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THE NEVADA MINERAL INDUSTRY 1996

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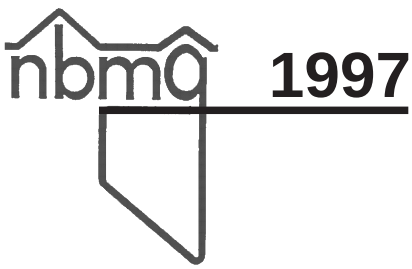
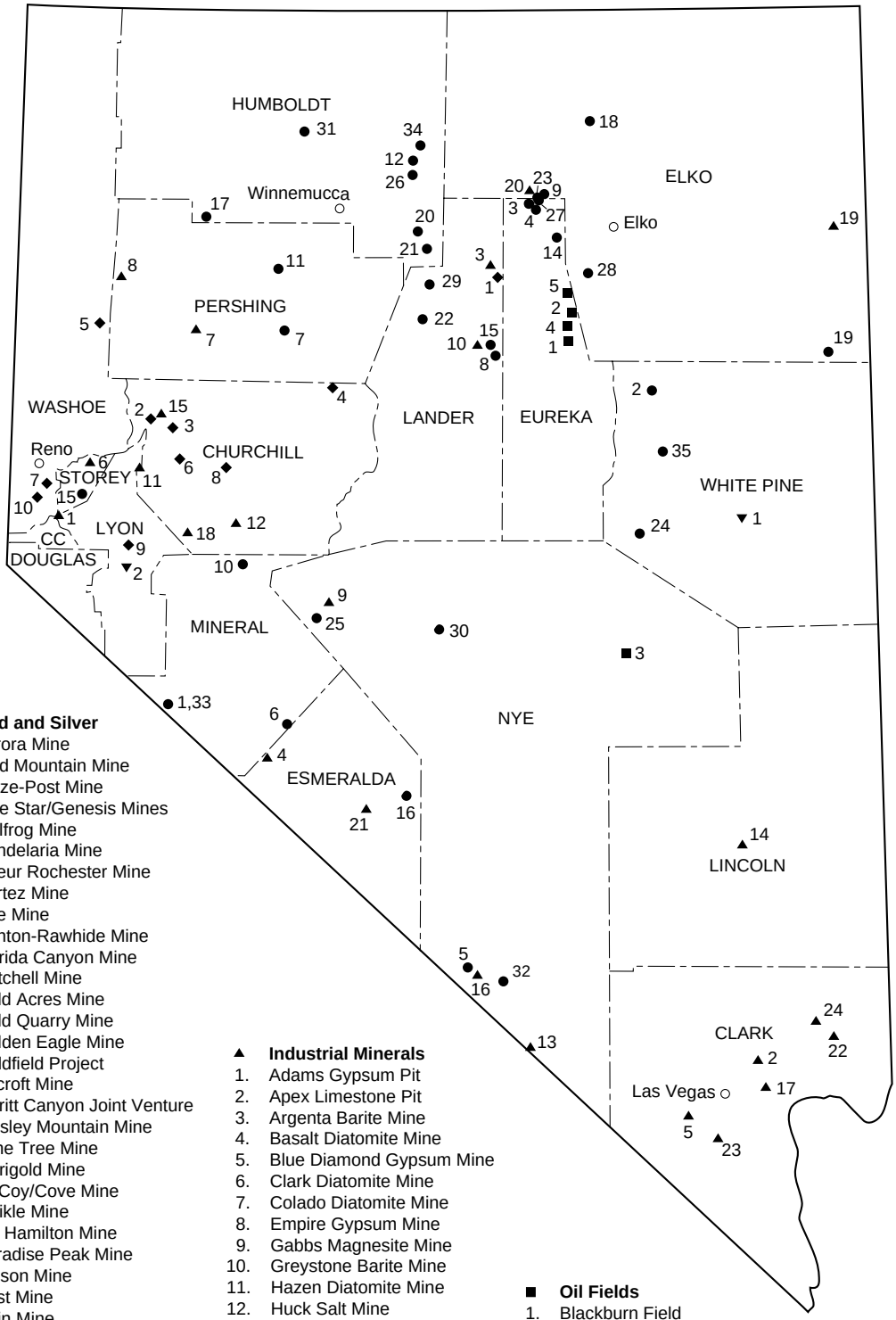




Gold and Silver

1. Aurora Mine
2. Bald Mountain Mine
3. Betze-Post Mine
4. Blue Star/Genesis Mines
5. Bullfrog Mine
6. Candelaria Mine
7. Coeur Rochester Mine
8. Cortez Mine
9. Dee Mine
10. Denton-Rawhide Mine
11. Florida Canyon Mine
12. Getchell Mine
13. Gold Acres Mine
14. Gold Quarry Mine
15. Golden Eagle Mine
16. Goldfield Project
17. Hycroft Mine
18. Jerritt Canyon Joint Venture
19. Kinsley Mountain Mine
20. Lone Tree Mine
21. Marigold Mine
22. McCoy/Cove Mine
23. Meikle Mine
24. Mt. Hamilton Mine
25. Paradise Peak Mine
26. Pinson Mine
27. Post Mine
28. Rain Mine
29. Reona Mine
30. Round Mountain Mine
31. Sleeper Mine
32. Sterling Mine
33. The Aurora Partnership
34. Twin Creeks Mine
35. Yankee Mine

Copper

1. Robinson Mine (also gold and silver)
2. Yerington and MacArthur Mines

Industrial Minerals

1. Adams Gypsum Pit
2. Apex Limestone Pit
3. Argenta Barite Mine
4. Basalt Diatomite Mine
5. Blue Diamond Gypsum Mine
6. Clark Diatomite Mine
7. Colado Diatomite Mine
8. Empire Gypsum Mine
9. Gabbs Magnesite Mine
10. Greystone Barite Mine
11. Hazen Diatomite Mine
12. Huck Salt Mine
13. IMV-Floridin - clay
14. Mackie Perlite Mine
15. Moltan Diatomite Mine
16. New Discovery Montmorillonite Mine
17. PABCO Gypsum
18. Popcorn Perlite Mine
19. Pilot Peak Limestone Quarry
20. Rossi Barite Mine
21. Silver Peak lithium carbonate
22. Simplot Silica Products
23. Sloan Dolomite Quarry
24. Weiser Gypsum Quarry

Oil Fields

1. Blackburn Field
2. North Willow Creek Field
3. Railroad Valley (Eagle Springs, Trap Spring, Grant Canyon, Bacon Flat, Kate Spring, Duckwater Creek, Sans Spring, and Ghost Ranch Fields)
4. Three Bar Field
5. Tomera Ranch Field

Geothermal Power Plants

1. Beowawe
2. Bradys Hot Springs
3. Desert Peak
4. Dixie Valley
5. Empire
6. Soda Lake No. 1 and No. 2
7. Steamboat I, IA, II, and III
8. Stillwater
9. Wabuska
10. Yankee Caithness

Major mines, oil fields, and geothermal plants, 1996.

Summary

by Jonathan G. Price and Richard O. Meeuwig

Annual mineral and energy production in Nevada reached its all-time highest level of $3.4 billion in 1996. Contributions to the Nevada and U.S. economies are significant in terms of jobs, commerce, taxes, improvements to the infrastructure, and lowering of the U.S. trade deficit. Nevada ranks first in the nation in production of gold, silver, mercury, and barite, which are sold almost entirely on national and international markets. Construction of new homes, casinos, other businesses, and related facilities creates the strong demand for local sources of sand, gravel, crushed stone, gypsum, and cement.

Nevada ranked second in the United States in terms of nonfuel (excluding oil, gas, coal, and geothermal) mineral production in 1996. Arizona, which is a world leader in copper production, produced more, and California, boosted by large demands for construction raw materials, was the third largest nonfuel mineral producer in 1996.

This report highlights activities through 1996 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 1996, the Nevada Division of Minerals collected data for NBMG Special Publication P-8, *Major Mines of Nevada 1996*. This publication includes, in handbook form, location maps, names and telephone numbers of operators, numbers of employees, and preliminary, non-proprietary production figures for most mines in Nevada. The full contents of this 28-page publication are available for free on the World Wide Web (http://www.nbmg.unr.edu/mm/mm96.htm). The data from this survey are used, along with updated and corrected 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. Geological Survey.

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. Production in 1996 of nearly 7 million troy ounces (216 metric tons), a record year, was valued at $2.7 billion and came from 30 major mining operations.

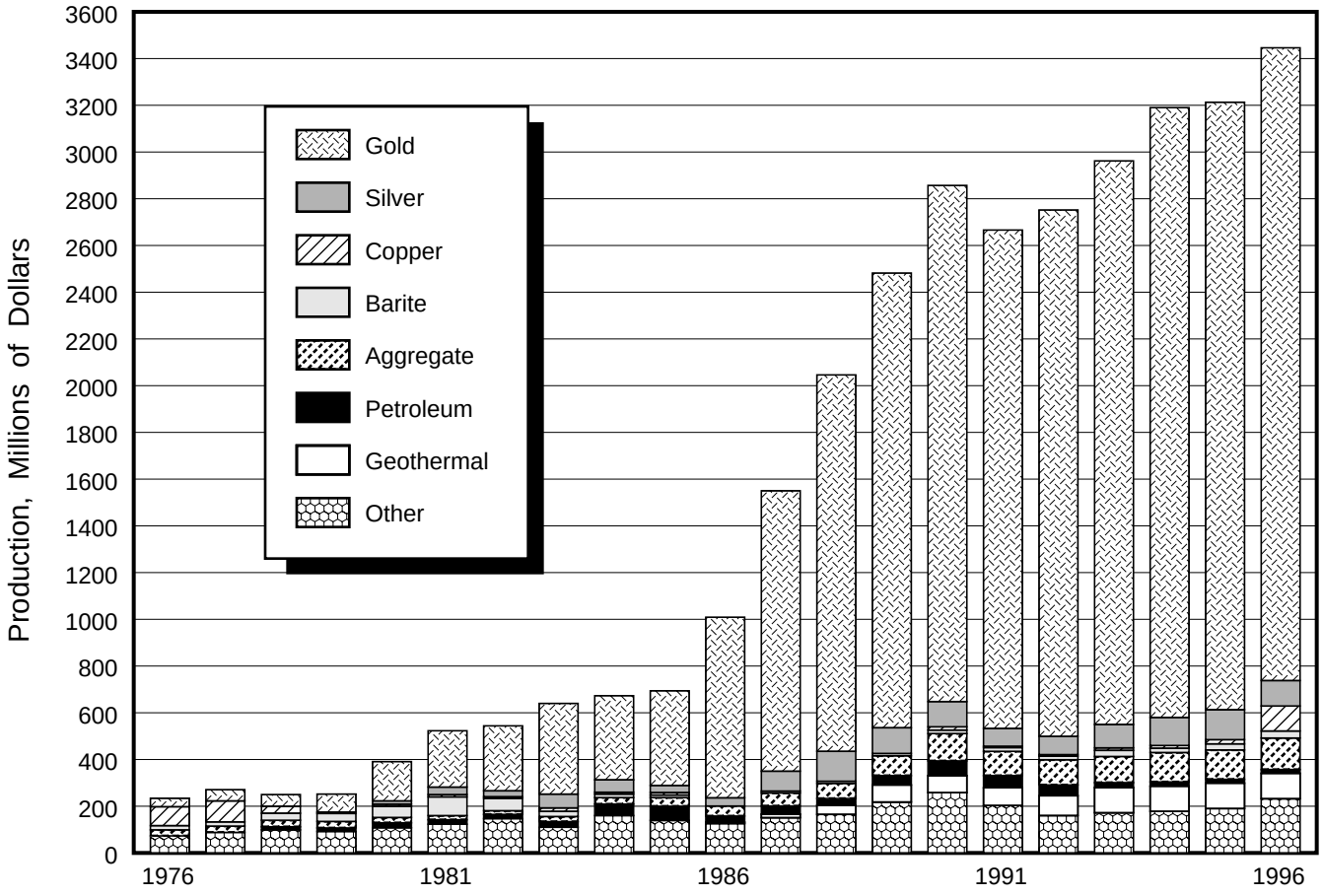
MINERAL, PETROLEUM, AND GEOTHERMAL POWER PRODUCTION IN NEVADA[1]

Minerals	1995		1996 preliminary		% change from 1995 to 1996	
	Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value
Barite (thousand short tons)	514	$25,700	603	$30,200	17	18
Copper (thousand pounds)	13,000	18,000	99,000	107,000	662	494
Geothermal energy (thousand megawatt-hours)	1,360	108,800	1,360	108,700	0	0
Gold (thousand troy ounces)	6,764	2,598,000	6,944	2,708,000	3	4
Petroleum (thousand 42-gallon barrels)	1,342	15,900	1,100	15,900	-18	0
Sand, gravel, crushed stone (thousand short tons)	28,000	126,000	30,000	135,000	7	7
Silver (thousand troy ounces)	24,602	127,700	20,531	108,800	-17	-15
Other minerals[2]	—	190,000	—	232,000	—	22
Total	—	3,210,000	—	3,445,600	—	7

[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, 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, 1975-1996

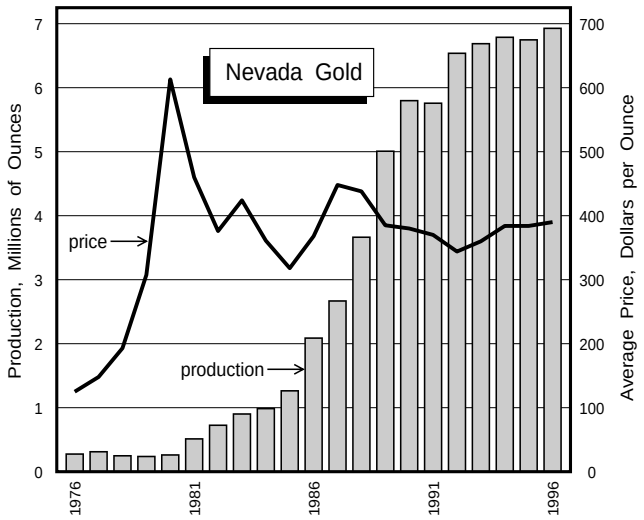
The Carlin Trend in northeastern Nevada accounted for 54% of the total production (all of Newmont's operations, prior to acquiring Santa Fe Pacific Gold in 1997, plus Barrick's Betze-Post and Meikle Mines and Rayrock's Dee Mine). Twelve additional mines, not on the Carlin Trend, each produced over 100,000 ounces of gold from generally multimillion ounce deposits.

Barrick Goldstrike's Betze-Post Mine in Eureka County, which produced 1.9 million ounces, is the largest gold mine in the United States. Nearby in Elko County, Barrick's Meikle Mine is the largest underground gold mine in the United States. Four new major mines are expected to add to production in 1997: Placer Dome's Pipeline and South Pipeline deposits in Crescent Valley, Homestake's Ruby Hill Mine near Eureka, Santa Fe's (now Newmont's) Mule Canyon Mine near Argenta (all three in Eureka County), and Newmont's and Hecla's Rosebud property in Pershing County.

Nevada is a major force in the national and international gold markets, accounting for approximately 67% of U.S. production and 9.5% of world production (according to statistics collected by the U.S. Geological Survey). Nevada production makes the United States a net exporter of gold and helps offset the trade deficit, which averaged approximately $10 billion per month in recent years. The United States, with 325 metric tons of gold in 1996, is second only to South Africa (490 metric tons) in gold production. Nevada production alone in 1996 was less than that of Australia (285 metric tons), but ahead of other major producing countries — Canada (160 metric tons), China (150 metric tons), and Russia (120 metric tons).

Exploration, including grass-roots activity and work in known mining districts, and development of extensions to known deposits successfully added to the Nevada resource base in 1996. Mineable deposits continue to be discovered. Major successes were reported on the Carlin Trend, in the Independence Mountains and in Crescent Valley, and at Aurora, Florida Canyon, Getchell, Kinsley, Marigold, Midas, Olinghouse, Round Mountain, Silver Peak, and Twin Creeks. In 1996 companies explored, mostly for gold, in or near at least 88 of Nevada's 526 mining districts.

At the end of 1996 the published gold resources in Nevada, including mineable reserves and perhaps some subeconomic resources, totaled 141 million ounces of gold, enough to sustain gold production at substantial levels for 20 to 30 years, assuming stable prices. As measured by the numbers of active claims

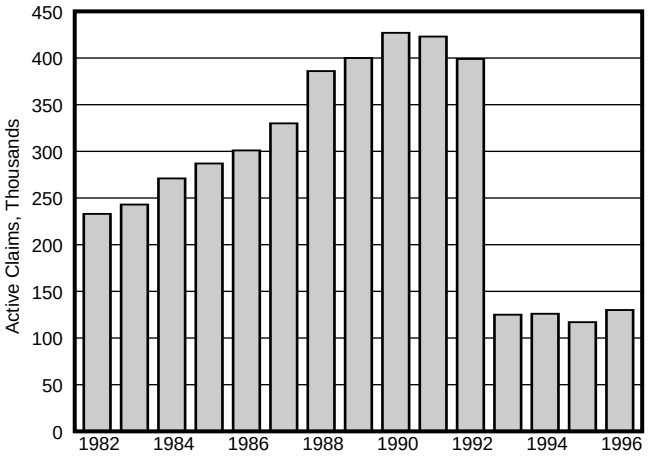


on public lands, exploration *activity* has remained fairly steady in the last four years, after dropping precipitously in 1992, when a new claim-holding fee was imposed by the federal government.

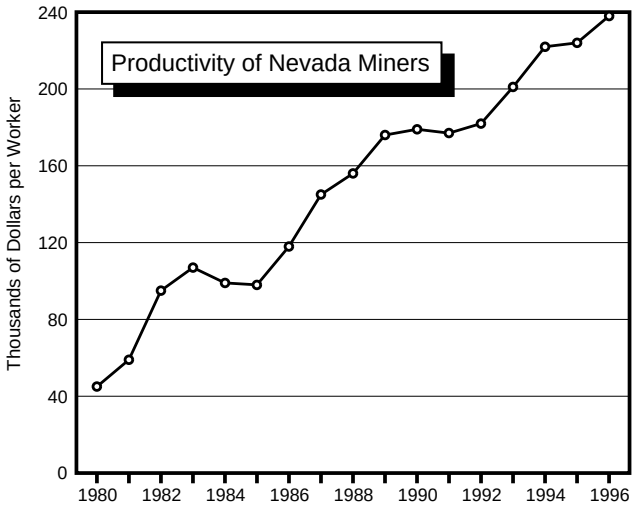
The Nevada Division of Minerals recently completed its third annual survey of companies active in exploration in Nevada (Driesner, Doug, 1997, *Exploration Summary, 1996*: Nevada Department of Business and Industry, Division of Minerals, Carson City, 20 p.). The 49 companies that responded to the questionnaire plan to spend a total of $125 million on exploration in Nevada in 1997, up 3% from actual expenditures of $121 million in 1996. These companies employed 273 geologists in Nevada in 1996 and expect the same number in 1997.

The companies answered questions regarding the factors influencing their exploration activities in the United States; chief among these are existence of favorable geology (continually a major attraction for Nevada), uncertainty and length of permitting timeframes, uncertainty over mining law reform, and commodity prices. The impact of the Bre-X mining scam, which was reported after this survey was conducted, on the availability of venture capital used by smaller exploration companies is uncertain, as are the impacts of new rules promulgated by the U.S. Bureau of Land Management.

Productivity of Nevada mining operations is exceptionally high and continues to rise. 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 $238,000 in mined products in 1996. Lower gold prices, relative to 1996, likely will lower the overall productivity in 1997. As indicated in *The U.S. Gold Industry 1996* (John L. Dobra, NBMG Special Publication 21, 32 p.), however, the mining industry typically hedges its sales of gold to reduce the risk of price fluctuations.



Number of active claims in Nevada as of October 1, from 1982 through 1996. Data from the Nevada State Office of the Bureau of Land Management.



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

Approximately 14,600 workers were employed directly in the Nevada mining industry in 1996 according to the Nevada Department of Employment, Training, and Rehabilitation. They estimate that the 1996 direct payroll alone from the mining industry in Nevada was approximately $714 million. The Division of Minerals (see NBMG Special Publication P-8) estimates, using U.S. Department of Commerce multipliers, that there are 48,000 additional jobs created in Nevada to provide goods and services needed by the mining industry and its workers. The Department of Employment, Training, and Rehabilitation places this figure at 52,900 additional jobs.

Challenges that face the precious metal mines in Nevada include economic, safety, and environmental concerns regarding regulatory changes; treating refractory (iron disulfide and/or carbon-bearing) ores; more underground mining, dewatering mines, ultimate chemical compositions of pit lakes, and treatment and disposal of large volumes of water, some of which may contain potentially toxic elements that need to be removed or may be too warm to introduce directly into streams.

Nevada led the nation in silver production in 1996, with about 20.5 million troy ounces (638 metric tons) valued at $110 million. Much of this silver was a by-product of gold mining. With a ratio of value (average price of gold in dollars per ounce to average price of silver) of 74:1, only those deposits with more than 74 times as much silver as gold can be considered primary silver deposits. Two such deposits operated in Nevada in 1996 — the Coeur Rochester Mine in Pershing County (with a silver to gold ratio of 84:1 and total silver production of 6.3 million ounces) and the Kinross-Candelaria Mine in Mineral County (with a silver to gold ratio of 257:1 and total silver production of 3.9 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 7.1 million ounces of silver from ore with an average silver to gold ratio of 26:1. These three operations produced 83% of Nevada's silver in 1996.

ANNUAL TAX ON NET PROCEEDS OF MINERALS

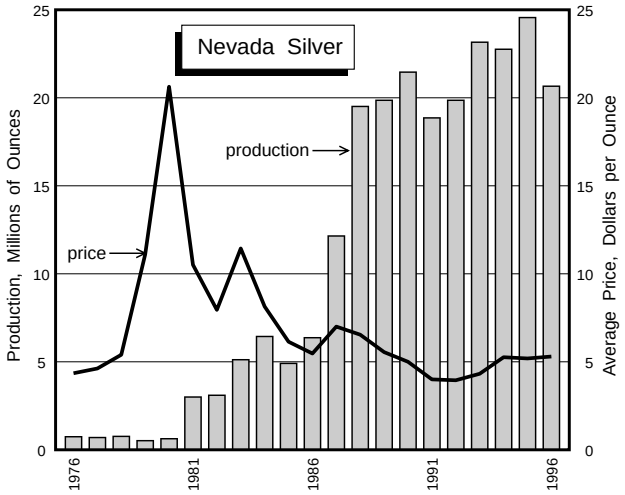
Year	Annual net proceeds[1] (thousands)	Annual tax (thousands)
1982	$159,999	$1,800
1983	245,688	4,152
1984	184,987	3,222
1985	198,263	3,527
1986	374,664	6,091
1987	627,330	12,084
1988	798,253	13,568
1989	748,052	36,238
1990	887,035	42,737
1991	706,250	33,678
1992	694,457	33,128
1993	734,399	35,150
1994	994,416	48,205
1995	786,843	37,568
1996	613,167	29,198

[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 fee[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
1995	395	78
1996	370	58

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

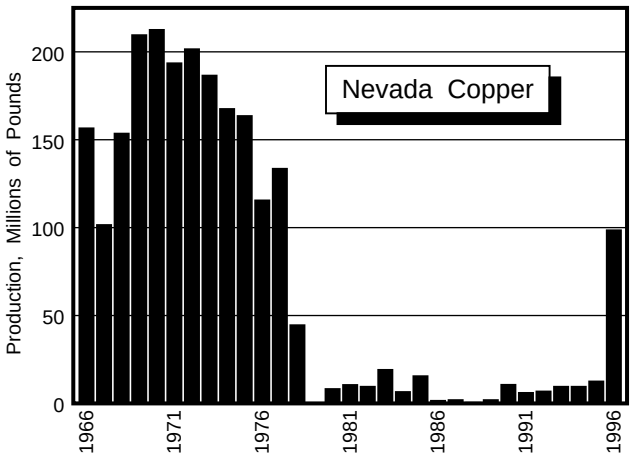


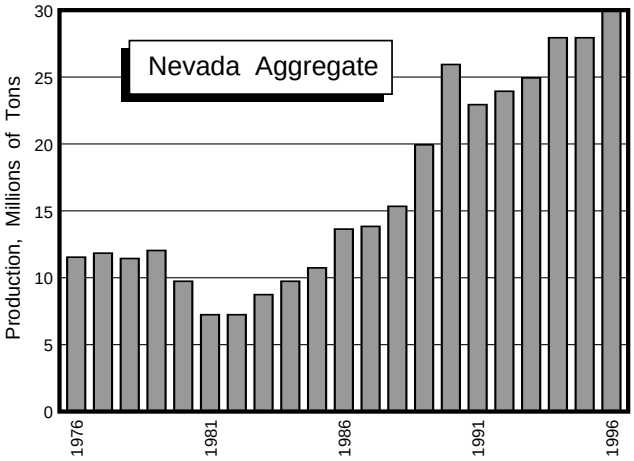
At the end of the year the published silver resources in Nevada, including mineable reserves and perhaps some subeconomic resources, totaled 343 million ounces of silver. Depending on price, Nevada is likely to retain the present-day distinction of its nickname, the "Silver State." Nevada's production accounts for 36% of the U.S. total and 4% of the world total. The United States (with about 1,800 metric tons, according to the U.S. Geological Survey) is the third largest silver producer in the world, behind Mexico (2,400 metric tons) and Peru (2,000 metric tons) but ahead of Canada (1,200 metric tons) and Australia (900 metric tons).

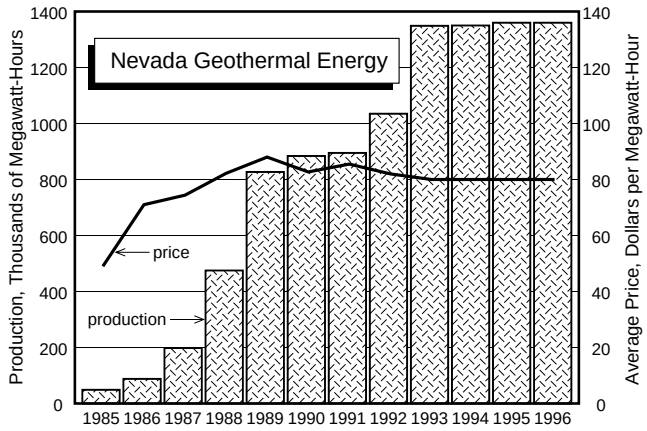
Copper production increased nearly eight-fold from 1995 to 1996, as BHP Copper went into full production at its Robinson property near Ely. This mine produced 84 million pounds of copper plus 39,000 ounces of by-product gold and 170,000 ounces of by-product silver. Arimetco, Inc. also produced copper from its MacArthur and nearby Yerington Mines in Lyon County. Nevada's copper production, the highest annual level since 1977, represented 2% of total U.S. production in 1996.

The section on **Industrial Minerals** covers developments during 1996 and gives details on important commodities produced from Nevada, such as aggregate, barite, building stone, cement, clays, diatomite, dolomite, fluorspar, gypsum, lime, limestone, lithium, magnesia, perlite, salt, and silica. In

terms of dollar value, the most significant industrial mineral commodity is aggregate (sand, gravel, and crushed stone), with a value of $135 million in 1996, much less than the value of gold but more than any other mineral including silver. Aggregate production remains high as a result of Nevada's expanding population with its demands for construction materials and as a result of building resort hotels, airports, and highways.



