

# **Nevada Bureau of Mines and Geology**

## **Special Publication MI-2005**

# **The Nevada Mineral Industry 2005**

This report, twenty-seventh of an annual series, describes mineral, oil and gas, and geothermal activities and accomplishments in Nevada in 2005: 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.

**Metals**

**Industrial  
Minerals**

**Oil and Gas**

**Geothermal**

**Exploration**

**Development**

**Mining**

**Processing**

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First edition, first printing, 2006, 140 copies  
Printed by: UNR Copy Center  
Cover stock: Wausau Astrobright, Galaxy Gold

Editor: Dick Meeuwig  
Graphics: Dick Meeuwig  
Typography: Jack Hursh

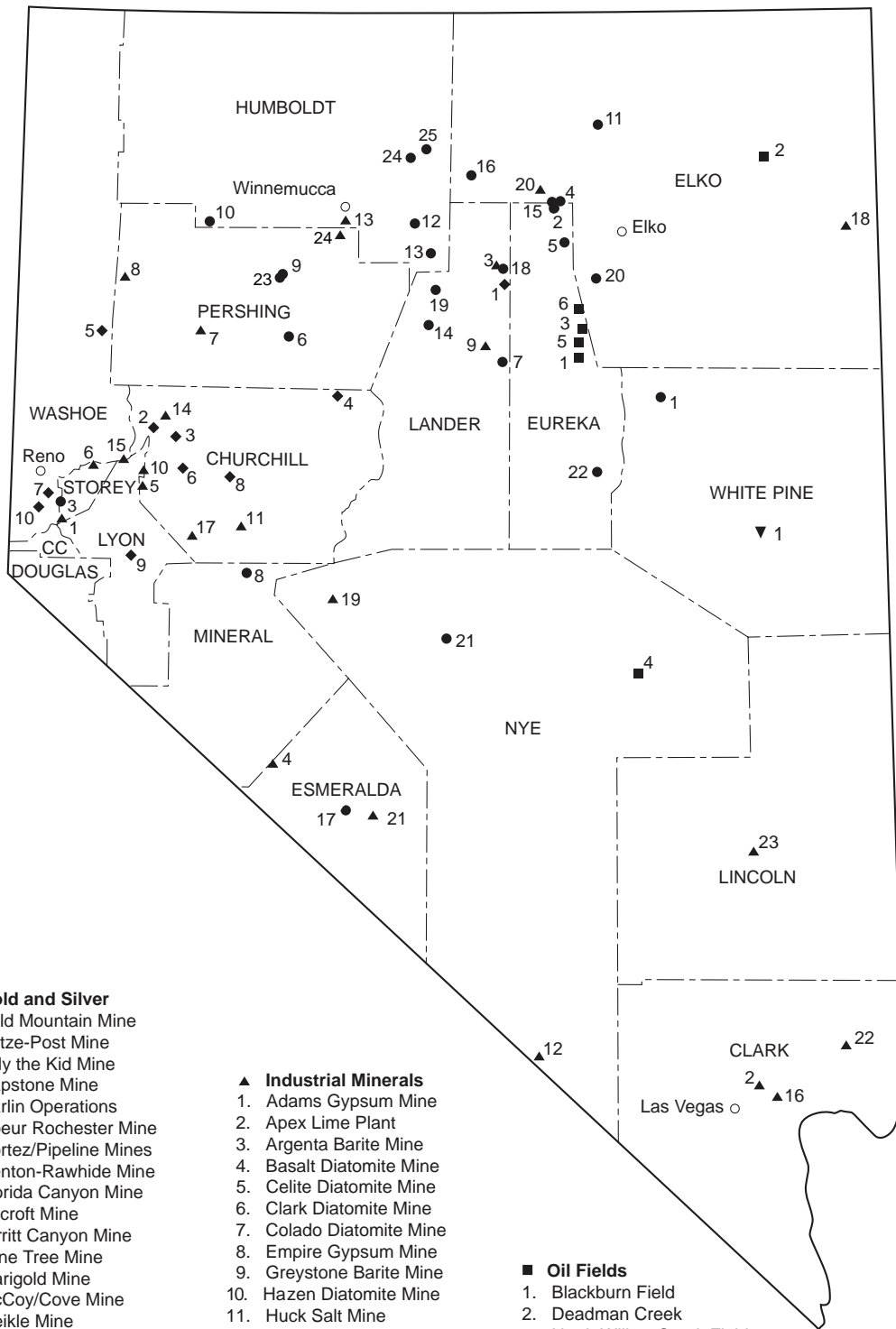
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5. Carlin Operations
6. Coeur Rochester Mine
7. Cortez/Pipeline Mines
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10. Hycroft Mine
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- |                       |                                 |
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**Major mines, oil fields, and geothermal plants, 2005.**

# Overview

by Jonathan G. Price and Richard O. Meeuwig

This report highlights activities through 2005 in metals, industrial minerals, geothermal energy, and petroleum. Numerous graphs and charts are incorporated for rapid inspection of trends in production and price. The value of overall mineral and energy production in Nevada reached an all-time high of \$3.9 billion in 2005, primarily as a result of the increase in the prices of gold and nearly all other commodities. Gold production decreased from a high of 8.86 million ounces in 1998 to 6.85 million ounces in 2005, but 2005 was nonetheless the tenth highest production year in history. Nevada led the nation in the production of gold, barite, diatomite, and gypsum, and was the only state that produced magnesite, lithium, and the specialty clays, sepiolite and saponite. Other commodities produced in Nevada in 2005 included construction aggregate (sand, gravel, and crushed stone), geothermal energy, lime, cement, silica (industrial sand), silver, clays, dolomite, perlite, dimension stone, salt, zeolite, semiprecious gemstones, 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 2005 (according to the U.S. Geological Survey, Mineral Commodity Summaries 2006, <http://minerals.usgs.gov/minerals/pubs/mcs/2006/>). Arizona, the nation's leading copper producer, leapfrogged into first place because of dramatic increases in copper prices. California, with its large population and commensurate demands for construction raw materials, was third. Utah, a major producer of copper and molybdenum, primarily from

one mine near Salt Lake City, was fourth. Texas, another populous state and major producer of construction raw materials, was fifth. Florida, the leader in phosphate production, was sixth, and Minnesota, the leader in iron-ore production, was seventh.

Nevada's production of gold, valued at \$3.0 billion, was 83% of the U.S. total and helped make the U.S. the second leading gold producer in the world in 2005. Nevada alone accounted for 9% of world production of gold. Only the countries of South Africa, Australia, and China produced more gold than the State of Nevada in 2005. Second to gold in terms of Nevada's mineral value in 2005 was copper (\$213 million), followed closely by construction aggregate (\$207 million). Electrical power from geothermal energy production in Nevada in 2005 was valued at \$74 million. Silver, chiefly a by-product or co-product of gold production, ranked as the fifth leading mineral commodity in 2005, with a value of \$71 million.

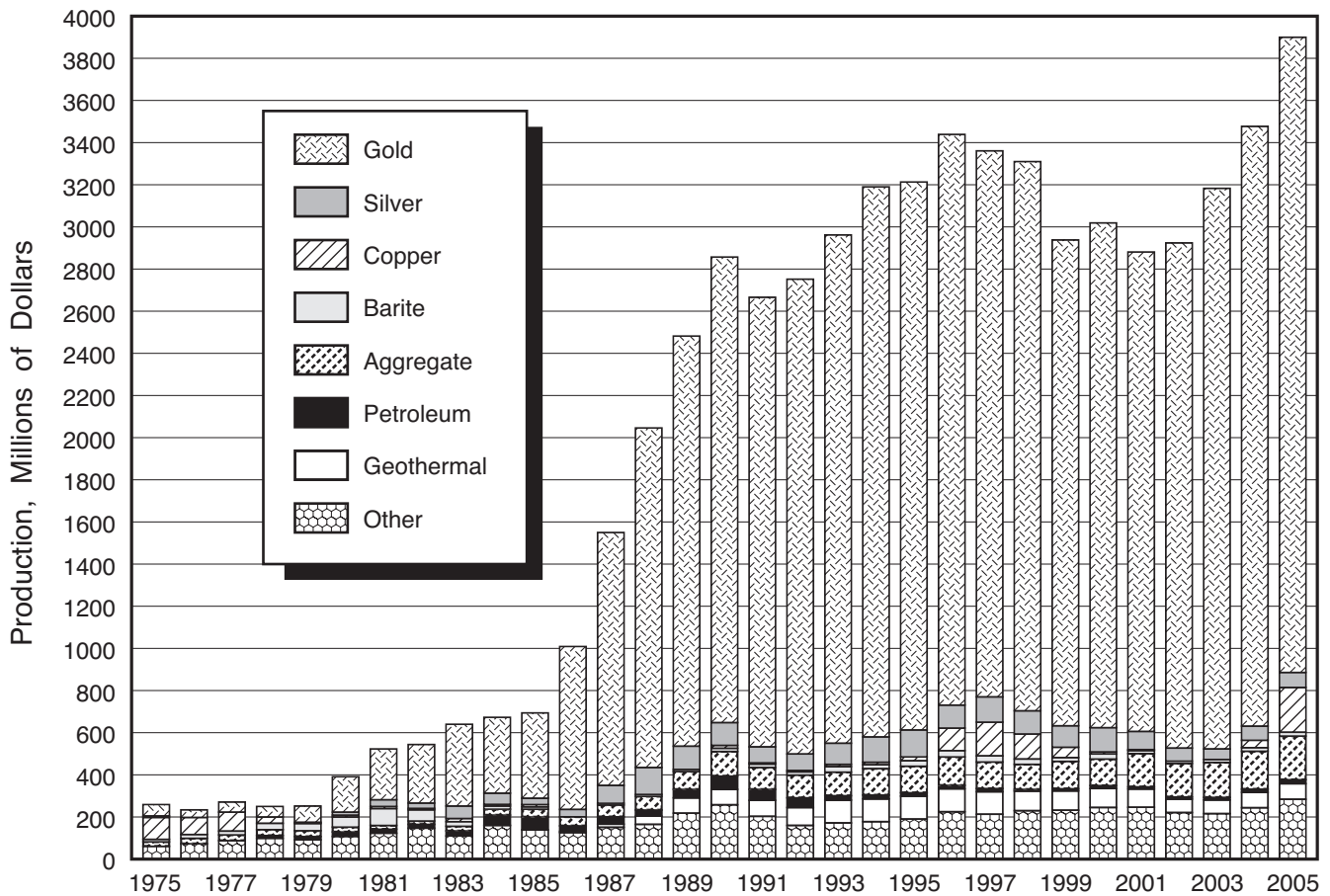
The contributions that mining makes to the economies of Nevada and the U.S. are significant in terms of jobs, commerce, taxes, improvements to the infrastructure, and lowering of the U.S. trade deficit. Because of Nevada's production, the U.S. is a net exporter of gold, most of which is sold on the international market for jewelry and arts, and some of which is sold for its conductive and non-corrosive qualities in computers and other electronics and for use in dental work. 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 (82% of total U.S. consumption from imports in 2005,

## MINERAL, GEOTHERMAL POWER, AND PETROLEUM PRODUCTION IN NEVADA<sup>1</sup>

Minerals	2004		2005		% change from 2004 to 2005	
	Quantity	Value (millions)	Quantity	Value (millions)	Quantity	Value
<b>Gold</b> (thousand troy ounces)	6,942	\$2,846.0	6,852	\$3,014.4	-1.3	+5.9
<b>Silver</b> (thousand troy ounces)	10,398	67.2	9,946	71.1	-4.3	+5.8
<b>Copper</b> (thousand pounds)	26,900	35.1	126,225	213.3	+469.2	+607.7
<b>Aggregate</b> (thousand short tons)	40,000	180.0	46,000	207.0	+15.0	+15.0
<b>Gypsum</b> (thousand short tons)	2,083	31.2	1,775	24.9	-14.8	-20.2
<b>Barite</b> (thousand short tons)	560	16.8	511	17.9	-8.9	+6.5
<b>Geothermal energy</b> (thousand megawatt-hours)	1,285	73.0	1,269	73.5	-1.2	+0.7
<b>Petroleum</b> (thousand 42-gallon barrels)	462	14.8	447	19.2	-6.7	+29.7
<b>Other minerals<sup>2</sup></b>	—	243.7	—	259.2	—	+6.4
<b>Total</b>	—	\$3,507.8	—	\$3,900.5	—	+11.1

<sup>1</sup> 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.

<sup>2</sup> Building stone, cement, clay, diatomite, lime, lithium carbonate, magnesite, mercury, perlite, salt, and silica sand.



**Nevada mineral, geothermal power, and petroleum production, 1975–2005.**

according to the U.S. Geological Survey, used primarily to prevent blowouts in oil and gas drilling), silver (57%, used in photographic and other applications), copper (40%, used primarily to conduct electricity), and gypsum (29%, used in wallboard). Exports of gold from Nevada help offset the staggering U.S. trade deficit (difference between imports and exports of goods and services), which amounted to a record \$717 billion in 2005 (according to the Department of Commerce, Bureau of Economic Analysis, [www.bea.gov](http://www.bea.gov)).

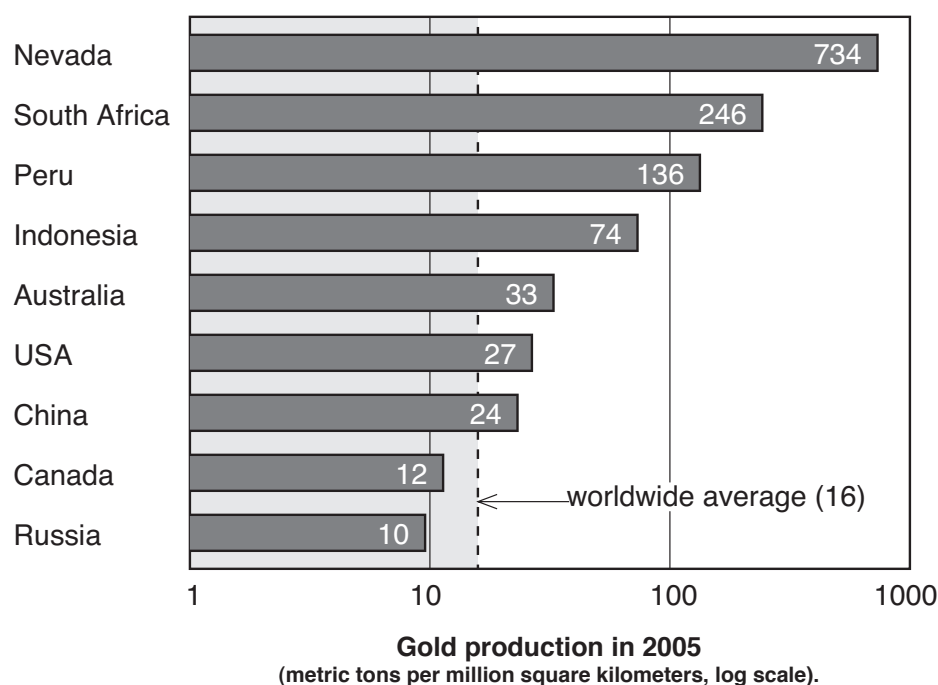
The local economy also benefits from mining. Construction of new homes, casinos, other businesses, schools, and roads requires local sources of sand, gravel, crushed stone, gypsum, and raw materials for cement, all of which are abundant in Nevada. The mining industry directly employed 10,561 people in 2005, and the industry is responsible for another 48,000 jobs related to providing the goods and services needed by the industry and its employees (Driesner and Coyner, 2006, *Major Mines of Nevada 2005*, Mineral Industries in Nevada’s Economy, Nevada Bureau of Mines and Geology Special Publication P-17, 28 p.; available at [www.nbmj.unr.edu/dox/mm/mm05.pdf](http://www.nbmj.unr.edu/dox/mm/mm05.pdf)).

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 2005) and industrial sand (27% of world production). In addition to gold, the U.S. is a leading silver producer (6% 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 2005 was approximately 2.91 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](http://www.eia.doe.gov)), the U.S. produced and consumed approximately 1.0 billion metric tons of coal in 2005, more than in any previous year. Although no coal is produced in Nevada, coal is the major source of energy for generation of electricity in Nevada and many other states.

### WORLD PRODUCTION OF SELECTED MINERAL COMMODITIES (metric tons) in 2005\*

Country/State	Area (10 <sup>6</sup> km <sup>2</sup> )	Gold	Silver	Copper	Gypsum	Barite	Industrial Sand
Algeria	2.38	—	—	—	—	48,000	—
Australia	7.68	254	2,250	930,000	4,000,000	—	4,500,000
Austria	0.08	—	—	—	1,000,000	—	6,800,000
Belgium	0.03	—	—	—	—	—	1,800,000
Brazil	8.51	—	—	—	1,550,000	55,000	1,600,000
Canada	9.96	115	1,330	580,000	9,500,000	—	1,600,000
Chile	0.76	—	1,400	5,320,000	—	—	—
China	9.57	225	2,800	640,000	7,500,000	3,900,000	—
Egypt	1.00	—	—	—	2,000,000	—	—
France	0.57	—	—	—	3,500,000	82,000	6,500,000
Gambia	0.01	—	—	—	—	—	1,500,000
Germany	0.36	—	—	—	1,750,000	94,000	7,500,000
India	3.28	—	—	—	2,400,000	1,000,000	1,500,000
Indonesia	1.90	140	—	1,050,000	—	—	—
Iran	1.65	—	—	—	11,000,000	210,000	1,700,000
Italy	0.30	—	—	—	1,200,000	—	3,000,000
Japan	0.38	—	—	—	5,800,000	—	4,500,000
Kazakhstan	2.72	—	—	400,000	—	—	—
Korea, North	0.12	—	—	—	—	70,000	—
Mexico	1.97	—	2,700	420,000	7,000,000	290,000	2,000,000
Morocco	0.45	—	—	—	—	360,000	—
Norway	0.32	—	—	—	—	—	1,500,000
Peru	1.29	175	3,060	1,000,000	—	—	—
Poland	0.31	—	1,300	530,000	1,300,000	—	1,500,000
Romania	0.24	—	—	—	—	—	1,100,000
Russia	17.07	165	—	675,000	800,000	60,000	—
Slovakia	0.05	—	—	—	—	—	2,200,000
Slovenia	0.02	—	—	—	—	—	11,000,000
South Africa	1.22	300	80	—	—	—	2,240,000
Spain	0.50	—	—	—	7,500,000	—	6,500,000
Thailand	0.51	—	—	—	8,000,000	210,000	—
Turkey	0.78	—	—	—	—	135,000	1,300,000
United Kingdom	0.24	—	—	—	1,500,000	60,000	4,000,000
Uruguay	0.18	—	—	—	1,100,000	—	—
Zambia	0.75	—	—	450,000	—	—	—
United States	9.37	258	1,230	1,150,000	17,500,000	500,000	31,300,000
<b>Nevada</b>	<b>0.29</b>	<b>213</b>	<b>309</b>	<b>57,300</b>	<b>1,610,000</b>	<b>464,000</b>	<b>680,000</b>
<b>WORLD</b>	<b>149.90</b>	<b>2,462</b>	<b>20,300</b>	<b>14,900,000</b>	<b>106,000,000</b>	<b>7,620,000</b>	<b>117,000,000</b>

\* 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 of some data from USGS mineral commodity specialists; production data for Nevada are from Driesner and Coyner (2006), with modifications as noted in this report; USGS statistics are adjusted to be consistent with Nevada data.



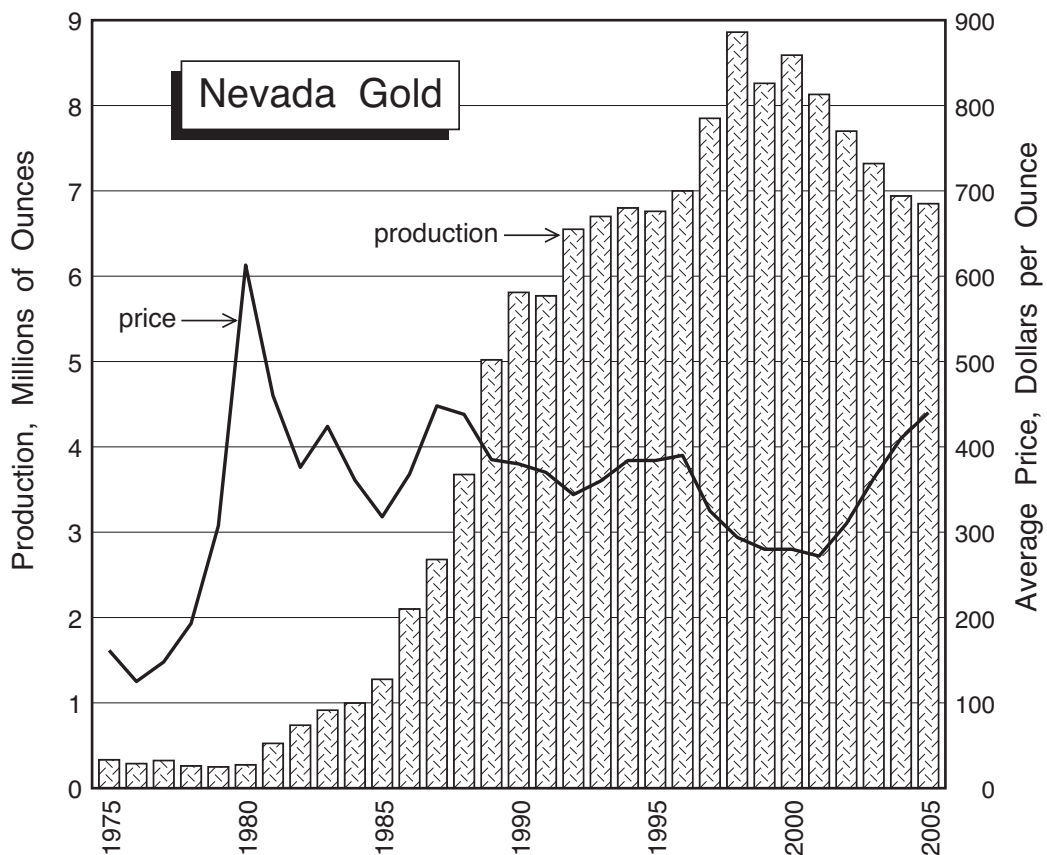
As a result of its favorable geology, Nevada has tremendous potential for the discovery of additional mineral deposits. Areas where prospective rocks are beneath a cover of young, valley-filling sediments and volcanic rocks have only been explored to a limited extent, and ore deposits continue to be 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 2006, the Nevada Division of Minerals collected data for Nevada Bureau of Mines and Geology Special Publication P-15, Major Mines of Nevada 2005. This publication includes, in handbook form, location maps, names and telephone numbers of operators, numbers of employees, and 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.nbmng.unr.edu](http://www.nbmng.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

2005 came from 24 major mining operations. The Carlin trend in northeastern Nevada accounted for 50% 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.

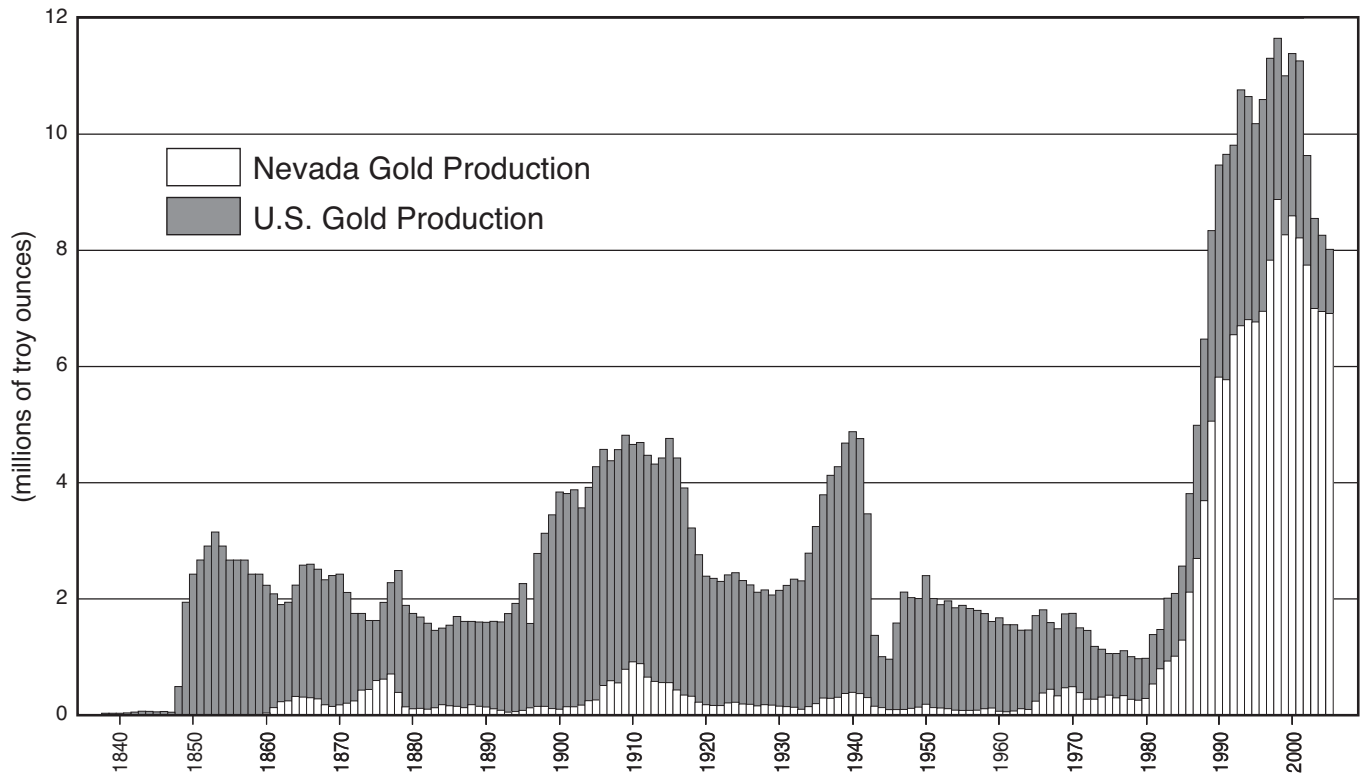
Nevada and the U.S. have produced a significant portion of world gold. The U.S. Geological Survey estimates that total world gold production, since the beginning of civilization, has been 152,000 metric tons (4.9 billion troy ounces). Interestingly, about 85% of that gold is still in use (in bullion, coins, jewelry, electronics, etc.), and most gold currently being mined is recycled. Through 2005, cumulative gold production in Nevada (beginning with the Comstock lode in 1859) stands at 5,080 metric tons (163.32 million ounces). Remarkably, 85% of this total has been produced since the Carlin Mine began production in 1965; 82% of this total has been produced during the current boom from 1981 to the present; and 49% of this total has been produced in the decade from 1996 to 2005. Total U.S. production, primarily since 1835, is approximately 16,000 metric tons (514 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 2005, cumulative production from the Carlin trend reached 1,939 metric tons of gold (62.4 million ounces), keeping its place as one of the most productive gold-mining districts in the world.



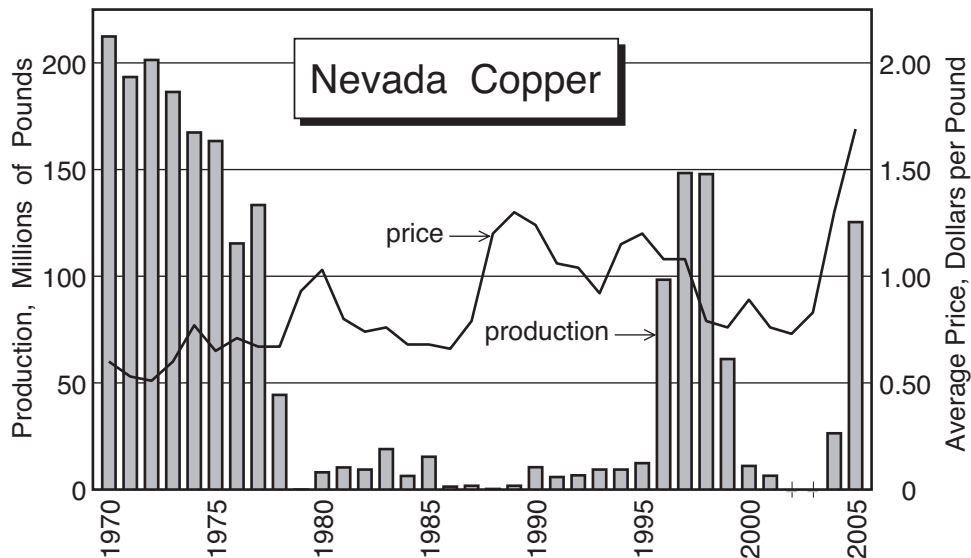


We continue to be in the midst of the biggest gold boom in U.S. history, as the graph of historical U.S. gold production illustrates. The recent surge in production in the U.S. is largely the result of discoveries of Carlin-type gold deposits and other deposits in which gold occurs primarily in grains that are so small that they are invisible to the naked eye. These deposits are primarily in Nevada. The U.S. production so far in the current boom, the period from 1981 to 2005, has been 194.8 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 1996 to 2005 alone was 101 million ounces. The current boom is bigger than previous booms not only in



United States and Nevada gold production from 1835 through 2005. Data from U.S. Gold Industry 1998 (NBMG Special Publication 25) by J.L. Dobra and from the U.S. Geological Survey.



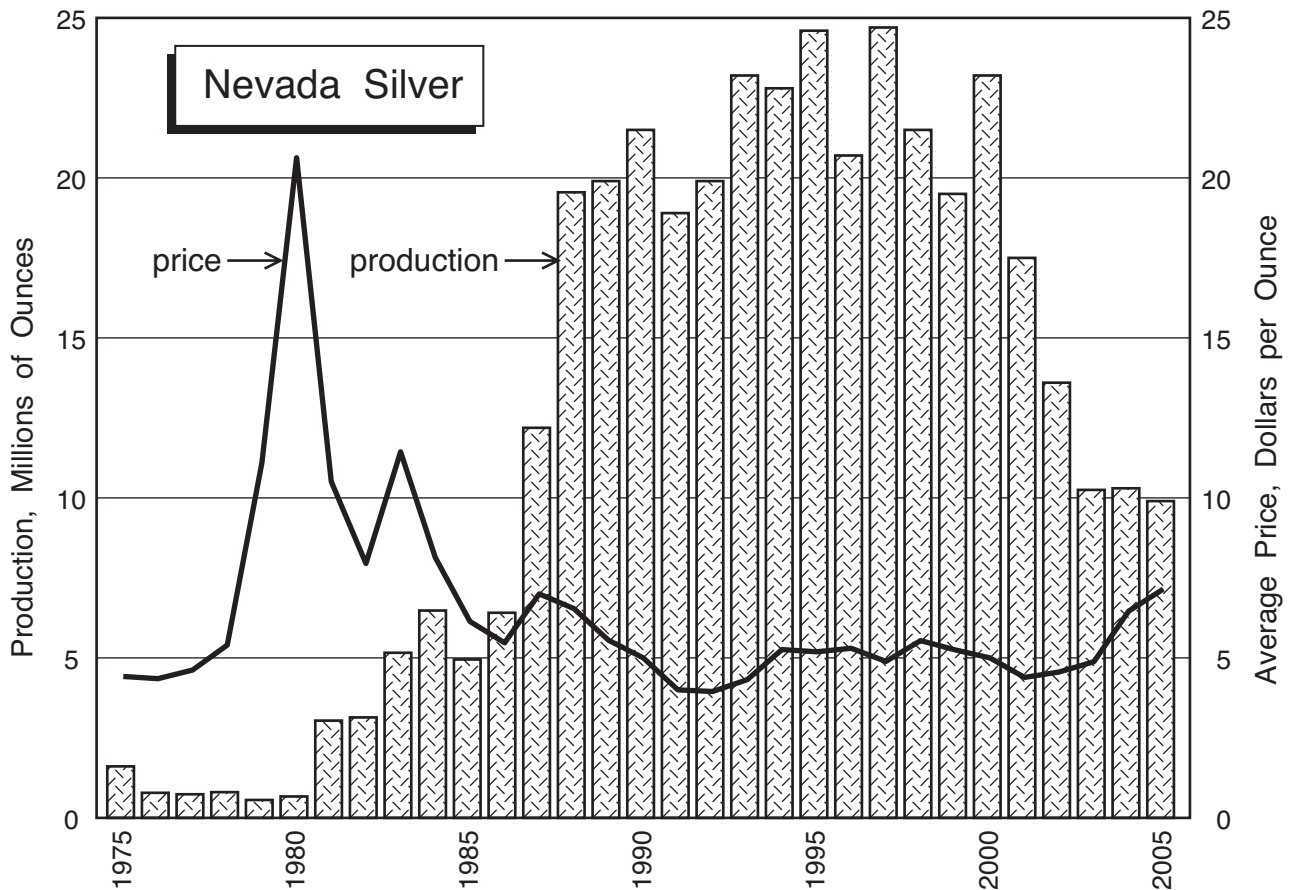
terms of cumulative production but also in terms of peak annual production (11.6 million ounces in 1998 versus 4.8 million ounces in 1909, 2.6 million ounces in 1866, and 3.1 million ounces in 1853) and duration (at least 25 years for the current boom versus no more than 24 years for any of the earlier booms).

In 2005, Barrick's Betze-Post Mine in Eureka County produced 1.514 million ounces, making it the largest gold mine in the state, and Barrick's Meikle Mine in Elko County produced 509,568 ounces, making it the largest underground producer. Barrick was the largest gold producer in Nevada in 2005, both on the Carlin trend and statewide. Barrick acquired Placer Dome near the beginning of 2006. Newmont's production on the Carlin trend, including its Carlin operations and Capstone/Bootstrap and Rain Mines, totaled 1,401,836 ounces, boosting it to be the second largest gold producer in Nevada. Copper production, encouraged by record-high prices for the year, increased sharply at the Robinson copper-gold-silver mine, operated by Quadra Mining Ltd. near Ely in White Pine County. Golden Phoenix began production from its Ashdown molybdenum mine in northwestern Humboldt County in 2006.

Exploration in 2005 (summarized in the section on **Metals**) included high-grade (mostly vein) targets, which tend to be popular during times of depressed prices for gold, and low-grade, large tonnage deposits, which

generally become more profitable when gold prices are higher. Average price in 2005 was \$440 per ounce, well above prices in the previous four years (\$410 in 2004, \$363 in 2003, \$310 in 2002, \$280 in 2001). New discoveries were reported along the Carlin trend and in several other districts. At least 50 companies, ranging from juniors to majors, drilled at least 110 projects in Nevada in 2005.

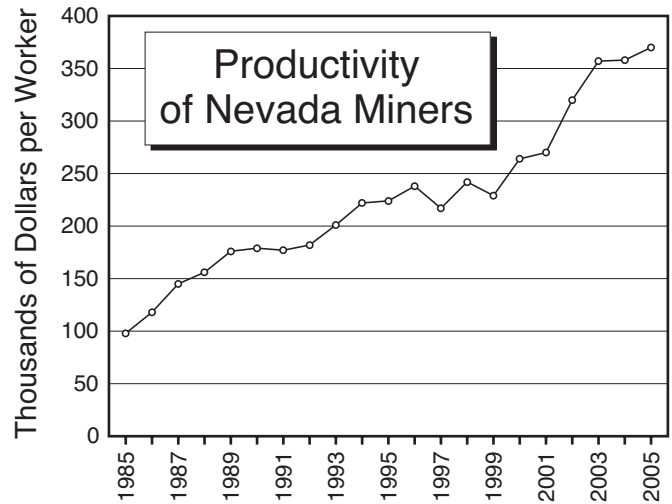
Most exploration focused on gold and silver, but high prices have stimulated exploration for several other commodities, including molybdenum, copper, uranium, and zinc. As measured by the numbers of active claims on public lands, grass-roots exploration activity rose significantly during the last year. According to a survey of exploration activities by the Nevada Division of Minerals (D. Driesner, 2006, Nevada Exploration Survey 2005, available at <http://minerals.state.nv.us/>), exploration activity in Nevada has been steadily increasing since 2001, when companies reported \$51.2 in expenditures in Nevada. The 23 companies responding to the survey reported spending \$121.3 million on exploration in Nevada in 2005, substantially higher than the \$79.7 million reported in 2004 and approaching the level of \$138.8 million in 1995. The companies are so optimistic about Nevada's potential that they project spending to be \$153.6 million in 2006. Another measure of exploration activity is the number of exploration geologists employed by these companies: 190 in 2005 compared with 123 in



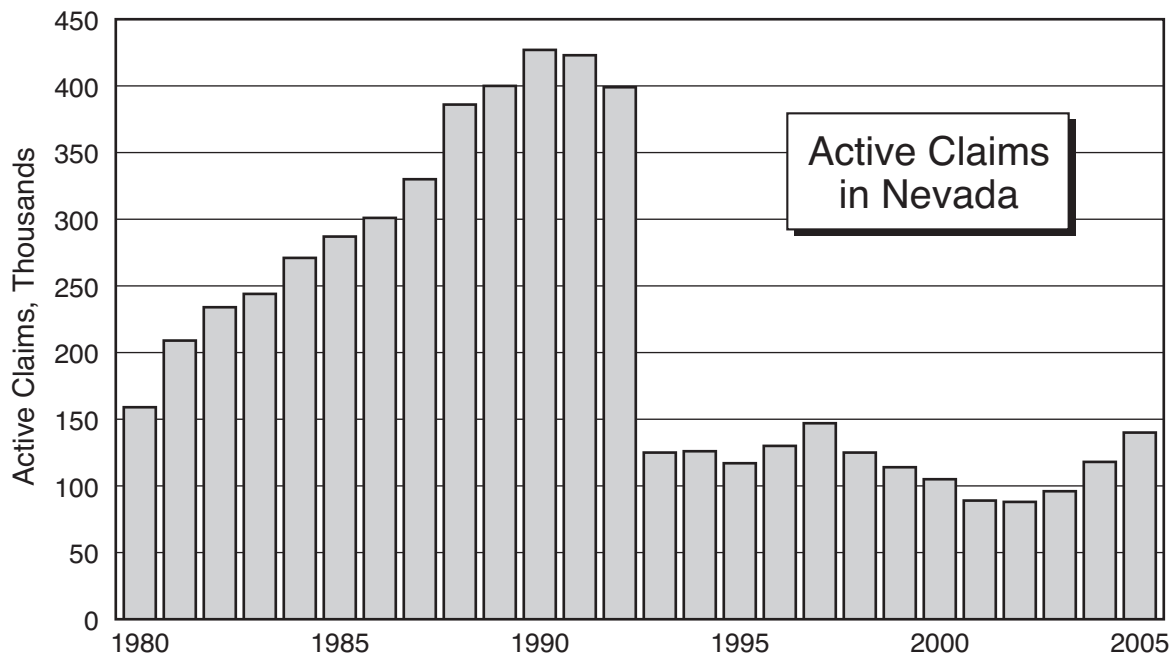
2004, 126 in 2003, and 309 in 1997. These companies project employing 201 exploration geologists in 2006. Because of its favorable geology and regulatory climate, Nevada continues to attract a large portion of the worldwide exploration expenditures of the companies actively exploring in Nevada. Significant exploration (including drilling, geochemical sampling, geological mapping, and claim staking) was reported in 14 of the 17 Nevada counties. Only the more populated counties—Clark, Carson City, and Washoe—did not have reported exploration activity, although mining of industrial minerals occurred in these three jurisdictions. The number of active claims in Nevada rose substantially in 2005 but is still close to the relatively low level reached in 1993 after the introduction of new fees by the federal government.

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 multimillion-ounce 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 high gold prices and continued technological improvements, some of the subeconomic resources of previous years have been upgraded to 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 10,561 workers in the nonfuel mineral industry in Nevada produced approximately \$360,600 in mined products in 2005, an all-time high figure.



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



**Number of active claims in Nevada as of October 1, 1980 through 2005. Data from the Nevada State Office of the U.S. Bureau of Land Management.**

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;
- preservation of archaeological and ecological resources;
- 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.

