NEVADA BUREAU OF MINES AND GEOLOGY
SPECIAL PUBLICATION MI-1994

THE NEVADA MINERAL INDUSTRY—1994

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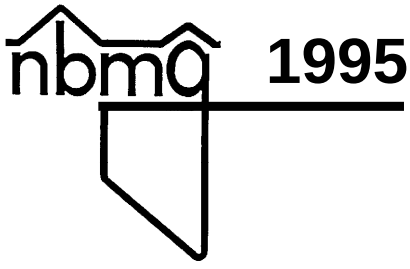

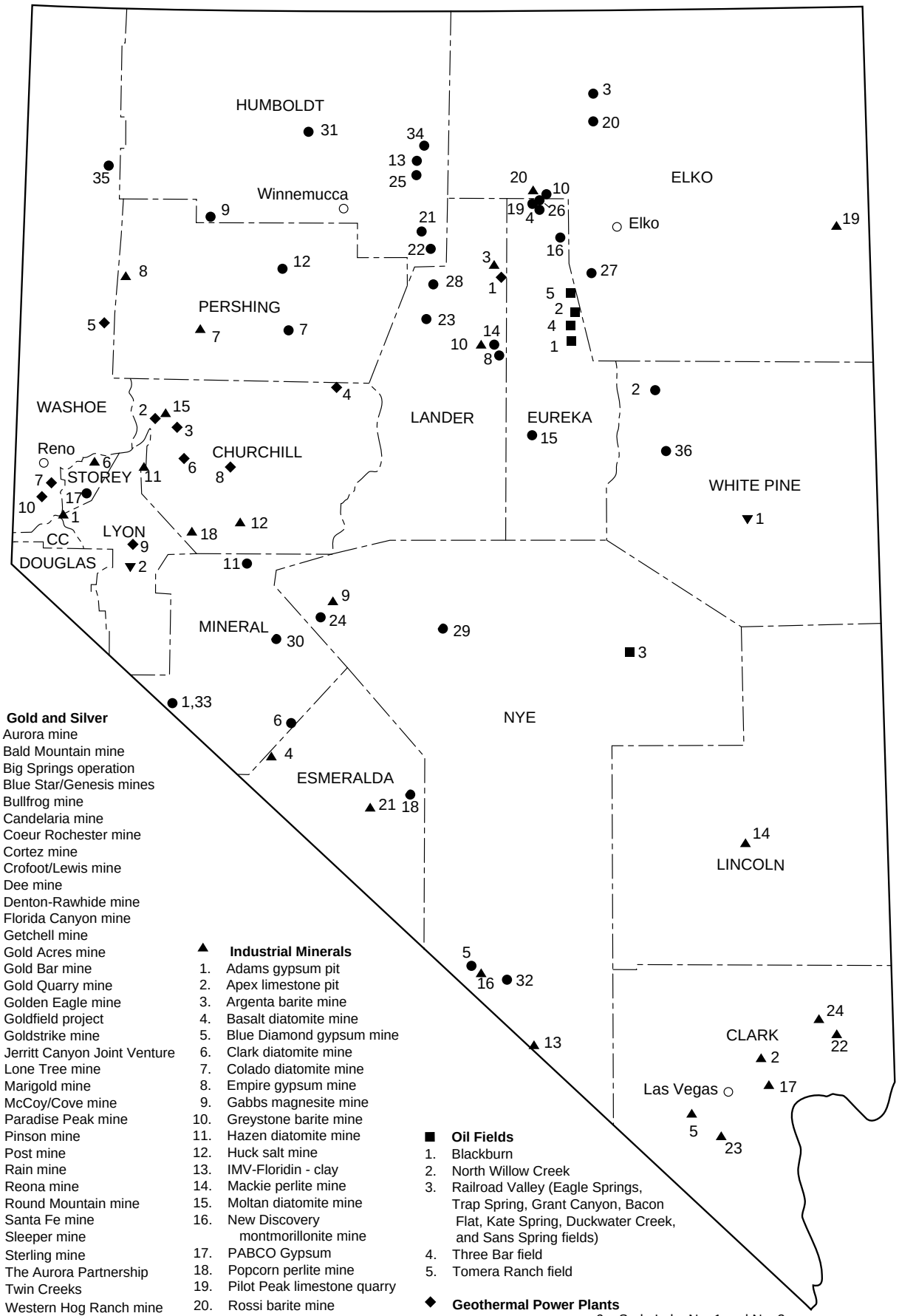

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Major mines, oil fields, and geothermal plants, 1994.

Summary

by Jonathan G. Price

Mineral and energy production in Nevada reached an all-time high in 1994 — $3.19 billion. This contribution to the Nevada economy is significant not only in terms of jobs and commerce but also in terms of taxes and improvements to the infrastructure. Nevada ranks first in the nation in production of gold, silver, mercury, and barite, which are sold on national and international markets. Construction of casinos, hotels, airports, and highways has increased demand for aggregate resources, including sand, gravel, and crushed stone, to record levels.

This report highlights activities through 1994 in metals, industrial minerals, geothermal energy, and petroleum. Numerous graphs and charts are incorporated for rapid inspection of trends in production and price.

Through a survey conducted early in 1995, the Nevada Division of Minerals collected data for Nevada Bureau of Mines and Geology Special Publication P-6, *Major Mines of Nevada 1994*. The publication includes, in handbook form, location maps, names and telephone numbers of operators, numbers of employees, and preliminary, nonproprietary production figures for most mines in Nevada. The data from this survey are used, along with information from other sources, in the figures of this publication and will be used to update, revise, or check preliminary statistics collected and released by the U.S. Bureau of Mines.

The section on **Metals** and the table of **Major Precious-Metal Deposits** provide details on new deposit discoveries, new mine openings, mine closures, additions to reserves, and mine expansions. As has been the case in recent years, gold has been the leading commodity produced in Nevada. Record production of 6.8 million troy ounces, valued at $2.6 billion, came from approximately 37 major mines. Most of that production, 84%, came from the top nine producers; two producers on the Carlin trend in northeastern Nevada, Barrick and Newmont, accounted for half of the total production. Barrick's Goldstrike mine, which produced 1.849 million ounces, is the largest gold mine in the United States. Nevada is a major force in the national and international gold markets, accounting for approximately 64% of U.S. production and 10% of world production.

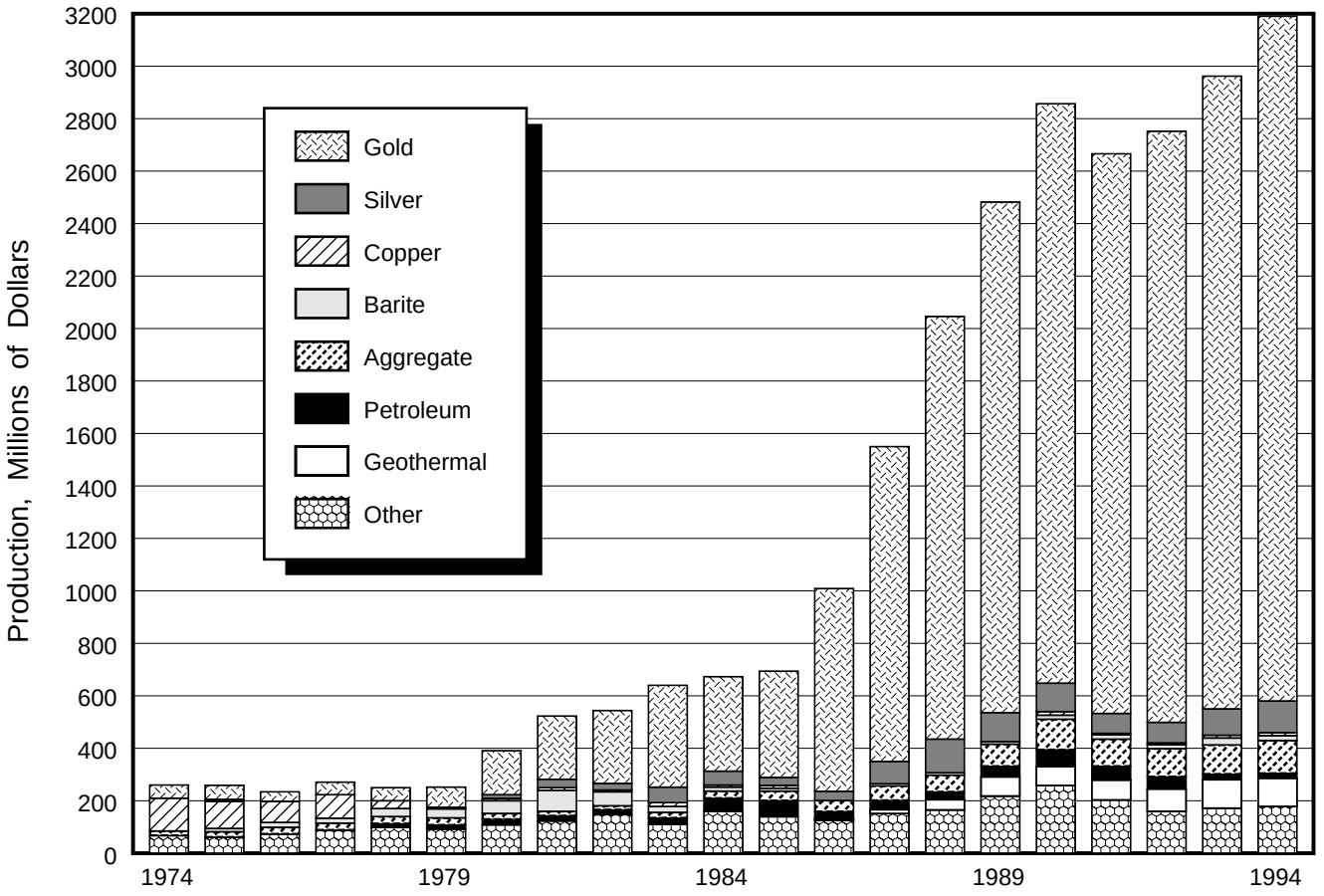
MINERAL, PETROLEUM, AND GEOTHERMAL POWER PRODUCTION IN NEVADA[1]

Minerals	1993		1994 preliminary		% change from 1993 to 1994	
	Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value
Barite (thousand short tons)	529	$26,380	360	$18,000	-32	-32
Copper (thousand pounds)	10,000	9,200	10,000	11,500	0	25
Geothermal energy (thousand megawatt-hours)	1,349	108,000	1,349	108,000	0	0
Gold (thousand troy ounces)	6,700	2,412,000	6,800	2,610,000	1	11
Petroleum (thousand 42-gallon barrels)	1,862	22,270	1,697	18,400	-9	-17
Sand, gravel, crushed stone (thousand short tons)	25,000	112,500	28,000	126,000	11	11
Silver (thousand troy ounces)	23,200	100,220	22,800	120,000	-2	20
Other minerals[2]	—	171,860	—	178,100	—	4
Total	—	2,962,430	—	3,190,000	—	8

[1] Production as measured by mine shipments, sales, or marketable production (including consumption by producers); compiled by the Nevada Division of Minerals and the Nevada Bureau of Mines and Geology.

[2] Production data for cement, clay, diatomite, building stone, gemstones, gypsum, lime, lithium carbonate, magnesite, mercury, perlite, salt, and silica sand are combined. See text for details of some of the commodities.

Products milled or processed in Nevada but mined from deposits in California are not included. Specifically, colemanite from a mill in Amargosa Valley in Nye County and zeolite from the Ash Meadows plant in Nye County are excluded from these totals.



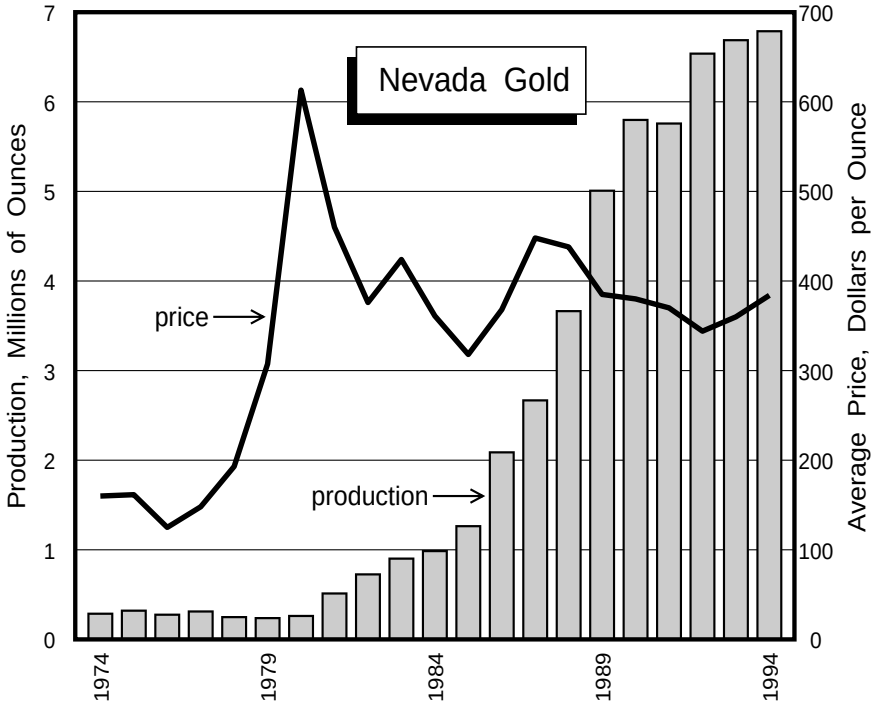
Nevada mineral, petroleum, and geothermal production, 1974–1994.

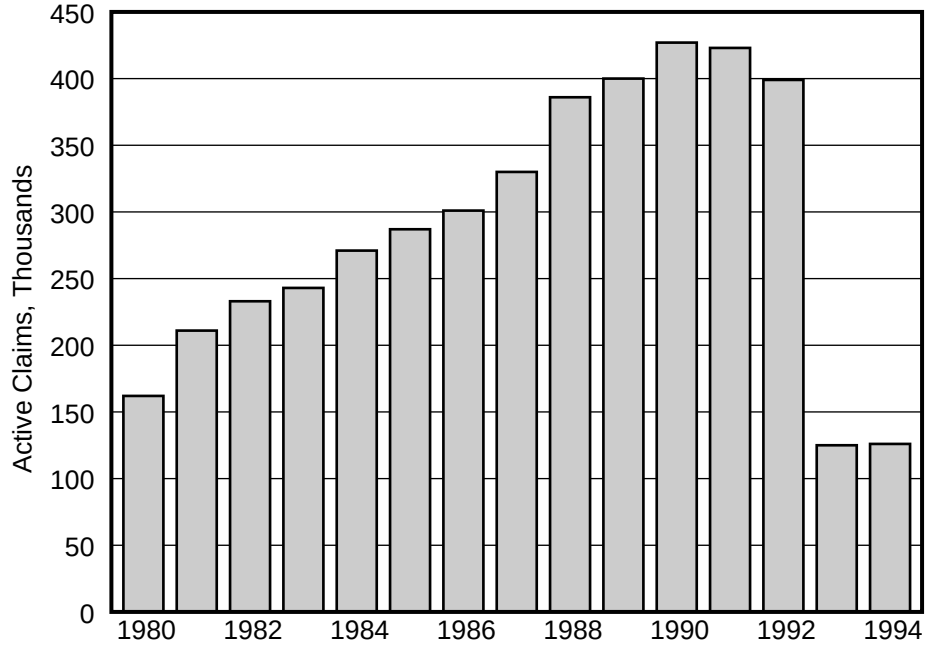
Exploration, including grass roots activity and work in known mining districts, and development of extensions to known deposits added to the Nevada resource base in 1994. Exciting discoveries in recent years have outlined 4 million ounces in the Pipeline and South Pipeline deposits, under alluvial cover near Cortez in Lander County, and 1.6 million ounces in the Eureka district in Eureka County. At the end of the year published gold resources in Nevada, including mineable reserves and perhaps some subeconomic resources, totaled 137 million ounces of gold, enough to sustain gold production at substantial levels for at least 20 years, assuming stable prices. As measured by the numbers of active claims on public lands, grass-roots exploration activity has declined in recent years. It is unlikely that newly discovered reserves will continue to replace production at current levels.

The Nevada Division of Minerals recently completed a survey of companies active in exploration in Nevada (Nevada Department of Business and Industry, Division of Minerals, *Exploration Survey Results*, March 16, 1995). The 46 companies that responded to the questionnaire spent a total of $154 million on exploration in Nevada in 1994. Twenty-seven companies had exploration expenditures in excess of $1.8 million for the year, and 19 spent less than $500,000. Interestingly, exploration expenditures by these companies are expected to be nearly constant in Nevada in 1995 and 1996, although these companies project that they will increase their overseas exploration budgets substantially in 1996. The companies answered questions regarding the factors influencing their exploration activities in the United States; chief among these are existence of favorable geology (a major attraction for Nevada), uncertainty over mining law reform, and permitting time frames. The companies listed citizen suits, determining suitability, and gross royalties as major concerns regarding mining law reform.

Productivity of Nevada mining operations is exceptionally high. Measured simply by the value of the commodities produced divided by the number of employees, productivity of Nevada miners is outstanding. On

the average, each person in the nonfuel mineral industry in Nevada produced approximately $222,000 in mined products in 1994. It is interesting that, according to the Nevada Division of Minerals survey, exploration companies on the average spent approximately $480,000 per geologist (total exploration budget divided by total number of geologists) in Nevada in 1994. As long as these exploration geologists (approximately 320 working in Nevada in 1994) replace reserves at the a rate of 4 to 8 million ounces of gold per year (with a gross value of $1.9 to 2.7 billion, or $6 to 8 million per geologist), these levels of expenditure ($19 to $38 per ounce of mineable gold discovered) are well warranted.





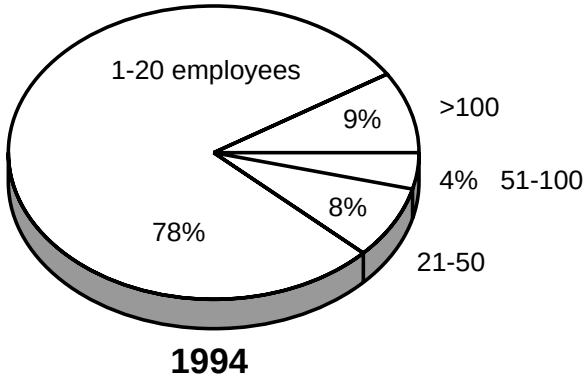
Number of active claims in Nevada as of September 30, 1980 through 1993, and as of September 1, 1994. Data from the Nevada State Office of the Bureau of Land Management.

NUMBER OF MINES AND EMPLOYEES IN NEVADA'S MINERAL INDUSTRY

Data for 1978-1987 are from the State Mine Inspector's Reports; 1988-89 data were compiled from the Directory of Mining and Milling Operations in NBMG Special Publications MI-1988 and MI-1989; 1990 data are from NBMG Special Publication 11 and the State Mine Inspector's Report; 1991-1992 data are adapted from the State Mine Inspector's Report; 1994 data are adapted from NBMG Special Publication P-5 and the State Mine Inspectors Report, March 1994.

NUMBER OF MINES BY WORK-FORCE SIZE

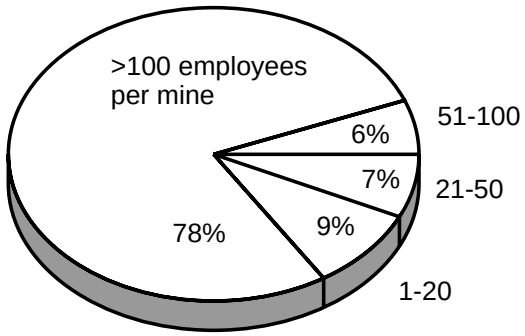
Year	Work-force size (employee/mine)				
	1-20	21-50	51-100	>100	Total
1978	306	18	9	9	342
1979	340	25	10	7	382
1980	392	30	11	17	450
1981	383	34	12	16	445
1982	312	22	8	14	356
1983	315	22	8	15	360
1984	325	24	12	18	379
1985	289	24	16	15	344
1986	250	26	14	21	311
1987	260	26	16	24	326
1988	155	25	22	33	235
1989	148	24	23	30	225
1990	226	31	21	36	314
1991	215	24	11	34	284
1992	245	21	13	35	314
1993	286	27	13	26	352
1994	249	27	13	29	318



1994

NUMBER OF EMPLOYEES BY WORK-FORCE SIZE

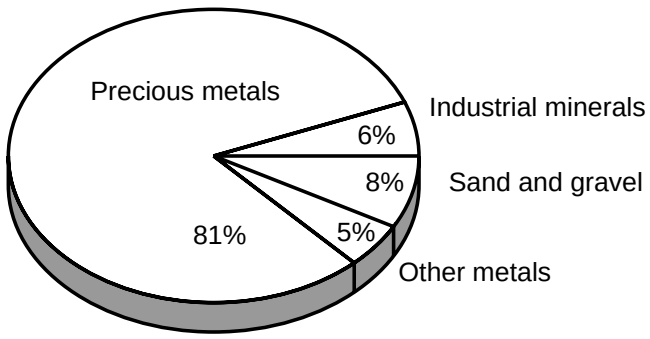
Year	Work-force size (employee/mine)				
	1-20	21-50	51-100	>100	Total
1978	1,544	609	626	2,205	4,984
1979	1,738	791	588	1,311	4,428
1980	2,139	1,037	799	4,195	8,170
1981	2,124	1,128	884	4,400	8,536
1982	1,640	716	533	2,632	5,521
1983	1,635	742	561	2,812	5,750
1984	1,437	767	887	3,127	6,218
1985	1,279	722	1,129	3,310	6,440
1986	1,315	848	921	5,171	8,255
1987	1,376	799	1,166	6,973	10,314
1988	941	832	1,483	9,441	12,697
1989	945	854	1,821	9,936	13,556
1990	1,243	1,019	1,314	11,643	15,219
1991	1,217	787	784	11,518	14,306
1992	1,245	719	891	11,534	14,389
1993	1,392	851	873	10,963	14,079
1994	1,255	957	809	10,788	13,809



1994

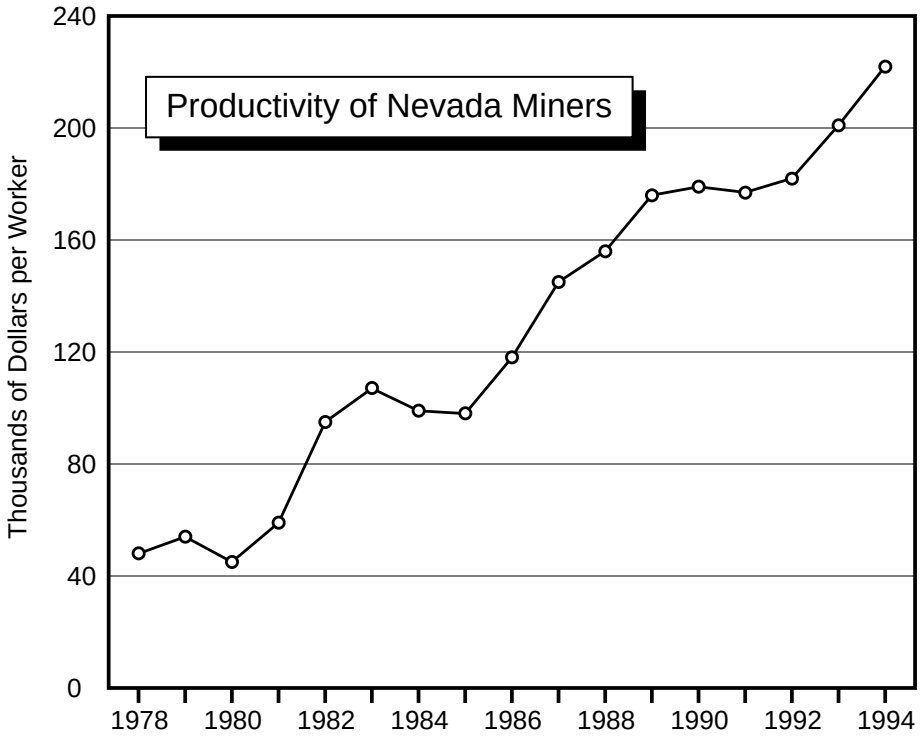
NUMBER OF EMPLOYEES BY COMMODITY

Year	Precious metals	Other metals	Industrial minerals	Sand & gravel	Total
1978	1,096	1,859	1,479	550	4,984
1979	1,503	833	1,604	488	4,428
1980	3,808	1,918	1,804	640	8,170
1981	4,263	2,018	1,760	495	8,536
1982	2,905	867	1,357	392	5,521
1983	3,616	598	1,104	432	5,750
1984	4,097	646	1,049	426	6,218
1985	4,595	256	1,046	543	6,440
1986	6,460	175	976	644	8,255
1987	8,636	160	901	617	10,314
1988	10,638	412	1,090	557	12,697
1989	11,088	510	1,448	510	13,556
1990	12,957	492	1,132	638	15,219
1991	12,123	344	975	864	14,306
1992	12,144	168	1,191	886	14,389
1993	11,860	156	1,209	854	14,079
1994	11,189	727	1,110	783	13,809



1994

Challenges that face the precious metal mines in Nevada include not only issues regarding mining law reform but also economic, safety, and environmental concerns such as treating refractory (iron disulfide and/or carbon-bearing) ores, underground mining of more ores, dewatering mines, and treatment and disposal of large volumes of water, some of which may be too warm to introduce directly into streams or may contain toxic elements that need to be removed.



Total value of mined product per worker in Nevada (exclusive of petroleum and geothermal energy).

ANNUAL TAX ON NET PROCEEDS OF MINERALS

Year	Annual net proceeds[1] (thousands)	Annual tax (thousands)
1982	$159,999	$1,800
1983	245,688	4,152
1984	184,987	3,222
1985	198,263	3,527
1986	374,664	6,091
1987	627,330	12,084
1988	798,253	13,568
1989	748,052	36,238
1990	887,035	42,737
1991	706,250	33,678
1992	694,457	33,128
1993	734,399	35,150
1994	994,416	48,205

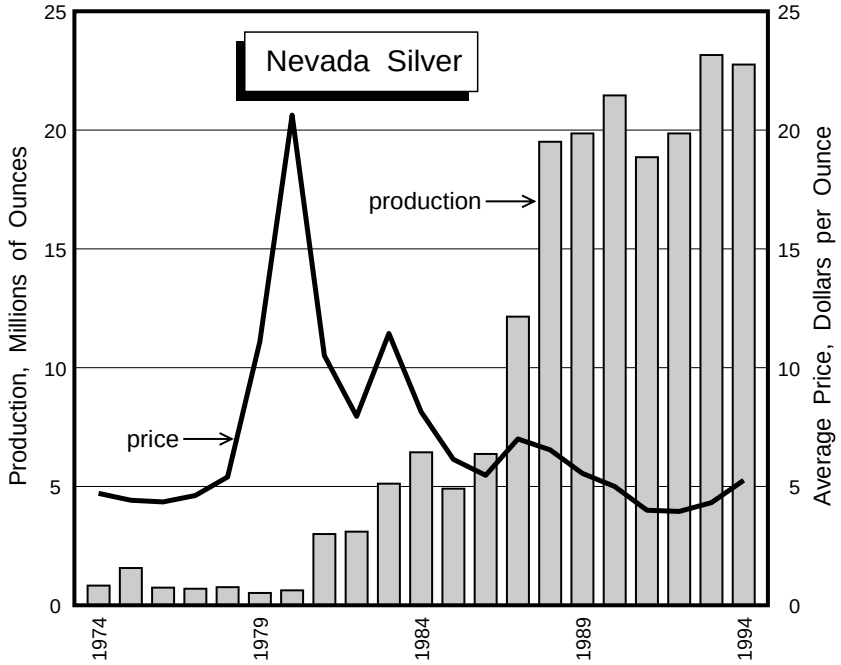
[1]Net proceeds are gross income minus direct costs incurred at the mine site.
Source: Nevada Department of Taxation.

