

40TH ANNUAL REPORT

FOR

FISCAL YEAR 1978-1979



DEPARTMENT OF MINERAL RESOURCES

STATE OF ARIZONA

PHOENIX, ARIZONA

JOHN H. JETT
DIRECTOR



STATE OF ARIZONA
DEPARTMENT OF MINERAL RESOURCES

MINERAL BUILDING, FAIRGROUNDS
PHOENIX, ARIZONA 85007

602/255-3791

October 31, 1979

Honorable Bruce Babbitt
Governor of Arizona
State House
Phoenix, Arizona 85007

Dear Governor Babbitt:

In accordance with ARS 27-106, we are pleased to submit the annual report of the Department of Mineral Resources and the Arizona Mineral Museum. The reports covers the Department's and the Museum's activities for 1978-1979. The Director's Quarterly Reports and a complete financial statement are included, all as required by ARS 27-106.

The mining industry's basic role in society is to provide vital, raw materials that are necessary for our present quality of life, balanced with an equitable evaluation of society's other needs.

It is the Department's responsibility to encourage interest and investment in Arizona's mineral resources. New mineral discoveries can result in new operations providing increased employment opportunities and an expanded tax base.

It is the intent of the Department of Mineral Resources to meet all responsibilities in fulfilling its prime obligation to "aid in the promotion and development of the mineral resources of the State." This will be done in harmony with the changing and expanding goals of society.

Respectfully,

BOARD OF GOVERNORS
DEPARTMENT OF MINERAL RESOURCES
ARIZONA MINERAL MUSEUM

Curtis J. Ritter, Chairman
Curtis A. Jennings, Vice Chairman
Richard C. Cole, Secretary
Ed Peplow
Thomas A. Clary

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BOARD OF GOVERNORS

Curtis J. Ritter - Chairman - Kirkland
(Term expires January 31, 1980)

Curtis A. Jennings - Phoenix
Vice Chairman
(Term expires January 31, 1979)

Richard C. Cole - Pinetop
Secretary
(Term expires January 31, 1983)

Thomas A. Clary - Miami
(Term expires January 31, 1982)

Ed Peplow - Tempe
(Term expires January 31, 1981)

STAFF PERSONNEL

Phoenix Office - Mineral Building, Fairgrounds - 255-3791

John H. Jett	Director
Ann Turney	Administrative Assistant
Clifford J. Hicks	Field Engineer
Ken A. Phillips	Field Engineer
.....	Mineral Resources Specialist
Therese Synakowski	Bookkeeper/Secretary
Aleta Phillips	Secretary
Mariada Worthington	Secretary
William H. Hammers	Custodian

Tucson Office - Room 208, State Office Building - 882-5399

Gerald W. Irvin	Mining Engineer
Mike Greeley	Mining Engineer

Mineral Museum - Mineral Building, Fairgrounds - 255-3791

Arthur W. Bloyd	Curator
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FORWARD

Mineral development is preceded by prospecting and exploration. Therefore, a plan for the development of mining Arizona's minerals should first aim at attracting, encouraging and assisting prospecting and exploration.

Arizona has had in the past and continues to have to this day, a great attraction to the minerals industry. Old mines no longer working, and existing mines, are not only evidence of past discoveries but also can provide a great deal of information to an individual or a group that is looking for the best places to prospect. They have contributed much to the geological knowledge of their areas and of mineral occurrences generally. They can show mineral belts and trends and most of those producing today include or are very near to the small mines of years ago. Some exceptions could be made such as uranium.

It is one of the goals of the Department of Mineral Resources to research for and obtain all data possible, on past and present mineral occurrence and activity and make it available to the prospector and exploration companies.

New discoveries in technology and increasing demands for a product may also stimulate exploration. They may promise mining profits for sub-marginal properties. In-situ leaching, solvent extraction plants, high prices for gold, silver and uranium, and an energy shortage are examples.

However, there is one important right that must be defended, if Arizona's minerals are to be developed, and is very basic to the supplying of this state and our nation's needs. This is the present right, under the federal mining laws, to prospect for, discover, develop and acquire title to valuable minerals in unappropriated, vacant public lands. We work to preserve this right.

ARIZONA'S MINERAL PRODUCTION

According to preliminary figures from the Bureau of Mines, the value of Arizona's 1978 mineral output increased to \$1,659,759,000. This is approximately 7% over 1977. Copper production was just short of 1,000,000 tons. By-product gold, silver and molybdenum showed significant increases in value, with gold alone increasing production. The value of these three by-products was \$202,469,000.

A substantial increase in the value of other minerals, including non-metallics, was experienced. This resulted from both increased unit prices and production. Total value was \$170,837,000, including sand and gravel but excluding copper, gold, silver and molybdenum. The energy fuels are not included. Minerals included are gem stones, clay, gypsum, lime, lead, pumice, stone, asbestos, cement, feldspar, mica, fluorspar, perlite, salt, tungsten, pyrite, and zeolites.