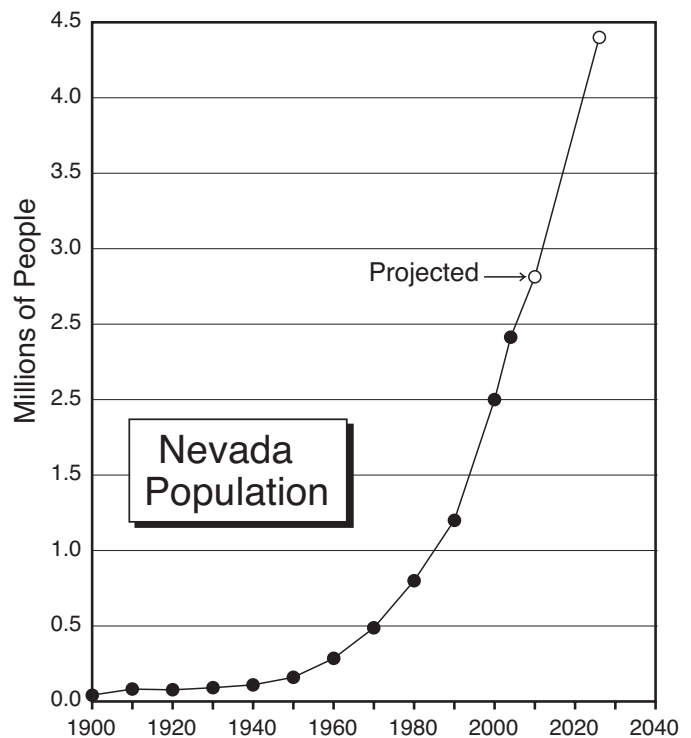
Much of Nevada's silver production in 2005, which totaled 9.9 million ounces, was a co-product or by-product of gold mining. With a ratio of value (average price of gold to average price of silver) of 61:1 in 2005, only those deposits with more than 61 times as much silver as gold can be considered primary silver deposits. Only one such deposit operated in Nevada in 2005—the Coeur Rochester Mine in Pershing County (with a silver to gold production ratio of 81:1 and total silver production of 5.7 million ounces). This one mine produced 58% of Nevada's silver in 2005. Nevada's production in 2005 accounted for 25% of the U.S. total and 1.5% of the world total. Although the Coeur Rochester Mine is approaching closure, and production in Alaska now makes it the leading silver producer in the country, by-product silver production allows Nevada to claim its nickname, the "Silver State," on the basis of both historical and present-day production.

The section on **Industrial Minerals** covers developments during 2005 and gives details on important commodities produced from or processed in Nevada, such as aggregate, barite, cement, clays, diatomite, dimension stone, dolomite, gypsum, lime, limestone, lithium, magnesite and brucite, perlite, salt, semiprecious gemstones (opal and turquoise), silica, and zeolites (clinoptilolite and mordenite). In 2005 Nevada ranked first in the nation in barite and diatomite production. The Silver Peak lithium operation in Clayton

Valley, Esmeralda County, where subsurface brines are evaporated on a 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 2005 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 because of Nevada's increasing population. According to the U.S. Census Bureau (<http://www.census.gov/>), Nevada's population reached 2.6 million in 2006, up 30% from 2.0 million in the 2000 census. The booming population requires extraordinary amounts of construction raw materials. Population growth is particularly strong in the Las Vegas metropolitan area (Clark County), where the influx of nine to ten new residents per hour results in approximately two acres per hour of land development for homes, businesses, and roads (Ronald Lynn, personal commun., 2006). A new cement plant, anticipated to be in production by 2008, is planned for the Las Vegas market.

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. These are mined locally to reduce transportation costs and related concerns regarding highway safety. Post-mining land uses include suburban developments, landfills, and recreation areas. Gypsum mines near the urban growth areas of Las Vegas are now being considered as sites for housing developments.



Data from the U.S. Census Bureau <[www.census.gov](http://www.census.gov)>. Projection to 2026 by Nevada State Demographer.

Developments in the geothermal industry are covered in the section on **Geothermal Energy**. Electric power production decreased slightly from 2004 to 2005, but sales remained steady. Fourteen plants operating at ten sites sold \$73.5 million in electricity, far surpassing the value of petroleum production. Additionally, geothermal energy is used at numerous places in Nevada for space heating, domestic warm water, recreation, dehydrating vegetables, and other agricultural applications. 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. Five 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. Nevada Bureau of Mines and Geology Map 151, Geothermal Potential Map of the Great Basin, Western United States, provides regional information for assessing the potential for high-temperature (>150°C) geothermal systems. Considerable information on geothermal energy resources in Nevada is provided on the Web at: [www.nbmjg.unr.edu/geothermal/gthome.htm](http://www.nbmjg.unr.edu/geothermal/gthome.htm).

Nevada has great potential for renewable energy (particularly geothermal, wind, and solar energy for electricity). Approximately 92% of Nevada's electricity currently is generated by power plants that burn fossil fuels, with 48.5% from coal and 43.5% from natural gas (2004 statistics from the Energy Information Administration, <http://www.eia.doe.gov/>). Hydroelectric dams account for 4.3%, and geothermal power plants account for about 3%. Geothermal energy experts at a July 25, 2005 meeting of a taskforce set up by the Western Governors' Association to assess geothermal

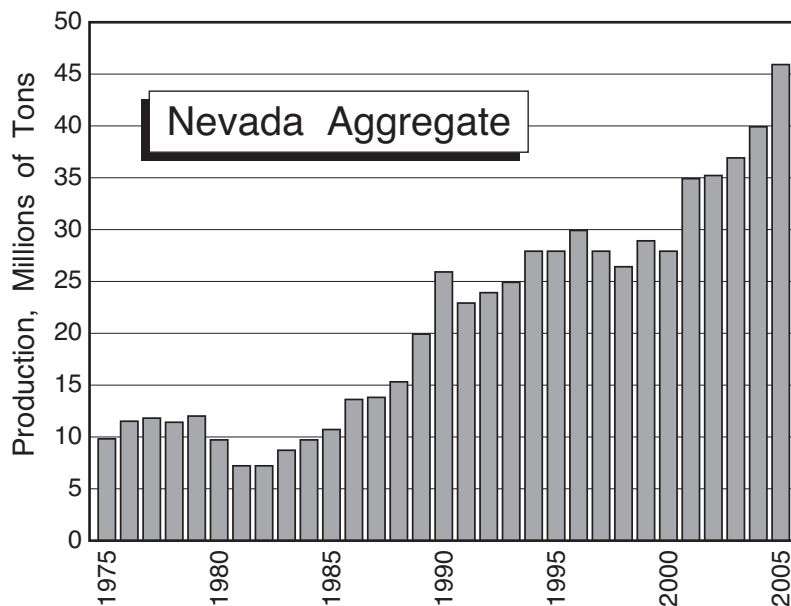
resource potential estimated that within the next 20 years Nevada could add approximately 1,500 to 2,900 megawatts of geothermal power-generating capacity (beyond the current capacity of 222 megawatts). If this potential were realized, and if energy prices continue to rise, geothermal power could become a billion-dollar per year business in Nevada.

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 \$17.1 million in 2005) is a minor part of U.S. production. The amount of oil production declined for the twelfth consecutive year, and no new fields were discovered in 2005. Small amounts of co-produced natural gas are used to fuel equipment used for oil production.

Relatively high oil prices and the 2003 discovery of oil at the Covenant field near Richfield in south-central Utah, where by the end of 2004 Wolverine Oil and Gas Corporation was producing 1,500 barrels per day from two wells, has stimulated exploration and leasing of federal lands in Nevada. According to the Utah Geological Survey, this oil field is in folded Jurassic Navajo Sandstone within the Sevier overthrust belt. Similar geological settings occur in Nevada.

In May 2005, the U.S. Geological Survey released its assessment of undiscovered oil and gas resources of the Eastern Great Basin (available at <http://energy.cr.usgs.gov/oilgas/noga/index.htm>), an area that includes the eastern portion of Nevada, western Utah, and part of southeastern Idaho. The U.S. Geological Survey estimates mean figures of 1.6 billion barrels of oil and 1.8 trillion cubic feet of natural gas remaining to be found in this region.

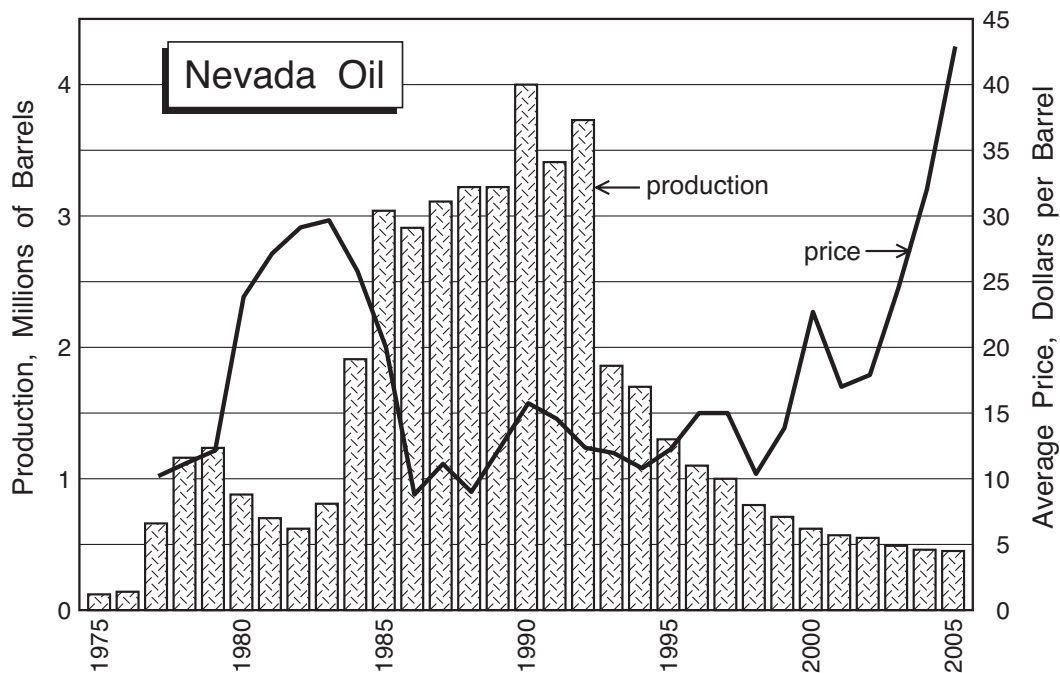
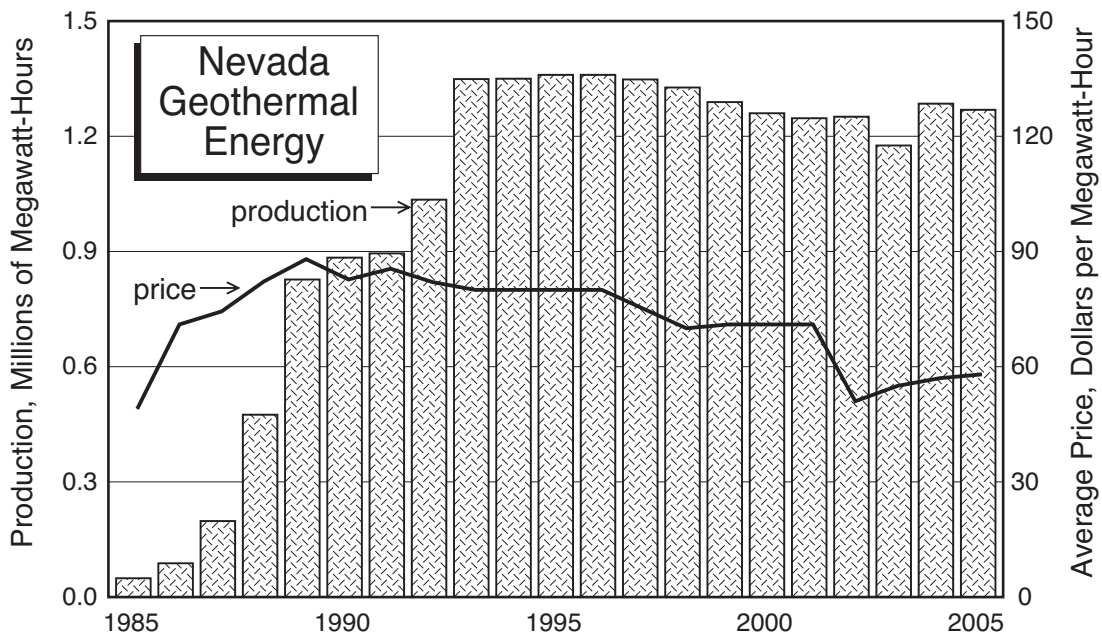
Exploration for oil in Nevada is encouraged by the cumulative production from the two premier fields in Railroad Valley, Grant Canyon and Trap Spring (21 million and 14 million barrels, respectively). Historically, few



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, Nevada has the potential for finding more multimillion-barrel fields. Ten new exploration wells were spudded in 2005. In part because of high prices for oil and gas, and in part because of Nevada's small production relative to fields in California, Utah, and elsewhere, operators in Nevada have been unable to find the rigs needed for drilling that is permitted.

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.nbmgs.unr.edu/](http://www.nbmgs.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/](http://www.eia.doe.gov/)) provides data on oil and gas, geothermal, and other energy sources. The Geological Society of Nevada ([www.gsn.org](http://www.gsn.org)) held its semi-decadal symposium in the May of 2005; approximately 90 reviewed papers were published in a bound volume.



# Metals

by John L. Muntean

Nevada produced 6.85 million ounces of gold, 9.95 million ounces of silver, 126 million pounds of copper, and 0.24 million pounds of mercury in 2005. Gold production was down 72,000 ounces from 2004, but Nevada still maintained its place as the leading producer of gold in the United States. Twenty-eight mines in Nevada reported gold production in 2005.

Barrick Gold Corp., with production from its Betze-Post, Meikle, and Ruby Hill Mines (plus its 50% share of Round Mountain's production and 33% share of Marigold's production) produced a total of 2,462,573 ounces of gold, the highest in Nevada. Newmont Mining Corp., reporting production from its Carlin trend mines, and from Twin Creeks, Lone Tree, Mule Canyon, Midas, and Phoenix Mines (plus its 25% share of the Turquoise Ridge joint venture), had a total Nevada production of 2,287,747 ounces, the second highest in Nevada. Placer Dome Inc., which was taken over by Barrick in early 2006, produced 783,669 ounces.

For the sixth consecutive year, Barrick's Betze-Post Mine was Nevada's most productive gold mine, with an output of 1,514,320 ounces. Newmont's Carlin trend mines produced 1,397,583 ounces, whereas the operations at the Cortez Joint Venture (60% Placer Dome and 40% Kennecott) produced 915,889 ounces from the Pipeline open pit. Barrick's Meikle Mine, the largest underground mine in Nevada, produced 509,568 ounces.

Coeur d'Alene Mines Corp.'s Rochester Mine maintained its place as the largest silver mine in Nevada with a production of 5,720,489 ounces. Newmont's Midas Mine was in second place with 2,166,396 ounces of silver, and the Round Mountain Mine followed in third place with 636,361 ounces.

Copper production in 2005 was up 370%, entirely due to ramping up of production from Quadra Mining's Robinson Mine. Mercury production was entirely a by-product of gold production.

## EXPLORATION

The current exploration boom in Nevada that started in 2004 continues unabated. Nevada county recorders registered 166,952 claim filings in 2005, a 14.4% increase over 2004 (fig. 1). These include both new claims and annual maintenance of existing claims. A total of 26,781 new claims were filed with the BLM in 2005 (according to the LR2000 database on 2/27/06), a 7% decrease from

2004 (fig. 2). Intense staking campaigns in 2005 were carried out in and around Placer Dome's Bald Mountain Mine, in Kobeh Valley, in and around the McDermitt caldera, and in the Bottle Creek district across Desert Valley from the old Sleeper Mine. At least 110 projects were drilled in 2005 (fig. 3). Thirty-eight different junior companies completed 60 of those projects<sup>1</sup>. The rest were done by 12 major or mid-tier companies<sup>1</sup>. The main exploration objective in Nevada continues to be gold.

Major and mid-tier companies continued to focus their exploration in 2005 in and around their active mines. Most new mine reserves were the result of drilling that converted resources to reserves. In some cases, resources were converted to reserves without drilling, simply because of the higher gold price. Major drill programs were carried out in 2005 by Newmont at its Leeville, Gold Quarry, Deep Post, Twin Creeks, and Midas Mines. Known, but undeveloped, deposits are being put into production. Newmont continued a major program at its Phoenix project in 2005, which will be put into full production in 2006. In addition to gold, Newmont will produce copper from the Phoenix project. Newmont is also in the process of permitting its Emigrant deposit for a planned start-up in 2007 or 2008. Barrick drilled ~250,000 feet in and around its Goldstrike Mine in 2005, both on the surface and underground. In addition to a major drill program at its East Archimedes project in 2005, Barrick started pre-stripping, and production is planned for 2007. Other active mines with major drill programs in 2005 included Bald Mountain (Placer Dome), Cortez Joint Venture (60% Placer Dome, 40% Kennecott), Turquoise Ridge Joint Venture (70% Placer Dome, 30% Newmont), Round Mountain Joint Venture (50% Kinross, 50% Barrick), Marigold Joint Venture (67% Glamis, 33% Barrick), and Jerritt Canyon (Queenstake).

Northumberland and Ren were the only major drill projects in 2005 undertaken by major or mid-tier companies outside its active mines. Newmont is trying to increase and convert to reserves an estimated resource of 2 million ounces at Northumberland, located north of Round Mountain. It can earn a 60% interest in Northumberland, which is owned by NewWest, by spending \$25 million. Centerra continues to explore the Ren deposit (JV with Barrick) in the northern Carlin trend. Drilling in 2005 increased the measured and indicated resource at Ren to 1,201,000 ounces at a grade of 0.397 opt (troy ounces per short ton) gold.

<sup>1</sup> The classification of companies into major, mid-tier, or junior in this section of the report is arbitrarily based on gold production and market capitalization. The loose criteria are as follows: 1) major companies produce greater than 1 million ounces of gold worldwide, and have market capitalizations of over \$3 billion, 2) mid-tier companies produce between 50,000 and 1 million ounces of gold and have market capitalizations less than \$3 billion, and 3) junior companies produce less than 50,000 ounces of gold and have market capitalizations less than \$500 million.

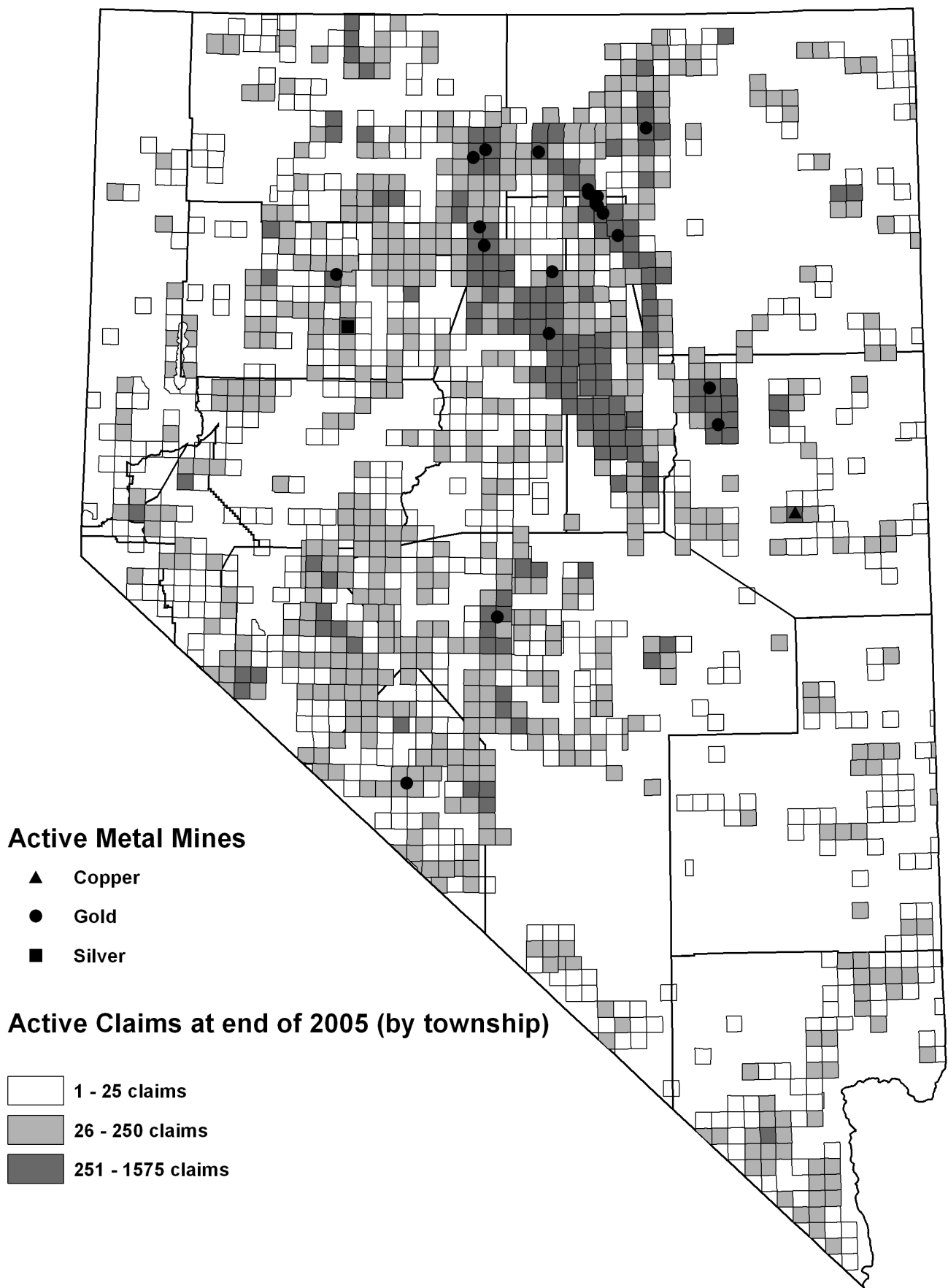


Figure 1. Map showing distribution of active mining claims by township at the end of 2005. Source of data is Bureau of Land Management's LR 2000 database.



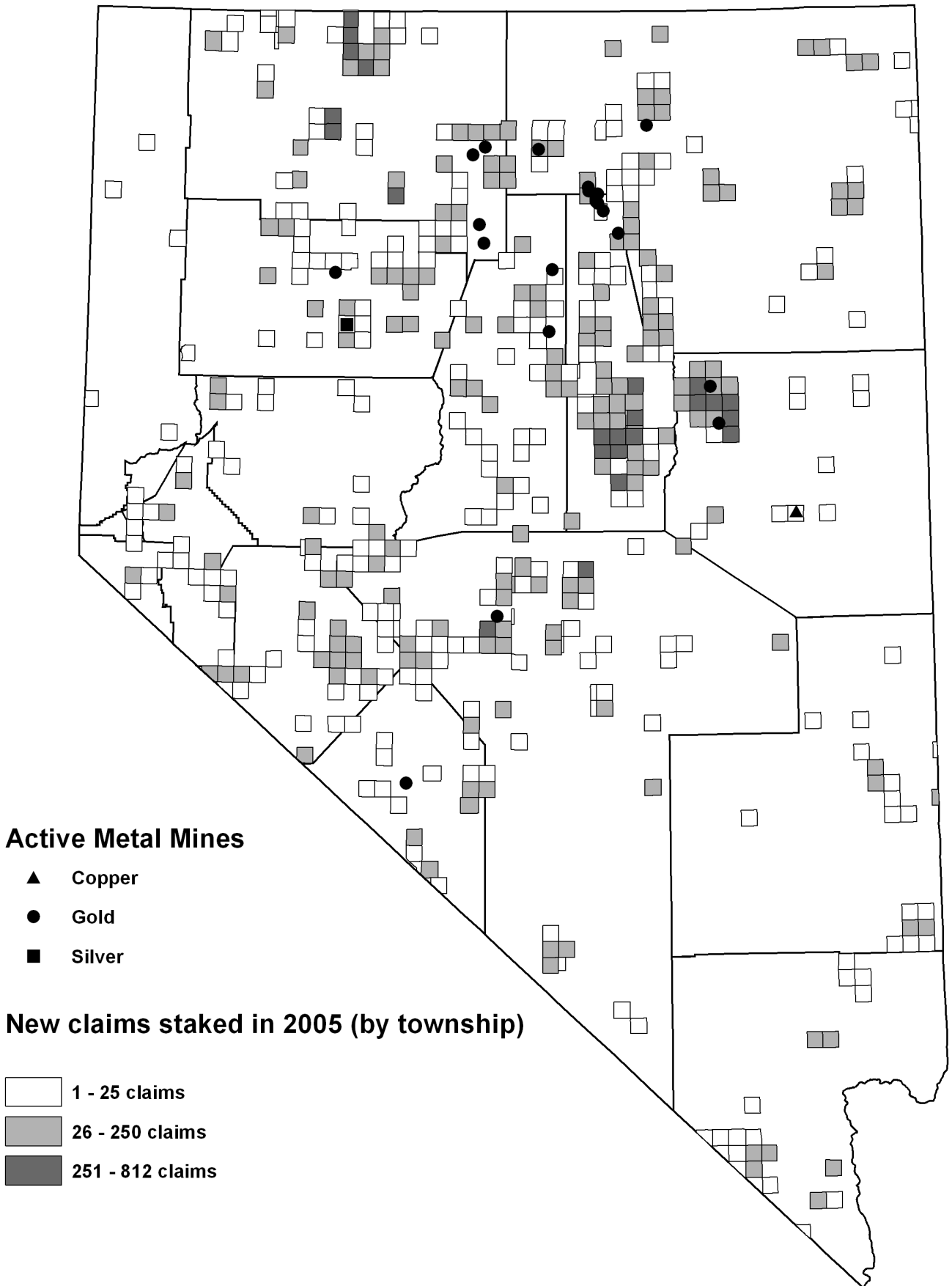


Figure 2. Map showing distribution of new mining claims by township staked in 2005. Source of data is Bureau of Land Management's LR 2000 database.

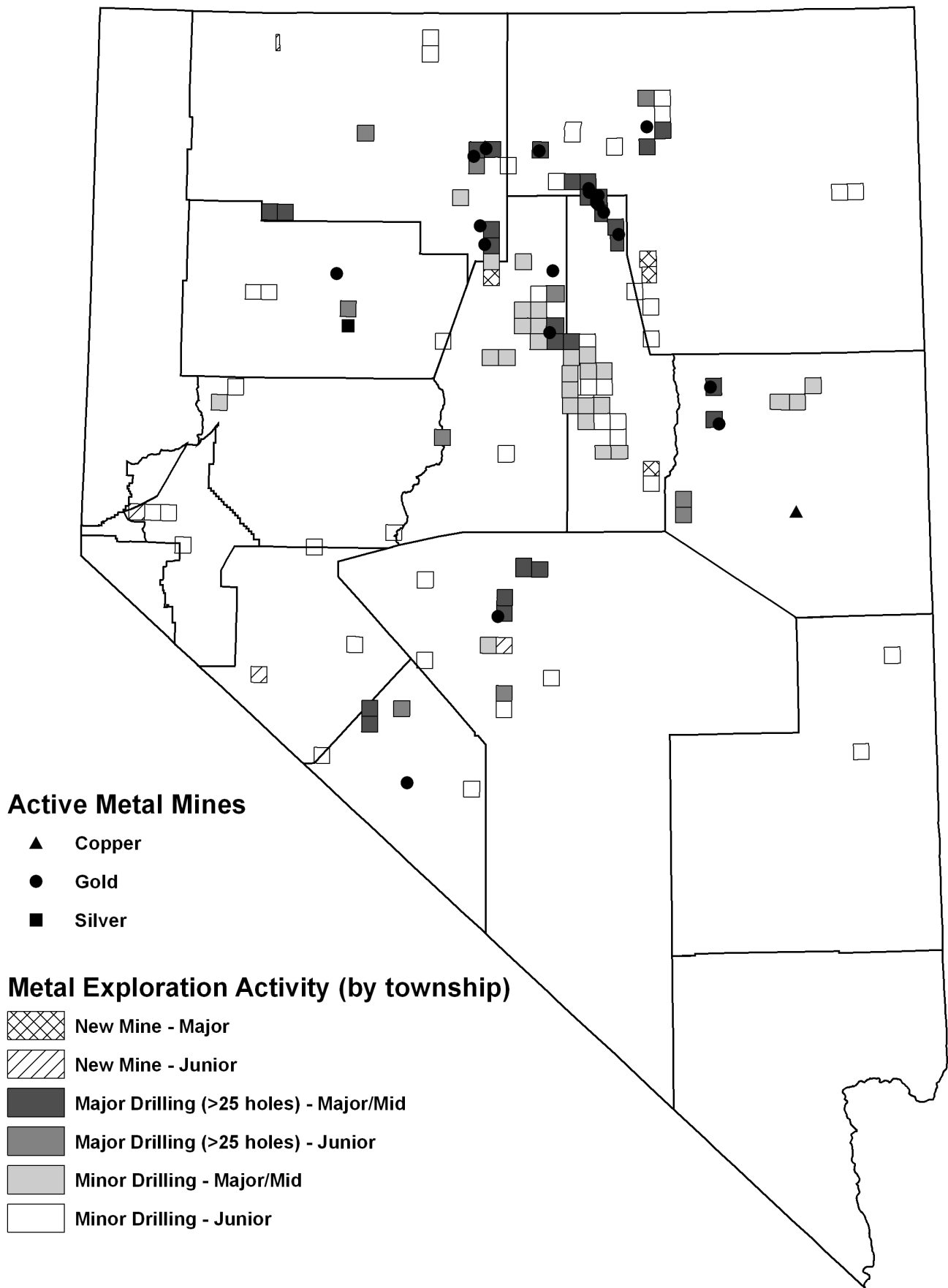


Figure 3. Map summarizing drilling and mine development activity by township in 2005.

The discovery of Cortez Hills by Placer Dome in 2002 continued to fuel much of the investment in junior companies exploring in Nevada. Junior companies have concentrated their efforts on the Battle Mountain-Eureka trend, and have either drilled their own properties, or have joint-ventured them with majors. In 2005 Placer continued to delimit the size of the Cortez Hills deposit (60% Placer Dome, 40% Kennecott) and to convert resources to reserves. Placer announced in September a bulk-mineable proven and probable reserve of 58.7 million tons of 0.079 opt gold at Cortez Hills - 5,545,000 ounces. An underground resource (measured and indicated) of 2,422,000 ounces of gold at a grade of 14.4 g/t (grams per metric ton) occurs below the reserve. A decline is planned for 2006 to begin converting those underground resources into reserves.

Although gold still dominates the Nevada mining industry, companies are beginning to show interest in other metals. Quadra Mining Ltd. reopened the Robinson copper mine in 2004. Although it did not do any exploration in 2005, it is planning a significant program in 2006. The only other project in the state in 2005, where copper was the primary metal of interest, was Aberdene Mine Ltd.'s New York Canyon project near Luning. Golden Phoenix took advantage of the high price of molybdenum by opening the Ashdown Mine in northwestern Humboldt County. In 2005, Golden Phoenix began a decline to take a bulk sample and built a small flotation mill on site. Idaho General Mines was assessing whether to develop the Mount Hope porphyry molybdenum deposit north of Eureka and put it into production. Likewise in 2005, Augusta Resources was planning on drilling at Mount Hamilton east of Eureka to assess whether the existing molybdenum-copper-tungsten-gold resources there can be put into production.

Although Coeur d'Alene's Rochester Mine in Pershing County remains the largest primary silver mine in the United States, mining is planned to end in 2007. Despite high silver prices, Midway Gold's Black Prince project in Lincoln County was the only reported silver project that was drilled in 2005. Piedmont and AuEx plan to evaluate remaining resources and potential at the old Trinity Silver Mine in Pershing County.

Vanadium International staked 13 claims in the south part of the Fish Creek Range in northern Nye County. And, in a play that is reminiscent of the uranium exploration boom in the 1970s, more than 2,000 claims were staked by Western Energy Development Corp. in 2005 in the McDermitt caldera area west of McDermitt in Humboldt County.

Exploration activity is summarized below by county and district. Projects that were drilled in 2005 or leading to new production in the near future are emphasized. Also, areas of intense claim staking in 2005 are highlighted. Updated resources and reserves are listed in the section "Major Precious-Metal Deposits."

## CHURCHILL COUNTY

### Jessup District

**Hannah.** Lincoln Gold Corp. completed an 11-hole (4,815-foot) reverse circulation drill program on its Hannah property just west of Jessup proper. The best intercept was 10 feet of 0.094 opt gold and 5.05 opt silver (hole H-11, 15–25 feet), which was targeted on a silicified iron-stained breccia cutting altered Jurassic-Triassic metasedimentary rocks. The small breccia outcrop is exposed on the edge of a pediment that slopes to the west. (Lincoln Gold Corp. press release, 7/6/2005; Lincoln Gold website, [www.lincolngold.com](http://www.lincolngold.com))

### Truckee District

**Fireball Ridge.** Newcrest completed an 11-hole (6,235-foot) reverse circulation drill program at Fireball Ridge, where low-sulfidation epithermal gold mineralization occurs in Jurassic-Triassic metasedimentary rocks. The best intercepts were 5 feet of 0.093 opt gold (hole N-1, 85–90 feet) and 15 feet of 0.027 opt (hole N-17, 405–420 feet). Newcrest terminated their lease agreement with AuEx Ventures Inc. (AuEx press releases, 10/21/2006, 2/7/06; AuEx website, [www.auexventures.com](http://www.auexventures.com))

### New Pass District

**New Pass.** Bonaventure Enterprises Inc. (joint venture with White Knight Resources Ltd.) drilled 28 reverse circulation holes (9,140 feet) in and around the existing gold resource that is hosted by Triassic sedimentary rocks. Hole NP-0503 intersected 65 feet of 0.031 opt gold; NP-0505 intersected an upper zone of 30 feet at 0.025 opt gold and a new lower zone of 15 feet at 0.046 opt gold; and NP-0508 intersected 50 feet of 0.039 opt gold. The drilling confirmed previous drilling results in the area of the historical resource and potentially expanded the resource to the north. The drilling also intersected higher grade zones across north-northwest-trending, high-angle faults, including 10 feet of 0.307 opt gold and 0.39 opt silver (NP05-20, 135–145 feet). (White Knight Resources press releases, 10/4/05, 11/15/05; Bonaventure and White Knight websites, [www.bonaventure.us](http://www.bonaventure.us), [www.whiteknightres.com](http://www.whiteknightres.com))

## DOUGLAS COUNTY

### Buckskin District

**Lincoln Flat.** Lincoln Gold Corp. drilled nine reverse circulation holes (5,145 feet) in the Lincoln Flat area between the Singatse and Buckskin Ranges. Scattered intercepts of 150 to 330 ppb (parts per billion) gold, with a high of 770 ppb gold, were encountered. The property was returned to the underlying owner. (Lincoln Gold Corp. press release, 10/13/2005; Lincoln Gold website, [www.lincolngold.com](http://www.lincolngold.com))

## ELKO COUNTY

### Bootstrap District

**Ren.** Centerra Gold's 2005 drill program on the Ren property (62% Centerra Gold, 38% Barrick Gold Corp.) resulted in a 52% increase in contained gold in the indicated resources category over the 2004 year-end resource estimate. The resource is now 3.035 million tons at 0.397 opt gold (1.201 million ounces of gold). The increase was due to upgrading inferred resources in the 69 Zone through additional drilling, the completion of two additional holes into a high grade section of the JB Zone and increasing the top-cut levels from 40 to 70 g/t gold. The drilling confirmed continuity of high grade mineralization in the JB Zone. (Centerra Gold press releases, 7/29/2005, 1/23/2006; Centerra website [www.centerragold.com](http://www.centerragold.com))

**South Arturo.** Barrick Gold Corp. drilled 28 holes in 2005 at South Arturo—a new discovery on the Dee property (60% Barrick, 40% Glamis Gold) at the northern end of the Carlin trend. South Arturo is located just south of the Dee open pit. All the holes hit significant oxide gold mineralization over a 1,000- by 1,500-foot area. The mineralization is open to the south, east, and west. (Barrick Gold website, [www.barrick.com](http://www.barrick.com))

**Storm.** Barrick Gold Corp. completed a ~70,000-foot drill program (surface reverse circulation and underground core drilling) at the Storm property (60% Barrick Gold, 40% Meridian Gold). The measured and indicated resource was increased to 0.55 million tons at 0.45 opt gold (272,500 ounces of gold). (Barrick Gold website, [www.barrick.com](http://www.barrick.com) and Meridan Gold website, [www.meridiangold.com](http://www.meridiangold.com))

### Carlin District

**Emigrant.** Newmont Mining Corp. submitted an EIS to put its Emigrant gold deposit into production as an open pit. Construction has been delayed until 2007, awaiting permits. (Nevada Clearinghouse 2/9/05, Elko Mining Quarterly Winter 2005–2006)

### Gold Circle District

**Clover.** New Sleeper Gold Corp. carried out a ~2,000-foot core drill program at Clover, a low-sulfidation epithermal gold prospect west of Midas. After the drill program they terminated their joint venture with Atna Resources Ltd. (New Sleeper Gold press releases 9/20/2005, 2/24/2006; Atna Resource website, [www.atna.com](http://www.atna.com))

**Midas.** Newmont carried out mostly resource to reserve drilling. It also drilled exploration targets on veins that are extensions of and parallel to the Colorado Grande and Gold Crown veins. (Newmont website, [www.newmont.com](http://www.newmont.com))

## Independence Mountains District

**Big Springs.** Gateway Gold Corp. drilled more than 75 holes. Multiple drill intercepts between 0.04 and 0.15 opt gold within 500 feet of the surface were reported in 2005. The drill program resulted in an expansion of the Beadles Creek zone, high-grade intercepts and expansion of the Crusher zone, and identification of a north-south-trending gold-bearing structural zone, referred to as Brien's trend. Results from the Crusher zone, about 650 feet northeast of the North Sammy Pit, include 165 feet of 0.102 opt gold (hole GW05-166, 130–295 feet), which included 20 feet of 0.525 opt gold, and 25 feet of 0.818 opt gold (hole GW05-172, 70–95 feet). The Beadles Creek target area is at the northeast end of a 7,000-foot structural corridor that includes the South Sammy and 601 deposits. Drilling results at Beadles Creek in 2005 include 95 feet of 0.104 opt gold (hole GW05-203C, 445–540 feet), which included 25 feet of 0.253 opt gold. Brien's trend is up to 100 feet wide and 3,500 feet long and links the South Sammy 701 and 401 open pits. Results along Brien's trend include 135 feet of 0.103 opt gold (hole GW05-234, 79–214 feet). Samples of outcrops of lower plate rocks 4,300 feet west of the Mac Ridge open pit and 2,400 feet east of the nearest drill hole assayed up to 0.165 opt gold.<sup>2</sup> Gateway announced a new inferred resource for Big Springs. At a cut-off grade of 0.025 opt gold, the resource is 1.195 million ounces of gold in 15.145 million tons at a grade of 0.078 opt gold. At a cut-off grade of 0.3 opt gold, the resources is 211,000 ounces of gold in 468,000 tons at a grade of 0.45 opt gold. (Gateway Gold press releases, 7/13/2005, 8/11/2005, 10/18/2005, 11/1/2005, 1/12/2006, 1/23/2006, and 1/30/2006; Gateway Gold Website, [www.gatewaygold.com](http://www.gatewaygold.com))

**Dorsey Creek.** Gateway Gold Corp. drilled six core holes. Significant mineralized intervals in the holes range from 0.007 to 0.074 opt gold and 0.1% to greater than 1.0% arsenic. Mineralized core lengths range from 70 to 405 feet. Results include 20 feet of 0.255 opt gold, 5 feet of 0.204 opt, and 5 feet of 0.260 opt. (Gateway Gold press release, 2/15/2005; Gateway Gold Website, [www.gatewaygold.com](http://www.gatewaygold.com))

**Golden Dome.** Gateway Gold Corp. drilled three deep core holes at its project located between Big Springs and Jerritt Canyon. Hole GD05-06C intersected lower plate (limestone?) at 1,510 feet. The hole contained 15 feet of 0.026 opt gold in upper plate rocks. Hole GD05-07C hit lower plate at 1,707 feet and continued in lower plate, where it intersected anomalous gold and arsenic, until the bottom of the hole at 2,752 feet. Hole GD05-08C hit lower plate at 1,698 feet and intersected 25 feet of 0.039 opt gold between 1,698 and 1,723 feet. (Gateway Gold press releases, 10/6/2005, 11/15/2005; Gateway Gold website, [www.gatewaygold.com](http://www.gatewaygold.com))

<sup>2</sup> Lower plate and upper plate refer to the footwall and hanging wall, respectively, of the Roberts Mountains thrust fault. The lower plate is predominantly carbonates, which are more receptive to gold mineralization than upper plate rocks, which are predominantly siliceous and non-calcareous.