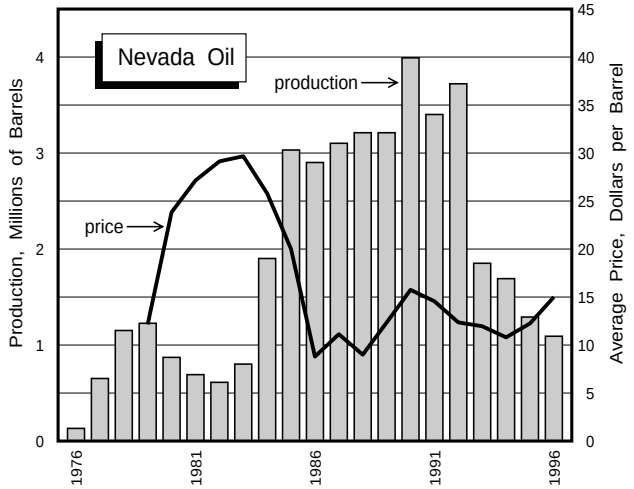




Developments in the geothermal industry are covered in the section on **Geothermal Energy**. Production in 1996 equaled the historic high reached the previous year. Fourteen power plants (operating at ten sites) sold $109 million in electricity, far surpassing the value of petroleum production. Additionally, geothermal energy is used at numerous places in Nevada for space heating, warm water, recreation, and dehydrating vegetables. Relatively low prices for natural gas have limited development of known geothermal resources and exploration for new resources.

Developments in the Nevada petroleum industry are covered in the section on **Oil and Gas**. Oil is produced primarily in two areas: Railroad Valley in Nye County and Pine Valley in Eureka County. A third area, northeast of Wells in Elko County, had limited production in 1996. Total annual oil production from Nevada (valued at $16 million) accounts for 0.04% of U.S. production. Oil production declined for the fourth consecutive year, despite discovery of a new field, Ghost Ranch. The largest producing fields in 1996 were Trap Spring (309 thousand barrels) and Grant Canyon (168 thousand barrels) in Railroad Valley and Blackburn (240 thousand barrels) in Pine Valley. Minor gas production from the Kate Spring Field is used to power oil production equipment.

The two premier fields in Railroad Valley, Grant Canyon and Trap Spring (with cumulative production of 20 million and 12 million barrels, respectively), are examples of the targets for some exploration. Oil exploration and development activity in Nevada was down in terms of numbers of wells spudded (15 in 1996 versus 25 in 1995). Of the 21 wells completed in 1996, three were producers. Given the low total number of exploration wells drilled in the state (less than 1,000), the potential for finding more multimillion-barrel fields remains high.



Additional information about the Nevada mineral industry and the U.S. gold industry, including the contents of selected publications, is readily available on line through the World Wide Web from the Nevada Bureau of Mines and Geology (www.nbmg.unr.edu/) and the Nevada Division of Minerals (www.state.nv.us/busi_industry/mineral/mineral.htm). Useful national and international data on nonfuel minerals can be obtained from the U.S. Geological Survey (http://minerals.er.usgs.gov/minerals/), and the U.S. Energy Information Administration (www.eia.doe.gov/) provides data on oil and gas, geothermal, and other energy sources.

Metals

by Joseph V. Tingley and Daphne D. La Pointe

The information in this section was compiled from news releases in The Mining Record (DMR), Skillings Mining Review (SMR), International California Mining Journal (ICMJ), The Northern Miner (NM), Society of Economic Geologists Newsletter (SEG), Rocky Mountain Pay Dirt (RMPD), American Mining Congress Journal (AMCJ), and 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 produced nearly 7 million oz (troy ounces) of gold in 1996 along with 20.5 million oz of silver. Nevada gold production set a new record in 1996. Silver production, however, was lower than the all-time high of 24.6 million oz set in 1995. Two of Nevada's mines set individual records of their own in 1996. Barrick Gold's Meikle claimed title to the largest producing underground gold mine in North America, and Coeur d'Alene Mines Corporation's Coeur Rochester Mine became the largest primary silver mine in the history of the state of Nevada by reaching a lifetime production of 50 million oz. Nevada again maintained its place as the leading gold and silver producing state in the United States with 34 mines reporting gold production and 27 mines producing silver during 1996. Nevada's 1996 copper production increased more than ten times above 1995 output with the commencement of operations at BHP's Robinson Mine. Nevada again ranked first in U.S. production of barite and was the only producer of mined magnesite in the United States. Nevada is one of only three states that produce mercury, but mercury production data are not disclosed. All mercury production is a by-product of gold mining operations, however, and Nevada traditionally has been the leading producer.

For the second straight year, Barrick Gold's Betze-Post Mine was the largest Nevada gold producer with 1,934,966 oz and Newmont's Carlin Trend deposits were second with a combined production of 1,700,033 oz of gold. Other major gold producers in 1996 included Santa Fe Pacific Gold's Twin Creeks Mine, 459,083 oz; Smoky Valley Common Operation's Round Mountain Mine, 410,977 oz; Independence Mining Co.'s Jerritt Canyon Mine, 309,477 oz; Echo Bay Minerals, 271,731 oz from its McCoy/Cove operation; Santa Fe Pacific Gold's Lone Tree Mine, 205,738 oz; Barrick Gold's Bullfrog Mine, 205,348 oz; the Florida Canyon Mine of Florida Canyon Mining Co., 183,176 oz; and Getchell Gold's Getchell Mine, 171,286 oz. A major new gold producer in 1996 was BHP's Robinson Mine which contributed 39,000 oz of gold as a by-product of its copper operation (The Robinson Mine figures have been revised since publication of preliminary figures in NBMG Special Publication P-8 and the June, 1997 issue of the NBMG newsletter).

Nevada's silver production originated mainly from three properties in 1996: Echo Bay's McCoy/Cove operation produced 7.1 million oz, Coeur d'Alene Mines' Rochester Mine produced 6.25 million oz, and Kinross Gold's Candelaria Mine produced 3.9 million oz. Other major producers were Kennecott Rawhide Mining Co.'s Denton-Rawhide Mine with 1.1 million oz, the Hycroft Mine of Hycroft Resources Inc. with 321,315 oz, and Barrick Gold's Bullfrog Mine with 288,700 oz. The Robinson Copper Mine produced 170,000 oz of silver as a by-product.

Copper production by Arimetco International Inc. from the Yerington and MacArthur Mines in Lyon County totaled 15 million pounds. The Robinson Mine in White Pine County, operated by BHP Copper North America, shipped concentrates containing 84 million pounds of copper to the BHP smelter at San Manuel, Arizona, in 1996. The Robinson Mine production returned Nevada's copper production to a level not seen since 1977.

New projects in line for startup in 1997 include Placer Dome's Pipeline/South Pipeline, which will add an estimated 440,000 oz of gold to Nevada's annual production, and Homestake's Ruby Hill Mine which will add an additional 105,000 oz annually.

At year's end, attention in Nevada was diverted briefly from gold exploration to company acquisition as Newmont, followed by Homestake, each announced plans to acquire Santa Fe Pacific Gold Corp. A combination of Newmont, now the second largest gold producer in the state, with Santa Fe Pacific, the number three producer, will likely move the company into first place in gold production.

EXPLORATION

Exploration activity in Nevada was widespread across the central and northern parts of the state in 1996 with heavy concentrations of activity in the Battle Mountain-Eureka, Getchell, and Carlin trends. This was accompanied by considerable activity in the south central part of the state, including the Walker Lane mineral/structural belt in Mineral, Esmeralda, and western Nye Counties. Figure 1 shows the locations of Nevada mining districts in which exploration activity was reported during 1996.

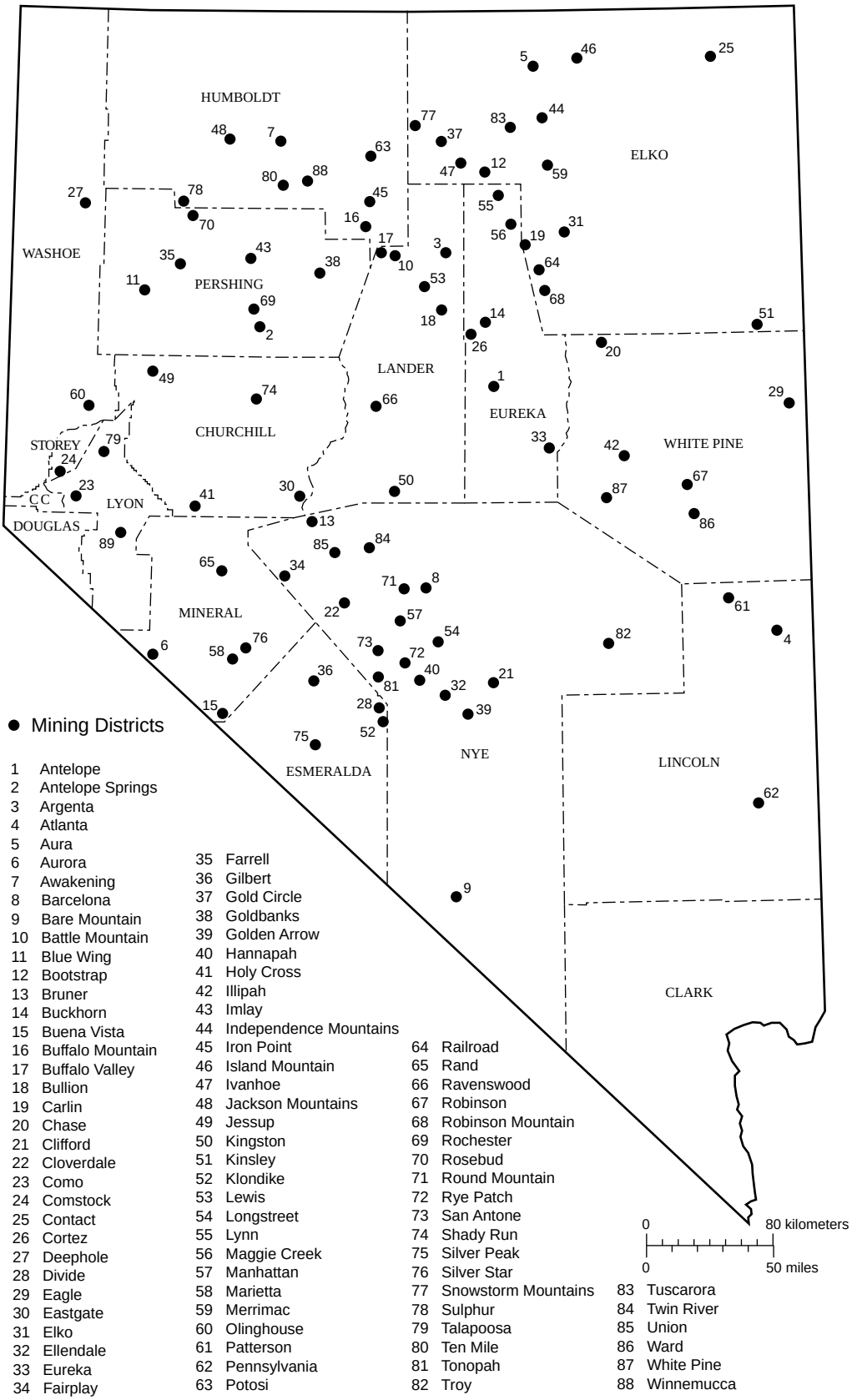


Figure 1. Nevada mining districts with reported 1996 precious metals exploration activity. (Please refer to NBMG Report 47, *Mining Districts of Nevada*, for details on these and other mining districts through 1992.)

CHURCHILL COUNTY

Eastgate District

Societe Miniere Mimiska Inc. has entered into an agreement to acquire a half interest in the Buffalo Valley property. The 44 claims of the property cover 900 acres and contain a near-surface resource of over 96,000 oz of gold. To date, only limited drilling has been carried out, with the best hole returning a value of 0.303 opt (troy ounces per short ton) gold over 40 feet (DMR, 5/1/96).

Holy Cross District

Silver Trend Mining Co. reported that new ore has been discovered in an inclined shaft sunk at its Pyramid Mine. At the 185-foot level of the shaft, a silver/gold vein was intersected with an average grade of 9 opt silver and 0.09 opt gold across a 12-foot face. The vein may be an extension of the #1 vein accessed 250 feet to the north in old workings. The vein is open at depth and continues along strike to the southeast. (DMR, 1/15/97)

Jessup District

Echo Bay Mines will manage exploration on the Jessup gold prospect in a joint venture with Americomm Resources, the property owner. Twenty out of 29 holes drilled earlier on the property intersected significant grade and thicknesses of gold and silver within 300 feet of the surface (DMR, 12/18/96).

ELKO COUNTY

Aura District

In the northern part of Elko County, Louis Koncher filed a plan for exploration at the Riddle Mine. Work will consist of road construction, trenching and underground maintenance (Humboldt-Toiyabe National Forest Plan of Operations, 8/1/96).

Bootstrap District

Rayrock Yellowknife Resources Inc. plans to begin mining of their Deep North orebody at the Dee Mine in a two-phase expansion in 1997. This will add about 600,000 oz of gold contained in about 11 million tons of ore to their reserves and is expected to extend the projected mine life of Dee by 7 years. If both phases are implemented, 60,000 oz of gold could be produced annually (DMR, 10/16/96). Minorca Resources Inc. completed a four-hole first phase core drilling program at Trio Gold's Rodeo Creek property. Favorable results were obtained, and a second phase drill program is planned (DMR, 8/31/96). Also in the Bootstrap area, FMC Gold Co. planned to commence a deep drilling project at its Rossi Mine in July. At the Ren property, east of Bootstrap, Romarco Minerals drill-tested a structural wedge with an associated induced-polarization anomaly and favorable geochemistry. The Ren Mine (a joint venture with Uranerz and Corona Gold) already has produced about 20,000 oz of gold, and earlier drilling cut several 5-foot intervals grading up to 2.03 opt gold, and a 60-foot interval grading 0.21 opt gold. The Ren property is cut by the Post fault, which is associated with Barrick's Meikle and Goldstrike Mines (NM,1/8/96;12/2/96).

Carlin District

Newmont Gold Co. became the sole owner of the Tess Joint Venture property, located in the southern part of this district adjacent to its producing Rain underground mine, by purchasing the remaining interest in the property from Quest U.S.A. Resources Inc. Situated along the northwestern extension of the Rain fault, Tess has been explored by Newmont since 1992 and 13 holes have been drilled into the underground target (Newmont press release, 8/22/96; NM, 9/9/96).

Contact District

White Knight Ltd. has acquired the 42-claim Ivy Wilson property and is conducting gold/copper exploration along a contact between sedimentary rocks and a granodiorite stock (DMR, 6/5/96).

Gold Circle District

The Gold Circle district saw continued activity in 1996 as Franco-Nevada and Euro-Nevada Corporations Ltd. proceeded with plans to develop the Rex-Grande deposit at Midas as the Ken Snyder Mine in honor of its discoverer. Proven and probable reserves total 1,132,000 tons grading 1.324 opt gold and 14.95 opt silver. The indicated/inferred resource totals 1.83 million tons grading 1.37 opt gold and 17.4 opt silver. At the Acme Zone, located 2 miles south of the Rex Grande, an additional 1.1 million oz of gold resources were delineated by the 1996 drilling program, bringing the total resource to 4.1 million oz of gold equivalent. Reserves extend along 2,200 feet of a fault zone and the orebody remains open along strike to the north and south. In 1997, exploration activity will focus on the Sleeping Beauty area, located 1,000 to 3,000 feet south of the Ken Snyder Mine, where several holes drilled in late 1996 showed good potential to increase resources. In the same district, Romarco Minerals reported that drilling along the Gold Crown vein, an apparent extension of the Rex-Grande zone at Midas, encountered gold values along numerous quartz-calcite-amethyst veins for at least 2,000 feet of strike. Many drill intercepts exceeded 0.10 opt gold; some exceeded 1 opt. (SEG, 10/1/96; DMR1/29/97; NM, 9/9/96).

Independence Mountains District

Independence Mining Co. plans to conduct additional exploration on its Greenstone Draw exploration area. The property is located within the California Creek watershed, on the east side of the Independence Range (Humboldt-Toiyabe National Forest Plan of Operations,11/8/96).

Island Mountain District

Aur Resources Inc. encountered widespread gold values in seven backhoe trenches completed in the Southern Mineralized Area of the Coleman Canyon property. In contrast to mineralization in the northern part of the property, which mainly is in veins in a granitic intrusion, gold in the southern zone appears to be a Carlin-type replacement deposit in sedimentary rocks. A substantial drilling program is planned at Coleman Canyon for spring of 1997 (NM, 12/2/96; DMR,12/4/96).

Ivanhoe District

Evaluation of the Ivanhoe Mining Venture by a number of major gold mining companies continues. Although near-surface drill-indicated and inferred resources remain in the Hollister area, Cornucopia will be directing its efforts toward exploring for larger, deep Carlin-type gold systems. Newmont will be filing a reclamation plan for approval by the BLM for the previously mined USX pit areas. Once reclamation begins, it is unlikely that the shallow gold resource at Hollister will be mined (Cornucopia Resources Ltd. press release, 8/14/96). Knomex Resources Inc. has acquired an option to earn a 50% interest in the 34-claim Willow Creek gold property from Bullion Monarch Mining Co. and Gold Valley Resources Inc. A drilling program was planned to begin immediately on the Willow Creek project (DMR, 5/15/96; NM 6/3/96).

Kinsley District

Drilling by Alta Gold confirmed three new ore deposits at the Kinsley Mine: the Robinson Gulch, the Deep Main, and Breitrick deposits. Drilling has also expanded reserves in the Access and Lower Main deposits. The Robinson Gulch discovery was made by drilling a soil geochemical anomaly adjacent to the mine. Ore grade mineralization of 0.31 opt was encountered in the first five holes drilled in altered shales and jasperoid. Current production is from the West Ridge, Upper, and Access pits, and it is expected to continue to average approximately 50,000 oz per year for the next two and one half years (NM, 2/12/96; DMR, 6/5/96).

Lynn District

In the north part of the Lynn district, the Meikle Mine of Barrick Goldstrike Mines Inc. was officially opened in September 1996. With 6.6 million oz of gold reserves and annual production of 400,000 oz, it is the largest underground gold mine in the U.S. The high-grade sulfide orebody is hosted by Devonian carbonate rocks. Less than a mile south of the Meikle production shaft, Barrick is sinking an exploration shaft into the Rodeo deposit and plans to evaluate the mineral potential of the Griffin deposit south of the South Meikle zone (DMR, 9/4/96; RGJ, 9/26/96; NM, 9/30/96).

Merrimac District

Tri Origin Exploration added the 230-claim Lone Mountain gold property to its exploration portfolio and planned to begin ground geochemical and geophysical surveys in conjunction with drilling. Previous exploration at the property included surface work and shallow drilling, with the best intersection cutting 0.17 opt gold, with base metal values (NM, 9/9/96).

Railroad District

Exploration Mirandor has entered into an agreement to acquire the Railroad gold property located south of Newmont's Rain Mine. Earlier drilling on the property indicated a near surface gold resource of more than 200,000 oz of gold. The property also includes several old underground mines in the central part of the Railroad district that were active between 1904 and 1956 (DMR, 9/4/96).

Robinson Mountain District

In the Robinson Mountain district, Royal Standard Minerals, Inc. has delineated two gold resources on its Piñon property: one at South Bullion and the other at Dark Star. At the nearly 40,000 acre South Bullion deposit, more than 200 closely spaced drill holes defined ore in two broad stratiform and silicified zones that are stratigraphically and structurally controlled along the folded and thrust-faulted contact separating Devonian Devils Gate and Mississippian Webb Formations. Drill testing of several deep, high-grade feeder targets adjacent to the identified reserves is planned. The potential bulk-mineable resource for South Bullion and Dark Star combined is estimated at 300,000 oz of gold, or 12.86 million tons grading 0.026 to 0.029 opt gold. The geologic mineral inventory for the Piñon property is currently estimated at 38.3 million tons grading 0.026 opt gold, much of which lies below 200 feet (DMR, 8/31/96, 10/2/96, 11/6/96, 11/13/96; MJ, 9/20/96).

Snowstorm Mountains District

Crown Resources initiated a seven-hole drilling program in early August 1996 on the 52-claim Snowstorm gold property located in the Snowstorm Mountains northwest of the town of Midas. Four drilling targets were earlier identified by extensive geochemical and geophysical surveys (Crown Resources Second Quarter Report, 8/10/96).

Elko District

Royaledge Resources Inc. completed a five-hole drill program totaling 4,485 feet on the South Fork property located 10 miles southwest of Elko. Drilling encountered widespread alteration accompanied by several zones of gold enrichment in thick units of silty and sandy limestone. The first hole intercepted 25 feet of 0.054 opt gold with the highest grade being 0.128 opt gold (DMR, 1/1/97; Royaledge Resources, oral commun., 3/97).

Tuscarora District

Newcrest Resources plans further exploration at Tuscarora where drilling has intersected long intervals of low-grade gold mineralization and strong quartz-adularia alteration. Drilling is planned in two areas in 1997: one south of Cottonwood Peak about 5 miles north of the old town of Tuscarora; and the other on the western edge of Independence Valley about one mile southeast of Tuscarora (Newcrest 1996 Quarterly Reports; BLM Project and Planning Schedule, 12/1/96).

ESMERALDA COUNTY

Buena Vista District

Dos Amigos Inc. has submitted a proposal to the U.S. Forest service to develop and open-pit gold mine at the site of the Tip Top Mine about 6 miles south of Montgomery Pass. The company plans to mine and heap-leach about 110,000 tons of ore.

Divide District

Franco-Nevada has acquired 4,200 acres on and surrounding Hasbrouck Mountain, south of Tonopah. A joint venture has been formed with Euro-Nevada; active exploration and drilling is planned for the property. Initially, 60 exploration holes will be drilled in a general reconnaissance program with follow-up drilling scheduled for the second half of 1997 (DMR, 6/5/96). North of Hasbrouck Mountain, Eastfield Resources and Prism Resources Inc. report that nine holes, totaling 3,370 feet, have been completed at the Hill of Gold deposit since drilling began on June 17. The drilling is directed at defining the limits of mineralization on either side of a northeast-trending complex of rhyolite intrusive breccia; the majority of previous drilling had been along the southeast side (Eastfield Resources (USA) Inc. press releases, 7/15/96 and 12/2/96).

Gilbert District

Fischer-Watt Gold Co. has acquired Kennecott Exploration Co.'s 500-acre Castle property located on the south edge of the Monte Cristo Range along U.S. Highway 95 about 22 miles west of Tonopah. Epithermal gold mineralization at Castle is closely associated with northeast- and northwest-trending fault zones. The deposit is hosted in the Ordovician Palmetto Formation beneath Tertiary volcanic cover. Previous work by Kennecott defined a drill-indicated reserve of 3.7 million tons of 0.03 opt gold, (about 100,000 oz of gold). The deposit reportedly is open in several directions (DMR, 10/30/96; NM, 11/4/96).

Klondyke District

Knomex Resources Inc. completed the first phase of an exploration and drilling program on their Klondike property. Fourteen shallow exploratory holes, totaling 3,385 feet, were drilled to test the high-grade gold- and silver-bearing quartz veins down dip of the old workings (DMR,4/17/96).

Silver Peak

Cornucopia Resources started mine construction and pre-production mining of the upper benches of the Gold Wedge pit at its Mineral Ridge property near Silver Peak. Production is expected to begin by the end of June 1997. The Mineral Ridge property has proven and probable reserves of 5,176,000 tons of ore at an average grade of 0.068 opt gold contained within several deposits. The mine is expected to produce 50,000 oz of gold per year for five and a half years. Mineralization at Mineral Ridge consists of electrum and native gold associated with some galena, sphalerite, and molybdenite that occurs along low-angle faults that cut Precambrian metasedimentary rocks (MJ,11/15/96; NM, 6/3/96; SEG, 7/1/96). In the same region, Camnor Resources Ltd. completed the first phase of an exploration program on their Argentite property, where detailed mapping and rock chip and grid soil sampling defined a gold anomaly measuring approximately 1,500 by 1,000 feet in an area of stockwork gold mineralization and extensive silicification. Five or more initial drill holes are planned to test the zone to depths of 500 feet (DMR, 5/8/96; 9/11/96).

Tonopah District

Eastfield Resources and Prism Resources bought the Three Hills property, located in Esmeralda County west of Tonopah, from Coeur Exploration for $320,000. Previous work on the property outlined a resource of 3.18 million tons grading 0.036 opt gold hosted in Miocene tuffs. Five new exploration targets were outlined by geophysical surveys, geological mapping, rock sampling, and drilling during the 1996 program (NM, 4/8/96; Eastfield Resources (USA) Inc. press release, 12/2/96).

EUREKA COUNTY

Antelope District

Many companies were active during 1996 in the part of the Roberts Mountains included in the Antelope district. In mid-year, a positive feasibility study paved the way for Gold Capital's Tonkin Springs gold property to advance to production. The proposed mine would operate for a period of 5 years based on proven and probable reserves of 9.8 million tons grading 0.056 opt gold. Sulfide ore will be pretreated on a bio-oxidation pad, then sent to the existing mill. Lower-grade ore will be moved to a pad for conventional heap-leaching. At full production, the mine is expected to produce 100,000 oz of gold per year (NM, 6/3/96). At the Dry Canyon property, located between Tonkin Springs and the now inactive Gold Bar Mine, Cordex Exploration planned to drill about 60 holes to test areas defined by last year's program of geophysical surveys, geochemical sampling, and drilling (NM, 6/3/96). Cathedral Gold Corp. signed an exploration option agreement with Cordex on Cathedral's 75 North property located adjacent to Gold Bar (DMR, 8/21/96). At the Gold Bar property, Granges Inc. announced that assay results from three recently completed drill holes demonstrated the existence of gold mineralization outside the mined area (DMR, 3/6/96). On the northeast slopes of the Roberts Mountains, in the eastern part of the Antelope district, Summit Silver signed an agreement with BHP Minerals covering the COR, W, and RW claim groups (DMR, 4/10/96). Also in the Antelope district, Cominco American Inc. started a drilling program on the Afgan/Kobeh Joint Venture property to test geological and geophysical targets in the Webb Formation under shallow gravel cover. The targets lie south of surface gold mineralization at the north end of the Afgan prospect, where a shallow drill-indicated reserve of approximately 80,000 oz of gold was established by previous work (DMR, 5/8/96). Delta Gold and White Knight Resources commenced a 10,000-foot reverse circulation drill program at their Indian Ranch property early in 1996 to test geophysical targets associated with gold-bearing jasperoid outcrops. White Knight later announced that Delta Gold had decided not to continue its option on the 8,800-acre property (DMR, 6/19/96, 12/25/96).

Buckhorn District

Royal Gold announced plans to conduct additional drilling to test anomalies and to extend areas of known mineralization at the Buckhorn South property. This property contains one known gold deposit, Zeke, consisting of approximately 2 million tons with an average grade of 0.056 opt gold (DMR, 2/26/97; 6/5/96).

Cortez District

Oro Nevada Resources Inc. commenced a 20,000-foot drilling program in four areas on its Dean Ranch property, situated in the Dry Hills, Crescent Valley, and Cortez Mountains of Eureka and Lander Counties. The program is structured to test areas of shallow alluvial cover near known gold shows in bedrock along the west side of the Cortez Mountains where targets have been outlined by geophysical surveys. The specific targets are: Duff, where a gold-bearing quartz-flooded zone is exposed for several hundred feet along the main Cortez Mountains range-front fault; Duff North, where a ground magnetic anomaly is present immediately west of the Cortez Mountains range-front fault; Hand-Me-Down, where earlier exploration identified a gold-bearing sinter several hundred feet long and over 100 feet wide; and Cottonwood, where past exploration confirmed the presence of Lower Plate sedimentary rocks with weak gold mineralization (DMR, 11/27/96). In the Simpson Park Mountains south of the Cortez district, Fischer-Watt Gold Co. started drilling on the Coal Canyon property. Several 1,500-foot holes are planned to test deep extensions of known gold mineralization in Ordovician to Silurian age carbonate rocks (DMR, 10/30/96).

