Nevada Bureau of
Mines and Geology

Special Publication MI-2003

The Nevada Mineral Industry 2003

Metals

Industrial Minerals

Oil and Gas

Geothermal

Exploration

Development

Mining

Processing

This report, twenty-fifth of an annual series, describes mineral, oil and gas, and geothermal activities and accomplishments in Nevada in 2003: production statistics, exploration and development including drilling for petroleum and geothermal resources, discoveries of orebodies, new mines opened, and expansion and other activities of existing mines. Statistics of known gold and silver deposits, and directories of mines and mills are included.

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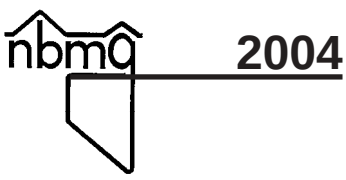

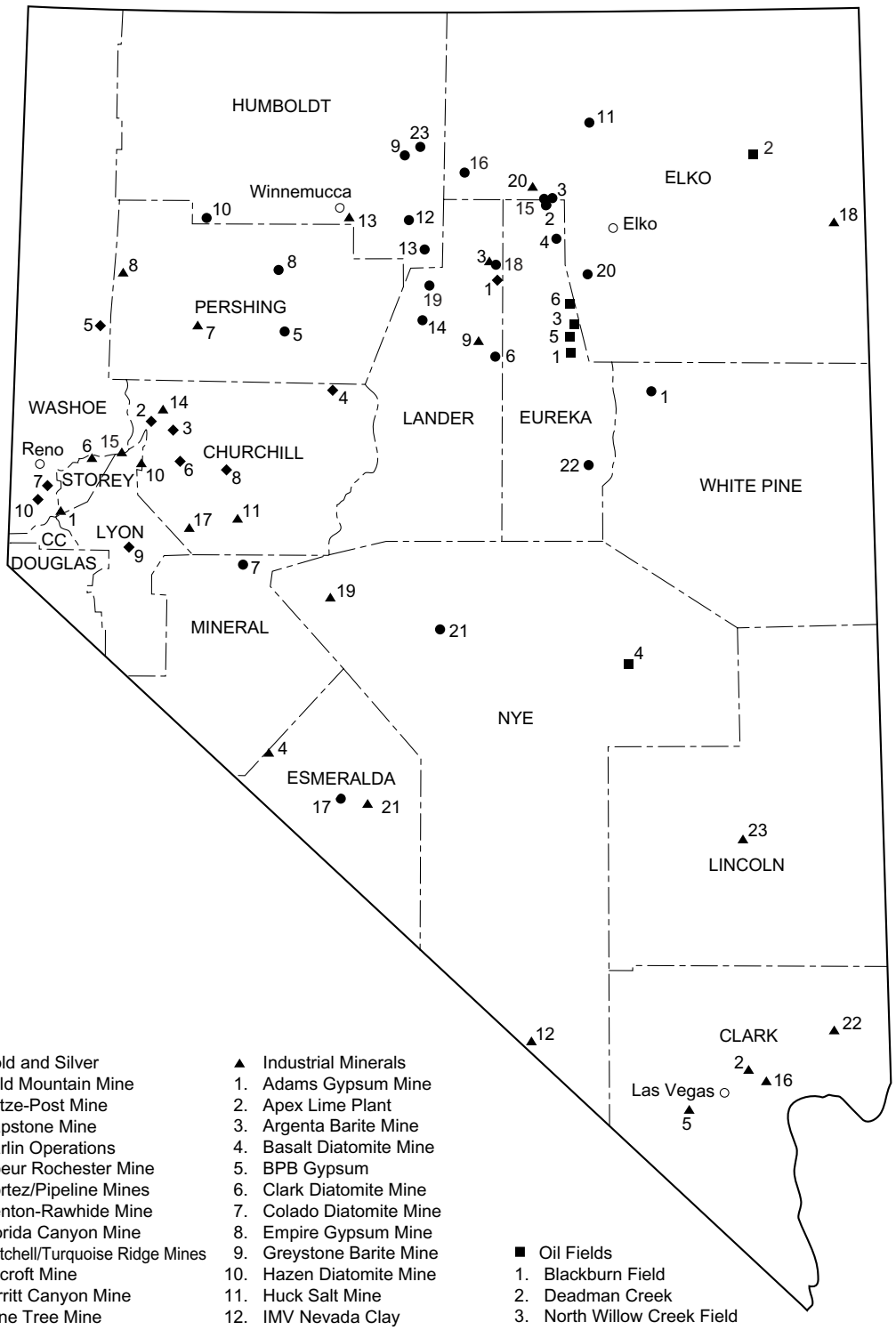

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Major mines, oil fields, and geothermal plants, 2003.

Overview

by Jonathan G. Price and Richard O. Meeuwig

This report highlights activities through 2003 in metals, industrial minerals, geothermal energy, and petroleum. Numerous graphs and charts are incorporated for rapid inspection of trends in production and price. Overall mineral and energy production in Nevada in 2003, valued at $3.2 billion, rose nearly 9% from the previous year, primarily as a result of the increase in the price of gold. Gold production steadily decreased from 8.1 million ounces in 2001 to 7.7 million ounces in 2002, to 7.3 million ounces in 2003, but 2003 was nonetheless the seventh highest level in history. Nevada led the nation in the production of gold, barite, and diatomite and was the only state that produced magnesite, lithium, and the specialty clays, sepiolite and saponite. Other commodities produced in Nevada in 2003 included construction aggregate (sand, gravel, and crushed stone), geothermal energy, lime, diatomite, gypsum, cement, clays, silica (industrial sand), silver, dimension stone, semiprecious gemstones, perlite, salt, kalinite (potassium alum), zeolite, mercury as a by-product of gold and silver processing, and petroleum.

Nevada ranked second in the United States in terms of value of overall nonfuel (excluding oil, gas, coal, and geothermal) mineral production in 2003 (according to the U.S. Geological Survey, Mineral Commodity Summaries 2004, http://minerals.usgs.gov/minerals/pubs/mcs/). California, with its large population and commensurate demands for construction raw materials, was first. Arizona, the nation's leading copper producer, was third. Texas, another populous state and major producer of construction raw materials, was fourth. Florida, the leader in phosphate production was fifth.

Nevada's production of gold, valued at nearly $2.7 billion, was 82% of the U.S. total and helped make the U.S. the second leading gold producer in the world in 2003. Nevada alone accounted for 9% of world production of gold. Only the countries of South Africa and Australia produced more gold than the State of Nevada in 2003. Second to gold in terms of Nevada's mineral value in 2003 was construction aggregate, $166 million. Electrical power from geothermal energy production in Nevada in 2003 was valued at $65 million. Silver, chiefly a by-product or co-product of gold production, ranked as the fourth leading mineral commodity in 2003, with a value of $50 million.

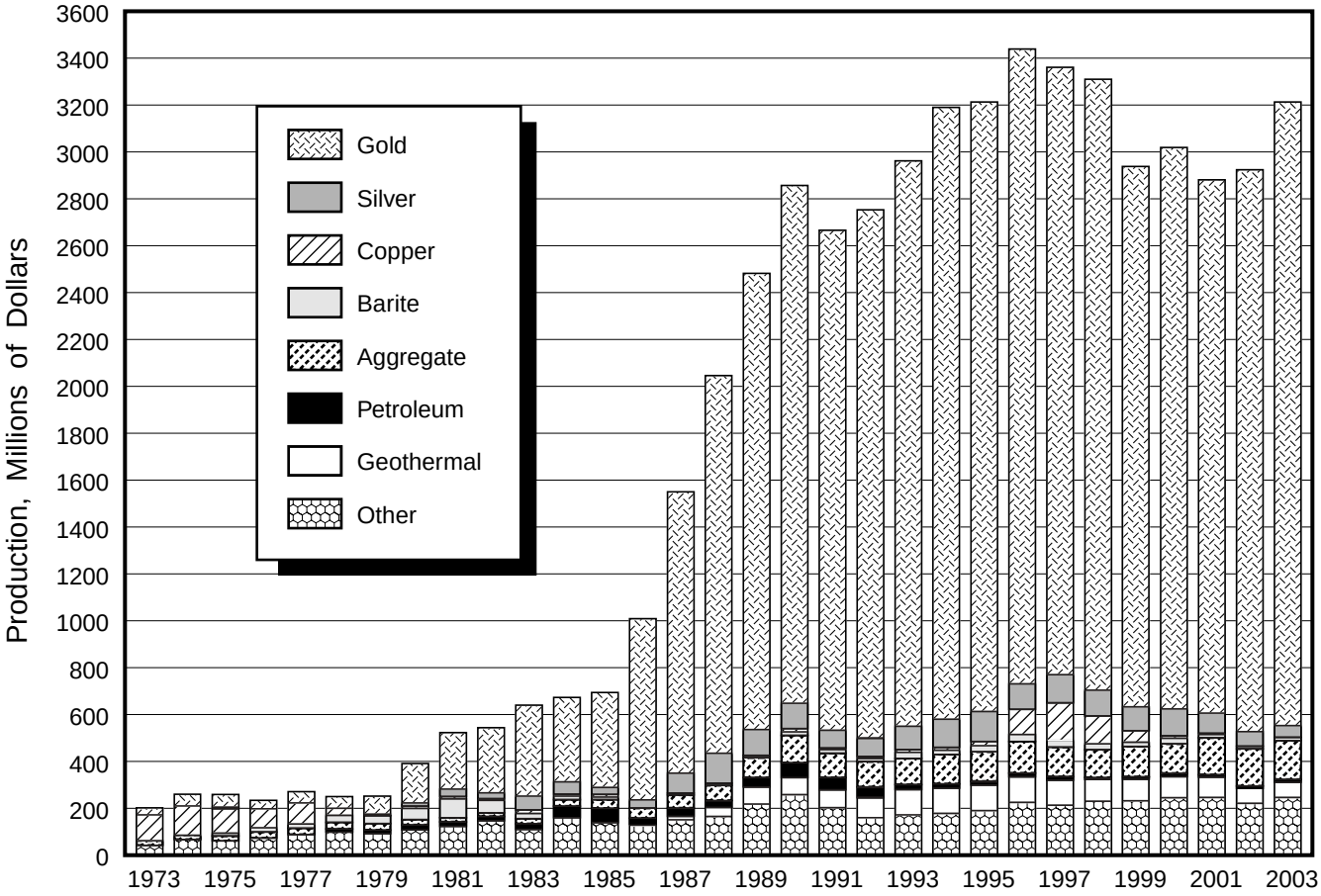
The contributions that mining makes to the economies of Nevada and the U.S. are significant in terms of jobs, commerce, taxes, improvements to the infrastructure, and lowering of the U.S. trade deficit. Because of Nevada's production, the U.S. is a net exporter of gold, most of which is sold on the international market for jewelry and arts and some of which is sold for its superior qualities in computers and other electronics. The U.S. is a net exporter of few mined commodities and a net importer of many. Among the major mined products in Nevada, the U.S. relies upon imports for barite (81% of total U.S. consumption from imports in 2003, according to the U.S. Geological Survey, used primarily to prevent blowouts in oil and gas drilling), silver (56%, used in photographic and other applications), copper (38%, used primarily to conduct electricity), and gypsum (23%, used in wallboard). Our exports of gold help offset the staggering U.S. trade deficit (difference between imports and exports of goods and services), which amounted to

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

Minerals	2002 Quantity	2002 Value (millions)	2003 Quantity	2003 Value (millions)	% change from 2002 to 2003 Quantity	% change from 2002 to 2003 Value
Gold (thousand troy ounces)	7,732	$2,397.0	7,318	$2,660.0	-5.4	+11.0
Silver (thousand troy ounces)	13,564	61.9	10,246	50.0	-24.5	-19.2
Copper (thousand pounds)	0	0	0	0	—	—
Aggregate (thousand short tons)	35,300	158.9	37,000	166.5	+4.8	+4.8
Gypsum (thousand short tons)	1,850	29.6	1,865	29.9	+0.8	+1.0
Barite (thousand short tons)	377	10.9	466	13.5	+23.6	+23.9
Geothermal energy (thousand megawatt-hours)	1,251	64.0	1,176	65.0	-6.0	+1.6
Petroleum (thousand 42-gallon barrels)	553	9.9	493	12.1	-10.8	+22.2
Other minerals[2]	—	220.7	—	216.1	—	-2.0
Total	—	$2,951.9	—	$3,213.1	—	+8.8

[1] Production as measured by mine shipments, sales, or marketable production (including consumption by producers); compiled by the Nevada Division of Minerals and the Nevada Bureau of Mines and Geology. Products milled or processed in Nevada but mined from deposits in California are excluded. Specifically, colemanite from a mill in Amargosa Valley in Nye County and zeolite from the Ash Meadows plant in Nye County are not included in these totals.

[2] Building stone, cement, clay, diatomite, lime, lithium carbonate, magnesite, mercury, perlite, salt, and silica sand.



Nevada mineral, geothermal power, and petroleum production, 1973–2003.

an annual record of $497 billion in 2003 (according to the Department of Commerce, Bureau of Economic Analysis, www.bea.gov).

The local economy also benefits from mining. Construction of new homes, casinos, other businesses, schools, and roads continues the strong demand for local sources of sand, gravel, crushed stone, gypsum, and raw materials for cement, all of which are abundant in Nevada. The mining industry directly employed approximately 8,800 people in 2003, and the industry is responsible for another 44,000 jobs related to providing the goods and services needed by the industry and its employees (Driesner and Coyner, 2003).

Nevada and the U.S. make significant contributions to the world's production of several mineral commodities. Thanks in part to Nevada's production, the U.S. is the world's leading producer, as well as consumer, of gypsum (with the U.S. accounting for 16% of world production in 2003) and industrial sand (30% of world production). In addition to gold, the U.S. is a leading silver producer (7% of world production). The U.S. is essentially self sufficient, as are most countries, in construction aggregate, largely because of the high expense of transportation. Total U.S. production of construction sand, gravel, and crushed stone in 2003 was approximately 2.62 billion metric tons, according to the U.S. Geological Survey. Net imports of aggregate account for less than 1% of consumption. The U.S. is also self sufficient in the other major mined material, coal. According to the U.S. Energy Information Administration (www.eia.doe.gov), the U.S. produced and consumed approximately 970 million metric tons of coal in 2003. Although no coal is produced in Nevada, coal is the primary source of energy for generation of electricity in Nevada.

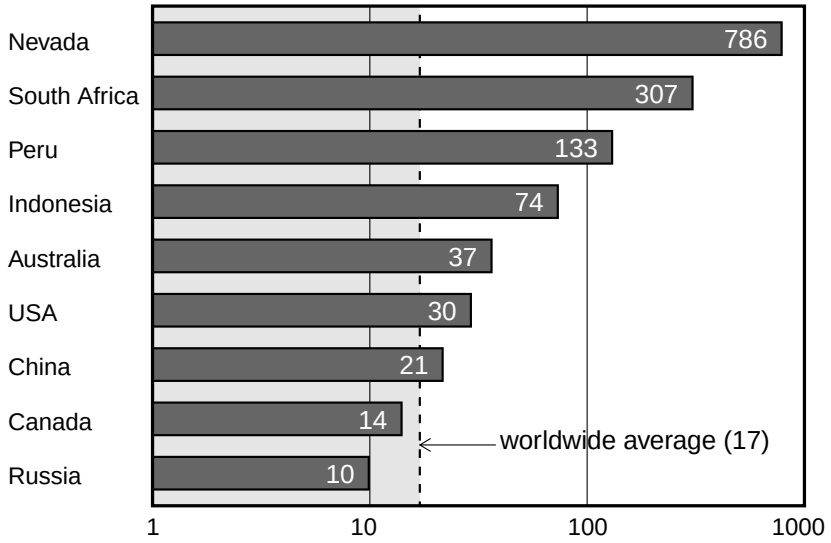
As a result of its favorable geology, Nevada has tremendous potential for the discovery of additional mineral deposits. Areas where prospective rocks are beneath a cover of young, valley-filling sediments and volcanic rocks have only been explored to a limited extent, and ore deposits continue to be discovered in and near Nevada's 526 historical mining districts. Like the Transvaal, the most productive region of South Africa, Nevada is a world leader in terms of gold production per unit area.

Through a survey conducted early in 2004 the Nevada Division of Minerals collected data for Nevada Bureau of Mines and Geology Special Publication P-15, Major Mines of Nevada 2003. This publication includes, in handbook form, location maps, names and telephone numbers of operators, numbers of employees, and

WORLD PRODUCTION OF SELECTED MINERAL COMMODITIES (metric tons) in 2003*

Country/State	Area (10^6 km^2)	Gold	Silver	Gypsum	Barite	Industrial Sand
Algeria	2.38	—	—	—	50,000	—
Australia	7.68	282	1,872	4,000,000	—	4,500,000
Austria	0.08	—	—	1,000,000	—	6,800,000
Belgium	0.03	—	—	—	—	1,800,000
Brazil	8.51	—	—	1,650,000	55,000	1,600,000
Burma	0.68	—	—	—	nd	—
Canada	9.96	141	1,309	9,000,000	—	1,600,000
Chile	0.76	202	250	—	—	—
China	9.57	195	2,300	6,900,000	3,500,000	—
Egypt	1.00	—	—	2,000,000	—	—
France	0.57	—	—	3,500,000	75,000	5,500,000
Germany	0.36	—	—	—	125,000	8,500,000
India	3.28	—	—	2,300,000	900,000	1,450,000
Indonesia	1.90	140	—	—	—	—
Iran	1.65	—	—	11,500,000	250,000	1,700,000
Italy	0.30	—	—	1,200,000	—	3,000,000
Japan	0.38	—	—	5,700,000	—	1,900,000
Korea, North	0.12	—	—	—	70,000	—
Mexico	1.97	—	2,569	6,800,000	180,000	1,800,000
Morocco	0.45	—	—	—	470,000	—
Netherlands	0.04	—	—	—	—	nd
Norway	0.32	—	—	—	—	1,400,000
Peru	1.29	172	2,590	—	—	—
Poland	0.31	—	1,200	1,100,000	—	—
Russia	17.07	170	700	—	60,000	—
South Africa	1.22	375	—	—	—	2,300,000
Spain	0.50	—	—	7,500,000	—	6,500,000
Thailand	0.51	—	—	6,500,000	30,000	—
Turkey	0.78	—	—	—	100,000	1,300,000
United Kingdom	0.24	—	—	1,500,000	60,000	4,000,000
Uruguay	0.18	—	—	1,100,000	—	—
United States	9.37	277	1,240	16,700,000	468,000	27,500,000
Nevada	**0.29**	**228**	**311**	**1,692,000**	**421,000**	**612,000**
WORLD	149.90	2,628	18,700	103,000,000	6,810,000	94,000,000

* Production data for all areas except Nevada are from the U.S. Geological Survey (USGS) minerals information publications (http://minerals.usgs.gov/minerals/), with revisions for some data from USGS mineral commodity specialists; production data for Nevada are from Driesner and Coyner (2003), with modifications as noted in this report; USGS statistics are adjusted to be consistent with Nevada data. There are some discrepancies between the Nevada and USGS data, particularly for barite (USGS reports 480,000 metric tons total for USA), for which the USGS reports quantity sold and used rather than quantity produced in the year.



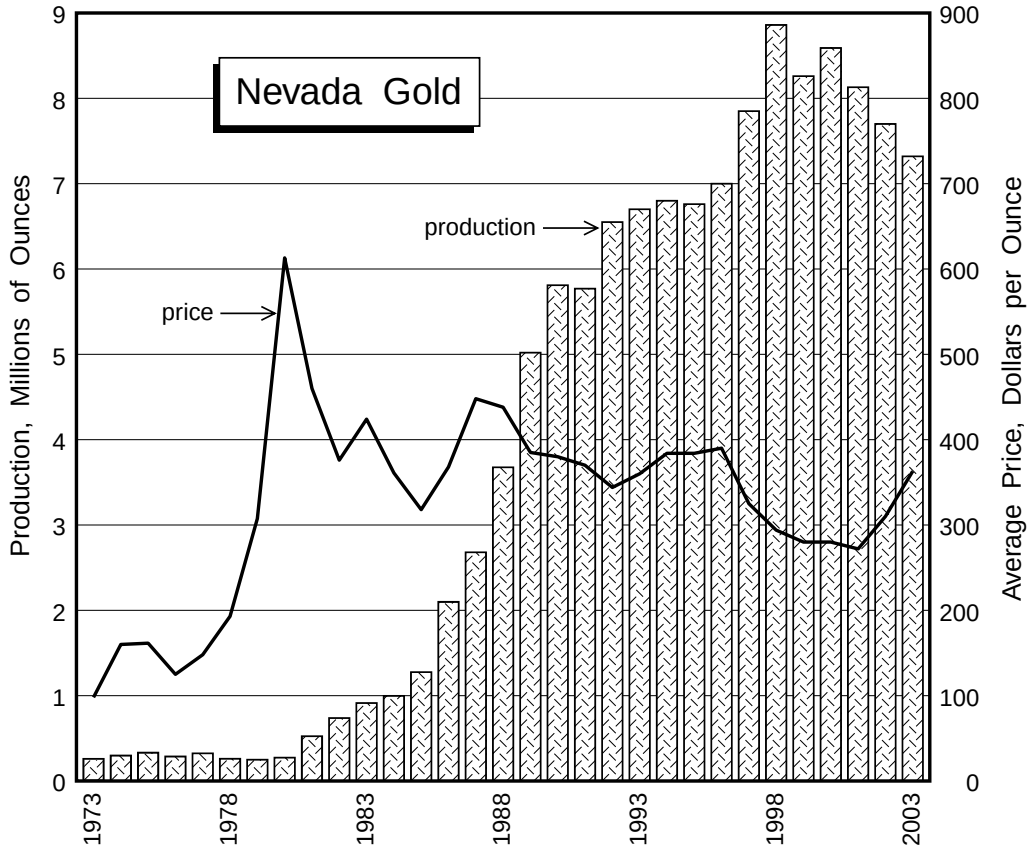
Gold production in 2003
(metric tons per million square kilometers, log scale).

nonproprietary production figures for most mines in Nevada. It also contains a section on economic impacts of the industry. The full contents of this 28-page publication are available for free on the World Wide Web (www.nbmg.unr.edu), as are the contents of this report. The data from this survey are used, along with information from other sources, in this publication and will be used to update, revise, and 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 of gold in 2003 came from 23 major mining operations. The Carlin trend in northeastern Nevada accounted for 44% of the total production. Eight additional mining operations, not on the Carlin trend, each produced over 100,000 ounces of gold from mostly multimillion-ounce deposits.

Nevada and the U.S. have produced a significant portion of world gold. The U.S. Geological Survey estimates that total world gold production, since the beginning of civilization, has been 145,200 metric tons (4.7 billion troy ounces). Interestingly, about 85% of that gold is still in use (in bullion, coins, jewelery, electronics, etc.), and most gold currently being mined is recycled. Through 2003, cumulative gold production in Nevada (since mining on the Comstock lode in 1859) stands at 4,651 metric tons (149.5 million ounces). Remarkably, 84% of this total has been produced during the current boom (since the Carlin mine began production in 1965), and 52% of this total has been produced in the decade from 1994 to 2003. Total U.S. production, primarily since 1835, is approximately 15,496 metric tons (498 million ounces or nearly 11% of total world gold production), and total Nevada production is 3% of total world production. The Carlin trend alone accounts for a bit more than one percent of all the gold ever mined in the world. By the end of 2003, cumulative production from the Carlin trend reached 1,732 metric tons of gold (55.7 million ounces), keeping its place as one of the most productive gold-mining districts in the world.

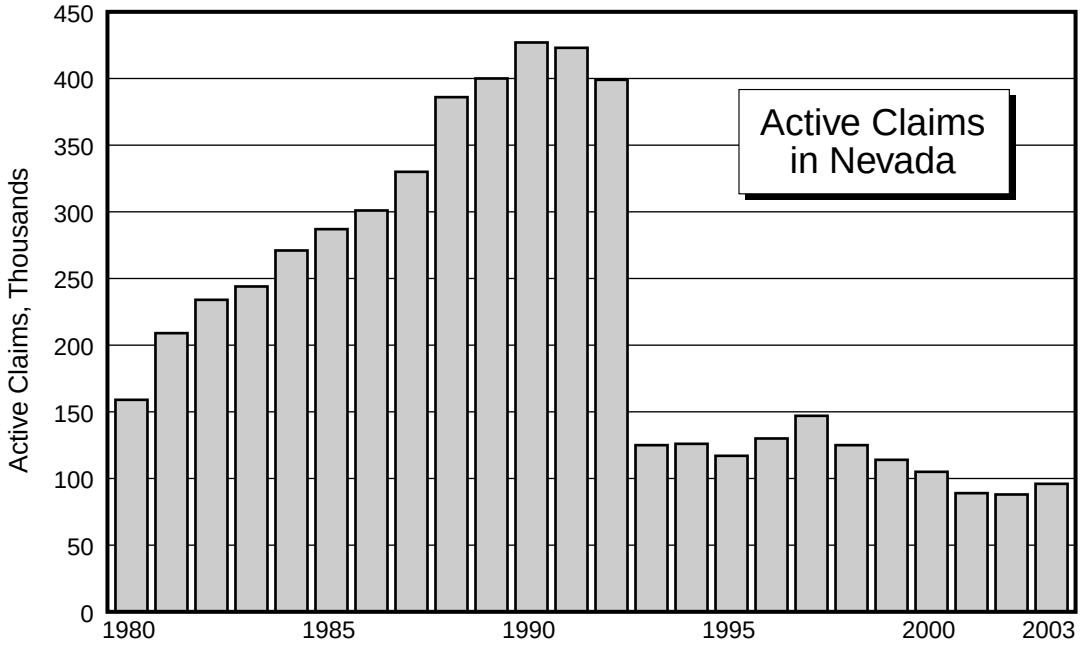
Barrick's Betze-Post Mine in Eureka County produced 1.56 million ounces, making it the largest producer in the state, and Barrick's Meikle Mine in Elko County produced nearly 551,664 ounces, making it the largest underground producer in 2003. Barrick's overall production in the state in 2003 totaled 2,568,859 ounces, and Newmont's overall production from several mines was a close second at 2,491,684 ounces. Newmont's production on the Carlin trend, including its Carlin operations and Capstone/ Bootstrap and Rain Mines, totaled 1,122,208 ounces. Placer Dome's Cortez operation (Pipeline and nearby deposits in Crescent Valley, Lander County) produced 1,156,004 ounces of gold in 2003.



Exploration in 2003 expanded beyond high-grade (mostly vein) targets, which tend to be popular during times of depressed prices for gold, to once again include low-grade, large tonnage deposits, which generally become more profitable when gold prices are higher. Average price in 2003 was $363 per ounce, substantially more than $310 per ounce in 2002. New discoveries were reported along the Carlin trend, in the Jerritt Canyon district, and in several other districts. Exploration activities are summarized in the section on **Metals**.

Most exploration efforts focused on gold and silver. As measured by the numbers of active claims on public lands, grass-roots exploration activity was up slightly over the previous year, but other reports indicate increased activity. According to a survey of exploration activities by the Nevada Division of Minerals (D. Driesner, 2004, Nevada Exploration Survey 2003, available at http://minerals.state.nv.us/), exploration activity in Nevada had been steadily declining since 1997, but 2002 saw an increase of 26% over 2001, and exploration expenditures in 2003 rose another 7% over 2002. The 30 companies responding to the survey reported spending $69.2 million on exploration in Nevada in 2003 up from $64.6 million in 2002 but well below the level of $138.8 million in 1995. They project spending $89.1 million in Nevada in 2004. Another measure of exploration activity is the number of exploration geologists employed by these companies: 126 in 2003 compared with 129 in 2002 and 309 in 1997. These companies project employing 158 exploration geologists in 2004. The decline in exploration was largely the result of low metal prices, and the increases in 2002 and 2003 are probably the result of relatively higher prices. Because of its favorable geology and regulatory climate, Nevada continues to attract a large portion of the worldwide exploration expenditures of the companies actively exploring in Nevada. Significant exploration (including drilling, geochemical sampling, and geological mapping) was reported in 13 of Nevada's 17 counties, and new claims were staked in 16 counties (with only the county of Carson City not showing activity). The number of active claims in Nevada rose slightly in 2003 but is still close to the relatively low level reached in 1993 after the introduction of new fees by the federal government.

We continue to be in the midst of the biggest gold boom in U.S. history, as the graph of historical U.S. gold production illustrates. The recent surge in production in the U.S. is largely the result of discoveries of Carlin-type gold deposits and other deposits in which fine-grained gold is widely disseminated in the ore. These deposits are primarily in Nevada. The U.S. production so far in the current boom, the period from 1981 to 2003, has been nearly 179 million ounces. This is significantly greater than the total production during the era of the California gold rush (1849 to 1859, with 29 million ounces), the Comstock (Nevada) era from 1860 to 1875 (with 34 million ounces), and the period from 1897 to 1920, when Goldfield (Nevada), the Black Hills (South Dakota), Cripple Creek (Colorado), and by-product production from copper mines in Arizona and Utah contributed to cumulative production of 95 million ounces. U.S. production in the decade from 1994 to 2003 alone was 106 million ounces.



Number of active claims in Nevada as of October 1, 1980 through 2003. Data from the Nevada State Office of the U.S. Bureau of Land Management.

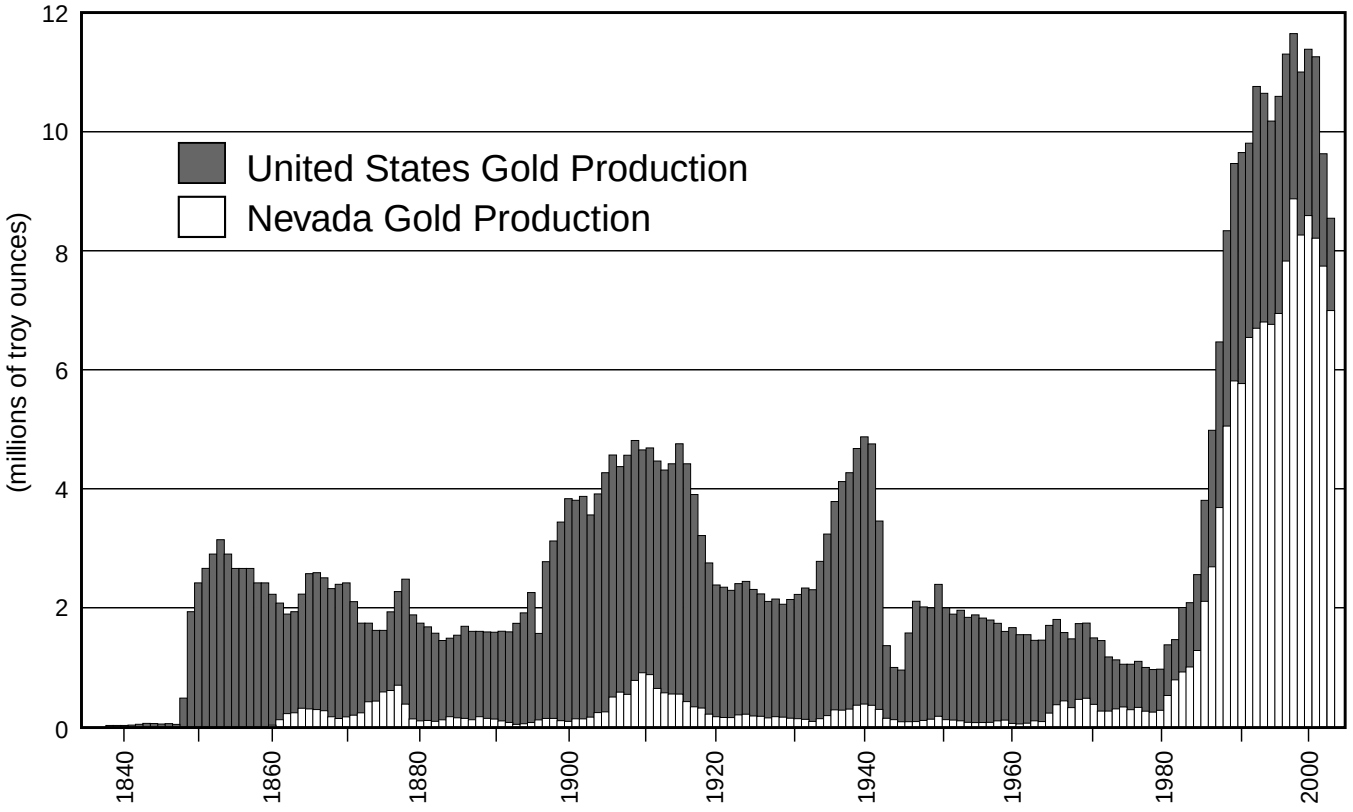
The announced gold resources in Nevada, including mineable reserves and perhaps some subeconomic resources (as reported in announcements by companies and compiled by the Nevada Bureau of Mines and Geology, with deductions for production), are enough to sustain gold production at substantial levels for 15 to 20 years, assuming stable prices. The term “reserve” has special meaning with regard to U.S. securities laws. To be called a reserve, the deposit must be able to be mined profitably. With relatively low gold prices, some of the reserves of previous years have been downgraded to subeconomic resources. When prices rise or when new technologies allow mining and gold processing costs to be lower, subeconomic resources can become reserves.

Productivity of Nevada mining operations is exceptionally high. Measured simply by the value of the commodities produced divided by the number of employees, productivity of Nevada miners is outstanding. On the average, each of the 8,776 workers in the nonfuel mineral industry in Nevada produced approximately $357,000 in mined products in 2003, an all-time high figure.

Challenges that face the precious metal mines in Nevada include:

- economic, safety, and environmental concerns, particularly uncertainty in metal prices;
- obtaining financial assurances (bonds) for reclamation and closure;
- hazards of underground mining;
- regulatory changes and length of time that it typically takes to obtain permits;
- treating refractory (iron sulfide and/or carbon-bearing) ores, including innovative ways to oxidize these ores and to recover gold-bearing pyrite by flotation;
- dewatering mines;
- predicting the ultimate chemical compositions of pit lakes;
- procedures for closure of heaps used for leaching gold and silver from ore; 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.

Through research on new technologies and engineering approaches, industry is responding well to these challenges.



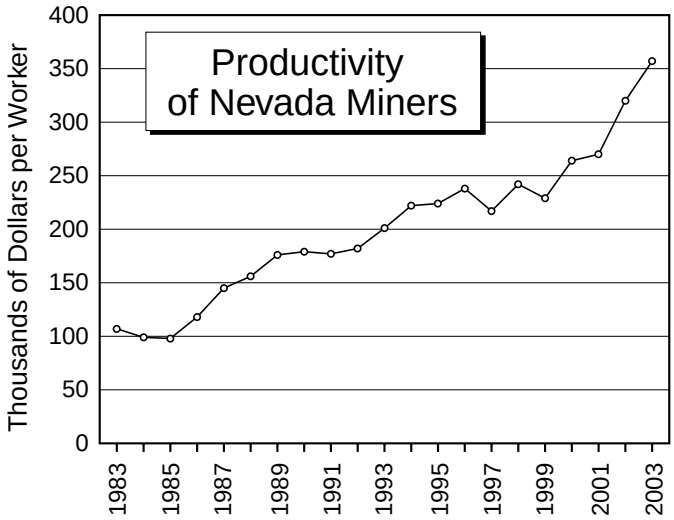
U.S. and Nevada gold production from 1835 through 2003. Data from The U.S. Gold Industry 1998 (NBMG Special Publication 25) by J.L. Dobra and from the U.S. Geological Survey.

Much of Nevada's silver production in 2003, which totaled 10.4 million ounces, was a co-product or by-product of gold mining. With a ratio of value (average price of gold to average price of silver) of 75:1 in 2003, only those deposits with more than 75 times as much silver as gold can be considered primary silver deposits. Only one such deposits operated in Nevada in 2003- the Coeur Rochester Mine in Pershing County (with a silver to gold production ratio of 107:1 and total silver production of nearly 5.6 million ounces). This one mine produced 55% of Nevada's silver in 2003. Nevada's production in 2003 accounted for 26% of the U.S. total and 1.7% of the world total. Depending on price, Nevada is likely to retain the present-day distinction of its nickname, the "Silver State."

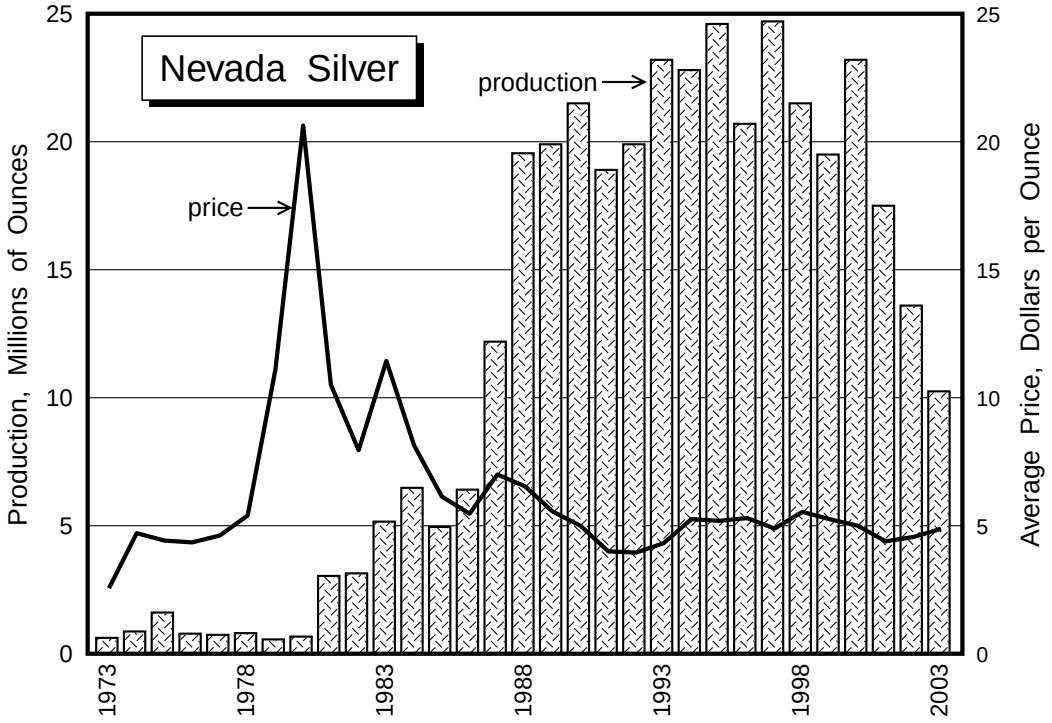
The section on **Industrial Minerals** covers developments during 2003 and gives details on important commodities produced from or processed in Nevada, such as aggregate, barite, cement, clays, diatomite, dimension stone, dolomite, gypsum, kalinite (potassium alum), lime, limestone, lithium, magnesite and brucite, perlite, salt, semiprecious gemstones (opal and turquoise), silica, and zeolites (clinoptilolite and mordenite). In 2003 Nevada ranked first in the nation in barite and diatomite production and third in gypsum (behind Oklahoma and Texas). The Silver Peak lithium operation in Clayton Valley, Esmeralda County, where subsurface brines are evaporated on the floor of the playa, is the only domestic lithium producer, and the Gabbs mine in Nye County is currently the nation's only producer of magnesite.

Aggregate production reached an all-time high in 2003 as a result of Nevada's expanding population and needs for construction materials for homes, schools, streets, highways, airports, resort hotels, and other businesses. Demand for construction raw materials is likely to remain strong owing to Nevada's booming population.

An interesting trend that is occurring nationwide as well as in the Las Vegas area is the combination of aggregate quarries with landfill operations. Planning for the eventual uses of quarries is vital in areas where urban expansion encroaches on the mineral resources that must be mined locally to reduce transportation costs and related concerns regarding highway safety. Gypsum mines near the urban growth areas of Las Vegas are now being considered as sites for housing developments.