**Jerritt Canyon.** Queenstake Resources Ltd. carried out a major drill program, mainly aimed at converting resources to reserves and extending the underground deposits at SSX, Smith, West Dash, and Steer. Production began at the Mahala underground mine, which is being accessed from the Smith underground mine portal. Results at the SSX-Steer deposits, where 386 reverse circulation and core holes totaling 48,707 feet were drilled, include 65 feet of 0.677 opt gold (discovered with drilling aimed at connecting Steer and SSX), 65 feet of 0.688 opt gold (Zone 5, SSX), and 210 feet of 0.385 opt gold (Zone 1, SSX). At Mahala, 76 reverse circulation holes totaling 17,005 feet and 9 core holes totaling 5,522 feet were drilled. Results include 55 feet of 0.354 opt gold and 65 feet of 0.407 opt gold. Results along the R4 and R11 dike trends in the Smith-Mahala mine area included 30 feet of 0.537 opt gold. Six surface reverse circulation holes (4,140 feet) were drilled in the West Dash area, where 30 feet of 0.544 opt gold were intersected. Results at the Smith mine, where 57 underground reverse circulation holes were drilled (9,825 feet), included 35 feet of 0.598 opt gold. The SSX deposit produced its one millionth ounce of gold in 2005. (Queenstake Resources press releases, 11/8/2005, 1/25/2006; Queenstake Resources website, [www.queenstake.com](http://www.queenstake.com))

**Starvation Canyon.** Queenstake Resources continued to drill out the deposit at Starvation Canyon at the south end of their Jerritt Canyon property. It drilled 46 holes (42 reverse circulation and 4 core), totaling 26,869 feet. Better intercepts included 60 feet of 0.357 opt gold (TJ-216C, from 660 feet) and 45 feet of 0.413 opt (TJ-242, from 400 feet). Based on drilling up to the end of 2005, Queenstake announced a probable reserve of 400,500 tons at 0.3 opt gold (121,100 ounces) and a measured and indicated resource 676,400 tons at 0.28 opt gold (190,700 ounces). The deposit lies above the water table in an area of steep topography that can be readily accessed by portal from the hillside. Mineralization remains open in several directions. (Queenstake Resources press releases, 9/27/2005, 1/18/2006, and 3/05/2006; Queenstake Resources website, [www.queenstake.com](http://www.queenstake.com))

## Ivanhoe District

**Hollister.** Hecla Mining Co. (in a joint venture with Great Basin Gold Ltd.) began underground development to access and evaluate the Gwenivere and Clementine vein systems. The exploration decline, which encountered poor ground conditions, finally intersected the Gwenivere vein 2,720 feet from the portal in late 2005. One exposure of the vein assayed 3.17 opt gold and 28.3 opt silver over a true width of 8.2 feet, including a section of 7.47 opt gold and 50.0 opt silver over 3.3 feet. A second exposure assayed at 0.49 opt gold and 7.9 opt silver over 15.2 feet (including a section of 0.77 opt gold and 9.9 opt silver over 8.9 feet). A major underground drill program is planned for 2006. (Hecla Mining press releases, 8/3/2005, 12/12/2005; Hecla website, [www.hecla-mining.com](http://www.hecla-mining.com))

**Silver Cloud.** Geologix Explorations Inc. completed two core holes (5,258 feet). Hole 05SC-001 was characterized by intense pervasive alteration and numerous, geochemically anomalous, sulfide-rich hydrothermal breccias. Hole 05SC-002 encountered a number of banded veins. No assays have been reported. (Geologix press release, 9/28/2005; Geologix website, [www.geologix.ca](http://www.geologix.ca))

## Pequop District

**Pequop.** AuEx Ventures Inc. drilled 15 reverse circulation holes totaling 6,435 feet. Seven of these were drilled at the Long Canyon target area on the eastern portion of the property and eight were drilled on the Acrobat and Juggler targets approximately 3 miles to the west of Long Canyon. Results from Long Canyon included: 70 feet of 0.189 opt gold (hole LC-012, 0–70 feet), 70 feet of 0.176 opt (hole LC-010, 65–135 feet), 50 feet of 0.161 opt (hole LC-013, 50–100 feet), and 40 feet of 0.126 opt (hole LC-014, 60–100 feet). Results from the Acrobat and Juggler targets included: 55 feet of 0.117 opt (hole WN-056, 75–130 feet). All of the intercepts were visually oxidized. Metallurgical tests are underway. (AuEx press release, 10/25/2005; AuEx website, [www.auexventures.com](http://www.auexventures.com))

## Railroad District

**Railroad.** Royal Standard Minerals Inc. drilled 14 shallow holes (22- to 300-foot depths) in the known deposits at Railroad. The holes were drilled to assist in mine permitting and metallurgical testing. Several holes were extension tests of the mineralized zone at the East Jasperoid deposit and to fill in a resource gap in the Pod deposit. At Pod, hole POD-05-04 intersected 110 feet of 0.134 opt gold at a depth of 100 feet, which included 60 feet of 0.212 opt gold. This drilling extended the known Pod resource approximately 100 feet westward as well as upwards into siltstone in the upper part of the Webb Formation. (Royal Standard press releases, 11/7/2005, 12/05/2005; Royal Standard website, [www.royal-standard.com](http://www.royal-standard.com))

## Robinson Mountain District

**Pony Creek.** Grandview Gold Inc. completed two core holes (2,014 feet) within the known resource at Pony Creek to verify earlier Newmont results. Its best intercept was 55 feet of 0.149 opt gold (PC-05-02/2A, 395–450 feet), which included 10 feet of 0.365 opt gold within a fine-grained, pyrite-rich sandy unit beneath rhyolite porphyry. (Grandview press release, 2/1/2006; Grandview website, [www.grandviewgold.com](http://www.grandviewgold.com))

## Rock Creek District

**Horse Mountain.** Keegan Resources Inc. drilled one deep core hole to 2,945 feet. The hole intersected down-dip extensions of splays of the Rock Creek fault that were anomalous in both gold (up to 89 ppb) and arsenic

(up to 4,944 ppm). The hole did not intercept its lower plate target, and instead penetrated additional faulted blocks of upper plate argillites and siltstones. Keegan mobilized a core rig in November to drill two holes to test a prominent soil pediment anomaly on the southern part of the property. No results were reported. Keegan has dropped the property. (Keegan press releases, 7/20/2005, 8/10/2005, 11/22/2005, 3/27/2006; Keegan website [www.keeganresources.com](http://www.keeganresources.com))

## Tuscarora District

**Danny Boy.** GrandCru Resources Corp. drilled six holes (2,603 feet). The best mineralization was found at Beard Hill. Drill hole DB05-1 intersected 55 feet of 0.012 opt gold from 61–116 feet. (GrandCru press release, 1/4/2006 press release; GrandCru website, [www.grandcruresources.com](http://www.grandcruresources.com))

## Union District

**Leonid.** Nevada Superior (joint venture with AuEx Ventures Inc.) drilled three reverse circulation holes. No significant gold was reported. (AuEx press release, 2/7/2006; AuEx website, [www.auexventures.com](http://www.auexventures.com))

## ESMERALDA COUNTY

### Buena Vista District

**Tip Top.** Gold Summit Corp. drilled three core holes. Better intercepts included 1.3 m of 15.6 g/t gold (MMC-19, from 21.1 m ) and 4.2 m of 4.1 g/t gold (MMC-17, from 48.7 m), which included 0.9 m of 9.7 g/t gold. (Gold Summit press release, 9/14/05; Gold Summit website, [www.goldsummitcorp.com](http://www.goldsummitcorp.com))

### Gilbert District

**Monte Cristo.** Gold Summit Corp. drilled approximately 25 core holes that were targeted on high-grade veins below the McLean pit. Better intercepts included 1 m of 22.5 g/t gold (hole MCC20, from 239.8 m), 1.2 m of 14.6 g/t gold and 1,309 g/t silver (hole MCC-21, from 218 m), 2.43 m of 117.5 g/t gold (hole MCC-23, from 256 m) that contained 0.91 m of 261 g/t gold, and 2.65 m of 16.17 g/t gold (hole MCC-34, from 271 m). It reported several intervals >2 m that assayed >5 g/t gold over an area approximately 350 m by 350 m. A resource estimate was underway in 2005. (Carraher and Taylor, 2005; Gold Summit press releases, 3/1/2006, 3/24/2005, 6/23/05, 8/18/2005, 9/14/2005, 3/1/2006; Gold Summit website, [www.goldsummitcorp.com](http://www.goldsummitcorp.com))

### Goldfield District

**Gemfield.** Metallic Ventures Gold Inc. drilled 14 reverse circulation holes (6,300 feet)—mainly offsets of the known Gemfield deposit. Many holes intercepted

thick oxide intervals (100–250 feet) of 0.01 opt gold in Sandstorm rhyolite, including a zone within a mile northeast of the Gemfield deposit, where one hole hit 25 feet of 0.049 opt gold. (Metallic Ventures Gold press releases, 9/26/2005, 1/11/2006; Metallic Ventures Gold website, [www.metallicventuresgold.com](http://www.metallicventuresgold.com))

## Rock Hill District

**Redlich.** Newcrest Mining Ltd. (joint venture with Miranda Gold Corp.) drilled 26 reverse circulation drill holes (16,145 feet). Results have not yet established significant continuity of high-grade gold mineralization within the Redlich fault zone. Better intercepts included 5 feet of 1.945 opt gold, which suggested a potentially deeper bonanza zone below the zone of previous drilling, and 210 feet of 0.019 opt gold, which contained 10 feet of 0.195 opt gold. (Miranda Gold press releases 9/1/05, 11/4/06; Miranda website, [www.mirandagold.com](http://www.mirandagold.com))

## EUREKA COUNTY

### Antelope District

**Celt.** Teck-Cominco (joint venture with White Knight Resources Ltd.) drilled eight holes in the central portion of the Celt property, located along the western range front of the Roberts Mountains. Lower plate carbonate host rocks were encountered at relatively shallow depths under a veneer of upper plate siliciclastic rocks in five of the eight holes. Though rock chip samples assayed up to 6.17 ppm gold at the surface, only minor anomalous gold was detected in the drill holes. Gravity and IP data suggests a 7-km-long zone fault block, interpreted to be the faulted western edge of a subsurface lower-plate horst block. Teck-Cominco plans additional drilling in 2006. (White Knight press release, 2/28/2006; White Knight website, [www.whiteknightres.com](http://www.whiteknightres.com))

**Cottonwood.** White Knight Resources' Cottonwood project is located along the Wall fault in the Roberts Mountains about 5 miles northeast of the Gold Bar Mine and adjacent to the Gold Canyon open pit. In 2005, it drilled five shallow holes at the southern end of the target area where a hole drilled by Barrick Gold in the late 1990s was reported to have significant gold in favorable host rocks. None of the five holes hit significant gold. (White Knight press release, 2/28/2006; White Knight website, [www.whiteknightres.com](http://www.whiteknightres.com))

**Gold Bar.** American Bonanza Gold Corp. drilled seven holes (4,719 feet). Most of the holes hit gold mineralization between 600 and 700 feet. Intercepts include 30 feet of 0.046 opt gold (BZGB-7, 690–720 feet), and 80 feet of 0.071 opt gold (BZGB-8, 615–695 feet). It apparently was drilling an extension of the known Mill Site gold deposit. (January 2006 SEG Newsletter, American Bonanza press release, 11/30/2005)

**Gold Pick.** White Knight Resources drilled 19 reverse circulation holes (11,700 feet). The drill program was designed to test for extensions of feeder structures beyond the design limits of the Gold Pick open pit. The drilling significantly extended both the southwest and northwest feeder zones. Hole GPQ-6 intersected 30 feet (515–545 feet) grading 0.062 opt gold, including 5 feet of 0.230 opt gold. Hole GPQ-9 intersected 25 feet (225–250 feet) grading 0.143 opt gold, including a 15-foot intercept of 0.226 opt gold. Hole GPQ-16 intersected 25 feet (525–550 feet) of 0.083 opt gold, including 10 feet of 0.16 opt gold. Holes GPQ-6 and GPQ-16 extended the resource 600 feet to the southwest. The mineralization remains open along the northeast extension of the feeder fault for Gold Pick East. (White Knight press releases, 11/25/2005, 2/15/2006; White Knight website, [www.whiteknightres.com](http://www.whiteknightres.com))

**Gold View.** Minterra (joint venture with Golden Patriot Corp.) reported it was carrying out a four-hole drill program to test a coincident gravity high-gold soil anomaly on the pediment north of the Roberts Mountains. No results have been released. (Golden Patriot press release, 10/14/05).

**McClusky Pass.** White Knight drilled one core hole to 1,191 feet and one reverse circulation hole to 775 feet on their McClusky Pass property, located just south of Tonkin Springs. The two holes were drilled 1,000 feet apart to test a horst block interpreted from geophysics. Both holes bottomed in upper plate rocks. The reverse circulation hole was lost because of poor drilling conditions before it hit the intended geophysical target, but the hole encountered anomalous gold, dikes, and strong dolomitization. No assays have been reported for the core hole. (White Knight press release, 2/28/2006; White Knight website, [www.whiteknightres.com](http://www.whiteknightres.com))

**Red Canyon.** Newmont Mining Corp. (joint venture with Miranda Gold Corp.) completed geologic mapping, reinterpretation of geophysical data, three-dimensional modeling, and a gas geochemical survey followed by 13,115 feet of reverse circulation drilling in 11 holes. No results were reported, except that gold assays were disappointing. Newmont terminated its agreement with Miranda. (Miranda Gold press releases, 2/15/2006, 4/12/2006)

## Buckhorn District

**HC.** J-Pacific Gold Inc. completed a four-hole reverse circulation drill program (5,235 feet). All four holes terminated in quartzite with pyrite that assayed up to 664 ppb gold in hole HC-01. HC-01 was then deepened to 2,500 feet. It never hit lower plate or any significant gold. (J-Pacific press releases, 10/12/05, 3/16/06; J-Pacific website, [www.jpgold.com](http://www.jpgold.com))

## Cortez District

**ET Blue.** The Cortez Joint Venture (60% Placer Dome and 40% Kennecott Minerals) reportedly carried out some drilling at ET Blue, but no further information is available.

**Golden Trend.** J-Pacific Gold Inc. completed one core hole to 2,000 feet. The hole drilled gravel to 180 feet and bottomed in upper plate. The best intercept was 5 feet of 0.039 opt gold (185–190 feet). (J-Pacific press release 12/15/05; J-Pacific website, [www.jpgold.com](http://www.jpgold.com))

**Horse Canyon.** The Cortez Joint Venture reportedly carried out drilling south of the Horse Canyon open pits and north of ET Blue in the Red Hill area, but no further information is available.

**Mill Canyon.** Victoria Resource Corp. continued their deep drill program at Mill Canyon. During phase 1 (late 2004/early 2005), seven holes (4,850 m) were drilled to follow-up previous hole OC-36 in the RJR zone (25.9 m grading 10.4 g/t gold). Anomalous gold occurs throughout alteration and breccia zones with values up to 1.175 g/t gold over 39.6 m (hole RJR-3, 807.7–847.3 m) and 1.58 g/t gold over 22.3 m in (hole RJR-4, 718.1–740.4 m). The RJR alteration and mineralized zone is at least 600 m long, 215 m wide, and at least 600 m in a down-dip direction. During phase 2 in 2005, four deep holes were drilled. Hole RJR-6 intersected 10.7 m of 2.7 g/t gold (405.4–416.1 m) and 2.3 m of 7.5 g/t gold (418.2–420.5 m), and hole RJR-7 intercepted 10.7 m of 3.1 g/t gold (333.5–344.1 m) and 2.1 m of 12.25 g/t gold (1,185.5–1,186.7 m). (Victoria Resource press releases, 2/8/2005, 10/20/2005; Victoria Resource website, [www.victoriaresource.com](http://www.victoriaresource.com))

## Eureka District

**East Archimedes.** Barrick Gold Corp. continued its large-scale drill program (34,500 feet combined reverse circulation and core) to drill the limits of East Archimedes and convert resources to reserves. The permit to mine was approved and pre-stripping began. Mining is planned to start in late 2006, and the first gold pour is planned for early 2007. Drilling also continued on the Ruby Deeps target below Archimedes. (Barrick website, [www.barrick.com](http://www.barrick.com))

**Eureka South.** In the Ratto Canyon area south of Eureka, Staccato Gold Resources Ltd. drilled three core holes in and around the old Lookout Mountain pit and intercepted high-grade sulfide material over a strike length of 500 feet. Hole BH-05-01 hit 65 feet of 0.344 opt gold (270–335 feet), including 25 feet of 0.641 opt gold. BH-05-02 intersected 25 feet of 0.196 opt gold (425–450 feet). BH-05-03 intersected 3 feet of 2.25 opt gold (193–196 feet) and 80 feet of 0.215 opt gold

(380–460 feet). All the intercepts contained orpiment, realgar, fine-grained pyrite, and carbon. (Staccato Gold press release, 1/04/2006, Staccato Gold website, [www.staccatogold.com](http://www.staccatogold.com))

**Jewel Ridge.** Greencastle Resources Ltd. drilled 21 reverse circulation holes. Their best intercept was 39.6 m of 2.1 g/t gold (hole, HRC-11, from 94.5 m), which was drilled at a 45° angle to test a northeast-trending structure. (Greencastle Resources press release, 9/24/2005, Greencastle Resources website, [www.greencastleresources.com](http://www.greencastleresources.com))

## Lone Mountain District

**Kobeh.** Greencastle Resources Ltd. reported that it initiated a reverse circulation drill program at its Kobeh project in September. No results have been reported. (Greencastle Resources press release, 9/24/2005, Greencastle Resources website, [www.greencastleresources.com](http://www.greencastleresources.com))

**Kobeh Valley.** In the wake of Newmont Mining Corp.'s major staking campaign in 2004, about 2,000 claims were staked in Kobeh Valley in 2005. The major claimants were T&T Exploration LLC, Owyhee Exploration LLC, and Miranda Gold Corp.

**South Lone Mountain.** Placer Dome Inc. (joint venture with Bravo Venture Group Inc.) drilled nine holes (11,529 feet). Four holes were drilled in a bedrock shelf area, three of which hit the Roberts Mountains Formation. The fourth was lost in gravel. Hole PSLM0601 (mud rotary) intersected 12 m of low-level gold (up to 65 ppb gold and up to 239 ppm arsenic), beginning at 456 m. The top of bedrock, dolomitized Roberts Mountains Formation, was encountered at 427 m. Hole PSLM0601 was located about 15 m from an oil well that contained 2.36 g/t gold in gravel immediately above bedrock. Three holes were drilled in the “pediment area.” One hole hit the Bartine Member of McColley Canyon Formation. No anomalous gold was intersected. The other two holes were lost in gravel. (Bravo Ventures press releases, 12/15/05, 3/6/06; Bravo Ventures website, [www.manexresourcegroup.com/bravo](http://www.manexresourcegroup.com/bravo))

## Lynn District

**Deep Post.** Newmont Mining Corp. focused on drilling to convert resources to reserves in the Deep Post underground mine on the northern Carlin trend. It also carried out an intense exploration program along the Deep Post-Deep Star corridor. (Newmont website, [www.newmont.com](http://www.newmont.com))

**Goldstrike.** Barrick Gold Corp. completed a 250,000-foot drill program in and around the Betze-Post pit and in its underground mines at their Goldstrike complex

on the northern Carlin trend. The drilling was mostly focused on converting resources to reserves. (Barrick Gold website, [www.barrick.com](http://www.barrick.com))

**Leeville.** Newmont Mining Corp. began producing ore from the Leeville Mine—their first underground mine in Nevada accessed by a shaft. It drilled 180 holes (71,150 feet) at Leeville, aimed at mainly converting resources to reserves. (R. Streiff, oral commun., Dec. 2005; Newmont website, [www.newmont.com](http://www.newmont.com))

**Pete.** Newmont Mining Corp. carried out a major drill program to convert resources to reserves at the Pete deposit. (Newmont website, [www.newmont.com](http://www.newmont.com))

## Maggie Creek District

**Gold Quarry.** Newmont Mining Corp. drilled 76 holes (79,836 feet) at Gold Quarry, mostly focused on resource to reserve conversion. Projects included the South Layback of the open pit and continued development of the underground Chukar and Deep Sulfide deposits. (R. Streiff, oral commun., Dec. 2005; Newmont website, [www.newmont.com](http://www.newmont.com))

**Mike.** Newmont Mining Corp. continued to explore the Mike gold-copper deposit. They drilled 14 holes (13,680 feet). The best results were 410 feet of 0.87% copper, including 215 feet of 1.38% (REB-098), 125 feet of 1.82% copper including 65 feet of 3.35% copper (REB-110), and 405 feet of 0.036 opt gold including 27 feet of 0.25 opt gold (REB-107). (R. Streiff, oral commun., Dec. 2005)

## Northern Simpson Park Mountains

**Cornerstone.** Nevada Pacific Gold Inc. discovered gold mineralization at the surface at its Cornerstone property, located about 1,000 feet north of U.S. Gold's Rooster resource at Tonkin Springs. Twenty-four of 69 rock chip samples taken from the Flag zone contained between 0.025 opt and 0.317 opt gold. The zone is characterized by iron oxides, carbonate and jasperoid breccia, is northeast-trending, and is about 3,000 feet long and 800 feet wide. Rocks, previously thought to be upper plate Ordovician Vinini Formation, have returned Devonian fossils. The southern end of the Flag zone contains another anomalous trend, which has been named the CSZ zone. The CSZ zone has a north-northwest trend with a strike length of at least 1000 feet and a width of over 300 feet. Trenching of the CSZ zone resulted in 180 feet of 0.041 opt gold, including 30 feet of 0.204 opt (Trench #1) and 205 feet of 0.012 opt gold, including 75 feet of 0.021 opt (Trench #6). Nevada Pacific drilled 14 reverse circulation holes (~10,000 feet) to follow-up these surface results. The best drill results came from the CSZ zone, where hole CSR05-02 intersected 95 feet of 0.017 opt gold from 40 to 135 feet, which included 65 feet of 0.023 opt gold. Hole CSR05-14 intersected 120 feet of 0.015 opt gold from 10 to 130 feet, including 50



feet of 0.029 opt gold. (Nevada Pacific press releases, 8/4/05, 9/7/05, 9/21/05, 10/13/05, 1/16/06; Nevada Pacific website, [www.nevadapacificgold.com](http://www.nevadapacificgold.com))

**Fye Canyon.** Teck-Cominco (joint venture with White Knight Resources Ltd.) drilled four reverse circulation holes targeted on geophysical targets (gravity, IP). The high gold assay was only 56 ppb gold. The holes reportedly did not intercept lower plate rocks. (White Knight press release, 2/28/2006; White Knight website, [www.whiteknightres.com](http://www.whiteknightres.com))

**Indian Ranch.** Placer Dome Inc. (joint venture with White Knight Resources Ltd.) carried out a three-hole (6,000 feet) reverse circulation drill program. The best intercept was 30 feet of 0.046 opt gold at 1,398-foot depth within a zone of 335 feet that averaged 0.007 opt gold (PIR 05-10). Mineralization is hosted in the upper part of the Roberts Mountains Formation. Placer Dome offset the intercept in November and December with additional holes and reportedly intersected similar grades and thicknesses at similar depths. (White Knight press release, 11/8/2006)

**Red Hill.** Placer Dome Inc. carried out a small drill program at its Red Hill property. On the portion of the property that is joint-ventured from Miranda Gold Corp., Placer drilled one hole to 940 feet, which had no anomalous gold. Results from the other drill holes have not been reported. (Miranda press release, 11/4/2005)

**Trend.** Agnico-Eagle Ltd. (joint venture with NDT Ventures Ltd.) drilled four reverse circulation holes (7,880 feet). The holes locally encountered silicification, clay, and pyrite. The highest gold assay was only 74 ppb. (NDT Ventures press release, 6/8/2005)

## Roberts District

**Keystone.** Nevada Pacific Gold Inc. drilled seven holes (3,245 feet) exploring for base-metal mineralization at Keystone. No assays were reported. Placer Dome Inc. (in a joint venture with Nevada Pacific) explored the same property for gold. In December 2005, it had two drill rigs on the property. No results have been released. (Nevada Pacific press releases, 8/10/2005, 12/16/2005; Nevada Pacific website, [www.nevadapacificgold.com](http://www.nevadapacificgold.com))

**UNR.** Placer Dome Inc. carried out a small drill program on the UNR property located just south of Keystone. No results have been reported.

## HUMBOLDT COUNTY

### Awakening District

**Sleeper.** New Sleeper Gold Corp. (joint venture with X-Cal Resources Ltd.) drilled 23 core holes (4,402 m) and 17 reverse circulation holes (2,880 m) between

November 2004 and August 2005. The targets in this drilling campaign included West Wood, Bedrock, Casino, Facilities, Mill Vein, Old Placer, South Dump, North Sleeper, and Northwest Sleeper. The best assays were from the known West Wood mineralization and included 5.1 m of 16.5 g/t gold and 4.6 m of 13.2 g/t gold (hole WW-33-04). Better intercepts from other targets were generally between 3 and 10 m in length and between 0.5 to 2 g/t gold. (New Sleeper Gold and X-Cal press release, 8/31/2005; March 2006 43-101 rpt, [www.sedar.com](http://www.sedar.com))

### Battle Mountain District

**Hot Pot.** At its Hot Pot project 5 miles north of the Marigold Mine, Battle Mountain Gold Exploration Corp. drilled nine reverse circulation holes over a 4-square-mile area for a total of almost 4,000 feet. Drilling depths ranged from 300 to 620 feet. Paleozoic bedrock was intersected at depths between 100 and 390 feet. Alteration was intersected in five of the holes. Battle Mountain Gold Exploration is routinely analyzing for gold in groundwater in their drill programs and got up to 267 ppt (parts per trillion) gold, similar to values of gold in water seen at the nearby Lone Tree Mine. (Battle Mountain Gold Exploration press release, 6/24/2005; Battle Mountain Gold Exploration website, [www.bmegold.com](http://www.bmegold.com))

**Marigold.** Glamis Gold Ltd. (joint venture with Barrick Gold Corp.) continued drilling to define the limits of mineralization in and around the Basalt and Antler pits and to test the continuity of mineralization between the Target 3 deposit and the Red Rock portion of the Terry zone. Drilling also continued on the Bison Claims and in the pediment area north of the known deposits. An EIS for the West Marigold Expansion was completed. (Glamis Gold and Barrick Gold websites, [www.glamis.com](http://www.glamis.com), [www.barrick.com](http://www.barrick.com))

### Bottle Creek District

**Bottle Creek.** According to BLM's LR2000 database, Golden Gryphon U.S.A. Corp. staked 740 claims on the pediment west of the Bottle Creek mercury district across Desert Valley from the Sleeper Mine.

### Disaster District

**McDermitt.** Western Energy Development Corp. staked over 2,000 claims in and around the McDermitt caldera, with the objective of drilling for uranium in 2006.

### National District

**Buckskin-National.** Romarco Minerals Inc. drilled five core holes (7,416 feet) to test numerous vein and breccia targets. The drilling revealed a wide zone of gold mineralization, intersecting 55 feet of 0.042 opt gold in one hole and 5 feet of 16.1 opt silver in another. The zone of gold mineralization occurs 1,400 feet west of the

surface outcrop of the Bell Vein. Additionally, the drilling revealed the presence of multiple vein systems that need to be drill tested at greater depth, new targets that were previously unknown and broad zones of strongly enriched associated elements. (Romarco Minerals press release, 10/31/2005)

**National.** Gold Summit Corp. drilled six widely spaced reverse circulation holes to test the Birthday vein, which has been mapped for 1.5 km along strike and yielded consistent surface values of >100 g/t silver with highs of over 1,500 g/t silver. Partial results from the drilling include 1.5 m of 0.6 g/t gold and 113 g/t silver (hole 1, 46.7–48.2 m), 1.5 m of 0.4 g/t gold and 115 g/t silver (hole 2, 67–67.5 m), and 1.5 m of 0.4 g/t gold and 166 g/t silver (hole 3, 218–218.5 m). (Gold Summit press release, 11/22/2005; Gold Summit website, [www.goldsummitcorp.com](http://www.goldsummitcorp.com))

## Potosi District

**Pinson.** Atna Resources Ltd. breathed new life into the old Pinson Mine in 2005. Results of drilling on the Range Front target include 55 feet of 0.275 opt gold and 27 feet of 0.738 opt gold. Underground development of a decline to drill the Range Front target from underground resulted in the discovery of high-grade oxide mineralization in the Ogee zone, where initial channel samples included 35 feet of 0.692 opt gold. Subsequent underground drilling on the Ogee resulted in the following gold intercepts: 147.5 feet of 0.97 opt, 58.5 feet of 1.691 opt, 81.5 feet of 0.899 opt, and 25.2 feet of 1.175 opt. The high grade mineralization persists to a depth of at least 420 feet below the 4800 level and north along strike for at least 250 feet. Atna announced a measured and indicated resource of 1.692 million tons at 0.421 opt gold for 712,600 ounces of gold. By early 2006, Atna had spent enough to earn into the project. Barrick Gold Corp. decided to exercise its option to back in and earn a 70% interest in Pinson by spending \$30 million over the next 3 years. (Atna Resources press releases, 9/13/2005, 10/20/2005, 11/28/2005, 1/11/2006, 2/14/2006, 4/6/2006; Atna website, [www.atna.com](http://www.atna.com))

**Preble.** Barrick Gold Corp. carried out a limited drill program near the old Preble Mine, but no further information is available.

**Turquoise Ridge.** Placer Dome Inc. (joint venture with Newmont Mining Corp.) carried out an underground exploration drill program in the footwall of the Getchell fault. It also completed a limited surface drill program outside the joint venture area.

**Twin Creeks.** Newmont Mining Corp. carried out a drill program at the Fiberline, Sage, Twin Creeks, and Section 30 areas, mostly to convert resources to reserves. (R. Streiff, oral communication, Dec. 2005)

## Sulphur District

**Hycroft Mine.** Canyon Resources Corp. terminated its option with Vista Gold Corp. after drilling 33 drill holes totaling 12,475 feet and producing a new resource estimate at the Brimstone deposit. Canyon cited increased costs and shortage of labor and large mining equipment as reasons for termination. (Canyon Resources press release, 8/4/2005)

## Vicksburg District

**Ashdown.** Golden Phoenix Minerals Inc. took advantage of the high price of molybdenum by opening the Ashdown Mine in northwestern Humboldt County. It began a decline to take a bulk sample of the Sylvia vein—a quartz vein containing 1–20% Mo—and built a small flotation mill on site. (Golden Phoenix website, [www.golden-phoenix.com](http://www.golden-phoenix.com))

## LANDER COUNTY

### Aspen District

**Highland.** Rio Fortuna Exploration Corp. drilled seven core holes, one of which contained two intercepts: 2.5 feet of 0.285 opt gold and 5 opt silver and 1 foot of 0.276 opt gold and 12 opt silver. The intercept is about 15 feet below a high-grade intercept from an older hole. All the other holes encountered narrow intervals of low-grade gold. Rio Fortuna signed a deal with Newcrest Mining Ltd., where Newcrest can earn a 70% interest if it spends \$5 million and completes a pre-feasibility study within 5 years. (Rio Fortuna press releases, 5/27/2005, 11/2/2005; Rio Fortuna website, [www.manexresourcegroup.com](http://www.manexresourcegroup.com))

### Battle Mountain District

**BMX.** Placer Dome Inc. drilled two holes on Long Peak, located at the south end of Nevada Pacific Gold Inc.'s BMX property. The best intercept was 65 feet of 0.021 opt gold. Placer returned the property to Nevada Pacific. (K. Everson, oral commun., December 2005; Nevada Pacific press releases, 9/16/2005, 11/25/2005; Nevada Pacific website, [www.nevadapacificgold.com](http://www.nevadapacificgold.com))

**Elephant.** Randsburg International Gold Corp. drilled five core drill holes (2,370 m) on their Elephant property which abuts Newmont Mining Corp.'s Phoenix property. Their best intercept was 6.6 m of 1.13 g/t gold, 27.61 g/t silver, 0.39% lead, and 0.46% zinc (hole P-5C, 163.5–170.1 m), which included 0.6 m of 4.4 g/t gold, 81 g/t silver, 0.21% copper, 1.6% lead, and 2.29% zinc. (Randsburg International press release, 9/7/2005; Randsburg International website, [www.randsburgdiamonds.com](http://www.randsburgdiamonds.com))

**Phoenix.** Newmont Mining Corp. carried out a major drill program mainly to convert resources to reserves. Drilling took place at Box Canyon, West Bonanza, Minnie, Yellow Jacket, and Glory Hill, which are a blend of copper and gold targets. Gold and copper production is planned to start in 2006. (Newmont website, [www.newmont.com](http://www.newmont.com))

## **Bullion District**

**Elder Creek.** Minterra Resources Corp. (joint venture with Mill City Gold Corp.) intersected limestone, believed to be lower plate, at a depth of 2,176 feet in hole EC-2. Hole EC-2 was pre-collared with reverse circulation to a depth of 1,860 feet and completed with core to a depth of 2,305.5 feet. Gold assays ranged up to 180 ppb gold. Hole EC-2 encountered fined-grained pyrite, carbon flooding, and argillized, sulfidized dikes. (Minterra press release, 1/19/2006)

**Fire Creek.** Klondex Mines Ltd. drilled 28 holes (~35,000 feet) at Fire Creek within the the Northern Nevada Rift. Better intercepts, mainly within the Main Vein zone, include 24.8 feet of 1.22 opt gold (hole FC0513, 1025.2–1050 feet), 25 feet of 0.615 opt gold that contained 2.55 opt over 5 feet (hole FC0502, 950–955 feet), and 140 feet of 0.148 opt gold (hole FC0528, 1120–1260 feet), which included 30 feet of 0.312 opt. Step-out drilling ~1,500 feet to the north of the Main and West Vein zones intersected 20 feet of 0.49 opt gold within a broader zone of 0.177 opt gold over 120 feet (hole FC0522, 1,040–1,060 feet). A new vein was discovered between Main and West Vein zones, where 10 feet of 2.57 opt gold was intersected in a drill hole (hole FC0515, 925–935 feet). Two other holes hit the new vein along strike. Higher grade mineralization is mostly between 600 and 1,300 feet below the surface. Klondex is considering a decline to better define the mineralization with closer spaced underground drilling. (Klondex Mines press releases, 4/11/2005, 10/21/2005, 12/13/2005, 1/20/2006, Klondex Mines website, [www.klondexmines.com](http://www.klondexmines.com))

**Horse Mountain.** Barrick Gold Corp. (joint venture with Miranda Gold Corp.) drilled one core hole to a depth of 1,641 feet (hole BHM-001) and intersected 98.2 feet of 0.023 opt gold (926.1–1024.3 feet), including 33 feet of 0.047 opt gold and 7.5 feet of 0.092 opt gold. The Roberts Mountains thrust was intersected at ~940 feet. Lower plate carbonate rocks below the thrust are interpreted to be Roberts Mountains Formation. The hole bottomed in Hanson Creek Formation. Barrick then drilled a reverse circulation hole to a depth of 1,485 feet. That hole had no significant gold. They capped it and may re-enter it with a core rig in 2006. (Miranda Gold press releases, 9/27/2005, 12/15/2005, 2/15/2006; Miranda website, [www.mirandagold.com](http://www.mirandagold.com))

**Lander Ranch.** Agnico-Eagle Ltd. drilled two reverse circulation holes (3,240 feet) on the Lander Ranch property (joint venture with Coral Gold Corp.). The best intercept was 45 feet of 0.05 opt gold (hole LR0502, 1035–1080 feet). The holes were drilled near two Placer Dome Inc. (Cortez Joint Venture) holes drilled in 1999 that intersected 60 feet of 0.051 opt gold and 110 feet of 0.037 opt gold. The holes have not intersected the lower plate. (Coral Gold press release, 11/07/2005; Coral Gold website, [www.coralgold.com](http://www.coralgold.com))

**Norma Sass.** Agnico-Eagle Ltd. (joint venture with Coral Gold Corp.) drilled six reverse circulation holes (10,650 feet) just southeast of the Gold Acres open pit (Cortez Joint Venture). Limestone of the lower plate Wenban Formation was intersected at depths between 250 and 1,100 feet. The best intercept was 20 feet of 0.04 opt gold, starting at a depth of 610 feet. (Coral Gold press release, 11/07/2005; Coral Gold website, [www.coralgold.com](http://www.coralgold.com))

**Pipeline.** Placer Dome Inc. (Cortez Joint Venture) carried a major drill program, mainly aimed at converting resources to reserves near the Pipeline open pit, but no further information is available.

**Robertson.** Coral Gold Corp. drilled 14 reverse circulation holes totaling 13,250 feet. Better intercepts of partially reported results in the Robinson/39A Zone include: 25 feet of 0.262 opt gold (hole CR05-1, from 950 feet); 80 feet of 0.059 opt gold (hole CR05-2, from 850 feet); and 90 feet of 0.069 opt gold (hole CR05-3, from 375 feet). (Coral Gold press release, 9/07/2005; Coral Gold website, [www.coralgold.com](http://www.coralgold.com))

## **Cortez District**

**Cortez Hills.** Placer Dome Inc. (Cortez Joint Venture) continued to drill the limits of the Cortez Hills deposit and convert resources to reserves. An underground decline was started in early 2006 to delineate deeper, high-grade mineralization at the contact between the Wenban and Roberts Mountains Formations. (October 2005 43-101 technical report, [www.sedar.com](http://www.sedar.com))

## **Hilltop District**

**Hilltop.** Placer Dome Inc. (Cortez Joint Venture) reportedly carried out a minor drill program at Hilltop, but no further information is available.

## **Lewis District**

**Mill Creek.** Placer Dome Inc. (Cortez Joint Venture) drilled two holes (4,100 feet) at Mill Creek. No assays were reported. Placer returned the property to X-Cal Resources Ltd. (X-Cal Resources press releases, 8/12/2005, 11/8/2005, 1/19/2005)

## Reese River District

**Cottonwood.** Bonaventure Enterprises Inc. drilled five reverse circulation holes (1,655 feet) at its Cottonwood property. The best intercept was 15 feet of 0.028 opt gold (hole CR-03, 205-220 feet). North-northeast-trending shears, locally containing quartz-arsenopyrite, occur on the surface in quartz diorite and argillites of the Ordovician Valmy Formation. The shears assay up to 1.67 opt gold. (Bonaventure Enterprises press release, 12/19/2005; Bonaventure Enterprises website, [www.bonaventure.us](http://www.bonaventure.us))

## Shoshone Range

**Cedars.** Newcrest Mining Ltd. reportedly carried out a minor drill program at its Cedars property. (Medallion Resources press release, 10/6/2005).

## LINCOLN COUNTY

### Atlanta District

**Silver Park.** Northern Abitibi Mining Corp. drilled eight reverse circulation holes (922 m). The drill program tested silicified fault zones, a silicified low-angle unconformity and large zones of jasperoid within carbonate host rocks. The best intercept was 27.4 m of 0.4 g/t gold (hole SP05-RC8, 10.7–38.1 m). (Northern Abitibi Mining press release, 1/26/2006).