New discoveries and outgoing investigations result in a positive attitude to Arizona's mineral industry expanding and diversifying. Major copper deposit near Florence in Pinal County, near Patagonia in Santa Cruz County, Copper Basin in Yavapai County, Santa Rita Mountains in Pima County, and west of Casa Grande, are being investigated. Possibilities of a major uranium district, potash deposit investigation and considerable interest in non-metallic minerals, all substantiate the minerals industry importance to Arizona.

DEPARTMENT ACTIVITIES

The annual report of the Department must include the quarterly reports of the Director to the Board of Governors. The Director's reports are based on activities of the Department. These reports are included. For ease of reading, the quarterly statistical reports have been consolidated into one and highlights of the reports are provided.

Mineral Resource Conferences

Thirty-five conferences were held with more than 1500 prospector-small miners attending. They were held in Safford, Phoenix, Globe, Yuma, Quartzsite, Congress, Payson, Douglas, and Tombstone. In addition, joint conferences were held with ASMOA in Tucson, Kingman and Arivaca.

The new state recording and location laws, BLM recordation and mapping procedures, and prospecting were the main topics. Speakers from the Mine Inspector's Office and the BLM State Office were utilized.

Publications

Four reports, five directories, fifteen information circulars, thirteen miscellaneous items, and eighteen press releases were published during the year. These publications resulted in four hundred and ninety-nine actual pages and over 107,000 reproductions.

Most of these were mimeographed and assembled in the Department's office and a minor amount was printed at the State's printing press.

Special Projects

The Department received a grant from the U. S. Bureau of Mines. The grant was to start an inventory of known mineral occurrences in Arizona. The name of the project is MILS - Minerals Industry Location System. Rather than add to the Department's staff, the work was sub-contracted to two outside contractors. If the project is completed with no major problems, a contract will be submitted to complete the state. Five counties are presently being researched.

A special sampling program to locate basalt for rock wool was conducted.

Considerable work was done with an engineering group from Belgium on limestone.

Meetings were conducted with the U. S. Forest Service to establish leach pad construction guidelines.

Bulk-density determinations on a mineral were made for the Securities Division of the Arizona Corporation Commission.

Intense propagation efforts, state wide, on new recording regulations and adverse effects of proposed land withdrawals from mineral entry were and will continue to be made.

Meetings and Conferences Attended

The following meetings and conferences were attended: Governor's Commission on Arizona Environment, AEC AdHoc on Mill Tailings, AIME (local and state), Public Land Users Coalition, California Mining Association, American Mining Congress, Arizona Association of Earth Science Clubs, USGS Mapping Advisory Group, Arizona Council of Engineering Societies, Officials of State Mining Associations, Financial Advisory Committee, USBM Industry Briefing, Arizona Geological Society, Western Mining Council, SMEA, BLM and Mining Officials, Tucson Gem and Mineral Show and numerous administration meetings such as Blood Drive, Bond Drive, United Fund, Affirmative Action, and others.

Museum

The Curator led a field trip to Burro Creek. Displays were prepared and loaned to an ASU group, a public library, and a school. 6,000 pounds of material for educational kits was picked up in Kingman. The material had been donated. A mineral collection plus a saw and polisher were donated. A Museum Curator from West Germany visited the Arizona Mineral Museum. The Curator from the International Museum of Natural History, McAllen, Texas, visited the Arizona Mineral Museum and talked with the Curator to learn and observe his methods of providing programs to the schools. A visitor from China was in to acquire gemstones for processing in China. The Curator presented programs on RARE II to Earth Science Clubs, and over 6,000

letters to the Forest Service resulted. Records were kept in the third quarter of visitors who signed the visitor register. People from forty-four states, five provinces of Canada, and seven foreign countries signed. No guess can be made as to what percent did or did not sign the register.

Miscellaneous

Information or assistance was provided to fifteen state and county agencies and thirteen federal agencies. Technical assistance was provided to visitors and contact from twenty-three states and six foreign countries. California with nineteen led the list, followed by Colorado with seventeen. Forty-five different commodities were discussed.

Programs were presented to high schools, community colleges, a university, AIME groups, church groups, civic clubs, lapidary groups, and others.

Workshops on BLM Wilderness and Forest Service RARE II were attended.

MINERAL ACTIVITY

Mining

The Department's Directory of Active Mines, published in December 1978, lists all continuously active mines and sand and gravel producers in the state. It does not list the numerous intermittent operations that sporadically produce small quantities of ore or the many operations attempting to rework the dumps of former producing gold and silver mines.

Copper producers dominate with listing of twenty-two open pit mines and five underground mines. In addition, there were seven copper mines under development and two open pit mines on standby status. Processing facilities include eight smelters (one chemical), two refineries, six electrowinning plants, seven precipitation plants, six acid (sulphuric) plants and two rod plants. The precipitation plants make use of tin (steel) cans and containers recovered from urban waste to produce cement copper.