Eureka District

Homestake's Ruby Hill deposit near Eureka entered the final permitting stage. Construction was scheduled to begin in March 1997, with mining operations to commence late in the fourth quarter of 1997. The West Archimedes deposit within the Ruby Hill property has a proven ore reserve of 7.62 million tons at a grade of 0.099 opt gold. Once in full operation, Ruby Hill is expected to produce approximately 105,000 oz of gold annually. Deep exploration of the property continued in 1996; two holes drilled below the planned West Archimedes open pit intersected an 850-foot width grading 0.065 to 0.075 opt gold at a depth of approximately 1,000 feet. Within this interval is a higher grade zone of 0.23 to 0.41 opt gold 30 to 80 feet wide. The significance of these intercepts can-

not be assessed without further drilling but they indicate that the known Ruby Hill mineralization may be part of a much larger gold system (HMC press releases, 2/8/96; 10/25/96). Immediately west of Homestake's Archimedes property, Royal Gold Inc. is working on the Signal Peak property, where gold mineralization occurs in jasperoid and in silicified Mississipian rocks (DMR, 6/5/96).

Lynn District

Exploration continued during 1996 at Barrick Gold Corp.'s Goldstrike property. Work was underway during the first quarter of the year at Screamer, North Betze, and the North Block. Preparation for the $16 million Rodeo exploration shaft project continued with surface construction and shaft collaring work (Barrick Gold Corp., First Quarter Report, 3/31/96).

At the Carlin East deposit of Newmont Gold Co., originally thought to contain 1.88 million tons at 0.40 opt gold, infill drilling resulted in a significant increase in both tonnage and grade. Mining plans are under evaluation at the Carlin West deposit which contains 100,000 tons grading 0.41 opt gold. Newmont's continued evaluation of Deep Star confirmed reserves of 798,000 tons of 1.13 opt gold. The Deep Star orebody is bounded on two sides by fault zones and lies 800 feet below the surface; the full extent of the mineralization has not been determined. Newmont's deep Goldbug/Barrel deposit, located 1,500 feet north of the Barrick Betze-Post pit, contains approximately 1.5 million oz of mineralized material at a grade of 0.3 opt gold. If ongoing exploration finds sufficient ore, this deposit could be included in an extension of the Betze-Post pit (NM, 6/3/96; DMR, 6/5/96).

Newmont Gold announced plans to exercise its back-in option on a joint venture between High Desert Mineral Resources and Barrick Gold on the High Desert property, located one mile northeast of Newmont's Carlin open pit. High Desert Mineral Resources continues to operate the project, in which it has a 44% interest. Barrick retains 31%, while Newmont now holds the remainder. Newmont will earn into the venture by making a payment equivalent to 25% of the cost of exploration to date, and by financing 25% of future exploration. Newmont and Barrick share a 60-40 joint venture on the adjacent Leeville Corridor project which has a resource of 7.1 million tons grading 0.348 opt gold (nearly 2.5 million oz of gold), not including mineralization discovered at the Four Corners and Hardie Footwall targets. The Four Corners deposit is a deep, refractory gold occurrence about 1.5 miles north of the Carlin pit. Mineralization occurs in a flat 30- to 70-foot-thick zone grading 0.5 opt gold extending laterally over more than half a mile at a depth of 1,600 feet (DMR, 6/5/96; NM,10/7/96).

Maggie Creek District

Silver Eagle Resources commenced drilling on the Section 8 anomaly at its High Dollar property located two miles southwest of Newmont's Gold Quarry Mine. Silver Eagle identified an anomalous geochemical zone extending for half a mile along the James Creek fault. The initial 3,000-foot hole was intended to determine the depth to the Roberts Mountains thrust fault zone and to test the rocks beneath the thrust. Drilling was being funded and managed by Seven Gold Corp. as part of its joint venture earn-in with Silver Eagle (Silver Eagle Resources Ltd. press releases, 6/6/96 and 11/24/96; DMR, 12/4/96). West of Maggie Creek, Exploration Brex Inc. continued a third phase of exploratory drilling on its Section 12 Carlin Trend property. Drilling targets are favorable host rocks and structures delineated by the first two phases of exploration. The first four holes completed totaled 7,100 feet, and significantly thick sections of anomalous gold mineralization were reported in two holes (DMR, 8/31/96; Exploration Brex Inc. news release, 11/19/96).

HUMBOLDT COUNTY

Awakening District

The last gold was mined from Amax Gold Inc.'s Sleeper Mine about the middle of March 1996. Shortly thereafter, X-Cal Resources Ltd. began exploration work under an agreement with Amax that combined the Sleeper area lands of the two companies into one 10,000-acre project area. In mid-year, X-Cal reported that drilling on the West Wood Target at the Sleeper Mine confirmed the presence of a body of gold mineralization. The West Wood Target lies less than 200 feet from the western edge of the existing Wood Pit at Sleeper Mine. The results suggest that a north-striking mineralized structure roughly paralleling the Sleeper Vein extends for at least 650 feet along the west boundary of the Wood Pit, from the bedrock surface to at least 1,000 feet. The structure contains a high-grade core of gold mineralization which may be amenable to underground mining. One hole contained 380 feet of 0.086 opt gold, including 75 feet of 0.358 opt gold (PD, 5/1/96; DMR, 7/24/96; SEG, 10/1/96).

Battle Mountain District

In the Humboldt County part of the Battle Mountain district, Rayrock Yellowknife Resources completed drilling in the Old Marigold/Ponds area of the Marigold Mine property. Results indicate the presence of two shallow, broad mineralized zones that remain open to the north. Significant gold values were encountered in both the Havallah sequence and

Valmy Formation as well as in the Antler sequence, which hosted ore at the old underground mine. Also at Marigold, a drilling program was completed for the Shaft Zone south of the present design pit at East Hill South. In addition, at East Hill North, several holes drilled beyond the west wall of the pit encountered substantial thicknesses of mineralization. The net result was a 22% upward revision of Marigold's reserves during 1996 (DMR, 6/5/96; 10/16/96).

Buffalo Mountain District

In the southeastern corner of the county in the Buffalo Mountain district, Santa Fe's Lone Tree Mine flotation project is expected to start up in the second quarter of 1997. The 4,500-ton/day flotation circuit will improve gold recovery from low-grade sulfide ore with about half the flotation concentrates to be processed through the autoclave at Lone Tree and half through the autoclaves at Twin Creeks. As a result, Lone Tree is expected to increase its production from its current annual rate of about 220,000 oz up to 260,000 to 280,000 oz. Additional infill drilling also was planned at Lone Tree in 1996 (PD, 2/1/96). Four miles southwest of Lone Tree, a second phase of drilling on Romarco Minerals' Nike gold property was completed, with favorable results prompting Romarco to increase its exploration budget. Nine of eleven holes in the 1996 drilling program at Nike hit significant mineralization (NM, 6/24/96). Romarco Minerals also entered into a joint venture with Uranerz USA to earn a half interest from Santa Fe Pacific Gold in the Converse property, also in the Buffalo Mountain district. In late 1996, 11 holes totaling nearly 7,000 feet were drilled in an effort to expand known mineralization. Results included about 500 feet grading about 0.03 opt gold at hole 31, and about 400 feet grading about 0.026 opt, plus about 125 feet of 0.05 opt at hole 32. Uranerz will use the data to calculate a preliminary resource estimate for the deposit. To buy into the Converse property, Romarco and Uranerz must spend a total of $2.6 million on exploration (NM, 12/2/96; SEG, 1/1/97).

Buffalo Valley District

At Santa Fe's Trenton Canyon property, located 11 miles south of the Lone Tree Mine near the Lander County line, 140 holes were drilled to fill in certain areas, to extend mineralization in others, and to explore new targets in the area. A new zone of shallow oxide mineralization was encountered in the Valmy deposit area. A second target, referred to as the Hollywood zone, lies on a ridge northeast of the Trenton Canyon deposit where seven drill holes have intercepted a high-angle zone of near-surface oxide mineralization with grades between 0.03 and 0.13 opt in intercepts 40 to 105 feet thick. Drilling on this project is planned to continue into 1997 (PD, 11/1/96).

Iron Point District

Newcrest Industries Inc. reported plans to resume drilling on its Iron Point property in May 1997 (Newcrest Mining 1997 first quarter report).

Jackson Mountains District

Gerle Gold (US) Inc. is maintaining its option on the Happy Creek gold-silver property and is preparing plans for 1997 work (Gerle Gold Ltd. 1996 Annual Report).

Potosi District

Early in 1996, Getchell Gold Corp. reported another discovery on the Getchell property at the Powder Hill prospect, located about 2,000 feet south of Turquoise Ridge. Drilling showed an inferred resource of 1.6 million tons at 0.465 opt gold. Subsequent drilling between Powder Hill and Turquoise Ridge encountered another significant zone of gold mineralization about 1,000 feet due south of the Turquoise Ridge orebody. In this area, an inferred resource of 1.5 million tons at an average grade of 0.454 opt is contained within a 500-foot by 700-foot mineralized zone lying 1,200 to 2,500 feet below the surface. Also at Getchell, mining on the Valmy Hill orebody was expected to be completed by late 1996. The Valmy Hill oxide orebody contains approximately 834,000 tons of ore grading 0.02 opt gold. Getchell Gold Corp. reported that exploration activities during 1996 had added a net 1.5 million oz of gold to reserves at Turquoise Ridge and Getchell underground deposits after replacing ounces mined during the year, resulting in a year-end mineral inventory (reserves plus resources) of 9.5 million oz (DMR, 6/5/96; Getchell Gold Corp. Fourth Quarter report, 2/12/97).

Northeast of Getchell, Santa Fe Pacific Gold's efforts to expand gold resources at the Twin Creeks mine during the year have focused on three areas: the Galena vein, Zone 40, and Section 30 South Mega pit. The Galena vein underground target is relatively high-grade (0.25-0.40 opt) mineralization within a northeast-trending fault zone in the greenstones immediately beneath the currently producing Vista deposit. The target extends along strike for over 1,000 feet and about 500 feet down the structure, has an average width of about 10 to 15 feet, and is open along strike and at depth. The Zone 40 target is a fold-controlled zone of high-grade (about 0.5 opt) refractory mineralization at the bottom of the Mega pit. Fourteen holes have been drilled in the zone this year, confirming over 1,000 feet of strike length and about 500 feet of dip extent with average width of about 30 feet. In the Section 30 South Mega pit area, a 40-hole drilling program in 1996 found mill-grade oxide mineralization in both limbs of a large fold.

Mineralization extends over 1,500 feet south of the limit of the Mega pit as currently planned and is still open to the south (NM, 6/3/96; PD, 11/1/96).

At the Pinson Mine, south of Getchell, Homestake Mining Co. and Barrick Gold Corp. announced they will purchase the remaining interests in the Pinson Partnership not already owned by them. As a result of the purchase, Homestake and Barrick each will own 50% of the Partnership and Homestake will become the manager. The Pinson Partnership holds interests in almost 23,000 acres of property south of the Getchell Mine, including the Pinson open-pit mine and mill facility with 180,000 oz of proven and probable gold reserves. The mine has produced approximately one million oz of gold from oxide ores since it began operation in 1981. The existing reserves are estimated at 1,595,000 tons of mill ore grading 0.098 opt and an additional 945,000 tons of heap-leach ore grading 0.026 opt. Although the Pinson property has been explored for a number of years, the focus has been on shallow, open-pit oxide deposits. Barrick and Homestake have committed to a substantial exploration program over the next several years to test the deeper potential of the property (HMC press release, 12/16/96).

Elsewhere in the district, Oro Nevada Resources Inc. plans a 15,000-foot drill program to test up to three targets on its Nevada First Ranches property by the end of 1996. The initial target will be Anderson Canyon in the Osgood Mountains west of the Getchell Mine (DMR 11/27/96).

Sulphur District

In late 1996, Granges reported that the Brimstone expansion of its Hycroft Mine was on schedule and ore had been placed on the new pad, with the first production from the new plant expected before the end of the year. Upon completion, gold production will increase from the current design capacity of 100,000 oz/year to 115,000 oz/year in 1997 (MJ, 11/18/96).

Ten Mile District

Blue Desert Mining Inc. completed nine widely spaced, step-out drill holes on the Northeast zone of its Golden Sage project. Seven of the holes have highly anomalous amounts of gold over their entire length. Twenty previously drilled holes outlined the tabular, flat-lying Main Zone estimated to contain a geologic resource of 390,000 oz of gold with a further 100,000 oz estimated in veins, shears, and other associated mineralization. The nine new holes are 1,000 to 2,500 feet northeast of the Main Zone. Blue Desert is earning an undivided 50% interest in the Golden Sage project under an option agreement with Nassau Limited, which first discovered significant mineralization on the property in 1982 (DMR, 5/8/96, 10/16/96).

Winnemucca District

Anvil Resources Ltd. announced the start of a multiphase exploration program on its Nevada Gold project located about a mile and a half northwest of Winnemucca. Previous work on the property has proven 130,000 to 140,000 oz of gold and drill-indicated 300,000 oz of gold. The property has significant tonnage potential within a 100-foot-wide stockwork zone along a strike length of more than 2,000 feet (DMR, 4/3/96).

LANDER COUNTY

Argenta District

In northwestern Lander County, the first gold from Santa Fe Pacific Gold Corp.'s Mule Canyon Mine was poured at its Lone Tree facility. Mining began at Mule Canyon in October with high-grade ore trucked to the Lone Tree plant where the first gold was included in a pour in November. The Mule Canyon contribution was about 3,000 tons of ore with an average grade of 0.57 opt gold. Plans call for between 800,000 and 900,000 tons of Mule Canyon ore to be shipped to Lone Tree and Twin Creeks for processing during 1997. The Mule Canyon property contains almost 9 million tons grading 0.112 opt gold (Santa Fe Pacific Gold Corp. news releases, 6/3/96; 11/1/96; 12/11/96).

Battle Mountain District

Production at Battle Mountain Gold Co.'s Phoenix Project is scheduled for the first half of 1998. Last reported reserves at the Phoenix project totaled 46.6 million tons grading 0.04 opt gold. In addition, about 14.2 million tons grading 0.037 opt gold have potential to be brought into the reserve category. (DMR, 6/5/96)

Buffalo Valley District

Fairmile Acquisitions reported that several holes drilled at the Buffalo Valley Mine intersected deep, high-grade intervals (such as 15 feet of 3.73 opt gold) along a northwest projection of the fault zone that controlled mineralization at the Buffalo Valley Mine. All of the gold mineralization is in the Havallah sequence rocks, but some is closely associated with granodiorite intrusions (SEG, 4/1/96). Fairmile reported reserves at the Buffalo Valley Mine of 8.6 million tons grading 0.035 opt gold, and an inferred resource of 3.5 million tons grading 0.028 opt gold (SEG, 10/1/96).

Bullion District

During 1996, Placer Dome U.S. Inc., as operator of the Cortez Joint Venture, drilled 51 core holes and six reverse circulation holes on the South Pipeline property. The core holes, located in the area known as the Gaslight property, expanded the resource base and showed continuity of mineralization between South Pipeline and Gaslight. In September, Placer Dome announced plans to integrate development of the 2.5-million-ounce gold deposit, South Pipeline, with the adjacent 4.3-million-ounce Pipeline deposit. Facilities to treat ore from the deposits are currently under construction. Total combined gold production is expected to average 440,000 oz of gold per year over a 12-year mine life. The first gold from Pipeline is expected to be poured in the spring of 1997 (Placer Dome news release, 9/24/96; DMR, 2/26/97). The Ruf claims adjacent to Pipeline were optioned by Coral Gold Corp. to Levon Resources, who completed six reverse circulation holes in 1996. Drilling identified a 3,000-foot-long gold zone striking north-south onto the adjacent Pipeline ground. An induced polarization program was planned to define further drill targets (Coral Gold Corp. 1996 annual report, 4/17/96). Seven miles north of the Pipeline deposit, Romarco Minerals completed a drilling program of 22 reverse circulation holes totaling more than 13,000 feet on its Grey Eagle property (NM, 12/2/96). Golden Peaks Resources Ltd. completed a review of its Cottonwood project, located approximately 10 miles north of the Pipeline deposit, and announced the acquisition of additional claims at the site. Previous drilling on the Cottonwood zone intersected up to 0.101 opt gold over 20 feet. Fifty-three new claims were staked to cover prospective geology in the footwall of the Crescent Fault (Golden Peaks Resources Ltd. news release, 5/9/96).

Royal Gold planned 1996 drilling of a number of geophysical anomalies on the NAD property located about 4 miles south of the Pipeline/South Pipeline deposit (DMR, 6/5/96). Pallium Minerals Ltd. reported progress at the Bullion Mountain property where previous work by Placer Dome, ASARCO, Bow Valley Mining, and Lac Minerals identified altered fault structures carrying up to 0.312 opt gold. Three targets were identified for further work (DMR, 8/21/96). Akiko Gold Resources Ltd. and Bradner Resources Ltd. received a proposal from ASARCO Incorporated to lease their interests below 700 feet in the Colorback mining claims. ASARCO recently drilled six to nine deep holes on its adjoining property near Akiko's eastern boundary. Previous drilling in the central part of the Colorback claims had identified shallow, potentially open-pit-mineable gold mineralization. Follow-up drilling partially defined a gently dipping tabular zone of gold mineralization, 25 to 50 feet thick and open to the southeast. A preliminary geologic resource of 297,000 tons averaging 0.038 opt was calculated for this zone based on the results of eight holes (Akiko Gold Resources Ltd. press release, 6/4/96).

At the JDN property, First International Metals Corp. completed a seven-hole drilling program in September that tested soil anomalies found during a 1995 sampling program. Four of the seven holes encountered sufficient mineralization to justify further exploration (First International Metals Corp. Second Quarter report, 10/31/96). Coral Gold Corp. granted Levon Resources Ltd. an option to earn 50% interest in the Norma Sass claims, which adjoin the southwest border of the Gold Acres Mine (Coral Gold Corp. 1996 annual report, 4/17/96). Minerais Barexor announced plans to open its gold placer mine in Crescent Valley. The mine will begin producing at the rate of 2,000 yards/day, and can produce approximately 40,000 oz of gold per year. Barexor estimated that the demand for diverse gravel products, produced at its plant as a by-product of gold recovery, could exceed 200,000 yards annually (DMR, 9/4/96).

Kingston District

Verdstone Gold Corp. and Stirrup Creek Gold Ltd. announced they have acquired an additional 10 claims adjacent to the Victorine Mine, and they have submitted a Plan of Operations to drill 40 exploration holes at the site (DMR, 2/28/96; Humboldt-Toiyabe National Forest Plan of Operations, 5/24/96).

Lewis District

Eastfield Resources optioned the North Mill Creek property, 18 miles southeast of Battle Mountain, from Cyprus Minerals. Cyprus previously conducted mapping and sampling, and drilled three shallow holes on the property. Eastfield has completed two drill holes, 1,740 feet and 2,185 feet, and both cut through a thick succession of hydrothermally altered chert and quartzite exhibiting quartz microveining, pyrite, calcite veining, and locally well-developed carbon alteration. More holes are planned for the area in the spring of 1997 (Eastfield Resources (USA) Inc. press releases, 5/1/96, 12/4/96).

Ravenswood District

Fischer-Watt Gold Co., Inc., and Digger Resources Inc. announced plans for a drilling and evaluation program on the Tempo property. The main focus of the 1996 drilling program was the 5,000-foot-long mineralized zone identified as the Southern Target. Gold values from a recently completed trenching program in the Upper Plate rocks along this target demonstrated potential for a shallow heap-leach operation. Additional work will also be conducted on the Central Target, which is a gold anomaly similar in size to the Southern Target (DMR, 6/5/96).

LINCOLN COUNTY

Atlanta District

Golden Chief Resources planned to drill eight holes on its Atlanta Gold property to test gold mineralization trending from the main Atlanta pit to the south and southeast. Measured reserves on the property are listed as 300,000 oz of gold and 3 million oz of silver (NM, 6/3/96).

Patterson District

At the Patterson Pass property, Lexam Explorations reported that their drilling encountered 25 feet of 0.040 opt gold starting at 30 feet, and 25 feet of 0.014 opt gold starting at 75 feet (Lexam Explorations Inc. news release, 2/19/96).

Pennsylvania District

Royal Standard Minerals Inc. is assessing the ore potential of the partially developed resource on its Caliente property. Forty-eight new lode claims have been staked to control the entire Pennsylvania quartz vein system, including the high-grade Jumbo open pit and several gold skarn zone targets on the property. Based on previous drilling, the high-grade Jumbo zone is believed to contain 10,000 to 30,000 tons grading 0.126 opt gold. This mineralization remains open down plunge toward the east (DMR, 8/28/96).

LYON COUNTY

Como District

Adamas Resources Corp. obtained an option to acquire the Hydra-Hercules property where earlier exploration work indicated a large, near-surface gold system. The company anticipates spending at least $1 million on exploration, development, and permitting work on the project with an emphasis on drilling vertical and lateral extensions to known reserves. Stated property reserves are 7,313,000 tons proven and probable ore grading 0.023 opt gold and 0.159 opt silver, and an additional resource of 20 to 50 million tons grading 0.040 to 0.045 opt gold (DMR, 2/12/97).

Talapoosa District

Defined resources of Miramar Mining Corp.'s Talapoosa Mine stand at 1.1 million oz of gold and 15 million oz of silver. Within this resource, a proven and probable resource of 788,000 oz of gold and 12 million oz of silver has been determined. Production is planned to begin in 1997 (DMR, 6/5/96).

Yerington District

Miranda Industries Inc. drilled three holes at their Artesia project in summer 1996; all three intercepted extensive zones of quartz-veined volcanic tuff with grades up to 0.2 opt gold. However, the overall low gold values and the location of the drilling suggest that the remaining target is too small to host a significant gold deposit, prompting Miranda to terminate its option on the property (Miranda Industries Inc. press releases, 9/11/96, 10/31/96; NM, 6/3/96).

MINERAL COUNTY

Aurora District

In the Aurora district, Consolidated Nevada Goldfields reported that deep drilling of its 1.16-million-ton Martinez deposit resulted in an increase in the average grade of the deposit from previously reported 0.056 opt gold to 0.092 opt gold (SEG, 1/1/97).

Marietta District

Alta Gold Co. has acquired the 62-claim Excalibur gold property located east of the old Moho Mine about 20 miles southwest of Mina. Gold mineralization at Excalibur occurs in a large jasperoid breccia cutting the Triassic Excelsior Formation. The central area of jasperoid and surface gold mineralization occurs over an area approximately 1,000 feet wide by 3,000 feet long. All of the 79 geochemical samples taken from the property showed mineralization, and one third of the samples defined four gold anomalies with grades averaging 0.29 opt. Alta Gold is doing further sampling and geological studies, and initial drilling is planned for the first quarter of 1997 (Pay Dirt, 11/1/96; DMR, 12/25/96; Alta Gold, oral commun., 3/97).

Rand District

Romarco Minerals acquired an option for the Rand gold property from Lac Minerals. The area is a volcanic-hosted, epithermal target in the Walker Lane trend. Romarco can earn a 60% interest in the 4,000-acre property from Barrick Gold by spending $500,000 over the next three years. Toward that end, Romarco drilled 14 RC holes, totaling more than 9,000 feet, on five targets on the property in 1996 (NM, 12/2/96).

Silver Star District

Cimarron Minerals Ltd. commenced trenching on its Sunset Gold property. Cimarron reports that its wholly owned subsidiary, Cactus West Explorations Inc., has optioned an additional four claims contiguous to the property and the company has staked nine additional claims covering iron-stained Tertiary volcanic rocks that consistently yield assays of 0.03 to 0.1 opt gold in shear zones. Noranda Exploration is

reported to have discovered a one-million-ton resource with a gold grade of 0.06 opt on this property (DMR, 10/2/96; Cimarron Minerals Ltd, oral commun., 3/97).

NYE COUNTY

Barcelona District

Royal Standard Minerals Inc. announced plans to carry out a trenching and drilling program on the Antone Canyon property to further investigate two resource areas identified by Freeport in an exploration program in the 1980s (DMR, 8/31/96; Royal Standard Minerals Inc. project description, 3/25/97).

Bare Mountain District

Inter-Rock Gold Inc. announced the first gold pour from ore mined at the Daisy Mine. The 439 oz of gold were poured at Rayrock Yellowknife Resources Marigold mill near Battle Mountain. The Marigold mill processes activated carbon loaded with gold leached from oxide ore stacked on Daisy's leach pads. With mineable reserves of 11.9 million tons grading 0.018 opt gold, Daisy is expected to yield 30,000 oz per year. Inter-Rock also completed the first phase of a drill program to define additional reserves on the 13.7-square-mile property (NM, 10/7/96; DMR, 12/25/96). Further south in the Bare Mountain district, Placer Dome U.S. Inc. obtained an option on the Sterling Mine of Cathedral Gold Corp. to explore for deep sulfide ore below the known oxide reserves. Recently a small-diameter, high-grade pipe (averaging 2 opt gold) of gold-bearing sulfide mineralization was discovered at the mine. Placer Dome has completed a program of surface and underground mapping, airborne geophysical surveys, and underground geophysical surveys that outlined targets for drilling below the Sterling Mine orebody, and an underground drilling program is planned (DMR, 5/1/96; SEG, 7/1/96).

Bruner District

Newgold hopes to revive the Bruner gold property, which it has leased from Miramar Mining. Recent exploration has outlined a resource of about 15 million tons grading 0.025 opt gold (NM, 12/2/96).

Clifford District

Golconda Resources Ltd. and its joint-venture partner, Gold Valley Resources Inc., drilled holes to test the potential for deeper mineralized zones on the 42-claim Clifford Mine property (Golconda Resources Ltd. website, 3/19/97).

Cloverdale District

Late in the year, Homestake Mining Co. filed plans with the U.S. Forest Service to drill 122 holes on its Golden Project located at the old camp of Golden in the southern Toiyabe Range (Toiyabe National Forest Plan of Operations, 11/19/96).

Ellendale District

Golconda Resources Ltd. reports that it has discovered a large, blind gold zone on its South Monitor claims located west of the Ellendale district. Previous drilling outlined about 250,000 oz of gold on the property, and Golconda's drilling showed the system is open to the south and at depth. The property is located south of U.S. Highway 6, in T2N, R45E, south of McKinny Tanks. More drilling is planned on the property (Golconda Resources Ltd. website, 3/19/97).

Fairplay District

Arimetco International Inc. began gold leaching operations on the Ketchup Flats heaps with plans to expand to include the Paradise Peak heaps at its Paradise Peak project. The Ketchup Flats pit contains 5 million tons of oxidized ore grading 0.022 opt gold and about 0.2 opt silver. Mining of primary ore from the nearby Sullivan orebody was planned to commence early in 1997. Sullivan hosts 17 million tons of oxidized ore grading 0.34% copper and 0.0255 opt gold, as well as another 8.5 million tons of copper-only ore grading 0.32% copper. The current plan is to mine 70,000 tons of ore per week from Sullivan to be processed at Paradise Peak, producing 18 million pounds of cathode copper and 70,000 oz of gold per year, in addition to heap-leach gold production at Paradise Peak (Pay Dirt, 4/1/96).

Golden Arrow District

In the Golden Arrow district, Golconda Resources agreed to lease the CNR claims of Mountain View Exploration where earlier sampling had reportedly outlined a large gold and silver anomaly with rock chip values of up to 1 opt gold and 13 opt silver (DMR, 6/26/96). Also in Golden Arrow district, Kennecott Exploration confirmed zones of anomalous gold mineralization at the Hidden Hill and Gold Coin Zones of its Golden Arrow deposit. Recent drilling in these zones extended significant mineralization at depth and along trend to the south and west. Previous work on the Golden Arrow deposit defined a resource of 290,000 to 477,000 oz of gold and 4.1 to 6.2 million oz of silver located in the two separate areas. Gold-silver mineralization is associated with north-northwest-trending, quartz-after-calcite sheeted veins and stockwork zones (DMR, 3/12/97).