### Highland District

**Black Prince.** Midway Gold Corp.'s Black Prince project in Lincoln County was the only reported silver project that was drilled in 2005. Surface exposures of epithermal silver-gold veins range from 2 to 18 m wide, and select samples of the veins grade in excess of 5 g/t gold and 600 g/t silver. Midway Gold drilled 12 holes (1,829 m). Three new veins were discovered. The most significant was in hole BP05-08, which hit 22.9 m of 1.18 g/t gold and 70.6 g/t silver at 97.5 m downhole depth. (Midway Gold press releases, 9/27/2005, 10/28/2005, 11/14/2005; Midway Gold website, [www.midwaygold.com](http://www.midwaygold.com))

## LYON COUNTY

### Como District

**Hercules.** American Goldfield drilled seven holes (753 m) at its Hercules property at the north end of the Como district. The drilling extended the known near-surface precious metals mineralization and defined several fault zones that fed these mineralized areas; however, no assays have been reported. (American Goldfields press release, 12/8/2005; American Goldfields website, [www.americangoldfields.com](http://www.americangoldfields.com))

## MINERAL COUNTY

### Borealis District

**Borealis.** Gryphon Gold Corp. is awaiting permits to develop the inactive Borealis Mine by expanding five open pits. It carried out a major drill program mostly aimed at identifying and defining resources around the existing open pits and expanding the Graben deposit. Significant mineralization was also identified in an area previously not drilled between the East Ridge and Northeast Ridge pits. One hole in this area contains an interval of 145 feet of 0.021 opt gold, starting from the surface. One hole at the northeastern margin of the Freedom Flats deposits encountered 245 feet of 0.054 opt gold, including 35 feet of 0.189 opt gold. Two holes along the eastern margin of the Graben deposit near Freedom Flats, encountered 85 feet of 0.069 opt gold and 250 feet of 0.069 opt gold. All of the mineralized areas are still open. (April 2006 SEG Newsletter; Gryphon Gold press release, 2/1/2006; Gryphon Gold website, [www.gryphongold.com](http://www.gryphongold.com))

### Rawhide District

**Regent.** Keegan Resources Inc. drilled four holes down-dip along structures with previously drilled high-grade intercepts. The best intercept was 52 feet of 2.7 g/t gold (R05-02, 478–530 feet), including 13.5 feet of 5.5 g/t gold and 3.7 feet of 12.6 g/t gold. (Keegan press releases, 10/19/2005, 12/6/2005; Keegan website [www.keeganresources.com](http://www.keeganresources.com))

### Santa Fe District

**New York Canyon.** Aberdene's New York Canyon project, a SX-EW-extractable copper-oxide skarn deposit near Luning was the only exploration project in Nevada in 2005 where copper was the primary target. Aberdene drilled nine core holes and 28 reverse circulation holes (14,856 feet) to validate results of historical exploration by Conoco, Coca Mines, and Kookaburra Gold. Two holes were drilled in the Copper Queen porphyry system; the remainder were drilled in the Longshot Ridge area. Several thick intervals of >0.2% copper were intersected at Longshot Ridge in the 2005 drill campaign, with the best intercept being 170 feet of 1.114% copper within 340 feet of 0.695% copper that started from the surface (hole 05-11). Drilling revealed that the strongest, thickest, and most continuous mineralization at Longshot ridge occurs in a northeast-trending zone, 200 feet wide by 1,300 feet long. (Aberdene Mines press releases, 10/18/2005, 11/3/2005, 11/17/2005, 2/10/2006; Aberdene Mines website, [www.aberdenemines.com](http://www.aberdenemines.com))

## NYE COUNTY

### Arrowhead District

**Needles.** Taranis Resources Inc. drilled four core holes (832 m), mainly to test IP targets on a pediment. Anomalous gold in the 50–200 ppb range was encountered. (Taranis Resources press release, 5/4/2005; Taranis Resources website, [www.taranis.us](http://www.taranis.us))

### Longstreet District

**Longstreet.** Harvest Gold Corp. drilled seven reverse circulation holes (3,773 feet) exploring for “Round Mountain-type” epithermal mineralization. Several narrow (<20 feet wide) intervals of silver mineralization at grades between 0.5 and 1.0 opt were encountered. The best gold assay was 0.012 opt. The silver:gold ratio at Longstreet is approximately 200:1. (Harvest Gold Corp. press releases, 11/2/2005, 2/23/2006; Harvest Gold website, [www.harvestgoldcorp.com](http://www.harvestgoldcorp.com))

### Manhattan District

**Gold Wedge.** Royal Standard Minerals Inc. continued their underground development and test-mining program at their Gold Wedge deposit at Manhattan, which has a measured and indicated resource of 330,000 tons at 0.310 opt gold. The deposit has a strike length of about 1,000 feet and a vertical extent of 100 to 500 feet. It occurs in a steeply dipping north-trending fault zone that crosscuts limestone and siltstone beds. A small mill and gravity recovery plant are now on site. An initial bulk sampling program, planned to be between 3,000 and 5,000 tons, was initiated. Better drill intercepts included 30 feet of 1.89 opt gold, 25 feet of 1.297 opt gold, 265 feet of 0.257 opt gold, and 225 feet of 0.357 opt gold. Sampling of the underground crosscuts encountered 10 feet of 1.226 opt gold. (Royal Standard press releases, 7/12/2005, 10/27/2005; Royal Standard website, [www.royal-standard.com](http://www.royal-standard.com); April 2005 43-101 Rpt [www.sedar.com](http://www.sedar.com))

**Palo Alto Hills.** Kinross Gold Corp. (joint venture with Barrick Gold Corp.) reportedly carried out a small drill program at their Palo Alto Hills prospect south of Round Mountain, but no further information is available. (Barrick Gold website, [www.barrick.com](http://www.barrick.com))

### Northumberland District

**Northumberland.** Newmont Mining Corp. (joint venture with NewWest Gold) continued a major drill program at Northumberland with the goal of completing a pre-feasibility study. A Plan of Operations at three project areas over two townships (458 drill sites) was approved by the U.S. Forest Service in November. (Newmont website, [www.newmont.com](http://www.newmont.com); U.S. Forest Service; NewWest Gold website, [www.newwestgold.com](http://www.newwestgold.com))

## Republic District

**Fri.** Keegan Resources Inc started a small drill program in December, 2005. No assays have been reported. Keegan dropped the property in early 2006. The program was designed to test the type and tenor of gold mineralization encountered in a core hole drilled in 1972. The 1972 hole, which was targeting copper-molybdenum mineralization, intersected 20 feet of 0.178 opt gold, 8 feet of 0.096 opt gold and 10 feet of 0.067 opt gold. (Keegan press releases, 12/8/2005, 3/27/2006)

### Round Mountain District

**Gold Hill.** Kinross Gold Corp. (joint venture with Barrick Gold Corp.) continued to drill the limits of the Gold Hill deposit north of Round Mountain and convert resources to reserves. (Barrick Gold website, [www.barrick.com](http://www.barrick.com))

**Round Mountain.** Kinross Gold Corp. (joint venture with Barrick Gold Corp.) continued to drill and convert resources to reserves in and around Round Mountain pit. Drilling also tested the West Sinter-Deep Vein, North Pediment, South Pediment, and SE Paleozoic areas. An underground exploration decline from the bottom of the Round Mountain pit was started. Underground drilling will begin in 2006. (Elko Mining Quarterly Winter 2005–2006; Barrick Gold website, [www.barrick.com](http://www.barrick.com))

### Rye Patch District

**Midway.** Midway Gold Corp. drilled approximately 20 holes and discovered a new zone. The Dauntless zone is about 500 feet east-southeast of the Discovery resource and is a series of veins hosted in the argillite of the Ordovician Palmetto Formation about 200 feet below the surface. Better intercepts in the Dauntless zone include: 1) 175 feet of 0.349 opt gold (hole MW-399, from 195 feet), including 70 feet of 0.785 opt gold and 15 feet of 3.163 opt gold; 2) 100 feet of 0.45 opt gold (hole MW-409, from 250 feet), including 10 feet of 2.845 opt gold; and 3) 40 feet of 0.824 opt gold (hole MW-411, from 220 feet), including 10 feet of 3.197 opt gold. (Midway Gold press releases, 9/28/2005, 10/14/2005, 1/6/2006, 1/17/2006; Midway Gold website, [www.midwaygold.com](http://www.midwaygold.com))

**Thunder Mountain.** Alaska Gold Company drilled seven reverse circulation holes (5,545 feet) at the Thunder Mountain property near Midway. The best intercept was 10 feet of 1.79 opt silver (DTM-4, 640–650 feet). Alaska Gold dropped out of its joint venture with owner AuEx Ventures Inc. (AuEx press release, 10/21/2006; AuEx website, [www.auexventures.com](http://www.auexventures.com))

### Union District

**Buffalo Canyon.** Nevada Pacific Gold Inc. drilled 23 holes (10,525 feet) to depths of 215 to 525 feet to test an intrusion-related gold system at Buffalo Canyon. The

drilling program was designed to test southern portion of a 1,600-foot by 2,600-foot, open-ended, >50 ppb gold soil anomaly. Rock-chips assayed up to 0.492 opt gold. Drilling showed a zone of low-grade gold mineralization over an area of 300 feet by 500 feet. Results include 500 feet of 0.0133 opt gold (hole BCR05-05) and 500 feet of 0.0129 opt gold (BCR05-03), including 75 feet of 0.026 opt gold. Both intercepts start from the surface. (K. Everson, oral commun. Dec. 2005; Nevada Pacific press releases, 8/31/2005; Nevada Pacific website, [www.nevadapacificgold.com](http://www.nevadapacificgold.com))

## PERSHING COUNTY

### Jersey Valley District

**Jersey Canyon.** Geologix Explorations Inc. completed a drill program at their Jersey Canyon project southwest of Cove-McCoy in the Fish Creek Mountains. At least 13 holes were drilled in late 2004 and early 2005. The best intercept was 79 m of 0.26 g/t gold. Disseminated precious-metal mineralization at Jersey Canyon is hosted by calcareous sandstones of the Havallah Formation, which have been intruded by an Oligocene-aged stock. Intensely altered dikes were intersected in drilling and along the range front. (Geologix press release, 5/03/2005; Geologix website, [www.geologix.ca](http://www.geologix.ca))

### Seven Troughs District

**Seven Troughs.** Quincy Energy Corp. drilled seven reverse circulation holes (7,700 feet) in the Seven Troughs district. Four holes were drilled in the Coalition Mine area, one hole in the Badger Hill area, and two holes in the Fairview Mine area. The holes ranged from 755 to 1,305 feet in depth and averaged 1,100 feet. The best assay was 819 ppb gold over 5 feet in the Coalition Mine area. (Quincy Energy press release, 7/7/2005)

### Spring Valley District

**Spring Valley.** Midway Gold Corp. continued to drill gold mineralization at its Spring Valley property in the Humboldt Range. Gold mineralization is beneath 50 to 300 feet of alluvium in the basal portion of the Rochester rhyolite that consists of intercalated lithic tuff, welded tuff, flow-banded rhyolite, and spherulitic rhyolite. Mineralization is along the northeast margin of a large diatreme. The entire breccia complex is about 1 by 2 km in area. Coarse-grained gold occurs in a hydrothermal breccia, quartz±tourmaline veins along the diatreme margin, and quartz±tourmaline veins and breccias in the rhyolites. Midway drilled about 100 holes. The best

intercepts were 105 feet of 0.325 opt gold, 65 feet of 0.116 opt gold, and 90 feet of 0.199 opt gold. (April 2006 SEG Newsletter; Midway Gold press releases, 5/27/05, 8/8/05, 8/31/05, 10/11/05, 10/12/05 10/28/05, 11/28/05, 12/6/05, 1/20/06; Midway Gold Website, [www.midwaygold.com](http://www.midwaygold.com))

## STOREY COUNTY

### Silver City District

**Hartford Hill Complex.** GoldSpring Inc. continued to produce gold from open pits and heap leaching at the Hartford Hill complex near Gold Hill. It drilled 96 exploration drill holes to an average depth of 160 feet, which resulted in a 170% increase in their mineral inventory. (GoldSpring website, [www.goldspring.us](http://www.goldspring.us))

## WHITE PINE COUNTY

### Bald Mountain District

**Bald Mountain.** Placer Dome Inc. completed a major, multi-rig drill program at Bald Mountain. It re-engineered the north pits (1-5, RBM) and doubled the measured and indicated resource to 2.8 million ounces (includes the Vantage at Alligator Ridge). Placer Dome staked over 2,200 claims in the Bald Mountain district. (Placer Dome press release, 11/30/05)

### Butte Valley District

**Limousine Butte.** Placer Dome Inc. (joint venture with Nevada Pacific Gold Ltd.) drilled six holes (2,700 feet) at Limousine Butte in 2005. No results have been reported. (Nevada Pacific Gold press release, 12/5/2005, Nevada Pacific Gold website, [www.nevadapacificgold.com](http://www.nevadapacificgold.com))

### Pancake District

**Pan.** Castleworth Ventures Inc. continued drilling at its Pan project. Intercepts from their 2005 program, which comprised about 115 holes, include 40 feet of 0.101 opt gold, 90 feet of 0.029 opt gold, and 85 feet of 0.036 opt gold. These intercepts start at the surface and are in three different holes located 1000–2000 feet west of the north-south Pan fault, along which the known resource is located. In early 2006 Castleworth changed its name to Pan-Nevada Gold Corp. (Castleworth Ventures press releases, 8/15/05, 9/19/05, 10/11/05; Pan-Nevada Gold website, [www.pannevada.com](http://www.pannevada.com))

# Major Precious-Metal Deposits

by John L. Muntean

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 149, 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
<b>CHURCHILL COUNTY</b>				
<b>Bell Mountain</b> (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
<b>Buffalo Valley gold property</b> (Eastgate district)	1996: 96,000 oz Au		rhyolitic ash-flow tuff	Tertiary
<b>Dixie Comstock</b> (Dixie Valley district)	1991: 2.4 million tons, 0.049 opt Au 1995: 100,000 oz Au		Tertiary rhyolite	Miocene?
<b>Fondaway Canyon</b> (Shady Run district)	1988: 400,000 tons, 0.06 opt Au 1990: 400,000 tons, 0.06 opt Au 2001: 396,000 tons, 0.428 opt Au (indicated resource) 372,849 tons, 0.409 opt au (inferred resource)	1989: 1,065 oz Au, 87 oz Ag 1990: 12,000 oz Au	Triassic slate and phyllite	
<b>Jessup</b> (Jessup district)	1998: 8,376,564 tons, 0.024 opt Au, 0.25 opt Ag ("global resource")			
<b>New Pass property</b> (New Pass district)	1994: 3.4 million tons, 0.042 opt Au 1997: 3.1 million tons, 0.055 opt Au 2005 (inferred resource): 11.5 million tons, 0.0226 opt Au, 0.0041 opt Ag		Triassic siltstone	
<b>CLARK COUNTY</b>				
<b>Crescent property</b> (Crescent district)	1992: 390,000 tons, 0.05 opt Au; 3.3 million tons, 0.022 opt Au			
<b>Keystone</b> (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
<b>ELKO COUNTY</b>				
<b>Big Springs</b> (Independence Mountains district)	1987: 3.76 million tons, 0.148 opt Au 1989: 1.55 million tons, 0.172 opt Au 2005 (inferred resource, 0.025 opt Au cut-off): 15.145 million tons, 0.078 opt Au 2005 (inferred resource, 0.3 opt Au cut-off): 468,000 tons, 0.45 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
<b>Bootstrap/Capstone/Tara</b> (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 51 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 2004: 154,521 oz Au, 43,566 oz Ag 2005: 3,849 oz Au, 322 oz Ag	dacitic dikes, Paleozoic siltstone and laminated limestone/chert	Eocene
<b>Burns Basin</b> (Jerritt Canyon, Independence Mountains district)	2005: 29,700 tons, 0.13 opt Au (measured and indicated resource) 30,700 tons, 0.19 opt Au (underground measured and indicated resource), 50,600 tons, 0.23 opt Au (underground inferred resource)		Hanson Creek and Roberts Mountains Formations	

continued

**MAJOR PRECIOUS-METAL DEPOSITS (continued)**

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
<b>ELKO COUNTY (continued)</b>				
<b>California Mountain (Jerritt Canyon, Independence Mountains district)</b>	2005: 8,000 tons, 0.11 opt Au (measured and indicated resource) 32,100 tons, 0.38 opt Au (underground measured and indicated resource), 9400 tons, 0.33 opt Au (underground inferred resource)		Hanson Creek and Roberts Mountains Formations	
<b>Coyote Zone (Jerritt Canyon, Independence Mountains district)</b>	2005: 45,200 tons, 0.21 opt Au (underground measured and indicated resource) 2700 tons, 0.18 opt Au (underground inferred resource)		Hanson Creek and Roberts Mountains Formations	
<b>Cobb Creek (Mountain City district)</b>	1988: geologic resource-3.2 million tons, 0.045 opt Au			
<b>Cord Ranch (Robinson Mountain district)</b>	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	
<b>Dee (Bootstrap district)</b>	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
<b>Doby George (Aura district)</b>	1995: 3.7 million tons, 0.060 opt Au 1997: 250,000 oz Au		Schoonover	
<b>Hollister (Ivanhoe district)</b>	1989 oxide - 18.4 million tons, 0.035 opt Au, estimated mineral inventory 83.5 million tons, 0.034 opt Au, with 52.8 million tons of oxide and 30.7 million tons of sulfide 1995: geologic resource - 1,3000,000 oz Au; 42 million tons of 0.031 opt au (combined oxide and sulfide) 2001: 719,000 tons, 1.29 opt Au, 7 opt Ag	1990: 6,000 oz Au 1991: 60,000 oz Au	rhyolitic tuff, flows,	Miocene
<b>Jerritt Canyon Property (Independence Mountains district)</b>	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 2004: 9.988 million tons, 0.241 opt Au measured and indicated resources; 4.1 million tons, 0.219 opt Au inferred resources 2005: 3.723 million tons, 0.24 opt Au (proven and probable reserves); 8.812 million tons, 0.24 opt Au (measured and indicated resources, includes proven and probable reserves), 2.6465 million tons, 0.23 opt Au (inferred resource)	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 oz Ag 2002: 338,660 oz Au, 8,154 oz Ag 2003: 302,095 oz Au 2004: 243,333 oz Au 2005: 202,911 oz, 6322 oz Ag	Hanson Creek and Roberts Mountains Formations	~40 Ma
<b>Kinsley Mountain (Kinsley district)</b>	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?

*continued*



**MAJOR PRECIOUS-METAL DEPOSITS (continued)**

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
<b>ELKO COUNTY (continued)</b>				
<b>Maverick Springs (Maverick Springs area)</b>	2002: 350,000 oz Au, 32.3 million oz Ag, indicated resources; 747,000 oz Au, 68.8 million oz Ag inferred resources 2004: 69.63 million tons, 0.01 opt Au, indicated resources; 85.55 million tons, 0.008 opt Au, inferred resources			
<b>Meikle (Lynn district)</b>	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 2004: 7,575,000 tons, 0.392 opt Au proven and probable reserves; 6,268,000 tons, 0.379 opt Au mineral resource 2005 (includes all underground resources at Goldstrike): 7.319 million tons, 0.379 opt Au proven and probable reserves 3.234 million tons, 0.386 opt Au measured and indicated resources 3.034 million tons, 0.386 opt Au inferred resource	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 2004: 561,345 oz Au, 129,520 oz Ag 2005(includes all underground production at Goldstrike): 509,568 Au, 133,979 Ag (1.488 million tons at 0.38 opt Au)	Popovich and Roberts Mountains Formations	38-40 Ma
<b>MCE (Jerritt Canyon, Independence Mountains district)</b>	2005: 4400 tons, 0.20 opt Au (underground measured and indicated resource) 7800 tons, 0.19 opt Au (underground inferred resource)		Hanson Creek and Roberts Mountains Formations	
<b>Midas (Ken Snyder) Mine (Gold Circle district)</b>	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 2004: 2.9 million tons, 0.510 opt Au proven and probable reserves; 200,000 tons, 0.58 opt Au indicated resources; 700,000 tons, 0.31 opt Au inferred resources 2005: 1.5 million tons, 0.58 opt Au, proven and probable reserves 600,000 tons, 0.42 opt Au, inferred resource	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 2004: 219,778 oz Au, 2,471,135 oz Ag 2005: 167,297 oz Au, 166,396 oz Ag	Tertiary volcanic rocks	15.3 Ma
<b>Mill Creek (Jerritt Canyon, Independence Mountains district)</b>	2005: 78,400 tons, 0.12 opt Au (measured and indicated resource)		Hanson Creek and Roberts Mountains Formations	
<b>Murray (incl. Zone 9) (Jerritt Canyon, Independence Mountains district)</b>	2005: 243,300 tons, 0.26 opt Au (proven and probable reserve) 789,200 tons, 0.29 opt Au (measured and indicated resource, includes reserves)		Hanson Creek and Roberts Mountains Formations	

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**MAJOR PRECIOUS-METAL DEPOSITS (continued)**

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
<b>ELKO COUNTY (continued)</b>				
<b>Pie Creek (Jerritt Canyon, Independence Mountains district)</b>	2005: 190,200 tons, 0.16 opt Au (measured and indicated resource) 28,300 tons, 0.14 opt Au (inferred resource)		Hanson Creek and Roberts Mountains Formations	
<b>Piñon (South Bullion and Dark Star) (Robinson Mountain district)</b>	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	
<b>Pony Creek (Robinson Mountain district)</b>	1994: geologic resource-1.1 million tons, 0.057 opt Au 2004: 32.41 million tons, 0.044 opt Au (inferred resource)			
<b>Railroad Property (POD zone) (Railroad district)</b>	1997: 1.5 million tons, 0.085 opt Au drill-indicated resource			
<b>Rain Property (Carlin district)</b>	1982: 3.4 million tons, 0.147 opt Au and 8.3 million tons, 0.083 opt Au			
<b>Gnome deposit</b>	1988: 2.7 million tons, 0.048 opt Au		Webb Formation	Eocene
<b>Rain Emigrant Springs deposits</b>	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 2004: 1,227,000 oz Au	1994–96: 160,000 oz Au 1997–98: included in Newmont Gold production, page 51	Webb Formation	36-37 Ma
<b>Rain deposit</b>	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 2004: 1,956 oz Au, 551 oz Ag 2005: 404 oz Au, 90 oz Ag		
<b>SMZ deposit</b>	1989: geologic resource-1.6 million tons, 0.019 opt Au			
<b>Rain district</b>	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			
<b>Ren (Bootstrap district)</b>	2003: 2.1 million tons, 0.43 opt Au (inferred resource) 2005: 2.1 million tons, 0.38 opt Au (measured and indicated resource) 1.4 million tons, 0.37 opt Au (inferred resource)			
<b>Road Canyon (Jerritt Canyon, Independence Mountains district)</b>	2005: 148,600 tons, 0.14 opt Au (measured and indicated resource) 74,300 tons, 0.13 opt Au (inferred resource)		Hanson Creek and Roberts Mountains Formations	
<b>Rossi Mine (Storm resource) (Bootstrap district)</b>	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 2005: 500,000 tons, 0.449 opt Au measured and indicated resource 800,000 tons, 0.376 opt Au, inferred resource		Popovich Formation	Eocene

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**MAJOR PRECIOUS-METAL DEPOSITS (continued)**

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
<b>ELKO COUNTY (continued)</b>				
<b>SSX-Steer (Jerritt Canyon, Independence Mountains district)</b>	2005: 1,333,300 tons, 0.25 opt Au (proven and probable reserve) 2,597,500 tons, 0.28 opt Au (measured and indicated resource, includes reserves) 1,052,200 tons, 0.23 opt Au (inferred resource)		Hanson Creek and Roberts Mountains Formations	
<b>Saval (Jerritt Canyon, Independence Mountains district)</b>	2005: 104,400 tons, 0.23 opt Au (proven and probable reserve) 460,500 tons, 0.25 opt Au (measured and indicated resource, includes reserves) 270,000 tons, 0.25 opt Au (inferred resource)		Hanson Creek and Roberts Mountains Formations	
<b>Smith (Jerritt Canyon, Independence Mountains district)</b>	2005: 949,300 tons, 0.29 opt Au (proven and probable reserve) 1,863,300 tons, 0.28 opt Au (measured and indicated resource, includes reserves) 677,000 tons, 0.24 opt Au (inferred resource)		Hanson Creek and Roberts Mountains Formations	
<b>Starvation Canyon (Jerritt Canyon, Independence Mountains district)</b>	2005: 400,500 tons, 0.30 opt Au (proven and probable reserve) 676,400 tons, 0.28 opt Au (measured and indicated resource, includes reserves) 51,400 tons, 0.31 opt Au (inferred resource)		Hanson Creek and Roberts Mountains Formations	
<b>Trout Creek (Contact district)</b>	1988: 1.5 million tons, 0.04 opt Au	1988: exploration	Miocene sedimentary rocks	
<b>Tuscarora (Dexter) (Tuscarora district)</b>	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
<b>Waterpipe II (Jerritt Canyon, Independence Mountains district)</b>	2005: 37,400 tons, 0.21 opt Au (underground inferred resource)		Roberts Mountains Formation	
<b>West Mahala (Jerritt Canyon, Independence Mountains district)</b>	2005: 368,100 tons, 0.22 opt Au (underground measured and indicated resource) 141,900 tons, 0.21 opt Au (underground inferred resource)		Hanson Creek and Roberts Mountains Formations	
<b>Winters Creek (Jerritt Canyon, Independence Mountains district)</b>	1986: 1.4 million tons, 0.146 opt Au 2005: 148,900 tons, 0.22 opt Au underground measured and indicated resource, 37,200 tons, 0.2 opt Au, underground inferred resource		lower Paleozoic carbonate rocks	Eocene
<b>Wright Window (Jerritt Canyon, Independence Mountains district)</b>	1986: 1.3 million tons, 0.095 opt Au 2005: 32,600 tons, 0.23 opt Au, proven and probable reserves, 97,800 tons, 0.16 opt Au, (measured and indicated resource, includes reserves) 19,000 tons, 0.23 opt Au (inferred resource)	1992: 3,500 oz Au	lower Paleozoic carbonate rocks	Eocene
<b>ESMERALDA COUNTY</b>				
<b>Boss (Gilbert district)</b>	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?

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**MAJOR PRECIOUS-METAL DEPOSITS (continued)**

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
<b>ESMERALDA COUNTY (continued)</b>				
<b>Castle (includes Boss) (Gilbert district)</b>	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	
<b>Gemfield (Goldfield district)</b>	1996: 9.5 million tons, 0.04 opt Au 1998: 500,000 oz, 0.04 opt Au 2003: see Goldfield project 2004: 16,853,000 tons, 0.032 opt Au measured and indicated resources; 1,001,000 tons, 0.022 opt Au inferred resource		Oligocene Sandstorm Rhyolite	21 Ma?
<b>Goldfield Project (Goldfield district) (see Gemfield, Goldfield Main, and McMahon Ridge)</b>	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
<b>Goldfield Main (Goldfield district)</b>	2004: 6,651,000 tons, 0.036 opt Au measured and indicated resources; 2,129,000 tons, 0.038 opt Au inferred resources			
<b>Hasbrouck (Divide district)</b>	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 2003: 20,300,00 tons, 0.023 opt Au (indicated resource) 8,160,000 tons, 0.021 opt Au (inferred resource)		Siebert Formation tuff and volcanoclastic rocks	16 Ma
<b>Hill of Gold deposit (Divide district)</b>	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
<b>Mary-Drinkwater (Silver Peak district)</b>	1991: 531,300 tons, 0.124 opt Au	1991: 25,000 oz Au, 8,000 oz Ag	Wyman Formation	Mesozoic?
<b>McMahon Ridge (Goldfield district)</b>	2004: 8,200,000 tons, 0.035 opt Au measured and indicated resources; 171,000 tons, 0.019 opt Au inferred resources			
<b>Mineral Ridge (Silver Peak district)</b>	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 2004: 3,638 oz Au, 3,062 oz Ag 2005: 1,589 oz Au, 1,073 oz Ag	Wyman Formation	Mesozoic?
<b>Monte Cristo (Gilbert district)</b>	2005: 365,000 tons, 0.19 opt Au, 0.6 opt Ag (inferred resource)	late 1980s: 300,000 tons grading 0.072 opt Au	Tertiary andesite, lithic tuff	Tertiary
<b>Tip Top (Fish Lake Valley district)</b>	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		Tertiary quartz latite	
<b>Three Hills (Tonopah district)</b>	1996: 3.2 million tons, 0.036 opt Au 1997: 6.3 million tons, 0.023 opt Au 2003: 5,736,000 tons, 0.023 opt Au (indicated resource)		Miocene Siebert Formation and Oddie Rhyolite	
<b>Weepah (Weepah district)</b>	1986: 200,000 tons, 0.1 opt Au, 0.4 opt Ag	1986–87: 58,000 oz Au	Wyman Formation	Cretaceous

**MAJOR PRECIOUS-METAL DEPOSITS (continued)**

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
<b>EUREKA COUNTY</b>				
<b>Afgan (Antelope district)</b>	1996: 80,000 oz Au drill indicated resource 1999: 2.8 million tons, 0.037 opt Au oxide resource 2004: 1.85 million tons, 0.027 opt Au (indicated resource) 1.29 million tons, 0.026 opt Au (inferred resource)		Webb Formation	
<b>Betze-Post (Lynn district)</b>	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 2004: 123,334,000 tons, 0.131 opt Au proven and probable reserves; 22,318,000 tons, 0.050 opt Au mineral resource 2005: 114,512,000 tons, 0.128 opt Au (proven and probable reserve) 21,115,000 tons, 0.050 opt Au (measured and indicated resource) 417,000 tons, 0.089 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 2004: 1,381,315 oz Au, 130,609 oz Ag 2005: 1,514,320 oz Au, 114,248 oz Ag	Ordovician to Devonian chert, shale, siltstone, and impure carbonates; in part, Vinini Formation	Eocene
<b>Buckhorn property (Buckhorn district)</b>	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
<b>Buckhorn South/ Zeke deposit (Buckhorn district)</b>	1989: 2 million tons, 0.056 opt Au, 0.224 opt Ag 1998: 2.4 million tons, 0.046 opt Au		lower Paleozoic rocks	
<b>Carlin North, Newmont (Lynn district)</b>				
<b>Blue Star</b>	1987: 1.95 million tons, 0.066 opt Au 1989: geologic resource-22.2 million tons, 0.030 opt Au	1974–84: intermittent 1988–2005: included in Newmont Gold production, page 51	lower Paleozoic sandy siltstone and carbonate rocks, granodiorite	Eocene
<b>Bobcat</b>	1988: geologic resource-17.7 million tons, 0.029 opt Au		lower Paleozoic rocks	Eocene
<b>Bullion Monarch</b>	1987: 1 million tons, 0.10 opt Au	1977–84: 17,779 oz Au	lower Paleozoic sedimentary rocks	Eocene
<b>Deep Star</b>	1996: 1.4 million tons, 0.8765 opt Au proven and probable reserves	1995: 2,800 oz Au 1996: 93,400 oz Au 1997–2005: included in Newmont Gold production, page 51	Popovich Formation	Eocene
<b>Genesis</b>	1989: geologic resource-35.8 million tons, 0.044 opt Au 1990: 32 million tons, 0.047 opt (includes Blue Star) 2004: 1,065,000 oz Au (proven and probable reserve)	1986: production commenced 1988–2005: included in Newmont Gold production, page 51	Ordovician-Devonian limestone, argillite chert	Eocene
<b>Genesis/North Star</b>	1996: 22.7 million tons, 0.034 opt Au proven and probable reserves; 11 million	1994–95: 684,600 oz Au 1996–2005: included in Newmont Gold production, page 51	Ordovician-Devonian limestone, argillite chert	Eocene

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**MAJOR PRECIOUS-METAL DEPOSITS (continued)**

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
<b>EUREKA COUNTY (continued)</b>				
<b>Carlin North, Newmont (Lynn district) continued</b>				
<b>Genesis Complex</b>	2000: 14.1 million tons, 0.026 opt Au proven and probable open-pit reserves 2004: 1,065,000 oz Au (proven and probable reserve)			
<b>Leeville</b>	2004: 2,612,000 oz Au (proven and probable reserves)	2005: included in Newmont Gold production, page 51	Roberts Mountains Formation	Eocene
<b>North Lantern</b>	2004: 199,940 oz Au			
<b>North Star</b>	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 1989-2005: included in Newmont Gold production, page 51	lower Paleozoic sedimentary rocks	Eocene
<b>Post/Goldbug</b>	1996: 25.6 million tons, 0.190 opt Au proven and probable reserves; 43.6 million tons, 0.079 opt Au mineralized material	1999-2005: included in Newmont Gold production, page 51	lower Paleozoic sedimentary rocks	Eocene
<b>Deep Post</b>	2000: 3.1 million tons, 0.814 opt Au proven and probable underground reserves 2004 (includes Deep Star) 1,462,000 oz Au (proven and probable reserve)	2005: included in Newmont Gold production, page 51		
<b>Turf</b>	1996: 2.5 million tons, 0.367 opt Au mineralized material	included in Newmont Gold production, page 51	Roberts Mountains Formation	Eocene
<b>West LEEVILLE (Newmont)</b>	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 51	Roberts Mountains Formation	Eocene
<b>West LEEVILLE (Newmont-Barrick)</b>	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
<b>Carlin Mine</b>	1965: 11 million tons, 0.32 opt Au	1965-86: 3.8 million oz Au		
<b>Carlin/Pete/Lantern</b>	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 2004: 940,040 oz Au (proven and probable reserves)	1994-96: 68,700 oz Au 1997-2005: included in Newmont Gold production, page 51	Roberts Mountains Formation	Eocene
<b>Carlin Underground</b>	2004: 163,000 oz Au			
<b>Carlin North-other</b>	2000: 19.8 million tons, 0.052 opt Au, proven and probable open-pit reserves			
<b>Carlin North area total</b>	2000: 8.2 million tons, 0.495 opt Au, proven and probable underground reserves			
<b>Carlin North area, total open-pit</b>	2001: 32.6 million tons, 0.044 opt Au, proven and probable reserves; 13.0 million tons, 0.039 opt Au mineralized material			
<b>Carlin North area, total underground</b>	2001: 10.9 million tons, 0.56 opt Au, proven and probable reserves; 2.1 million tons, 0.55 opt Au mineralized material			
<b>Carlin South, Newmont (Maggie Creek district)</b>				
<b>Gold Quarry/Mac/Tusc</b>	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 2004: 5,984,000 oz (proven and probable reserve)	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 51 1994-96: 2,978,000 oz Au 1997-2005: included in Newmont Gold production, page 51	Ordovician to Devonian chert, shale, siltstone, and impure carbonates; in part, Vinini Formation	Eocene

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**MAJOR PRECIOUS-METAL DEPOSITS (continued)**

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
<b>EUREKA COUNTY (continued)</b>				
<b>Carlin South, Newmont (Maggie Creek district) continued</b>				
<b>Soap Creek (formerly Mike)</b>	1999: 408,000,00 tons, .006 opt Au 151,000,000 tons, 0.10 % Cu 19,000,000 tons, 1.00 % Zn ("drill-indicated mineral inventory)			
<b>Tusc</b>	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 51	lower Paleozoic sedimentary rocks	Eocene
<b>Carlin South area</b>	2000: 75.2 million tons, 0.059 opt Au proven and probable open-pit reserves			
<b>Carlin South open-pit</b>	2001: 61.3 million tons, 0.062 opt Au proven and probable reserves; 24.6 million tons, 0.028 opt Au mineralized material			
<b>Chukar Footwall underground</b>	2001: 278,000 tons, 0.49 opt Au proven and probable reserves; 115,000 tons, 0.46 opt Au mineralized material 2004: 172,000 oz Au (proven and probable reserves)			
<b>Carlin North and South combined (includes all Newmont's Carlin properties)</b>				
<b>Carlin open pit</b>	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 2004: 201,600,000 tons, 0.047 opt Au proven and probable reserves; 13,200,000 tons, 0.022 opt Au indicated material; 7,700,000 tons, 0.034 opt Au inferred material 2005: 238.3 million tons, 0.043 opt Au (proven and probable reserve) 28.1 million tons, 0.04 opt Au (measured and indicated resources) 4.2 million tons, 0.024 opt Au (inferred resource)	2004–2005: included in Newmont Gold gold production, page 51		Eocene
<b>Carlin underground</b>	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 2004: 8,700,000 tons, 0.510 opt Au proven and probable reserves; 100,000 tons, 0.260 opt Au indicated material; 3,900,000 tons, 0.470 opt Au inferred material 2005: 7.7 million tons, 0.49 opt Au (proven and probable reserve) 300,000 tons, 0.33 opt Au (measured and indicated resources) 3.7 million tons, 0.46 opt Au (inferred resource)	2004–2005: included in Newmont Gold gold production, page 51		Eocene
<b>Gold Bar (Antelope district)</b>	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?
<b>Gold Canyon (Antelope district)</b>	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)	Devonian Upper Denay Limestone Formation	Eocene?

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**MAJOR PRECIOUS-METAL DEPOSITS (continued)**

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
<b>EUREKA COUNTY (continued)</b>				
<b>Gold Pick (Antelope district)</b>	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 2005: 7,874,000 tons, 0.041 opt Au (indicated resource)	(reported with Gold Bar)	Devonian McColley Canyon Formation	Eocene?
<b>Gold Ridge (Antelope district)</b>	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)	Devonian McColley Canyon Formation	Eocene?
<b>Goldstone (Antelope district)</b>	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)	Devonian Upper Denay Limestone Formation	Eocene?
<b>Horse Canyon (Cortez district)</b>	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	Wenban Limestone	≤35 Ma?
<b>Maggie Creek (Maggie Creek district)</b>	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
<b>Ratto Canyon (Lookout Mountain) (Eureka district)</b>	1984: ~200,000 oz Au (entire Ratto Ridge area): 2005: 13,022,200 tons, 0.021 opt Au	1987-88: 17,000 oz Au	Dunderberg Shale, Hamburg Dolomite	Eocene
<b>Rock Creek (Eureka-Lander Co. line)</b>	1997: 800,000 tons, 0.045 opt Au		Tertiary latite tuff	
<b>Rodeo Projects (Rodeo, Griffin, Goldbug, North Betze) (Lynn district)</b>	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 2005: reserves are combined with Meikle reserves, p.	see Meikle (p. 31) for production		Eocene
<b>Ruby Hill (Eureka district)</b>	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 2004: (East Archimedes) 17,093,000 tons, 0.059 opt Au proven and probable reserves; 3,049,000 tons, 0.061 opt Au mineral resource	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 2004: 6,057 oz Au, 1,868 oz Ag	Goodwin Limestone	
<b>Tonkin Springs (Antelope district)</b>	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,	Eocene?
<b>Windfall (Eureka district)</b>	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



**MAJOR PRECIOUS-METAL DEPOSITS (continued)**

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
<b>HUMBOLDT COUNTY</b>				
<b>Adelaide Crown (Gold Run district)</b>	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
<b>Ashdown (Vicksburg district)</b>	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
<b>Buckskin (National district)</b>	1997: 50,221 oz Au, 466,243 oz Ag estimated resource		Miocene rhyolite flows and flow breccias	15 Ma
<b>Chimney Creek (Potosi district)</b>	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	
<b>Converse/Redline (Buffalo Valley district)</b>	2003: 77,459,000 tons, 0.020 opt Au measured and indicated resources 2004: 263 million tons, 0.0150 opt Au, 0.0582 opt Ag (measured and indicated resource) 35 million tons, 0.0143 opt Au, 0.0524 opt Ag		Havallah Formation granodiorite	Tertiary
<b>Getchell (Potosi district)</b>	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 2005: Turquoise Ridge Mine, include Turquoise Ridge and Getchell Footwall deposits: 7.6 million tons, 0.56 opt Au (proven and probable reserve) 5.6 million tons, 0.42 opt Au (measured and indicated resource) 400,000 tons, 0.54 opt (inferred resource)	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 2004: 162,637 oz Au 2005: 208,492 oz Au, 54,419 oz Ag	Comus and Preble Formations, granodiorite dikes, granodiorite	37-41 Ma
<b>Hycroft formerly Crofoot/Lewis (Sulphur district)</b>	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 2004: 47,479,000 tons, 0.016 opt Au measured and indicated; 12,029,000 tons, 0.011 opt Au inferred resources 2005: 33.32 million tons, 0.02 opt Au (proven and probable reserve) 52.7 million tons, 0.019 opt Au (measured and indicated resource) 8.7 million tons, 0.015 opt Au (inferred resource)	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 2004: 61 oz Au	Camel conglomerate, rhyolite dikes	1-2 Ma

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**MAJOR PRECIOUS-METAL DEPOSITS (continued)**

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
<b>HUMBOLDT COUNTY (continued)</b>				
<b>Lone Tree (Buffalo Mountain district)</b>	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 2004: 14,000,000 tons, 0.063 opt Au proven and probable reserves; 3,400,000 tons, 0.044 opt Au indicated material; 200,000 tons, 0.116 opt Au inferred material 2005: 4 million tons, 0.080 opt Au (proven and probable reserve) 3 million tons, 0.032 opt Au (measured and indicated resource)	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 2004: 497,065 oz Au, 140,144 oz Ag 2005: 339,187 oz Au, 46,934 oz Ag	Havallah Formation, Antler Sequence and dacite porphyry	38 Ma
<b>Marigold (Battle Mountain district)</b>	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 2004: 71,218,500 tons, 0.023 opt Au proven and probable reserves; 18,043,500 tons, 0.022 opt Au measured and indicated resources; 21,000,000 tons, 0.014 opt Au inferred resource 2005: 98.21 million tons, 0.021 opt Au (proven and probable reserve) 157.48 million tons, 0.020 opt Au (measured and indicated resource, includes reserve) 163.23 million tons, 0.013 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 2004: 141,304 oz Au, 2,354 oz Ag 2005: 205,663 oz Au, 1,723 oz Ag	Paleozoic chert, argillite, and carbonate rocks	
<b>North Stonehouse (Buffalo Mountain district)</b>	1991: 2.5 million tons, 0.103 oz Au mill ore		Havallah Formation and porphyry dikes	39 Ma
<b>Pinson (includes Mag pit) (Potosi district)</b>	1980: 3.245 million tons, 0.119 opt Au 1989: 480,000 oz Au 1996: 2.6 million tons, 0.072 opt Au 2005: 1,692,000 tons, 0.421 opt Au (measured and indicated resource) 3,097,000 tons, 0.34 opt Au (inferred resource)	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	Cornus Formation	Eocene?
<b>Preble (Potosi district)</b>	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?