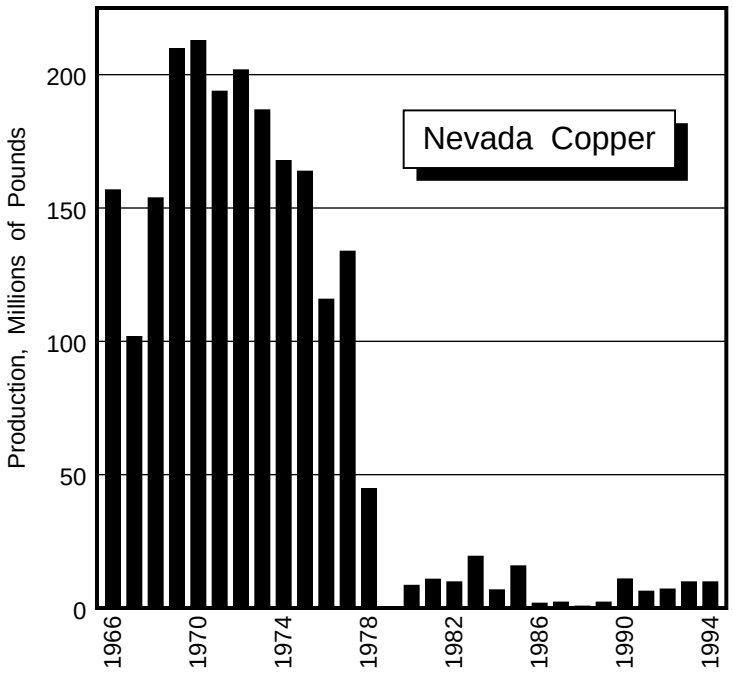
OTHER REVENUE TO THE STATE OF NEVADA FROM THE MINERAL INDUSTRY

Fiscal year[1]	Mining claim fee[2] (thousands)	Oil production tax[3] (thousands)
1984	$158	$52
1985	160	129
1986	160	155
1987	175	146
1988	337	158
1989	402	161
1990	408	178
1991	386	202
1992	351	156
1993	333	159
1994	420	81

[1]July 1 through June 30.
[2]The state receives a fee of $2.50 for each new claim and each assessment report.
[3]Does not include drill permit fee: $.05 per barrel of oil produced.
Source: Nevada Division of Minerals.

Nevada led the nation in silver production in 1994, with 22.8 million troy ounces valued at $120 million. Most of this silver was a by-product of gold mining. With a ratio of value (average price of gold : average price of silver) of 73:1, only those deposits with more than 73 times as much silver as gold can be considered primary silver deposits. Only two such deposits operated in Nevada in 1994 — the Coeur Rochester mine in Pershing County (with a silver to gold ratio of 105:1 and total silver production of 5.9 million ounces) and the Kinross-Candelaria mine in Mineral County (with a silver to gold ratio of 249:1 and total silver production of 3.19 million ounces).



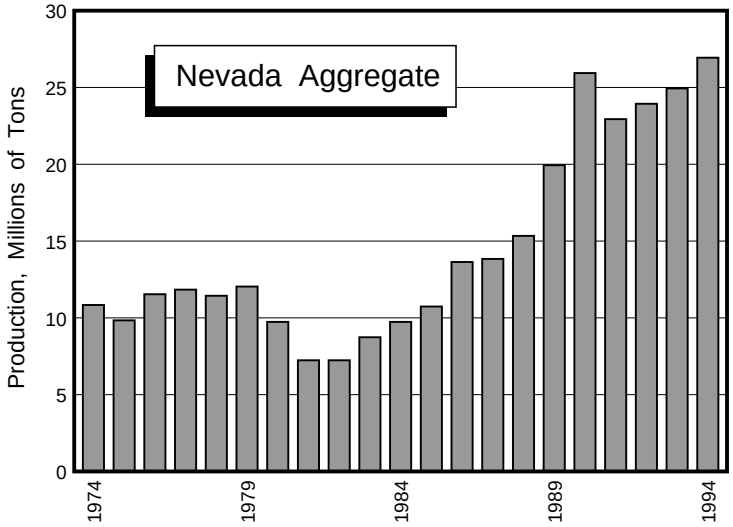


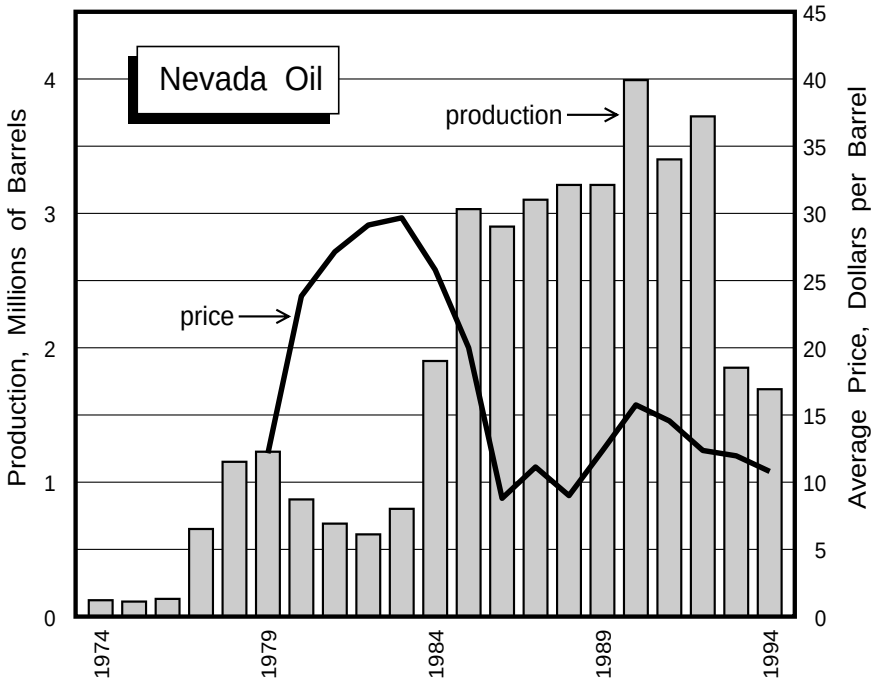
The largest silver producer in the United States, Echo Bay's McCoy-Cove mine complex in Lander County, is primarily a gold mine; it yielded 10.44 million ounces of silver from ore with an average silver to gold ratio of 29:1. In early 1995 the Nevada Bureau of Mines and Geology published Map 103, *Geologic Map of the McCoy Mining District, Lander County, Nevada,* a 1:12,000-scale detailed map with cross sections and text covering the geology, history, and mineral resources of the district. The map was authored by company geologists.

A resurgence in copper mining in Nevada is on the way. Mining in the historically active districts near Yerington, Ely, and Battle Mountain ceased in the late 1970s. In 1994 Arimetco International produced 10 million pounds of copper from the Yerington mine in Lyon

County. Magma Copper Company's Robinson copper-gold property near Ely is scheduled to produce approximately 135 million pounds of copper annually, beginning in 1996.

The section on **Industrial Minerals** covers developments during 1993 and gives details on commodities such as aggregate, barite, building stone, cement, clay, diatomite, fluorspar, garnet, gypsum, lime, lithium carbonate, magnesia, perlite, salt, silica, wollastonite, and zeolites. According to statistics collected by the U.S. Bureau of Mines, in 1994 Nevada was the only producer of brucite and magnesite, ranked first among four states producing barite, second among four producing diatomite, third in fluorspar, fourth in perlite, fifth in gypsum, and seventh in kaolin clays. In terms of dollar value, the most significant industrial mineral commodity is aggregate (sand, gravel, and crushed stone), with a value of $126 million, second only to gold in 1994. Aggregate production reached an all-time high in 1994 as a result of our expanding population and tourist industries with their demands for construction materials for resi-

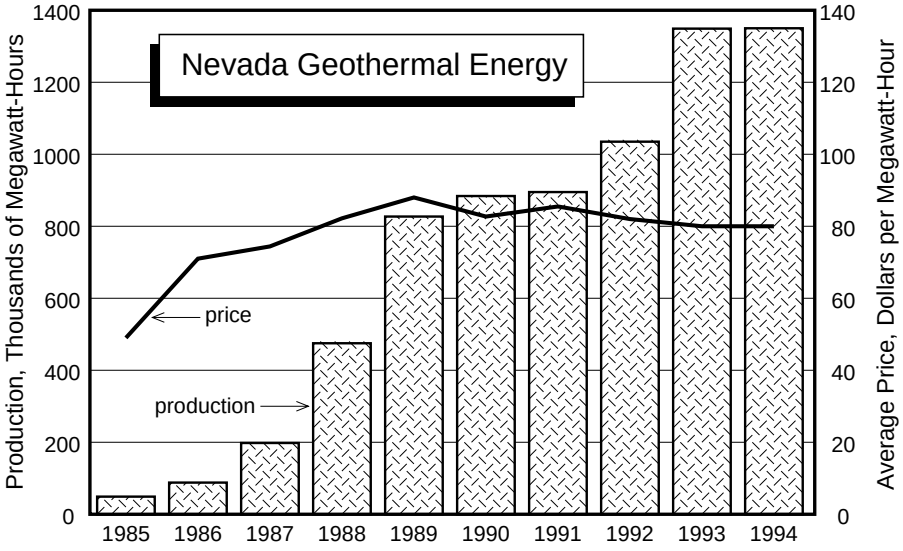




dences, resort hotels, airports, and highways.

Developments in the Nevada petroleum industry are covered in the section on **Oil and Gas**. Oil is produced in two areas — Railroad Valley in Nye County and Pine Valley in Eureka County. Oil production declined for the second consecutive year, largely as a result of excess water in wells in the Grant Canyon field. Production declined in nine of the 11 producing fields and rose in two (Eagle Springs and Bacon Flat, both in Railroad Valley.) Nevada production accounts for less than 0.1% of total U.S. oil production. Few exploration wells have been drilled in Nevada (less than 1,000). With much area unexplored and with a history of significant production, the potential for finding more multimillion-barrel fields remains high.

Developments in the geothermal industry are covered in the section on **Geothermal Energy**. Production in 1994 equaled the historic high reached the previous year. Ten power plants sold $108 million in electricity, far surpassing the value of petroleum production. Additionally, geothermal energy is used at numerous places in Nevada for space heating, warm water, recreation, and dehydrating vegetables.



Metals

by Joseph V. Tingley

The information in this section was compiled from news releases in The Mining Record (DMR), Skillings Mining Review (SKL), California Mining Journal (CMJ), The Northern Miner (NM), Society of Economic Geologists Newsletter (SEG), Rocky Mountain Pay Dirt (RMPD), American Mining Congress Journal (AMCJ), Reno Gazette-Journal (RGJ). Information was also extracted from various company annual reports and news releases on file at the Nevada Bureau of Mines and Geology, from the Nevada Division of Minerals monthly newsletter, and from the Nevada Mining Association monthly newsletter.

Nevada metal miners enjoyed another record production year in 1994. Gold reached a new production high of 6.8 million troy oz, exceeding the previous record year of 1993 by 100,000 oz. Silver production was 22.8 million oz, 400,000 oz less than 1993 but still enough to maintain Nevada's place as the largest producer of silver in the U.S. Nevada ranks first in U.S gold and silver production also in mercury production. As in 1993, all mercury production in the state was a by-product of gold mining.

The two largest gold producers in the state in 1994 were Barrick Gold Corp. with 1.8 million oz from the Goldstrike mine, and Newmont Gold Co. with a total of 1.5 million oz from its Carlin-trend properties. Other major gold producers in 1994 included Santa Fe Pacific Gold Corp.'s Twin Creek mine, 502,000 oz; Smoky Valley Common Operation's Round Mountain mine, 423,000 oz; Echo Bay Minerals Co., 359,000 oz from its McCoy/Cove operation; Independence Mining Co.'s Jerritt Canyon mine, 326,000 oz; Barrick Gold Corp.'s Bullfrog mine, 301,000 oz; FirstMiss Gold Inc.'s Getchell mine, 230,000 oz; and Santa Fe Pacific Gold Corp.'s Lone Tree mine, 227,000 oz.

Nevada silver production originated mainly from two properties, Echo Bay's McCoy/Cove operation produced 10.4 million oz and Coeur d'Alene Mines Corp.'s Rochester mine produced 5.9 million oz. Other major producers included Kinross Gold Corp.'s Candelaria mine with 3.2 million oz and the Kennecott Rawhide Mining Co.'s Denton Rawhide mine with 952,000 oz.

Copper production by Arimetco International Inc. from the Yerington mine in Lyon County totaled 10 million pounds, equal to 1993 production. This figure is expected to increase when production from the nearby MacArthur property begins. In September 1994, Magma Copper Co. received final permits from the Bureau of Land Management for construction of its new mine and mill complex at the Robinson copper/gold property near Ely, White Pine Co. When this property is placed into production in 1996, it will contribute some 135 million pounds of copper along with substantial amounts of gold and silver annually to Nevada's metal production.

Tempering somewhat the record metal production year was a noticeable reduction in mineral exploration within Nevada in 1994. Major companies cut exploration staffs, claim staking was more focused, and fewer projects were pursued. Although the 1872 Mining Law survived another year without Congressional adjustment, some of the exploration decline might be attributed to the uncertain future of mineral title in the face of potential reform legislation.

In spite of this, overall exploration was still at a high level in 1994 and projects were underway in almost every county of the state. Figure 1 is a map of locations of new mining projects filed with the Bureau of Land Management and the Forest Service during 1994. These locations are not claim-staking plays but include more advanced exploration activity such as access road building, drilling, and trenching. Figure 1 shows clearly the intense activity focused along the northern Carlin trend in Eureka and Elko Counties and along the Battle Mountain-Eureka mineral belt in Eureka, Lander, and Humboldt Counties. Other concentrations of exploration activity in 1994 were in the Walker Lane area of Mineral County and in the Toiyabe and Toquima Ranges of Nye County. Figure 2, a map showing locations of similar project filings for 1993, can be compared with figure 1 to see the relative decline in activity from 1993 to 1994.

CHURCHILL COUNTY

Bell Mountain district

Globex Mining of Montreal has optioned the Bell Mountain property southeast of Fallon. Drilling at Bell Mountain by previous operators outlined occurrences of gold and silver mineralization in a stockwork of quartz-calcite veins along sections of the mile-long Stockton vein. Values from previous drilling range between 0.02 and 0.14 oz Au/ton and 0.08 and 3.5 oz Ag/ton over widths varying from 10 to 155 feet. Globex plans additional drilling on the property (NM, 10/10/94).

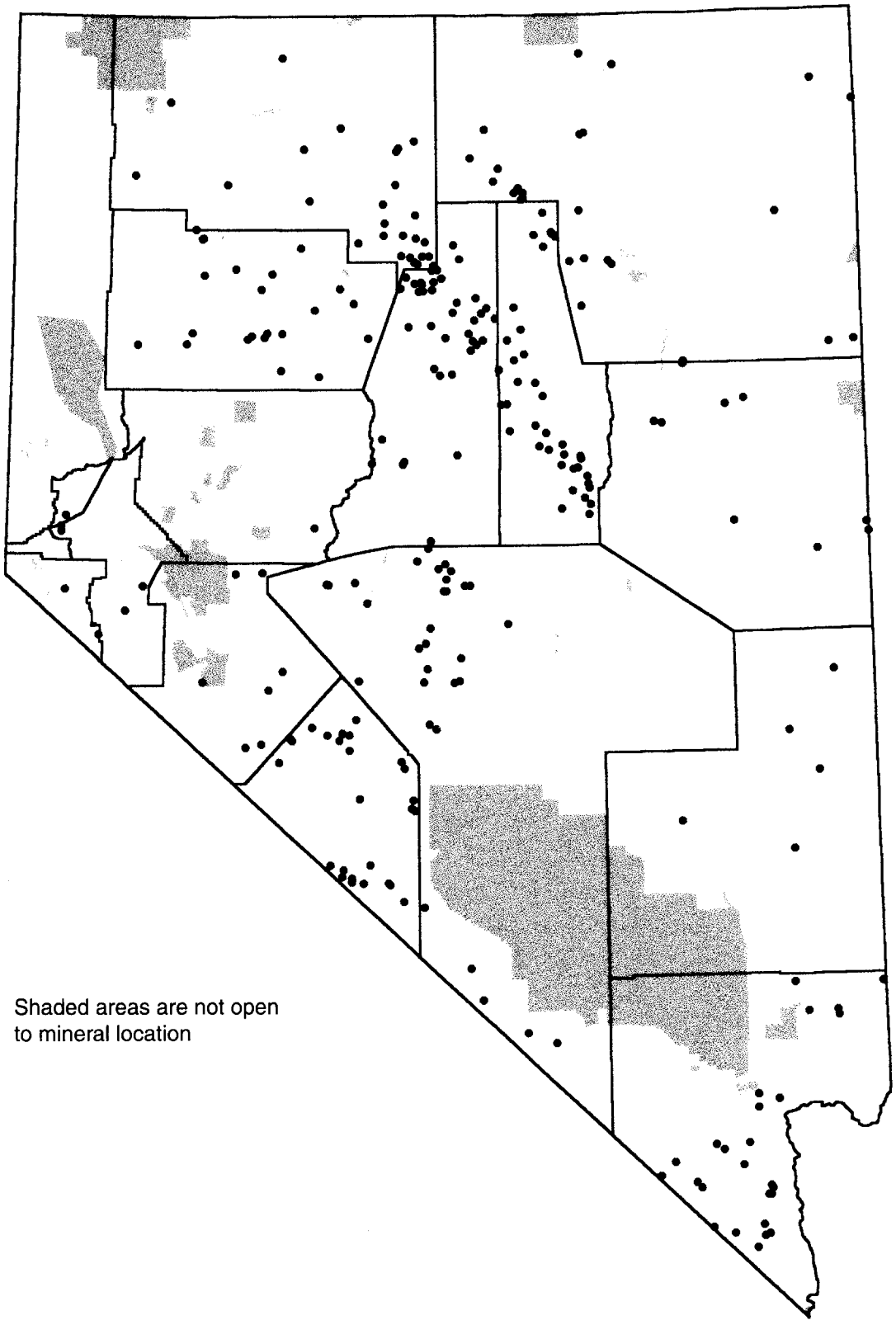


Figure 1. Mining plans of operation filed with BLM and the U.S. Forest Service in 1994.

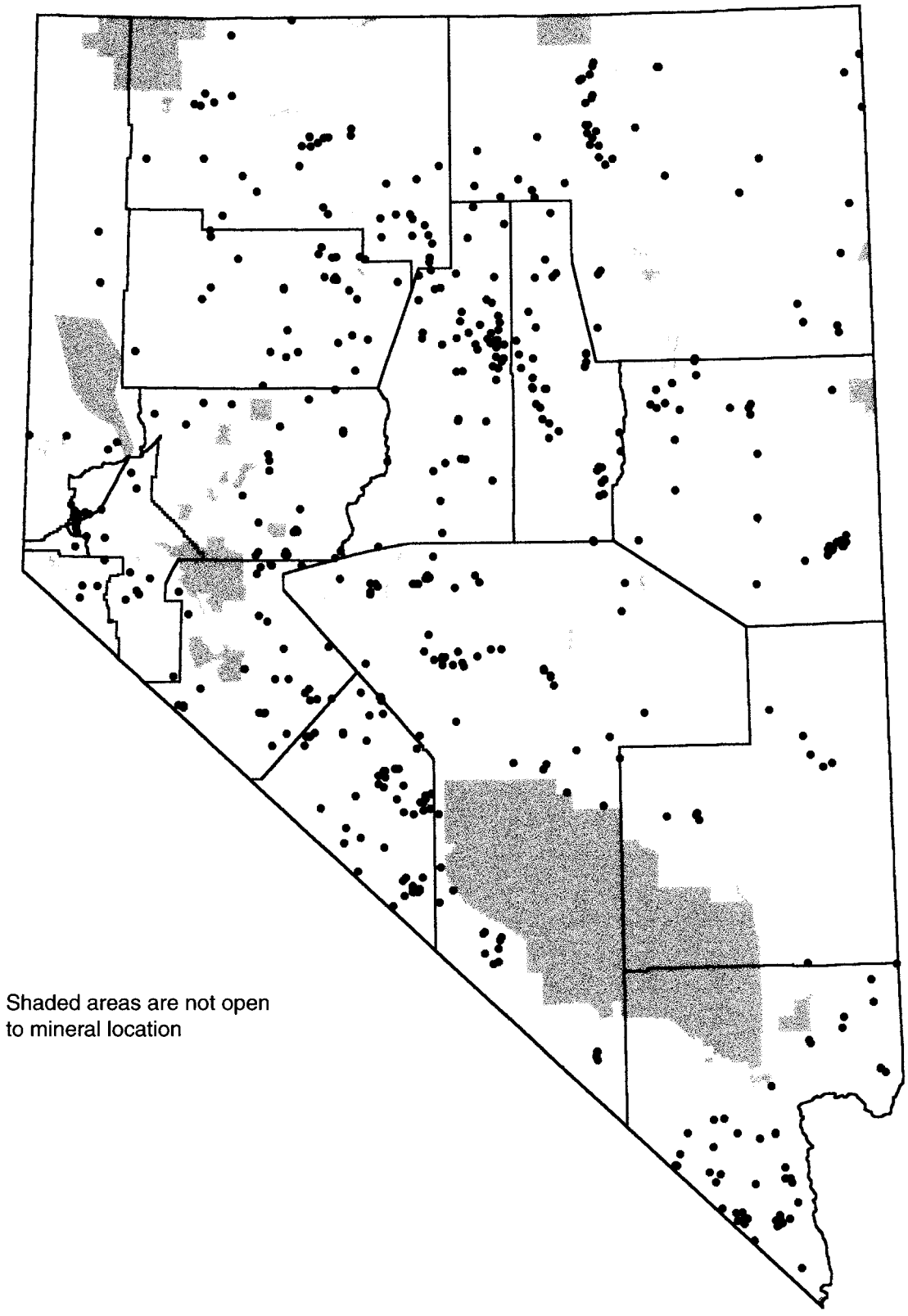


Figure 2. Mining plans of operation filed with BLM and the U.S. Forest Service in 1993.

New Pass district

Westmont Gold Inc., a wholly-owned subsidiary of Ramrod Gold (USA) Inc., and Consolidated Ramrod Gold Corp. have signed an agreement with Santa Fe Pacific Gold Corp. to further explore Westmont's 211-claim New Pass property. The New Pass property is a jasperoid-hosted gold system that has been explored by Westmont and predecessor companies since the early 1980s. Drilling to date has defined a geologic resource of 3.4 million tons averaging 0.042 oz Au/ton. (DMR, 11/30/94).

CLARK COUNTY

Eldorado district

Future Petroleum Corp., formerly Intermountain Exploration Co., has closed the sale of its Eldorado Canyon mining properties to a Nevada company (DMR, 4/6/94).

DOUGLAS COUNTY

Wellington district

Early in 1994, Saga Exploration Co. announced plans to drill three mineral targets on its Boulder Hill claim group (USFS project notice, 4/15/94).

ELKO COUNTY

Bootstrap district

Rayrock Yellowknife Resources Inc. has increased its ownership in the Dee gold mine from 44% to 100%. Rayrock purchased a 44% interest held by Corona Gold Inc. and a 12% interest held by a private individual for a total purchase price of $21.15 million. Drilling at Dee defined a new orebody of oxidized mineralization to the north of the existing pit with a preliminary geologic resource of approximately 1 million oz of gold (CMJ, 6/1/94).

Preliminary interpretation by Trio Gold Corp. of the drill and geological data from the last exploration program at Trio's Rodeo Creek property is nearing completion. Seven holes, two deep and five shallow, were drilled. Traces of gold were widespread and the data suggest that a number of targets warrant additional drilling (DMR, 8/31/94).

In the southern part of the district, Newmont Gold Co. plans to re-open the Bootstrap/Capstone open-pit mine and to initiate mining at the Tara open-pit mine located 1,500 feet south of Bootstrap. Expected life of the combined project is 7 years. (BLM project announcement, 11/22/94).

Independence Mountains district

Independence Mining Co. is planning to expand gold mining operations at the Jerritt Canyon mine. The expansion will involve surface and underground mining in the DASH mine area and the California mine area. Both mine sites are on the east side of the Independence Mountains south of the Jerritt Canyon mill. The proposed mining activities will replace gold ore reserves that have been exhausted over the past 14 years at the existing Jerritt Canyon mining operation. (USFS Scoping Document, 11/1/94; RMPD, 12/1/94).

Island Mountain district

Westmont Gold Inc. has signed an agreement with BHP Minerals International to form a joint venture at Westmont's Coleman Canyon property. BHP plans to drill 37 holes and construct approximately 2.5 miles of temporary exploration roads in the area of Coleman Canyon and Poorman Creek (USFS project notice, 6/24/94; The Miners News, August-Sept. 1994).

Ivanhoe district

The Ivanhoe Mining Venture (Newmont 75%; Cornucopia Resources Ltd. 25%) has encountered high-grade gold intercepts in drill holes beneath the west Clementine zone of the Hollister deposit. One drill hole returned a 15-foot assay from 745 to 760 feet of 1.520 oz Au/ton. A second hole, off-set from the first, encountered a 2.4 foot intercept at 744.3 to 746.7 feet assaying 37.373 oz Au/ton. Inspection of the core revealed visible gold in quartz vein fault breccia fragments in upper plate Valmy Formation quartzite (Cornucopia Resources Ltd. news release, 9/9/94).

Kinsley district

Alta Gold Co. exercised its option to buy a 100% interest in the Kinsley Gold deposit from Cominco American Resources Inc. Mining at Kinsley began in the latter part of September and gold production was scheduled to commence by the end of the year. Full production at 3,300 oz per month will begin in 1995. The Kinsley deposit is reported to contain 3.5 million tons at a grade of 0.0437 oz Au/ton (RMPD, 5/1/94; DMR, 11/30/94).

Mountain City district

AUR Resources (USA), Inc. announced plans to construct about 0.125 miles of road, drill five holes, and cut 11 trenches at their Mountain City project located between the Rio Tinto mine and Chicken Creek (USFS project notice, 6/10/94).

Railroad district

Minefinders Corp. leased its Gutsy and BM properties to Santa Fe Pacific Gold Corp. The properties are located within the Carlin trend, about 2 miles to the northwest of the Rain mine. Santa Fe has agreed to spend at least $100,000 per year on exploration and development work on the properties over the next 5 years (DMR, 1/18/95).

Uranerz USA has entered into an existing joint venture with Westmont Gold Inc. and Newmont Exploration Ltd. to explore the Pony Creek property, located approximately 16 miles south of Newmont's Rain mine. Newmont explored the property in the 1980s, Westmont entered into a joint venture with Newmont in 1990 and explored the property from 1990 through 1993. Uranerz will act as the manager of the new exploration venture. The property contains a geological resource of 1,124,000 tons averaging 0.057 oz Au/ton (DMR, 9/7/94).

Geophysical surveys have indicated a number of exploration targets on the Ramrod Gold (USA) Inc. Railroad property, situated 5 miles south of Newmont's Rain mine. Six holes just completed encountered several mineralized zones and some assays above 0.01 oz Au/ton (DMR, 11/23/94).

Recently released results of drilling on the Tess property, located just a few thousand feet north of Newmont's Rain mine, suggest potentially ore grade mineralization over a possible strike length of at least 1,000 feet. One hole intersected 52 feet with a gold assay of 0.208 oz Au/ton. This is a joint venture between Ramrod Gold Corp. and Newmont Exploration Ltd. in which Newmont has a 50% interest and is the operator (DMR, 6/22/94).

Robinson district

Cyprus Gold Exploration has acquired Pinon Exploration Corp., a wholly-owned subsidiary of Crown Resources Corp. Among Pinon's assets is the right to earn a 70% interest in Crown's Cord Ranch and adjacent properties. Crown initiated exploration of this 35,000-acre property in 1989 and over the past 5 years has delineated three mineral deposits totaling about 350,000 ounces gold. Cyprus is currently spending $400,000 in drilling the Pinon properties. All mineral deposits discovered to date are near-surface and amenable to heap-leach gold recovery methods (DMR, 11/30/94).

ESMERALDA COUNTY

Goldfield district

Mineralization at Kennecott Exploration's Gemfield project is reported to be typical of the Goldfield district: widespread, low-grade gold with erratic higher-grade zones in quartz-alunite altered volcanic rocks. Drill holes typically bottom in fresh volcanics (SEG, 1/1/94).