Total value of mined product per mine worker in Nevada (excluding petroleum and geothermal energy)



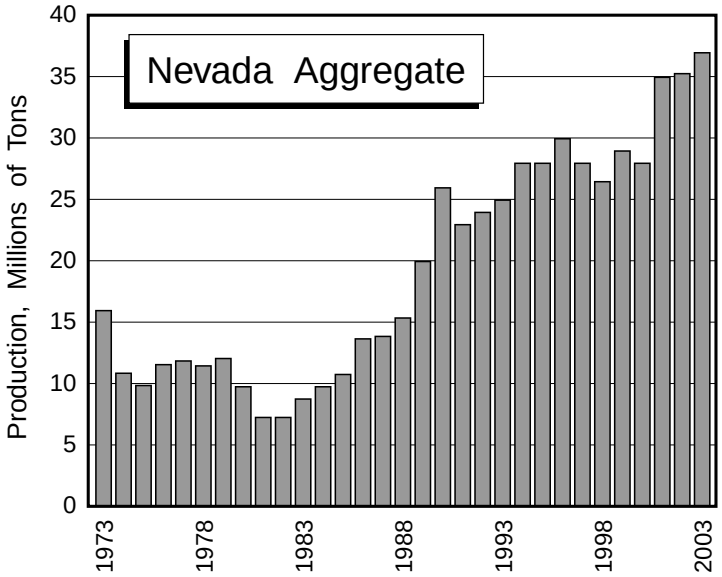
Developments in the geothermal industry are covered in the section on **Geothermal Energy**. Electric power production in 2003 was slightly lower than in the previous year, but the unit value of the production rose with general rises in energy prices. Fourteen plants operating at twelve sites sold $65 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, particularly onions and garlic. New programs in the U.S. Department of Energy, energy bills passed by the Nevada and California legislatures, and activities of the Great Basin Center for Geothermal Energy at the University of Nevada, Reno are stimulating geothermal development in Nevada. Four new plants are planned to meet Nevada's renewable energy portfolio standard. Nevada Bureau of Mines and Geology Map 141, Nevada Geothermal Resources, shows the locations of geothermal plants, direct-use locations, hot and warm springs and wells; it demonstrates the fact that Nevada has considerable potential for geothermal development. Considerable information on geothermal energy in Nevada is provided on the Web (http://www.nbmg.unr.edu/geothermal/gthome.htm).

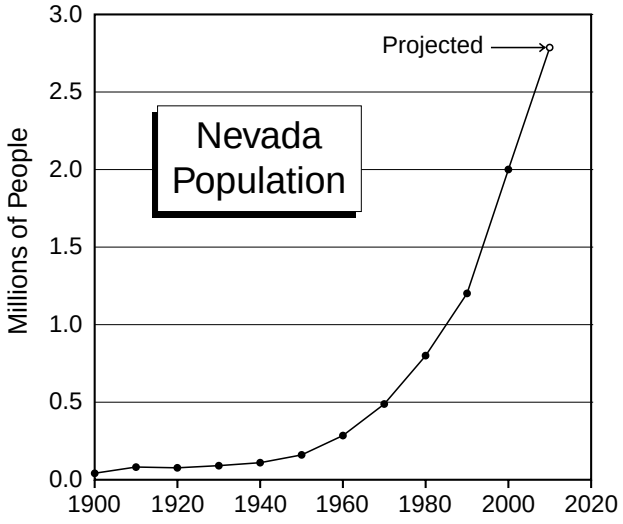
Nevada has great potential for renewable energy (particularly geothermal, wind, and solar energy for electricity). Approximately 89% of Nevada's electricity currently is generated by power plants that burn fossil fuels, with 51% from coal and 38% from natural gas (Statistics from the Energy Information Administration, exclusive of geothermal energy).

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. Total annual oil production from Nevada (valued at $12.1 million in 2003) is a minor part of U.S. production. The amount of oil production declined for the tenth consecutive year, and no new fields were discovered in 2003. Small amounts of natural gas are used to fuel equipment needed for oil production.

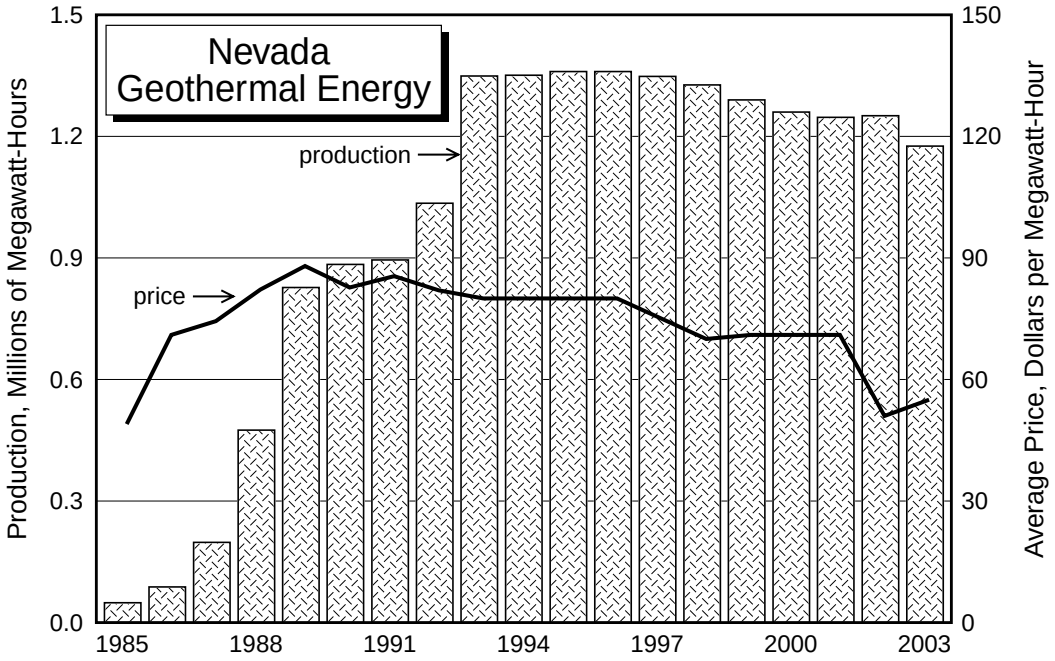
Exploration for oil in Nevada is encouraged by the cumulative production from the two premier fields in Railroad Valley, Grant Canyon and Trap Spring (21 million and 13 million barrels, respectively). Historically, few exploration wells have been drilled in the state (fewer than 1,000 wells, or fewer than one well per 111 square miles or 286 square kilometers). With so much area unexplored, even discounting areas underlain by high-grade metamorphic and granitic rocks, the potential for finding more multimillion-barrel fields remains high. Seven new exploration wells were spudded in 2003.

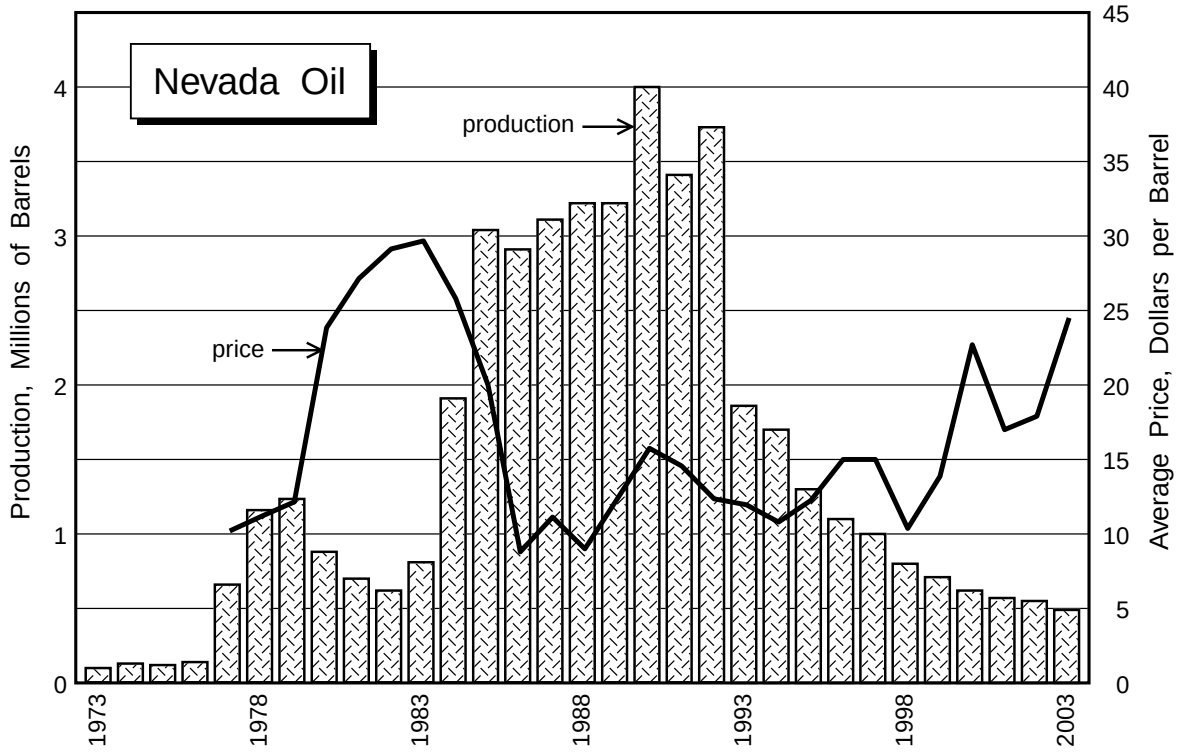
Additional information about the Nevada mineral industry and the U.S. gold industry, including the contents of selected publications, is readily available on line through the World Wide Web from the Nevada Bureau of Mines and Geology (www.nbmg.unr.edu/) and the Nevada Division of Minerals (http://minerals.state.nv.us/). Useful national and international data on nonfuel minerals can be obtained from the U.S. Geological Survey (http://minerals.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.





Nevada population. Data from the U.S. Census Bureau <www.census.gov>. Projection to 2010 by Nevada State Demographer.


Nevada
Geothermal Energy
production
price
Production, Millions of Megawatt-Hours
Average Price, Dollars per Megawatt-Hour
1.5
1.2
0.9
0.6
0.3
0.0
150
120
90
60
30
0
1985
1988
1991
1994
1997
2000
2003


Nevada Oil
production
price
Production, Millions of Barrels
Average Price, Dollars per Barrel
4
3
2
1
0
45
40
35
30
25
20
15
10
5
0
1973
1978
1983
1988
1993
1998
2003

Metals

by Joseph V. Tingley

Nevada produced 7.32 million ounces of gold and 10.2 million ounces of silver in 2003, both amounts less than production reported in 2002. Gold production was down by almost 414 thousand ounces and silver production was less by about 3.3 million ounces. The substantial decline in silver production was due mainly to the absence of production from the McCoy/Cove Mine in Lander County which closed in 2002. Nevada, however, maintained its place as the leading producer of gold and silver in the United States. Twenty-three mines in Nevada reported gold production in 2003, while 20 reported silver production.

Barrick Gold Corp., with production from its Betze-Post, Meikle, and Ruby Hill Mines (plus its 50% share of Round Mountain's production and one-third-share of Marigold's production), had a total production of 2,568,859 ounces of gold, taking first place for 2003. Newmont Mining Corp., reporting production from its Carlin trend mines, Twin Creeks, Lone Tree, Mule Canyon, Phoenix, McCoy/Cove, and the Midas Mine, had a total Nevada production of 2,491,684 ounces of gold.

For a fourth consecutive year, Barrick Gold's Betze-Post Mine was Nevada's largest gold producer, with an output of 1,559,401 ounces. Newmont's Carlin trend mines produced 1,122,208 ounces of gold, and Placer Dome's Cortez operation produced 1,065,402 ounces of gold. Barrick's Meikle Mine, the largest underground mine in Nevada, produced 551,664 ounces of gold in 2003, about 90,000 ounces less than in 2002.

Coeur D'Alene Mines Corp.'s Rochester Mine was the largest silver mine in Nevada in 2003, with a production of 5,585,385 ounces of silver. Newmont's Midas Mine was in second place with 2,647,374 ounces, and the Round Mountain Mine was in a distant third place with a still-respectable production of 761,333 ounces.

EXPLORATION

For the second consecutive year, exploration activity in Nevada showed a healthy increase. The concept of "high-grade feeder veins" beneath previously exploited low-grade surface ores continued to gain followers, and was expressed as claim staking and drilling in numerous old districts scattered across the state. Ripples of interest spread from Newmont's Midway property in Nye County and generated activity in the nearby Ellendale, Hannapah, Belle Helen, Golden Arrow, and Clifford districts. To the north, in the Cortez and Simpson Park Mountains of Eureka County, continued discoveries by Placer Dome fueled excitement, claim staking, and drilling in that area. Several companies were active in the Battle Mountain and adjacent districts of Lander and Humboldt Counties, sparked by announcements of pending development and production at Newmont's Phoenix project.

Gold and silver remained the metals of choice for Nevada exploration companies, although two copper properties received mention in the year's mining news. Most noteworthy was the announcement that the porphyry copper deposit at the Robinson Mine near Ely in White Pine County may again be brought into production.

Over 17,700 new mining claims were recorded in Nevada in 2003, exceeding 2002's total of 13,500. As was true in 2002, the 2003 claims were spread across the state. Major staking was recorded in the Battle Mountain district (940 claims), the Northern Simpson Park area (745 claims), and the Ivanhoe district (730 claims).

Figure 1 shows the location of Nevada mining districts and areas in which exploration activity was reported during 2003. Figure 2 shows the distribution of claim staking activity, by district and area, in Nevada in 2003.

Specific 2003 exploration and development projects are summarized by county and mining district in the following section.

CHURCHILL COUNTY

Gold Basin District

Gold Summit Corp. Optioned two properties in the Gold Basin district. The properties total 50 lode claims covering two quartz vein-shear zone systems, some 1.2 miles apart, where up to 0.35 opt (troy ounces per short ton) Au in grab samples have been reported in the past. (Gold Summit Corp. press release, 12/3/2003)

Holy Cross District

Pyramid Mine. Western Goldfields, Inc. continues to hold the Pyramid Mine in the Holy Cross district. The Pyramid mine is a high-grade, silver-gold-lead-zinc vein system hosted in altered volcanic rocks. Underground exploration conducted in the 1990s encountered multiple high-grade faces with samples ranging as high as 2.86 opt Au and 453 opt Ag. In addition, a limited inferred mineral resource was estimated of approximately 4,000 tons containing an average grade of 0.516 opt Au, 74.99 opt Ag, 5.95% Pb and 7.08% Zn. Mineralization remains open both along strike and down dip throughout the project area. (Western Goldfields, Inc. press release, 3/6/03)

Shady Run District

Fondaway Canyon Property. Royal Standard Minerals Inc. completed a technical report for its148-claim Fondaway Canyon gold property located on the western slope of the Stillwater Range. Nearly vertical, east-west trending mineralized shear zones host the Half Moon, Paperweight, Hamburger Hill and South Pit gold deposits, which are reported to contain indicated

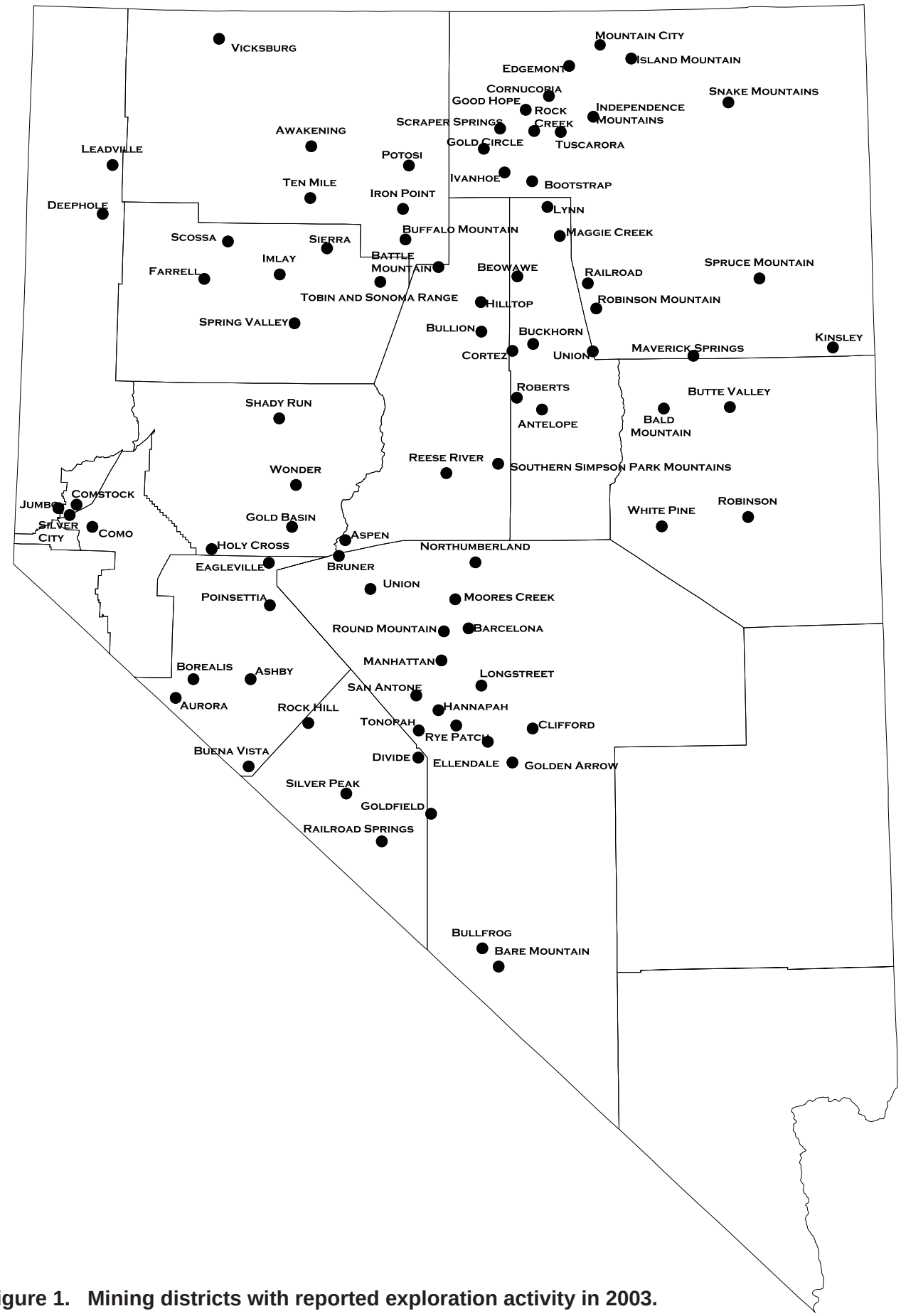


Figure 1. Mining districts with reported exploration activity in 2003.

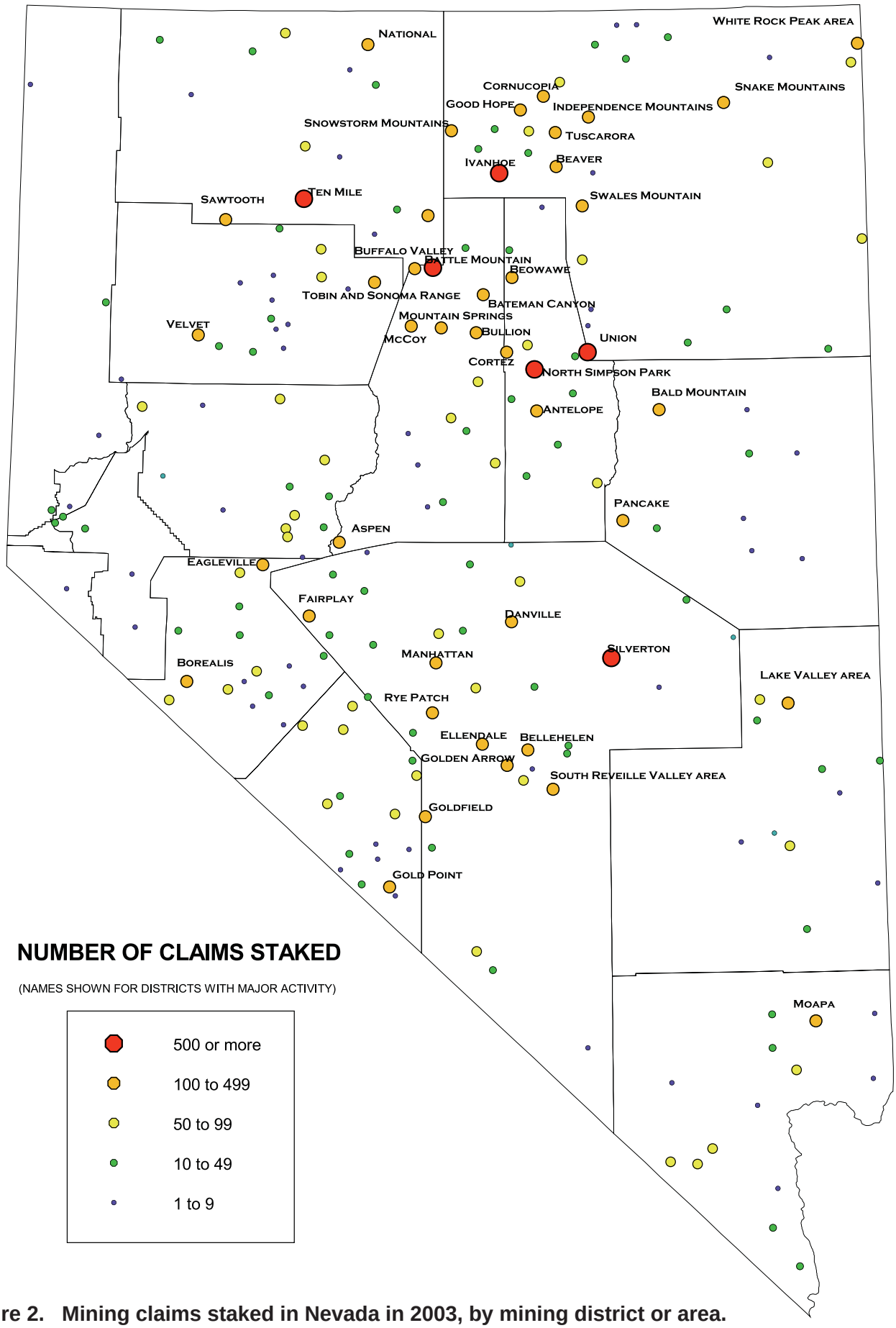


Figure 2. Mining claims staked in Nevada in 2003, by mining district or area.

resources of 390,636 tons of 0.428 opt Au and inferred resources of 372,849 tons of 0.409 opt Au at a 0.20 opt cutoff grade.

The company plans a surface and underground drilling program to upgrade the indicated and inferred resources on the property. The drill program will be followed by a mine feasibility study to determine a mine plan for the proposed development of a 500 to 1,000 tons per day underground mine on this project. The company will begin the process of filing the necessary mining and surface use permits from Federal and State agencies in 2004. (Royal Standard Minerals Inc. press releases, 9/3/2003, 11/5/2003)

Wonder District

Gold Summit Corp. Optioned 42 lode mineral claims in the Wonder district. The Nevada Wonder Mine, the main producer in this district, produced almost 400,000 tons of gold ore between 1911 and 1919 from the Wonder Vein, and the district contains numerous other northeast- and northwest-trending trending quartz veins which show little evidence of modern exploration. Gold Summit plans mapping and surface sampling for 2004 to identify diamond drill targets. (Gold Summit Corp. press release, 12/3/2003)

ELKO COUNTY

Bootstrap District

Rodeo Creek Property. Trio Gold Corp. commenced drilling in July 2003 on its Rodeo Creek property. The first phase of drilling will consist of three holes designed to test for gold mineralization in both the Rodeo Creek and the Popovich Formations to a depth of approximately 3,200 feet along the Look fault system. Trio's property is located approximately 1 mile northwest of Barrick's Rossi/Storm and Dee gold mines in the northern portion of the Carlin trend. (Trio Gold Corp. press releases, 6/19/2003, 9/29/2003)

Rossi Property. Underground infill drilling by Barrick at the Rossi property has intersected significantly higher grades than previous drill programs. A total of 12 holes on two stations have been completed in a 50-hole program. This program will increase drill density to a 50 foot by 50 foot spacing in the 49er Zone. A resource calculation will be completed by the end of 2003. (Barrick Third Quarter Report 2003, 9/30/2003)

Cornucopia, Good Hope, Rock Creek Districts

Carlin North Project. Consolidated Global Minerals Ltd. is planning exploration at its Carlin North project. The project consists of the Rock Creek (82 Bluto and Dry claims), Good Hope (97 GHP, GH, and GGH claims), and Cornucopia (8 PAR claims) precious metal properties situated in the Tuscarora Mountains. Various companies have conducted exploration on the properties in the past for volcanic-hosted, high-grade Au-Ag veins and sedimentary-rock-hosted, bulk tonnage Au-Ag deposits. No resources have thus far been defined on the three properties, but past work has defined large (greater than 1,000 feet by 5,000 feet) areas of strongly argillized volcanic rocks which host numerous silicified breccia zones. The proposed exploration program will explore for Carlin-type mineralization beneath shallow volcanic cover on these properties. (press release, 12/1/2003)

Edgemont District

Black Jack Silver Project. The underground workings at the Burns Mine will be reopened for exploration. The mine is in White Rock Canyon in Bull Run Mountains, 14 miles southwest of Mountain City. Forest Service analysis of the project is complete, and the work is scheduled for 2004. (Humboldt-Toiyabe National Forest, Schedule of Proposed Activities, October through December 2003, 8/27/2003)

Gold Circle District

Clover Prospect. Newmont USA Limited has entered into an agreement to acquire an interest in Atna Resources Ltd.'s Clover gold prospect, a high-grade, epithermal vein gold prospect situated along the northern margin of the Midas trough, on the southwest flank of the Snowstorm Mountains. Drilling by previous operators intersected mineralized and veined breccias and shear zones, with significant intercepts including 32 feet grading 0.74 opt Au, 25 feet of 0.23 opt Au, and 10 feet of 0.29 opt Au. High-grade float boulders grading up to 0.90 opt Au and 9.0 opt Ag in grab samples, were discovered on the property, approximately 2 miles north-northwest of this drilling. A strong resistivity anomaly identified by an airborne TEM geophysical survey occurs about 1,300 feet south of the float boulders. Newmont intends to initiate a detailed ground geophysical survey to confirm the TEM resistivity anomaly, followed by drilling. (Atna Resources Ltd. press release, 9/4/2003)

Sno Property. Pacific Ridge Exploration Ltd. will acquire Atna Resources Ltd.'s Sno property, a vein-hosted epithermal gold prospect located along the northern front of the Midas trough $2^{1}/_{2}$ miles east of Atna's Clover property. During 2003, Atna carried out geological mapping and sampling on the property. A total of 92 rock samples were collected and assayed, giving values ranging up to 0.28 opt Au. The highest grade samples came from steeply dipping, chalcedonic quartz and quartz/calcite veins associated with north- to north-northwest-trending structures. Pacific Ridge will commence permitting for drilling in preparation for drilling during the first quarter of 2004. (Pacific Ridge Exploration Ltd. news release, 1/5/2004)

Independence Mountains District

Big Springs Property. Gateway Gold Corp. has identified eight target zones on its Big Springs property, all of which were drill-tested during 2003. Significant gold intersections were encountered in seven of the target zones. The eighth zone, the Crusher zone, has been drilled but results have not yet been received. Based on the initial success of this program, the company is planning a follow-up program of a minimum of 98,400 feet of drilling at Big Springs. (Gateway Gold Corp. press release, 11/5/2003; 12/16/2003)

Consolidated Global Minerals Ltd. Property. Consolidated Global Minerals Ltd. acquired 45 mining claims, and the mineral rights to approximately 2,025 acres of ranch land located adjacent to the Jerritt Canyon Mine in the Independence Mountains mining district. There is a small resource located on the claims (464,000 tons at 0.034 opt Au) and prior work also indicates the presence of possible high grade zones at depth. (Consolidated Global Minerals Ltd. press release, 10/14/2003)

Jerritt Canyon Mine. On June 30, 2003, Meridian Gold completed the sale of its 30% interest in the Jerritt Canyon Joint Venture property to Queenstake Resources USA Inc. This concluded the agreement signed by the parties on June 2, 2003 that was preceded by Queenstake's unsolicited offer to acquire the property. Queenstake has accepted full closure and reclamation and other liabilities. The operating permits of the mine were transferred to Queenstake. (Meridian Gold, Inc. press release, 7/2/2003)

Queenstake reported that its underground and surface drilling programs carried out after acquisition of the Jerritt Canyon Mine are finding new mineralization. According to Queenstake, the underground drilling at SSX Mine and Smith Mine found mineralization that can be expected to be converted to reserves, and surface drilling in the Coyote target area also identified ore-grade mineralization. The identification of new ore-grade mineralization from surface drilling of the Coyote target opens a potential new extension to the Murray Mine. Exploration by Queenstake since completing the acquisition of Jerritt Canyon has focused on drilling adjacent to current workings. This will continue next year and will be complemented by district-scale exploration of the many targets within Queenstake's extensive land position in the Independence Mountains. (Elko Daily Free press, 11/19/2003)

Island Mountain District

Island Mountain Exploration Project. Exploration drilling is planned in the Coleman Canyon and Poorman Peak area, 15 miles southeast of Mountain City. (Humboldt-Toiyabe National Forest, Schedule of Proposed Activities, October through December 2003, 12/1/2003)

Gold Creek Project. Argosy Minerals Inc. announced that it has optioned the Diamond Jim Mine claims, 33 unpatented claims covering a possible northern extension of the gold-rich St. Elmo vein system. An induced polarization survey completed by Golden Hope Mines in 1998 identified a 1,600-foot-long, roughly south-southeast-trending resistivity high on the eastern slopes of Rosebud Peak which may be coincident with a fault zone that possibly controls gold mineralization at the St. Elmo. Rock chip sampling along the resistivity high detected the presence of gold values up to 0.5 opt in quartz veins and breccia in quartzite. In the spring of 2004, Argosy plans a detailed surface mapping program designed to delineate the known outcropping high grade gold zone on Rosebud Peak. (Argosy Minerals Inc. news release, 12/15/2003)

Ivanhoe District

Golden Cloud Property. Atna Resources Ltd. completed a gravity survey at Golden Cloud, adjacent to the Hecla/Great Basin Gold Ivanhoe deposit and the Placer Dome/Teck-Cominco Silver Cloud discovery. The survey defined major northwest striking structures similar to those associated with other deposits in the district. Geologic mapping by Atna defined a large silica sinter field on the property that is anomalous in both gold and mercury. Abundant cinnabar is readily visible in the surface outcrop. The principal target at Golden Cloud is a "bonanza-style" epithermal vein gold deposit. Great Basin Gold Ltd. acquired an interest in the property in August 2003, and will manage the future exploration program with support from Atna personnel. (press releases, 7/8/2003, 8/26/2003)

Ivanhoe Creek and Rimrock Properties. Senator Minerals Inc. leased the 48-claim Ivanhoe Creek property and the 45-claim Rimrock property, located 3 miles north of Hecla/Great Basin Gold's Ivanhoe project. A minimal exploration program was carried out on both properties by Newmont in 1994, searching for shallow open-pit mineable gold targets. Results of that program were not significant, but the properties are now being prospected for high-grade, underground gold-silver deposits. (Senator Minerals Inc. press release, 9/22/2003)

Ivanhoe Project. Since acquiring the Ivanhoe property in 1997, Great Basin has conducted drilling programs that outlined three high-grade vein systems—the Clementine, Gwenivere, and South Gwenivere. The drilling also discovered a number of additional north-northwesterly trending vein systems, and uncovered the presence of Carlin-style mineralization at depth. Great Basin completed resource and economic studies of the Clementine, Gwenivere, and South Gwenivere vein systems in 2001. The property contains an inferred resource of 719,000 tons at a grade of 1.29 opt Au and 7.0 opt Ag. In mid-2001, a deep drill hole was completed

to test for the presence of the units that host Carlin-style disseminated gold deposits to the southeast on the Carlin trend. The hole intersected 74 feet of strongly anomalous gold, silver and pathfinder metals in rocks of the Rodeo Creek Formation immediately above the lower plate carbonate rocks that typically host Carlin deposits, suggesting the presence of a Carlin-style mineralizing system at the Ivanhoe property. In 2002, Great Basin entered into agreements with Hecla Mining Co. for a two-stage exploration and development that will lead to eventual production of the Clementine-Gwenivere high-grade gold-silver vein systems within the Hollister Development Block. Stage 1 will consist of driving a decline to access the high-grade gold veins, and underground drilling to establish mineral reserves. Stage 2 will consist of pre-production underground development. Hecla would also operate the mine. Permitting for Stage 1 is advancing and it is expected that tunneling of the decline to access the high-grade gold veins will begin at site in the first quarter of 2004. (Great Basin Gold Ltd. Website, 10/21/2003)

West Silver Cloud Property. Senator Minerals Inc. acquired the West Silver Cloud property from RMIC Gold in April 2003. This 760-acre claim block is located adjacent to and west of the original Silver Cloud property. Limited exploration work resulted in two phases of silica veining being found along this fault corridor, along with remnants of silica sinter sheets along volcanic bedding and erosion surfaces. Regional gravity-station data suggest that these fault structures form the western control-fault boundary of the Silver Cloud structural system, which projects north to the Midas Mine. (Senator Minerals Inc. press release, 8/11/2003)

Kinsley District

Kinsley Mountain Property. Nevada Sunrise, LLC canceled their joint venture agreement with Lateegra Resources Corp. on the Kinsley Mountain property on May 17, 2003 because Lateegra failed to comply with the terms of its agreements with Nevada Sunrise. Interpretation of existing drill and geophysical data indicate the existence of potentially large, unexplored high-grade gold zones beneath the known oxide deposits mined by Alta Gold. No follow-up geophysical work or drilling was performed on these targets by Lateegra. Nevada Sunrise is presently seeking a joint venture partner for continued advancement of this property. (Nevada Sunrise, LLC press release, 5/27/2003)

Maverick Springs Area

Maverick Springs Project. Vista Gold Corp. granted Silver Standard Resources Inc. an option to acquire Vista's interest in the silver resources hosted in the Maverick Springs project. In October 2003, Silver Standard completed a 14-hole, 12,920-feet drill program on the property. Maverick Springs is a flat-lying, silver-dominant, Carlin-type system with mineralization occurring in a zone 100 to 400 feet thick. All holes intersected mineralization, confirming mineralization within a zone measuring approximately 2,500 feet north-south by 2,000 feet east-west. Earlier work on the property outlined indicated silver resources of 32.3 million ounces and inferred silver resources of 68.8 million ounces. (Vista Gold Corp. press release, 6/17/2003; 11/24/2003)

Mountain City District

Rocky Gulch Exploration Project. Exploration drilling was completed in October on the Rocky Gulch project located in the Chicken Creek drainage, 3 miles South of Mountain City. (Humboldt-Toiyabe National Forest Schedule of Proposed Activities, 8/27/2003)

Railroad District

Dixie Creek Property. Frontier Pacific Mining Corp. received permitting approval from the BLM, and commenced drilling on their Dixie Creek property. The drilling is designed to test for gold potential at the structural intersection of the east margin of the Carlin Horst and the Webb Formation at depths below 1,000 feet. The 35-claim Dixie Creek property is located 20 miles south of Carlin, on the eastern side of the Piñon Range. Two core drill holes, totaling up to 5,000 feet of drilling, are planned. (Frontier Pacific Mining Corp. press release, 7/3/2003)

South Carlin Project. Analysis has been completed on all core samples from the Phase II drill program on Nevada Pacific Gold's 17-square-mile South Carlin project. No economic concentrations of gold were encountered in the drilling but wide zones of alteration containing strong pathfinder element signatures were present. Effective January 20, 2003, Placer Dome U.S., Inc. terminated its South Carlin option and joint venture agreement with Nevada Pacific Gold and forfeited all rights to earn an interest in the project. (Nevada Pacific Gold Ltd. news release, 1/21/2003)

Robinson Mountain District

Triple Junction and Dixie Fork Properties. Mapping at the Triple Junction and Dixie Fork properties has focused on an area known as Jasperoid Wash, an area is characterized by intense argillic alteration, silicification in structures, and barite associated with gold values up to 0.20 opt Au. The outcropping lithologies at Dixie Fork and Triple Junction occur stratigraphically above a limestone-siltstone contact which hosts most of the known reserves in the nearby Rain district. A gravity survey was completed to delineate the structurally dislocated stratigraphic blocks and to determine depth to the potential ore horizon. Results are being integrated with magnetics and geology for interpretation. (Atna Resources Ltd. press release, 7/8/2003)

Piñon and Railroad Projects. Royal Standard Minerals Inc. reevaluated the data on its Piñon and Railroad projects to determine the economic potential of the near-surface resources. This work concentrated on the Piñon, Main, and North Pod and the Railroad, Pod, and East jasperoid deposits that are included within Royal Standard Mineral's approximately 16,000 acre property. An initial 10-hole (2,620 feet) drilling program was completed on the Piñon Main Zone deposit. The drilling was focused upon extending the near surface portion of the deposit toward the south, southeast and northwest into areas of thin overburden in an effort to determine the gold-silver resource tonnage and grade potentials within these areas for a proposed mine plan. The overall grade of the resource included within the mine feasibility study is estimated to be 0.045 opt gold. The current dimensions of the Piñon near surface portion of the measured gold-silver oxide deposit is 1,400 feet along strike, 300 to 600 feet wide and 15 to 150 feet thick. The company will continue with the current feasibility study on the Piñon-Railroad project, and plans to complete a draft of a development plan and the filing of the first draft mining permit application to Federal and State agencies for a 5,000-ton/day mine and heap-leach facility before the end of 2003. (Royal Standard Minerals Inc. press releases, 4/21/2003; 11/3/2003; 11/5/2003)

Scraper Springs District

Horse Mountain, Rock Horse, and North Star Properties. In February 2003, Mill City International Corp. optioned Anaconda Gold Corp.'s Horse Mountain, Rock Horse, and North Star gold properties. Several mining companies conducted exploration work on the properties in the early 1980s, but that work focused on testing for near-surface gold mineralization and ignored the deep exploration potential of the properties. In July 2003, Anaconda Gold terminated the option agreement. (Mill City International Corp. press release, 2/26/2003; 7/3/2003)

Snake Mountains District

Loomis Mountain Gold Project. Newmont Mining Corp. has signed a joint venture agreement covering Western States' Loomis Mountain Gold project in Elko County. (The NewWest Resources Group press release, 11/4/2003)

Spruce Mountain District

Clover Valley Project. A fall drilling program on Nevada Pacific Gold Ltd.'s Clover Valley Gold project was designed to follow up recent geochemical and geophysical surveys which outlined several new target areas on the property. The Clover Valley project, 2.25 square miles in size, is located along the western edge of the Spruce Mountain mining district approximately 35 miles south of Wells. Exploration carried out over the last several months included geological mapping, rock chip and soil sampling, and the acquisition of gravity data. The rock and soil sampling program was centered on an area of historical drilling and covered the entire land package where favorable host rocks either outcropped or were projected to lie under shallow cover. Nevada Pacific Gold has increased the size of the land position through claim staking extending the project area some 3,000 feet to the north. The 2004 drill program is to follow up on the recent geochemical and geophysical surveys. (Nevada Pacific Gold Ltd. press release, 9/23/2003, 11/11/2003, 12/16/2003)

Tuscarora District

Tuscarora Project. Phase I of Terraco Gold Corp.'s exploration program at Tuscarora was completed with a total of 9,330 feet of drilling in 18 holes. The drill results from the Phase I drilling along with results from previous operators will be reviewed in conjunction with the geophysical test results in order to further understand the Tuscarora geology and develop a second phase drilling program. Terraco also plans on continuing a geophysical survey for other areas of the Tuscarora property. (Terraco Gold Corp. press release, 12/19/2003)

ESMERALDA COUNTY

Buena Vista District

Tip Top Project. Gold Summit Corp. completed 2,313 feet of HQ core in nine holes over a 200-foot strike length in its latest drilling program on its Tip Top property. The holes tested down dip and along strike of a series of high grade gold veins intersected by previous drilling. The first round of core drilling in the area of the Tip Top Adit extended a high grade gold shoot partially drilled by previous explorers. It appears that this and other known ore shoots near the adit have shallow northerly plunges along the plane of the north-east striking Tip Top fault zone. The next phase of drilling will concentrate on testing for further high grade extensions of this shoot to the northeast as well as other targets along the 2.2-mile strike length of the exposed system. (Gold Summit Corp. press release, 1/9/2004)

Divide and Tonopah Districts

Hasbrouck and Three Hills Properties. Vista Gold Corp. purchased the Hasbrouck property in the Divide district, and the Three Hills property in the Tonopah district from Newmont Mining Corp. Each property hosts oxidized, epithermal gold-silver mineralization. Geological resources on the Hasbrouck property have been calculated at 20.3 million tons at 0.023 opt Au indicated and 8.2 million tons at 0.021 opt Au inferred. The Three Hills property has an indicated resource of 5.7 million tons at 0.023 opt Au. (Vista Gold Corp. press release, 3/20/2003, 7/31/2003)

Goldfield District

Gemfield Property. Metallic Ventures Inc. completed a 69,000-foot, 222-hole drilling program on its Gemfield gold deposit in 2003. The program added significantly to the grade, continuity, and understanding of the deposit, and defined the limits of economic mineralization. The final 21 holes of the 2003 drilling program are located on the eastern perimeter of the deposit where gold mineralization daylights at its up-dip extension and/or is cut off by a post mineral fault. Upon completion of a new permit application and accompanying Environmental Assessment with the BLM, drilling will continue within the Gemfield area. (Metallic Ventures Inc. press release, 7/7/2003)

McMahon Ridge Deposit. Metallic Ventures Inc.'s 2003 exploration drilling program on the McMahon Ridge Gold deposit increased the strike length and the down dip extension of the deposit. These increases, combined with a greater geologic understanding of the deposit, significantly enhance the resource. This phase of drilling totaled 54 reverse-circulation drill holes with a combined total footage of 25,585 feet. (Metallic Ventures, Inc. press release, 5/5/2003)