Five of the copper mines produce molybdenum concentrates with one processing the concentrates into a ferromolybdenum.

Three industrial minerals, asbestos, fluorspar and salt are mined by underground methods. Eight silica mines, one hydraulic sand and a high purity quartz mine were operating.

Other operating mines included stone quarries, perlite, bentonite, coal, dolomite, scoria, and gypsum.

One gold and one silver mine worked continuously, with many operations on an intermittent basis.

Exploration

The Department's Directory of Exploration Companies Active in Arizona, lists forty-eight major companies with offices in the state. In addition, there are many exploration projects being conducted in the state by companies with offices in other states. There are also numerous individual consultants and exploration geologists intermittently working in the state on behalf of their clients both in and out of state.

The active companies listed are scattered throughout the state, with Tucson having the majority of the offices. Other offices are located in Prescott, Bagdad, Phoenix, Casa Grande, Claypool, Douglas, Duncan, Miami and Flagstaff.

Many of the large companies have expanded their area of interest from copper to include non-metallics, other base metals, and precious metals. The diversity of interest is encouraging.

STATISTICS

Prospector-Small Miner Consultations in Office	2,949
Prospector-Small Miner Field Conferences	273
Mine Visits by Engineer.	187
Mineral Resources Conferences Held	35
Prospector-Small Miner Attendees	1,500
ASMOA Meetings	11
Telephone Activity	10,890
Meetings Attended	129
Programs Presented	54
Properties Discussed with Prospectors in Office	274
Mine Files Library and Other Documents	
Used by Public.	1,928
Pages of Mine File Data Copies	4,300
Mineral Identifications	1,058
School Groups and Attendees to Museum	193 - 7,792
Club Meetings at Museum	50 - 939
Total Museum Attendance	48,448
Mineral Educational Kits Made	268
Field Trip Information Provided To	1,542

RECEIPTS AND EXPENDITURES

A Statement of Expenditures is attached. Personnel Funds and Employee Related Funds returned to the State Treasurer were in the amount Ten Thousand Ninety-Six Dollars and Seventy-Three Cents (\$10,096.73) due to resignations of employees.

One Thousand One Hundred Thirty-Five Dollars and Seventy-Five Cents (\$1,135.75) was returned from Other Operating Expenditures since this money had been allocated for the printing of the Laws and Regulations booklet and it was not received by the Department in time to do the printing in the 1978-1979 Fiscal Year. These monies had been transferred from Employee Related Funds for the specific printing project.

One Thousand One Hundred Thirty-Four Dollars and Sixty-Six Cents (\$1,134.66) was deposited to the General Fund of the State. These receipts were from the sale of publications (\$611.56), and reproduction charges (\$466.59).

Donations to the Mineral Museum during Fiscal Year 1978-1979 totaled Sixty-One Dollars (\$61.00).

STATEMENT OF EXPENDITURES THRU FOURTH QUARTER 1979 - FISCAL YEAR 1978-1979

	1978-1979 <u>Appropriation</u>	Spent Thru Fourth Quarter <u>June, 1978-1979</u>	Unspent Balance Fourth Quarter <u>Allotment</u>	Unspent Balance 1978-1979 <u>Budget Year</u>
PERSONAL SERVICES	\$ 216,400.00			
Director		\$ 26,997.88		
Mining Engineers (4)		87,049.82		
Mineral Resources Specialist		14,076.28		
Curator		16,454.10		
Administrative Assistant		10,989.93		
Secretary III		9,889.09		
Secretary II (2)		15,891.49		
Typist II		2,730.85		
Typist I		363.08		
Custodian		9,640.02		
Tour Guides		12,272.64		
		\$ 206,355.18	\$ 10,044.82	\$ 10,044.82
EMPLOYEE RELATED	\$ 37,900.00	\$ 37,848.09	\$ 51.91	\$ 51.91
TRAVEL - In State	\$ 11,000.00	\$ 10,885.47	\$ 114.53	\$ 114.53
TRAVEL - Out of State	\$ 1,300.00	\$ 1,300.00	-0-	-0-
PROFESSIONAL & OUTSIDE SERVICES	\$ 400.00	\$ 400.00	-0-	-0-
OPERATING EXPENDITURES	\$ 20,800.00			
Utilities		\$ 4,869.81		
Office Supplies		1,712.00		
Field Supplies		655.36		
Printing		1,615.82		
Subscriptions		731.00		
Postage		1,540.90		
Telephone		3,118.61		
Technical/Reference Books		746.09		
Maintenance & Repairs (Occupancy)		1,831.37		
Maintenance & Repairs (Equipment)		486.69		
Housekeeping Supplies		455.37		
Print Shop Materials		104.32		
Advertising		47.63		
Conference Expenses		111.00		
Rent		1,500.00		
Miscellaneous		138.33		
		\$ 19,664.30	\$ 1,135.70	\$ 1,135.70
CAPITAL OUTLAY - Equipment	\$ 400.00	\$ 396.71	\$ 3.29	\$ 3.29
TOTAL	\$ 288,200.00	\$ 276,849.75	\$ 11,350.25	\$ 11,350.25