Red Rock Mining Corp. shareholders approved the acquisition of the remaining 50% of the Goldfield Joint venture from American Resource Corp. and approved a name change to American Pacific Minerals Ltd. Mineable ore reserves are projected at 3.5 million tons containing 0.071 oz Au/ton. Assuming a cutoff of 0.02 oz Au/ton, in-situ reserves are estimated at 10.2 million tons containing 0.065 oz Au/ton. In April, Kennecott Exploration entered into a joint venture for the further exploration and development of APM's properties that are adjacent to Kennecott's Gemfield project (NM, 5/23/94, DMR, 6/22/94).

Silver Peak district

Cornucopia Resources Ltd. began infill drilling in late March to assess the continuity of gold mineralization in the Drinkwater zone of the Mary-Drinkwater deposit (Cornucopia 1994 1st quarter report, 3/31/94).

EUREKA COUNTY

Antelope district

Atlas Corp. and Rayrock Mines entered an exploration joint venture on approximately 1,000 claims in the northern part of Atlas' Gold Bar claim group. Rayrock will spend $1.5 million on exploration and development within 3 years along with other commitments in order to earn a 60% interest in the property (Atlas Corp. news release, 8/8/94). Atlas also entered into a $3 million exploration joint venture agreement with Homestake Mining Co. on about 450 claims on the southern portion of Atlas' Gold Bar claim group. Homestake can earn a 60% interest in the claims by spending $3 million on exploration over 5 years. Atlas also signed a letter of agreement with Hemlo Gold Mines (USA), Inc. for an exploration agreement

covering 138 Atlas claims and 42 contiguous Hemlo claims located 4 miles northeast of Atlas' main Gold Bar claim block (Atlas Corp. news release, 10/26/94). On its own account, Atlas said it will spend $1 million on a development drilling program designed to expand the 240,000 oz of permitted mineable gold reserves currently outlined at the Gold Ridge and Gold Pick deposits and will be spending an additional $1.5 million on a deep-drilling program at Gold Bar designed to explore for higher-grade gold mineralization beneath the existing surface deposits. This exploration program will be conducted on the portion of the Gold Bar property not under joint venture, which contains all of the presently known mineralization on the property and contains a majority of Atlas' identified and untested exploration targets. Proven and probable reserves at the Gold Pick and Gold Ridge deposits as of June 30, 1994 consist of 5.4 million tons at a grade of 0.045 oz Au/ton. Mine planning and design are continuing on the remaining 17 million tons of mineralized material averaging 0.028 oz Au/ton at the Gold Pick, Gold Ridge, Gold Canyon, Hunter, and Cabin Creek deposits. Pot Canyon, a new target drilled by Atlas Corp. during 1994, currently contains a mineral inventory of 27,757 oz of gold and remains open in several directions. It will be examined for its heap leach potential (DMR, 9/28/94; NM, 10/17/94; RMPD, 11/1/94; Atlas Corp. 1994 Annual Report).

Elsewhere in the district, U.S. Gold sold a 60% interest in its Tonkin Springs property to Gold Capital Corp. and concurrently formed a joint venture to operate the property (DMR, 1/12/94).

Buckhorn district

Royal Gold Inc. has secured an assignment of a leasehold interest in the Buckhorn South property, some 138 claims that are about 2 miles south of the Buckhorn mine. Formerly known as the Zeke property, the claims are held by the Damele family (DMR, 3/23/94).

Cortez district

The Cathedral Gold Corp.-Kennecott Exploration Co. joint venture has expanded the Trendline property position by approximately 1,300 acres to a total of 3,200 acres. Trendline adjoins the boundary of the Cortez Joint Venture and is located 16 miles southeast of the Pipeline gold deposits. Kennecott completed geological compilation work and geophysical surveys in the Trendline area prior to entering into the agreement. Additional detailed geophysical surveys have been completed and have indicated a number of drill targets on the Trendline property. Drilling is planned to commence early in 1995 (DMR, 12/14/94).

Eureka district

In 3 years of exploration, Homestake Mining Co. has developed a geological inventory of about 1.6 million oz of gold at its Ruby Hill project. Homestake has completed a $4 million drilling program and has outlined four zones hosting a global geological inventory of 20 million tons of oxide material averaging 0.08 oz Au/ton. Homestake now plans to proceed with a feasibility study on the oxide portion of one mineralized zone, the West Archimedes. The three other zones that comprise the inventory are the East Archimedes, the East Deep Sulfide, and the Fad Shaft zones. The West Archimedes, discovered in 1993, is shallow—between 50 and 300 feet below surface—and oxidized mineralization is associated with decalcified and silicified limestone. Mineralization is composed of a high-grade core of about 3 million tons averaging 0.25 oz Au/ton. The core is surrounded by a halo of lower-grade mineralization which brings the total oxide resource of the zone to almost 5.5 million tons averaging 0.15 oz Au/ton. The East Archimedes lies 500 feet below surface and, although not as extensively drilled as the West Archimedes, hosts a preliminary geological resource of 5 million tons averaging 0.07 oz Au/ton. Deeper drilling below the East Archimedes intersected a third mineralized system where gold is associated with high base metal values in massive sulfide replacement and skarn zones. The Deep East is open in all directions. The fourth zone, known as the Fad Shaft, is 1.5 miles south of the Deep East. Discovered by previous owners, it is estimated to contain a 3-million-ton sulfide resource averaging 0.16 oz Au/ton, 5.7 oz Ag/ton, and 12% combined lead and zinc (NM, 10/31/94).

Lynn district

Newmont Gold Co. plans to expand operations in the Bluestar area and will begin work on its Section 36 project. The project consists of the development and mining of five open-pit mines (Sold, Beast, Payraise, North Star, and Bobcat) along with the construction of associated waste dumps and haul roads. Ongoing operations within the Bluestar operations area include mining the Genesis/Bluestar mine (BLM project notice, 8/31/94).

Exploration and development are expected to fuel additional growth at the Barrick Gold Corp. Goldstrike property which encompasses the Betze-Post mine and the Meikle mine. Total reserves on these properties at the end of 1994 were 29.6 million ounces. Reserves should increase as exploration continues to result in the discovery of mineralized zones such as the Screamer (west of Betze-Post), North Post, West Betze, Rodeo, and Griffin (between the Betze-Post

mine and the Meikle project). Drilling in 1994 indicated the likelihood of a continuous ore body from Betze-Post to Screamer. Mine reserves at Meikle, which is expected to come on-stream in 1996, are 6.6 million tons averaging 0.68 oz Au/ton; the Betze-Post portion of the reserves is 23 million ounces (RMPD, 4/1/94; NM, 11/7/94; Barrick Gold Corp. 1994 annual report).

Maggie Creek district

Santa Fe Pacific Gold Corp. has entered an agreement with Royal Gold to acquire Royal Gold's Bob Creek project. Santa Fe will assume all Royal Gold's obligations under two underlying mining leases and will spend at least $150,000 in exploration during the next 12 months and progressively greater amounts during the succeeding 3 years. The Bob Creek property consists of 103 unpatented mining claims covering about three square miles of land on the western slope of the southern Tuscarora Mountains (RGJ, 11/11/94).

HUMBOLDT COUNTY

Awakening district

Three new areas have been defined for drilling on the Sleeper Extension gold property of X-Cal Resources. Trenching in one area has exposed a 45-foot-wide zone averaging 0.046 oz Au/ton. At a second area, the historic Alma gold mine in the center of the property, underground sampling disclosed an 11-foot-wide zone of 4.146 oz Au/ton. A third area has been defined around what is known as the "Breccia zone," where a surface showing 10 feet wide tested 0.266 oz Au/ton. The property extends from 1.5 to slightly over 3 miles southeast of the Sleeper mine pit (DMR, 1/18/95).

Bottle Creek district

Gerle Gold (US) Inc. has an option to acquire 100% interest in the Happy Creek gold/silver property. Exploration targets, defined by enzyme leach surveys, indicate potential for Carlin-type deposits and six drill holes are planned for 1995 (Gerle Gold Ltd. 1994 Annual Report).

Potosi district

Proven and probable reserves on the Getchell property of FirstMiss Gold Inc. at the end of the fiscal year (June 30, 1994) were 1,591,700 oz of gold. Development drilling added 558,700 oz to reserves during the fiscal year, more than replacing the 280,000 oz consumed by the mill and heap leach during the year. Sulfide reserves are 6.7 million tons at an average grade of 0.225 oz/ton Au. This includes underground reserves in the main Getchell area of 3.7 million tons at an average grade of 0.302 oz Au/ton. The underground orebody is open at depth and along strike. Oxide reserves are 2.9 million tons at an average grade of 0.028 oz Au/ton. Exploration drilling has also identified 4 million tons of sulfide mineral deposits at an average grade of 0.232 oz Au/ton (FirstMiss Gold news release, 7/12/94). Drilling results at the Turquoise Ridge deposit, discovered in 1993, continue to be encouraging. Five of six holes drilled during the last three months of 1994 encountered mineralization containing better than 0.200 oz Au/ton, with one hole intercepting 185 feet of 0.502 oz Au/ton at a depth of 1,500 feet. Based on drilling to date, Turquoise Ridge now appears to contain about 1.7 million oz of gold. Other targets within the Getchell property include Hansen Creek south of the Getchell pit, Section 13 adjoining Santa Fe Pacific's Twin Creek property, and the underground area between the Main pit and the North pit (FirstMiss Gold 2nd quarter 1994 report, 1/19/95).

Santa Fe Pacific Gold Corp. received the approval of its Board of Directors to proceed with the Twin Creeks mine sulfide project. When this project comes on line in early 1997, Santa Fe Pacific will be able to process the sulfide ores that comprise approximately 4.9 million oz of gold, or about 57% of the reserves at Twin Creeks. The project is expected to increase gold production and to extend the life of the mine to at least the year 2008 (DMR, 11/30/94).

Sulphur district

Drilling by Hycroft Resources and Development Corp. south of the operating South Central pit at the Crofoot/Lewis mine confirmed an additional 4.7 million tons of proven and probable ore averaging 0.017 oz Au/ton. This defined ore is within a broader resource of about 12 million tons averaging 0.019 oz Au/ton in the Gap and South Central zones. On October 1. 1994, total proven and probable reserves amounted to 58.1 million tons averaging 0.019 oz Au/ton (Hycroft 3rd quarter report, 11/23/94).

Vicksburg district

International Mahogany has concluded the Ashdown property is uneconomic under present conditions and they have terminated their lease on the property (NM, 12/26/94).

LANDER COUNTY

Bateman Canyon district

Alta Gold Co. signed a mining lease with Cyprus Gold Exploration on the Slaven property. Cyprus will spend $500,000 on exploration of mining claims and fee land within the property, reported to contain a 50,000-oz of gold refractory resource (RGJ, 7/26/94; SEG, 10/1/94).

Reverse circulation drilling on the Slaven South property has intersected additional gold mineralization. Uranerz USA and Takla Star Resources are carrying out a 4,000-foot drilling program to evaluate several geochemical targets and an extensive mineralized system that was discovered last year. Ten of the 19 shallow holes intersected mineralization averaging up to 0.3 oz Au/ton over 45 feet. Follow up drilling is planned to test the deep potential, as well as the lateral extent of the mineralization (NM, 8/8/94).

Battle Mountain district

Battle Mountain Gold Co. completed evaluation of the Phoenix project at its Battle Mountain complex. The project contains estimated proven and probable gold reserves of approximately 1.475 million ounces (BMG Co. 1994 Annual Report). The gold-milling project appears to have the potential to average about 120,000 oz of gold per year with start-up possible in 1997 (DMR, 4/20/94). Also, Battle Mountain Gold Co. announced it has made its first gold pour at the Reona heap-leach mine. The Reona zone hosts 13.5 million tons averaging 0.028 oz Au/ton. With a gold recovery of 70%, the mine is expected to yield 260,000 oz of gold (NM, 10/17/94). Annual production is expected to reach 70,000 oz in 1995 (DMR, 10/19/94).

In the northwestern part of the district, Santa Fe Pacific Gold Co. reached a joint-venture agreement with International Calneva Gold on the SBD claims. Santa Fe Pacific can earn an undivided 70% interest in the claims by spending $500,000 on exploration over the next 5 years. At Santa Fe Pacific's adjoining Trenton Valmy property, three drill rigs have been pushing the deposit limits northward. A 20.8 million tons resource with a grade of 0.03 oz Au/ton is reported to be present in mineralized Vinini Formation (SEG, 10/1/94; NM, 1/9/95).

Buffalo Valley district

Data recently acquired by Fairmile Acquisitions on Fairmile's Buffalo Valley property indicates a resource approaching 700,000 oz of gold. An underground geological resource in excess of 250,000 oz of gold is presently recognized at Buffalo Valley with significant potential for further development. Drilling by Fairmile in 1994 established significant gold mineralization along the Front fault, a north-south striking, 40-50° west-dipping structure that has been traced for over 2,000 feet south of its intersection with the main Buffalo Valley structure. A geological resource within the Front fault zone of 350,000+ oz of gold has been recognized. At the Dore Hills prospect, about 3,000 feet north of the old Buffalo Valley pit, limited drilling has confirmed the presence of similar mineralization with short intercepts in the 0.1 to 0.2 oz Au/ton range (DMR; 9/14/94, 11/30/94).

Bullion district

Santa Fe Pacific Gold Co. began exploratory drilling on International Calneva Gold's Blue Spider claims in November 1994. Santa Fe Pacific can earn a 65% interest in this property by spending $900,000 over 5 years (NM, 1/9/95).

During a third phase of drilling on the Bru-Lovie joint venture (Bradner Resources Ltd., Ramrod Gold, and Akiko Gold Resources Ltd.), 14 holes have been drilled in the north central portion of the Colorback claims which indicate a zone of ore-grade gold mineralization extending west, southwest, and southeast of earlier drilled mineralization. The newly discovered gold mineralization is fully oxidized and occurs in a shallow, gently dipping tabular zone varying from 25 to 50 feet thick within upper plate rocks similar to those at the nearby Robertson gold deposit (DMR, 1/25/94). Ramrod Gold also started a drill program November 15 on the nearby Santa Fe Lander property. The Santa Fe Lander project is a joint venture with Santa Fe Pacific Gold Corp. (DMR, 11/23/94).

Amax Gold, Inc. has submitted the feasibility study for production on the Porphyry zone, one of the gold bearing areas within Coral Gold's Robertson property (Coral Gold news release, 11/17/94). Reserves at Robertson consist of: the 39A zone, 4,700,000 tons at 0.077 oz Au/ton; the Gold Pan zone, 6,100,000 tons at 0.028 oz Au/ton; the Widow's Mine zone, 2,900,000 tons at 0.016 oz Au/ton; the Porphyry zone, 20,000,000 tons at 0.020 oz Au/ton; and Altenburg Hill, 2,100,000 tons at 0.019 oz Au/ton (Coral Gold Co. special report)

Gold production started from the Crescent pit portion of Cortez Joint Venture's 4,000-acre South Pipeline deposit. An estimated total of 217,000 ounces of gold will be recovered from mill grade ore at the Crescent Pit over a projected life of 2 1/2 to 4 years. Geologists now estimate that the total resource for the South Pipeline deposit, including the new Gaslight zone, is 76.49 million tons of material averaging 0.048 oz Au/ton. This includes 17.6 million tons

mill grade at 0.110 oz Au/ton and 55.7 million tons of heap leach material averaging 0.022 oz Au/ton. The Gaslight deposit, located immediately south of South Pipeline, is rumored to contain less than 1 million oz of gold but it is open in several directions (SEG, 7/1/94; DMR, 5/11/94, 9/7/94).

The legal dispute between Placer Dome Inc. and Gold Fields Mining Co. with respect to the Pipeline deposit was settled in March 1995. The Pipeline deposit is reported to consist of 21.2 million tons of proven and probable reserves containing 0.145 oz Au/ton and 8.3 million tons of measured and indicated resources containing 0.035 oz Au/ton (Placer Dome Inc. news release, 2/24/95).

Maymac Petroleum has paid $500,000 for the Crescent Valley placer gold mine. The property consists of 8,500 acres and a mill capable of processing 2,000 cubic yards per day. Gold has been found in three zones with proven and probable reserves estimated at more than 8 million cubic yards with a grade of 0.031 oz/cubic yard (0.045 oz Au/ton. In addition to gold revenue, Maymac expects to receive revenue from the sale of clean sand and gravel within the tailings (NM, 5/2/94).

Early in 1994, Takla Star and Uranerz USA signed a second joint venture agreement which enabled the former to explore an additional 10,320 acres in the Crescent Valley area. Takla can acquire 40% interest in Uranerz's Utah and Cortez projects as well as a 33% interest in Uranerz's right to earn 70% of the Orbit and Hand-Me-Down projects. Taklas commitments include spending $3.5 million over 5 years (NM, 3/21/94). By mid-year, however, a 2,990-foot drilling program was completed on the Hand-Me-Down property but no significant mineralization was found and this property has been dropped by the partners (NM, 8/8/94).

Lewis district

Exploration and development drifting is underway at the St. George Metals Dean mine and stoping is being done to mine about 5,000 tons of high-grade ore that had been blocked out earlier. The vein segment being mined is 3 to 3 1/2 feet wide and 165 feet long and lies at a 52° dip. The vein averages in excess of 1 oz Au/ton (DMR, 9/7/94).

LINCOLN COUNTY

Delamar district

A substantial amount of high grade ore encountered in the Phase Two drill program by World Wide Minerals Inc. at the Easter project has increased the average grade from 0.064 to 0.069 oz Au/ton. Of the 3.36 million tons of mineral inventory previously outlined by Homestake Mining Co., about 1.5 million tons has been defined as an open-pit reserve. The reserves are within a 1,600-foot-long by 40- to 90-foot-wide segment of the Main Vein, part of a 7,000-foot-long mineralized structure (DMR, 10/5/94).

LYON COUNTY

Pine Grove district

Regeena Resources plans to conduct exploration on the Teck/Silver Standard Pine Grove property. Teck has spent $2.2 million on the property outlining a geologic resource of 2.5 million tons averaging 0.061 oz Au/ton in two zones. Silver Standard has an agreement to acquire the property from Teck, and, Regeena, in turn, can earn half of Silver Standard's interest by spending $2.5 million over four years. Exploration, including infill drilling, is expected to start shortly (NM, 7/11/94).

Talapoosa district

The Talapoosa Joint Venture between Athena Gold Corp. and Pegasus Gold Corp. terminated April 25, 1994 with Athena now retaining a 100% interest in the project. Miramar Mining plans to acquire Talapoosa through a merger with Athena. After the acquisition is complete, Miramar plans to continue with the permitting process at Talapoosa, as well as fund an independent feasibility study (NM, 8/22/94). Reported reserves at the property are about 50 million tons averaging 0.026 oz Au/ton and 0.35 oz Ag/ton (CMJ, 6/1/94).

Yerington district

Permits for development of the MacArthur copper deposit have finally been received by Arimetco International and development of the deposit has started. MacArthur crops out at the surface and contains estimated proven and probable oxide copper reserves of 97 million tons containing 0.21% Cu. The nearby Yerington mine also has an open-pit oxide reserve of about 15 million tons averaging 0.32% copper. Arimetco entered into an agreement with Billiton Metals Inc. for Billiton to finance an expansion of the Yerington-MacArthur solvent extraction-electrowinning plant for cathode copper from 50,000 pounds per day to 80,000 pounds per day. Arimetco planned to complete the expansion by the end of 1994 (NM, 1/3/94; DMR, 8/31/94).

MINERAL COUNTY

Aurora district

Consolidated Nevada Goldfields Corp. reports that additional mineable reserves have been discovered on east-trending extensions of the Juniata vein, which is currently being mined at the Aurora mine. A new mine plan, designed to include these reserves, has resulted in an increase in mineable reserves of 80,000 tons at 0.12 oz Au/ton. Total mineable reserves now stand at 316,000 tons at 0.120 oz Au/ton (DMR, 12/21/94).

In this same district, Electra Mining Consolidated assumed total ownership of the Aurora Partnership heap-leach gold mine. During 1994, the mine produced its 200,000th ounce of gold since production commenced in 1987, and the company expects gold recovery from heap-leach pads to continue into 1997. Additional open-pit reserve potential is seen in the area, and the property also contains an underground resource of 1.5 million tons averaging 0.1 oz Au/ton, including an estimated 100,000 tons averaging 0.32 oz Au/ton. During 1994, Electra staked 3,200 acres northeast and southwest of the mine and, in 1995, plans an aggressive, multistage exploration program to assess the claims (DMR, 9/7/94; NM, 12/26/94; SKL, 2/11/95).

Candelaria district

Kinross Gold Corp. announced a 60-million-oz increase in reserves at its Candelaria silver mine near Hawthorne. The increase consists of surface-mineable reserves of about 15 million oz of silver and 42,000 oz of gold, resulting in a three-year increase in open-pit operations, and drill-indicated underground reserves of 45 million ounces of silver and 46,000 ounces of gold, representing 10 years of operation. A mineable reserve of nearly 10.5 million tons averaging 1.41 oz of silver and 0.004 oz of gold per ton has been confirmed in the Northern Belle pit. This will be an open-pit heap-leach operation. The underground reserve is estimated at about 6.5 million tons of 6.78 oz of silver and 0.007 oz of gold per ton. The new reserves will allow an annual production above 3 million oz of silver and 10,000 oz of gold for many years (AMCJ, 10/1/94).

Pamlico district

Reverse circulation drilling is under way at the Pamlico property. Pamlico Gold is testing eight separate areas by 15,000 feet of drilling in 20 to 30 holes. Geochemical and geophysical work has outlined extensive zones of quartz veining and induced polarization responses and anomalous gold-silver values have been found in rock samples. Pamlico Gold can earn a 51% interest in the property from Cactus West Exploration by spending $1.3 on exploration, development, and option payments (NM, 12/26/94).

NYE COUNTY

Bare Mountain district

Rayrock Yellowknife Resources Inc. will participate in developing the Daisy-Mother Lode property of Inter-Rock Gold Inc. Proven and probable open-pit reserves at the Daisy-Mother Lode now total about 18 million tons containing 425,000 ounces of gold. The reserves are contained in four separate deposits: Secret Pass with 6.8 million tons contains 135,000 oz Au; Mother Lode contains 9.4 million tons of sulfide mineralization averaging 0.046 oz Au/ton; Sunday Night contains 2.8 million tons of oxide material averaging 0.04 oz Au/ton; and the West Zone contains 0.7 million tons of oxide averaging 0.027 oz Au/ton. Inter-Rock is now completing a mine operation study for the Secret Pass deposit. Other areas of the Daisy property have been identified as having good possibilities and additional exploration work is planned for 1995 (DMR, 1/25/95).

Union district

Santa Fe Pacific Gold Corp. plans to drill up to 50 holes and to construct about 5 miles of new road in the Buffalo Canyon area. This is a phased project with 20 holes planned the first year and more, if needed, in the following year or two (USFS project notice, 8/4/94).

Marshall Earth Resources Inc. has discovered a geologic resource at the Nevada Mercury mine presently estimated at around 50,000 oz Au. Goldfields Mining Co., who had leased the property during 1992-93, made the initial discovery during their first phase of drilling on the Burro patented mining claim. Marshall is excited about the potential for exploration of a large area of disseminated low-grade gold (DMR, 9/7/94).

PERSHING COUNTY

Antelope Springs district

Trev Corp. is earning a 49% interest in the Relief Canyon property from J.D. Welsh. Reserves are estimated to be 1.5 million tons containing 0.035 oz Au/ton (SEG, 7/1/94).

Goldbanks district

Restoration Minerals drilled more than 100 holes in the Goldbanks Hills about 35 miles south of Winnemucca. The drilling focused along a 3,000-foot zone next to the old mercury workings at Squaw Butte. A preliminary assessment of the deposit prepared by Pincock, Allen & Holt concluded the property contains probable ore reserves in excess of 900,000 oz Au. and, early in 1994, MK Gold Co. entered into an agreement with Restoration Minerals to participate in the development and operation of the property. After a two-month review of the project, however, MK elected to discontinue further participation (SEG, 1/1/94; SKL, 1/29/94; DMR, 4/27/94).

Rochester district

Coeur d'Alene Mines Corp. reported that ore reserves continue to be upgraded at its Rochester mine. At the end of 1994, proven and probable reserves stood at 75 million tons with an average grade of 1.76 oz Ag/ton and 0.0103 oz Au/ton. Assuming favorable precious metals prices, this will allow nine to ten more years of mining at Rochester (Nevada Mining Association Newsletter, March 1995)

Rosebud district

Hecla Mining Co. intends to develop the Rosebud gold project upon completion of a feasibility study in late 1995. The property carries a reserve of 512,000 oz of gold (DMR, 3/23/94).

STOREY COUNTY

Comstock district

Rea Gold's South Comstock open-pit, heap-leach mine began production a year ago, and permitting is under way for a second phase of operation during which an additional 47,000 oz of gold would be produced. Reported reserves stand at about 3 million tons of 0.05 oz Au/ton (DMR, 9/7/94; NM, 11/28/94).

WASHOE COUNTY

Olinghouse district

Alta Gold Co. purchased the Olinghouse gold property from Phelps Dodge Corp. for $6,875,000 in cash and securities and plans to begin operations in 1995. Alta Gold proposes to drill 550 holes, construct 12 miles of new road, excavate three trenches, and reopen some existing adits for bulk sampling. Work will commence in early 1995 and be completed by the end of 1996. Results from 45 drill holes already completed show a large area of high-grade mineralization in a 1,200-foot-long by 75-foot-wide vein and stockwork zone developed in andesitic volcanic rocks. The property contains an indicated resource of about 500,000 oz of gold with an average grade of 0.057 oz Au/ton (BLM project notice, 12/6/94).RGJ, 7/26/94).

WHITE PINE COUNTY

Robinson district

Construction on Magma Copper Co.'s new Robinson mine commenced in mid-October. Robinson's defined reserves of 252 million tons containing 2.1 billion pounds of recoverable copper and 1.8 million oz of gold. When the operation reaches planned production, it will produce 135 million pounds of copper, 110,000 oz of gold, and 325,000 oz of silver annually over a 16-year period with net cash operating costs of less than 50 cents per pound of copper (RGJ, 10/13/94). Magma believes that with the tremendous exploration potential that the property holds, mining could extend beyond the expected current mine life of 16 years (DMR, 10/19/94).

White Pine district

Alta Gold Co. exercised its option with Griffon Resources Inc. to purchase 100% interest in the Griffon gold property. The property comprises 69 unpatented mining claims and is 30 miles west of Ely. Drilling has defined a proven reserve of 50,454 oz at an average grade of 0.039 oz Au/ton. Production is anticipated in the fourth quarter of 1995 (RMPD, 10/1/94).

Mining at Alta Gold Co.'s Easy Junior mine was completed in August 1994. Alta anticipates that gold production will continue to be generated from Easy Junior through the second quarter of 1995 as the mined ore stockpile is drawn down and processed (DMR, 11/30/94).

Within 5 months of acquiring the Mt. Hamilton property, Rea Gold has poured its first gold-silver doré bar. Within the property, two adjoining deposits, the NE Seligman and the Centennial, contain a mineable reserve of 9.04 million tons averaging 0.052 oz Au/ton and 0.38 oz Ag/ton. The total geologic resource is estimated at 16.6 million tons averaging

0.04 oz Au/ton and 0.39 oz Ag/ton. NE Seligman remains open to the east, while Centennial is open towards the southeast. Mt. Hamilton is expected to produce 352,700 oz of gold and 1.5 million oz of silver over a mine life of at least 7.5 years. The Mt. Hamilton property comprises about 15 square miles and, when combined with the neighboring Monte Cristo property, the company controls a total land package of 25 square miles within the district (NM, 11/28/94).

Drill rigs at Bald Mountain mine *(S.B. Castor photo).*

Major Precious-Metal Deposits

by Harold F. Bonham, Jr., and Ronald H. Hess

The information in this compilation was obtained from the Nevada Division of Minerals and from published reports, articles in mining newsletters, and company annual reports and press releases. Locations of most of these deposits are shown on NBMG Map 91, and most active mines are shown on page 2 of this publication.