Tom Keane Project. Metallic Ventures Gold Inc. completed drilling at the Tom Keane project located on the south eastern edge of their Goldfield property. Results from 10 drill holes on the Tom Keane Target have detected strongly anomalous gold mineralization associated with prominent northwest striking structural features. (Metallic Ventures, Inc. press release, 7/21/2003)

Railroad Springs District

Imperial Mine. Miranda Gold Corp. received approval to drill its Imperial Mine property in the Railroad Springs mining district. The Imperial Mine, located approximately 19 miles southwest of Goldfield, has a history of exploration dating to the 1920s, and between 2,000 and 3,000 ounces of gold were recovered from the property in the 1930s. Recent exploration for bulk tonnage gold mineralization began in the early 1980s and included trenching, sampling and approximately 8,700 feet of shallow drilling in 48 holes. The primary exploration target at Imperial is shallow, oxidized, Carlin-style gold mineralization. A secondary target is high-grade gold mineralization hosted by the Imperial fault. (Miranda Gold Corp. press release, 9/29/2003)

Rock Hill District

Redlich Project. Miranda Gold Corp. staked an additional 18 claims at its Redlich project in Esmeralda County. Several companies have explored the Redlich project area including Inspiration Development, FMC Gold, and the Cordilleran Nevada syndicate (Cordex). Boulders and cobbles of high-grade, well-banded quartz vein material have been discovered in exposures of Tertiary alluvium over an area of approximately 100 acres, most of which remains untested by drilling. (Miranda Gold Corp. press release, 9/23/2003)

Silver Peak District

Mineral Ridge Mine. Golden Phoenix Minerals, Inc. began Phase 1 operations at its Mineral Ridge Mine in July 2003. The company will mine low-grade ore from the Drinkwater open pit and high-grade ore from the deeper levels of the Mary Mine. The first drilling program at the mine is scheduled to begin on January 7, 2004. More than 50 holes will be drilled the Brodie Pit, Oro-Monte, and the East Mary areas in the initial test. (Golden Phoenix Minerals, Inc. press releases, 5/21/2003, 7/29/2003, 12/29/2003)

EUREKA COUNTY

Antelope District

Gold Bar Property. The first drill hole in American Bonanza Gold Mining Corp.'s Gold Bar deep exploration program was partially drilled earlier this year, but technical difficulties caused the hole to be abandoned. To complete the drill hole, a core drilling rig reentered the drill hole and was wedged off to avoid reverse-circulation drill steel that was lost at the bottom of the hole. The drill hole is designed to explore for mineralized feeder structures within the Roberts Mountains Formation at depth below the Gold Bar open pit. (American Bonanza Gold Mining Corp. press release, 12/16/2003)

Indian Ranch Property. White Knight Resources Ltd. and Chapleau Resources Ltd. executed an option-joint venture agreement with Placer Dome U.S. Inc. on their Indian Ranch property located 15 miles southeast of the Gold Acres-Cortez window. Drilling to date on Indian Ranch has found substantial gold mineralization in both upper and lower plate lithologies. (White Knight Resources Ltd. news release, 4/1/2003)

Red Canyon Property. Miranda Gold Corp. leased the Red Canyon property, comprising 237 unpatented lode mining claims located approximately 20 miles south of Placer Dome's Hills discovery, between the Tonkin Springs and the Gold Bar deposits. Several companies have explored Red Canyon, including Meridian Minerals Company, Tenneco Minerals, Great Basin Mining and Exploration, Hemlo Gold Mines (U.S.) and Kennecott Exploration Co. Past sampling and drilling identified three areas of gold mineralization. The strongest mineralization is in the Ice Zone, where the highest-grade drill sample over a 5-foot interval returned 0.32 opt Au. (Miranda Gold Corp. press release, 11/20/2003)

Tonkin Springs Gold Mine. U.S. Gold Corp. and BacTech Environment Corp. entered into an agreement giving BacTech the right to acquire a 55% interest in the Tonkin Springs Mine. A gold resource of 1.4 million ounces exists at the mine in addition to facilities that include a 3,000-ton/day mill with a bio-oxidation circuit and complete infrastructure. In 2002, U.S. Gold licensed from Newmont Mining Corp. their N2TEC flotation technology that will allow sulfide gold ore at Tonkin Springs to be efficiently concentrated. BacTech anticipates very little retrofitting of the existing bio-oxidation circuit in order to apply the bioleaching technology. BacTech continues to work toward a final feasibility study for Tonkin Springs, and they are anticipitating gold production at the Tonkin Springs Mine in 2004. (U.S. Gold Corp. press release, 5/5/2003, 11/4/2003)

Beowawe District

Beowawe Prospect. Detailed mapping of structure and alteration zonation at Atna Resources' Beowawe prospect has extended the known hydrothermal system an additional 2 miles to the west of the original target area, greatly increasing the prospective target size. Multiple, subparallel high-level chalcedonic quartz veins up to five meters wide are strongly anomalous in gold and other pathfinder elements. A geothermal well drilled on the western block of Atna's property intersected 0.20 opt Au in a 100-foot composite sample. An IP survey has begun to map out sulfide distribution and define drill targets. (Atna Resources Ltd. press release, 7/8/2003)

Buckhorn District

SF Property. Bravo Venture Group Inc. has acquired two properties located east and south of Placer Dome's ET Blue discovery. The 68-claim SF property forms the point of a triangle, with the ET Blue to the west, and the historical Buckhorn Mine 3 miles to the north. A series of northwest- and northeast-trending structures project through the property which is covered by shallow pediment gravels. A second prospect, lying approximately 10 miles southeast of ET Blue, has been acquired as a classic sedimentary-rock-hosted gold target. On this property, development of jasperoid along a thrust fault separating upper plate Vinini Formation from lower plate Devils Gate Formation occurs over several hundred feet of strike length and is as much as 50 feet thick. Anomalous pathfinder elements and gold values occur associated with the jasperoid. Compilation of existing exploration data, geochemical sampling, and geological mapping is planned on both properties prior to drilling. (Bravo Venture Group Inc. press release, 12/1/2003)

Cortez District

Cortez Hills Deposit. Placer Dome U.S. Inc. announced that the Cortez joint venture in Nevada has made a significant new oxidized gold discovery called Cortez Hills. The new resource is approximately 7.5 miles southeast of the existing Pipeline/South Pipeline complex and 0.5 mile north of the Pediment deposit. Although in proximity to Pediment, the Cortez Hills resource is a distinct and separate mineralized zone. Cortez estimates that the new discovery currently contains 4.5 million ounces of measured and indicated gold mineral resources and an additional inferred mineral resource of 1 million ounces. It may be possible to develop the resource concurrently with either the Pediment or Pipeline/South Pipeline deposits. The deposit currently has a strike length of more than 980 feet and is approximately 490 feet wide. The mineralized zone starts approximately 390 feet below surface and continues to a depth of more than 500 feet. The new discovery is open along strike and to the west. (Placer Dome Inc. news release, 4/29/2003, 6/11/2003)

Mill Canyon Property. Victoria Resource Corp. acquired the Mill Canyon property, consisting of 426 unpatented and 11 patented mining claims in the Cortez Mountains. Previous exploration on the property identified two zones of mineralization with small inferred resources. A gold-bearing skarn reportedly contains an inferred resource of 75,000 tons at 0.917 opt Au, and the Chute resource, located adjacent to the Horse Canyon deposit to the southeast, reportedly contains approximately 240,000 tons with an estimate grade of 0.132 opt Au. (Victoria Resource Corp. press release, 1/21/2003)

Lynn District

Goldstrike-North Pit Target. Drilling commenced at the Goldstrike-North Pit target, located immediately north of Betze-Post. Five of six initial holes contain mineralization. Two additional drill rigs have been added to accelerate the program. (Barrick Third Quarter Report 2003, 9/30/2003)

Maggie Creek District

Gold Quarry Mine. Deep drilling by Newmont Mining Corp. in the Gold Quarry pit beneath the Dos Equis and Chukar deposits intersected mineralization that will be further investigated for potential pit expansion or underground mining. (Newmont Mining Corp. First Quarter 2003 Report, 5/7/2003; Third Quarter 2003 Report, 10/29/2003)

Leeville Project. Surface facilities are essentially complete at the Leeville project. The sinking of the ventilation and production shafts is continuing on schedule and Leeville is expected to begin gold production in the fourth quarter of 2005. (Newmont Mining Corp. First Quarter 2003 Report, 5/7/2003; Third Quarter 2003 Report, 10/29/2003)

Pete Mine. Newmont Mining Corp.'s Pete Mine is in production. Pete is a four-phase project that will eventually mine roughly 100 million tons of rock, including gold ore. Pete will be the largest of three open pits that together comprise the Pete Mine. The Pete Pit will provide near-surface oxide ore for heap leaching,

although in a later phase, there will be carbonaceous ore for the roaster. The Castle Pit is oxide, and Crow Pit is refractory ore. The Pete Pit will have a life of 8 to 10 years, and contains 700,000 ounces of gold reserves. Crow has 100,000 ounces of gold reserves, while Castle has 30,000 ounces of gold. (Elko Daily Free press, Adella Harding, 10/9/2003)

Roberts District

Keystone Property. The Keystone property is located to the south of the Pipeline Mine and covers a lower plate carbonate window and an intrusive complex. Geophysical surveys completed on the property have outlined a number of drill targets. Geochemical gold targets and high-grade massive sulfide skarn mineralization (including float boulders containing more than 50% combined base and precious metals) will be the focus of a drill program in 2004. (Nevada Pacific Gold Ltd. press release, 9/23/2003, 12/16/2003)

Union District

Phoenix Project. Maximus Ventures Ltd. acquired the rights to a 70% interest in the 11,000 acre Phoenix gold-copper project located in the area of Union Summit in the Sulphur Springs Range of Eureka County. Maximus will spend $400,000 by the end of 2004 on exploring the gold project, another $1 million by the end of 2005, and a further $2 million before the end of 2007. (The Canadian Press, 12/18/2003)

HUMBOLDT COUNTY

Awakening District

Sleeper Property. Drilling commenced January 31, 2003 on X-Cal Resources Ltd.'s Sleeper property. A gravity survey covering about 10 line-miles was completed, along with new detailed surface geological mapping of areas east of the mine. Twenty-nine new mineral claims were staked by X-Cal as part of ongoing work to cover newly identified prospect areas. (X-Cal Resources Ltd. press release, 2/5/2003, 9/8/2003)

Battle Mountain District

Marigold Property. Glamis Gold Ltd. continued the Marigold exploration program to extend the recent TZN discovery and other promising targets on the property. Recently, Glamis has focused much of its Marigold exploration program on the Section 7 area that resulted in the new TZN discovery. The mineralization encountered to date is oxidized, above the water table and appears to be amenable to run-of-mine heap leaching. Current objectives are to define the resource and complete a scoping study which will investigate the possibility of a further expansion of Marigold Mine to a production rate in excess of 200,000 ounces of gold annually. (Glamis Gold Ltd. press release, 8/5/2003; 11/3/2003)

Buffalo Mountain District

Buffalo Mountain Property. The Cordex Syndicate completed ten reverse-circulation drill holes totaling 5,560 feet at the Buffalo Mountain property, located approximately 26 miles southeast of Winnemucca. The results were mostly poor, and the syndicate is reviewing all available data from the Buffalo Mountain and Buffalo Valley area to determine if other drilling targets might be justified and if the current property claims should be dropped. (Franc-Or Resources Corp. press release, 6/12/2003)

Converse Project. At Metallic Venture's Converse project, earlier wide spaced drilling on 400 foot centers defined a gold resource of indicated plus inferred resources totaling 1,588,000 and 1,141,000 ounces of gold respectively. In late 2003, the company completed 18-hole reverse-circulation drill holes and eight core holes at the property designed to verify previous drilling results. Core holes were placed throughout the known deposit to achieve representative samples of the deposit. Geologic analysis of the core and comparison to nearby reverse-circulation twins shows a strong control on gold mineralization by fracture density that is not uniform across the breadth of the deposit. However, the average assays for all of the core twins is very close to the same average for the reverse-circulation holes and the total accumulative gold within the deposit does not change. As a result of these data, MVG will proceed with the delineation of the deposit on 200-foot centers with less expensive reverse-circulation drilling while maintaining a regular check with core drilling. Metallurgical testing of the eight core holes will begin in January of 2004. (Metallic Ventures Inc. press release, 2/5/2003; 9/8/2003; 12/17/2003)

Iron Point District

Humboldt Springs Property. The Cordex Syndicate completed two vertical reverse-circulation drill holes at the Humboldt Springs property, and encountered a shallow horst with epithermal veining in volcanic rocks. The targeted Antler sequence rocks were not intersected to the depths drilled. Seismic reflection profiles are currently being re-analyzed at Humboldt Springs to determine if altered Antler sequence rocks could be indicated within 1,500 feet of the surface, and if it would be prudent to drill an additional hole to attempt to intersect them. (Franc-Or Resources Corp. press release, 4/17/2003)

Potosi District

Getchell Property. On April 15, 2003, Placer Dome announced it was resuming operation of the Turquoise Ridge gold mine on the Getchell property. At the end of 2003, Placer Dome Inc. and Newmont Mining Corp. completed a joint venture transaction at Turquoise Ridge.

Placer Dome, through its wholly owned subsidiary Placer Turquoise Ridge Inc. (PTRI), owns 75% of the joint venture and is the operator. Newmont has acquired a 25% interest in the joint venture, which includes the Turquoise Ridge and Getchell deposits. Under ore sale agreements, Newmont will purchase up to 730,500 tons per year of ore and process it at cost at its nearby Twin Creeks mill. PTRI and Newmont will each contribute their pro-rata share of mine development funding requirements, including capital costs and environmental closure expenses related to future joint venture operations. (Placer Dome Inc. News releases, 7/29/2003; 1/5/2004)

Twin Creeks Property. Newmont commenced stripping at the Section 30 Layback (south Mega Pit) at the Twin Creeks property in August 2003. Gold production is expected in 2005. (Newmont Mining Corp. press release, Third Quarter 2003 Report, 10/29/2003)

Preble-Pinson Property. Victoria Resource Corp. has acquired the Preble-Pinson property in the Potosi district. The property consists of a lease of all of Newmont's mineral interests in parts or all of approximately 24 square miles of the checkerboard property in the Edna and Osgood mountains, 28 miles northwest of Battle Mountain. (Victoria Resource Corp. press release, 1/21/2003)

Ten Mile District

Crown Point Property. Luna Gold Corp. staked 22 claims in the vicinity of the old WP Mine in the Ten Mile district about 13 miles east-southeast of the company's Blue Mountain project. The WP Mine was worked in the early 1940s and produced limited tonnages of high-grade antimony ore. The target at Crown Point is a high-grade, underground gold system located within the structural zone that was previously exploited for antimony. Present plans for the project include completing further surface sampling and geologic mapping. Luna Gold is also considering opening up the caved underground workings to complete new sampling and evaluation of the main structures. (Luna Gold Corp. press release, 10/2/2003)

Vicksburg District

Ashdown Mine. Golden Phoenix Minerals, Inc. plans to begin operations at the Ashdown gold-molybdenum property in the Vicksburg district. The Ashdown mine previously produced about 50,000 ounces of gold from underground ores between about 1880 and 1942. More recently, about $8 million was spent drilling 270 holes, performing metallurgical test work, excavating an 1,800-foot tunnel for bulk samples, and feasibility studies for potential open-pit and underground mining operations. Those studies identified gold and high-grade molybdenum resources on the property. As operator of the project, Golden Phoenix will perform the requirements of construction and start up of the new mine. (Golden Phoenix Minerals, Inc. press release, 9/23/2003)

LANDER COUNTY

Sure Fire Project. Pacific Rim staked the Sure Fire project located along the Northern Nevada rift in Crescent Valley. The Sure Fire project consists of 191 claims staked along the rift structures that control the Fire Creek Mine and the Mule Canyon Mine. (Pacific Rim Mining Corp. press release, 12/18/2003)

Aspen District

Highland Project. Rio Fortuna Exploration Corp. began a 4,000-foot, six-hole reverse-circulation drill program on its Highland gold property. Four drill holes will test down plunge and along strike of previously reported high-grade intercepts in the Main Zone of the Highland vein system. A further two drill holes will test a second potential high-grade shoot in the "Split Vein" area about 500 feet along strike to the southeast of the Main Vein area. The company also is making permit application for a more comprehensive diamond and reverse-circulation drill program to be undertaken in March/April 2004. (Rio Fortuna Exploration Corp. press release, 11/17/2003)

Battle Mountain District

BMX Gold Project. Two reverse-circulation drill rigs arrived in December at the Company's BMX project and began initial drill testing of gold targets generated during a Phase 1 exploration program that included property-wide geologic mapping and rock-chip sampling, collection and analysis of over 3,300 geochemical samples. The drill program will include 5,000 to 6,000 feet of reverse-circulation drilling in seven to ten holes. Drill targets identified to date include: 1) the Elder Creek area where initial drilling will target gold-bearing breccias, highly fractured zones, and geochemical anomalies within the mineralized Elder Creek structural corridor; 2) the Elder Creek Pediment area where a large multi-element geochemical anomaly has been identified on trend with the same mineralized structural corridor; 3) the Bluebird target where numerous high-grade assays have been obtained from surface (up to 0.887 opt Au) and underground (up to 1.55 opt Au) and; 4) the Overlook area where detailed ground magnetic and soil surveys have defined targets of both sediment-hosted and structurally controlled mineralization. (Nevada Pacific Gold Ltd. press release, 12/2/2003)

Lewis Property. Madison Enterprises Corp. resumed drilling at its Lewis property in Lander County and, during 2003, the company completed 20 in-fill and step-out drill holes totaling 11,050 feet over a strike extent of more than 1,800 feet. Madison's exploration of the Lewis property will resume in early 2004. Exploration will focus on establishing a preliminary resource estimate for that portion of the Virgin structural zone where Madison has carried out detailed drilling, as well as expanding step-out and detailed drilling northwards and southwards

along the Virgin fault. Madison will also begin exploration of the Buena Vista and Trinity fault systems and the northward extent of the Virgin fault. (Madison Enterprises Corp. press releases, 7/15/2003; 12/3/2003;12/17/2003)

Phoenix Project. Newmont Mining Corp.'s planned Phoenix project received approval from the U.S. Bureau of Land Management and from Newmont's board to begin development of the Phoenix mining operation. Newmont plans to begin detailed engineering in 2004 and construction of a mill and development work will start in 2005. Work will consist of developing the Reona Pit, expanding the Fortitude and Northeast Extension Pits to form the Phoenix Pit, expanding North Midas and South Midas Pits to form the Midas Pit and expanding the Iron Canyon Pit. Ore that isn't mill grade will be processed on an expanded Reona heap-leach pad. Phoenix has more than 6 million ounces of gold reserves, and Newmont plans to produce about 400,000 ounces of gold per year from the site. (Elko Daily Free Press, Adella Harding, 12/10/2003)

Bullion District

Crescent Valley Project. Pacific Gold Corp. planned to file the Plan of Operations for its Crescent Valley project during the first quarter of 2004. Nevada Rae Gold, a subsidiary of Pacific Gold Corp, acquired a gold project known as Crescent Valley, which is reported to contain a large alluvial gold deposit. (Pacific Gold Corp press release, 12/18/2003)

Mill Creek Property. X-Cal Resources Ltd. allocated an initial $500,000 budget for work on its 640-acre Mill Creek gold property in the Bullion district. The property is located on the "Goat Window" to the northwest of Placer's Pipeline Mine. The planned 2004 work program at Mill Creek will include offset drilling of previous gold-bearing intercepts and testing of drill targets in the northeast corner of the property nearest to the lower plate outcrops. (X-Cal Resources Ltd. news release1/5/2004)

Hilltop District

Hilltop-Slaven Property. Victoria Resource Corp. acquired interest in the Hilltop-Slaven property in the Hilltop district. The Hilltop-Slaven property consists of all of Newmont's mineral interests in parts or all of approximately 50 square miles of the checkerboard property and 19 unpatented mining claims in the Northern Shoshone Range, 17 miles southeast of Battle Mountain. (Victoria Resource Corp. press release, 1/21/2003)

Reese River District

Amador Canyon Property. The permitting process on Nevada Pacific Gold Ltd.'s Amador Canyon property is progressing and an initial 5,000-foot drill program is planned for 2004. The 820-acre property is located in the northern portion of the Reese River mining district 4 miles north of Austin. The primary exploration target at Amador is a bulk tonnage disseminated/stockwork-type silver deposit which could be mined by open-pit methods. To the company's knowledge, the Amador Canyon property has never been drill tested. (Nevada Pacific Gold Ltd. press release, 12/16/2003)

Southern Simpson Park Mountains Area

Water Canyon Property. Fjordland Exploration Inc. acquired the 53-claim Water Canyon property through the purchase of Nevada Prospectors Limited Liability Company, a private company based in Reno, Nevada. Fjordland intends to drill test the property commencing in spring 2004. Previous operators at Water Canyon (St. Joe American, Chevron Resources) drilled 19 reverse-circulation holes along a north-trending valley (Hole in-the-Wall Creek), under the assumption that a high-angled, mineralized, feeder system would be encountered. Although the results of this drilling were largely negative, a reevaluation of trench and drill results suggests a subhorizontal control to the mineralization. A program of reverse-circulation drilling will be undertaken on the east side of Hole-in-the-Wall Creek, above the trenches, to test this concept. (Fjordland Exploration Inc. press release, 11/12/2003)

LYON COUNTY

Como District

Como Claims. GoldSpring Inc. acquired the Plum Mining Co. in October 2003. In addition to property in the Silver City district, the acquisition included claims in the Hully-Logan trend of the Como district. The Como Claims contain about 700,000 tons of 0.09 opt Au and 0.51 opt Ag. (GoldSpring Inc. press release, 10/13/2003)

Silver City District

GoldSpring Placer Properties. Visator Inc. purchased the Gold Canyon and Spring Valley gold placer properties in the Silver City district (GoldSpring Placer property). The GoldSpring property consists of 21 unpatented placer mining claims covering approximately 850 acres. This property is reported to contain 1,199,000 ounces of gold in 41,000,000 cubic yards of sand and gravel. (Visator Inc. press release, 3/5/2003; GoldSpring, Inc. press release, 7/31/2003)

In September, 2003 GoldSpring purchased Plum Mining Company, LLC located in Gold Hill, NV, about 3 miles north of the GoldSpring placer gold claims. This acquisition included the Billie The Kid open-pit gold property with substantial drill proven gold reserves, and the adjacent Lucerne pit with reported remaining resources excess of 850,000 tons at 0.06 opt gold and 0.51 opt silver. The Plum acquisition also included 40 acres of private land with buildings, laboratories, and

heavy earth moving equipment. In addition, there are approximately 9,000 tons of ore, containing an estimated 630 ounces of gold and 5,400 ounces of silver, already mined and hauled from Billie the Kid and stacked next to the crusher. (GoldSpring Inc. press release, 11/19/2003)

MINERAL COUNTY

Ashby District

Ashby Property. Fjordland Exploration Inc. acquired the Ashby property and will drill the seven-claim property in early 2004. Gold mineralization at Ashby occurs in a series of northwest-striking, steeply dipping, quartz veins in altered sediments and volcanic rocks of the Jurassic Dunlap Formation. Between 1934 and 1937, a total of 9,000 ounces of gold is recorded to have been mined from ten steeply inclined shafts and associated underground workings. The latest operations were during the 1980s and 1990s when the family that owned the property removed a few hundred ounces per year. This family optioned the mine to Coca Mines during the 1980s, which drill-tested the area for disseminated gold. Coca Mines reportedly intersected high-grade vein gold but did not pursue the veins. A program of geochemical sampling and geophysical surveying was expected to be undertaken in February 2004, with reverse-circulation drilling to follow. (Fjordland Exploration Inc. press release, 12/1/2003)

Aurora District

Aurora Property. Pacific Rim Mining Corp. plans mapping and sampling on its 81-claim Aurora property which borders Metallic Ventures' Esmeralda project. This work will be followed by a reverse-circulation (RC) drilling program. (Pacific Rim Mining Corp. press release, 12/18/2003)

Bald Peak Property. Fjordland Exploration Inc. acquired the Bald Peak property in the Aurora district through the purchase of Nevada Prospectors Limited Liability Co., a private company based in Reno, Nevada. The Bald Peak property contains high-grade, bonanza-type, gold-silver veins in a geological/structural setting similar to that at the nearby Aurora-Bodie gold mining camps. Fjordland intends to drill test the property commencing in spring 2004. (Fjordland Exploration Inc. press release, 11/12/2003)

Esmeralda Property. Metallic Ventures Gold, Inc. will begin underground mining at the Esmeralda property. A 350 ton/day mill is currently being prepared to resume processing and full production is expected by early 2004. Underground core drilling along portions of the Prospectus and Martinez vein systems intercepted high grade gold and silver mineralization that adds to the overall resource total for the project. Surface drilling west of the rehabilitated Chesco workings intercepted ore-grade gold mineralization on strike with a vein previously mined from the Chesco workings. Previous drilling by Metallic Ventures and prior operators also intercepted significant gold mineralization. Over 340 linear feet of stoping has been completed along the Prospectus vein. Mapping and sampling of the stopes has demonstrated excellent continuity to gold and silver mineralization with grades that equal or exceed those predicted by drilling. (Metallic Ventures Gold, Inc. press releases, 9/15/2003; 1/12/2004)

Borealis District

Borealis Mine. Golden Phoenix Minerals, Inc. signed a joint venture agreement on its Borealis gold project with Gryphon Gold Corp. Gryphon Gold will develop the property in three phases. Phase 1 will evaluate the leach pads, which hold more than 10 million tons of previously leached gold ore, for the possibility of releaching and gold production. Phase 2 will further evaluate the remaining oxide ores in the district that could be mined and transported to the new leach pad. Phase 3 will evaluate the deeper, high- grade sulfide mineralization found in numerous areas of the property. Phase 1 will extend from July 2003 to March 2005 with the program budgeted at $1.5 million. Gryphon Gold has already been active with its Phase One plans, including staking of an additional 293 claims, application for water rights, permitting of the initial leach pad drilling program and preliminary design and engineering. Pending approval of drilling permits from the U.S. Forest Service, Gryphon Gold planned to begin further leach pad drilling in January 2004. (Golden Phoenix Minerals, Inc. press release, 5/13/2003; 12/2/2003)

Eagleville District

Eagleville Property. Terraco Gold Corp. has initiated prospecting at Eagleville. CSAMT surveying will be undertaken in January 2004 with drilling to follow shortly thereafter. Eagleville is located 8 miles east of Kennecott's Rawhide Mine. (Terraco Gold Corp. press release, 12/19/2003)

Poinsettia District

Black Hills Property. NDT Ventures Ltd. will maintain its interests in the Black Hills property for a second year. NDT's main target at the 28-claim Black Hills property is a potentially large carbonate hosted skarn locally exposed through cover on the eastern flanks of the range. Sampling has identified gold values up to 0.15 opt and copper assays up to 6%. Metal values mainly come from zones of sulfide replacement of calc-silicate skarn with copper staining and quartz veining in proximity to a granodiorite intrusion. Only a small part of this potentially large target zone is exposed on the surface

and a geophysical program designed to identify buried sulfides will be conducted. Priority targets defined by the geophysics will be drilled. (NDT Ventures 2003 Annual Report, 9/29/2003)

Rand District

Blue Sphinx Prospect. A third block of 75 unpatented lode claims has been acquired at Gold Summit's Blue Sphinx prospect. The new claims adjoin the Blue Sphinx and Golden Pen claims already held by Gold Summit. The Golden Pen Mine area was explored in recent years with widely spaced reverse-circulation drill holes and surface bulldozer cuts in an attempt to develop a surface heap leach operation. Gold Summit is currently completing compilation of historical information and plans to carry out detailed mapping prior to drill testing the vein system to depth. (Gold Summit Corp. press release, October 7, 2003)

NYE COUNTY

Barcelona District

Antone Canyon Property. Senator Minerals Inc., sold its interest in the option to acquire the Antone Canyon property to Golden Spike Mining, a Nevada corporation. Golden Spike will pay an amount equal to what Senator has spent on property acquisition and exploration work to date. (Senator Minerals Inc. press release, 12/17/2003)

Corcoran Canyon Property. Senator Minerals Inc has acquired an option on the 41 claim Corcoran Canyon property. A low grade silver resource has been identified in the Silver Reef area of the property, but Senator Minerals is interested in exploring the claims for their gold potential as limited drilling has shown increasing gold values at depth. (Senator Minerals Inc. press release, 3/31/2003)

Bare Mountain District

Sterling Property. Imperial Metals Corp. completed 17 drill holes at its Sterling gold property southeast of Beatty. Results have expanded the 144 Zone to 500 feet by 750 feet. The 144 Zone is approximately 700 feet below surface and remains open in all directions. Gold mineralization is concentrated in silty carbonate rocks and breccias at the contact between the Bonanza King Dolomite and underlying Carrara Limestone. An additional 29 claims covering an area of approximately 599 acres were leased to cover the potential northerly extension of the gold bearing structures. More drilling is planned to further expand the 144 Zone and extend high-grade structures within the zone. (Imperial Metals Corp. press release, 7/23/2003)

Bruner District

Baxter Prospect. Rio Fortuna Exploration Corp. acquired the 71-claim Baxter prospect located near Chalk Wells approximately 3.4 miles southwest of the company's Highland property. Previous exploration on the property included historical excavation of several shallow shafts and adits by small miners and shallow reverse-circulation drilling during the 1980s and 1990s which targeted near-surface, bulk-mineable gold deposits but failed to follow-up narrower higher-grade intercepts indicative of vein deposits. Future exploration on the property will focus on identifying key structural and lithological controls on gold mineralization. Detailed surface mapping and geochemical sampling will be used to identify high-grade mineralized shoots along the prospective structures for follow-up drill testing. (Rio Fortuna Exploration Corp. press releases, 3/18/2003; 9/29/2003)

Vernal and Bruner Properties. Patriot Gold Corp. purchased the Vernal and Bruner properties in the Bruner district. The Bruner property consists of 16 unpatented mining claims. The Vernal property, located approximately 10 miles east-northeast of the Bruner claims, consists of 12 unpatented mining claims. During September 2003, a ground magnetics survey and detailed mapping and rock chip geochemical sampling of the western portion of the claim block on the Bruner property was completed. The magnetics indicate the presence of northwesterly and northerly trending faults under the pediment cover that may host gold mineralization. Geologic mapping of rocks exposed in the western portion of the claims show several small quartz bearing structures trending northwest and dipping steeply to the northeast. These small structures are thought to be related to a much larger fault-hosted vein system under gravel cover in the broad valley south of the mapping. Mapping is also underway at the Vernal property. (Patriot Gold Corp. press release, 6/27/2003; 11/4/2003)

Bullfrog District

Providence Gold Project. Alberta Star Development has agreed to explore and develop JABA Inc.'s Providence property in Nye County. The property consists of 45 unpatented and three patented claims and is located on the east edge of the Montgomery-Shoshone pit of the Barrick Bullfrog mine complex. Geologic and alteration mapping and detailed geochemistry suggests that extension of the same gold mineralization present across the property boundary that forms the east wall of the open pit is present in strongly altered and closely veined tuff on the Providence property. (JABA Inc. press release, 9/24/2003)

Clifford District

Clifford Property. Castleworth Ventures, Inc. began field work at its Clifford property in preparation for a planned drilling program. This property consists of 135 claims totaling 2,700 acres centered on the Clifford Mine.

Initial work will include follow-up surface sampling and mapping combined with a VLF survey to develop detailed drill targets on the property. The Clifford deposit was discovered in 1905 by James Clifford and was operated by the Clifford family and various lessees intermittently through the late 1960s. While the district has no official published production, ore is known to have been shipped to the Merger mill at Bellehelen and the West End plant in Tonopah. Estimated gold production is in the 15,000 to 20,000 ounce range from a number of shallow shafts and cuts with two shafts in excess of 200 feet deep. (Castleworth Ventures Inc. press release, 5/30/2003; 6/18/2003)

Ellendale District

South Monitor and Monitor Flat Properties. Drilling on the South Monitor property successfully intersected a quartz-adularia gold-vein system. Assay results indicate that drilling intersected the veins high in the system and there is potential that they will grade into a high-grade Bonanza vein system below the level intersected by the drilling. In the next phase, diamond drilling will try to intercept these veins at greater depth. At Monitor Flat, the initial drill program was successful in outlining a large hydrothermal gold system. The property, which lies on the gravel covered southern slope of the Monitor Range has about 1% outcrop, consisting of three small hills. Golconda will employ geochemical and geophysical methods in the next phase to try to outline the potassic altered zones which could contain substantial gold mineralization. Golconda has increased its claim holdings from 540 acres to 1,740 acres. (Golconda Resources Ltd. press release, 10/20/2003)

Golden Arrow District

Golden Arrow Property. In November, Phase II drilling was underway on Pacific Ridge Exploration Ltd.'s Golden Arrow property. The 2003 Phase II program called for about 25,000 feet of drilling on two high-grade epithermal gold vein feeder systems within the Gold Coin and Hidden Hill zones as well as initial drilling of the large, recently discovered Sunrise target. (Pacific Ridge Exploration Ltd. news release, 11/12/2003)

Hannapah District

Thunder Mountain Property. Castleworth Ventures, Inc. announced that results from the first four holes drilled on its Thunder Mountain joint venture generated lower than expected gold and silver grades but geophysical surveys successfully identified the presence of bonanza-type structures. The Thunder Mountain system, where drilled, does not appear to be mineralized enough to support a stand-alone deposit. The 4,500-acre Thunder Mountain project, located 25 miles east of Tonopah, is owned by Pacific Intermountain Gold Company, a 75% owned subsidiary of Seabridge Gold. (Seabridge Resources Inc. press release, 5/30/2003)

Longstreet District

Longstreet Mine. Rare Earth Metals Corp. received final permits for a 40-hole drill program at its Longstreet Mine project, and drilling began in late October on Phase I of the program. The program consists of 10 to 15 reverse-circulation drill holes designed to verify the extent and grade of the resource calculated in a 1988 preliminary feasibility study by Mine Development Associates of Sparks, Nevada. MDA reported a measured resource of 3,613,229 tons of mineralization grading 0.024 opt Au and 0.57 opt Ag, excluding talus. (Rare Earth Metals Corp. press release, 11/5/2003)

Piñon Project. The Tonopah Ranger District received a request from MinQuest Inc., representing Rare Earth Metals Corp. to conduct exploratory drilling on its Piñon project, located in Section 16, T6N, R47E. Rare Earth Metals proposes drilling four holes by either track-mounted or skidder-mounted reverse-circulation drill rig. (U.S. Forest Service Plan of Operations #04-03-002, 2/21/2003)

Manhattan District

Baxter Spring Property. Golconda Resources Ltd. staked an additional 67 claims in Ralston Valley, bringing their total there to 117 claims covering 2,390 acres. The claims are situated in the Baxter Spring area at the southern tip of the Toquima Range. The claims cover a gold mineralized structural zone parallel to the one explored by Newmont and Midway Gold to the west of the property. Carlin-type gold mineralization occurs in Paleozoic carbonaceous limestones, shales, and siltstones. (Golconda Resources Ltd. press release, 2/21/2004)

Gold Wedge Property. The Gold Wedge property is currently permitted for a mine and mill facility—a proposed 500-tons/day underground operation. Royal Standard Minerals Inc. plans construction of a 2,000-foot decline and bulk sampling program as a means to complete the mine feasibility study. (Royal Standard Minerals Inc. press release, 11/5/2003)

White Caps Property. Drilling of Calais Resources' White Caps property will begin pending issuance of permits. The company plans to drill several deep holes in search of a replacement gold deposit. (Calais Resources Inc. press release, 3/12/2003)

Moores Creek District

Pasco Canyon Property. NDT Ventures Ltd. conducted a detailed ground magnetic survey its Pasco Canyon property. The geophysical program was designed to provide priority targets for a drill program scheduled upon completion and interpretation of the survey results. The property contains a volcanic-hosted, epithermal gold system that crops out on the edges of a range front and is interpreted by geophysics to extend under a pediment

adjacent to the outcrop. The Pasco Canyon property sits in a similar geological setting to the Round Mountain gold mine, and drilling will be designed to test the similarities. (NDT Ventures Ltd. press release, 10/7/2003)

Northumberland District

Northumberland Property. The NewWest Resources Group announced that Newmont USA Limited has signed a joint venture agreement for the exploration and development of its Northumberland project with NewWest's Nevada Western Gold Corp. The Northumberland property comprises more than 30,000 acres of fee and mining claims in Smoky Valley, north of Round Mountain. (The NewWest Resources Group press release, 12/24/2003)

Round Mountain District

Gold Hill Property. Round Mountain Gold Corp. is starting the permitting process for a proposed mine at Nevada Star Resource Corp.'s Gold Hill property. Drilling continues to define the gold deposit. The Gold Hill property is 4 miles north of the main Round Mountain open-pit mine. (Nevada Star Resource Corp. press release, 7/2/2003)

Round Mountain Mine. A 2004 underground exploration program at Round Mountain is currently being planned to follow up on encouraging high grade drilling intercepts behind the existing ultimate pit wall. (Barrick Third Quarter Report 2003, 9/30/2003)

Rye Patch District

Midway Gold Property. The first phase regional drill program has been completed on the Midway Gold prospect. Since March, 2003 a total of 25,830 feet of reverse-circulation drilling in 55 holes has tested seven regional targets identified along a 15-mile strike length of the prominent mineralized structure at Midway. Fourteen of the 55 holes returned weak to moderately anomalous concentrations of gold. Results from the regional program confirmed epithermal style alteration at the Willow, Rye Patch, Silver Ace, and Silver Ridge target areas. For the year to date, a total of 16,070 feet of drilling in 28 holes has been completed in the central Discovery area of the Midway property. Gold mineralization has been identified over a one mile by half-mile area within three zones that may coalesce into a single mineralized region referred to as the greater Discovery Zone. Permitting of a Plan of Operations with the Bureau of Land Management is progressing. Once approved, the Plan will allow for up to 600 additional holes for definition of the main Discovery Zone and test for continuity of gold mineralization outward from the three identified zones. Drilling will recommence once final approval of the plan is received. Newmont USA Limited, a subsidiary of Newmont Mining Corp., is the joint venture partner and manager of the Midway project. (Midway Gold Corp. press release, 3/24/2003; 7/3/2003)

San Antone District

Tonopah Copper Mine. On July 16, 2003 a unanimous jury verdict for $136.9 million was awarded to Equatorial Mining Limited and its U.S. subsidiaries over claims arising out of a Kvaerner feasibility study, which was relied upon for Equatorial's purchase and construction of the Tonopah Copper Mine north of Tonopah.