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**MAJOR PRECIOUS-METAL DEPOSITS (continued)**

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
<b>HUMBOLDT COUNTY (continued)</b>				
<b>Rabbit Creek (Potosi district)</b>	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?
<b>Sleeper (Awakening district)</b>	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
<b>Trenton Canyon (includes Valmy and North Peak) (Buffalo Valley district)</b>	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		
<b>Trout Creek (Battle Mountain district)</b>	1989: 50,000 oz Au			
<b>Twin Creeks (Chimney and Rabbit Creeks) (Potosi district)</b>	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 2004: 61,800,000 tons, 0.075 opt Au proven and probable reserves; 15,300,000 tons, 0.077 opt Au indicated material; 800,000 tons, 0.043 opt Au inferred material 2005: 61.2 million tons, 0.074 opt Au (proven and probable reserve) 19.9 million tons, 0.049 opt Au (measured and indicated resource) 3.1 million tons, 0.033 opt Au (inferred resource)	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 oz Ag 2004: 352,810 oz Au, 99,472 oz Ag 2005: 267,620 oz Au, 144,172 oz Ag	Paleozoic	41-43 Ma
<b>Winnemucca Mountain (Winnemucca district)</b>	1998: 130,000 to 140,000 oz Au proven, 300,000 oz Au indicated			
<b>LANDER COUNTY</b>				
<b>Austin Gold Venture (Birch Creek district)</b>	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
<b>Battle Mountain Complex (Battle Mountain district)</b>	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
<b>Buffalo Valley Gold Project (Buffalo Valley district)</b>	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?

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**MAJOR PRECIOUS-METAL DEPOSITS (continued)**

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
<b>LANDER COUNTY (continued)</b>				
<b>Cortez Joint Venture (Bullion district)</b>	1968: 3.6 million tons, 0.279 opt Au (Cortez deposit)	1942–84: 2.4 million tons, 0.13 oz Au/ton; 2 million tons, 0.041 opt Au leached. Little Gold Acres:	Roberts Mountains Formation, Wenban Limestone, Valmy	
<b>CJV includes original Cortez Mine, Pipeline, South Pipeline, Gold Acres, Cortez Hills</b>	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 2004: 193,560,000 tons, 0.046 opt Au proven and probable reserves; 188,860,000 tons, 0.028 opt Au measured and indicated; 20,500,000 tons, 0.024 opt Au inferred resource 2005 (Sept 1): 275.8 million tons, 0.040 opt Au (proven and probable reserve) 309 million tons, 0.033 opt Au (measured and indicated resource) 39.2 million tons, 0.058 opt Au (inferred resource)	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 2004: 1,051,197 oz Au 2005: 915,889 oz Au, 52,160 oz Ag	Formation, quartz porphyry dikes	
<b>Cortez Hills</b>	2005 (Sept 1): 71.3 million tons, 0.079 opt Au, 5,545,000 oz Au (proven and probable reserve) 5.75 million tons, 0.42 opt Au, 2,421,667 oz Au (measured and indicated resource, underground) 13.8 million tons, 0.13 opt Au, 1,856,667 oz Au (inferred resource, open pit and underground)			
<b>Crescent Pit</b>	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			
<b>Crescent Valley (Bullion district)</b>	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			
<b>Dean (Lewis district)</b>	1995: proven reserve-11,000 oz Au possible to probable resource-240,000 oz Au			
<b>Elder Creek Project/Shoshone (Lewis district)</b>	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
<b>Fire Creek (northeast of Bullion district)</b>	1982: 350,000 tons, 0.06 opt Au 2005 (May): 1,779,196 tons, 0.328 opt Au (indicated resource)	1983–84: 767 oz Au	basaltic andesite	Miocene
<b>Fortitude Complex (Battle Mountain district)</b>	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 Pumpnickel Formation	37 Ma
<b>Fortitude Extension (Battle Mountain district)</b>	1992: 500,000 oz Au 1993: geologic resource-900,000 oz Au 1996: included in Battle Mountain Complex			
<b>Hilltop (Hilltop district)</b>	1984: 10.3 million tons, 0.073 opt Au 1989: 10 million tons, 0.049 opt Au 2005: 121 million tons, 0.019 opt Au (measured and indicated resource)		Valmy Formation	Oligocene?
<b>Klondike property</b>	1989: 100,000 oz Au equivalent			

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**MAJOR PRECIOUS-METAL DEPOSITS (continued)**

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
<b>LANDER COUNTY (continued)</b>				
<b>McCoy/Cove (McCoy district)</b>	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 2004: 8,454 oz Au, 64,335 oz Ag 2005: 2,740 oz Au, 776 oz Ag	Panther Canyon Formation (conglomerate, sandstone), Augusta Mountain Formation (limestone), granodiorite	39.5 Ma
<b>Mud Springs (Bald Mtn. Zone) (Bullion district)</b>	1993: geologic resource-42,000 oz Au			
<b>Mule Canyon (Argenta district)</b>	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, 1,490 oz Ag 2004: 2,289 oz Au, 645 oz Ag 2005: 47,896 oz Au, 5,449 oz Ag	basalt and basaltic andesite	15-16 Ma
<b>Phoenix (Battle Mountain district)</b>	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 2004: 248,000,000 tons, 0.034 opt Au proven and probable reserves; 33,900,000 tons, 0.022 opt Au indicated material; 34,900,000 tons, 0.028 opt Au inferred material; 216,700,000 tons, 0.15% Cu probable; 32,000,000 tons, 0.21% Cu indicated; 29,800,000 tons, 0.17% Cu inferred 2005: 308.4 million tons, 0.029 opt Au (proven and probable reserve) 22.2 million tons, 0.023 opt Au (measured and indicated resource) 16.5 million tons, 0.026 opt Au (inferred resource)	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 2004: 7,887 oz Au, 2,224 oz Ag 2005: 6,406 oz Au, 1,156 oz Ag		Eocene
<b>Pipeline (Bullion district)</b>	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?

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**MAJOR PRECIOUS-METAL DEPOSITS (continued)**

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
<b>LANDER COUNTY (continued)</b>				
<b>Robertson (Bullion district)</b>	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 2005: 22.9 million tons, 0.031 opt Au (measured and indicated resource) 9,408,000 tons, 0.046 opt Au (inferred resource)	1989: 3,700 oz Au	Valmy Formation	early Oligocene
<b>Slaven Canyon property (Bateman Canyon district)</b>	1994: 50,000 oz Au 2002: 1.6 million tons, 0.043 opt Au			
<b>South Pipeline (Bullion district)</b>	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?
<b>Surprise (Battle Mountain district)</b>	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
<b>Toiyabe</b>	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?
<b>Victorine (Kingston district)</b>	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	
<b>LINCOLN COUNTY</b>				
<b>Atlanta gold property (Atlanta district)</b>	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
<b>Caliente property (Pennsylvania district)</b>	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	
<b>Easter and Delamar Project (Delamar district)</b>	1994: geologic resource-3.36 million tons, 0.069 opt Au 1995: 1.5 million tons, 0.069 opt Au		Cambrian quartzite	Miocene
<b>LYON COUNTY</b>				
<b>Fire Angel (Como district)</b>	1989: 5,600 oz Au, geologic resource-148,500 oz Au			
<b>Hydra-Hercules (Como district)</b>	1997: 259,329 oz Au, 1,956,511 oz Ag		Tertiary andesite	
<b>Pine Grove (Pine Grove district)</b>	1994: 2.5 million tons, 0.061 opt Au		Cretaceous granodiorite	
<b>South Comstock Joint Venture (Silver City district)</b>	1994: 3 million tons, 0.05 opt Au 1995: 100,000 oz Au			

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**MAJOR PRECIOUS-METAL DEPOSITS (continued)**

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
<b>LYON COUNTY (continued)</b>				
<b>Talapoosa (Talapoosa district)</b>	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
<b>MINERAL COUNTY</b>				
<b>Aurora Mine (Aurora district)</b>	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
<b>Aurora Partnership (Aurora district)</b>	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
<b>Borealis (Borealis district)</b>	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 2005 (May): 44.7 million tons, 0.03 opt Au (measured and indicated resource) 34.8 million tons, 0.02 opt Au (inferred 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
<b>Candelaria Mine (Candelaria district)</b>	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
<b>Denton-Rawhide (Rawhide district)</b>	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 2004: 43,390 oz Au, 446,000 oz Ag 2005: 33,820 oz Au, 311,760 oz Ag	rhyolite plugs, flows, tuffs, breccias	16 Ma
<b>Esmeralda (Aurora district)</b>	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
<b>Mina Gold (Bell district)</b>	1997: 1.77 million tons, 0.055 opt Au geologic resource	1997: exploration	Tertiary feldspar porphyry	
<b>Mindora (Garfield district)</b>	1988: 1.0 million tons, 0.037 opt Au and 1.78 opt Ag	1988: exploration		
<b>Santa Fe (Santa Fe district)</b>	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

**MAJOR PRECIOUS-METAL DEPOSITS (continued)**

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
<b>NYE COUNTY</b>				
<b>Baxter Springs (Manhattan district)</b>	1988: 1 million tons, 0.050 opt Au 1990: geologic resource-5 million tons 0.050 opt Au			
<b>Bruner property, Duluth zone (Bruner district)</b>	1992: geologic resource-15 million tons, 0.026 opt Au	1993: exploration	Tertiary volcanic rocks	Miocene
<b>Bullfrog (Bullfrog district)</b>	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
<b>Cimmaron (San Antone district)</b>	2004: 1,730,600 tons, 0.035 opt Au inferred material			
<b>Corcoran Canyon (Barcelona district)</b>	2004: 1,774,700 tons, 0.025 opt Au, 5.11 opt Ag indicated and inferred material		rhyolitic ash-flow tuff	
<b>Daisy (Bare Mountain district)</b>	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(?)
<b>Gold Bar (Bullfrog district)</b>	1987: 1.23 million tons Au ore 1993: idle		silicic volcanic rocks	Miocene
<b>Golden Arrow (Golden Arrow district)</b>	1997: 12.4 million tons, 0.039 opt Au resource		Tertiary rhyolite tuff	
<b>Gold Hill property (Round Mt. district)</b>	1998: 306,620 oz Au, 4,871,890 oz Ag potential resource 2003: (included in Round Mt.)		rhyolite ash-flow tuff	26 Ma(?)
<b>Gold Wedge property (Manhattan district)</b>	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 2005: 333,000 tons, 0.310 opt Au (measured and indicated resource)			
<b>Longstreet property (Longstreet district)</b>	1989: 4 million tons, 0.024 opt Au, geologic resource-9.6 million tons, 0.024 opt Au		rhyolitic volcanic rocks	Oligocene
<b>Manhattan property (Manhattan district)</b>	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	
<b>Midway (Rye Patch district)</b>	1997: 270,000 oz Au preliminary resource 2005: 5,526,000 tons, 0.039 opt Au (inferred resource)		Ordovician Palmetto Formation Tertiary volcanic rocks	
<b>Montgomery Shoshone (Bullfrog district)</b>	1988: 3.1 million tons, 0.072 opt Au, 0.240 opt Ag		rhyolitic ash-flow tuff	9.5 Ma
<b>Nevada Mercury (Bare Mountain district)</b>	1994: geologic resource-50,000 oz Au			
<b>Northumberland (Northumberland district)</b>	1988: 12 million tons, 0.06 opt Au 2005 (July): 30,910,000 tons, 0.067 opt Au (measured and indicated resource) 4,381,000 tons, 0.091 opt Au (inferred resource)	1939-42: 327,000 oz Au 1981-84: 950,000 tons/year 1988: 29,667 oz Au, 130,394 oz Ag 1981-1990: ~230,000 oz Au, 485,000 oz Ag	Roberts Mountains and Hanson Creek Formations, granodiorite, tonalite, quartz porphyry dikes	
<b>Paradise Peak/ Ketchup Flats pit (Fairplay district)</b>	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

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**MAJOR PRECIOUS-METAL DEPOSITS (continued)**

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
<b>NYE COUNTY (continued)</b>				
<b>Reward property (Bare Mountain district)</b>	1998: 77,500 oz Au		Cambrian Wood Canyon Formation	
<b>Round Mountain (Smoky Valley) (Round Mountain district)</b>	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) 2004: 433,400,000 tons, 0.018 opt Au proven and probable reserves; 64,000,000 tons, 0.015 opt Au mineral resource 2005: 275,608,000 tons, 0.017 opt Au (proven and probable reserve) 35,412,000 tons, 0.017 opt Au (measured and indicated resource) 35,374,000 tons, 0.013 opt Au (inferred resource)	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 2004: 762,966 oz Au, 773,950 oz Ag 2005: 736,886 oz Au, 636,361 oz Ag	rhyolite ash-flow tuff	26 Ma
<b>Sterling (Bare Mountain district)</b>	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
<b>South Monitor (west of Ellendale district)</b>	1996: 250,000 oz Au 1997: 14 million tons, 0.026 opt Au, 0.12 opt Ag		Tertiary volcanic rock	
<b>Sullivan (Fairplay district)</b>	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

**PERSHING COUNTY**

<b>Bunce (Velvet district)</b>	1989: geologic reserve - 600,000 tons, 0.04 opt Au 1990: 500,000 tons, 0.04 opt Au		rhyolite	Miocene?
<b>Colado Gold (Willard district)</b>	1997: 15 million tons, 0.022 opt Au resource		Triassic-Jurassic metasedimentary rocks	
<b>Florida Canyon (Imlay district)</b>	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 2004: 16,792,000 tons, 0.016 opt 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 2004: 73,082 oz Au, 60,405 oz Ag (includes Standard) 2005 (Florida Canyon): 29,186 oz Au, 17,571 oz Ag 2005 (Standard): 21,522 oz Au, 51,751 oz Ag	Grass Valley Formation	2 Ma

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**MAJOR PRECIOUS-METAL DEPOSITS (continued)**

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
<b>PERSHING COUNTY (continued)</b>				
<b>Goldbanks Project (Goldbanks district)</b>	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			
<b>Relief Canyon (Antelope Springs district)</b>	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	Tertiary
<b>Rochester (Rochester district)</b>	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 2004: 21,453,000 tons, 0.010 opt Au, 0.87 opt Ag proven reserves; 2,545,000 tons, 0.010 opt Au, 0.81 opt Ag probable reserves; 26,205,000 tons, 0.010 opt Au, 0.81 opt Ag measured resources; 8,551,000 tons, 0.010 opt Au, 0.96 opt Ag indicated resources; 308,000 tons, 0.003 opt Au, 1.73 opt Ag inferred resources 2005: 10,168,000 tons, 0.011 opt Au, 0.86 opt Ag (probable reserve) 15,646,000 tons, 0.010 opt Au, 1.03 opt Ag (measured and indicated resource)	1986–98: 810,329 oz Au, 59.3 million oz Ag 1999: 70,396 oz Au, 6.2 million oz Ag 2000: 75,886 oz 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 2004: 69,456 oz Au, 5,669,073 oz Ag 2005: 70,298 oz Au, 5,720,489 oz Ag	Koipato Group, Weaver Rhyolite Rochester Rhyolite	Late Cretaceous
<b>Rosebud Project (Rosebud district)</b>	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
<b>Spring Valley (Spring Valley district)</b>	2005: 10,030,000 tons, 0.024 opt Au (measured and indicated resource) 7,753,000 tons, 0.025 opt Au (inferred resource)			
<b>Standard (Imlay district)</b>	2002: 17.2 million tons, 0.019 opt Au proven and probable reserves 2003: 404,100 oz Au proven and probable reserves 2004: 25,776,000 tons, 0.017 opt Au proven and probable reserves	1939–42, 1946–49: 45,743 oz Au, 127,451 oz Ag 2004: included with Florida Canyon 2005: 21,522 oz Au, 51,751 oz Ag	Natchez Pass Limestone, Grass Valley Formation argillite	
<b>Tag-Wildcat (Farrel district)</b>	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
<b>Trinity (Trinity district)</b>	1987: 1 million tons, 5.25 opt Ag Sulfide resource: ~4 million tons, 2.5 opt Ag	1987–89: ~5-6 million oz Ag	rhyolite porphyry, rhyolite tuff	26 Ma
<b>Wildcat (Farrel district)</b>	2003: 38.1 million tons, 0.018 opt Au indicated resources; 28.4 million tons, 0.015 opt Au inferred resources		Tertiary volcanic	Miocene
<b>Willard (Willard district)</b>		~90,000 oz Au (late 1980s to early 1990s)	Jurassic-Triassic Grass Valley Formation	6 Ma

**MAJOR PRECIOUS-METAL DEPOSITS (continued)**

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
<b>STOREY COUNTY</b>				
<b>Hartford Hill Complex</b> (includes Billie the Kid Mine) (Silver City district)		2004: 2,836 oz Au, 12,695 oz Ag 2005: 5,715 oz Au, 26,488 oz Ag		
<b>Comstock heap leach project</b> (Comstock district)	1992: 475,000 tons, 0.072 opt Au, 0.60 opt Ag 1996: 100,000 oz Au, 1.2 million oz Ag			
<b>Flowery (Golden Eagle)</b> (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
<b>Oliver Hills</b> (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		
<b>WASHOE COUNTY</b>				
<b>Mountain View Gold Project</b> (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
<b>Olinghouse</b> (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
<b>Hog Ranch</b> (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
<b>Wind Mountain</b> (San Emidio)	1988: 15 million tons, 0.021 opt Au, 0.42 opt Ag	1989: 30,900 oz Au, 335,000 oz Ag 1991: 91,000 oz Au, 405,000 oz Ag 1992: 54,690 oz Au, 297,403 oz Ag 1993: 19,570 oz Au, 92,630 oz Ag	Tertiary sedimentary rocks	late Tertiary or Quaternary
<b>WHITE PINE COUNTY</b>				
<b>Alligator Ridge</b> (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

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**MAJOR PRECIOUS-METAL DEPOSITS (continued)**

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
<b>WHITE PINE COUNTY (continued)</b>				
<b>Bald Mountain (Top) (Bald Mountain district)</b>	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 2004: 21,530,000 tons, 0.044 opt Au proven and probable reserves; 53,586,000 tons, 0.027 opt Au measured and indicated resource; 10,808,000 tons, 0.018 opt Au inferred resource 2005: 105,050,700 tons, 0.032 opt Au (proven and probable reserve) 35,000,000 tons, 0.023 opt Au (measured and indicated resource) 14,868,000 tons, 0.026 opt Au	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 2004: 46,685 oz Au, 27,635 oz Ag 2005: 77,767 oz Au, 32,652 oz Ag	quartz porphyry, Cambrian shale and limestone	Jurassic?
<b>Bellview (White Pine district)</b>	1988: 277,000 tons, 0.04 opt Au, geologic resource-1 million tons, 0.036 opt Au			
<b>Casino/Winrock (Bald Mountain district)</b>	1989: Casino - 804,000 tons, 0.054 opt Au; Winrock 1.3 million 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
<b>Easy Junior (Nighthawk Ridge) (White Pine district)</b>	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
<b>Golden Butte (Cherry Creek district)</b>	1989: 4.23 million tons, 0.031 opt Au	1989–91: 43,519 oz Au, 16,911 oz Ag	Chainman Shale	Cretaceous or Eocene
<b>Griffon Gold property (White Pine district)</b>	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	
<b>Horseshoe (Bald Mountain district)</b>	1991: 1.5 million tons, 0.039 opt Au		Pilot Shale and intrusive quartz porphyry	36-38 Ma
<b>Illipah (Illipah district)</b>	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?
<b>Little Bald Mtn. (Bald Mountain district)</b>	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
<b>Mt. Hamilton (White Pine district)</b>	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
<b>Pan (White Pine district)</b>	1989: 241,000 oz Au 1998: 10.86 million tons, 0.022 opt Au drill indicated and inferred 2003: 17,890,000 tons, 0.019 opt Au indicated resources; 7,986,000 tons, 0.016 opt Au inferred resources		Mississippian rocks	

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**MAJOR PRECIOUS-METAL DEPOSITS (continued)**

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
<b>WHITE PINE COUNTY (continued)</b>				
<b>Robinson (Robinson district)</b>	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 2005: 160,400,000 tons, 0.69% Cu, ) 0.073 opt Au (proven and probable reserve) 610,979,000 tons, 0.55% Cu, 0.0064 opt Au (measured resource, 0.2% Cu cut-off) 171,858,000 tons, 0.44% Cu, 0.0041 opt Au (indicated resource, 0.2% Cu cut-off) 98,166,000 tons, 0.32% Cu, 0.0015 opt Au (inferred resource, 0.2% Cu cut-off)	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 lbs Cu 1999: 26,250 oz Au, 153,104 oz Ag, 62 million lbs Cu 2004: 12,228 oz Au, 27 million lbs Cu 2005: 80,941 oz Au, 191,479 oz Ag, 126 million lbs Cu	Rib Hill Sandstone Riepe Spring Limestone intrusions	Cretaceous
<b>Taylor (Taylor district)</b>	1980: 10 million tons, 3 opt Ag	1980: 1,200 tons/day	Guilmette and Joana Limestones, rhyolite dikes	Eocene or Oligocene
<b>White Pine (White Pine district)</b>	1989: 63,000 oz Au, 0.04 opt Au	1989: 20,654 oz Au	Pilot Shale	Oligocene?
<b>Yankee (Bald Mountain district)</b>	1992: 683,000 oz Au	1990: ~15,000 oz Au 1992: 10,800 oz Au <b>1993: see Bald Mountain</b>	Pilot Shale	36-38 Ma?

**Newmont Gold and Silver Production in the Carlin Trend**

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

<b>Year</b>	<b>Gold (oz)</b>	<b>Silver (oz)</b>
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	1,536,401	255,011
2000	1,865,648	108,111
2001	1,547,247	292,241
2002	1,378,782	277,753
2003	1,122,208	206,767
2004	1,287,674	363,052
2005	1,397,583	227,158

NA= not available

# Industrial Minerals

*by Stephen B. Castor*

Unlike most states, where the value of industrial minerals production exceeds metals production, Nevada's mining industry has been dominated by gold production since 1982. In recent years, industrial minerals have accounted for about 15% of the total value of the state's annual mineral production. The total value of industrial minerals produced in Nevada in 2005, an estimated \$507 million, was 7% above that of 2004. In order of estimated value, the most important Nevada industrial minerals in 2005 were construction aggregate, lime, diatomite, cement, gypsum, barite, silica, magnesia, 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, and gemstones. Borate and zeolite were processed in Nevada but mined in California, and were not included in the estimate of total industrial mineral value reported above. 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.

## **Aggregate (Sand and Gravel, Crushed Stone)**

According to the U.S. Geological Survey, in 2005 the U.S. produced about 2.9 billion metric tons (3.2 billion short tons) of sand and gravel + crushed stone, up slightly from 2004. The average price for this material was \$5.97 per metric ton (\$5.43 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.

For the year 2005, Nevada's statewide construction aggregate production is estimated at 46 million tons, 15% more than production for 2004. This production had an approximate value of \$207 million, well below that of gold and slightly less than the value of copper production. Aggregate production from sand and gravel deposits accounted for about 65% of aggregate production statewide, with crushed stone and lightweight aggregate making up the balance.

Construction aggregate produced in the Las Vegas area in 2005, estimated at 34 million tons, was about 15% higher than in 2004. Las Vegas has topped the University of Central Florida's Private Construction Intensity Index every year since 1999 (i.e., more new home construction permits were issued per 1000 non-farming jobs in

Las Vegas than in any other metropolitan area in the country). The boom in new home construction, along with attendant infrastructure construction and tourist destination building, has maintained local demand for construction aggregate at high levels for many years.

Sand and gravel operations accounted for more than 70% of the aggregate used in the Las Vegas metropolitan area in 2005, with crushed stone and lightweight aggregate making up the balance. The most important source of sand and gravel aggregate for Las Vegas is the Lone Mountain area northwest of Las Vegas, which accounted for more than 10 million tons in 2005. Significant production also comes from sand and gravel pits and stone quarries south and northeast of Las Vegas, and in the El Dorado Valley area southeast of Henderson. Since the mid 1990s, portable crushers that produce aggregate from sand and gravel at construction sites have been important producers of base aggregate in Las Vegas.

Companies in the Las Vegas area that produced more than a million tons of aggregate in 2005 were Nevada Ready Mix Corp., Las Vegas Paving Corp., Aggregate Industries, Rinker Materials, and American Sand and Gravel. Companies with production in excess of 500,000 tons per year were Granite Construction and Hollywood Sand and Gravel.

Nevada Ready Mix mined all of its aggregate from a complex of pits in alluvium in the Lone Mountain area; minor production also came from adjacent bedrock. Las Vegas Paving mostly produced sand and gravel from its Blue Diamond and Lone Mountain pits. The company also produced crushed stone from the Apex landfill about 10 miles northeast of Las Vegas. Rinker Materials, a subsidiary of the Australian-based CSR Group, produced crushed granite from the El Dorado pit near Railroad Pass. Aggregate Industries, which became a subsidiary of the Swiss company Holcim in 2005, 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 7 million tons to the Las Vegas area total in 2005. American Sand and Gravel mostly produced aggregate from such a community pit in the Lone Mountain area. The Southern Nevada Lightweight operation near Jean produced aggregate for lightweight concrete block and sand for use in stucco. Lightweight aggregate was also shipped into the Las Vegas market by the Cind-R-Lite Block Company from a cinder operation near Amargosa Valley in Nye County.

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 slated as feed for lime or cement operations. This trend was initiated in 2001 when Rinker Materials Inc. acquired claims on carbonate rocks in the Sloan area south of Las Vegas. In 2004, the U.S. Bureau of Land Management (BLM) completed a Mining Claim Validity Report on these claims, which included comparative testing of materials from the claims with similar material from producers of crushed carbonate rock in the Las Vegas area. On the basis of this report, the BLM challenged the claims in federal court. As of the end of 2005, the matter was still under consideration, and finalization of judgment and appeal for this case may take years.

Nevada Aggregate Holdings staked more than 100 lode claims and nearly 100 placer claims in 2005 over Paleozoic carbonate rock exposures in the Dry Canyon Range about 15 km northeast of Las Vegas and east of Interstate 15. These claims, which were presumably staked on aggregate resources, are in the vicinity of the Apex Landfill, which is the site of aggregate production for the Las Vegas metropolitan area. Companies that held claims on carbonate rocks or other aggregate materials in the Las Vegas area in 2005 include Aggregate Industries in the Sloan area, Sierra Ready Mix in the Ivanpah area about 20 miles south of Las Vegas, Las Vegas Paving in the Dry Lake area northeast of Las Vegas, and Diamond Generating Corp. in the Ivanpah area.

Production of construction aggregate in the Reno-Sparks-Carson City area, at about 8 million tons, was about 10% higher than in 2004. Companies in the area that produced more than a million tons of aggregate were RMC Nevada (now owned by the Mexican company Cemex S.A.), Granite Construction Co., and Martin Marietta Materials Inc. RMC Nevada owns the former All-Lite Aggregate crushed rhyolite and Paiute Pit Aggregates sand and gravel operations. Granite Construction produced aggregate from several pits in the area, but the bulk of the company's production was crushed andesite and crushed granitic rock from its Lockwood and Hidden Canyon pits, respectively. Most of Martin Marietta's production comes from the Rocky Ridge Quarry north of Sparks, which produces crushed granitic rock. Rilite, Frehner Construction, and A & K Earthmovers, Inc., were also important producers. Crushed rock accounted for about 60% of the aggregate used in 2005 in the Reno-Sparks-Carson City area. Lightweight aggregate, an important component of crushed rock production in the area, was produced by RMC Nevada, Rilite, and Basalite.

Aggregate that was produced outside of the major metropolitan areas in 2005 is estimated at about 4 million tons. Operators in Nye County together produced more than 500,000 tons of aggregate in 2005, mostly in the Pahrump area. Lincoln, Elko, Churchill, and Lyon County each produced more than 200,000 tons of aggregate. Douglas and Humboldt County each produced more

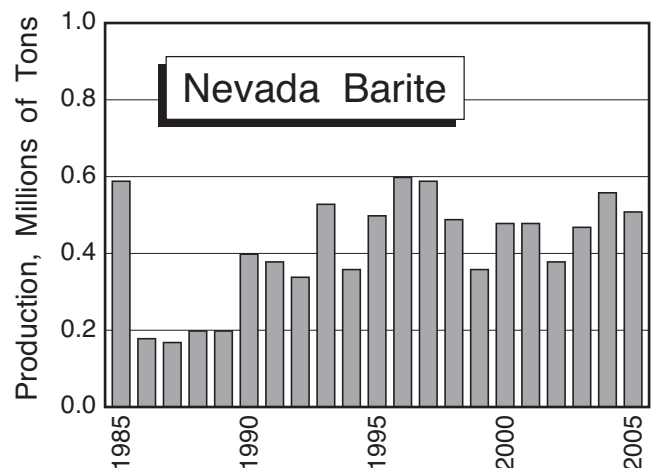
than 100,000 tons of aggregate. Other rural Nevada counties are estimated to have produced less than 100,000 tons of aggregate each in 2005.

## Barite

Nevada produces nearly all of the barite mined in the United States, and about 95% of the barite sold domestically is used as a weighting agent in oil and gas well drilling fluids. In 2005 the total U.S. drill rig count rose about 16% over 2004, and the Canadian rig count rose about 24%, indicating that barite usage should increase. However, Nevada barite production slipped from 560,000 tons in 2004 to 511,000 tons in 2005. Apparently, increases in domestic use of the commodity have so far been satisfied by increases in importation. According to the U.S. Geological Survey, the country imported more than 2.3 million metric tons of barite in 2005, an increase of about 20% over 2004. Nevada barite is mostly sold into western U.S. and Canadian markets.

M.I. Swaco, which is jointly owned by Smith International and Schlumberger, was the largest Nevada barite producer in 2005, with combined production of about 275,000 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. Baroid Drilling Fluids, a subsidiary of Halliburton Co., was the second largest producer in Nevada, shipping 169,000 tons. The company mined barite from the Rossi Mine in Elko County and processed it at the Dunphy Mill in Eureka County. Baker Hughes INTEQ shipped 68,000 tons of barite from its Argenta operation 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.

Nevada barite mining is now a shadow of its former glory years during the late 1970s and early 1980s, when as much as 2.4 million tons were produced annually by 25 or more producers. Since then, increased usage of imported Chinese barite, particularly in the Gulf



Coast, sent Nevada production into decline. However, recent increases in domestic demand for barite may spur domestic exploration for the commodity. In 2005, Excalibar Minerals Inc., a Texas company that produces barite and calcium carbonate products, staked 30 claims in the Independence Mountains in Elko County about 25 miles northwest of Elko. The claims were presumably staked for barite because they are in an area of barite prospects near Lone Mountain.

## **Borate**

American Borate Co. processes colemanite from stockpile at the Lathrop Wells mill in Nye County. The colemanite was mined from the Billie Mine in Death Valley, California, which is now shut down. The Nevada plant has a 22,000-ton annual capacity (B<sub>2</sub>O<sub>3</sub> basis), but its production is not included in the estimate of total value of Nevada minerals because the ore is from out of state.

## **Cement**

Based on U.S. Geological Survey estimates, about 97.5 million metric tons of cement were produced in 2005 in the U.S. at an average mill price of about \$84 per metric ton. The only major Nevada producer, the Nevada Cement Co. (part of Texas-based Eagle Materials Inc.) in Fernley, Lyon County, has annual production of about 600,000 tons of cement. The cement is manufactured from Tertiary lacustrine limestone mined a few miles south of Fernley, and other ingredients come from northern Nevada. The deposit near Fernley has limited reserves, and Nevada Cement is evaluating a limestone deposit in the Natchez Pass Formation in the Humboldt Range of Pershing County. The limestone may be used as raw material in a proposed new cement plant on mill site claims located 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 in the past. Royal Cement Co. reported minor production between 2000 and 2002 at a cement plant near Logandale in Clark County. In 2004, Ash Grove Cement Co. announced plans for a major cement plant northeast of Las Vegas on the Moapa Indian Reservation. The proposed source of limestone is from exposures of Devonian Sultan Limestone on the reservation. Proposed annual capacity of the plant, which is projected to cost \$250 million, is 1.5 million tons of cement. Construction is slated to begin in 2006, with completion predicted by 2008.

## **Clay**

Nevada clay production is estimated at 34,000 short tons in 2005, slightly less than in 2004. This does not include halloysite clay mined in Washoe County for Nevada Cement (which is included in the cement figure).

IMV Nevada, owned by Mud Camp Mining Company, LLC, produced more than 30,000 tons of sepiolite, saponite, and bentonite from deposits in lacustrine sediments in the Ash Meadows-Amargosa Flat area of Nye County. The clay occurs in shallow, flat-lying deposits in Pliocene lacustrine rocks. It is processed at a plant in Amargosa Valley, and clay products are exported worldwide. The sepiolite and saponite deposits are unusual, and are considered to have originated in a Pliocene playa with an area of at least 22 square miles. The sepiolite, which yields most of the profits for the operation, occurs in an almost continuous bed with an average thickness of about 7 feet.

Two companies mine and ship relatively minor amounts of Nevada clay from several sites for use in high-value 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 2005, the company shipped 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 its Nassau property in Coal Canyon in Pershing County. The clay is shipped to the American Colloid plant in South Dakota, where it is used in specialty clay products.

## **Diatomite**

The U.S. is the largest producer of diatomite worldwide. The international diatomite industry changed significantly in recent years; filter aid markets continued to grow, demand for diatomite fillers fell, and major producers changed ownership. In addition, concerns over health and safety issues associated with the crystalline silica in calcined diatomite have resulted in substitution of talc or calcium carbonate for diatomite fillers.

Nevada accounts for more than 30% of domestic diatomite production. About two-thirds of the diatomite produced in Nevada 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, in 2005 domestic diatomite production increased slightly over 2004, and the average domestic price in 2005 was slightly higher at \$264 per metric ton f.o.b.

Eagle-Picher Minerals, Inc., a division of Eagle-Picher Industries, Inc., produces most of Nevada's diatomite at three different locations. The company's Colorado operation in Pershing County is the most productive. It consists of a plant at Lovelock that mostly makes filtration products from diatomite mined about 15 miles to the northwest. 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. Eagle-Picher Industries, the



parent company, filed to reorganize under Chapter 11 of the U.S. Bankruptcy Code in April 2005. Eagle-Picher Minerals was reportedly for sale in 2005.

The Celite Corp. operates a mine at Hazen and plant in Fernley which produces diatomite fillers. Celite is a subsidiary of World Minerals Inc., the largest diatomite producer worldwide with operations in California and six foreign sites. World Minerals was acquired by Imerys of France in 2005. Moltan Co. of Tennessee ships absorbent products, cat litter, and soil conditioner under several labels from a mine and plant complex in Churchill County about 20 miles northeast of Fernley. The Moltan diatomite resource is large, reportedly containing 100 years of reserves. The Grefco diatomite operation near the Esmeralda/Mineral County line is small relative to other Nevada diatomite producers. American Diatomite Inc. holds claims in the Esmeralda County in the vicinity of the Shu Fly diatomite deposit about ten miles north of Coaldale.

### 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, oversize stone blocks are sold for use in wall construction, and new dimension stone operations are being evaluated.

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 generally too friable for building stone.

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 large slabs, is used for flagstone and other types of uncut building stone.

### Gemstones

Precious opal is produced from the several mines in Virgin Valley area of Humboldt County. The best known are the Royal Peacock, Rainbow Ridge, Bonanza, and Hidden Valley Mines. Virgin Valley is a well-known source of gem stones in North America; much of the opal comes from pay-to-dig operations and is unreported. In addition, Nevada had recorded production of turquoise from the early years of the twentieth century, and probably has produced more than \$30 million worth of the gemstone. In 2005, minor amounts of turquoise were produced from the Blue Ridge Mine in the Bullion district of Lander County.

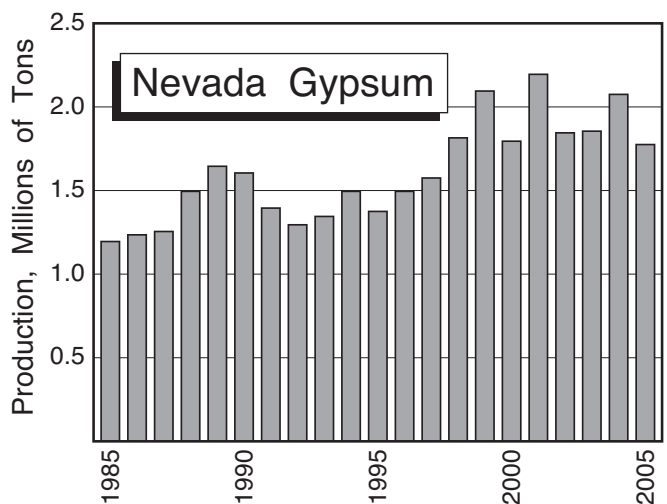
### Gypsum

In 2005, gypsum production in Nevada was an estimated 1.8 million short tons, about 15% less than in 2004. According to the USGS, Nevada was the third leading gypsum producer and accounted for about 11% of domestic gypsum production in 2004; however, one of the state's largest producers stopped mining in 2005, and the state's ranking has probably slipped. The two largest Nevada producers, PABCO Gypsum and USG, utilize most of the gypsum mined in Nevada in wallboard plants adjacent to mining operations.

PABCO Gypsum in Clark County northeast of Las Vegas mined and processed about 1.7 million tons of gypsum ore in 2005. Although processing yields only about 70% by weight gypsum from the ore, the company still ranks as the largest producer in Nevada. The gypsum, which is in a nearly flat-lying late Miocene gypsite blanket in excess of 120 feet thick in places, occurs atop a 5-square-mile mesa.

USG, the nation's largest wallboard producer, was the second largest Nevada producer in 2005, at about 365,00 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 Company 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 exploits the same late Miocene gypsite deposit as the PABCO operation about 5 miles to the north.



The gypsum mining operation of BPB PLC at Blue Diamond in Clark County was shut down in 2004. The gypsum deposit, which still contains reserves, consists of more-or-less flat-lying beds of nearly pure Permian gypsum as much as 30 feet thick on a table mountain that overlooks Las Vegas. The Blue Diamond area has been the site of gypsum mining since 1925, but is now in the path of metropolitan growth, and the former mine site is slated to become an upscale housing development. The adjacent Blue Diamond plant continued to produce wallboard in 2005, using gypsum imported from northern Arizona.

In 2005, more than 130 eight-member placer claims were staked in the Snow Flake block in southeastern Lincoln County about 12 miles northwest of Mesquite. The claims, which are in the area of the Snowwhite gypsum prospect, were staked over an extensive surficial gypsum deposit on behalf of Federated Commercial Industries Inc. of Las Vegas.

### **Lime, Limestone, and Dolomite**

According to the U.S. Geological Survey, in 2005 Nevada was one of seven states that produced more than 1 million tons of lime. Limestone is mined for lime production at two sites in Nevada that are nearly at opposite ends of the state, but the high-calcium limestone that is utilized at both sites is from the same Devonian limestone unit (although it is assigned to

different 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.

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 company's Henderson plant processes Type S 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.