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
CHURCHILL COUNTY				
Bell Mountain	1989: *reserves*—30,000 oz Au, 125,000 oz Ag	no production	rhyolitic tuff	Miocene
Dixie Comstock	1991: 2.4 million tons, 0.049 oz Au/ton	1989: development 1990-93: exploration	Tertiary rhyolite	Miocene?
Fondaway Canyon	1988: 400,000 tons, 0.06 oz Au/ton 1990: 400,000 tons, 0.06 oz Au/ton	1989: 1,065 oz Au, 87 oz Ag 1990: 12,000 oz Au 1993: idle	Triassic slate and phyllite	Cretaceous
New Pass property	1994: 3.4 million tons, 0.042 oz Au/ton			
CLARK COUNTY				
Crescent property	1992: 390,000 tons, 0.05 oz Au/ton; 3.3 million tons, 0.022 oz Au/ton			
Goodsprings (Keystone)	1990: *estimated geologic resource* 64 million tons, 0.05 oz Au/ton 1992: 110,000 tons, 0.11 oz Au/ton	1990: ~1,000 oz Au 1993: idle	lower Paleozoic carbonate rocks	Triassic
ELKO COUNTY				
Big Springs (Sammy Creek)	1989: 1.55 million tons, 0.172 oz Au/ton	1987-88: ~106,000 oz Au 1989: 60,376 oz Au, 4,416 oz Ag 1990: 73,224 oz Au, 3,060 oz Ag 1991: 69,539 oz Au, 3,327 oz Ag 1992: 71,035 oz Au, 600 oz Ag 1993: 52,752 oz Au 1994: 28,315 oz Au, 2,597 oz Ag	Mississippian to Permian overlap assemblage clastic and carbonate rocks	Cretaceous or Tertiary
Bootstrap/ Capstone	1989: *geologic resource*—25.1 million tons, 0.039 oz Au/ton 1990: 18.3 million tons, 0.044 oz Au/ton 1994: 169,000 oz Au, *geologic resource*—1 million oz Au	1988-90: NGO	dacitic dikes, Paleozoic siltstone and laminated limestone/chert	~37 Ma
Burns Basin	Reserves and production included in Jerritt Canyon figures		Roberts Mountains and Hanson Creek Formations	Cretaceous or Tertiary
Cobb Creek	1988: *geologic resource—3.*2 million tons 0.045 oz Au/ton			
Cord Ranch	1991: 3.5 million tons, 0.037 oz Au/ton 1992: 6.0 million tons, 0.03 oz Au/ton 1994: 350,000 oz Au in 3 deposits			
Dark Star	1991: 4.5 million tons, 0.022 oz Au/ton 1992: 5.76 million tons, 0.02 oz Au/ton			
Dee	1990: 4.5 million tons, 0.059 oz Au/ton 1992: 5.2 million tons, 0.049 oz Au/ton 1994: *geologic resource*—958,000 oz Au	1987-88: ~97,000 oz 1989: 44,500 oz Ag, 45,000 oz Ag 1990: 48,095 oz Au, 64,650 oz Ag 1991: 42,000 oz Au, 42,000 oz Ag 1992: 38,150 oz Au, 35,500 oz Ag 1993: 25,860 oz Au 1994: 24,219 oz Au	Vinini Formation Devonian carbonates, dacitic dikes	Cretaceous or Tertiary
Emigrant Springs	1989: 30.3 million tons, 0.021 oz Au/ton	exploration	lower Paleozoic sedimentary rocks	Cretaceous or early Tertiary

NGO: Newmont Gold Operations (Bootstrap/Capstone, Blue Star, Carlin, Genesis, Gold Quarry and Rain mines) reported production of 895,500 oz Au in 1988, 1,467,800 oz Au and 117,400 oz Ag in 1989, 1,676,000 oz Au in 1990, 1,575,700 oz Au in 1991, 1,588,000 oz Au and 98,000 oz Ag in 1992, 1,666,400 oz Au and 175,000 oz Ag in 1993, and 1,554,000 oz Au and 158,000 oz Ag in 1994.

MAJOR PRECIOUS-METAL DEPOSITS (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
ELKO COUNTY (continued)				
Hollister (Ivanhoe)	1989: *oxide*—18.4 million tons, 0.035 oz Au/ton; estimated mineral inventory 83.5 million tons, 0.034 oz Au/ton, with 52.8 million tons of oxide and 30.7 million tons of sulfide	1990: 6,000 oz Au 1991: 60,000 oz Au 1993: exploration	rhyolitic tuff, flows, volcaniclastic rocks, Paleozoic sedimentary rocks	Miocene
Jerritt Canyon (includes Saval Canyon)	1989: 21.6 million tons, 0.143 oz Au/ton mill ore; 6.5 million tons, 0.043 oz Au/ton leachable 1990: new discovery south of current mine has a geologic resource of 3.2 million tons, 0.284 oz Au/ton 1991: *geologic resource*—4.7 million oz Au	1981-89: ~2.3 million oz Au 1990: 323,000 oz Au 1991: 374,354 oz Au, 4,727 oz Ag 1992: 318,020 oz Au, 8,264 oz Ag 1993: 361,820 oz Au, 6,470 oz Ag 1994: 326,000 oz Au, 5,440 oz Ag	Hanson Creek and Roberts Mountains Formations	~40 Ma
Kinsley Mountain	1988: 2.1 million tons, 0.048 oz Au/ton 1993: 2.6 million tons, 0.047 oz Au/ton 1994: 3.5 million tons, 0.044 oz Au/ton	1993: evaluation	upper Paleozoic carbonate rocks	Oligocene?
Meikle (Purple Vein)	1992: *geologic resource*—7.9 million tons, 0.613 oz Au/ton 1993: *geologic resource*—6.6 million oz Au 1994: 6.6 million tons, 0.68 oz Au/ton	underground development	Popovich and Roberts Mountains Formations	Cretaceous or Tertiary
Pony Creek	1994: *geologic resource*—1.1 million tons, 0.057 oz Au/ton			
Rain	1989: *geologic resource*—22.6 million tons, 0.052 oz Au/ton 1990: 9 million tons, 0.063 oz Au/ton	1988: 29,000 oz Au 1991: 135,400 oz Au 1994: NGO	Webb Formation	36-37 Ma
SMZ	1989: *geologic resource*—1.6 million tons, 0.019 oz Au/ton			
Trout Creek	1988: 1.5 million tons, 0.04 Au/ton	1988: exploration	lower Paleozoic rocks	Cretaceous or Tertiary
Tuscarora (Dexter)	1987: 2 million tons, 0.039 oz Au and 1.9 oz Ag/ton 1988: 1.8 million tons, 0.037 oz Au/ton 0.74 oz Ag/ton	1896-1902: 29,940 oz Au, 28,543 oz Ag 1987-89: 33,000 oz Au, 143,000 oz Ag 1990: 1,163 oz Au, 41,865 oz Ag 1992-93: idle	Eocene rhyolitic ignimbrite and andesite	38 Ma
Winters Creek	1986: 1.4 million tons, 0.146 oz Au/ton	evaluation, exploration	lower Paleozoic carbonate rocks	Cretaceous or Tertiary
Wood Gulch	1988: 500,000 tons, 0.098 oz Au and 0.4 oz Ag/ton 1991: mined out	1989: 19,810 oz Au, 31,122 oz Ag 1990: 14,926 oz Au, 35,374 oz Ag	lower Paleozoic sedimentary rocks, andesite-dacite dikes and sills	Cretaceous or Tertiary
Wright Window	1986: 1.3 million tons, 0.095 oz Au/ton	1992: 3,500 oz Au	lower Paleozoic carbonate rocks	Cretaceous or Tertiary
ESMERALDA COUNTY				
Boss Mine	1987: 500,000 tons, 0.07 oz Au/ton	1993: idle	Ordovician sedimentary rocks	Miocene?
Boss property	1990: *reserves*—637,500 tons, 0.023 oz Au/ton 1990: *geologic resource*—31,000 oz Au			
Divide	1988: 500,000 tons, 0.04 oz Au and 0.40 oz Ag/ton	evaluation 1991-93: idle	Miocene silicic tuff	16 Ma
Goldfield Project	1983: 1.75 million tons, 0.087 oz Au/ton 1991: 1.2 million tons, 0.05 oz Au/ton 1993: 2.3 million tons, 0.073 oz Au/ton 1994: 3.48 million tons, 0.071 Au/ton	1903-45: 4.19 million oz Au, 1.45 million oz Ag 1989: 1,987 oz Au, 200 oz Ag 1993: 11,350 oz Au	andesite, rhyodacite, rhyolite	21 Ma
Hasbrouck	1986: 12.9 million tons, 0.0291 oz Au and 0.59 oz Ag/ton	1986-92: exploration 1993: idle	Siebert Formation tuff and volcaniclastic rocks	16 Ma
Mary-Drinkwater	1993: 1.6 million tons, 0.196 oz Au/ton			

NGO: Newmont Gold Operations (Bootstrap/Capstone, Blue Star, Carlin, Genesis, Gold Quarry and Rain mines) reported production of 895,500 oz Au in 1988, 1,467,800 oz Au and 117,400 oz Ag in 1989, 1,676,000 oz Au in 1990, 1,575,700 oz Au in 1991, 1,588,000 oz Au and 98,000 oz Ag in 1992, 1,666,400 oz Au and 175,000 oz Ag in 1993, and 1,554,000 oz Au and 158,000 oz Ag in 1994.

MAJOR PRECIOUS-METAL DEPOSITS (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
ESMERALDA COUNTY (continued)				
Silver Peak	1991: 531,300 tons, 0.124 oz Au/ton	1991: 25,000 oz Au. 8,000 oz Ag	Wyman Formation	Mesozoic?
Top	1986: *geologic resource*—5.2 million tons, 0.093 oz Au/ton			
Weepah	1986: 200,000 tons, 0.1 oz Au and 0.4 oz Ag/ton	1986-87: 58,000 oz Au 1988-90: idle	Wyman Formation	Cretaceous
EUREKA COUNTY				
Archimedes/Ruby Hill Project	1994: *geologic resource*—20 million tons, 0.08 oz Au/ton	exploration		
Blue Star	1989: *geologic resource*—22.2 million tons, 0.030 oz Au/ton 1990: 32 million tons, 0.047 oz Au/ton (includes Genesis)	1974-84: intermittent 1988-94: NGO	lower Paleozoic sandy siltstone and carbonate rocks, granodiorite	Cretaceous or early Tertiary
Bobcat	1988: *geologic resource*—17.7 million tons, 0.029 oz Au/ton		lower Paleozoic rocks	Cretaceous or Eocene
Buckhorn	1990: 700,000 tons, 0.05 oz Au/ton; *geologic resource*—200,350 oz Au 1991: 409,000 tons, 0.062 oz Au/ton 1992: open pit ore mined out 1993: *geologic resource*—1.1 million tons, 0.11 oz Au/ton	1988-91: 97,922 oz Au, 376,487 oz Ag 1992: 7,700 oz Au, 28,800 oz Ag 1993: 3,800 oz Au, 4,600 oz Ag	basaltic andesite, sinter, silicified sedimentary rocks	14.6 Ma
Bullion Monarch	1987: 1 million tons, 0.10 oz Au/ton	exploration, evaluation	lower Paleozoic sedimentary rocks	Tertiary or Mesozoic
Carlin	1989: *geologic resource*—20.8 million tons, 0.029 Au/ton 1990: 1.4 million tons, 0.066 oz Au/ton	1965-84: 4.3 million oz Au 1988: 25,320 oz Au 1989: idle 1991: 35,500 oz Au 1993: underground development 1994: NGO	Roberts Mountains Formation	Cretaceous or early Tertiary
Genesis	1989: *geologic resource*—35.8 million tons, 0.044 oz Au/ton 1990: 32 million tons, 0.047 oz Au/ton (includes Blue Star)	1986: production commenced 1988-94: NGO	Ordovician-Devonian limestone, argillite chert	Cretaceous or early Tertiary
Gnome	1988: 2.7 million tons, 0.048 oz Au/ton	exploration	Paleozoic sedimentary rocks	Cretaceous or early Tertiary
Gold Bar	1988: 2.75 million tons, 0.10 oz Au/ton 1989: *geologic resource*—1.45 million oz Au 1990: mined out in December 1994: 240,000 oz Au	1987-88: 91,000 oz Au 1989: 66,000 oz Au 1990: 81,263 oz Au 1991: 80,727 oz Au, 3,000 oz Ag 1992: 80,000 oz Au 1993: 55,080 oz Au 1994: 20,000 oz Au	Devonian Nevada Formation	Eocene?
Gold Canyon	1992: *reserves*—86,500 oz Au, *geologic resource*—131,000 oz Au 1993: 770,000 tons, 0.080 oz Au/ton			
Gold Pick	1988: 10 million tons, 0.06 oz Au/ton 1990: 9.7 million tons, 0.057 oz Au/ton includes Gold Ridge and Goldstone 1991: 4.5 million tons, 0.055 oz Au/ton 1992: *geologic resource*—329,700 oz Au, includes eastern deposit 1993: 1.4 million tons, 0.079 oz Au/ton	exploration	Paleozoic sedimentary rocks	Eocene?
Gold Quarry	1987: 197.8 million tons, 0.042 oz Au/ton 1988: *geologic resource*—503 million tons, 0.04 oz Au/ton 1990: 212.6 million tons, 0.042 oz Au/ton, *geologic resource*—534.3 million tons, 0.037 oz Au/ton 1991: *reserves*—9.3 million oz Au	1985 170,000 oz Au 1988-94: NGO	Ordovician to Devonian chert, shale, siltstone, and impure carbonates; in part, Vinini Formation	Cretaceous or early Tertiary

continued

NGO: Newmont Gold Operations (Bootstrap/Capstone, Blue Star, Carlin, Genesis, Gold Quarry and Rain mines) reported production of 895,500 oz Au in 1988, 1,467,800 oz Au and 117,400 oz Ag in 1989, 1,676,000 oz Au in 1990, 1,575,700 oz Au in 1991, 1,588,000 oz Au and 98,000 oz Ag in 1992, 1,666,400 oz Au and 175,000 oz Ag in 1993, and 1,554,000 oz Au and 158,000 oz Ag in 1994.

MAJOR PRECIOUS-METAL DEPOSITS (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
EUREKA COUNTY (continued)				
Gold Ridge	1988: 4 million tons, 0.06 oz Au/ton 1990: *see* Gold Pick 1991: 2.9 million tons, 0.04 oz Au/ton 1992: 1.4 million tons, 0.038 oz Au/ton 1993: 426,000 tons, 0.059 oz Au/ton	exploration, evaluation	Paleozoic sedimentary rocks	Eocene?
Goldstone	1988: 1.7 million tons, 0.08 oz Au/ton 1990: *see* Gold Pick 1991: 845,000 tons, 0.063 oz Au/ton 1992: 878,000 tons, 0.061 oz Au/ton 1993: 130,928 tons, 0.104 oz Au/ton	exploration, evaluation	Paleozoic sedimentary rocks	Eocene?
Goldstrike (Betze, Post), and Meikle	1988: 128.4 million tons, 0.095 oz Au/ton 1990: *geologic resource*—18.4 million oz Au 1992: 112.1 million tons, 0.180 oz Au/ton, *geologic resource*—21 million oz Au 1993: *geologic resource*—29.1 million oz Au 1994: *reserves*—29.6 million oz Au	1980-88: 440,000 oz Au 1989: 207,264 oz Au, 15,500 oz Ag 1990: 352,880 oz Au, 20,112 oz Ag 1991: 546,146 oz Au, 22,000 oz Ag 1992: 1,108,218 oz Au, 34,735 oz Ag 1993: 1,439,929 oz Au 1994: 1,849,503 oz Au, 107,330 oz Ag	Ordovician to Devonian chert, shale, sltstone, and impure carbonates; in part, Vinini Formation	Cretaceous or early Tertiary
Horse Canyon	1984: 3.94 million tons, 0.055 oz Au/ton 1988: included in Gold Acres figures	1984: 40,000 oz Au 1988-93: included with Gold Acres	Vinini Formation, Wenban Limestone	34 Ma?
Lantern	1988: *geologic resource*—15.45 million tons, 0.028 oz Au/ton	exploration	lower Paleozoic sedimentary rocks	Cretaceous or early Tertiary
Maggie Creek	1988: *geologic resource*—303,000 tons, 0.092 oz Au/ton	1984: 1,250,000 tons 1986: intermittent production 1988: no production reported	Ordovician to Devonian siltstone, chert, sandstone, impure limestone	Cretaceous or early Tertiary
North Star	1989: *geologic resource*—6.9 million tons, 0.052 oz Au/ton 1990: 3.9 million tons, 0.052 oz Au/ton	1988: 4,250 oz Au	lower Paleozoic sedimentary rocks	Cretaceous or early Tertiary
Pete	1988: *geologic resource*—15.7 million tons, 0.030 oz Au/ton 1989: 4.3 million tons, 0.036 oz Au/ton, *geologic resource*—15.8 million tons, 0.030 oz Au/ton	exploration	Roberts Mountains Formation	Cretaceous or early Tertiary
Post/Deep Post	Newmont Gold Co. holdings only- 1988: *geologic resource*—195 million tons, 0.062 oz Au/ton 1990: 40.1 million tons, 0.147 oz Au/ton 1992: 9 million oz Au	1988: 4,930 oz Au 1991: 177,500 oz Au	Vinini Formation, lower Paleozoic carbonate rocks	Cretaceous?
Project Glister		1989: 8,450 oz Au, 23,519 oz Ag		
Ratto Canyon	1984: ~200,000 oz Au	exploration	Dunderberg Shale, Hamburg Dolomite	Oligocene
Rock Creek	1988: 30,000 oz Au			
Tonkin Springs	1987: *oxide*—1.5 million tons, 0.05 oz Au/ton; *sulfide*—2.5 million tons, 0.09 oz Au/ton 1991: 9 million tons, 0.05 oz Au/ton	1987: ~9,700 oz Au 1988: 565 oz Au 1989: 1,753 oz Au, 1,402 oz Ag 1990: 2,068 oz Au, 470 oz Ag 1992: idle, exploration, metallurgical testing	Vinini Formation, dacitic dikes	Oligocene?
Tusc	1988: *geologic resource*—15.8 million tons, 0.059 oz Au/ton 1990: 13.3 million tons, 0.062 oz Au/ton	exploration	lower Paleozoic sedimentary rocks	Cretaceous or early Tertiary
Windfall	1988: 3 million tons, 0.03 oz Au/ton	1908-16: 24,000 oz Au 1975-84: 90,000 oz Au 1988: 6,380 oz Au, 59 oz Ag	Hamburg Dolomite	Eocene or Oligocene
Zeke	1989: 2 million tons, 0.056 oz Au and 0.224 oz Ag/ton			
HUMBOLDT COUNTY				
Adelaide Crown	1989: *south pit*—585,000 tons, 1.313 oz Ag and 0.043 oz Au/ton; *additional area* - 165,000 tons, 0.015 oz Au and 1.10 oz Ag/ton	1990: 3,068 oz Au, 37,537 oz Ag 1991: 1,849 oz Au, 15,937 oz Ag 1992: idle	Preble Formation	Tertiary

MAJOR PRECIOUS-METAL DEPOSITS (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
HUMBOLDT COUNTY (continued)				
Ashdown	1988: 1 million tons, 0.11 oz Au/ton 1992: 1.1 million tons, 0.12 oz Au/ton	exploration	Mesozoic granite	Mesozoic
Chimney Creek	1988: *proven, probable*—26.9 million tons, 0.068 oz Au/ton; *inferred in south pit*—2.1 million oz Au 1989: *geologic resource*—4.6 million oz Au 1993: *see* Twin Creeks	1987-88: 300,000 oz Au 19989: 222,556 oz Au, 55,953 oz Ag 1990: 220,000 oz Au 1991: 228,065 oz Au, 100,000 oz Ag 1992: 247,969 oz Au, 113,463 oz Ag 1993: *see* Twin Creeks	upper Paleozoic sedimentary rocks	Eocene?
Crofoot/Lewis	1988: 25 million tons, 0.025 oz Au/ton 1990: 12 million tons, 0.020 oz Au/ton 1991: 13.9 million tons, 0.019 oz Au/ton 1992: 29.8 million tons, 0.024 oz Au/ton, *geologic resource*—45 million tons, 0.021 oz Au/ton 1993: 29.8 million tons, 0.024 oz Au/ton 1994: *geologic resource*—56.7 million tons, 0.018 oz Au/ton 1994: *geologic resource*—58.1 million tons, 0.019 oz Au/ton	1988: 75,800 oz Au 1989: 82,000 oz Au, 123,000 oz Ag 1990: 92,000 oz Au, 110,000 oz Ag 1991: 94,340 oz Au, 151,553 oz Ag 1992: 100,000 oz Au, 280,000 oz Ag 1993: 86,516 oz Au, 310,559 oz Ag 1994: 94,500 oz Au, 297,000 oz Ag	Camel conglomerate, rhyolite dikes	1-2 Ma
Getchell	1989: 8.1 million tons, 0.154 oz Au/ton mill grade and 1.43 million tons, 0.049 Au/ton heap-leach ore; *additional geologic resource* - 5.7 million tons, 0.092 oz Au/ton sulfide and 2.6 million tons, 0.055 oz Au/ton oxide 1991: 6.5 million tons, 0.192 oz Au/ton sulfide and 1.8 million tons, 0.039 oz Au/ton oxide. 1992: *sulfide*—7.0 million tons, 0.194 oz Au/ton; *oxide*—2.5 million tons, 0.031 oz Au/ton 1993: *geologic resource*—1.3 million oz Au 1994: *reserves*—1.59 million oz Au	1938-50, 1962-67: 788,875 oz Au 1987-88: ~35,000 oz Au 1989: 120,730 oz Au, 9,407 oz Ag 1990: 172,029 oz Au 1991: 200,958 oz Au 1992: 230,600 oz Au, 78,700 oz Ag 1993: 210,000 oz Au, 51,000 oz Ag 1994: 230,000 oz Au, 57,000 oz Ag	Comus and Preble Formations, granodiorite dikes, granodiorite	90 Ma
Lewis	1984: 10 million tons, 0.04 oz Au/ton 1987: 9 million tons, 0.032 oz Au/ton	1984: 3,500 tons/day 1987: ~8,800 oz Au 1988-90: included in Crofoot/Lewis	Camel conglomerate, rhyolite dikes	1-2 Ma
Lone Tree	1990: 5.4 million tons oxide mill ore, 0.159 oz Au/ton, 5.7 million tons heap-leach ore, 0.025 oz Au/ton and 1.2 million oz Au in sulfide ore 1991: *reserves*—1 million oz Au 1992: 3.14 million oz Au 1993: 3.8 million oz Au 1994: 4 million oz Au	1991: 36,424 oz Au 1992: 128,000 oz Au 1993: 155,000 oz Au 1994: 226,911 oz Au	Havallah Formation and dacite porphyry	38 Ma
Marigold	1990: 4.3 million tons, 0.105 oz Au/ton mill ore, 7.6 million tons, 0.026 oz Au/ton heap-leach ore 1992: 10 million tons, 0.055 oz Au/ton	1989: 16,000 oz Au, 484 oz Ag 1990: 60,750 oz Au, 1,600 oz Ag 1991: 65,469 oz Au, 2,000 oz Ag 1992: 90,000 oz Au, 4,000 oz Ag 1993: 90,000 oz Au, 1,700 oz Ag 1994: 84,895 oz Au	Paleozoic chert, argillite, and carbonate rocks	early Oligocene
North Stonehouse	1991: 2.5 million tons, 0.103 oz Au mill ore		Havallah Formation and porphyry dikes	39 Ma
Pinson (includes Mag pit)	1989: 480,000 oz Au 1992: 4.98 million tons, 0.064 oz Au/ton	1980: 56,000 oz Au 1986-88: 189,864 oz Au 1989: 72,489 oz Au (includes Preble) 1990: 56,382 oz Au 1991: 55,640 oz Au 1992: 50,340 oz Au, 5,730 oz Ag 1993: 50,870 oz Au, 3,470 oz Ag 1994: 44,000 oz Au, 3,500 oz Ag	Comus Formation	90 Ma
Preble	1989: 15,110 oz Au 1992: idle, mined out	1985: 17,000 oz Au 1987: 28,000 oz Au 1988: 18,828 oz Au 1989: included with Pinson 1990: 1,161 oz Au	Preble Formation	90 Ma?

continued

MAJOR PRECIOUS-METAL DEPOSITS (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
HUMBOLDT COUNTY (continued)				
Rabbit Creek	1989: 4.1 million oz Au; *additional geologic resource*—1 million Au in refractory material 1990: *reserves*—2.5 million oz Au; *geologic resource*—5.1 million oz Au 1992: *reserves*—3.26 million oz Au 1993: *see* Twin Creeks	1990: 25,000 oz Au 1991: 115,500 oz Au 1992: 156,000 oz Au 1993: *see* Twin Creeks	Ordovician	Eocene?
Sleeper	1989: 1,975,000 oz Au 1990: 44.1 million tons, 0.038 oz Au and 0.152 oz Ag/ton 1991: 1.7 million oz Au, 6.7 million oz Ag 1993: 751,000 oz Au	1986: 128,000 oz Au, 94,000 oz Ag 1987: 158,696 oz Au 1988: 230,410 oz Au 1989: 256,000 oz Au, 339,650 oz Ag 1990: 250,131 oz Au, 391,886 oz Ag 1991: 183,346 oz Au, 289,463 oz Ag 1992: 132,383 oz Au, 285,011 oz Ag 1993: 100,020 oz Au, 254,690 oz Ag 1994: 106,912 oz Au, 142,597 oz Ag	Miocene "latite" flows and dikes, silicic ash-flow tuff, Triassic slate and phyllite	Miocene
Trenton/Valmy	1994: *geologic resource*—20.8 million tons, 0.03 oz Au/ton			
Trout Creek	1989: 50,000 oz Au			
Twin Creeks (Chimney and Rabbit Creeks)	1993: 5.7 million oz Au 1994: *geologic resource*—8.5 million oz Au	1993: 482,600 oz Au, 206,200 oz Ag 1994: 501,897 oz Au, 244,710 oz Ag	Paleozoic	Eocene?
LANDER COUNTY				
Austin Gold Venture	1989: mined out	1986-88: 141,000 oz Au 1989: 50,000 oz Au	Antelope Valley Limestone	Cretaceous or Tertiary
Buffalo Valley	1988: 1.5 million tons, 0.05 oz Au/ton 1991: idle 1994: 4.8 million tons, 0.07 oz Au/ton	1988: 9,238 oz Au 1989: 14,660 oz Au 1990: 15,770 oz Au 1991: W		Eocene?
Cortez	mined out	1968-82: 1.0 million oz Au	Roberts Mountains Formation	Cretaceous or early Tertiary
Crescent Pit	1994: 1.97 million tons mill grade, 0.125 oz Au/ton, 2.2 million tons heap leach, 0.029 oz Au/ton			
Crescent Valley	1994: *placer reserve*—8 million cu yd, 0.031 oz Au/cu yd			
Elder Creek Project/ Shoshone	1989: 91,500 oz Au 1990: 1.5 million tons, 0.041 oz Au/ton	1990: 17,400 oz Au 1991: 2,702 oz Au	Valmy Formation	Cretaceous or Eocene
Fire Creek	1982: 350,000 tons, 0.06 oz Au/ton	1983-84: 767 oz Au	basaltic andesite	Miocene
Fortitude (Copper Canyon) (Battle Mtn.)	1989: *proven, probable*—6.7 million tons, 0.13 oz Au and 0.47 oz Ag/ton (includes Surprise and Labrador) 1992: r*eserves*—3.1 million tons, 0.05 oz Au and 0.4 oz Ag/ton	1986: 259,000 oz Au, 902,000 oz Ag 1987: 255,000 oz Au 1988: 243,000 oz Au, 675,000 oz Ag 1989: 254,507 oz Au, 301,272 oz Ag 1990: 261,338 oz Au, 458,143 oz Ag (1988-90 production includes Surprise) 1991: 233,522 oz Au, 417,193 oz Ag 1992: 178,569 oz Au, 421 oz Ag 1993: 57,630 oz Au, 109,650 oz Ag 1994: 38,000 oz Au, 79,700 oz Ag	Battle Formation, Antler Peak Limestone, Pumpernickel Formation	37 Ma
Fortitude Extension (Phoenix)	1992: 500,000 oz Au 1993: *geologic resource*—900,000 oz Au			