The judgment amount entered against Kvaerner US includes interest and costs awarded by the Court as well as damages awarded by the 10-person jury after the seven-week trial. Equatorial's attorney fees incurred in prosecuting the litigation will also be awarded. but Kvaerner is still contesting the exact amount. The mine commenced operations in early 2000 but experienced persistent metallurgical recovery problems related to the basic characteristics of the ore, including high levels of clay and fluorine—characteristics not identified as problems in Kvaerner's feasibility study. Despite the efforts of management and several international mineralogical and process experts to save the mine, operations were losing about $2 million a month and were shut down in June 2001. Equatorial Mining is negotiating with a third party, and has U.S. Bureau of Land Management approval, to use the mine site for a solar and wind energy farm. (Equatorial Mining Limited press release, 8/17/2003)

Union District

Buffalo Canyon Property. Nevada Pacific Gold Ltd. staked 44 lode claims covering the Buffalo Canyon property on the west flank of the Shoshone Range, approximately four miles south of the town of Ione. The Buffalo Canyon project covers an intrusive-related gold system with five known gold targets. Only one of the target areas, the Main Zone, has been drill tested. A program of data compilation, mapping, and sampling is underway to assess the five mineralized zones, and a drill program is planned for 2004. (Nevada Pacific Gold Ltd. press release, 5/30/2003; 12/16/2003)

PERSHING COUNTY

Buster Silver Project. Nevada Pacific Gold Ltd. acquired the Buster Silver project in Pershing County. The property is centered on historical mine workings consisting of adits, pits, and trenches that explore a linear, north-south breccia zone with a quartz matrix containing silver and base-metal sulfides. The 3,000-foot-long mineralized structure is vertical on the north changing to an easterly 60° dip on the south. The host rock is a package of silty to clastic limestone that has been recrystallized and contains jasperoids and

silicification. The Buster Silver project consists of 24 unpatented lode mining claims staked by Nevada Pacific. (Nevada Pacific Gold Ltd. press release, 2/10/2003)

Farrell District

Wildcat Property. Vista Gold Corp. acquired the Wildcat gold property located about 35 miles northwest of Lovelock and north of the old camp of Seven Troughs. The property, consisting of 74 unpatented claims and four patented claims, is reported to contain indicated resources of 38.1 million tons of 0.018 opt Au, and inferred resources of 28.4 million tons of 0.015 opt Au. (Vista Gold Corp. press release, 10/30/2003)

Imlay District

Standard Mine. Apollo Gold Corp. resumed its development drilling program at the Standard Mine, near Apollo's Florida Canyon Mine, in the fourth quarter of 2003. The Standard Mine project will be in the development phase most of 2004, with operating permits expected in the third quarter, and approximately 10,000 ounces of gold production expected in the fourth quarter 2004. (Apollo Gold Corp. press release, 10/7/2003; 2/26/2004)

Scossa District

Scossa Gold Property. Romios Gold Resources Inc. drilled five holes, totaling 2,521 feet, on the Scossa vein at its Scossa Gold property. The holes were designed to intersect the vein at various intervals below the deepest underground workings on the property, and confirmed the continuity of the Scossa vein system at depth, the increased width of the vein at depth, and the fact that the vein continues to be gold-bearing. The company intends to drill additional holes on the property. (Romios Gold Resources Inc. press release, 5/1/2003; 9/17/2003)

Sierra District

Barber Canyon Property. Haber, Inc., a New Jersey-based company with proprietary technology for analytical instrumentation and the processing of gold-bearing ores, announced that Gold City Inc. (a Nevada corporation), the licensee company of Haber Inc.'s gold extraction process, is continuing exploration of its Barber Canyon property. (Haber, Inc. press release, 12/11/2003)

Dun Glen Project. Golden Patriot Corp. completed detailed geologic mapping and rock sample geochemistry on its Dun Glen property. The property, located in the East Range about 15 miles southwest of Winnemucca, consists of approximately 935 acres containing forty-seven unpatented lode claims, two patented claims, and two parcels of private land. Preliminary results of the program substantiate earlier interpretations of significant potential for economic gold mineralization within the property. (Golden Patriot Corp. press release, 12/1/2003)

Spring Valley District

Spring Valley Property. Midway Gold Corp. acquired the Spring Valley property, located on the east side of the Humboldt Range in Pershing County. Gold mineralization at Spring Valley is associated with quartz-tourmaline stockwork veins hosted within Triassic-age rhyolite and volcaniclastic rocks. Approximately 100,000 ounces of placer gold was recovered from Spring Creek, which transects the Spring Valley property. Midway began a drill program on the property in September 2003, and a total of 15,540 feet of reverse-circulation drilling in 19 holes was completed by mid-December. Mineralization has been traced by drilling over an area extending over 5,000 feet by 2,700 feet and appears open in all dimensions. A CSAMT geophysical program is scheduled for early January 2004 to outline resistive features that may be associated with the mineralized zones covered by alluvium, and follow-up core and reverse-circulation drilling will begin in mid-January. (Midway Gold Corp. press release, 12/31/2003)

Tobin and Sonoma Range

Big Mike Copper Project. GoldSpring, Inc. plans to advance the Big Mike project to production as a vat leach copper recovery operation. The Big Mike property has approximately 1.2 million tons of copper ore, already mined and suitable for leaching, which contains approximately 25 million pounds of copper with an average estimated grade of 1.05%. (GoldSpring, Inc. press release, 12/18/2003)

STOREY COUNTY

Comstock District

Virginia City Dumps. GoldSpring, Inc. plans to conduct a series of bulk sample tests on four large Virginia City mine dumps: the Ophir, Con Virginia, and the North and Main C&C dumps which contain 1,073,380 tons of previously rejected mining material from the historical underground operations. The Con Virginia property is being prepared for a future hotel site and a series of recent test trenches located on top of and below the hotel site produced assay results of 0.048 opt Au and 1.167 opt Ag from the upper zone and even higher values from the lower zone of 0.337 opt Au and 12.77 opt Ag. (GoldSpring, Inc. press release, 11/6/2003)

Silver City District

Billie the Kid Mine. GoldSpring, Inc. has purchased Plum Mining Company, LLC located in Gold Hill about 3 miles north of the GoldSpring placer gold claims. Plum owns the Billy The Kid open-pit mine which is reported to contain substantial drill-proven reserves. The pit is on patented land and is fully permitted for operation. The average drill proven grade is 0.074 opt Au and 0.32 opt Ag. (GoldSpring, Inc. news release, 9/24/2003)

WASHOE COUNTY

Deephole District

Mountain View Property. Vista Gold Corp. began a five-hole, 4,000-foot reverse-circulation drilling program at its Mountain View property. (Vista Gold Corp. press release, 10/30/2003)

Jumbo District

Jumbo Property. Fjordland Exploration Inc. purchased the Jumbo property of nine contiguous mineral claims situated 3 miles west of Virginia City. Most of the mining activity in the Jumbo district was centered on the Pandora, Bargo, Jumbo, and Fink/Mahoney Mines which were active mainly during the period 1909–1911, although some production is recorded as late as 1948. Less than 10,000 ounces of gold in total are recorded to have been produced from the district. The mines occur along two parallel, north-northeasterly trending, silicified fault zones which have been traced northerly from the Jumbo mineshaft for a distance of 1 mile. The Jumbo veins are not known to have been drill-tested, and the deepest shafts in the area are reported to be no greater than 230 feet deep. Fjordland plans a program of detailed mapping and sampling beginning in January 2004, followed by a preliminary reverse-circulation drilling program to test the vein systems at depth. (Fjordland Exploration Inc. press release, 12/1/2003)

Leadville District

Hog Ranch Property. Romarco Minerals Inc. entered into agreement with Seabridge Gold Inc. for exploration on the Hog Ranch property located in northern Washoe County. Romarco will be the operator during the term of the agreement. Previous exploration and mining activities at Hog Ranch focused on open-pit deposits amenable to heap leaching. Romarco believes the property has potential for high-grade quartz-adularia veins occurring at greater depth than the previously mined low grade, near surface deposits. Romarco intends to initiate a staged exploration program consisting of data compilation, geological mapping, and geophysical and geochemistry surveys with the purpose of identifying vein drill targets. Depending on timing of permitting and weather, Romarco planned to begin drill testing some of the targets in late 2003 or early 2004. (Romarco Minerals Inc. press release, 8/7/2003; 11/18/2003)

WHITE PINE COUNTY

Bald Mountain District

Bald Mountain Mine. In June 2003, Placer Dome approved the development of Stage 7 of Bald Mountain's Top Pit. Mining at Bald Mountain, which was previously scheduled to cease in July 2003, is now expected to continue until the first quarter of 2007 with the heap-leach pads expected to produce gold until 2009. Pre-stripping of Top Pit Stage 7 started in June 2003 with production scheduled to commence in 2004. Stage 7 adds 400,000 incremental ounces to the mine's production profile with total future production now estimated at approximately 600,000 ounces. (Placer Dome Inc. press release, 7/29/2003)

Cherry Canyon Springs. Mineral exploration drilling was done near Cherry Canyon Springs at the south end of the Ruby Mountains. Drilling was completed in October of 2003. (Humboldt-Toiyabe National Forest Schedule of Proposed Activities, 9/17/2003)

Butte Valley District

Limousine Butte Property. Nevada Pacific Gold Ltd. acquired all of Newmont's rights, title, and interest in the 15-square-mile Limousine Butte property. In 2002, Newmont earned a 50% interest in the project by completing expenditures of $1,000,000 pursuant to the 1999 Joint Venture Agreement between the companies. Through multiple drill phases and the compilation of historical data, Newmont was successful in identifying five oxide gold zones containing approximately 620,000 ounces of gold. Nevada Pacific plans to explore for and develop additional gold resources on the property, and is currently drilling to augment the existing gold mineral inventory. The first two holes returned high-grade gold results and the drill program has subsequently been expanded by 3,000 feet to 8,200 feet and from 8 to 14 holes to incorporate additional testing. (Nevada Pacific Gold Ltd. press release, 4/7/2003; 12/16/2003)

Robinson District

Robinson Mine. Canada-based Quadra Mining Ltd. has agreed to pay $18 million for the idle Robinson Mine near Ely and plans to return the facility to full production early next year. The British Columbia company said it would buy Robinson from BHP Billiton Ltd. BHP Nevada Mining Co. suspended operations at Robinson in 1999 because of low metal prices, laying off 440 workers. The Robinson Mine produced 61.8 million pounds of copper concentrate in 1999, along with 26,250 ounces of gold and 153,104 ounces of silver. (Associated Press, 12/5/2003)

White Pine District

Pan Property. Castleworth Ventures Inc. completed a successful first phase drill program at its Pan property and is authorizing an independent scoping study to evaluate the potential for the development of an open-pit mine. The study will also recommend the additional drilling required to advance the resource to the feasibility stage and potentially expand it. (Castleworth Ventures Inc. press release, 7/7/2003; 9/9/2003)

Major Precious-Metal Deposits

by Joseph V. Tingley

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 120, 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)	1982: 1 million tons, 0.055 opt Au, 1.4 opt Ag 1989: *reserves*—30,000 oz Au, 125,000 oz Ag 1997: 2.5 million tons, 0.059 opt Au equiv. oz		rhyolitic tuff	Miocene
Buffalo Valley gold property (Eastgate district)	1996: 96,000 oz Au		rhyolitic ash-flow tuff	Tertiary
Dixie Comstock (Dixie Valley district)	1991: 2.4 million tons, 0.049 opt Au 1995: 100,000 oz Au		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	Triassic slate and phyllite	Cretaceous
New Pass property (New Pass district)	1994: 3.4 million tons, 0.042 opt Au 1997: 3.1 million tons, 0.055 opt Au		Triassic siltstone	
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)	1987: 3.76 million tons, 0.148 opt Au 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 1994–95: 30,095 oz Au, 2,877 oz Ag	Mississippian to Permian overlap assemblage clastic and carbonate rocks	Eocene
Bootstrap/Capstone/ Tara (Bootstrap district)	1989: *geologic resource*—25.1 million tons, 0.039 opt Au 1996: 20.2 million tons, 0.046 opt Au proven and probable reserves; 1 million tons, 0.086 opt Au mineralized material	1988–90: included in Newmont Gold production, page 47 1996: 19,800 oz Au 1999: 147,088 oz Au, 28,395 oz Ag 2000: 131,979 oz Au, 13,402 oz Ag 2001: 92,775 oz Au, 21,093 oz Au 2002: 23,415 oz Au, 4,717 oz Ag 2003: 29,742 oz Au, 5,480 oz Ag	dacitic dikes, Paleozoic siltstone and laminated limestone/chert	Eocene
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 1994: 350,000 oz Au in 3 deposits (*see* Piñon)		Webb Formation Devils Gate Formation Tomera Formation Diamond Peak Formation	
Dee (Bootstrap district)	1982: 2.5 million tons, 0.12 opt Au 1990: 4.5 million tons, 0.059 opt Au 1999: 1.4 million tons, 0.157 opt Au, proven and probable reserves	1985–88: 189,983 oz Au 1989–92: 172,745 oz Au, 142,000 oz Ag 1993–95: 97,860 oz Au 1996: 45,070 oz Au, 50,322 oz Ag 1997–98: 72,595 oz Au 1999: 36,329 oz Au, 68,400 oz Ag 2000: 61,171 oz Au, 110,900 oz Ag 2001: 2,351 oz Au, 6,028 oz Ag	Vinini Formation Devonian carbonates, dacitic dikes	Eocene

continued

MAJOR PRECIOUS-METAL DEPOSITS (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
ELKO COUNTY (continued)				
Doby George (Aura district)	1995: 3.7 million tons, 0.060 opt Au 1997: 250,000 oz Au		Schoonover Formation	
Jerritt Canyon (includes Saval Canyon and Burns Basin) (Independence Mountains district)	1981: 12.5 million tons 0.231 opt Au 1989: 21.6 million tons, 0.143 opt Au mill ore; 6.5 million tons, 0.043 opt Au leachable 1999: 1.5 million oz Au, proven and probable reserves; 3.8 million oz Au other 2000: 1.3 million oz Au proven and probable; 3.7 million oz Au other mineralized material 2001: 2.058 million oz Au proven and probable; 893,000 oz Au other 2002: 580,913 oz Au, proven and probable reserves; 1.296 million oz Au measured and indicated resources; 1.035 million oz Au inferred resources 2003: 820,104 oz Au, proven and probable reserves; 2.295 million oz Au measured and indicated resources; 1.034 million oz Au inferred resources	1981–90: ~2.6 million oz Au 1991–94: 1,380,000 oz Au, 25,000 oz Ag 1995–98: 1,296,492 oz Au 1999: 363,000 oz Au 2000: 334,747 oz Au 2001: 295,328 oz Au, 7,752 Ag 2002: 338,660 oz Au, 8,154 oz Ag 2003: 302,095 oz Au	Hanson Creek and Roberts Mountains Formations	~40 Ma
Ken Snyder (Midas) Mine (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 1999: 3.0 million tons, 0.816 opt Au, 9.835 opt Ag proven and probable reserves 2000: 3.4 million tons, 0.63 opt Au, 7.77 opt Ag proven and probable reserves 2002: 3.4 million tons, 0.65 opt Au proven and probable reserves; 400,000 tons 0.46 opt Au measured and indicated mineralized material; 200,000 tons 0.55 opt Au inferred mineralized material 2003: 700,000 tons, 0.83 opt Au proven reserves; 2,700,000 tons, 0.51 opt Au probable reserves; 900,000 tons 0.42 opt Au indicated material	1998: 4,357 oz Au, 55,329 oz Ag 1999: 189,081 oz Au, 1,938,470 oz Ag 2000: 197,800 oz Au, 1,941,989 oz Ag 2001: 198,518 oz Au, 2,393,246 oz Ag 2002: 232,949 oz Au, 2,870,164 oz Ag 2003: 218,966 oz Au, 2,647,374 oz Ag	Tertiary volcanic rocks	15.3 Ma
Kinsley Mountain (Kinsley district)	1988: 2.1 million tons, 0.048 opt Au 1996: 3.4 million tons, 0.032 opt Au	1993: evaluation 1995–97: 127,065 oz Au, 24,452 oz Ag 1998: 9,543 oz Au 1999: 1,543 oz Au	upper Paleozoic carbonate rocks	Oligocene?
Maverick Springs (Maverick Springs area)	2002: 350,000 oz Au, 32.3 million oz Ag, indicated resources; 747,000 oz Au, 68.8 million oz Ag inferred resources			
Meikle (Lynn district)	1992: *geologic resource*—7.9 million tons, 0.613 opt Au 1999: 5.9 million tons, 0.647 opt Au proven and probable reserves; 3.3 million tons, 0.457 opt Au mineralized material 2000: 4.9 million tons, 0.540 opt Au proven and probable reserves; 2.9 million tons, 0.450 opt Au mineral resource 2001: 9 million tons, 0.439 opt Au proven and probable reserves; 13.5 million tons, 0.433 opt Au mineral resource 2002: 9.8 million tons, 0.398 opt Au proven and probable reserves; 12.9 million tons, 0.396 opt Au mineral resource 2003: 3,316,000 tons, 0.467 opt Au proven reserves 5,862,000 tons, 0.326 opt Au probable reserves 1,580,000 tons, 0.435 opt Au measured resources 4,261,000 tons, 0.423 opt Au indicated resources 7,725,000 tons 0.366 opt Au inferred resources	1996: 78,442 oz Au 1997–98: 1,421,621 oz Au, 426,030 oz Ag 1999: 977,356 oz Au, 263,225 oz Ag 2000: 805,718 oz Au, 205,000 oz Ag 2001: 712,688 oz Au, 213,370 oz Ag 2002: 640,337 oz Au, 203,574 oz Ag 2003: 551,664 oz Au, 99,614 oz Ag	Popovich and Roberts Mountains Formations	Eocene
Piñon (South Bullion and Dark Star) (Robinson Mountain district)	1996: 38.3 million tons, 0.026 opt Au geologic mineral inventory 2002: 30.6 million tons, 0.026 opt Au, measured, indicated, and inferred resources		Webb Formation siltstone Devils Gate Limestone	
Pony Creek (Carlin district)	1994: *geologic resource*—1.1 million tons, 0.057 opt Au			

continued

MAJOR PRECIOUS-METAL DEPOSITS (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
ELKO COUNTY (continued)				
Railroad Property (POD zone) (Railroad district)	1997: 1.5 million tons, 0.085 opt Au drill-indicated resource			
Rain Property (Carlin district)	1982: 3.4 million tons, 0.147 opt Au and 8.3 million tons, 0.083 opt Au			
Gnome deposit	1988: 2.7 million tons, 0.048 opt Au		Webb Formation	Eocene
Rain Emigrant Springs deposits	1989: 30.3 million tons, 0.021 opt Au 1996: 16 million tons, 0.028 opt Au proven and probable reserves; 10.4 million tons, 0.021 opt Au mineralized material	1994–96: 160,000 oz Au 1997–98: included in Newmont Gold production, page 47	Webb Formation	36–37 Ma
Rain deposit	1999: 13,467,000 tons, 0.026 opt Au proven and probable open-pit ore, 411,000 tons, 0.316 proven and probable underground ore	1999: 23,477 oz Au 2000: 25,004 oz Au, 2,539 oz Ag 2001: 43,488 oz Au, 9,887 oz Ag 2002: 20,065 oz Au, 4,042 oz Ag 2003: 5,039 oz Au, 928 oz Ag		
SMZ deposit	1989: *geologic resource*—1.6 million tons, 0.019 opt Au			
Rain district	2000: 13.5 million tons, 0.026 opt Au proven and probable open-pit ore; 308,000 tons, 0.267 opt Au proven and probable underground ore 2001: 13.5 million tons, 0.026 opt Au proven and probable open-pit ore; 21,000 tons, 0.024 opt Au proven and probable underground ore; 1.3 million tons, 0.048 opt Au mineralized material			
Rossi Mine (Storm resource) (Bootstrap district)	1998: 3.1 million tons, 0.371 opt Au resource 2000: 2.7 million tons, 0.345 opt Au resource 2002: 1.9 million tons, 0.335 opt Au measured and indicated resources; 1 million tons, 0.0335 opt Au inferred resources		Popovich Formation	Eocene
Trout Creek (Contact district)	1988: 1.5 million tons, 0.04 opt Au	1988: exploration	Miocene sedimentary rocks	
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 1987–90: 34,163 oz Au, 189,865 oz Ag	Eocene rhyolitic ignimbrite and andesite	39 Ma
Winters Creek (Independence Mountains district)	1986: 1.4 million tons, 0.146 opt Au		lower Paleozoic carbonate rocks	Eocene
Wright Window (Independence Mountains district)	1986: 1.3 million tons, 0.095 opt Au	1992: 3,500 oz Au	lower Paleozoic carbonate rocks	Eocene
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 1997: 10 million tons, 0.03 opt Au resource 2000: 215,000 oz Au indicated resource and 93,000 oz Au inferred resource		Ordovician Palmetto Formation	
Gemfield (Goldfield district)	1996: 9.5 million tons, 0.04 opt Au 1998: 500,000 oz, 0.04 opt Au 2003: see Goldfield project		Oligocene Sandstorm Rhyolite	21 Ma?
Goldfield Project (Goldfield district)	1983: 1.75 million tons, 0.087 opt Au 1994: 3.48 million tons, 0.071 opt Au 2003: 23,410,200 tons, 0.031 opt Au measured and indicated resources; 10,239,100 tons 0.024 opt Au inferred resources (includes Goldfield Main, McMahon Ridge, and Gemfield)	1903–45: 4.19 million oz Au, 1.45 million oz Ag 1989–97: 28,373 oz Au	andesite, rhyodacite, rhyolite	21 Ma

continued

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
ESMERALDA COUNTY (continued)				
Hasbrouck (Divide district)	1982: 5 million tons 0.06 opt Au, 1.5 opt Ag 1986: 12.9 million tons, 0.0291 opt Au, 0.59 opt Ag 1998: 7.7 million tons, 0.036 opt Au, 0.7 opt Ag	1986–92: exploration	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 1996: 1.6 million tons, 0.026 opt Au		Miocene silicic tuff	16 Ma
Mary-Drinkwater (Silver Peak district)	1991: 531,300 tons, 0.124 opt Au	1991: 25,000 oz Au, 8,000 oz Ag	Wyman Formation	Mesozoic?
Mineral Ridge (Silver Peak district)	1995: 5.2 million tons, 0.068 opt Au proven and probable reserves (includes Mary-Drinkwater) 1998: 4 million tons, 0.06 opt Au; 241,000 oz Au 2000: 2.84 million tons, 0.074 opt Au minable reserve 2002: 2.66 million tons, 0.079 opt Au total reserves 2003: 8.3 million tons, 0.061 opt Au resources (includes 2.66 million tons, 0.079 opt Au reserves)	1997: 13,793 oz Au, 7,907 oz Ag 1998: 8,582 oz Au, 4,877 oz Ag 1999: 27,145 oz Au, 19,915 oz Ag 2000: 2,200 oz Au, 1,000 oz Ag 2001: 1,399 oz Au, 424 oz Ag 2002: 397 oz Au, 396 oz Ag 2003: 675 oz Au, 704 oz Ag	Wyman Formation	Mesozoic?
Tip Top (Fish Lake Valley district)	1997: 109,000 tons, 0.103 opt Au, 0.88 opt Ag indicated resource 1998: 168,000 tons, 0.088 opt Au inferred geologic resource	1997: exploration 2001: exploration	Tertiary quartz latite	
Three Hills (Tonopah district)	1996: 3.2 million tons, 0.036 opt Au 1997: 6.3 million tons, 0.023 opt Au		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	Wyman Formation	Cretaceous
EUREKA COUNTY				
Afgan (Antelope district)	1996: 80,000 oz Au drill indicated resource 1999: 2.8 million tons, 0.037 opt Au oxide resource		Webb Formation	
Betze-Post (Lynn district)	1988: 128.4 million tons, 0.095 opt Au 1999: 135.6 million tons, 0.153 opt Au proven and probable reserves; 23.3 million tons, 0.099 opt Au mineralized material 2000: 116.4 million tons, 0.155 opt Au proven and probable; 55.9 million tons, 0.063 opt Au mineral resource 2001: 108.9 million tons, 0.151 opt Au proven and probable; 49.9 million tons, 0.069 opt Au mineral resource 2002: 107.1 million tons, 0.150 opt Au proven and probable reserves; 47.6 million tons, 0.070 opt Au mineral resource 2003: 61,551,000 tons, 0.128 opt Au proven reserves; 48,191,000 tons, 0.162 opt Au probable reserves; 14,077,000 tons, 0.059 opt Au measured resources; 23,326,000 tons, 0.061 opt Au indicated resource; 323,000 tons, 0.065 opt Au inferred resource	1974: 302,807 oz Au 1980–88: 440,000 oz Au 1989–92: 2,214,508 oz Au, 92,347 oz Ag 1993: 1,439,929 oz Au 1994–98: 8,920,871 oz Au, 372,403 oz Ag 1999: 1,130,094 oz Au, 65,804 oz Ag 2000: 1,646,640 oz Au, 52,000 oz Ag 2001: 1,549,975 oz Au, 261,261 oz Ag 2002: 1,409,984 oz Au, 135,716 oz Ag 2003: 1,559,401 oz Au, 115,473 oz Ag	Ordovician to Devonian chert, shale, sltstone, and impure carbonates; in part, Vinini Formation	Eocene
Blue Star (Lynn district)	1987: 1.95 million tons, 0.066 opt Au 1989: *geologic resource*—22.2 million tons, 0.030 opt Au	1974–84: intermittent 1988–2003: included in Newmont Gold production, page 47	lower Paleozoic sandy siltstone and carbonate rocks, granodiorite	Eocene
Bobcat (Lynn district)	1988: *geologic resource*—17.7 million tons, 0.029 opt Au		lower Paleozoic rocks	Eocene
Buckhorn property (Buckhorn district)	1984: 5 million tons, 0.044 opt Au, 0.585 opt Ag 1990: 700,000 tons, 0.05 opt Au; *geologic resource*—200,350 oz Au 1993: *geologic resource*—1.1 million tons, 0.11 opt Au	1988–93: 109,422 oz Au, 409,887 oz Ag	basaltic andesite, sinter, silicified sedimentary rocks	14.6 Ma

continued

MAJOR PRECIOUS-METAL DEPOSITS (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
EUREKA COUNTY (continued)				
Buckhorn South/ Zeke deposit (Buckhorn district)	1989: 2 million tons, 0.056 opt Au, 0.224 opt Ag 1998: 2.4 million tons, 0.046 opt Au		lower Paleozoic rocks	
Bullion Monarch (Lynn district)	1987: 1 million tons, 0.10 opt Au	1977–84: 17,779 oz Au	lower Paleozoic sedimentary rocks	Eocene
Carlin North (Lynn district)				
Deep Star	1996: 1.4 million tons, 0.8765 opt Au proven and probable reserves	1995: 2,800 oz Au 1996: 93,400 oz Au 1997–2003: included in Newmont Gold production, page 47	Popovich Formation	Eocene
Genesis	1989: *geologic resource*—35.8 million tons, 0.044 opt Au 1990: 32 million tons, 0.047 opt (includes Blue Star)	1986: production commenced 1988–2003: included in Newmont Gold production, page 47	Ordovician-Devonian limestone, argillite chert	Eocene
Genesis/North Star/ Sold	1996: 22.7 million tons, 0.034 opt Au proven and probable reserves; 11 million	1994–95: 684,600 oz Au 1996–2003: included in Newmont Gold production, page 47	Ordovician-Devonian limestone, argillite chert	Eocene
Genesis Complex	2000: 14.1 million tons, 0.026 opt Au proven and probable open-pit reserves			
Post/Goldbug	1996: 25.6 million tons, 0.190 opt Au proven and probable reserves; 43.6 million tons, 0.079 opt Au mineralized material	1999–2003: included in Newmont Gold production, page 47	lower Paleozoic sedimentary rocks	Eocene
Deep Post	2000: 3.1 million tons, 0.814 opt Au proven and probable underground reserves			
Carlin Mine	1965: 11 million tons, 0.32 opt Au 1965–86: 3.8 million oz Au			
Carlin/Pete/Lantern	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	1994–96: 68,700 oz Au 1997–2003: included in Newmont Gold production, page 47	Roberts Mountains	Eocene Formation
Carlin North-other	2000: 19.8 million tons, 0.052 opt Au, proven and probable open-pit reserves			
Carlin North area	2000: 8.2 million tons, 0.495 opt Au, proven and probable underground reserves			
Carlin North area, open-pit	2001: 32.6 million tons, 0.044 opt Au, proven and probable reserves; 13.0 million tons, 0.039 opt Au mineralized material			
Carlin North area, underground (including Deep Post)	2001: 10.9 million tons, 0.56 opt Au, proven and probable reserves; 2.1 million tons, 0.55 opt Au mineralized material			
Carlin South (Maggie Creek district)				
Gold Quarry/Mac/Tusc	1982: 25.1 million tons, 0.106 opt Au and 150 million tons, 0.036 opt Au 1987: 197.8 million tons, 0.042 opt Au 1990: 212.6 million tons, 0.042 opt Au, *geologic resource*—534.3 million tons, 0.037 opt Au 1996: 174.8 million tons, 0.046 opt Au proven and probable reserves; 51.9 million tons, 0.058 opt Au mineralized material	1981: 6,000 oz Au, 1982: 19,000 oz Au 1983: 74,000 oz Au, 1984: 68,200 oz Au 1985: 136,200 oz Au, 1986: 309,800 oz Au 1987: 446,600 oz Au 1988–93: included in Newmont Gold production, page 47 1994–96: 2,978,000 oz Au 1997–2003: included in Newmont Gold production, page 47	Ordovician to Devonian chert, shale, siltstone, and impure carbonates; in part, Vinini Formation	Eocene
Carlin South area	2000: 75.2 million tons, 0.059 opt Au proven and probable open-pit reserves			
Carlin South open-pit	2001: 61.3 million tons, 0.062 opt Au proven and probable reserves; 24.6 million tons, 0.028 opt Au mineralized material			
Chukar Footwall underground	2001: 278,000 tons, 0.49 opt Au proven and probable reserves; 115,000 tons, 0.46 opt Au mineralized material			

continued

MAJOR PRECIOUS-METAL DEPOSITS (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
EUREKA COUNTY (continued)				
Carlin North and South combined (includes all Carlin properties)				
Carlin open pit	2002: 181.8 million tons, 0.042 opt Au proven and probable reserves; 9.5 million tons, 0.028 opt Au measured and indicated mineralized material; 9.3 million tons, 0.035 opt Au inferred mineralized material 2003: 17,500,000 tons, 0.052 opt Au proven reserve; 203,300,000 tons, 0.044 probable reserve; 1,000,000 tons 0.035 measured material; 11,200,000 tons 0.024 indicated material; 10,400,000 tons 0.034 opt Au inferred material			
Carlin underground	2002: 10 million tons, 0.57 opt Au proven and probable reserves; 2.6 million tons, 0.50 opt Au measured and indicated mineralized material; 200,000 tons, 0.53 opt Au inferred mineralized material 2003: 2,700,000 tons, 0.670 opt Au proven reserves; 6,100,000 tons, 0.500 opt Au probable reserves; 3,700,000 tons 0.480 opt Au inferred material			
Genesis (see Carlin North-Genesis)				
Genesis/North Star/Sold (see Carlin North-Genesis)				
Gold Bar (Antelope district)	1984: 2.8 million tons, 0.09 opt Au 1990: mined out in December 1994: 240,000 oz Au 1995: 190,000 oz Au 2001: 473,000 oz Au in 6 deposits 2002: 3.6 million tons, 0.100 opt Au resource	1987–90: 238,262 oz Au 1991: 80,727 oz Au, 3,000 oz Ag 1992–94: 155,080 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 2001: see Gold Bar 2002: 2.5 million tons, 0.056 opt Au resource	(reported with Gold Bar)	Paleozoic sedimentary rocks	Eocene?
Gold Pick (Antelope district)	1988: 10 million tons, 0.06 opt Au 1993: 1.4 million tons, 0.079 opt Au 2001: see Gold Bar 2002: 5 million tons, 0.057 opt Au measured mineral resource	(reported with Gold Bar)	Paleozoic sedimentary rocks	Eocene?
Gold Quarry/Mac/Tusc (see Carlin South)				
Gold Ridge (Antelope district)	1988: 4 million tons, 0.06 opt Au 1993: 426,000 tons, 0.059 opt Au 2001: see Gold Bar 2002: 584,164 tons, 0.046 opt Au resource	(reported with Gold Bar)	Paleozoic sedimentary rocks	Eocene?
Goldstone (Antelope district)	1988: 1.7 million tons, 0.08 opt Au 1993: 130,928 tons, 0.104 opt Au 2001: see Gold Bar	(reported with Gold Bar)	Paleozoic sedimentary rocks	Eocene?
Horse Canyon (Cortez district)	1984: 3.94 million tons, 0.055 opt Au 1988: included in Cortez Joint Venture figures	1984: 40,000 oz Au 1988–93: included with Cortez Joint Venture	Vinini Formation, Wenban Limestone	≤35 Ma?
Maggie Creek (Maggie Creek district)	1977: 4.5 million tons, 0.09 opt Au 1988: *geologic resource*—303,000 tons, 0.092 opt Au	to 1986: est. 400,000 oz Au operation transferred to Gold Quarry Mine	Ordovician to Devonian siltstone, chert, sandstone, impure limestone	Eocene
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 1989–2003: included in Newmont Gold production, page 47	lower Paleozoic sedimentary rocks	Eocene
Post/Goldbug (see Carlin North-Post)				
Ratto Canyon (Eureka district)	1984: ~200,000 oz Au		Dunderberg Shale, Hamburg Dolomite	Oligocene
Rock Creek (Eureka-Lander Co. line)	1997: 800,000 tons, 0.045 opt Au	1997: exploration	Tertiary latite tuff	

continued

MAJOR PRECIOUS-METAL DEPOSITS (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
EUREKA COUNTY (continued)				
Rodeo Projects (Rodeo, Griffin, Goldbug, North Betze) (Lynn district)	1998: 2.9 million tons, 0.487 opt Au proven and probable reserves; 5.8 million tons, 0.302 opt Au mineralized material 1999: 5.8 million tons, 0.466 opt Au, proven and probable reserves; 13.0 million tons, 0.270 opt Au mineralized material 2000: 9.2 million tons, 0.414 opt Au proven and probable; 7.4 million tons, 0.333 opt Au mineral resource			Eocene
Ruby Hill (Eureka district)	1994: *geologic resource*—20 million tons, 0.08 opt Au 1995: 7.62 million tons, 0.099 opt Au 1999: 3.77 million tons, 0.110 opt Au proven and probable; 7.33 million tons, 0.072 opt Au mineralized material 2000: 2.7 million tons, 0.105 opt Au proven and probable reserves; 7.3 million tons, 0.072 opt Au mineralized material	1997–98: 133,100 oz Au, 8,686 oz Ag 1999: 123,841 oz Au, 7,688 oz Ag 2000: 125,193 oz Au, 7,984 oz Ag 2001: 134,737 oz Au, 9,315 oz Ag 2002: 135,448 oz Au, 9,750 oz Ag 2003: 18,134 oz Au, 2,441 oz Ag	Goodwin Limestone	Cretaceous? or Oligocene?
Tonkin Springs (Antelope district)	1983: 1.84 million tons, 0.089 opt Au, 0.204 opt Ag 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 1999: 30.7 million tons, 0.045 opt Au resource	1987–88: 10,265 oz Au 1989–90: 3,821 oz Au, 1,872 oz Ag	Vinini Formation, dacitic dikes	Oligocene?
Turf (Lynn district)	1996: 2.5 million tons, 0.367 opt Au mineralized material	included in Newmont Gold production, page 47	Roberts Mountains Formation	Eocene
Tusc (Maggie Creek district)	1988: *geologic resource*—15.8 million tons, 0.059 opt Au 1990: 13.3 million tons, 0.062 opt Au	included in Newmont Gold production, page 47	lower Paleozoic sedimentary rocks	Eocene
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	1995–96: 272,000 oz Au 1997–2000: included in Newmont Gold production, page 47	Roberts Mountains Formation	Eocene
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		Roberts Mountains Formation	Eocene
Windfall (Eureka district)	1988: 3 million tons, 0.03 opt Au 1995: mined out	1908–16: 24,000 oz Au 1975–84: 90,000 oz Au 1988: 6,380 oz Au, 59 oz Ag	Hamburg Dolomite	Eocene or Oligocene
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	1990–91: 4,917 oz Au, 53,474 oz Ag	Preble Formation	Tertiary
Ashdown (Vicksburg district)	1987: 1.16 million tons, 0.125 opt Au 1992: 1.1 million tons, 0.12 opt Au 2002: 100,000 oz Au		Mesozoic granite	Mesozoic
Buckskin (National district)	1997: 50,221 oz Au, 466,243 oz Ag estimated resource		Miocene rhyolite flows and flow breccias	15 Ma
Chimney Creek (Potosi district)	1988: *proven, probable*—26.9 million tons, 0.068 opt Au; *inferred in south pit*—2.1 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 1991–92: 476,034 oz Au, 213,463 oz Ag 1993: *see* Twin Creeks	upper Paleozoic sedimentary rocks	41.9 Ma
Converse/Redline (Buffalo Valley district)	2003: 77,459,000 tons, 0.020 opt Au measured and indicated resources		Havallah Formation granodiorite	Tertiary

continued

MAJOR PRECIOUS-METAL DEPOSITS (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
HUMBOLDT COUNTY (continued)				
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 1999: 18.1 million tons, 0.359 opt Au 2000: 2.8 million oz Au measured resources, 5.5 million oz Au indicated resources, and 6.7 million oz inferred resources 2002: 2.69 million oz Au proven and probable reserves; 1.51 million oz Au measured and indicated mineral resources 2003: (Turquoise Ridge) 6,000,000 tons, 0.570 opt Au proven reserve; 2,400,000 tons, 0.620 opt Au probable reserve; 4,400,000 tons, 0.300 opt Au measured material; 2,800,000 tons, 0.400 opt Au indicated material; 4,800,000 tons, 0.490 opt Au inferred material	1938–50, 1962–67: 788,875 oz Au 1987–88: ~35,000 oz Au 1989: 120,730 oz Au, 9,407 oz Ag 1990–91: 372,987 oz Au 1992–95: 790,600 oz Au, 258,700 oz Ag 1996–97: 348,517 oz Au 1998: 175,302 oz Au, 52,490 oz Ag 1999: 111,000 oz Au 2002: 54,600 oz Au, 5,400 oz Ag 2003: 93,337 oz Au	Comus and Preble Formations, granodiorite dikes, granodiorite	42–41 Ma
Hycroft (formerly Crofoot/Lewis) (Sulphur district)	1988: 25 million tons, 0.025 opt Au 1999: 23.8 million tons, 0.0204 opt Au proven and probable reserves; 2.3 million tons, 0.0177 opt Au indicated reserves 2000: 41.9 million tons, 0.0196 opt Au measured and indicated resources; 14.1 million tons, 0.0152 opt Au inferred resources	1988: 75,800 oz Au 1989–98: 868,544 oz Au, 2,717,170 oz Ag 1999: 40,075 oz Au, 183,190 oz Ag 2000: 13,493 oz Au, 38,418 oz Ag 2001: 3,232 oz Au, 2,000 Ag 2002: 1,771 oz Au, 217 oz Ag 2003: 644 oz Au, 100 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 1994: 4 million oz Au 2000: 40.8 million tons, 0.060 opt Au proven and probable reserves (Lone Tree Complex) 2001: 29.2 million tons, 0.065 opt Au proven and probable reserves; 7.9 million tons, 0.032 opt Au mineralized material 2002: 21 million tons, 0.069 opt Au proven and probable reserves; 2 million tons, 0.057 opt Au measured and indicated mineralized material; 1 million tons, 0.047 opt Au inferred mineralized material 2003: 3,300,000 tons, 0.092 opt Au proven reserves 13,000,000 tons, 0.084 opt Au probable reserves 2,100,000 tons, 0.054 opt Au indicated material 600,000 tons, 0.054 opt Au inferred material	1991–99: 546,335 oz Au 1995: 240,000 oz Au, 11,000 oz Ag 1996–97: 536,820 oz Au 1998: 257,702 oz Au, 27,484 oz Ag 1999: 191,975 oz Au, 35,617 oz Ag 2000: 281,022 oz Au, 38,346 oz Ag 2001: 260,518 oz Au, 29,974 oz Ag 2002: 327,160 oz Au, 65,905 oz Ag 2003: 434,704 oz Au, 80,094 oz Ag	Havallah Formation and dacite porphyry	38 Ma
Marigold (Battle Mountain district)	1987: 8 million tons, 0.0935 opt Au 1990: 4.3 million tons, 0.105 opt Au mill ore, 7.6 million tons, 0.026 opt Au heap-leach ore 1999: 19.09 million tons, 0.032 opt Au 2000: 30.2 million tons, 0.035 opt Au proven and probable reserves; 20.7 million tons, 0.029 opt Au measured and indicated resources 2001: 75.5 million tons, 0.027 opt Au proven and probable reserves; 109.9 million tons, 0.014 opt Au measured and indicated resources 2002: 79.1 million tons, 0.026 opt Au proven and probable reserves; 129.7 million tons, 0.014 opt Au mineral resource 2003: 9,366,000 tons, 0.031 opt Au proven reserve; 83,909,000 tons, 0.023 opt Au probable reserves; 19,937,000 tons, 0.020 opt Au measured reserve; 20,069,000 tons, 0.020 opt Au indicated resource; 177,450,000 tons, 0.014 opt Au inferred resource	1989–93: 322,219 oz Au, 9,784 oz Ag 1994–98: 363,771 oz Au 1999: 74,000 oz Au 2000: 68,000 oz Au 2001: 84,784 oz Au, 401 oz Ag 2002: 83,321 oz Au, 1,281 oz Ag 2003: 142,100 oz Au, 2,080 oz Ag	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