Hannapah District

Apex Energy (US), Inc. notified the U.S. Forest Service that it plans to drill 16 exploratory holes on its Hann Claims located 1 mile south of Hannapah of the Monitor Range (Humboldt-Toiyabe National Forest Plan of Operations, 2/22/96).

Longstreet District

To date Naneco Minerals Ltd. has drilled 492 reverse circulation holes at the Longstreet Mine property. Drill-proven reserves now stand at 140,000 oz, with an equal amount of potential to the north where mineralization remains open. In addition, exploration drilling has revealed at least three other areas on the property that have ore-grade mineralization and potential for additional mineable reserves (Naneco Minerals Ltd. website, 3/19/97).

Manhattan District

American Technologies Group, Inc. reported that, in 1996, its wholly owned subsidiary, New Concept Mining, Inc., poured and shipped the first gold and silver produced at its Manhattan facility. The company has identified geologic reserves in excess of 161,000 oz of gold and has begun a 12,000-foot drilling project on two of its Manhattan district properties to confirm existing reserves and delineate additional reserves. The planned drilling project will also test both vein extensions on the company's Hooligan and GP properties and the north extension of the vein system on its Gold Wedge property (DMR, 11/13/96). In the East Manhattan area, Hemlo Gold Mines is planning to conduct exploration drilling of 19 holes at its Salisbury Peak Project (Toiyabe National Forest Plan of Operations, 12/26/96).

Round Mountain District

The Smoky Valley Common Operation at Round Mountain was awaiting permitting to begin construction in 1996 of a mill to process large quantities of unoxidized ore. Planned initial capacity is 8,000 tons/day, and startup is expected in late 1997. Round Mountain added much more gold to reserves than it mined during the year. At year's end, its reserves totaled 10.0 million oz. Round Mountain has an indicated mine life of 17 more years even if no more gold is found there (Echo Bay Mines press release, 2/14/96).

Rye Patch District

Kennecott Exploration reported a preliminary resource of 270,000 oz of gold on its 220-claim Midway property. Low-grade gold mineralization is associated with pervasive silica flooding in Tertiary tuffs and sediments and Paleozoic argillite. Gold mineralization has been encountered in drilling along a strike length of over 2 miles and remains open to the northwest and southeast (DMR, 3/12/97).

San Antone District

Romarco Minerals drilled 22 shallow reverse circulation holes at its Cimarron gold property, located north of Tonopah in the San Antonio Mountains. The property is a joint venture with Brancote USA, with operator Romarco holding a 70% interest (NM, 12/2/96).

Troy District

In this district in eastern Nye County, Saga Exploration Co. announced plans to drill up to 21 holes at its Locke Mine property. The project site is located in Troy Canyon on the west side of the Grant Range (Humboldt-Toiyabe National Forest Plan of Operations, 2/16/96).

Twin River District

Knomex Resources Inc. plans to sample material from the Ophir Canyon property. A stockpile on the property, operated as the Murphy Mine in the late 19th century, contains approximately 30,000 tons at a grade of +20 opt silver and 0.1 opt gold. Extensive mapping and soil testing carried out on the property indicates widespread gold and silver mineralization (DMR, 6/5/96).

Union District

Norcal Resources Ltd. began a 16-hole reverse circulation program to test three target areas on its Summit property. Mineralization on the 140-claim property is associated with structural zones and contacts between sedimentary rocks and volcanics. A current open-pit mineral resource of about 100,000 tons at an estimated grade of 0.07 opt gold has been indicated (DMR, 6/19/96; 9/18/96; 10/30/96).

PERSHING COUNTY

Antelope Springs District

A joint venture between Newgold Inc. and Casmyn Corp. is planning to reopen the Relief Canyon Mine. Based on earlier drilling, the property's bulk-mineable resources are estimated to range from 5.6 million tons grading 0.022 opt gold to 8.6 million tons of 0.02 opt gold (SEG, 10/1/96; NM, 12/2/96).

Blue Wing District

At the Blue Wing property of Miranda Industries Inc., drilling was carried out to test extensions of alter-

ation zones identified by trenching earlier in the year. Seven reverse circulation holes intersected thick sequences of altered volcanic rocks at shallow depths and identified what appears to be a major fault system trending north-south across the property. This fault system appears to control three sinter deposits which assayed up to 0.088 opt gold. The company plans additional geophysical surveys on the property to identify more drill targets (Miranda Industries Inc. press release 9/11/96).

Farrell District

Coromandel Resources Ltd. has been granted an option to acquire a 100% interest in the 319-claim Wildcat Project. The project already is at an advanced stage and an extensive drill program is planned (DMR, 12/11/96).

Goldbanks District

Kinross Gold Corp. reports that during the last seven months Kinross Goldbanks Mining Co. and Restoration Minerals Co. have completed an additional 115,000 feet of core and reverse circulation drilling on the 27,800-acre Goldbanks Joint Venture property. Recent drilling results, coupled with extensive laboratory tests, have significantly increased resource estimates of the Main Zone and KW gold deposits. In addition, exploration drilling discovered two new areas of extensive gold mineralization. By year's end, mineral resource estimates calculated for the project totaled 145 million tons with an average grade of 0.029 opt gold containing about 4.2 million oz of gold. There also is an additional tonnage of a lower grade mineral resource totaling 287 million tons with an average grade of 0.007 opt gold containing about 2.0 million oz of gold. (SMR, 12/21/96; DMR, 12/11/96). In the same area, Newhawk Gold Mines Ltd. reported results from the first phase of a drill program on its Goldbanks property, located east and west of the Restoration Goldbanks property. On the west property, the Del Oro, two target areas were drilled with significant anomalous and low-grade gold values returned in both areas. On the Pronto Plata target, gold mineralization is associated with a westerly dipping, nearly north-striking fault zone. Drilling indicates that the mineralized fault zone extends to the north of the old Pronto Plata Mine. Several targets remain to be tested. Also in this area, Newhawk optioned the 20-claim Table Mountain property from Kennecott Exploration Co. Previous rock chip sampling on the property indicated a large geochemical anomaly (+100 ppb gold) (DMR, 2/21/96; 9/18/96). Homestake Mining Co. and Cyprus Amax also were rumored to be active in the Goldbanks district in 1996 (SEG, 7/1/96).

Imlay District

Drilling by Pegasus Gold at Florida Canyon doubled the mineable reserves to 1.4 million oz. In addition to oxide mineralization in the eastern high-wall of the pit, a large sulfide zone was discovered. About 8 million tons of 0.061 opt gold were defined along a north-south structure at the western margin of the mine (SEG, 10/1/96).

Rochester District

Coeur d'Alene Mines Corp. entered into a three-year lease option agreement on the Nevada-Packard property adjacent to Coeur's Rochester Mine, and a 22,000-foot drilling program is scheduled. The Nevada-Packard property includes 35 claims and 1,200 acres of land (Coeur d' Alene Mines Corp. press release, 8/14/96). The Coeur Rochester Mine became the largest primary silver mine in the history of the state of Nevada when it passed a historical production milestone of 50 million oz of silver produced since operations began in 1986. The mine also is a substantial gold producer, surpassing 500,000 oz of gold production since operations began (Coeur d' Alene Mines Corp. press release, 5/14/96).

Rosebud District

Santa Fe Pacific Gold and Hecla Mining Co. have entered into a 50-50 joint venture to develop the Rosebud property located about 50 miles west of Winnemucca. Hecla will be the operator and ore will be trucked to Santa Fe's Twin Creek Mine in Humboldt County for processing. Annual production will be about 100,000 oz with first production planned for early 1997. Reserves at Rosebud stand at 1.2 million tons at a grade of 0.45 opt gold and 2.75 opt silver (DMR, 6/5/96; MJ, 9/20/96).

STOREY COUNTY

Comstock District

BMR Gold Corp. has entered into an agreement with Rea Gold to acquire Rea's Comstock heap-leach property. BMR's wholly owned Nevada subsidiary, Oliver Hills Mining, has until the end of the year to exercise the option. At last report, the mineable reserves stood at 2.1 million tons containing more than 100,000 oz of gold and 1.2 million oz of silver in two open-pit-mineable deposits, the Lucerne and Billie the Kid. The property has underground possible resources of 2 to 3 million tons grading 0.2 to 0.5 opt gold. In the same area, BMR Gold has negotiated an option to increase its interest to 100% in the South Comstock project located in Storey and Lyon Counties, south of Virginia City (DMR, 5/1/96; NM, 6/3/96).

WASHOE COUNTY

Deephole District

In the Deephole district of northern Washoe County, the Mountain View gold project will advance to a feasibility study with Homestake Mining Co. funding necessary expenditures under a joint-venture agreement with Canyon Resources. Homestake's exploration work confirmed the high-grade gold zone previously discovered by Canyon Resources, and identified other gold-bearing areas on the property (NM, 6/3/96).

Olinghouse District

Alta Gold has confirmed a new orebody at its Olinghouse gold property. The orebody, situated in an area known as Green Hill, is the site of considerable historic production and is adjacent to the main orebody outlined in previous drilling by Alta. Of the first 68 holes drilled, 50 encountered gold at or near surface. Because of its location and abundance of near-surface ore, Alta plans to put Green Hill into production first followed closely by the much larger Payback Pit, situated immediately to the southwest. Drilling results and soil sample surveys at Olinghouse continue, and Alta is working hard to get Olinghouse permitted by early spring 1997, with site development and mining to begin immediately thereafter (SMR 10/26/96; PD, 11/1/96). Five miles north of Alta Gold's Olinghouse property, Golden Peaks Resources Ltd. completed a review of historical exploration data on its Moongold property, and acquired 11 additional claims at the site. The Moongold property contains an extensive bleached and argillized zone in volcanic rocks which has yielded up to 1 opt gold in surface samples (Golden Peaks Resources Ltd. news release, 5/9/96).

WHITE PINE COUNTY

Chase District

Homestake Mining Co. announced plans to drill up to ten holes at its Bellview property in the upper Water Canyon and Cherry Spring Canyon areas north of Overland Pass (Humboldt-Toiyabe National Forest Plan of Operations, 4/18/96).

Eagle District

Aquaterre Mineral Development defined a 350-foot by 1,100-foot gold geochemical anomaly as well as six soil anomalies on the Red Hills-Arla property, located southwest of the Kern Mountains. Further exploration was planned for the prospect (NM, 1/8/96).

Illipah District

Barrick Gold has leased the Illipah gold property from Alta Gold in exchange for annual cash payments and a net smelter return royalty. The Illipah forms part of the larger Antelope Ridge project where mineralization is hosted in Mississippian Chainman Shale. Barrick's planned drill holes will average about 1,100 feet, targeting potential mineralization in the deeper Pilot Shale (NM, 10/21/96).

Robinson District

BHP Copper Nevada Mining Co. sent its first shipment of copper concentrate from the Robinson Mine to the BHP smelter at San Manuel, Arizona, in February 1996 (DMR, 6/5/96).

Ward District

At its Ward property, Alta Gold Co. plans to test for deep copper mineralization in a geological environment identical to the Robinson district, 12 miles to the north (DMR, 6/5/96).

White Pine District

New drilling was planned at Rea Gold Corp.'s Mount Hamilton Gold Mine, where open-pit mineable reserves in the Seligman and adjoining Centennial deposits are 10.8 million tons grading 0.038 opt gold and 0.241 opt silver. Exploration at the property identified several gold anomalies that the company planned to drill. About 20,000 feet of reverse circulation drilling are planned for the newly defined Chester Zone 2,500 feet south of the Centennial deposit, and up to 12 sites will be drilled at the Mohawk Canyon location northwest of Mount Hamilton (DMR, 6/5/96; Humboldt-Toiyabe National Forest Plan of Operations, 5/31/96). In the same district, Alta Gold has developed a mine plan and advanced to the permitting stage on its Griffon property, expected to begin production in 1997. Stated reserves are 2.7 million tons proven and probable ore (68,000 oz of gold), and the property is expected to have a mine life of less than two years. Gold at Griffon is closely associated with jasperoid replacement in the Pilot Shale (PD, 5/1/96; DMR, 6/5/96; SEG, 7/1/96). On the west side of the White Pine Range, Sagebrush Exploration Inc. planned to drill seven holes on the Jasper Claims in the vicinity of Cathedral Canyon (Humboldt-Toiyabe National Forest Plan of Operations, 1/28/97).

Major Precious-Metal Deposits

by Ronald H. Hess, Joseph V. Tingley, and Harold F. Bonham, Jr.

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.

opt = troy ounces per short ton.

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
CHURCHILL COUNTY				
Bell Mountain (Bell Mountain district)	1989: *reserves*—30,000 oz Au, 125,000 oz Ag	no production	rhyolitic tuff	Miocene
Buffalo Valley gold property (Eastgate district)	1996: 96,000 oz Au			
Dixie Comstock (Dixie Valley district)	1991: 2.4 million tons, 0.049 opt Au 1995: 100,000 oz Au	1989: development 1990-93: exploration	Tertiary rhyolite	Miocene?
Fondaway Canyon (Shady Run district)	1988: 400,000 tons, 0.06 opt Au 1990: 400,000 tons, 0.06 opt Au	1989: 1,065 oz Au, 87 oz Ag 1990: 12,000 oz Au 1993: idle	Triassic slate and phyllite	Cretaceous
New Pass property (New Pass district)	1994: 3.4 million tons, 0.042 opt Au		Permian greenstone	Mesozoic?
CLARK COUNTY				
Crescent property (Crescent district)	1992: 390,000 tons, 0.05 opt Au; 3.3 million tons, 0.022 opt Au			
Keystone (Goodsprings district)	1990: *estimated geologic resource* 64 million tons, 0.05 opt Au 1992: 110,000 tons, 0.11 opt Au	1990: ~1,000 oz Au 1993: idle	lower Paleozoic carbonate rocks	Triassic
ELKO COUNTY				
Big Springs (Independence Mountains district)	1989: 1.55 million tons, 0.172 opt Au	1987-88: ~106,000 oz Au 1989-92: 274,000 oz Au, 48,000 oz Ag 1993: 52,752 oz Au 1994: 28,315 oz Au, 2,597 oz Ag 1995: 1,780 oz Au, 280 oz Ag	Mississippian to Permian overlap assemblage clastic and carbonate rocks	Cretaceous or Tertiary
Bootstrap/Capstone (Bootstrap district)	1989: *geologic resource*—25.1 million tons, 0.039 opt Au 1990: 18.3 million tons, 0.044 opt Au 1994: 169,000 oz Au, *geologic resource*—1 million oz Au	1988-90: *see* "Newmont Gold Production" on page 37	dacitic dikes, Paleozoic siltstone and laminated limestone/chert	~37 Ma
Bootstrap/Capstone/ Tara (Bootstrap district)	1996: 20.2 million tons, 0.046 opt Au proven and probable reserves; 1 million tons, 0.086 opt Au mineralized material	1996: 19,800 oz Au		
Cobb Creek (Mountain City district)	1988: *geologic resource—3*.2 million tons, 0.045 opt Au			
Cord Ranch (Robinson Mountain district)	1991: 3.5 million tons, 0.037 opt Au 1992: 6.0 million tons, 0.03 opt Au 1994: 350,000 oz Au in 3 deposits			
Dee (Bootstrap district)	1990: 4.5 million tons, 0.059 opt Au 1992: 5.2 million tons, 0.049 opt Au 1994: *geologic resource*—958,000 oz Au 1995: 550,000 oz Au 1996: 579,000 oz Au	1987-88: ~97,000 oz Au 1989-92: 135,000 oz Au, 142,000 oz Ag 1993: 25,860 oz Au 1994: 24,219 oz Au 1995: 45,000 oz Au 1996: 45,070 oz Au, 50,322 oz Ag	Vinini Formation Devonian carbonates, dacitic dikes	Cretaceous or Tertiary

MAJOR PRECIOUS METAL DEPOSITS (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
ELKO COUNTY (continued)				
Deep Star (Lynn district)	1996: 1.4 million tons, 0.8765 opt Au proven and probable reserves	1995: 2,800 oz Au; 1996: 93,400 oz Au		
Doby George (Aura district)	1995: 3.7 million tons, 0.060 opt Au			
Gnome (Carlin district)	1988: 2.7 million tons, 0.048 opt Au	exploration	Paleozoic sedimentary rocks	Cretaceous or early Tertiary
Jerritt Canyon (includes Saval Canyon and Burns Basin) (Independence Mountains district)	1989: 21.6 million tons, 0.143 opt Au mill ore; 6.5 million tons, 0.043 opt Au leachable 1990: new discovery south of current mine has a geologic resource of 3.2 million tons, 0.284 opt Au 1991: *geologic resource*—4.7 million oz Au	1981-90: ~2.6 million oz Au 1991-94: 1,380,000 oz Au, 25,000 oz Ag 1995: 328,000 oz Au 1996: 309,477 oz Au	Hanson Creek and Roberts Mountains Formations	~40 Ma
Kinsley Mountain (Kinsley district)	1988: 2.1 million tons, 0.048 opt Au 1993: 2.6 million tons, 0.047 opt Au 1994: 3.5 million tons, 0.044 opt Au 1995: 3.5 million tons, 0.045 opt Au 1996: 3.4 million tons, 0.032 opt Au	1993: evaluation 1995: 44,040 oz Au, 8,050 oz Ag 1996: 44,553 oz Au, 10,930 oz Ag	upper Paleozoic carbonate rocks	Oligocene?
Meikle (Lynn district)	1992: *geologic resource*—7.9 million tons, 0.613 opt Au 1993: *geologic resource*—6.6 million oz Au 1996: 8.5 million tons, 0.716 opt Au proven and probable; 1.4 million tons, 0.717 opt Au mineralized material	1996: 78,442 oz Au	Popovich and Roberts Mountains Formations	Eocene
Midas Gold Project (Gold Circle district)	1995: 13 million tons, 0.16 opt Au, 2.7 opt Ag, announced resource, proven Au reserve <500,000 oz 1996: 1.1 million tons, 1.324 opt Au, 14.95 opt Ag		Tertiary volcanic rocks	15.3 Ma
Piñon (South Bullion and Dark Star) (Robinson Mountain district)	1996: 38.3 million tons, 0.026 opt Au geologic mineral inventory			
Pony Creek (Carlin district)	1994: *geologic resource*—1.1 million tons, 0.057 opt Au			
Rain Emigrant Springs (Carlin distrct)	1989: 30.3 million tons, 0.021 opt Au 1995: 169,000 oz Au 1996: 16 million tons, 0.028 opt Au proven and probable reserves; 10.4 million tons, 0.021 opt Au mineralized material	1994: 79,000 oz Au 1995: 32,100 oz Au 1996: 48,900 oz Au	Webb Formation	36-37 Ma
SMZ (Carlin district)	1989: *geologic resource*—1.6 million tons, 0.019 opt Au			
Trout Creek (Carlin district)	1988: 1.5 million tons, 0.04 opt Au	1988: exploration	lower Paleozoic rocks	Cretaceous or Tertiary
Tuscarora (Dexter) (Tuscarora district)	1987: 2 million tons, 0.039 opt Au, 1.9 opt Ag 1988: 1.8 million tons, 0.037 opt Au, 0.74 opt Ag	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	39 Ma
Winters Creek (Independence Mountains district)	1986: 1.4 million tons, 0.146 opt Au	evaluation, exploration	lower Paleozoic carbonate rocks	Cretaceous or Tertiary
Wright Window (Independence Mountains district)	1986: 1.3 million tons, 0.095 opt Au	1992: 3,500 oz Au	lower Paleozoic carbonate rocks	Cretaceous or Tertiary

continued

MAJOR PRECIOUS METAL DEPOSITS (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
ESMERALDA COUNTY				
Boss (Gilbert district)	1987: 500,000 tons, 0.07 opt Au 1990: *reserves*—637,500 tons, 0.023 opt Au *geologic resource*—31,000 oz Au 1996: *see* Castle		Ordovician sedimentary rocks	Miocene?
Castle (includes Boss) (Gilbert district)	1996: 3.7 million tons, 0.03 opt Au	exploration	Palmetto Formation	
Goldfield Project (Goldfield district)	1983: 1.75 million tons, 0.087 opt Au 1991: 1.2 million tons, 0.05 opt Au 1993: 2.3 million tons, 0.073 opt Au 1994: 3.48 million tons, 0.071 opt Au	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 1995: 9,850 oz Au 1996: 3,810 oz Au, 1,349 oz Ag	andesite, rhyodacite, rhyolite	21 Ma
Hasbrouck (Divide district)	1986: 12.9 million tons, 0.0291 opt Au, 0.59 opt Ag	1986-92: exploration 1993: idle	Siebert Formation tuff and volcaniclastic rocks	16 Ma
Hill-of-Gold deposit (Divide district)	1988: 500,000 tons, 0.04 opt Au, 0.40 opt Ag 1995: *geologic resource*—100,000 oz Au, including reserves of 20,000 oz at 0.036 opt Au 1996: 1.6 million tons, 0.026 opt Au	1991-93: idle	Miocene silicic tuff	16 Ma
Silver Peak (Silver Peak district)	1991: 531,300 tons, 0.124 opt Au 1995: *proven and probable reserves*—5.2 million tons, 0.068 opt Au, *geologic resource*—405,000 oz Au (includes Mary-Drinkwater project)	1991: 25,000 oz Au. 8,000 oz Ag	Wyman Formation	Mesozoic?
Three Hills (Tonopah district)	1996: 3.2 million tons, 0.036 opt Au	exploration	Miocene Siebert Formation and Oddie Rhyolite	
Weepah (Weepah district)	1986: 200,000 tons, 0.1 opt Au, 0.4 opt Ag	1986-87: 58,000 oz Au 1988-90: idle	Wyman Formation	Cretaceous
EUREKA COUNTY				
Afgan (Antelope district)	1996: 80,000 oz Au drill indicated resource	exploration	Webb Formation	
Archimedes/Ruby Hill project/East and West Archimedes/Deep East and Achilles (Eureka district)	1994: *geologic resource*—20 million tons, 0.08 opt Au 1995: 7.62 million tons, 0.099 opt Au (West Archimedes)	exploration	Goodwin Limestone	Cretaceous?
Betze, Post (Lynn district)	1988: 128.4 million tons, 0.095 opt Au 1990: *geologic resource*—18.4 million oz Au 1992: 112.1 million tons, 0.180 opt Au, *geologic resource*—21 million oz Au 1993: *geologic resource*—29.1 million oz Au 1994: *reserves*—29.6 million oz Au 1995: 23 million oz Au 1996: 122.7 million tons, 0.192 opt Au proven and probable reserves: 55.8 million tons, 0.189 opt Au mineralized material	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 1995: 2,031,883 oz Au, 68,217 oz Ag 1996: 1,934,966 oz Au, 73,140 oz Ag	Ordovician to Devonian chert, shale, sltstone, and impure carbonates; in part, Vinini Formation	Cretaceous or early Tertiary
Blue Star (Lynn district)	1989: *geologic resource*—22.2 million tons, 0.030 opt Au	1974-84: intermittent 1988-96: *see* "Newmont Gold Production" on page 37	lower Paleozoic sandy siltstone and carbonate rocks, granodiorite	Cretaceous or early Tertiary
Bobcat (Lynn district)	1988: *geologic resource*—17.7 million tons, 0.029 opt Au		lower Paleozoic rocks	Cretaceous or Eocene

MAJOR PRECIOUS METAL DEPOSITS (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
EUREKA COUNTY (continued)				
Buckhorn/ Buckhorn South property (Buckhorn district)	1990: 700,000 tons, 0.05 opt Au; *geologic resource*—200,350 oz Au 1991: 409,000 tons, 0.062 opt Au 1992: open-pit ore mined out 1993: *geologic resource*—1.1 million tons, 0.11 opt Au 1996: 2 million tons, 0.056 opt Au	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 (Lynn district)	1987: 1 million tons, 0.10 opt Au	exploration, evaluation	lower Paleozoic sedimentary rocks	Tertiary or Mesozoic
Carlin/Pete/ Lantern (Lynn district)	1995: 14.8 million tons, 0.031 opt Au 1996: 13.7 million tons, 0.046 opt Au proven and probable reserves; 14.7 million tons, 0.046 opt Au mineralized material	1994: 27,700 oz Au 1995: 9,300 oz Au 1996: 31,700 oz Au	Roberts Mountains Formation	Cretaceous or early Tertiary
Genesis (Lynn district)	1989: *geologic resource*—35.8 million tons, 0.044 opt Au 1990: 32 million tons, 0.047 opt Au (includes Blue Star)	1986: production commenced 1988-93: *see* "Newmont Gold Production" on page 37	Ordovician-Devonian limestone, argillite chert	Cretaceous or early Tertiary
Genesis/North Star/ Sold (Lynn district)	1996: 22.7 million tons, 0.034 opt Au proven and probable reserves; 11 million tons, 0.050 opt Au mineralized material	1994: 417,200 oz Au 1995: 267,400 oz Au 1996: 245 oz Au	Ordovician-Devonian limestone, argillite chert	Cretaceous or early Tertiary
Gold Bar (Antelope district)	1988: 2.75 million tons, 0.10 opt Au 1989: *geologic resource*—1.45 million oz Au 1990: mined out in December 1994: 240,000 oz Au 1995: 190,000 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 (Antelope district)	1992: *reserves*—86,500 oz Au, *geologic resource*—131,000 oz Au 1993: 770,000 tons, 0.080 opt Au			
Gold Pick (Antelope district)	1988: 10 million tons, 0.06 opt Au 1990: 9.7 million tons, 0.057 opt Au includes Gold Ridge and Goldstone 1991: 4.5 million tons, 0.055 opt Au 1992: *geologic resource*—329,700 oz Au, includes eastern deposit 1993: 1.4 million tons, 0.079 opt Au	exploration	Paleozoic sedimentary rocks	Eocene?
Gold Quarry (Maggie Creek district)	1987: 197.8 million tons, 0.042 opt Au 1988: *geologic resource*—503 million tons, 0.04 opt Au 1990: 212.6 million tons, 0.042 opt Au, *geologic resource*—534.3 million tons, 0.037 opt Au 1991: *reserves*—9.3 million oz Au	1985 170,000 oz Au 1988-93: *see* "Newmont Gold Production" on page 37	Ordovician to Devonian chert, shale, siltstone, and impure carbonates; in part, Vinini Formation	Cretaceous or early Tertiary
Gold Quarry/Mac/Tusc (Maggie Creek district)	1996: 174.8 million tons, 0.046 opt Au proven and probable reserves; 51.9 million tons, 0.058 opt Au mineralized material	1994: 967,700 oz Au; 1995: 1,094,000 oz Au; 1996: 916,300 oz Au		
Gold Ridge (Antelope district)	1988: 4 million tons, 0.06 opt Au 1990: *see* Gold Pick 1991: 2.9 million tons, 0.04 opt Au 1992: 1.4 million tons, 0.038 opt Au 1993: 426,000 tons, 0.059 opt Au	exploration, evaluation	Paleozoic sedimentary rocks	Eocene?
Goldstone (Antelope district)	1988: 1.7 million tons, 0.08 opt Au 1990: *see* Gold Pick 1991: 845,000 tons, 0.063 opt Au 1992: 878,000 tons, 0.061 opt Au 1993: 130,928 tons, 0.104 opt Au	exploration, evaluation	Paleozoic sedimentary rocks	Eocene?
Horse Canyon (Cortez district)	1984: 3.94 million tons, 0.055 opt Au 1988: included in Gold Acres figures	1984: 40,000 oz Au 1988-93: included with Gold Acres	Vinini Formation, Wenban Limestone	34 Ma?
Maggie Creek (Maggie Creek district)	1988: *geologic resource*—303,000 tons, 0.092 opt Au	1984: 1,250,000 tons 1986: intermittent production 1988: no production reported	Ordovician to Devonian siltstone, chert, sandstone, impure limestone	Cretaceous or early Tertiary

continued

MAJOR PRECIOUS METAL DEPOSITS (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
EUREKA COUNTY (continued)				
North Star (Lynn district)	1989: *geologic resource*—6.9 million tons, 0.052 opt Au 1990: 3.9 million tons, 0.052 opt Au	1988: 4,250 oz Au	lower Paleozoic sedimentary rocks	Cretaceous or early Tertiary
Post/Goldbug (Lynn district)	1996: 25.6 million tons, 0.190 opt Au proven and probable reserves; 43.6 million tons, 0.079 opt Au mineralized material			
Ratto Canyon (Eureka district)	1984: ~200,000 oz Au	exploration 1995: idle	Dunderberg Shale, Hamburg Dolomite	Oligocene
Tonkin Springs (Antelope district)	1987: *oxide*—1.5 million tons, 0.05 opt Au; *sulfide*—2.5 million tons, 0.09 opt Au 1991: 9 million tons, 0.05 opt Au 1995: *proven and probable reserves*—956,000 oz Au 1996: 9.8 million tons, 0.056 opt Au	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?
Turf (Lynn district)	1996: 2.5 million tons, 0.367 opt Au mineralized material			
Tusc (Maggie Creek district)	1988: *geologic resource*—15.8 million tons, 0.059 opt Au 1990: 13.3 million tons, 0.062 opt Au	exploration 1995: in production	lower Paleozoic sedimentary rocks	Cretaceous or early Tertiary
West Leeville (Newmont) (Lynn district)	1996: 2 million tons, 0.377 opt Au proven and probable reserves; 581,000 tons 0.354 opt Au mineralized material	1995: 99,800 oz Au 1996: 173,000 oz Au		
West Leeville (Newmont-Barrick) (Lynn district)	1996: 7.1 million tons, 0.425 opt Au proven and probable reserves; 500,000 tons 0.328 opt Au mineralized material			
Zeke (Buckhorn district)	1989: 2 million tons, 0.056 opt Au, 0.224 opt Ag			
HUMBOLDT COUNTY				
Adelaide Crown (Gold Run district)	1989: *south pit*—585,000 tons, 1.313 opt Ag, 0.043 opt Au; *additional area* - 165,000 tons, 0.015 opt Au, 1.10 opt Ag	1990: 3,068 oz Au, 37,537 oz Ag 1991: 1,849 oz Au, 15,937 oz Ag 1992: idle	Preble Formation	Tertiary
Ashdown (Vicksburg district)	1988: 1 million tons, 0.11 opt Au 1992: 1.1 million tons, 0.12 opt Au	exploration	Mesozoic granite	Mesozoic
Chimney Creek (Potosi district)	1988: *proven, probable*—26.9 million tons, 0.068 opt Au; *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 1989: 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	41.9 Ma
Getchell (Potosi district)	1989: 8.1 million tons, 0.154 opt Au mill grade and 1.43 million tons, 0.049 opt Au heap-leach ore; *additional geologic resource* - 5.7 million tons, 0.092 opt Au sulfide and 2.6 million tons, 0.055 opt Au oxide 1991: 6.5 million tons, 0.192 opt Au sulfide and 1.8 million tons, 0.039 opt Au oxide. 1992: *sulfide*—7.0 million tons, 0.194 opt Au; *oxide*—2.5 million tons, 0.031 opt Au 1993: *geologic resource*—1.3 million oz Au 1994: *reserves*—1.59 million oz Au 1995: *resource*—6.2 million tons, 0.354 opt Au, *reserves*—1.25 million oz Au (Turquoise Ridge only) 1996: 15 million tons, 0.304 opt Au (underground and surface, includes Turquoise Ridge)	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 1995: 120,000 oz Au, 72,000 oz Ag 1996: 171,286 oz Au	Comus and Preble Formations, granodiorite dikes, granodiorite	90 Ma?