W: withheld

MAJOR PRECIOUS-METAL DEPOSITS (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
LANDER COUNTY (continued)				
Gold Acres and Little Gold Acres	1987: 4.8 million tons, 0.105 oz Au/ton 1988: 5.4 million tons, 0.093 oz Au/ton 1992: *reserves*—3.1 million tons, 0.05 oz Au and 0.4 oz Ag/ton	1942-84: 2.4 million tons, 0.13 oz Au/ton; 2 million tons, 0.041 oz Au/ton leached. *Little Gold Acres:* 800,000 tons, 0.124 oz Au/ton 1988: 42,322 oz Au (includes Horse Canyon) 1989: 39,993 oz Au, 12,234 oz Ag (includes Horse Canyon) 1990: 53,945 oz Au, 10,150 oz Ag 1991: 53,500 oz Au, 6,600 oz Ag 1992: 75,000 oz Au 1993: 66,850 oz Au	Roberts Mountains Formation, Wenban Limestone, Valmy Formation, quartz porphyry dikes	92.8-94 Ma and 36 Ma
Hilltop	1984: 10.5 million tons, 0.073 oz Au/ton 1989: 10 million tons, 0.049 oz Au/ton	no production	Valmy Formation	Oligocene?
Klondike property	1989: 100,000 oz Au equivalent			
McCoy/Cove	1989: *proven and probable reserves* - 2.9 million oz Au, 128 million oz Ag *geologic resource*—3.5 million oz Au, 1.50 million oz Ag 1990: *reserves*—58.7 million tons, 0.045 oz Au, 2.32 oz Ag/ton 1993: *reserves*—63.3 million tons, 0.037 oz Au, 1.66 oz Ag/ton, *geologic resource*—2.43 million oz Au, 107 million oz Ag	1986: 50,000 oz Au 1987: 200,000 oz Au, 5 million oz Ag 1988: 100,000 oz Au, 700,000 oz Ag 1989: 214,566 oz Au, 2.26 million oz Ag 1990: 255,044 oz Au, 1.98 million oz Ag 1991: 284,327 oz Au, 5.62 million oz Ag 1992: 301,512 oz Au, 7.92 million oz Ag 1993: 395,610 oz Au, 12.45 million oz Ag 1994: 359,360 oz Au, 10.44 million oz Ag	Panther Canyon Formation (conglomerate, sandstone), Augusta Mountain Formation (limestone), granodiorite	39.5 Ma
Mud Springs (Bald Mtn. Zone)	1993: *geologic resource*—42,000 oz Au			
Mule Canyon	1992: 8.5 million tons, 0.136 oz Au/ton	1992: exploration	basalt and basaltic andesite	15-16 Ma
Pipeline	1991: *geologic resource*—11.3 million tons, 0.237 oz Au/ton 1993: 35.3 million tons, 0.120 oz Au/ton 1994: *reserves*—21.2 million tons, 0.145 oz Au/ton; *plus other resources*—8.3 million tons, 0.035 oz Au/ton		Roberts Mountains Formation	Cretaceous or early Tertiary
Reona project	1992: 360,000 oz Au, *geologic resource*—800,000 oz Au 1994: 370,000 oz Au	1994: 12,000 oz Au, 15,000 oz Ag		
Robertson	1988: 11 million tons, 0.04 oz Au/ton 1993: *geologic resource*—20 million tons, 0.036 oz Au/ton	1989: 3,700 oz Au	Valmy Formation	early Oligocene
Slaven Canyon property	1994: 50,000 oz Au			
South Pipeline	1992: 9 million tons, 0.082 oz Au/ton 1993: *geologic resource*—31.4 million tons, 0.106 oz Au/ton 1994: *geologic resource*—76.5 million tons, 0.048 oz Au/ton		Roberts Mountains Formation	Cretaceous or early Tertiary
Surprise	1987: 225,000 oz Au 1988-91: production and reserve included in Fortitude figures	1987: 2,000 oz Au	skarn	37 Ma
Toiyabe	1988: 813,400 tons, 0.066 oz Au/ton	1988: 32,000 oz Au, 10,300 oz Ag 1990: 11,700 oz Au, 9,100 oz Ag 1991: 8,780 oz Au, 6,025 oz Ag	lower Paleozoic calcareous siltstone	Eocene?
Trenton Valmy	1994: *resource*—20.8 million tons, 0.03 oz Au/ton		Vinini Formation	
Victorine (Kingston district)	1992: 915,000 tons, 0.304 oz Au/ton			

continued

MAJOR PRECIOUS-METAL DEPOSITS (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
LINCOLN COUNTY				
Atlanta	1980: 1.1 million tons, 0.08 oz Au and 1.6 oz Ag/ton 1991: idle	1980: 88,000 oz Au, 1,710,000 oz Ag 1987-89: idle 1990-93: idle	Pogonip Group, Ely Springs and Laketown Dolomites, Oligocene silicic tuff, dacite dikes	early Miocene
Delamar	1988: 200,000 tons, 0.079 Au/ton	1988: exploration 1990: exploration	Cambrian quartzite	Miocene
Easter project	1994: *geologic resource*—3.36 million tons, 0.069 oz Au/ton			
LYON COUNTY				
Fire Angel	1989: 5,600 oz Au, *geologic resource*—148,500 oz Au			
Pine Grove	1994: 2.5 million tons, 0.061 oz Au/ton			
South Comstock Joint Venture	1994: 3 million tons, 0.05 oz Au/ton			
Talapoosa	1988: 2.5 million tons, 0.041 oz Au and 0.53 oz Ag/ton *oxide* 14.9 million tons, 0.03 oz Au and 0.49 oz Ag/ton *sulfide* 1989: *additional resources delineated* - 2.7 million tons, 0.054 oz Au and 0.654 oz Ag/ton 1991: *geologic resource* - 19.6 million tons, 0.045 oz Au and 0.61 oz Ag/ton 1992: *geologic resource*—18 million tons, 0.044 oz Au and 0.61 oz Ag/ton 1994: *geologic resource*—50 million tons, 0.026 oz Au/ton, 0.35 oz Ag/ton	preproduction	Kate Peak Formation	Miocene
MINERAL COUNTY				
Aurora	1989: 347,000 tons, 0.253 oz Au/ton 1990: 433,000 tons, 0.21 oz Au/ton 1992: 493,000 tons, 0.15 oz Au/ton 1993: 537,400 tons, 0.123 oz Au/ton, *geologic resource*—100,000 oz Au 1994: 316,000 tons, 0.120 oz Au/ton	1989: 12,683 oz Au, 16,400 oz Au 1990: 12,973 oz Au, 18,162 oz Ag 1991: 15,000 oz Au 1992: 15,000 oz Au, 35,000 oz Ag 1993: 8,600 oz Au, 17,200 oz Ag	andesite, rhyolite	10 Ma
Aurora Partnership	1983: 1.5 million tons, 0.129 oz Au 0.3 oz Ag/ton 1990: 816,880 tons, 0.103 oz Au/ton 1992: 790,000 tons, 0.13 oz Au/ton *geologic resource*—267,640 oz Au 1994: 1.5 million tons, 0.1 oz Au/ton	1930's: 100,000 oz Au 1983: 10,000 oz Au 1988: 10,302 oz Au 1989: 27,825 oz Au, 26,000 oz Ag 1991: 36,000 oz Au, 68,000 oz Ag 1992: 39,100 oz Au, 79,200 oz Ag 1993: 30,120 oz Au, 59,880 oz Ag 1994: 30,000 oz Au, 57,000 oz Ag	andesite, rhyolite	10 Ma
Borealis	1988: 1.792 million tons, 0.046 oz Au/ton 1991: known reserves mined out	1981-84: 170,000 oz Au 1986-88: 116,256 oz Au 1989: 89,060 oz Au, 37, 032 oz Ag 1990: 18,435 oz Au, 15,396 oz Ag, production ceased 1992: exploration	rhyolite flow dome, andesite flows, breccias, volcaniclastic rocks	5 Ma
Candelaria	1988: 24 million tons, 1.267 oz Ag and 0.011 oz Au/ton 1992: mine idle, heap-leaching continuing 1993: *geologic resource*—20,000 oz Au, 5.8 million oz Ag 1994: *surface-mineable reserve*—15 million oz Ag, 42 thousand oz Au *underground reserve*—45 million oz Ag, 46 thousand oz Au	1982: 1.7 million oz Ag, 9,000 oz Au 1987: total production was 10 million oz Ag as of June 1987 1988: 3.8 million oz Ag, 11,000 oz Au 1989: 4.36 million oz Ag, 13,800 oz Au 1990: 4.89 million oz Ag, 11,796 oz Au, 1991: 1.68 million oz Ag, 2,870 oz Au 1992: 1.06 million oz Ag, 2,431 oz Au 1993: 904,810 oz Ag, 1,810 oz Au 1994: 3.19 million oz Ag, 12,800 oz Au	Candelaria Formation serpentinite, granitic dikes	Cretaceous

MAJOR PRECIOUS-METAL DEPOSITS (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
MINERAL COUNTY (continued)				
Denton-Rawhide	1989: *reserves*—29.4 million tons, 0.040 oz Au and 0.368 oz Ag/ton; *geologic resource*—59.3 million tons, 0.0274 oz Au and 0.298 oz Ag/ton 1991: 29.4 million tons, 0.040 oz Au and 0.368 oz Ag/ton; *geologic resource*—59.3 million tons, 0.0274 oz Au and 0.298 oz Ag/ton 1992: *geologic resource*—54 million tons, 0.026 oz Au/ton with 29.4 million tons, 0.04 oz Au and 0.39 Ag/ton and 29.9 million tons, 0.015 oz Au/ton and 0.23 oz Ag/ton 1993: 1.3 million oz Au, 15 million oz Ag	1990: 39,000 oz Au, 170,000 oz Ag 1991: 76,000 oz Au, 500,000 oz Ag 1992: 92,000 oz Au, 804,000 oz Ag 1993: 105,000 oz Au, 1 million oz Ag 1994: 118,000 oz Au, 952,000 oz Ag	rhyolite plugs, flows, tuffs, breccias	16 Ma
Mindora	1988: 1.0 million tons, 0.037 oz Au and 1.78 oz Ag/ton	1988: exploration		
Santa Fe	1990: 6.8 million tons, 0.035 oz Au and 0.241 oz Ag/ton	1989 60,000 oz Au, 150,000 oz Ag 1990: 64,336 oz Au, 177,244 oz Ag 1991: 67,102 oz Au, 149,168 oz Ag 1992: 61,000 oz Au, 100,000 oz Ag 1993: 54,030 oz Au, 64,950 oz Ag 1994: 22,361 oz Au, 28,267 oz Ag	Luning Formation	Miocene
NYE COUNTY				
Baxter Springs	1988: 1 million tons, 0.050 oz Au/ton 1990: *geologic resource*—5 million tons 0.050 oz Au/ton			
Bruner property, Duluth zone	1992: *geologic resource*—15 million tons, 0.026 oz Au/ton	1993: exploration	Tertiary volcanic rocks	Miocene
Bullfrog	1989: 18.6 million tons, 0.097 oz Au/ton 1992: 8.8 million tons, 0.14 oz Au/ton plus an additional *geologic resource*—1.8 million tons, 0.102 Au/ton	1989: 50,011 oz Au, 40,905 oz Ag 1990: 220,000 oz Au, 229,000 oz Ag 1991: 205,000 oz Au, 189,000 oz Ag 1992: 323,800 oz Au, 313,000 oz Ag 1993: 340,000 oz Au, 400,000 oz Ag 1994: 301,000 oz Au, 410,000 oz Ag	rhyolitic ash-flow tuff	9.5 Ma
Daisy Gold property	1993: 4.7 million tons, 0.024 oz Au/ton *geologic resource*—430,000 oz Au 1994: *geologic resource*—18 million tons, 425,000 oz Au			
Cuervo (Sullivan)	1987: 10.2 milliom tons, 0.039 oz Au and 0.086 oz Ag/ton and 0.37% Cu 1988: *proven*—10.8 million tons, *probable* - 2.7 million tons, 0.025 oz Au/ton	1992: idle 1993: idle	Mesozoic granodiorite and metavolcanic rocks	Mesozoic
Gold Bar	1987: 1.23 million tons Au ore 1993: idle	1989-91: W	silicic volcanic rocks	Miocene
Ketchup Flat	1989: 300,000 oz Au, 3.1 million oz Ag 1993: mined out	preproduction included in Paradise Peak	Miocene volcanic rocks	Miocene
Longstreet property	1989: 4 million tons, 0.024 oz Au/ton, *geologic resource*—9.6 million tons, 0.024 oz Au/ton	idle	rhyolitic volcanic rocks	Oligocene
Manhattan	1988: 22.4 million tons, 0.021 oz Au/ton 1989: 1.7 million tons, 0.017 oz Au/ton 1991: mined out 1992: idle 1993: idle	1905-59: 500,000 oz Au 1983: 26,000 - 27,000 oz Au 1986: 3,000 tons/day 1987: 24,855 oz Au 1988: 4,752 oz Au 1989: 32,389 oz Au, 17,611 oz Ag 1990: included with Round Mountain	Gold Hill Formation	16 Ma
Manhattan property	1989: *geologic resource*—100,000 tons, 0.50 oz Au/ton			
Montgomery Shoshone	1988: 3.1 million tons, 0.072 oz Au and 0.240 oz Ag/ton	1989: preproduction 1992: idle 1993: pre-production	rhyolitic ash-flow tuff	9.5 Ma

W: withheld

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MAJOR PRECIOUS-METAL DEPOSITS (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
NYE COUNTY (continued)				
Mother Lode (includes Sunday Night Anomaly)	1989: *reserves, proven and probable* - 4.9 million tons, 0.054 oz Au/ton, of which 1.8 million tons, 0.048 oz Au/ton are in the Sunday Night Anomaly 1990: Sunday Night Anomaly *oxide reserves* - 927,372 tons, 0.047 oz Au/ton; *sulfide ore reserves*—65,217 tons, 0.042 oz Au/ton 1992: mined out	1989: 1,000 oz Au, 150 oz Ag 1990: 30,000 oz Au, 3,100 oz Ag 1991: W 1992: idle 1993: idle	lower Paleozoic rocks, Tertiary dacite porphyry	14 Ma
Nevada Mercury	1994: *geologic resource*—50,000 oz Au			
Northumberland	1988: 12 million tons, 0.06 oz Au/ton	1939-42: 327,000 oz Au 1981-84: 950,000 tons/year 1988: 29,667 oz Au, 130,394 oz Ag 1989: W 1990-93: idle	Roberts Mountains and Hanson Creek Formations, granodiorite, tonalite, quartz porphyry dikes	85 Ma
Paradise Peak	1989: 5.22 million tons, 0.09 oz Au and 3.62 oz Ag/ton, mill ore; 11.52 million tons, 0.036 oz Au and 0.445 oz Ag/ton, leachable 1991: ~ 2 year mine life 1992: r*eserves*—197,000 oz Au, 4.3 million oz Ag 1993: mining ceased, remaining resource refractory sulfides	1986-88: 560,000 oz Au, 8.5 million oz Ag 1989: 228,000 oz Au, 5.17 million oz Ag 1990: 198,800 oz Au, 5.42 million oz Ag 1991: 182,000 oz Au, 2.26 million oz Ag 1992: 251,000 oz Au, 1.85 million oz Ag 1993: 156,000 oz Au, 795,000 oz Ag 1994: 39,084 oz Au, 130,086 oz Ag	rhyolite and andesite flows, ash-flow and air-fall tuffs	Miocene
Round Mountain (Smoky Valley)	1989: *geologic resource*—271 million tons, 0.032 oz Au/ton 1990: 256.8 million tons, 0.033 oz Au/ton 1993: 151.2 million tons, 0.024 oz Au/ton, *geologic resource*—3,876,000 oz Au	1977-84: 313,480 oz Au, 160,419 oz Ag 1984: 70,000 oz Au 1987: 190,600 oz Au 1988: 233,700 oz Au 1989: 386,227 oz Au, 211,297 oz Ag 1990: 483,192 oz Au, 236,600 oz Ag (includes Manhattan) 1991: 339,000 oz Au, 260,000 oz Ag 1992: 370,600 oz Au, 316,700 oz Ag 1993: 370,000 oz Au, 300,000 oz Ag 1994: 423,000 oz Au, 268,000 oz Ag	rhyolite ignimbrite	25 Ma
Secret Pass (Bare Mtn. District)	1994: *geologic resource*—6.8 million tons, 0.019 oz Au/ton			
Sterling	1989: 469,000 tons, 0.21 oz Au/ton 1990: 519,000 tons, 0.209 oz Au/ton 1992: 403,000 tons, 0.24 oz Au/ton *geologic resource*—765,000 tons, 0.178 oz Au/ton	1983-88: 75,900 oz Au 1990: 12,626 oz Au 1991: 12,215 oz Au	Wood Canyon and Bonanza King Formations	14 Ma
Tellis claims	1988: 850,000 tons, 0.053 oz Au/ton			
PERSHING COUNTY				
Bunce	1989: *geologic reserve* - 600,000 tons, 0.04 oz Au/ton 1990: 500,000 tons, 0.04 oz Au/ton	exploration	rhyolite	
Florida Canyon	1988: 37 million tons, 0.023 oz Au/ton 1991: 48.3 million tons, 0.018 oz Au/ton	1987-88: 109,300 oz Au 1989: 81,484 oz Au, 24,721 oz Ag 1990: 83,200 oz Au, 19,300 oz Ag 1991: 80,586 oz Au, 20,951 oz Ag 1992: 89,954 oz Au, 37,775 oz Ag 1993: 109,190 oz Au, 37,550 oz Ag 1994: 92,000 oz Au, 25,000 oz Ag	Grass Valley Formation	Cretaceous or Tertiary
Goldbanks	1994: 900,000 oz Au			
Relief Canyon	1988: ~ 1.3 million tons, 0.03 oz Au/ton 1991: mined out 1994: 1.5 million tons, 0.035 oz Au/ton	1984: 24,500 oz Au 1987-88: 82,000 oz Au 1989: 30,266 oz Au, 32,835 oz Ag 1990: 4,000 oz Au, 6,400 oz Ag	Natchez Pass Limestone, Grass Valley Formation	Cretaceous

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MAJOR PRECIOUS-METAL DEPOSITS (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
PERSHING COUNTY (continued)				
Rochester	1989: *geologic resource*—94.5 million tons, 0.012 oz Au and 1.40 oz Ag/ton 1993: 75 million tons, 1.32 oz Ag and 0.0113 oz Au/ton	1986-88: 122,400 oz Au, 13 million oz Ag 1989: 76,032 oz Au,4.63 million oz Ag 1990: 59,000 oz Au, 4.8 million oz Ag 1991: 61,000 oz Au, 5.8 million oz Ag 1992: 57,000 oz Au, 5.6 million oz Ag 1993: 66,412 oz Au, 5.9 million oz Ag 1994: 56,000 oz Au, 5.9 million oz Ag	Koipato Group, Weaver Rhyolite	Late Cretaceous
Rosebud project	1992: 570,000 oz Au (0.362 oz/ton), 5.5 million oz Ag (5.5 oz/ton) 1994: 512,000 oz Au	1993: underground exploration	Tertiary volcanic rocks	Miocene
Standard	mined out	1932-51: 46,602 oz Au, 102,721 oz Ag	Natchez Pass Limestone, Grass Valley Formation	73 Ma
Tag-Wildcat	1989: *geologic resource*—1.5 million tons, 0.043 oz Au/ton 1989: 416,000 Ttons, 0.076 oz Au/ton	1989: exploration	Tertiary volcanic rocks	Miocene
Trinity	1988: 1 million tons, 5.25 oz Ag/ton 1991: mined out	1988: mining ended August 1988, heap-leaching continuing 1989: 718,714 oz Ag, 70 oz Au	rhyolite plugs	Miocene
Willard	1989: 3.61 million tons 1993: mined out	1989: preproduction 1992-93: W	Triassic siltstone	Cretaceous
STOREY COUNTY				
Comstock heap leach project	1992: 475,000 tons, 0.072 oz Au and 0.60 oz Ag/ton 1993: *geologic resource*—3.2 million tons, 0.05 oz Au and 0.5 oz Ag/ton			
Flowery (Golden Eagle)	1989: 1 million tons, 0.037 oz Au/ton 1990: 6.3 million tons, 0.043 oz Au/ton *geologic resource*—1.16 million oz Au 1991: *geologic resource*—29.3 million tons, 0.04 oz Au/ton 1993: 362,000 tons, 0.064 oz Au and 0.97 oz Ag/ton, *geologic resource*—88,128 oz Au and 1 million oz Ag	1988: 836 oz Au, 9,473 oz Ag 1990: 6,000 oz Au, 70,000 oz Ag 1991: W 1992: 2,253 oz Au, 34,572 oz Ag 1993: 2,200 oz Au, 30,000 oz Ag 1994: 5,000 oz Au, 41,000 oz Ag	Alta Formation	12 Ma
Oliver Hills	1990: 3.37 million tons, 0.054 oz Au/ton 1.2 oz Ag/ton 1991: *geologic resource*—8.5 million tons, 0.060 oz Au/ton and 0.60 oz Ag/ton 1993: 4 million tons, 0.05 oz Au and 0.5 oz Ag/ton, *geologic resource*—225,000 oz Au and 2.25 million oz Ag	1991: 573 oz Au, 6,947 oz Ag		
WASHOE COUNTY				
Olinghouse	1994: *geologic resource*—500,000 oz Au, 0.057 oz Au/ton		Miocene andesites	Miocene
Western Hog Ranch	1988: *reserves, proven and probable* - 5.5 million tons, 0.064 oz Au/ton; *geologic resource*—20.1 million tons, 0.029 oz Au/ton 1990: 1.1 million tons, 0.05 oz Au/ton 1993: mined out at end of year	1986: 50,000 oz Au 1988: 30,000 oz Au 1989: 25,000 oz Au, 4,000 oz Ag 1990: 25,000 oz Au, 4,500 oz Ag 1991: 18,700 oz Au, 2,100 oz Ag 1992: 30,000 oz Au, 10,000 oz Ag 1993: 9,295 oz Au, 2,500 oz Ag 1994: 7,000 oz Au, 2,000 oz Ag	rhyolite, explosion breccia, sinter	15-16 Ma
Wind Mountain	1988: 15 million tons, 0.021 oz Au and 0.42 oz Ag/ton 1993: mined out, heap-leach only	1989: 30,900 oz Au, 335,000 oz Ag 1990: W 1991: 91,000 oz Au, 405,000 oz Ag 1992: 54,690 oz Au, 297,403 oz Ag 1993: 19,570 oz Au, 92,630 oz Ag	Tertiary sedimentary rocks	late Tertiary or Quaternary

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MAJOR PRECIOUS-METAL DEPOSITS (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
WHITE PINE COUNTY				
Alligator Ridge	1989: 1 million tons, 0.064 oz Au/ton 1990: 624,000 tons, 0.059 oz Au/ton, *geologic resource*—2.1 million tons 0.043 oz Au/ton 1992: 11.5 million tons, 0.046 oz Au/ton; *geologic resource*—661,888 oz Au, includes Casino/Winrock	1981-88: 560,000 oz Au, 70,000 oz Ag 1989: 54,057 oz Au, 10,188 oz Ag 1990: 18,000 oz Au, 4,000 oz Ag 1991: 17,000 oz Au 1992: 10,450 oz Au 1993: *see* Bald Mountain 1994: 40,000 oz Au	Pilot Shale	Mesozoic or early Tertiary
Bald Mountain (Top)	1989: 6.7 million tons, 0.069 oz Au/ton 1990: 8.7 million tons, 0.062 Au/ton 1992: *geologic resource*—600,000 oz Au	1986: 50,000 oz Au 1988: 48,619 oz Au 1989: 55,112 oz Au 1990: 60,000 oz Au, 5,000 oz Ag 1991: 55,000 oz Au, 12,000 oz Ag 1992: 81,500 oz Au, 33,600 oz Ag 1993: 90,610 oz Au, 26,145 oz Ag (includes Alligator Ridge and Yankee Projects) 1994: 80,000 oz Au	quartz porphyry, Cambrian shale and limestone	Jurassic
Bellview	1988: 277,000 tons, 0.040 oz Au/ton, *geologic resource*—1 million tons, 0.036 oz Au/ton			
Casino/ Winrock	1989: **Casino** - 804,000 tons, 0.054 oz Au/ton; **Winrock** 1.3 millon tons, 0.037 oz Au/ton 1990: **Winrock** - 993,000 tons, 39,000 oz Au 1992: *see* Alligator Ridge	1990: 7,000 oz Au 1991: 20,000 oz Au 1992: 19,800 oz Au	late Paleozoic sedimentary rocks	Eocene
Easy Junior (Nighthawk Ridge)	1989: 5.68 million tons, 0.031 oz Au/ton 1991: 137,000 oz Au	1990: 11,500 oz Au, 900 oz Ag	Devonian and Mississippian rocks	Eocene
Golden Butte	1989: 4.23 million tons, 0.031 oz Au/ton	1989: 12,187 oz Au, 1,448 oz Ag 1990: 22,362 oz Au, 7,700 oz Ag 1991: 8,970 oz Au, 7,763 oz Ag	Chainman Shale	Cretaceous or Eocene
Green Springs	1988: 1.25 million tons, 0.06 oz Au/ton *additional possible resource*—500,000 tons, 0.036 Au/ton 1992: mined out	1988: ~12,000 oz Au 1989: 30,000 oz Au, 5,000 oz Ag 1990: 16,000 oz Au, 4,000 oz Ag 1991: 5,000 oz Au	Paleozoic sedimentary rocks	Eocene?
Griffon Gold Property	1993: *geologic resource*—60,000 oz Au 1994: *geologic resource*—50,454 oz Au, 0.039 oz Au/ton			upper Joana Limestone
Horseshoe	1991: 1.5 million tons, 0.039 oz Au/ton	exploration	Pilot Shale and intrusive quartz porphyry	36-38 Ma
Illipah	1988: mined out	1987: ~25,000 oz Au/year 1988: 25,324 oz Au, mining ended 1989: 3,874 oz Au, heap-leached	Paleozoic sedimentary rocks	Eocene?
Little Bald Mtn.	1989: 200,000 tons, 0.13 oz Au/ton; *geologic resource*—260,000 tons, 0.127 oz Au/ton 1993: 140,000 tons, 0.13 oz Au/ton, *geologic resource*—21,800 oz Au	1985-88: 21,700 oz Au 1989: 5,500 oz Au, 1,500 oz Ag	Antelope Valley Formation	35-38 Ma
Mt. Hamilton	1988: 7.7 million tons, 0.05 oz Au and 0.5 oz Ag/ton 1994: *reserve*—9.04 million tons, 0.052 oz Au and 0.38 oz Ag/ton	1988: preproduction 1993: idle	Dunderberg Shale	Cretaceous
Pan	1989: 241,000 oz Au			
Robinson	1989: 46.0 million tons, 0.019 oz/ton; *geologic resource*—1 million oz Au 1991: *geologic resource*—200 million tons 0.012 oz Au/ton 1992: 1.2 million oz Au, *geologic resource*—2.21 million oz Au 1994: *geologic resource*—252 million tons, 0.553% Cu, 0.0102 oz Au/ton	1986: 48,000 oz Au, 96,000 oz Ag 1987: 50,207 oz Au 1988: 38,750 oz Au 1989: 78,828 oz Au, 66,340 oz Ag 1990: 75,000 oz Au, 55,000 oz Ag 1991: 21,674 oz Au 1992: 35,581 oz Au, 55,000 oz Ag 1993: 13,432 oz Au	Rib Hill Sandstone Riepe Spring Limestone	Cretaceous

MAJOR PRECIOUS-METAL DEPOSITS (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
WHITE PINE COUNTY (continued)				
Sunnyside	1988: 32,000 oz Au at 0.187 oz/ton gold equivalent			
Taylor	1980: 10 million tons, 3 oz Ag/ton	1980: 1,200 tons/day	Guilmette and Joana Limestones, rhyolite dikes	Eocene or Oligocene
White Pine	1989: 63,000 oz Au, 0.04 oz Au/ton	1989: 20,654 oz Au	Pilot Shale	Oligocene?
Yankee	1992: 683,000 oz Au	1990: ~15,000 oz Au 1992: 10,800 oz Au 1993: *see* Bald Mountain	Pilot Shale	36-38 Ma?