STATE OF ARIZONA
DEPARTMENT OF MINERAL RESOURCES
MINERAL BUILDING, FAIRGROUNDS
PHOENIX, ARIZONA 85007

602/271-3791

ACTIVITIES REPORT FOR THE FIRST QUARTER

FISCAL YEAR 1978-1979

New state legislation affecting the location and recording of mining claims became effective this quarter. There were some major changes. Considerable effort was spent trying to educate the prospector-small miner and others on these changes. An abstract of the new law was prepared for the Department by Mr. John Lacy. The abstract was printed and given wide distribution. News releases along with the abstract were sent to all newspapers in the state and other news media. In conjunction with this activity, the new BLM recordation laws and the approaching deadline on the "grandfather clause" for existing claims were emphasized. Five Mineral Resources Conferences were held with more than 235 attending. Mr. Ted Eyde, consultant from Tucson, provided a good seminar on nonmetallic minerals at the Globe conference. A BLM engineer spoke on patenting a mining claim at the Prescott conferences. This data will be presented at all the conferences possible. It was a controversial and active program. Barite prospecting was taught at one seminar.

Barite has suddenly become a "hot" mineral. It appears it is in short supply for drilling need. We have worked with several out of state companies and individuals on Barite. However, ground mica for the same use was discussed with one out of state company.

Meetings attended with department personnel as participants included Governors Commission on Arizona Environment, Arizona Atomic Energy Commission Ad Hoc Committee Meeting for application for Uranium mill (Union Oil Co), Tucson and Phoenix sections of AIME, Mining Club of the Southwest, SMEA, Public Land Users Coalition, Arizona Association of Earth Science Clubs, State Blood, Savings Bonds and United Fund Drives and Budget. Mr. Curtis Ritter arranged special meetings with Governor Babbitt's representative for an early meeting on our budget request.

Thirty cartons of books were picked up from the ASU Library. If they are not needed in the department library, they will be passed on to one of the community colleges.

Other meetings attended with input provided by department personnel included BLM Wilderness Workshop, Forest Services RARE II Workshop, ASMOA, USGS on mapping Arizona, EIS on Anderson mine road (BLM), and Arizona Council of Engineering Societies student project for State Fair.

First Quarter Activities Report
FY - 1978 - 1979

Programs were presented to a Maricopa Lapidary Society (On RARE II), Bola Tie Association (RARE II), and Gila Valley Gem and Mineral Society (RARE II). This RARE II activity resulted in 6200 pieces of mail by more than 4,000 individuals being sent to the Forest Service. A program was presented to a group of educators at the request of Mr. Jay Dotson, mining professor at the University of Arizona. A school in Tucson was provided with a program.

The department provides a monthly metals price list for Pay Dirt. In addition, information was provided to two TV stations and four major newspapers. The Tucson engineers were interviewed by a business magazine. They were quoted in the publication.

Some unusual discussions included the following: proposed underground tourist trip at Jerome, Research Project on Solar Energy for small, remote mine operation, geophysical prospecting, Internal Revenue Service and what can be considered legitimate expenses when prospecting, crushed smelter slag for sandblasting, zeolitic tuff deposits for kitty litter, Forest Service personnel on mine taxation and its community contribution, copper nodule mining from the ocean floor and its effect on Arizona copper production, development of methods to recover silver from manganiferous silver ores, tungsten mill flow sheets, location of pyrites to be used in copper recovery process, and cyaniding dumps.

Other work projects included distribution of RARE II data to rock shops, weigh and label the mineral display in First National Bank, provide specimens to museum in Mesa, picked up 3-4 tons of minerals in Kingman (donated to the department), which include 14 different minerals for teacher's kits, county index series, proposed MILS study, sampled mica mine and made bulk density determinations (for Securities Division of Corporation Commission), made Arizona commodity map for U. S. Bureau of Mines (to be included in a Profile of Arizona's Mineral Industry), obtained mica to be shipped to U. S. Bureau of Mines research station in Alabama (trying to develop low-water process).

Discussions with out of state visitors were held with people from Denver, Colorado; Waukegan, Illinois; Waterbury, Connecticut; Joplin, Missouri; Midland, Texas; Beatty, Nevada; San Francisco, California; New Mexico; Canada; Princeton, New Jersey; Albuquerque, New Mexico; Lucerne Valley, California; Birmingham, Alabama; Greeley, Colorado; Walnut Park, Pennsylvania; and Rhode Island. Others were not specifically identified as being out of state.