MAJOR PRECIOUS METAL DEPOSITS (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
HUMBOLDT COUNTY (continued)				
Hycroft (formerly Crofoot/Lewis) (Sulphur district)	1988: 25 million tons, 0.025 opt Au 1990: 12 million tons, 0.020 opt Au 1991: 13.9 million tons, 0.019 opt Au 1992: 29.8 million tons, 0.024 opt Au, *geologic resource*—45 million tons, 0.021 opt Au 1993: 29.8 million tons, 0.024 opt Au 1994: *geologic resource*—56.7 million tons, 0.018 opt Au 1994: *geologic resource*—58.1 million tons, 0.019 opt Au 1995: 66.5 million tons, 0.019 opt Au	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 1995: 101,128 oz Au, 417,823 oz Ag 1996: 89,381 oz Au, 321,315 oz Ag	Camel conglomerate, rhyolite dikes	1-2 Ma
Lone Tree (Buffalo Mountain district)	1990: 5.4 million tons oxide mill ore, 0.159 opt Au, 5.7 million tons heap-leach ore, 0.025 opt Au 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 1995: 240,000 oz Au, 11,000 oz Ag 1996: 205,738 oz Au	Havallah Formation and dacite porphyry	38 Ma
Marigold (Battle Mountain district)	1990: 4.3 million tons, 0.105 opt Au mill ore, 7.6 million tons, 0.026 opt Au heap-leach ore 1992: 10 million tons, 0.055 opt Au 1996: 648,000 oz Au	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 1995: 59,800 oz Au 1996: 73,500 oz Au	Paleozoic chert, argillite, and carbonate rocks	early Oligocene
North Stonehouse (Buffalo Mountain district)	1991: 2.5 million tons, 0.103 oz Au mill ore		Havallah Formation and porphyry dikes	39 Ma
Pinson (includes Mag pit) (Potosi district)	1989: 480,000 oz Au 1992: 4.98 million tons, 0.064 opt Au 1996: 2.6 million tons, 0.072 opt Au	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 1995: 44,854 oz Au 1996: 42,431 oz Au, 2,850 oz Ag	Comus Formation	90 Ma?
Preble (Potosi district)	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?
Rabbit Creek (Potosi district)	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 (Awakening district)	1989: 1,975,000 oz Au 1990: 44.1 million tons, 0.038 opt Au, 0.152 opt Ag 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 1995: 82,062 oz Au, 98,694 oz Ag 1996: 38,200 oz Au, 36,800 oz Ag	Miocene "latite" flows and dikes, silicic ash-flow tuff, Triassic slate and phyllite	16.1 Ma
Trenton Canyon (Buffalo Valley district)	1994: *oxide resource*—14.6 million tons, 0.035 opt Au, (517,000 oz Au) 1996: 20 million tons, 0.029 opt Au (590,000 oz Au)		Vinini Formation	

continued

MAJOR PRECIOUS METAL DEPOSITS (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
HUMBOLDT COUNTY (continued)				
Trout Creek (Battle Mountain district)	1989: 50,000 oz Au			
Twin Creeks (Chimney and Rabbit Creeks) (Potosi district)	1993: 5.7 million oz Au 1994: *geologic resource*—8.5 million oz Au 1996: 10.5 million oz Au	1993: 482,600 oz Au, 206,200 oz Ag 1994: 501,897 oz Au, 244,710 oz Ag 1995: 451,285 oz Au, 265,462 oz Ag 1996: 459,083 oz Au, 137,914 oz Ag	Paleozoic	Eocene?
LANDER COUNTY				
Austin Gold Venture (Birch Creek district)	1989: mined out	1986-88: 141,000 oz Au 1989: 50,000 oz Au	Antelope Valley Limestone	Cretaceous or Tertiary
Battle Mountain Complex (Battle Mountain district)	1992: 500,000 oz Au 1993: *geologic resource*—900,000 oz Au 1995: *resource* (overall Battle Mountain complex)—60.2 million tons, 0.036 opt Au, including *reserves*—46.6 million tons, 0.040 opt Au 1996: 52.9 million tons, 0.038 opt Au	1994: 12,000 ox Au, 15,000 oz Ag 1995: 74,958 oz Au, 206,807 oz Ag 1996: 73,100 oz Au, 201,460 oz Ag		Eocene
Buffalo Valley Gold Project (Buffalo Valley district)	1988: 1.5 million tons, 0.05 opt Au 1991: idle 1994: 4.8 million tons, 0.07 opt Au 1995: 511,000 oz Au 1996: 301,000 oz Au	1988: 9,238 oz Au 1989: 14,660 oz Au 1990: 15,770 oz Au		Eocene?
Crescent Pit (Bullion district)	1994: 1.97 million tons mill grade, 0.125 opt Au, 2.2 million tons heap-leach, 0.029 opt Au			
Crescent Valley (Bullion district)	1994: *placer reserve*—8 million cu yd, 0.031 oz Au/cu yd 1995: *placer resource*—6 million cu yd, 0.03 oz Au/cu yd			
Dean (Lewis district)	1995: *proven reserve*—11,000 oz Au *possible to probable resource*—240,000 oz Au			
Elder Creek Project/Shoshone (Lewis district)	1989: 91,500 oz Au 1990: 1.5 million tons, 0.041 opt Au	1990: 17,400 oz Au 1991: 2,702 oz Au	Valmy Formation	Cretaceous or Eocene
Fire Creek (northeast of Bullion district)	1982: 350,000 tons, 0.06 opt Au	1983-84: 767 oz Au	basaltic andesite	Miocene
Fortitude Extension (Battle Mountain district)	1992: 500,000 oz Au 1993: *geologic resource*—900,000 oz Au 1996: *see* Battle Mountain Complex			
Gold Acres and Little Gold Acres (Cortez Gold Mines) (Bullion district)	1987: 4.8 million tons, 0.105 opt Au 1988: 5.4 million tons, 0.093 opt Au 1992: *reserves*—3.1 million tons, 0.05 opt Au, 0.4 opt Ag	1942-84: 2.4 million tons, 0.13 oz Au/ton; 2 million tons, 0.041 opt Au leached. *Little Gold Acres:* 800,000 tons, 0.124 opt Au 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 1996: 160,782 oz Au, 6,800 oz Ag	Roberts Mountains Formation, Wenban Limestone, Valmy Formation, quartz porphyry dikes	92.8-94 Ma and 36 Ma
Hilltop (Hilltop district)	1984: 10.5 million tons, 0.073 opt Au 1989: 10 million tons, 0.049 opt Au	no production	Valmy Formation	Oligocene?
Klondike property	1989: 100,000 oz Au equivalent			

MAJOR PRECIOUS METAL DEPOSITS (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
LANDER COUNTY (continued)				
McCoy/Cove (McCoy district)	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 opt Au, 2.32 opt Ag 1993: *reserves*—63.3 million tons, 0.037 opt Au, 1.66 opt Ag, *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 1995: 310,016 oz Au, 11,905,805 oz Ag 1996: 271,731 oz Au, 7,102,348 oz Ag	Panther Canyon Formation (conglomerate, sandstone), Augusta Mountain Formation (limestone), granodiorite	39.5 Ma
Mud Springs (Bald Mtn. Zone) (Bullion district)	1993: *geologic resource*—42,000 oz Au			
Mule Canyon (Argenta district)	1992: 8.5 million tons, 0.136 opt Au 1995: *reserves*—oxide 4.222 million tons, 0.058 opt Au; sulfide 5.780 million tons, 0.145 opt Au 1996: 9 million tons, 0.112 opt Au	1992: exploration	basalt and basaltic andesite	15-16 Ma
Pipeline (Bullion district)	1991: *geologic resource*—11.3 million tons, 0.237 opt Au 1993: 35.3 million tons, 0.120 opt Au 1994: *reserves*—21.2 million tons, 0.145 oz Au/ton; *plus other resources*—8.3 million tons, 0.035 opt Au 1995: 4.3 million oz Au 1996: 136.7 million tons, 8.7 million oz Au measured resource, includes South Pipeline		Roberts Mountains Formation	Cretaceous or early Tertiary
Robertson (Bullion district)	1988: 11 million tons, 0.04 opt Au 1993: *geologic resource*—20 million tons, 0.036 opt Au 1996: *geologic resource*—1 million oz Au	1989: 3,700 oz Au	Valmy Formation	early Oligocene
Slaven Canyon property (Bateman Canyon district)	1994: 50,000 oz Au			
South Pipeline (Bullion district)	1992: 9 million tons, 0.082 opt Au 1993: *geologic resource*—31.4 million tons, 0.106 opt Au 1994: *geologic resource*—76.5 million tons, 0.048 opt Au 1996: *see* Pipeline	1995: 111,215 oz Au, 6,804 oz Ag	Roberts Mountains Formation	Cretaceous or early Tertiary
Surprise (Battle Mountain district)	1987: 225,000 oz Au 1988-91: production and reserve included in Fortitude figures 1994: mined out	1987: 2,000 oz Au	skarn	37 Ma
Toiyabe	1988: 813,400 tons, 0.066 opt Au	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?
Victorine (Kingston district)	1992: 915,000 tons, 0.304 opt Au 1995: *proven and probable reserves*—256,000 tons, 0.36 opt Au, plus *additional geologic resource*—31,160 oz Au			
LINCOLN COUNTY				
Atlanta gold property (Atlanta district)	1980: 1.1 million tons, 0.08 opt Au, 1.6 opt Ag 1996: 300,000 oz Au, 3 million oz Ag	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
Easter and Delamar Project (Delamar district)	1994: *geologic resource*—3.36 million tons, 0.069 opt Au 1995: 1.5 million tons, 0.069 opt Au	1994: exploration	Cambrian quartzite	Miocene

continued

MAJOR PRECIOUS METAL DEPOSITS (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
LYON COUNTY				
Fire Angel (Como district)	1989: 5,600 oz Au, *geologic resource*—148,500 oz Au			
Pine Grove (Pine Grove district)	1994: 2.5 million tons, 0.061 opt Au			
South Comstock Joint Venture (Silver City district)	1994: 3 million tons, 0.05 opt Au 1995: 100,000 oz Au			
Talapoosa (Talapoosa district)	1988: 2.5 million tons, 0.041 opt Au, 0.53 opt Ag *oxide* 14.9 million tons, 0.03 opt Au, 0.49 opt Ag *sulfide* 1989: *additional resources delineated* - 2.7 million tons, 0.054 opt Au, 0.654 opt Ag 1991: *geologic resource* - 19.6 million tons, 0.045 opt Au, 0.61 opt Ag 1992: *geologic resource*—18 million tons, 0.044 opt Au, 0.61 opt Ag 1994: *geologic resource*—50 million tons, 0.026 opt Au, 0.35 opt Ag 1995: *geologic resource*—45 million tons, 0.025 opt Au and 0.33 opt Ag, including *proven and probable reserves* of 29.9 million tons, 0.026 opt Au and 0.4 opt Ag	preproduction	Kate Peak Formation	Miocene
MINERAL COUNTY				
Aurora Mine (Aurora district)	1989: 347,000 tons, 0.253 opt Au 1990: 433,000 tons, 0.21 opt Au 1992: 493,000 tons, 0.15 opt Au 1993: 537,400 tons, 0.123 opt Au, *geologic resource*—100,000 oz Au 1994: 316,000 tons, 0.120 opt Au 1995: 1.54 million tons, 0.055 opt Au 1996: 900,000 tons, 0.1 opt Au	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 1995: 15,000 oz Au, 35,000 oz Ag 1996: 10,374 oz Au	andesite, rhyolite	10 Ma
Aurora Partnership (Aurora district)	1983: 1.5 million tons, 0.129 opt Au, 0.3 opt Ag 1990: 816,880 tons, 0.103 opt Au 1992: 790,000 tons, 0.13 opt Au *geologic resource*—267,640 oz Au 1994: 1.5 million tons, 0.1 opt Au (underground) 1995: 230,000 tons, 0.208 opt Au (in portion of Humboldt vein system)	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 1995: 15,048 oz Au, 39,853 oz Ag 1996: 7,528 oz Au, 15,000 oz Ag	andesite, rhyolite	10 Ma
Candelaria Mine (Candelaria district)	1988: 24 million tons, 1.267 opt Ag, 0.011 opt Au 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, 42,000 oz Au *underground reserve*—45 million oz Ag, 46,000 oz Au 1995: *geologic resource*—44 million oz Ag, 45,000 oz Au, including reserves of 6.663 million tons, 0.005 opt Au and 1.68 opt Ag 1996: 1.4 million tons, 1.76 opt Ag and 0.005 opt Au proven ore; 10.8 million tons, 4.21 opt Ag and 0.0045 opt Au drill indicated resources	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 1995: 2,866,000 oz Ag, 10,720 oz Au 1996: 3,857,000 oz Ag, 15,030 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 (Rawhide district)	1989: *reserves*—29.4 million tons, 0.040 oz Au and 0.368 opt Ag; *geologic resource*—59.3 million tons, 0.0274 opt Au, 0.298 opt Ag 1991: 29.4 million tons, 0.040 opt Au, 0.368 opt Ag; *geologic resource*—59.3 million tons, 0.0274 oz Au and 0.298 opt Ag 1992: *geologic resource*—54 million tons, 0.026 opt Au with 29.4 million tons, 0.04 opt Au, 0.39 opt Ag and 29.9 million tons, 0.015 opt Au, 0.23 opt Ag 1993: 1.3 million oz Au, 15 million oz Ag 1995: 470,000 oz Au, 6 million oz Ag 1996: 535,000 oz Au, 7.3 million oz Ag proven ore	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 1995: 117,000 oz Au, 960,000 oz Ag 1996: 126,000 oz Au, 1,073,000 oz Ag	rhyolite plugs, flows, tuffs, breccias	16 Ma
Mindora (Garfield district)	1988: 1.0 million tons, 0.037 opt Au and 1.78 opt Ag	1988: exploration		
Santa Fe (Santa Fe district)	1990: 6.8 million tons, 0.035 opt Au and 0.241 opt Ag	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 1995: 16,670 oz Au, 41,000 oz Ag	Luning Formation	Miocene
NYE COUNTY				
Baxter Springs (Manhattan district)	1988: 1 million tons, 0.050 opt Au 1990: *geologic resource*—5 million tons 0.050 opt Au			
Bruner property, Duluth zone (Bruner district)	1992: *geologic resource*—15 million tons, 0.026 opt Au	1993: exploration	Tertiary volcanic rocks	Miocene
Bullfrog (Bullfrog district)	1989: 18.6 million tons, 0.097 opt Au 1992: 8.8 million tons, 0.14 opt Au plus an additional *geologic resource*—1.8 million tons, 0.102 opt Au 1996: 10.2 million tons, 0.062 opt Au proven and probable reserves; 3.7 million tons, 0.040 opt Au mineralized material	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 1995: 177,631 oz Au, 413,587 oz Ag 1996: 205,348 oz Au, 288,700 oz Ag	rhyolitic ash-flow tuff	9.5 Ma
Daisy (Bare Mountain district)	1993: 4.7 million tons, 0.024 opt Au *geologic resource*—430,000 oz Au 1994: *geologic resource*—18 million tons, 425,000 oz Au 1995: 12 million tons, 0.018 opt Au, *geologic resource*—51.1 million tons, 0.026 opt Au (includes five orebodies listed below)			
Gold Bar (Bullfrog district)	1987: 1.23 million tons Au ore 1993: idle		silicic volcanic rocks	Miocene
Longstreet property (Longstreet district)	1989: 4 million tons, 0.024 opt Au, *geologic resource*—9.6 million tons, 0.024 opt Au	idle	rhyolitic volcanic rocks	Oligocene

Orebody	Gold Resource	Gold Reserve
West zone	1.45 million tons, 0.021 opt	0.6 million tons, 0.025 opt
South zone	0.76 million tons, 0.097 opt	—
Secret Pass zone	36.6 million tons, 0.018 opt	11.4 million tons, 0.018 opt
Mother Lode deposit	9.4 million tons, 0.046 opt (*sulfide ore*)	
Sunday Night zone (Joshua Hollow)	2.87 million tons, 0.039 opt	

Total: 11.4 million tons, 0.018 opt plus 9.16 million tons, 0.01 opt oxide and sulfide ore

continued

MAJOR PRECIOUS METAL DEPOSITS (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
NYE COUNTY (continued)				
Manhattan property (Manhattan district)	1989: *geologic resource*—100,000 tons, 0.50 opt Au 1996: *geologic resource*—161,000 oz Au			
Montgomery Shoshone (Bullfrog district)	1988: 3.1 million tons, 0.072 opt Au, 0.240 opt Ag		rhyolitic ash-flow tuff	9.5 Ma
Nevada Mercury	1994: *geologic resource*—50,000 oz Au			
Northumberland (Northumberland district)	1988: 12 million tons, 0.06 opt Au	1939-42: 327,000 oz Au 1981-84: 950,000 tons/year 1988: 29,667 oz Au, 130,394 oz Ag 1990-93: idle	Roberts Mountains and Hanson Creek Formations, granodiorite, tonalite, quartz porphyry dikes	85 Ma
Paradise Peak/ Ketchup Flats pit (Fairplay district)	1989: 5.22 million tons, 0.09 opt Au, 3.62 opt Ag, mill ore; 11.52 million tons, 0.036 opt Au, 0.445 opt Ag, 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, heap-leaching continued 1996: 5 million tons, 0.022 opt Au, 0.2 opt Ag (Ketchup Flats pit)	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) (Round Mountain district)	1989: *geologic resource*—271 million tons, 0.032 opt Au 1990: 256.8 million tons, 0.033 opt Au 1993: 151.2 million tons, 0.024 opt Au, *geologic resource*—3,876,000 oz Au 1995: 10 million oz Au 1996: 9 million 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 1995: 344,437 oz Au, 250,529 oz Ag 1996: 410,977 oz Au, 345,258 oz Ag	rhyolite ignimbrite	26 Ma
Sterling (Bare Mountain district)	1989: 469,000 tons, 0.21 opt Au 1990: 519,000 tons, 0.209 opt Au 1992: 403,000 tons, 0.24 opt Au *geologic resource*—765,000 tons, 0.178 opt Au 1995: 483,000 tons, 0.19 opt Au 1996: 129,000 tons, 0.245 opt Au	1983-88: 75,900 oz Au 1990: 12,626 oz Au 1991: 12,215 oz Au 1995: 14,000 oz Au 1996: 14,000 oz Au	Wood Canyon and Bonanza King Formations	14 Ma
South Monitor (west of Ellendale district)	1996: 250,000 oz Au	exploration	Tertiary volcanic rock	
Sullivan (Fairplay district)	1987: 10.2 million tons, 0.039 opt Au, 0.086 opt Ag and 0.37% Cu 1988: *proven*—10.8 million tons, *probable* - 2.7 million tons, 0.025 opt Au 1995: *proven and possible*—17 million tons of 0.34% Cu, 0.0255 opt Au, + 8.5 million tons of 0.32% Cu		Mesozoic granodiorite and metavolcanic rocks	Mesozoic
PERSHING COUNTY				
Bunce (Velvet district)	1989: *geologic reserve* - 600,000 tons, 0.04 opt Au 1990: 500,000 tons, 0.04 opt Au	exploration	rhyolite	
Florida Canyon (Imlay district)	1988: 37 million tons, 0.023 opt Au 1991: 48.3 million tons, 0.018 opt Au 1995: *reserves*—72.4 million tons, 0.019 opt Au, *additional geologic resource*—8 million tons, 0.061 opt Au, sulfide	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 1995: 111,157 oz Au, 62,624 oz Ag 1996: 183,176 oz Au, 104,684 oz Ag	Grass Valley Formation	Cretaceous or Tertiary

MAJOR PRECIOUS METAL DEPOSITS (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
PERSHING COUNTY (continued)				
Goldbanks Project (Goldbanks district)	1994: 900,000 oz Au 1995: *reserves*—45.6 million tons, 0.019 opt Au, 0.044 opt Ag, *plus geologic resource*—60 million tons, 0.017 opt Au, 0.071 opt Ag 1996: 80.8 million tons, 0.019 opt Au proven and probable reserves; 7.4 million tons, 0.014 opt Au possible reserves; 106.8 million tons, 0.028 opt Au drill indicated resources			
Relief Canyon (Antelope Springs district)	1988: ~ 1.3 million tons, 0.03 opt Au 1991: mined out 1994: 1.5 million tons, 0.035 opt Au 1996: 8.6 million tons, 0.022 opt Au	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?
Rochester (Rochester district)	1989: *geologic resource*—94.5 million tons, 0.012 opt Au, 1.40 opt Ag 1993: 75 million tons, 1.32 opt Ag, 0.0113 opt Au 1996: *reserves*—81 million oz Ag, 696,000 oz Au	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 1995: 59,226 oz Au, 6,491,167 oz Ag 1996: 74,293 oz Au, 6,251,180 oz Ag	Koipato Group, Weaver Rhyolite	Late Cretaceous
Rosebud Project (Rosebud district)	1992: 570,000 oz Au (0.362 opt), 5.5 million oz Ag (5.5 opt) 1994: 512,000 oz Au 1995: 1.6 million tons, 0.36 opt Au, 2.3 opt Ag 1996: 1.2 million tons, 0.45 opt Au, 2.75 opt Ag	1993: underground exploration	Tertiary volcanic rocks	Miocene
Tag-Wildcat (Farrel district)	1989: *geologic resource*—1.5 million tons, 0.043 opt Au 1989: 416,000 tons, 0.076 opt Au	1989: exploration	Tertiary volcanic rocks	Miocene
STOREY COUNTY				
Comstock heap leach project (Comstock district)	1992: 475,000 tons, 0.072 opt Au, 0.60 opt Ag 1993: *geologic resource*—3.2 million tons, 0.05 opt Au, 0.5 opt Ag 1996: 100,000 oz Au, 1.2 million oz Ag			
Flowery (Golden Eagle) (Comstock district)	1989: 1 million tons, 0.037 opt Au 1990: 6.3 million tons, 0.043 opt Au *geologic resource*—1.16 million oz Au 1991: *geologic resource*—29.3 million tons, 0.04 opt Au 1993: 362,000 tons, 0.064 opt Au, 0.97 opt Ag, *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: Withheld 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 1995: 5,300 oz Au, 58,000 oz Ag 1996: 2,080 oz Au, 31,500 oz Ag	Alta Formation	12 Ma
Oliver Hills (Comstock district)	1990: 3.37 million tons, 0.054 opt Au, 1.2 opt Ag 1991: *geologic resource*—8.5 million tons, 0.060 opt Au, 0.60 opt Ag 1993: 4 million tons, 0.05 opt Au, 0.5 opt Ag, *geologic resource*—225,000 oz Au and 2.25 million oz Ag	1991: 573 oz Au, 6,947 oz Ag		
WASHOE COUNTY				
Mountain View Gold Project (Deephole district)	1995: 19.5 million tons, 0.027 opt Au		rhyolite	Miocene
Olinghouse (Olinghouse district)	1994: *geologic resource*—500,000 opt Au, 0.057 opt Au 1995: *geologic resource*—775,000 oz Au, *proven and probable reserves*—9,655,000 tons, 0.036 opt Au		Miocene andesite	Miocene

continued

MAJOR PRECIOUS METAL DEPOSITS (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
WHITE PINE COUNTY				
Alligator Ridge (Bald Mountain district)	1989: 1 million tons, 0.064 opt Au 1990: 624,000 tons, 0.059 opt Au, *geologic resource*—2.1 million tons 0.043 opt Au 1992: 11.5 million tons, 0.046 opt Au; *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 1995: idle 1996: *see* Bald Mountain	Pilot Shale	Mesozoic or early Tertiary
Bald Mountain (Top) (Bald Mountain district)	1989: 6.7 million tons, 0.069 opt Au 1990: 8.7 million tons, 0.062 opt Au 1992: *geologic resource*—600,000 oz Au 1996: 30 million tons, 0.033 opt Au proven and probable reserves; 21 million tons, 0.05 opt Au other resources	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 1995: 114,200 oz Au, 11,800 oz Ag 1996: 107,708 oz Au, 50,660 oz Ag (includes Alligator Ridge)	quartz porphyry, Cambrian shale and limestone	Jurassic?
Bellview (White Pine district)	1988: 277,000 tons, 0.04 opt Au, *geologic resource*—1 million tons, 0.036 opt Au			
Casino/Winrock (Bald Mountain district)	1989: **Casino** - 804,000 tons, 0.054 opt Au; **Winrock** 1.3 millon tons, 0.037 opt Au 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) (White Pine district)	1989: 5.68 million tons, 0.031 opt Au 1991: 137,000 oz Au	1990: 11,500 oz Au, 900 oz Ag	Devonian and Mississippian rocks	Eocene
Golden Butte (Cherry Creek district)	1989: 4.23 million tons, 0.031 opt Au	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
Griffon Gold Property (White Pine district)	1993: *geologic resource*—60,000 oz Au 1994: *geologic resource*—50,454 oz Au, 0.039 opt Au 1995: *proven and probable reserves*—2,737,000 tons, 0.025 opt Au		upper Joana Limestone	
Horseshoe (Bald Mountain district)	1991: 1.5 million tons, 0.039 opt Au	exploration	Pilot Shale and intrusive quartz porphyry	36-38 Ma
Illipah (Illipah district)	1988: mined out 1996: new exploration	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. (Bald Mountain district)	1989: 200,000 tons, 0.13 opt Au; *geologic resource*—260,000 tons, 0.127 opt Au 1993: 140,000 tons, 0.13 opt Au, *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 (White Pine district)	1988: 7.7 million tons, 0.05 opt Au, 0.5 opt Ag 1994: *reserve*—9.04 million tons, 0.052 opt Au, 0.38 opt Ag 1996: 10.8 million tons, 0.038 opt Au, 0.24 opt Ag	1988: preproduction 1993: idle 1995: 52,000 oz Au, 100,000 oz Ag 1996: 35,000 oz Au, 71,500 oz Ag	Dunderberg Shale	Cretaceous
Pan (White Pine district)	1989: 241,000 oz Au			

MAJOR PRECIOUS METAL DEPOSITS (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
WHITE PINE COUNTY (continued)				
Robinson (Robinson district)	1989: 46.0 million tons, 0.019 opt Au; *geologic resource*—1 million oz Au 1991: *geologic resource*—200 million tons 0.012 opt Au 1992: 1.2 million oz Au, *geologic resource*—2.21 million oz Au 1994: *geologic resource*—252 million tons, 0.553% Cu, 0.0102 opt Au	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 1996: 39,000 oz Au, 170,000 oz Ag, and 84 million pounds of Cu	Rib Hill Sandstone Riepe Spring Limestone	Cretaceous
Taylor (Taylor district)	1980: 10 million tons, 3 opt Ag	1980: 1,200 tons/day 1995: idle	Guilmette and Joana Limestones, rhyolite dikes	Eocene or Oligocene
White Pine (White Pine district)	1989: 63,000 oz Au, 0.04 opt Au	1989: 20,654 oz Au	Pilot Shale	Oligocene?
Yankee (Bald Mountain district)	1992: 683,000 oz Au	1990: ~15,000 oz Au 1992: 10,800 oz Au 1993: *see* Bald Mountain	Pilot Shale	36-38 Ma?