Argenta barite mill *(S.B. Castor photo).*

Industrial Minerals

by Stephen B. Castor

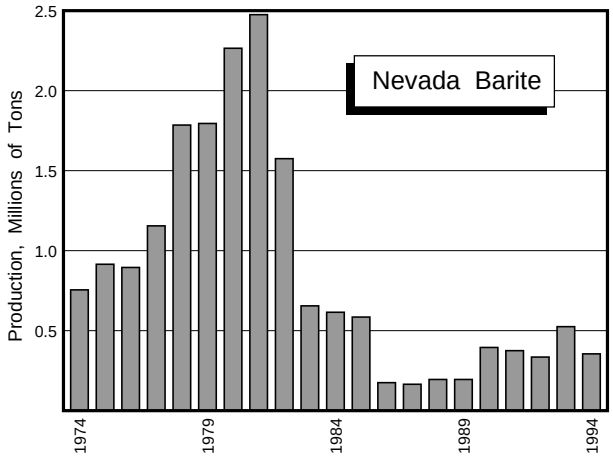
Industrial minerals produced in Nevada in 1994 had an estimated value of about $322 million, an increase of about 6% from 1993. Increases in production and dollar values of aggregate, cement, diatomite, gypsum, lime, and silica in 1994 overshadowed decreases in barite, lithium carbonate, perlite, and salt. In order of estimated dollar value the most important Nevada industrial minerals produced in 1994 were aggregate, diatomite, lime, cement, gypsum, barite, lithium carbonate, silica, clay, and magnesia. Data used for these estimates, and data reported for individual commodities below, were obtained from a survey conducted by the Nevada Division of Minerals and directly from companies that produced industrial minerals.

AGGREGATE (SAND, GRAVEL, AND CRUSHED STONE) Next to gold, construction aggregate is Nevada's most important mined material in terms of value. For 1994, statewide aggregate production is estimated at 28 million tons. Production in the Las Vegas area, which accounted for more than 18 million tons, increased nearly 15% over 1993, while production in the Reno-Sparks-Carson City area, estimated at 5.5 million tons, was about 5% higher than in 1993. In 1994, crushed stone and lightweight aggregate accounted for about 12% of aggregate production statewide.

Companies in the Las Vegas area that produced more than a million tons in 1993, in approximate order of produced value, were Nevada Ready Mix Corp., Bonanza Materials, Inc., WMK Transit Mix, Inc., and Las Vegas Paving Corp. Las Vegas area community pits and aggregate recovered from the Flamingo Wash detention basin, which are administered by the U.S. Bureau of Land Management, provided a combined total of two million tons in 1994, up about 30% from 1993. Construction of major resort hotels, airport facilities, and highways in the Las Vegas and Henderson area accounted for most of the increase in aggregate use in 1994, although residential construction continued to be strong. Most aggregate in the Las Vegas area was mined from alluvial sand and gravel deposits in the Lone Mountain, Henderson, and Spring Mountain Road areas. In 1994, crushed stone and lightweight aggregate accounted for about 10% of aggregate used in the Las Vegas metropolitan area. Frehner Construction Co., which mines and processes limestone from the Sloan property of Chemical Lime Co., produced nearly a million tons of crushed stone in 1994.

In the Reno-Sparks-Carson City area, companies that produced 500,000 or more tons in 1993 were Granite Construction Co., Rocky Ridge Inc., and All-Lite Aggregate Co. R. L. Helms Construction, a major aggregate producer in the past, declared Chapter 11 bankruptcy in 1993, but production from its main pit was continued in 1994 by Frehner Construction Co.. Nordic Industries of California was also a major sand and gravel producer in this market area in 1994, operating at Paiute Pit near Wadsworth. Crushed rock operations of Granite Construction and Rocky Ridge Inc. and lightweight rhyolite aggregate from All-Lite Aggregate Co., Rilite Aggregate Co., and Naturalite Aggregate Corp. accounted for nearly 40% of the aggregate used in 1994 in the Reno-Sparks-Carson City area.

BARITE In 1994, barite shipments from Nevada were about 360,000 tons, 32% less than in 1993. Baroid Drilling Fluids Inc. was the largest Nevada producer in 1994, shipping barite from the Dunphy mill in Eureka County and the Rossi mine in Elko County. M.I. Drilling Fluids Co., owned by Dresser Industries, Inc. (64%) and Halliburton Co. (36%), has been a major Nevada barite producer since 1987, operating a plant near Battle Mountain and the Clipper and Greystone mines in Lander County. In late 1993, Baroid and Dresser merged and, as part of the merger agreement with the Antitrust Division of the U.S. Department of Justice, Dresser agreed to sell its share of M. I. Drilling Fluids. In February, 1994, Smith



International, a worldwide provider of drilling technology, purchased the Dresser share of M. I. Drilling Fluids for $160 million. In 1994, Milpark, Inc. produced barite at its Argenta property near Battle Mountain, Lander County, and Circle-A Construction, Inc. produced barite from its Big Ledge/Snoose Creek operation in Elko County.

BORATE American Borate Co. continued to produce colemanite concentrate in 1994 at the Amargosa Valley mill in Nye County from ore shipped from the Billie mine in Death Valley, California. Because the ore is from out of state, this production is not included in the estimate of total value of Nevada minerals.

BUILDING STONE Nevada Neanderthal Stone, which quarries and cuts several varieties of Tertiary tuff near Beatty in Nye County, produced floor tile, wall panels, and other stone products in 1994. Las Vegas Rock produced building and landscape rock from Jurassic Aztec Sandstone at Goodsprings, Clark County.

CEMENT The Nevada Cement Co., which is owned by Centex Construction Products (prior to 1994, a wholly owned subsidiary of Centex Corp.), has a plant at Fernley, about 30 miles east of Reno. In 1994, the company shipped more than 400,000 tons of cement that was manufactured from locally mined limestone, and regionally mined clay, iron ore, and gypsum.

CLAY IMV Division of Floridin Co., operating several open pits and a processing plant in Amargosa Valley, Nye County, was the largest producer of clay in Nevada in 1994. Relatively high-value specialty clay products, including organic-clad clays, provide most of the operation's cash flow. During 1994, Vanderbilt Minerals Co. shipped clay from the New Discovery mine near Beatty in Nye County, which serves as the company's processing site for all Nevada clay, but the other mines were idle. American Colloid Co., which mines clay from a montmorillonite deposit in Pershing County and from a hectorite deposit in Humboldt County, has purchased a second Humboldt County hectorite property from J.M. Huber. The Art Wilson Co. shipped a small amount of montmorillonite in 1994 that was mined from the Jupiter clay mine in Lyon County. Also in 1994, Minor, Inc. of Pennsylvania purchased the Tuttle montmorillonite mine in Mineral County, which it plans to use as a source for agricultural products. Relatively large tonnages of halloysite clay are mined from a deposit 20 or 30 miles north of Pyramid Lake in Washoe County by Nevada Cement Co., but this production is not reported as clay in NBMG mineral production figures because it is included in cement.

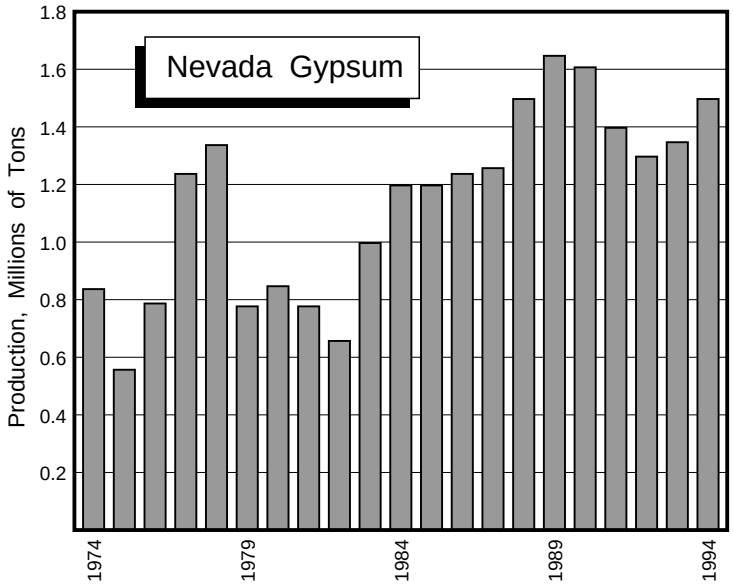
DIATOMITE On the basis of value, diatomite is the second most important industrial material mined in Nevada, and in 1994 diatomite production in Nevada was about 30% of total U. S. production. Eagle-Picher Minerals, Inc., which produces most of Nevada's diatomite, has been mining diatomite in Nevada since 1945 and now mines up to 250,000 tons annually. Estimated operating profits for 1994 were as much as $66 million. The company ships diatomite filtration products worldwide from the Colado plant near Lovelock in Pershing County. In addition, it ships diatomite from the Clark plant and mine in Storey County and from a pit near Fernley in Lyon County. In 1991 the company's mother firm, Eagle-Picher Industries Inc., went into chapter 11 bankruptcy as a result of asbestos-related litigation. In 1994, the company reached an agreement with the claimants that will allow it to emerge from chapter 11 in 1995.

Three other companies produced diatomite in Nevada in 1994. Grefco, Inc. ships diatomite from its Basalt property, which consists of a plant in Esmeralda County and pits in Esmeralda and Mineral Counties. Most of Grefco's diatomite is produced in California where it makes calcined filter products; it sells Nevada diatomite mainly as uncalcined filler. Moltan Co. mines low-grade diatomite near Fernley from which it produces absorbent and cat litter that are marketed regionally. CR Minerals, also near Fernley, sells natural diatomite that is mostly used in North America, although it has established markets overseas.

FLUORSPAR The Crowell Fluorspar mine (Daisy mine) near Beatty in Nye County has been shut down since 1989. However, small tonnages of fluorspar have been sold each year from stockpiled ore; in 1994 approximately 150 tons were shipped for use in steel and cement manufacture. The family-owned company presently has more than 2,000 tons of fluorspar stockpiled, and does not expect to reopen the mine in the near future.

GARNET In September 1994, a plan of operations for the Danielle Garnet Mine project in White Pine County was submitted to the U.S. Forest Service. This project, located in the Hampton Creek drainage on the east slope of Mount Moriah, is in the same area examined by a Canadian company for garnet mining in 1988. The area contains a placer garnet deposit derived from quartz-garnet-biotite-staurolite schist estimated to average less than 10% garnet. The plan involves relatively shallow excavations in garnet-rich soil and a concentration plant in the same drainage. About one-third of the proposed project disturbance would be in areas already affected by previous mining.

GYPSUM Total gypsum production in Nevada in 1994 was about 1.5 million tons, the highest annual production since 1990. Most Nevada gypsum was used in the production of wallboard, with minor amounts used in cement, plaster, and agricultural products. In 1994, U. S. Gypsum Corp., which mines gypsum in Pershing County and processes it at a mill and wallboard plant at Empire in Washoe County, was the largest producer in the state at 450,000 tons. James Hardie Gypsum at Blue Diamond southwest of Las Vegas was the second largest producer at about 430,000 tons. PABCO Gypsum east of Las Vegas in Clark County mined 540,000 tons of ore in 1994, but the ore contains only 60 to 70% gypsum, so actual production of gypsum was less than 400,000 tons. Georgia Pacific Corp., also mined gypsum from Weiser Ridge north of Las Vegas. The Art Wilson Co., Carson City, the only gypsum producer in Nevada that does not have a wallboard plant, mainly sells gypsum for use in cement and in agricultural applications. The company, which was in Chapter 11 bankruptcy for about two years, emerged from Chapter 11 in May 1994.



LIME AND DOLOMITE In 1994 lime production in Nevada was about the same as in 1992 and 1993. Chemical Lime Co. (formerly Chemstar Lime Co.) produced high-calcium lime at Apex just northeast of Las Vegas and dolomitic lime in Henderson from dolomite mined at Sloan, south of Las Vegas. Most of the dolomitic lime is type S lime, which is used in construction materials such as stucco, but lesser amounts of quicklime are sold to a glass manufacturer. The Pilot Peak high-calcium lime operation near Wendover in Elko County, owned by Continental Lime, Inc., sells lime to northern Nevada gold mining operations.

In addition to dolomitic lime, Chemical Lime produces non-calcined dolomite in Henderson, which it sells to a glass manufacturer in California. Min-Ad, Inc. and Nutritional Additives Corp., both located near Winnemucca, produce ground dolomite, mainly for agricultural use. Min-Ad's production, about 45,000 tons in 1994, has increased steadily over the last five years.

LITHIUM CARBONATE Production of lithium carbonate by Cyprus Amax Minerals Co. at its lithium brine operation at Silver Peak declined from production levels of recent years. Earnings from the company's combined lithium operations declined in 1994 due to a $3 million charge to move division headquarters, and the U.S. work force was reduced by 25%.

MAGNESIA Premier Services Corp. continued to produce magnesia from magnesite at Gabbs, Nye County. The Gabbs operation mainly produces light-burned or caustic magnesia for use in the western U.S., but minor amounts of dead-burned refractory magnesia were shipped in 1994.

PERLITE The Wilkin Mining and Trucking Co., Lincoln County, ships 3,000 to 4,000 tons of perlite that it mines from the Mackie mine about 35 miles west of Caliente and processes in a popping plant in Caliente. In 1994, Eagle-Picher Minerals, Inc. began producing expanded perlite filtration products from a new facility at its Colado diatomite plant. The perlite is mined from a location in Churchill County 16 miles south of Fallon. Production capacity at the new facility is about 15,000 tons per year.

SALT In 1994, salt production by Huck Salt Co. of Fallon decreased due to smaller volumes of road salt needed during the mild winter of 1993/4.

SILICA Simplot Silica Products produced 594,600 tons of silica sand in 1994 from its operation at Overton in Clark County, up about 12% over 1993. Mining Enterprises, Inc. opened a silica deposit south of Goldfield in Esmeralda County late in 1994. The product is to be used as a filler in applications requiring an inert and high brightness material.

WOLLASTONITE American Wollastonite Mining Co., Vancouver (formerly White Plains Resources

Corp.) is fine-tuning a 10,000 ton/year pilot plant to process wollastonite from its Gilbert district property in Esmeralda County. Expected start date for production from the plant is in 1995. The company has identified more than 1 million tons of ore grading 60 to 70% wollastonite at the property.

ZEOLITES In 1994, American Resource Corp. processed small amounts of clinoptilolite mined in California at its plant in Nye County. In addition, the company sold the Eastgate mordenite deposit and plant to American Colloid Co. which plans to begin producing cat litter in 1995.

Huck Salt operation in Churchill County *(S.B. Castor photo).*

Directory of Mining and Milling Operations

by Lindsay G. Christensen and Stephen B. Castor

Compiled from information supplied by the Nevada Division of Mine Inspection, Nevada Division of Minerals, and U.S. Mine Safety and Health Administration. *Sand and gravel operations with less than 300,000 tons annual production are not listed.*

EX = exploration, HL = heap leach, ML = mill, OP = open-pit mine, OS = other surface, PL = placer, UG = underground mine.

Mine/plant name	Operator	Location	Commodity	Type	Process/ activity	Employees	Address
CHURCHILL COUNTY							
Huck Salt	John Huckaby and Sons	S12,T16N,R31E	salt	OS	solar evaporation	3	Tracy Huckaby 5033 Austin Highway Fallon, NV 89406
Moltan mine and plant	B. J. Gurley	S28,29,32,33, T23N,R27E	diatomaceous earth	OP,ML	single bench crushing screening	55	Craig Paisley P.O. Box 860 Fernley, NV 89408-0860
Popcorn mine	Eagle-Picher Minerals, Inc.	S24,T16N,R28E	perlite			2	Myron S. Burdette P.O. Box 10480 Reno, NV 89510
CLARK COUNTY							
Apex quarry and plant	Chemical Lime Co.	S23,26,T18S,R63E	lime	OP,ML	multiple bench calcining hydrating	50	Art Reber P.O. Box 3609 North Las Vegas, NV 89036
Blue Diamond mine and mill	James Hardie Gypsum, Inc.	S20,29-31,32, T21S,R59E; S5,T22S,R59E S24-26,T21S,R58E	gypsum	OP	grinding calcining	103	William Rogers HCR 89033, Box 2900 Las Vegas, NV 89124
Bonanza Materials pit and plant	Bonanza Materials, Inc.	S9,16,T22S,R62E	sand gravel	OP,ML	single bench crushing screening	40	Dan Stewart, President 565 Lalif Road Henderson, NV 89015
Buffalo Road pit and mill	W.M.K. Transit Mix, Inc.	S21,T21S,R60E	sand gravel	OP,ML	single bench crushing screening	18	Peter Mahoney 6075 S. Eastern Avenue, Suite 11 Las Vegas, NV 89119
Flamingo Wash detention basin	Hollywood Gravel Co., Inc.	S28,33,T21S,R60E	sand gravel	OP	single bench		Norman Perry, Operations Manager 912 Valley View Boulevard Las Vegas, NV 89107
Henderson plant	Chemical Lime Co.	S18,T22S,R63E	dolomitic lime	ML	calcining	43	Dave Johnson, President P.O. Box 127 Henderson, NV 89015
Hollywood pit and Henderson mill	Nevada Ready Mix Corp.	S32,T21S,R63E; S11,T21S,R62E	sand gravel	OP,ML	single bench crushing screening	24	Richard Thornton General Manager-Vice President P.O. Box 42755 Las Vegas, NV 89104
Las Vegas Cement plant	Las Vegas Cement, Inc.	S10,T15S,R67E	cement	ML	construction	13	Aldo Dinardo, Owner and President P.O. Box 380 Logandale, NV 89021
Lone Mountain Community pit	Quality Sand and Gravel	S1,T20S,R59E	sand gravel	OS	single bench	2	Gary Vosburg, President P.O. Box 15476 Las Vegas, NV 89114
Lone Mountain Mendenhall pit	Las Vegas Paving Corp.	S35,T19S,R59E	sand gravel	OP	single bench	7	Robert Mendenhall, Owner 4420 S. Decatur Boulevard Las Vegas, NV 89103
Lone Mountain Nevada Ready Mix pit	Nevada Ready Mix Corp.	S36,T19S,R59E	sand gravel	OP,ML	single bench crushing screening	32	Darrel Thornton, President P.O. Box 42755 Las Vegas, NV 89104
Lone Mountain Stocks pit	Southern Nevada Paving	S3,4,T20S,R59E S34,35,T19S,R59E	sand gravel	OP	single bench	35	Floyd Meldrum, President 3555 Polaris Avenue Las Vegas, NV 89102
Money pit	Southern Nevada Liteweight	S9,16,T25S,R61E	lightweight aggregate	OP	crushing screening	12	Spencer Apple 4675 Wynn Road Las Vegas, NV 89103
PABCO Gypsum-Apex pit and plant	Pacific Coast Building Products, Inc.	S7,8,17,18, T20S,R64E	gypsum	OP	single bench wash plant	82	Emil Kapilovich 1973 N. Nellis Boulevard #328 Las Vegas, NV 89115

continued

DIRECTORY OF MINING AND MILLING OPERATIONS (continued)

Mine/plant name	Operator	Location	Commodity	Type	Process/ activity	Employees	Address
CLARK COUNTY (continued)							
Salt Lake Highway pit	American Sand and Gravel	S25,T19S,R62E	sand gravel	OP	single bench	6	Art Melonas, Owner 5004 Stanley Avenue Las Vegas, NV 89115
Simplot Silica Products pit and mill	Simplot Industries	S30,T16S,R68E	silica sand	OP,ML	flotation multiple bench drying screening	43	Jack Olsen, Manager 1551 S. Moapa Valley Blvd. Overton, NV 89040
Sloan quarry and mill	Chemical Lime Co.	S13,T23S,R60E	dolomite	OP	crushing sizing	53	Rex Simpson HCR 37, Box 2300 Las Vegas, NV 89124
Sloan rock pit	Frehner Construction Co.	S13,T23S,R60E	sand gravel	OS,ML	single bench crushing screening	11	Donald G. Groch, Vice President/ General Manager 124 West Brooks Avenue North Las Vegas, NV 89030
Spring Mountain pit and mill	Wells Cargo, Inc.	S15,T21S,R60E	sand gravel	OS,ML	single bench crushing screening	8	Howard Wells, General Manager P.O. Box 81170 Las Vegas, NV 89180
Wallboard plant	Georgia-Pacific Corp.	S34,T18S,R63E	gypsum	ML	calcining	11	Bob Shajary, Manager P.O. Box 30006 North Las Vegas, NV 89030
Weiser Ridge quarry	Georgia-Pacific Corp.	S14,T16S,R66E	gypsum	OP	single bench crushing	4	Bob Shajary P.O. Box 30006 North Las Vegas, NV 89030
ELKO COUNTY							
Big Ledge mine	Circle A Construction	S26,35, T42N,R61E	barite	OP	multiple bench	4	Tom G. Schmidt, Superintendent Star Route Jackpot, NV 89825
Big Springs mine and mill	Independence Mining Co.	S1-3,11,12 T42N,R53E	gold silver	OP,HL	cyanide fluid-bed roasting	37	Ben Guenther HC31, Box 78 Elko, NV 89801
Dunphy mill	Baroid Drilling Fluids, Inc.	S26,T33N,R48E	barite	ML	grinding		Terrell Young P.O. Box 340 Battle Mountain, NV 89820
Dee mine	Rayrock Mines, Inc.	S34,T37N,R49E	gold silver	OP,HL, ML	cyanide	65	Terry Fagg P.O. Box 1193 Elko, NV 89801
Jerritt Canyon joint venture	Independence Mining Co.	S33,T41N,R53E	gold silver	OP,ML, HL	cyanide grinding fluid bed roasting	664	Ben Guenther HC31, Box 78 Elko, NV 89801
Kinsley Mountain mine	Alta Gold Co.	S5,6,T26N,R68E	gold	OP	multiple bench	60	Joe Pecio, Project Manager 778 S. Pioche Highway Ely, NV 89301
Pilot Peak lime plant	Continental Lime, Inc.	S14,T34N,R68E	lime	OP	multiple bench roasting grinding rotary kiln	27	Norman Tupper P.O. Box 2520 Wendover, NV 89883
Rossi mine	Baroid Drilling Fluids, Inc.	S15,21,22, T37N,R49E	barite	OP,ML	multiple bench crushing gravity concentration	8	Terrell Young P.O. Box 340 Battle Mountain, NV 89820
ESMERALDA COUNTY							
Basalt mine and mill	Grefco, Inc.	S29,T2N,R34E	diatomaceous earth	OP,ML	grinding	6	Robert A. Poelvoorde, Plant Manager P.O. Box 288 Mina, NV 89422
Blanco mine	Vanderbilt Minerals Corp.	S22,T1N,R37E	clay	OP	grinding bagging	6	Jerry W. Lease 2320 Viking Road Las Vegas, NV 89109
Goldfield Project	American Pacific Minerals, Ltd.	S35,35,T2S,R42E	gold	OP,HL	cyanide	124	Tom Rinaldi P.O. Box 160 Goldfield, NV 89013

DIRECTORY OF MINING AND MILLING OPERATIONS (continued)

Mine/plant name	Operator	Location	Commodity	Type	Process/ activity	Employees	Address
ESMERALDA COUNTY (continued)							
Silver Peak operation	Cyprus Amax Mineral Co.	S22,T2S,R39E	lithium carbonate	OS	evaporation precipitation	64	C. B. Loundagin P.O. Box 98 Silver Peak, NV 89047
EUREKA COUNTY							
Barrick-Goldstrike mine	Barrick Gold Corp.	S12,20,29,30, T36N,R50E; S23-26,T36N,R49E	gold silver	OP,ML, HL	cyanide milling	1,550	Charles Geary P.O. Box 29 Elko, NV 89803
Gold Bar mine	Atlas Gold Mining, Inc.	S26,27,T22N,R49E	gold	OP,ML, HL	multiple bench crushing grinding cyanidation	25	R. Michael Robb P.O. Box 282 Eureka, NV 89316
Newmont Gold operations	Newmont Gold Co.	T31-36N, R49-53E	gold silver mercury	OP,ML, HL	carbon-in-leach carbon-in-pulp cyanide	3,800	W. James Mullin P.O. Box 669 Carlin, NV 89822-0669
HUMBOLDT COUNTY							
Bonanza opal mine	Lloyd H. Olds	S13,T45N,R25E	precious opal	OP	single bench	3	Lloyd H. Olds P.O. Box 13 Denio, NV 89404
Crofoot/Lewis mine	Hycroft Resources & Development, Inc.	S24?,T35N,R29E; S19,20?, T35N,R30E	gold silver	OP,HL	crushing cyanide	247	Paul Wright, General Manager P.O. Box 3030 Winnemucca, NV 89446
Disaster Peak clay mine	American Colloid Co.	S26,T47N,R34E	hectorite	OP	single bench		Pete Maul 1500 West Shure Drive Arlington Heights, IL 60004
Getchell mine	FirstMiss Gold, Inc.	S3,4,T38N,R42E; S33,T39N,R42E	gold silver	OP,ML, HL	multiple bench fluid-bed roasting cyanide	288	Q. Allen Neal P.O. Box 220 Golconda, NV 89414
Kelley mine	C. George Hewitt	S30,T45N,R26E	precious opal	OP		1	C. George Hewitt, Owner P.O. Box 33 Denio, NV 89404
Lone Tree mine	Santa Fe Pacific Gold Corp.	S11,T34N,R42E	gold silver	OP	multiple bench cyanide	325	Ken Pavlich, Project Manager P.O. Box 388 Valmy, NV 89438
Marigold mine	Rayrock Mines, Inc.	S8,9,17-19, T33N,R43E	gold	OP,ML, HL	grinding multiple bench cyanide	104	Dave Cook P.O. Box 9 Valmy, NV 89438
MIN-AD mine and mill	MIN-AD, Inc.	S25,T36N,R37E; S28,T35N,R38E	dolomite	OP	grinding	20	Charles Evans, Mill Superintendent 4210 W. Jungo Road Winnemucca, NV 89445
Pinson mine	Rayrock Mines, Inc.	S28,29,32,33, T38N,R42E	gold silver	OP,ML, HL	cyanide grinding	103	Jerry Harrington P.O. Box 129 Winnemucca, NV 89445
Rainbow Ridge opal mine	Rainbow Ridge Opal Mines, Inc.	S6,7,22,23, T45N,R26E	precious opal	OP,UG	multiple bench	1	G. Keith Hodson, Owner P.O. Box 97 Denio, NV 89404
Royal Peacock opal mine	Royal Peacock Opal Mines, Inc.	S19,20,T45N,R26E	precious opal	OP	hand digging	2	Walter Wilson 10 Virgin Valley Road P.O. Box 55 Denio, NV 89404
Sexton mill	Nutritional Additives Corp.	S20,T36N,R38E	dolomite	ML	crushing screening	3	W. Glen Sexton, General Manager P.O. Box 802 Winnemucca, NV 89445
Sleeper mine	AMAX Gold Inc.	S16,17,20,21 T40N,R35E	gold silver	OP,ML, HL	multiple bench cyanide gravity grinding	170	Barry P. Olson Manager 600 Sod House Road Winnemucca, NV 89445
Twin Creeks mine	Santa Fe Pacific Gold Corp.	S5-8,19,29,31, T39N,R43E	gold silver	OP,HL	carbon-in-leach multiple bench	730	Steve Lang, Project Manager P.O. Box 69 Golconda, NV 89414

continued

DIRECTORY OF MINING AND MILLING OPERATIONS (continued)