Discussions on prospecting, mining, processing or marketing of minerals and ores specifically includes barite, pyrite, limestone, opal, gold, silver, slat, perlite, tungsten, mica, flatstone, dictonite, rare earths, copper scheelite, fluorspar, zeolite, agate, uranium, and vanadium.

The engineers discussed 58 different properties and 175 mine or property files were used by the public. Books, professional papers and other library material used by the public numbered 60. In addition, many maps were used for study.

First Quarter Activities Report
FY - 1978 - 1979

Publications included mineral reports, directories, information circulars and numerous miscellaneous items. A complete list is attached. Eighteen-thousand eight hundred were offset print and 25,803 sheets were mimeographed.



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ACTIVITIES REPORT FOR THE SECOND QUARTER

FISCAL YEAR 1978-1979

Nine Mineral Resource Conferences were held this quarter with more than 491 attending. Guest speakers included a member of the State Mine Inspector's office and the State offices of the Bureau of Land Management. How to patent mining claims, Federal mine safety requirements, gold prospecting, State and Federal claim recordation procedures and platinum recovery were some of the topics of discussion.

Board member Mr. Clary and the Director attended a two day meeting on Arizona Energy. It was called by Governor Babbitt. Time was well spent in defending nuclear energy, mineral considerations in planning against the department being part of a new energy agency.

Board Chairman, Mr. Ritter, arranged for and participated in a department and budget discussion with representatives from the Governor's office. The director attended with Mr. Ritter.

In addition to the Mineral Resource Conferences, programs were presented to four schools, one in Eloy, one Junior College and two rockhound clubs. Forty-one school groups (1,817 students) were provided programs and tours at the Museum. Six clubs (158 attendees) were provided programs at the Museum. Ten clubs used the Museum for meetings during the quarter.

Other meetings attended this quarter included Section meetings of the AIME, annual AIME State meeting, ASMOA, SMEA, United Way, Governor's Commission on Arizona Environment, Affirmation Action workshops, Finance Advisory--JLBC, Planning Sessions for National SME annual meeting (to be held in Tucson), AEC uranium mill application, U.S. Bureau of Mines Industry Briefing, American Mining Congress and Budget Meetings.

Special meetings were held with U.S. Bureau of Mines on the possibility of an Arizona office, a delegation from Hungary (accompanied by U.S. Bureau of Mines representation), Chief of Intermountain Field Operations office of the U.S. Bureau of Mines, new Regional Mining Engineer for U.S. Forest Service and Geochemical Laboratories.

A special meeting with State offices of the BLM and several mining companies was attended. One engineer spent considerable time with the State Parks to incorporate mining data on the interpretive programs presented at Lake Pleasant.

Second Quarter Activities Report
FY - 1978 - 1979

Meetings were held and research done to assist a group from Belgium wanting to start up a nonmetallic operation in Arizona. This includes limestone, vermiculite, tuff and perlite. This work was done through OEPAD. Other work done with OEPAD included discussion on possibilities of minerals other than copper that might be mined in depressed areas.

Assistance was provided to young Engineers and Scientists for their display at the State Fair. This included set-up, monitoring during the Fair and later removal. Mineral commodity price lists were provided to two publications. This is a continuing monthly project and is printed for benefit of prospectors.

One engineer was on a radio talk show for twenty-five minutes discussing the Department and prospecting. A letter to the Editor of the Republic was published. Several phone calls and letters were received relating to the letter.

Governmental agencies assisted included Pima County Planning Department, Pima County Attorney's Office, F.B.I. (mining properties), F.B.I. follow-up on visit by Hungarians, U.S. Bureau of Mines, Department of H.E.W. (division of International Education), D.P.S. (Criminal Investigation Division), U.S. Commerce Department (International Trade Program), U.S. Forest Service, OEPAD, BLM (Wilderness Study Chief), U.S.G.S., State Legislators, Department of Revenue and Securities Division of the Corporation Commission.

A grant from the U.S. Bureau of Mines for the MILS project was received. It was decided to subcontract the works. Bids were solicited and two contracts were given. One contractor, Coe and Van Loo Engineering Co. was given the contract to research Mohave and Santa Cruz Counties. A second contractor, Wallaby Enterprises, was given a contract to research Pima, Cochise and Yuma Counties. A general orientation meeting was held with the contractors, the Department and Contract Administrator for the U.S. Bureau of Mines. They are off to a very good start.

Activity by out of state companies included a California Company sampling gypsum and limestone, Ohio Company studying black sands, Pennsylvania Engineering Company, New Mexico engineering company, two California companies on barite, New Mexico banks on silver mines, two California engineering firms on environmental studies, Canadian firm drilling prospect, Canadian firm looking at gold and mercury deposits, Colorado company needing mine hoist assistance for Arizona uranium mine, Louisiana group opening up an old shaft, California engineering company on possible mining on Indian Reservations and numerous out of state individuals needing information or assistance on prospecting and properties.