Newmont Gold Production

Production data for individual mines owned by Newmont Gold Co. are not available in some cases, particularly during 1988-1993. Total production of Newmont operations in Nevada by years is as follows:

Year	Gold (oz)	Silver (oz)
1988	895,500	
1989	1,467,800	117,400
1990	1,676,000	
1991	1,575,700	
1992	1,588,000	98,000
1993	1,666,400	175,000
1994	1,554,000	158,000
1995	1,634,500	188,000
1996	1,700,000	322,000

Industrial Minerals

by Stephen B. Castor

Although record gold production was the most significant mining industry news in Nevada for 1997, the state also had an exceptional year in terms of industrial mineral production. The estimated total value of industrial minerals was about $397 million, an increase of about 18% over 1995. In order of estimated dollar value, the most important Nevada industrial minerals produced in 1996 were aggregate, diatomite, lime, barite, cement, lithium, gypsum, silica, clay, and magnesia. Data used for these estimates, and data reported for individual commodities below, were obtained from the Nevada Department of Minerals or directly from companies that produced industrial minerals.

AGGREGATE (SAND, GRAVEL, AND CRUSHED STONE) In 1996, construction aggregate production in Nevada had an estimated total value of $135 million and was ranked second among the state's mined commodities, surpassed only by gold. For 1996, statewide aggregate production is estimated at 30 million tons, up about 7% from 1995. Production in the Las Vegas area, which accounted for about 21 million tons, increased about 5% from 1995, while production in the Reno-Sparks-Carson City area, estimated at 5.5 million tons, was about 22% more than in 1995. In 1996, aggregate produced from sand and gravel deposits accounted for 83% of aggregate production statewide, with crushed stone and lightweight aggregate making up the balance.

Total aggregate production estimated for the Las Vegas area in 1995 (16.5 million tons as reported in NBMG Special Publication MI-1995) was too low; it is now estimated at 20 million tons. Production of base material using portable crushers at large construction sites, such as the Del Webb Summerlin Project, and from two new large-scale permanent aggregate sources were not included in the 1995 figure. The new sources are the Blue Diamond Materials sand and gravel pit southwest of Las Vegas and the Lopke Granite Products crushed stone quarry at Railroad Pass south of Henderson.

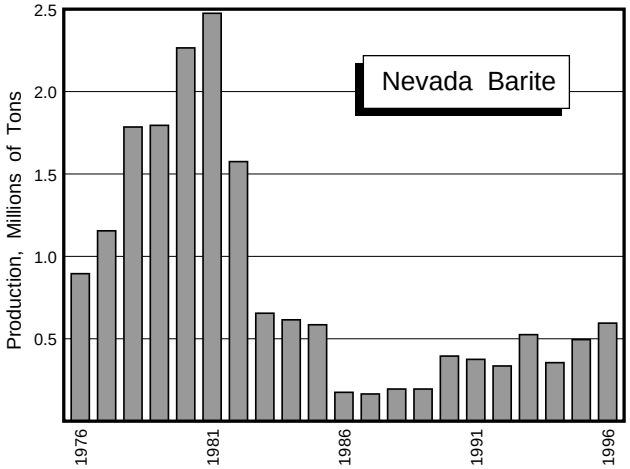
Companies in the Las Vegas area that produced more than a million tons in 1996, ranked in approximate order of tonnage produced, were Nevada Ready Mix Corp., Bonanza Materials, Inc., WMK Transit Mix, Inc., Wells Cargo, Inc., Lopke Granite Products, Blue Diamond Materials Co., and Las Vegas Paving Corporation. Las Vegas area community pits, which are administered by the U.S. Bureau of Land Management, provided an estimated 3 million tons in 1995. As in the past five years, the most important source of aggregate in the Las Vegas region in 1996 was alluvial sand and gravel deposits in the Lone Mountain area which adjoins the Las Vegas metropolitan area in the northwest. While significant production still comes from the Spring Mountain Road area, which is now within the urbanized area of Las Vegas, future production likely will come increasingly from more distant sources. In 1996, common aggregate was hauled into Las Vegas from pits as much as 50 miles to the northeast in Clark and Lincoln Counties. In addition, increasing amounts of volcanic cinder, which is mainly used in lightweight concrete block, are hauled 80 miles from the Cind-R-Lite operation in Nye County.

In 1996, crushed stone and lightweight aggregate accounted for about 8% of aggregate used in the Las Vegas metropolitan area. Major crushed stone producers in the Las Vegas area were Lopke Granite Products, Frehner Construction Co., and Southern Nevada Lightweight.

In the Reno-Sparks-Carson City area, only Granite Construction Co. produced more than a million tons of aggregate in 1996. Companies that produced 500,000 or more tons in 1996 included Rocky Ridge Inc., All-Lite Aggregate Company, and Rilite Aggregate Co.. Crushed rock continued to be an important source of aggregate in this area; crushed rock operations of Granite Construction and Rocky Ridge Inc. and lightweight rhyolite aggregate from All-Lite Aggregate Company, Rilite Aggregate Company, and Naturalite Aggregate Corp. accounted about 40% of the aggregate used in 1996 in the Reno-Sparks-Carson City area.

BARITE In 1996, barite shipments from Nevada were about 603,000 tons, 17% more than in 1995 and the highest since 1984. M.I. Drilling Fluids Co., a subsidiary of Smith International, was the largest producer in 1996, shipping nearly 360,000 tons of barite that included high-grade crude ore from the Greystone Mine and ground and bagged barite from its Battle Mountain plant, both in Lander County. Baker Hughes INTEQ, which produced barite at its Argenta property near Battle Mountain, Lander County, was second with shipments of slightly more than 130,000 tons. Baroid Drilling Fluids Inc. was the third largest Nevada producer in 1996, shipping barite from the Dunphy mill in Eureka County and the Rossi

Mine in Elko County. Standard Industrial Minerals mined barite from the P and S Mine in Nye County and shipped small amounts of relatively high-value, paint-grade, white barite from its processing plant in Bishop, California.



BORATE American Borate Co. produced colemanite concentrate in 1996 at the Lathrop Wells mill in Nye County from ore mined 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 Las Vegas Rock produced building and landscape rock from Cretaceous Aztec Sandstone at Goodsprings, Clark County. 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 1996.

CEMENT The Nevada Cement Co., a subsidiary of Centex Construction Products, Inc., is the only cement manufacturer in Nevada. Portland cement produced at the company's plant in Lyon County near Fernley is an important part of the company's business, which also includes cement plants in Wyoming, Texas, and Illinois. All of the Centex cement plant production was "sold out" in 1996 at prices up 6% over those in 1995. Raw materials for the cement include limestone mined from quarries about 7 miles southeast of the plant, along with regionally mined clay, iron ore, and gypsum.

CLAY Clay production in Nevada in 1996 was the highest since 1991, according to NBMG records. IMV Division of Floridin Co., a subsidiary of the giant RTZ PLC, was the largest producer of clay in Nevada in 1996 in terms of dollar value. In 1996, an agreement to sell off Floridin was held up by anti-trust action. A separate agreement to sell IMV, which consists solely of the Nevada clay operation, to a small industrial mineral company in San Luis Obispo, California, is dependent on the outcome of this action. IMV mines sepiolite, montmorillonite, and saponite from several open pits and operates a processing plant in Amargosa Valley, Nye County. Sepiolite is the most important clay mineral produced in terms of both total tonnage and value. In the past, IMV produced organoclad clays, mainly from hectorite mined nearby in California. However, IMV sold its hectorite property in 1994 and is no longer in the organoclad clay business.

American Colloid Co. mines montmorillonite in Pershing County and hectorite in Humboldt County and ships most of this clay to South Dakota for processing. Some of the clay from the Lovelock mine was used with diatomite to make cat litter at a plant in Churchill County. Vanderbilt Minerals Co. mined clay from sites in Pershing, Esmeralda, and Nye Counties, and shipped it from a crushing plant near Beatty in Nye County. The Art Wilson Company shipped a small amount of montmorillonite in 1996 from a clay mine in Lyon County. Halloysite clay is mined from a deposit in Washoe County by the Art Wilson Co. for Nevada Cement. This halloysite production is not reported as clay in NBMG mineral production figures because it is included in cement. Minor Natural Minerals, Inc. of Pennsylvania reportedly mined montmorillonite for sale into agricultural markets from a deposit formerly owned by Tuttle's Golden Minerals west of Hawthorne in Lyon County. However, the U.S. Forest Service, which administers the land, has no record of mining at the property since 1988.

Exploration for clay in Nevada in 1996 included evaluation by Oil-Dri Corp. of a "fuller's earth" deposit a few miles north of Reno in Hungry Valley, Washoe County. In addition, the company continues to hold claims on a mixed clay and diatomite deposit in the Smoke Creek Desert of Washoe County. Specialty Clays, Inc. is evaluating a clay deposit near Salt Wells in Churchill County, and American Colloid has staked claims in the vicinity of the Jupiter Mine near Wabuska in Lyon County.

DIATOMITE Eagle-Picher Minerals, Inc., a division of Eagle-Picher Industries, Inc., produces most of Nevada's diatomite at three different operations. The company processes diatomaceous earth filtration products at its Colado plant in Pershing County from diatomite mined northwest of Lovelock, diatomite that is mainly used in fillers and absorbents at its Clark plant and mine in Storey County, and diatomite used in insulation from a pit near Hazen in Lyon County. Eagle-Picher Industries emerged from Chapter 11, which it entered in 1991, on November 29, 1996; an earlier report of emergence in 1995 was premature.

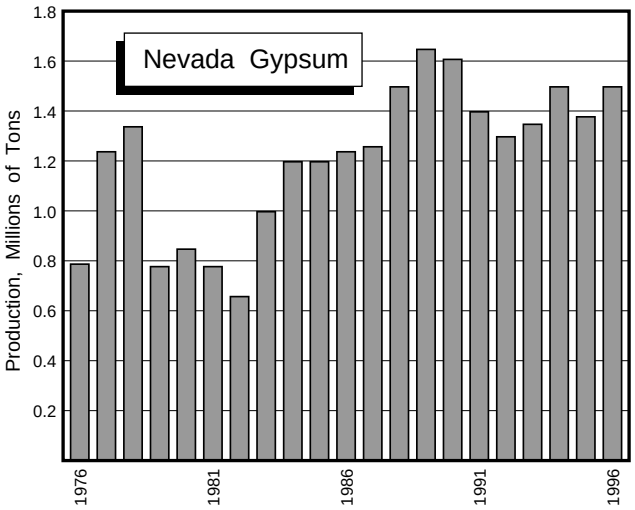
Entry into Chapter 11 was forced by asbestos-related personal injury claims estimated at $2.5 billion that are unrelated to Eagle-Picher operations in Nevada.

In terms of volume, Moltan Co. of Memphis, Tennessee is the second largest diatomite miner in Nevada, producing cat litter, oil absorbent, and soil conditioner from diatomite mined in Churchill County northeast of Fernley. Other companies that produced diatomite in Nevada in 1996 were Grefco Inc. at its Basalt operation in Esmeralda and Mineral Counties, CR Minerals at Hazen in Lyon County, and American Colloid at Eastgate, Churchill County. The American Colloid Eastgate operation produces cat litter in a plant previously used by another company to process zeolite from a mixture of clay mined near Lovelock and diatomite from an unspecified source in Nevada.

FLUORSPAR Minor amounts of fluorspar were sold from stockpiled ore in Beatty. The fluorspar was mined from the nearby Crowell Fluorspar Mine in Nye County, which closed in 1989.

GARNET In 1996, Golden Kootenay Resources, Inc., constructed a 10,000-ton/year pilot plant to process andradite garnet from a replacement deposit at the Black Horse tungsten mine about 12 miles west of Coaldale Junction in Esmeralda County. The deposit is reported to be 4,000 feet long and as much as 300 feet wide. The ore, which consists of about 80% garnet, 13% diopside, and 7% calcite, is crushed, washed with dilute acid to remove the calcite, dried, and screened to produce a concentrate that contains 95-96% garnet. The company hopes to sell the concentrate as a sand-blasting agent and has hired a distributor to market it.

GYPSUM Total gypsum production in Nevada in 1996 is estimated at 1.5 million tons, about 8% more than in 1995. Most of this gypsum is used to make wallboard at plants in Nevada. The Blue Diamond, Clark County, operation of James Hardie Gypsum was the largest producer at about 530,000 tons. Approximately 400,000 tons of this was used to make nearly 500,000 million square feet of wallboard, and the rest was sold as plaster or to cement plants. USG Corp., which mines gypsum in Pershing County, was the second largest producer in the state at about 440,000 tons. USG processes gypsum into wallboard and plaster at Empire in Washoe County. Although PABCO Gypsum in Clark County east of Las Vegas mined more than 540,000 tons of ore in 1996, actual production of gypsum was less than 400,000 tons because the ore contains only 60 to 70% gypsum. PABCO processes most of this gypsum into wallboard. The Art Wilson Company, Carson City, shipped about 135,000 tons of gypsum from the Adams Mine in Lyon County for use in cement and agricultural markets. Georgia Pacific Corp., which has a wallboard plant northeast of Las Vegas, performed little or no mining in Nevada but purchased gypsum from the Western Gypsum Mine near St. George, Utah.



LIME, LIMESTONE, AND DOLOMITE In 1996, lime production in Nevada reached record levels, increasing nearly 60% over 1995. Two companies produced approximately equal amounts of lime from carbonate rock mined in Nevada. Chemical Lime Co. makes high-calcium lime at Apex northeast of Las Vegas and dolomitic lime at a plant in Henderson. For raw materials, the company mines limestone adjacent to the Apex plant and dolomite at Sloan south of Las Vegas. The high-calcium lime is sold into gold mine processing, paper manufacturing, and environmental markets; the dolomitic lime is mostly used in construction. The Continental Lime, Inc. Pilot Peak high-calcium lime operation near Wendover in Elko County, mainly sells lime to Nevada gold mining operations for use in pH control.

In addition to lime, Chemical Lime Co. produces non-calcined dolomite and limestone. Min-Ad, Inc. and Nutritional Additives Corp., both located near Winnemucca, produce ground dolomite for agricultural use. Min-Ad's production, about 56,000 tons in 1996, has increased steadily over the past seven years.

LITHIUM Lithium carbonate has been extracted from brines pumped from beneath the Clayton Valley dry lake in Esmeralda County since 1965, when Foote Minerals began production. At present, Cyprus Foote Mineral Co., a subsidiary of Cyprus Amax Minerals Co. that was formed by merger in 1988, produces lithium carbonate from the brine at a plant in nearby Silver Peak. In addition, the company also sells lithium hydroxide monohydrate and anhydrous

lithium hydroxide prepared at this plant. The company is the largest lithium producer in the world; in addition to the Nevada operation it extracts lithium from brine in Chile. The lithium operations of Cyprus Amax earned a record $30 million in 1996, up 9% from the previous record in 1995. Although lithium producers enjoyed expanding markets and increasing prices for years, the lithium market was slightly oversupplied in 1996 and the price has been relatively stable since 1993. It is possible that production from new lithium brine operations in South America, along with that from lithium pegmatites in Australia, Africa, and North America, will cause lithium prices to decline in the near future.

MAGNESIA Annual production of magnesia from magnesite at Gabbs, Nye County, by Premier Services Corp. was approximately the same in 1996 as in 1995. The Gabbs operation mainly produces light-burned or caustic magnesia for use in western U.S. agricultural markets. In addition, the company sells relatively small amounts of the mineral brucite ($Mg[OH]_2$), which is mined from the Gabbs magnesite deposit.

PERLITE Eagle-Picher Minerals Inc. produces expanded perlite in a popping plant at the Colado diatomaceous earth facility in Pershing County. The perlite is mined at the Popcorn Mine in Churchill County. The Wilkin Mining and Trucking Co. mines perlite from the Mackie Mine, Lincoln County, and operates a small popping plant in Caliente. In addition, USG Corp. expands perlite for use in wallboard at its plant in Washoe County, but purchases the raw perlite from a mine in California. Nevada is one of only five states with perlite mining operations, but annual production from Nevada mines is small when compared to that of New Mexico and Oregon.

SALT The Huck Salt Co. of Fallon produced about 13,000 tons of salt in 1996. The salt, mined from Fourmile Flat in Churchill County, is mainly used as road salt in Nevada.

SILICA Simplot Silica Products at Overton, Clark County, produced 655,000 tons of silica sand in 1996, a decrease of about 5% from 1995. The sand is mined from a large deposit of Cretaceous sandstone nearby and transported via a slurry pipeline to the plant. In 1996 an unknown amount of silica was produced from a deposit of friable, opaline rock owned by Mining Enterprises Inc. that is about 5 miles north of Lida Junction in Esmeralda County. The operating company, Marlin Pacific Mines Inc., mines and screens the silica.

ZEOLITES In 1996, American Resource Corp. processed small amounts of clinoptilolite mined in California at its plant in Nye County.

Geothermal Energy

by Ronald H. Hess

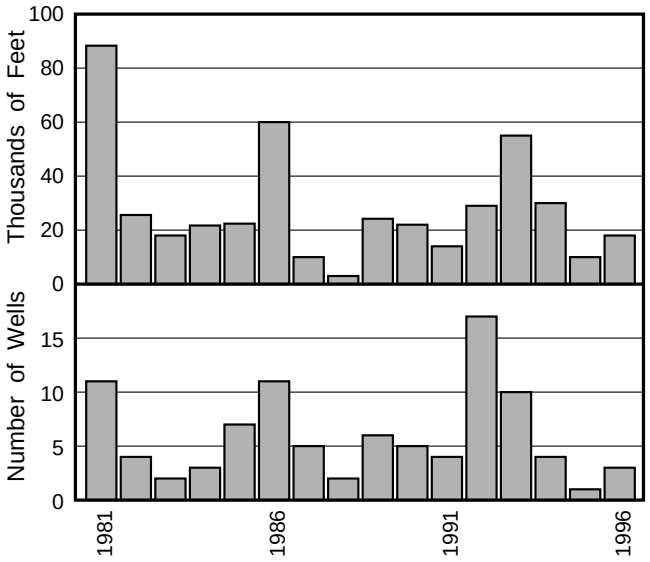
Seven geothermal well permits were issued during 1996 by the Nevada Division of Minerals: five industrial/ commercial class wells (including one redrill), one gradient well, and one redrill of an injection well. During the same period three industrial/commercial class wells (one redrill), one injection well, and one gradient well were reported to have been drilled. A total of about 21,300 feet was drilled during 1996.

During 1996 there were 102 federal geothermal noncompetitive leases in effect covering 153,377 acres and 43 competitive federal leases covering 51,251 acres in Nevada. This is a decrease of 9,623 noncompetitive lease acres and an increase of 2,251 competitive lease acres from 1995 totals. The annual rental fee paid for these leases was $183,875. Total gross electrical production from geothermal resources on public lands was 1,259,224 megawatt-hours (MWh); net production was approximately 1,050,000 MWh. Gross electrical sales from federal lands totaled $105 million. Production royalties on that amount equaled $4,897,128. By regulation, half of all rental fees and royalties are returned to the state and in 1996 the total amount of fees returned to the state was $2,540,502. (R. Hoops, personal commun., 1997, Bureau of Land Management)

Total Nevada geothermal electrical production from both federal and fee lands combined in 1996 was 1,668,428 MWh gross; net production was 1,358,558 MWh (Nevada Division of Minerals, 1997) with a sales value of about $108.7 million. Production capacity from the currently developed geothermal resources at ten existing geothermal power plants in Nevada is 210.5 megawatts. Nevada is second only to California in total installed geothermal generating capacity.

Bradys Hot Springs

A new production well, number 27-1, was brought on-line on October 24 by Brady Power Partners at the Bradys Hot Springs Plant. It replaced well number 56A-1 which was shut-in. The Bradys Power Plant produced 169,786 MWh gross (131,160 MWh net) during 1996, which was 17,791 MWh gross (12,288 MWh net) less than 1995 output. (Nevada Division of Minerals, 1997)



Industrial-class (power generating) wells drilled in Nevada, 1980-1996.

Dixie Valley

The U.S. Department of Energy, in a cooperative technology development program with Oxbow Geothermal Corp., is supporting a design and demonstration project of a low-temperature flash steam plant designed to utilize lower temperature fluids that are currently being discharged from the Dixie Valley Plant. This additional low-temperature steam flash plant should produce 4,690 kilowatts (kW) of additional power from 230EF fluid that is being discharged from the Dixie Valley Plant.

NONDOMESTIC GEOTHERMAL WELLS REPORTED AS DRILLED OR COMPLETED IN NEVADA DURING 1996

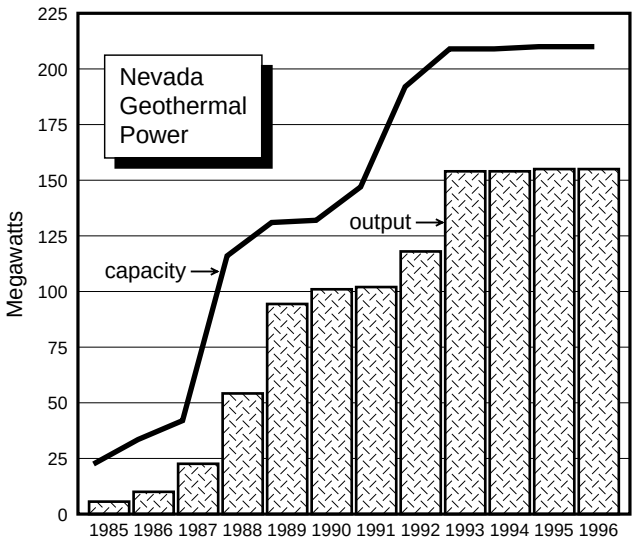
Area	Company	Well name	Permit no.	Location	Type
Churchill County					
Bradys Hot Springs	Brady Power Partners	Well #27-1	437	SW1/4 SW1/4 S1,T22N,R26E	Production
Dixie Valley	Oxbow Geothermal	Production Well #82A-7	88	NE1/4 NE1/4 S7,T24N,R37E	Production (redrill)
Dixie Valley	Oxbow Geothermal	Production Well #24-5	440	SW1/4 NW1/4 S5,T24N,R37E	Production
Stillwater	Oxbow Power Services	S.T. Well #1 (36-32)	431	NE1/4 SW1/4 S32,T18N,R30E	Thermal gradient
Washoe County					
Steamboat	Steamboat Development Corp.	Well IW-4 SDCT-35-28	299	NE1/4 SW1/4 S28,T18N,R20E	Injection (redrill)

If this project is successful it will demonstrate the ability to utilize flash steam power generation technology to develop lower temperature resources than previously thought feasible. It is anticipated that the installed cost of this flash plant addition will be less than $1,100 per kWe, which is significantly lower than $1,760 per kWe cost of an installed binary system. (Geothermal Progress Monitor No. 17, 1995).

Steamboat Hot Springs

Reno Energy, owned by Far West Capital Group, has requested approval to develop a heating district with the potential to eventually heat 30 million square feet of industrial and commercial space. The project is located in southern Reno, which is a rapidly developing area. It will use brine discharged from electrical generation plants currently operating at Steamboat to heat a freshwater closed loop system that will circulate throughout the heat district. The freshwater in the closed loop system will be heated to 240EF with connections to energy users metered for volume and energy consumption. The used brine from this process will be reinjected to the geothermal resource.

If all approvals are obtained, construction of the main freshwater loop is planned to begin in April of 1997 at a projected cost of $41 million. It is estimated that this system could save its customers between 35 and 55% of long term cost of conventional heating and cooling. (Reno Energy LLC News Release, 1996).



Rated capacity and average net output of Nevada geothermal plants, 1985–1996. 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.