continued

MAJOR PRECIOUS-METAL DEPOSITS (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
HUMBOLDT COUNTY (continued)				
Pinson (includes Mag pit) (Potosi district)	1980: 3.245 million tons, 0.119 opt Au 1989: 480,000 oz 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) 1990–91: 112,022 oz Au 1992–94: 145,210 oz Au, 12,700 oz Ag 1995: 44,854 oz Au 1996–98: 128,935 oz Au, 7,990 oz Ag 1999: 11,975 oz Au, 442 oz Ag 2000: 1,116 oz Au, 31 oz Ag 2001: 679 oz Au	Comus Formation	Eocene?
Preble (Potosi district)	1985: 1.8 million tons, 0.062 opt Au 1986: 3.16 million tons, 0.093 opt Au heap leach, 80,000 tons, 0.242 opt Au mill grade 1989: 15,110 oz Au	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	Eocene?
Rabbit Creek (Potosi district)	1989: 4.1 million oz Au; additional geologic *resource*—1 million Au in refractory material 1992: *reserves*—3.26 million oz Au 1993: *see* Twin Creeks	1990–92: 296,000 oz Au 1993: *see* Twin Creeks	Ordovician	Eocene?
Sleeper (Awakening district)	1985: 4.2 million tons, 0.13 opt Au, 0.73 opt Ag 1989: 1,975,000 oz Au 1990: 44.1 million tons, 0.038 opt Au, 0.152 opt Ag 1999: 2.1 million oz Au at average grade of 0.025 opt Au; 18.1 million oz Ag at average grade of 0.208 opt Ag	1986: 128,000 oz Au, 94,000 oz Ag 1987–88: 389,106 oz Au 1989–96: 1,149,054 oz Au, 1,838,791 oz Ag 2001: 90 oz Au, 197 oz Ag 2002: 130 oz Au, 263 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) 1999: 995,000 tons, 0.021 opt Au (North Peak); 10.8 million tons, 0.022 opt Au (Valmy)	2000: included with Lone Tree 2001: 24,228 oz Au, 2,996 oz Ag 2002: 3,685 oz Au, 742 oz Ag	Vinini Formation	
Trout Creek (Battle Mountain district)	1989: 50,000 oz Au			
Twin Creeks (Chimney and Rabbit Creeks) (Potosi district)	1993: 5.7 million oz Au 1999: 87.1 million tons, 0.079 opt Au proven and probable 2000: 75.2 million tons, 0.086 opt Au proven and probable 2002: 47.6 million tons, 0.081 opt Au proven and probable reserves; 55 million tons, 0.057 opt Au measured and indicated mineralized material; 1.8 million tons, 0.046 opt Au inferred mineralized material 2003: 14,000,000 tons, 0.085 opt Au proven reserve 48,200,000 tons, 0.074 opt Au probable reserve 8,000,000 tons, 0.051 opt Au measured material 34,800,000 tons, 0.051 opt Au indicated material 1,700,000 tons, 0.041 opt Au inferred material	1993–98: 3,338,026 oz Au, 1,317,456 oz Ag 1999: 879,453 oz Au, 119,191 oz Ag 2000: 779,075 oz Au, 103,909 oz Ag 2001: 831,962 oz Au, 95,721 oz Ag 2002: 786,313 oz Au, 158,401 oz Ag 2003: 697,607 oz Au, 128,535	Paleozoic	Eocene?
Winnemucca Gold property (Winnemucca district)	1998: 130,000 to 140,000 oz Au proven, 300,000 oz Au indicated			
LANDER COUNTY				
Austin Gold Venture (Birch Creek district)	1986: 1.75 million tons, 0.16 opt Au 1989: mined out 1999: 154,000 oz Au resource	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 1995: *resource* (overall Battle Mountain complex)—60.2 million tons, 0.036 opt Au, including *reserves*—46.6 million tons, 0.040 opt Au 1999 (Phoenix): 5,680,000 oz Au proven and probable; 1.5 million oz Au additional mineralization 2000: 175.2 million tons, 0.034 opt Au proven and probable reserves	1994–98: 274,741 oz Au, 632,739 oz Ag 1999: 8,322 oz Au, 19,526 oz Ag 2000: 1,509 oz Au, 1,756 oz Ag 2001: see Phoenix		Eocene

continued

MAJOR PRECIOUS-METAL DEPOSITS (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
LANDER COUNTY (continued)				
Buffalo Valley Gold Project (Buffalo Valley district)	1988: 1.5 million tons, 0.05 opt Au 1994: 4.8 million tons, 0.07 opt Au 1997: 600,106 oz Au resource; 100,797 oz Au, other mineralized material	1988–90: 39,668 oz Au		Eocene?
Cortez Joint Venture (Bullion district) CJV includes original Cortez Mine, Pipeline, and South Pipeline	1968: 3.6 million tons, 0.279 opt Au (Cortez deposit) 1987: 4.8 million tons, 0.105 opt Au 1999: 189.4 million tons, 0.050 opt Au proven and probable; 119.1 million tons, 0.035 opt Au mineralized material 2000: 151.3 million tons, 0.047 opt Au proven and probable; 60.0 million tons, 0.047 opt Au mineralized material 2001: 191.1 million tons, 0.044 opt Au proven and probable; 76.6 million tons, 0.040 opt Au resources 2002: 229.3 million tons, 0.034 opt Au proven and probable reserves; 281.7 million tons, 0.025 opt Au measured and indicated mineral resources 2003: 88,131,000 tons, 0.061 opt Au proven reserve 49,623,000 tons, 0.045 opt Au probable reserve 44,617,000 tons, 0.046 opt Au measured resource 130,580,000 tons, 0.027 opt Au indicated resource 18,023,000 tons, 0.047 opt Au inferred resource	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) 1990–91: 107,445 oz Au, 16,750 oz Ag 1992–93: 141,850 oz Au 1995–98: 1,817,273 oz Au, 31,332 oz Ag 1999: 1,328,525 oz Au 2000: 1,009,992 oz Au 2001: 1,184,732 oz Au 2002: 1,081,677 oz Au 2003: 1,065,402 oz Au	Roberts Mountains Formation, Wenban Limestone, Valmy Formation, quartz porphyry dikes	92.8–94 Ma and 36 Ma
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 1997: included in Cortez Joint Venture			
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	1990–91: 20,102 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 Complex (Battle Mountain district)	1984: 16 million tons, 0.15 opt Au, 0.57 opt Ag	1986: 253,000 oz Au, 902,000 oz Ag 1987: 255,000 oz Au 1988–93: 985,616 oz Au, 1,707,992 oz Ag (includes Surprise) 1994: 50,000 oz Au, 95,000 Ag (Reona Mine) 1995: see Battle Mountain Complex 2001: see Phoenix	Battle Formation Antler Peak Limestone Pumpernickel Formation	37 Ma
Fortitude Extension (Battle Mountain district)	1992: 500,000 oz Au 1993: *geologic resource*—900,000 oz Au 1996: included in Battle Mountain Complex			
Hilltop (Hilltop district)	1984: 10.3 million tons, 0.073 opt Au 1989: 10 million tons, 0.049 opt Au		Valmy Formation	Oligocene?
Klondike property	1989: 100,000 oz Au equivalent			

continued

MAJOR PRECIOUS-METAL DEPOSITS (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
LANDER COUNTY (continued)				
McCoy/Cove (McCoy district)	1981: 2.5 million tons, 0.08 opt Au, 1 opt Ag (McCoy) 1987: 14 million tons, 0.05 opt Au (McCoy); 4 million oz Au, 250 million oz Ag (Cove) 1989: *proven and probable reserves* 2.9 million oz Au, 128 million oz Ag *geologic resource*—3.5 million oz Au, 1.50 million oz Ag 1999: 11.8 million tons, 0.043 opt Au, 2.387 opt Ag proven and probable reserves; 100,000 tons, 0.350 opt Au, 2.0 opt Ag other mineralization 2000: 4.7 million tons, 0.034 opt Au, 2.309 opt Ag proven and probable reserves 2001: 430,000 tons, 0.031 opt Au, 2.624 opt Ag proven and probable reserves	1986: 50,000 oz Au 1987–98: 3,046,660 oz Au, 85.79 million oz Ag 1999: 124,500 oz Au, 8.43 million oz Ag 2000: 162,784 oz Au, 12,328,297 oz Ag 2001: 94,633 oz Au 6,451,425 oz Ag 2002: 33,142 oz Au, 1,987,421 oz Ag 2003: 4,699 oz Au, 706 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 1996: 9 million tons, 0.112 opt Au	1996: 6,743 oz Au 1999: 55,392 oz Au, 10,022 oz Ag 2000: 40,027 oz Au, 5,856 oz Ag 2001: 33,616 oz Au, 3,100 oz Ag 2002: 13,444 oz Au, 2,708 oz Ag 2003: 8,086 oz Au, 1490 oz Ag	basalt and basaltic andesite	15–16 Ma
Phoenix (Battle Mountain district)	2001: 174.2 million tons, 0.034 opt Au proven and probable reserves; 156.3 million tons, 0.17% Cu proven and probable reserves; 73.8 million tons, 0.026 opt Au mineralized material; 99.6 million tons, 0.14% Cu mineralized material 2002: 174.2 million tons, 0.034 opt Au probable reserves; 156.3 million tons, 0.16 % Cu probable reserves; 1.5 million tons, 0.033 opt Au measured and indicated mineralized material; 72.3 million tons, 0.026 opt Au inferred mineralized material; 63.5 million tons, 0.14 % Cu inferred mineralized material 2003: 175,700,000 tons, 0.035 opt Au probable reserves; 94,700,000 tons, 0.022 opt Au indicated material; 18,900,000 tons, 0.029 opt Au inferred material; 85,200 tons, 0.12% Cu indicated material; 14,300 tons, 0.11% Cu inferred material	2001: 5,641 oz Au, 6,468 oz Ag 2002: 6,134 oz Au, 1,236 oz Ag 2003: 5,444 oz Au, 1,003 oz Ag		Eocene
Pipeline (Bullion district)	1991: *geologic resource*—11.3 million tons, 0.237 opt Au 1996: 136.7 million tons, 8.7 million oz Au measured resource, includes South Pipeline 1997: included in Cortez Joint Venture	included in Cortez Joint Venture	Roberts Mountains Formation	Eocene?
Robertson (Bullion district)	1988: 11 million tons, 0.04 opt Au 1999: Porphyry zone, 254,678 oz Au proven and probable reserves; Lucky Boy, 33,000 oz Au measured; Altenburg Hill, 21,300 oz Au measured; Widows Mine, 37,300 oz Au inferred; Gold Pan, 91,400 oz Au measured	1989: 3,700 oz Au	Valmy Formation	early Oligocene
Slaven Canyon property (Bateman Canyon district)	1994: 50,000 oz Au 2002: 1.6 million tons, 0.043 opt Au			
South Pipeline (Bullion district)	1992: 9 million tons, 0.082 opt Au 1994: *geologic resource*—76.5 million tons, 0.048 opt Au 1996: *see* Pipeline 1997: included in Cortez Joint Venture		Roberts Mountains Formation	Eocene?
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

continued

MAJOR PRECIOUS-METAL DEPOSITS (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
LANDER COUNTY (continued)				
Toiyabe	1988: 813,400 tons, 0.066 opt Au	1988: 32,000 oz Au, 10,300 oz Ag 1990–91: 20,480 oz Au, 15,125 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 2000: 120,000 oz Au proven and probable reserves; 200,000 oz Au possible reserves		Cambrian to Ordovician Broad Canyon sequence	
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	Pogonip Group, Ely Springs and Laketown Dolomites, Oligocene silicic tuff, dacite dikes	early Miocene
Caliente property (Pennsylvania district)	1997: *geologic reserves*—50,000 tons, 0.03 opt Au, 0.80 opt Ag; *geologic resource*—700,000 tons, 0.039 opt Au		Tertiary diorite Tertiary andesite	
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
LYON COUNTY				
Fire Angel (Como district)	1989: 5,600 oz Au, *geologic resource*—148,500 oz Au			
Hydra-Hercules (Como district)	1997: 259,329 oz Au, 1,956,511 oz Ag	1997: exploration	Tertiary andesite	
Pine Grove (Pine Grove district)	1994: 2.5 million tons, 0.061 opt Au		Cretaceous granodiorite	
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* 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		Kate Peak Formation	Miocene
MINERAL COUNTY				
Aurora Mine (Aurora district)	1989: 347,000 tons, 0.253 opt Au 1996: 900,000 tons, 0.1 opt Au 2003: see Esmeralda	1989–90: 25,656 oz Au, 34,562 oz Ag 1991: 15,000 oz Au 1992–93: 23,600 oz Au, 52,200 oz Ag 1995: 15,000 oz Au, 35,000 oz Ag 1996: 10,374 oz Au 1997–98: 15,414 oz Au, 7,287 oz Ag	andesite, rhyolite	10 Ma
Aurora Partnership (Aurora district)	1983: 1.5 million tons, 0.129 opt Au, 0.3 opt Ag 1995: 230,000 tons, 0.208 opt Au (in portion of Humboldt vein system) 2003: see Esmeralda	1930s: 100,000 oz Au 1983: 10,000 oz Au 1988: 10,302 oz Au 1989: 27,825 oz Au, 26,000 oz Ag 1991–96: 157,796 oz Au, 318,933 oz Ag	andesite, rhyolite	10 Ma

continued

MAJOR PRECIOUS-METAL DEPOSITS (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
MINERAL COUNTY (continued)				
Borealis (Borealis district)	1981: 2.1 million tons, 0.08 opt Au, 0.5 opt Ag 1988: 1.792 million tons, 0.046 oz Au/ton 2000: 33.4 million tons, 0.044 opt Au, 0.22 opt Ag cumulative resource	1981–84: 170,000 oz Au 1986–88: 116,256 oz Au 1989–90: 107,495 oz Au 52,401 oz Ag	rhyolite flow dome, andesite flows, breccias, volcaniclastic rocks	5 Ma
Candelaria Mine (Candelaria district)	1982: 18.5 million tons, 1.09 opt Ag, 0.009 opt Au 1988: 24 million tons, 1.267 opt Ag, 0.011 opt Au 1999: 27.3 million tons, 3.4 opt Ag unmined resource; additional 8 million oz Ag in low-grade stockpile 2000: 48,000 oz Au and 45.4 million oz Ag indicated reserves	1982: 1.7 million oz Ag, 9,000 oz Au 1987: total production was 10 million oz Ag as of June 1987 1988–98: 30.67 million oz Ag, 95,218 oz Au 1999: 96,896 oz Ag, 237 oz Au	Candelaria Formation serpentinite, granitic dikes	Cretaceous
Denton-Rawhide (Rawhide district)	1986: 24.1 million tons 0.045 opt Au, 0.47 opt Ag 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 1997: 447,000 oz Au, 3.9 million oz Ag	1990–98: 916,800 oz Au, 7,438,000 oz Ag 1999: 115,900 oz Au, 665,000 oz Ag 2000: 104,349 oz Au, 817,787 oz Ag 2001: 100,747 oz Au, 727,095 oz Ag 2002: 82,584 oz Au, 695,248 oz Ag 2003: 63,283 oz Au, 525,809 oz Ag	rhyolite plugs, flows, tuffs, breccias	16 Ma
Esmeralda (Aurora district)	2003: 30,710,500 tons, 0.031 opt Au bulk-minable measured and indicated resources 9,206,300 tons, 0.025 opt Au bulk-minable inferred resources 192,152 tons, 0.50 opt Au underground-minable resources (Martinez & Prospectus)		andesite rhyolite	10 Ma
Mina Gold (Bell district)	1997: 1.77 million tons, 0.055 opt Au geologic resource	1997: exploration	Tertiary feldspar porphyry	
Mindora (Garfield district)	1988: 1.0 million tons, 0.037 opt Au and 1.78 opt Ag	1988: exploration		
Santa Fe (Santa Fe district)	1984: 8 million tons, 0.032 opt Au, 0.26 opt Ag 1990: 6.8 million tons, 0.035 opt Au and 0.241 opt Ag	1989–95: 345,499 oz Au, 710,629 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 1996: 10.2 million tons, 0.062 opt Au proven and probable reserves; 3.7 million tons, 0.040 opt Au mineralized material	1989–98: 2,237,484 oz Au, 2,935,484 oz Ag 1999: 76,159 oz Au, 90,967 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 1998: 4.2 million tons, 0.033 opt Au proven and probable reserves	1997–98: 64,504 oz Au 1999: 30,660 oz Au 2000: 8,740 oz Au 2001: 347 oz Au	Cambrian Bonanza King, Nopah, and Carrara Formations	11–13 Ma(?)
Gold Bar (Bullfrog district)	1987: 1.23 million tons Au ore 1993: idle		silicic volcanic rocks	Miocene
Golden Arrow (Golden Arrow district)	1997: 12.4 million tons, 0.039 opt Au resource		Tertiary rhyolite tuff	
Gold Hill property (Round Mt. district)	1998: 306,620 oz Au, 4,871,890 oz Ag potential resource 2003: (included in Round Mt.)		rhyolite ash-flow tuff	26 Ma(?)
Gold Wedge property (Manhattan district)	2002: 104,706 oz Au, 0.494 opt Au measured resource; 47,052 oz Au, 0.583 opt Au indicated resource; 394,626 oz Au, 0.494 opt Au inferred resource			

continued

MAJOR PRECIOUS-METAL DEPOSITS (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
NYE COUNTY (continued)				
Longstreet property (Longstreet district)	1989: 4 million tons, 0.024 opt Au, *geologic resource*—9.6 million tons, 0.024 opt Au		rhyolitic volcanic rocks	Oligocene
Manhattan property (Manhattan district)	1989: *geologic resource*—100,000 tons, 0.50 opt Au 1997: 1.7 million tons, 0.13 opt Au proven and probable		Cambrian Gold Hill Formation	
Midway (Rye Patch district)	1997: 270,000 oz Au preliminary resource		Ordovician Palmetto Formation	
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 (Bare Mountain district)	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	Roberts Mountains and Hanson Creek Formations, granodiorite, tonalite, quartz porphyry dikes	
Paradise Peak/ Ketchup Flats pit (Fairplay district)	1984: 10 million tons, 0.1 opt Au, 3 opt Ag 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 1996: 5 million tons, 0.022 opt Au, 0.2 opt Ag (Ketchup Flats)	1986–88: 560,000 oz Au, 8.5 million oz Ag 1989–94: 1,054,084 oz Au, 15.6 million oz Ag	rhyolite and andesite flows, ash-flow and air-fall tuffs	Miocene
Reward property (Bare Mountain district)	1998: 77,500 oz Au		Cambrian Wood Canyon Formation	
Round Mountain (Smoky Valley) (Round Mountain district)	1977: 12 million tons, 0.061 opt Au, 0.07 opt Ag 1989: *geologic resource*—271 million tons, 0.032 opt Au 1999: 320 million tons, 0.018 opt Au proven and probable reserves; 126 million tons, 0.016 opt Au mineralized material 2000: 273.2 million tons, 0.019 opt Au proven and probable reserves; 18.7 million tons, 0.022 opt Au mineralized material 2002: 192.1 million tons, 0.020 opt Au proven and probable reserves; 54.6 million tons, 0.012 opt Au mineral resource 2003: 129,866,000 tons, 0.017 opt Au proven reserve; 49,838,000 tons, 0.020 opt Au probable reserve; 21,000,000 tons, 0.013 opt Au measured resource; 54,440,000 tons, 0.018 opt Au indicated resource; 19,580,000 tons, 0.018 opt Au inferred resource (includes Gold Hill)	1977–84: 313,480 oz Au, 160,419 oz Ag 1987–88: 424,300 oz Au 1989: 386,227 oz Au, 211,297 oz Ag 1990: 483,192 oz Au, 236,600 oz Ag (includes Manhattan) 1991–98: 3,248,946 oz Au, 2,607,892 oz Ag 1999: 541,808 oz Au, 464,415 oz Ag 2000: 640,133 oz Au, 424,530 oz Ag 2001: 746,949 oz Au, 509,121 oz Ag 2002: 755,493 oz Au, 627,579 oz Ag 2003: 784,587 oz Au, 761,333 oz Ag	rhyolite ash-flow tuff	26 Ma
Sterling (Bare Mountain district)	1983: 200,000 tons, 0.20 opt Au 1989: 469,000 tons, 0.21 opt Au 1996: 129,000 tons, 0.245 opt Au	1983–88: 75,900 oz Au 1990–91: 24,841 oz Au 1995–98: 36,811 oz Au 1999: 3,093 oz Au	Wood Canyon and Bonanza King Formations	14 Ma
South Monitor (west of Ellendale district)	1996: 250,000 oz Au 1997: 14 million tons, 0.026 opt Au, 0.12 opt Ag		Tertiary volcanic rock	
Sullivan (Fairplay district)	1987: 10.2 million tons, 0.039 opt Au, 0.086 opt Ag and 0.37% Cu 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

continued

MAJOR PRECIOUS-METAL DEPOSITS (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
PERSHING COUNTY				
Bunce (Velvet district)	1989: *geologic reserve* - 600,000 tons, 0.04 opt Au 1990: 500,000 tons, 0.04 opt Au		rhyolite	
Colado Gold (Willard district)	1997: 15 million tons, 0.022 opt Au resource		Triassic-Jurassic metasedimentary rocks	
Florida Canyon (Imlay district)	1987: 22 million tons, 0.023 opt Au 1988: 37 million tons, 0.023 opt Au 1997: *reserves*— 45.5 million tons, 0.024 opt Au proven and probable mineralized material, 122.8 million tons, 0.022 opt Au 2002: 20 million tons, 0.017 opt Au proven and probable reserves 2003: 374,393 oz Au proven and probable reserves	1987–88: 109,300 oz Au 1989–98: 1,146,148 oz Au, 610,326 oz Ag 1999: 139,590 oz Au, 111,232 oz Ag 2000: 173,623 oz Au, 129,361 oz Ag 2001: 121,206 oz Au, 98,645 oz Ag 2002: 121,516 oz Au, 72,567 oz Ag 2003: 101,811 oz Au, 60,065 oz Ag	Grass Valley Formation	Late Tertiary?
Goldbanks Project (Goldbanks district)	1994: 900,000 oz Au 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 2000: 569,000 oz Au and 1.7 million oz Ag indicated reserves			
Relief Canyon (Antelope Springs district)	1983: 9 million tons, 0.032 opt Au 1988: ~ 1.3 million tons, 0.03 opt Au 1996: 8.6 million tons, 0.022 opt Au	1984: 24,500 oz Au 1987–88: 82,000 oz Au 1989–90: 34,266 oz Au, 39,235 oz Ag	Natchez Pass Limestone, Grass Valley Formation	Cretaceous?
Rochester (Rochester district)	1981: 75 million tons, 1.5 opt Ag 1989: *geologic resource*—94.5 million tons, 0.012 opt Au, 1.40 opt Ag 1997: 74.2 million oz Ag, 603,000 oz Au 2000: 50 million oz Ag, 410,000 oz Au (includes Nevada Packard) 2001: 51.4 million tons, 0.85 opt Ag, 0.007 opt Au proven and probable reserves; 61.8 million tons, 0.75 opt Ag, 0.005 opt Au mineralized material 2002: 46.9 million tons, 0.008 opt Au, 0.85 opt Ag proven and probable reserves; 33.8 million tons, 0.009 opt Au, 0.77 opt Ag mineralized material (includes Nevada Packard) 2003: 32.7 million tons, 0.01 opt Au, 0.91 opt Ag proven and probable reserves; 40.3 million tons, 0.01 opt Au, 0.77 opt Ag mineralized material	1986–98: 810,329 oz Au, 59.3 million oz Ag 1999: 70,396 oz Au, 6.2 million oz Ag 2000: 75,886 Au, 6,678,274 oz Ag 2001: 81,200 oz Au, 6,478,916 oz Ag 2002: 71,905 oz Au, 6,417,792 oz Ag 2003: 52,363 oz Au, 5,585,385 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) 1999: 216,000 tons, 0.323 opt Au	1997–98: 225,651 oz Au, 815,123 oz Ag 1999: 112,652 oz Au, 247,900 oz Ag 2000: 47,944 oz Au, 191,919 oz Ag	Tertiary volcanic rocks	Miocene
Standard (Imlay district)	2002: 17.2 million tons, 0.019 opt Au proven and probable reserves 2003: 404,100 oz Au proven and probable reserves	1939–42, 1946–49: 45,743 oz Au, 127,451 oz Ag	Natchez Pass Limestone, Grass Valley Formation argillite	
Tag-Wildcat (Farrel district)	1989: *geologic resource*—1.5 million tons, 0.043 opt Au; *reserves*—416,000 tons, 0.076 opt Au 2003: see Wildcat		Tertiary volcanic rocks	Miocene
Trinity (Trinity district)	1987: 1 million tons, 5.25 opt Ag	1988: active, production not reported 1989: 718,714 oz Ag, 70 oz Au	rhyolite plugs	Miocene
Wildcat (Farrel District)	2003: 38.1 million tons, 0.018 opt Au indicated resources; 28.4 million tons, 0.015 opt Au inferred resources		Tertiary volcanic	Miocene

MAJOR PRECIOUS-METAL DEPOSITS (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
STOREY COUNTY				
Comstock heap leach project (Comstock district)	1992: 475,000 tons, 0.072 opt Au, 0.60 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 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 1992–97: 16,949 oz Au, 195,701 oz Ag	Alta Formation	12 Ma
Oliver Hills (Comstock district)	1990: 3.37 million tons, 0.054 opt Au, 1.2 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 1998: 10.7 million tons, 0.055 opt Au 2002: 23.2 million tons, 0.013 opt Au indicated resources; 4.5 million tons, 0.039 opt Au inferred resources		rhyolite	Miocene
Olinghouse (Olinghouse district)	1994: *geologic resource*—500,000 opt Au, 0.057 opt Au 1997: 512,800 oz Au proven and probable reserves, 0.042 opt Au	1998: 2,912 oz Au, 1,879 oz Ag 1999: 28,655 oz Au, 17,598 oz Ag	Miocene andesite	Miocene
Hog Ranch (Leadville district)	1984: 2.5 million tons, 0.085 opt Au 1988: 5.5 million tons, 0.064 opt Au proven and probable reserves; 20.1 million tons, 0.029 opt Au geologic resource 2003: 1,598,350 tons, 0.033 opt Au indicated; 440,924 tons, 0.054 opt Au inferred	1986–87: 80,000 oz Au 1988–95: 118,045 oz Au, 25,400 oz Ag	rhyolite, explosion breccia sinter	15–16 Ma
WHITE PINE COUNTY				
Alligator Ridge (Bald Mountain district)	1983: 5 million tons, 0.09 opt Au 1989: 1 million tons, 0.064 opt Au 1992: 11.5 million tons, 0.046 opt Au; *geologic resource*—661,888 oz Au, includes Casino/Winrock	1981–90: 632,057 oz Au, 84,188 oz Ag 1991–92: 27,450 oz Au 1993: included with Bald Mountain 1994: 40,000 oz Au 1995: idle 1996: included with Bald Mountain	Pilot Shale	Mesozoic or early Tertiary
Bald Mountain (Top) (Bald Mountain district)	1989: 6.7 million tons, 0.069 opt Au 1999: 32.6 million tons, 0.041 opt Au, proven and probable reserves; 31.7 million tons, 0.044 opt Au, mineralized material 2000: 509,000 oz Au proven and probable; 2.03 million oz Au measured and indicated resources 2002: 508,000 oz Au proven and probable reserves; 2.03 million oz Au measured mineral resources 2003: 10,143,000 tons, 0.033 opt Au proven reserves; 8,549,000 tons, 0.040 opt Au probable reserve; 10,371,000 tons, 0.027 opt Au measured resource; 10,836,000 tons, 0.043 opt Au indicated resource; 19,224,000 tons, 0.029 opt Au inferred resource	1986: 50,000 oz Au 1988–89: 103,731 oz Au 1990–93: 287,110 oz Au, 76,745 oz Ag 1994: 80,000 oz Au 1995–96: 221,908 oz Au, 62,460 oz Ag 1997–98: 243,500 oz Au, 63,416 oz Ag 1999: 105,475 oz Au, 18,058 oz Ag 2000: 134,469 oz Au, 14,400 oz Ag 2001: 108,392 oz Au, 18,321 oz Ag 2002: 172,328 oz Au, 21,547 oz Ag 2003: 90,602 oz Au, 26,810 oz Ag	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	1990–92: 46,800 oz Au	late Paleozoic sedimentary rocks	Eocene

continued

MAJOR PRECIOUS-METAL DEPOSITS (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
WHITE PINE COUNTY (continued)				
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 1997: 510 oz Au, 76 oz Ag	Devonian and Mississippian rocks	Eocene
Golden Butte (Cherry Creek district)	1989: 4.23 million tons, 0.031 opt Au	1989–91: 43,519 oz Au, 16,911 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 1997: 100,000 oz Au	1998: 37,921 oz Au, 269 oz Ag 1999: 24,740 oz Au	upper Joana Limestone	
Horseshoe (Bald Mountain district)	1991: 1.5 million tons, 0.039 opt Au		Pilot Shale and intrusive quartz porphyry	36–38 Ma
Illipah (Illipah district)	1987: 57,000 oz Au	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)	1986: 1 million tons, 0.10 opt Au 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 1997: 7.72 million tons, 0.035 opt Au	1995–97: 99,500 oz Au, 207,500 oz Ag	Dunderberg Shale	Cretaceous
Pan (White Pine district)	1989: 241,000 oz Au 1998: 10.86 million tons, 0.022 opt Au drill indicated and inferred		Mississippian rocks	
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 1999: 194 million tons, 0.59% Cu, 0.007opt Au, proven and probable reserves 2003: 146.3 million tons, 0.687% Cu, 0.008 opt Au, proven and probable reserves	1986: 48,000 oz Au, 96,000 oz Ag 1987–88: 88,957 oz Au 1989–90: 153,828 oz Au, 121,340 oz Ag 1991: 21,674 oz Au 1992: 35,581 oz Au, 55,000 oz Ag 1993: 13,432 oz Au 1996–98: 196,000 oz Au, 783,500 oz Ag, 370 million pounds Cu 1999: 26,250 oz Au, 153,104 oz Ag, 62 million pounds Cu	Rib Hill Sandstone Riepe Spring Limestone intrusions	Cretaceous
Taylor (Taylor district)	1980: 10 million tons, 3 opt Ag	1980: 1,200 tons/day	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 in Carlin Trend

Production data for individual mines owned by Newmont Gold Co. in the Carlin trend are not available in many cases. Total production of Newmont operations in the Carlin trend is as follows:

Year	Gold (oz)	Silver (oz)
1988	895,500	NA
1989	1,467,800	117,400
1990	1,676,000	NA
1991	1,575,700	NA
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
1997	1,819,000	118,000
1998	1,575,391	150,400
1999	1,365,866	255,011
2000	1,708,665	108,111
2001	1,410,984	261,261
2002	1,335,302	268,994
2003*	1,087,427	200,359

NA= not available

* Production from the Capstone and Rain deposits is not included.

Industrial Minerals

by Stephen B. Castor

The total value of industrial minerals produced in Nevada in 2003, an estimated $425 million, was slightly above that of 2002. In order of estimated value, the most important Nevada industrial minerals in 2003 were construction aggregate, lime, diatomite, cement, gypsum, magnesia, barite, silica, and clay, each valued at more than $10 million. Commodities with values of less than $10 million were lithium, dolomite, perlite, dimension stone, salt, zeolite, potassium alum, and gemstones. Borate and some zeolite were processed in Nevada but mined in California, and were not included in the estimate of total industrial mineral value. Data used for these estimates, and data reported for individual commodities below, were obtained from the Nevada Division of Minerals, the U.S. Bureau of Land Management, or directly from companies that produced the commodities. Data are given in short tons unless otherwise noted.

In May 2003, the annual Forum on the Geology of Industrial Minerals was held in Sparks, Nevada. This meeting, which was attended by about 250 participants from industry, government, and academia, offered three days of technical sessions and eight field trips. The proceedings publication for this meeting, which includes several papers on Nevada industrial mineral deposits, along with papers on other domestic and international industrial mineral topics, is available from the NBMG (NBMG Special Publication 33).

Aggregate (Sand and Gravel, Crushed Stone)

According to the U.S. Geological Survey, in 2003 the U.S. produced about 2.6 billion metric tons (2.9 billion short tons) of sand and gravel + crushed stone, down slightly from 2002. The average price for this material was $5.50 per metric ton ($5.00 per short ton). Some of the crushed stone reported by the U.S. Geological Survey is used in the manufacture of commodities such as cement and lime; such material is not included in our aggregate figures because the processed commodities are listed separately.

Nevada's statewide construction aggregate production in 2003 is estimated at 37 million tons, 2 million tons more than production for 2002. This production had an approximate value of $166 million, well below that of gold but higher than that of any other of the state's mined commodities. Aggregate production from sand and gravel deposits accounted for about 75% of aggregate production statewide, with crushed stone and lightweight aggregate making up the balance.

Construction aggregate produced in the Las Vegas area in 2003, estimated at 27 million tons, was slightly more than in 2002. Continued growth in the Las Vegas area will likely maintain demand and production, and the planned new Ivanpah Valley airport and attendant urbanization south of Las Vegas constitute major future markets.

Sand and gravel operations accounted for about 80% of the aggregate used in the Las Vegas metropolitan area in 2003, with crushed stone and lightweight aggregate making up the balance. The most important source of sand and gravel for Las Vegas is the Lone Mountain area northwest of Las Vegas, which accounted for about 7 million tons in 2003. Significant production also comes from sand and gravel pits in the southwest part of Las Vegas. Since the mid 1990s, portable crushers that produce aggregate from sand and gravel at construction sites have become important producers of base aggregate in Las Vegas. Crushed stone, mostly crushed carbonate rock mined from outlying areas, has gained importance in the Las Vegas construction aggregate market in recent years, particularly for concrete aggregate.

Companies in the Las Vegas area that produced more than a million tons of aggregate in 2003 were Nevada Ready Mix Corp., Las Vegas Paving Corp., Rinker Materials, Frehner Construction, and Diamond Construction. Other important producers were Granite Construction, Wells Cargo Inc., Impact Sand and Gravel, Infiniton, and Southern Nevada Lightweight.

Nevada Ready Mix mined all of its aggregate from a complex of pits in alluvium in the Lone Mountain area; minor production also comes from adjacent bedrock. Las Vegas Paving produced sand and gravel from its Blue Diamond and Lone Mountain pits, and portable crushing operations. The company also produced crushed stone from the Apex landfill about 10 miles northeast of the metropolitan area. Rinker Materials (a subsidiary of the Australian-based CSR Group) produced sand and gravel from its Buffalo Road pit and crushed granite from the El Dorado pit near Railroad Pass. Frehner Construction mined and crushed limestone from its Sloan property a few miles south of Las Vegas. Community pits and other aggregate mining facilities administered by the U.S. Bureau of Land Management and operated by several companies contributed more than 4 million tons to the Las Vegas area total in 2003. The Southern Nevada Lightweight operation near Jean mainly produced aggregate for lightweight concrete block and sand for use in stucco. Lightweight aggregate was also shipped into the Las Vegas market from a cinder operation near Amargosa Valley in Nye County by Cind-R-Lite Block Co.

In recent years, aggregate producers have staked mining claims on carbonate rock resources in the Las Vegas area; however, some of the material may be used as feed for lime or cement operations and would not be classified as "common variety" mineral. Carbonate rocks

suitable for aggregate and judged to be “common variety” are not subject to location under the Mining Lae of 1872. This process was initiated in 2001 when Rinker Materials Inc. acquired claims on carbonate rock in the Sloan area south of Las Vegas. In 2003, U.S. Bureau of Land Management (BLM) personnel began preparation of a Mining Claim Validity Report on these claims, which includes comparative testing of materials from the claims with similar material from four producers of crushed carbonate rock in the Las Vegas area. A decision on whether or not to challenge the claims will be made by the U.S. BLM Nevada State Director in 2004. If a challenge is issued by the BLM, a hearing may take place in 2004, but finalization of judgment and appeal may take as long as 10 years.

Companies that staked claims on carbonate rock or other aggregate material in 2003 include Frehner Construction Co. in the Sloan area, Sierra Ready Mix in the Ivanpah area about 20 miles south of Las Vegas near the proposed site of a new international airport, and Las Vegas Paving in the Dry Lake area northeast of Las Vegas. Diamond Generating Corp., a subsidiary of Mitsubish Electric that is building a power plant in the Ivanpah area, has also staked claims in that area, possibly covering a construction aggregate resource. Other companies may have staked aggregate resources in the Las Vegas area by proxy.

Production of construction aggregate in the Reno-Sparks-Carson City area, at about 6 million tons, was about the same as in 2003. Three companies in the area produced more than a million tons of aggregate: Granite Construction Co., RMC Nevada, and Martin Marietta Materials Inc. Granite Construction produced aggregate from five pits in the area. RMC Nevada, part a U.S. holding company for a U.K. group, now owns All-Lite Aggregate and Paiute Pit Aggregates. Most of Martin Marietta’s production comes from the Rocky Ridge Quarry north of Sparks. Rilite Aggregate Co., Frehner Construction, and A & K Earthmovers, Inc., were also important producers. Crushed rock, which accounted for more than 60% of the aggregate used in 2002 in the Reno-Sparks-Carson City area, included material from Martin Marietta Materials, Granite Construction, and Frehner operations and lightweight rhyolite aggregate from All-Lite, Rilite, and Naturalite Aggregate Corp.

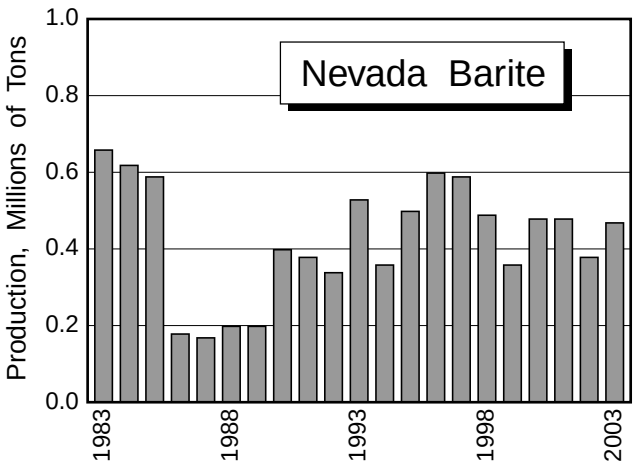
Aggregate that was produced outside of the major metropolitan areas in 2003 is estimated at about 3 million tons. Operators in Nye County together produced more than 500,000 tons of aggregate in 2003, mostly in the Pahrump area. Churchill County and Lyon County each produced more than 300,000 tons of aggregate; much of the Lyon County material was sold into the Reno-Carson City metropolitan area. Lincoln, Storey, Elko, and Humboldt County each produced more than 100,000 tons of aggregate; other rural Nevada counties are estimated to have produced less than 100,000 tons of aggregate each in 2003.

Barite

Nevada produces most of the barite mined in the United States. About 465,000 tons of barite was produced in the state in 2003, a significant increase over the 377,000 tons produced in 2002. At present, four companies mine barite in Nevada; by contrast, in the early 1980s when as much as 2.5 million tons were produced annually there were more than 25 Nevada producers. Foreign competition and relatively little domestic oil drilling are the main factors that have limited Nevada barite mining in recent years. About 95% of the barite sold in the U.S. is used as a weighting agent in oil and gas well drilling fluids. In 2002 about 700 domestic onshore rigs were operating; by contrast, nearly 1,000 were operating in the third quarter of 2003. According to the U.S. Geological Survey, the country imported 2.0 million metric tons of barite in 2003, about 30% more than in 2001. Most of the imported barite is from China.

M.I. Drilling Fluids, which is jointly owned by Smith International and Schlumberger, was again the largest Nevada barite producer in 2003, with combined production of about 260,000 tons of screened and crushed high-grade ore from the Greystone Mine and ground and bagged barite from its Battle Mountain plant, both in Lander County. The company was reportedly evaluating barite deposits elsewhere in Nevada in 2003, and has staked seven claims in the Lone Mountain area in Elko County, presumably on barite deposits.

Baroid Drilling Fluids, a subsidiary of Halliburton Co., was the second largest producer in Nevada in 2003. The company mined barite from the Rossi Mine in Elko County and processed it at the Dunphy Mill in Eureka County. Baker Hughes INTEQ also produced a significant amount of barite from its Argenta property near Battle Mountain in Lander County. Standard Industrial Minerals shipped a small amount of barite from a deposit of white, paint-grade barite at the P and S Mine in Nye County to a processing plant in Bishop, California.



Borate

In 2003, American Borate Co. mined borate minerals the Billie Mine in Death Valley, California. The ore is processed in Nye County in Nevada at the Lathrop Wells mill, which has a 22,000-ton annual capacity (B_2O_3 basis), but because the ore is from out of state this production is not included in the estimate of total value of Nevada minerals.

Cement

Based on U.S. Geological Survey data, in 2003 about 93 million metric tons of cement was produced in the United States at an average mill price of about $75 per metric ton. The only major Nevada producer, the Nevada Cement Co. in Fernley, Lyon County, has annual production in excess of 500,000 tons of cement. The cement is manufactured from limestone mined from a deposit a few miles south of Fernley, and other ingredients come from northern Nevada. The limestone deposit formed in a Tertiary lake, and shows many features that are similar to modern tufa deposits in northern Nevada. Because the Fernley deposit has limited reserves, Nevada Cement plans a drilling project in limestone of the Natchez Pass Formation in the Humboldt Range in Pershing County on claims staked 12 years ago. The limestone will be evaluated as raw material for portland cement production, possibly in a new plant to be constructed near the Rye Patch exit on Interstate 80.

Limestone suitable for cement production is widespread near Las Vegas, and several attempts have been made to initiate cement production in the area, without long-term success. In 1999, Royal Cement Co. restarted an idle cement plant near Logandale in Clark County. Limestone was mined at a site near the plant, and other raw materials were purchased from regional suppliers. According to the operator, production in 2000 was about 120,000 tons, and U.S. Geological Survey personnel reported minor production in 2001 and 2002. According to the Directory of Nevada Mine Operations, American Cement and Aggregate, Lake Forrest, California, was the operator in 2001. The Logandale plant was shut down in 2003. In 2002, Minerals Mining staked limestone for cement in the Apex district northeast of Las Vegas. Claims were staked over carbonate rock in the same area by Republic Dumpco, but this activity may be defensive staking of rock that is currently mined as construction aggregate.