Minerals discussed included mica, gold, silver, copper, platinum, rare earths, diatomaceous earth, pegmatites, tungsten, perlite, slag, gemstones,

Second Quarter Activities Report
FY - 1978 - 1979

iron, strontium and alunite. One engineer went to Bishop, California to visit with the tungsten operations of Union Carbide Corporation. Much valuable data was obtained relating to custom buying ore from small mines. This was done at the engineer's own expense.

Discussion with prospectors and others included exploration, prospecting school bond underwriters on future of minerals in a county selling school bonds, how to use Bruntons, and map mining claims, tabling and amalgamation of gold, mica reserve estimating, Salt River Project on mineral located on Indian lands, water availability for processing plants, EPA dredging requirements, radiometric surveying and locations of leachable copper deposits.

Other properties discussed included the Cerro Colorado, Colorado Clark, Ajax (ore being stockpiled), Edwards (under development with mill), Brenda, Montana (leach dump), Silver Seven, Halloween, Spook, Snowball, Fay Lee, Gunsight Mt., Wren, Bullard, Great Scott, Money Metals, Queen of Sheba (opening up), Oxbow, Greaterville property, Holland, Duquesne, Rose Tungsten (made a shipment), Mystic Mine (will be sinking shaft), Dos Cabeza area, Spring Creek (being cleaned out, retimbered and sampled), Mica Mule, Golden Anchor group, Jane group, Little Daisy (table and amalgamation), numerous barite properties, lead-moly properties, Half Hitch, Density, William Shaft (new headframe being retimbered), L. V. group, Lucky Stop group, Four Bagger group, Dawn, Kimberly and Weekender groups, Phantom, Black Bottle, Reymert and Stardust.

A research project to map and tabulate known copper reserves in Arizona was compiled. The data was also used in the copper report.

Publications included four directories, five information circulars, one report and sixteen miscellaneous items. 1200 sheets were printed at the printing office. 34,349 sheets were mimeographed and assembled in the Department's office. A complete list of publications is attached. A statement of expenditures for the quarter is attached.



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ACTIVITIES REPORT FOR THE THIRD QUARTER

FISCAL YEAR 1978 - 1979

Eight Mineral Resources Conferences were held this quarter with more than 369 attending. Programs were presented on modern prospecting methods, gold deposits, how the Federal Mine Safety Act affects the small miner-pro prospector, detailed claim staking and the new laws and regulations. A BLM engineer spoke on patenting mining claims. Specific problems of individuals relating to their own claims were also discussed.

Other meetings attended included ASMOA, AIME, SMEA, Arizona Geological Society, Financial Advisory Committee, BLM Wilderness Hearings, Affirmative Action Workshops, Arizona Society of Professional Administrators (environmental administration), Tucson Gem and Mineral Show (looked for replacement specimen), special BLM workshop on resource management policy and a special advisory meeting with the USGS on 1980 Arizona mapping. The Director attended a meeting with Governor Babbitt as a member of a mining advisory group. Programs were presented to the Tucson and Ajo AIME sections, Tucson, Arivaca and Congress ASMOA Councils, Grand Canyon College, five earth science clubs, Scottsdale Community College class, Boy Scout group, and one men's club. This does not include programs presented at the Museum. A career counseling session was presented to a West High School group.

One engineer was interviewed on a Yuma radio station regarding Mineral Resources Conferences. Some surplus books and technical publications were donated to the libraries at Quartzsite, Central Arizona College and Arizona Western College.

A representative from the State Mine Inspector's Office presented a lecture to the department's technical staff. This led to certification on the "self-rescuer" which is mandatory equipment today if the engineers go underground.

Yavapai College expressed interest in the Department teaching a prospecting class at the college. This has been done in the past.

Mrs. Turney assisted the AMIGOS organization with their annual meeting in Tucson.

At the request of a rock wool manufacturing company, a basalt sampling program was conducted. Final samples were air-mailed to the customer at their expense. A second company came in with the same request.

Third Quarter Activities Report
Fiscal Year 1978-1979

Some out of state companies that were in contact with the Department included: Resources International, Englewood, Colorado; L & B Partners, Orange, California; West Coast Precious Metals, California; Plaza Mining Resources Int., Colorado; Nuclear Resources, Greenwich, Connecticut; Natural Resource Company, Fresno, California; Triangle Mining Company, Boise, Idaho; Bever Exploration Company, Canada; U. S. Development Company, Las Vegas, Nevada; Standard Metals Company, Colorado; Continental Materials Company, Colorado; Rocky Mountain Metals Refining, Salt Lake City, Utah; Pickands Mather Company, Cleveland, Ohio; Occidental Exploration Company, Denver, Colorado; Utah Power and Light, Salt Lake City, Utah; Mineral Resources Ltd., Atlanta, Georgia; Cotter Corporation, Denver, Colorado; Western Mud Sales, California; MPH Consultants, Parker, Colorado; Pfizer Chemical, Lucern Valley, California. Other companies included Coastal Mining Company, U. S. Borax Inc., Tech Associates, Southwestern Exploration Associates, Sunburst Mining Company, Tucson Gas and Electric, Nalco Chemical Company, IROPA Industries, Gulf Chemical and Metallurgical Company, ASARCO, AMOCO, Duval Corporation, Centroid Consolidated Mine, Natural Resources Development Company, Greater Swansea Mines Inc., Arizona Desert Minerals, Arizona Mining and Smelting, Western Exploration Inc., Lock Rock Corporation, GMS Mica Company, Beversdorf Mining Company, Arizona-New Mexico Land and Cattle Company, Mt. View Mining and Milling Company, Band A Mining Company, Crandall Refining Company and Space Age Mica.