NEVADA GEOTHERMAL POWER PLANTS 1996

Plant name (year on line)	Production capacity[1] (MW)	1996 Production (MWh) Gross	Net (sales)	Location	Operator
Beowawe (1985)	16.7	138,185	108,890	S13,T31N,R47E	Oxbow/Beowawe Geothermal Power Co. HC 66, Unit 1, Box 16 Beowawe, NV 89821
Bradys Hot Springs (1992)	21.1	169,786	131,160	S12,T22N,R26E	Brady Power Partners P.O. Box 649 Fernley, NV 89408
Desert Peak (1985)	9.9	74,290	65,792	S21,T22N,R27E	Western States Geothermal Co. P.O. Box 2627 Sparks, NV 89432-2627
Dixie Valley[2] (1988)	66.0	535,600	481,362	S7,T24N,R37E S33,T25N,R37E	Oxbow Geothermal Corp. 5250 South Virginia St., Suite 304 Reno, NV 89502
Empire (1987)	3.6	14,640	10,281	S21,T29N,R23E	Amor II Corporation P.O. Box 40 Empire, NV 89405
Soda Lake No. 1 (1987) and Soda Lake No. 2 (1991)	16.6	129,185	98,934	S33,T20N,R28E	Nevada Operations, Inc. 5500 Soda Lake Road Fallon, NV 89406
Steamboat I, I-A (1986) and Steamboat II, III (1992)	48.0	413,358	312,284	S29,T18N,R20E	S.B. Geo, Inc. P.O. Box 18199, 1010 Power Plant Dr. Reno, NV 89511
Stillwater (1989)	13.0	113,765	77,863	S1,T19N,R30E S6,T19N,R31E	Nevada Operations, Inc. 5500 Soda Lake Road Fallon, NV 89406
Wabuska (1984)	1.2	0	0	S15,16,T15N, R25E	Tad's 10 Julian Lane Yerington, NV 89447
Yankee Caithness (1988)	14.4	79,619	71,992	S5,6,T17N,R20E	Yankee Caithness J.V.L.P. P.O. Box 18160 Reno, NV 89511
TOTAL	210.5	1,668,428	1,358,558		

[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.

Oil and Gas

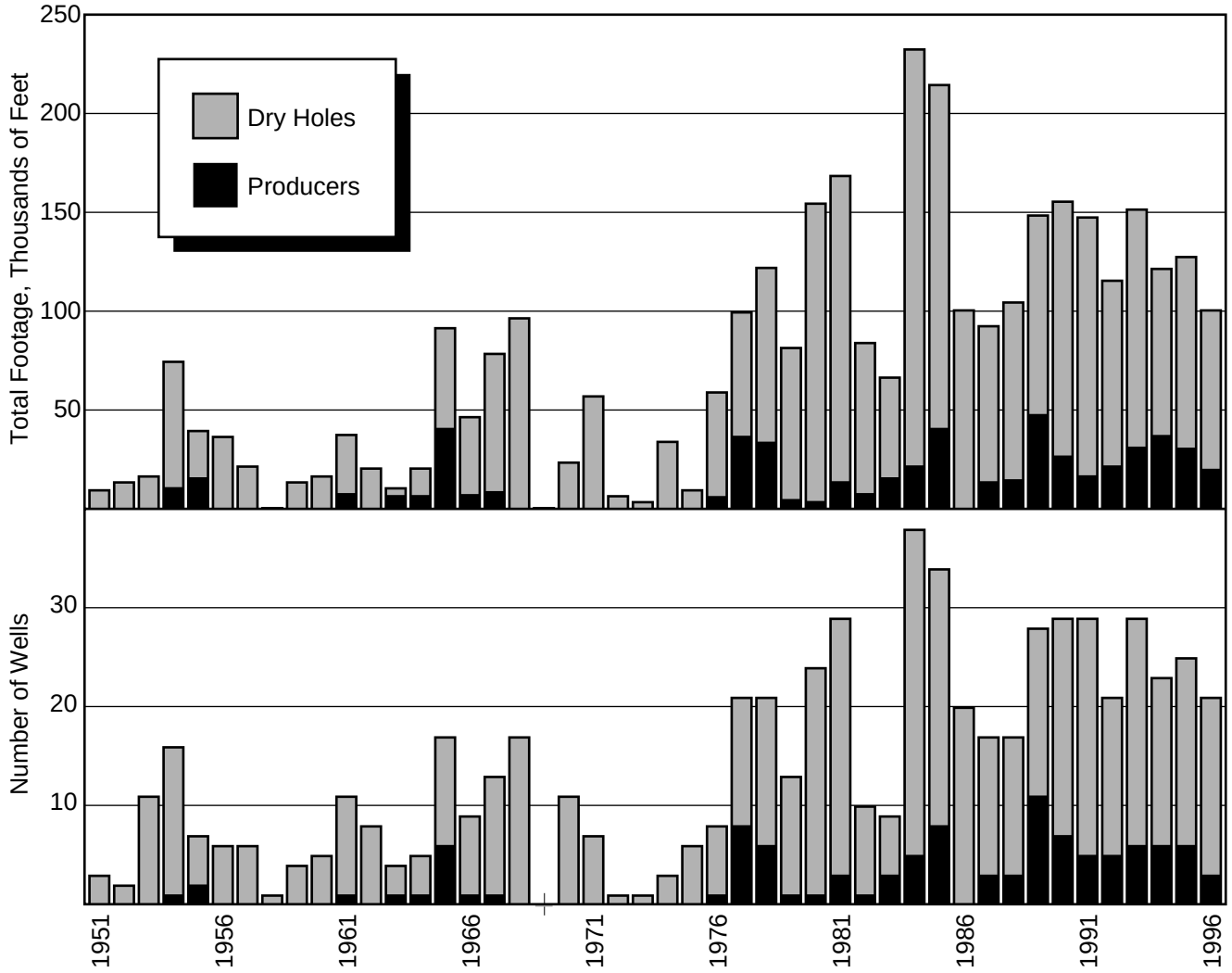
by David A. Davis

Production

Nevada currently produces oil from 11 fields in Nye and Eureka Counties. Of the 92 wells listed as producers in 1996, three were new producers, seven were shut in for 6 to 12 months, and 18 were shut in for the entire year. The total net oil production in 1996 was 1,059,106 barrels, which is 0.04% of the total U. S. production. The sales value was estimated at $15.9 million according to the Nevada Division of Minerals. The 21.1% decline in oil production from 1995 to 1996 is due to an overall drop of 25.9% in production in nine fields and the shutting in of one field. Production increased only in the Eagle Springs Field, and the new Ghost Ranch Field came on line.

For the first nine months of the 1996, Nevada's highest volume producer, for the third year in a row, was Blackburn Unit No. 19 (Petroleum Corp. of Nevada), which averaged 372 barrels oil and 687 barrels of water per day for the year. For the last three months of 1996, Nevada's second highest producer, Grant Canyon No. 9 (Makoil, Inc.), overtook Blackburn Unit No. 19 and finished the year as Nevada's highest volume producer. It averaged 404 barrels of oil and 352 barrels of water per day during 1996.

Production from the Bacon Flat Field decreased 32.9%. Only one of its three wells produced in both 1995 and 1996. Production from the Blackburn Field decreased 45%. Production increased at one well, but was offset by decreases at the remaining five



producers. The Currant Field was shut in throughout 1996, and production from the one producer in the Duckwater Creek Field decreased 33.9%.

Production from the Eagle Springs Field in 1996 increased 5.8% over 1995. The addition of one new producer and increased production from eight wells offset decreased production from 10 wells and the shutting in of one well for the year. Eagle Springs Ltd. suspended production of two wells for six months or more and shut in one well for the entire year.

The new Ghost Ranch Field came on line with one producer in August 1996, and ended the year as the sixth out of Nevada's 11 producing oil fields. Production from the Grant Canyon Field decreased 16.8%. Two

OIL WELL DRILLING ACTIVITY IN NEVADA IN 1996

Company	Well	Permit no.	Location	Spud date	Depth (feet)	Status (31 Dec 96)
ELKO COUNTY						
Foreland Corp. (Formerly: Sun Exploration)	Deadman Creek No. 44-13 (Formerly: Southern Pacific No. 3-13)	342	$SE^1/_4$ $SE^1/_4$ S13 T39N R65E	Nov 95	8865	Producer
EUREKA COUNTY						
Trail Mountain, Inc.	Three Bar Unit No. 6	765	$SW^1/_4$ $SE^1/_4$ $NE^1/_4$ S25 T28N R51E	Mar 96	9350	TA
Petroleum Corp. of Nevada	Blackburn No. 20	776	$NW^1/_4$ $SE^1/_4$ S7 T27N R52E	Apr 96	6974	P&A
Phillips Petroleum Co.	Alpha Strat No. 1	785	$SE^1/_4$ $NW^1/_4$ S27 T25N R52E	Jul 96	2130	P&A
Foreland Corp.	Pine Creek No. 1-7	787	$NE^1/_4$ $NE^1/_4$ $NE^1/_4$ S7 T28N R52E	Jul 96	W	W
LINCOLN						
Frontier Exploration Co.	Cobb Creek Federal No. 11-1	751	$NW^1/_4$ $NW^1/_4$ S11 T6N R70E	Oct 96	W	W
Tide Petroleum Co.	Baseline Canyon Unit Federal No. 2	762	$NE^1/_4$ $SW^1/_4$ $SW^1/_4$ S21 T1N R59E	Nov 95	W	W
Conley P. Smith Operating Co.	Cave Valley Federal No. 13-10	777	$NW^1/_4$ $SE^1/_4$ S13 T7N R63E	Dec 95	5600	P&A
Conley P. Smith Operating Co.	Sidehill Pass Federal No. 18-13	778	$SW^1/_4$ $SW^1/_4$ S18 T6N R64E	Feb 96	6802	P&A
Falcon Energy LLC	Hamlin Wash No. 19-1	782	$SE^1/_4$ $NE^1/_4$ S19 T8N R70E	May 96	6980	P&A
Hunt Oil Co.	USA No. 1-30	783	$NE^1/_4$ $SE^1/_4$ S30 T1N R66E	Jul 96	W	W
Falcon Energy LLC	Hamlin Wash No. 18-1	795	$SE^1/_4$ S18 T8N R70E			
NYE COUNTY						
Eagle Springs Production LLC	Eagle Springs/Plains Petroleum No. 13-36	744	$NW^1/_4$ $SW^1/_4$ $NW^1/_4$ S36 T9N R57E	Nov 95	6921	Producer
Eagle Springs Production LLC	Ghost Ranch No. 48-35	779	$SE^1/_4$ $SE^1/_4$ $SW^1/_4$ S35 T9N R57E	Jun 96	4545	Producer
Makoil, Inc.	Midland Trail No. 29-24	780	$SE^1/_4$ $SW^1/_4$ S29 T6N R56E	Dec 95	7150	P&A
Big West Oil and Gas, Inc.	Blue Eagle Springs No. 4-15 (Formerly: 5-15)	788	$NW^1/_4$ $NW^1/_4$ S15 T8N R57E	Oct 96	W	W
Eagle Springs Production LLC	Ghost Ranch No. 58-35	789	$SW^1/_4$ $SW^1/_4$ $SE^1/_4$ S35 T9N R57E	Oct 96	4782	P&A
Makoil, Inc.	Grant Canyon No. 21-12	790	$SW^1/_4$ $NW^1/_4$ S21 T7N R57E	Oct 96	W	Drilling (?)
Big West Oil and Gas, Inc.	Sans Springs No. 5-14A	792	$SW^1/_4$ $NW^1/_4$ S14 T7N R56E			
MKJ Xploration, Inc.	Whipple Cave Federal No. 14-1	794	$SW^1/_4$ $SW^1/_4$ S16 T8N R62E	Dec 96	W	W
Makoil, Inc.	Radio No. 6-22	796	$SE^1/_4$ $NW^1/_4$ S6 T9N R57E			
PERSHING COUNTY						
Evans-Barton, Ltd.	Kyle Spring No. 11-14	791	$SW^1/_4$ $NW^1/_4$ S11 T29N R36E			
WHITE PINE COUNTY						
Medallion Oil Co.	Federal No. 1-18	767	$SW^1/_4$ $NW^1/_4$ $NE^1/_4$ S18 T19N R58E	Oct 95	3882	P&A
Phillips Petroleum Co.	Sidewinder No. 1-1	769	$SE^1/_4$ $SW^1/_4$ S1 T22N R58E	Nov 95	8025	P&A
Phillips Petroleum Co.	Roulette No. 1	771	$SE^1/_4$ $NE^1/_4$ S20 T10N R56E	Feb 96	6854	P&A
Phillips Petroleum Co.	Three of a Kind No. 1	772	$SE^1/_4$ $NW^1/_4$ S21 T9N R56E	Dec 95	7596	P&A
Pioneer Oil and Gas Co.	Grubstake Unit Federal No. 16-1	784	$SW^1/_4$ $SE^1/_4$ S16 T21N R57E			
Pioneer Oil and Gas Co.	Maverick Springs Unit Federal No. 27-44	786	$SW^1/_4$ $SE^1/_4$ $SE^1/_4$ S27 T23N R58E	Aug 96	9579	P&A

W: Withheld in accordance with company requests and Nevada regulations.
P&A: Plugged and abandoned.
TA: Temporarily abandoned.
Drilling: Drilling not finished in 1996.

wells remained shut in through the year, and production decreased at the two remaining producers.

Production from the Kate Spring Field decreased 16.1%. Production increased modestly at one well, but decreased at four others, and Western General, Inc. shut in a sixth well for the entire year. Production from the North Willow Field decreased 43.6%. Production decreased at both producing wells, and the third producer continued to be shut in throughout 1996.

Production from the Sans Spring Field decreased 22.3%. Only one of its two wells produced in 1995 and 1996. The Three Bar Field was shut in throughout 1996. Production in the Tomera Ranch Field decreased 72.5%. Only one of its two wells produced in 1996, and that for only six months.

Production from the Trap Spring Field decreased 15.5%. The increase in production of 14 wells was offset by the decrease in production of 22 wells. Makoil, Inc., suspended production from two wells for six months or more and continued the shut-in status of four wells throughout the year. Frontier Exploration suspended production from one well for six months and continued the shut-in status of one well for the entire year.

According to the Nevada Division of Minerals, the average net wellhead price for Nevada crude oil in 1996 was approximately $15 per barrel. Most Nevada oil is used to make such products as No. 1 and No. 2 diesel fuel, kerosene, stove oil, and asphalt. Nevada crude oil is transported by tank trucks to several refineries: the Petro Source Refining Corp. 8,000 barrel per day capacity 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, and the Crysen Refining refinery at Woods Cross, Utah (presently refining only Pine Valley crude oil).

A total of 10,766 thousand cubic feet of gas was produced from the Kate Spring Field in 1996, a decrease of 20.2% from 1995. The gas is used to operate production and related equipment at the lease sites of Apache Corp. and Western General, Inc.

New Producers

Two new wells and one redrilled well were put into production in 1996. The two new wells are Eagle Springs/Plains Petroleum No. 13-36 and Ghost Ranch No. 48-35, (both Eagle Springs Production, LLC) both in Railroad Valley, and the redrilled well is Deadman Creek No. 44-13 (Foreland Corp.) in Elko County about 20 miles east-northeast of Wells.

Deadman Creek No. 44-13 was drilled to a depth of 8,865 feet in Elko County. Production began on December 16, 1996, with 29 barrels of "fluid swabbed," which included "overnight inflow," 24% "load water," and 4% "emulsion." The casing was

FEDERAL OIL AND GAS LEASES IN EFFECT IN FISCAL YEARS 1995 AND 1996[1]

County	NUMBER OF LEASES						ACREAGE					
	Competitive		Noncompetitive		Simultaneous[2]		Competitive		Noncompetitive		Simultaneous[2]	
	FY95	FY96	FY95	FY96	FY95	FY96	FY95	FY96	FY95	FY96	FY95	FY95
Carson City	0	0	0	0	0	0	0	0	0	0	0	0
Churchill	0	0	2	0	2	2	0	0	3,805	0	5,278	5,278
Clark	0	0	2	2	2	2	0	0	1,262	1,262	5,761	5,761
Douglas	0	0	0	0	0	0	0	0	0	0	0	0
Elko	27	23	134	55	38	15	41,550	34,703	236,208	92,238	117,929	38,385
Esmeralda	0	0	7	11	0	0	0	0	20,549	26,312	0	0
Eureka	58	33	102	108	87	47	83,416	45,165	164,678	179,959	261,650	144,414
Humboldt	0	0	0	0	0	0	0	0	0	0	0	0
Lander	0	0	2	3	0	0	0	0	3,874	5,953	0	0
Lincoln	52	42	248	224	28	17	88,683	71,602	534,002	486,498	126,521	73,968
Lyon	0	0	0	0	0	0	0	0	0	0	0	0
Mineral	0	0	0	2	0	0	0	0	0	12,441	0	0
Nye	304	274	327	285	215	135	279,891	229,916	585,439	499,458	275,329	151,142
Pershing	19	20	16	15	0	0	40,399	40,519	32,009	27,941	0	0
Storey	0	0	0	0	0	0	0	0	0	0	0	0
Washoe	0	0	0	0	0	0	0	0	0	0	0	0
White Pine	136	79	260	170	108	68	205,666	119,360	507,320	324,555	272,573	163,199
TOTAL	596	471	1,100	875	480	286	739,605	541,265	2,089,148	1,656,618	1,065,041	582,148

[1]Data from the U.S. Bureau of Land Management FY95 = Oct. 1994-Sept. 1995; FY96 = Oct. 1995-Sept. 1996

[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)	1989	1990	1991	1992	1993	1994	1995	1996	TOTAL
Eagle Springs (1954)	3,945,592	41,609	42,043	49,767	7,075	66,565	162,296	171,638	4,486,585
Trap Spring (1976)	8,295,840	939,792	690,257	554,410	427,150	378,955	362,985	306,858	11,956,247
Currant (1979)	641	0	0	0	0	0	278	0	919
Bacon Flat (1981)	314,660	0	0	178,845	102,030	192,601	43,057	28,891	860,084
Blackburn (1982)	1,905,504	238,240	203,023	231,719	599,857	576,853	435,975	239,934	4,431,105
Grant Canyon (1983)	11,838,668	2,345,858	2,124,021	2,499,831	495,934	308,709	202,129	168,163	19,983,313
Kate Spring (1986)	271,148	434,349	339,310	203,274	150,309	122,436	104,574	87,789	1,713,189
Tomera Ranch 1987)	6,478	2,605	3,067	2,295	2,140	1,970	1,405	387	20,347
N. Willow Creek (1988)	13,493	3,169	2,365	4,491	3,928	3,736	6,419	3,619	41,220
Three Bar (1990)		3,601	17,684	362	1,961	229	0	0	23,837
Duckwater Creek (1990)		3,095	4,190	2,764	2,256	1,269	655	433	14,662
Sans Spring (1993)					69,478	44,279	22,174	17,228	153,159
Ghost Ranch (1996)								34,166	34,166
TOTAL	26,592,024	4,012,318	3,425,960	3,727,758	1,862,118	1,697,602	1,341,947	1,059,106	43,718,833
Change from previous year		25%	-15%	9%	-50%	–9%	-21%	-21%	

perforated between 8,165 and 8,850 feet, which is in the lower part of the Miocene Humboldt Formation. Deadman Creek No. 44-13 is a redrill of Southern Pacific No. 3-13 (formerly owned by Sun Exploration), which had originally been completed to 10,932 feet and then plugged and abandoned in February 1983.

In the Eagle Springs Field, Eagle Springs/Plains Petroleum No. 13-36 was drilled to a depth of 6,921 feet. Production began February 1, 1996 with 376 barrels of fluid containing 28% water the first 24 hours, and averaged 62 barrels of oil and 56 barrels of water per day through the rest of the year. The casing was perforated between 6,610 and 6,704 feet, which is in the Paleocene to Eocene Sheep Pass Formation. Three oil and gas zones were reported between 6,357 and 6,586 feet in Tertiary volcanics, and ten were reported between 6,620 and 6,874 feet in the underlying Sheep Pass Formation. The production zones are largely within vuggy, light- to medium-gray, microcrystalline to medium crystalline, locally pelitic, lacustrine limestone with good matrix porosity.

Ghost Ranch No. 48-35, the first producer of the new Ghost Ranch Field, was drilled to 4,545 feet. Production began September 14, 1996 with 448 barrels of fluid containing 0.6% water the first 24 hours and averaging 273 barrels of oil and 31 barrels of water per day throughout the rest of the year. The casing was perforated in several places between 4,397 and 4,463 feet, which is in the Devonian Guilmette Formation. Five oil and gas zones were reported between 4,370 and 4,532 feet, all in the Guilmette Formation. The production zones are largely in medium-brown to brown-gray, finely to coarsely crystalline dolomite with fair to good crystalline and some fracture porosity and occasional vugs.

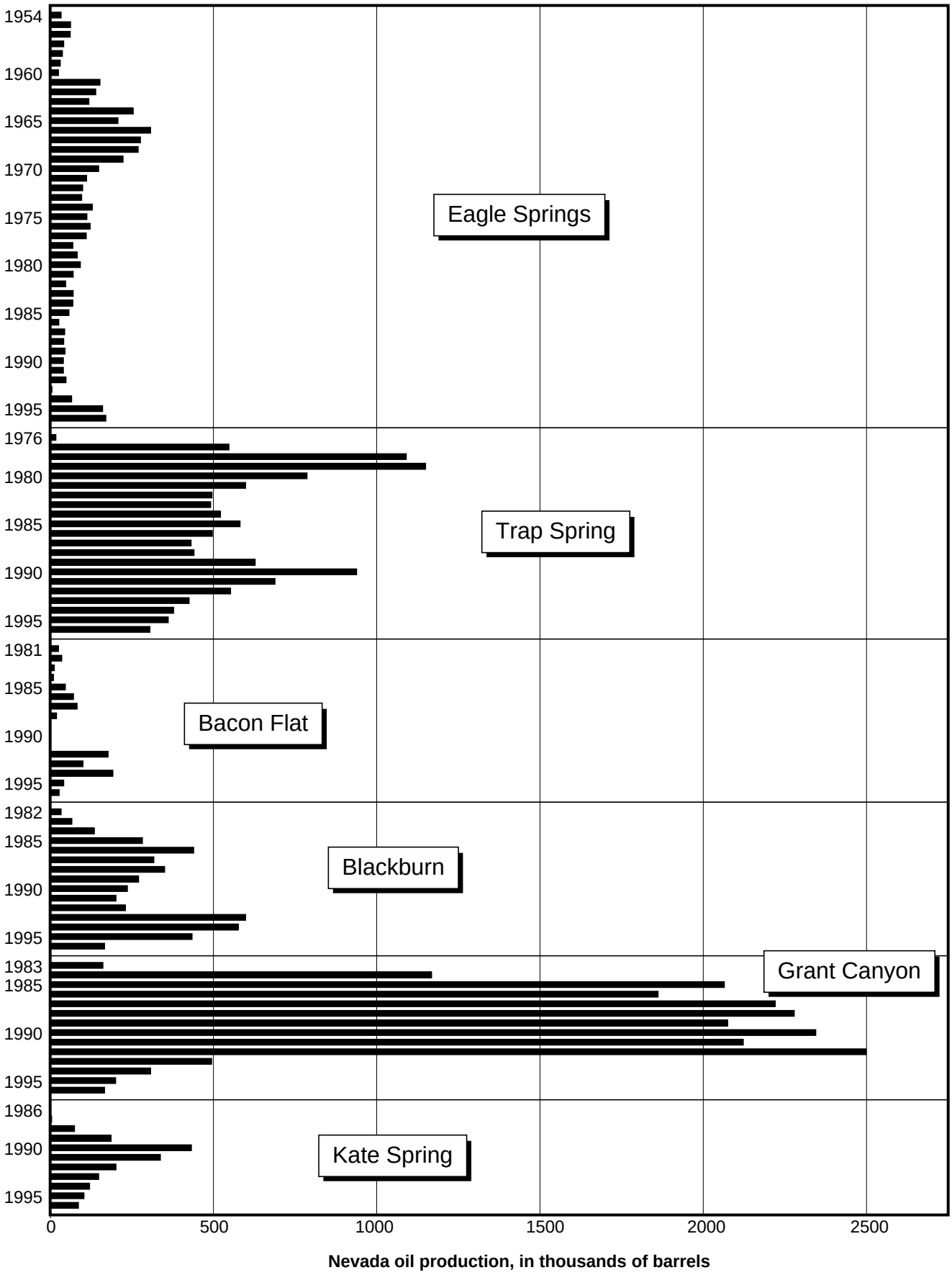
Eagle Springs Production, LLC, proposed that the Ghost Ranch discovery be considered a separate field because: 1. The structure depth of 4,500 feet and reservoir formation (Guilmette) are different from the structure depth of 6,400 to 8,400 feet and reservoir formations (Sheep Pass and volcanics) common to the Eagle Springs Field; and 2. The seismic data and oil characteristics (17 API gravity versus 10.5) suggest a separate reservoir from the Kate Springs Field.

Exploration

Fifteen wells were spudded for oil and gas in 1996, down from 25 spudded in 1995. Eight wells spudded in 1995 were completed in 1996. Drilling was completed on 21 wells totaling 101,253 feet during 1996. At year end, one well was temporarily abandoned. The peak drilling rig count started at a high of seven during January and February and varied between three and six through the rest of the year.

Oil shows were reported for one dry hole in Eureka County. Petroleum Corporation of Nevada reported its Blackburn No. 20 contained a poor to fair oil show between 6,952 and 6,974 feet consisting of medium to dark brown oil stains with dull yellow-green fluorescence and a bright-yellow streaming cut in 10% of the cuttings. Total gas of 8.8 units was also reported. The rock consisted of brown, dense, finely crystalline dolomite of the Devonian Nevada Formation.

Oil shows were reported for one dry hole in Lincoln County. Conley P. Smith Operating Co. reported at least four shows in its Cave Valley Federal No. 13-10. The first show was in black to very dark


1954
1960
1965
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Eagle Springs
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1995
Trap Spring
1981
1985
1990
1995
Bacon Flat
1982
1985
1990
1995
Blackburn
1983
1985
1990
1995
Grant Canyon
1986
1990
1995
Kate Spring
0
500
1000
1500
2000
2500
Nevada oil production, in thousands of barrels

brown petroliferous shale at 3,238 feet that upon crushing yielded a bright-yellow streaming to yellow milky cut. The second show was in three light-brown, fine-grained sandstone units between 3,594 and 3,693 feet, which contained good medium-brown oil staining with dull-yellow fluorescence and a bright-yellow streaming cut. The third show was in light- to medium-brown, fine- to medium-grained sandstone at 3,943 feet, which contained medium-brown oil staining with spotty gold fluorescence and background gas of up to 16 units. The fourth show was in light-gray to medium-brown fine-grained sandstone at 4,166 feet, which contained abundant medium-brown oil staining with gold fluorescence and a yellow streaming cut, and background gas up to 17 units. All these units are in the Mississippian Chainman Shale.

Oil shows were reported for two dry holes in Nye County. Makoil, Inc. reported at least three minor shows in its Midland Trail No. 29-24. The first consisted of asphaltic/dead oil stains between 4,280 and 4,320 feet with very dull yellow-green fluorescence and no cut coating surfaces in matrix porosity in varicolored conglomerate with clasts mostly of tuff and minor quartz sandstone, limestone, and dolomite. This show is in the Garrett Ranch caprock. The second show consisted of “chips” of thermally altered dead oil between 4,680 and 4,730 feet with no fluorescence or cut in a varicolored conglomerate of reworked fragments and pebbles of tuff and minor dolomite. The third show consisted of traces of carbonized and brittle black dead oil stains between 4,750 and 4,860 feet with no fluorescence or cut in light-reddish-brown, locally mottled, moderately to highly welded tuff. The second two shows were in the Tertiary Garrett Ranch Volcanics.

Eagle Springs Production LLC reported several shows between 4,590 and 4,782 feet in the Ghost Ranch No. 58-35. The first main show was between 4,590 and 4,612 feet at the contact between valley fill and carbonate of the Devonian Guilmette Formation where about 25% of the samples were saturated with dark-brown sticky oil with and even dull-gold fluorescence and dark-brown heavy cut in white light. The second main show was between 4,616 and 4,636 feet and was similar to the first show. The third main show was between 4,666 and 4,680 feet where about 15% of the samples contained dark-brown sticky oil with even dull fluorescence and heavy dark-brown cut. The fourth main show was between 4,728 and 4,782 feet (total depth) and consisted of dark-brown oil stains with no fluorescence and an intermediate streaming cut.