**Lime kiln at Apex (Jon Price photo).**

## Lithium

Nevada is the only state with domestic production of lithium raw materials. The Nevada producer is Chemetall Foote Co., a subsidiary of Chemetall GmbH. The company produces lithium carbonate, lithium hydroxide monohydrate, and lithium hydroxide anhydrite at Silver Peak in Esmeralda County. The lithium chemicals are produced by solar evaporation preconcentration and subsequent refining techniques from brine that is pumped from beneath Clayton Valley playa. Production figures are confidential; the most recent public information, from 1998 Securities and Exchange Commission data, showed annual production of about 12 million pounds of lithium carbonate and 5 million pounds of lithium hydroxide. The U.S. price for lithium carbonate was about \$2.00 per pound until the late 1990s, when large shipments of lithium carbonate began to be sold at about half list price due to increased production from South American brine operations. The price for large lots of lithium carbonate delivered in the U.S. was \$1.15–1.50 per lb. in 2005. U.S. lithium imports have increased more than 200% and exports have fallen by more than 20% since 1997. According to USGS data, imports of lithium increased significantly for the third straight year in 2005, mostly because of growth in lithium-based rechargeable battery sales.

## 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. 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 increased steadily between 1996 and 2004. Production in 2005 was about the same as in 2004.

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 as complex replacement bodies in Triassic dolomite in a large area. The resource is thought to be well in excess of 50 years at present mining rates.

## Perlite

According to U.S. Geological Survey information, production of domestic perlite decreased from over 700,00 metric tons in 1999 to about 500,000 tons in 2005, probably due to decreases in usage in construction. 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., and imported perlite has made up about 30% of apparent U.S. consumption in recent years.

Nevada has large perlite resources and several deposits of perlite that have been mined extensively; however, the state now produces only minor amounts of perlite. 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 2005 the company shipped about 1,600 tons of expanded perlite.

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 2005 S & B Industrial Minerals NA staked nearly 100 claims in Lincoln County near the Utah state line. No mineral deposits are known in the area, which contains exposures of volcanic rock. Because the company is one of the world's largest producers of perlite, the claims possibly cover previously undiscovered deposits of perlite in the area. However, the claims may have been staked on clay mineral resources because the company is also a major clay producer.

## Potassium Alum

A small amount of potassium alum (kalinite) was shipped 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 Company produced more than 30,000 tons of salt in 2005, up more than 100% over the 2004 production. The salt is mainly used for deicing roads, and production levels are dependent on weather. The

2005 increase was probably due to depleted road salt stockpiles following a series of heavy snow storms in northern Nevada in the winter of 2004/2005. The salt is mined from a playa in Fourmile Flat about 25 miles southeast of Fallon in Churchill County, where it has been harvested almost every year 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. In 2005, domestic production rose about 3% to more than 31 million metric tons due to increased usage in construction according to the U.S. Geological Survey. Nevada's major silica producer, Simplot Silica Products at Overton in Clark County shipped about 750,000 tons of silica sand in 2005, about the same as in 2004. The sand is mined from a large open pit 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.

American Cement and Aggregate produces silica sand from the Ordovician Eureka Quartzite 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 product, which contains about 98% SiO<sub>2</sub>, is mainly used as construction sand. The company also holds claims that cover an abandoned quarry in Eureka Quartzite that contains more than 99% SiO<sub>2</sub> in Clark County about 30 miles northeast of Las Vegas.

In 2005, James Hardie Building Products Inc. conducted an environmental assessment for the expansion of a small mineral-materials-sale operation at the Kramer Hill quartzite quarry 1.5 miles south of Golconda in Humboldt County. The material was mined for testing and is under consideration as feed for the company's fiber-cement siding manufacturing plant near Reno. The expansion proposal would cover the removal of as much as 4,000,000 short tons over a 20-year period from the property, which includes both public and private land. The company staked claims in the area in 2004 and added ten claims in 2005.

## **Vermiculite**

IBI Corp., a junior international mining and investment company that operates a vermiculite mine in Africa, signed an option agreement in 2005 to purchase claims staked for vermiculite that cover an area of more than 1,200 acres near Mica Peak in Clark County. The vermiculite occurs in altered Precambrian mafic and ultramafic rock in three claim blocks that were originally staked in 1993 and 1994 and include a deposit that was mined on a small scale in the 1940s.

## **Zeolites**

Nevada contains large known resources of zeolite; however, zeolite production has been small and no zeolite is currently mined in Nevada. 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 small open pit in California that is in a large area of zeolite deposits that extends into Nevada.

# Geothermal Energy

by Ronald H. Hess

Sixty-seven geothermal well permits were issued during 2005 by the Nevada Division of Minerals: four project area permits, 17 industrial production well permits, seven industrial injection well permits, three domestic well permits, and 36 gradient/observation well permits. A total of 34 geothermal wells of all types were reported as drilled during 2005. (Nevada Division of Minerals, 2006)

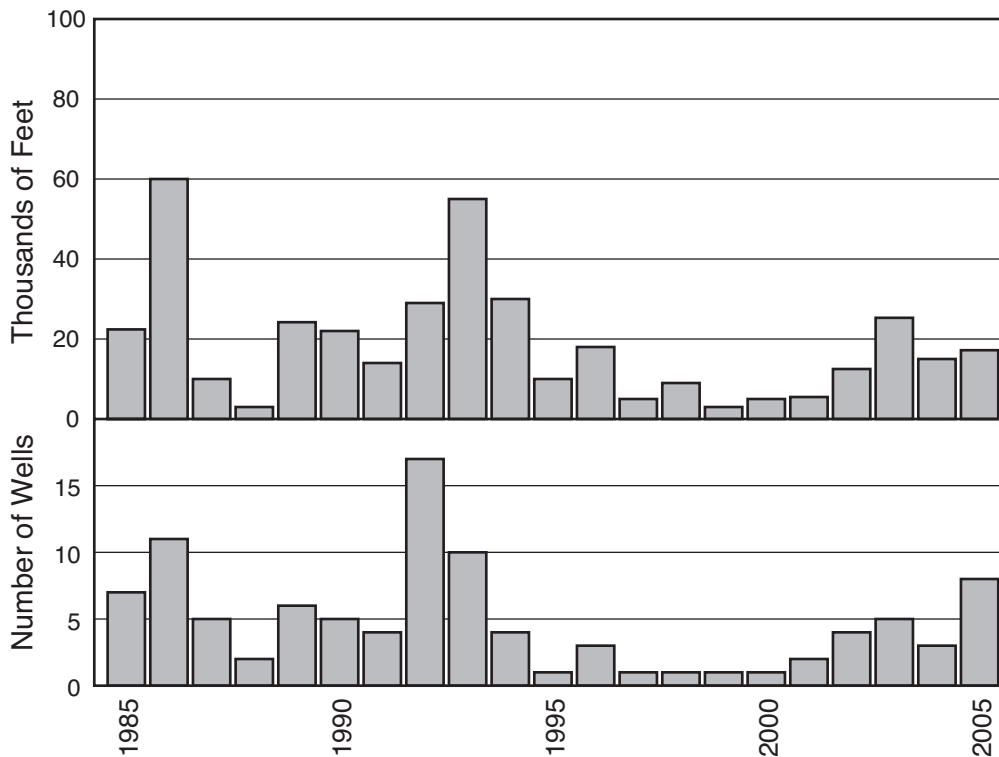
During 2005 there were 160 federal noncompetitive leases covering 244,261 acres and 66 federal

competitive leases covering 85,257 acres in Nevada. Total lease rental revenue value for 2005 was \$255,825. (Rich Hoops, BLM, oral commun., 2006)

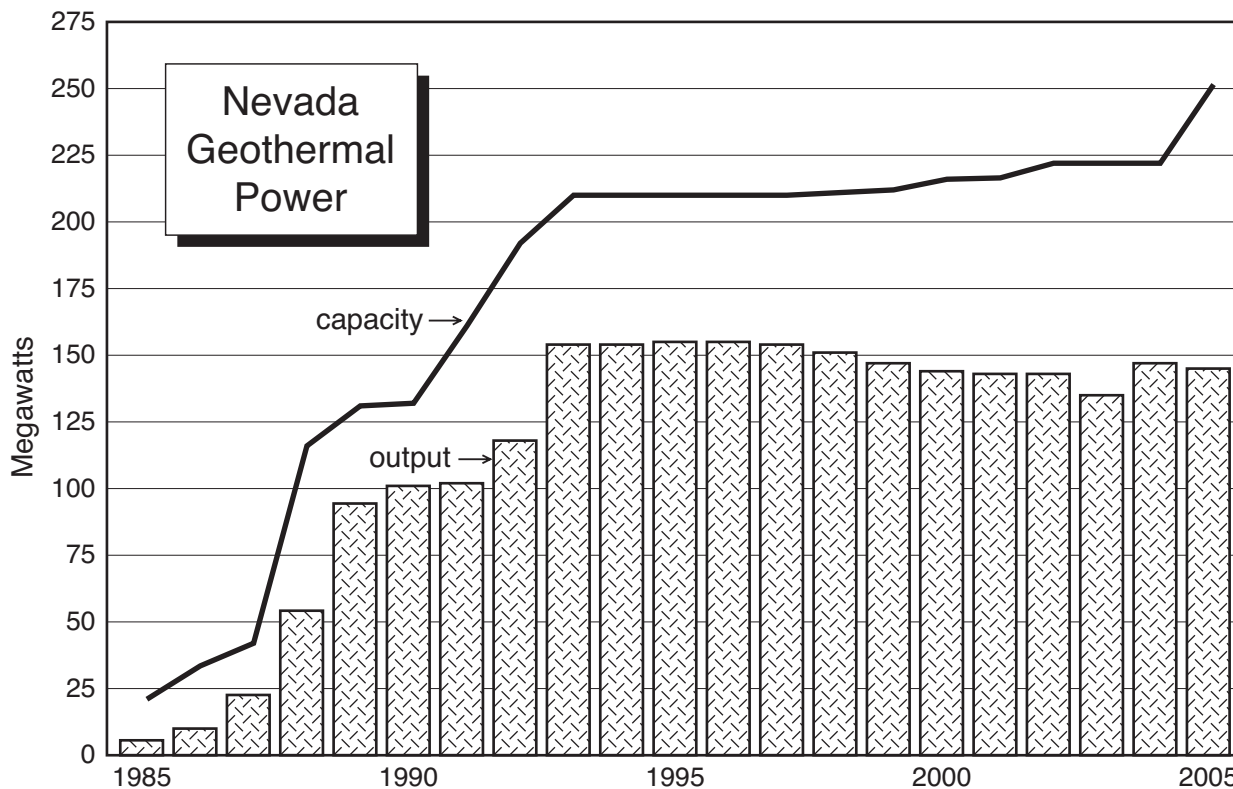
Total gross electrical production during 2005 from geothermal resources on public lands was 1.18 million megawatt-hours (MWh), a decrease of 30,000 MWh over 2004; net production was approximately 993,909 MWh, a decrease of 16,091 MWh from 2004. Gross electrical sales from federal lands was \$57.6 million, an

## NONDOMESTIC GEOTHERMAL WELLS REPORTED AS DRILLED, REDRILLED, OR COMPLETED IN NEVADA DURING 2005

Area	Company Name	Well name	Permit#	Location	Type	Permitted Depth
<b>Churchill County</b>						
Eightmile Flat (Salt Wells)	NV Geothermal Specialists, LLC	Industrial Production Well PW-1	566	NW¼ NW¼, S36, T17N, R30E	Production	750
	NV Geothermal Specialists, LLC	Industrial Production Well PW-2	568	SW¼, NW¼, S36, T17N, R30E	Production	750
	NV Geothermal Specialists, LLC	Industrial Production Well PW-3	569	SE¼, SE¼, S26, T17N, R30E	Production	750
	NV Geothermal Specialists, LLC	Industrial Injection Well IW-1	571	SE¼, NE¼, S36, T17N, R30E	Injection	1500
	NV Geothermal Specialists, LLC	Observation Well IW-2	572	SE¼, NE¼, S36, T17N, R30E	Observation	1500
Stillwater	AMP Resources (Stillwater), LLC	Industrial Injection Well 34-7	594	SE¼, NW¼, S7, T19N, R31E	Injection	1200
	AMP Resources (Stillwater), LLC	Industrial Injection Well 54-7	595	SW¼, NE¼, S7, T19N, R31E	Injection	1400
	AMP Resources (Stillwater), LLC	Industrial Production Well 67-19	606	SW¼, SE¼, S19, T20N, R31E	Injection	2600
<b>Humboldt County</b>						
Blue Mountain	Noramex Corp.	Thermal Gradient TG-13	557	SW¼, SW¼, NE¼, S15, T36N, R34E	Gradient	500
Hot Springs (Tipton Ranch (Pumpnickel Valley))	Noramex Corp.	Thermal Gradient Well PVTG-H	597	NW¼, NW¼, S33, T33N, R40E	Gradient	1000
	Noramex Corp.	Thermal Gradient Well PVTG-C	599	NE¼, NE¼, S5, T33N, R40E	Gradient	1000
	Noramex Corp.	Thermal Gradient Well PVTG-E	600	SE¼, SW¼, S33, T33N, R40E	Gradient	1000
	Noramex Corp.	Thermal Gradient Well PVTG-J	601	SE¼, NE¼, S33, T33N, R40E	Gradient	1000
	Noramex Corp.	Thermal Gradient Well PVTG-GB	607	NW¼, NE¼, S9, T33N, R40E	Gradient	1640
<b>Lander County</b>						
Beowawe Geysers	Beowawe Power, LLC	Industrial Production Well 57-13	565	SW¼, SE¼, S13, T31N, R47E	Production	8500
Hot Springs at Hot Springs Point, Grass Valley	Ormat Nevada, Inc.	Thermal Gradient Well #1 / 44-16	580	NW¼, SE¼, S16, T24N, R47E	Gradient	500
	Ormat Nevada, Inc.	Thermal Gradient Well #2 / 67-16	581	SE¼, SE¼, S16, T24N, R47E	Gradient	500
	Ormat Nevada, Inc.	Thermal Gradient Well #3 / 14-15	582	SW¼, NW¼, S15, T24N, R47E	Gradient	500
	Ormat Nevada, Inc.	Thermal Gradient Well #4 / 66-21	583	NE¼, SE¼, S21, T24N, R47E	Gradient	500
	Ormat Nevada, Inc.	Thermal Gradient Well #5 / 11-15	584	NW¼, SW¼, S15, T24N, R47E	Gradient	500
<b>Lyon County</b>						
Hazen (Patua Hot Springs)	Geothermal Rail Ind. Dev., LLC	Thermal Gradient Well HTG 2	610	SE¼, NW¼, NW¼, S19, T20N, R26E	Gradient	500
	Geothermal Rail Ind. Dev., LLC	Thermal Gradient Well HTG 3	611	NW¼, NW¼, NW¼, S17, T20N, R26E	Gradient	500
	Geothermal Rail Ind. Dev., LLC	Thermal Gradient Well HTG 4	612	NW¼, SW¼, S17, T20N, R26E	Gradient	500
<b>Nye County</b>						
Hot Creek Canyon	NV Geothermal Specialists, LLC	Thermal Gradient Well UHCR-1	585	SW¼, NW¼, S29, T8N, R50E	Gradient	500
	NV Geothermal Specialists, LLC	Thermal Gradient Well UHCR-3	586	SE¼, NW¼, S22, T8N, R50E	Gradient	500
	NV Geothermal Specialists, LLC	Thermal Gradient Well UHCR-4	587	NE¼, SE¼, S33, T8N, R50E	Gradient	500
	NV Geothermal Specialists, LLC	Thermal Gradient Well UHCR-5	588	NE¼, SE¼, S32, T8N, R50E	Gradient	500
	NV Geothermal Specialists, LLC	Thermal Gradient Well UHCR-15	616	NW¼, NE¼, S1, T7N, R50E	Gradient	500
<b>Washoe County</b>						
Steamboat Hot Springs	ORNI 7, LLC	Industrial Production Well 78-29	563	SE¼, SE¼, S29, T18N, R20E	Production	1000
	Steamboat Development Corp.	Industrial Production Well 38B-28	567	SE¼, SW¼, S28, T18N, R20E	Production	850
	Steamboat Hills, LLC	Industrial Injection Well 42-32	575	NE¼, NW¼, S32, T18N, R20E	Injection	1500
	Steamboat Hills, LLC	Industrial Production Well 44-32	577	SE¼, NW¼, S32, T18N, R20E	Production	1500
	Steamboat Hills, LLC	Industrial Production Well 34-32	578	SE¼, NW¼, S32, T18N, R20E	Production	1500



Industrial-class (power generating) wells drilled in Nevada, 1984–2005. Depth taken from original drilling permit.



Currently developed resource capacity and average net output of Nevada geothermal plants, 1985–2005. 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.

increase of \$600,000 over 2004. Production royalties on that amount equaled \$2.1 million. By regulation, half of all Federal geothermal lease rental fees and production royalties are returned to the state. For 2005, \$127,912 in lease rental fees and \$1,050,000 in royalty production fees should be returned to Nevada. (Rich Hoops, BLM, oral commun., 2006)

Total Nevada geothermal electrical production in 2005 from federal and fee lands combined was 1,590,940 MWh gross and 1,268,791 MWh net (Nevada Division of Minerals, 2006) with a sales value of about \$73.5 million, including capacity payment. Production capacity from the currently developed geothermal resources at ten existing geothermal power production sites in Nevada is 251.5 megawatts (MW), a 30 MW increase from 2004. This increase in production capacity had little effect on 2005 production figures because it came online late in the year. Currently installed equipment, or nameplate, capacity for the same sites totals 274.3 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 in the United States.

The Geothermal Energy Association (GEA) released a report entitled "Update on US Geothermal Power Production and Development, March 14, 2006". This report states that at present there is 157 MW of new geothermal generating capacity under construction in the western states. Identified as under construction in Nevada are projects at Desert Peak, Steamboat (Galena project), and Stillwater. These projects represent 60 MW of new geothermal production or 38.2% of the 157 MW geothermal plant capacity that is currently under construction in the West.

Nevada geothermal projects identified as in initial exploration, with approximate potential of 138 MW, include Emigrant, Grass Valley, Hawthorne Army Depot, and the Pyramid Lake Paiute Reservation. Other projects identified as currently drilling, with approximate potential of 55 MW, include Blue Mountain and Pumpernickel Valley. Projects in the final permitting stage, with approximate potential of 70 MW, include the Beowawe addition, Fallon Naval Air Base, Salt Wells, and Steamboat Hills (Galena) binary project. (Update on US Geothermal Power Production and Development, March 14, 2006, Geothermal Energy Association)

The following list of currently active projects in Nevada was excerpted from "Update on US Geothermal Power Production and Development, March 14, 2006" with the permission of the Geothermal Energy Association:

**Phase 1: Identifying site, secured rights to resource, initial exploration drilling**

- Emigrant - 49–118MW - ESMERALDA ENERGY CO.
- Grass Valley - 20MW - Ormat
- Hawthorne Army Depot - 10MW minimum
- Pyramid Lake Paiute Reservation - 25MW - The drilling of thermal gradient holes began in November, 2005

**Phase 2: Drilling and Confirmation being done; PPA not secured**

- Blue Mountain - 30MW
- Pumpernickel - 20–30MW - Nevada Geothermal Power

**Phase 3: Securing PPA and final permits**

- Beowawe addition - 20MW - Caithness
- Fallon Naval Base - 30MW - US NAVY geothermal program - contract w/ Ormat
- Salt Wells - 12MW - AMP RESOURCES
- Steamboat Hills binary - Galena (5–10MW) - ORMAT

**Phase 4: Under Construction**

- Desert Peak - 15MW - ORMAT
- Galena 2 - 18MW - ORMAT
- Stillwater 27MW addition - AMP RESOURCES (AMP will be building a 37MW plant, while decommissioning the existing 10MW plant, thus resulting in a 27MW addition.)

**Unconfirmed:** Proposed projects that may or may not have secured the rights to the resource, but exploration has been done

- Black Warrior - 50MW
- Fish Lake - 50MW
- Hot Sulphur Springs (Tuscarora) - Received GRED III funding - WGA report said 20MW near-term
- Reese River - Received GRED III funding. WGA report said 18MW near-term - Western Geothermal Partners
- Rye Patch 12MW - A power plant already exists on the site. The site will require further drilling for development. Rye Patch received GRED I money.
- Silver Peak - WGA report said 50MW near-term

If all 13 confirmed projects are completed (including those currently under construction), geothermal power output in Nevada would increase by about 323 MW, which will more than double the existing geothermal generating capacity in Nevada.

**Nevada Office of Energy**

The Nevada Office of Energy (NSOE) was created in 2001 by the Nevada State Legislature. The legislation, combined with earlier statutes, provided for general duties including: energy and energy conservation, preparation of petroleum allocation and rationing plans (including administration of federal allocation programs), authorization to create regulations regarding energy conservation in buildings, administration of federal energy grant programs, and general provisions related to conflicts of interest. In later sessions, the Legislature authorized the NSOE to develop a program and distribute funds to install or improve net metering installations.

## Beowawe Geothermal Area, Lander/Eureka Counties

Beowawe Power LLC/Caithness Operating has signed a 29-year power sales contract with Sierra Pacific Power Co. that took effect January 2006. Their existing contract with Southern California Edison expired in December 2005. The Beowawe power plant came on-line in December 1985 and has an equipment generating capacity of 16.6 MW. In 2005 electrical production at the plant was 106,464 MWh gross with 87,042 MWh net generation. (Nevada Division of Minerals, 2006)

## Black Warrior Peak, Washoe County

Noramex Corporation, a wholly owned subsidiary of Nevada Geothermal Power, Inc. (NGP), has filed a geothermal lease application for 640 acres, located in Section 8, T23N, R25E, a project area they are calling Black Warrior Peak. The application is currently pending. This is in the same area that Noramex has acquired lease rights on 7 square miles of private land near Black Warrior Peak. The temperature gradient in this area was recorded as greater than 200°C/km in 10 shallow gradient test holes drilled by Phillips Petroleum in the

### PROPOSED ELECTRICAL GENERATION PLANTS IN NEVADA - 2006 Public Utilities Commission of Nevada, 2006

Name/Owner	Gross Megawatts	Plant Type	Location	Date Announced	Construction Status	Proposed On-line Date
Desert Peak 2/Ormat	25	Geothermal	Desert Peak KGRA, Churchill County	Nov. 2002	Complete	June 2006
Burdette 1/Ormat	20	Geothermal	Steamboat KGRA, Washoe County	July 2004	Complete	Online
Galena 2/Ormat <sup>1</sup>	13	Geothermal	Steamboat KGRA, Washoe County	Nov. 2002	Drilling	Late 2006
Boulder City Solar Project/ Solargenix Energy <sup>2</sup>	50	Solar	El Dorado Valley, Clark County	Dec. 2002	Under Construction	Early 2007
Ely Wind Generation Facility/ Carlson & Associates <sup>3</sup>	50	Wind	Ruth, White Pine County	Nov. 2002	Expected 2006	2007
Chuck Lenzie Generating Station/ Nevada Power Company <sup>4</sup>	1200	Natural Gas-Fired Combined Cycle	Moapa Valley, Clark County	June 2004	Complete	Mid 2006
Harry Allen Unit 4/ Nevada Power Company	80	Combustion Turbine Peaking Plant	Harry Allen Plant, Clark County	July 2003	Under Construction	Summer 2006
Tracy Combined Cycle GT Sierra Pacific Power Company	514	Combined Cycle	Tracy Power Plant, Storey County	July 2004	Under Construction	June 2008
Blue Mountain Geothermal/ Nevada Geothermal Power	30	Geothermal	Blue Mountain, Humboldt County	Oct. 2002	Drilling	2007
Granite Fox Power Project/ Sempra Energy	1450	Coal Fired	Gerlach, Washoe County	Winter 2004		
Western 102 Generation Project/ Barrick Goldstrike Mines <sup>5</sup>	115	Gas Fired Reciprocating Engines	Near Tracy, Storey County	Spring 2004	Completed	Dec. 2005
Salt Wells Geothermal Project/ Nevada Geothermal Specialists	10	Geothermal	Salt Wells, Churchill County	Spring 2004	Transmission line construction to design	2007
White Pine Project/ LS Power Associates	1600	Coal Fired	White Pine County	Winter 2004		Expected 2010
Ely Energy Project Sierra Pacific Power Company	1500+	Coal Fired	White Pine County	Jan. 2006		750 MW in 2011 + 750 MW in 2014
Ely Energy Project Sierra Pacific Power Company	1000	Coal Fired	White Pine County	Jan. 2006		TBD <sup>6</sup>
TS Power Plant/ Newmont Mining Corporation	200	Coal Fired	Eureka County	Spring 2004	Under Construction	June 2008
Toquop Energy Project/ Sithe Global	750	Coal Fired	Lincoln County	Mar. 2003		2010
Fallon Naval Air Station/Ormat	30	Geothermal	Churchill County	Jan. 2006		2010 - Phase 1
No. Nevada Corrections Center State of Nevada, Department of Corrections	1	Biomass	Carson City	Nov. 2005	Under Construction	early 2007

<sup>1</sup>Project location was changed from Desert Peak to Steamboat.

<sup>2</sup>Project has applied for participation in the Temporary Renewable Energy Development Program.

<sup>3</sup>Project has applied for participation in the Temporary Renewable Energy Development Program. Expansion phases planned.

<sup>4</sup>Nevada Power acquired the partially constructed power plant from Duke Energy.

<sup>5</sup>Barrick Goldstrike Mines exited Sierra Pacific's system under AB 661 and will sell 8MW back to the utility.

<sup>6</sup>Date to be determined for two 500-MW coal gasification units.



early 1980s. These holes were spread over a wide area with the deepest (NV-ST-1) recording a bottom-hole temperature of 128°C at 552 m. (Nevada Geothermal Power Inc., Report for the year ending June 30, 2005)

### **Blue Mountain Geothermal Area, Humboldt County**

Nevada Geothermal Power, Inc. (NGP), is starting their initial production well drilling program. Four 13-inch-diameter wells will be drilled to a depth of 4,000 feet to a moderate temperature geothermal target that has been identified in earlier drilling. One of these wells will go to 6,500 feet to explore for a hotter, 450°F, reservoir that is predicted based on shallow geothermal fluid chemistry data. The current drilling program is aimed at developing a 30-MW power plant. If a suitable geothermal resource is identified in the deep well the production potential for this site could be as high as 100 MW. (Blue Mountain Geothermal Project, Nevada Geothermal Power, Inc., press release, May 15, 2006) The Blue Mountain area is located at T36N, R34E in south-central Humboldt County, Nevada.

### **Buffalo Valley Hot Springs, Lander County**

Ormat Nevada, Inc. submitted applications to drill 10 temperature gradient wells and four observation wells spread through sections 22, 24, 25, 26, 27, 34, and 35 of T29N, R41E. (Nevada Geothermal Update, April 2006, Nevada Division of Minerals) The Buffalo Valley Hot Springs are located in the southeast part of Buffalo Valley in Section 23, T29N, R41E. They have historically reported surface temperatures up to 79°C mainly from 11 springs over an area of 1.2 hectares. The estimated thermal reservoir temperature using the silica geothermometer is 125°C. In 2002 temperatures ranged from 12 to 77.3°C in the 58 springs measured. The Na-K-Ca temperature from 2002 data is 130°C. Thermal groundwater is present over an area of about 5 km<sup>2</sup>, with temperatures up to 89°C encountered in shallow test holes. (Geothermal Resources of Nevada as updated on the web at [www.nbmj.unr.edu/geothermal/site.php?sid=Buffalo%20Valley%20Hot%20Springs](http://www.nbmj.unr.edu/geothermal/site.php?sid=Buffalo%20Valley%20Hot%20Springs)).

### **Desert Peak Geothermal Area, Churchill County**

Ormat Nevada, Inc. is planning to construct a new binary power plant near the existing 9.9-MW dual flash geothermal power plant at Desert Peak. The new project, Desert Peak 2, will consist of two independently operated Ormat Energy Converter (OEC) units. OEC-1 will be a 15-MW gross binary power plant cooled by a bank of air condensers. OEC-2 will be an 11-MW gross binary power plant unit cooled by a new two-cell condenser tower. Power generated from this project will be sold to Nevada Power Co. (The Public Utilities Commission of Nevada, Docket No. 05-3024, April 27, 2005)

The existing geothermal power plant at Desert Peak is a 9.9-MW dual-flash plant that produces from two production wells with an average depth of 3,683 feet and fluid temperature of 312°F. Desert Peak has two injection wells with an average depth of 4,000 feet and injection temperature of 198°F. The Desert Peak plant came online in 1985 and during 2005 had a gross output of 60,771 MWh and a net production of 50,506 MWh. (Nevada Division of Minerals, 2006)

### **Eight Mile Flat (Salt Wells), Churchill County**

Nevada Geothermal Specialists, LLC. has received approval from the U.S. Bureau of Land Management to construct a 20-MW power plant at Eight Mile Flat near Salt Wells. As part of the Salt Wells project, they currently plan to build a 10-MW power plant first and bring a second 10-MW facility on-line later if the geothermal resource will support it. A new 6-mile-long, 230KV power line will link the plant to the Sierra Pacific Power Co. grid. At the end of 2004, AMP Resources, LLC. purchased the Salt Wells geothermal project, including all associated resource assets, from Nevada Geothermal Specialists, LLC. (Lahontan Valley News and Fallon Eagle Standard, March 1, 2005 and Nevada Division of Minerals, 2005) This geothermal area was originally drilled by Anadarko Petroleum Corporation in the early 1980s. (Bulletin Geothermal Resources Council, March/April 2004, v. 33, no. 2)

AMP Resources, LLC. has secured a new power sales contract for about 12 MW with Sierra Pacific Power Co. This will allow them to move forward with construction of the first Salt Wells Plant. (AMP Resources project web site: [www.ampresources.com/projects.php](http://www.ampresources.com/projects.php))

Prior to AMP Resources, LLC taking over the Salt Wells project, the Nevada Division of Minerals issued a geothermal project area permit (#564PA) to Nevada Geothermal Specialists, LLC for this project. It anticipates development of six production wells with an estimated depth of 1,000 feet, four injection wells with an estimated depth of 3,000 feet, and ten observation wells with an estimated depth of 1,000 feet. One of the first wells drilled under this geothermal project area permit was the Industrial Production Well PW-2 (permit #568) drilled by Amp Resources, LLC in the spring of 2005 to a depth of 471 feet (143.6 m). Static temperature surveys showed a peak temperature of 145°C and a flowing temperature of 140°C. The well was flowed at a rate of 2,500 gallons per minute for 46 hours with no drawdown. (Nevada Division of Minerals, 2005, and Geothermal Resources of Nevada as updated on the web at [www.nbmj.unr.edu/geothermal/site.php?sid=Eightmile%20Flat](http://www.nbmj.unr.edu/geothermal/site.php?sid=Eightmile%20Flat)).

### **Fallon Naval Air Station, Churchill County**

ORMAT Technologies has received a contract to build a 30-MW geothermal power plant at the Fallon Naval Air Station. The contract was signed on December 20, 2005

for a period of 50 years. The Navy will receive 5% of gross income for the first 20 years of power production and 15% of gross income for the remaining 30 years of the contract. Under terms of the contract, ORMAT will be responsible for drilling production and injection wells and for plant facility design and construction. Power produced by the plant will be sold to Sierra Pacific Power Co.

ORMAT anticipates spending \$80 million in development of the resource and construction of the plant. A drilling program in the 4,000-acre project area will be undertaken to better define the extent and potential of the resource. ORMAT is also looking into obtaining rights on some potential geothermal resources located on BLM ground adjacent to the Naval Air Station. (Bulletin Geothermal Resources Council, January/February 2006, v. 35, no. 1)

Since the 1970s, the U.S. Navy has conducted a series of studies aimed at better defining the geothermal resource of the Naval Air Station. The Navy drilled a 6,952-foot well in August 1993, which had a maximum high temperature reading of 376°F during a successful flow test. Geothermal fluid is believed to exist below an area of 10 km<sup>2</sup> or more. Current minimum estimated power potential of the Fallon geothermal resource is 30 MW. (Bulletin Geothermal Resources Council, July/August 2001, vol. 30, no. 4; and Garside, L.J. and others, Status of Nevada Geothermal Resource Development, Spring 2002, GRC Proceedings)

### **Hazen (Patua Hot Springs) Geothermal Area, Lyon and Churchill Counties**

Geothermal Rail Industrial Development, LLC., (GRID) is developing a large renewable energy commercial and industrial park on property it owns in the Hazen geothermal area east of Reno. GRID currently owns approximately 4,500 acres in Lyon and Churchill Counties. They are pursuing acquisition of geothermal rights on additional acreage. During 2005 they drilled four geothermal gradient wells. This location is close to major highway and railway connections and less than an hour drive to an airport. Part of this area is located adjacent to the community of Fernley, Nevada. (Nevada Division of Minerals, 2006 and GRID Website, [www.gridusa.biz/index.htm](http://www.gridusa.biz/index.htm))

### **Hot Springs (Tipton) Ranch, Pumpernickel Valley, Humboldt County**

Nevada Geothermal Power, Inc. (NGP), has completed a detailed gravity survey consisting of 282 stations in 14 east-west lines across the valley and fault zone within the project area. The project is located around a group of hot springs adjacent to the Pumpernickel Valley fault system. The survey has assisted in mapping the valley faults and their relationship to the geothermal resource.

This survey, combined with an earlier resistivity survey, will help define the extent of the geothermal resource and assist in targeting future drilling.

NGP has a 100% leasehold interest in a 5 square mile area of potential geothermal lands from Newmont USA Ltd., and Inovision Solutions Inc. has an option to earn 50% joint venture interest in the NGP geothermal lease. Inovision, in exercising this option, will have to make certain cash payments, issue common shares to NGP, and commit \$4.4 million in project development expenditures over 5 years. (Bulletin Geothermal Resources Council, March/April 2006, v. 35, no. 2)

### **Pyramid Lake Geothermal Area, Washoe County**

The Pyramid Lake Paiute Tribe is undertaking the Pyramid Lake Energy Project to develop geothermal resources on their reservation. The project includes geophysical, gravity, and magnetic surveys in addition to a thermal gradient drill-hole program. Drilling of the gradient holes started in November of 2005 and three had been completed by March 2006 (Nevada Geothermal Update, April 2006, Nevada Division of Minerals). Part of the exploration and geophysical work is being done in collaboration with the University of Nevada, Reno, Great Basin Center for Geothermal Energy.

### **Steamboat Hot Springs, Washoe County**

Ormat Nevada Inc. (ORMAT) has brought online the Richard Burdette Power Plant, which is part of the Galena Geothermal Project. This plant was formerly known as the Galena 1 project but has been renamed in honor of Governor Kenny Guinn's late energy advisor Richard Burdette Jr. The state-of-the-art 27-MW (nameplate capacity) power plant was completed on November 14, 2005 only 8 months after the ground breaking ceremony. This is the first power plant constructed in Nevada under the Nevada Renewable Portfolio Standard (RPS) legislation. It is a binary, air-cooled power plant with a closed fluid production cycle that allows 100% of geothermal fluids to be re-injected. (Nevada Geothermal Update, April 2006, Nevada Division of Minerals)

On May 9, 2006 Sierra Pacific Resources and ORMAT Technologies Inc. jointly announced that Sierra Pacific Power Co., Sierra Pacific Resources northern Nevada utility, and ORNI 14 LLC, a subsidiary of ORMAT Nevada, Inc., signed a 20-year 20-MW Power Purchase Agreement (PPA) for Galena No. 3, a new geothermal power plant being built as part of the Galena Geothermal Project. This plant is expected to increase the output currently supplied from the Steamboat Hot Springs to Sierra Pacific Power Co. by between 15 and 25 MW. The design of the Galena No. 3 plant will be similar to the Richard Burdette Power Plant above. (ORMAT press release, Reno, Nevada, May 9, 2006)

## Stillwater Geothermal Area, Churchill County

AMP Resources, LLC. purchased the Stillwater Power Plant and associated geothermal resources from Stillwater Holdings, LLC., effective 12/31/2004. In August 2005 Amp Resources applied to the Nevada Public Utilities Commission (PUC) for a permit to construct a 37-MW binary geothermal power plant adjacent to the existing Stillwater power plant. In May 2006 the Nevada PUC approved a permit to build a 26-MW power plant. Upon completion the new power plant will replace the existing Stillwater plant, online since 1989, which will be dismantled. When the new plant is completed, in late 2007, it will be known as Stillwater 2 Geothermal Power Plant (AMP Resources Web Site: [www.ampresources.com/](http://www.ampresources.com/)). In 2005 electrical production at the Stillwater plant was 99,345 MWh gross with 60,321 MWh net generation. (Nevada Division of Minerals, 2006)

## Nevada Geothermal Resources Map

The map entitled "Nevada geothermal resources," NBMG map 141 second edition, is authored by Lisa Shevenell and Larry J. Garside. The color map, 1:750,000-scale, shows active direct-use applications and power plants as of 2005, and all known thermal springs and wells on a topographic base map. This map may be purchased at the Nevada Bureau of Mines and Geology publications office or on the Web at [www.nbmgs.unr.edu/sales/](http://www.nbmgs.unr.edu/sales/). An Acrobat pdf file format version of this map can also be viewed and downloaded for free from the Web at [www.nbmgs.unr.edu/dox/m141.pdf](http://www.nbmgs.unr.edu/dox/m141.pdf).

A Web-enabled interactive version of this map can be accessed at [www.nbmgs.unr.edu/geothermal/gtmap.pdf](http://www.nbmgs.unr.edu/geothermal/gtmap.pdf). You can pan around on the interactive map, click on a geothermal area, and it will present detailed information on the particular geothermal resource, with many sites having additional links to maps and photos.

## Geothermal Bibliography

An on-line searchable bibliography of approximately 1,400 geothermal references can be accessed on the Nevada Bureau of Mines and Geology Web site at [www.nbmgs.unr.edu/geothermal/biblio/find.htm](http://www.nbmgs.unr.edu/geothermal/biblio/find.htm). The full list of references can also be downloaded as a Microsoft Word file.

The Geothermal Resources map and the online bibliography are just two of the many online resources and links that are available under the general geothermal information Web page at the Nevada Bureau of Mines and Geology Web site [www.nbmgs.unr.edu/geothermal/](http://www.nbmgs.unr.edu/geothermal/).

The U.S. Department of Energy (DOE) Geothermal Technologies Program and the DOE Office of Scientific and Technical Information (OSTI) have scanned approximately 3,300 agency and national lab technical reports. These files are in a PDF, full text searchable, format and accessible online at [www.osti.gov/energycitations/](http://www.osti.gov/energycitations/).

## Web Links to Other Geothermal Information

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](mailto:rhess@unr.edu):

- 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](http://www.unr.edu/geothermal/index.html). This site contains geothermal exploration data, interactive maps, lease and incentive program information, and numerous geothermal digital data sets.
- 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>.
- Geothermal biz.com [www.geothermal-biz.com/](http://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 Web site at [www.eere.energy.gov/geopoweringthewest/](http://www.eere.energy.gov/geopoweringthewest/).
- Southern Methodist University Geothermal Lab Web page [www.smu.edu/geothermal/](http://www.smu.edu/geothermal/).
- Geothermal Site Identification And Qualification Report, Prepared For: California Energy Commission, Public Interest Energy Research (PIER) Program. Report prepared by GeothermEx, Inc. This report provides summary information on potential power producing geothermal resources within California and Western Nevada that could supply additional power to the California market. The report can be found at [www.geothermex.com/CEC-PIER\\_Reports.htm](http://www.geothermex.com/CEC-PIER_Reports.htm).
- Summary of Supporting Data for USGS Regional Heat-flow Studies of the Great Basin, 1970–1990, by John H. Sass, Susan S. Priest, Arthur H. Lachenbruch, S. Peter Galanis, Jr., Thomas H. Moses, Jr., John P. Kennelly, Jr., Robert J. Munroe, Eugene P. Smith, Frederick V. Grubb, Robert H. Husk, Jr., and Charles W. Mase; USGS Open-File Report 2005-1207 online version 1.0 on the Web at <http://pubs.usgs.gov/of/2005/1207/>.
- 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/](http://www.puc.state.nv.us/).
- The Bureau of Land Management is pleased to announce that the public reports for the Land and Mineral Records-LR2000 system is now available for online use from 4:00 AM to 11:00 PM Mountain Time. The Bureau of Land Management Land and Mineral Records-LR2000 system Web address is <http://www.blm.gov/lr2000/>.
- GeoCommunicator is the publication site for the Bureau of Land Management's National Integrated Land System (NILS). GeoCommunicator provides searching, accessing and dynamic mapping of data for federal land stewardship, land and mineral use records, and land survey information. GeoCommunicator provides spatial display for land and mineral cases from BLM's LR2000 system. The Web address for the GeoCommunicator is [www.geocommunicator.gov/](http://www.geocommunicator.gov/).