Mine/plant name	Operator	Location	Commodity	Type	Process/ activity	Employees	Address
LANDER COUNTY							
Argenta mine and mill	Baker Hughes INTEQ	S6,13,24,T32N,R46E	barite	OP	gravity grinding	14	Keith S. Olson P.O. Box 277 Battle Mountain, NV 89820
Battle Mountain grinding plant	M-I Drilling Fluids Co.	S18,T32N,R45E	barite	ML	gravity grinding	54	Gary Thielen, Operations Manager P.O. Box 370 Battle Mountain, NV 89820
Clipper mine	M-I Drilling Fluids Co.	S31,32,T28N,R46E	barite	ML	gravity concentration crushing	15	Gary Thielen, Operations Manager P.O. Box 370 Battle Mountain, NV 89820
Cortez Gold Mines	Placer Dome U.S., Inc.	S13,21,24, T27N,R47E; S36,T28N,R46E	gold silver	OP,ML, HL	cyanide grinding	184	Quayle Lusty, Mine Manager HC66-50 Beowawe, NV 89821
Dean mine	St. George Metals, Inc.	S36,T30N,R45E	gold silver	UG,OP	exploration development	29	Frank Varseveld, President 1140 Chukar Lane Battle Mountain, NV 89820
Greystone mine	M-I Drilling Fluids Co.	S16,T28N,R46E	barite	OP,ML	multiple bench gravity concentration crushing	5	Gary Thielen, Operations Manager P.O. Box 370 Battle Mountain, NV 89820
McCoy/Cove mine	Echo Bay Minerals Co.	S1,2,11,T28N,R42E; S36,T28N,R43E	gold silver	OP,ML, UG,HL	cyanide grinding	500	Jeff C. Smith P.O. Box 1658 Battle Mountain, NV 89820
Reona project (Fortitude)	Battle Mountain Gold Co.	S21,22,T31N,R43E; S28,T32N,R44E	gold silver	OP,HL	cyanide flotation gravity grinding	121	Ken Kluksdahl, Manager P.O. Box 1627 Battle Mountain, NV 89820
LINCOLN COUNTY							
Mackie mine and Caliente plant	Wilkin Mining & Trucking Co.	S34,T4S,R62E (mine); S5,T4S,R67E (plant)	perlite	UG,ML	room pillar crushing expansion	5	Joseph D. Wilkin, Owner P.O. Box 472 Panaca, NV 89042
LYON COUNTY							
Adams pit	Art Wilson Co.	S25,T16N,R20E	gypsum/ anhydrite	OP,ML	grinding	44	Art Wilson, President P.O. Box 1160 Carson City, NV 89702
Arimetco	Arimetco Inc.	S16,T13N,R25E	copper	OP,HL	leaching electrowinning	73	Rick Havenstrite, General Manager 102 Burch Drive Yerington, NV 89447
Hazen pit	Eagle-Picher Minerals, Inc.	S8,17,T19N,R26E	diatomite	OP	crushing drying calcining	2	Myron Burdette P.O. Box 10480 Reno, NV 89510
Limestone mine	Nevada Cement Co.	S3-6,19,25, T19N,R25E; S31-33,T20N,R25E	limestone	OP	multiple bench	12	Alan Speagall, President P.O. Box 840 Fernley, NV 89408
Nevada Cement plant	Nevada Cement Co.	S2,3,10,11, T20N,R24E	cement	OP	rotary kiln	135	Alan Speagall, President P.O. Box 840 Fernley, NV 89408
Section 8 mine and Fernley mill	CR Minerals Corp.	S8,17,T19N,R26E S11,T20N,R24E	diatomaceous earth	OP,ML	grinding	15	Chris Harris, Superintendent P.O. Box 455 Fernley, NV 89408
MINERAL COUNTY							
Aurora mine	Nevada Goldfields, Inc.	S17,18,T5N,R28E	gold silver	OP,UG, ML	multiple bench	45	Don Hopkins P.O. Box 3070 Hawthorne, NV 89415
Aurora Partnership	Electra Mining Corp.	S17,T5N,R28E	gold silver	OP,HL	multiple bench cyanide	14	James Burt P.O. Box 1628 Hawthorne, NV 89415

DIRECTORY OF MINING AND MILLING OPERATIONS (continued)

Mine/plant name	Operator	Location	Commodity	Type	Process/ activity	Employees	Address
MINERAL COUNTY (continued)							
Denton-Rawhide mine	Kennecott Rawhide Mining Co.	S4,5,8,16,17, T13N,R32E	silver gold	OP,HL	cyanide	165	Dennis Kerstiens, General Manager P.O. Box 2070 Fallon, NV 89407
Kinross Candelaria mine	Kinross Gold U.S.A. Inc.	S32-34,T4N,R35E; S3-5,T3N,R35E	silver gold	OP,HL	cyanide	135	Jeff W. Butwell P.O. Box 1240 Hawthorne, NV 89415
Santa Fe mine	Corona Gold, Inc.	S6,T8N,R35E; S36,T9N,R34E; S31,T9N,R35E	gold silver	OP,HL	multiple bench cyanide	14	Bruce Thieking, Resident Manager P.O. Box 3220 Hawthorne, NV 89415
NYE COUNTY							
Amargosa Valley plant and pits	IMV Div. of Floridin Co.	S15,29,T17S,R49E; S6,21,T17S,R51E	clay minerals	OP	grinding drying	37	William T. Jacobs Route Box 549 Amargosa Valley, NV 89020
Ash Meadows plant	American Resource Corp.	S25,T18S,R50E	zeolite	ML	screening drying bagging	4	Dave Lewis State Route 15 P.O. Box 7006 Amargosa Valley, NV 89020
Barrick-Bullfrog mine	Barrick Gold Corp.	S15,T12S,R46E	gold silver	OP,HL	multiple bench cyanide grinding	290	Dave Russell P.O. Box 519 Beatty, NV 89003
Cinder Cone pit	Cind-R-Lite Co.	S36,T14S,R48E; S1,T15S,R48E	cinder	OP	gravity	2	H.D. Allen, President 3333 Cinder Lane Las Vegas, NV 89103
Crown mine/Ione placer/ primary mill	Marshall Earth Resources	S28,34, T13N,R39E	gold silver	ML,OP	screening washing	15	Hugh Marshall, President Route 1, Box 29A Austin (Ione), NV 89310
Gabbs mine and mill	Premier Services Corp.	S26,34,T12N,R36E	magnesite	OP,ML	calcining dead burning sizing separation	77	Lyndon Johnson, Mine Manager P.O. Box 177 Gabbs, NV 89409
Lathrop mill	American Borate Co.	S36,T17S,R49E	calcium borate	ML	flotation calcination	9	Darrel Cypert, Vice President Star Route 15 Box 610 Amargosa Valley, NV 89020
Nevada Neanderthal plant	Nevada Neanderthal Stone	S10,T11S,R47E	dimension stone	ML	stone cutting	6	Dave Spicer, President P.O. Box 897 Beatty, NV 89003
New Discovery mine and mill	Vanderbilt Minerals Corp.	S13-24,T12S,R46E; S18,19,T12S,R47E	clay	UG,ML	grinding bagging	6	Jerry W. Lease 2320 Viking Road Las Vegas, NV 89109
Paradise Peak mine	FMC Gold Co.	S7,12,13,24, T10N,R36E; S3-22,T10N,R35E	gold silver	HL	cyanide Merrill-Crowe	28	William Scanlon P.O. Box 145 Gabbs, NV 89409
Round Mountain mine	Echo Bay Mines Ltd.	S19,20,29,30, T10N,R44E; S12,24,25,36, T10N,R43E	gold silver	OP,HL, ML	cyanide	530	Chet Diercks, General Manager P.O. Box 480 Round Mountain, NV 89045
Sterling mine	Greg Austin	S6,T13S,R48E	gold	UG,ML, HL	drifting cyanide	42	Chuck Stevens P.O. Box 187 Beatty, NV 89003
PERSHING COUNTY							
Buff mine	Vanderbilt Minerals Corp.	S2,T27N,R32E	clay	OP	grinding bagging	6	Jerry W. Lease 2320 Viking Road Las Vegas, NV 89109
Coeur Rochester mine	Coeur D'Alene Mines Corp.	S15,16,21,22, T28N,R34E	silver gold	OP,HL	cyanide	309	Robert Martinez, Vice President P.O. Box 1057 Lovelock, NV 89419
Colado mine and plant	Eagle-Picher Minerals, Inc.	S7,T28N,R29E; S6,T27N,R32E	diatomite	OP,ML	crushing drying classification grinding calcining	135	Jack P. Richards 150 Coal Canyon Rd. Lovelock, NV 89419

continued

DIRECTORY OF MINING AND MILLING OPERATIONS (continued)

Mine/plant name	Operator	Location	Commodity	Type	Process/ activity	Employees	Address
PERSHING COUNTY (continued)							
Empire mine	United States Gypsum Co.	S31,T31N,R24E	gypsum	OP	multiple bench	130	Mike Phillips, Manager P.O. Box 130 Empire, NV 89405
Florida Canyon mine	Florida Canyon Mining, Inc.	S1-3,10-12,37,38, T31N,R33E	gold silver	OP,HL	cyanide	20	Doug Stewart P.O. Box 330 Imlay, NV 89418
Section 8 mine	American Colloid Co.	S8,T27N,R33E	clay	OP	single bench		Pete Maul 1500 West Shure Drive Arlington Heights, IL 60004
Sexton mine	Nutritional Additives Co.	S5,8,T34N,R38E	dolomite/ limestone	OP	grinding	5	Donald Sexton 1230 S. Bridge Winnemucca, NV 89445
STOREY COUNTY							
All-Lite pit and plant	All-Lite Aggregate Inc.	S34,T19N,R21E	lightweight aggregate sand gravel	ML	multiple-bench crushing	16	Bill Poulter, Manager P.O. Box 10865 Reno, NV 89510
Clark mine and mill	Eagle-Picher Minerals, Inc.	S28,33,34, T20N,R23E; S35,T20N,R22E	diatomite	OP,ML	crushing drying calcining	62	Myron S. Burdette P.O. Box 10480 Reno, NV 89510
Golden Eagle mine and mill	American Eagle Resources, Inc.	S22,23,24,26,27, T17N,R22E	gold silver	OP,HL	cyanide	21	Bob Spengler, General Manager P.O. Box 859 Virginia City, NV 89440
Lower Naturalite pit and plant	Naturalite Aggregate Corp.	S16,T17N,R22E	lightweight aggregate	OS,ML	multiple bench crushing screening	6	Fritz Anthes, General Manager 2600 Boeing Way Carson City, NV 89701
Patrick pit	Granite Construction	S6,T19N,R22E	sand gravel	OP	single bench	11	Jim Roberts, Branch Manager P.O. Box 2087 Sparks, NV 89432
WASHOE COUNTY							
Clay mine	Art Wilson Co., *contractor for* Nevada Cement Co.	S13,T27N,R19E	clay	OP	single bench	5	Art Wilson, Operator P.O. Box 1160 Carson City, NV 89702
Empire mill	United States Gypsum Co.	S11,13,T31N,R23E	gypsum	ML	grinding calcination	15	Mark Cubbage, Mines Superintendent P.O. Box 130 Empire, NV 89405
Lockwood quarry	Granite Construction Co.	S17,T19N,R21E	aggregate	OP	single bench crushing screening	7	Jim Roberts, Branch Manager P.O. Box 2087 Sparks, NV 89432
102 Ranch pit	Lost Dutchman Construction Co.	S36,T20N,R22E	sand gravel	OS,ML	crushing screening	5	Jerry Helms P.O. Drawer 608 Sparks, NV 89432
Paiute pit	Paiute Pit Aggregates, Inc.	S22,27,34, T21N,R24E	sand gravel	OP	single bench	7	Alex Karlshoet, Owner P.O. Box 159 Wadsworth, NV 89442
Rilite Aggregate	Rilite Aggregate Co.	S23,T18N,R20E	aggregate	OP	grinding crushing	8	Bruno Benna P.O. Box 11767 Reno, NV 89511
Sha-Neva pits	Sha-Neva Inc.	S24,T21N,R19E S17,T19N,R21E	aggregate	OP	screening	6	Pat Shane, President 10655 Sha-Neva Rd. Truckee, CA 96161
Sky Ranch pit	Rocky Ridge, Inc.	S15,T21N,R20E	sand gravel	OS,ML	multiple bench crushing screening	15	Pat Shane, President 10655 Sha-Neva Rd. Truckee, CA 96161

DIRECTORY OF MINING AND MILLING OPERATIONS (continued)

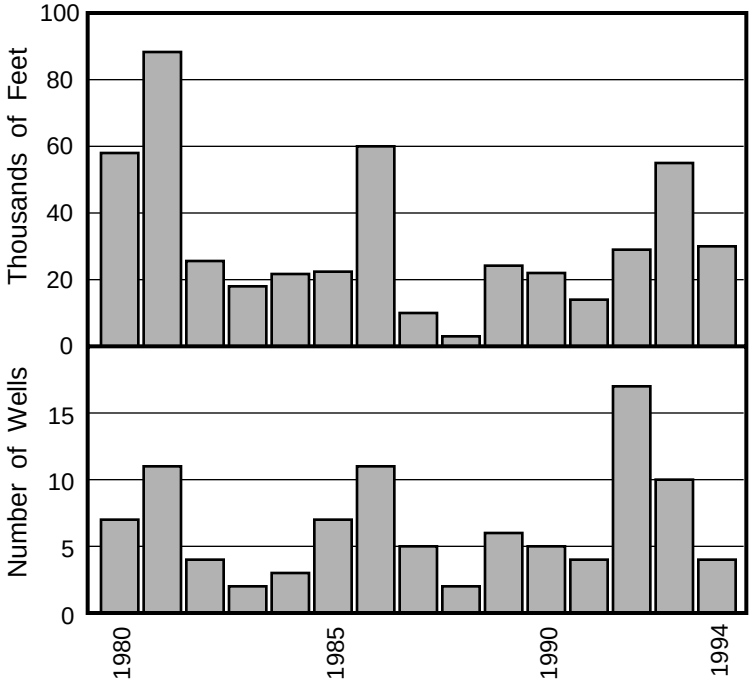
Mine/plant name	Operator	Location	Commodity	Type	Process/ activity	Employees	Address
WASHOE COUNTY (continued)							
Western Hog Ranch mine	Western Mining Corp. USA	S24,T38N,R22E	gold silver	OP,HL, ML	cyanide	23	C. A. Moore, Resident Manager P.O. Box 9 Gerlach, NV 89412
Wind Mountain mine	Amax Gold Inc.	S33,34,T30N,R23E	gold silver	HL	cyanide	6	Barry Olson, General Manager P.O. Box 160 Empire, NV 89405
WHITE PINE COUNTY							
Bald Mountain mine (Includes Alligator Ridge, Yankee Projects)	Placer Dome U.S., Inc.	S22-26,35,36, T22N,R57E; S24,T24N,R56E; S17,20,T24N,R57E; S25,T21N,R57E	gold	OP,HL	multiple bench cyanide	120	Doug Bailey P.O. Box 2706 Elko, NV 89801
Easy Junior Project	Alta Gold Co.	S9,T15N,R56E	gold	OP	multiple bench heap leach	45	Gary Cummings, General Manager P.O. Box 324 East Ely, NV 89315
Mt. Hamilton Gold Project	Mount Hamilton Mining Co.	S5,6,7,8,15, T16N,R57E	gold silver	OP	multiple bench	128	Hans Geertsema, General Manager P.O. Box 150476 East Ely, NV 89315
Robinson project	Magma Nevada Mining Co.	S10,11,15 T16N,R62E	gold silver copper	OP,ML, HL	CIL mill cyanide		Harry Smith P.O. Box 382 Ruth, NV 89319

Geothermal Energy

by Ronald H. Hess

Thirty-five geothermal well permits were issued during 1994 by the Nevada Division of Minerals: seven industrial/commercial class wells, three domestic class, twenty-one observation or gradient wells, and four injection wells. During this same period four industrial/commercial class wells, two domestic class, five thermal gradient wells, and one injection well were reported to have been drilled. Total footage drilled for the period was about 30,000 feet.

During 1994 there were 160 federal geothermal noncompetitive leases covering 251,548 acres and 51 competitive federal leases covering 76,617 acres in Nevada. The annual rental fee paid for these leases was $570,000. Total gross electrical production from geothermal resources on public lands was 1,234,000 megawatt-hours; net production was 1,051,000 megawatt-hours. Gross electrical sales from federal lands was 101 million dollars. Production royalties on that amount equaled about $4.5 million. By regulation, half of all rental fees and royalties are returned to the state and in 1994 the total amount of fees returned to the state was $2,535,000.



Industrial-class (power generating) wells drilled in Nevada, 1980–1994.

NONDOMESTIC GEOTHERMAL WELLS REPORTED AS DRILLED OR COMPLETED IN NEVADA DURING 1994

Area	Company	Well name	Permit no.	Location	Type
Churchill County					
Bradys Hot Springs	Brady Power Partners	Injection Well #82A-11	370	NE¼ NE¼ S11,T22N,R26E	Injection
Bradys Hot Springs	Brady Power Partners	Production Well #48A-1	316	SE¼ SW¼ S1,T22N,R26E	Production
Desert Peak	Western States Geothermal	Production Well #86-21	417	SE¼ NE¼ S21,T22N,R27E	Production
Dixie Valley	Oxbow Geothermal	Production Well #36(13)-14	382	NE¼ SW¼ S23,T24N,R36E	Production
Washoe County					
Gerlach	San Emidio Resources, Inc.	Gerlach PA-94 GTG-3	393	SW¼ NW¼ S10,T32N,R23E	Thermal gradient
Gerlach	San Emidio Resources, Inc.	Observation Well #18-10	412	SW¼ SW¼ S10,T32N,R23E	Thermal gradient
Gerlach	San Emidio Resources, Inc.	Gerlach PA-94 GTG-7	395	SE¼ NE¼ S10,T32N,R23E	Thermal gradient
Gerlach	San Emidio Resources, Inc.	Gerlach PA-94 GTG-2	398	NE¼ NW¼ S10,T32N,R23E	Thermal gradient
San Emidio	Empire Farms, Inc.	Production Well #75B-16	403	NE¼ SE¼ S16,T29N,R23E	Production
Steamboat	S.B. Geo, Inc.	Thermal Gradient Hole MTH #21-33	384	NW¼ NW¼ S33,T18N,R20E	Thermal gradient

NEVADA GEOTHERMAL POWER PLANTS 1994

Plant name (year on line)	Production capacity[1] (MW)	1994 Production (MWh)		Location	Operator
		Gross	Net (sales)		
Beowawe (1985)	16.0	135,199	102,843	S13,T31N,R47E	Oxbow/Beowawe Geothermal Power Co. P.O. Box 6 Beowawe, NV 89821
Bradys Hot Springs (1992)	21.1	201,152	153,792	S12,T22N,R26E	Oxbow Power Services, Inc. P.O. Box 649 Fernley, NV 89408
Desert Peak (1985)	8.7	80,676	72,298	S21,T22N,R27E	Western States Geothermal Co. P.O. Box 2627 Sparks, NV 89432-2627
Dixie Valley[2] (1988)	66.0	507,280	458,164	S7,T24N,R37E S33,T25N,R37E	Oxbow Geothermal Corp. 5250 South Virginia St. Suite 304 Reno, NV 89502
Empire (1987)	3.6	13,969	9,025	S21,T29N,R23E	Nevada Operations, Inc. P.O. Box 1650 Fallon, NV 89407
Soda Lake No. 1 (1987) and Soda Lake No. 2 (1991)	16.6	123,289	95,351	S33,T20N,R28E	Nevada Operations, Inc. P.O. Box 1650 Fallon, NV 89407
Steamboat I, I-A (1986) and Steamboat II, III (1992)	48	398,822	300,293	S29,T18N,R20E	S.B. Geo, Inc. P.O. Box 18087 Reno, NV 89511
Stillwater (1989)	13.0	95,511	85,127	S1,T19N,R30E S6,T19N,R31E	Nevada Operations, Inc. P.O. Box 1650 Fallon, NV 89407
Wabuska (1984)	1.2	4,133	1,991	S15,16,T15N, R25E	Tad's 10 Julian Lane Yerington, NV 89447
Yankee Caithness (1988)	14.4	76,676	69,856	S5,6,T17N,R20E	Yankee Caithness J.V.L.P. P.O. Box 18160 Reno, NV 89511
TOTAL	208.6	1,636,707	1,348,740		

[1]Production capacity from currently developed geothermal resources.
[2]Gross output of the Dixie Valley plant occasionally exceeds 66 MW.
Sources: Nevada Division of Minerals, plant operators, and NBMG files.

Total Nevada geothermal electrical production from both federal and fee lands combined in 1994 was 1,636,707 megawatt-hours gross; net production was 1,348,740 megawatt-hours with an approximate sales value of $108,000,000 (Nevada Division of Minerals, 1995). Production capacity from the currently developed geothermal resources at ten existing geothermal power plants in Nevada is 208.6 megawatts. Nevada is second only to California in total installed geothermal generating capacity.

The Nevada Bureau of Mines and Geology (NBMG) released Open-File Report 94-2, *Nevada Low-Temperature Geothermal Resource Assessment: 1994*. This report was prepared as part of a study of low to moderate temperature geothermal resources of Nevada under the U.S. Department of Energy Low-Temperature Geothermal Resources and Technology Transfer Program. A hardcopy of the report with map and digital data on diskette is available for viewing or purchase at NBMG.

Beowawe

Oxbow/Beowawe Geothermal Power Co. modified its 1994 injection program at the 16 megawatt Beowawe plant. During 1994 injection was switched from zones in a distant cooler reservoir outside of the resource reservoir to injection back into the principal producing reservoir. This appears to have reversed a steady downward trend in temperature and pressure that has been occurring in the principal reservoir over the last several years. (Dick Benoit, personal commun., 1995; GRC Nevada Section Bulletin, v. 7, no. 2, April 1994).

Desert Peak

The Western States Geothermal Co., Desert Peak plant went on line in 1985. Production during 1994 was down slightly due to fill in the bottom of well no. 86-21. The plant was down two weeks to install a new turbine rotor. Overall on-line plant availability is 96.2% for 1994. (Nevada Division of Minerals, 1995)

Dixie Valley

Oxbow Geothermal Corp. Dixie Valley plant was down two weeks in April for plant maintenance and overhaul. Plant production was also interrupted from October 17 to October 26 due to a U.S. Navy helicopter that downed a power transmission line to the plant. These interruptions in production caused a 22,800 megawatt-hour drop in net production from 1993. (Dick Benoit, personal commun., 1995; Nevada Division of Minerals, 1995)

Fish Lake Valley

Fish Lake Power Co., a subsidiary of Magma Power Co., has filed with the Nevada Public Service Commission and the Bureau of Land Management for approval to construct a 16-megawatt-hour geothermal power plant in section 13, T1S, R35E, in Fish Lake Valley, Esmeralda County. The project anticipates a 30-year plant life, and the need for 15 geothermal production wells, eight injection wells, and a 29-mile transmission line that will connect to the grid at the Oasis substation on the Nevada/California state line. If the project gets approval it could be on-line in 1996. (Geothermal Progress Monitor, no.16, December 1994)

San Emidio Desert

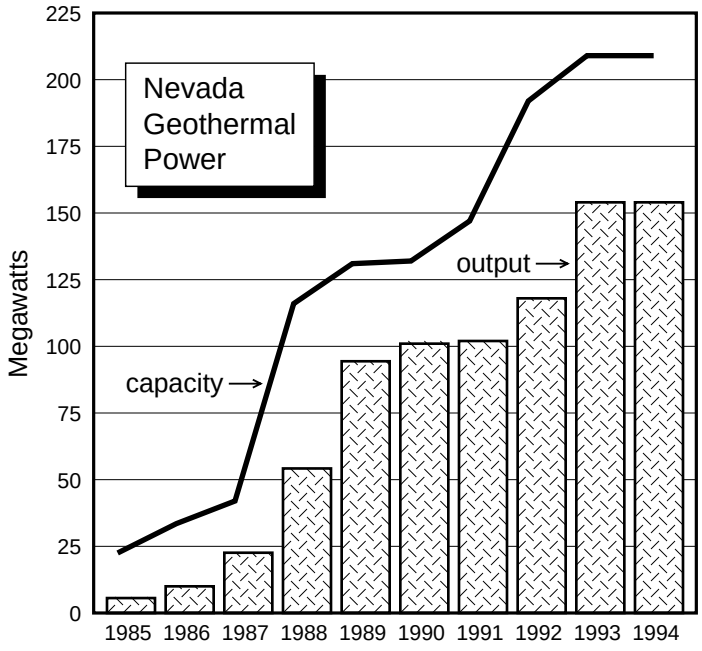
Integrated Ingredients vegetable dehydration plant was dedicated on May 25, 1994. It is in the San Emidio Desert area southwest of Gerlach. The plant is a few miles north of the Empire (OESI/AMOR II) electric-power plant. Integrated Ingredients (Spice Islands, Fleischmann's, and other brands) is part of international food manufacturer Burns Philp. The plant will use approximately 130°C geothermal fluid to heat process air for the dehydration system. About 14 million pounds of dry product will be produced annually: 60% onion and 40% garlic. A 350-foot production well, with a 75-horsepower pump, will produce up to 900 gallons per minute of 130°C water to the plant. It is estimated that maximum energy use is 45 million Btu per hour. The plant is designed to allow for construction of an additional dehydration production line and additional geothermal fluid for this equipment will be supplied by a second production well. (Geothermal Progress Monitor, No.16, December 1994)

Steamboat Springs

Yankee Caithness J.V.L.P. operates a 14.4-megawatt (gross) flash turbine system producing from a 338°F resource. The plant was down 34 days in 1994 and net production was 5,500 megawatt-hours less than in 1993. (Nevada Division of Minerals, 1995)

Wabuska

Tad's Enterprises Inc., Wabuska plant celebrated its tenth anniversary in July 1994. This was the first commercial geothermal power plant in Nevada. The plant capacity in 1984 was 600 kilowatts generated from a single Ormat Energy Converter. A second unit was installed in 1987, doubling the capacity to 1.2 megawatts. The plant operates on fluids at 225°F produced from a depth of 350 feet. (GRC Bulletin, July 1987; GRC Nevada Section Bulletin, v. 7, no. 2, April 1994)



Rated capacity and average net output of Nevada geothermal plants, 1985–1994. Average net output is annual sales in megawatt-hours divided by the number of hours in a year (8,760). No commercial geothermal power was produced in Nevada before 1985.

