

1980 MINING AND EXPLORATION DEVELOPMENTS
IN MONTANA

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by
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Mineral exploration activity continued at a high level in Montana during 1980, extending the trend of the past few years. Major mining activity was interrupted by the 5-month copper workers' strike against The Anaconda Copper Company, but other mining activity was little affected by the national recession and continued strong throughout the state. According to statistics released by the Department of State Lands, license and permit volume increased about 20 percent overall, with the greatest increases reflected in exploration licenses and small-mine operator permits. There are currently 75 active mine-operation permits issued in Montana, and six of these were issued during 1980. Thirty-eight companies or individuals were active in exploration in the state, 12 for the first time, and these 38 firms or individuals were active in 61 projects. One thousand small-mine operator permits were issued, and of these 250 were new permits.

Increased mining and exploration activity is also reflected in increased state revenues, which have been rising dramatically during the past few years. During the last decade, net proceeds and property taxes related to mining have increased from 30 to 100 million dollars; assessed valuation of real and personal property related to patented claims, property improvements, and machinery jumped from approximately 100 to nearly 300 million dollars. Revenue from coal mining increased from less than one million in 1970 to an estimated 25 million dollars in 1980, while oil and gas income rose from 3.5 to 10 million dollars; all other sources remained about the same.

PRODUCTION

Major news items and events of interest to the mineral resource community during 1980 included:

. . . the decision by The Anaconda Copper Company, a subsidiary of ARCO, to shut down the copper smelter at Anaconda, Montana, after 80 years of operation, and the related closing of the refinery at Great Falls, due to the prohibitive cost of upgrading antiquated equipment and meeting Federal air-quality standards. Although closure represents a significant loss of U.S. smelting and refining capacity and the loss of many jobs in western Montana, the shutdown is not expected to affect mining operations at Butte.

. . . the increasing interest and favorable outlook for oil and gas potential in western Montana's overthrust belt. Several test holes were completed in western Montana during the year, and great interest continues to surround the recently completed deep test by Amoco, near Wisdom, in Beaverhead County.

. . . passage of Initiative 84 during the general election by an extremely close margin. The initiative to ban disposal of radioactive waste products in Montana was widely regarded as anti-mining, and was first reported as defeated by 2,000 votes. The final vote tally released by the Secretary of State indicated 172,909 votes were cast in support of the measure, and 172,493 votes were cast against, a margin for passage of 416 votes. Legislation for the initiative remains to be written by the 1981 Legislature.

. . . the intent of the state of Montana to finance a new High Tongue dam adjacent to the antiquated and allegedly unsafe Tongue River reservoir near Decker, by leasing

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and mining coal present at the proposed reservoir site, with coal-lease revenues earmarked to partially repay bonds sold to finance the new dam construction. About \$50 million in coal-lease revenues is estimated to be applicable to this project.

. . .in education, the Montana Mining and Mineral Resources Research Institute/Montana Bureau of Mines and Geology joint effort at Montana Tech to provide support to small-mine operators, continued to provide a broad range of services and advice to operators on geology, mining methods, milling and processing techniques, reclamation practices, and permitting procedures, in addition to limited metallurgical bench testing and analytical services on Montana ores. Placer mining short courses emphasizing hands-on experience have been offered in Billings, Butte, Kalispell, Great Falls, and Missoula, and consistently are oversubscribed.

. . .the National Materials and Minerals Policy, Research, and Development Act of 1980, passed by Congress and signed into law by the President on October 21, 1980, places new and heightened emphasis on the significance of non-fuel mineral policy and domestic strategic and critical mineral resources. This new legislation is expected to have a major impact on technological research and development of Montana's many strategic and critical mineral resources.

PRECIOUS METALS

Montana's precious metal mining, production, and exploration industry experienced a mixed year. Production of gold and silver was strongly curtailed because of the nationwide strike against the copper mining companies and the loss of byproduct gold and silver from Butte ore, reputed to contain an average of 0.2 oz/ton silver and 0.0028 oz/ton gold, with the announced closing of the smelter in Anaconda and the refinery in Great Falls. At the same time, Montana has been the scene of greatly revived interest in precious metal mining and recovery by small-mine operators.

Exploration and development activity continued in the Stillwater Complex by The Anaconda Copper Company and Johns-Manville/Chevron, who are exploring and developing the platinum-gold resources in the complex. During the year, Anaconda completed its development drift at the Mouat millsite. Johns-Manville began work on a new portal on Chrome Mountain—the Frog Pond project—at the west end of the complex, where ore is reputed to be 20 to 50 percent higher grade than on the east end of the complex. Drilling, sampling, and experimental stoping continue in order to develop samples for metallurgical testing and to refine grade estimates. The chrome stockpile in the Stillwater was reduced by shipments of ore from Columbus by unit train, but no exploration or production activity was recorded on chrome deposits during the year.

Gold Cup Mining Company's planned gold-silver-platinum openpit operation in the Crazy Mountains has been postponed because of delay in receiving Forest Service approval. In the Little Rockies, mining and development activities continued at Landusky and Zortman, with Newmont Mining continuing contract mining on its holdings.