Oil shows were reported for four dry holes in White Pine County. Medallion Oil Co. reported at least four oil shows in its Federal No. 1 well. The first show consisted of scattered black dead oil stains between 630 and 650 feet with fair to poor streaming to yellow milky cut in sandstone. The second show consisted of a few chips of dolomite from between 1,070 and 1,100 feet containing dull-yellow fluorescence and weak milky cut but no stain. The third show consisted of scattered brown dead oil stains between 2,150 and 2,190 feet with weak yellow milky cut in limestone and dolomite. The fourth show consisted of dark-brown to black dead oil stains between 2,370 and 2,405 feet with gold fluorescence and a yellow milky cut. The first two shows were in the Mississippian Chainman Shale, and the second two were in the Mississippian Joana Limestone.

Phillips Petroleum Co. reported a trace oil show in its Sidewinder No. 1-1 between 5,595 and 5,630 feet in the Mississippian Joana Limestone. This consisted of traces of brown oil stains with weak to poor or no cut in limestone.

Phillips Petroleum Co. also reported a poor oil show in its Three of a Kind No. 1 between 7,103 and 7,118 feet in the Ordovician Laketown Dolomite. This consisted of trace amounts of brownish-black oil stains along calcite fractures in dark-brownish-black, well indurated, aphanitic to microcrystalline dolomite. The stains had no fluorescence but had a fast bright-yellow-white streaming cut with a dull-golden-yellow residual ring.

Pioneer Oil and Gas reported five very minor shows in it Maverick Springs Unit Federal No. 27-44 between 4,570 and 4,645 feet in the Mississippian Joana Limestone. These shows consist generally of scattered brown stains with dull fluorescence and streaming cut.

Four unit agreements and no development contracts were in effect with the Bureau of Land Management in Nevada during fiscal year 1996, which is unchanged from 1995. There were 2,780,031 acres under federal oil and gas leases in fiscal 1996, a decrease of 1,113,763 acres from 1995.

Transfers

Big West Oil and Gas, Inc. purchased the producer Federal No. 5-14 from Cenex in January 1996.

U.S. Oil Production and Consumption

According to the Energy Information Agency (EIA) of the Department of Energy (www.eia.doe.gov), petroleum imports accounted for 53.6% of U.S. consumption in 1996, which surpasses the previous annual peak of 52.4% set in 1995. 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 6,471,000 barrels per day in 1996, 1.4% less than in 1995. Petroleum consumption increased by 3.1%. Oil provided about 42% of the nation's total energy supply in 1996, according to EIA. This percentage has remained about the same since 1991. Natural gas consumption increased by 2.2%, which for the first time in ten years has been a lower rate of increase than for petroleum. The slower increase of demand for natural gas is due in part to an overall 16% rise in price. This resulted in a 13.7% drop in the use of natural gas offset by a 5.1% increase in the use of coal and a 15% increase in the use of petroleum for the production of electricity. Coal consumption increased 4.4% in 1996 as opposed to a 0.3% increase in 1995 and surpassed the rate of increase for petroleum for the first time since 1993.

Directory of Mining and Milling Operations

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

CIL = carbon-in-leach, CIP = carbon-in-pulp, 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	Huck Salt Co.	S12,T16N,R31E	salt	OS	solar evaporation	4	John R. Huckaby, Owner 5033 Austin Highway Fallon, NV 89406 702-423-2055
Moltan Mine and Plant	Moltan Co.	S28,29,32,33, T23N,R27E	diatomaceous earth	OP,ML	drying crushing screening	69	Craig Paisley, Plant Manager I-80 Frontage Road Fernley, NV 89408-0860 702-423-6668 Fax: 423-6411
Popcorn Mine	Eagle-Picher Minerals, Inc.	S24,T16N,R28E S19,T16N,R29E	perlite	OP		1	Myron S. Burdette, Operations Manager P.O. Box 10480 Reno, NV 89510 702-343-1818 Fax: 343-1821
CLARK COUNTY							
Apex Quarry and Plant	Chemical Lime Co.	S14,22,23,26,27,34,35 T18S,R63E	lime	OP,ML	crushing calcining hydrating	50	Bryan Nielson, Operations Manager P.O. Box 3609 North Las Vegas, NV 89036 702-643-7702 Fax: 643-9517
Blue Diamond Mine and Mill	James Hardie Gypsum, Inc.	S20,29-31, T21S,R59E; S5-8,T22S,R59E S24-26,T21S,R58E	gypsum	OP,ML	grinding calcining	128	Alex Beeman, Manufacturing Manager HCR 89033, Box 2900 Las Vegas, NV 89124 702-875-4111 Fax: 875-4213
Bonanza Materials Pit and Plant	Bonanza Materials, Inc.	S9,16,T22S,R62E	sand gravel	OP,ML	multiple bench crushing screening	40	Dan Stewart, President 565 Lalif Road Henderson, NV 89015 702-565-1313
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 702-798-3900
El Dorado Pit	Lopke Granite Products	S11,T23S,R63E	crushed stone	OP	single bench crushing screening	20	Ray Huntington, President 4905 Portraits Place Las Vegas, NV 89129 702-293-2083
Georgia-Pacific Quarry and Wallboard Plant	Georgia-Pacific Corp.	S10,11,14,16,22, T16S,R66E S34,T18S,R63E	gypsum	OP,ML	crushing, calcining	47	Bob Shajary, Plant Manager P.O. Box 30006 North Las Vegas, NV 89030 702-643-8100 Fax: 643-2049
Gornowich Plant	Gornowich Sand & Gravel, Inc.	S15,22,T23S, R63E	sand gravel	OP	single bench screening	8	Robert S. Martinez, President 3450 S. Procyon Avenue Las Vegas, NV 89102 702-876-2777
Henderson Plant	Chemical Lime Co.	S18,T22S,R63E	dolomitic lime	ML	calcining	43	Dave Johnson, President P.O. Box 127 Henderson, NV 89015 702-565-8991
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 702-457-1115
Jones Pit	Blue Diamond Materials	S26,T22S,R60E	sand gravel	OP	single bench crushing screening	17	Bruce Nelson 89 Glen Carran Circle Sparks, NV 89431 702-263-2150

continued

DIRECTORY OF MINING AND MILLING OPERATIONS (continued)

Mine/plant name	Operator	Location	Commodity	Type	Process/ activity	Employees	Address
CLARK COUNTY (continued)							
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 702-644-3668
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 702-378-6102
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 702-457-1115
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 702-876-5226
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 Pit and Plant	Pacific Coast Building Products, Inc.	S7,T20S,R64E	gypsum	OP	single bench wash plant	83	Emil Kapilovich, Manufacturing Mgr. 1973 N. Nellis Boulevard #328 Las Vegas, NV 89115 702-643-1016 Fax: 643-6249
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 702-452-1900
Simplot Silica Products Pit and Mill	Simplot Industries	S30,T16S,R68E	silica sand	OP,ML	flotation drying screening	44	Jack Olsen, Manager P.O. Box 308 Overton, NV 89040 702-397-2667 Fax: 397-2798
Sloan Quarry	Chemical Lime Co.	S12,13,T23S,R60E S18,T23S,R61E	dolomite	OP	crushing	7	Bryan Nielson, Regional Operations Manager HCR 37, Box 2300 Las Vegas, NV 89124 702-361-6901 Fax: 361-7890
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 702-649-6250
Spring Mountain Pit and Mill	Wells Cargo, Inc.	S15,T21S,R60E	sand gravel	OS,ML	multiple bench crushing screening	8	Howard Wells, General Manager P.O. Box 81170 Las Vegas, NV 89180 702-873-7440
ELKO COUNTY							
Dee Gold Mine	Rayrock Mines, Inc.	S33,34,T37N,R49E; S3,4,T36N,R49E	gold silver	OP,HL, ML	CIL cyanide	89	Bill Brown, General Superintendent P.O. Box 160 Valmy, NV 89438 702-738-6440 Fax: 635-2455
Dunphy Mill	Baroid Drilling Fluids, Inc.	S26,T33N,R48E	barite	ML	crushing grinding	46	Paul J. Mills, Production Manager P.O. Box 340 Battle Mountain, NV 89820 702-468-0515 Fax: 468-2060
Jerritt Canyon Joint Venture	Independence Mining Co.	T39-41N,R52-54E	gold silver	OP,ML, UG,HL	CIP, CIL cyanide grinding	660	Ben Guenther Senior Vice President HC31, Box 78 Elko, NV 89801 702-758-9221 Fax: 758-9231

DIRECTORY OF MINING AND MILLING OPERATIONS (continued)

Mine/plant name	Operator	Location	Commodity	Type	Process/ activity	Employees	Address
ELKO COUNTY (continued)							
Kinsley Mountain Mine	Alta Gold Co.	S4,5,6,T26N,R68E	gold	OP	heap-leach	96	Joe Pecio, General Manager 778 S. Pioche Highway Ely, NV 89301 702-289-3007 Fax: 289-4816
Meikle Mine	Barrick Goldstrike Mines, Inc.	S13,T36N,R50E	gold	UG	CIL cyanide	238	Donald R. Prahl P.O. Box 29 Elko, NV 89803 702-778-8196 Fax: 738-6543
Pilot Peak Lime Plant	Continental Lime, Inc.	S14,15,22,23,26, T34N,R68E	lime	OP,ML	multiple bench roasting grinding rotary kiln	53	Jack Elliott, Plant Manager P.O. Box 2520 Wendover, NV 89883 702-478-5463 Fax: 478-5149
Rossi Mine	Baroid Drilling Fluids, Inc.	S14-16,21-23, 26-28,34-35; S15,21,22, T37N,R49E	barite	OP	multiple bench crushing	1	Paul J. Mills P.O. Box 340 Battle Mountain, NV 89820 702-468-0515 Fax: 468-2060
ESMERALDA COUNTY							
Basalt Mine and Mill	Grefco Minerals, Inc.	S29-32,T2N,R34E	diatomaceous earth	OP,ML	grinding	6	Robert A. Poelvoorde, Plant Manager P.O. Box 288 Mina, NV 89422 Dicalite Toll Station #1 Fax: 619-872-6006
Blanco Mine	Vanderbilt Minerals Corp.	S22,T1N,R37E	clay	OP	grinding bagging	6	Jerry W. Lease 2320 Viking Road Las Vegas, NV 89109 702-732-3174
Goldfield Operation	American Resource Corp.	S35,35,T2S,R42E; S1,2,T35,R42E	gold	OP,HL	cyanide	15	Martin Quick, Vice President P.O. Box 160 Goldfield, NV 89013 702-485-3218 Fax: 485-3268
Silver Peak Operations	Cyprus Foote Mineral Co.	S22,T2S,R39E	lithium carbonate	OS	solar evaporation precipitation	83	C.B. Loundagin, Vice President P.O. Box 98 Silver Peak, NV 89047 702-937-2222 Fax: 937-2250
EUREKA COUNTY							
Betze-Post Mine	Barrick Goldstrike Mines, Inc.	S12,20,29,30, T36N,R50E; S23-26,T36N,R49E	gold silver	OP,ML, HL	CIL cyanide milling	1,723	Donald R. Prahl P.O. Box 29 Elko, NV 89803 702-778-8196 Fax: 738-6543
Gold Bar Mine	Atlas Gold Mining, Inc.	S26,27,T22N,R49E	gold	OP,ML, HL	CIL,CIP	7	Don Canepa P.O. Box 282 Eureka, NV 89316 702-237-5621
Newmont Gold Operations	Newmont Gold Co.	T31-36N, R49-53E	gold silver mercury	OP,ML, UG,HL	CIL, CIP cyanide	2,271	Tom Enos, General Manager P.O. Box 669 Carlin, NV 89822-0669 702-778-4000 Fax: 778-4754
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)	Hycroft Resources & Development, Inc.	S35,T35N,R29E; S19,T35N,R30E	gold silver	OP,HL	crushing cyanide	215	Hank Lesinski, General Manager P.O. Box 3030 Winnemucca, NV 89446 702-623-5260 Fax: 625-0215
Disaster Peak Clay Mine	American Colloid Co.	S26,T47N,R34E	hectorite	OP	single bench		Pete Maul 1500 West Shure Drive Arlington Heights, IL 60004

continued

DIRECTORY OF MINING AND MILLING OPERATIONS (continued)

Mine/plant name	Operator	Location	Commodity	Type	Process/ activity	Employees	Address
HUMBOLDT COUNTY (continued)							
Getchell Mine	Getchell Gold Corp.	S33,T39N,R42E	gold silver	OP,UG, HL	sulfide autoclave	493	R. David Russell, VP/COO P.O. Box 220 Golconda, NV 89414 702-635-5001
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.	S1,11,13,15,23, T34N,R42E	gold silver	OP,ML HL	CIL cyanide	444	Kenneth Pavlich, General Manager P.O. Box 388 Valmy, NV 89438 702-635-9000 Fax: 635-0111
Marigold Mine	Rayrock Mines, Inc.	S8,9,18-20, T33N,R43E	gold	OP,ML, HL	CIL cyanide	103	Virgil Larios, General Superintendent P.O. Box 160 Valmy, NV 89438 702-623-0818 Fax: 635-2455
MIN-AD Mine and Mill	MIN-AD, Inc.	S25,T36N,R37E; S28,T35N,R38E	dolomite	OP	grinding air separation screening	13	Charles Evans, Superintendent 4210 W. Jungo Road Winnemucca, NV 89445 702-623-5944 Fax: 623-9028
Pinson Mine	Pinson Mining Co.	S28,29,32,33, T38N,R42E	gold silver	OP,ML, HL	CIL cyanide	91	Ken A. Kluksdahl, General Manager P.O. Box 2280 Winnemucca, NV 89445 702-623-5036 Fax: 623-5030
Sexton Mill	Nutritional Additives Corp.	S20,T36N,R38E	dolomite	ML	crushing screening	6	W. Glen Sexton, CFO 1230 Bridge Street Winnemucca, NV 89445
Sleeper Mine	Nevada Gold Mining, Inc.	S16,17,20,21, T40N,R35E	gold silver	OP,ML, HL	CIP cyanide	33	Robert Cassinnelli, General Manager 600 Sod House Road Winnemucca, NV 89445 702-623-1112 Fax: 623-1115
Twin Creeks Mine	Santa Fe Pacific Gold Corp.	S4-33,T39N,R43E	gold silver	OP,HL	CIL	1,080	Jim Voorhees, General Manager P.O. Box 69 Golconda, NV 89414 702-635-9400 Fax: 635-4596
LANDER COUNTY							
Argenta Mine and Mill	Baker Hughes INTEQ	S14,T32N,R46E; S6,18,19,T32N,R47E	barite	OP	gravity grinding	18	Keith S. Olson, Manager P.O. Box 277 Battle Mountain, NV 89820 702-635-5441 Fax: 635-5455
Battle Mountain Complex (Fortitude)	Battle Mountain Gold Co.	S22,27,33,34, T31N,R43E	gold silver	OP,HL	cyanide	141	Larry Newcomer, Operations Mgr. P.O. Box 1627 Battle Mountain, NV 89820 702-635-2465 Fax: 635-8677
Battle Mountain Grinding Plant	M-I Drilling Fluids LLC	S18,T32N,R45E	barite	ML	gravity grinding	23	Garry Thielen, Operations Manager P.O. Box 370 Battle Mountain, NV 89820 702-635-5135 Fax: 635-2191
Clipper Mine	M-I Drilling Fluids Co.	S31,32,T28N,R46E	barite	OP,ML	gravity concentration crushing	15	Garry Thielen, Operations Manager P.O. Box 370 Battle Mountain, NV 89820 702-635-5135 Fax: 635-2191
Cortez Gold Mines	Placer Dome U.S., Inc.	S33,34, T27N,R47E	gold silver	OP,ML, HL	CIP cyanide roaster	417	Art Walsh, General Manager HC66-50 Beowawe, NV 89821 702-468-4400 Fax: 468-4496
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 702-635-2208
Greystone Mine	M-I Drilling Fluids LLC	S35,T28N,R45E	barite	OP	gravity	52	Garry Thielen, Operations Manager P.O. Box 370 Battle Mountain, NV 89820 702-635-5135 Fax: 635-2191

DIRECTORY OF MINING AND MILLING OPERATIONS (continued)

Mine/plant name	Operator	Location	Commodity	Type	Process/ activity	Employees	Address
LANDER COUNTY (continued)							
McCoy/Cove Mine	Echo Bay Minerals Co.	S2-11,T28N,R42E; S36,T29N,R42E	gold silver	OP,ML, UG,HL	cyanide grinding flotation	533	Jeff C. Smith, General Manager P.O. Box 1658 Battle Mountain, NV 89820 702-635-5500 Fax: 635-5098
Mule Canyon Mine	Santa Fe Pacific Gold Corp.	T31/32N,R47E	gold	OP		83	Kenneth Pavlich, General Manager P.O. Box 190 Battle Mountain, NV 89820 702-635-9200
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 702-728-4280
LYON COUNTY							
Adams Claim	Art Wilson Co.	S25,T16N,R20E	gypsum/ anhydrite	OP,ML	crushing	7	Art Wilson, President P.O. Box 1160 Carson City, NV 89702 702-882-0700 Fax: 882-0790
Dayton Pit	Granite Construction Co.	S25,T16N,R21E	sand gravel	OP	crushing screening	5	Jim Roberts, Branch Manager P.O. Box 2087 Sparks, NV 89432 702-358-8792
Hazen Pit	Eagle-Picher Minerals, Inc.	S6,9,T19N,R26E	diatomite	OP	crushing drying calcining	2	Myron Burdette, Operations Manager P.O. Box 10480 Reno, NV 89510 702-343-1818 Fax: 343-1821
Nevada Cement Mine and Plant	Nevada Cement Co.	S3-6,9,T19N,R25E S36,T40N,R24E; S31-33,T20N,R25E S2,3,10,11, T20N,R25E	limestone cement	OP,ML	rotary kiln	139	Allan Steagall, President P.O. Box 840 Fernley, NV 89408 702-575-2281 Fax: 575-4387
Section 8 Mine and Fernley Mill	CR Minerals Corp.	S8,17,T19N,R26E S11,T20N,R24E	diatomaceous earth	OP,ML	grinding drying milling	17	Chris Harris, Manager of Operations P.O. Box 858 Fernley, NV 89408 702-575-2536 Fax: 575-4857
Yerington and MacArthur Mines	Arimetco Inc.	S8,9,16,17,20,21, T13N,R25E S19,30,T14N,R25E	copper	OP,HL	solvent extraction electrowinning	97	H.R. Snipes, President 102 Burch Drive Yerington, NV 89447 702-463-3125 Fax: 463-3127
MINERAL COUNTY							
Aurora Mine	Nevada Goldfields, Inc.	S8,17,18, T5N,R28E	gold silver	OP,UG, ML	crushing grinding CIL	41	Gary Righettini, General Manager P.O. Box 3070 Hawthorne, NV 89415 702-945-3368 Fax: 945-3360
Aurora Partnership	The Aurora Partnership	S9,16,17, T5N,R28E	gold silver	OP,HL	multiple bench cyanide	18	Robert Prevost, Mine Manager P.O. Box 1628 Hawthorne, NV 89415 702-945-3341 Fax: 945-3162
Candelaria Mine	Kinross Candelaria Mining Co.	S32-34,T4N,R35E;	silver gold	OP,HL	cyanide Merrill-Crowe	105	Jeff W. Butwell, General Manager P.O. Box 1240 Hawthorne, NV 89415 702-573-2471 Fax: 573-2520
Denton-Rawhide Mine	Kennecott Rawhide Mining Co.	S4,5,8,16,17, T13N,R32E	silver gold	OP,HL	cyanide	189	D.H. Batchelor, General Manager P.O. Box 2070 Fallon, NV 89407 702-945-1015 Fax: 945-1213

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DIRECTORY OF MINING AND MILLING OPERATIONS (continued)

Mine/plant name	Operator	Location	Commodity	Type	Process/ activity	Employees	Address
NYE COUNTY							
Amargosa Valley Plant and Pits	Floridin Co.	S15,29,T17S,R49E; S6,21,T17S,R51E	clay minerals	OP	grinding drying	38	William T. Jacobs, Plant Manager Route Box 549 Amargosa Valley, NV 89020 702-372-5341 Fax: 372-5640
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 702-372-5524
Bullfrog Mine	Barrick Gold Corp.	S3,10,14,15,16,24, 26,27,T12S,R46E	gold silver	OP,UG	CIP	382	David McClure, General Manager P.O. Box 519 Beatty, NV 89003 702-553-2900 Fax: 553-2963
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 702-876-1775
Crown Mine/Lone 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 702-964-2003
Gabbs Mine and Mill	Premier Services Corp.	S23,25-27,34-36, T12N,R36E	magnesite	OP,ML	calcining gravity grinding packaging	96	Don Pressey, General Manager P.O. Box 177 Gabbs, NV 89409 702-285-2601 Fax: 285-4021
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 702-372-5339
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 702-553-2454
New Discovery Mine and Mill	Vanderbilt Minerals Corp.	S13,14,T12S,R46E; S18,19,T12S,R47E	clay	UG, ML	grinding bagging	8	Jerry W. Lease, VP General Manager 2320 Viking Road Las Vegas, NV 89109 702-732-3174 Fax: 731-3621
Paradise Peak Mine	Arimetco	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 702-285-0060
Round Mountain Mine	Round Mountain Gold Corp.	S19,20,29,30, T10N,R44E	gold silver	OP,HL, ML	cyanide	696	Steve Mueller, General Manager P.O. Box 480 Round Mountain, NV 89045 702-377-2366 Fax: 377-3240
Sterling Mine	Cathedral Gold US Corp.	S13,T13S,R48E	gold	UG,ML, HL	drifting cyanide	36	Chuck Stevens, Mine Manager P.O. Box 549 Beatty, NV 89003 702-222-4844 Fax: 372-1720
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 702-732-3174
Coeur Rochester Mine	Coeur D'Alene Mines Corp.	S9,10,11,15,16, 21,22,27,28, T28N,R34E	silver gold	OP,HL	cyanide Merrill-Crowe	288	Edgar Smith, Vice President P.O. Box 1057 Lovelock, NV 89419 702-273-7995 Fax: 273-7423
Colado Mine and Plant	Eagle-Picher Minerals, Inc.	S6,7,16,18,21,25, T28N,R29E; S33,T28N,R32E	diatomite perlite	OP,ML	drying classification grinding calcining	114	José Ontiveros, Operations Manager 150 Coal Canyon Road Lovelock, NV 89419 702-273-2636 Fax: 273-7553

DIRECTORY OF MINING AND MILLING OPERATIONS (continued)

Mine/plant name	Operator	Location	Commodity	Type	Process/ activity	Employees	Address
PERSHING COUNTY (continued)							
Empire Quarry	United States Gypsum Co.	S31,T31N,R24E	gypsum	OP	crushing calcining	10	Michael L. Christopher, Mine Manager P.O. Box 130 Empire, NV 89405 702-557-2341
Florida Canyon Mine	Florida Canyon Mining, Inc.	S2-4,9-11,14-16, 37-39,T31N,R33E	gold silver	OP,HL	cyanide	367	Doug Stewart, General Manager P.O. Box 330 Imlay, NV 89418 702-538-7300 Fax: 538-7324
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 and Mill	Nutritional Additives Corp.	S5,8,T34N,R38E	dolomite	OP	grinding	6	Donald Sexton, President 5184 E. Winnemucca Blvd. Winnemucca, NV 89445 702-623-3328
STOREY COUNTY							
Clark Mine and Mill	Eagle-Picher Minerals, Inc.	S27,33,34, T20N,R23E; S35,T20N,R22E	diatomite	OP,ML	grinding drying	67	Myron S. Burdette, Operations Manager P.O. Box 10480 Reno, NV 89510 702-343-1818 Fax: 343-1821
Golden Eagle Mine and Mill	American Eagle Resources, Inc.	S23,24,26, T17N,R21E	gold silver	OP,HL	cyanide	7	Bob Spengler, Manager of Operations P.O. Box 859 Virginia City, NV 89440 702-246-0761 Fax: 246-3117
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 702-358-8792
WASHOE COUNTY							
Bella Vista Pit	A&K Earth Movers Inc.	S3,T18N,R20E	rock gravel	OP	single bench screening		Michael A. Hiatt, Vice President P.O. Box 1059 Fallon, NV 89407 702-423-8898
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 702-246-0282
Empire Mill	United States Gypsum Co.	S11,13,T31N,R23E	gypsum	ML	grinding calcining	129	Kenneth A Samuelson, Plant Manager P.O. Box 130 Empire, NV 89405 702-557-2341
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 702-358-8792
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 702-356-5515
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 Pitt	Rilite Aggregate Co.	S23,T18N,R20E	aggregate	OP	grinding crushing	8	Bruno Benna P.O. Box 11767 Reno, NV 89511

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DIRECTORY OF MINING AND MILLING OPERATIONS (continued)

Mine/plant name	Operator	Location	Commodity	Type	Process/ activity	Employees	Address
WASHOE COUNTY (continued)							702-853-1463
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 916-587-3525
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 916-587-3525
WHITE PINE COUNTY							
Bald Mountain Mine (Includes Alligator Ridge, Yankee Projects)	Placer Dome U.S. Inc.	T24N,R57E	gold	OP,HL	multiple bench cyanide	206	Douglas Bailey, Mine Manager P.O. Box 2706 Elko, NV 89803 702-744-4227 Fax: 744-4216
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 702-289-3007
Mt. Hamilton Mine	Rea Gold Corp.	S5,6,7,8,16,17,21 T16N,R57E	gold silver	OP,HL	multiple bench	146	Joe R. Dewey, Vice President P.O. Box 150476 East Ely, NV 89315 702-237-5100 Fax: 237-5158
Robinson Operations	BHP Nevada Mining Co.	S7-18,T16N,R62E	copper gold silver	OP,ML, HL	flotation	427	Lee Browne, Vice President P.O. Box 382 Ruth, NV 89319 702-289-7000 Fax: 289-7009

For additional information on Nevada's mineral resources and mineral industries see the following NBMG publications:

Statewide Commodity Bulletins

Antimony (B61)
Barite (B98)
Fluorspar (B93)
Gypsum (B103)
Iron (B53)
Mercury (B41)
Montmorillonite, bentonite, and fuller's earth (B96)
Oil and gas (B104)
Radioactive minerals (B81)
Talcose minerals (B84)
Thermal waters (B91)
Tungsten (B105)
Zeolites (B79)

County Mineral Resource Bulletins

Carson City (B75)
Churchill (B83)
Clark (B62)
Douglas (B75)
Elko (B106)
Esmeralda (B78)
Eureka (B64)
Humboldt (B59)
Lander (B88)
Lincoln (B73)
Lyon (B75)
Mineral (B58)
Nye (B77, B99B)
Pershing (B89)
Storey (B70)
Washoe (B70)
White Pine (B85)

Special Publications

Oil and gas wells drilled in Nevada since 1986 (L-8)
Geothermal wells drilled since 1979 (L-5)
Nevada mining and you (SP8)
Nevada ore and concentrate buyers, custom mills, and smelters available to mine operators (L-7)
Major mines of Nevada 1996 (P-8)
Outline of Nevada mining history (SP15)
Mining districts of Nevada (R47)

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NBMG, USGS, USBM, and DOE open-file reports on Nevada geology and mineral resources
petroleum and geothermal exploration and production
mining district records and maps
mineral resources and reserves
mineral resource assessments
core and cuttings library
mining claim data
wilderness study area reports
general geologic studies
indexes and ordering information for maps, air photos, and remote sensing imagery