Clay

Nevada clay production in 2003 is estimated at 36,000 short tons, an increase of about 10% over 2002. This does not include halloysite clay mined in Washoe County for Nevada Cement (which is included in the cement figure). According to the U.S. Geological Survey, in 2002 Nevada ranked fifth in production of non-swelling bentonite and seventh in the production of swelling bentonite in the United States.

IMV Nevada, owned by Mud Camp Mining Co., LLC, produced more than 33,000 tons of sepiolite, saponite, and bentonite from deposits in lacustrine sediments in the Ash Meadows area of Nye County. The company has a processing plant in Amargosa Valley, and exports a variety of clay products worldwide. Most of the value from the operation comes from the sepiolite, which has specific uses in asbestos replacement and salt water drilling. IMV Nevada has the only commercial sepiolite deposit in North America.

Two companies campaign mine and ship relatively minor amounts of Nevada clay from several sites for use in high-cost specialty products. At its White Caps Mill near Beatty in Nye County, Vanderbilt Minerals Co. processes small amounts of clay stockpiled from several Nevada, Arizona, and California deposits. In 2003, the company mined no clay in Nevada, but shipped stockpiled clay from the New Discovery Mine near Beatty, the Blanco Mine in Esmeralda County, and the Buff and Satin Mines in Pershing County. The American Colloid Co. mines white bentonite from Coal Canyon in Pershing County and hectorite from the Disaster Peak Mine in Humboldt County. The clays are shipped to a plant in South Dakota, where they are blended into specialty clay products.

The Moltan Co. uses clay from a deposit near Empire in northern Washoe County to mix with diatomite in clumping cat litter produced at its plant near Fernley. In addition, Art Wilson Co. mines clay that is mostly used as pond liner sporadically from the Jupiter Mine near Wabuska in Lyon County. Specialty Clays Corporation has been evaluating a deposit of bentonite in Churchill County about ten miles southeast of Fallon. This bentonite is reported to have expansive qualities similar to that of Wyoming bentonite.

In 1999, Oil-Dri, the world's largest manufacturer of cat litter, announced discovery of a montmorillonite deposit with 300 million tons of proven reserves in Hungry Valley north of Reno. In 2000, the U.S. Bureau of Land Management ruled that the clay is a locatable mineral, and issued the final environmental impact statement (EIS) in 2001. The clay, considered to be excellent for making clumping cat litter, is mainly calcium montmorillonite. According to the EIS, the deposit consists of clay-rich lacustrine strata as much as 98 feet thick, is aerially extensive, and is near the surface. The company planned to employ about 100 people at a Hungry Valley mine and plant, to mine about 270,000 tons of clay annually, and to process it into more than 200,000 tons of products for absorbent and agricultural markets. In 2002, Washoe County denied operating permits on the basis of local opposition to the plan, and the company is now litigating this decision. In order to proceed with its plans to become a major west coast supplier of cat litter, the company purchased a mine and plant in Taft, California, from the Clorox Co.. Oil-Dri also holds the Capricorn clay deposit in northern Washoe County, but this deposit is considered to be too remote to be competitive at present.

Diatomite

Diatomite production in Nevada, which accounts for more than 30% of domestic production, was virtually unchanged from 2002 to 2003. About two-thirds of the diatomite produced is used in filtration with the remainder largely used in absorbents, fillers, and cement. Emerging small-scale uses include pharmaceutical processing and nontoxic insecticides. According to the U.S. Geological Survey, the average domestic price in 2002 was about $233 per ton f.o.b. plant.

Eagle-Picher Minerals, Inc., a division of Eagle-Picher Industries, Inc., a wholly owned subsidiary of Granaria Holdings Ltd. of the Netherlands, produces most of Nevada's diatomite at three different locations. The most productive is the Colado operation in Pershing County, which consists of a plant at Lovelock that makes diatomaceous earth filtration products from diatomite mined from pits about 15 miles northwest of Lovelock. The company also produces diatomite used in fillers and absorbents at its Clark plant and mine in Storey County about 20 miles east of Reno, and diatomite used in insulation from a pit near Hazen in Lyon County.

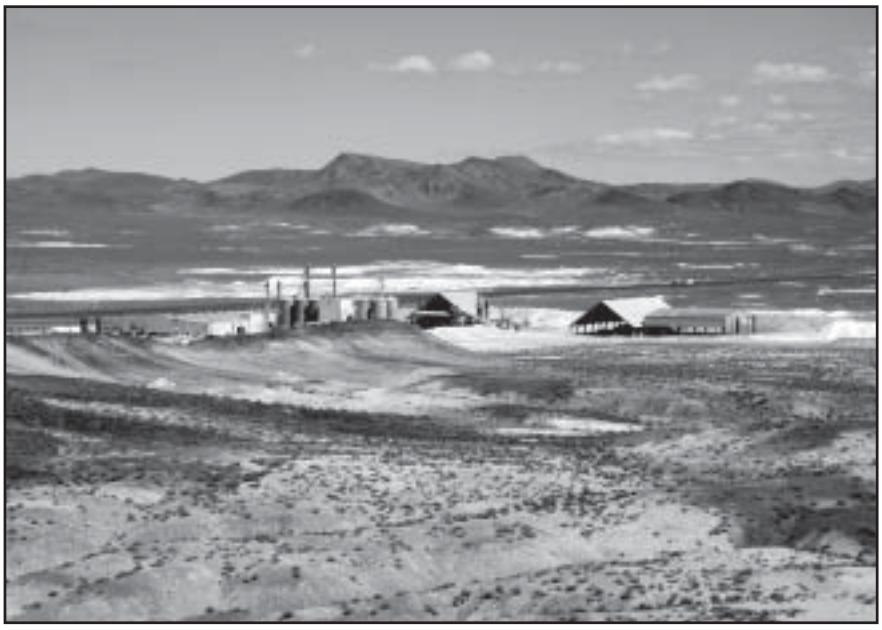
Moltan Co. of Tennessee is the second largest diatomite producer in Nevada, producing absorbent products, cat litter, and soil conditioner at a mine and plant complex in Churchill County about 20 miles northeast of Fernley. The diatomite resource is reported to contain 100 years of reserves. Moltan ships diatomaceous earth absorbents under several labels. The company produces two cat litter types in Nevada, a non-clumping diatomite product and a clumping product composed of diatomite and clay.

Other companies that mined diatomite in Nevada in 2002 were the Celite Corp. at Hazen in Lyon County and Grefco Inc. at Basalt near the Esmeralda/Mineral County line. Celite, a subsidiary of World Minerals Inc., part of the Alleghany Group, has a large diatomite facility in California, and recently acquired the CR Minerals mine at Hazen and plant in Fernley which produces functional filler. The Grefco operation, which is small relative to other Nevada diatomite producers, is being expanded, and may become a second producer of filter-grade diatomaceous earth in Nevada. American Diatomite Inc. has staked four claims in the Monte Cristo Range in Esmeralda County about ten miles north of Coaldale. The claims are in the vicinity of the Shu Fly diatomite deposit.

Dimension Stone

Nevada is not well known as a producer of dimension stone, and high-quality, cut and polished products are not currently produced from stone mined in the state. However, split dimension stone products are produced at two localities in Nevada, new dimension stone operations are being evaluated, and oversize stone blocks are used in wall construction.

Las Vegas Rock produces flagstone, ashlar, boulders, and crushed landscape rock from its Rainbow Quarries near Goodsprings, about 20 miles southwest of Las Vegas. The stone is quartz-cemented sandstone that is part of the Jurassic Aztec Sandstone, which crops out extensively in Clark County, but is too friable at most localities for building stone. The company also markets some cut stone and is planning to produce polished slabs and custom stone shapes.



Moltan diatomite plant, Churchill County. ***Photo by Larry Garside, 2004.***

Mt. Moriah Stone quarries flaggy, light-gray quartzite from the Cambrian Prospect Mountain Quartzite at a quarry about 15 miles north of Baker in White Pine County. This material, which naturally splits into slabs up to 5 feet by 8 feet by 4 inches thick, is used for flagstone and other types of uncut building stone. The company typically operates from April to December each year.

Milestone Minerals Inc. has staked the Champagne Marble claims in the vicinity of an inactive marble quarry about 5 miles northeast of Luning in Mineral County. Other potential dimension stone operations are being evaluated for variously-colored marble deposits at the old Carrara marble quarries near Beatty in Nye County, and for mottled pink to purple or blue dumortierite-andalusite-quartz rock at Lincoln Hill in Pershing County.

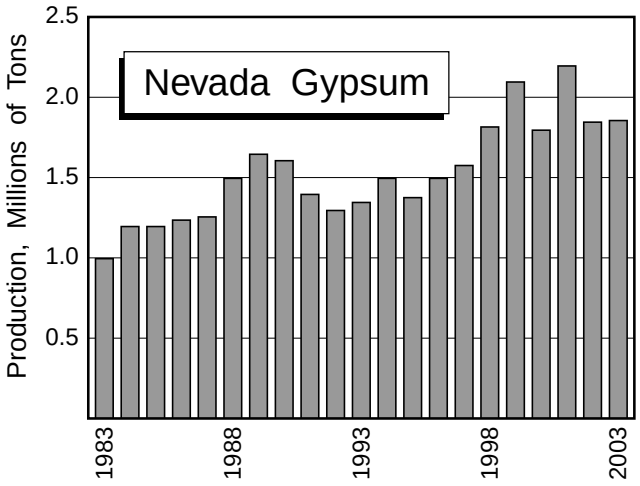
In recent years large amounts of stone boulders have been used to construct retaining walls in major metropolitan areas in Nevada. Most of this stone is produced as an oversized byproduct of quarried construction aggregate, and in terms of volume it constitutes a much larger market than traditional dimension stone mined in the state.

Gemstones

During 2003, precious opal was produced from the Royal Peacock, Rainbow Ridge, Bonanza, and Hidden Valley Mines in Virgin Valley, Humboldt County. Virgin Valley is a well-known source of gemstones in North America; much of the opal comes from pay-to-dig operations and is unreported. In 2003, gem chalcedony was produced from the Sage Mine in Humboldt County, and faustite and turquoise were recovered from the Blue Ridge (Wintle) Mine in Lander County.

Gypsum

In 2003, gypsum production in Nevada was an estimated 1.850 million short tons, about the same as in 2002. This is less than the 2.105 million tons reported in NBMG Special Publication SP-15 because the gypsum production reported in that publication included the impurities in the gypsum ore mined by PABCO Gypsum. Nevada accounts for more than 10% of domestic gypsum production, ranking only behind Oklahoma and Iowa. The three largest Nevada producers, PABCO Gypsum, BPB PLC, and USG, use most of this gypsum in local wallboard plants.



PABCO Gypsum in Clark County northeast of Las Vegas mined and processed more than a million tons of gypsum ore in 2003. Although processing yields only about 70% by weight gypsum from the ore, the company still ranks as the largest producer in Nevada. The gypsum is in a nearly flat-lying gypsite blanket, more than 120 feet thick in places, atop a 5-square-mile mesa. The ore is crushed in the pit and conveyed to a washing plant where impurities, mainly clay and silt, are removed.

The Blue Diamond operation of BPB PLC (until recently owned by James Hardie Gypsum) southwest of Las Vegas in Clark County was the second largest producer, at 565,000 short tons. The gypsum deposit is the largest of several Permian deposits in the Las Vegas area. It consists of more-or-less flat-lying beds of pure gypsum as much as 30 feet thick on a table mountain that overlooks the city. The Blue Diamond area has been the site of gypsum mining since 1925, but is now in the path of metropolitan growth, and gypsum mining there may give way to up-scale housing development.

USG, the nation's largest wallboard producer, was the third largest Nevada producer in 2003, at about 280,000 short tons. The company mines gypsum in western Pershing County and processes it into wallboard and plaster at a plant at Empire in Washoe County. The gypsum is of Triassic or Jurassic age and forms several masses in a 2-square-mile area. The largest mass, the Selenite orebody, contains 85 to 95 % gypsum and is generally well bedded with variable dips.

The Art Wilson Co. of Carson City ships gypsum and anhydrite from the Adams Mine in Lyon County and the D.L. Denman Construction Co. mines gypsum at the Pioneer Mine about 10 miles east of Las Vegas. Material from these relatively small operations is used in cement and agricultural applications. The Adams deposit is a folded, diapiric mass associated with limestone in Triassic metavolcanic rocks. The Pioneer Mine is in the same gypsite deposit as the nearby PABCO operation.

Lime, Limestone, and Dolomite

In 1997, lime supplanted diatomite as Nevada's second most valuable industrial mineral. According to the U.S. Geological Survey, in 2003 Nevada was the fourth leading state in lime production, ranking behind Alabama, Kentucky, and Missouri. Limestone is mined for lime production at two sites in Nevada that are nearly at

opposite ends of the state. The high-calcium limestone that is utilized at both sites is from the same Devonian limestone unit although it is assigned to different stratigraphic formations. In addition to lime, relatively minor amounts of crushed limestone are also shipped from both sites, and dolomite is mined at one of the sites.

The Pilot Peak high-calcium lime operation of Graymont Western US, Inc. (formerly Continental Lime, Inc.) 10 miles northwest of Wendover in Elko County is Nevada's largest producer, mainly marketing lime to gold-mining operations for use in cyanide-solution pH control. The Pilot Peak plant has three kilns with a combined capacity of more than 700,000 tons of quicklime per year and a hydrated lime plant capable of producing 350 tons per day. In 2003, the Pilot Peak plant was rated the eighth largest producer in the country.

Chemical Lime Co. produces lime at Apex about 20 miles northeast of Las Vegas. The operation makes high-calcium quicklime used in metallurgical processing, paper manufacturing, and environmental markets. The company also produces dolomitic lime and hydrated high calcium lime at Apex, mainly for construction uses. The Chemical Lime dolomite quarry at Sloan ceased operating in 1997, but in 2003, their Henderson plant continued to produce Type S hydrated lime for building and home construction.

In addition to lime, both Graymont Western U.S. and Chemical Lime ship crushed limestone. Other carbonate rock producers in Nevada are Min-Ad, Inc., and Nutritional Additives Corp., producers of agricultural and nutritional dolomite products near Winnemucca. Columbus S.M. LLC, a small California-based company, is evaluating the production of calcium carbonate and magnesium hydroxide from the Columbus Salt Marsh in Esmeralda County. The company plans to leach the commodities from material mined from the playa, and to market the calcium carbonate as a food additive.

Lithium

Chemetall Foote Co., a subsidiary of Chemetall GmbH, produces lithium carbonate, lithium hydroxide monohydrate, and lithium hydroxide anhydrite at Silver Peak in Esmeralda County. This operation, the only primary lithium producer in the United States, produces these chemicals from brine that is pumped from beneath Clayton Valley playa. Fifty production wells tap six aquifer systems beneath the playa. Lithium preconcentration is carried out in 20 active evaporation ponds covering more than 4,000 acres. Production figures are confidential; the most recent public information, from 1998 Securities and Exchange Commission data, showed production of about 12 million pounds of lithium carbonate and 5 million pounds of lithium hydroxide. Lithium carbonate is the main feedstock for major uses of the element in glass, ceramics, aluminum production, lubricants, and batteries. U.S. prices have remained steady at about $2.00 per pound for lithium carbonate and $2.60 per pound for lithium hydroxide monohydrate since 1997, but since 1998 large shipments of lithium carbonate have sold at about half list price due to low pricing by South American brine operations. Accordingly, U.S. lithium imports have increased more than 200% and exports have fallen by more than 20% since 1997.

Magnesia

Premier Chemicals LLC of Cleveland, Ohio, owns the Gabbs magnesia operation in Nye County. Magnesium minerals have been mined at Gabbs since 1935, and in the 1940s were processed in Henderson, Nevada to make magnesium metal. From the 1950s to the 1980s, mining and processing was by Basic Industries, a major producer of refractory magnesia. In 1991, Combustion Engineering Inc. sold Basic Industries to Premier Refractories Inc., which subsequently sold its U.S. magnesia chemicals business to Premier Chemicals LLC in 1999. During the 1990s, the availability of cheap foreign refractory magnesia caused production at Gabbs to be switched to light-burned (caustic) magnesia that is mainly marketed for wastewater treatment and agricultural uses. Although production of magnesia at Gabbs is still substantially below its peak in 1981, magnesia shipments from the Gabbs operation have increased steadily since 1996.

About 60% of U.S. magnesia production comes from seawater and natural brines, and the mine at Gabbs is the only place in the country where magnesite and brucite are mined. The brucite, which is shipped in relatively small amounts from the Gabbs operation, is now mainly mined from pods adjacent to igneous rocks in magnesite pits. Magnesite and brucite at Gabbs occur over an area of about 2 mi^2 in complex replacement bodies in Triassic dolomite. The magnesite is thought to have formed by hydrothermal activity related to emplacement of granite, and the brucite by alteration of the magnesite during later granodiorite intrusion.

Perlite

Nevada has large perlite resources and several deposits of perlite that have been mined extensively. The largest historical producer was the Hollinger Mine near Pioche in Lincoln County. Current perlite production in Nevada is restricted to relatively small-scale mining of two deposits for niche markets, and the state produces less than 1% of the domestic total.

Wilkin Mining and Trucking Inc. mines perlite from the Tenacity Perlite Mine about 25 miles west of Caliente in Lincoln County. The company has been mining perlite in the area for more than 25 years. In the past, most of the perlite was shipped as crude; however, the company has a small popping plant, the Tenacity Perlite Mill, in Caliente, and present sales are almost exclusively of expanded perlite that is mainly used for horticultural purposes. In 2003 the company filed a plan to mine perlite from a deposit near the Hollinger Mine in the Wilson Creek Range northeast of Pioche.

Eagle-Picher Minerals Inc. produces expanded perlite at its Colado diatomite plant in Pershing County from perlite mined at the Popcorn Mine about 15 miles south of Fallon in Churchill County. The perlite is marketed as a filter aid, and plant capacity is reportedly about 8,000 tons per year. In 2001, Noble International S.A. began mining perlite from a deposit in Nevada for use in the production of "Noblite" microspheres at a plant in Fallon. In 2002 the company ceased mining Nevada perlite and switched to raw material from the Tucker Hill perlite mine in Oregon. Although the U.S. is the world's largest producer of perlite, domestic perlite suffers transportation cost disadvantages in some areas of the eastern U.S. compared to Greek perlite, and domestic production has slipped for four years in a row while imports have increased.

Potassium Alum

A small amount of potassium alum (kalinite) was mined from a deposit in Esmeralda County about 10 miles north of Silver Peak by Rulco. The kalinite, which occurs with sulfur as veins and stringers in rhyolitic rock, is being marketed for horticultural use.

Salt

The Huck Salt Co. produced about 9,000 tons of salt in 2003, down 35% from 2002. The salt is mainly used for deicing roads, and production levels are dependent on weather. It is mined from a playa in Fourmile Flat about 25 miles southeast of Fallon in Churchill County, where it has been harvested almost continuously since the 1860s when it was hauled to the mills that processed Comstock silver and gold ore.

Silica

The U.S. is by far the world's largest producer of silica sand, and domestic annual production has hovered around 28 million metric tons for the past nine years, despite increases in recycled glass usage. Simplot Silica Products at Overton in Clark County shipped about 675,000 tons of silica sand in 2003, about the same as in 2002. The sand is mined from an open pit 1.5 miles long and 300 feet deep in the relatively friable Cretaceous Baseline Sandstone, washed in the pit, and transported via a 5-mile slurry pipeline to a plant where it is screened and bagged. Silica sand has been produced from the deposit since the 1930s; Simplot acquired the operation in 1955. The company plans to upgrade its processing facilities in the near future, with a view toward increasing production from current levels to as much as 850,000 tons per year.

In 2002, Silica LLC began mining quartzite from the Sugar mining claims about 3 miles southeast of Mercury in Nye County. A Plan of Operations submitted to the BLM in 2001 called for annual production of as much as 80,000 tons. The material, in the Ordovician Eureka Quartzite, was described as strongly brecciated and fractured and amenable to mining without blasting.

Zeolites

Nevada contains several large zeolite deposits that were discovered and evaluated during a flurry of zeolite exploration activity in the 1950s and 1960s; however, natural zeolite production never evolved into a major industry in the state. Ash Meadows Zeolite LLC, a subsidiary of Badger Mining Corp., ships 1,000 to 5,000 tons annually of clinoptilolite used in water filtration, odor control, and nuclear clean-up from a plant in Amargosa Valley in Nye County. The clinoptilolite is mined from a large deposit in California that extends into Nevada.

Moltan Co. mines mordenite from a deposit in the Trinity Range in Churchill County about 40 miles northeast of Fernley. The company uses the zeolite mineral to make absorbents at its Fernley plant.

Geothermal Energy

by Ronald H. Hess

Twenty-seven geothermal well permits were issued during 2003 by the Nevada Division of Minerals: two project area permits, six industrial production wells, one industrial injection well, two domestic wells, and sixteen gradient/observation wells. (Nevada Division of Minerals, 2004)

During 2003 there were 195 federal noncompetitive leases covering 295,800 acres and 72 federal competitive leases covering 90,400 acres in Nevada. Total lease rental revenue value for 2003 was $288,600. (R. Hoops, BLM, oral commun., 2004)

Total gross electrical production during 2003 from geothermal resources on public lands was 1.12 million megawatt-hours (MWh), an increase of 20,000 MWh over 2002; net production was approximately 938,500 MWh, a decrease of 41,000 MWh from 2002. Gross electrical sales from federal lands were $52.4 million, an increase of $3.2 million over 2002. Production royalties on that amount equaled $1.8 million. By regulation, half of all Federal geothermal lease rental fees and production royalties are returned to the state. For 2003, $144,300 in lease rental fees and $900,000 in royalty production fees should be returned to Nevada (R. Hoops, BLM, oral commun., 2004) .

Total Nevada geothermal electrical production in 2003 from both federal and fee lands combined was 1,637,028 MWh gross and net production was 1,175,560 MWh (Nevada Division of Minerals, 2004) with an approximate sales value of $65 million. Production capacity from the currently developed geothermal resources at ten existing geothermal power production sites in Nevada is 221.5 megawatts (MW); currently installed equipment, or nameplate, capacity for the same sites total 244.3 MW. The table of Nevada geothermal power plants lists operators, plant locations, and energy production for individual Nevada geothermal power producers. Nevada is second only to California in total installed geothermal generating capacity.

The 2001 State Legislature passed Senate Bill (SB) 372, which included requirements for Nevada's Renewable Energy Portfolio Standard. It requires, based on an escalating scale over time starting at 5% in 2005 and increasing to 15% by 2015, that a certain percentage of electricity sold to customers in Nevada be generated from renewable resources, including geothermal energy. This bill represents a significant move forward in requiring utilities to obtain and distribute electricity generated from renewable resources.

In response to this requirement, four new geothermal power production contracts with Nevada Power Co. were approved by the Public Utilities Commission of Nevada. These plants should be on line by the middle of 2005 and receive 4.2 to 5.2 cents per kilowatt-hour over the next 20 years. The projects to be built are Desert Peak 2 (25 MW) and Desert Peak 3 (13 MW) in Churchill County, Hot Sulphur Springs (25 MW) in Elko County, and Steamboat IV (44 MW) in Washoe County.

NONDOMESTIC GEOTHERMAL WELLS REPORTED AS DRILLED OR COMPLETED IN NEVADA DURING 2003

Area	Company	Well name	Permit#	Location	Type
Churchill County					
Desert Peak	Ormat Nevada, Inc.	Thermal Gradient ST 11 (c)	517	NE¼ SW¼, S15, T22N, R27E	Gradient
Desert Peak	Ormat Nevada, Inc.	Thermal Gradient ST 12 (a)	518	SE¼ NW¼, S21, T22N, R27E	Gradient
Desert Peak	Ormat Nevada, Inc.	Industrial Production Well 43-21	521	SE¼ NW¼, S21, T22N, R27E	Production
Desert Peak	Ormat Nevada, Inc.	Industrial Production Well 27-15	529	SW¼ SW¼, S15, T22N, R27E	Production
Desert Peak	Ormat Nevada, Inc.	Industrial Production Well 74-21	536	SE¼ NE¼, S21, T22N, R27E	Production
Elko County					
Hot Sulphur Springs	Earth Power Resources	Industrial Production Well 46-8 (57-8)	527	SW¼ SW¼, S8, T41N, R52E	Production
Hot Sulphur Springs	Earth Power Resources	Observation Well 67-8 (65-8)	528	NE¼ SE¼, S8, T41N, R52E	Observation
Washoe County					
Rye Patch	Presco Energy LLC	Thermal Gradient P 3-1	511	NE¼ NW¼, S3, T31N, R33E	Gradient
Rye Patch	Presco Energy LLC	Thermal Gradient P 10-1	513	SW¼ NE¼, S10, T31N, R33E	Gradient
Rye Patch	Presco Energy LLC	Thermal Gradient P 32-2	515	NE¼ SW¼, S32, T32N, R33E	Gradient
Washoe County					
Fly Ranch	SB Geo, Inc.	Thermal Gradient 11-12-TG	520	NW¼ NW¼, S12, T34N, R23E	Gradient
Steamboat Hot Springs	Yankee Caithness JV	Industrial Production Well 21B-5	525	NW¼ NW¼, S5, T17N, R20E	Observation
Steamboat Hot Springs	Yankee Caithness JV	Industrial Injection Well 64-32	530	SW¼ NE¼, S32, T18N, R20E	Injection

The Nevada Renewable Energy and Energy Conservation Task Force released a report estimating that full and continued implementation of the Nevada Renewable Portfolio Standard could add nearly $21.5 billion in gross State product by 2035 and over the same period add nearly 5,500 jobs related to the economic impacts of renewable energy (geothermal, wind, and solar) (Bulletin Geothermal Resources Council, May/June 2003, v. 32, no. 3).

Nevada Bureau of Mines and Geology Geothermal Website

A new Geothermal Resources of Nevada website (www.nbmg.unr.edu/geothermal/gthome.htm) has been launched by the Nevada Bureau of Mines and Geology (NBMG) and the Great Basin Center for Geothermal Energy with partial financial assistance from the 2001 DOE State Energy Program. It is an online update to "Thermal Waters of Nevada" by Larry Garside and John Schilling, published by NBMG in 1979. The website provides updated geochemical data and maps for geothermal resources in the state. The Web interface uses an interactive map to locate data about various thermal resources in Nevada.

GPS and Crustal Strain Measurements May Target New Geothermal Resources

Geoffrey Blewitt, NBMG geophysicist, reported the first assessment of data quality from a 30-station semi-continuous GPS network, installed to determine millimeter-level strain changes in the Earth's crust that might be used to target new geothermal resources. This network has been under construction for the first half of the fiscal year and came on line in late January 2004. Initial results from the first 60 days of operation show that station positions estimated every 24 hours repeat to within 1 to 2 mm in longitude and latitude. The goal is to resolve station motions to less than one millimeter per year, and then use 2–3 years of data to create a strain tensor map to identify areas undergoing active transtensional tectonics. Initial results show that the network is meeting the required level of data precision.

Blue Mountain Geothermal Area

Noramex Corp., a wholly owned subsidiary of Nevada Geothermal Power, Inc. (NGP), completed the observation well Deep Blue No. 1 (DB 1, permit number 500) to 2,205 feet. This well recorded temperatures of 145°C at 2,115 feet and a zone of 1,200 feet of high permeability rock in the highest temperature portion of the well. In April of 2004, a step-out well, Deep Blue No. 2 (DB 2), was spudded approximately 1 kilometer away from DB 1. The purpose of DB 2 is to test a series of northeast-trending young faults that appear to be related to the geothermal resource in this area and to better define and delineate the overall thermal anomaly. As of May 2004 it was reported that DB 2 had been drilled to a depth of 1,028 meters and had a maximum recorded temperature of 165°C (Bulletin Geothermal Resources Council, May/June 2004, v. 33, no. 3).

An excerpt from a Nevada Geothermal Power Inc., May 6, 2004, press release about DB 2 states "The maximum temperature measured in the well was 167°C (330°F) at 585 meters (1,920 feet) depth. A potential geothermal production zone between 515 and 760 meters (1690–2493 feet) is characterized by greater than 150°C (300°F) temperatures measured after 6 hours static time, multiple crystal-lined, open fractures and vuggy quartz veins."

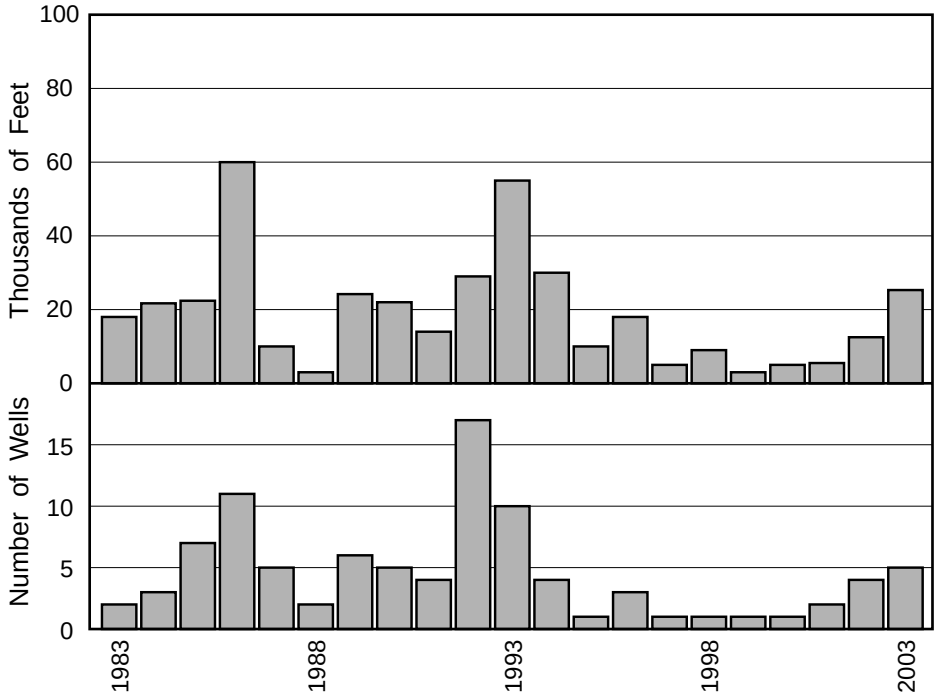
The U.S. Department of Energy (DOE) under the Geothermal Resource Exploration and Definition II (GRED II) program awarded Noramex Corp. a grant of $659,000, with Noramex to provide $164,000 in cost share, to assist in the DB 2 drilling project. Preliminary results from earlier exploration data and the above drilling indicate that a 30-megawatt (MW) geothermal power plant is feasible at Blue Mountain and with continued resource exploration and development the area may be able to produce upwards of 100 MW (Bulletin Geothermal Resources Council, May/June 2004, v. 33, no. 3).

Noramex Corp. applied to the Nevada Division of Minerals for and received an additional 15 geothermal well drilling permits for a series of 500-foot thermal gradient test wells in the Blue Mountain area (State permit numbers 545 through 559).

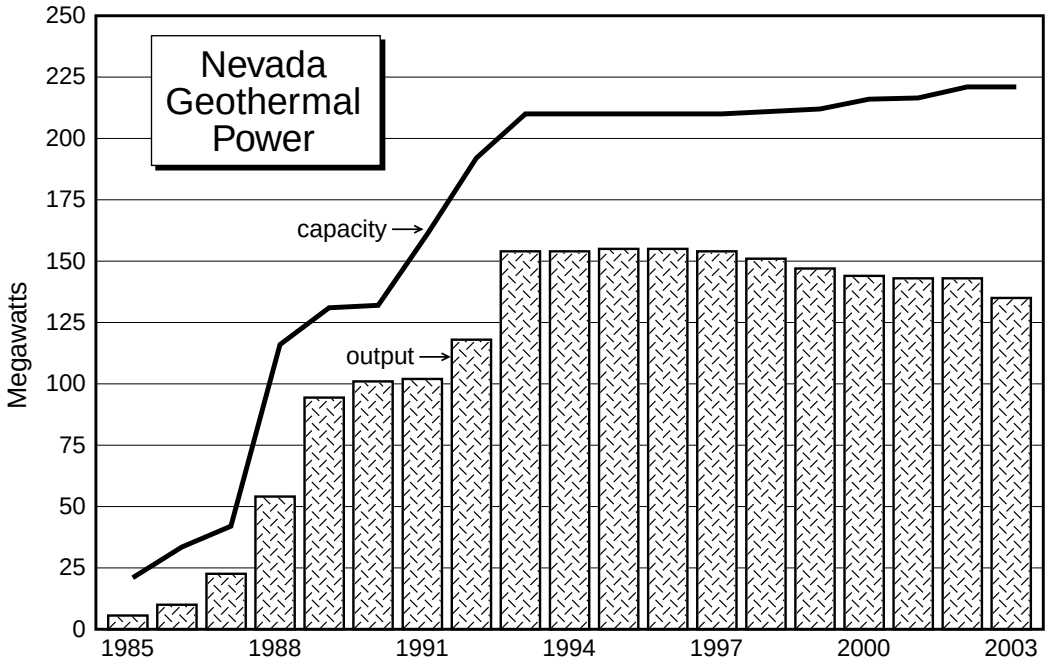
The Blue Mountain area, located at T36N, R34E in south-central Humboldt County, was originally explored for gold potential. During exploratory drilling they noted high temperatures when pulling the drill steel. Because of this near surface temperature anomaly, the property was explored for geothermal potential from the late 1990s to present. Nevada Geothermal Power, Inc., holds the geothermal leases to 7,680 acres and has reported that it believes the property to have a potential resource capable of producing 100 MW. (Nevada Geothermal Power Inc. Web Informational Flyer, 2003, (*www.continentalridge.com/blue-mountain-geothermal.htm*)

Hot Springs (Tipton) Ranch - Pumpernickel Valley

Noramex Corp., a wholly owned subsidiary of Nevada Geothermal Power, Inc. (NGP) has undertaken a geothermal development project in Pumpernickel Valley, Humboldt County, at the Hot Springs - Tipton Ranch geothermal area. They have acquired the leases for and surrounding an area where near boiling hot springs occur. Based on chemistry, NGP believes that at depth the temperature of the source fluids for a series of hot springs that occur along a one-mile section of a fault running through the geothermal area could be as high as 170°C (340°F). (Nevada Geothermal Power Inc., Pumpernickel



Industrial-class (power-generation) wells drilled in Nevada, 1982–2003. Depth taken from original drilling permit.



Currently developed resource capacity and average net output of Nevada geothermal plants, 1985–2003. 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.

Geothermal Project Development Program Outlined, May 6, 2004, press release)

An excerpt from Geothermal Resources of Nevada as updated on the web at *www.nbmg.unr.edu/geothermal/site.php?sid=Hot Springs (Tipton) Ranch* on the Hot Springs Tipton Ranch or Pumpernickel Valley (as updated 2003) reads:

> Hot springs at Tipton Ranch in Secs. 4, 5, T33N, R40E have reported temperatures as high as 85°C (Mariner and others, 1974), although one spring with a temperature of 87°C was sampled in September 2002. There are numerous springs and seeps, some discharging gas, along a N20°E fault that forms the boundary of the Sonoma Range in that area. The spring deposits are predominantly travertine with a trace of siliceous sinter. Most springs are relatively low flow, but the combined discharge from the area likely exceeds 400 L/min. The "best" estimates of the thermal-aquifer temperature are 194–196°C (Mariner and others, 1974), whereas the Na-K-Ca estimate based on 2002 samples is slightly lower at 175 to 192°C. Wollenberg (1974b) reported that slightly anomalous radioactivity (up to 22.5 μR/hr) is present at the springs. In 1974 Magma Power Co. drilled a geothermal well at Tipton Ranch to a total depth of 919.6 m (3,071 feet). Bottom-hole temperature was logged at 135°C after 10 hours of circulation, with the last 91 m having a gradient of 0.16°C/m (6.5°F/100 feet; Skip Matlick, personal comm.). In September 2002, the well was flowing at the surface through a leak in the casing and water was depositing travertine over the well head and surrounding area. Wellhead temperature was 95°C. The well has also previously been called the "Pumpernickel Valley well."

Fly Ranch

The U.S. Department of Energy (DOE) under the Geothermal Resource Exploration and Definition II (GRED II) program awarded **Advanced Thermal Systems, Inc.** a grant to perform geophysical testing to site and then drill a well to test the resource at **Fly Ranch Hot Springs** in Northern Washoe County (Bulletin Geothermal Resources Council, January/February 2003, v. 33, no. 1).