Ranchers Exploration and Development Corporation announced plans to develop an openpit gold mine—the Golden Grizzley—north of Cooke City in the Lulu Pass area between Yellowstone National Park and the Absaroka-Beartooth Wilderness. Company estimates based on drilling indicate a half-million-ton orebody, averaging 0.2 ounces of gold per ton.

Western Silver Development Company, lessee of the Nancy Lee silver mine near Superior, continued to develop vein silver deposits, with vein ore reported to average more than 10 ounces

of silver per ton. Anaconda Company's Flathead mine, under lease to Condon and Kelly, was the site of considerable work this summer through an agreement with Superior Oil of Canada. Work has proceeded to the point where an application for a mill to process silver ore is being actively considered. Production from the Portal silver mine, operated by Black Pine Mining, was anticipated to increase from 9,000 to 18,000 short tons per month. Management of this modern, trackless mine is considering installation of a mill to process ore in addition to the existing optical ore sorter. Midnite Mines is also studying construction of a mill employing a combination of cyanide leaching and electrolysis at the Polaris silver mine.

Several gold heap-leaching operations were active during the year. In the Little Rocky Mountains, full-scale leaching operations were initiated by Zortman Mining Company on three-quarters of a million tons of ore near Zortman, and a similar amount of ore was successfully leached by Landusky Mining Company at its Landusky-based operations. . .leaching began at the Mammoth mine in the Tobacco Root Mountains in what appears to be a well-planned and efficient operation that recently produced the first bullion. . .favorable mill tests of stockpiled ore from the Gregory mine south of Helena indicate that most of the gold and much of the silver can be recovered by modified heap-leach techniques. . .the heap-leach operation at the Tourmaline Queen in the Elkhorn District was reported in operation this year. . .the mill in the Rochester District has been optioned, and some thought is being given to adding a cyanide circuit. No gold production was recorded from the more than 50 patented claims in the district, but Noranda is reported to have staked claims in the Rochester Basin. . .mill rebuilding is expected to begin shortly on the Goldsil-Ranchers mill at the old Drumlummon mine near Marysville. The cyanide leaching mill was damaged by fire in July.

High gold prices have stimulated considerable interest in Montana's placer gold deposits, both by major corporations and small-mine operators. International Nickel has leased the Ruby placer situated 10 miles southeast of Wisdom in Beaverhead County on Ruby Creek. Under an option to explore and lease, INCO has drilled 30 holes to bedrock and removed 1,000 yards of gravel as part of its evaluation of the placer potential of this deposit. . .Playgo Mining has proposed mining Tertiary placer deposits south of Virginia City in the Gravelly Range. Recovery of significant gold value there may be hampered by substantial clay in the gravel.

1980 saw continued production, exploration, and permitting activities at Montana mines operating on complex precious metal-base metal ores. Kootenai National Forest officials approved ASARCO's four-year mineral exploration plan for the Chicago Peak area of the Cabinet Mountains Wilderness Area. ASARCO's plan to search for copper-silver ore includes drilling 36 core holes over the 149 claims held. . .at the Argentine mine near Wickes, Mascot Silver-Lead Mines, Inc., is developing a recently discovered lead-silver-gold vein averaging 11.2 percent lead, 11.6 ounces silver, and 0.1 ounce gold. The company also plans to reopen its Meadow mine near Helena, where assays reportedly indicate over 200 ounces of silver per ton of ore. Summit Silver is exploring at the Baltimore silver mine northwest of Boulder, Montana, a major past producer of gold, lead, and copper, with a production record in present-day value of over six million dollars. Viking Exploration Company of Denver has reopened the Spotted Horse gold mine in the Judith Mountains, a major gold producer in the late 1800s and early 1900s. As part of its effort, the company has contracted with Helena Silver Mines, Inc., to rebuild its mill to process Spotted Horse ore.

BASE METALS

Major news of the year was the decision by The Anaconda Copper Company, a subsidiary of ARCO, to close the copper smelter in Anaconda and the refinery in Great Falls. The closure represents a major loss of domestic smelting and refining capacity in addition to the loss of 1,500

jobs in western Montana. According to company representatives, the closure came as a result of the prohibitive costs, estimated at \$300 to \$400 million, of retrofitting the smelter to meet Federal air-quality standards. Officials indicated the closure decision will not affect the mining operation at Butte, and it is reported that Butte concentrate will be shipped to Japan.

At Butte, Anaconda announced its application to the state Air Quality Bureau to build a \$6 to \$8 million addition to the Weed Concentrator to process molybdenum ore. The addition would include flotation and dryer sections that would extract 30 tons of concentrate daily, containing about 50 percent molybdenum.

Exploration and development activities for molybdenum remained at a high level during the year. Increased exploration activity and property acquisition by American Metals-Climax in the Neihart-Hughsville area have led to rumors of a major molybdenum discovery on the Gwen McBride property adjacent to the Block P mine. Cyprus Mines and Moly Corp are actively exploring in the East Pioneers. The U.S. Geological Survey announced discovery during the year of zones in the Pioneer Mountains likely to contain moly deposits associated with anomalous amounts of silver, copper-lead-zinc, tin, and tungsten.