In addition to companies listed, assistance was given to out of state prospector-miners from Grand Junction, Colorado; Frisco, Colorado; Denver, Colorado; Pittsburgh, Pennsylvania; Oregon; Palo Alto, California; La Cresenta, California; Albuquerque, New Mexico; and Canada. Discussions and assistance included placering, ore buying, rock hauling, ASARCO slag, mining rhyolite, development of fluorspar mine, non-metallic limestone for scrubbing, and gold-silver mining.

Some unusual discussions involving the special expertise of the engineers included mining's demand on water, production costs of in-situ leaching, gold metallurgy, pottery clay, patent application analysis for BLM, OME loans, mine taxation, how to handle a "missed hole", black sand placers with titanium, rutile and ilmente, extralateral rights, sample preparation, cyaniding, lost mining districts, custom mill possibilities, tungsten concentrating and refining and potential coal fired power plant year Yuma.

A museum curator from West Germany visited the museum. The curator of the International Museum of Natural History, McAllen, Texas was in to study our school programs. Considerable time was spent with visitors from China wanting to purchase gem material for processing in China.

The Department engineers called a meeting with Forest Service Supervisors and Dr. Dave Rabb of the Arizona Bureau of Geology and Mineral Technology. The purpose was to establish guidelines in building leaching pads for cyaniding operations. This resulted from numerous proposed operating plans being submitted to the Forest Service for approval.

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Other agencies assisted included the following: Pima County Zoning, Arizona Department of Revenue, State Land Department, Bureau of Indian Affairs, several County Recorders, Securities Division, Senate Research Staff, Yavapai and Prescott Indian Tribal Planners, U. S. Bureau of Mines Spokane, Washington and Minneapolis offices, Bureau of Land Management Yuma District Engineer and Phoenix District Engineer, U. S. General Accounting Office, Maricopa and Yavapai County Sheriff's Department and House Interior and Insular Affairs Committee.

Mineral commodities discussed included barite, scheelite, gold, silver, copper, sphalerite, uranium, fluorspar, tungsten, molybdenum, platinum, gold telluride, basalt, sillimanite, kyanite, andalusite, diatomite, marble, clay, talc, pegmatites, hi-purity quartz, slag, feldspar, mica, diatomaceous earth, zeolites, opal, jasper and mica.

Eighty three mines, prospects or properties were discussed, 595 mine files and 172 other references were used by the public, 1,578 pages of material were reproduced.

The museum has a voluntary sign-in register and we do not know what percent of the visitors do sign in, however, it was interesting to note that there were visitors from forty-four states and seven foreign countries who signed the register this quarter. Five Canadian provinces were also listed.

Publications included one directory, three circulars and twenty-four miscellaneous items. Fifteen thousand five hundred and ninety sheets were mimeographed and assembled by the staff. A complete list of publications is attached.

A statement of expenditures is attached. Nineteen hundred (\$1900.00) dollars were transferred from Employee Related Expenditures to Professional and Outside Services and Other Operating Expenditures. This provides funds for revising and printing of the Laws and Regulations.



STATE OF ARIZONA
DEPARTMENT OF MINERAL RESOURCES
MINERAL BUILDING, FAIRGROUNDS
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ACTIVITIES REPORT FOR THE FOURTH QUARTER

FISCAL YEAR 1978-1979

Thirteen Mineral Resources Conferences were held this quarter with more than 375 attending. Prospecting, gold lectures, new BLM and State regulations, RARE II, BLM proposed wilderness study, gold prospecting - sampling procedures, and how to patent mining claims and mine safety were chief topics of discussion. Guest speakers were from the BLM State Office and the State Mine Inspectors Office.

Conferences were held in Ajo, Douglas, Congress, Globe, Kingman, Patagonia, Payson, Phoenix, Quartzsite, Safford, Tombstone, Yuma and Tucson.

