary workers' jobs to be lost at Morenci (~10 percent of the workforce) Average production lost will be 68,000 metric tons. Phelps Dodge expects costs to drop 4 cents though it has not released total cost estimates.
Peabody Western Coconino County	Peabody Western Coal Company is reducing their temporary and permanent salaried positions by 35. Peabody Western's mines on Black Mesa, Arizona supply the Mohave Generating Station near Laughlin, Nevada and the Navajo Generation Station located near Page.
Phoenix Cement Yavapai County	Phoenix Cement Company announced plans stage for plant modernization including an increase in plant capacity from the current 630,000 tons per year to 1,100,000 tons per year. When completed this expansion along with one planned by Arizona Portland Cement (see above) will significantly reduce the need to import Portland Cement into Arizona from Mexico, Texas, and California.
Queen Creek Limestone Pinal County	Omya (Pluess Staufer) of Lucern Valley, California held a groundbreaking ceremony for their new calcium carbonate grinding facility in Superior that will process limestone from their Queen Creek Limestone mine.
Ray Pinal County	Major producer with significant SX-EW plant expansion and modernization nearly complete.
San Manuel Mine, Concentrator, Smelter, Refinery, and Rod Plant Pinal County	The San Manuel smelter was shut down to install major improvements. At the end of the fiscal year, the concentrator and underground mine were shut down due to continued low copper prices. In situ leaching continues, as does the SX-EW plant and the rod mill. The improvements to the smelter were completed, but it was not restarted. The BHP operation is for sale.
Santa Cruz Pinal County	The experimental in situ leach research project has closed. Federal funding of portion of the project stopped. ASARCO and Freeport have a new area to study.
Sierrita Mine Pima County	Largest molybdenum producer in Arizona. One of the most efficient producers of copper and molybdenum due to their very low ore grades.
United Verde Yavapai County	Phelps Dodge and Cominco continue a joint venture exploration agreement. One of the largest zinc resources in the United States.
Western States Stone	Western State Stone's sandstone quarries and Ashfork stone yard was recently acquired by American Sandstone. The Ashfork facility will continue to

Mine(s) & County	Activities and/or Status
Yavapai County	operate as Western States Stone. This company, which sends thousands of tons of flagstone around the country, is one of the largest employers in the Ashfork community. In Ashfork they stockpile and process material for sale throughout the country and for foreign markets. The materials are giving Arizona an international reputation for fine building and decorative stone.
Yarnell Mine Yavapai County	<p>The Aquifer Protection Permit (APP) has been issued. The Draft EIS was released June 1998 with many comments and concerns from the projects detractors mediated or explained. ADEQ has authorized Yarnell Mining Company to proceed with the Yarnell Project. Most of the comments were responded to by referring to the APP Mining BADCAT Guidebook. The Director worked on a committee to prepare this guidebook that included a number of prescriptive designs that could be taken as standard designs.</p> <p>The BLM released their Environmental Impact Statement for this property and it should serve as an example for future gold projects. ADMMR supported this project by submitting comments to the official record and attending public hearings in Wickenburg, Yarnell, and Prescott. The Mineral Policy Center, Sierra Club and several other environmental groups have opposed the project.</p>

STATISTICAL REPORT FOR ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES JULY 1, 1998 THROUGH JUNE 30, 1999.

(Some data is not available due to partial reporting periods, tabulation startup, and illness of Museum Curator.)

