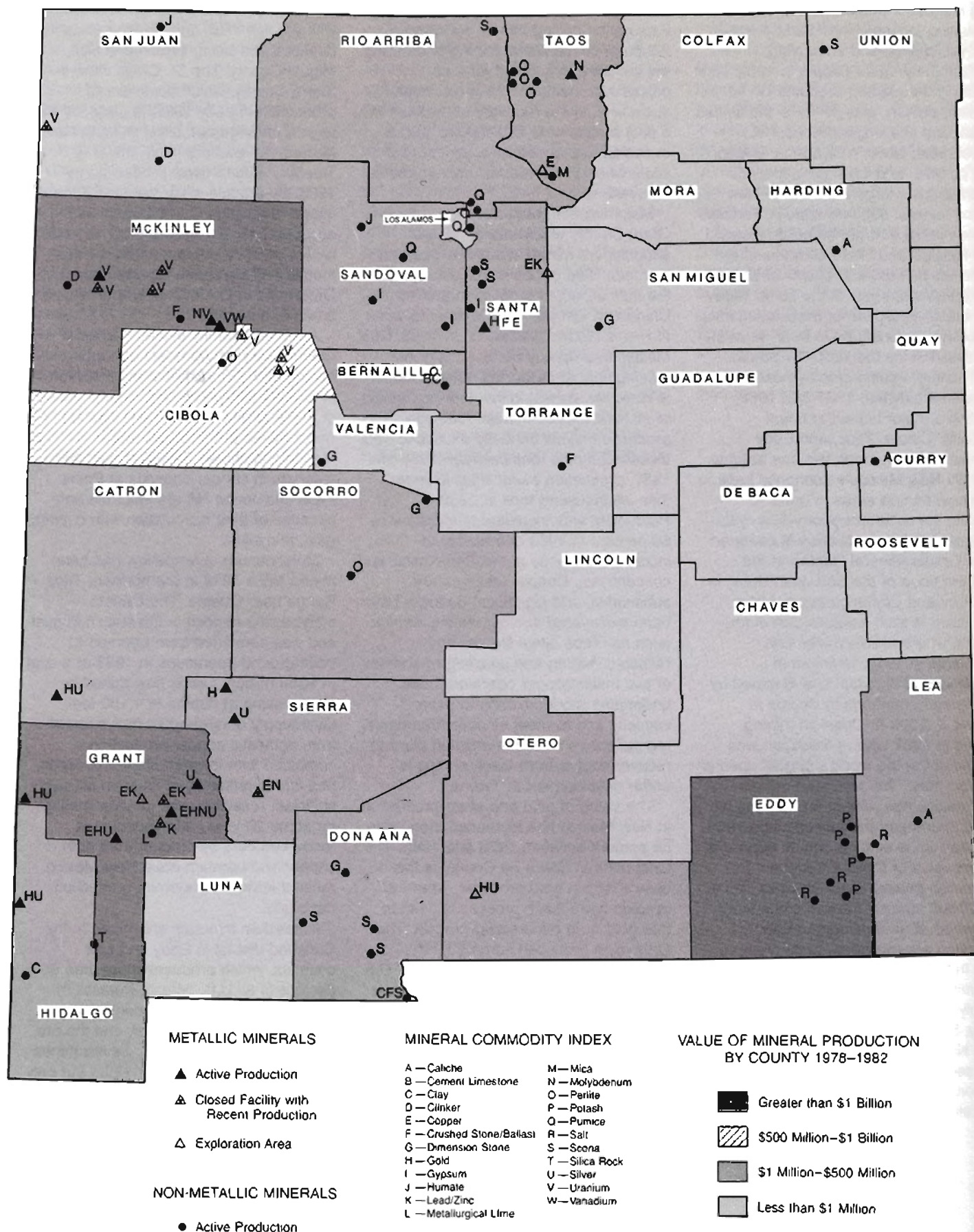


Mineral Mining



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Mineral Mining

Mineral mining (except of gas, oil, and coal) is a major industry in New Mexico, accounting for more than \$234.4 million in annual payroll and employing approximately 8,800 people in 1982. New Mexico is the leading producer of uranium, potash, and perlite in the United States, and is a major producer of copper, gold, silver, molybdenum, lead, zinc, pumice, and vanadium. Metallic minerals occur largely within the New Mexico mineral belt in a zone of Tertiary igneous rocks that trends northeastward from Hidalgo and Otero counties in the southwest to Taos and Colfax counties in the northeastern part of the state. With the notable exception of precious metals, all sectors of mining have been severely depressed since the 1980-81 period. Total mineral mining employment fell by 32 percent between 1981 and 1982, creating a major impact in Grant, McKinley, Cibola, Taos, and Eddy counties. Recent emphasis has been to diversify New Mexico's economic base in traditional mining areas in order to alleviate the recurrent boom-bust cycle.

Major uranium production is centered in the Grants Mineral Region at the southern edge of the San Juan Basin in McKinley and Cibola counties. Minor production is from western San Juan County, where uranium was first discovered in 1918. Uranium in sandstones of Jurassic age is mined by underground methods to depths in excess of 3,000 ft. Open-pit mining ceased in 1982 when production was phased out at the world's largest open-pit uranium mine, the Jackpile-Paguate.

New Mexico has ranked first among all states in uranium production since 1956, and uranium is second only to copper in current value of metal production. Production peaked in 1978, when more than 8,500 tons of uranium oxide were recovered. Both molybdenum and vanadium are recovered from uranium ores in New Mexico. Forty-five mines and five mills were operating during 1980 to supply both domestic and foreign nuclear utility. Since then, the uranium industry in both New Mexico and the United States has severely declined, largely in response to numerous nuclear reactor cancellations since 1979. By 1983, only

12 mines and two mills were in operation, all in McKinley County. Exploration drilling has all but ceased. Although conventional mining and milling will continue to account for most production, in situ leaching has been successful in the recovery of uranium at a pilot project near Crownpoint, and is expected to proceed on a commercial scale when the domestic uranium market recovers.