NEVADA GEOTHERMAL POWER PLANTS 2005					
Plant name (year on line)	Production capacity <sup>1</sup> (MW)	2005 Production (MWh)		Location	Operator
		Gross	Net (sales)		
Beowawe (1985)	16.7 (16.6)	106,464	87,042	S13,T31N,R47E	Caithness Operating Beowawe Power, LLC 9790 Gateway Dr., Suite 200 Reno, NV 89521 (775) 850-2266
Bradys Hot Springs (1992)	26.1 (26.1)	165,493	115,838	S12,T22N,R26E	Brady Power Partners/ORMAT P.O. Box 649 Fernley, NV 89408 (775) 423-5800
Desert Peak (1985)	9.9 (12.5)	60,771	50,506	S21,T22N,R27E	Brady Power Partners/ORMAT P.O. Box 649 Fernley, NV 89408 (775) 423-5800
Dixie Valley (1988)	66.0 (62.0)	564,464	511,340	S7,T24N,R37E S33,T25N,R37E	Caithness Dixie Valley, LLC 9790 Gateway Dr., Suite 200 Reno, NV 89521 (775) 850-2266
Empire (1987)	4.6 (4.8)	33,814	23,317	S21,T29N,R23E	Empire Energy, LLC P.O. Box 40 Empire, NV 89405 (775) 557-2015
Soda Lake No. 1 (1987) and Soda Lake No. 2 (1991)	16.6 (26.1)	98,516	67,746	S33,T20N,R28E	AMOR IX 5500 Soda Lake Road Fallon, NV 89406 (775) 867-5093
Steamboat I, I-A (1986) and Steamboat II, III (1992) and Galena (2005)	83.0 (88.6)	381,246	282,563	S29,T18N,R20E	ORMAT Nevada 1010 Power Plant Road Reno, NV 89502 (775) 852-1444
Stillwater (1989)	13.0 (21.0)	99,345	60,321	S1,T19N,R30E S6,T19N,R31E	Amp Resources Stillwater Holdings, LLC 4785 Lawrence Lane Stillwater, NV 89406 (775) 329-0700
Wabuska (1984)	1.2 (2.2)	8,661	5,782	S15,16,T15N,R25E	Homestretch Geothermal 1147 N. Daybreak Dr. Washington, UT 84780 (435) 668-6003
Steamboat Hills formerly Yankee Caithness (1988)	14.44 (14.44)	72,166	64,336	S5,6,T17N,R20E	ORMAT Nevada 1010 Power Plant Road Reno, NV 89502 (775) 852-1444
TOTAL	251.5 (274.3)	1,590,940	1,268,791		

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

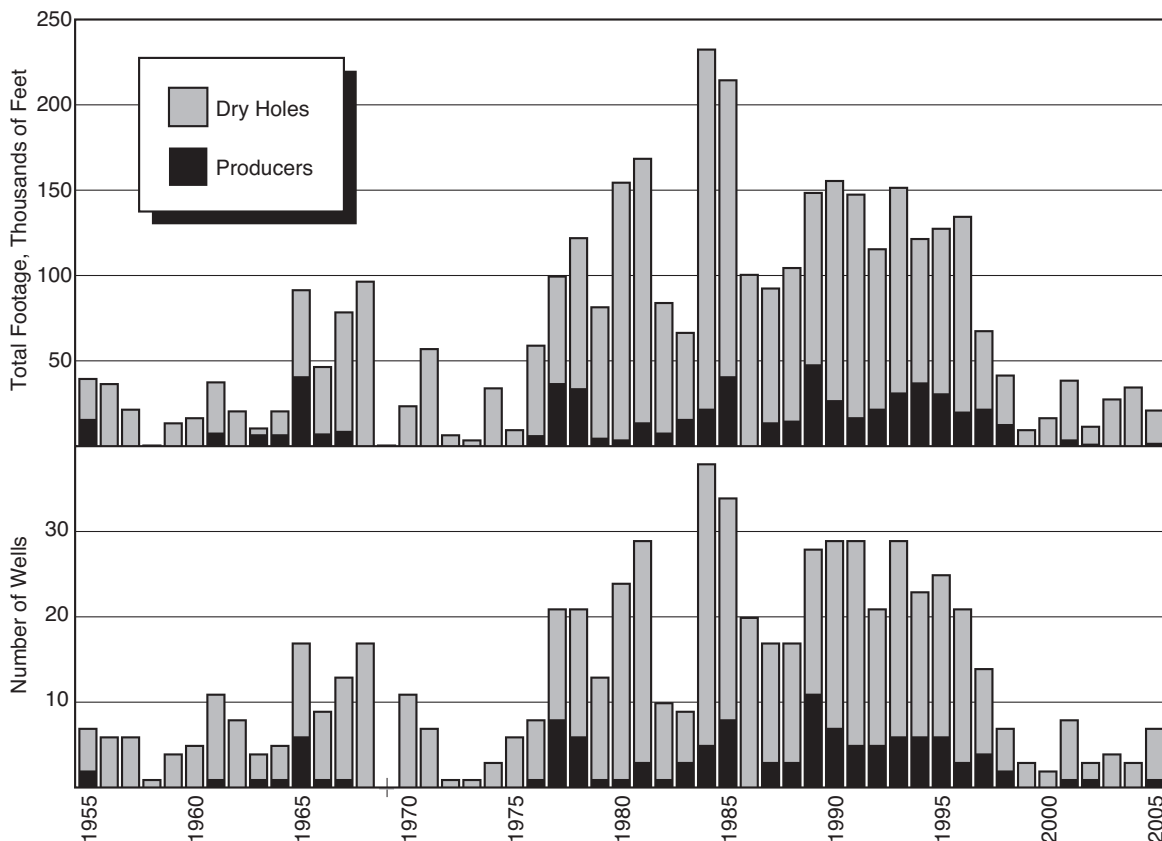
According to the Nevada Division of Minerals, Nevada's net oil production in 2005 was 446,439 barrels (0.024% of total U.S. production) from 60 actively producing wells in 10 fields in Railroad Valley (Nye County, 86.4%) and seven wells in two fields in Pine Valley (Eureka County, 13.6%). Two other minor fields were shut in throughout 2005. One minor field has been abandoned since 1998. Nevada ranked 27 out of the 31 oil producing states in the country in 2005 (*www.eia.doe.gov*). The average net wellhead price for Nevada crude oil increased 35.0% to \$43.18 in 2005 from \$31.98 per barrel in 2004. According to the Department of Taxation, the sales volume (or gross yield) increased 30.2% to \$19,276,411 in 2005 from \$14,807,339 in 2004.

One hundred wells in 14 fields were listed as producers in 2005. Of these, 33 were shut in for the entire year. At year's end, seven wells had been shut in for 6 to 12 months, three wells had been shut in for 1 to 2 years, one well had been shut in for 2 to 3 years, one

well had been shut in for 3 to 4 years, one well had been shut in for 4 to 5 years, and 23 wells had been shut in for more than 5 years.

Nevada's highest volume producer was Grant Canyon No. 9, which averaged 161 barrels of oil and 494 barrels of water per day during 2005, decreases of 6.4% and 2.0% respectively. Grant Canyon No. 9 has held this ranking since 1996. Blackburn No. 19 fell behind Kate Spring No. 1A as Nevada's second highest volume producer in 2005. Blackburn No. 19 averaged 56 barrels of oil and 1,326 barrels of water per day in 2005, a decrease of 17.6% and increase of 13.0% respectively. Blackburn No. 19 had been Nevada's second highest volume producer since 2002. Kate Spring No. 1A averaged 61 barrels of oil and 389 barrels of water per day in 2005.

The Bacon Flat Field, which produces from the Devonian Guilmette Formation (carbonate) between about 4,960 and 5,350 feet, averaged about 21 barrels of oil and about 13 barrels of water per day in 2005 and accounted for 1.7% of Nevada's total oil production.



**Number and total footage of Nevada oil wells completed as producers or as plugged and abandoned dry holes, 1955–2005.**

Oil production decreased 28.8%, and water production increased 32.0%. Only one of its three producers was active. One well has been shut in since 1993 and the other 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 140 barrels of oil and about 29,312 barrels of water per day in 2005 and accounted for 10.2% of Nevada's total oil production. Oil and water production decreased 11.7% and 83.2% respectively. Of the five active producers, oil production decreased in two and increased in two. One of the two inactive producers has been shut in since 2001. The other, Blackburn No. 3, which had been shut in since 1998, produced 11 barrels of oil and 6,645 barrels of water in November, and then shut in again.

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 149 barrels of oil and about

1,173 barrels of water per day in 2005 and accounted for 12.2% of Nevada's total oil production. Oil and water increased 4.9% and 20.0% respectively. Of the 16 active producers, oil production decreased in six and increased in ten. One well was shut in for two months, one was shut in for six months, one was shut in for seven months, one was shut in for eight months, and one was shut in for ten months. One well shut in since August 2003 produced in the last four month of 2005. 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 96 barrels of oil and 696 barrels of water per day in 2005 and accounted for 8.5% of Nevada's total oil production. Oil and water production increased 7.1% and 95.2% respectively. Oil production decreased in two and increased in two of the four producers.

The Grant Canyon Field, which produces from the Devonian Guilmette Formation between about 2,160 and 4,300 feet, averaged 201 barrels of oil and 1,199 barrels of water per day in 2005 and accounted for

#### OIL WELL DRILLING ACTIVITY IN NEVADA IN 2005

Company	Well	Permit No.	Location	Permit Date	Spud Date	Completion Date	Depth (Ft.)	Status
<b>ELKO COUNTY</b>								
V.F. Neuhaus Properties	Stampede 7-1	855	NW¼, NE¼, S7, T34N, R67E	Nov-03				Not Drilled
Foreland Corp.	Toano Draw No. 15-19	856	NW¼, SW¼, S19, T39N, R66E	Nov-03	Nov-03		*9,500	TA
Fasken Oil and Ranch, LP	Pinon No. 5 Federal No. 1	859	NE¼, NE¼, S5, T27N, R53E	Jul-04	Aug-05		*12,000	Drilled
<b>EUREKA COUNTY</b>								
V.F. Neuhaus Properties	Tomera Ranch 4-1	851	NW¼, NW¼, S4, T30N, R52E	May-03	Aug-03		*1,500	TA
<b>LINCOLN COUNTY</b>								
Falcon Energy/Kriac Energy, Inc.	Hamlin Wash No. 18-1R	805	SE¼, SE¼, S18, T8N, R70E	Aug-97	Aug-97	Sep-97	*3,100	TA
Falcon Energy/Kriac Energy, Inc.	Kriac No. 3	810	SE¼, SE¼, S18, T8N, R70E	Dec-97	Jan-98		*2,800	Suspended
<b>NYE COUNTY</b>								
Makoil, Inc.	Munson Ranch No. 11-44	672	SE¼, SE¼, S11, T9N, R56E	Apr-93	Jun-94	Jun-94	3,660	TA
Double D Nevada, LLC	Federal No. 12-14	673	NW¼, SW¼, S14, T7N, R56E	Apr-93	May-93	Jun-93	6,106	TA
Isern Oil Company	Gigante No. 1-4	837	NW¼, NE¼, S4, T12N, R35E	May-01	Aug-01	Dec-03	*5,000	TA
Alpine Inc.	Needle Springs 1-14	852	NW¼, NW¼, S14, T10N, R52E	Oct-03	Oct-03	Sep-05	*9,000	Drilled
Makoil, Inc.	East Inselberg No. 36-33	860	NW¼, SE¼, S36, T10N, R56E	Sep-04	Nov-04	Apr-05	1,322	Producer
Tri Valley Oil and Gas	Midland Trail No. 1-32	861	SW¼, SW¼, S32, T6N, R56E	Sep-04	Jun-05	Jul-05	*7,500	Drilled
Trail Mountain, Inc.	Currant Unit No. 1	862	SW¼, SW¼, S14, T10N, R57E	Sep-04	May-05	Jun-05	5,601	P&A
Trail Mountain, Inc.	Currant Unit No. 2	863	NE¼, SE¼, S31, T10N, R58E	Sep-04	Dec-05	Dec-05	7,400	P&A
V.F. Neuhaus Properties	Little Giant No. 36-1	864	NW¼, NE¼, S36, T10N, R56E	Sep-04	Mar-05	May-05	1,490	P&A
Makoil, Inc.	Radio No. 6-31	865	NE¼, NW¼, S6, T9N, R57E	Sep-04	May-05	May-05	*3,815	Drilled
Makoil, Inc.	Dry Lake No. 21-21	866	NE¼, NW¼, S21, T8N, R56E	Sep-04	Nov-05	Nov-05	1,132	P&A
V.F. Neuhaus Properties, Inc.	Currant Creek Ranch 31-1	872	SE¼, SW¼, S31, T10N, R57E	Jul-05	Jul-05		*2,200	TA
Makoil, Inc.	West Bacon Flat No. 18-43	873	SE¼, SE¼, S18, T7N, R57E	Sep-05				Not Drilled
Makoil, Inc.	West Bacon Flat No. 19-43	874	NE¼, SE¼, S19, T7N, R57E	Sep-05	Dec-05	Dec-05	6,176	P&A
Geyser Petroleum	Santa Maria De Los Angeles No. 1	875	NE¼, SW¼, S32, T10N, R57E	Oct-05				Not Drilled
Petro World Nevada Corp.	Cobble Questa No. 1-12	876	NW¼, SE¼, S12, T12N, R34E	Dec-05				Not Drilled
<b>PERSHING COUNTY</b>								
Evans-Barton Ltd.	Kyle Spring No. 12-13D	759	NW¼, SW¼, S12, T29N, R36E	Jul-95	Jul-95	Oct-96	1,000	Testing
Evans-Barton Ltd.	Kyle Spring No. 11-14	791	SW¼, SW¼, S11, T29N, R36E	Oct-96	Nov-96	Nov-96	2,622	Testing
Evans-Barton Ltd.	Kyle Spring No. 11-43	821	NE¼, SE¼, S11, T29N, R36E	Jul-98	Sep-98	Dec-02	*3,000	TA
Evans-Barton Ltd.	Kyle Spring No. 11-42A	838	NE¼, SE¼, S11, T29N, R36E	Jul-01	Aug-01		*625	Testing
Evans-Barton Ltd.	Kyle Spring No. 12-12	868	SW¼, NW¼, S12, T29N, R36E	Oct-04	Dec-04		*1,200	Testing
<b>WHITE PINE COUNTY</b>								
Energy Operations of Nevada	Yankee Mine West No. 1	867	NW¼, NE¼, S21, T21N, R57E	Oct-04	Dec-04	Jan-05	4390	P&A
Richardson Operating Company	Long Valley Federal No. 1	869	SW¼, NW¼, S21, T21N, R58E	Nov-04				Not Drilled
Geyser Petroleum	Pipeline Canyon No. 1	870	NE¼, SW¼, S28, T15N, R62E	Jan-05	Mar-05		*5150	Drilled
Energy Operations of Nevada	Yankee Mine West No. 2	871	NE¼, SE¼, S21, T21N, R57E	Jan-05				Not Drilled

P&A: Plugged and abandoned, TA: Temporarily abandoned, \*: permitted depth, which is given when actual depth is not available

## FEDERAL OIL AND GAS LEASES IN EFFECT IN FISCAL YEARS 2004 AND 2005

County	NUMBER OF LEASES						ACREAGE					
	Competitive		Noncompetitive		Simultaneous		Competitive		Noncompetitive		Simultaneous <sup>2</sup>	
	FY04	FY05	FY04	FY05	FY04	FY05	FY04	FY05	FY04	FY05	FY04	FY05
Carson City	0	0	0	0	0	0	0	0	0	0	0	0
Churchill	0	0	0	0	2	0	0	0	0	0	5,278	0
Clark	0	0	0	0	0	0	0	0	4,133	0	0	0
Douglas	0	0	0	0	0	0	0	0	0	0	0	0
Elko	68	79	165	210	3	0	65,196	87,457	298,504	487,863	7,545	0
Esmeralda	0	0	1	0	0	0	0	0	2,905	0	0	0
Eureka	91	106	101	183	3	2	130,570	122,175	299,060	466,594	2,449	1,345
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	3	9	15	27	1	1	11,558	14,374	24,692	46,316	1,921	7,040
Lyon	0	0	0	0	0	0	0	0	0	0	0	0
Mineral	0	0	4	0	0	0	0	0	5,997	0	0	0
Nye	342	373	128	159	19	19	293,253	211,276	331,720	423,115	7,998	7,398
Pershing	0	3	1	0	0	0	0	3,800	1,256	0	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	49	87	201	187	0	0	80,627	93,105	657,188	464,811	0	0
<b>TOTAL</b>	<b>553</b>	<b>657</b>	<b>616</b>	<b>766</b>	<b>28</b>	<b>22</b>	<b>581,204</b>	<b>444,730</b>	<b>1,625,455</b>	<b>1,400,836</b>	<b>25,191</b>	<b>15,783</b>

<sup>1</sup>Data from the U.S. Bureau of Land Management. Fiscal years (FY) run from Oct. 1 to Sept. 30.

<sup>2</sup>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)	1954-1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	Total
Eagle Springs (1954) (Railroad Valley)	4,643,130	137,278	111,562	82,067	59,394	67,024	67,908	57,946	45,175	54,362	5,325,846
Trap Spring (1976) (Railroad Valley)	11,562,511	288,686	257,921	263,566	246,725	218,198	206,424	193,191	181,937	170,895	13,590,054
Currant (1979) (Railroad Valley)	919	202	230	28	55	33	21	23	9	3	1,523
Bacon Flat (1981) (Railroad Valley)	860,084	22,465	18,757	16,849	14,766	13,898	12,633	11,763	10,612	7,556	989,383
Blackburn (1982) (Pine Valley)	4,431,105	151,151	112,008	89,400	78,136	66,899	62,412	54,623	51,371	45,369	5,142,474
Grant Canyon (1983) (Railroad Valley)	19,983,232	143,707	126,128	112,715	102,113	92,899	85,722	79,293	73,879	68,945	20,868,633
Kate Spring (1986) (Railroad Valley)	1,698,194	76,280	69,768	65,315	57,644	55,198	53,408	49,698	45,656	43,983	2,215,144
Tomera Ranch (1987) (Pine Valley)	20,347	659	574	398	488	0	11,901	1,981	124	0	36,472
North Willow Creek (1988) (Pine Valley)	41,221	1,478	1,502	123	146	144	573	349	476	2,065	48,077
Three Bar (1990) (Pine Valley)	23,837	0	0	0	0	0	0	0	0	0	23,837
Duckwater Creek (1990) (Railroad Valley)	14,662	168	491	93	116	968	869	436	201	185	18,189
Sans Spring (1983) (Railroad Valley)	153,159	45,001	21,759	11,127	6,990	6,356	5,532	4,775	4,169	3,324	262,192
Ghost Ranch (1996) (Railroad Valley)	34,166	113,016	65,370	49,348	41,454	36,173	31,814	26,129	35,375	37,874	470,719
Deadman Creek (1996) (Elko County)		109	258	0	0	0	0	0	0	0	367
Sand Dune (1998) (Railroad Valley)			12,465	15,122	12,624	13,461	14,211	13,123	13,125	11,878	106,009
<b>Total</b>	<b>43,466,567</b>	<b>980,200</b>	<b>798,793</b>	<b>706,151</b>	<b>620,651</b>	<b>571,251</b>	<b>553,428</b>	<b>493,330</b>	<b>462,109</b>	<b>446,439</b>	<b>49,098,480</b>
Change from previous year		-7%	-19%	-12%	-12%	-8%	-3%	-11%	-6%	-3%	

15.4% of Nevada's total oil production. Oil and water production decreased 6.7%, and 17.8% 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 121 barrels of oil and 1,182 barrels of water per day in 2005 and accounted for 9.9% of Nevada's total oil production. Oil production decreased 3.7% and water production increased 3.4%. Oil production decreased in all four active producers. Of the two inactive producers, one has been shut in since 1997 and the other since 1993. A total of 5,114 thousand cubic feet of gas was produced from the Kate Spring Field in 2005, a decrease of 6.6% from 2004. The gas is used to operate production and related equipment at the lease sites of Makoil, Inc., and Western General, Inc.

The Sand Dune Field's only producer, which produces from Permian and Pennsylvanian limestones between about 5,970 and 6,200 feet, averaged 33 barrels of oil and 87 barrels of water per day in 2005 and accounted for 2.7% of Nevada's total oil production. Oil production decreased 9.5%, and water production increased 3.7%.

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 9 barrels of oil and 654 barrels of water per day in 2005 and accounted for 0.7% of Nevada's total oil production. Oil and water production decreased 20.3%, and 23.7% respectively. Of the two inactive producers, one has been shut in since 1998 and the other since 1993 and since temporarily abandoned.

The Trap Spring Field, which produces from the Oligocene tuff of Pritchards Station between about 3,210 and 4,950 feet, averaged 468 barrels of oil and 5,657 barrels of water per day in 2005 and accounted for 38.3% of Nevada's total oil production. Oil production decreased 6.1%, and water production increased 19.5%. Oil production decreased in 27 active producers and increased in five. One well was shut in for one month, and two wells were shut in for three months. Of the ten inactive producers, one has been shut in since February 2003, 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. The Trap Spring Field also gained a new producer.

Three minor fields accounted for about 0.5% of Nevada's total oil production. Oil production from the Currant Field's only producer, which produces from the Eocene Sheep Pass Formation between about 6,850 and 7,080 feet, decreased from 9 to 3 barrels. Currant produces no water. Oil production the Duckwater Creek Field's only producer, which produces from the Oligocene Garrett Ranch Group between about 5,680 and 5,830 feet, decreased 8.0% and water production increased 39.2%. Oil and water 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, increased 331.9% and 39.2% respectively.

Three other minor fields recorded no production for 2005. The Tomera Ranch Field's most recently active producer, which produces from the Oligocene Indian Well Formation (chert and tuffaceous sandstone) between about 1,150 and 1,950 feet, has been shut in since April 2004. The only other producer in the Tomera Ranch Field has been shut in since 2000. The Three Bar Field's two producers produced from the Miocene Humboldt Formation (sandstone and volcanic rock), the

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

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

Field (year discovered)	1994-98	1999	2000	2001	2002	2003	2004	2005	Total
Eagle Springs (1954)	1,700,471	325,574	275,521	421,755	572,541	538,814	357,021	428,375	4,620,072
Trap Spring (1976)	14,507,374	2,802,716	2,850,603	2,648,176	1,844,621	1,802,383	1,727,583	2,064,848	30,248,304
Currant (1979)	0	0	0	0	0	0	0	0	0
Bacon Flat (1981)	350,253	1,756	358,879	613	27	5,080	3,479	4,694	724,781
Blackburn (1982)	9,581,923	1,938,408	1,884,096	1,792,102	2,008,218	1,805,820	10,728,237	1,804,581	31,543,385
Grant Canyon (1983)	1,411,727	397,888	417,564	431,433	435,004	425,905	438,911	390,927	4,349,359
Kate Spring (1986)	2,567,161	483,483	521,464	515,205	457,264	451,878	417,030	431,321	5,844,806
Tomera Ranch (1987)	146,723	31,121	33,245	0	94,643	169,487	23,393	0	498,612
N. Willow Creek (1988)	2,656	4	0	50	0	52	97	268	3,127
Three Bar (1990)	5,958	0	0	0	0	0	0	0	5,958
Duckwater Creek (1990)	49,188	840	1,196	4,778	4,442	2,503	1,013	1,410	65,370
Sans Spring (1993)	1,386,668	328,544	240,773	324,585	326,943	290,961	317,230	238,854	3,454,558
Ghost Ranch (1996)	274,641	202,678	208,488	188,592	155,714	123,897	254,781	497,386	1,906,177
Deadman Creek (1996)	0	0	0	0	0	0	0	0	0
Sand Dune (1998)	23,335	53,115	33,308	34,369	32,123	32,624	30,807	31,933	271,614
Total	32,008,078	6,566,127	6,825,137	6,361,658	5,931,540	5,649,404	14,299,582	5,894,597	83,536,123
Change from previous year		4.90%	3.90%	-6.80%	-6.80%	-4.80%	153.1%	-58.8%	



Oligocene Indian Well Formation, and the Cretaceous Newark Formation (sandstone and carbonate) between about 5,720 and 7,070 feet. One producer has been shut in since 1994 and the other since 1992. Deadman Creek's only producer, which produced briefly from the Miocene Humboldt Formation 8,165-8,850 feet, was plugged and abandoned in 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 2005.

## NEW PRODUCERS

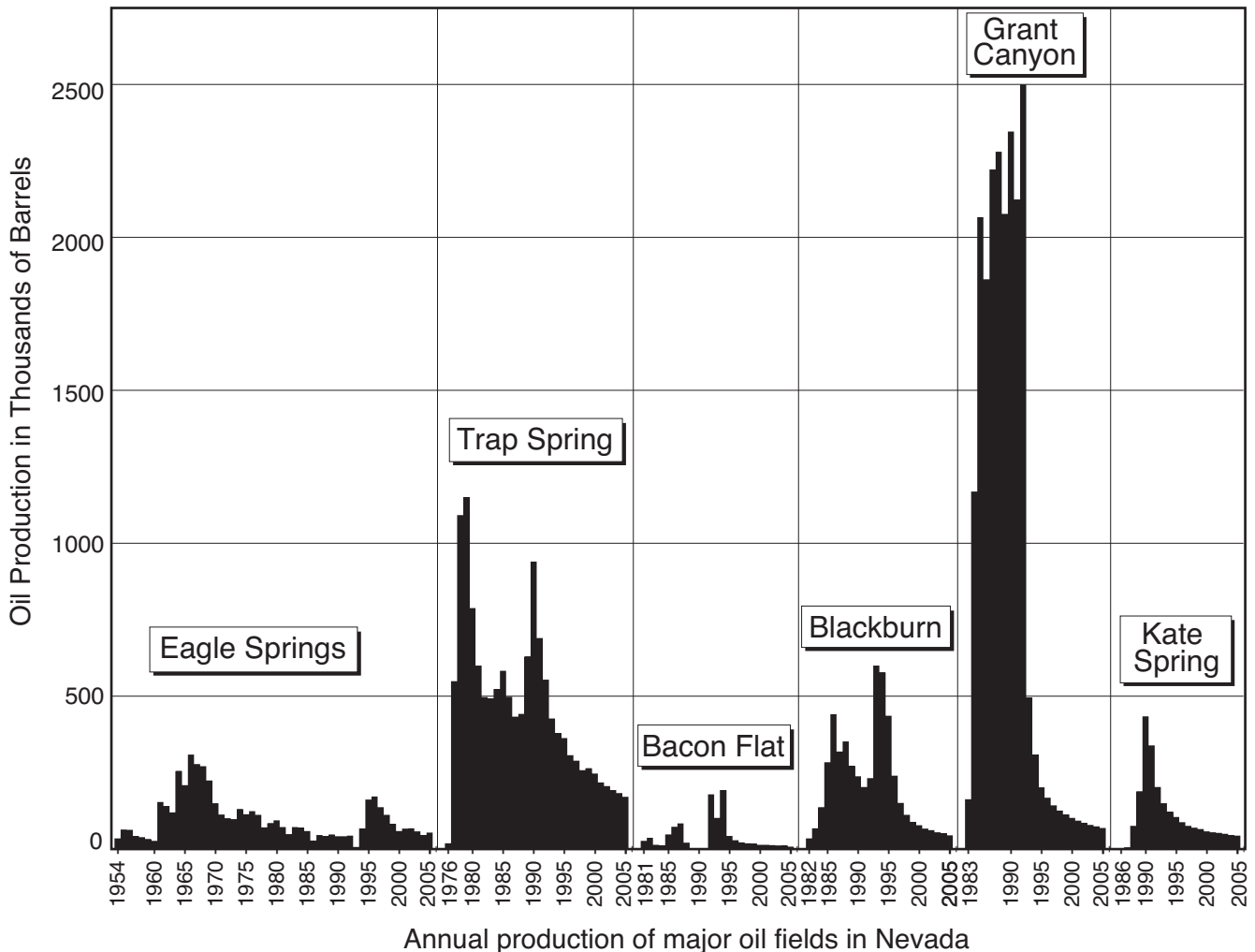
Nevada gained one new producer in 2005, which was in the Trap Spring Field. Makoil, Inc. completed the East Inselberg No. 36-33 on April 22, 2005 as a producer with a total depth of 1,322 feet. The well produced 322 barrels of oil and 2,962 barrels of water during 39 days of production between April and August, 2005, and then

was shut in. The casing was perforated in three places between 1,034 and 1,171 feet in Tertiary lacustrine limestone. The initial 24-hour test produced 30 barrels of 15o gravity oil and 90 barrels of water.

## EXPLORATION

Seven wells were permitted for oil and gas in 2005, down from 13 in 2004. Ten wells were spudded in 2005, up from six spudded in 2004. Drilling was completed on five of these wells, on one spudded in 2003, and two spudded in 2004, totaling 21,451 feet, down 38% from 34,769 feet in 2004. These figures will be revised in the future as the information from several wells was either still confidential or had not been provided to the Division of Minerals as of the time of this writing. Of the three wells spudded in 2005 but not completed, three were still waiting for a completion rig, and two were temporarily abandoned. Eleven wells drilled between 1993 and 2004 continued to be listed as either temporarily abandoned, testing, or suspended.

Two drill rigs operated during the periods January/February and March/April. Five drill rigs operated during



<b>NEVADA OIL REFINERIES</b>		
<b>Company</b>	<b>Refinery</b>	<b>Address and Phone Number</b>
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

<b>NEVADA OIL PRODUCERS</b>			
<b>Company</b>	<b>Field</b>	<b>Contact</b>	<b>Address and Phone and FAX Numbers</b>
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

the period May/June. Three rigs operated during the periods July/August and November/December. One rig operated during the period September/October.

In 2005, 1,445 oil leases totaling 1,861,349 acres were in effect in Nevada, up 20.7% and down 16.6% respectively from 2004. This is about 3.9% of the public lands managed by the U.S. Bureau of Land Management (BLM) in Nevada and covers an area larger than the State of Delaware.

On March 8, 2005, the Nevada State Office of the Bureau of Land Management held an oil and gas lease sale on 95 parcels covering 189,189 acres in Eureka, Nye, and White Pine Counties. The bonus bids totaled \$31,262 on 3 parcels covering 5,436 acres, which averaged \$5.75 per acre. The highest bid was \$6.75 per acre made by East Guadalupe Resources, LLC, of Bandera, TX, for Parcel No. 17 covering 1,920 acres in all of sections 13, 14, and 24, T5N, R54E. The second highest bid was \$6.50 per acre also made by East Guadalupe Resources, LLC, for Parcel No. 16 covering 1,691 acres in lots 1-4 in each of sections 1 and 2 and all of sections 11 and 12, T5N, R54E. Both are in southern Railroad Valley in Nye County. The third bid was \$4.00 per acre made by Dolar Energy, LLC, of Midvale, UT, for Parcel No. 95 covering 1,825 acres in portions sections 5, 6, 7, and 18, T10N, R62E in eastern White River Valley in White Pine County (PI/Dwight Plus Drilling Wire, Rocky Mountain Region, Four Corners Edition, Section I, January 26, 2005; [www.nv.blm.gov/minerals/oil\\_and\\_gas/Sales\\_2005/200503Sale/0503SALE\\_RESULTS.htm](http://www.nv.blm.gov/minerals/oil_and_gas/Sales_2005/200503Sale/0503SALE_RESULTS.htm); [www.nv.blm.gov/minerals/oil\\_and\\_gas/Sales\\_2005/200503Sale/0503FINLLST.htm](http://www.nv.blm.gov/minerals/oil_and_gas/Sales_2005/200503Sale/0503FINLLST.htm)).

On June 14, 2005, the Nevada State Office of the Bureau of Land Management held an oil and gas lease sale on 344 parcels covering 710,215 acres in Eureka, Nye, and White Pine Counties. The bonus bids totaled \$3,077,367 on 163 parcels covering 335,537 acres, which averaged \$9.17 per acre. The highest bid was \$95 per acre made by Fasken Nevada-1, LLC, of Midland, TX, for Parcel 225 covering 2,307 acres in section 5, T28N, R53E and sections 10 and 30, T29N, R53E and Parcel 230 covering the 640 acres of section 35, T28N, R53E in Elko County. The next two highest bids were \$75 and \$85 per acre. Ten parcels brought bids between \$51 and \$65 per acre, eight parcels brought bids between \$21 and \$50 per acre, 46 parcels brought bids between \$2.25 and \$20 per acre, and the rest brought the \$2.00 per acre minimum (PI/Dwight Plus Drilling Wire, Rocky Mountain Region, Northern Edition, Section I, June 20, 2005).

On September 13, 2005, the Nevada State Office of the Bureau of Land Management held an oil and gas lease sale on 114 parcels covering 181,058 in Clark, Eureka, Nye, and White Pine Counties. The high bids totaled \$727,749 on 59 parcels covering 86,224 acres, which averaged \$8.44 per acre. The highest bid was \$67 per acre made by Tierra Nevada Exploration Partners, LP, of New York, for Parcel 114 covering 1,078 acres in sections 10, 11, 14, and 23, T10N, R57E in Nye County.

The next three highest bids were \$65 per acre each. Five parcels brought bids between \$25 and \$40 per acre, 14 parcels brought bids between \$3 and \$19, and the rest brought the \$2.00 per acre minimum (PI/Dwight Plus Drilling Wire, Rocky Mountain Region, Southeastern Edition, Section I, September 1, 2005; PI/Dwight Plus Drilling Wire, Rocky Mountain Region, Southeastern Edition, Section I, September 15, 2005).

On December 13, 2005, the Nevada State Office of the Bureau of Land Management held an oil and gas lease sale on 597 parcels covering 1,166,594 acres in Elko, Humboldt, Lincoln, Nye, Pershing, and White Pine Counties. The bonus bids totaled \$1,187,990 on 162 parcels covering 307,107 acres, which averaged \$3.87 per acre. The highest bid was \$66 per acre made by the Richardson Production Company of Greenwood Village, CO, for Parcel 374 covering 2,000 acres in sections 9, 10, 11, 14, and 23, T7N, R55E in Nye. The next highest bids were for \$32, \$45, and \$60 per acre. Nine parcels brought bids between \$11 and \$20 per acre, and 32 parcels brought bids between \$3 and \$10 per acre, and the rest brought the \$2.00 per acre minimum (PI/Dwight Plus Drilling Wire, Rocky Mountain Region, Four Corners Edition, Section I, November 9, 2005; PI/Dwight Plus Drilling Wire, Rocky Mountain Region, Newsletter Edition, Section I, December 16, 2005).

## TRANSFERS

Energy Operations of Nevada acquired Yankee Mine West No. 1, Permit 867, and Yankee Mine West No. 2, Permit 871, in October 2005. Geysir Petroleum acquired Santa Maria de Los Angeles No. 1, Permit 875, from the Sawyer Oil and Gas Company in December 2005.

## OTHER DEVELOPMENTS

The RAND Corporation issued a study entitled Oil Shale Development in the United States, Prospects and Policy Issues, which can be viewed at [www.rand.org/pubs/monographs/2005/RAND\\_MG414.pdf](http://www.rand.org/pubs/monographs/2005/RAND_MG414.pdf). It notes that production of oil from oil shales with the current technology of mining and retorting would be expensive, and the oil produced would cost between \$70 and \$95 per barrel. However, Shell Oil Company is presently experimenting with insitu heating using coils and recovering the fluids from wells. This technology seems promising and could potentially produce oil at less than \$30 per barrel. Perfection of this technology is probably about 6 years away with potential commercial use at least 12 years away.

The report emphasizes the large oil shale deposits in the Green River Formation in Colorado, Utah, and Wyoming, but Nevada is briefly mentioned. It should be noted that northeastern Nevada has an estimated 600 million barrels of shale oil in the lacustrine Eocene Elko Formation (12,000 barrels were produced between 1917 and 1924) and a potentially large but unestimated

resource in related rocks (L.J. Garside, 1983, Nevada Oil Shale, Nevada Bureau of Mines and Geology Open-File report 83-5).

The Energy Policy Act of 2005 directed the Secretaries of Agriculture, Commerce, Defense, Energy, and the Interior to designate corridors on federal land in 11 western states for oil, gas, and hydrogen pipelines and electricity transmission lines and related structures. These “energy corridors” would be designated in Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming. The results of this study are to be reported in a programmatic environmental impact statement (PEIS) entitled, Designation of Energy Corridors on Federal Land in the 11 Western States. The U.S. Bureau of Land Management conducted public scoping meetings in 2005, and issued a report on them in early 2006. A draft PEIS is tentatively scheduled completion in the Fall of 2006. For more information and a copy of the scoping report, please visit the website: <http://corridoreis.anl.gov>.

## **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](http://www.eia.doe.gov)), crude oil imports accounted for 66.7% of U.S. consumption in 2004, a new all time peak. U.S. crude oil consumption decreased 2.1% to 15.37 million barrels per day in 2005 after increasing 1.1% in 2004, and production averaged 5.12 million barrels per day, down about 5.5% from 5.42 million barrels per day in 2004. The annual production for 2005 has been the lowest since 1949 when production was 5.046 million barrels per day. Oil provided about 40.51% of the nation’s total energy supply in 2005, up slightly from 40.46% in 2004. This is the highest percentage since 1988 when it was 41.3%.

The consumption of oil for electrical production increased 1.5% to 172,407,000 barrels in 2005 from 169,788,000 barrels in 2004. It accounted for 3.0% of electrical production and 3.1% of oil consumption in 2005, about even with 3.0% and 3.2% respectively in 2004. Gasoline production decreased 1.0% and accounted for 44.2% of all oil products consumption in 2005, up slightly from 43.3% in 2004. This percentage has hovered near 43% since 1982. The price of domestic oil increased 36.7% to \$50.26 per barrel in 2005 from an average of \$36.77 per barrel in 2004 ([www.eia.doe.gov](http://www.eia.doe.gov)).

In comparison to oil, natural gas consumption decreased 2.0% to 21,980,633 million cubic feet (mmcf) in 2004 from 22,430,225 mmcf in 2004. Consumption peaked at 23,333,121 mmcf in 2000, and had been consistently above 22,000,000 between 1995 and 2004. Production decreased 2.3% to 23,509,461 mmcf in 2005 from 24,055,432 mmcf in 2004. Production peaked at 24,500,779 mmcf in 2001, but has been consistently above 20,000,000 mmcf since 1987 and above 22,000,000 mmcf since 1992. Natural gas provided 22.6% of the nation’s total energy supply in 2005, down slightly from 22.9% in 2004, and a peak of 25.0% in 1995. It accounted for 18.6% of electrical production and 26.4.3% of natural gas consumption in 2005, up from 17.8% and 24.3% respectively in 2004. Except for a dip in 2003 and 2004, the electrical production from natural gas has been increasing since 1996 and reached a new high of 5,796,736 mmcf for that period in 2005. Industrial, residential, and commercial consumption decreased 8.4%, 1.0%, and 2.8% respectively in 2005. Vehicular fuel consumption of natural gas rose 8.5% in 2005 and has been consistently rising at least since 1997. The average well-head price increased 65.0% to \$9.01 per million feet (mcf) in 2005 from \$5.46 per mcf in 2004. The monthly average price of natural gas has been consistently above \$3 per mcf since October 2002 and above \$5 per mcf since January 2004 ([www.eia.doe.gov](http://www.eia.doe.gov)).