	1st ¼ 1998-99	2nd ¼ 1998-99	3rd ¼ 1998-99	4th ¼ 1998-99	Total Fiscal 1998-99
Visitors - Mineral Resource and Development Technical Information Center	310	583	404	364	1661
Number of above using databases, files, library, etc.	246	135	279	244	904
Possible new mine startups	N.A.	N.A.	N.A.	N.A.	85
Arizona Mining and Mineral Museum [Total of the following groupings]	14,460	12,360	17,417	11,352	55,589
General Museum Visitors All visitors to the Arizona Mining and Mineral Museum]	4,463	4,551	5,666	3,174	17,854
Student Visitors [Number of students and teachers in scheduled school field trips to the Museum]	7,267	5,990	9,216	6,596	29,069
Club Members [Earth science club members using the Museum facility.]	1,519	1,288	2,296	974	6,077
Americans with disabilities	169	207	93	207	676
Scouts	143	157	147	125	572
Lapidary shop users	335 hrs.	167 hrs.	488 hrs.	351 hrs.	1,341 hrs.
Organized museum tours	100	78	91	132	401
Telephone contacts - Incoming and outgoing	6,101	2,879	8,296	7,128	24,404
Letters sent out by mail, facsimile, and e-mail.	498	501	554	441	1994
Mineral and rock samples identified for the public	148	84	144	217	593
Total direct patron contacts	20,766	16,731	26,866	19,285	83,648
Mining & Mineral Museum gift shop sales	\$16,497	\$16,182	\$20,268	\$24,787	\$77,716
Publication sales	\$1,125	\$1,456	\$2,661	\$2,006	\$7,248
Mine files and library references used [Mine files pulled for visitors, used to answer telephone inquiries and to answer correspondence.]	793	403	809	1167	3,172

	1st ¼ 1998-99	2nd ¼ 1998-99	3rd ¼ 1998-99	4th ¼ 1998-99	Total Fiscal 1998-99
Technical conferences held	20	41	69	68	198
Meetings attended	28	56	29	55	168
Seminars and symposiums attended	0	5	8	1	14
Programs given and (number of people in attendance)	4 (136)	34 (408)	10 (195)	9 (94)	57 (833)
Written or public advocacy statements	6	17	10	4	37
Mining/mineral resource properties visited	1	19	8	17	45
Volunteer hours received	3,399 hrs.	3,682 hrs.	4,605 hrs.	1,910 hrs.	13,596 hrs.
Donations Cash	N.A.	N.A.	\$2,462	\$800	\$6,838.88
Donations Bulk rock & mineral material (pounds)	N.A.	N.A.	1984	3400	5384 pounds
Donations* Mine data, libraries, materials, collections (School curriculum programs)	0	0	0	0	0
Teacher mineral kits distributed	N.A.	N.A.	N.A.	N.A.	658
Additions and corrections to information base					
Museum specimens & information		5,101	730	3,488	12,425
Mineral resources information (Files updated)		253	373	129	915

* Donations of mine files, library collections, rock and mineral collections, various items and materials.

- Joe Arundale donation of technical books, and government documents
- Clancy Wendt donation of map sets
- William Chenoweth collection of mine files, data, and uranium maps
- Rough cut lumber and timbers to complete Boras Head Frame hoist house
- Digital camera
- Antique mining machinery including 3 mine cars and 2 sinking buckets
- Hauling and crane service
- Books, maps, and dynamite boxes from Gerry Irvin
- Michael Sandidge donation of technical books and maps
- Wheel chair
- Gold nuggets
- 550 micro mount mineral specimens

Appendix A. Museum Educational Programs
(The schools and number of children are listed by city.)