Rye Patch (Humboldt House) - Florida Canyon Geothermal System

The UNR-Great Basin Center for Geothermal Energy, in partnership with PRESCO Energy LLC and Apollo Gold Inc./Florida Canyon Mining Inc., has received $499,997 for the "Exploratory Drilling Program to Evaluate the Lifetime and Current Potential of the Florida Canyon Geothermal System, Pershing County Nevada." The program's objectives are to develop new methods of evaluating the lifetime and resource potential of geothermal systems in general, and to develop the geothermal resources within the Humboldt House Geothermal Area (HHGA), which may be the single largest geothermal production field in Nevada. For more information, contact Gina Tempel at: *gina@mines.unr.edu.*

Between May and July 2003, the Great Basin Center for Geothermal Energy at the University of Nevada, Reno (UNR) successfully drilled and completed five research wells located near the Florida Canyon Mine. These wells were funded by the U.S. Department of Energy grant to UNR in collaboration with Presco Energy and Apollo Gold. All wells were completed as temperature gradient wells at the following depths: one well to 500 feet, three wells to 1,000 feet, and one well to 1,500 feet. A total of 1,850 feet of core was obtained from three wells. The five wells were being monitored quarterly for temperature, and the cores were being studied using geochemical and petrographic techniques at UNR. (An excerpt from Geothermal Resources of Nevada as updated on the web at *www.nbmg.unr.edu/geothermal/site.php?sid=Rye Patch.*)

Salt Wells - Nevada Geothermal Specialists

A new company, Nevada Geothermal Specialists, successfully obtained 2,500 acres in the Salt Wells area, Churchill County, during this summer's Bureau of Land Management geothermal lease auction. This geothermal area was originally discovered by Anadarko Petroleum Corporation in the 1980s. If the permitting and approval process go as planned Nevada Geothermal Specialists hope to develop a 10-MW power plant on the site by late 2005. (Bulletin Geothermal Resources Council, March/April 2004, v. 33, no. 2)

Steamboat Hot Springs - ORMAT

ORMAT executed a letter of intent to acquire **Steamboat 2 and 3** binary power plants, surrounding land, and associated geothermal resources. Cost of the purchase was $32.5 million. ORMAT had already acquired Steamboat 1 and 1A power plants. ORMAT built the original Steamboat 1 plant in 1985. Shortly afterwards they built the 1A plant and then in 1990 Steamboat 2 and 3 were brought on-line, all built by ORMAT. (Bulletin Geothermal Resources Council, July/August 2003, v. 32, no. 4)

The **SB Geo Steamboat Hot Springs Geothermal Power Plants** had a gross output of 390,951 MWh and a net production of 287,672 MWh during 2003. (Nevada Division of Minerals, 2004)

Steamboat Hot Springs - Yankee Caithness

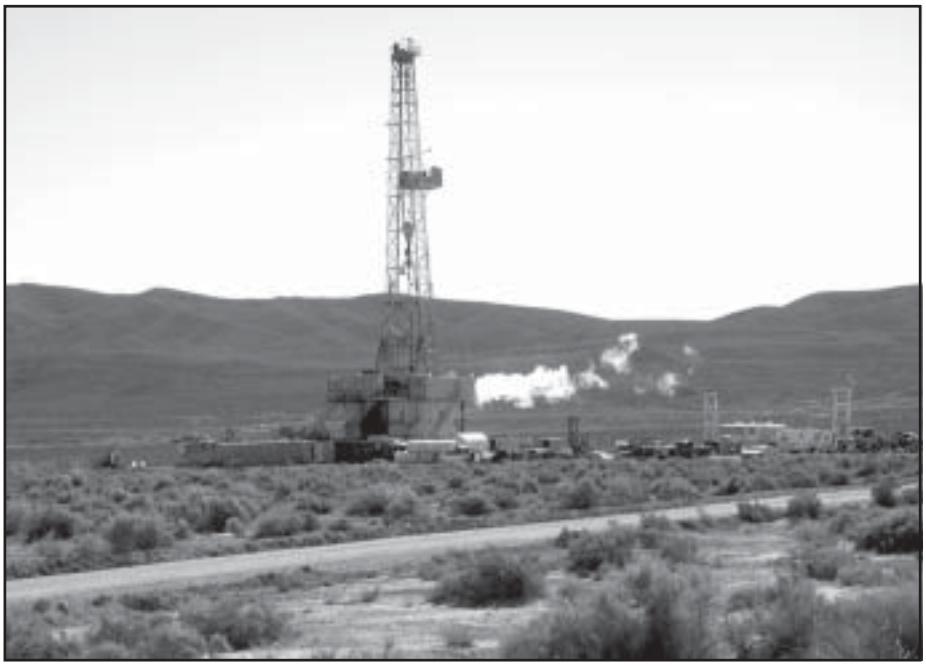
Also located in the **Steamboat Hot Springs** KGRA is the **Yankee Caithness Geothermal Power Plant**. During 2003 the 14.4-megawatt plant had a gross output of 65,810 MWh and a net production of 58,144 MWh. (Nevada Division of Minerals, 2004)

Nevada Geothermal Resources Map

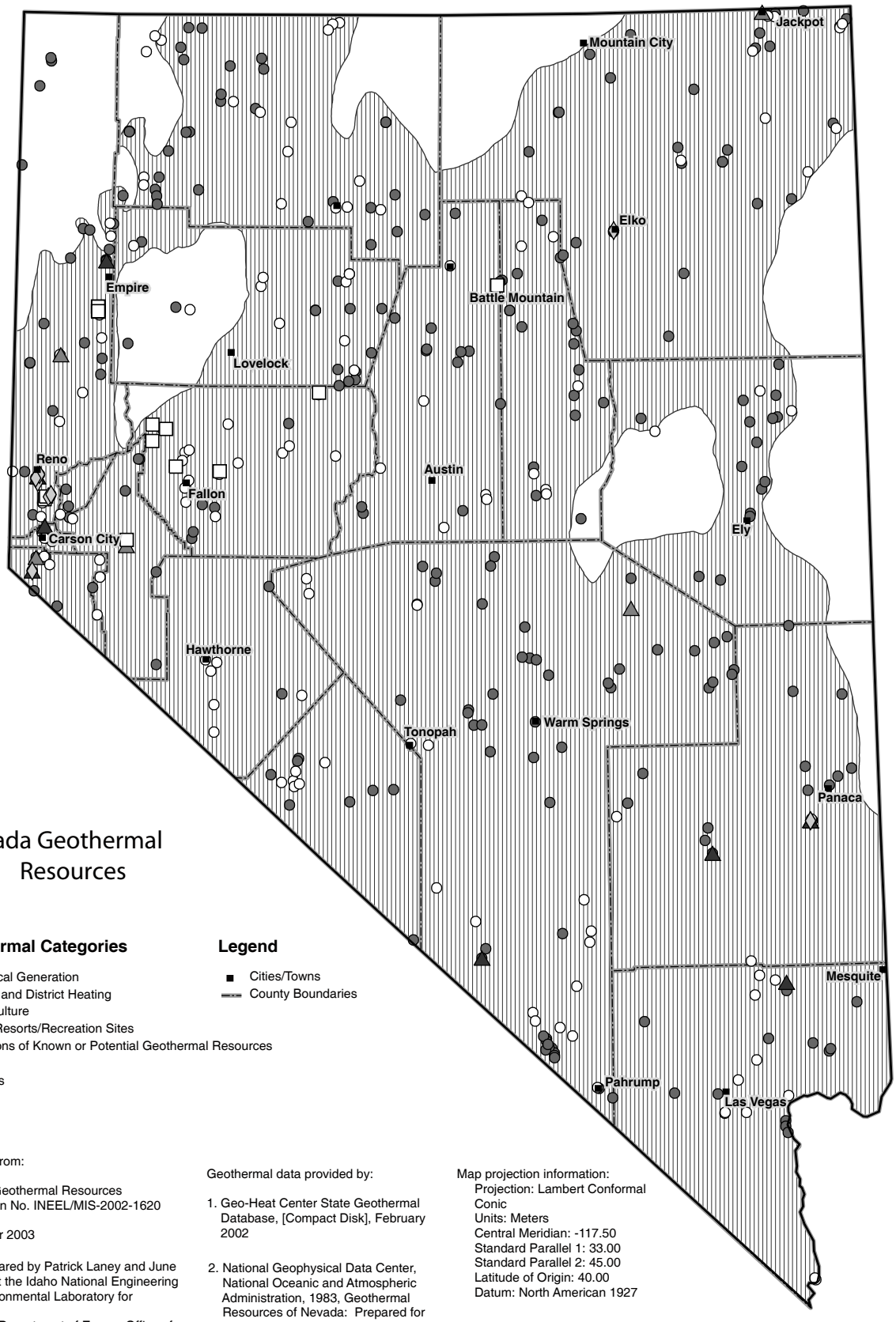
NBMG Map 141, ***Nevada Geothermal Resources***, authored by Lisa Shevenell and Larry J. Garside, shows active direct-use applications and power plants as of May 2003, and all known thermal springs and wells on a topographic base map. This 1:750,000-scale color map may be purchased at the Nevada Bureau of Mines and Geology publications office or on the Web at *www.nbmg.unr.edu/sales.htm*.

For further information on geothermal resources in Nevada check the following Web sites or contact Ron Hess at 775-784-6691 ext. 121 or via Email at *rhess@unr.edu*:

- Geothermal information at the Nevada Bureau of Mines and Geology Web site *www.nbmg.unr.edu/geothermal/*.
- Nevada Commission on Minerals, Nevada Division of Minerals at *http://minerals.state.nv.us/* or *http://minerals.state.nv.us/programs/ogg.htm*.
- Great Basin Center for Geothermal Energy at *www.unr.edu/geothermal/index.html*.
- GEO-HEAT CENTER, at *http://geoheat.oit.edu/*, Oregon Institute of Technology, Klamath Falls, Oregon.
- DOE/INEEL Geothermal Resource Location Maps for 13 Western States at *http://geothermal.id.doe.gov/maps-software.shtml*.
- Geothermal biz.com (*www.geothermal-biz.com/*) is part of the U.S. Department of Energy-led GeoPowering the West (GPW) initiative to dramatically increase the use of geothermal energy in the western United States, Alaska, and Hawaii.
- GeoPowering the West at *www.eere.energy.gov/geopoweringthewest/*.
- Southern Methodist University Geothermal Lab Web page *www.smu.edu/geothermal/*.
- Geothermal Industry Temperature Profiles from the Great Basin, by John H. Sass, Susan S. Priest, Arnold J. Blanton, Penelope C. Sackett, Stephanie L. Welch, and Mark A. Walters; USGS Open-File Report 99-425 online version 1.0 on the Web at *http://wrgis.wr.usgs.gov/open-file/of99-425/webmaps/home.html*.
- Nevada Public Utilities Commission *www.puc.state.nv.us/*.
- Nevada State Office, Bureau of Land Management, Nevada Geothermal Program *www.nv.blm.gov/minerals/geothermal/index.htm*.



C. and L. drill rig at Brady Hot Springs drilling geothermal observation well 88-11 during the summer of 2004. *Photo by Larry Garside.*



Nevada Geothermal Resources

Geothermal Categories

- Electrical Generation
- Space and District Heating
- Aquaculture
- Spas/Resorts/Recreation Sites
- Regions of Known or Potential Geothermal Resources
- Wells
- Springs

Legend

- Cities/Towns
- County Boundaries

Adapted from:

Nevada Geothermal Resources
Publication No. INEEL/MIS-2002-1620
Rev. 1
November 2003

Map prepared by Patrick Laney and June Brizzee at the Idaho National Engineering and Environmental Laboratory for

The U.S. Department of Energy Office of Energy Efficiency and Renewable Energy Geothermal Technologies Program

Geothermal data provided by:

1. Geo-Heat Center State Geothermal Database, [Compact Disk], February 2002

2. National Geophysical Data Center, National Oceanic and Atmospheric Administration, 1983, Geothermal Resources of Nevada: Prepared for the Geothermal and Hydropower Technologies Division United States Department of Energy, Map 1:500,000

Map projection information:
Projection: Lambert Conformal Conic
Units: Meters
Central Meridian: -117.50
Standard Parallel 1: 33.00
Standard Parallel 2: 45.00
Latitude of Origin: 40.00
Datum: North American 1927

NEVADA GEOTHERMAL POWER PLANTS 2003

Plant name (year on line)	Production capacity[1] (MW)	2003 Production (MWh) Gross	Net (sales)	Location	Operator
Beowawe (1985)	16.7 (16.6)	125,742	102,805	S13,T31N,R47E	Beowawe Power, LLC 9790 Gateway Dr., Suite 220 Reno, NV 89521
Bradys Hot Springs (1992)	26.1 (26.1)	223,596	85,010	S12,T22N,R26E	Brady Power Partners 980 Greg Street Sparks, NV 89431
Desert Peak (1985)	9.9 (12.5)	99,606	43,967	S21,T22N,R27E	Western States Geothermal Co. c/o Brady Power Partners 980 Greg Street Sparks, NV 89431
Dixie Valley (1988)	66.0 (62.0)	493,532	441,767	S7,T24N,R37E S33,T25N,R37E	Caithness Dixie Valley, LLC 9790 Gateway Dr. Suite 220 Reno, NV 89521
Empire (1987)	4.6 (4.8)	26,717	17,190	S21,T29N,R23E	Empire Energy, LLC P.O. Box 40 Empire, NV 89405
Soda Lake No. 1 (1987) and Soda Lake No. 2 (1991)	16.6 (26.1)	105,612	73,438	S33,T20N,R28E	Constellation Operating Services 5500 Soda Lake Road Fallon, NV 89406
Steamboat I, I-A (1986) and Steamboat II, III (1992)	53.0 (58.6)	390,951	287,672	S29,T18N,R20E	S.B. Geo, Inc. P.O. Box 18199 1010 Power Plant Dr. Reno, NV 89511
Stillwater (1989)	13.0 (21.0)	96,267	59,717	S1,T19N,R30E S6,T19N,R31E	Stillwater Holdings, LLC 1755 East Plumb Ln. #160 Reno, NV 89509
Wabuska (1984)	1.2 (2.2)	9,195	5,850	S15,16,T15N, R25E	Homestretch Geothermal P.O. Box 1150 Leeds, UT 84746
Yankee Caithness (1988)	14.44 (14.44)	65,810	58,144	S5,6,T17N,R20E	Yankee Caithness J.V.L.P. 9790 Gateway Drive, Suite 220 Reno, NV 89521
TOTAL	221.5 (244.3)	1,637,028	1,175,560		

1. Production capacity from currently developed geothermal resources (equipment capacity in parentheses).
Sources: Plant operators, Nevada Division of Minerals, and NBMG files.

Oil and Gas

by David A. Davis

Production

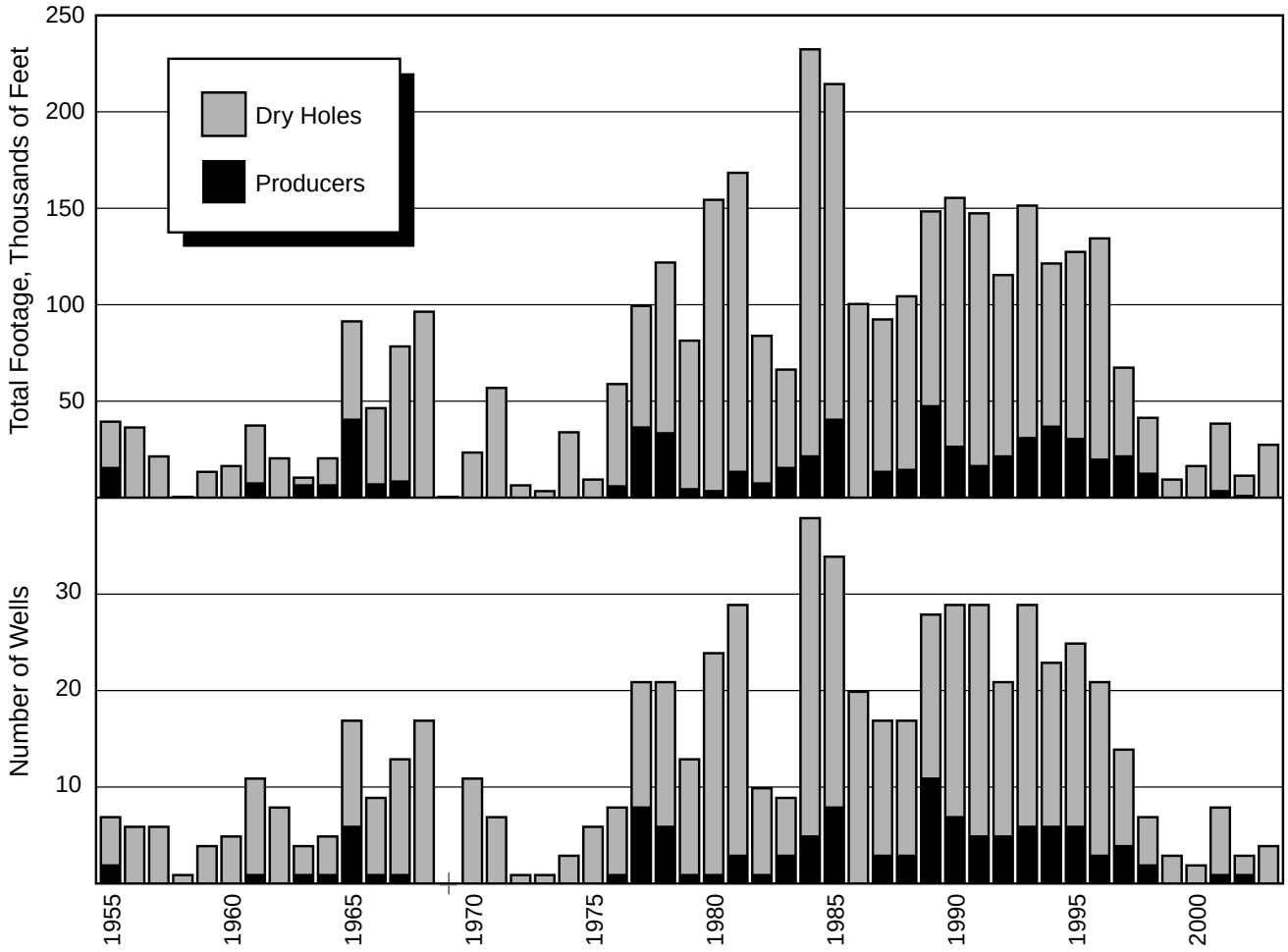
According to the Nevada Division of Minerals, Nevada's net oil production in 2003 was 493,330 barrels (0.022% of total U.S. production) from 70 actively producing wells in 10 fields in Railroad Valley (Nye County, 88.5%) and three fields in Pine Valley (Eureka County, 11.5%), 11% less than in 2002. Two other minor fields were shut in throughout 2003. Nevada ranked 26 out of the 31 oil producing states in the country in 2003 (www.eia.doe.gov). The average net wellhead price for Nevada crude oil increased 37.0% to $24.54 per barrel in 2003, and the sales volume increased 22.1% to about $12,100,000.

Ninety-nine wells in 14 fields were listed as producers in 2003. Of these, six wells were shut in for at least 6 months during 2003, and 29 were shut in for the entire year. At year's end, one well had been shut in for 1 to 2 years, three wells had been shut-in for 2 to 3 years, one well had been shut in for 3 to 4 years, and 24 wells had been shut in for more than 4 years.

Nevada's highest volume producer for the year was Grant Canyon No. 9, which averaged 184 barrels of oil and 526 barrels of water per day during 2003, drops of 8.9% and 4.2% respectively. Grant Canyon No. 9 has held this ranking since 1996. For the second year in a row, Nevada's second highest volume producer was Blackburn No. 19, which averaged 84 barrels of oil and 1,309 barrels of water per day in 2003.

The Bacon Flat Field, which produces from the Devonian Guilmette Formation (carbonate) between about 4,960-5,350 feet, averaged about 35 barrels of oil and about 15 barrels of water per day in 2003 and accounted for 2.5% of Nevada's total oil production. Oil production decreased 6.9%, and water production increased 187%. Only one of its three producers was active, and it was shut in for a month. One well has been shut in since 1993 and the third one since 1988.

The Blackburn Field, which produces from the Oligocene Indian Well Formation (tuff and tuffaceous sandstone), Mississippian Chainman Shale (sandstone),



and Devonian Nevada Formation (carbonate) between about 6,700 and 6,750 feet, averaged about 150 barrels of oil and about 4,947 barrels of water per day in 2003 and accounted for 11.1% of Nevada's total oil production. Oil production decreased 12.5%, and water production decreased 10.4%. Oil production decreased in the five active producers. One well was shut in for 1 month. Of the two inactive producers, one has been shut in since 2001 and the other since 1998.

The Eagle Springs Field, which produces from Oligocene ignimbrites, the Eocene Sheep Pass Formation (lacustrine carbonates), and the Pennsylvanian Ely Limestone between about 5,780 and 7,360 feet, averaged about 159 barrels of oil and about 1,476 barrels of water per day in 2003 and accounted for 11.7% of Nevada's total oil production. Oil production decreased 14.7% and water production decreased 5.7%. Of the 16 active producers, oil production decreased in 13 and increased in three. Two wells each were shut in for 3 months and 7 months and one well was shut in for 5 months. Of the five inactive producers, three have been shut in since 1997, one since 1996, and one since 1986.

The Ghost Ranch Field, which produces from the Devonian Guilmette Formation between about 4,350 and 4,620 feet, averaged 72 barrels of oil and 339 barrels of water per day in 2003 and accounted for 5.3% of Nevada's total oil production. Oil and water production decreased 17.9% and 20.4% respectively. Oil production decreased in all three active producers. The one inactive producer has been shut in since 1997.

The Grant Canyon Field, which produces from the Devonian Guilmette Formation between about 2,160 and 4,300 feet, averaged 217 barrels of oil and 1,166 barrels of water per day in 2003 and accounted for 16.1% of Nevada's total oil production. Oil and water production decreased 7.5% and 2.1% respectively. Oil production decreased in both active producers. Of the two inactive producers, one has been shut in since 1993 and the other since 1992.

The Kate Spring Field, which produces from the Tertiary Horse Camp Formation (breccia) and the Devonian Guilmette Formation between about 4,450 and 4,820 feet, averaged 136 barrels of oil and 1,238 barrels of water per day in 2003 and accounted for 10.1% of Nevada's total oil production. Oil and water production decreased 6.9% and 1.2% respectively. Oil production decreased in the three of the active producers and increased in one. Of the two inactive producers, one has been shut in since 1997 and the other since 1993. A total of 5.4 million cubic feet of gas was produced from the Kate Spring Field in 2003, a decrease of 16.5% from 2002. The gas is used to operate production and related equipment at the lease sites of Makoil, Inc., and Western General, Inc.

OIL WELL DRILLING ACTIVITY IN NEVADA IN 2003

Company	Well	Permit No.	Location	Permit Date	Spud Date	Completion Date	Depth (Ft.)	Status
ELKO COUNTY								
Westwood Petroleum, LLC	Dalton No. 1	847	NW¼, NE¼, S4, T34N, R62E	Oct-02	Dec-02			TA
Neuhaus Properties	Stampede 7-1	855	NE¼, S7, T34N, R67E	Nov-03				Not Drilled
Foreland Corp.	Toano Drive No. 15-19	856	NW¼, SW¼, S19, T39N, R66E	Nov-03	Nov-03			Drilling
EUREKA COUNTY								
Neuhaus/Winn Exploration	Tomera Ranch No. 33-3	844	SW¼, SW¼, S33, T31N, R52E	Jul-02	Aug-02	Aug-02	1,580	P&A
Trail Mountain, Inc.	Lucky Seven No. 1	845	SE¼, SW¼, S13, T27N, R51E	Aug-02	Aug-02	Feb-03	10,340	P&A
Neuhaus Properties	Tomera Ranch 4-1	851	NW¼, NW¼, S4, T30N, R52E	May-03	Aug-03			TA
Noble Energy, Inc.	Diamond Federal 11-22	853	NW¼, NW¼, S22, T24N, R54E	Nov-03	Nov-03			Drilling
LINCOLN COUNTY								
Falcon Energy/Kriac Energy, Inc.	Hamlin Wash No. 18-1R	805	SE¼, SE¼, S18, T8N, R70E	Aug-97		Sep-97		TA
Falcon Energy/Kriac Energy, Inc.	Kriac No. 3	810	SE¼, SE¼, SE¼, S18, T8N, R70E	Dec-97				Suspended
Conley P. Smith	Trough Springs Federal No. 33-16	827	SE¼, SE¼, S33, T7N, R63E	Jan-00		Feb-00		P&A
NYE COUNTY								
Makoil, Inc.	Munson Ranch No. 11-44	672	SE¼, SE¼, S11, T9N, R56E	Apr-93		Jun-94	3,660	TA
Big West Oil and Gas, Inc.	Federal No. 12-14	673	NW¼, SW¼, S14, T7N, R56E	Apr-93		Jun-93	6,106	TA
Ranken Energy Corporation	Needle Springs Federal No. 1-35	835	SE¼, S35, T11N, R52E	May-01				Expired
Isern Oil Company	Gigante No. 1-4	837	C, NW¼, NE¼, S4, T12N, R35E	May-01	Aug-01	Apr-03		TA
Sawyer Oil and Gas Co.	Blue Eagle 4-15R	842	NW¼, NW¼, S15, T8N, R57E	May-02	Sep-02	Mar-03	9,696	P&A
Trail Mountain, Inc.	White Dome No. 1	843	SW¼, SW¼, S12, T10N, R59E	May-02	Jun-02	Dec-02	8,862	P&A
AmeryxxEnergy, Inc.	Graham No. 11-14	846	SW¼, NW¼, NW¼, S14, T5N, R61E	Oct-02	Oct-02			TA
Alpine, Inc.	Sand Springs 1-15	848	SE¼, SE¼, S15, T11N, R54E	Dec-02	Jan-03	Feb-03	4,166	P&A
Winn Exploration	Currant No. 24-1	849	NW¼, NW¼, S24, T10N, R54E	Feb-03	Apr-03	Apr-03	3,435	P&A
Alpine Inc.	Needle Springs 1-14	852	NW¼, NW¼, S14, T10N, R52E	Oct-03	Oct-03			Drilling
PERSHING COUNTY								
Evans-Barton Ltd.	Kyle Spring No. 11-43	821	NE¼, SE¼, S11, T29N, R36E	Jul-98				Testing
Evans-Barton Ltd.	Kyle Spring No. 11-42A	838	NE¼, SE¼, S11, T29N, R36E	Jul-01				Drilled
WHITE PINE COUNTY								
Paleozoic Prospects, Inc.	PPI Bugs No. 1	809	NE¼, NW¼, S33, T22N, R59E	Nov-97				Suspended
Neuhaus Properties	Nevada No. 21-1	850	NE¼, SE¼, S21, T19N, R64E	Mar-03				Not Drilled
Noble Energy, Inc.	Rattlesnake Federal 12-26	854	SW¼, NW¼, S26, T22N, R55E	Nov-03	Dec-03			Drilling

P&A: Plugged and abandoned, TA: Temporarily abandoned

FEDERAL OIL AND GAS LEASES IN EFFECT IN FISCAL YEARS 2002 AND 2003

	NUMBER OF LEASES						ACREAGE					
	Competitive		Noncompetitive		Simultaneous		Competitive		Noncompetitive		Simultaneous[2]	
County	FY02	FY03	FY02	FY03	FY02	FY03	FY02	FY03	FY02	FY03	FY02	FY03
Carson City	0	0	0	0	0	0	0	0	0	0	0	0
Churchill	0	0	0	0	2	2	0	0	0	0	5,278	5,278
Clark	0	0	0	0	0	0	0	0	0	0	0	0
Douglas	0	0	0	0	0	0	0	0	0	0	0	0
Elko	52	67	65	71	3	3	51,467	61,787	93,414	110,881	7,545	7,545
Esmeralda	0	0	1	1	0	0	0	0	2,905	2,905	0	0
Eureka	80	86	36	38	3	3	106,150	124,325	49,828	57,228	2,449	2,449
Humboldt	0	0	0	0	0	0	0	0	0	0	0	0
Lander	0	0	0	0	0	0	0	0	0	0	0	0
Lincoln	17	3	46	20	1	1	26,619	11,558	71,994	34,292	1,921	1,921
Lyon	0	0	0	0	0	0	0	0	0	0	0	0
Mineral	0	0	4	4	0	0	0	0	5,997	5,997	0	0
Nye	327	314	132	119	19	19	262,796	254,858	371,492	340,399	7,998	7,998
Pershing	3	0	1	0	0	0	3,840	0	1,256	1,256	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	45	42	134	142	0	0	63,978	61,455	445,572	461,288	0	0
TOTAL	524	512	419	395	28	28	514,850	513,983	1,042,458	1,014,246	25,191	25,191

[1]Data from the U.S. Bureau of Land Management. Some FY00 data have been corrected from earlier reports. Fiscal years (FY) run from Oct. 1 to Sept. 30.
[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)	1954–1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	Total
Eagle Springs (1954) (Railroad Valley)	4,146,900	162,296	171,638	137,278	111,562	82,067	59,394	67,024	67,908	57,946	5,064,013
Trap Spring (1976) (Railroad Valley)	10,892,668	362,985	306,858	288,686	257,921	263,566	246,725	218,198	206,424	193,191	13,237,222
Currant (1979) (Railroad Valley)	641	278	0	202	230	28	55	33	21	23	1,511
Bacon Flat (1981) (Railroad Valley)	788,136	43,057	28,891	22,465	18,757	16,849	14,766	13,898	12,633	11,763	971,215
Blackburn (1982) (Pine Valley)	3,755,196	435,975	239,934	151,151	112,008	89,400	78,136	66,899	62,412	54,623	5,045,734
Grant Canyon (1983) (Railroad Valley)	19,612,940	202,129	168,163	143,707	126,128	112,715	102,113	92,899	85,722	79,293	20,725,809
Kate Spring (1986) (Railroad Valley)	1,505,831	104,574	87,789	76,280	69,768	65,315	57,644	55,198	53,408	49,698	2,125,505
Tomera Ranch (1987) (Pine Valley)	18,555	1,405	387	659	574	398	488	0	11,901	1,981	36,348
North Willow Creek (1988) (Pine Valley)	31,183	6,419	3,619	1,478	1,502	123	146	144	573	349	45,536
Three Bar (1990) (Pine Valley)	23,837	0	0	0	0	0	0	0	0	0	23,837
Duckwater Creek (1990) (Railroad Valley)	13,574	655	433	168	491	93	116	968	869	436	17,803
Sans Spring (1983) (Railroad Valley)	113,757	22,174	17,228	45,001	21,759	11,127	6,990	6,356	5,532	4,775	254,699
Ghost Ranch (1996) (Railroad Valley)			34,166	113,016	65,370	49,348	41,454	36,173	31,814	26,129	397,470
Deadman Creek (1996) (Elko County)				109	258	0	0	0	0	0	367
Sand Dune (1998) (Railroad Valley)					12,465	15,122	12,624	13,461	14,211	13,123	81,006
Total	40,903,218	1,341,947	1,059,106	980,200	798,793	706,151	620,651	571,251	553,428	493,330	48,028,075
Change from previous year		-21%	-21%	-7%	-19%	-12%	-12%	-8%	-3%	-11%	

The Sand Dune Field's only producer, which produces from Permian and Pennsylvanian limestones between about 5,970 and 6,200 feet, averaged 35 barrels of oil and 89 barrels of water per day in 2003 and accounted for 2.7% of Nevada's total oil production. Oil production decreased 7.7%, and water production increased 1.6%.

The Sans Spring Field's only active producer, which produces from the Oligocene Garret Ranch Group (volcaniclastic rocks and ignimbrites) between about 5,640 and 5,770 feet, averaged 13 barrels of oil and 797 barrels of water per day in 2003 and accounted for 1.0% of Nevada's total oil production. Oil and water production decreased 9.5% and 11.0% respectively. Of the two inactive producers, one has been shut in since 1998 and the other since 1993 and since temporarily abandoned.

The Tomera Ranch Field, which produces from the Oligocene Indian Well Formation (chert and tuffaceous sandstone) between about 1,150 and 1,950 feet, averaged 5 barrels of oil and 464 barrels of water per day and accounted for 0.4% of Nevada's total oil production. Oil production decreased 83.4%, and water production increased 79.1%. The only other producer has been shut in since 2000.

The Trap Spring Field, which produces from the Oligocene tuff of Pritchards Station between about 3,210 and 4,950 feet, averaged 529 barrels of oil and 4,938 barrels of water per day in 2003 and accounted for 39.2% of Nevada's total oil production. Oil and water production decreased 6.4% and 2.3% respectively. Oil production decreased in 22 active producers and increased in 11. Two wells were shut in for 10 months. Of the nine inactive producers, one has been shut in since 2001, one since 1999, two since 1998, two since 1996, one since 1992, one since 1991, and one since 1986.

Three minor fields accounted for about 0.2% of Nevada's total oil production. Oil production from the Currant Field's only producer, which produces from the Eocene Sheep Pass Formation from about 6,850 to 7,080 feet, increased 9.5%. Currant produces no water. Oil and water production from the Duckwater Creek Field's only producer, which produces from the Oligocene Garrett Ranch Group between about 5,680 and 5,830 feet, decreased 49.8% and 43.7% respectively. Oil production from the North Willow Creek Field's only active producer, which produces from the Mississippian Chainman Shale between about 6,290 and 6,470 feet, decreased 39.1%, while water production increased from 0 to 52 barrels for the year.

Two other minor fields recorded no production for 2003. The Three Bar Field's two producers, which produced from the Miocene Humboldt Formation (sandstone and volcanic rock), the Oligocene Indian Well Formation, and the Cretaceous Newark Formation (sandstone and carbonate) between about 5,720 and 7,070 feet, have been shut in since 1994 and 1992, respectively. Deadman Creek's only producer, which produced briefly from the Miocene Humboldt Formation between 8,165 and 8,850 feet, has been shut in since 1998.

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 was transported in batches by trucks to the Energy Income Fund, Inc. (EIF) 8,000-barrel-per-day capacity refinery near Currant in Railroad Valley. The EIF refinery and asphalt storage facility at Tonopah was not in operation in 2003.

New Producers

No wells were completed as producers in 2003.

Exploration

Eight wells were permitted for oil and gas in 2003, one more than in 2002. Seven wells were spudded in 2003, up from six spudded in 2002. Drilling was completed on two of these wells and on two spudded in 2002, totaling 27,637 feet, up 35% from 20,483 feet in 2002. Of the five

PRODUCTION OF WATER FROM NEVADA'S OIL FIELDS (barrels)

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

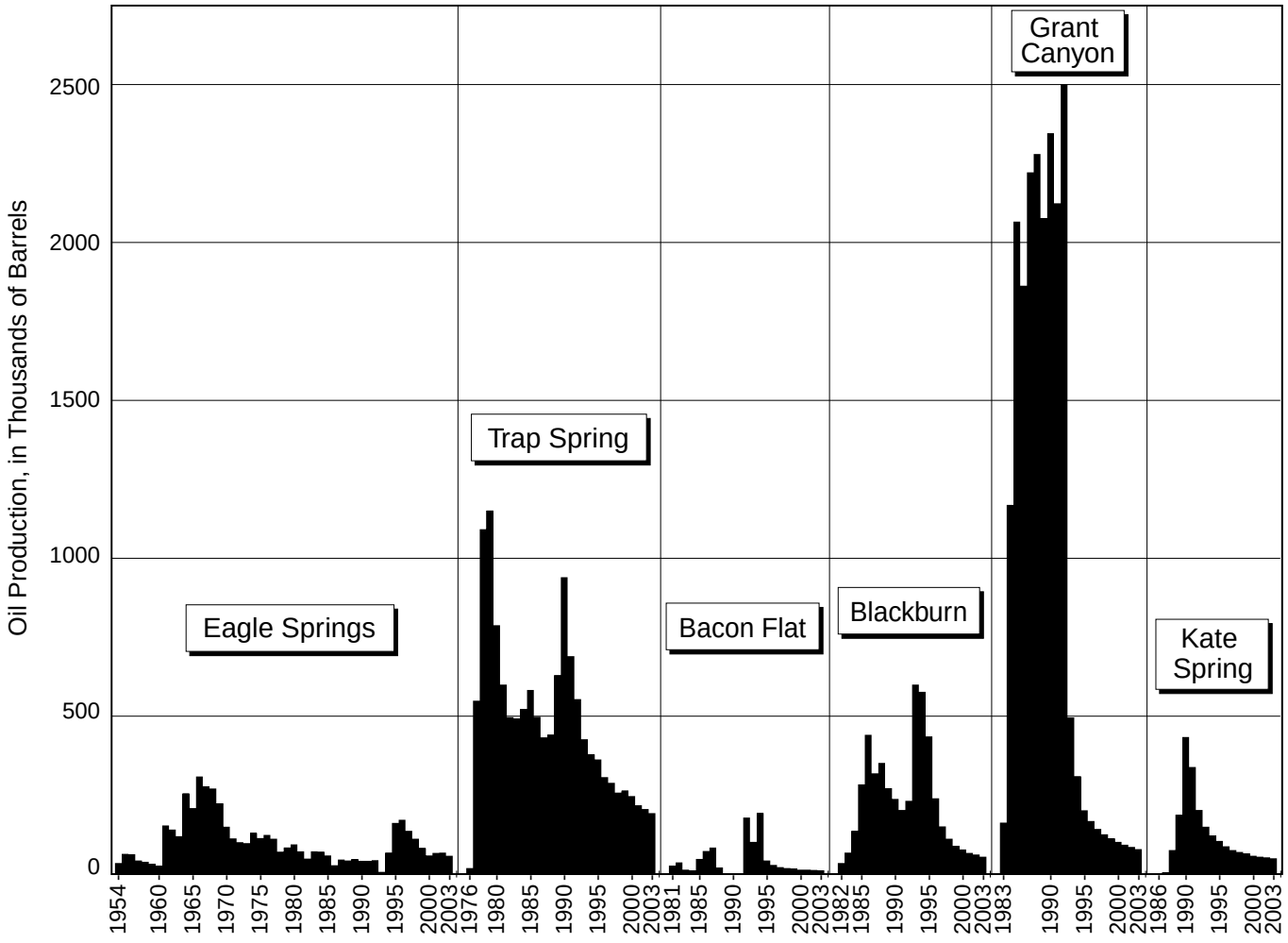
Field (year discovered)	1994–96	1997	1998	1999	2000	2001	2002	2003	Total
Eagle Springs (1954)	925,281	364,900	410,290	325,574	275,521	421,755	572,541	538,814	3,834,676
Trap Spring (1976)	9,016,564	3,046,366	2,444,444	2,802,716	2,850,603	2,648,176	1,844,621	1,802,383	26,455,873
Currant (1979)	0	0	0	0	0	0	0	0	0
Bacon Flat (1981)	234,616	100,708	14,929	1,756	358,879	613	27	5,080	716,608
Blackburn (1982)	5,866,001	1,777,941	1,937,981	1,938,408	1,884,096	1,792,102	2,008,218	1,805,820	19,010,567
Grant Canyon (1983)	698,190	335,603	377,934	397,888	417,564	431,433	435,004	425,905	3,519,521
Kate Spring (1986)	1,561,312	529,503	476,346	483,483	521,464	515,205	457,264	451,878	4,996,455
Tomera Ranch (1987)	79,334	31,948	35,441	31,121	33,245	0	94,643	169,487	475,219
N. Willow Creek (1988)	2,521	135	0	4	0	50	0	52	2,762
Three Bar (1990)	5,958	0	0	0	0	0	0	0	5,358
Duckwater Creek (1990)	42,715	1,853	4,620	840	1,196	4,778	4,442	2,503	62,947
Sans Spring (1993)	789,777	233,046	363,845	328,544	240,773	324,585	326,943	290,961	2,898,474
Ghost Ranch (1996)	2,775	99,945	171,921	202,678	208,488	188,592	155,714	123,897	1,154,010
Deadman Creek (1996)		0	0	0	0	0	0	0	0
Sand Dune (1998)			23,335	53,115	33,308	34,369	32,123	32,624	208,874
Total	19,225,044	6,521,948	6,261,086	6,566,127	6,825,137	6,361,658	5,931,540	5,649,404	63,341,944
Change from previous year		2.50%	4.00%	4.90%	3.90%	-6.80%	-6.80%	-4.80%	

wells spudded in 2003 but not completed, four were still being drilled and one was temporarily abandoned at year's end. One well drilled in 2000 was finally plugged and abandoned, but no drilling information has been forthcoming. Nine wells drilled between 1993 and 2002 continued to be listed as either temporarily abandoned, testing, suspended, or drilled with no other information. One well permit issued in 2001 expired in 2003. One drill rig operated during the periods January/February, March/April, and September/October. No rigs operated during the periods May/June and July/August. Three rigs operated during the period November/December.

On March 11, 2003, the Nevada State Office of the Bureau of Land Management held an oil and gas lease sale on 95 parcels covering 145,873 acres in Elko, Eureka, Lander, Nye, and White Pine Counties. The bonus bids totaled $46,388 on 20 parcels covering 23,191 acres. All 20 parcels went for the minimum bid of $2.00 per acre (PI/Dwight Plus Drilling Wire, Rocky Mountain Region, Four Corners Edition, Section I, February 12, 2003; PI/Dwight Plus Drilling Wire, Rocky Mountain Region, Four Corners Edition, Section I, March 26, 2003).

On June 10, 2003, the Nevada State Office of the Bureau of Land Management held an oil and gas lease sale on 63 parcels covering 100,504 acres in Elko, Eureka, Nye, and White Pine Counties. The high bids totaled $39,562 on 14 parcels covering 14,094 acres, which averaged $2.81 per acre. The highest bid was $6.75 per acre made by Makoil, Inc., for Parcel 12 covering 1,720 acres including all or part of sections 15, 16, 21, 22, 27, T8N, R56E in Nye County about 3 to 6 miles southwest of the Trap Spring field (PI/Dwight Plus Drilling Wire, Rocky Mountain Region, Four Corners, Section I, April 30, 2003; PI/Dwight Plus Drilling Wire, Rocky Mountain Region, Newsletter Edition, Section I, June 13, 2003).

On September 9, 2003, the Nevada State Office of the Bureau of Land Management held an oil and gas lease sale on 125 parcels covering 195,679 acres. The high bids totaled $56,792 on 22 parcels covering 20,180 acres, which averaged $2.81 per acre. Only two tracts generated bids of more than the $2.00 per acre minimum. The highest bid was $26 per acre made by William D. Harris of Amarillo, TX, for Parcel 105 covering the about 73 acres consisting of lots 2 and 3, section 30, T9N, R57E in Nye County about 2 miles southeast of the Trap Spring field (PI/Dwight Plus Drilling Wire, Rocky Mountain Region, Four Corners Edition, Section I, August 6, 2003; PI/Dwight Plus Drilling Wire, Rocky Mountain Region, Four Corners, Section I, September 17, 2003).



NEVADA OIL REFINERIES

Company	Refinery	Address and Phone Number
Energy Income Fund, Inc.	Currant	66 Miles South of Ely Ely, NV 89301 Phone: (775) 863-0229
Energy Income Fund, Inc.	Tonopah	105 Refinery Road Tonopah, NV 89049 Phone: (775) 482-3555

NEVADA OIL PRODUCERS

Company	Field	Contact	Address and Phone and FAX Numbers
Deerfield Production Co.	Deadman Creek Eagle Springs Ghost Ranch North Willow Creek Sand Dune	Robert Imel	5949 Sherry Lane, Suite 260 Dallas, TX 75225 Phone: (214) 692-7777 FAX: (214) 692-7820
Double D Nevada, LLC	Bacon Flat Sans Spring	Steve Durrett	1500 Poly Drive, Suite 100 Billings, MT 5902 Phone: 406-294-5990 FAX: 406-294-5992
Evans-Barton, Ltd.	Trap Spring	David M. Evans	P.O. Box 3153 Reno, NV 89505 Phone: (775) 827-1613
Frontier Exploration Co.	Trap Spring	Andy Pierce	3006 Highland Drive, Suite 206 Salt Lake City, UT 84106 Phone: (801) 486-5555 FAX: (801) 486-5575
Makoil, Inc.	Currant Duckwater Creek Grant Canyon Kate Spring Trap Spring	Gregg Kozlowski	500 N. Rainbow Blvd., Suite 300 Las Vegas, NV 89107 Phone: (714) 939-7560 FAX: (714) 939-7552
Petroleum Corp. of Nevada	Blackburn	Ken Chattin	P.O. Box 1447 Elko, NV 89801 Phone: (775) 753-6810
Trail Mountain, Inc.	Three Bar		105 South 4th St. Artesia, NM 88210 Phone: (505) 748-1471
V.F. Neuhaus Properties/ Winn Exploration	Tomera Ranch	Mark Richards	P.O. Box 1270 McAllen, TX 78505 Phone: (956) 686-2491
Western General	Kate Spring	Rick Taylor	801 Noahs Star Street Las Vegas, NV 89145 Phone: (702) 233-1490

On December 9, 2003, the Nevada State Office of the Bureau of Land Management held an oil and gas lease sale on 159 parcels covering 269,304 acres in Elko, Eureka, Nye, and White Pine Counties. The high bids totaled $146,852 on 21 parcels covering 27,027 acres, which averaged $5.43 per acre. The highest bid was $97.50 per acre made by Stephen G. Signorotti of Sacramento, CA, for Parcel 93 covering 560 acres covering parts of sections 28 and 29, T7N, R57E in Nye County about 1 mile south of the Grant Canyon field (PI/Dwight Plus Drilling Wire, Rocky Mountain Region, Newsletter Edition, Section I, October 31, 2003; PI/Dwight Plus Drilling Wire, Rocky Mountain Region, Wyoming Edition, Section I, December 16, 2003).