Other meetings attended by the Director and or technical staff included Public Land Management Alliance, BLM wilderness open house, Maricopa and Tucson chapters of AIME, Tucson AIME Board, SMEA, Bolo Tie Society, Bond Drive, Blood Drive, Governor's Budget meeting, Mineral Extraction Task Force Committee (2) (CAG), Mining Sub-Committee (2) (NACOG), Inspiration Consolidated Copper Company luncheon, Valley National Bank Mining meeting, Wild and Scenic River open house, Payson chapter of Western Mining Council (field engineer elected to Board), Special meeting of BLM, Dept. of Mineral Resources and the Arizona Mining Association, USBM Liaison officer and special group, and ASMOA meeting in Tucson (2), Congress (2), and Kingman (2).

Other special meetings and events included Chairman Ritter and the Director going to Denver and meeting with the U. S. Bureau of Mines to discuss MILS grants, presenting a program to the Natural Resource Youth Camp in Prescott, judging an engineering project at the Glendale Community College, programs presented to Carefree Kiwanis, Methodist Church Group, Mary Moppets group and the Bell Bikers Club, a special program presented to an area meeting at Payson of Economic Crime Investigators Association, special mineral display for ASU faculty wives meetings, programs for Glen Rockers and Stoneagers Clubs, Mineral display for a public library and sponsoring a student in a Maryvale Elk Government Project.

The Curator led a field trip of 78 people to Burro Creek.

Two of the field engineers visited the Reno Nevada Metallurgical Laboratories of the U. S. Bureau of Mines. The Nevada State Bureau of Mines was visited. A field trip to one of the large producing gold open pit mines was made. The purpose of the trip was to learn more about cyaniding gold and the recovery of the gold from solution. The Director attended two meetings held

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with Governor Bruce Babbitt and a Mining Advisory Group. A third meeting was held with one of the Governor's aides to discuss wilderness proposals.

The statistical section shows the staff met with 631 members of the public, met with 119 prospectors-small miners in the field and made 93 mine visits. Much of the request for assistance included the standard claim staking, panning, sampling, mapping and similar routine activities. Some of the unusual projects and discussions involved the following:

1. Researched data for major company in Denver to assist in evaluating Arizona Copper Report.
2. The use of Arizona mined Feldspar to make ceramic highway markers in Arizona.
3. Assisted a Tulsa, Oklahoma Company in locating and establishing small mining operation for zeolitic type kitty litter. It will be used for ammonia adsorption.
4. Meeting with Forest Ranger and prospectors to solve a problem of differences.
5. Consulted with Texas Company on possibilities of purchasing a mica plant and mine.
6. Worked with consultants to sample underground vein mine. Sufficient sampling for mill lab tests and evaluation.
7. Mapped underground mine for sampling.
8. Evaluated technical papers for AIME.
9. Evaluated proposed mining plans submitted to Forest Service.
10. Provide monthly commodity price lists for publication in Trade Journal.
11. Possibilities of turquoise and petrified wood for export to Japan.
12. Solve problems of prospector finding gold on state land.
13. Patenting of marble claims and marketing of end product.
14. Design and construction of leach pads.
15. Ore-sorting equipment possibilities with an English firm.
16. Leaching chemicals with out of state manufacturer.
17. Small prospects and remote sensing techniques with out of state company.

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18. Establishment of Perlite popping plant - evaluating usable equipment.
19. How to build a sluice-box.

Minerals discussed with various prospectors and small miners included uranium, tungsten, molybdenum, asbestos, copper, gold, silver, lead, zinc, selenium, mica, wolframite, scheelite, tellurides, cobalt, marble, chabazite, perlite (a light weight aggregate), manganese, opal, barite, fluorspar and mercury.

The Mineral Museum picked up 6,000 lbs. donation of material including iron-wood, quartzite, pink marble, jasper and others. Museum picked up donation of minerals for specimens display and teachers kits, saw and polisher.

Some of the out of state contacts and discussions are as follows: Colorado and Geology, New Mexico and dewatering shafts, Minnesota on royalties and specific mines operating, California and gold mines, New Mexico and promoters, Iowa and sluice boxes, New Mexico and gold mining, New Mexico and mine hoist, California and oxide coppers, Colorado and prospects, Nevada and prospects, Kansas and a gold mine, California and asbestos, New Mexico and a gold mine, Utah and withdrawals, Minnesota and a gold mine, Michigan and a gold mine, Colorado and active mines, Colorado and evaluation. New York and claims, England and equipment, Pennsylvania and Beryl, Canada and silver leach, Wisconsin and association placers, New Mexico and financing gold mines, Michigan and gold mines, Illinois and prospecting, California and amalgamating, Colorado and uranium, Pennsylvania and chemicals, Illinois and gold claims, Ohio and iron ore, Nevada and Perlite.

Governmental agencies using the Department's services includes Maricopa County Defense and Emergency Services, U. S. Bureau of Mines, OEPAD, JLBC Financial Advisor, Australia Consulate General, County Recorders, CAAG, NACOG, a Senator and a Congressman, Dept. of Revenue, BLM and Dept. of Energy.