Major copper production is centered in Grant County where disseminated deposits are mined, mainly by open-pit methods. Two deposits that account for the bulk of recent production are the Chino and Tyrone. The Continental mine at Fierro ceased production in 1982. New Mexico traditionally ranks among the leading copper-producing states; copper is currently highest in value of production of all New Mexico metals. Although production levels annually exceeded 120 thousand metric tons between 1978 and 1981, production plummeted to fewer than 76 thousand tons in 1982. Production was expected to increase by 60 percent in 1983 due mainly to increased capacity at the Chino mine and concentrator. Copper reserves are substantial, and significant deposits have been discovered in older mining districts such as Pinos Altos, Pecos, and Hillsboro. Milling and smelting operations of two major copper operators have undergone modernization to expand capacity and to meet strict environmental regulations. A solvent extraction plant to recover copper from leach dumps is under development at Tyrone.

The value of gold and silver production in New Mexico has increased more than 66 percent between 1978 and 1982. The Ortiz mine in Santa Fe County is the state's largest gold producer, where a cyanide heap leach process is used to free gold from mineralized breccia. The Ortiz mine produced some 50,000 ounces of gold in 1982 (4 percent of U.S. production). Gold is refined from copper ores in Grant County, with minor production reported at mines in Sierra, Hidalgo, and Grant counties.

Several mines in the Hermosa district of Sierra County began production of gold and silver in 1983. Silver is mined in

the Georgetown district of Grant County, and both gold and silver, which occur with copper, lead, and zinc in sulfide deposits, are being explored in San Miguel County. The St. Cloud mine in Sierra County, which commenced production in early 1982, is currently the largest underground silver mine in New Mexico. An ancillary mine, the U.S. Treasury, began silver production in 1983. By-product silver from the Tyrone copper deposit in Grant County has accounted for the bulk of production in recent years. Exploration for precious metals has also been reported near Orogrande in Otero County and in other areas of the state.

A limited quantity of zinc has been produced as a by-product of copper mining at the Continental mine at Fierro in Grant County. The severe depression of the lead and zinc markets has kept major mines at Vanadium and Magdalena closed. Newly proven zinc reserves in copper deposits at Pinos Altos and Jones Hill are valuable only because of their association with copper, gold, and silver.