Union Carbide has apparently found more tungsten in the Brown's Lake deposit near the old Minerals Engineering openpit property that operated during the fifties. No production is reported, but the company has completed considerable drilling. Homestake has been active at Jardine on property formerly leased by Anaconda. Extensive surface work and some underground activity are reported, including long hole drilling.

Uranium exploration has slowed along with the drop in price and passage of Initiative 84. Exxon is reported to have completed about a dozen drill holes in Tertiary sedimentary rocks on Parrot Bench, at the north end of the Tobacco Roots, with encouraging results. BurWest recently ceased exploration in the Helena valley in Broadwater County.

U.S. Antimony plant west of Thompson Falls continued steady production in response to a diversified market demand. The company has made application to build a second conventional mill, on Eddy Creek between Plains and Thompson Falls, to process gold-silver-lead ore.

INDUSTRIAL MINERALS

During 1980 the national economic downturn had a noticeable impact on Montana industrial mineral producers. Operators producing and selling industrial mineral products used in the construction and building industries experienced somewhat lessened demand, but major facilities such as U.S. Gypsum's Heath mine, Cominco's Warm Springs phosphate mine, and W. R. Grace's Libby vermiculite mine remained steady producers.

Barite—Montana Barite Company continued to mine barite at several deposits in western Montana, and to mill barite at its Missoula facility where the company is tripling mill capacity. Barite milling capacity will also be increased in the Missoula area by construction of a new mill at Wheeler Village. St. Regis Company, which purchased the Mullen barite mine during the year, plans to continue mining and will begin milling of barite from western Montana.

Bentonite—General softening of the domestic steel industry during the year reduced demand for bentonite in the taconite pelletizing process, which together with the manufacture of drilling mud, is a major market for Montana bentonite. Federal Bentonite Company closed its plant near Glasgow, which has not yet reopened at this writing. American Colloid continues to mine bentonite south of Malta and to operate its mill at Malta on a reduced scale, with plant production reported to be near 10,000 tons per month.

Gypsum—The U.S. Gypsum mine at Heath continued steady operation and did not appear much affected by the national recession. This mine, with substantial reserves close to the plant, is the single largest taxpayer in Fergus County. Two openpit gypsum mines are reported operating at Raynesford, and shipping gypsum to Ideal Cement at Trident, Montana, and to Kaiser Cement at Prickly Pear near Helena.

Talc—Production of Montana talc from the Beaverhead and Yellowstone mines (Cyprus Industrial Minerals) and the Treasure Chest mine (Pfizer, Inc.) is expected to decrease slightly this year because of decreased demand from paper, paint, and ceramic industries affected by the recession. Established producers and other companies not now mining talc in Montana continue to explore for new talc deposits and to develop known deposits. Some chlorite production was reported from the Golden Antler mine in Madison County during the year.

Other Commodities—Acid-grade fluorspar was mined from a pegmatite at the Snowbird mine west of Missoula in Mineral County. According to the two operators, this is the only direct-shipping, acid-grade fluorspar in the United States. Cominco's Warm Springs mine in Powell County, now in its 51st year of continuous production, remains a steady phosphate producer with no changes reported. Pacific Silica Company continued to produce metallurgical-grade silica from its mine near Basin, as in the past, and W. R. Grace continued to mine vermiculite near Libby, but Western Vermiculite, operating near Hamilton, closed until its screening plant could be modified to control dust.

FOSSIL FUELS

Production and exploration activities related to Montana's major coal, oil, and natural gas resources continued at a high level during the year.

The Fort Union Formation in southeastern Montana continues to be a major source of low-sulfur, subbituminous coal. Through September 1980, 22,101,865 tons of coal were strip mined by the 10 mines reporting production for a seasonally adjusted total of 30 million tons, which would represent a 10 percent reduction of coal produced, compared to 1979. This decrease is related to the general weakening of the economy and has resulted in some employee layoffs at the Decker mine. Despite the temporary slowdown, private companies and government agencies continue active coal exploration and resource evaluation programs to meet increasing demand for low-sulfur western coal.

Oil and gas exploration and production continued strong during the year. Major interest focused on the Disturbed Belt of western Montana, which has been the site of continuing geophysical prospecting and the completion of a deep test well by Amoco near Wisdom, Montana, in the Big Hole country.

Six hundred and one wells were completed in the state of Montana from January 1 to October 9, 1980. Of these, 321 were non-producers (including dry holes, abandoned holes, expired permits, etc.), 128 were producing oil wells, and 152 were producing gas wells. Of the producing oil and gas wells, 49 were discovery wells—26 in the Williston Basin, 19 in the Sweetgrass Arch area, and one each in the Miles City Arch, Bowdoin Dome, and the Disturbed Belt.

Most of the drilling in 1980 was in the Sweetgrass Arch area (Toole, Pondera, Liberty, Teton, and Glacier counties), and in the Williston Basin (concentrated in Richland, Roosevelt, and Sheridan counties). The majority of the oil wells (72 of 128) were drilled in the Williston Basin, and the majority of the gas wells (91 of 152) were drilled in the Sweetgrass Arch area.