Oil and Gas

by David A. Davis

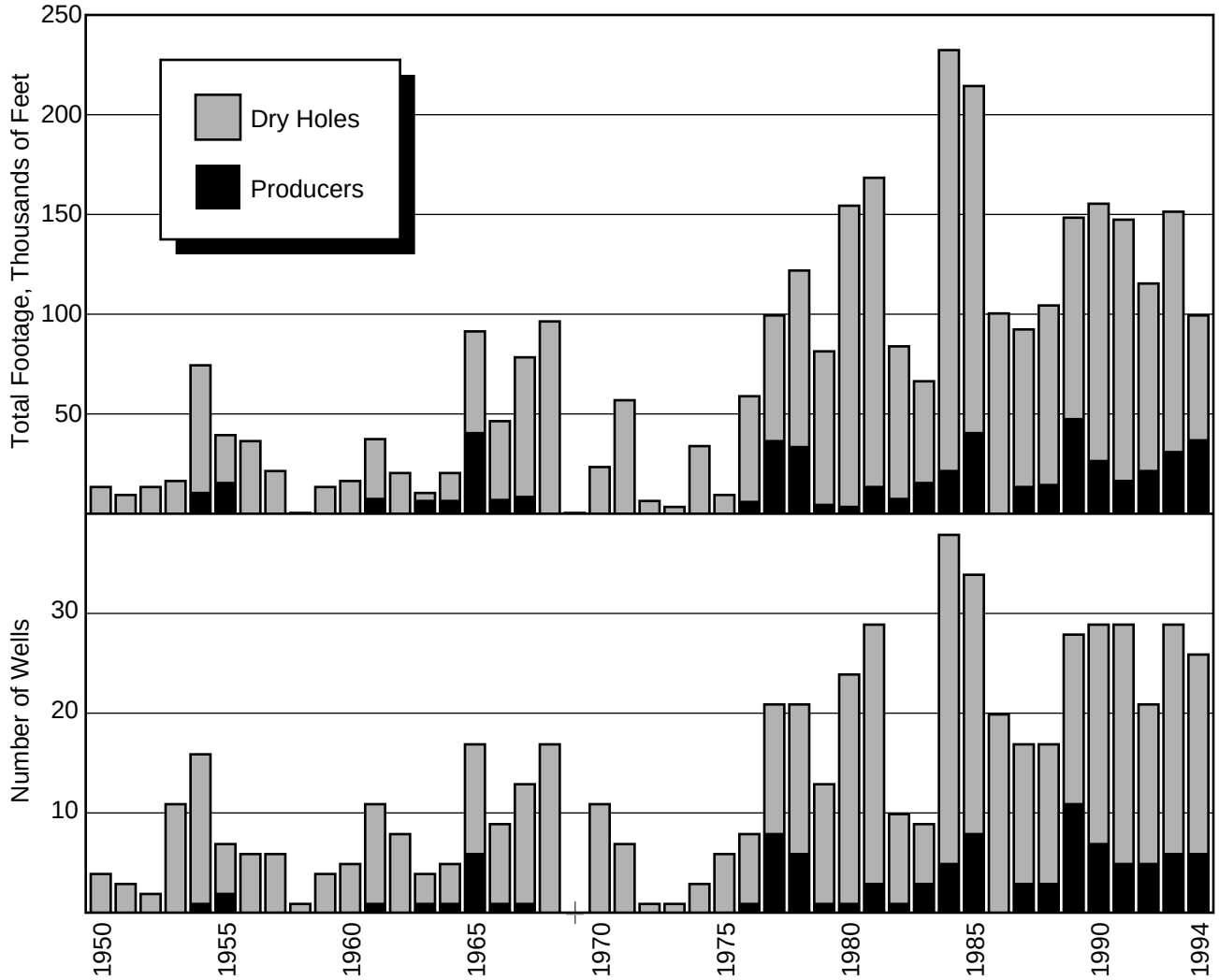
Exploration

Twenty wells were spudded for oil and gas in 1994, down from 31 spudded in 1993. Also, four wells spudded in 1993 were completed in 1994. Six new wells were put on production in 1994. The new producer in Eureka County was Petroleum Corp. of Nevada Blackburn Unit No. 19. The new producers in Nye County are Apache Corp. Grant Canyon No. 22-21, Equitable Resources Co. Balcron Oil Division Bacon Flat Federal No. 23-17A, Foreland Corp. Eagle Springs No. 54-35, Eagle Springs/Plains Petroleum No. 82-35, and Eagle Springs/Plains Petroleum No. 24-36.

Drilling was completed on 24 wells totaling 100,158 feet during 1994. At year end, drilling was in progress on one well and three were temporarily abandoned or shut in. The peak drilling rig count fell from six during January and February to one during May and June and rose up to seven during September through December.

Nevada currently produces oil and gas from 11 fields in Nye and Eureka Counties. The Blackburn field was Nevada's largest producer in 1994, followed by the Trap Spring field.

Nevada's highest volume producer for 1994 was Petroleum Corp. of Nevada Blackburn Unit No. 19



Number and total footage of Nevada oil wells completed as producers or plugged and abandoned, 1950–1994.

OIL WELL DRILLING ACTIVITY IN NEVADA IN 1994

Company	Well	Permit no.	Location	Spud date	Depth (feet)	Status (31 Dec 94)
ELKO COUNTY						
Frontier Exploration Co.	Federal No. 16-5	716	SE1/4 SE1/4 S5 T27N R56E	Oct 94	4,157	P&A
Petroleum Corp. of Nevada	AV No. 10-5	729	SW1/4 NW1/4 S10 T36N R54E	Sep 94	W	P&A
Foreland Corp.	Trout Creek No. 26-1	735	SW1/4 SE1/4 NW1/4 S26 T30N R52E	Nov 94	W	P&A
EUREKA COUNTY						
Foreland Corp.	Cedar Creek No. 2-1	721	NW1/4 NE1/4 S1 T17N R50E	Jan 94	5,660	P&A
Petroleum Corp. of Nevada	Blackburn Unit No. 19	724	NW1/4 SW1/4 S8 T27N R52E	Apr 94	6,851	Producer
NYE COUNTY						
Makoil, Inc.	Munson Ranch No. 11-44	672	SE1/4 SE1/4 S11 T9N R56E	Jun 94	W	TA
CENEX	Federal No. 11-33	702	NE1/4 SW1/4 S33 T10N R57E	Jan 94	6,115	P&A
Apache Corp.	Grant Canyon No. 22-21	705	SE1/4 NW1/4 S21 T7N R57E	Dec 93	4,065	Producer
Equitable Resources Co. Balcron Oil Division	Balcron Bacon Flat Fed. No. 23-17A	710	NE1/4 SW1/4 S17 T7N R56E	Nov 93	4,973	Producer
Baynon Oil and Exploration Co.	Railroad Valley No. 1	712	SW1/4 SW1/4 S4 T5N R55E	Dec 93	4,592	P&A
Foreland Corp.	Eagle Springs No. 54-35	726	SW1/4 SW1/4 NE1/4 S35 T9N R57E	Aug 94	7,130	Producer
Apache Corp.	Troy Canyon Unit No. 43-20	727	NW1/4 NE1/4 SE1/4 S20 T7N R57E	May 94	5,032	P&A
Foreland Corp.	Willow Springs No. 34-31	728	SE1/4 SW1/4 SE1/4 S31 T7N R57E	Sep 94	5,500	P&A
CENEX	Federal No. 12-14B	731	NW1/4 SW1/4 S14 T7N R56E	Sep 94	5,954	P&A
Baynon Oil and Exploration Co.	Portuguese Mountain No. 14-12	732	NE1/4 SE1/4 SW1/4 S12 T10N R56E	Sep 94	5,690	P&A
Foreland Corp.	Eagle Springs/ Plains Petroleum No. 82-35	734	SE1/4 NE1/4 NE1/4 S35 T9N R57E	Sep 94	6,945	Producer
Foreland Corp.	Eagle Springs/ Plains Petroleum No. 24-36	737	SE1/4 SW1/4 NW1/4 S36 T9N R57E	Sep 94	7,440	Producer
Equitable Resources Co. Balcron Oil Division	West Valley Fed. No. 34-18	740	SW1/4 SE1/4 S18 T8N R56E	Nov 94	W	P&A
Makoil, Inc.	Inselberg No. 2-12	742	SW1/4 NW1/4 S2 T9N R56E	Oct 94	1,827	P&A
Apache Corp.	Railroad Stock Fed. No. 12-34	746	SW1/4 SW1/4 NW1/4 S34 T12N R57E	Dec 94	W	Drilling
PERSHING COUNTY						
Evans-Barton, Ltd.	Kyle Spring No. 12-13	730	NW1/4 SW1/4 S12 T29N R36E	Aug 94	1,162	P&A
WHITE PINE COUNTY						
Frontier Exploration Co.	Indian Springs Federal No. 22A	699	NE1/4NE1/4NE1/4 S22 T18N R55E	Jun 94	2,435	P&A
Chevron U. S. A. Production Co.	Titan Federal No. 1-9	718	NE1/4 SE1/4 S9 T13N R64E	Feb 94	7,760	P&A
Chevron U. S. A. Production Co.	Bonanza Federal No. 1-32	719	NE1/4 NE1/4 S32 T20N R61E	Dec 93	6,870	P&A

W: Depth information withheld in accordance with company requests and Nevada regulations.
P&A: Plugged and abandoned.
TA: Temporarily abandoned.
Drilling: Drilling not finished in 1994.

(see New Producers) in the Blackburn field, which averaged 1,100 barrels of oil per day with little water from June through December. Petroleum Corp. of Nevada Blackburn Unit No. 18 in the Blackburn field was Nevada's second highest volume producer, which averaged 730 barrels of oil and 1000 barrels of water per day through 1994. Of Nevada's previous two highest volume producers, Apache Corp. Grant Canyon No. 7 was shut in all year, and Apache Corp. Grant Canyon No. 9 averaged 652 barrels of oil per day through 1994 and 407 barrels of water per day from March through December.

Seven unit agreements were approved and no development contracts were in effect with the Bureau of Land Management in Nevada during fiscal year 1994, compared with four unit agreements and three development contracts in fiscal year 1993. There were 5,498,508 acres under federal oil and gas leases in fiscal year 1994, a decrease of 433,385 acres from fiscal year 1993.

Oil shows were reported for three dry holes completed in Nye County in 1994. In its Federal No. 11-33 well, CENEX reported brown and black stains in very finely crystalline Paleozoic limestone between 4890 and 4920 feet.

In its Railroad Valley No. 1 well, Baynon Oil and Exploration Co. reported traces of black asphaltic oil within tuff of the Tertiary Horse Camp Formation between 1,300 and 1,330 feet.

In its Troy Canyon Unit No. 43-20 well, Apache Corp. reported long intervals of trace oil shows between 2,115 and total depth at 5,032 feet. These shows range from dark brown stains with spotty fluorescence and bright yellow cut to oil globs. The samples consist largely of limestone and dolomite in valley fill above 4,824 feet and Devonian Guilmette Formation below.

Kyle Spring No. 12-13, drilled by Evans-Barton, Ltd. about a mile southwest of Kyle Hot Spring, reportedly contained shows at two intervals. Early in the year, Independence Mining Co. encountered a flow of hot water containing tarry oil globules while drilling a gold test hole about one mile south of Kyle Hot Spring. The nearest reported oil shows are liquid hydrocarbons found in concretions and fossils in the southern Tobin Range (Geological Society of America Special Paper 178; Geothermal Research Council Special Report 13) about 30 miles southeast of Kyle Hot Spring. The nearest production is from the Blackburn field about 100 miles to the east.

FEDERAL OIL AND GAS LEASES IN EFFECT IN FISCAL YEARS 1993 AND 1994[1]

County	NUMBER OF LEASES						ACREAGE					
	Competitive		Noncompetitive		Simultaneous[2]		Competitive		Noncompetitive		Simultaneous[2]	
	FY93	FY94	FY93	FY94	FY93	FY94	FY93	FY94	FY93	FY94	FY93	FY94
Carson City	0	0	0	0	0	0	0	0	0	0	0	0
Churchill	0	0	3	3	2	2	0	0	5,085	5,085	5,278	5,278
Clark	0	0	6	5	7	4	0	0	3,743	3,103	8,041	6,441
Douglas	0	0	0	0	0	0	0	0	0	0	0	0
Elko	27	32	209	181	63	55	40,883	49,306	378,886	293,592	191,274	172,099
Esmeralda	0	0	5	7	0	0	0	0	8,949	18,574	0	0
Eureka	92	85	187	146	136	121	139,947	112,376	345,580	258,894	485,732	398,361
Humboldt	0	0	1	0	0	0	0	0	679	0	0	0
Lander	0	0	77	7	1	1	0	0	7,557	7,557	10,185	10,185
Lincoln	51	52	235	270	44	30	87,958	91,964	506,359	590,503	167,714	138,911
Lyon	0	0	0	0	0	0	0	0	0	0	0	0
Mineral	0	0	0	0	0	0	0	0	0	0	0	0
Nye	302	324	464	432	347	308	266,231	296,537	962,677	830,053	673,096	561,450
Pershing	0	19	3	27	0	0	0	40,399	5,085	56,740	0	0
Storey	0	0	0	0	0	0	0	0	0	0	0	0
Washoe	0	0	2	0	0	0	0	0	1,713	0	0	0
White Pine	169	179	324	348	196	171	247,847	266,298	737,365	736,375	641,029	548,425
TOTAL	641	691	1,516	1,426	796	692	782,866	856,880	2,963,678	2,800,476	2,185,349	1,841,150

[1]Data from the U.S. Bureau of Land Management FY93 = Oct. 1992-Sept. 1993; FY94 = Oct. 1993-Sept. 1994

[2]These are the remaining leases that were issued under the simultaneous leasing program that was terminated by the December 22, 1987 amendment to the 1920 Mineral Leasing Act.

PRODUCTION OF NEVADA'S OIL FIELDS (barrels)

Compiled from Producer's Reports filed with the Nevada Division of Minerals

Field (year discovered)	Thru 1987	1988	1989	1990	1991	1992	1993	1994	TOTAL
Eagle Springs (1954)	3,854,869	43,451	47,272	41,609	42,043	49,767	7,075	66,565	4,152,651
Trap Spring (1976)	7,224,727	441,832	629,281	939,792	690,257	554,410	427,150	378,955	11,286,404
Currant (1979)	641	0	0	0	0	0	0	0	641
Bacon Flat (1981)	293,805	20,855	0	0	0	178,845	102,030	192,601	788,136
Blackburn (1982)	1,281,803	351,582	272,119	238,240	203,023	231,719	599,857	576,853	3,755,196
Grant Canyon (1983)	7,482,073	2,280,323	2,076,272	2,345,858	2,124,021	2,499,831	495,934	308,709	19,613,021
Kate Spring (1986)	7,015	75,725	188,408	434,349	339,310	203,274	150,309	122,436	1,520,826
Tomera Ranch 1987)	1,032	5,221	225	2,605	3,067	2,295	2,140	1,970	18,555
N. Willow Creek (1988)		9,457	4,036	3,169	2,365	4,491	3,928	3,736	31,182
Three Bar (1990)				3,601	17,684	362	1,961	229	23,837
Duckwater Creek (1990)				3,095	4,190	2,764	2,256	1,269	13,574
Sans Spring (1993)							69,478	44,279	113,757
TOTAL	20,145,965	3,228,446	3,217,613	4,012,318	3,425,960	3,727,758	1,862,118	1,697,602	41,317,780
Change from previous year		4%	0%	25%	–15%	9%	–50%	-9%	

New Producers

Petroleum Corp. of Nevada Blackburn Unit No. 19 in the Blackburn field is the one new producer in Eureka County. Production of 27.2 gravity oil with no water began in June from the 6,846- to 6,868-foot interval in dolomite of the Devonian Nevada Formation. Production reached an average of 1331 barrels of oil per day in August and was averaging 1,200 barrels per day in December. This well was drilled within 1/4 mile southeast of Blackburn Unit No. 18, which was completed in 1992 and produces 24.8 gravity oil from the 6,708- to 6,748-foot interval of the Nevada Formation. Oil output of Blackburn Unit No. 18 continued to decline and water output continued to increase throughout 1994; daily output averaged 420 barrels of oil with 1,400 barrels of water in December 1994.

There were five new producers in Nye County for 1994. In the Bacon Flat field, Balcron Oil Bacon Flat Federal No. 23-17A began production in January from the 4,952- to 4,973-foot interval in dolomite of the Upper Devonian Guilmette Formation. Production reached 964 barrels per day in June and was averaging 208 barrels per day in December. Bacon Flat Federal No. 23-17A is within 1/4 mile of Bacon Flat Federal No. 23-17, which was completed in 1992 and produced up to 1,900 barrels per day from the 5,164- to 5,240-foot interval in the Guilmette Formation. This well last produced about 190 barrels per day for several days in December 1993.

In the Eagle Springs field, Foreland Corp. Eagle Springs/ Plains Petroleum No. 24-36 was completed as a producer on November 30, 1994. A test produced 63 barrels of oil and 16 barrels of water in 15 hours. Six oil zones are reported between 6,268 and 6,583 feet. Shows of dark brown stains are also reported deeper in the well.

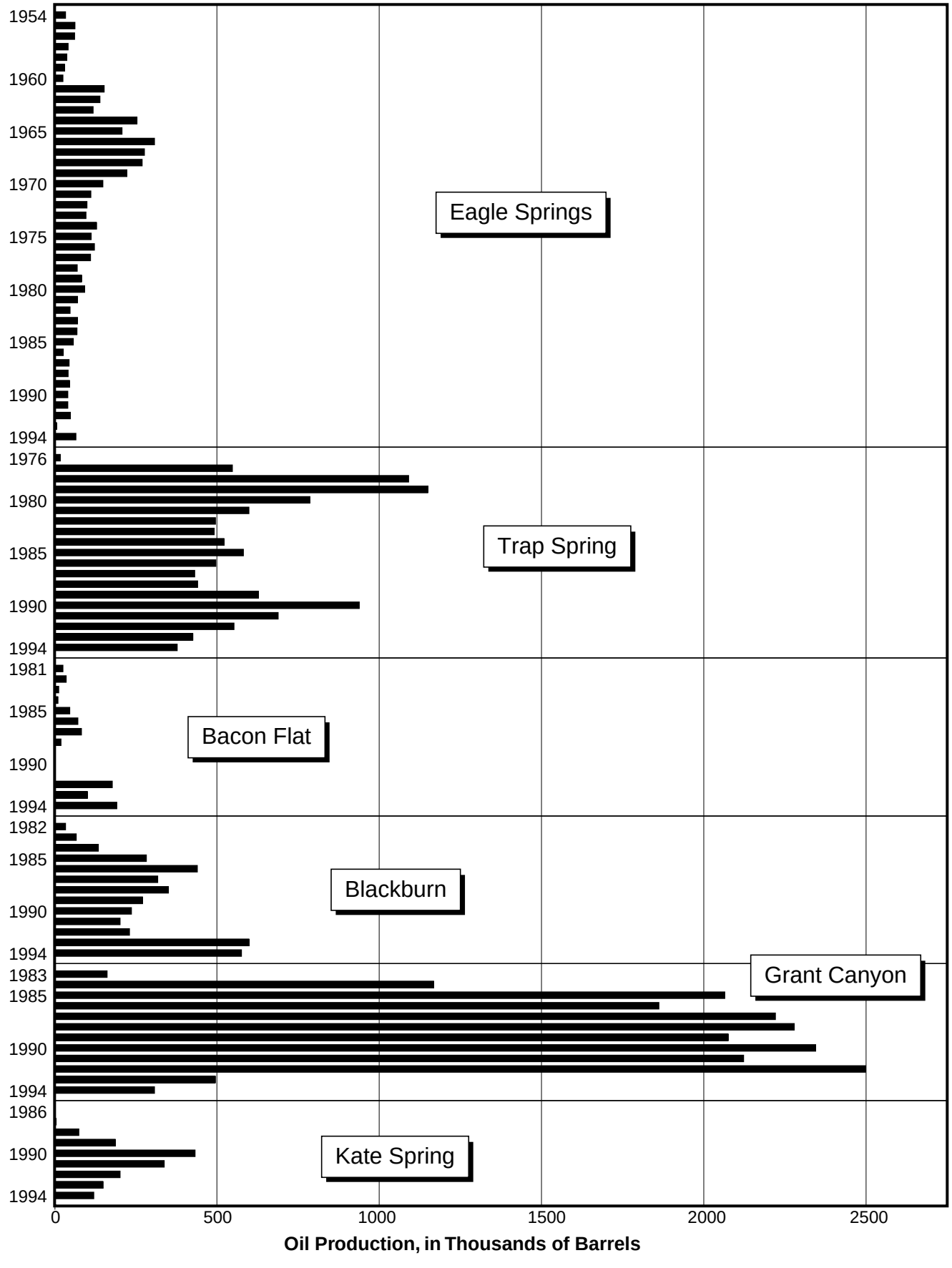
Foreland Corp. Eagle Springs No. 54-35 began production in October and averaged 124 barrels of oil and 215 barrels of water per day during 71 days of production between October and December. Foreland Corp. Eagle Springs/Plains Petroleum No. 82-35 began production in November and averaged 292 barrels of oil and 30 barrels of water per day through the end of the year.

In the Grant Canyon field, Apache Corp. Grant Canyon No. 22- 21 is listed as completed on January 1, 1994. Production averaged 1,297 barrels of oil and no water per day in January and then averaged 116 barrels of oil through the rest of the year. Water production began in April and rose steadily from 51 barrels per day in June to 215 barrels per day in December.

Oil and Gas Production

Nevada oil production decreased by 9% in 1994 compared to 1993. The decline in production is due to an overall drop in production in nine fields. Production increased in two fields.

Production from the Eagle Springs field increased from 7,075 barrels in 1993 to 66,565 barrels in 1994, an increase of 841%. The low production in 1993 was due to the Draycutt leases being shut in most of that year. Two new wells produced 21,032 barrels. Production increased at seven wells and decreased at three wells. Production from the Bacon Flat field


1954
1960
1965
1970
1975
1980
1985
1990
1994
Eagle Springs
1976
1980
1985
1990
1994
Trap Spring
1981
1985
1990
1994
Bacon Flat
1982
1985
1990
1994
Blackburn
1983
1985
1990
1994
Grant Canyon
1986
1990
1994
Kate Spring
0
500
1000
1500
2000
2500
Oil Production, in Thousands of Barrels

increased 89% , but all the production came from its new producer because the 1993 producers were shut in.

The Trap Spring field had an 11% decrease in production. Eleven wells had increases in production and 26 had decreases. Not counting its new producer, the Blackburn field had a 49% decrease in production. All of its 1993 producers had declines in production. However, its new producer made up most of the shortfall, and the final drop in production was only 4%. The Grant Canyon field had a 52% decline in production from its 1993 producers. Its new producer only made up part of the shortfall, and the total decline was 38%. All the wells in the Kate Spring field declined in production, and field production declined 23%. Production at the Tomera Ranch field declined at one well and increased at the other, and the total decline was 8%. Production at the North Willow Creek field decreased at two wells and increased at one, and the total decline was 5%. The single producing well at the Three Bar field declined 88% , and the single producing well at the Duckwater Creek field declined 44%. With one of its 1993 producers shut in and the other showing a decline in production, the Sans Spring field showed a 36% decline in production.

The total net oil production in 1994 was 1,697,602 barrels, with sales valued at $18,410,222, according to the U.S. Minerals Management Service. A total of 15,377 thousand cubic feet of gas was produced from the Kate Spring field in 1994 and was used to operate production and related equipment at the lease sites of Apache Corp. and Western General, Inc.

The average net wellhead price for Nevada crude oil in 1994 was about $11.25 per barrel. Nevada crude oil is transported by tank trucks to several refineries: the Petro Source Refining Corp. 8,000 barrel per day refinery and asphalt storage plant near Currant in Railroad Valley; the Petro Source Refining Partners' asphalt storage facility and refinery (used only a few days per month for refining) at Tonopah; the Petro Source Refinery in Salt Lake City, Utah (presently refining only Pine Valley crude oil). Most Nevada oil is used to make such products as diesel fuel, kerosene, stove oil, and asphalt.

Closures and Transfers

Of the 83 wells capable of producing, 20 were shut in for 6 months or more in 1994. Several operators continued to suspend production on their various fields in both Railroad Valley and Pine Valley.

In the Eagle Springs field, Eagle Springs Production Ltd. suspended production for 6 months or more on Eagle Springs Unit No. 4-36, Eagle Springs Unit No. 15-35, Eagle Springs Unit No. 35-35, Eagle Springs Unit No. 74-35, and Eagle Springs Unit No. 62-35. The first four wells were still shut in at year's end.

In the Trap Spring field, Makoil, Inc. continued suspension of production through 1994 on Zuspann No. 24-1, Munson Ranch No. 12-23, Britton No. 13-21, and J. N. Federal No. 1. Apache Corp. Trap Spring No. 8 produced only in October and November. David M. Evans continued suspension of production on Trap Spring No. 12-13 throughout 1994.

J. R. Bacon Drilling Co. continued suspension of production throughout 1994 on Munson Ranch No. 13-46 and Munson Ranch No. 14-49X. In October, approval was given for the transfer of the producing wells owned by J. R. Bacon Drilling Co. in the Trap Spring field to Frontier Exploration Co.

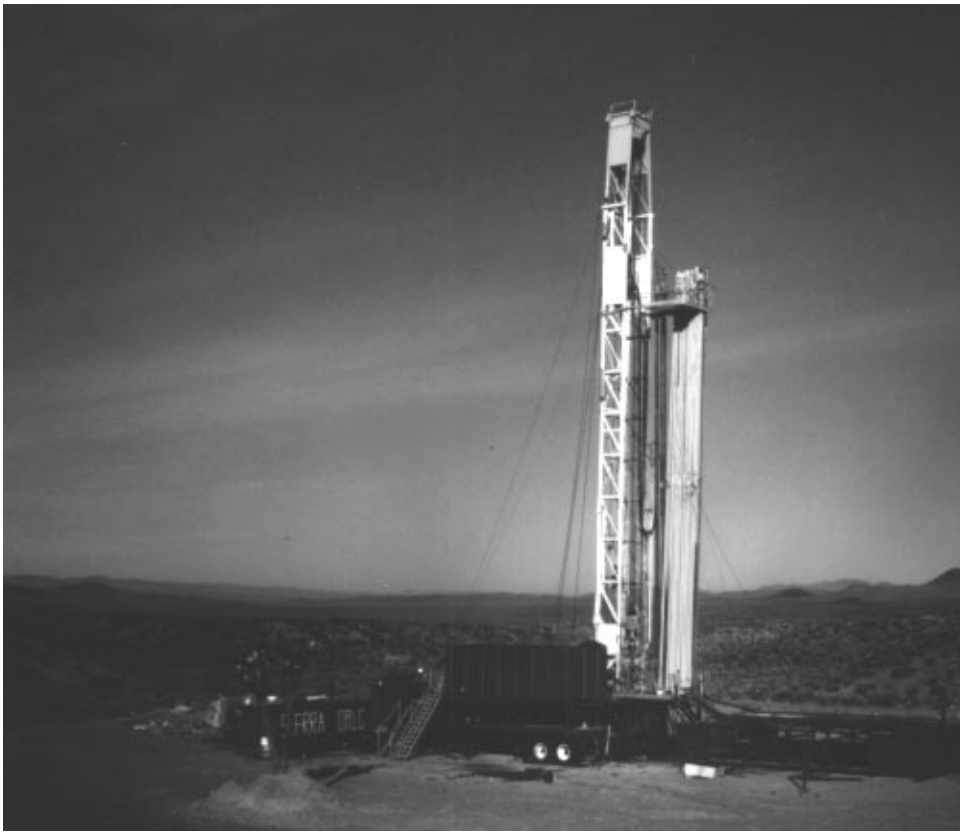
In the Grant Canyon field, Apache Corp. continued suspension of production at Grant Canyon No. 3 and Grant Canyon No. 7 throughout 1994. In the Bacon Flat field, Equitable Resources Co., Balcron Oil Division suspended production from Bacon Flat Federal No. 23-17 through the year, and continued suspension of production on Bacon Flat No. 1 through the year. In the Kate Spring field, Western General, Inc., continued suspension of production on Taylor Federal No. 2 throughout 1994.

In the North Willow Creek field, Foreland Corp. produced oil only in December from its Foreland-Southern Pacific Land Co. No. 1-27 and continued the suspension of production from its North Willow Creek No. 5-27 through 1994. In the Three Bar field, Trail Mountain, Inc. continued its suspension of production on Three Bar Unit No. 25-A through 1994, and only produced small amounts of oil from Three Bar Unit No. 5 during five months scattered through 1994. In the Tomera Ranch field, Foreland Corp. suspended production on Tomera Ranch No. 33-1 for the first five months of 1994.

U.S. Oil Production and Consumption

According to the American Petroleum Institute, petroleum imports accounted for 50.4% of U.S. consumption in 1994, which surpasses the previous annual peak of 49.9% set in 1993. Domestic crude oil production dropped to its lowest level since 1954 and dependence on imports reached a new high. U.S. crude oil production averaged about 6,629,000 barrels per day in 1994, a decline of 3.4% from the 1993 average of 6,860,000 barrels per day. A strong economic growth rate of about 4% resulted in domestic consumption growing by 2.4% in 1994 as compared to a 0.4% growth in domestic consumption in 1993.

Oil provided about 40% of the nation's total energy supply in 1994, according to the American Petroleum Institute. This percentage has remained about the same since 1991. Natural gas consumption increased by about 4.4% in 1994, and for the eighth year in a row, natural gas consumption increased more than petroleum. It also continued to increase more than other energy sources. This was mainly due to the continued growth in the industrial use of natural gas, particularly for the generation of electricity.



Oil drill northeast of Beatty, 1994 *(S.B. Castor photo).*