Avondale		Gilbert	
Aqua Fria High School	14	Greenfield Elementary	100
Avondale Elementary	60	Greenfield Elementary	100
Bagdad		Islands Elementary	50
Bagdad Elementary	15	La Petite Academy	12
Bapachule		La Petite Academy	12
Casa Blandea Middle School	48	Mesquite Elementary	125
Benson		Neely School	50
Benson Elementary	85	Neely School	50
Buckeye		Neely School	110
Buckeye Elementary	60	Pack 215	3
Buckeye Elementary	60	Pack 215	4
Buckeye Elementary	95	Pack 483	8
Buckeye Elementary	60	Playa del Rey	150
Liberty Elementary	90	Surrey Garden Christian School	35
Chandler		Glendale	
Andersen Elementary	50	Adams Oaks	34
Chandler High School	11	Bellair	60
Children's' World	30	Bi-Centennial North Elementary	30
Conley Elementary	150	Copper Creek	150
Dobson Academy	50	Deer Valley High School	45
Dobson Academy	45	Desert Garden	50
Fit and Fun Education Center	30	Desert Garden Elementary	60
Humphrey Elementary	110	Discovery Headstart	32
Larry C. Kennedy	60	Don Mensendick	100
Mirada Elementary	30	Greenbriar	90
Pack 455	11	Greenbriar	60
Pack 456	11	KinderCare	50
Paloma Elementary	50	KinderCare	30
Rudy Bologna Elementary	60	Melvin E. Sine	90
Sanborn Elementary	105	Mountain Shadows	136
Sirreine Elementary	115	Pack 105	3
Tarwater	85	Pack 262	19
Tots Unlimited	30	Park Meadows	80
Florence		Park Meadows	140
Florence Elementary	52	Peoria Summer Migrant School	40
Fountain Hills		Sunset and Acacia Elementary	65
Four Peaks	120	Sweetwater Elementary	66
Four Peaks	90		
Fort McDowell Day Care	4		

Globe	
East Globe	75
East Globe	75
Holy Angel School	25

Goodyear	
Sunrise School	10

Higley	
Pack 591	6
Pack 591	6
Towne Meadows Elementary	125

Kaibeto	
Kaibeto Boarding School	33

Lakeside	
Cradleboard Elementary	30

Litchfield Park	
Litchfield Park Elementary	100
Scott Libby Elementary	106

Mesa	
Children's' World	15
Kindercare	17
MARC Center	0
MARC Center	0
Mesa East Rock and Gem Club	0
Pack 355	4
Pack 387	3
Pack 450	6
Pack 530	8
Pack 542	3
Pack 547	6
Pack 551	3
Pack 756	7
Pack 773	6
Pack 855	7
Pack 856	3
Pack 863	4
Pack 867	4
Pack 87	6
Pilgrim Lutheran	13
Redbird Elementary	57
Saguaro Hills Christian School	8
Selss	0

Miami	
Inspiration	140

Paradise Valley	
Camelback Desert	11
Camelback Desert Elementary	19
Cherokee	75
Pack 545	6
Paradise Valley	
Phoenix Country Day School	65
Tesseract	27
Tesseract School	21

Peoria	
Freedom Plaza Retirement Community	0
Home School	10
Kindercare	35
Learning Works Preschool	13
Pack 293	8
Pack 742	3
Santa Fe Elementary	145
Sunrise Preschool	26

Phoenix	
ABC Alternative Learning Center	25
Acacia Elementary	50
Amigo Preschool	45
Bi-Centennial Elementary	60
Boulder Creek	100
Brooks	50
C. W. Harris	60
C.W. Harris Elementary	60
Camelback High School	15
Camp Gan Israel	50
Capital Elementary	26
Carl Hayden High School	34
Chaparral Elementary	95
Child Development Center	40
Children's' Campus	14
Children's' Campus	15
Childtime	17
Christown YMCA	30
Clarendon	60
Copper King Elementary	60
Creative Beginnings	32
Crockett Elementary	87

Davy Crockett Elementary	50
Discovery Elementary	26
Dunbar	45
Esperanza School	27
Estrella Jr. High	60
GATE Church Group	30
Gateway	110
Gateway Elementary	110
Glendale Union High School	30
Glenn L. Downs	90
Greenfield	75
Greenfield	92
Greenway High School	30
Heatherbrae Elementary	60
Hidden Hills	12
Home School	12
Hopi Elementary	105
Ironwood Elementary	55
Ironwood Elementary	52
Isaac Middle School	90
John Jacobs School	65
Joseph Zito Elementary School	90
Jr. Girl Scouts Troop 503	4
Kachina Middle School	20
Kenilworth Elementary	60
Kindercare	25
Kyrene de la Sierra	50
Kyrene de los Lagos	100
Larkspur Elementary	90
Larry C. Kennedy	63
Loma Linda	100
Longview Elementary	90
Madison Park Elementary	25
Madison Simis	90
Madison Simis	90
Maryland Elementary	90
Montecito Elementary	88
Montessori Children's School	12
Montessori Day School	50
Most Holy Trinity	50
National Association of Retired Federal Employees	0