Transfers

In March 2003, Big West Oil and Gas, Inc. transferred its holdings to Nance Petroleum, which in turn transferred them to Double D Nevada, LLC, in July 2003. The wells owned by Big West include: Federal No. 5-14, permit 635, producer; Bacon Flat Federal No. 23-17, Permit 657, producer; Federal No. 12-4, permit 673, temporarily abandoned; Bacon Flat Federal No. 23-17A, Permit 710, producer; and San Springs 5-14A, permit 792, producer.

Other Developments

The Kern River Gas Transmission Co. (KRGTC), a subsidiary of MidAmerican Energy Holdings Co., headquartered in Des Moines, IA, completed its Kern River Expansion Project, which enlarged the capacity of the existing KRGTC pipeline from Opal, Wyoming, to Dagget, California. The new pipeline became operational on May 1, 2003, and was running at 95% capacity within a few weeks. The Kern River 2003 Expansion Project involved building 634.5 miles of 36-inch-diameter pipeline and supporting facilities to bring more natural gas from Wyoming to consumers in Utah, Nevada, and California. The pipeline consists of 12 loops or segments running parallel to the existing KRGTC pipeline. In Nevada, the pipeline crosses northeast to southwest through the far southeast corner of Lincoln County and across Clark County through Las Vegas. In Clark County, a new compressor was built for the Dry Lake segment, and an existing compressor was upgraded at Goodsprings. This new expansion more than doubled the capacity of the older pipeline from 800 million to more than 1.7 billion cubic feet per day of natural gas, which could potentially power 10 million homes. (Final Environmental Impact Statement/Environmental Impact Report, Kern River 2003 Expansion Project, June 2002; *www.midamerican.com*; *www.freerepublic.com/focus/fr/913447/posts*).

On December 1, 2002, Tuscarora Gas Operating Company, a wholly owned subsidiary of Sierra Pacific Resources, completed an expansion of its 240-mile pipeline from Malin, Oregon, to northern Nevada. The expansion included adding two compressor stations to the Tuscarora mainline and building an 11-mile pipeline extension from Tuscarora's previous terminus near Reno, Nevada to Wadsworth, Nevada. This increased the capacity from 127 to about 182 million cubic feet per day. About 70% of the contracts involving this new capacity went into effect immediately, and the remaining 30% went into effect by the end of 2003 (*http://biz.yahoo.com/e/040507/tclp10-q.html*).

An interesting article entitled "Remote Sensing and Soil Gas Geochemical Study, Railroad Valley, Nye County," Nevada, by V.T. Jones of Exploration Technologies, Inc., Houston, TX; S. G. Burtell of Fugro-McClelland Marine Geosciences, Inc.; M. D. Matthews of Texaco Frontier Exploration Department, Bellaire, TX; R. A. Hodgson of Geologic Consulting Services, Jamestown, PA; K. Okada, T. Ohhashi, M. Kuniyasu, and T. Ando of Japex Geosciences Institute Inc., Tokyo, Japan; and J. Komai of Earth Resources Satellite Data Analysis Center, Tokyo, Japan, is presently on the website of Exploration Technologies, Inc. at *www.eti-geochemistry.com/rrv*. The article describes the results of a two-year remote sensing and soil gas geochemical study performed in 1984-85 and designed to define the relationships between light hydrocarbon seepage anomalies, known oil reservoirs, and geologic features as identified from satellite imagery and aerial photographs.

U.S. Fossil Fuel Production and Consumption

According to the Energy Information Agency (EIA) of the U.S. Department of Energy (*www.eia.doe.gov*), crude oil imports accounted for 62.7% of U.S. consumption in 2003, a new all-time peak. U.S. crude oil consumption increased 1.6% in 2003 after increasing 0.6% in 2002, and production averaged 5.737 million barrels per day, down about 0.2%. However, the annual production from 2000 through 2003 has been the lowest since 1950 when production was 5.407 million barrels per day. Oil provided about 39.8% of the nation's total energy supply in 2003, up slightly from 39.1% in 2002. This is the highest percentage since 1989 when it was 40.3%.

The use of oil for electrical production increased 25.7% in 2003 after decreasing 23.9% in 2002. It accounted for 3.1% of electrical production and 3.5% of oil consumption in 2003, up from 2.5% and 2.9% respectively in 2002. Oil-fired generators accounted for only about 0.08% of the electricity produced in Nevada in 2003, down slightly from 0.1% in 2002. Gasoline production increased 0.3% and accounted for 44.6% of all oil products consumption in 2003, down slightly from 44.7% in 2002. This percentage has hovered near 43% since 1982. The price of oil increased 22.4% from an average of $22.51 per barrel in 2002 to $27.56 per barrel in 2003 for domestic oil (*www.eia.doe.gov*).

Natural gas consumption decreased 4.6% to 21,941 billion cubic feet (bcf) in 2003 from 23,018 bcf in 2002. Consumption peaked at 23,333 bcf in 2000. Production increased 1.1% to 24,977 bcf in 2003 from 23,977 bcf in 2002. Production peaked at 24,501 bcf in 2001. Natural gas provided 22.9% of the nation's total energy supply in 2003, down from 24.1% in 2002, and a peak of 25.0% in 1995. The use of natural gas for electrical production decreased 13.1% in 2003 after increasing since 1996 and peaking in 2002. It accounted for 16.4% of electrical production and 22.5% of natural gas consumption in 2003, down from 17.9% and 24.6% respectively in 2002. Industrial consumption decreased 6.4%, while residential and commercial consumption increased 4.4% and 1.2% respectively in 2003. The average well-head price increased 68.9% from $2.95 per million feet (mcf) in 2002 to $4.98 per mcf in 2003. Throughout 2003, the monthly average price of natural gas has ranged between $4.34 and $6.69 per mcf and has been consistently above $3 per mcf since October 2002. Though Nevada produces no commercial quantities of natural gas, gas-fired generators provided 24.4% of the electricity produced in Nevada in 2003, down from 25.2% in 2002. Total electric utility net generation decreased 5.4% from 25,009 million kilowatt-hours (Mkwh) in 2002 to 23,670 Mkwh in 2003 (*www.eia.doe.gov*).

Coal consumption increased 2.6% in 2003 to a record 1,094,355,000 short tons after increasing 0.6% in 2002. Consumption has remained over 1 billion tons since 1996. Coal production decreased 2.3% to 1,069,496,000 the second annual decline since peaking at 1,127,689,000 tons in 2001. Production has remained over 1 billion tons since 1994. Coal provided 23.2% of the nation's total energy supply in 2003, up from 22.6% in 2002. This percentage has hovered between 22% and 23% since 1983. Production of electricity accounted for 93.9% of coal consumption in 2003, up from 89.3% in 2002. The use of coal for electrical production increased 2.7% in 2003 and reached over 1 billion tons for the first time. It also accounted for 51.2% of electrical production in 2003, up from a 50.1% share in 2002. The average price of coal delivered to electrical utilities increased 2.6% to $25.39 per short ton in 2003 from $24.74 in 2002. Though Nevada (which has a few small low-grade deposits) produces no coal, coal-fired generators provided 68.1% of the electricity produced in Nevada in 2003, up from 65.6% in 2002 (*www.eia.doe.gov*).

Directory of Mining and Milling Operations

by David A. Davis

Compiled from information supplied by the Nevada Division of Minerals and Mine Safety and Training Section.
Sand and gravel operations with less than 100,000 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, UG = underground mine.

Mine/plant name	Operator	Location	Commodity	Type	Process/ activity	Employees	Address
CARSON CITY							
Goni Pit	Cinderlite Trucking Co.	S28,T16N,R20E	decomposed granite	OP,ML	mining screening	3	1665 South Sutro Terrace Carson City, NV 89706 775-882-4483 Fax: 882-1671
CHURCHILL COUNTY							
Celite Mine	World Minerals, Inc.	S8,17,T19N,R26E	diatomite	OP,ML	mining classification drying milling	17	100 Front St. Fernley, NV 89408 775-575-2536 Fax: 575-4857 www.worldminerals.com
Desert Mountain Aggregate Pit	A and K Earthmovers	S9,16,17;T16N,R28E	aggregate	OP,ML	mining crushing screening	13	P.O. Box 1059, 1200 Auction Rd. Fallon, NV 89407 775-423-6085 Fax: 775-423-8410 www.akearthmovers.com
Huck Salt	Huck Salt and Sons, Inc.	S12,T16N,R31E	salt	OS	mining solar evaporation	4	2900 Phritzie Lane Fallon, NV 89406 775-423-2055 Fax: 423-0467
Moltan Mine and Plant	Moltan Co.	S28,32, T23N,R27E	diatomite clay	OP,ML	mining crushing drying screening	50	P.O. Box 860 I-80 Frontage Rd. Fernley, NV 89408-0860 775-423-6668 Fax: 423-6411
Popcorn Mine	Eagle-Picher Filtration and Minerals, Inc.	S24,T16N,R28E; S19,T16N,R29E	perlite	OP	mining	1	640 Clark Station Rd. Sparks, NV 89434 775-824-7700 Fax: 824-7715 www.epcorp.com
CLARK COUNTY							
American Sand and Gravel Pit No. 1 (Salt Lake Highway Pit)	American Sand and Gravel, LLC	S24,T19S,R62E	sand gravel	OP,ML	mining crushing	11	5260 Beesley Dr. Las Vegas, NV 89115 702-452-1900 Fax: 651-0375
American Sand and Gravel Pit No. 2 (Lone Mountain)	American Sand and Gravel, LLC	S36,T19S,R59E	sand gravel	OP,ML	mining crushing	10	5260 Beesley Dr. Las Vegas, NV 89115 702-452-1900 Fax: 651-0375
Apex Landfill Pit	Las Vegas Paving Corp.	S19,T18S,R64E	sand gravel	OP,ML	mining crushing screening	22	4420 S. Decatur Boulevard Las Vegas, NV 89103 702-251-5800
Apex Quarry and Plant	Chemical Lime Co.	S14,22,23,26,27,34,35 T18S,R63E	limestone	OP,ML	mining calcining crushing screening	110	P.O. Box 3609 North Las Vegas, NV 89036 702-643-7702 Fax: 643-9517
Apex Quarry	Granite Construction Co.	S14,22,23,26,27,34,35 T18S,R63E	aggregate sand	OP,ML	mining crushing screening washing	18	P.O. Box 2087 1900 Glendale Ave. Sparks, NV 89432 775-355-3434 Fax: 329-2803 www.graniteconstruction.com
Blue Diamond Mine	BPB Gypsum, Inc.	S24-26, T21S, R58E; S20, 29-31, T21S, R59E; S5-8, T22S, R59E	gypsum	OP,ML	mining calcining grinding	106	HCR 89033 Box 2900 Las Vegas, NV 89124 Phone: 702-875-4111 FAX: 702-875-4213 www.bpb-na.com
Blue Diamond (Jones) Pit	Las Vegas Paving Corp.	S26,T22S,R60E	sand gravel	OP,ML	mining crushing screening	17	4420 South Decatur Blvd. Las Vegas, NV 89103 702-251-5800
Bootleg Pit	Boulder Sand and Gravel, Inc.	S5,8,T23S,R64E	sand gravel landscape rock	OP,ML	mining crushing screening	10	624 Yucca Boulder City, NV 89005 702-294-1156 Fax: 294-0676
Buffalo Road Pit and Mill	Rinker Materials Corp.	S21,T21S,R60E	sand gravel	OS,ML	mining crushing screening	25	7150 Pollock Dr. Las Vegas, NV 89119 877-260-2772 Fax: 702-260-9903 www.csra.com/nevada

continued

Mine/plant name	Operator	Location	Commodity	Type	Process/ activity	Employees	Address
CLARK COUNTY (continued)							
Cactus Pit	CTC Crushing, LLC	S34,T22S,R61E	sand gravel	OP,ML	mining crushing screening	30	250 Pilot Rd., Suite No. 160 Las Vegas, NV 89120 702-407-0487 Fax: 407-0994
El Dorado Canyon (Railroad Pass) Quarry	Rinker Materials Corp.	S11,T23S,R63E	sand gravel	OP,ML	mining crushing screening	31	7150 Pollock Dr. Las Vegas, NV 89119 877-260-2772 Fax: 702-260-9903 www.csra.com/nevada
Henderson Plant	Chemical Lime Co.	S12,T22S,R62E	lime	ML	hydration	28	P.O. Box 127 BMI Complex Henderson, NV 89015 702-565-8991 Fax: 565-5902
Infinition	Infinition, LLC	S19,T13S,R66E	sand gravel	OP	mining	18	7885 Westwind Rd. Las Vegas, NV 89139 702-617-1893 Fax: 644-6541
Jetco Enterprises	Jetco Enterprises, Inc.	S30-31S,R65E	decorative rock	OP	mining	3	2076 Mohigan Way Las Vegas, NV 89109 702-734-2129 Fax: 369-9294
Lone Mountain	Diamond Const.	S36,T19S,R59E	sand gravel	OP,ML	mining gravity	22	7885 Westwind Road Las Vegas, NV 89139 702-644-1016 Fax: 644-6541
Lone Mountain	Hollywood Gravel, Inc.	S34,T19S,R59E,	sand gravel	OP,ML	mining crushing screening	15[1]	908 South Valley View Blvd. Las Vegas, NV 89107 702-870-7094 Fax: 870-8114
Lone Mountain	Las Vegas Paving Corp.	S35,T19S,R59E	sand gravel	OP,ML	mining crushing screening	10	4420 South Decatur Blvd. Las Vegas, NV 89103 702-251-5800
Lone Mountain	Nevada Ready Mix Corp.	S36,T19S,R59E	sand gravel	OP,ML	mining crushing screening	90	601 West Bonanza Las Vegas, NV 89106 702-457-1115
Lone Mountain Stocks Pit	Southern Nevada Paving	S34,35,T19S,R59E; S3,4,T20S,R59E	sand gravel	OP,ML	mining crushing screening	9	3555 Polaris Avenue Las Vegas, NV 89102 702-876-5226
Lone Mountain Community Pit	Various (BLM manages pit)	S36,T19S,R59E; S1,T20S,R59E	sand gravel	OP,ML	mining crushing screening		Bureau of Land Management 4765 West Vegas Dr. Las Vegas, NV 95901 702-647-5000 Fax: 647-5023 www.blm.gov
Moapa Pit	Ready Mix, Inc.	S22,27;T14S,R66E	aggregate	OP,ML	mining milling	15	3430 East Flamingo Road, Suite 100 Las Vegas, NV 89021 702-433-2090 Fax: 433-0189
Money Pit	Southern Nevada Liteweight, Inc.	S16,T25S,R61E	aggregate	OP,ML	mining crushing screening	14	1101 E. Alexander Road Las Vegas, NV 89030 702-399-8621 Fax: 633-5787
PABCO Gypsum-Apex Pit	Pacific Coast Building Products, Inc.	S7,18,T20S,R64E	gypsum	OP,ML	mining crushing washing	120	1973 N. Nellis Boulevard No. 328 Las Vegas, NV 89115 702-643-1016 Fax: 643-6249 www.paccoast.com
Pioneer Gypsum Mine	D.L. Denman Construction Co.	S30,T19S,R64E	gypsum	OP	mining	7	4880 Donovan Way North Las Vegas, NV 89031 702-399-5939 Fax: 399-8353
Pipes Pit	Pipes Paving	S1,T20S,R59E	sand gravel	OS,ML	mining crushing screening	60	3529 Clayton North Las Vegas, NV 89030 702-647-1162 Fax: 647-2387
Portable No. 4 Searchlight	Chase Crushing	S22,T28S,R63E	decorative rock	OS,ML	mining crushing screening	3	20 North Gibson Rd. Henderson, NV 89014 702-565-6611 Fax: 565-2281
Rainbow Quarries	Las Vegas Rock, Inc.	S34,T25S,R58E	stone	OP,ML	mining crushing	15	11635 Bermuda Rd. Las Vegas, NV 89052 702-429-4103 Fax: 702-896-4533
Salt Lake Highway Pit	Various (BLM manages pit)	S24,T19S,R62E	sand gravel	OP	mining		Bureau of Land Management 4765 West Vegas Dr. Las Vegas, NV 95901 702-647-5000 Fax: 647-5023 www.blm.gov

[1]**Combined pit operations.**

continued

DIRECTORY OF MINING AND MILLING OPERATIONS (continued)

Mine/plant name	Operator	Location	Commodity	Type	Process/ activity	Employees	Address
CLARK COUNTY (continued)							
Simplot Silica Products Pit	Simplot **Silica** Products	S2,3,11,12, T17S,R67E	silica sand	OP,ML	mining drying flotation screening	43	P.O. Box 308 Overton, NV 89040 702-397-2667 Fax: 397-2798
Sloan Quarry & Mill	Frehner Construction Co.	S13,T23S,R60E	sand gravel	OP,OS, ML	mining crushing screening	17	124 West Brooks Avenue North Las Vegas, NV 89030 702-649-6250 Fax: 642-2213 www.frehnerconstruction.com
Spanish Trails Pit	Hollywood Gravel, Inc.	S28,T21S,R60E	sand gravel	OP,ML	mining crushing screening	15[1]	908 South Valley View Blvd. Las Vegas, NV 89107 702-870-7094 Fax: 870-8114
Spring Mountain Pit	Wells Cargo, Inc.	S10,15;T21S,R60E	sand gravel	OS,ML	mining gravity	12	P.O. Box 81170 Las Vegas, NV 89160 702-873-7440 Fax: 873-1696 www.wellscargoconstruction.com
DOUGLAS COUNTY							
Dresslerville Pit	Cinderlite Trucking Co.	S27,T12N,R20E	decomposed granite	OP	mining screening	1	1665 South Sutro Terrace Carson City, NV 89706 775-882-4483 Fax: 882-1671
ELKO COUNTY							
Capstone Mine	Newmont Mining Corp.	S10,T36N,R49E	gold silver mercury	OP,HL, ML	mining heap leach milling	1588[2]	P.O. Box 669 Carlin, NV 89822-0669 775-778-4000 Fax: 778-4757 www.newmont.com
Dunphy Mill	BAROID/Halliburton Energy Services, Inc.	S26,T33N,R48E	barite	ML	crushing gravity grinding	36	912 Dunphy Ranch Road Battle Mountain, NV 89820 775-468-0515 Fax: 468-2060 www.halliburton.com
Jerritt Canyon Mine	Queenstake Resources USA, Ltd.	T39-41N,R52-54E	gold	UG,ML	mining heap leach milling	406	HC31 Box 78 Elko, NV 89801 775-738-5006 Fax: 758-9231 www.queenstake.com
Meikle Mine	Barrick Goldstrike Mines, Inc.	S13,T36N,R50E	gold silver	UG,ML	mining milling roasting	527	P.O. Box 29 Elko, NV 89803 775-738-8043 Fax: 738-6543 www.barrick.com
Midas (Ken Snyder) Mine	Newmont Mining Corp.	S21,22,27,28,33,34; T39N,R46E	gold silver	UG,ML	mining milling	170	HC66 Box 125 Midas, NV 89414 775-635-6423 Fax: 635-6460 www.newmont.com
Pilot Peak Quarry and Plant	Graymont Western U.S., Inc.	S14,15,22,23,26, T34N,R68E	limestone	OP,ML	mining grinding roasting rotary kiln	50	P.O. Box 2520 West Wendover, NV 89883 775-483-5463 Fax: 483-5149
Rain Mine	Newmont Mining Corp.	S33,T32N,R53E	gold silver mercury	UG HL,ML	mining heap leach milling	1588[2]	P.O. Box 669 Carlin, NV 89822-0669 775-778-4000 Fax: 778-4757 www.newmont.com
Rossi Mine	BAROID/Halliburton Energy Services, Inc.	S14-16,21-23,26-28, 34-35;T37N,R49E	barite	OP,ML	mining	1	912 Dunphy Ranch Road Battle Mountain, NV 89820 775-468-0515 Fax: 468-2060 www.halliburton.com

[1]**Combined pit operations.**
[2]**Combined Newmont Carlin Trend Operations.**

DIRECTORY OF MINING AND MILLING OPERATIONS (continued)

Mine/plant name	Operator	Location	Commodity	Type	Process/ activity	Employees	Address
ESMERALDA COUNTY							
Basalt Mine and Plant	Grefco Minerals, Inc.	S29-32,T2N,R34E	diatomite	OP,ML	mining grinding	18	P.O. Box 288 Mina, NV 89422-0288 775-573-2422 Fax: 573-2422
Blanco Mine	Vanderbilt Minerals Corp.	S22,T1N,R37E	clay	OP	bagging grinding screening	4	3561 Burgundy Dr. Pahrump, NV 89048 775-537-6976 Fax: 537-6879 www.rtvanderbilt.com
Heart of Rulco (Alum Mine)	Rulco, LLC	S32,33,T1N,R38.5E	potassium sulfate	OP,ML	crushing milling shipping	2	1019 CR330 Ignacio, CO 81137 800-658-5919 Fax: 970-883-2469
Mineral Ridge Mine	Golden Phoenix Minerals, Inc.	S1,2,12,T2S,R38E; S6,T2S,R39E	gold silver	OP,UG, HL	mining heap leach	26	Box 67 Silver Peak, NV 89047 775-482-4406 Fax: 482-4036 www.golden-phoenix.com
Silver Peak Operations	Chemetall Foote Co.	S22,T2S,R39E	lithium carbonate	OS,ML	mining solar evaporation precipitation	48	P.O. Box 98 Silver Peak, NV 89047 775-937-2222 Fax: 937-2250 www.chemetall.com
EUREKA COUNTY							
Betze/Post Mine	Barrick Goldstrike Mines, Inc.	S23-26,T36N,R49E; S12,20,29,30; T36N,R50E	gold	OP,CIL, HL,ML	mining heap leach milling	1079	P.O. Box 29 Elko, NV 89803 775-738-8043 Fax: 738-6543 www.barrick.com
Carlin North Genesis Complex	Newmont Mining Corp.	S33,T36N,R50E	gold	OP,HL, ML	mining bioleaching heap leach milling, roasting	1588[2]	P.O. Box 669 Carlin, NV 89822-0669 775-778-4000 Fax: 778-4757 www.newmont.com
Carlin North-Post and adjacent mines	Newmont Mining Corp.	S19,T36N,R50E	gold	OP,HL, ML	mining bioleaching milling milling, roasting	1588[2]	P.O. Box 669 Carlin, NV 89822-0669 775-778-4000 Fax: 778-4757 www.newmont.com
Carlin South-Carlin and adjacent mines	Newmont Mining Corp.	S14,T35N,R50E	gold	UG,HL, ML	mining bioleaching milling milling, roasting	1588[2]	P.O. Box 669 Carlin, NV 89822-0669 775-778-4000 Fax: 778-4757 www.newmont.com
Carlin South-Gold Quarry and adjacent mines	Newmont Mining Corp.	S3,T33N,R51E	gold	OP,HL, ML	mining bioleaching milling milling, roasting	1588[2]	P.O. Box 669 Carlin, NV 89822-0669 775-778-4000 Fax: 778-4757 www.newmont.com
Ruby Hill Mine	Barrick Gold Corp.	S9-11,14,15 T19N,R53E	gold silver	OP,CIL, CIP,HL, ML	heap leach milling	14	P.O. Box 676 Eureka, NV 89316 775-237-6060 Fax: 237-5408 www.barrick.com
HUMBOLDT COUNTY							
Getchell Underground Mine	Placer Dome US, Inc.	S33,T39N,R42E	gold silver	UG	mining stockpiling	215	HC 66 P.O. Box 220 Golconda, NV 89414-9702 775-529-5001 Fax: 529-0753 www.placerdome.com
Hycroft Mine	Hycroft Resources and Development, Inc.	S26,T35N,R29E	gold silver	OP,HL	heap leach	4	P.O. Box 3030 Winnemucca, NV 89446 775-623-5260 Fax: 623-0215 www.vistagold.com
Lone Tree Mine (Lone Tree Complex)	Newmont Mining Corp.	S1,11,13,15,23, T34N,R42E	gold silver	OP,HL, ML	mining flotation heap leach milling	450[3]	P.O. Box 388 Valmy, NV 89438-0388 775-635-9000 Fax: 635-0111 www.newmont.com
Marigold Mine	Glamis Marigold Mining Co.	S8,9,18-20, T33N,R43E	gold silver	OP,HL, ML	mining heap leach milling	143	P.O. Box 160 Valmy, NV 89438 775-635-2317 Fax: 635-2551 www.glamis.com
MIN-AD Mine	MIN-AD, Inc.	S28,T35N,R38E	dolomite	OP,ML	mining grinding	17	P.O. Box 39 Winnemucca, NV 89446 775-623-5944 Fax: 623-9028 www.min-ad.com

[2]**Combined Newmont Carlin Trend operations.**
[3]**Combined Lone Tree, Mule Canyon, and Phoenix Project**

continued

DIRECTORY OF MINING AND MILLING OPERATIONS (continued)

Mine/plant name	Operator	Location	Commodity	Type	Process/ activity	Employees	Address
HUMBOLDT COUNTY (continued)							
Rainbow Ridge Opal Mine	Rainbow Ridge Opal Mines, Inc.	S22,23,T45N,R26E	precious opal	OP	mining	2	P.O. Box 97 Denio, NV 89404 775-941-0270 (summer) 541-548-4810 (winter) www.nevadaopal.com
Royal Peacock Opal Mine	Walter Wilson	S30,T45N,R26E	precious opal	OP	mining	2	P.O. Box 144 Orovada, NV 89425 775-941-0374 (summer) 775-272-3246 (winter) www.royalpeacock.com
Sage Mine	West Coast Mining/ Dale E. Huett	S12,T43N,R35E	chalcedony	OP	mining extraction grading	1	P.O. Box 133 College Place, WA 99324 509-522-4851 Fax: 527-1233 www.wcmining.com
Sleeper	Nevada Gold Mining, Inc.	S9,10,15,16,17,20, 21,22; T32N,R43E	gold silver	OP,HL, ML	heap leach milling gravity	5	600 Sod House Road Winnemucca, NV 89445 775-427-8222 Fax: 427-8169
Thomas Canyon and Sonoma Pits	H.E. Hunewill Construction Co.	S24,T35N,R37E; S19,T35N,R38E	sand gravel	OP,ML	mining crushing screening	8	1410 West Railroad Rd. Winnemucca, NV 89445 775-623-2888 Fax: 623-2992
Twin Creeks Mine	Newmont Mining Corp.	S3-10,15-22,27-32 T39N,R43E	gold silver	OP,HL, ML	mining heap leach milling	467	P.O. Box 69 Golconda, NV 89414 775-623-4300 Fax: 635-4602 www.newmont.com
LANDER COUNTY							
Argenta Mine and Mill	Baker Hughes INTEQ	S6,18,19,T32N,R47E	barite	OP,ML	mining gravity grinding	18	P.O. Box 277 Battle Mountain, NV 89820 775-635-5441 Fax: 635-5455 www.bakerhughes.com
Battle Mountain Grinding Plant	M-I Swaco	S18,T32N,R45E	barite	ML	gravity grinding	29	P.O. Box 370 Battle Mountain, NV 89820 775-635-5135 Fax: 635-2191 www.midf.com
Blue Ridge Mine	Jay and Grace Wintle	S19,20,29,30, T28N,R47E	faustite turquoise	OP	mining screening sorting washing	2	810 Sheep Creek Road Battle Mountain, NV 89820 775-635-5231
Cortez/Pipeline Mines	Placer Dome U.S., Inc.	S31,33,34, T28N,R47E	gold	OP,CIL, HL,ML	mining heap leach milling	402	HC66 Box 1250 Crescent Valley, NV 89821 775-468-4400 Fax: 468-4496 www.placerdome.com
Greystone Mine	M-I Swaco	S35,T28N,R45E	barite	OP,ML	mining gravity milling shipping	34	P.O. Box 370 Battle Mountain, NV 89820 775-635-5135 Fax: 635-2191 www.midf.com
McCoy/Cove Mine	Newmont Mining Corp.	S1–11,T28N,R42E; S36,T29N,R42E	silver gold	OP,UG	reclamation	26	P.O. Box 1658 McCoy Mine Road, No. 1 Battle Mountain, NV 89820 775-635-4923 Fax: 635-4921 www.newmont.com
Mule Canyon Mine (Lone Tree Complex)	Newmont Mining Corp.	S4,T31N,R47E	gold silver	OP,HL, ML	mining	450[3]	P.O. Box 388 Valmy, NV 89438-0388 775-635-9000 Fax: 635-0111 www.newmont.com
Phoenix Project	Newmont Mining Corp.	S22,27,33,34, T31N,R43E	gold silver	OP,HL, ML	heap leach	450[3]	P.O. Box 388 Valmy, NV 89438-0388 775-635-9000 Fax: 635-0111 www.newmont.com

[3]**Combined Lone Tree, Mule Canyon, Phoenix Project**
[4]**Combined grinding plant and mine**

DIRECTORY OF MINING AND MILLING OPERATIONS (continued)

Mine/plant name	Operator	Location	Commodity	Type	Process/ activity	Employees	Address
LINCOLN COUNTY							
Tenacity Perlite Mine and Mill	Wilkin Mining and Trucking Co.	S34,T4S,R62E	perlite	OP,ML	mining milling	10	P.O. Box 829 Panaca, NV 89042 775-728-4463 Fax: 728-4456
LYON COUNTY							
Adams Claim Gypsum Mine	Art Wilson Co.	S25,T16N,R20E	gypsum limestone	OP,ML	mining crushing screening	32	P.O. Box 20160 Carson City, NV 89702 775-882-0700 Fax: 882-0790 www.awgypsum.com
Desert Creek Pit	H.E. Hunewill Construction Co.	S20,21,T10N,R24E	sand gravel	OP,ML	mining crushing screening	7	315 Artist View Wellington, NV 89444 775-465-2448 Fax: 465-2629
Hazen Pit	Eagle-Picher Filtration and Minerals, Inc.	S6, 9, T19N, R26E	diatomite	OP	mining	2	P.O. Box 10480 Reno, NV 89510 775-824-7700 Fax: 824-7715 www.epcorp.com
Nevada Cement Mine	Nevada Cement Co.	S3-6,9,T19N,R25E; S31-33,T20N,R25E	limestone clay	OP,ML	mining crushing dry milling rotary kiln	120	P.O. Box 840 Fernley, NV 89408 775-575-2281 Fax: 575-4387
MINERAL COUNTY							
Denton-Rawhide Mine	Kennecott Rawhide Mining Co.	S4,5,8,16,17, T13N,R32E	gold silver	OP,HL	heap leach milling	21	P.O. Box 2070 Fallon, NV 89407 775-945-1015 Fax: 945-1213 www.kennecottminerals.com
NYE COUNTY							
Ash Meadows Plant	Ash Meadows Zeolite, LLC	S25,T18S,R50E	zeolite	ML	crushing screening packaging	12	HCR 70, Box 7006 Amargosa Valley, NV 89020 775-372-5524 Fax: 372-5524 www.badgerminingcorp.com
Cinder Cone Pit	Allied Building Materials, Inc./ Cind-R-Lite Co.	S36,T14S,R48E; S31,T14S,R49E; S1,T15S,R48E; S6,T15S,R49E	cinder	OP,ML	mining screening	9	4745 Mitchell St. North Las Vegas, NV 89031 702-651-1550 Fax: 651-1551
Gabbs Mine	Premier Chemicals, LLC	S23,25-27,34-36, T12N,R36E	magnesite	OP,ML	mining calcining	80	P.O. Box 177 Gabbs, NV 89409 775-285-2601 Fax: 285-4030 www.premierchemicals.com
IMV Pits	Mud Camp Mining Co., LLC	S28,29,T17S,R49E; S6,21,T17S,R51E	clay	OP,ML	mining milling	29	Route Box 549 Amargosa Valley, NV 89020 775-372-5341 Fax: 372-5640
Lathrop Mill	American Borate Co.	S36,T17S,R49E	calcium borate	ML	calcination flotation	25	American Borate Co. HCR 70 Box 610 Amargosa Valley, NV 89020 775-372-5339
New Discovery Mine/ White Caps Mill	Vanderbilt Minerals Corp.	S13,14,T12S,R46E; S18,19,T12S,R47E	clay	OP,UG, ML	bagging grinding screening	8	3561 Burgundy Dr. Pahrump, NV 89048 775-537-6976 Fax: 537-6879 www.rtvanderbilt.com
P & S	Standard Industrial Minerals, Inc.	S14,T13N,R45E	barite	OP	shipping	1	P.O. Box 10477 Reno, NV 89509 775-324-1334 Fax: 324-2458
Pahrump Community Pit	Various (BLM owns pit)	S28,29,T20S,R54E	sand gravel	OP	mining		Bureau of Land Management 4765 Vegas Dr. Las Vegas, NV 95901 702-647-5000 Fax: 647-5023 www.blm.gov
Round Mountain Mine (Smoky Valley Common Operation)	Round Mountain Gold Corp.	S19,20,29,30, T10N,R44E	gold silver	OP,HL, ML	mining gravity heap leach milling	628	P.O. Box 480 Smoky Valley Mine Rd. Round Mountain, NV 89405 775-377-2366 Fax: 377-3224 www.kinross.com

DIRECTORY OF MINING AND MILLING OPERATIONS (continued)

Mine/plant name	Operator	Location	Commodity	Type	Process/ activity	Employees	Address
PERSHING COUNTY							
Buff-Satin Mine	Vanderbilt Minerals Corp.	S2,T27N,R32E	clay	OP	processing shipping	4	3561 Burgundy Dr. Pahrump, NV 89048 775-537-6976 Fax: 537-6879 www.rtvanderbilt.com
Coeur Rochester Mine	Coeur d'Alene Mines Corp., Inc.	S9-11,15,16,21,27, 28,T28N,R34E	silver gold	OP,HL, ML	mining heap leach milling	257	P.O. Box 1057 Lovelock, NV 89419 775-273-7995 Fax: 273-7423 www.coeur.com
Colado Mines	Eagle-Picher Filtration and Minerals, Inc.	S6,7,16,18,21,25, T28N,R29E	diatomite perlite	OP,OS	mining	30	P.O. Box 959 150 Coal Canyon Road Lovelock, NV 89419 775-824-7540 Fax: 824-7582 www.epcorp.com
Colado Plant	Eagle-Picher Filtration and Minerals, Inc.	S33,T28N,R32E	diatomite perlite	ML	drying classification grinding calcining	94	P.O. Box 959 150 Coal Canyon Road Lovelock, NV 89419 775-824-7540 Fax: 824-7582 www.epcorp.com
Empire Quarry	United States Gypsum Co.	S31,T31N,R24E	gypsum	OP	mining	11	P.O. Box 130 Empire, NV 89405 775-557-2341 Fax: 557-2212 www.usg.com
Florida Canyon Mine	Apollo Gold, Inc.	S1-4,9-15,T31N,R33E; S37-39,T31½N,R33E; S33-35,T32N,R33E	gold	OP,HL, ML	mining heap leach milling	181	P.O. Box 330 Imlay, NV 89418 775-538-7300 Fax: 538-7324 www.apollogold.com
Section 8 Mine	American Colloid Co.	S8,T27N,R33E	clay	OP	shipping	4	1500 West Shure Drive Arlington Heights, IL 60004 847-392-4600 Fax: 506-6199 www.colloid.com
W. Glen Sexton Family Trust	Nutritional Additives Co.	S5,8,T34N,R38E	dolomite	OP,ML	mining milling	2	415 Wellington Street Winnemucca, NV 89445 775-623-1151 Fax: 623-1153
STOREY COUNTY							
Basalite Dayton Pit	Basalite Division of Pacific Coast Building Products	S8,9,16,17, T17N,R22E	sand gravel	OS,ML	mining crushing milling	5	2600 Boeing Way Carson City, NV 89701 775-882-9336 Fax: 887-1025 http://basalite.paccoast.com
Clark Mine and Mill	Eagle-Picher Filtration and Minerals, Inc.	S27,33,34, T20N,R23E	diatomite	OP,ML	mining calcining drying grinding	69	640 Clark Station Rd. Sparks, NV 89434 775-824-7700 Fax: 824-7715 www.epcorp.com
Mustang Pit	Gopher Construction, Inc.	S14,T19N,R21E	decorative rock	OP	mining crushing	4	P.O. Box 801 Fernley, NV 89408 775-575-4333 Fax: 575-1137
Sierra Stone Quarry	RMC Nevada, Inc.	S22,T19N,R22E	sand gravel	OS,ML	mining crushing screening	24	333 Galletti Way Reno, NV 89512 775-329-5585 www.rmcnevada.com
WASHOE COUNTY							
Bella Vista Pit	A and K Earthmovers	S3,T18N,R20E	sand gravel	OS,ML	mining screening	10	P.O. Box 1059 1200 Auction Rd. Fallon, NV 89407 775-423-6085 Fax: 423-8410
Clay Mine	Art Wilson Co.	S13,T27N,R19E	clay	OP	mining	3	P.O. Box 20160 Carson City, NV 89721 775-882-0700 Fax: 882-0790 www.awgypsum.com
Empire Mill	United States Gypsum Co.	S11,13,T31N,R23E	gypsum	ML	calcining crushing	136	P.O. Box 130 Empire, NV 89405 775-557-2341 Fax: 557-2212 www.usg.com

continued

DIRECTORY OF MINING AND MILLING OPERATIONS (continued)

Mine/plant name	Operator	Location	Commodity	Type	Process/ activity	Employees	Address
WASHOE COUNTY (continued)							
Golden Valley Pit	A and K Earthmovers	S11,T19N,R20E	decomposed granite	OS,ML	mining screening	4	P.O. Box 1059 1200 Auction Rd. Fallon, NV 89407 775-423-6085 Fax: 423-8410 www.akearthmovers.com
Hidden Canyon	Granite Construction Co.	S16,T20N,R20E	aggregate	OP,ML	mining crushing screening washing	5	P.O. Box 2087 1900 Glendale Ave. Sparks, NV 89432 775-355-3434 Fax: 329-2803 www.graniteconstruction.com
Lockwood Quarry	Granite Construction Co.	S17,T19N,R21E	aggregate	OP,ML	mining crushing screening washing	17	P.O. Box 2087 1900 Glendale Ave. Sparks, NV 89432 775-355-3434 Fax: 329-2803 www.graniteconstruction.com
Mustang Pit	Frehner Construction Co.	S4,T19N,R21E	aggregate	OP,ML	mining crushing screening	6	55 Coney Island Dr., Suite 100 Sparks, NV 89434 775-356-5200 www.frehnerconstruction.com
Paiute Pit	RMC Nevada, Inc.	S2,27,34, T21N,R24E	sand gravel	OP	mining	13	333 Galletti Way Reno, NV 89512 775-329-5585 www.rmcnevada.com
Rilite Aggregate Pit	Rilite Aggregate Co.	S23,T18N,R20E	aggregate	OP,ML	mining grinding crushing	10	3025 Mill St. Reno, NV 89502 775-329-8842 Fax: 329-3593
Spanish Springs Plant No. 6	Martin Marietta Minerals	S15, T21N,R20E	sand gravel	OP,ML	mining crushing screening	36	11059 Pyramid Lake Rd. Sparks, NV 89436 775-425-4455 Fax: 425-5131 www.martinmarietta.com
Wade Sand Pit	Granite Construction Co.	S3,T20N,R24E	sand	OP,ML	mining screening	6	P.O. Box 2087 1900 Glendale Ave. Sparks, NV 89432 775-355-3434 Fax: 329-2803 www.graniteconstruction.com
WHITE PINE COUNTY							
Bald Mountain Mine	Placer Dome U.S. Inc.	S14,15,19,20 T24N,R57E	gold	OP,HL, ML	mining heap leach milling	107	P.O. Box 2706 Elko, NV 89803 775-237-7100 Fax: 237-7101 www.placerdome.com
Mount Moriah Quarry	Mt. Moriah Stone Quarries, LLC	S22,23,26,27,34-36 T16N,R70E	building stone decorative stone	OP	mining	19	P.O. Box 35 No. 10 Hatch Rock Rd. Baker, NV 89311 435-855-2232 Fax: 855-2332

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)

Other Publications

Index to geothermal well files housed at NBMG (L-5)
Gold and silver resources in Nevada (M120)
Nevada geothermal resources (M126)
Geothermal resources (M141)
Industrial mineral deposits (M142)
Oil and gas wells drilled in Nevada since 1907 (L-8)
Nevada mining and you (SP8)
Major mines of Nevada 2003 (P-15)
Outline of Nevada mining history (SP15)
Mining districts of Nevada (R47)

NBMG maintains an open-file office with the following information available to the public:

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

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