Molybdenum, a ferroalloy, has been mined since 1918 in the northern Taos Range near Questa. The Questa molybdenite deposit is the state's largest and was converted from open-pit to underground operations in 1983 at a cost of \$250 million. Ore is now mined by block-caving at depths to 1,100 feet. Oversupply of by-product molybdenum from domestic copper production, combined with lowered steel production, has forced cutbacks at Questa, although sufficient reserves exist to allow mining for some 20 years. Molybdenum is recovered as a by-product from both copper and uranium ores. New Mexico ranks third in molybdenum production nationally.

Potassium minerals are mined in the Carlsbad district in Eddy and Lea counties, which produces more than 80 percent of all U.S. potash. Potassium salts are contained in evaporites at depths of 800 to 2,200 feet, and the ore is mined by vertical shafts. Seven mines were in production in early 1982, but only five remained in production through 1983 at reduced levels in response to low

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world demand. Potash production declined 5 percent during 1982 and is expected to decline further in 1983. Improvements to mine, plant, and transportation facilities are under way to make New Mexico potash more competitive.

Next to potash, perlite is the most valuable nonmetallic mineral mined in New Mexico, and the state has led the nation in perlite production since 1957. The lightweight volcanic glass is produced at three mines in western Taos County and one mine each in Cibola and Socorro counties. Production has declined by 31 percent in New Mexico since 1979 in response to the nationally depressed construction industry. Between 1978 and 1983, New Mexico accounted for more than 85 percent of U.S. perlite production.

Other lightweight volcanic stones, pumice and scoria, are mined principally in Santa Fe, Cibola, Rio Arriba, Doña Ana, and Union counties. Pumice production in New Mexico accounted for 23 percent of total U.S. production in

1982 while contributing 49 percent over the five-year period between 1978 and 1982.

A wide variety of stone products and raw materials are produced in the state, among them limestone for cement, metallurgical lime, and crushed aggregate; travertine or onyx marble and flagstone for decorative dimension and paving stone; basalt, granite, quartzite, and caliche for crushed and broken stone. In 1983 the startup of a new grinding and flotation mill for bulk mica at Velarde was announced; it will double the existing capacity to 40,000 tons per year. New Mexico is a major mica producer, ranking second nationally in 1982. Gypsum is mined from open pits in the Todilto Limestone of Santa Fe and Sandoval counties for use in wallboard, cement manufacture, and as a soil amendment. Both rock salt and salt from solar evaporation of underground brines associated with potash are produced in Eddy and Lea counties. One cement plant operates near Albuquerque, and lime, clay, and silica are produced in

southwestern New Mexico for metallurgical use.

New Mexico has virtually inexhaustible resources of high-quality sand and gravel, which are used in highway construction and the building industry. Gravel deposits, too numerous to depict here, are worked particularly along the Rio Grande in the Albuquerque and Las Cruces areas, and to a lesser extent along the San Juan, Pecos, Canadian, Gila, San Francisco, and Mimbres rivers. Clinker deposits from fused shale around coal seams in the San Juan Basin and caliche deposits on the Llano Estacado or High Plains east of the Pecos River must substitute in those areas that are notably deficient in gravel and hard rock. Although no deposits of any tonnage are known, the search for occurrences of high-silica sand could receive added impetus as it is a basic raw material for glass manufacture, photovoltaics, and semiconductors.

William O. Hatchell

New Mexico Mineral Production Summary

Mineral	1978-1982 Production			Cumulative Historical Summary	
	Quantity	Value (\$1 thousands)	National Rank	Quantity	Value (\$1 millions)
Uranium	33,845*	1,833,296	1	155,424*	>3,000
Copper	671,105**	1,248,255	3	4,700,000**	4,621
Potash	8,942,000**	1,167,141	1	60,200,000**	2,737
Molybdenum	***	***	4	***	>100
Gold	168,791****	70,440	7	2,400,000****	134
Silver	***	***	7	88,095,000****	165
Perlite	2,600,000*	70,126	1	9,500,000*	133

*short tons

**metric tons

***withheld to avoid disclosure of proprietary data

****troy ounces