Nevitt Elementary	90
Nevitt Elementary	90
North High School	8
Northwest Community Christian	23
Northwest Community Christian School	25
Northwest Community Christian School	23
Orangewood Elementary	120
Ottawa University	0
Pack 105	8
Pack 179	9
Pack 234	11
Pack 25	10
Pack 365	2
Pack 428	6
Pack 431	5
Pack 478	6
Pack 5	10
Pack 861	8
Packs 424 & 627	9
Papago Elementary	15
Papago Elementary	15
Papago Elementary	15
Paradise Valley Christian School	27
Paseo Hills	100
Pera Club	25
Peralta Elementary	150
Percy L. Julian School	12
Phoenix Day School for Deaf	15
Phoenix First Child Care & Learning Center	75
Phoenix Hebrew Academy	50
Phoenix Hebrew Academy	10
Phoenix Police Dept.	40
Phoenix Police Dept.	23
Precision High School	20
Precision High School	10
Residerata	20
Richard E. Miller	50
Richard E. Miller	50
Roselinda Elementary	17
Sahuaro Elementary	82

Santa Maria Elementary	50
Shadow Mountain High School	8
Solana Elementary	50
Solano	50
Solano	50
Spitalny Elementary	120
Squaw Peak Elementary	85
St. Catherine Of Siena	19
St. Matthews	25
Starlight Park	50
Starlight Park	26
Starlight Park	0
Sunray Charter School	9
Sunrise Elementary	50
Sunrise Elementary School	27
Sunrise Preschool	15
Sunrise Preschool	25
Sunset Elementary	27
Sunset Elementary	132
Susie's Mama Bear	60
Susie's Mama Bear	30
Tavan Elementary	100
Tesseract	17
Tesseract	16
Tomahawk	65
Tomahawk	60
Tomahawk	60
Tutor Time--Arrowhead	20
Tutor Time--Awatukee	20
Tutor Time--Bell Town	20
Tutor Time--Gilbert	11
Tutor Time--Mesa	9
Tutor Time--Scottsdale	20
Tutor Time--Union Hills	20
Valley Christian Center	80
Valley of the Sun School	0
Westview Services	0
Westwind Elementary	90
YMCA-Christown	110
Zito Elementary	80
Sacaton	
Gila Indian Reservation	95
San Manuel	
San Manuel High School	100

Scottsdale	
Camelback Desert School	9
Cheyenne	45
Cheyenne	77
Childtime	15
Desert Springs Elementary	50
Desert Springs Elementary	50
El Dorado Home Educators	30
Grayhawk Elementary	90
Home School	30
Home School	12
Maricopa Elementary	60
Navajo Elementary	90
Our Lady of Perpetual Help	3
Pack 448	10
Pack 548	4
Pack 6	15
Roadrunner Rock Club	0
Scottsdale Foundation for Handicapped	0
Scottsdale Foundation for the Mentally Challenged	0
Sequoia Elementary	60
Sequoia Elementary	60
Tesseract	15
Tonalea Elementary	90
Zuni Elementary	90
Sun City	
Eldorado	0
Sun City West	
Grandview Terrace	0
Tempe	
Montessori Day School	20
Pack 378	3
Pack 574	4
Tolleson	
Tolleson High School	15
Tolleson High School	5
Waggoner Elementary	125
YMCA-Tempe	50
Tucson	
De Grazia Elementary	140