Coal consumption in the United States increased 1.9% in 2005 to a record 1,128,299,000 (short) tons from 1,107,255,000 tons in 2004. Consumption has remained over 1 billion tons since 1996. Domestic coal production increased 1.9% to 1,133,253,000 tons in 2005 from 1,112,099,000 tons in 2004 and surpassed the previous peak production of 1,127,689,000 tons in 2001. Production has remained over 1 billion tons since 1994. Coal provided 22.9% of the nation’s total energy supply in 2005, up slightly from 22.4% in 2004. This percentage has hovered between 22% and 23% since 1983. Production of electricity accounted for 92.1% of coal consumption in 2005, up from 91.8% in 2004. The consumption of coal for electrical production increased 2.2% in to 1,038,962,000 tons in 2005 from 1,016,268,000 tons in 2004 and has over 1 billion tons since 2003. It accounted for 49.9% of electrical production in 2005, up slightly from 49.8% in 2004. This share peaked at 56.9% in 1998, and has been consistently over 50% between 1980 and 2003. The average price of coal delivered to electrical utilities increased 13.2% to \$30.91 per ton in 2005 from \$27.28 per ton in 2004 ([www.eia.doe.gov](http://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	Company/Contract Employees	Address
<b>CARSON CITY</b>							
<b>Goni Pit</b>	Cinderlite Trucking Corp.	S28,T16N,R20E	decomposed granite sand gravel	OP,ML	mining crushing screening	5/1	1665 South Sutro Terrace Carson City, NV 89706 775-882-4483 Fax: 882-1671 www.cinderlite.com
<b>CHURCHILL COUNTY</b>							
<b>Celite Mine</b>	World Minerals, Inc.	S8,17,T19N,R26E	diatomite	OP,ML	mining classification drying grinding milling	16/2	100 Front St. Fernley, NV 89408 775-575-2536 Fax: 575-4857 www.worldminerals.com
<b>Desert Mountain Aggregate Pit</b>	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
<b>Huck Salt</b>	Huck Salt Co.	S11,12,13,T16N,R31E; S7,T16N,R32E	salt	OS	mining solar evaporation	6	2900 Phritzie Lane Fallon, NV 89406 775-423-2055 Fax: 423-0467
<b>Moltan Mine and Plant</b>	Moltan Co., LP	S28,32, T23N,R27E	diatomite	OP,ML	mining crushing drying packaging screening	56	P.O. Box 860 I-80 Frontage Rd. Fernley, NV 89408-0860 775-423-6668 Fax: 423-6411 www.moltan.com
<b>Popcorn Mine</b>	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
<b>CLARK COUNTY</b>							
<b>American Sand and Gravel Pit No. 1 (Salt Lake Highway Pit)</b>	American Sand and Gravel, LLC	S24,T19S,R62E	sand gravel	OP,ML	mining gravity	7	5260 Beesley Dr. Las Vegas, NV 89115 702-452-1900 Fax: 651-0375
<b>American Sand and Gravel Pit No. 2 (Lone Mountain)</b>	American Sand and Gravel, LLC	S36,T19S,R59E	sand gravel	OP,ML	mining gravity	3	5260 Beesley Dr. Las Vegas, NV 89115 702-452-1900 Fax: 651-0375
<b>Apex Landfill Pit</b>	Las Vegas Paving Corp.	S19,T18S,R64E	sand gravel	OP,ML	mining crushing screening	26/5	4420 S. Decatur Boulevard Las Vegas, NV 89103 702-251-5800
<b>Apex Quarry and Plant</b>	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 www.chemicallime.com
<b>Apex Quarry</b>	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
<b>Blue Diamond (Jones) Pit</b>	Las Vegas Paving Corp.	S26,T22S,R60E	sand gravel	OP,ML	mining crushing screening	54	4420 South Decatur Blvd. Las Vegas, NV 89103 702-251-5800
<b>Blue Diamond Mine and Plant</b>	BPB Gypsum, Inc.	S24-26, T21S, R58E; S20, 29-31, T21S, R59E; S5-8, T22S, R59E	gypsum	OP,ML	mining calcining grinding	28	HCR 89033 Box 2900 Las Vegas, NV 89124 Phone: 702-875-4111 FAX: 702-875-4213 www.bpb-na.com
<b>Bootleg Pit</b>	Boulder Sand and Gravel, Inc.	S8,T23S,R64E	sand gravel	OP,ML	mining crushing	9	P.O. Box 62186 Boulder City, NV 89006

continued

**DIRECTORY OF MINING AND MILLING OPERATIONS (continued)**

Mine/plant name	Operator	Location	Commodity	Type	Process/ activity	Company/Contract Employees	Address
<b>CLARK COUNTY (continued)</b>							
<b>Charlie Brown Construction No. 2</b>	Charlie Brown Construction	S29,T19S,R60E	gravel	OP,ML	mining crushing	3	801 Colton Ave. North Las Vegas, NV 89030 702-399-6600 Fax: 702-399-1641
<b>East Pit</b>	Various (BLM manages pit)	S2,11,12,14 T21S,R62E	sand gravel	OP,ML	mining crushing screening		Bureau of Land Management 4701 North Torrey Pines Drive Las Vegas, NV 89130-2301 702-515-5000 www.blm.gov
<b>El Dorado Canyon (Railroad Pass) Quarry</b>	Rinker Materials Corp.	S11,T23S,R63E	sand gravel	OP,ML	mining crushing screening	36/3	7150 Pollock Dr. Las Vegas, NV 89119 702-260-9900 Fax: 702-260-9901 www.csra.com/nevada
<b>Gornowich Pit</b>	Impact Sand and Gravel	S15,22,T22S,R63E	sand gravel	OP,ML	mining crushing screening		250 Pilot Rd., Suite No. 160 Las Vegas, NV 89120 702-597-1010
<b>Henderson Plant</b>	Chemical Lime Co.	S12,T22S,R62E	lime	ML	calcining	29	P.O. Box 127 BMI Complex Henderson, NV 89015 702-565-8991 Fax: 702-565-5902 www.chemicallime.com
<b>Infiniton</b>	Infiniton, LLC	S19,T13S,R66E	sand gravel	OP	mining	18	7885 Westwind Rd. Las Vegas, NV 89139 702-617-1893 Fax: 702-644-6541
<b>Jean Pit</b>	Various (BLM manages pit)	S14,15,21,23,26, 27,28,33,34,35 T24S,R60E	sand gravel	OP,ML	mining crushing screening		Bureau of Land Management 4701 North Torrey Pines Drive Las Vegas, NV 89130-2301 702-515-5000 www.blm.gov
<b>Jetco Enterprises</b>	Jetco Enterprises, Inc.	S33,T30S,R65E	decorative rock	OP	mining	3	2076 Mohigan Way Las Vegas, NV 89109 702-734-2129 Fax: 702-369-9294
<b>KMI Zeolite Plant</b>	KMI Zeolite, Inc.	S3,T25S,R57E	zeolite	ML	processing	4	HCR 37 Box 52 Sandy Valley, NV 89019 702-723-5415
<b>Lone Mountain</b>	Diamond Const.	S36,T19S,R59E	sand gravel	OP,ML	mining gravity	22	7885 Westwind Road Las Vegas, NV 89139 702-644-1016 Fax: 702-644-6541
<b>Lone Mountain</b>	Hollywood Gravel, Inc.	S35,T19S,R59E,	sand gravel	OP,ML	mining crushing screening	11/1	5145 South Rogers St., Suite A-1 Las Vegas, NV 89118 702-870-7094 Fax: 870-8114
<b>Lone Mountain</b>	Las Vegas Paving Corp.	S3,T20S,R60E	sand gravel	OP,ML	mining crushing screening	38/5	4420 South Decatur Blvd. Las Vegas, NV 89103 702-251-5800
<b>Lone Mountain</b>	Nevada Ready Mix Corp.	S36,T19S,R59E	sand gravel	OP,ML	mining crushing screening	88	601 West Bonanza Las Vegas, NV 89106 702-457-1115
<b>Lone Mountain Stocks Pit</b>	Southern Nevada Paving	S34,35,T19S,R59E; S3,4,11,T20S,R59E	sand gravel	OP,ML	mining crushing screening	9	3555 Polaris Avenue Las Vegas, NV 89102 702-876-5226
<b>Lone Mountain Community Pit</b>	Various (BLM manages pit)	S36,T19S,R59E; S1,T20S,R59E	sand gravel	OP,ML	mining crushing screening		Bureau of Land Management 4701 North Torrey Pines Drive Las Vegas, NV 89130-2301 702-515-5000 www.blm.gov
<b>Moapa Pit</b>	Ready Mix, Inc.	S22,27,T14S,R66E	aggregate decorative rock	OP,ML	mining milling	20	3430 East Flamingo Road, Suite 100 Las Vegas, NV 89021 702-433-2090 Fax: 702-433-0189 www.readymixinc.com
<b>Money Pit</b>	Southern Nevada Liteweight, Inc.	S16,T25S,R61E	sand	OP,ML	mining milling	14	1101 E. Alexander Rd. Las Vegas, NV 89030 702-399-8621 Fax: 702-633-5787 www.snlsand.com
<b>PABCO Gypsum-Apex Pit</b>	Pacific Coast Building Products, Inc.	S7,18,T20S,R64E	gypsum	OP,ML	mining crushing washing	129	1973 N. Nellis Boulevard No. 328 Las Vegas, NV 89115 702-643-1016 Fax: 643-6249 www.paccoast.com

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**DIRECTORY OF MINING AND MILLING OPERATIONS (continued)**

Mine/plant name	Operator	Location	Commodity	Type	Process/ activity	Company/Contract Employees	Address
<b>CLARK COUNTY (continued)</b>							
<b>PABCO Gypsum-Apex Pit</b>	Pacific Coast Building Products, Inc.	S7,18,T20S,R64E	gypsum	OP,ML	mining crushing washing	164	1973 North Nellis Blvd., No. 328 Las Vegas, NV 89115 702-643-1016 Fax: 643-6249 www.paccoast.com
<b>Pioneer Gypsum Mine</b>	D.L. Denman Construction Co.	S30,T19S,R64E	gypsum	OP	mining	7	4880 Donovan Way North Las Vegas, NV 89031 702-399-5939 Fax: 702-399-8353
<b>Pipes Pit</b>	Pipes Paving	S1,T20S,R59E	sand gravel	OP,ML	mining crushing screening	7	3529 Clayton North Las Vegas, NV 89032 702-647-1162 Fax: 702-647-2387
<b>Racetrack Pit</b>	Las Vegas Paving Corp.	S26,T19S,R62E	sand gravel	OP,ML	mining crushing screening		4420 South Decatur Blvd. Las Vegas, NV 89103 702-251-5800
<b>Rainbow Quarries</b>	Las Vegas Rock, Inc.	S34,T25S,R58E	gravel stone	OP,ML	mining crushing	15	11635 Bermuda Rd. Henderson, NV 89052 702-429-4103 Fax: 702-896-4533 www.vegasrock.com
<b>Salt Lake Highway Pit</b>	Various (BLM manages pit)	S13,24,T19S,R62E; S17,18,19,T19S,R63E	sand gravel	OP	mining		Bureau of Land Management 4701 North Torrey Pines Drive Las Vegas, NV 89130-2301 702-515-5000 www.blm.gov
<b>Simplot Silica Products Pit</b>	Simplot Silica Products	S11,T17S,R67E	silica sand	OP,ML	mining drying flotation screening	45	P.O. Box 308 Overton, NV 89040 702-397-2667 Fax: 397-2798
<b>Sloan Quarry &amp; Mill</b>	Bardon Materials	S13,T23S,R60E	sand gravel	OP,OS, ML	mining crushing screening	88	3920 West Hacienda Ave. Las Vegas, NV 89118 702-876-5226 Fax: 702-876-6808 www.aggregate-us.com
<b>Spanish Trails Pit</b>	Hollywood Gravel, LP	S28,T21S,R60E	sand gravel	OP,ML	mining crushing screening	3	908 South Valley View Blvd. Las Vegas, NV 89107 702-870-7094 Fax: 702-870-8114
<b>Spring Mountain Pit and Mill</b>	Wells Cargo, Inc.	S10,15,T21S,R60E	sand gravel	OS,ML	mining gravity	14	P.O. Box 81170 Las Vegas, NV 89160 702-873-7440 Fax: 702-873-1696 www.wellscargoconstruction.com

**DOUGLAS COUNTY**

<b>Bing Materials Pit and Plant</b>	Bing Materials Co.	S16,T12N,R20E	sand gravel	OP,ML	mining crushing screening	9	P.O. Box 487 Minden, NV 89423 775-265-3641
<b>Dressler Pit</b>	A and A Construction, Inc.	S32,33,T12N,R20E	sand	OS,ML	mining screening	1	P.O. Box 995 Minden, NV 89423 775-782-5957 Fax: 775-782-0322

**ELKO COUNTY**

<b>Boehler Pit</b>	Boehler Construction Co.	S12,T34N,R55E	aggregate sand gravel	OP,ML	mining crushing	7	P.O. Box 789 2755 Last Chance Rd. Elko, NV 89803 775-738-8155, Fax: 775-738-8851
<b>Capstone Mine</b>	Newmont Mining Corp.	S10,T36N,R49E	gold silver mercury	OP,HL, ML	mining heap leach milling	1844 <sup>1</sup>	P.O. Box 669 Carlin, NV 89822-0669 775-778-4000 Fax: 778-4757 www.newmont.com
<b>Dunphy Mill</b>	BAROID/Halliburton Energy Services, Inc.	S26,T33N,R48E	barite	ML	crushing gravity grinding	28	912 Dunphy Ranch Road Battle Mountain, NV 89820 775-468-0515 Fax: 775-468-2060 www.halliburton.com
<b>Elburz Pit</b>	Vega Construction and Trucking Co.	S9,T33N,R52E	sand gravel	OP,ML	mining crushing screening	23	P.O. Box 1630 Elko, NV 89803 775-738-5381 Fax: 775-738-6311

*continued*

<sup>1</sup>Combined Newmont Carlin Trend Operations.

**DIRECTORY OF MINING AND MILLING OPERATIONS (continued)**

Mine/plant name	Operator	Location	Commodity	Type	Process/ activity	Company/Contract Employees	Address
<b>ELKO COUNTY (continued)</b>							
<b>Jerritt Canyon Mine</b>	Queenstake Resources USA, Ltd.	T39-41N,R52-54E	gold silver mercury	UG,ML	mining heap leach milling	416/40	HC31 Box 78 Elko, NV 89801 775-738-5006 Fax: 775-758-9231 www.queenstake.com
<b>Meikle Mine</b>	Barrick Gold Corp.	S12,13,T36N,R50E	gold silver	UG,ML	mining milling roasting	500	P.O. Box 29 Elko, NV 89803 775-738-8043 Fax: 775-738-6543 www.barrick.com
<b>Midas Mine</b>	Newmont Mining Corp.	S21,22,27,28,33,34; T39N,R46E	gold silver	UG,ML	mining milling	217	HC66 Box 125 Midas, NV 89414 775-635-6423 Fax: 635-6460 www.newmont.com
<b>Pilot Peak Quarry and Plant</b>	Graymont Western U.S., Inc.	S14,15,22,23,26, T34N,R68E	limestone	OP,ML	mining grinding roasting rotary kiln	58	P.O. Box 2520 West Wendover, NV 89883 775-483-5463 Fax: 483-5149
<b>Rain Mine</b>	Newmont Mining Corp.	S33,T32N,R53E	gold silver mercury	UG HL,ML	mining heap leach milling	1844 <sup>1</sup>	P.O. Box 669 Carlin, NV 89822-0669 775-778-4000 Fax: 778-4757 www.newmont.com
<b>Rossi Mine</b>	BAROID/Halliburton Energy Services, Inc.	S14-16,21-23,26-28, 34-35;T37N,R49E	barite	OP,ML	mining	2/20	912 Dunphy Ranch Road Battle Mountain, NV 89820 775-468-0515 Fax: 468-2060 www.halliburton.com

**ESMERALDA COUNTY**

<b>Basalt Mine and Plant</b>	Grefco Minerals, Inc.	S23-26,T2N,R33E; S28,29,32,T2N,R34E	diatomite	OP,ML	drying milling	4	P.O. Box 288 Mina, NV 89422-0288 775-573-2422 Fax: 775-573-2422 www.grefco.com
<b>Blanco Mine</b>	Vanderbilt Minerals Corp.	S22,T1N,R37E	clay	OP	mining bagging grinding screening	4	3561 Burgundy Dr. Pahrump, NV 89048 775-537-6976 Fax: 775-537-6879 www.rtvanderbilt.com
<b>Mineral Ridge Mine</b>	Golden Phoenix Minerals, Inc.	S1,2,12,T2S,R38E; S6,T2S,R39E	gold silver	OP,UG, HL	mining heap leach	3	1675 East Prater Way, Suite 102 Sparks, NV 89434 775-853-4919 Fax: 775-853-5010 www.golden-phoenix.com
<b>Rulco (Alum Mine)</b>	Rulco, LLC	S32,33,T1N,R38.5E	potassium sulfate	OP,ML	crushing milling shipping	2/2	1019 CR330 Ignacio, CO 81137 970-883-2468 Fax: 970-883-2469
<b>Mineral Ridge Mine</b>	Golden Phoenix Minerals, Inc.	S1,2,12,T2S,R38E; S6,T2S,R39E	gold silver	OP,UG, HL	mining heap leach	39	1675 East Prater Way, Suite 102 Sparks, NV 89434 775-853-4919 Fax: 853-5010 www.golden-phoenix.com
<b>Silver Peak Operations</b>	Chemetall Foote Corp.	S22,T2S,R39E	lithium carbonate	OS,ML	mining solar evaporation precipitation	50/9	P.O. Box 98 Silver Peak, NV 89047 775-937-2222 Fax: 775-937-2250 www.chemetall.com

**EUREKA COUNTY**

<b>Betze/Post Mine</b>	Barrick Gold Corp.	S23-26,T36N,R49E; S12,20,29,30; T36N,R50E	gold	OP,CIL, HL,ML	mining heap leach milling	1107	P.O. Box 29 Elko, NV 89803 775-738-8043 Fax: 775-738-6543 www.barrick.com
<b>Carlin North Genesis Complex</b>	Newmont Mining Corp.	S33,T36N,R50E	gold	OP,HL, ML	mining bioleaching heap leach milling roasting	1844 <sup>1</sup>	P.O. Box 669 Carlin, NV 89822-0669 775-778-4000 Fax: 775-778-4757 www.newmont.com
<b>Carlin North-Post and adjacent mines</b>	Newmont Mining Corp.	S19,T36N,R50E	gold	OP,HL, ML	mining bioleaching heap leach milling roasting	1844 <sup>1</sup>	P.O. Box 669 Carlin, NV 89822-0669 775-778-4000 Fax: 775-778-4757 www.newmont.com

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<sup>1</sup>Combined Newmont Carlin Trend Operations.



**DIRECTORY OF MINING AND MILLING OPERATIONS (continued)**

Mine/plant name	Operator	Location	Commodity	Type	Process/ activity	Company/Contract Employees	Address
<b>EUREKA COUNTY (continued)</b>							
<b>Carlin South-Carlin and adjacent mines</b>	Newmont Mining Corp.	S14,T35N,R50E	gold	UG,HL,ML	mining bioleaching heap leach milling roasting	1844 <sup>1</sup>	P.O. Box 669 Carlin, NV 89822-0669 775-778-4000 Fax: 775-778-4757 www.newmont.com
<b>Carlin South-Gold Quarry and adjacent mines</b>	Newmont Mining Corp.	S3,T33N,R51E	gold	OP,HL,ML	mining bioleaching heap leach milling roasting	1844 <sup>1</sup>	P.O. Box 669 Carlin, NV 89822-0669 775-778-4000 Fax: 775-778-4757 www.newmont.com
<b>Ruby Hill Mine</b>	Barrick Gold Corp.	S9-11,14,15 T19N,R53E	gold silver	OP,CIL, CIP,HL, ML	heap leach milling	85/4	P.O. Box 676 Eureka, NV 89316 775-237-6060 Fax: 775-237-5408 www.barrick.com

**HUMBOLDT COUNTY**

<b>Ashdown Mine</b>	Golden Phoenix Minerals, Inc.	S17,T47N,R30E	molybdenum gold	UG	mining development	12	1675 East Prater Way, Suite 102 Sparks, NV 89434 775-853-4919 Fax: 775-853-5010 www.golden-phoenix.com
<b>Hycroft Mine</b>	Hycroft Resources and Development, Inc.	S26,T35N,R29E	gold silver	OP,HL	heap leach	4/3	P.O. Box 3030 Winnemucca, NV 89446 775-623-5260 Fax: 775-623-0215 www.vistagold.com
<b>Lone Tree Mine (Lone Tree Complex)</b>	Newmont Mining Corp.	S1,11,13,15,23, T34N,R42E	gold silver	OP,HL,ML	mining flotation heap leach milling	586 <sup>2</sup>	P.O. Box 388 Valmy, NV 89438-0388 775-635-9000 Fax: 775-635-0111 www.newmont.com
<b>Marigold Mine</b>	Glamis Gold, Inc.	S8,9,18-20, T33N,R43E	gold silver	OP,HL,ML	mining heap leach milling	178/90	P.O. Box 160 Valmy, NV 89438 775-635-2317 Fax: 635-2551 www.glamis.com
<b>MIN-AD Mine</b>	MIN-AD, Inc.	S28,T35N,R38E	dolomite	OP,ML	mining grinding	16/4	P.O. Box 39 Winnemucca, NV 89446 775-623-5944 Fax: 623-9028 www.min-ad.com
<b>Rainbow Ridge Opal Mine</b>	Rainbow Ridge Opal Mines, Inc.	S22,23,T45N,R26E	opalized wood precious opal	OP	mining	1	P.O. Box 97 Denio, NV 89404 775-941-0270 (summer) 541-548-4810 (winter) www.nevadaopal.com
<b>Royal Peacock Opal Mine</b>	Walter Wilson	S30,T45N,R26E	precious opal	OP	mining	1	P.O. Box 165 Denio, NV 89404 775-941-0374 (summer) 775-272-3246 (winter) www.royalpeacock.com
<b>Turquoise Ridge Joint Venture</b>	Barrick Gold Corp.	S33, T39N,R42E	gold silver	UG	mining	302/73	HC 66 Box 220 Golconda, NV 89414-9702 775-529-5001 Fax: 775-529-0753 www.placerdome.com
<b>Twin Creeks Mine</b>	Newmont Mining Corp.	S3-10,15-22,27-32 T39N,R43E	gold silver	OP,HL,ML	mining heap leach milling	567	P.O. Box 69 Golconda, NV 89414 775-623-4300 Fax: 775-635-4602 www.newmont.com

**LANDER COUNTY**

<b>Argenta Mill</b>	Baker Hughes INTEQ	S6,T32N,R47E	barite	ML	gravity grinding	6	P.O. Box 277 Battle Mountain, NV 89820 775-635-5441 Fax: 775-635-5455 www.bakerhughes.com
<b>Argenta Mine</b>	Baker Hughes INTEQ	S13,14,T32N,R46E S18,19,T32N,R47E	barite	OP	mining	13	P.O. Box 277 Battle Mountain, NV 89820 775-635-5441 Fax: 775-635-5455 www.bakerhughes.com

<sup>1</sup>Combined Newmont Carlin Trend operations.

<sup>2</sup>Combined Lone Tree, Mule Canyon, Phoenix, and Trenton Canyon.

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**DIRECTORY OF MINING AND MILLING OPERATIONS (continued)**

Mine/plant name	Operator	Location	Commodity	Type	Process/ activity	Company/Contract Employees	Address
<b>LANDER COUNTY (continued)</b>							
<b>Battle Mountain Grinding Plant</b>	M-I Swaco	S18,T32N,R45E	barite	ML	gravity grinding	37	P.O. Box 370 Battle Mountain, NV 89820 775-635-5135 Fax: 775-635-2191 www.midf.com
<b>Blue Ridge Mine</b>	Jay and Grace Wintle	S19,20,29,30, T28N,R47E	turquoise	OP	mining screening sorting	2	810 Sheep Creek Road Battle Mountain, NV 89820 775-635-5231
<b>Cortez/Pipeline Mines</b>	Barrick Gold Corp.	S31,33,34, T28N,R47E	gold	OP,CIL, HL,ML	mining heap leach milling	488/43	P.O. Box 29 Elko, NV 89803 775-738-8043 Fax: 738-6543 www.barrick.com
<b>Greystone Mine</b>	M-I Swaco	S35,T28N,R45E	barite	OP,ML	mining gravity	48	P.O. Box 370 Battle Mountain, NV 89820 775-635-5135 Fax: 775-635-2191 www.midf.com
<b>McCoy/Cove Mine</b>	Newmont Mining Corp.	S1-11,T28N,R42E; S36,T29N,R42E	silver gold	OP,UG	reclamation	8	P.O. Box 1658 McCoy Mine Road, No. 1 Battle Mountain, NV 89820 775-635-4923 Fax: 775-635-4921 www.newmont.com
<b>Mule Canyon Mine (Lone Tree Complex)</b>	Newmont Mining Corp.	S4,T31N,R47E	gold silver	OP	mining	586 <sup>2</sup>	P.O. Box 388 Valmy, NV 89438-0388 775-635-9000 Fax: 775-635-0111 www.newmont.com
<b>Phoenix Project</b>	Newmont Mining Corp.	S22,27,33,34, T31N,R43E	gold silver	OP,HL, ML	mining heap leach	586 <sup>2</sup>	P.O. Box 388 Valmy, NV 89438-0388 775-635-9000 Fax: 775-635-0111 www.newmont.com
<b>Trenton Canyon Mine</b>	Newmont Mining Corp.	S7,18,19, T32N,R43E	gold silver	OP,HL, ML	mining heap leach	586 <sup>2</sup>	P.O. Box 388 Valmy, NV 89438-0388 775-635-9000 Fax: 775-635-0111 www.newmont.com

**LINCOLN COUNTY**

<b>Natural Pozzolan of Nevada</b>	Natural Pozzolan of Nevada, LLC	S25,36,T1S,R67E	pozzolan	OP,ML	mining crushing screening	5	P.O. Box 308 450 East Main Panaca, NV 89042 877-676-7699 www.naturalpozzolan.com
<b>Tenacity Perlite Mine and Mill</b>	Wilkin Mining and Trucking Co.	S34,T4S,R62E	perlite	OP,ML	mining milling	8	P.O. Box 829 Panaca, NV 89042 775-728-4463 Fax: 775-728-4456

**LYON COUNTY**

<b>Adams Claim Gypsum Mine</b>	Art Wilson Co.	S25,T16N,R20E	gypsum limestone	OP,ML	mining crushing screening	47	P.O. Box 20160 Carson City, NV 89702 775-882-0700 Fax: 882-0790 www.awgypsum.com
<b>Hazen Pit</b>	Eagle-Picher Filtration and Minerals, Inc.	S6,9,T19N,R26E	diatomite	OP	mining	2	640 Clark Station Rd. Sparks, NV 89434 775-824-7700 Fax: 824-7715 www.epcorp.com
<b>Mound House Pit</b>	Bardon Materials	S19,T16N,R21E	sand gravel	OP,ML	mining crushing screening	9	3920 West Hacienda Ave. Las Vegas, NV 89118 702-876-5226 Fax: 702-876-6808 www.aggregate-us.com
<b>Nevada Cement Mine</b>	Nevada Cement Co.	S3-6,9,T19N,R25E; S31-33,T20N,R25E	limestone clay	OP	mining	11	P.O. Box 840 Fernley, NV 89408 775-575-2281 Fax: 775-575-4387 www.eaglematerials.com

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<sup>1</sup>Combined Newmont Carlin Trend operations.

<sup>2</sup>Combined Lone Tree, Mule Canyon, Phoenix, and Trenton Canyon.

**DIRECTORY OF MINING AND MILLING OPERATIONS (continued)**

Mine/plant name	Operator	Location	Commodity	Type	Process/ activity	Company/Contract Employees	Address
<b>LYON COUNTY (continued)</b>							
Nevada Cement Plant	Nevada Cement Co.	S10,11,T20N,R24E	limestone clay	ML	crushing dry milling rotary kiln	104	P.O. Box 840 Fernley, NV 89408 775-575-2281 Fax: 575-4387 www.eaglematerials.com
Yerington Plant	Grant Smith Associates, Inc.	S4,T12N,R25E	sand gravel	OS,ML	mining crushing screening	22	435 Highway 339 Yerington, NV 89447 775-463-3111 Fax: 775-463-4642
<b>MINERAL COUNTY</b>							
Denton-Rawhide Mine	Kennecott Rawhide Mining Co.	S4,5,8,16,17, T13N,R32E	gold silver	OP,HL	heap leach	18/4	P.O. Box 2070 Fallon, NV 89407 775-945-1015 Fax: 775-945-1213 www.kennecottminerals.com
<b>NYE COUNTY</b>							
Ash Meadows Plant	Ash Meadows Zeolite, LLC	S25,T18S,R50E	unaltered ash zeolite	ML	crushing screening packaging	3	HCR 70, Box 7006 Amargosa Valley, NV 89020 775-372-5524 Fax: 775-764-0090 www.badgerminingcorp.com
Bolling (Simkins) Pit	Bolling Construction, Inc.	S26,T19S,R53E	sand gravel	OP,ML	mining milling	17	651 East Wilson Pahrump, NV 89048 775-727-7070 Fax: 775-727-6432
Borasky Pit	A. Borasky Excavating	S29,T20S,R53E	gravel	OP,ML	mining screening	2	1640 Manse Road Pahrump, NV 89048 775-751-1862 Fax: 775-751-2649
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	7	4745 Mitchell St. North Las Vegas, NV 89031 702-651-1550 Fax: 702-651-1551 www.abmnv.com
Gabbs Mine	Premier Chemicals, LLC	S22,23,25-27,34-36, T12N,R36E	magnesite	OP,ML	mining calcining	78	P.O. Box 177 Gabbs, NV 89409 775-285-2601 Fax: 775-285-4030 www.premierchemicals.com
IMV Pits	Mud Camp Mining Co., LLC	S28,29,T17S,R49E	clay	OP,ML	mining milling	29	Route Box 549 Amargosa Valley, NV 89020 775-372-5341 Fax: 775-372-5640
Lathrop Mill	American Borate Co.	S36,T17S,R49E	calcium borate	ML	calcination flotation	3	American Borate Co. HCR 70 Box 610 Amargosa Valley, NV 89020 775-372-5339
Mesquite Community Pit	Various (BLM manages pit)	S12,T20S,R53E	sand gravel	OP	mining		Bureau of Land Management 4701 North Torrey Pines Dr. Las Vegas, NV 89130-2301 702-515-5000 www.blm.gov
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: 775-537-6879 www.rtvanderbilt.com
P and S	Standard Industrial Minerals, Inc.	S11,14,15, T13N,R45E	barite	OP	mining shipping	2	P.O. Box 10477 Reno, NV 89510 775-324-1334 Fax: 775-324-2458
Pahrump Community Pit	Various (BLM manages pit)	S28,29,T20S,R54E	sand gravel	OP	mining		Bureau of Land Management 4701 North Torrey Pines Dr. Las Vegas, NV 89130-2301 702-515-5000 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	636	P.O. Box 480 Smoky Valley Mine Rd. Round Mountain, NV 89405 775-377-2366 Fax: 775-377-3224 www.kinross.com

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**DIRECTORY OF MINING AND MILLING OPERATIONS (continued)**

Mine/plant name	Operator	Location	Commodity	Type	Process/ activity	Company/Contract Employees	Address
<b>NYE COUNTY (continued)</b>							
Royal Royston	Dean Otteson and Danny Otteson	S31,T6N,R40E	turquoise	OP	mining	2	P.O. Box 564 Tonopah, NV 89049 970-375-2401 www.roystonturquoise.com
Silica LLC Pit	American Cement and Aggregate	S29,T15S,R54E	silica sand	OP	mining		639 East Brooks Avenue North Las Vegas, NV 89030 702-642-9350
<b>PERSHING COUNTY</b>							
Buff-Satin Mine	Vanderbilt Minerals Corp.	S2,T27N,R32E	clay	OP	bagging grinding screening	4	3561 Burgundy Dr. Pahrump, NV 89048 775-537-6976 Fax: 775-537-6879 www.rtvanderbilt.com
Coeur Rochester Mine	Coeur Rochester, Inc.	S9-11,15,16,21,27, 28,T28N,R34E	silver gold	OP,HL, ML	mining heap leach milling	206	P.O. Box 1057 Lovelock, NV 89419 775-273-7995 Fax: 273-7050 www.coeur.com
Colorado Mines	Eagle-Picher Filtration and Minerals, Inc.	S6,7,16,18,21,25, T28N,R29E	diatomite perlite	OP,OS	mining	29	P.O. Box 959 150 Coal Canyon Road Lovelock, NV 89419 775-824-7540 Fax: 775-824-7582 www.epcorp.com
Colorado Plant	Eagle-Picher Filtration and Minerals, Inc.	S33,T28N,R32E	diatomite perlite	ML	drying classification grinding calcining	88	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: 775-557-2212 www.usg.com
Florida Canyon Mine	Florida Canyon Mining, Inc.	S1-4,9-15,T31N,R33E; S37-39,T31½N,R33E; S33-35,T32N,R33E	gold	OP,HL, ML	mining heap leach milling	100 <sup>3</sup> /4 <sup>3</sup>	P.O. Box 330 Imlay, NV 89418 775-538-7300 Fax: 775-538-7324 www.jipangu.co.jp
Nassau (Section 8) Mine	American Colloid Co.	S8,T27N,R33E	clay	OP	mining shipping	4	P.O. Box 2010 Belle Fourche, SD 57717 605-892-6371 Fax: 605-892-3178 www.colloid.com
Standard Mine	Standard Gold Mining, Inc.	S1,12,T30N,R33E; S35,T31N,R33E	gold	OP,HL ML	mining heap leach milling	100 <sup>3</sup> /4 <sup>3</sup>	P.O. Box 330 Imlay, NV 89418 775-538-7300 Fax: 775-538-7324 www.jipangu.co.jp
W. Glen Sexton Family Trust	Nutritional Additives Co.	S5,T34N,R38E	dolomite	OP,ML	mining milling	3	415 Wellington Street Winnemucca, NV 89445 775-623-1151 Fax: 775-623-1153
<b>STOREY COUNTY</b>							
All-Lite Pit and Plant	All-Lite Aggregate	S26,33,34, T19N,R22E	sand gravel	OS,ML	mining crushing screening	31	P.O. Box 51990 3005 Canyon Way Sparks, NV 89434 775-342-0500
Basalite Dayton Pit	Basalite Division of Pacific Coast Building Products	S8,9,16,17, T17N,R22E	sand gravel	OS,ML	mining crushing milling	6	2600 Boeing Way Carson City, NV 89701 775-882-9336 Fax: 775-887-1025 http://basalite.paccoast.com
Billie the Kid Mine	The Plum Mining, Co., LLC	S6,T16N,R21E	gold silver	OP,HL, ML	mining heap leach milling	19/10	P.O. Box 1118 Virginia City, NV 89440 775-847-5272 Fax: 847-4762 www.goldspring.us
Clark Mill	Eagle-Picher Filtration and Minerals, Inc.	S35,T20N,R23E	diatomite	OP,ML	mining	54	640 Clark Station Rd. Sparks, NV 89434 775-824-7700 Fax: 775-824-7715 www.epcorp.com
Clark Mine	Eagle-Picher Filtration and Minerals, Inc.	S27,33,34, T20N,R23E	diatomite	ML	calcining classification drying grinding	15	640 Clark Station Rd. Sparks, NV 89434 775-824-7700 Fax: 824-7715 www.epcorp.com

<sup>3</sup>Combined Florida Canyon and Standard Mines.

**DIRECTORY OF MINING AND MILLING OPERATIONS (continued)**

Mine/plant name	Operator	Location	Commodity	Type	Process/ activity	Company/Contract Employees	Address
<b>WASHOE COUNTY</b>							
<b>Bella Vista Pit</b>	A and K Earthmovers	S3,4,T18N,R20E; S33,34,T19N,R20E	sand rock	OP,ML	mining crushing screening	14	P.O. Box 1059 1200 Auction Rd. Fallon, NV 89407 775-423-6085 Fax: 775-423-8410 www.akearthmovers.com
<b>Clay Mine and Mill</b>	Art Wilson Co.	S13,14,T27N,R19E	clay	OP,ML	mining milling	3	P.O. Box 20160 Carson City, NV 89721 775-882-0700 Fax: 882-0790 www.awgypsum.com
<b>Empire Mill</b>	United States Gypsum Co.	S11,13,T31N,R23E	gypsum	ML	calcining crushing	120	P.O. Box 130 Empire, NV 89405 775-557-2341 Fax: 557-2212 www.usg.com
<b>Golden Valley Pit</b>	A and K Earthmovers	S11,12,T19N,R20E	aggregate	OP,ML	mining screening	3	P.O. Box 1059 1200 Auction Rd. Fallon, NV 89407 775-423-6085 Fax: 423-8410 www.akearthmovers.com
<b>Hidden Canyon</b>	Granite Construction Co.	S16,T20N,R20E	aggregate	OP,ML	mining crushing screening washing	5/7	P.O. Box 2087 1900 Glendale Ave. Sparks, NV 89432 775-355-3434 Fax: 775-329-2803 www.graniteconstruction.com
<b>Lemon Valley Pit</b>	Martin Marietta Minerals	S23,24,T21N,R19E	sand		shipping	2	11059 Pyramid Lake Rd. Sparks, NV 89436 775-425-4455 Fax: 425-5131 www.martinmarietta.com
<b>Lockwood Quarry</b>	Granite Construction Co.	S17,T19N,R21E	aggregate	OP,ML	mining crushing screening washing	19	P.O. Box 2087 1900 Glendale Ave. Sparks, NV 89432 775-355-3434 Fax: 329-2803 www.graniteconstruction.com
<b>Mustang Pit</b>	Bardon Materials	S4,T19N,R21E	aggregate	OP,ML	mining crushing screening	30	3920 West Hacienda Ave. Las Vegas, NV 89118 702-876-5226 Fax: 702-876-6808 www.aggregate-us.com
<b>Paiute Pit</b>	Paiute Aggregates Inc.	S2,27,34, T21N,R24E	sand gravel	OP	mining	13	10 Hill Ranch Rd. Wadsworth, NV 89442 775-575-1162
<b>Rilite Aggregate Pit</b>	Rilite Aggregate Co.	S23,T18N,R20E	sand rock	OP,ML	mining crushing grinding	15	3025 Mill St. Reno, NV 89502 775-329-8842 Fax: 775-329-3593
<b>Spanish Springs Quarry</b>	Martin Marietta Minerals	S15, T21N,R20E	aggregate	OP,ML	mining crushing screening	25	11059 Pyramid Lake Rd. Sparks, NV 89436 775-425-4455 Fax: 425-5131 www.martinmarietta.com
<b>Wade Sand Pit</b>	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: 775-329-2803 www.graniteconstruction.com

**WHITE PINE COUNTY**

<b>Bald Mountain Mine</b>	Barrick Gold Corp.	S14,15,19,20 T24N,R57E	gold	OP,HL, ML	mining heap leach milling	162	P.O. Box 29 Elko, NV 89803 775-738-8043 Fax: 775-738-6543 www.barrick.com
<b>Mount Moriah Quarry</b>	Mt. Moriah Stone Quarries, LLC	S27,34-36 T16N,R70E	building stone decorative stone	OP	mining	40	P.O. Box 35 No. 10 Hatch Rock Rd. Baker, NV 89311 435-855-2232 Fax: 775-855-2332
<b>Robinson Mine</b>	Robinson Nevada Mining Co.	S6,8,17,18, T16N,R62E	copper gold	OP,ML	mining milling	438	P.O. Box 382 Ruth, NV 89319 775-289-7000 Fax: 775-289-7103 www.placerdome.com
<b>Star Dust Mines</b>	Dunbar Stone Co.	S22,23,26,35, T16N,R70E	buildin stone decorative stone	OP	mining	5	P.O. Box 430 Chino Valley, AZ 86323 928-637-2592

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

### **Statewide Commodity Publications**

Antimony (B61)	Oil and gas (B104, OF01-7, OF04-1)
Barite (B98)	Radioactive minerals (B81, OF06-19)
Fluorspar (B93)	Talcoses minerals (B84)
Gypsum (B103)	Thermal waters (B91, M141, M151)
Iron (B53)	Tungsten (B105)
Mercury (B41)	Zeolites (B79)
Montmorillonite, bentonite, and fuller's earth (B96)	

### **County Mineral Resource Bulletins**

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

### **Other Publications**

- Index to geothermal well files housed at NBMG (L-5)
- Gold and silver resources in Nevada (M149)
- Geothermal resources (M141)
- Industrial mineral deposits (M142)
- Nevada oil and gas well database (OF04-1)
- Major mines of Nevada 2005 (P-17)
- Outline of Nevada mining history (SP15)
- Mining districts of Nevada (R47)

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



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